BIOCELL
2008, 32(2): A33-A101

ISSN 0327 - 9545
PRINTED IN ARGENTINA

TUCUMAN BIOLOGY ASSOCIATION

(Asociación de Biología de Tucumán)

Abstracts from the

XXIV ANNUAL SCIENTIFIC MEETING

November 8 – 10, 2007
Tafí del Valle, Tucumán, Argentina

The abstracts have been revised and evaluated by the Scientific Committee
of the Tucuman Biology Association

1.

DIFFUSION OF Ca $(OH)_2$ PASTES WITH IRRIGATING SOLUTIONS IN ROOT DENTIN

Bulacio MA, de la Casa ML, López G, Sáez M, Raiden G.
Department of Endodontics. School of Dentistry. National University of Tucuman. Argentina.

The purpose of this study was to compare pastes diffusion on dentin using a dye indicator.
Eighteen recently extracted human teeth were used. Crowns were amputated and a standardized well was prepared on the buccal face. A step-back technique was used. The pieces were irrigated with a NaOCl 1% solution and an EDTA 17% solution as final irrigation. Cement was removed and root canals were filled with Ca $(OH)_2$ pastes: $Ca(OH)_2$ + physiological solution, $Ca(OH)_2$ + NaOCl 1%, $Ca(OH)_2$ + Chlorhexidine 1%. These vehicles were also used as controls. Apex and access were sealed with glass ionomer cement and the pieces were placed in Eppendorf tubes containing physiological solution. After 21 days, roots were divided into three thirds and dyed, observed and measured using a magnifying glass. The ANOVA test revealed no significant differences in the dyed surfaces in any of the experimental groups. Dentin was not dyed in the control group.
All pastes used showed a similarly colored dentinal surface. The middle third was the least dyed.
Calcium Hydroxide-Sodium Hypochlorite–Chlorhexidine.
Partially supported by CIUNT

2.

BIOCHEMICAL ANALYSIS OF CREVICULAR FLUID IN AGGRESSIVE PERIODONTITIS BEFORE AND AFTER TREATMENT

Castro CE[2], Koss MA[1], López ME[1].
[1]Cát Química Biológica, [2]Cátedra Periodoncia, Facultad de Odontología, UNT. E-mail: cecilia.castro@odontología.unt.edu.ar

Inflammation is associated with vascular exudate, which can be collected from the gingivo-crevicular fluid (GCF) to analyze the inflammatory and destructive process in biochemical terms. The objective of this work was to determine the chemical changes in GCF during Aggressive Periodontitis (AP) before and after periodontal treatment. Forty-six patients with diagnosis of AP and 20 controls (21-35 yrs old) were included in the study. Samples of GCF were collected from 6 places of the buccal cavity 30 d after the basic therapy was carried out. Periodontal diagnosis included plaque and gingival indices, probing depth, insertion level and bleeding. Inclusion criteria were: absence of systemic illnesses, previous periodontal therapy and no use of antibiotics or anti-inflammatories for the last 6 months. Aspartate Amino transferase (AST), Lactate Dehydrogenase (LDH), Alkaline Phosphatase (AP), Collagenase (zimography), hydroxiproline and proteins were determined. Statistically significant differences ($p<0.01$) were found for AST, LDH and AP, proteins and hydroxiproline decreases. Zimography showed lower collagenolytic activity. Biochemical determinations in GCF could be used as inflammation markers in AP.

3.

ORAL LESIONS, SALIVARY AND CREVICULAR FLUID CHEMICAL PARAMETERS IN HIV/AIDS

Salúm MK[1], Recúpero G[2], Luna E[2], Valdez C[2], Costilla Campero G[3], López ME[1].
[1]Cát Química Biológica, [2]Servicio de Infectología, Hosp Centro de Salud, [3]Hosp Padilla, Fac. Odontología, UNT.
E-mail: karina.salum@odontología.unt.edu.ar

Numerous buccal lesion can appear during the progress of AIDS. The aim of this work was to relate oral lesions to immunological conditions and chemical parameters in total saliva (TS) and gingivo-crevicular fluid (GCF). One hundred HIV+ patients (Elisa+Western Blot) >500 cells/µl (n=52), 200-500 cells/µl (n=27), <200 cells/µl (n=21) were included, with no Antiretroviral Treatment (ARVT) (n=39) or low ARVT (n=61). Diagnosis of oral lesions (OL) was carried out following A-C Clearing-House (1993). Buccal pathologies were related to demographic data, immune suppression, ARVT, chemical determinations in TS (Total Proteins (TP), Mucins and Peroxidase) and GCF (TP, Hydroxiproline (Hpo), Lactate Dehydrogenase (LDH) and Glutamic Oxalacetic Transaminase (GOT). The Chi-square test was applied. No relationship was found between OL and sex, age, infection route, instruction level or ARVT, while there was a relation between OL and smoking and between OL and <200 cells/µl. No relation was found between OL and TP, Hpo, LDH or GOT in GCF. Pseudomembranose Candidiasis, periodontal disease and neoplasia are related to the progression of the disease, while Eritematose Candidiasis was present. High values of TP and muccoproteins in TS would be related to bacterial lesions and xerostomy to a subclinical disease in the salivary glands.

4.

USE OF MEDICATIONS FOR PREVALENT ORAL DISEASES IN PRIMARY HEALTH CARE CENTERS (PHCC) IN TUCUMAN

Basualdo M, Mitre P, Aybar E, Luna S.
Fac. de Odontología, UNT. E-mail: basualdo52@yahoo.com.ar

Caries and periodontal illness have increased in the last decades due to poor oral hygiene, higher carbohydrate consumption, deficient nutrition and lack of access to antimicrobial agents. Risk groups are those with low socioeconomic levels that do not receive regular dental care or have no access to dental services. The purpose of this work was to determine the supply of medications with respect to dose and time and to evaluate the prescriptive pattern provided to dentists in different public health care programs. A descriptive cross-sectional study was carried out. A test with closed questions was given to dentists of the primary health car centers (PHCC) in the eastern and western 6th area of Tucumán, Argentina. Results: medication of choice for toothache was ibuprofen, administered every 8 h for 3 or 5 days. Paracetamol was used for pregnant women. First choice medication for abscesses was ibuprofen plus amoxicillin. As a second choice dexametasone with amoxicillin and ibuprofen was resorted to in some cases and, in others, dipyrone-metronidazol. Choice of treatment depended not only on the infection but also on the existing medication supply, duration of treatment and dose required. In some cases treatment was changed due to lack of antibiotics with Betalactamase inhibitors or of clorhexidine glyconate 0.12% for local use. Conclusion: more effective drugs such as diclofenac, ketorolac, clorhexidine glyconate 0.12% and systemic antibiotics with IBL should be supplied to CAPS in order to prevent more serious complications.

5.

INMUNOCOMPLEX GLOMERULONEPHRITIS: EXPERIMENTAL MODEL VALIDATION

Sosa ML, Gómez J, Abdala M, Alonso J, Andrés J, Fontenla M, Valdez E, Uñates J, Prchal A, Remis J, F. de Petrino S.
Cát. Biología, Facultad de Medicina, UNT. Avda Roca 2100-PB. S.M. de Tucumán. E-mail: cbiologia@fm.unt.edu.ar

We designed an experimental model of inmunocomplex glomerulonephritis (GN) and validated it with functional and biochemical tests and histopathological and inmunohistochemical analyses. Male 3 month old Wistar rats (n=8) were used. GN induction was carried out by bovine serum albumin inoculation. Proteinuria was detected after 4 weeks of GN induction, and 5 weeks after that, animals were sacrificed by anaesthesia overdose and analyses carried out. Nephritic animals showed marked disorders in all biochemical determinations (proteinuria, creatinine clearance, uremia, proteinemia, lipidic profile). Kidney histology demonstrated glomerular hypercellularity with inflammatory infiltrates and glomerular capillary basal membrane thickening. IgG inmunocomplexes were found by inmunofluorescence, correlated with electron dense deposits in the epithelial basal membrane. Electron microscopy also showed basal membrane thickening and podocyte structural disorders. All these data validate our experimental model.

6.

RELATIONSHIP BETWEEN TSH WITHIN NORMAL RANGES, BMI AND SMOKING

Villagra MV, Garcia MI, Montanaro SB, Lopez SB, Parnás PS, Nieva MA.
Catedra de Bioquímica Clínica II - Inst of Applied Biochemistry, UNT. Balcarce 747. E-mail: mvousset@yahoo.com.ar

Introduction: numerous reports have demonstrated the effect of smoking on the thyroid gland and on the metabolic condition of individuals; smoking has been identified as a risk factor for autoimmune thyroiditis and goiter. **Objective:** to evaluate the relationship between TSH, BMI and smoking. **Materials and Methods:** 398 patients aged 15-76 with TSH 0.3 to 5 µU/mL were classified into smokers (S) and non-smokers (NS). Height (m), weight (K) and serum TSH (immunoradiometric method) were determined. BMI: weight/ height^2. **Results:** TSH (µU/mL) in 294 patients: NS: 1.74 ± 0.99 and 104; S: 1.62±0.90. TSH averages for BMI (<o=25): NS: 1.74 ± 1.01; S: 1.32 ± 0.73; BMI (25-30): NS: 1.90 ± 1.10; S: 1.54±0.80; BMI (30-40): NS: 1.59±0.92; S: 1.88±1.01; BMI (>40): NS: 1.78 ± 0.80; S: 2.15 ± 1.20. **Conclusion:** the Chi square test indicated that there is no relation between TSH and BMI; however, there is a direct proportional relation between BMI and TSH for the S risk group.

7.

GENDER DETERMINATION THROUGH DNA AMPLIFICATION OF SALIVA AND BLOOD SAMPLES

Zenteno N, Abramovich M, Orresta M, Palermo A, Ferrari M.
Cát. de Odontología Legal y Forense. Fac. de Odontología-UNT. Av. B. Aráoz 800. Tucumán. Argentina. Tel. (0381–4107319). E-mail: nezevasc@yahoo.com.ar

Small amounts of saliva samples are found in cigarette butts, envelopes, stamps, stained clothes, chewing gum, muzzles, glasses, etc. In the saliva buccal ephitelium cells are found from which DNA is obtained. In sexual chromosomes there numerous genetic markers that can be used for specific purposes. **Objectives:** to amplify DNA through blood and saliva samples to determine gender. **Materials and methods:** blood and saliva samples were collected from men and women with their previous informed consent. For DNA extraction a commercial matrix was used (Whatman FTA Elute®). Amplification was performed with a commercial mix (Hot Master Mix from Eppendorf®) and two primers. Amplification products were evaluated in agarose gels 2% with 0.5–2 ug/ml of Etidio Bromide. **Results:** The results of the amplification by PCR of amelogenine loci showed only one band for females and two bands for males. The mix of AMEL F and AMEL R gave amplificons of 542 (X) and 368 (Y) pairs of bases visible in agarose gels of 1.5 %-2%. **Conclusion:** saliva is a good fluid for DNA obtainment. The primer AMEL F loses specificity associated with other sites in the DNA chain. Spurious products could be removed by modifying hybridation temperature.

8.

ADAPTATION OF RIA DESIGNED FOR THE QUANTITATIVE MEASUREMENT OF URINARY FREE CORTISOL (UFC) TO CHEMIO-LUMINESCENT-ENZYME-IMMUNOASSAY (CLIA)

Bettolli R, Paez JB.
ASUNT, Tucumán.

Introduction: Cortisol is an indicator of adrenocortical function; the measurement of urinary free cortisol (UFC) levels is useful in the differential diagnostic of several diseases. **Objective:** the adaptation of RIA designed for the quantitative measurement of UFC to CLIA. **Material and methods:** 24-hour urinary samples from 10 patients; 2 levels of quantitative urine controls (CUV); dichloromethane (CH_2Cl_2), cortisol diluent (CD), reagents for cortisol determination by RIA and CLIA. **Procedure:** 0.75ml urine + 1.5ml CH_2Cl_2 (vortex 2 min) was centrifuged for 5 min (3000rpm). We worked with a lower phase (organic extract, OE) and continued with the RIA procedure. In another tube 0.6ml OE was evaporated to complete dryness at room temperature (dry extract, DE). Once dry, 0.3ml CD (protein extract, PE) was added and processed by RIA and CLIA. **Results:** intra-assay precision (within-run) showed variation coefficients (VC) <4% for patient samples and 10% for CUV. By linear regression: 1) CLIA-RIA: slope=1.02, intercept=0.3. 2) CLIA–conventional RIA: slope=1.05, intercept=0.5. **Conclusion:** our VCs were lower than the manufacturer's. This led us to suppose that the extraction steps did not add significant variability. We have no explanation for higher VC with CUV, but we think that it may be due to the matrix effect. Linear regression results showed how similar are the two methods.

9.

ANTIXENOSIS EVALUATION IN BEAN GERMOPLASM (*Phaseolus vulgaris* L.) AGAINST *Bemisia tabaci* Gennadius

Melchiorre GB, Truol G, Di Feo L del V.
Instituto de Fitopatología y Fisiología Vegetal. Instituto Nacional de Tecnología Agropecuaria (IFFIVE-INTA). Camino 60 Cuadras Km 5 ˚. 5119. Córdoba. E-mail: gabrielamelchiorre@hotmail.com

One of the main limitations to bean yields is the whitefly *Bemisia tabaci.* It is an important worldwide pest that causes direct and indirect damages leading to yield decrease in crops. The objective was to evaluate antixenosis by the analysis of attraction and oviposition preference of *Bemisia tabaci*, biotype A, in seven bean cultivars, using free choice tests. The following parameters were measured: number of adults on the abaxial leaf surface; number of eggs/ leaf; number of eggs/ cm^2; the attraction index (AI) and the oviposition preference index (OPI) were calculated. Genotypes Light Red Kidney and Gateado had the highest number of eggs/leaf. Both cultivars and Alubia, the susceptible control, showed the greatest values for number of eggs/ cm^2 and OPI. On the other hand, AI was highest for Light Red Kidney, Gateado and Alubia. This last genotype showed the highest values for both AI and OPI indexes. We may conclude that Borlotti Bush, Borlotti Clio, Borlotti Lengua de Fuego and Cannellini were the most resistant cultivars to *B. tabaci* while Alubia, Light Red Kidney and Gateado expressed greatest susceptibility to the insect.

10.

FALL ARMYWORM STRAINS (LEPIDOPTERA: NOCTUIDAE) IN ARGENTINA. RESPONSE TO DIFFERENT MORTALITY FACTORS

Virla E, Álvarez A, Loto F, Baigorí M, Pera L.
PROIMI-CONICET. Av. Belgrano y Pje caseros. SM de Tucumán (4000). E-mail: lymb@arnet.com.ar

The fall armyworm (FAW) is a polyphagous pest that causes important damage in different regions of the American continent. There are at least two morphologically identical FAW host strains. The rice strain is associated with rice and bermudagrass, while the corn strain predominates on corn, sorghum and cotton. The purpose of this work was to identify FAW host strains in Argentina and to determine their response to different mortality factors. Bioassays were conducted by using pesticides (chlorpyriphos and cypermethrin), transgenic corns (Cry 1Ab and Cry 1F) or an indigenous *Bacillus thuringiensis* strain (RT 3). Strain specificity was determined by the presence of diagnostic mitochondrial markers. Mean survival time data were analyzed by using NTSYS program (SM coefficient and UPGMA). Four rice and eleven corn strain populations were found in Argentina. The numerical analysis clearly revealed two major clusters at a similarity level of 54%. Cluster A comprised seven FAW populations, all of these identified as corn strain, while cluster B included both rice (4) and corn (4) FAW strains.

Acknowledgments: PICTO-UNT 761 and PIP 6062.

11.

FAUNAL ANALYSIS OF PARASITOIDS ATACKING AGROECOSYSTEM SOYBEAN PESTS IN TUCUMÁN

Berta DC[1,2], Colomo MV[1], Valverde L[1], Romero Sueldo M[1], Dode M[1]. [1]Fund. M. Lillo, Miguel Lillo 251, 4000 S.M. de Tucuman. [2]CONICET. E-mail: dcberta@csnat.unt.edu.ar

The analysis of the biodiversity of natural enemies that attack soybean agroecosystem pest species in Tucumán is focused on parasites because of their role as efficient insect pest controllers. The objective of this work was to perform a faunal analysis of hymenoptera and diptera parasites associated with the crop and surrounding weeds. During the soybean harvest campaign (2005-2006) weekly samplings were conducted in three commercial batches: INTA (Leales Department), Tala Pozo and road to Cañete (Burruyacu Department). Sampling was conducted on each batch in three transects. In addition to the systematic analysis, the rates of occurrence and dominance were considered. Twenty-four families of parasitoids, 20 of which belonged to Hymenoptera and four to Diptera, were recorded. Thirty-six genera and eight species, most of them belonging to the Braconidae family, were recorded. The highest indices were obtained for Encyrtidae (Hym.), with dominance values of 66.18%; 46.22%; 67.43% and occurrence of 18.75%; 48.68%; 48.61% and for Phoridae (Dip), with 18.49%; 16.37%; 30.56% and 38.75% dominance and 52.63%; 30.56% occurrence. The main parasite due to its occurrence and dominance was *Copidosoma floridanum* (Ashmead) (Hym.), Encyrtidae), probably because of its polyembryonic status.

12.

EVALUATION OF SOWING MODALITIES AND EFFECT OF FERTILIZATION WITH LOMBRICOMPOST ON RADISH (*Raphanus sativus* L.) PRODUCTION

Villagra EL, Hecker LM, Argañaraz LM, Campo GC, Sotomayor C.
Horticulture. Dpto. Vegetable Crops. FAZ-UNT. Tucumán. Argentina. E-mail: evillagra@faz.unt.edu.ar

Field practices influence the growth and development of crops. Objective: to evaluate sowing modalities and effect of fertilization with lombricompost (LC) on radish crops. The assay was carried out in fields belonging to the Chair of Horticulture of the Faculty of Agronomy and Zoo techniques (FAZ), UNT. An experimental design with random blocks was used with six treatments (3 combined sowing modalities with and without fertilization) and three repetitions. The cv. round rosy or red with white tip type was sown. The treatments were:T1=broadcast sowing of 25 $kg.ha^{-1}$-without LC; T2 = broadcast sowing of 25 $kg.ha^{-1}$-with LC; T3=sowing in 3 lines 20 cm apart from each other and density of 25 $kg.ha^{-1}$-without LC; T4=sowing in 3 lines 20 cm apart and density of 25 $kg.ha^{-1}$-with LC; T5=sowing in 4 lines 15 cm apart and density of 33 $kg.ha^{-1}$-without LC; T6=sowing in 4 lines 15 cm apart and density of 33 $kg.ha^{-1}$-with LC. Three dm^3 of fertilized LC per lot was used. Two samplings of plants were carried out and evaluated: root, foliate and total fresh and dry weight; root and foliate length, plant size and mean root diameter. Data were analyzed with R and InfoStat software. The results showed a higher accumulation of dry matter in roots and aerial parts of the crops and an increase in the average root diameter in T2 (8.48) and T4 (9.48) with lombricompost, sowing in 4 lines being the least productive. Sowing modalities and fertilization affect radish yields.

13.

MIXED-SPECIES FLOCKS OF BIRDS IN THE SUBTROPICAL MONTANE FOREST (YUNGAS) IN TUCUMÁN, ARGENTINA

Fanjul ME, Echevarria AL, Nores M.
CONICET - Fundación Miguel Lillo. Miguel Lillo 251, Tucumán, Argentina. E-mail: mefanjul@arnet.com.ar

The aim of this work was to determine the structure, composition and social organization of the mixed-species flocks (MF) in the subtropical montane forest (Yungas) of Tucumán, Argentina. Three sampling sites were selected: Sierra de San Javier Biological Park (S.S.J.), Campo de los Alisos National Park (C.A.) and Higuerilla Farm (H.F. - Escaba). In each site 10 transects of 300 x 20 m, visited three times from June to August 2006-2007, were determined. The richness and abundance of each flock and the stratum and substratum used were recorded. A hundred and twenty-one MF were observed, with a total of 45 registered species. In S.S.J. we observed 51 MF, 27 species and 7.53 ind/MF. In C.A. 27 MF were observed, with 24 species and 5.26 ind/MF. In H.F. 46 BM were registered, with 35 species and 8.04 ind/MF. Six nuclear species were detected. Most of the flocks comprised 3 or 4 species, with a range of 2-13 species per flock. Foliage was the most used substratum and the most used strata ranged from 0-2 to 2-5 m. Flock formation would be an important tactic in the birds of Tucumán, mainly in the Sierra de San Javier Biological Park, followed by the Higuerilla Farm.

14.

BUCCAL HEALTH OF CHILDREN IN RELATION TO HABITS AND BIOCHEMICAL INDICATORS

Avellaneda RV[1], Vargas CF[2], Ibáñez HR[1], Fernández PM[1], López ME[2].
[1]Cátedra Odontopediatría, [2]Cátedra Química Biológica, Facultad de Odontología, UNT. Av B Aráoz 800. SM Tuc Arg. E-mail: rosavel2001@yahoo.com.ar

Numerous investigations have demonstrated a high prevalence of cavities in children in Tucumán as well as the need to teach them how to brush their teeth. The objective of this work was to examine the buccal health of a group of children in relation to their habits and to the chemical composition of total saliva.
Nine male and female 4-13 year old children were included in the study together with their clinical history, exploration and saliva samples. Flow rate, pH, proteins, calcium and phosphor were determined. Data were analyzed by ANOVA test. Results were compared with previous studies in children of both sexes (n=35, 3-11 yrs old) and without (n=10, 9-11 yrs) active caries. All children were born after a normal pregnancy, 2 were premature. They were all breast-fed for a minimum of 1 yr, and 4 were also bottle-fed until aged 3. All of them showed a normal general physical condition, with no diseases in the previous 20 d. They had no records of tonsillectomy or endocrine congenital illnesses. One boy only received previous dental care. Four showed high and 5 low cavity risk. Two showed an ogival palate, 1 dental packing and 1 an open bite. Calcium and pH showed statistically significant differences (p<0.05) with previous data. Demineralization due to poor dental hygiene was also found.

15.

ESTIMATION OF CHRONOLOGICAL AGE IN CHILDREN FROM NUMERIC VARIABLES RELATED TO THE APICAL SUPERFACE

Wuscovi LF, Aragón HN, López ME, Gordillo ME.
Cátedra Radiología, Fac Odontología, UNT. Av. B. Aráoz 800. S.M.Tucumán, Arg. E-mail: luisfernandowuscovi@hotmail.com

From the radiographic study of dental germs the chronological age of children can be predicted. Methods based on dental development are poor in accuracy. The aim of this study was to analyze the prediction of chronological age through measurement of the central and lateral incisors and upper canines using X-ray images. Children from a rural school comprising girls (n=18) (4-9 yrs) and boys (n=20) (3–9 yrs) were selected for this study. Maxillary X-rays of both sides were taken and a systematized technique was used. Chronological age was estimated from the date of birth. Images were digitized with 600 dpi resolution and analyzed with Image Tool 3.0 software. The triangular non calcified radiolucent surface located in the apical area and its vertex in the coronary direction was calculated. The linear regression test was applied (p>0.05). For girls, measures of central incisors were 0.13, of lateral incisors 0.15, and of canines, 0.69. For boys, measures of central incisors were 0.02, of lateral incisors 0.19, and of canines 0.046. A strong association exists between real age and surface X-ray measure in upper canines.

16.

DIFFERENT Ca $(OH)_2$ PASTES WITH IRRIGATING SOLUTIONS. SOLVENT ACTION

de la Casa ML, Bulacio MA, López G, Sáez M, López ME, Raiden G.
Department of Endodontics. School of Dentistry. National University of Tucuman. Argentina.

Calcium hydroxide has been extensively used as a temporary dressing medicament. Different vehicles have been proposed for mixing with Ca $(OH)_2$ powder such as distilled water, physiological solution, anesthetic solution, propyleneglycol and camphorated monochlorophenol. Recent studies have suggested the combination of Ca $(OH)_2$ powder with different irrigation solutions to improve tissue solvent capacity and antimicrobial effect, especially against *E. faecalis* and *Candida albicans*, which are resistant to traditional pastes (Stevens *et al*., 1983; Waltimo *et al*., 1999; Estrella *et al*., 2001).
The purpose of this study was to determine the solvent action different Ca $(OH)_2$ pastes on bovine pulp tissue. Bovine pulp from young animals was used to evaluate the action of Ca $(OH)_2$ + Chlorhexidine paste, Ca $(OH)_2$ + NaOCl 1% paste and Ca $(OH)_2$ + physiological solution paste at different time periods. The above vehicles were used as controls.
Data were statistically analyzed by the ANOVA test. Pulpar tissue diminished its weight with all pastes; none dissolved it. There were no statistical differences.
Calcium hydroxide- Sodium hypochlorite- solvent- Chlorhexidine gluconate.
Partially supported by CIUNT.

17.

CYTOLOGICAL STUDY OF PERIODONTAL POCKETS IN PATIENTS AT DIFFERENT CLINICAL STAGES

Koss MA[1], Carino S[2], Castro CE[3], Manlla AM[4], López ME[1]
[1]Cát Química Biológica, [2]Cát Anatomía Patológica, [3]Cát Periodoncia Fac Odontología, [4]CIDIE, Fac Agron Zoot. UNT. E-mail: myriam.koss@odontología.unt.edu.ar

Periodontitis (P) is a disease caused by many factors such as genetic susceptibility, presence of specific pathogens and immunoinflamatory response of the guest. The different degrees of Periodontitis are Slight (SP), Moderate (MP) and Advanced (AP). The aim of this work was to cytologically characterize the periodontal pocket of patients with P at different clinical stages through exfoliative cytology. This method allowed us to obtain material without destroying the tissue. Flaked superficial cells and, in a smaller proportion, intermediate cells of the spinout stratum could be observed as well as scarce transitory leucocyte-type cells with defense functions, hematies and microbial flora. Nineteen patients around 43 yrs old, 6 with SP, 6 with MP and 7 with AP were included in this study. The periodontal diagnoses were carried out by a gauged examiner. Samples were obtained from the soft wall of the periodontal pocket, fixed in alcohol 96º and colored with Papanicolau. Data were analyzed with the Kruskal-Wallis test. Results showed statistically significant differences in PMN and histiocytes ($p<0.01$), intermediate parabasal cells and microbial flora ($p<0.05$) for SP, MP and AP. Patients with a clinical diagnosis of MP or AP evidenced high tissue damage.

18.

SPINOCELLULAR CARCINOMA RELATED TO RISK FACTORS

Ansonnaud A, Wierna A, Alvarez M, Camino E, Ansonnaud C, Chaya ME, Gonzalez Mac Donald M, Ferrari M.
Semiology Department and Stomatological Clinic of the FOUNT. Av. Benjamín Aráoz 800. Tucumán.
E-mail: gonzalezmacdonald@arnet.com.ar

Although the etiology of buccal cancer is still unknown, there are risk factors associated with its development such as age, sex, habits (alcohol, tobacco) and traumatic agents. The aim of this work was to show the frequency of the presence of risk factors in patients that developed spinocellular carcinoma in their buccal cavity. It is a descriptive and retrospective study carried out between1996 and 2006 that included a total of 467 outpatients of the Stomatological Clinic of the FOUNT (Dental School, National University of Tucumán). The methodology used was the review of clinical histories, habits protocols and anatomopathological exams. Out of the total number of patients treated at the Service, 18 (3.85%) were clinically and histopathologically diagnosed with spinocellular carcinoma. Out of these, 3 (16.66%) had no risk habits while 15 (83.33%) did: 7 smoked (46.66%), only one drank (6.66%) and 7 smoked and drank (46.66%). Out of the 18 patients with spinocellular carcinoma, 2 (11.11%) presented local traumatic agents while the remaining 16 (88.89%) had no associated trauma. Average age was 60.5. Sixteen patients were male (88.88%) and 2 female (11.11%).The results obtained show a close relationship between squamous cell carcinoma and the above risk factors.

19.

HISTOLOGY OF OVARIES OF *PHYLLOMEDUSA HYPOCHONDRIALIS AZUREA* (ANURA, HYLIDAE. OVULATION PERIOD

Pucci Alcaide A, Pucci Alcaide F, Alcaide M.
Fundación Miguel Lillo. Tucumán. CP (4000). E-mail: felisaalcaide@gmail.com

Specimens of the G. *Phyllomedusa* genus lay their eggs on leaves near the water. The spawn is a gelatinous mass with large non pigmented eggs with numerous transparent vesicles. Analysis of ovaries was performed because of the macroscopic differences found with other species studied under the same conditions. Ovary samples collected immediately after ovulation were analyzed with routine histological techniques. The cell tissue structures of the ovarian lobes were well preserved. We found scarce vitellogenic oocytes, absence of previtellogenic and atresic oocytes, protein fluid, fat structures with white vacuoles in the central region and extremely vascularized brown peripheral areas. Each lobe is covered with thin epithelium and collagen fibers. In some lobes we observed cortex and medulla separated by muscular fiber bundles. Oogonius were found either isolated or in groups at different stages of mitotic and/or meiotic division. Stroma with blood vessels, neurons, fibroblasts, macrophages, mast cells and other connective cells were also found. Our studies showed similarities with *Gastrotheca christiani.* The fairly good preservation and restructuration of the ovaries allowed us to infer that this species could have another ovulation within the annual reproductive cycle, an infrequent process in subtropical anuran species.

20.

ENTEROPARASITOSIS AND ITS RELATION TO STUDENT DEVELOPMENT IN THE "EL PUESTITO DE ARRIBA" PRIMARY SCHOOL

Amadio RC, Rodriguez Calvo V, Soria Cano E.
Lab. Central, Hospital Nicolas Avellaneda.

"El Puestito de Arriba" school is located on the mountain range in the northeast of the province of Tucumán, (Burruyacu Department), Argentina. Twenty-five students were included in this study to determine the prevailing intestinal infections. An anthropometric evaluation was conducted at the same time. *Enterobius vermicularis* was the prevailing parasite in 75% of the children. Among protozoa the prevalent one was *Blastocystis hominis* in 87% of the students, followed by *Endolimax nana* in 31%, *Entamoeba coli* in 19% and *Giardia lamblia* in 6%. However, these facts showed only a low impact on the children's physical development measured as weight and height. Results: There is a high level of parasitosis (94%) among the students, in most cases (75%) with more than 1 parasite. The Mean Arithmetic index Age/Height and Weight/Height was within normal values in the lower limits of the growth index. The high rate of parasitosis observed in this rural school showed little impact on the physical development of the subjects in relation to the biological characteristics of the species found, thus demonstrating parasite-host equilibrium associated with a chronic evolution process.

21.

RISK FACTORS IN UNIVERSITY STUDENTS: BODY MASS INDEX (BMI) AND LIPIDIC PROFILE

Cardinale M, Coromina E, Torres P, Olmos Fassi J.
Cátedra de Fisiología. Facultad de Odontología. UNT Benjamín Aráoz 800. E-mail: marcecardinale@arnet.com.ar

Obesity and dyslipidemia are cardiovascular associated risk factors. Obesity is an independent risk factor for cardiovascular disease and regional fat distribution is greatly relevant in cardiac-related deaths. This paper assesses overweight (OW) and obesity (O) occurrence and the lipidic profile related to Body Mass Index (BMI). One hundred and four Physiology students (mean age 22.2 ± 0.8) were followed in 2006. Serum cholesterol concentrations (CT), triglycerides (TG), HDL and LDL levels were measured in fasting blood samples; weight, height and BMI as a nutritional indicator were measured and estimated. The values were scored as Normal (N), OW and O. The results yielded 81% N, 16% OW and 3% O subjects. Alterations in HDL, TG, CT, LDL levels were found in 29%, 12%, 10% and 5%, respectively. Altered CT levels were observed in 10% N and in 12% OW students. Similar results were found for TG and LDL values: 8% in N and 29% in OW, 4% in N and 12% in OW, respectively. HDL altered levels were found in 26% students with N nutritional status, 41% OW, and 33% O. Most importantly, OW and O were found in 34% and 3% male students whereas OW and O women were 9% and 3%, respectively. There is enough evidence to support that overweight and obesity are associated risk factors in males (exact test, p=0.005). No significant associations were found between BMI and lipidic profile in the population studied.

22.

ATTITUDINAL REPRESENTATIONS TOWARDS WRITING IN AN EDUCATIONAL SETTING

Cohen de Chervonagura E[1], Schallmach JN[2]
[1]Cát. Lengua Española II, Fac. Filosofía y Letras, U.N.T.-CONICET. [2]Cát. Química Biológica, Fac. Odontología, U.N.T. Av. Benjamín Aráoz 800, (4000) S. M. de Tucumán. E-mail: judit1964@hotmail.com

Mastery of writing is a major requirement for a wide range of activities However, it requires the fostering of certain abilities, skills, and, mainly, attitudes. This paper analyzes some attitudinal aspects towards writing in first-year Dentistry students. Non-structured interviews were administered to fifty individuals. The following functions were ascribed to writing: knowledge transference, expression of feelings, data registration and learning of new contents. Sixty-six per cent of the students claimed a liking for writing, 14% a limited liking and the rest a dislike. Writing preferences included letters, text messages and songs in contrast with essays, note-taking and poetry. However, 72% often took notes, wrote essays and e-mails; only some wrote poetry; 70% admitted thinking before writing, 22% started writing right away, and 8% acknowledged either; 92% consulted dictionaries, grammars or other reference books. The affective component of attitude yielded the students satisfaction, pleasure, joy, and freedom; 72% felt satisfied. Strengths and weaknesses were also analyzed. Finally, 86% were in favor of teaching writing at the university. Those against it felt that this should be dealt with at earlier educational stages. On the whole, first-year students exhibited a favorable attitude towards writing.

23.

SCIENTIFIC EDUCATION - TECHNOLOGICAL EDUCATION: SIGNIFICANCE AND APPLICATION IN BIOLOGICAL SCIENCES

Soria E, Salas L, Romero B, Quevedo G, Vergara M.
FACEN UNCa. E-mail: ibisoria11@hotmail.com

The aim of this work was to assess the necessity of incorporating the technological dimension into the treatment of scientific contents in a transverse and integrated way; to find our whether educational establishments had new technology in their equipment; to analyze if it was effectually incorporated into the practice of Biology and Natural Sciences teachers. We applied qualitative, ethnographic and action research methodology and used the technique of participant observation and bibliographical research; the analysis units were Biology and Natural Sciences teachers in schools of the third cycle of Elementary Education and Secondary Education of the capital city of Catamarca and student teachers. The analysis of the contents evidenced a fragmentation in the treatment of scientific and technological contents. New teaching technology is scarcely used by the Natural Sciences teachers. A technological dimension is necessary in the teaching-learning processes of Natural Sciences, incorporating activities and new technologies that will allow students to learn Biological Sciences and investigate current technological issues.

24.

INFLUENCE OF FOLIAR CALCIUM FERTILIZATION OF SOYBEAN CROPS (*Glycine max (L) Merr)* ON BIOLOGICAL NITROGEN FIXATION

Colacelli NA[1], Fernández MC[1], Orlando CA[1], Arrigó N[2].
[1]Facultad de Agronomía y Zootecnia, UNT. Av Roca 1900 S. M. de Tucumán. [2]Facultad de Agronomía U.B.A.
E-mail: usonorb@faz.unt.edu.ar

The aim of this work was to evaluate the influence of calcium, applied as a foliar fertilizer, on the biological nitrogen fixation (BNF) process and on culture rates in soybean crops.
The essay was carried out in Burruyacu, Tucumán, under conventional farming, with 12 plots of 4x 5 m each.
Cultivation was performed in a totally randomized experimental design.
Three treatments, T_1=10%Ca^{2+}applied 1.5 L.ha^{-1}, T_2 = 3.0 L.ha^{-1} and T_0 = control, with four repetitions, were performed.
The calcium source used was an EDTA-Ca^{++} complex.
After harvest in R_3 and R_6 states, fresh and dry weight and number of nodules were determined.
The activity of the nodules was measured with regard to their rosy appearance. The plots were manually harvested and thrashed in a stationary way. Culture yield was evaluated. Humidity was 13%.
The results showed a positive influence of the application of calcium on the weight, number and activity of the nodules. From these results, it can be concluded that the foliar application of calcium results in an effective and inexpensive way to increase the culture yield of soybean on account of a greater efficiency in the BNF process. The use of lower fertilizer doses is also possible when applying this fertilization practice.

25.

BENEFICAL ASPECTS OF LACTIC ACID BACTERIA IN RANICULTURE

Pasteris SE[1], Vera Pingitore E[1], Roig Babot G[1], Bühler MI[1], Nader-Macías ME[2]
[1]INSIBIO-CONICET; [2]CERELA-CONICET. Chacabuco 461. C.P. 4000. Tucumán. E-mail: pasteris@fbqf.unt.edu.ar

Lactic acid bacteria (LAB), which are widely distributed in many ecological niches in nature, can function as probiotics. Raniculture, a growing activity, entails an intensive process that leads to the outbreak of infectious diseases such as the red leg syndrome (RLS). Ethiological agents include *Ps. aeruginosa*, Enterobacteriaceae and *S. epidermidis.* Disposal of non healthy *R. catesbeiana* specimens or the application of antibiotic therapies is frequent, which increases production costs. Thus, probiotics are a novel alternative for the prevention and control of infectious diseases in hatcheries. Some benefical properties of LAB isolated from a local hatchery were studied. One hundred and seventy LAB strains were able to inhibit the growth of the assayed pathogens by acidity, with the exception of *Lactobacillus plantarum* CRL 1606, which also inhibited the growth of RLS-related pathogens by H_2O_2. Food-borne bacteria were sensitive to organic acid produced while *S. aureus* was also inhibited by H_2O_2. The strains produced low H_2O_2 concentrations in MRS+TMB+ peroxidase medium. Several *Lactobacillus* strains were hydrophilic. A similar behavior was observed in *E. faecium* strains. *Lactococcus lactis* inhibited the growth of *Ps. aeruginosa* and *Listeria* species by a combined effect of acidity, a class IIa bacteriocin and H_2O_2. From these studies we selected four *L. plantarum* strain; two *P. pentosaceus* strains and *L. lactis* CRL 1584 as probiotic candidates for raniculture and for potential use in fish aquaculture.

26.

EVALUATION OF THE ANTIMICROBIAL ACTIVITY OF *Enterococcus mundtii* CRL35 IN WHEY

Salvucci E, Pescuma M, Bustos AY, Sesma F.
CERELA–CONICET, Chacabuco145, S.M.deTucumán.

In Argentina, regional cheeses are made with non pasteurized milk with high microbiological risk. Some cheeses are manufactured with whey and fermented for 20 h with a temperature gradient that favors the selection of specific strains that confer the specific characteristics of each cheese.

Enterococcus mundtii CRL35, isolated from artisanal cheese from Tucumán, produces enterocin CRL35, a subclass IIa bacteriocin with antilisterial activity. In order to improve the microbiological quality of Argentinean cheeses, in this preliminar work we evaluated the ability of this strain to produce enterocin CRL35 in whey, an inexpensive medium with technological applicability.

In whey, the producer strain has a slightly lower growth than in the optimal medium LAPTg ($2{,}1.10^9$ vs. $2{,}2.10^{10}$ CFU/mL. after 8 h). Bacteriocin production was also lower in whey ($1{,}5.10^4$ Arbitrary Units per milliliter [AU/mL] vs. $1{,}2.10^5$ in LAPTg). These levels of activity could be associated with the differences in growth. Bacteriocin production in whey is accompanied by low pH variation. This study demonstrates the production of this antimicrobial peptide in whey, an inexpensive substrate of interest for industrial application.

27.

EFFECT OF PROTEASE ON THE CO-FLOCCULATION OF WINE YEASTS

Sosa OA, Santillán EN, Manca de Nadra MC, Farías ME.
CERELA and FBQF–UNT, Ayacucho 471 (4000) Tucumán. E-mail: mefarias@fbqf.unt.edu.ar

Kloeckera apiculata mc1 expresses a flocculent phenotype characterized by lectin-galactose interaction stabilized by Ca^{2+}. This apiculate yeast can co-flocculate with a non-flocculent strain of *Saccharomyces cerevisiae*. This work investigates the effect of proteolytic enzymes on the co-flocculation between *K. apiculata* mc1 and *S. cerevisiae* mc2 with the aim of understanding the cell-cell interaction pattern. Pure and mixed cultures of both yeasts were grown in YMPG medium for 24 h at 28º. The cells were resuspended in PBS plus $1mg.ml^{-1}$ protease and incubated for 2 h at 28ºC. The flocculation percentage was measured spectrophotometrically and by differential cell counts. The cell surface was examined by SEM. Protease treatment did not cause a modification in cell viability; however, it completely abolished self-flocculation and co-flocculation. Co-flocculent yeasts were highly susceptible to chymotrypsin and proteinase K and partially resistant to trypsin. SEM showed a loss of intercellular connecting homogeneous mucus between co-flocculent yeasts after protease treatment. These results suggest that cell wall protein receptors might play an important role in the co-flocculation phenomenon.

28.

PRODUCTION OF METABOLITES OF BACILLUS SPP. WITH ANTIFUNGAL ACTION BY SOLID STATE FERMENTATION (SSF)

Maldonado MC, Vargas V, Gordillo MA, Navarro AR.
Inst. de Biotecnología. Fac. de Bioq., Qca y Farmacia. Ayacucho 465 UNT. E-mail: biotec@fbqf.unt.edu.ar

Optimization of the production of *Bacillus spp* metabolites (BM) with antifungal action by solid state fermentation (SSF) was studied and compared to the one obtained by submerged fermentation (Sf). Their antifungal action was demonstrated using *Geotricum candidum*. We used Landy media (LM) control (20 g/l glucose), LM 1 (25 g/l glucose), LM 2 (30 g/l glucose) and LM 3 with 5 g/l of $CaCl_2$. Sf: *Bacillus spp.* (1.10^8 CFU/ml) was inoculated in LM. SSF: *Bacillus spp.* (1.10^{10} CFU/ml) was inoculated in 18.5 ml LM and absorbed in 6.93 g bagasse. They were incubated at 28ºC. Samples were collected after 12, 24, 48 and 72 h. In Sf the BM were concentrated while in SSF the samples were recovered by adding water and pressing. Antagonistic tests: 45 ml PD broth; 2.5 ml phytopatogenic fungi and 2.5 ml of BM. They were incubated at 28ºC, 250 rpm, for 5 days. Dry weight was determined. In LM 1, BM incubated for 72 h inhibited 18.79% of *Geotrichum candidum* growth; when LM 2 was used, inhibition was 2.64%. Inhibition values were lower than the ones obtained when LM control was used (71.36%); with LM 3 inhibition values were 0.1-2.5%. In both systems the greater production of BM was after 72 h of culture, with 71.36% and 58% inhibition in SSF and Sf.

29.

CHARACTERIZATION OF METABOLITES PRODUCED BY S*TREPTOMYCES* RO3 WITH ANTIFUNGIC ACTION

Maldonado MC, Orosco CE, Navarro AR.
Inst. de Biotecnología. Fac. de Bioq., Qca y Farmacia. Ayacucho 465 UNT. E-mail: biotec@fbqf.unt.edu.ar

The objective of this work was to partially characterize the metabolites produced by *Streptomyces* RO3 and to determine their antifungal way of action (fungicidal or fungistatic). We studied the thermosusceptibility of these metabolites a) sterilized to 121ºC for 15 min and b) sterilized by filtration using a cellulose nitrate membrane. The molecular weight of the metabolites was considered using benzolid dialysis membranes (M.W 1200-2000). Five ml of metabolites was dialyzed at 4ºC for 6 h in phosphate buffer pH 7. The inhibitory action of these metabolites against *P.digitatum* was evaluated by *in vitro* antagonism tests. In order to determine the way of action of the metabolites, 1ml of *P.digitatum* ($1x10^3$ esp/ml) and 1ml of metabolites were placed in a sterile test tube (in the control test the metabolites were supplanted by 1ml of water) and incubated at 30ºC for 3 days. The samples were centrifuged, washed and sown in APG. Then they were Incubated at 30ºC for 5 days to evaluate the inhibiting effect of the metabolites. The metabolites obtained are senstive to heat. They present a M. W. > 2000. The way of action of the metabolites produced by *Streptomyces* RO3 was fungicidal.

30.

INHIBITION OF *PSEUDOMONAS AERUGINOSA* BIOFILM AND ELASTASE FROM THE MUCUS OF CYSTIC FIBROSIS PATIENTS BY DNASE AND *LACTOBACILLUS PLANTARUM*

Ramos AN, Rachid M, Venecia A, Perret L, Fernández E, Valdez JC.
Inmunología, Facultad de Bioquímica, Química, Farmacia y Biotecnología. UNT.

Introduction: Cystic fibrosis (CF) predisposes to infection by *Pseudomonas aeruginosa* (*Pa*) due to the hyperviscosity of the bronchial mucus produced mainly by DNA from necrotic neutrophils (Ns) which release substances such as elastase (E) that cause tissue destruction. Nebulization with DNase (D) to fluidify mucus improved the functionality of the lung but also promoted the inflammation. Objectives: to show the effect of D and the supernatants of *L. plantarum* (SLp) on the biofilm (Bf) of *Pa* formed on Ns lysates and mucus from patients with CF (MCF) and to study the release of E by the fluidification of MCF with D and the inhibition of the E activity released with SLp. **Materials and methods:** Strains: *Pa* from clinical samples (Pa) and mutant non acyl-homoserine lactones (AHLs) producer (qsc119). We assayed Bf inhibition produced by Pa and qsc119 on MCF, Ns lysates using D and SLp. Bf was quantified by crystal violet. E was determined in the MCF and Ns alone and supplemented with D and/or SLp using the Red congo-Elastine technique. **Results and conclusions:** *Pa* produced more biofilm that the qsc119 strain (AHLs are important in Bf). The dilution of the MCF decreased Bf (MCF promotes Bf formation). SLp and D inhibited Bf. D released E (promotes tissue destruction). SLp inhibited E both in MCF and in Ns. The combination of D and SLp should be taken into consideration in the treatment of CF.

31.

INFLUENCE OF THE ADMINISTRATION OF LACTIC BACTERIA AND FERMENTED MILK ON LEPTIN SECRETION IN MICE

Gauffin Cano P[1], Valdez C[1], Gonzalez S[1,2]
[1]CERELA-CONICET. Tucumán, Argentina. [2]Universidad Nacional de Tucumán. E-mail: pgauffin@cerela.org.ar

Leptin plays multiple homeostatic functions in the organism. There is scarce information about the influence of lactic acid bacteria (LAB) on leptin secretion. Aim: to compare the influence of LAB administration (in suspension or in a fermented product) on leptin secretion and its relationship to certain immunological and nutritional parameters in an experimental mouse model. Methods: adult Swiss mice received 10^8 ufc/ml of *Lactobacillus casei* CRL 431 (Lc431) and 10^7 ufc/ml of *Lactobacillus plantarum* 236 (Lp236) and their fermented milks for 5 days. Serum leptin concentration, Nº of IgA+ cells in the large intestine and phagocytic activity were determined. A histological analysis of the intestinal structure was performed. Results: administration of Lc431 and Lp236 increased significantly leptin levels compared to the control group while the fermented milks induced a significant decrease in leptin. Lc431 and LF-Lc431 induced an increment in IgA+ cells and phagocytic activity. None of the treatment produced alterations in the structure of the large intestine. These results suggest that the oral administration of LAB has an influence on serum leptin secretion. However, differences were observed depending on whether these microorganisms were administered in a suspension or a fermented product, suggesting that the products of the fermentation also affect the secretion of this hormone.

32.

ANTIFUNGAL EFFECTIVENESS OF METABOLITES PRODUCED BY LACTIC ACID BACTERIA

Torres MJ[1], Gerez CL[1], Torres Leal G[2], Font de Valdez G[1], Rollan G[1]
[1]Centro de Referencia para Lactobacilos. Tucumán, Argentina. [2]Instituto Nacional de Tecnología Agropecuaria. Famaillá, Tucumán. Argentina. E-mail: rollan@cerela.org.ar

The antifungal activity of lactic acid bacteria (LAB) was demonstrated in previous studies. The aim of this work was to identify the biofungicide compounds (BF) and to evaluate their effectiveness with respect to the chemical additives (CA) used in industry for conservation purposes. The BF were identified in the LAB cultures by the HPLC method. The ability of the BF to inhibit conidia germination was evaluated.

BF are acidic in nature and related to lactic, acetic, and phenyl lactic acid (PLA). The antifungal activity was directly proportional to the acid concentration and depended on the fungus species. Lactic acid was the least and PLA the most effective BF identified. The effectiveness of the BF was determined by comparing its lethal dose 80 (LD) to that of different CAs. Sorbate, a CA frequently used in the food industry, showed lower effectiveness (LD: 35mM) than PLA (LD: 21mM). The inhibitory effect of CA was directly correlated to its concentration, with the exception of imazalyl activity, which decreased at greater concentrations. The use of BAL and/or the BF as a Bio-conservative is an alternative to reduce the use of CA in the agro industry.

33.

META-ANALYSIS OF LACIC ACID BACTERIAL GENOMES: FOLATE BIOSYNTHESIS GENES

LeBlanc JG[1], Savoy de Giori G[1,2], Sesma F[1]
[1]CERELA-CONICET. Tucumán, Argentina. [2]UNT. Fac.Bqca.,Qca. y Fcia. Cát. Microbio. Superior. E-mail: leblanc@cerela.org.ar

Folates participate in numerous metabolic reactions and their deficiency can cause many physiological disorders. Folic acid, a synthetic chemical commonly used in food fortification programs, can mask vitamin B12 deficiencies and overdoses can cause spontaneous abortions whereas "natural" folates, such as those produces by bacteria, do not.
The objective of this work was to analyse the genomes of LAB to identify strains that have the capability to produce *de novo* folates. Some strains of *Lc. lactis*, *Lb. plantarum*, *Lb. bulgaricus* and *St. thermophilus* posses all the folate biosynthesis genes whereas *Lb. gasseri*, *Lb. salivarius*, *Lb. acidophilus* and *Lb. johnsonii* do not. However, preliminary results in our lab have shown that folate production is a strain dependant trait.
These results will help in the search for novel LAB strains that can produce folates as a first step in the development of novel fermented foods with increased "natural" folate levels.

34.

EFFECTS OF *CITRUS AURANTIUM* EXTRACTS ON *SPODOPTERA FRUGIPERDA*

Villafañe E[1], Popich S[1,2], Neske A[1], Bardón A[1].
[1]Instituto de Química Orgánica. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471(4000). [2]Universidad Nacional de Chilecito, 9 de Julio 22 (5063) Chilecito, La Rioja. E-mail:aneske@fbqf.unt.edu.ar

Citrus aurantium (Rutaceae) is a tree commonly found in the city of Tucumán, Argentina. Ethanol extracts from the seeds, pulp, and peel of *C. aurantium* were incorporated into the larval diet of the lepidopteran pest *Spodoptera frugiperda* in order to evaluate its feeding behaviour (choice test) as well as the effects produced by the treatments on larval growth and diet consumtion. Larval and pupal mortality was quantified and adult malformation was observed. Our results indicated that 250 µg of pulp extract per g of diet deterred 50% feeding. The peel extract (250 µg per g of diet) produced an increment in growth rates and the diet consumption; however, 40% of the larval and 45% of the pupal populations died after 96 h of treatment.

35.

EFFECT OF AN ETHANOLIC EXTRACT OF *PHORADENDRON LIGA* (HILL. EX H. & ARN.) ELCH. ON CITRUS PATHOGENIC FUNGI

Selis de Orsi AN[1], Sgroi NA[2], Sgariglia MA[3], Soberón JR[3], Quiroga EN[3], Vattuone MA[3].
[1]Cátedra de Física II, [2]Cátedra de Qca. Analítica, Facultad de Agronomía y Zootecnia. [3]Cátedra de Fitoquímica, Inst. de Estudios Vegetales "Dr. A.R. Sampietro". Fac. de Bioq., Quim. y Farmacia. Universidad Nacional de Tucumán. Argentina. E-mail: lorsi@arnet.com.ar;instveg@unt.edu.ar

Tucumán, Argentina, is a worldwide exporter of lemons. Fungi produce high economic losses when they infect lemons during postharvest. To avoid or alleviate these losses the current trend is the use of antifungal products that are innocuous for humans and animals. In this work we assayed the effect of ethanol extracts of *P. Liga* on *Penicillium digitatum*, *Penicillium expansum*, *Geotrichum candidum*, and *Aspergillus niger* growth. Tinctures (96% ethanol, 10% w/v) of dry milled leaves of *P. Liga* were prepared. Fungal growth inhibition was assayed by bioautographic assays on Silica gel plates and radial growth inhibition (RGI). Bioautographies showed fungal growth inhibition. The radial growth of *P. digitatum, P. expansum*, *G. candidum*, and *A. niger* was inhibited 79.64; 38.70; 58.30 and 35.60%, respectively, when fungi were cultivated on solid medium in the presence of 0.15 mg of FC/ml.
Consequently, the ethanolic extract of *P. Liga* would be a suitable natural source of antifungal principles to be applied in the formulation of agrochemicals.

36.

EFFECTS OF *ROLLINIA OCCIDENTALIS* (ANNONACEAE) SEED EXTRACT ON SOYBEAN PESTS IN A FIELD ASSAY

Tolosa D[1], González G[1], Fernández R[1], Popich S[1,2], Neske A[1], Bardón A[1].
[1]Instituto de Química Orgánica. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471(4000). [2]Universidad Nacional de Chilecito, 9 de Julio 22 (5063) Chilecito, La Rioja, Argentina. E-mail: aneske@fbqf.unt.edu.ar

Previous results from our laboratory indicated that the annonaceous acetogenins (ACGs) from seeds of *Rollinia occidentalis* produced toxic effects on larvae of the polyphagous lepidopteran *Spodoptera frugiperda*, a serious corn pest in Argentina. On the basis of the above results, we decided to test the effects of a methanol extract from seeds of *R. occidentalis* against soybean pests. We prepared a suspension of the extract in water containing a surfactant and applied 150 g of active ingredient per hectare in an experimental soybean field. Treatment produced a significant decrease in the populations of Anticarsia, Rachiplusia, Pseduplusia, Loxostege and Spodoptera. Comparison of the effects produced by the *R. occidentalis* extract with the action of two commonly used insecticides (lufenuron and cypermethrin) showed that, at the dose tested, the extract displayed lower toxic effects on natural enemies than commercial insecticides.

37.

ANTIOXIDANT ACTIVITY IN PARTIALLY PURIFIED RITIDOME EXTRACTS OF *CAESALPINIA PARAGUARIENSIS* (D. PARODI) BURK

Sgariglia MA, Soberón JR, Sampietro DA, Quiroga EN, Vattuone MA. Instituto de Estudios Vegetales, Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán. Ayacucho 471 (4000). San Miguel de Tucumán. Argentina.
E-mail: melinasgariglia@gmail.com

Previous reports showed that infusions prepared from the bark of *C. paraguariensis* exert a strong free radical scavenging activity (AO). This might explain, in part, the vulnerary properties attributed to this plant species by popular medicine. Moreover, toxicity studies showed that the infusion of *C. paraguariensis* is neither cytotoxic nor genotoxic.
The aim of this study was to perform bioguided purification and to determine the chemical nature of the antioxidant substances present in the infusion.
The lyophilized Infusion was extracted with solvents of increasing polarity (ether, chloroform and methanol). The methanolic fraction was separated by Sephadex LH20 with methanol in 12 fractions (F1-F12). The F3 fraction (with the greatest AO activity) was purified by HPLC. Ten eluates corresponding to peaks (p) 14, 15, 16, 18, 18.5, 19, 20, 22, 25 and 40 min were collected. They were analyzed by Autography with DPPH, and by TLC. AO activity was localized in p16, p18, p20, p22 and p25 eluates. Such activity would be associated with flavones and/or flavonols.

38.

FREE RADICAL SCAVENGING ACTIVITY OF PURIFIED COMPOUNDS FROM *TRIPODANTHUS ACUTIFOLIUS* (RUIZ & PAVÓN) VAN TIEGHEM

Soberón JR, Sagriglia MA, Sampietro DA, Quiroga EN, Vattuone MA. Cátedra de Fitoquímica, Instituto de Estudios Vegetales "Dr. A. R. Sampietro". Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471. (4000) S. M. de Tucumán. Argentina. E-mail: jrsrody@yahoo.com

Free radicals are highly reactive molecules responsible for various diseases. The health impact of uncontrolled free radical proliferation and the well-known toxicity of synthetic antioxidants have led to the search for alternative free radical scavenging molecules. Five antioxidant compounds were isolated and identified from *T. acutifolius* leaves infusion. Purification was achieved after extraction with increasing polarity solvents, column chromatography through Sephadex LH-20, and reverse phase HPLC. Four compounds were identified as glycoflavonoids: rutin, nicotiflorin, hyperoside and isoquercitrin. The fifth was a novel compound: 4-(3',4'-dihydroxy)phenil-2-β-D-glucofuranosylbutane (DHGB). DHGB was more active as shown by DPPH and lipid peroxidation inhibition assays [effective concentration 50 (EC_{50}) = 3,4 and 120 ppm respectively] than the other compounds. Hyperoside and isoquercitrin were more effective hydroxyl radical scavengers (EC50 = 100 ppm) than the other compounds. Flavonoids and DHGB phenolic groups could be responsible for free radical scavenging activities.

39.

SESQUITEPENE LACTONE PROFILE OF TWENTY-FIVE CULTIVARS OF YACON (SMALLANTHUS SONCHIFOLIUS), AN ANDEAN MEDICINAL PLANT

Mercado MI[1,2], Coll Araoz MV[1,2], Manrique I[3], Catalán C[1], Grau A[2]. [1]Inst de Qca Org de la Fac de Bioqca Qca y Farm and [2]LIEY - U.N.T., Argentina. [3]C.I.P., Lima, Perú. E-mail : mainesmer@yahoo.com.ar

Smallanthus sonchifolius (Asteraceae) is an Andean crop commonly known as yacón. Yacón leaf Infusions produce a remarkable hypoglycemic effect on both normal and diabetic rats that has been attributed to enhydrin, its main sesquiterpene lactone (SL). This work aimed at determining the infraspecific SL variation in 25 yacón cultivars. Leaves of cultivars from Perú, Bolivia, Ecuador and Argentina were analysed. Lactones were extracted by soaking whole leaves in chloroform for 20 seconds; after solvent evaporation and de-waxing, the extracts were analyzed by GC/MS. Nine SL were identified in the extracts, most of them previously reported in yacón. Significant quantitative differences were found. Twenty-two cultivars showed enhydrin as the most abundant lactone; out of these 13 had uvedalin, 5 fluctuanin and 4 an unidentified SL as their second major component. Uvedalin was the main SL in the 3 remaining cultivars. According to the SL profile, two clearly defined chemotypes (CT) were characterized: CT enhydrin and CT uvedalin. No relationship between chemotype and cultivar geographical origin was found.

40.

VOLATILE PIGMENTS IN PAPRIKA AND RELATION TO THEIR MICROBIOLOGICAL CONDITION

Arjona M[1], Amaya S[1], Ahumada C[2].
[1]Facultad de Cs. Exactas y Naturales. [2]Facultad de Cs. de la Salud. Univ. Nacional de Catamarca Av. Belgrano 300 (4700) Catamarca. E-mail: milarj2002@yahoo.com.ar

Paprika carotenoids, together with volatile components, are significant serine and protease inhibitors of volatile components in paprika. The objective of this work was to analyze the main volatile components present in paprika produced in the Santa María district (Catamarca province, Argentina), and their relation to microbiological condition. Eleven major volatile components were determined and analyzed by gas chromatography and mass spectrometer (CG-MS) in Headspace. Seven sesquiterpenes were identified, mainly of the cadinane group, cubebene being the most prominent, 1 compound of the bisabolene group, 1 of the germacrene, 1 monoterpene, and 1 derived from lycopene. The presence of aldehydes, ketones, hydroxyl and oxygen compounds as major components was very poor. Microbiological analyses showed high counts of total mesophilous flora > 3,000,000 colonies/g and a colimetric index of 23 colonies/g for that volatile composition. These results indicate high microbiological contamination in which not only manufacture and storage conditions might exert an influence, but also the composition of the volatile organic compounds (VOCs) present because some of them have a certain microbiological activity.

41.

BIOACTIVE VOLATILE CONSTITUENTS OF *ACANTHOSPERMUM HISPIDUM* DC

Alva M[1], Cartagena E[1], Popich S[1,2], Bardón A[1].
[1]Cátedra de Química Orgánica III. Fac. de Bioqca. Qca. y Farmacia UNT. Tucumán, Argentina. [2]Departamento de Ciencias Básicas, Físicas y Naturales. Universidad Nacional de Chilecito. La Rioja, Argentina.

Acanthospermum hispidum DC. is a native herbaceous plant widely spread in northwestern Argentina. We investigated the antifeedant and toxic effects of the essential oil (EO) from the flowers and leaves of *A. hispidum* on 2nd instar larvae of *Spodoptera frugiperda*, a serious pest in the north of Argentina. Incorporation of 250 ppm of EO per g of diet deterred 40% *S. frugiperda* larval feeding. Larval growth and diet consumption were reduced by 65% and 44%, respectively, in relation to the control. Furthermore, we studied the antibacterial activity of the EO and of the chloroform extract (CE) of *A. hispidum* on two pathogenic strains of *Staphylococcus aureus* (ATCC 6538P and methicillin resistant F7), two strains of *Enterococcus faecalis* (ATCC 39212 and ampicillin resistant F208), a strain of *Pseudomonas aeruginosa* ATCC 27853 and strains of non pathogenic *Lactobacillus.* Antibacterial activity was assayed by the liquid microdilution method. EO selectively inhibited *S. aureus* F7 (MIC=62,5 μg/mL) while CE was more active against *S. aureus* ATCC 6538P (MIC= 31,2 μg/mL). Both treatments were inactive on beneficial lactobacillus strains.

42.

RAPID DETERMINATION OF TRACE AMOUNTS OF CARBENDAZIM AND THIABENDAZOLE IN LEMON ESSENTIAL OIL USING HPLC

Navarro ME, Alva M, Lacina M, Kamiya N, Ruiz M.
Sección Química de la EEAOC, Avda. William Cross 3150, Las Talitas (4101). E-mail: calidad@eeaoc.org.ar

A fast and precise method to quantify and confirm the presence of traces of the fungicides carbendazim (MBC) and thiabendazole (TBZ) in lemon essential oil was developed. The pesticides were extracted from sample commodities with an acid-base and methylene chloride extraction process. The purified extract was then analyzed by reverse-phase HPLC (C-18) using 1-decanesulfonate – methanol at two different concentrations as mobile phases. Fluorescence detection was carried out at λ_{exc}=280 ηm / λ_{em}=310 ηm and λ_{exc}=305 ηm / λ_{em}=345 ηm. These last conditions are selective for TBZ and thus constitute a useful method for confirming identification, which enables the evaluation of lower concentrations due to its greater sensitivity.
Mobile phase force was adjusted to reach a total sample run time between 10 and 14 min. Under these conditions, work ranges of 0.1 to 10 mg/kg for MBC and 0.01 to 10 mg/kg for TBZ were established and average recovery percentages from 72 to 110% for MBC and 72 to 116% for TBZ were obtained.

43.

SALICYLIC ACID AS A SIGNAL MOLECULE IN THE DEFENSE RESPONSE OF STRAWBERRY

Grellet C, Mamaní A, Castagnaro A, Diaz Ricci JC.
Depto. de Bioquímica de la Nutrición INSIBIO. CONICET-UNT. Instituto de Química Biológica "Dr. Bernabé Bloj", Fac. Bioq. Qca. y Farm. Chacabuco 461. (4000) Tucumán.
E-mail: failosk8@yahoo.com.ar

Plants have developed several defense mechanisms against infections caused by pathogens that involve a complex network of signals initiated by the accumulation of reactive oxygen species, followed by variations in the levels of signal molecules such as salicylic acid (SA), jasmonic acid (JA), ethylene (ET) and others which induce the expression of defence genes and proteins. In this work we investigated the participation of SA in the establishment of a defense response in the strawberry cv. Pájaro. Results showed that when plants were challenged with the isolate M23 of *Colletotrichum fragariae*, which produced an incompatible interaction, a significant accumulation of superoxide (6 hpi) and SA (48 hpi) took place, whereas no accumulation of these metabolites was observed during a compatible interaction with the isolate M11 of *C. acutatum*. Furthermore, the accumulation of both defense response markers was associated with plant resistance toward the pathogen used. These results suggest that SA is directly involved in the establishment of the defense response in strawberry.

44.

FACTORS INVOLVED IN MAIZE RESISTANCE TO *FUSARIUM VERTICILLIOIDES*

Sampietro DA[1], Fauguel CM[2], Presello DA[2], Vattuone MA[1], Catalán CA[1].
[1]Facultad de Bioquímica, Química y Farmacia.Universidad Nacional de Tucumán. Ayacucho 461(4000).Tucumán. Argentina. [2]Instituto Nacional de Tecnología Agropecuaria. CC31, B2700KXC, Pergamino, Argentina.

Fusarium verticillioides Sacc Niremberg produces maize ear rot. The fungus contaminates the grains with fumonisins that are toxic to humans and animals. The aim of this work was: 1) to determine differences in fumonisin accumulation among Argentinean maize genotypes and 2) To identify factors involved in resistance to fumonisin accumulation. Drilled and whole grains obtained by open pollinization of hybrids Cargill 350, Syngenta Chalten and Syngenta Condor were assayed. Grains of each hybrid were inoculated with a spore suspension of 5 10^{-5} microconidia/ml. Then, they were incubated at 28 ºC and 90% relative humidity for 7 days. Fumonisin content was determined by immunochemical assays. Fumonisin accumulation was similar in both drilled and whole grains of Cargill 350. Chalten and Condor hybrids showed higher fumonisin accumulation in drilled than in whole grains. Our results suggest that differences in susceptibility of maize genotypes to *F. verticillioides* are due to pericarp characteristics.

45.

INCIDENCE AND PREVALENCE OF GEMINIVIRUS IN SOYBEAN AND BEAN CROPS IN NORTHWESTERN ARGENTINA AND IN THE PROVINCE OF CÓRDOBA

Alemandri V, Rodríguez Pardina P, Truol G.
IFFIVE-INTA, Camino 60 Cuadras, km 5 °, X5020ICA Córdoba, Argentina. E-mail: vanialemandri@yahoo.com.ar

The whitefly vector *Bemisia tabaci* Gennadius and the geminivirus it transmits have become a major economic problem worldwide because the virus in question is of the emerging type. The purpose of this study was to determine the incidence and prevalence of geminivirus in soybean and bean in Northwestern Argentina and in the Province of Córdoba. During 2007 54 lots were sampled, 36 of soybean and 18 of bean, in the provinces of Salta, Jujuy, Tucumán, Santiago del Estero and Córdoba. Geminivirus presence was determined by molecular hybridizing using probes. The results showed a prevalence of 83% in bean and 64% in soybean. The incidence was 21.1% in bean and 6.2% in soybean. The order of incidence in the provinces was the following: Salta, Santiago del Estero, Jujuy, Córdoba and Tucumán, with 16.4%, 13.3%, 9.3%, 4.7% and 2.9% respectively. These results lead to the conclusions that bean presented both the highest prevalence and incidence of geminivirus and that Salta was the province most affected by this virus infection.

46.

GROWTH AND MINERAL COMPOSITION OF CLEOPATRA MANDARIN (C*itrus reticulata)* AND CITRUMELO (*Citrus paradisi* x *Poncirus trifoliata)* UNDER SALINE STRESS

Meloni DA, David RN, Ayrault G, Medina V.
UNSE, FAyA, Av. Belgrano (S) 1912, 4200- Santiago del Estero, Argentina. E-mail: dmeloni@unse.edu.ar

The increase in cultivable areas affected by salinity demands the selection of genotypes tolerant to such stress. Although citrus are sensitive to this condition, differences among rootstocks have been found. The objective of this work was to evaluate salinity tolerance in Cleopatra mandarin and Citrumelo and its relationship to their mineral composition. Fresh weight and ion composition were determined in seedlings of both species incubated in water or NaCl 30 mM. The experimental design was completely randomized with 3 replications and data were analyzed using ANOVA and Tukey's test. The growth of Citrumelo was more sensitive to salinity than in Cleopatra. The former excluded ions Na^+ and Cl^- from its aerial part and restricted them to the root system, while the latter acted in the opposite way. In Citrumelo, NaCl increased K^+ concentration in leaves but decreased it in roots while in Cleopara it diminished in both leaves and roots. Ca^{+2} concentrations remained constant in Citrumelo leaves and increased in roots. Cleopatra registered lower Ca^{+2} concentrations in both roots and leaves. NaCl decreased Mg^{+2} concentrations in the leaves of both species but did not affect their roots. It can be concluded that Citrumelo is more tolerant to salinity than Cleopatra by excluding Na^+ and Cl^- from its aerial part.

47.

INFLUENCE OF MOLASSES ON SOIL CELLULOLYTIC MICROORGANISMS AND MINERALIZATION OF SUGARCANE TRASH

Jimenez CM, Sampietro DA, Vattuone MA, Sgariglia MA, Soberón JR, Quiroga EN.
Cátedra de Fitoquímica. Instituto de Estudios Vegetales "Dr. A. R. Sampietro". Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 461.CP 4000. S.M.deTucumán. Argentina.

Green harvest is a desirable agricultural practice that provides sustainability to the sugarcane agroecosystem. However, sugarcane trash interferes with the agricultural practices usually performed after harvest. The aim of this work was to evaluate the populations of cellulolytic microorganisms and the microbial mineralization of sugarcane trash after molasses incorporation. 0.6% and 2% molasses were added to soil containers where sugarcane trash was incorporated into the soil or left on its surface. Containers irrigated with water were used as controls. Soil samples were taken from containers at different times after molasses addition. Cellulolytic fungus and bacterial populations were monitored using specific media. Cellulose content and organic matter were also evaluated. Our results indicate that addition of molasses to sugarcane trash accelerates cellulose degradation by stimulation of soil cellulolytic microorganisms, increasing organic matter mineralization when trash is soil incorporated.

48.

SPATIAL AGGRESSIVENESS OF *Tithonia tubaeformis* (Jacq.) Cass. IN SUGARCANE CROPS IN EASTERN TUCUMÁN (AR)

Chaila S[1], Sobrero MT[2], Nasif AMM[1], Díaz LP[1], Piscitelli FR[1], Arévalo RA[3].
[1]UNT-AR; [2]UNSE-AR; [3]APTA Centro Sul –PIRACICABA.BR. E-mail: sach@faz.unt.edu.ar

Tithonia tubaeformis (TITHU) is a recently introduced weed in northern Argentina. The spatial aggressiveness index (Sai) is a bioecological parameter for the distribution characteristics of weed species. The objective of this work was to determine Sai for 3 sugarcane localities and to compare their population behavior. Qualiquantitative determinations were made between September 2005 and January 2006 in the localities of El Bracho, El Cevilar and Mancopa (Tucumán, AR) on cultivar LCP 85-384, 3-year ratoon. In each locality a 5000 m^{-2} area was analyzed. ANOVA and Tukey's test 5% were used. To calculate Sai a simple model with the following components was used: Plant height and its dry biomass, number of invading plants in the study area around the outstanding plant, mean dry biomass, mean height and measurement area. Indexes were: a) El Bracho, Sai=4.95. b) Mancopa, Sai=3.49. c) Cevilar, Sai=3.90. The SaiI of El Bracho showed significant differences with the Mancopa and El Cevilar ones. There were no significant differences between the last two localities. SaiI is related to spatial distribution so when area increases Sai increases as well. The greater the height of the main plant, the higher the SaiI value. When the number, height and mean biomass of the surrounding plants increase, Sai decreases. Values of *T.tubaeformis* SaiI are related to factors that determine greater growth and survival.

49.

EXPERIMENTAL DEMOGRAPHY APPLIED TO THE STUDY OF *Tagetes minuta* L. (TAGMI) POPULATION IN EASTERN TUCUMAN SUGARCANE CROPS

Chaila S[1], Arévalo RA[2], Sobrero MT[3], Villagrán LF, Ramón NA[1], Galindo GS[1], García AM[1].
[1]F.A.Z; [2]APTA – BR. [3]F. A.A.–U.N.S.E.
E-mail: sach@manant.unt.edu.ar

T. minuta (*Asteraceae)* affects Tucumán sugarcane crops. The objective of this work was to study the demography and the mechanisms that influence population size and growth in time. We worked in cultivar TUC 77-42 of sugarcane crops in eastern localities of Tucumán on 150 km^2, from October 2004 to January 2006. Periodical samples and population measurements were made in 3 randomized plots of 160 m^2 each. Number of adult and young plants and plantlets; dying plants; seeds per plant; germinative power and seed viability were determined*: Gross Mortality Rate (GMR ‰ o qx= dead plants per year), Gross Birth Rate (GBR ‰ o nx= 1000-TBM), Gross Survival Rate (GSR ‰ o lx =plants that survive during the year). Survival Probability per plant (SP= individuals that will survive / 1000), Individuals with Reproductive Capacity [IRC = Seed.Ing. x Viab./ 100]; Real Reproductive Capacity per plant [RRC= IRC x GP/100] and Infestation Potential of one plant [IP= RRC/dens*.] were calculated. TAGMI initial density was high (6.17 pl.m^2 and 17.63 pl.m^2). Seed reproduction per plant, 11.947 to 18.439. IRC low. RRC 15-20% of the original seed production. Infestation potential (IP) low to medium (112.17 m^2 to 668.14 m^2). GMR low owing to efficient seed and flow germination. This species has a high birth rate and its strategies allow it to remain and become established as a weed in sugarcane crops.

50.

SPATIAL AGGRESSIVENESS INDEX (SAI) OF *Flaveria bidentis* (L.) O. Kuntze FOR COTTON CROP cv GUAZUNCHO INTA AT LA MARIA, SANTIAGO DEL ESTERO

Sobrero MT[1], Chaila S[1,2], Ochoa M del C[1], Feil WR[1], Trejo D[1].
[1]F.A.y A.-UNSE. (AR); [2]F.A.Z.-U.N.T.(AR).
E-mail: renny@ciudad.com.ar

The spatial aggressiveness index (Sai) is a parameter that indicates distribution characteristics of a species since its arrival in the area and its progress in colonization or resource competence. The objective of this work was to determine *Flaveria bidentis* (FLAVI) Sai to compare its population behavior in cotton crops. The assay was carried out in 2006-2007 in cotton crop cv GUAZUNCHO at Campo Experimental La María (INTA), Santiago del Estero province. For calculation of FLAVI index a simple model was used that interrelates the following components: outstanding plant height, dry biomass, number of invading plants, their mean dry biomass and mean height, and the study area. Plots in the cotton crop were determined, the area where plants were counted was marked and samples were collected. Outstanding plant by its size was previously determined. After the basic tasks the marked area underwent no culture handling. Parametric statistical analysis, ANOVA and Tukey's test 5% were performed. The SAI obtained was 0.659. This index is in function of spatial distribution; when area and height increase SAI will increase as well. The index of a species is not the same for different localities.

51.

ROLE OF GAP JUNCTIONS IN THE CAPACITY FOR POLYSPERMY BLOCKADE DURING OOCYTE MATURATION IN *BUFO ARENARUM*

Oterino J, Sánchez Toranzo G, Zelarayán L, Ajmat MT, Bonilla F, Bühler M.
Inst. de Biología. Fac. de Bqca, Qca y Farm. UNT. Chacabuco 461. Tucumán. E-mail: jmoterino@fbqf.unt.edu.ar

The oocyte maturation process involves morphological, biochemical and physiological changes through which the oocyte acquires its competence for fertilization and development. The presence of follicular cells during maturation is very important. One of the routes through which these cells transmit information to the oocyte is gap junctional communication. The aim of this work is to analyze the role of gap junctions in the capacity for polyspermy blockade during oocyte maturation in *Bufo arenarum.* Two pieces of *Bufo arenarum* ovaries were treated *in vitro* 1) with progesterone (1µg / ml); 2) with gap junction inhibitors 1-octanol (2mM) or halotane (4mM) for 2 h. After that time the medium was supplemented with progesterone. After 18 h of culture the oocytes reached metaphase II and were isolated and inseminated with homologous sperm. The results showed absence of polyspermy in oocytes treated with gap junction inhibitors before progesterone addition and absence of polyspermy in oocytes treated with progesterone without gap junction inhibitors. These observations suggest that the disruption of gap junctions between the oocyte and the follicle cell during maturation *in vitro* does not modify the capacity for polyspermy blockade. This suggests that the factors involved in the establishment of polyspermy blockade would use other routes.

52.

ORNAMENTAL POTENTIAL OF *SEEMANNIA* (GESNERIACEAE) FROM THE SUBTROPICAL MONTANE FOREST (YUNGAS) OF NORTHWESTERN ARGENTINA

Ibañez MS, Flores C, Enrico E, Borgonovo F, Grau A.
LIEY, FCN e IML; U.N.T. C.C. 34 Yerba Buena (4107). E-mail: silvinaibanez@yahoo.com.ar

Seemannia Regel (*Gloxinia* s.l.) is a South American genus with showy flowers. The tropical *S. sylvatica* has achieved worldwide diffusion as an ornamental plant. *Seemania nematanthodes* (Kuntze) K. Schum. and *S. gymnostoma* (Griseb.) Toursark are common in shady subtropical montane forest (Yungas) sites from Salta to Catamarca provinces between 700 and 1800 m a.s.l. Plant structure, flower morphology and color of 30 lines propagated clonally were evaluated during the 2005-2006 and 2006-2007 growth seasons. The collected material corresponds to the typical species described and to intermediate forms of probable hybrid origin, exhibiting diversity in plant structure, flower morphology and flower color. Controlled crossings were performed between *S. gymnostoma, S. nematanthodes* and *S. sylvatica* (Kunth) Hanst, producing viable seeds and resulting in interespecific hybrids. The remarkable natural diversity observed may have commercial potential. Artificial crossings would further increase this variability and enable the establishment of a breeding program.

53.

EFFECT OF COW YOGURT ON HEPATIC TISSUE DAMAGE AND APOPTOSIS INDUCED BY D-GALACTOSAMINE IN BALB-c MICE

Lazarte S[1], Haro C[1], Caram M[2], Zelaya H[1], Agüero G[1].
[1]Instituto de Bioquímica Aplicada. UNT. Balcarce 747. [2]Facultad de Medicina. UNT. Avenida Roca 1900. San Miguel de Tucumán. CP4000. E-mail: sal16@latinmail.com.ar

D-Galactosamine (DG) induces acute liver injury (ALI) in experimental models. This damage is characterized by inflammation and varying degrees of hepatocyte degeneration and cell death via apoptosis or necrosis. Many papers support the anti-inflammatory properties of cow yogurt (CY). BALB-c mice were orally fed with CY for 7d and then received an intraperitoneal injection of DG (CY+DG). Control DG were inoculated only with the drug (CDG). Animals fed for 7d with CY (control feeding (CYC)) and normal controls (NC) were injected with saline solution. Samples were obtained 12 h post-inoculation and processed for 1) light microscopy for morphological exam and neutrophil infiltrates (NI) counts; 2) transmission electron microscopy (TEM) for ultra structural analyses; 3) flow cytometry for hepatic apoptosis. DG induced intrahepatic neutrophil infiltration and an increase in the percentage of apoptotic and dead cells. TEM allowed us to see alterations to the mitochondria morphology. The administration of CY for 7d before DG injection decreased NI and cell death but had no effect on apoptotic cells nor did it reverse intimate changes in liver histology.

54.

ENVIRONMENTAL LEAD PRESENCE AND EFECTS ON HUMAN HEALTH

Feldman G, Martínez Riera N.
Dpto. Salud Pública-O. Toxicología. Facultad de Medicina. U.N.T. Tucumán. E-mail: norymar@arnet.com.ar

Numerous city dwellers are chronically exposed to low environmental lead levels. The objective of this work was to evaluate blood lead levels in people who live in areas near polluting lead sources and to associate them with clinical manifestations and age. The study included people from 10 blocks in a closed residential area of Tucumán (Argentina). Forty-two places that use lead were identified including battery assembly, recharge and sale factories and stores and car body repair and paint workshops. Subjects with a previous history of lead contact were excluded. An interview was made to obtain clinical data and blood for lead determination. Results: 42 individuals between 7 and 60 years of age; lead average: 16 μg/dl (6.1 μg/dl- 59 μg/dl). Clinical manifestations: in 23% of the individuals with high lead levels these were correlated with hypertension, polyneurophaties, adinamy and abdominal pain; in 6 children with high lead values previous records of anemia, epilepsy, oligoanury and learning problems were found. Nine per cent presented lead levels above highest reference values. This work aims at contributing to the knowledge of the sources of ambient pollution that will enable prediction and prevention of its consequences in order to seek alternatives that will decrease environmental impact.

55.

EVALUATION DE KNOWLEDGE OF ENVIRONMENTAL POLLUTING AGENTS AND HEALTH IN MEDICAL STUDENTS

Martinez Riera N, Feldman G, Soria N.
Dpto. Salud Pública-O. Toxicología. Fac de Med. U.N.T. Tucumán. E-mail: norymar@arnet.com.ar

Contamination is one of the most important environmental problems that affect our country and the world. The objective of this work was to evaluate the knowledge of medical students on the issue. An inquiry of 72 students in the fifth year of medical school was made before they took the Toxicology course. Statistics: descriptive. Seventy-six per cent had environmental health information; 3.6% declared having above average information acquired mostly through mass media (Internet, television and magazines); 87.5% were not aware of all the possible polluting agents included in the survey; 72% associated toxicological pathologies with dermatological and respiratory manifestations and related them to labor and family environment. With respect to the characteristics of drinking water, 50% correctly mentioned all the polluting agents that could affect it. Biological agents were the most widely recognized (bacteria, viruses, parasites). 41.6% of the students admitted the presence of toxic substances such as drugs, alcohol and medicines in their home environment. This type of work will enable an integration of the results into a plan of action to inform and prepare students of health-related sciences from their first year onwards to become MDs specialized in pollution-related issues.

56.

AN ENDEMIC PROBLEM IN LEALES (TUCUMAN): ARSENIC IN DRINKING WATER

Soria N, Molina G, Feldman G, Martínez Riera N.
Dpto. Salud Pública-O. Toxicología. Facultad de Medicina. U.N.T. Tucumán. Argentina. E-mail: norymar@arnet.com.ar

Water pollution caused by arsenic, defined as Endemic Regional Chronic Hydroarsenicism, is an important worldwide public health issue due to the carcinogenic and chronic poisonous effects of arsenic on individuals. Objectives: to produce an updated reference record of the arsenic levels in the water in a district of Leales (Tucumán province, Argentina); to evaluate the existence of clinical dermatological manifestations; to determine if the population is aware of the toxics effects of arsenic on the organism. Material and method: ten families (25 people) living in the district were evaluated by customized visits. The test of AQassay for quantitative determination of arsenic in the water was used. Statistics: descriptive. Results: 60% of the subjects related the origin of the polluting agents to natural sources; 36% identified it as produced by arsenic. Ninety-six per cent drank water from wells; 64% had clinical dermatological manifestations; 50% presented arsenic levels in the limit reference values (0.01mg/l – WHO, 2007). Many of the present regulations based on WHO guidelines are very high and raise the need for reconsidering the limit values. This information will contribute to the development of strategies for elimination, prevention and early diagnosis to improve the life quality of the population.

57.

HISTOMETRIC STUDY IN A BREAST CANCER MURINE MODEL WITH ONCOIMMUNOLOGICAL TREATMENT

Carino S, Mercau GTN, Elías A, Mercau G, Caram MM, González ML, Aybar A, Campero F, Saet M, Valdéz JC.
Department of Histology. Faculty of Medicine. Department of Pathology. Dental Faculty. University of Tucumán. E-mail: silvia.carino@gmail.com

The goal of medical treatments is to enhance the immune response by activating the immune defenses.
The purpose of this study was to increase the immunogenic capacity of tumour-associated antigens released during chemotherapy by means of bacterial vaccines and a histometric study in a breast cancer murine model.
We worked with 17 BALB/c mice with a spontaneous M3 breast adenocarcinoma. All animals were intradermally inoculated in their right flank with 10^4 tumour cells. In the dextrolateral tail vein 0.1ml (0.15mg) of doxorubicin (DX) was applied and 0.05 ml of vaccine (V) was intramuscularly inoculated.
Mice were divided into control (C), V, DX and DX-V groups. The histometric study was performed in the necrotic areas and tumor mitosis was quantified using the Image Pro Plus software.
The differences were statistically significant between C and V with $p => 0.001$ and between C and DX-V with $p => 0.001$, (TVR)-76.2% and +39.2% respectively (One-way ANOVA-Dunnett test). The increase in tumour necrosis would indicate that the combined action of a chemotherapeutic agent and a vaccine is more effective.

58.

ONCOIMMUNOLOGIC TREATMENT IN A BREAST CANCER MURINE MODEL. SPLEEN HISTOMETRIC STUDY

Carino S, Mercau GTN, Elías A, Mercau G, Caram M, González ML, Aybar A, Campero F, Saet M, Valdéz JC.
Department of Histology Faculty of Medicine. Department of Pathology. Dental Faculty. University of Tucumán. E-mail: silvia.carino@gmail.com

Human cancers are immunogenic in nature; nevertheless, the immune response to cancer is not demonstrated by the immune suppression mechanisms of the tumour. The purpose of this study was to increase the immunogenic capacity of tumour-associated antigens released during chemotherapy by means of bacterial vaccines and a histometric study in spleen. We worked with 17 BALB/c mice with an M3 spontaneous breast adenocarcinoma. All animals were intradermally inoculated with 10^4 tumour cells in their right flank. In the dextrolateral tail vein 0.1ml (0.15mg) of doxorubicin (DX) was applied and 0.05 ml of vaccine (V) was intramuscularly inoculated. Mice were divided into control (C), vaccine (V), doxorubicin (DX) and (DX-V) groups. The histometric study was performed in the follicular areas and the spleen megakaryocytes were quantified using the Image Pro Plus software. Statistically significant differences were found between C and V with $p < 0.002$ and between C and DX-V with $p < 0.001$. There was more reactivity with the combined use of the chemotherapeutic agent and the vaccine, which would promote spleen reactivity. The increase in spleen megakaryocytes might be related to increased thrombopoiesis in the V group.

59.

MORPHOLOGICAL AND BIOCHEMICAL PLASTICITY OF *DUCHESNEA INDICA*, *FRAGARIA VESCA* AND *POTENTILLA TUCUMANENSIS* IN RESPONSE TO ENDOMYCORRHIZAL INOCULATION

Albornoz P[1,2], González J[2], Prado F[1], Hilal M[1], Castagnaro A[3], Díaz Ricci J[4].
[1]Fac. Cs. Nat. e IML. [2]Fundación Miguel Lillo. [3]EEAOC. [4]INSIBIO, Tucumán. E-mail: albornoz@csnat.unt.edu.ar

In Tucumán these wild vegetable species appear in association with native endomycorrhizal fungi. The morphological and biochemical plasticity of these species in response to endomycorrhizal inoculation was studied. The experiment consisted in two treatments with five repetitions with five individuals per treatment. In one treatment 50g of inoculable soil was added. The morphological variables measured were: specific foliar mass (SFM), plant height, and tissue thickness. The metabolic variables were: photosynthetic pigments, flavonoids and soluble sugars. The SFM showed a significant positive variation ($P<0.01$) in *D. indica*. Mycorrhizas enabled this species to save 16% of carbon. *D. indica* showed changes in tissue thickness, in the empalized parenchyma with an increase of 23% and in the spongy parenchyma with a similar decrease. With respect to plant height, *F. vesca* showed an increase of 15.2%. Photosynthetic pigments, flavonoids and soluble sugars showed a decrease of over 30% in *P. tucumanensis*. The results show that the wild species studied have a different behaviour in their morphology and metabolism towards endomycorrhizal inoculation.

60.

TRICHOGLOSSUM HIRSUTUM VAR. _HIRSUTUM_ (PERS.) BOUD. (GEOGLOSSACEAE, HELOTIALES). A NEW RECORD FOR ARGENTINA

Catania M del V[1], Romero AI[2].
[1]Fund. M. Lillo, Botánica. M. Lillo 251, S.M. Tucumán (4000), Argentina. E-mail: catania@csnat.unt.edu.ar. [2] CONICET

Trichoglossum Boud. is a genus found especially in temperate zones that includes approximately 19 morphospecies (Kirk *et al.*, 2001). It is characterized by stipite, clavate to spatulate ascomata, with fleshy consistency, black coloured, totally hairy, which gives it its velvety aspect. Gamundí´s reports are the only records of this genus for our country. She reported (1979, 1986) the genus for Argentina for the first time, describing *T. ctopartitum* Mains in the province of Tierra del Fuego. The objective of this work is to present for the first time the record of the genus in northwestern Argentina as well as to describe its macroscopic and microscopic characteristics and illustrate the morphospecies identified. The specimens were collected during fungal explorations in forests of *P. parlatorei* Pilg. in the province of Catamarca. The material was dried and preserved in the LIL herbarium. Microscopy preparations and observations were performed with routine methods. In conclusion, *Trichoglossum hirsutum* var. *hirsutum* (Pers.) Boud. was identified, this being the first record of this morphospecies in Argentina.

61.

ANATOMY OF THE SPOROPHYTE OF ADIANTOPSIS CHLOROPHYLLA (SW.) FÉE (PTERIDACEAE)

Hernández MA, Rodríguez F.
Instituto de Morfología. Fundación Miguel Lillo. Miguel Lillo. Miguel Lillo 251. 4000 Tucumán. E-mail: mteran@csnat.unt.edu.ar

Adiantopsis is an American genus that includes 7 species. *A.chlorophylla* is the only representative of the genus in NW Argentina. It grows in modified communities between 300 and 1600 meters above sea level. The aim of this work is to analyse its anatomy. Conventional anatomical techniques were applied. Stomatic index, stomata and trichome size were calculated for 10 individuals with 10 repetitions. Polocytic and actinocytic stoma of 41.3 μm x 27.7 μm at the same level as the other epidermic cells. Stomatic Index 24.72. Both epidermises with rectangular cells with lobulated walls, with plain cuticle. Glandular trichomes with 1-2 cellular foot 90.6 μm total length. The mesophyll has 2-3 strata of pallisade and spongy parenchyma. Protostelic vascular bundle surrounded by endodermis. Subcircular petiole with 2 membranose wings. Sclerenchymatic epidermis and subepidermis, protostelic vascular bundle, with V-shaped xylem, pericycle and endodermis. Solenostelic rhizome with bicolor scales. Meristeles surrounded by pericycle and endodermis. Cortex and pith formed by esclereids. Adventitious roots with primary diarch structure. The anatomy of this species is described for the first time and the characteristics of diagnostic value are: type of trichomes, stomata, steles, and amount of esclerenchymatic tissue.

62.

ANATOMY OF THE SPOROPHYTE OF *DORYOPTERIS CONCOLOR* (LANGSD & FISCH) KUHN (PTERIDACEAE)

Hernández MA, Benavidez A, Terán G.
Instituto de Morfología Vegetal. Fundación Miguel Lillo. Miguel Lillo 251. 4000 Tucumán. E-mail: mteran@csnat.unt.edu.ar

D. concolor (Langsd & Fisch) Kuhn is a fern that is found from Central America to NW Argentina between 400 and 1600 meters above sea level. This plant has pedate fronds, with interrupted marginal sori, dark petiole and compact rhizome. This work analyzes its anatomy. Conventional anatomical techniques were applied. Stomatic Index, trichome index, stomata and trichome size were calculated for 23 individuals with 5 repetitions. Both epidermises present rectangular cells with lobated walls. Hipostomatic leaves with polocytic and actinocytic stomata of 36.62 μm x 29 μm. The mesophyll has 2 layers of palisade and 3-4 layers of spongy parenchyma. Protostelic vascular bundle surrounded by endodermis. Stomatic index, 9.77. Glandular trichomes, 67.5 μm, with unicellular foot and head, trichome index 2.49. Lobulated reflex margin. Subcircular petiole with glandular trichomes in the dorsal part. Sclerenchymatic epidermis and subepidermis, protostelic vascular bundle with V-shaped xylem, pericicle and endodermis. Solenostelic rhizome covered by scales, pith and cortex formed by esclereids, meristeles with endodermis. Adventitious roots with primary diarch structure. The anatomy of this species is described for the first time. The characters of diagnostic value are: type of trichomes, stomata, steles, and the amount of esclerenchymatic tissue.

63.

SENSIBILITY OF *Pseudomonas aeruginosa* AGAINST PHENOLIC COMPOUNDS FROM *Coronopus didymus* (Brassicaceae)

Lizarraga E, Gaudioso C, Cecilia M.
Universidad Nacional de Tucumán

C. didymus L. Sm., a medicinal herb known as "quimpe", is used in the treatment of numerous diseases by several indigenous populations in Argentina. Major phenolic compounds from *C. didymus* were obtained from aerial parts by maceration with 80 and 50% ethanol; fractions were first concentrated and then diluted with distilled water. Biological assays were performed against *P. aeruginosa* ATCC 27853 and five human pathogenic strains. The diffusion method was employed to qualitatively determine the activity of the control strain. Minimum inhibitory concentration (MIC) was tested according to CLSI guidelines. Bactericidal activity was tested against *P. aeruginosa* (MIC 20 mg/ml) and bacterial cell counts were carried out every 2 h for 24 h. The diffusion method revealed 41, 40 and 38 mm inhibition halos for the concentrations assayed. The MIC for the control strain was 10 mg/ml, whereas the MIC for 4 of the human isolates was 40 mg/ml and 20 mg/ml for the remaining 2 strains. The death curve showed a decrease in bacterial population of more than 3 log between 4 and 8 h. The total extract showed antimicrobial activity against the *P. aeruginosa* strains assayed. Bactericidal activity of the extract was demonstrated by the death curve.

64.

BACTERICIDIAL EFFECT OF THE AQUEOUS EXTRACT OF *QUERCUS ROBUR* L. *IN P. aeruginosa AND S. haemolyticus* ISOLATED FROM SKIN BY ELECTRONIC MICROSCOPY

Villafañe R, Aulet O, Castillo MC.
UNT. E-mail: microbiologaclinica@fbqf.unt.edu.ar

Skin and soft tissue infections are generally associated with *Staphylococcus sp*. and *Pseudomonas sp*. Nowadays natural substances with scar promoting and homeostatic activity are used as alternative therapies for these infections.
Quercus robur L has astringent, scar forming and antibacterial activity in the treatment of wounds, burns and dermal ulcers.
The aim of this study was to evaluate de bactericidal activity of the *Quercus robur* L extract (Ext-Qr) against *S. haemolyticus* and *P. aeruginosa* isolated from skin infections to determine bacteria death time and to assess the effect of the extract on the strains using electron microscopy. Bactericidal activity was determined following CLSI guidelines.
Ext-Qr presented bactericidal activity against the assayed strains, with a > 3 log ufc/ml decrease in viable cells after 4 h and death after 12 h of incubation, respectively. Electronic microscopy allowed us to observe a reduction in cell wall, a loss of cytoplasmic material in *P. aeruginosa* and a degenerated wall with loss of integrity in *S.haemolyticus* after incubation for 4 h. Consequently, on the basis of cell damage corroborated by electron microscopy, we can conclude that Ext-Qr presents bactericidal action against the above strains.

65.

CYTOHISTOLOGICAL MODIFICATIONS IN MOUSE BY *H. influenzae* INOCULATION

Santos V, Cangemi R, Cecilia M, Aulet O.
UNT. E-mail: microbiologiaclinica@fbqf.unt.edu.ar

H.influenzae (Hi) is associated with human infections that can be slight or invasive and occur mainly in children under the age of two. The aim of this study was to determine the histological modifications in different organs after intraperitoneal inoculation with type b Hi in BALB/c mice. We used lots of eight 15-day-old BALB/c mice, four inoculated with Hi and the rest with phyisiological solution (controls). Mice were sacrificed after cardiac puncture (24 h). Two mm slices from the heart, liver, brain, lung and trachea were obtained, homogenated in 0.3 ml of physiological solution and then cultured in MTH agar. Type b Hi was isolated in all the organs. Cytohistological studies were carried out in brain and respiratory tract. Activated macrophages were observed in the lung imprints. Histological slices of trachea and bronchus did not present structural modifications. In respiratory bronchioles exudation of polymorphonuclears and a congestive capillary zone were observed. In brain polymorphonuclears were found at the subarachnoid space and near the leptomeningean vessels. A systemic infection in BALB/c mouse after inoculation of type b Hi was histologically demonstrated.

66.

ANTIOXIDANT ACTIVITY OF AQUEOUS AND ETHANOL EXTRACTS FROM THE STEM BARK OF *POLYLEPIS AUSTRALIS BITT* (QUEÑOA)

Habib N, Daud A, Aristimuño E, Reynoso MA, Sánchez Riera A.
Universidad Nacional de Tucumán, Chacabuco 461. San Miguel de Tucumán (4000), Tucumán, Argentina.
E-mail: sariera@fbqf.unt.edu.ar

The use of plants in popular medicine is frequent in northwestern Argentina. Oxidative stress is a natural event in all organisms and it has been well established that injuries caused by ROS release result in vascular damage and metabolic disorders such as diabetes. Polylepis australis Bitt, commonly known as "queñoa", is found in the Calchaquies Mountains and is used by the indigenous population in the treatment of diseases such as diabetes and hypertension. The aim of the present work was to evaluate the antioxidant and free radical-scavenging activities of the aqueous and ethanol extract of the stem bark of Polylepis australis Bitt. Free radical-scavenging activity was assayed using the DPPH method. The results revealed that the ethanol extract has a greater depurative activity on DPPH than the aqueous one, both being more effective than BHT. Antioxidant activity was determined by the β-carotene method. The different extract concentrations used demonstrated that their effect is dose dependent. The ethanol extract (100 μg/ml) showed the same antioxidant activity as BHT (100 μg/ml). The aqueous extract had lower antioxidant activity than the ethanol extract and the positive controls under the same experimental conditions.
The antioxidant activity of queñoa stem bark extracts observed in this study would justify the use of Polylepis australis Bitt in popular medicine.

67.

INHIBITORY EFFECTS OF EDTA ON THE DEVELOPMENT *IN VITRO* OF *CANDIDA ALBICANS* STRAINS SENSITIVE AND RESISTANT TO ANTIFUNGAL AGENTS

Nieva Moreno SG[1], Runco R[1,2], van Gelderen A[2].
[1]Laboratorio de Bacteriología, Hospital del Niño Jesús, [2]Cátedra de Micología, Fac. de Bqca, Qca y Fcia, Universidad Nacional de Tucumán, Tucumán, Argentina.

Candida albicans is a dimorphic fungus that causes candidiasis. Treatment with azoles is effective but, in recent years, strains resistant to these antifungal agents have been found. This led to the search for new substances with antifungal activity. This study examines the inhibitory effect of EDTA on the development *in vitro* of *Candida albicans* strains. The strains were obtained from cases of oral candidiasis. Sensitivity to antifungal agents was determined by tablets diffusion test using Ketoconazole, Itraconazole, Fluconazole, Voriconazole and Amphotericin B. The activity of EDTA was determined using disks with 10 ul-EDTA solution (0.342 mol / l) spread on cultures of each yeast strain according to the technique used to determine the sensitivity to antifungal agents for comparative results. Three strains were resistant to all antifungal agents tested while three others proved sensitive. The six strains were sensitive to the EDTA concentration tested. The results suggest the need for studies to clarify the potential usefulness of EDTA as a decontaminating and antifungal agent.

68.

ANTIRADICAL ACTIVITY OF A FLAVONOID ISOLATED FROM THE EXTERNAL RESINOUS EXUDATE OF *GOCHNATIA GLUTINOSA*

López ME, Catalán CAN, Schuff C.
Instituto de Química Orgánica, Facultad de Bioquímica Química y Farmacia, Universidad Nacional de Tucumán, Ayacucho 471, S. M. de Tucumán (T4000INI), Argentina. E-mail: runylopez@hotmail.com

The genus *Gochnatia* (tribe Mutisieae, family Asteraceae) is rich in flavonoids. In a previous work we reported that extracts from *G. glutinosa* (Don) Don ex Hooker et Arnott, *G. polymorpha* (Less.) Cabrera and *G. haumaniana* Cabrera displayed powerful antioxidant and radical scavenging activities. In the present work we report the isolation and antiradical activity of a flavonoid isolated from the external exudates of *G. glutinosa*. The phenolic compounds were extracted from fresh leaves and flowers with a 5% NaOH solution. After acidification of the alkaline liquor with HCl, a precipitate was obtained which was repeatedly column chromatographed on Si gel to yield a flavonol identified as 3',4',5,7-tetrahydroxy-3-methoxyflavone (3-O-methylquercetin). Its structure was established by ^{1}H NMR and UV spectroscopy using shift reagents. The antiradical activity was determined using the 1,1-diphenyl-2-picrylhydrazyl radical assay. Butylated hydroxytoluene (BHT) was used as reference. The isolated flavonoid showed an antioxidant activity 200 times higher than BHT.

69.

INHIBITORY EFFECT OF THE SESQUITERPENE LACTONE POLYMATIN A AGAINST BACTERIA FROM CLINICAL ISOLATES AND FROM GRAM (+) AND GRAM (-) ATCC STRAINS

Porcel N[1], de Pedro A[2], Perotti M[2], Catalán C[2], de Castillo M[1].
[1]Cátedra de Bacteriología. [2]Instituto de Química Orgánica. Facultad de Bioqca, Qca y Fcia U.N.T. Ayacucho 471 (4000). Tucumán, Argentina. E-mail: adrydepedro@hotmail.com

Polymatin A is a melampolide-type sesquiterpene lactone isolated from the aerial parts of *Smallanthus macroscyphus* (Baker ex Martius) A. Grau (subtribe Melampodiinae, tribe Heliantheae, family Asteraceae). Several closely related lactones possessing antimicrobial activity have been isolated from the most relevant member of this genus, the Andean crop *Smallanthus sonchifolius* (yacon). The aim of this work was to evaluate the inhibitory effect of polymatin A against reference bacterial strains and against pathogenic clinical isolates (CI). The microorganisms *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923 and CI from *E. coli,* methycillin resistant as well as methycillin sensitive *S. aureus Salmonella* spp*, Pseudomonas aeruginosa* and a β-lactamase of wide spectrum *Enterobacter* spp were used. Agar well diffusion methods were used and Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) were determined. Polymatin A showed an inhibitory effect against most of the microorganisms assayed.

70.

β-THALASSEMIC MINOR AND GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY DETECTION IN A BLOOD BANK: A PRELIMINARY STUDY

Rossi E[1], Leri M[1], Lazarte S[1], Medici H[2], Issé B[1] Agüero G[1]
[1]Inst de Bqca Aplicada. UNT. Balcarce 747. [2]Centro de Medicina Transfusional Alberdi 38. S. M. de Tucumán.
E-mail: eleonorarossi@arnet.com.ar

β thalassaemia is an inherited syndrome characterized by defects in the synthesis of one of the β globin chains. Glucose 6 phosphate dehydrogenase deficiency (G6PD) is an enzyme inherited sex-linked alteration susceptible to haemolysis produced by oxidant drugs and infections. Both pathologies are particularly common in the Mediterranean and Middle East area. Since the population of the province of Tucumán, Argentina, is mostly composed of individuals of Italian, Spanish and Middle Eastern descent, we were interested in identifying the prevalence of the above pathologies. One hundred and thirty-one blood donors were studied between August and September 2007. 4 g/L single-tube osmotic fragility (OF) and methaemoglobin reduction tests (MRT) were performed. When OF decreased, haemogram and serum iron were studied. All MRT assayed were negative. OF decreased (32±13% haemolysis) in 16 (12%) subjects; in this group two individuals suffered from anemia (Hb<120 g/l). Although our study did not show any G6PD o BTh alterations, it seems important to pursue these studies further to prevent clinical symptoms and their consequences in our population.

71.

CHARACTERIZATION OF REGIONAL FRUIT JAMS

Genta H[1,2], Llanos C[1], Barnes N[1], Chauvet S[1], Albarracín P[1].
[1]Dpto Ing. Procesos y Gestión Industrial, (FACET-UNT), [2]Fac. Bioq., Qca. y Fcia., UNT. E-mail: palbarracin@herrera.unt.edu.ar

The province of Tucumán is an important producer of regional foods. In August 2006 the Argentine Food Code (AFC) demanded that the following information be included in the product label: Carbohydrates (Chy), Proteins, Total Fat, saturated and trans, Dietary Fiber, Sodium and Energy Value. In this work we characterized jams made from Sweet Lime, Blueberry, Orange, Fig, and Sweet Lime in syrup produced by a regional cooperative. Analyses were carried out in the Food Analysis Laboratory from FACET-UNT and results were compared with industrial products. Parameters were studied according to AFC methodology: humidity by gravimetry, proteins by Kjeldahl, lipids by Soxhlet, sodium by spectrophotometry and dietary fiber by alkaline-acid digestion. Chy were calculated by difference. Energy was calculated from Chy contribution (4Kcal/g). Percentages of daily values were calculated on the basis of a diet of 2000 kcal or 8400 kJ. Sweet Lime in syrup has the highest energetic value correlated with the highest Chy value. Proteins and fats were not significant in any of the samples. Dietary fiber and sodium values showed that Sweet Lime in syrup presented the greatest contribution to the daily value. There were no significant differences between the values obtained and those of industrial products. The samples complied with AFC regulations and the quantity and quality of nutrients contents were similar to the ones in industrial products.

72.

REPRODUCTIVE AND PRODUCTIVE PIG PARAMETERS OBTAINED WITH CROSS LANDRACE x YORSHIRE SOWS BY A GROUP OF SMALL PRODUCERS IN TUCUMAN

Reales MA, Cisneros Núñez JC, Blanco M, Máscaro PM, Ibáñez MA. Facultad de Agronomía y Zootecnia, UNT. Av. Roca 1900. S. M. de Tucumán, Argentina. E-mail: jcisneros@faz.unt.edu.ar ; mmreales@terra.es

In the last ten years a large number of Argentinean pig breeders decided to work with white pig breeds such as Landrace and Yorkshire and with their different cross breeds based on their good reproductive and productive performance and on the preference of buyers for pigs and capons. The objective of this work was to quantify the reproductive and productive parameters of white pig breeds belonging to a group of small producers. Materials and Methods: The experience was carried out for one year in the Department of Simoca in the province of Tucumán. We worked with two groups of small producers. Service was performed with Spotted Polland pigs chosen for their toughness. During their service, gestation and suckling sows were given a suitably balanced diet. They were health controlled and service, gestation, farrow and suckling were carried out in a field pigpen with shades and pig-water dispensers. Results and conclusions: Group I: Litter rate, 1.98; piglets born/sows/farrow, 7.5; weaned piglets /sows/ farrow, 6.2. Group II: Litter rate, 2.27; piglets born/sows/farrow, 10.4; weaned piglets/sows/farrow, 9. Group I: 12.20 pigs weaned per mother per year. Group II, 20.4. In these groups of small scale producers with low investments in facilities results were satisfactory and in this way they are part of the Farming Productive Process.

73.

CLIMATIC CHARACTERIZATION OF THE *WHEAT STREAK MOSAIC VIRUS* (WSMV) PATHOLOGY SYSTEM AND ITS VECTOR A*ceria tosichella* Keifer USING A GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Alemandri V, Melchiorre GB, Sagadin M, Izaurralde J, Truol G.
IFFIVE-INTA. Camino 60 Cuadras km 5 °. X5020ICA. Córdoba, Argentina. E-mail: vanialemandri@yahoo.com.ar

In Argentina, the *Wheat streak mosaic virus* (WSMV) disease has been present since 2003, when it was detected for the first time in the districts of Marcos Juárez and Jesús María, province of Córdoba. Since then, the disease has been rapidly expanding. This study was undertaken for the purpose of characterizing through a geographical information system (GIS) the areas where the disease was detected up to the present. Data were used for 28 sites where virosis was detected during the 2003-2006 period. FloraMap 1.02 software was used to characterize the sites. Maximum and minimum altitudes recorded were 1280 and 30 m above sea level respectively. Maximum and minimum average ambient temperatures (AAT) were 27.9ºC and 6.1ºC respectively. Maximum and minimum average environmental pressure (AEP) was 239 mm and 2 mm respectively. All sites had a dry season lasting from 6 to 11 months. These results will contribute to an epidemiological study by providing data on climatic features.

74.

EVALUATION OF SUSCEPTIBILITY TO *WHEAT STREAK MOSAIC VIRUS* (WSMV) IN ARTIFICIALLY PRODUCED INFECTIONS IN VARIOUS WHEAT CULTIVARS

Sagadín M[1], Bainotti C[2], Truol G[1].
[1]IFFIVE-INTA, Camino 60 Cuadras, km 5 °, X5020ICA Córdoba, Argentina. [2]EEA. INTA Marcos Juárez. E-mail: gtruol@correo.inta.gov.ar

The*Wheat streak mosaic virus* (WSMV) disease causes significant crop losses in wheat producing areas. Its presence has been recorded in Argentina since the year 2003 and it has shown a rapid expansion up to now. We considered it important to use artificial infection to assess the amount of damage caused by the disease, so this became the purpose of the present study. Susceptibility to virosis was assessed in 4 wheat cultivars (ACA304, 801, P. Gaucho, P. Molinero). These were ranked for severity and serology. All four cultivars proved susceptible and, despite the lack of significant statistical differences, a diminution in yield of 37% and 11% and an incidence of 33% and 12% were observed in cv. P. Gaucho and cv. ACA 304 respectively. In the remaining cultivars no analysis was possible because the health control samples became infected also. The average grade of symptom severity (AGSS) was 1.25 and 1.20 in the Gaucho and ACA 304 cultivars respectively. Our studies of yield drop and susceptibility will continue in order to find a way to control the disease.

75.

ANTIFUNGAL ACTIVITY OF TWO *BACCHARIS* SPECIES COLLECTED IN THE ARGENTINE PUNA

Zampini IC[1,3], Ordóñez AL[2], Isla MI[1,3].
[1]Cátedra Fitoquímica. [2]Cátedra Farmacotecnia II. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Tucumán. Argentina. [3]CONICET. E-mail: misla@fbqf.unt.edu.ar

The genus *Baccharis* (Asteraceae) includes approximately 96 species in Argentina. The species selected for the present study, *Baccharis incarum* and *B. boliviensis*, grow in extreme zones of low atmospheric pressure, wide temperature ranges and high solar radiation (Antofagasta de la Sierra, Province of Catamarca, Puna de Atacama, Argentina). These plants are popularly known as "lejía" (bleach) and are commonly used by the inhabitants to protect the stomach and liver, restore blood circulation, reduce inflammatory processes and cure ulcers, burns and skin wounds. The aim of the present work was to evaluate the antifungal potential of the aerial parts of both plant species against human pathogenic yeasts and micelal fungi.
Tinctures in 80% ethanol were prepared. Antifungal activity was evaluated by bioautography assay. Minimum fungicide concentration (MFC) was determined by the agar macrodilution method in accordance with CLSI recommendation against *Aspergillus* spp and *Candida albicans.* MFC values were 200 to 400 μg/ml for *Aspergillus* spp and *Candida albicans*.

76.

ACTIVITY OF ORGANIC EXTRACTS FROM PUNA SPECIES OF *Fabiana sp.* (SOLANACEAE) AGAINST ANTIBIOTIC RESISTANT STRAINS

Cuello S[1,3,4], Lizarraga E[2], Isla MI[1,2,3,5].
[1]Fac. de Bioq., Qca. y Farm. [2]Fac. de Ciencias Naturales e IML. U.N.T. [3]Fundación Miguel Lillo. [4]ANPCyT. [5]CONICET. E-mail: misla@tucbbs.com.ar

Fabiana bryoides Phil., *Fabiana punensis* S.C.Arroyo, *Fabiana densa* J. Rémy, which grow in northwestern Argentina, are used as antiseptics in popular medicine. The purpose of the present study was to extract antimicrobial agents from their aerial parts with different solvent systems. The fractions were obtained by Soxhlet from dry plant material using hexane, chloroform, EtOAc and MeOH. Bioautography assays by dot blot (100 μg) against the resistant strains *S. aureus, E. faecalis, P. aeruginosa* and *E. coli* isolated from clinical samples were used. The active fraction (150 μg of each fraction) was developed in different solvent systems. Then bioautography assays were performed.
The fractions obtained with hexane, chloroform and AcOEt were more active than the MeOH fraction, especially against Gram (+) bacteria. The *F. punensis* ethyl acetate fraction had the widest activity spectrum. The results obtained justify the traditional use of these species.

77.

HISTOMORPHOMETRICAL AND MICROCHEMICAL CHARACTERIZATION OF DEVELOPING ENAMEL IN RATS FED A BORON-DEFICIENT DIET

Haro Durand L, Vera Mesones R, Nielsen FH, Gorustovich A.
Res. Lab. CONICET-CNEA, A4408FTV, Salta. Grand Forks Human Nutrition Research Center, ND, USA.

Emerging evidence indicates that boron (B) plays a role in bone formation and maintenance. However, its effects on mineralized tooth structures are not clearly defined. The aim of the present study was to determine whether dietary B-deficiency affects developing enamel on mandibular incisors in rats. Twenty-one-day-old male Wistar rats were given a B-deficient diet (-B; 0.07 mg/kg diet) for 14d while control animals received a B-adequate diet (+B; 3 mg B/kg diet). The mandibles were resected and fixed in 10% formalin solution. Paraffin and/or undecalcified buccolingually oriented sections were obtained at the level of the mesial root of the first lower molar. The mid/late maturation zone of incisor enamel was studied. No statistically significant differences in food intake, body weight or mandibular growth were observed between the groups. Histomorphometric evaluation found -B rats had 30 ±3% reduction in enamel thickness (p<0.05). The microchemical characterization of enamel by EDX found no statistically significant differences in Ca/P ratio between the groups. In conclusion, our findings suggest that dietary B deprivation in rats alters amelogenesis due to the inhibition of enamel matrix deposition.

78.

EFFECT OF VITREOUS-CERAMIC SCAFFOLDS ON ENDOCHONDRAL OSSIFICATION IN CHICK EMBRYOS

Vargas G, Vera Mesones R, Porto López JM, Boccaccini AR, Gorustovich A.
Res. Lab. CONICET-CNEA, A4408FTV, Salta. E-mail: agorustovich@gmail.com. Department of Materials, Imperial College London, UK.

45S5 Bioglass®-derived glass-ceramic scaffolds showed, as early as five days after implantation on the choryoallantoic membrane (CAM) of chick embryos grown in shell-less culture, restoration of the bone-like phenotype in chick embryonic skeleton as detected by Alcian blue-alizarin red double staining in whole-mount preparations. The aim of this work was to perform a histological evaluation and microchemical characterization of tibiae primary ossification center of the embryos subjected to implantation of a 45S5 Bioglass®-derived glass-ceramic scaffold. Chick embryos were divided into two groups: control (C, n:15), and experimental (E, n:15). Scaffolds (5x5x2 mm^3) were placed on the CAM at 7 days of total incubation in embryos of group E. A marked reduction (93%) in Ca content in the scaffolds was evidenced by EDX at 7 days post-implantation. In both groups the cartilaginous primordium was surrounded by rows of anastomosing trabeculae of bone. The microchemical characterization by EDX evidenced bone mineralization (Ca/P:1.79±0.10) in embryos of group E. However, no mineralization of embryonic bones was detected in group C.

79.

ANALYSIS OF FINAL EXAM RESULTS IN GENERAL ZOOLOGY STUDENTS (Natural Resources and Environmental Engineering-UNSa)

Romero NM, Vera R, Vázquez L, Martínez A, Martínez M, Floriani G, Daher D, Terroba A.
Cátedra de Zoología General, Facultad de Ciencias Naturales, Universidad Nacional de Salta. Avda. Bolivia 5150. 4400-Salta. E-mail: nmarceromero@hotmail.com

The difficulties of students in dealing with first year subjects are obvious but no coherent explanation has been offered for them. Evaluation is an important part on the learning process. Many students are unable to pass the final exam before a new course of the subject begins. The main objective of this work was to analyze the behavior of students when they took the General Zoology final exam. Six cohorts were analyzed (1999-2004), considering fifteen scheduled and special exam turns. In the periods analyzed, 760 students fulfilled the requirements for taking the final exam and 71% took it. Out of the 92% that passed the exam, only 77.5% passed it first time they took it. Most students were able to pass their exam during the first 4 turns, highest marks being obtained during that period. The results showed that the students reached the objectives of the course.

80.

NEW COMUNICATION STRATEGIES IN NATURAL RESOURCES AND ENVIOREMENTAL ENGINEERIG FIRST YEAR STUDENTS. SALTA. ARGENTINA

Nieva LB, Vera Mesones R.
Cátedra Zoología General. Fac. Cs. Nat. Escuela de Recursos Naturales. Escuela de Biología. Universidad Nacional de Salta. Avda. Bolivia Nº 5150. 4400. Salta. Argentina.
E-mail: lnieva_5@hotmail.com

The purpose of this work was to analyze the influence of new communication technologies and changes in the frequency of Practical Activities in the teaching-learning process of General Zoology. New technologies were incorporated to improve academic standards by creating new communication spaces and generating a new cultural context. The impact of these strategies was evaluated on the basis of the results of interviews and regularity and assessment lists. The 2006 (N=237) and 2007 (N=332) data were compared. Highest regularity indexes are from 2007, as well as fewer dropouts and higher permanence of students in the course (57.83% in 2007 and 36.25% in 2006). The interviews showed that the students used all the teaching materials provided, although they suggested the use of better preserved materials and more dissections. We consider new technology and the implementation of 2 weekly Practical Activities as positive for the improvement of students' performance.

81.

HISTOPATOLOGICAL FINDINGS IN KIDNEY AND LIVER IN AN EXPERIMENTAL MODEL OF MIXED CONNECTIVE TISSUE DISEASE

Nuñez JM, Alabarse GM, Uñates JE, Valverde MH.
Histology Department. Faculty of Medicine, Univ. Nacional de Tucumán. E-mail: juanmanuelpety@hotmail.com

Mixed connective tissue disease (MCTD) is an illness that overlaps clinical features of systemic lupus erytematosus, progressive systemic sclerosis, rheumatoid arthritis and dermatomyositis. Aims: To describe the histopatological findings in kidneys and livers of an experimental model of MCTD. Material and Methods: Eighteen 40-week-old male and female BALB/c mice were inoculated with ribonucleoprotein in Freund's complete adjuvant. *Control group*: 8 mice of the same species and age were inoculated only with Freund's adjuvant. After the third month of the last inoculation mice were sacrificed and the organs were processed. Result: *Kidneys*: a) Perivascular and interstitial lymphocytes infiltrates (90%). b) Hipercelular glomeruli invaded by lymphocytes (72%). c) Vasculitis (44%). *Livers*: a) Inflammatory lymphocytes infiltrates in the portal and periportal region (67%). b) Focal inflammatory infiltrates in hepatic lobules (83%). c) Hepatocytes vacuolar degeneration (5%). d) Vasculitis (33%). Conclusions: The lesions observed would be compatible with chronic active hepatitis, nephritis and glomerulonephritis. Our findings were in agreement with the literature, although frequency proved to be higher in our model.

82.

THE LEARNING PROCESS IN THE UNIVERSITY STUDENT

Gakman C, Sogno C.
Education for Health. Faculty of Dentistry. UNT. Avda. Benjamín Araoz 800. E-mail: cgakman@arnet. com.ar

Objetive: to explore the ways of studying and learning of 2nd year student of the Faculty of Dentistry of the National University of Tucumán, Argentina. **Material and Method:** The prospect methodology adopted is exploratory. The population included 16 second-year students of the Faculty of Dentristy who attended the Health Education course. We applied an anonymous self-administered questionnaire with questions with precategorized options. It produced and calculated absolute and relative frequencies. **Results:** 50% of the students organized their study hours according to time availability while 33% drew up a timetable to distribute daily and weekly study hours. Sixty-two per cent studied by themselves. 86% used class notes and photocopies. They asked their classmates for the required bibliography; only 33% requested information from the chair. When using textbooks, scarcely 12% were able to identify authors. 35% established relationships between different authors in the development of information. **Conclusion:** The organization of the time devoted to studying is a key variable to assess the efficacy of the learning process. This, however, does not seem to be one of the students' strengths. Speculation over time results in superficial and disorganized learning and this disorganization leads to fragmentation of contents, dispersal of effort and improvisation.

83.

COMPUTER INFORMATION TECHNIQUES IN THE BIOLOGY LAB: A STRATEGY FOR THE CONSTRUCTION OF KNOWLEDGE

Ponce R, Cabana M, Vilte Martínez M, Giunta S.
Cátedra de Biología, Facultad de Ingeniería, UNJu. Gorriti 237. 4600-Jujuy. Argentina. E-mail: sagiunta@fi.unju.edu.ar

The use of the images and texts creates the possibility of storing information in the long-term memory, helping to organize information spatially and to understand processes temporarily. The Biology Department of the Faculty of Engineering of the National University of Jujuy, Argentina, has developed a research perspective that aims at facilitating the teaching-learning process. We assessed the problems and applied certain modifications to improve teaching practices, generating production of materials on paper, designed specifically for the systematic learning of the General and Cellular Biology course. The use of this material was supplemented by various computer information techniques (Web pages, digitized videos, CD-ROMs) to delve into the subject. We also considered the results of the partial exams. The data were processed statistically. 85% of the students felt that the printed material and the combination of teaching resources were effective in improving learning, which was measured in the partial results of the evaluations performed. However, 60% admitted not following the instructions for the use of the teaching material and only 15% verified that they met the objectives set for each unit. 50% stated that they seldom resorted to bibliographical material. In previous years, abound 50% of the students passed their partial exams. After the implementation of new teaching resources 63% did so. The use of printed material is proposed together with the combination of teaching resources for the learning of biology subjects, stressing the key role of visual images in the organization, integration and storage of information.

84.

THEORETICAL AND METHODOLOGICAL CRITERIA FOR ECOLOGICAL INDICATORS IN ENVIRONMENTAL ASSESSMENT IN CATAMARCA, ARGENTINA

March JM[1], Dios MM[2].
[1]Escuela de Arqueología, Universidad Nacional de Catamarca. [2]Facultad Ciencias Exactas y Naturales, UNCA. E-mail: juanmanuelmarch@yahoo.com.ar

The objective is to determine Environmental Indicators (EI) used in Environmental Impact Assessment (EIA) as ecosystem balance indicators and to identify theoretical and methodological criteria associated with them.
Methodology: metatheoretical analyses of concepts that define an EI in a sample of EIAs conducted in the province of Catamarca from 2001 to 2007 that correspond to mining, roadway and industrial projects. The selection criteria were qualitative.
Results: The level of certainty of environmental analyses becomes diffused by not using ecological methodology.
Conclusion: these environmental studies do not present a deep ecological analysis that would enable them to provide a reliable account of environmental imbalances, which is evident in the absence of EI. A theoretical and methodological reformulation closer to the ecological viewpoint is required.

85.

IMPLEMENTATION OF A BIOASSAY TO EVALUATE THE EFFECTS OF AN EFFLUENT FOR THE CELLULOSE-PAPER INDUSTRY

Cabana M, Ponce R, Cruz M, Rodríguez I, Giunta S.
Cátedra de Biología, Facultad de Ingeniería. Universidad Nacional de Jujuy. Gorriti 237. 4600-Jujuy, Argentina.
E-mail: sagiunta@fi.unju.edu.ar

Industrial effluents are the main source of freshwater contamination. In the province of Jujuy there is only one cellulose paper plant that manufactures high quality writing paper from sugar cane bagasse. The aim of this study was to assess the effects of a cellulose paper effluent on seed germination and root growth in *Lactuca sativa* (lettuce) and *Raphanus sativus* (radish) The pure sample (100%) and four dilutions (0.625; 12.5; 25; 50%) as well as a negative control (distilled water) were assayed. All assays were carried out in duplicate. The measurements of biological indicators were recorded after incubating samples for 120 h at 20 ± 2ºC in the dark. We calculated actual concentration or concentration inhibitory of 50% germination (AC/CIg50) compared to the control and actual concentration or concentration inhibitory of 50% length of the root compared to the control (AC/CIr50) for both species. The results showed 38.31% AC/CIg50 and 49.21% AC/CIr50 for *Lactuca sativa* and 79.81% AC/CIg50 and 76.18% AC/CIr50 for *Raphanus sativus*. *Lactuca sativa* proved to be more sensitive than *Raphanus sativus*. The physicochemical analyses performed on the effluent showed low pH and high concentrations of sulfates, chlorides and bicarbonates. These by-products of the manufacture of cellulose paste would indicate the possible causes of germination inhibition and increased root length in the species assayed.

86.

RELATIVE ABUNDANCE OF THE VIVIPAROUS FISH *Gambusia affinis* (CYPRINODONTIFORMES, POECILLIDAE) IN ENVIRONMENTS ASSOCIATED WITH THE JURAMENTO RIVER BASIN IN SALTA, ARGENTINA

Nieva LB, Escobar E, Bianchi CL, Alcaraz M.
Proyecto Nº 1503. Museo de Ciencias Naturales. Laboratorio de Piscicultura y Pesquerías. Facultad de Cs. Naturales. CIUNSa. Av. Bolivia Nº 5150. 4400. Salta.

The *Gambusia affinis* species was introduced in Argentina as a biocontrol of the aquatic stages of mosquito populations and for commercial use in aquariums. The objective of this work is to contribute to the knowledge of the ecological history, abundance and distribution of the species in the Juramento river basin. Monthly samplings were carried out in 2006 in 7 areas along the basin. Fish specimens were captured with clump nets with different netting spaces and set in 10% formaldehyde buffer. Males (n = 30) and females (n = 90) were separated and measured for total length (L_T), standard length (L_{ST}) and total weight (W_T). The following results were obtained: females have a greater average length (16.26±092) than males (15.60± 1.52). The variability found demonstrated that most individuals in these populations are young. Most of the fish (56.04%) were detected in site 4 followed by site 2 (37.40 %), site 7 (4.94%) and finally site 6 (1.65%), the last three corresponding to environments with more dense vegetation and shallow water. In these sites the river bed is composed of gravel, mud and sand. The study confirms an increase in the area of distribution of the species.

87.

A FIRST APPROACH TO THE STUDY OF THE DIVERSITY OF THE MYCOBIOTA AND ITS STRUCTURAL ANALYSIS IN THE MONTANE FOREST, PACLÍN DEPARTMENT, CATAMARCA

Solohaga W, Martinez G, Vargas R, Mendoza A, Mamani J, Cisneros N, Rodríguez E, Contreras C, Costello J, Dios MM, Agüero A.
Lab. Diversidad Vegetal, Facultad Ciencias Exactas y Naturales, Univ. Nac. de Catamarca. E-mail: mariamartha011@yahoo.com.ar

This area studied is located in the phytogeographical province of the subtropical montane forest (Yungas) in Catamarca, Paclín Department, on the eastern foothill of the Sierra de Guayamba, Quebrada del Arroyo Los Laureles, at an altitude of 950 m a.s.l., where most endemic species are at the limit of their distribution and under water- and heat-stress conditions. This research is a first study in which mycobiota diversity was assessed and a seasonal (winter and spring) sampling structural analysis was performed with random 10 X 10 m quadrants in the bushwood. Results: fungi consist mainly of Aphyllophorales (Basiomycota), followed by Xylariales (Ascomycota) and Lycoperdales (Basidiomycota). Numerous Myxomycetes (Protista), treated here as fungi, were also collected. We also determined monthly fluctuation values and population dispersal and diversity. These results will enable the planning of strategies for the development of the Yungas ecosystems.

88.

THE LEECHES COLLECTION (ANNELIDA, HIRUDINEA) OF THE FOUNDATION MIGUEL LILLO (TUCUMÁN, ARGENTINA)

Montero JG, Teisaire ES.
Instituto de Invertebrados, Fundación Miguel Lillo. Miguel Lillo 251, 4000, Tucumán, Argentina. E-mail: teisaire@tucbbs.com.ar

The Hirudinea collection of the Miguel Lillo Foundation is one of the few that exist in our country; it was started in the 1940s by Konstantin Gavrilov and Zlatko Tomsic and includes samples from several Argentine provinces, especially from the northwest region. It consists of 176 lots with about 1000 samples. Information about each lot includes the name of the collector, the place of collection, the habitat in which the materials were found and the method of fixation and conservation. Only 40% of the lots are identified down to the species level, possibly with some mistakes and not updated, so the objective of this work is the recovery of the material and the taxonomic identification of all samples.
The materials and the card index were revised. The material was computerized and maps of the distribution of the specimens in the collection were drawn with a view to facilitating the planning and organization of future collections. This work is the necessary first step to ascertain the state of the Hirudinea collection, to increase it in future and to optimize its taxonomic identification through the use of keys and specialized bibliography.

89.

SIBLING SPECIES IN *LEPTODACTYLUS* (AMPHIBIA, ANURA): MORPHOLOGICALLY IDENTICAL?

Ponssa ML.
Instituto de Herpetología. Fundación Miguel Lillo. Miguel Lillo 251. E-mail: mlponssa@arnet.com.ar

The concept of "sibling" species was introduced by Mayr (1942) to describe pairs or groups of morphologically identical or nearly identical species. In a cladistic methodological approach, the term is restricted to two taxa that share a most recent common ancestor. The aim of this work was to determine whether the species considered traditionally as sibling species in the genus *Leptodactylus* have morphological differences and also whether they are sister taxa within a phylogenetic context. Phylogenetic hypotheses were obtained through a parsimony analysis based on a matrix of 43 species and 114 characters (external morphology, osteological, larval, and natural history). The pairs of species *L. didymus-L. mystaceus, L. gracilis-L.plaumanni, L. fragilis-L. latinasus* were closer to one another than to any other related species. Morphological differences were found between the pair *L. gracilis-L. plaumanni* (one character), and between the pair *L. fragilis-L. latinasus* (five characters). The pair *L. didymus-L.mystaceus* showed no morphological differences.

90.

PRE-GERMINATIVE TREATMENTS IN ROOTSTOCKS OF AVOCADO (*Persea americana* Mill.): II.- INFLUENCE ON SEEDLING GROWTH

Figueroa R MI, Portas AM, Gianfrancisco S, Arce O, Olivera G.
Facultad de Agronomía y Zootecnia. U.N.T. Avda. Roca 1900. S. M. de Tucumán. E-mail: marines@faz.unt.edu.ar

Commercial propagation of avocado includes two important stages: seedbed and nursery. The seedbed stage is vital because germination of seeds and establishment of seedlings must be guaranteed. These seeds germinate in an uneven way, even when conditions are adequate, possibly due to cotyledons resistance, impermeability of the seminal covers or presence of inhibitors. It has been proved that a practical method to favour uniform germination and later seedling growth is to perform a basal and apical cut of the cotyledons. The objective of this work is to determine the influence of the cuts performed to the seeds on the growth of the seedlings. The test was carried out in a greenhouse where seeds were placed in small pots with earth and inert material. The seminal covers were discarded and the seeds were disinfected with fungicide and planted on April 2nd. The treatments were: T_1 (full seeds) and T_2 (cut seeds) in a random design with checkups every 7 to 10 days. For data analysis a mixed model was used with nested effects and random coefficients. The results indicate that in T1 growth was linear, with great variability among seedlings, unlike T2, which presented growth with a quadratic tendency. The cut of the seeds promotes the obtainment of a larger number of seedlings with heights similar to those at the time of grafting.

91.

WATER RELATIONSHIPS IN TWO CITRUS ROOTSTOCKS WITH DIFFERENT SALINE STRESS TOLERANCE LEVELS

David RN, Legname C, Abdala G, Fraña A, Meloni DA.
UNSE, FAyA, Av. Belgrano (S) 1912, 4200 - Santiago del Estero, Argentina. E-mail: dmeloni@unse.edu.ar

Citrumelo (*Citrus paradisi* x *Poncirus trifoliata)* is more tolerant to salinity than Cleopatra mandarin *(Citrus reticulata)*. This behavior may be due to the osmotic adjustment caused by the accumulation of osmocompatible solutes that makes the plant water potential diminish without interfering with its metabolism The objective of this work was to evaluate the saline stress effect upon water relationships in Citrumelo and Cleopatra mandarin seedlings. Seeds were set to germinate between paper towels wetted with distilled water or a 30 mM NaCl solution at 25°C and a 12 h photoperiod. Relative water content (RWC) and root and leaf proline concentration were determined. The experimental design was completely randomized with 3 replica and data were analyzed using ANOVA and Tukey's test. The RWC remained constant in Citrumelo and Cleopatra, demonstrating that both genotypes adjust osmotically. Concurrently, a significant increase in foliar proline concentration was observed, it being higher in Citrumelo than in Cleopatra. As to the roots, the concentration of this osmocompatible solute remained constant in both Citrumelo and Cleopatra. We concluded that both rootstocks adjust osmotically by accumulating proline in leaves; higher proline concentration in Citrumelo accounts for its remarkable tolerance to salinity.

92.

PUTATIVE HYBRIDS AMONG WILD STRAWBERRIES WITH RED AND WITHE FRUITS

Debes MA[1], Díaz Ricci JC[2], Arias ME[1].
[1]Fac. Cs. Nat. e IML, UNT. Miguel Lillo 205. [2]Instituto Superior de Biología (INSIBIO-CONICET). Chacabuco 469. CP. 4000. Tucumán. E-mail: marioadebes@yahoo.com.ar

In order to study the transfer of the albino character in wild species related to cultivated strawberry, pollen-pistil compatibility relations were analyzed in dodecaploid specimens (2n = 12X = 84) crosses of *Duchesnea indica* f. *indica* with red fruits and *D. Indica* f. *albocaput* with white fruits. Intraespecific crosses with wild genotypes from the Germoplasm Bank Activs of strawberry (BGA-UNT) were carried out. For the prezygotic study, the pistils removed 48 h post-polinization were analyzed with an optical microscope with UV light. The achenes were scarified with 50% Na hypochloride and the putative hybrids obtained were evaluated in laboratory and greenhouse. Germination of the pollen grain and pollen tube growth were found in the prezygotic analysis. The hybrid seedlings presented leaves with 1, 2 and 3 leaflets and pinkish fruiting receptacle with red achenes and some white, pink-green and brown ones. The prezygotic analysis suggests that the parents are compatible and that the achenes produced would be of sexual origin with fertile offspring at least to the level of F1. The achenes obtained from self-fertilized flowers of F1 showed varied colorations, so that further evaluation of these hybrids is required.

93.

INFESTATION POTENTIAL OF *Solanum nigrum* L. AND *Solanum lorentzii* Bitter

Mansilla de Andrada NJ, Chaila S.
Fac. Agron. FAZ Univ. Nac. de Tucumán.
E-mail: noramansillaandrada@arnet.com.ar

The *Solanum* genus includes various important food species and crop weeds. Infestation potential (IP) is an index that determines the capacity of a species to invade an area with its offspring. The objective of this work was to establish the IP of two weed species of *Solanum* genus. Fruits were harvested from ten wild plants in El Manantial (Tucumán, Argentina) during the growth period 2005-2006. Seeds were collected, washed for 30 minutes, dried and stored for three months. Germination power and viability were determined. Seeds germinated for 90 days were counted. Viability was determined by the Tetrazolium Chloride method. The density of each species was measured in different areas of El Manantial. Chaila's report (2001) was used to calculate seeds entered in the bank. The number of individuals with reproductive capacity was obtained by multiplying the number of seeds entered in the bank by the germination power and dividing by 100. Real reproductive capacity was obtained by multiplying ICR (Individuals with Reproductive Capacity) by viability of seeds and dividing by 100. IP was obtained by dividing RRC (Real Reproductive Capacity) by density. For *Solanum nigrum L.* (SOLNI): ICR=1177.25 pl; RRC =47.09 pl; IP=941.80 m^2/pl. For *Solanum lorentzii Bitter* (SOLLO): ICR =326.85 pl; RRC =34.31 pl; IP= 343.19 m^2/pl. SOLNI has the highest values. This species can infest a great surface from its seed production. SOLLO has the lowest values with the exception of germination power and density. Its infestation capacity is lower but it is important as a crop competitor.

94.

EVALUATION OF THE ASSESS PROGRAM (APS) TO MEASURE SUGARCANE BROWN RUST SEVERITY

Funes C, Acosta EM, Ramallo CJ.
Estación Experimental Agroindustrial Obispo Colombres. Av. William Cross 3150. (4101) Las Talitas - Tucumán, Argentina. E-mail: laboratoriofito@eeaoc.org.ar

In Tucumán, the severity of sugarcane brown rust (*Puccinia melanocephala* H.& P. Sydow) has been traditionally determined by observing the affected foliar area while applying a diagrammatic scale (ISSCT). The aim of this work was to adjust the use of the ASSESS program software (APS) to evaluate sugarcane brown rust severity and to compare both methodologies. Seventy-two samples of five +1 leaves were examined in the traditional way while ASSESS software was used to study the scanned images of the 20-centimetre-long leaf pieces. Two different severity values for each sample were obtained with the two methodologies. Data were compared through linear regression analysis. The adjustment equation was y= -1.59 + 1.23*x, with y = severity assessed through observation and x = severity assessed by the ASSESS program. Adjustment R^2 was 0.71 with 1% significance. In 14 cases, severity values did not differ. In contrast, in 11 cases values obtained through observation were higher, and in 47, they were lower. The program is easy to use, even when studying other diseases, and values are not influenced by the observer.

95.

***Fusarium oxysporum*, THE MAIN PATHOGEN ISOLATED FROM ROTTEN PLANTS OF FIVE CHICKPEA (*Cicer arietinum*) CULTIVARS IN TUCUMÁN, ARGENTINA**

González V, Romero MB, Reznikov S, Espeche MC, Ruiz S, Ploper LD.
Estación Experimental Agroindustrial "Obispo Colombres". William Cross 3150. 4101 Las Talitas. Tucumán. Argentina. E-mail: laboratoriofito@eeaoc.org.ar

Cultivated chickpea (*Cicer arietinum*) is one of the most important cold season food legumes in the country. The most economical and practical control of chickpea diseases can be achieved through an integrated management program, including resistant varieties and improved agricultural practices. During the 2007 season, incidence of root and stem rots were evaluated at the flowering stage in plots of five chickpea cultivars in La Ramada, Tucumán, Argentina. In the laboratory, samples of diseased tissues were disinfected in NaOCL, plated on PDA, and incubated for 7 days at 27ºC. *Fusarium oxysporum* was the predominant pathogen isolated from root and crown rots. The five cultivars showed different incidences of these rots: Blanco lechoso, 4.2%; Blanco mexicano, 17.6%; Norteño, 12.5%; Sauzalito, 0%; and Selección Ricci, 8.3%. *Alternaria* sp., a secondary pathogen, was the prevalent fungus isolated from stem rots. Annual yield losses on chickpea from root and stem rots have been estimated as ranging from 10 to 15%. These results may influence the choice of chickpea cultivars for *Fusarium* rot management.

96.

ANATOMICAL CHARACTERS OF LEAVES AND WOOD FOR IDENTIFICATION OF *HELIOCARPUS POPAYANENSIS* H.B.K.

Huarte G[1], Jaime G[2,3], Arias M[1,4].
[1]Cát. de Biología Vegetal de la UNCA, Catamarca. [2]Fac. Bioq. Qca. y Farm. UNT. Ayacucho 471. [3]UNDEC- La Rioja. [4]Fac. Cs. Nat. e I.M.L. UNT. Miguel Lillo 205. Tucumán 4000.
E-mail: arias@csnat.unt.edu.ar

Heliocarpus popayanensis H.B.K. is a tree belonging to the Tiliaceae family, known as "Afata Blanca". This native species grows in Jujuy, Salta, Misiones, and Tucumán, Argentina, in the lower level of Sylva between 500-900 m above sea level. It colonizes secondary environments in the piedmont at 1350 m a.s.l. The aim of this work was to analyze the histological characters of leaf and wood in order have reference patterns for the correct identification of the fragments found in herbivore faeces. Histological preparations were treated using microanalysis techniques. The results showed dorsiventral hypostomatic leaves and anomocytic stomata, unistratified epidermis and thicker cuticle, simple, stellate, and glandular trichomes and stellate and glandular hairs with mucilage. The midrib presents 1-6 secretory channels of mucilage. The wood shows vessels with alternate pits, a plate with simple perforations, vasicentric tracheids, libriform fibers and radial and axial parenchyma. There are clustered crystals in mesophyll and wood parenchyma. The anatomical characters described are useful tools to characterize and identify this species.

97.

STEM TRICHOMES IN *ACALYPHA POIRETII* (EUPHORBIACEAE)

Slanis AC, Guantay ME, Bulacio E del V.
Fundación Miguel Lillo. Miguel Lillo 251. S. M. de Tucumán (4000).
E-mail: albertoslanis@yahoo.com.ar

Acalypha L. (Euphorbiaceae) comprises about 500 species distributed mainly in the tropics and subtropics. Fourteen of the species are found in Argentina. We were unable to identify *Acaypha* plant material from the province of Tucumán using Lourteig & O'Donnell' key (1942). The material was later identified as *A. poiretii* Spreng by comparison with LIL herbarium exsiccata. The main problem with the key proposed by these authors lies in the erroneous grouping of *A. poiretii* together with others that lack stem glandular hairs. The objective of the present work is to describe *A. poiretii* stem trichomes and evaluate their taxonomic value. Live and FAA fixed material was used. Hand-made sections were treated with 50% NaCLO, washed thoroughly with water, stained with safranin and mounted.
The following stem trichomes types were found: a) Long eglandular trichome, filiform, uniseriate, pluricelular; b) Medium size eglandular trichome, filiform, uniseriate, adpressed, curved, pluricelular; c) Short glandular trichome. Globose head with a flat top, pluricelular wtih radiate cells. Pluricellular and pluriseriate foot; d) Long glandular trichome. Obconic-peltate head, pluricellular with radiate cells.
Glandular trichomes found in the stems of *A. poiretii* can serve as good taxonomic tools.

98.

MORPHOANATOMY OF ROOTS FROM *SMALLANTHUS MACROSCYPHUS* (HELIANTHEAE, ASTERACEAE)

Coll Aráoz MV[1,2], Mercado MI[1,2], Grau A[1], Ponessa GI[2].
[1]LIEY, Facultad de Ciencias Naturales, U.N.T. [2]Instituto Morf. Veg. F.M.L. Tucumán, Arg. E-mail: victoriacoll1981@yahoo.com.ar

Smallanthus macroscyphus (Backer ex Martius) Grau, "yacon del campo", is a wild species from the subtropical montane forest (Yungas) closely related to *S. sonchifolius*, an ancient Andean crop known as "yacon", whose roots are consumed as fresh vegetable and its leaves as an infusion. Recently numerous medicinal and dietary properties have been attributed to yacon. Since *S. macroscyphus* could be employed for crossbreeding with *S. sonchifolius*, we found these species particularly interesting and studied the morphoanatomy of their roots.
Both *S. macroscyphus* and *S. sonchifolius* have subterraneous organs with similar characteristics such as few absorbent roots and well developed tuberous roots used for storage. Nevertheless, tuberous roots from *S. macroscyphus* are narrow, usually 2 cm in diameter, in contrast to 10 cm diameter in *S. sonchifolius*. The peridermis of tuberous roots from *S. macroscyphus* usually has trichomes. The cortex parenchyma originates in the endodermis and secretory canals are formed between the endodermic cells and the cells from the adjacent cortical parenchyma. Numerous xylematic radii with associated fibre can be observed in the vascular cylinder and some isolated metaxylem elements appear in the parenchymatic medulla.

99.

CHARACTERISTICS OF SIX SPECIES OF CACTACEAE – CACTOIDEAE PRESENT IN ARGENTINA

Muruaga NB[1], Figueroa Romero MR[1], Kiesling R[2].
[1]Fundación Miguel Lillo, Laboratorio de Taxonomía Vegetal Fanerogámico, Miguel Lillo 251, 4000 Tucumán, Argentina. [2]IADIZA. Instituto de Zonas Áridas, Mendoza. Previamente: Instituto de Botánica Darwinion, CONICET.
E-mail: nmuruaga@yahoo.com.ar

Rebutia K Schum is a Cactaceae genus that grows in humid environments in the Northwest of Argentina between 1100 and 3000 m above sea level. It is still unknown how many Argentinean species of this genus exist and which they are. Kiesling (1999) mentions 5 species while Hunt (2000) mentions nine species for Argentina. Barthlott & Hunt (2000) have demonstrated that seed morphology is a good taxonomic characteristic in the Cactaceae – Cactoideae family. The aim of this work is to describe 6 Argentinean species to detect exo-micromorphological characteristics that enable their identification. This study was carried out with fresh material and the characteristics were observed with an optical (OM) and a scanning electron microscope (SEM). Differences in color, shape and size were found. There was a variation in symmetry and in cells around the apex testa as well as in the relief of the cuticle. These data enabled the differentiation of *R. deminuta*, *R. fabrisii*, *R. fiebrigii*, *R. marsoneri*, *R. minuscula* and *R. padcayensis*, thus reinforcing other reproductive characteristics of taxonomic value for this genus.

100.

NATURAL PRODUCTS FOR THE CONTROL OF FUNGAL PATHOGENS IN CITRUS

Torres S[3], Negrillo Kovacevich L[2], Isla MI[1,3], Sayago J[2].
[1]Cátedra Fitoquímica. [2]Cátedra Botánica. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. [3]CONICET. E-mail: misla@fbqf.unt.edu.ar

Green mold, blue mold, and sour rot, the most important post-harvest diseases in citrus, are caused by *Penicillium digitatum*, *Penicillium italicum*, and *Geotrichum candidum*, respectively. At present, synthetic fungicides are used to control post-harvest diseases. However, these fungicides have different risks in terms of their toxicity and the impact caused on the environment. As a direct result, research efforts to develop more environmentally friendly methods for the control of these pathogens have been intensified. Aim: To evaluate antimicrobial activity against the fungal phytopathogens *Penicillium digitatum* and *Geotrichum candidum* from hydro-alcoholic extracts of plants of the Argentine Puna. Methods: Antimicrobial activity was evaluated using the agar diffusion assay. The minimum inhibitory concentration (MIC; μg/ml of phenolic compounds) was determined using the agar dilution method. Results: *Chuquiraga atacamensis* extracts inhibited the growth of *P. digitatum*, whereas *Lucilia flageliformis* extracts inhibited the growth of both *P. digitatum* and *G. candidum* with a MIC=300 μg/ml against both fungi. *Ch. Atacamensis* extracts, at concentrations higher than 200 μg/ml, caused a decrease in the growth rate of *P. digitatum*. These results demonstrate that the *L. flageliformis* species is a potential source of compounds with antimicrobial activity against fungal pathogens in citrus.

101.

YIELD EVALUATION THROUGH THE PRODUCTION SEASON OF STRAWBERRY HYBRID CLONES IN THE SUB-TROPIC (REGION/S AREAS OF ARGENTINA

Salazar SM[1,2], Mariotti Martínez JA[3], Jeréz EF[3], Kirschbaum DS[1], Díaz Ricci JC[3], Castagnaro AP[3].

[1]EEA INTA Famaillá, [2]FAZ-UNT, [3]INSIBIO (CONICET-UNT). Ruta 301 Km 32 (4132) Famaillá. E-mail: ssalazar@correo.inta.gov.ar

In 2006, a comparative yield trial was conducted at INTA's Agricultural Experimental Station, Famaillá, Tucumán, Argentina. Strawberry hybrid clones at different selection stages were evaluated against commercial varieties such as 'Camarosa' and 'Milsei'. The specimens were planted on April 23-25 on a field that had not been farmed for several years. Plant performance was recorded from July through November. Yield components such as marketable fruit weight and number (fruit ≥ 10 g) per plant and average fruit weight were assessed. The best performance corresponded to clones 04/19-7, 04/222-13 and 04/221-45, with yields of 466.8, 485.5 and 518.2 g per plant, respectively. In terms of number of fruits per plants, results were 26, 36 and 32 for the above clones. The highest average fruit weight was that of clone 04/222-36 with 18.16 g. The causes for fruit not being considered marketable were also analyzed. Discarded fruit in clone 04/19-7 was 25% of the total, where 9.9% was fruit < 10 g. For 04/222-13, discarded fruit was 32%, 14% corresponding to small fruit, 1% to malformed fruit, and 2% to rotten fruit. In 04/221-45, discarded fruit reached 20%, with 15% small, 2% malformed and 1% rotten fruit.

102.

CYTOGENETIC CHARACTERIZATION OF *Doru lineare* (Dermaptera, Forficulidae)

Ruiz de Bigliardo G[1,2], Romero Sueldo M[2], Caro MS[1], Murillo Dasso S[1].

[1]Fac. de Cs Naturales, e I.M.L. [2]Fundación Miguel Lillo. M. Lillo 205-251. S. M. de Tucumán. 4000. E-mail: grabigliardo@hotmail.com

Dermaptera or earwigs, which are found all over the world, densely populate Argentina from the north to the center of the country. Some species cause significant damage to crops while others are predators, as is the case with *Doru lineare*, a natural enemy of the corn pest insect *Spodoptera frugiperda* (Lep: Noctuidae). The purpose of this work is the cytogenetic study of a *D. lineare* population. The specimens were obtained from corn crops in El Manatial (Lules Department, Tucumán). Preparations were obtained from testicles using routine techniques. Summarized results were as follows: Chromosomic number ♀ 2n=20; ♂ 2n=19; 2) Sex determination system XX/X0; 3) Telocentric chromosomes; 4) A pair of satellite bearing autosomes; 5) Interphases with numerous large heterochromatic blocks; 6) No anomalies were detected in the meiotic divisions analyzed. Data allow us to place our results within the range of the chromosomic numbers quoted for the group (between 10 and 26), telocentric chromosomes differentiating them, since for Dermaptera holocentric chromosomes have usually been reported. From the determination in *D. lineare* of normal meiotic divisions we can infer the existence of a stable balanced karyotype that ensures the transmission of the genetic flow to subsequent generations.

103.

TAXONOMIC AND NOMENCLATURAL UPDATE OF THE HYPOXYLON MORPHOSPECIES PROPOSED BY SPEGAZZINI

Hladki AI, Romero AI.

Fundación Miguel Lillo, Miguel Lillo 251, S.M. de Tucumán, CP4000. E-mail: adrianahladki@yahoo.com.ar

Hypoxylon Bull. Includes one hundred species ranging from pathogens to endophytes. Spegazzini´s papers are the only source of information (1884/87/88a,b/89/99, 1908a,b/09/10/21) for southern South America. He proposed 36 morphospecies and 2 varieties. Twenty *Hypoxylon* holotypes were studied and their taxonomic and nomenclatural positions are discussed. Twelve synonyms are proposed: *-H. albostigmatosum* and *H. guarapiense* Syn. of *H. anthochroum, -H. anthracoderma* Syn. of *H. monticulosum, -H. goliath* Syn. of *Rosellinia bunodes, -H. mbaiense* Syn. of *H. notatum, -H. paulistanum* Syn. of *H. diatrypeoides, -H. plumbeum* Syn. of *H. perforatum, -H. porteri* Syn. of *Biscogniauxia capnodes, -H. puiggarii S*yn. of *Annulophypoxylon subeffusum, -H. subvinosum* Syn. of *H. lenormandii, -H. turbinatum* var. *guaraniticum* Syn. of *Phylacia turbinata, -H. valsarioides* Syn. of *Creosphaeria sassafras.* Two new combinations are proposed: *Annulohypoxylon apiahynum* and *A. subeffusum.* Besides, the transference of *H. leptascum to A. leptascum* and *H. latissimum to Nemania latissima* is accepted. *H. subnigricans* and *H. umbilicatum* are also accepted and the existence of the holotype *of H. albostigmatosum* is confirmed so the lectotypification carried out by Shear (1945) was unnecessary.

104.

CONTRIBUTION TO THE STUDY OF THE GENUS LEPTODONTIUM (POTTIACEAE, BRYOPHYTA). NEW RECORDS FROM ARGENTINA

Colotti MT, Schiavone MM.

Facultad de Ciencias Naturales e IML, Miguel Lillo 205, San Miguel de Tucumán, 4000, Argentina. E-mail: t_colotti@hotmail.com

The latest taxonomic revisions to the genus *Leptodontium* in Argentina are reported. *Leptodontium* has a worldwide distribution. It is a common genus in the montane forests, although some species prefer higher places. They are robust plants, growing in thick mats or turfs on soil, rocks and trees. In this work we describe three new records for Argentina, *L. araucarieti* and *L. longicaule* var. *longicaule* in Tucumán and *L. planifolium* in Salta.

105.

EPILYTHIC ALGAE COMMUNITY OF THE CALIMAYO STREAM IN TUCUMAN, ARGENTINA

Taboada M[1,2], Isasmendi S[2], Seeligmann C[2], Tracanna B[1,2,3]
[1]Fundación Miguel Lillo, Miguel Lillo 205, (4000). San Miguel de Tucumán, Tucumán; [2]Facultad de Ciencias Naturales e IML; [3]CONICET. E-mail: mat_220@hotmail.com

The aim of this work was to analyse the epilythic algae community in the Calimayo stream. Two sample sites were selected: one upstream (S1) and one downstream (S2) a paper mill discharge. Water temperature at S1 was lower than at S2 (15.4 and 24.2ºC, respectively). Electrical conductivity, pH and dissolved oxygen were 174 µS cm^{-1}, 7.8 and 9 mg l^{-1} for S1 and 264 µS cm^{-1}, 10.2 and 0 mg l^{-1} for S2, respectively. Ten algae genera were described, all of which were found at site 1, due to the absence of rocks at site 2. Bacillariophyceae were clearly prevalent (94%), followed by Chlorophyta (4.4 %) and Cyanophyta (1.6%). Chlorophyll *a* was 13.96 µg l^{-1}. Physical and chemical parameters analysed showed that site 2 presented a high level of pollution caused by discharges from the factory whereas the water quality of site 1 was satisfactory. Further studies would be necessary to determine possible effects of the effluents on epilython. This is the first time epilythic algae of the Calimayo stream have been described.

106.

THE SALI RIVER AND ITS QUALITY. 2006-2007 PERIOD

González M del C[1], Núñez Recio LA[2], Pourrieux J[1], Medina L[1].
[1]Direction of Water Resources of the Province of Tucumán. 197 Haití St –Tucumán, Argentina. [2]Burgos University. Spain. E- mail: carminaglez16@yahoo.com.ar

The aim of this survey is to compare the monitoring of the years 2006-2007 in order to determine if the policies imposed on the main agro industrial activities by the provincial government show improvements in the values of the parameters Biological Oxygen Demand (BO_5D) and Dissolved Oxygen (DO).
The Sali River was studied in route 305, Lucas Córdoba Bridge and route 323 during sugarcane and citrus harvest. The samples collected for the Pollution Control Project were analized at the Obispo Colombres Experimental Station Laboratory, using the methods APHA 5210 B (Winkler's method) for BO_5D (five days) and APHA 4500-O C (iodometric method) for DO.
The results indicate that the site Salí 305 keeps the parameters within the standard. In the Salí River, from the Lucas Córdoba Bridge onwards, there is organic pollution due to industrial and sewage effluents.
The parameters measured showed a slight decrease in the year 2007 over the two months studied, evidencing that the industries are trying to achieve better control of their effluents.

107.

INDUCED AUTOIMMUNITY BY snRNP IN AN EXPERIMENTAL MODEL OF MIXED CONNECTIVE TISSUE DISEASE

Valdez JC, Alabarse G, Fiad L, Núñez JM, Uñates J, Oquilla J, Ajmat C, Haro MI, Valverde M.
Cátedra de Histología. Fac. Medicina Univ. Nacional de Tucumán. E-mail: gustavoalabarse@yahoo.com.ar

Anti ribonuclearprotein (U1-snRNP) antibodies are found in the serum of patients with Mixed Connective Tissue Disease (MCTD). Aims: to develop an MCTD model in mice by snRNP antigen inoculation and to relate the induced antibodies to histopathological injuries. Materials and methods: 26 BALB/c mice were inoculated: 18 with snRNP antigen (obtained by Blobel and Potter's method) in Freund's adjuvant and 8 with Freund's adjuvant (control group). Three months later mice were sacrificed. Sera were kept at -20ºC and organs were processed. Anti snRNP autoantibodies were tested by ELISA (plates sensitized with 1µg snRNP/100 µl per well) and antinuclear antibodies by indirect immunofluorescence (IIF) over Hep-2 cells. Results: 3 ranges of anti-snRNP values were obtained (OD 490nm): high (0,650-0,850), intermediate (0,500-0,600) and low (0,400-0,500) titers. IIF: 67% positive with ring, stained and homogeneous patterns. Eighty-nine per cent of the females and 33% of the males were positive. One hundred per cent showed histopathological damage. The severity of the injuries correlates with high or intermediate antibody titers and IIF positivity. Conclusion: snRNP inoculation in BALB/c mice induces anti-snRNP and antinuclear antibodies consistent with liver, kidney and lung injury.

108.

EFFECT OF *LACTOBACILLUS CASEI* ON INFLAMMATION-HEMOSTASIS INTERACTION IN AN EXPERIMENTAL MODEL OF ACUTE LIVER INJURY

Haro C, Zelaya H, Agüero G.*
*Inst. de Bioq. Aplicada. UNT. Balcarce 747. Tucumán (4000). *E-mail: gaguero@fbqf.unt.edu.ar*

The pathogenesis of acute liver injury (ALI) is characterized by inflammation and haemostatic disorders. The immunomodulatory effects of lactic acid bacteria have been documented in different studies. The effects of *Lactobacillus casei* (Lc) on inflammation and coagulation that occur in ALI were studied. Adults BALB-c mice were fed Lc for 2 days and then injected with D-Galactosamine (DG) (Lc+DG group). Untreated mice were used as controls. At 6,12 and 24 h post-DG injection we determined: a) serum GPT and GOT, b) total and differential leukocytes count, c) neutrophils peroxidase activity (MPO), d) activated partial thromboplastin time (APTT), e) prothrombin time (PT), f) platelets count, g) fibrinogen (F) and h) factors V (FV) and VIII (FVIII). Results: Lower leukocytes counts, increased MPO, altered PT and APTT values, lower platelets counts and low levels of F and FV were observed in the DG group. The Lc+DG group showed normal levels of leukocytes, MPO, F and FV at 24 h post-DG. Although levels of FVIII were increased in both groups, Lc+DG showed lower values. Conclusion: *Lactobacillus casei* administration modulates inflammation during ALI; however, it is not capable of limiting haemostatic alterations.

109.

STRUCTURAL AND ULTRAESTRUCTURAL CHANGES PRODUCED IN RAT KINDEY BY CICLOSPORINE A CHRONIC TREATMENT

Rey M del R, de la Cruz RC, Posleman S.
Cát Bioquímica Clínica III Fac Bqca, Qca y Fcia U.N.T. Balcarce 747. (4000) S. M. de Tucumán. Argentina.
E-mail: labsanmartin@hotmail.com

Cyclosporine (CyA) is one of the most widely used immunosuppressants in organ transplants in many autoimmune illnesses and in atopic dermatitis treatments.
The sharp nephrotoxicity caused by CyA is characterized by a decrease in the renal plasmatic flow that causes a diminution in the glomerular filtration indexz, a phenomenon that can be reversed by suppression of the drug.
The object of this study was to determine the structural changes produced in kidney in treatments with CyA.
Adult Wistar rats weighing 200-260 g fed a standard diet were used. CyA was administered with the food at doses of 25 and 50 mg/kg/day for four months.
Structural studies were carried out using the conventional histological technique. Slices were coloured with Hematoxilin –eosine and Mallory's trichromic stains were used for fibrosis evaluation.
Sharp reversible nephrotoxicity appeared after a few weeks of treatment and compromised renal ducts, producing cytoplasmatic vacuolization, nuclear loss in tubular cells, cell desquamation, apparition of gigantic mitochondria and congestion of tubular capillaries that resulted in a decrease in glomerular filtration.
The effects produced by CyA increase with time. In prolonged treatments, CyA can present a potential risk of nephrotoxicity.

110.

IDENTIFICATION OF MOLECULAR GENETIC MARKERS FROM VICUÑA GENOME BY RAPD

Longo A, Roldán-Olarte M, Valdecantos P, García D, Miceli DC.
Instituto de Biología. Facultad de Bioquímica, Química y Farmacia. INSIBIO. UNT. Chacabuco 461. 4000 San Miguel de Tucumán. E-mail: titalongo@hotmail.com

Vicuñas, wild South American Camelids extremely appreciated for the quality of their hair, are nowadays a protected species. The aim of this work was to identify new genetic markers in the vicuña genome for the analysis of the genetic variability in a vicuña population of the INTA Abra Pampa (Jujuy). The Random Amplified Polymorphic DNA technique (RAPD) was utilized. To generate amplification patterns, two sets of primers were assayed: 1) RAPD primers of 10 nucleotides (nt) and 2) 20-22 nt containing 60- 70% of CG in the last 10 nt. Samples of DNA isolated from blood and bulb of the treaded off fibers corresponding at different individuals were analyzed. Polymorphic patterns of amplification were generated with the two variants of RAPD assayed. The primer A10 was selected as a possible polymorphic marker since differential amplifications products were detected in samples from different animals. In the second way, at least 12 bands of amplifications were selected and isolated to analyze possible polymorphisms in the vicuña genome sequence. Knowledge of the sequence of selected bands would enable the generation of Sequence Characterized Amplified Region (SCARs) markers in order to asses differences in the genetic composition of related individuals.

111.

EXPRESSION OF GENES RELATED TO EBAF OVIDUCTAL FUNCTION

Argañaraz ME, Valdecantos PA, Miceli DC.
INSIBIO, (CONICET-UNT), Chacabuco 461, 4000 SM. de Tucumán. E-mail: martin3ea@yahoo.com.ar

Ebaf, a member of the TGF-β family, is involved in the regulation of other members of this family. Besides, it is one of the factors that regulate the extracellular matrix (ECM) turnover during menstrual bleeding. The expression of Ebaf; CFC (receptor) and other proteins that participate in ECM remodeling (CTGF and MMP7) in the early pregnant and pseudopregnant rat oviduct were studied. By RT-PCR Ebaf, CFC and MMP7 showed a similar expression pattern. All genes showed higher expression levels at day 4 of pregnancy while no changes were observed during pseudopregnancy. Ebaf expression level was lower in the pseudopregnant than in the pregnant rat oviduct. CTGF showed no differences between pregnancy and pseudopregnancy. Western blot assays revealed that the mature form of Ebaf (26 kDa) was increased at day 4 of pregnancy with respect to the control. These results demonstrate that Ebaf and related genes such as CFC and MMP7 are up-regulated during pregnancy although their regulation seems to be unrelated to sexual hormones control. The embryo and the cytokines present in the oviductal fluid during early pregnancy might be involved. The presence of CFC and Ebaf mature protein in the oviduct and the fluid would indicate that Ebaf is active and that it could act in an autocrine way on the oviduct and in a paracrine way one on the embryo.

112.

OMEGA-3 FATTY ACIDS IN MUSCLE FROM *Rana catesbeiana*. SHAW, 1802, "BULLFROG"

Peterson G[1], Albo G, Tavella M, Martinez Zabala S, Ricci A.
PROPIA (Programa de Prevención del Infarto en Argentina). Comisión de Investigaciones Científicas de la Prov. de Buenos Aires. Facultad de Ciencias Médicas. Calle 60 y 120 Tercer piso, (1900) La Plata. E-mail: gpeterso@atlas.med.unlp.edu.ar

Introduction: According to international health organizations, human diet should be poor in salt, sugar, saturated (SFA) and hydrogenated (trans) fatty acids and rich in unsaturated fatty acids (UFA, particularly omega-3) and fiber. In Argentina, the standard diet is poor in omega-3, and *Rana catesbeiana*, Shaw, 1802, "Bullfrog" would be an alternative for the consumption of omega-3 since it consumes a balanced diet rich in UFAs. Aim: to evaluate the effect of FA composition of the lipid portion of the food consumed during the three stages of development of *Rana catesbeiana* on muscle FA composition in imagoes and adult frogs. **Materials and Methods:** We analysed FA composition in three balanced formulas. Muscle FA composition of imagoes and adults was analysed by gas chromatography. **Results:** Different balanced formula had different FA compositions. Muscle samples from imagoes and adult frogs had a high content of long chain omega-3 FA and low SFA contents. **Conclusion:** Decreased SFA content associated to increased omega-6 and -3 FA content in meat from imagoes and adult frogs according to the formula ingested would suggest that SFA would be used for energy and UFA would be stored in tissues. *Keywords: Rana castesbeiana*, saturated fatty acids, omega-3 fatty acids, omega-6 fatty acids.

113.

SPERM BINDING TO A VITELLINE ENVELOPE COMPONENT (GP 39) OF *BUFO ARENARUM* OOCYTES

Barrera D, García EV, Miceli DC.
INSIBIO (CONICET-UNT). Chacabuco 461. Tucumán (4000). E-mail: abarrera@fbqf.unt.edu.ar

In *Bufo arenarum* fertilization, the vitelline envelope (VE) has an active participation in gamete interaction. The first portion of the oviduct, the Pars Recta (PR), synthesizes and secretes the serine protease oviductin. This enzyme produces the specific and limited proteolysis of certain glycoprotein components of the VE which might expose sperm binding sites. It was demonstrated that sperm binding, penetration and subsequent gamete fusion are improved by oviductin. The VE is composed of at least six glycoproteins: GP 122, 82, 48, 42, 39 and GP 34. In previous experiments we demonstrated that GP 39 shares common amino acid sequences with the ZPC glycoprotein family. In order to determine whether spermatozoa bind specifically to GP39, we obtained a polyclonal antibody against this purified GP. An *in vitro* assay was developed for this aim: 150 ul of dissolved VE proteins (150 ug P) was incubated with 50 ul sperms suspension ($7x10^7$ sperm in the mixture reaction). GP39–sperm binding was observed by an immuno-cytochemical assay with biotin labeled second antibody and extravidin-FITC as amplifier. The label over the sperm acrosome membrane was observed. This indicated specific binding of GP39. Given that GP39 belongs to the ZPC family and that its concentration is increased in VE after oviductin action, its participation in early fertilization events seems feasible.

114.

GLYCOCONJUGATES CHARACTERIZATION IN LLAMA OVIDUCT BY LECTINHISTOCHEMISTRY

Apichela SA, Jiménez-Diaz MA, Miceli DC.
INSIBIO (CONICET-UNT). (4000) SM de Tucumán. E-mail: sapichela@hotmail.com

Oviduct-sperm binding is a reversible process that appears to involve epithelial cell membrane oligosaccharides and sperm surface Ca2+ dependent lectins. The glycoconjugate involved in the llama sperm reservoir formation is still unknown. Llamas are induced ovulators, although ovulation only occurs when, at the time of mating, the dominant follicle is larger than 7 mm. This study characterizes the glycosylate residues in the llama oviduct by using fluorescent lectins. Oviducts where classified into two groups according to the size of the dominant follicle: >7 mm or <7 mm. Uterotubal Junction, Isthmus and Ampulla where separated, fixed (formaldehyde 10% pH 7.2) and embedded in paraffin. Seven um sections where labeled with WGA, WGAs, UEA 1, DBA, RCA 120, Con A, PSA, LCA, PHA E, PHA L, GSL and SJA lectins FITC/rhodamine conjugated and observed by Confocal Laser Scanning Microscopy. The glycocalix along the three oviductal segments showed abundant ∝-mannopyranosyl, ∝-glucopyranosyl, N-acetyl glucosamine, and *N*-acetylneuraminic acid residues and few ∝-linked N-acetyl galactosamine and β-galactosyl residues. Neither ∝-L-fucopyranosyl nor β-N-acetyl galactosamine residues were observed. No differences where found between ovarian stages. The sugar residues found could be related to a sperm reservoir oviductal function.

115.

SYNERGYSM BIOASSAY OF NATURAL ANTIBACTERIALS WITH COMMERCIAL ANTIBIOTICS AT NON TOXIC DOSES FOR *LACTOBACILLUS*

Cartagena E, Alva M, Bardón A.
Cátedra de Química Orgánica III. Facultad de Bioquímica Química y Farmacia UNT. Ayacucho 471. Tucumán, Argentina. E-mail: ecartagena@fbqf.unt.edu.ar

The main objective of the present study was to perform a rapid and accessible bioassay to evaluate the degree of synergistic activity when we combined natural antibacterials with commercial antibiotics with different mechanisms of action on resistant pathogenic bacteria and beneficial Lactobacillus strains. The purpose of this investigation was to decrease MIC in antibiotics extensively used in therapeutic treatments. The assays were screened by liquid microdilution methods. EtOH-PEG 400 and DMSO-PEG 400 were used to dissolve and obtain a good dispersion of the liposoluble substances in aqueous media.

To evaluate the effect of the combinations, we used the "Chequerboard MIC technique" and the fractional inhibitory concentration index (FICI) was calculated for each combination. The following formula was used to calculate the FICI: MIC of drug A in combination with drug B / MIC of drug A alone+ MIC of drug B in combination with drug A / MIC of drug B alone. Synergy was defined as a FICI of ≤ 0.5. Indifference was defined as a FICI of >0.5 but of ≤ 4. Antagonism was defined as a FICI of >4.

116.

KILLER PHENOTYPE DETERMINATION OF WINE YEASTS

Mendoza LM, Manca de Nadra MC, Farías ME.
CERELA and UNT. (4000) Tucumán.

An inhibitory mechanism that can occur in wine fermentations is the so-called yeast killer activity. Killer yeasts have the intrinsic ability to kill sensitive yeasts by secreting a proteinaceous toxin to which they themselves are immune. We investigated the killer activity of *Kloeckera apiculata* mc1 and *Saccharomyces cerevisiae* mc2 and determined whether the toxin produced was involved in the diminution of maximum cell population in a mixed culture. The tests were performed in plates of YPD medium containing 0.03 g/l methylene blue and 0.1 M citrate-phosphate buffer at different pH values (pH 3.5, 4.5 and 5). Strains are scored as killers when the inoculated strain on the lawn sensitive yeast is surrounded by a clear zone of inhibition fringed with blue colour. The sensitive character was detected by inoculating killer reference strains on the lawn of the strains to be tested. The strain that did not respond to both reference strains was considered as neutral. The plates were incubated for 3-5 days at 18ºC. *S. cerevisiae* mc2 was killer sensitive against the reference killer toxins and *K. apiculata* was killer neutral. Additionally, none of the strains were killer positive towards the killer sensitive strain. The variation of pH from 3.6 to 5.0 did not bring about different results. When *S. cerevisiae* was seeded on *K. apiculata* lawn a zone of inhibition could be observed, but no ring of dead cells was present, indicating that inhibition may be caused by metabolites other than yeast killer toxins.

117.

PHYTOTOXIC ACTIVITY IN *Plantago sp.*

Arjona M[1], Pacciaroni A[2], Sosa V[2].
[1]Facultad Cs. Exactas y Naturales, Universidad Nacional de Catamarca, Av. Belgrano 300. (4700) Catamarca. [2]Facultad de Cs. Químicas. Departamento de Química Orgánica -IMBIV-CONICET- UNC. Córdoba. E-mail: milarj2002@yahoo.com.ar

Plantago Sp. ("*llantén*"), widely spread in Argentina, was collected in the city of Catamarca and sent for taxonomic study to the Multidisciplinary Institute of Vegetable Biology (IMBIV). Leaves and flowers were extracted with ethanol, and after the solvent was evaporated the residue was re-suspended in ethanol-water and separated with hexane, methyl chloride and ethyl acetate. The objective of this work was to evaluate the phytotoxic activity of the hexane extract of *Plantago Sp.* in seeds of *Lactuca sativa* (lettuce) and *Sorghum bicolor*. Concentrations of 10, 100, and 1000 mg/L hexane extract were used. Root growth inhibition was determined. Data were analysed with ANOVA for a randomized design with three repetitions. The results obtained indicate that the hexane extract stimulated root growth in *Sorghum bicolor* seeds while in *Lactuca sativa* the inhibition percentage varied between 4% and 34% for the different concentrations assayed. According to these results, we can conclude that the hexane extract showed a phytotoxic effect in the presence of *Lactuca sativa* seeds while with *Sorghum bicolor* there was no inhibitory effect. We intend to continue with the research and chemical characterisation of the metabolites with phytotoxic activity present in hexane extract.

118.

FUNGITOXIC PRENYLISOFLAVANONES ISOLATED FROM *GEOFFROEA DECORTICANS* EXTRACTS

Quiroga EN, Sgariglia MA, Soberón JR, Sampietro DA, Vattuone MA. Cátedra de Fitoquímica, Inst. de Estudios Vegetales "Dr. Antonio R. Sampietro", Facultad de Bioqca, Qca y Farmacia, UNT, Ayacucho 471, 4000- San Miguel de Tucumán, Argentina. E-mail: emquiroga@unt.edu.ar

Fungi are a major cause of spoilage of stored grains. Certain fungi belonging to the genus *Aspergillus* can produce mycotoxins. There is a pressing need to replace synthetic fungicides for natural antifungal compounds that can be used in the preservation of human and animal food. In this work we isolated and identified two prenylisoflavanones from *Geoffroea decorticans* alcoholic extracts. They can inhibit the growth *in vitro* of some *Aspergillus* strains isolated from farm animal feeds (*A. flavus, A. parasitiens, A. nomius* VSC23 *and A. nomius* 13137). Their biocide activity was determined by bioautography and radial growth inhibition assays.
They were isolated by CC and TLC and identified by NMR as tethrahydroxy-methoxi-prenyl-iso-flavanones (1) and trihydroxy-methoxi-prenyl-iso-flavanones (2). MICs and MFCs of crude extract and isolated substances were determined and compared to those of a synthetic fungicide (Clotrimazole) and ascorbic and sorbic acids used as preservatives. From our results we can suggest that *G. decorticans* extracts and the isolated purified compounds could be used as biopesticides against *Aspergillus* species and also in food conservation.

119.

FUNGITOXIC ACTION OF EXTRACTS FROM SILIQUES OF *RAPHANUS SATIVUS* L. (NABÓN) ON STRAWBERRY PATHOGENS

Sgroi NA[1], Selis de Orsi AN[2], Sgariglia MA[3], Soberón JR[3], Quiroga EN[3], Vattuone MA[3].
[1]Cát. Química Analítica, Facultad de Agronomía y Zootecnia. UNT. Av. Roca 1900. Tucumán, Argentina. [2]Cá.t Física II - FAZ-UNT. Tucumán, Argentina. [3]Cát. Fitoquímica, FBQ y F- UNT. Tucumán, Argentina. E-mail: nsgroi31@hotmail.com

Tucumán, Argentina, is the second national strawberry producer. Fungi that attack crops cause severe production losses. Natural products extracted from plants would contribute to a sustainable management of crops. This paper studies the ability of extracts from siliques of *Raphanus sativus* L. (nabón) to inhibit strawberry fungal pathogen growth (*Colletotrichum acutatum* and *Colletotrichum fragariae*). Aqueous (infusion, I, and decoction, D) and ethanolic (tincture, T) extracts (10% w/v) were prepared from dry and milled siliques.
The fungal inhibitory capacity of the extracts was assayed by radial growth inhibition on glucose-potato-agar (GPA) plates. The percentage of growth inhibition of *C. acutatum* produced by 15 mg extracted material (EM)/mL was 63; 59 and 78%, for I, D and T, respectively. For *C. fragariae* it was 40, 43 and 29, respectively. The yield of the extractions was decoction $\geq$ infusion $\geq$ tincture (8.1; 2.25; 0.45 mg phenolic compounds (FC)/mL, respectively. We concluded that the extracts of siliques of *Raphanus sativus* L. (nabón) inhibit the growth of strawberry fungal pathogens.

120.

EFFECT OF PYROLIGNEOUS ACID WITH IMAZAPYR HERBICIDE ON *CYNDA* C*ynodon dactylon* CONTROL

Guirado N[1], Arévalo RA[1], Ambrosano EJ[1], Rossi F[1], Chaila S[2], Piacentini Zagatto G[1].
[1]APTA, Piracicaba, Br. [2]FAZ. UNT, AR. E-mail: sach@faz.unt.edu.ar

Cynodon dactylon (L.) Pers. *Poaceae* is one of the most important weeds. The objective of this work was to reduce the doses of the herbicide Imazapyr (Contain 250 $g.L^{-1}$ i.a. water solution) applied together with distilled pyroligneous acid (BioBIRE). The experiment was carried out in vases of 35 L capacity with a 0.16 square meter area. Eight treatments with four replications were performed in randomized blocks. The treatments and doses of the commercial products used were: Imazapyr 500; 375 and 250 g ha^{-1}; BioBIRE 0.5 and 1.0 L ha^{-1}; Imazapyr mixtures 375 g ha^{-1} + BioBIRE 0.5 L ha^{-1}; Imazapyr 250 g ha^{-1} + BioBIRE 1.0 L ha^{-1} and control. The best results were obtained with Imazapyr 375 g ha^{-1} + BioBIRE 0.5 L ha^{-1}, followed by Imazapyr 500; 375 and 250 g ha^{-1} and Imazapyr 250 g ha^{-1} + BioBIRE 1.0 L ha^{-1}. However, no significant differences between the various treatments were found. Pyroligneous acid at 0.5 % and 1.0% doses stimulated plant development, showing no statistically significant differences with the control.

121.

INFLUENCE OF MOLASSES ON INORGANIC NUTRIENTS IN SOILS AMENDED WITH SUGARCANE TRASH

Jimenez CM, Sampietro DA, Vattuone MA, Sgariglia MA, Soberón JR, Quiroga EN.
Cátedra de Fitoquímica. Instituto de Estudios Vegetales "Dr. A. R. Sampietro". Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 461.CP 4000. S.M.deTucumán. Argentina.

In a previous work, we showed that soil irrigation with molasses accelerates microbial mineralization of sugarcane trash. In this work, we evaluated evolution of nitrogen and phosphorous contents after molasses incorporation in soils where sugarcane trash was incorporated or left on the soil surface. Plastic containers filled with soil were irrigated with 0.6 and 2% molasses. Sugarcane trash was incorporated or left on the soil surface. Containers irrigated with water were used as controls. Soil samples were collected at different times after molasses incorporation. Nitrate, ammonium and phosphor contents were determined with Hach reagents. Molasses incorporation increased soil nitrogen, ammonium and phosphor contents. Highest increase in nitrogen and phosphor contents was observed when trash was soil incorporated. Our results suggest that incorporation of 2% molasses to soil amended with sugarcane trash increases nitrogen and phosphor available for plant growth.

122.

PERMANENT COMPETENCE OF *Tagetes minuta* L. IN SUGARCANE cv TUC 77-42, EL CEVILAR, TUCUMAN

Chaila S[1], Sobrero MT[2], Nasif AMM[1], Díaz LP[1], Arévalo RA[3], Piscitelli FR[1].
[1]U.N.T., [2]U.N.S.E., [3]APTA-Piracicaba. BR.
E-mail: sach@faz.unt.edu.ar

Tagetes minuta (TAGMI) invasion in sugarcane crops occurs in December while escaping post-emergence herbicide action. The objective of this work was to determine the losses caused in crops by the effect of competence. The assay was carried out in El Cevilar (Tucumán) in 2006 on 2-year ratoon sugarcane of healthy cultivar TUC 77-42. The experimental design was randomized blocks with 5 treatments and 3 replications: Without competence, Permanent Competence Level 1(13.4 pl.m^2), 2 (7.2 pl.m^2), 3 (5.5 pl.m^2) and 4 (1.6 pl.m^2). Each plot was 64 m^2. In the August 2006 harvest cane weight determination, saccharine analysis, and height and stem diameter measurements were carried out. ANOVA and Tukey α= 0.05 Test were used. Results: Sugarcane losses between 1.92 and 34.15%, and sugar losses between 4.71 and 31.83%. Permanent competence losses for stem number were 10.52 to 36.84%; for stem height 4.28 to 22.14%, and stem diameter decreases 2.44 to 15.10%. We concluded that when TAGMI competes with varietTUC77-42, it produces a great decrease in number, height and stem diameter with important cane and sugar losses per hectare.

123.

COMPARATIVE ANALYSIS OF EMERGENCE VELOCITY OF *Sicyos polyacanthus* Cogn. USING DIFFERENT INDEXES

Chaila S[1], Sobrero MT[2], Díaz LP[1], Arévalo RA[3], Nasif AMM[1].
[1]FAZ-UNT; [2]FA y A-UNSE; [3]APTA Centro Sul. (BR). E-mail: salvadorchaila@yahoo.com

The germination velocity and the emergence velocity of plantlets are two tests used for evaluation of seed vigor. The objective of this work was to test different emergence indexes and to propose a new one for the calculation of emergence velocity of *Sicyos polyacanthus*. The assay was carried out in Santa Bárbara (Tucumán, AR) during the year 2005, in plots of 2 x 2 m totally randomized with 5 replications; 150 seeds were sown per plot in furrows of 0.40 m at 0.02 m deep. Each plot was sown with 5 lines and 30 seeds. The different models for comparative calculus were: EV (emergence velocity); EVI (emergence velocity index), EVC (emergence velocity coefficient) and ERV (emergence relative velocity). The proposal of the ERV index was made for species emergence in field plots. Greater values were obtained with ERV and there were significant differences between this and the other indexes. This index enables the determination of vigor and velocity by simple readings. In tests with *S. Polyacanthus*, the ERV index is the most adequate for vigor and emergence velocity due to its sensibility for differentiation and comparison of plots, samples and fields, with their different values and management practices.

124.

TEMPORAL AND SPATIAL STUDY OF THE *Bemisia tabaci*-GEMINIVIRUS COMPLEX USING A GEOGRAPHICAL INFORMATION SYSTEM (GIS)

Alemandri V, Izaurralde J, Melchiorre GB, Truol G.
IFFIVE-INTA, Camino 60 Cuadras, km 5 °, X5020ICA Córdoba, Argentina. E-mail: vanialemandri@yahoo.com.ar

Currently, GIS are being used in different research fields such as plant pathology as key tools for the study of diseases. The purpose of this study was the temporal and spatial analysis of the *Bemisia tabaci* -geminivirus complex, using a geographical information system. Data were used on 54 location points where *B. tabaci* and/or geminivirus were found in soybean and bean in 2007. The data were incorporated into the GIS Floramap 1.02. A map with the probability surface was thus obtained of the potential locations where *B. tabaci*-geminivirus might be found, bearing in mind climate features, and using 2007 data. This layer of information was superposed on the probability surface obtained from the data of the previous 2004-2006 period, showing an increase of potential locations, mainly in the provinces of Córdoba, Santa Fe, Entre Ríos, San Luis and Buenos Aires. It may be concluded that the implementation of technology such as GIS in spatial and temporal studies of plant diseases produced by vector-transported viruses is highly useful.

125.

FOLIAR AND CAULINAR MORPHO-ANATOMY OF *SMALLANTHUS MACROSCYPHUS*

Mercado MI[1,2], Coll Araoz MV[1,2], Grau A[1], Ponessa GI[2].
[1]LIEY, Facultad de Ciencias Naturales, U.N.T. [2]Instituto Morf. Veg. F.M.L. Tucumán, Argentina. E-mail: mainesmer@yahoo.com.ar

Smallanthus macroscyphus, commonly known as "*yacón del campo*" (wild yacon), is an herb from Bolivia and Nothwestern Argentina, closely related to *Smallanthus sonchifolius*, "yacón", a species with growing agroindustrial importance due to its wide range of uses as food and popular medicine. The infusion of wild yacon leaves shows a medicinal effect similar to that of yacon leaves. The aim of this work was to study the foliar and caulinar morpho anatomy of *Smallanthus macroscyphus*. Since *S. macroscyphus* is a potential source for crossbreeding with *S. Sonchifolius*, it could be possible to achieve improvements in the medicinal activity of yacon. Wild yacon presents foliar morphological characters that allow its identification: yellowish-green leaves, actindrome suprabasal primary venation, eroso-irregular margin and petiole with wings that become narrow when they reach the foliar base. Anatomical characters have no diagnostic value in the identification of wild yacón with respecto to other *Smallanthus* species. The stem presents glandular and eglandular trichomes, subepidermic collenchyma, euestele and hollow pith with schizogenous secretory cavities.

126.

DETERMINATION OF THE ASSOCIATIVE VALUE (AV) OF *Amaranthus quitensis* Kunth Q AND *Ipomoea nil* (L.) Roth. IN COTTON CROPS IN THE ARRAGA LOCALITY (SANTIAGO DEL ESTERO)

Sobrero MT, Chaila S, Ochoa M del C, Trejo D, Feil WR.
UNSE. RA. E-mail: marite@unse.edu.ar

The association of different weed species in crops implies a permanent accompaniment in the agro ecological system in which they develop. The objective of this work was to determine the associative value (AV) of the associations of *Amaranthus quitensis (*AMAQU*)* and *Ipomoea nil (*IPONI*)* in cotton crops. The assay was carried out at the Estación Experimental Agrícola Santiago del Estero–INTA, Arraga locality. Ten 1m^2 samplings were made in a completely weedy crop of cv Guazuncho INTA during the 2007 harvest. The quantitative value of the association arising from the relationship between abundance, cover, manifest aggressiveness and the observed frequency was determined for each case. Differences were compared with adequate statistical analyses. It was found that direct associations correspond to second order with densities of 11 to 20 pl/m^2. Indirect associations are of third order with 5 pl/m^2. We concluded that associations of weeds AMAQU and IPONI in the cotton crop respond to a second order for direct associations with an AV = 14.7(AMAQU) and AV = 11.52 (IPONI) and a third order for the indirect ones.

127.

PHYSIOLOGICAL BASIS FOR SALINE TOLERANCE IN VINAL (*Prosopis ruscifolia*)

Meloni DA, Gulotta MR, Ledesma R.
UNSE, Av. Belgrano (S) 1912, 4200- Santiago del Estero, Argentina, E-mail: dmeloni@unse.edu.ar

Vinal is a native species from the Western Chaco Park highly tolerant to salinity due to mechanisms that still remain unknown. This work aims at determining the physiological foundations of salt tolerance in vinal. Seedlings were incubated in 0; -0.4; -0.8; -1.2; and -1.5 MPa NaCl solutions under controlled conditions in a growth chamber at 25ºC and 12 h photoperiod. The design was completely randomized with 5 replica and data were analyzed using ANOVA and Duncan's test. After a 12-day treatment, the concentration of ions Na^+, K^+, and Cl^- was determined in roots and leaves. Both Na^+ and Cl^- were excluded from the aerial part but concentrated in roots. The concentrations of these two ions increased in leaves and roots from -0.8 MPa and -0.4 MPa NaCl respectively. This increase occurred as the K^+ concentrations decreased, which, in turn, caused an increase in the Na^+/K^+ rate. This trend was stronger in roots than in leaves. The Na^+/K^+ rate in roots was about 30% higher than in the aerial part of the seedlings grown in the -1.5 MPa NaCl solution. We concluded that vinal excludes the ions Na^+ and Cl^- from its aerial part, a mechanism that may be responsible for its salt stress tolerance.

128.

ANNUAL VARIATION IN THE QUALITY OF THE SALI RIVER - TUCUMAN. ARGENTINA

González M del C, Núñez Recio LA, Pourrieux J, Riat MN, Montalván U, Guillén S.
197 Haití St. San Miguel de Tucumán.
E-mail: carminaglez16@yahoo.com.ar

The Direction of Water Resources monitors 33 points of different sources of superficial water from El Tala, in the limit with Salta, to the Rio Hondo Dam. The physical, chemical and biological parameters and the volume of water are monitored at every point
The aim of this survey is the evaluation of Biological Demand of Oxygen (BDO5) and Dissolved Oxygen (DO) in order to obtain an easy evaluation of the quality of the running water. The samples were collected from Río Sali: route Nº 305 (S 26º 43´ 18,87´´ W 65º 09´ 44.78´´); Lucas Cordoba Bridge: (S 26°56´15,6" W 65°47´11,1") and route Nº 323 (S 27º 8´ 0,21´´ W 65º 18´ 49.75´´). We compared the period with and without sugarcane and citrus harvests. The samples were analyzed in the Obispo Colombres Experimental Station Laboratory. The methods of analysis were APHA QPT 3530 (DBO5) and APHA QPT 3529 (OD).The results showed: 1) large differences in the quality of the Sali River in the three sites; 2) differences in quality in both periods.
Citrus processing plants, sugar cane mill and meat processing plants are responsible for organic contamination.

129.

STUDY OF CASES USED BY FIFTH YEAR STUDENTS OF THE AGRONOMICAL ENGINEER CAREER FOR PLANNING, ORGANIZATION AND FOLLOWING OF SUGARCANE FIELD PRODUCTION

Díaz L, Chaila S.
Facultad de Agronomía y Zootecnia. UNT.
E-mail: ldiaz@faz.unt.edu.ar

From 1995 to 2006 the Study of Cases of sugarcane fields was incorporated into the Caña de Azúcar Chair in the fifth year of the Agronomical Engineer career (FAZ-UNT). The objective was to integrate subject knowledge by means of the management of different productive activities by fifth year students. First, 5 to 7 groups of 8 to 12 students were formed and then they were asked to describe a sugarcane field from a productive point of view. After theoretical classes of plantation, culture and harvest the different groups made conclusions by means of guided discussions. Each group had to make a management proposal with an agronomical basis and they had an oral presentation and a written report at the end of the course. Students were conceptually qualified by their participation in group tasks and oral expositions. There were positive results: a) Utilization and participation in the classes (30%); b) Active participation in interviews to producers and technicians (25%); c) Predisposition to the critical analysis of productive activities (25-30%); d) Good use of bibliographical research (20%); f) Adequate and on time consulting with the teacher (60%); g) Learning and writing a report (20-30%). The Study of Cases enabled the satisfactory integration of the theoretical and practical elements of the course.

130.

GROUP WORK, TUTOR AND TUTORIAL MEETINGS, FUNDAMENTAL ELEMENTS OF THE PROBLEM BASED LEARNING METHOD

Nasif AM, Fracchia LN.
Genética. Fac. Agr.(UNT). Cát. Metodología Investigación. Fac. Medicina (UNT). E- mail: aliciamn2002@yahoo.com.ar

Problem Based Learning (PBL) is a teaching method. The students reach knowledge by means of independent study. Small student groups work with a tutor in tutorial meetings. PBL mainly aims at promoting in students the development of comprehension, critical thought and capacity for team work. In each meeting the tasks are organized following a particular sequence and the students learn the subject from problem planning. Nowadays it is considered that comprehension is synonymous with learning and tutorial meetings with small student groups represent a way for them to acquire self-independence. The role of the tutor is to facilitate the learning process. In Genetics (FAZ) the method was applied to 48 students. The objective of this work was to know their opinion concerning the tutor's role, tutorial meetings and group work in order to evaluate the results of new method with respect to these three fundamental aspects. A group enquiry with open questions was applied. Answers were divided into categories and percentages were calculated: 100% said that tutors stimulated discussion, participation and criticism. Tutorial meetings were very positive; 100% stated that group method generated reflection. We can conclude that PBL was positive and very satisfactory with respect to the items under consideration.

131.

PRELIMINARY FINDINGS ON THE ENDOGENOUS INTESTINAL MICROBIAL COMMUNITY OF *PONTOSCOLEX CORETHRURUS* (ANNELIDA: GLOSSOSCOLECIDAE)

Picón MC, Teisaire ES.
Instituto de Invertebrados. Fundación Miguel Lillo y Fac. de Cs. Naturales e I.M.L. Miguel Lillo 251. 4000 San Miguel de Tucumán.
E-mail: teisaire@tucbbs.com.ar

Earthworms have a close symbiotic relationship with microorganisms that live in their intestinal tube and actively participate in digestion and are vectors favoring their dispersion. However, there is little information on the taxonomy of such microorganisms. Consequently, we aimed at determining the communities of the intestinal microwildlife of a cosmopolitan species (Pontoscolex corethrurus) by using a simple experimental model to identify populations and their possible ecological functions.
Earthworms were collected in the Chicligasta Department, Km 745 away from national route 38, in a sugarcane field in the province of Tucumán. The material was obtained by dissecting worms. The strains were isolated in different dilutions in nutrient agar (solid) medium with the striation technique. We used the Gram Nicolle technique, motility, description of colonies, individual morphology and biochemical tests to achieve identification using Bergey´s keys. In the second phase the same procedure was performed on samples obtained from the soil to perform identifications and subsequent relevant comparisons. Preliminary results helped identify 13 different strains in the intestinal maceration.

132.

MYCOBIOTA IN DENTAL UNITS (DU) FROM A CLINIC OF THE FACULTY OF DENTISTRY (FOUNT)

van Gelderen A[1], Komaid van Gelderen AM, Annan MS, Benito IL, Granillo BA[2].
Mycology Department, Fac. of Biochemistry, Chemistry and Farmacy. Microbiology and Parasitology Department, Fac. Of Dentistry. UNT. E-mail: micologia@fbqf.unt.edu.ar

Different studies have shown that once the extremity of a syringe is contaminated, microorganisms are dragged into it by capillary action, which implies microbial colonization in the tubes through the development of biofilm.
The aim of this work was to identify the presence of fungi in the water from the water supply and in the water of the syringes from dental armchairs of a FOUNT Clinic.
Water samples were collected from the supply water and from the triple syringes of 18 DU. Then Letheen broth was added to 1 ml of each sample. They were seeded in Sabouraud-agar (SAB) medium with chloranfenicol and incubated at 28ºC for 15 days.
In 47.37% of the samples no fungi contamination was found. 15.79% was contaminated with yeasts, *Rhodotorula* being the most widely isolated genus. Molds were present in a 36.84% of the samples, *A. niger* being the most widely isolated. A variety of enviromental molds were also present in the samples.
Water and air control should be encouraged in Dental Units since they presents a labor risk and should be included in Biosecurity plans.

133.

PRELIMINARY SEM STUDY OF THE EROSIVE EFFECT OF IRRIGATION SOLUTIONS ON THE BOVINE DENTIN STRUCTURE

Salas MM[1], De la Casa ML[2], López ME[1].
[1]Cát. Quím. Biol., [2]Cát. Endod., Fac. Odontol., UNT. Av. B. Aráoz 800. Tuc, Arg. E-mail: mercedes.salas@odontologia.unt.edu.ar

Irrigation solutions are used during endodontic treatment. Objective: to microscopically evaluate the action of irrigation solutions on dentin tissue. 12 roots of young bovine uniradicular teeth were longitudinally cut; one half (control) was treated with distilled water and the experimental half with: 1% NaClO, 17% EDTA, 1% $Ca(OH)_2$ and 0.2%Clorhexidine (CHx) for 30 min by triplicate. They were fixed in glutaraldehyde and processed for Scanning Electronic Microscopy (SEM). The characteristics of the intertubular spaces and the organic remains were observed. The erosive action of NaClO was evidenced on the superficial remains of the dentin with extensive tubules, in agreement with previous studies where proteins, hydroxyproline and calcium were detected in the irrigation solution. With EDTA no superficial modifications were observed in the tubules with respect to the control, although previous studies detected an important action on the organic and inorganic components of dentin. $Ca(OH)_2$ and CHx evidenced their partial solvent action on the organic remains. Conclusions: NaClO evidenced solvent and erosive action of the pulp tissue. The other irrigation solutions only showed a solvent effect.

134.

CLINICAL ALTERNATIVE TO REESTABLISH THE BIOLOGICAL SPACE. RESULTS AFTER TWO YEARS

Loi JA, Valdivia G, Montero Córdoba A, Aragón HN.
Periodontics Chair, University ot Odontology, U,N.T. (National University ot Tucumán). Avda. Benjamin Aráoz 800 C. P. 4000 San Miguel de Tucumán. Argentina. E-mail: joseangelloi@yahoo.es

Anatomical-biological conditions represent the key for the taking of clinical decisions on periodontal treatment. Objectives: to provide information about a procedure that enables the re-establishment of the biological space in a new position. Materials and. Methods: eight single permanent roots from patients attending the community service provided by the Periodontics Chair were selected for this treatment in which forceps were used for supragingival luxation and removal. The new position of the root was obtained preserving a normal area, which enebled the reinsertion of Sharpey's fibres and the adhesion of the epithelium union. The roots were splinted in a semi-rigid way with fishingline and vitreous ionomer for two weeks. Results: The analysis of clinical data showed no significant differences with Friedman's test (p>0.05). Conclusions: this procedure proved to be fast and practical. Besides, it can be performed bv general dentists.
Subsidized by C.I.U.N.T. (Investigation Centre of the National University of Tucumán). Key words: Biological space. Luxation.

135.

***IN VITRO* EFFECT OF A BUCCAL RINSE ON SALIVARY CHEMICAL PARAMETERS**

Vargas C, López ME.
Cátedra de Química Biológica, Facultad de Odontología, UNT. E-mail: carmen.vargas@odontologia.unt.edu.ar

Saliva has minerals and proteins that maintain the integrity of buccal tissues. Although different rinses are used as preventives, their effect on salivary parameters has been poorly studied. The aim of this work was to analyze the *in vitro* effect of a buccal rinse on ions, proteins and enzymes of total non stimulated saliva. Eight healthy individuals with good buccal health, normal salivary flow rate and not using medicaments were included in the study. Total saliva was aspired for 5 min in the morning after 2 h of fasting, centrifuged at 10000 rpm at 4ºC and kept at -20ºC. The rinse contained 0.05% sodium fluoride. Distilled water was used as control. Saliva was incubated at 37ºC with the same volume of the rinse, with agitation for 1, 5, 10, 15 min. The rinse produced no alteration in pH. Then it was centrifuged at 10000 rpm at 4ºC and calcium, phosphor, total proteins, amylase and peroxidase were quantified. Data was analyzed by ANOVA. Calcium and phosphor showed no statistically significant differences among groups at any of the studied times (p>.05). Proteins showed differences (p<.05) with the rinse, with a marked decrease from 5 min of incubation onwards. Peroxidase showed a similar behavior (p<.001). Amylase showed no differences among groups (p<.05). Salivary proteins were affected by fluoride, which also strongly inhibited peroxidase. Ions were not affected by the rinse.

136.

THE TEACHER IN THE MEDIATION PROCESS OF HEALTH CARE KNOWLEDGE

Gakman C, Gil Moreno MC.
Education for Health, Faculty of Dentistry. Educational Psychology, Faculty of Psychology. Benjamin Aráoz 800. E-mail: cgakman@arnet.com.ar

Objective: exploration of the knowledge and opinions that the teacher has on the teaching of Education for Health (EFH) in the school.
Material and method: The study is descriptive, the number of teachers is 36 and they belong to public schools in urban areas (UA) and urban-marginal areas (UMA). A questionnaire with 26 items was used. Absolute and relative frequencies were calculated.
Results: The population was constituted by 36 (n=36) female teachers aged between 29 and 56. They teach EFH, integrating the contents to the areas of Natural Sciences. We wanted to find out whether teachers were aware of the existence of official EFH study programs. The results showed that 47% in UA and 65% in UMAE did not know about the existence of such programs. When investigating the knowledge of teachers on published teaching materials, only 21% in the UA and 12% in UMA were aware of their existence.
Conclusion: most teachers are ignorant of official publications on EFH nor do they know about curricular regulations enforcing their use. They consider the ministry of Education within a social context that supports the educator when considering the EFH as one more aspect in their daily teaching duties.

137.

MODEL OF BUDDING POTENTIAL FOR FUTURE STUMPS OF cv LCP 85-384 SUGARCANE FROM MICROPROPAGATION

Díaz L, Chaila S.
Facultad de Agronomía y Zootecnia. UNT.
E-mail: ldiaz@faz.unt.edu.ar

Budding potential (BP) is an indicator for the prediction of the future stumps that sugarcane crops will have. The objective of this work was to provide the theoretical approach for a simple and practical model to predict the future stump production from a plantlet from micropropagation. The experimental assay was performed at La Tala, Tucumán, on cv. LCP 85-384 during 2003-2005 in randomized blocks with 4 treatments and 4 replications. T1: uninodal bud plantlets, T2: organogenic plantlets T3: embryogenic plantlets SB and T4: embryogenic plantlets E10. Micropropagated plants were from the Caña de Azúcar Chair Laboratory (FAZ-UNT). Partial models were used for the calculation of buds with shooting capacity (BSC), Real Budding Capacity (RBC) and BP for regenerating stumps. The model proposed for BP calculus consists in joining components BSC and RBC to describe budding potential or regeneration stumps from an original plantlet, then first plant, then first stump stem- and bud-forming which will originate a new plantation. ANOVA, mean comparison, Tukey's test, linear regression analysis, Pearson's concordance test and others were used. For BP the following was obtained: stakes 8.60; organogenesis 11.48; embryogenesis E10 11.29 and embyiogenesis SB 12.30. Buds from embryogenesis SB have greater budding potential. Values of RBC and RBC show that budding capacity and real budding capacity increase with this treatment.

138.

RELATIVE GERMINATION VELOCITY CALCULUS (RGV) OF *Solanum nigrum* L. AND *Solanum lorentzii* Bitter

Mansilla de Andrada NJ, Chaila S.
Fac. FAZ-UNT. E-mail: sach@faz.unt.edu.ar

S. nigrum (SOLNI) and *S. lorentzii* (SOLLO) are two important weeds for various crops of the region. The objective of this work was to calculate the relative germination velocity (RGV) of two *Solanum* species by means of the RGV index. Fruits of *S.nigrum* and *S. lorentzii* were harvested from weeds of the Finca Experimental El Manantial during the growth cycle 2005-2006. Fruits and seeds were obtained from ten plants of each species. Germination tests were made with controlled humidity and at 30°C in a germination device. Germinated seeds were counted every day for 90 days. For RGV calculus (Chaila, 2001), we counted the number of seeds in the samples, the number of seeds germinated at the counting time, the number of days from seeding to the respective counting and the number of replications of the assay. Both species present difficulties in their germination. Seeds remained viable and germination took a long time. SOLNI (0.622) presents a greater RGV than SOLLO (0.289). This demonstrates that from the competence point of view SOLNI is a more dangerous species than SOLLO.

139.

EVALUATION OF DIFFERENT CULTURE MEDIA TO REDUCE EXOPOLYSACCHARIDES PRODUCED BY *Sphaceloma* spp. AND IMPROVE DNA EXTRACTION

Acosta ME, Canton NV, Fogliata GM, Ramallo CJ.
Estación Experimental Agroindustrial Obispo Colombres. EEAOC. Av. William Cross 3150 (4101). Las Talitas. Tucumán. Argentina.
E-mail: laboratoriofito@eeaoc.org.ar

The colonies of the *Sphaceloma* species developed in potato d-glucosa agar (PDA) at 2% produce exopolysaccharides exudation that interferes with DNA purification. The aim of this work was to evaluate different culture media that inhibit or reduce exudation. Isolate 28 was used and the media were: a) Potato glucose agar (PGA) 2%, 1.5%, 1%, 0.5% and 0.2%; b) Potato sucrose agar 2%; c) Potato agar; d) Sterile cellophane paper disks on PGA 2%. Exopolysaccharide exudation was reduced or eliminated in all media evaluated. In addition the mycelium does not stick in sterile cellophane paper disks on PGA 2%, so clean colonies can be obtained for DNA extraction.

140.

ELISA DOT BLOT PROCEDURE TO IDENTIFY *Xanthomonas axonopodis* pv *citri* COLONIES *IN VITRO*

Martinez CV, Ramallo CJ, Acosta ME.
Estación Experimental Agroindustrial Obispo Colombres, Avda. William Cross 3150, (4101) Las Talitas, Tucuman, Argentina. E-mail: cristinamartinez8@hotmail.com

The objective of this work was to validate the ELISA dot blot procedure to identify *Xanthomonas axonopodis* pv *citri* (Xac) colonies in nutrient agar. The different assays evaluated were: a) Nitrocellulose membrane and Whatman filter paper; b) with and without pre-wetting of nitrocellulose membrane; c) with and without drying at 28ºC overnight nitrocellulose membrane after sticking the Xac colonies; d) primary mono- and polyclonal antibodies; e) different concentrations of substrate solution. The results showed no differences between nitrocellulose membrane or Whatman filter paper whereas pre-wetting and drying were essential steps in the procedure. Mono- and polyclonal antibodies had the same sensitivity and the latter was effective up to 1:20000 dilution. The substrate must be used following manufacturer' protocols and it can be reused only once.

141.

TRICHOGLOSSUM HIRSUTUM VAR. _HIRSUTUM_ (PERS.) BOUD. (GEOGLOSSACEAE, HELOTIALES). A NEW RECORD IN ARGENTINA

Catania M del V[1], Romero AI[2]
[1]Fund. M. Lillo, Botánica. M. Lillo 251, S.M. Tucumán (4000), Argentina. [2]CONICET. E-mail: catania@csnat.unt.edu.ar

Trichoglossum Boud., a genus found especially in temparate zones, is formed by approximately 19 morphospecies (Kirk *et al.*, 2001). It is characterized by stipite, clavate to spatulate ascomata, fleshy consistency, black colour, entirely hairy, which gives it its velvety aspect. Gamundi's works are the only records of this genus for our country. She reported (1979, 1986) the genus for the first time for Argentina, describing *T. ctopartitum* Mains in the province of Tierra del Fuego. The objective of this work is to present for the first time the record of the genus in northwestern Argentina, to describe macroscopic and microscopic characteristics and to illustrate the morphospecies identified. The specimens were collected during fungal explorations in forests of *P. parlatorei* Pilg. in the province of Catamarca. The material was dried and preserved in the LIL herbarium. The microscopic preparations and observations were made with routine methods. In conclusion, *Trichoglossum hirsutum* var. *hirsutum* (Pers.) Boud. was identified, this being the first record of this morphospecies for Argentina.

142.

TAXONOMIC AND NOMENCLATURAL UPDATE OF _MNIOBRYUM_ IN SOUTH AMERICA

Suárez GM, Schiavone MM.
Fundación Miguel Lillo, Miguel Lillo 251, 4000 Tucumán, Argentina. CONICET, Myndel Botanica Foundation, CIUNT. E-mail: suarezgm@csnat.unt.edu.ar

We revised the South American species of *Mniobryum* as a comprehensive systematic and phylogenetic study of *Pohlia,* aiming at a nomenclatural and taxonomic update.
Mniobryum was erected by Limpricht in 1892, based on sporophytics characters, while the gametophytic characters are the same ones as in *Pohlia*. Aman (1983) reduced *Mniobryum* to subgenus level, while Brotherus (1903, 1924) recognized *Mniobryum* as genus. Later Shaw (1982) examined all North and Central American and Caribean *Mniobryum* species , placing them in *Pohlia*. More recently Arts, (1995, 2001) points out to the likely relationship between several *Leptobryum Wils.* species and *Pohlia*, synonimizing *M. bracteatum* Bartram with *L. wilsonii*.
Having examined the type specimens of the South American species of *Mniobryum* listed in the literature deposited in H, JE and LPS, we conclude that *M. bolivianum* (from Bolivia), *M. philonoteum*, *M. aulticaule* var. *crassinerve* and *M. alticaule* var. *robustius* (from Argentina) are synonyms of *P. Wahlenbergii*, while *M. aspillacae* (from Chile) and *M. bractearum* are synonyms of *Leptobryum wilsonii*.

143.

HYDROALCOHOLIC GEL BASED ON _Aloe vera_ EXTRACT

Costello C, Sesto Cabral ME, Zampini C, Gómez JD, Arias ME.
Facultad de Bioquímica, Química y Farmacia. Ayacucho 471. E-mail: marias@fbqf.unt.edu.ar

Aloe vera (*Aloe barbadensis* Miller), which belongs to the Liliáceas family, is popularly used in the cosmetic, food and pharmaceutical industry. Many works demonstrated that the *Aloe vera* gel possesses the property of healing wounds, ulcers and burnings. Its use as a medicine has been limited due to its short shelf life. Ethanol gel is used as a very effective antiseptic agent.
Objective: to evaluate the efficiency of the hydroalcoholic gel supplemented with *Aloe vera* extract intended as a sanitizing agent.
A glycolic extract was obtained from *Aloe vera* leaves. Fifteen formulations of hydrogels were obtained using different proportions of carbopol, ethanol and glycolic extract from *Aloe vera* extracts. Pharmacotechnical and microbiological tests were performed. The efficiency of the formulations was tested on workers from a lemon packaging factory.
The glycolic extract from *Aloe vera* leaves tested against Gram (+) and Gram (-) bacteria has demonstrated to be active. Out of the fifteen formulations tested, nº 12 demonstrated to be the most active due to the concomitant action of ethanol (60%) and glycolic extract (5%) compared to a standard hydroalcoholic gel used as a sanitizing agent.

144.

VALIDATION OF THE PROCEDURE FOR THE DEVELOPMENT OF SALBUTAMOL SYRUP

Ordoñez A.
Cátedra de Farmacotécnia I. Carrera de Farmacia. Universidad Nacional de La Rioja. La Rioja. Argentina.
E-mail: anadriordonez@yahoo.com.ar

Salbutamol is widely used in the form of sulphate as a bronchodilator in the treatment of asthma. Its use is justified by the lower incidence of adverse reactions manifested when compared to isoproterenol. However, the current formulation presents physicochemical stability problems that cause its shelf life not to exceed 6 months. Stability has been little studied and there is scarce bibliography on the kinetics of decomposition of the active path through oxidative damage.
A new technology for the production of salbutamol syrup is presented aimed at eliminating the problems of chemical and physical stability of the previous formulation. A new formulation was obtained that met all the quality specifications required for this drug. It was proved that its useful life increased up to 2 years stored at room temperature in its original bottle.

145.

PHYTOCHEMICAL AND BIOLOGICAL CHARACTERIZATION OF PHYTOTERAPEUTIC PREPARATIONS OF *ACACIA* SPECIES

Zampini I[1,2,4,6], Danert C[6], Cuello S[5,6], Arias M[3], Isla M[1,2,4,6]
[1]Cát.Qca Orgánica. y Biológica (Fac. Ciencias Naturales), [2]Cát. Fitoquímica and [3]Cát. Farmacotécnia II (Fac.Bioq, Qca y Fcia), [4]CONICET, [5]ANPCyT. UNT. [6]Fundación Miguel Lillo. Tucumán. Argentina. E-mail: misla@fbqf.unt.edu.ar

Although the *Acacia* genus (Fabaceae) is represented by more than 1350 species distributed worldwide, there are few reports on the chemical composition and biological properties of Argentinean *Acacia* species. The presence of different flavonoids in the leaves and stems has been reported. *Acacia aroma* is the most widely studied species in this genus. Antioxidant, anti-inflammatory and antimicrobial activity against multi-resistant human pathogenic bacteria have been reported for *A.aroma*.

In this work we present the study of the phytochemical and biological (antioxidant and antibacterial activity) screening from four Argentinean *Acacia* species extracts (*Acacia aroma*, *Acacia caven*, *Acacia visco*, *Acacia praecox*).

Phytochemical screening showed similar chemical patterns by TLC for *A. aroma* and *A. visco* The presence of alkaloids was discarded. TLC-autography (DPPH/ABTS) and bioautography assay against *Staphylococcus aureus* methicillin-resistant were performed. Antioxidant and antibacterial activities were demonstrated in all preparations.

146.

NUTRITIONAL AND FUNCTIONAL PROPERTIES OF REGIONAL FRUITS

Cardozo ML[2], Ordoñez RM[1,2], Isla MI[1,2].
[1]Cátedra Fitoquímica. [2]CONICET. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Tucumán. Argentina. E-mail: misla@fbqf.unt.edu.ar

Consumption of fruits and vegetables helps prevent numerous chronic diseases. This property might be caused by antioxidant phytochemicals present in their composition. The specific aim of this study was to determine the nutritional and functional properties of fruit ethanolic and aqueous extracts of four plant species that grow in northwestern Argentina. This study shows that all fruits analyzed accumulate glucose and fructose. *Zisyphus mistol* aqueous extracts exhibit the highest amounts of soluble proteins (133 mg/g) and total phenolic compounds (27.42mg/g) followed by *Cereus forbesii, Morus nigra* and *Cyphomandra betacea.* The DPPH scavenging ability of all fruit extracts was higher than that of synthetic antioxidants. Another antioxidant activity screening method applicable to both lipophilic and hydrophilic antioxidants, $ABTS^{\bullet+}$ (ABTS radical cation) assay, showed results similar to those obtained with DPPH. The aqueous extract of *Z. mistol* scavenged both radicals at a weak rate (50%) at 53 μg/mL while the SC_{50} values for the other extracts ranged between 5 and 8 μg/mL.

147.

ANTIMICROBIAL SENSITIVITY IN SALMONELLA STRAINS ISOLATED FROM POULTRY FOOD INGREDIENTS

Soria MA, Bueno DJ, Trinidad JA.
INTA Estación Experimental Agropecuaria Concepción del Uruguay, CC Nº 6, 3260, Entre Ríos, Argentina.
E-mail: msoria_1@yahoo.com.ar

Food is considered the most important source of Salmonella introduction in poultry farms. Antimicrobial agents are normally used to control these bacteria. The aim of this study was to determine antimicrobial sensitivity in Salmonella strains isolated from poultry food ingredients. Salmonella strains showed different antimicrobial susceptibility. Seventeen were sensitive to all antibiotics studied while the other 16 strains were intermediate to 1 or 2 antimicrobial agents. There was 100% sensitivity to gentamycin (120 μg), streptomycin and norfloxacin. With respect to other antibiotics tested, 91 to 97% of the strains were susceptible, except for amikacyn, where 70% of strains were susceptible, with 27% of intermediate strains. There were not multiresistant Salmonella strains. Therefore, antimicrobial resistance was not a problem in Salmonella strains isolated from poultry food ingredients. Before using amikacyn to control these bacteria, antimicrobial susceptibility testing should be emphasized.

148.

PHYSICAL, CHEMICAL AND MICROBIOLOGICAL ANALYSES OF HONEY FROM EXTRACTION FACILITIES WITH DIFFERENT TECHNOLOGICAL LEVELS

Mouteira MC, Soria ME, Malacalza NH.
Fac. Cs. Agr. y Ftales, UNLP y Direc. Prov. de Gan., MAA. C.C. N° 19. La Plata. E-mail: mouteiracecilia@yahoo.com.ar

Handling, machinery and environmental conditions alter the physical, chemical and microbiologic quality of honey. This study examines the way in which different levels of technology affect the extraction process. Facility "A" was equipped with frame, electric knife, bateau and drum; Facility "B" with frame, steam powered knife, bateau, well and drum. Tests followed IRAM specifications. Mean values for fungus and yeast, total coli, colour, humidity and HMF were: Facility A: Frame 36.67, <0.3, 30.9, 17.87 and 5.44; electric knife: 73.0, <0.3, 24.50, 16.75 and 9.89; bateau 143, <0.3, 25.87, 17.58 and 3.88; drum 19.67, <0.30, 23.33, 17.65 and 2.57. Facility B: frame 29.75, <0.30, 23.34, 26.64 and 2.62; steam powered knife 90, 29, 22.68, 15.9, 3.38; bateau 33.33, 10.74, 29.23, 16.07 and 3.64; well 79.67, 9.91, 30.34, 16.39, 2.89; and drum 47.13, 19.87, 24.67, 16.29, 2.87, respectively. *Salmonella spp* was not present in any of the samples. The increase in fungus-yeast (facilities A and B) and total coliforms (facility B) indicates poor hygienic-sanitarian management of the product. The physical and chemical analyses for both facilities are within AFC values.

149.

COLORIMETRIC ANALYSIS OF HONEYS OF *Lotus tenuis* AND THEIR RELATIONSHIP TO POLLEN CONTENT

Ringuelet J, Dedomenici A[1], Leveratto D[2], Passarelli L[3].
[1]Lab. del MAA Pcia. de Bs. As.; [3]Fac. Cs. Nat. y Museo. UNLP; [2]Producción Animal I. Fac. Cs. Agrarias y Forestales UNLP. Calle 60 y 119. CP 1900 La Plata, Bs. As. Argentina. E-mail: zooamg@ceres.agro.unlp.edu.ar

We conducted the study of color and pollen content of monofloral honey *Lotus tenuis Waldst et Kit*, a honeybee colony in the Salado region, Buenos Aires, Argentina, in order to observe the changes in apparent color according to the changes in the pollen and determine patterns of color among which *Lotus tenuis* can be found. Ten honey samples obtained during the harvest (January to March) with a frequency of ten days were used. The pollinological analysis was performed according to the usual techniques (Louveaux, 1978) and the color was analyzed with Pfund's Color Grader. We considered secondary pollen contribution the ones that appeared with a frequency between 15 and 45%. All honeys presented a percentage of pollen *Lotus tenuis* higher than 50%. Apiaceae (*Carduus sp*), Brassicaceae, Lamiaceae (*Mentha sp*) and Myrtaceae (*Eucalyptus sp*) supplied secondary pollen. The variation observed in the colors of honey does not correspond to the input side of pollen. Pfund's scale values were 10% White, 20% of Water White and 70% Extra White.

150.

CONTROL OF THE MITE *VARROA DESTRUCTOR* (VARROIDAE) IN HONEYBEE COLONIES OF *APIS MELLIFERA* (HYMENOPTERA: APIDAE) BY THYMOL

Leveratto D[1], Pérez R[1], Guardia López A[1], Marcangeli J[2].
[1]Curso Producción Animal1 Facultad Ciencias Agrarias y Forestales. UNLP. calle 60 y 119. CP 1900 La Plata, Bs. As. Argentina. [2]Fac. de Ciencias Naturales, UNMdP. E-mail: zooamg@ceres.agro.unlp.edu.ar

The aim of this work was to evaluate the acaricide efficacy of thymol in plates to control the mite *Varroa destructor* in honeybee colonies during the autumn months, 2007. The assays were carried out in an experimental apiary located in La Plata, province of Buenos Aires. Ten Langstroth hives were divided into two equal groups. The first group received a total of four plates with 8.03 g of thymol at 15-day periods. The second one was the control group. Dead mites were collected weekly from special floors designed to prevent mite removal by adult honeybees. Then, both groups received one Cumavar® strip to kill remaining mites. Thymol showed an average acaricide efficacy of 63.68% ± 18.75, showing significant differences with the control group ($p \leq 0.05$). During the experience, great numbers of bee brood were observed. No negative effect on honeybee brood was recorded. In spite of moderate efficacy, results showed that thymol is a useful agent to kill a significant number of mites. However, treatments would present better results without the presence of honeybee brood, especially after the winter months.

151.

SPONTANEUS DENTAL ROOT RESORPTION IN AN ANIMAL MODEL

Kozuszko S, Territoriale E, Juárez J, Guzmán H, Missana L.
Experimental Path.Lab. Oral Path. Dental School. Tucumán University Av. Benjamín Araóz 800. T4000. Tucumán. E-mail: silviakozuszko@yahoo.com.ar

Objetive: The aim of this study was to investigate and evaluate spontaneus dental root resorption in an animal model.
Methodology: Buccal media roots at mandibular 1st molar from Sprague Dawley rats aged 2, 3, 4, and 12 weeks were fixed in phormol buffer 10%, slowly decalcified and processed in a routine manner for light microscopy. Histological and morphometrical studies were performed using an image analysis system (Image ProPlus Software).
Results: root resoption was absent at 2 weeks, resoption active areas (12%) being observed at 3 ws. Then, they increased (14%) at 4 ws, (31%) at 5 ws and (28 %) at 12 ws.
Conclusion: From these results, resorption started after 2 ws and was observed in many areas at 3 ws. Resorption steps were found at all time periods. This is a good animal model to study dental resorption biology as well as to evaluate dental therapies.
Granted by CIUNT. Key words: root resorption, animal model, cementum regeneration.

152.

INFLUENCE OF PROTEIN UNDERNOURISHMENT IN BONE FORMATION OF THE CREST OF ALVEOLAR BONE. HISTOMOROMETRIC STUDY

Pani M[1], Lopez Miranda L[1], Martin AE[1], Garat JA[1], Ruiz Holgado N[1], Meheris HE[1], Rodriguez G[1], Gonzalez S[2,3].
[1]Dep. of Histology. School of Dentistry. National University of Tucuman. [2]CERELA. CONICET. [3]Faculty of Public Health, School of Biochemistry, Chemistry and Pharmacy. National University of Tucuman.

Undernourishment caused by the lack of certain dietary components alters bone modeling and remodeling. Since alveolar bone differs from long bones, the aim of this study was to determine the response of the alveolar crest in a model of protein undernourishment. Male Wistar rats were assigned to one of the following groups: Group I: Fed with a conventional diet. Group II: Fed with a protein deficient diet *ad libitum*. Animals were sacrificed 30 days after the beginning of the study. Lower jaws were processed for light microscopy. In mesiodistal samples of the first lower molars stained with hematoxylin-eosin, the following parameters were evaluated in the alveolar crest: bone resorption surfaces, bone forming surfaces, surfaces at rest. Number of osteoclasts and bone volume (Tv/Tbv), where Tv: Trabecular volume and Tbv: Total bone volume. Statistical analysis was performed using Student's test.
Results: Bone resorption was higher in the experimental group while osteoclast and bone volume did not show significant differences between groups.
Sponsored by CIUNT.

153.

ANTIMICROBIAL ACTIVITY OF EXTRACTS FROM *Coronopus didymus* Sm. (Brassicaceae)

Lizarraga E, Allori CG de, Castillo MC de, Catalán C.
Universidad Nacional de Tucumán.

C. didymus is a herb known as "quimpe" used in popular medicine for the treatment of several diseases. Extracts from the aerial parts were obtained by Soxhlet using solvents of increasing polarity. Hexane, chloroform and ethyl acetate extracts were dissolved in ethanol 96% and the methanol fraction was dissolved in distilled water. The assays were performed against the human pathogenic strains listed below. The Minimum Inhibitory Concentration (MIC) of the extracts was determined following CLSI guideless. Hexane and methanol extracts showed low activity (MIC 30 mg/ml and >30 mg/ml). The MIC of chloroform and ethyl acetate extracts are summarized in the table below.

Microorganism	MIC mg/ml Chloroform	MIC mg/ml Ethyl acetate
E. coli ATCC 35218	4.75	5
E. coli ATCC 25922	4.75	5
S. aureus ATCC 29213	4	4.25
S. aureus ATCC 25923	4.75	4.5
E. faecalis ATCC 29212	4	4
P. aeruginosa ATCC 27853	4	4

Our results indicate that *C. didymus* exhibits only a moderate activity against the human pathogenic bacteria tested.

154.

DETECTION OF ANTIOXIDANT ACTIVITY IN BREASTMILK FROM NEONATES' MOTHERS

Petros C[1], Zampini IC[2], Rojo HP[1], Isla MI[2].
[1]Facultad de Medicina. [2]Facultad de Ciencias Naturales e Instituto Miguel Lillo. UNT. Fundación Miguel Lillo. Tucumán, Argentina. E-mail: heberojo@gmail.com

Maternal milk possesses a complex and variable mix of chemical components, many of which may have antioxidant activity. The objective of this study is to determine the antioxidant activity of samples taken from newborn babies' mothers. Milk samples collected with the previous consent of the mothers were taken to the laboratory and refrigerated. They were centrifuged at 2000 rpm for 10 min and a watery extract was obtained after separating the fat layer. The protein content was determined (Lowry *et al*.) and results were expressed in casein equivalents. The antioxidant activity was determined in qualitative terms. Samples were seeded in TLC and covered with 0.09% agar containing the radical ABTS•+ (2,2'-azinobis-3-ethylbenzothiazoline-6 sulfonic acid). Besides, colorimeter determination was made by measuring its absorption at 734 nm of ABTS•+ control and that of the sample with ABTS•+. Antioxidant activity was found in all samples examined (n=24). Conclusion: Antioxidant activity is one of the numerous benefits of maternal milk.

155.

SIMULATION OF THE PRODUCTION OF FRUCTO-OLIGOSACCHARIDES

Salinas M[1,2], Perotti N[1,2]
[1]Universidad Nacional de Tucumán. FACEyT. [2]PROIMI-CONICET. Av. Belgrano y Pje. Caseros, (4000) Tucumán, Argentina. E-mail: msalinas@proimi.org.ar

Introduction: Fructooligosaccharides (FOS) are considered both alimentary additives and nutraceutics. Several studies have demonstrated their prebiotic properties. A simulation of FOS production was made. Kinetics parameters of FOS growth and synthesis were studied.
Objective: The objective of this work was to simulate FOS production in several initial conditions using a mathematical model developed by the authors.
Materials and Methods: Experimental data were obtained using the strain *Aureobasidium* sp. The bioproduction conditions and the details of the model were previously reported by the authors. The software used for the simulation was Matlab 7.
Results and Conclusions: The simulation shows the relationship between the sugars at different initial concentrations. Sucrose rapidly disappears, enabling FOS and glucose formation. An increase in sucrose concentration resulted in an increase in FOS production. This will contribute to the study of the production of this prebiotic.

156.

PREVALENCE OF INTESTINAL PARASITISM IN SCHOOLCHILDREN FROM FAMAILLÁ CITY, TUCUMÁN PROVINCE, ARGENTINA

Dib JR, Oquilla J del V, Lazarte SG.*
*Cátedra de Parasitología, Instituto de Microbiología, Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán. Argentina. *E-mail: tafisl@hotmail.com*

The prevalence of intestinal parasites was investigated in children attending a rural primary school in Famaillá city, Tucumán province, Argentina. Stool specimens were collected from 149 schoolchildren. The prevalence rate of intestinal parasite infections was 86.6%. No significant age or sex differences were observed in parasite distribution. *Blastocystis hominis* was the most commonly found protozoan parasite (54.4%), followed by *Entamoeba coli* (35.6%), *Giardia lamblia* (24.8%) and others (16.7%). *Enterobius vermicularis* was the most prevalent intestinal helminth (27.5%) followed by *Ascaris lumbricoides* (20.8%), *Tricuiris trichiura* (12.8%) and others (5.4%).
Polyparasitism was observed in most of the patients (62.4%); protozoan infections prevailed over heltminthic infections.
These results show high rates of parasitism in Famaillá schoolchildren that would be associated with socioeconomic factors and poor environmental sanitation conditions in the area.

157.

PREVALENCE OF THE CONSUMPTION OF ADDICTIVE SUBSTANCES IN A POPULATION OF ADOLESCENTS AND YOUNG STUDENTS

González M de los A, Encina M, Marangoni P, Mentel P, Cardinale M, De la Orden M, Navarro P.
Cátedra de Fisiología. Facultad de Odontología. UNT. Benjamín Aráoz 800. 4000 Tucumán. E-mail: marcecardinale@arnet.com.ar

Adolescence is a critical stage in the acquisition of addictive behaviors. The objective of this work was to determine the prevalence of addictive substance consumption in a population of adolescents and young students of the province of Tucumán. The total population (TP) consisted of 641 individuals between 14 and 21 years of age attending private and public educational establishments. An anonymous self-administered questionnaire was given them. From the descriptive analysis of the data, 37% of the students smoke while 63% do not. 74% drink alcohol while 26% do not. 25% consume drugs while 75% do not. Out of those who smoked, 73% were male and 27% female. As to alcohol consumption, 72% were male and 28% female and among drug users, 94% were male and 6% female. The prevalence in the use of addictive substances shows an increase in alcohol consumption in this population, but from the sanitary point of view, the consumption of any of these substances is equally important. This investigation was developed by students of the 3rd year of the Polimodal de Ciencias Naturales of the Instituto Guillermina Léston de Guzmán within the framework of the curricular subject "Proyecto de Intervención Socio – Comunitaria" (socio-communitarian intervention Project).

158.

HOW DO MEDICAL STUDENTS CHOOSE?

Bartolucci CP, Blanca RS, Santillán RM, Orqueda D.
Fac. Medicina, UNT. Santa Fe 872, 4ºA, SM Tucumán. E-mail: cristinapbartolucci@yahoo.com.ar

Introduction: for students of Medicine, studying this career represents the possibility of fulfilling their professional choice, choosing a way of life and an identity (being a doctor). Students' motivations will influence their professional role. **Objective:** to determine the relation between motivation in the choice of a career and personal representation of the professional role. **Methodology:** a survey was carried out among 60% of these students. We enquired: **A)** reasons for the choice, **B)** representation of the future professional role; **C)** meaning of entering the career. **Results:** answers were grouped as follows: **A)** *With no grounds*: **33%** due to vocation, or interest; **6%** interest since childhood; *Human Values:* **13%** to help; **4%** humanistic vocation; *For Medical Knowledge*: **16%** interest in the human body, Genetics, etc; **13%** like to investigate; *To succeed socially*: **13%** to earn money and social prestige; **11%** family influence; **4%** due to its wide field of action.- **B)** *Aid tasks*: **33%** to heal, save lives, perform operations; **21%** to diagnose and treat diseasse; *Community related:* **20%** health promotion and prevention; **6%** humanistic tasks; *Tasks in the field of knowledge:* **15%** to investigate, **5%** to teach.-**C)** *Self-assertion:* **73%** personal satisfaction, pride, great achievements; *Training*: **10%** to start a new stage, **7%** to acquire discipline, grow up, to learn, **4%** eager to improve; *Relief:* **4%;** Illusion of a secure future: **2%. Conclusion:** Students who chose Medicine expecting social and economic success have a traditional representation of the doctor performing individual aid tasks. However, the choice based on an ideal of solidarity is associated with the representation of a professional doctor committed to the community who is a teacher and an investigator as well.

159.

DIFFICULTIES IN SOLVING PHYSICS PROBLEMS BY FIRST YEAR STUDENTS IN THE FACULTY OF DENTISTRY

Alderete MS, Merletti SM, Perez LI.
Department of Biophysics. Faculty of Odontology. National University of Tucumán. E-mail: stellamerletti@hotmail.com

Research on how to solve Physics problems is a permanent activity in the field of the Didactics of Science (Maloney, 1994). This interest is based on the importance that problem-solving has in the teaching of Physics and on the high percentage of failure among students. Failure at problem-solving is even more surprinsing among those students who usually have very good or excellent results at exams in which only theory is tested. In the Department of Biophysics at the FOUNT (Faculty of Dentistry), after the presentation of each topic, students are expected to learn how to solve problems and to be able to apply this procedure to similar cases. Therefore, the resolution of a problem situation is presented using the strategy of a model problem. These problems are based on physical magnitudes to be determined or on the relationship between physical magnitudes. The way of solving them is unique and linear. The aim of this work is to analyze the difficulties in problem solving in the General Physics course of first-year FOUNT students. The problems set the first term written tests corresponding to the year 2007 were analysed. This test consisted of nine theoretical questions and three problems. Results showed that 88 students (41.71%) out of 211 could not solve any of the problems. 56 (26.54%) solve only one; 49 (23.22%) solved two and only 18 (8.53%) solved all three problems. In conclusion, we can say that this high level of difficulty at problem solving shows that most students cannot apply their basic theoretical knowledge to problem situations. In this sense, a critical revision of the habitual strategies used to teach how to solve problems, which are conceived as "application exercises", is necessary. Key Words: model-problem, learning, students´ failure.

160.

RELATION BETWEEN HIGH SCHOOL AND UNIVERSITY ACADEMIC AVERAGES AMONG DENTAL SCHOOL STUDENTS

Alderete MS, Cordoba JE, Merletti SM, Perez LI, Singh FJ.
Department of Biophysics. Faculty of Odontology. National University of Tucumán. 800 Benjamín Araoz Av. (4000). E-mail: lilianainesperez@hotmail.com

The transition from High School to University represents one of the most critical issues in the Argentinean educational system. Passivity, poor academic results, difficulties in comprehension and expression are very common. These difficulties have their origin in the primary school and in some cases become more serious during high school.

The aim of this paper is to relate the general academic average of high school graduates to the results they obtain at the university to provide information to those involved in the articulation process as regards the influence that high school has upon university students.

This work is based on data obtained from the Students' Department of the FOUNT. A random sample of 217 students was analyzed. Out of these students, 131 (60.37%) had a very good (9 and 8 out of 10) high school average; 85 (38.25) good (7 and 6 out of 10) and 3 (1.38%) fair (5 and 4 out of 10). Only 29 (22.14%) of those students who had a very good average maintained it at the University; 85 (64.88%) got only a good average and 17 (12.98%) got a fair average. Out of the 83 who had obtained a good average, 68 (81.93) kept the same level; 7 (8.43%) improved to very good and 8 (9.64%) got a fair average. The three students whose average had been fair obtained the same results in the university. The relationship between high school and university average was 7.88 / 6.59. In conclusion, we can say that most students finish their university studies with a good academic performance; there is a marked decrease in academic results in those students who had very good marks in high school, while fair students continued the same.

Key words: general academic average, High School and University.

161.

LEARNING STRATEGIES USED BY STUDENTS WHO TOOK BIOLOGY COURSES IN THE AGRONOMICAL ENGINEERING CAREER

Amado ME, Rodríguez Rey JA.
Cát. Fisiología Vegetal. Fac. Agronomía y Zootecnia, UNT. Avda. Roca 1900. (4000) Argentina. E-mail: meamado@faz.unt.edu.ar

Strategic training enables students to deal with new situations by allowing them to acquire cognitive learning strategies to analyze, understand and organize information and transfer knowledge to real situations. The objective of this work was to reveal the learning strategies used by students who took biology courses in the first and second year of the Agronomical Engineering career at the Tucumán National University. For this purpose an anonymous self-administered enquiry with closed questions was set to 60 Vegetal Physiology students in 2006. The results showed that 57% of the students read books comprehensively; 10% make conceptual maps, 8% interrelated concepts and 5% integrate ideas and hypotheses. Knowledge transfer strategies are not among the most widely used. Data were analyzed by Descriptive Statistical and Frequency Distribution. Reading books comprehensively is the strategy most often used in the lower level in the above scale. It is important to integrate sequences of activities and build meanings. First and second year students memorize knowledge. Because of these results, teaching practices for autonomy, creative, significant learning and learning strategies of reasoning, problem solution and knowledge transference were used in Vegetal Physiology courses.

162.

BIOLOGICAL ACTIVITY OF EXTRACTS OF *Funastrum gracile* (DECNE.) SCHLTDL

Turbay S, Álvarez Gimenez JM, Pastoriza A, Fortuna AM, Riscala E, Gordillo MA, Trimarco J.
Fac. de Agronomía y Zootecnia. UNT. Avda Roca 1900. silvia_tuhar@hotmail.com

The purpose of this paper is to assess: I) the influence of the *F. gracile* methanolic extract (ME) on *Brassica campestris*' seed germination and II) the antibacterial activity of ME and hexanic and chloroformic subextracts (HSE, CSE) of the species studied. Four boxes with 35 seeds and 300, 600, and 1000 $\mu g.mL^{-1}$ ME concentrations were used. The results were analyzed with ANOVA and mean confrontation using Tukey's test. The variables determined were: number of germinated seeds, root and hypocotyl lengths (RL, HL), cell efflux conductivity (CEC), dehydrogenase activity (DHA), and mitotic index (MI). The results suggest that the number of germinated seeds was little affected. A decrease in RL and HL at 600 and 1000 $\mu g.mL^{-1}$ was observed. CEC and DHA experienced similar increases at 600 and 1000 $\mu g.mL^{-1}$. The MI was 14.7% at 600 and 1000 $\mu g.mL^{-1}$. Antibacterial activity: ME, HSE, and CSE were tested on *E. coli, P. aeruginosa*, and *X. axonopodis* pv citri *(*10^5 ufc/mL) at 500, 250, and 125 µg/mL using antibiotics as reference. The method of halo inhibition formation was used (LB agar). ME had no effect. Moderate inhibition was observed in *P. aeruginosa* with CSE at 250 and 500 µg/mL and in *X. axonopodis* pv citri with HSE at 250 and 500 µg/mL.

163.

PHYTOTOXICITY OF ISOIVASPERIN ISOLATED FROM HYALOSERIS ANDRADE-LIMAE

Trimarco J[1], Chain F[2], Fortuna AM[1,2], Gordillo MA[1,2], Riscala E[1], Catalán CAN[2].
[1]Agronomía y Zootecnia and [2]Bioq., Quím. y Farm.,UNT. E-mail: jtrimarco@herrera.unt.edu.ar

The effect of Isoivasperin at three Sesquiterpenic lactone (SL) concentrations (25, 50, and 100 $\mu g.g^{-1}$) was studied in two monocotyledonous and two dicotyledonous species. Germination percentage (GP), root and hypocotyl lengths (RL, HL), and dehydrogenase activity (DHA) were assessed on 25 seeds placed on agar. The seeds were kept at 25ºC for 96 h. One-way ANOVA and relative variation rate (RVR) were used for the analysis of the results. **Onion:** GP was not significant; RVR decreased 17.8 and 16.6% at 25 and 100 $\mu g.g^{-1}$; plantlet length decreased as SL concentrations increased; DHA showed differences at 25 $\mu g.g^{-1}$. **Wheat:** GP was not significant; RVR decreased 13.68, 8.42, and 17.89% at 25, 50, and 100 $\mu g.g^{1}$, respectively; DHA decreased at the start of hypocotyl development. **Radish:** GP was not significant; RL and HL decreased. DHA was similar for root and hypocotyl. DHA was higher in all cases. **Lettuce:** highest SL concentrations stimulated GP (25.92%). Hypocotyl (60%) and root (44.55%) lengths decreased. DHA increased. Thus, Isoivasperin only affected plantlet development.

164.

EVALUATION OF SOIL SUSTAINABILITY IN LEMON CULTURE. TUCUMÁN, ARGENTINA

Guillén SC, González M del C, Vidal PJM, Manzur J.
Facultad de Agronomía y Zootecnia de Tucumán, UNT. Av. Roca 1900. San Miguel de Tucumán. CP 4000.

Lemon culture, an important factor in the economy of the province of Tucumán, is carried out in areas where the soil has been extremely affected. Since the concept of sustainability involves the time factor, the present work evaluates the soil sustainability of lemon cultures in time through indicators using the native forest as reference. The assay was carried out in Lules, and measurements were performed in 2002 and 2006. The variables corresponding to the evaluation of chemical and physical fertility were: Light carbon (LC), Organic Matter (OM), total Nitrogen (Tot N), Cation exchange capacity (Cec), Bulk Density (BD) and Structural Stability (SS). An alteration index was calculated (agro system value / forest value) between 0 and 1, 0 being total alteration and 1 absence of alteration. The chemical variables LC, OM and Tot N had a *medium* alteration index for the years 2002 and 2006, except for OM, whose index for 2006 was *low*. With respect to physical fertility, BD changed from a *low* index in 2002 to a *medium* one in 2006, while SS remained *low.* The results indicate that no significant changes were found in the variables studied in a 4-year period , with the exception of OM and BD, where a slight increase and a decrease were detected, respectively.

165.

ABOVEGROUND BIOMASS PRODUCTION OF SEVEN WARM-SEASON PERENNIAL GRASS GENOTYPES IN RANGELANDS OF CENTRAL ARGENTINA

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur, 8000 Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía, CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

Studies were conducted in 3 genotypes: *Pappophorum subbulbosum Achnatherum hymenoides* cv. 'Paloma', 'Nezpar' and 'Rimrock', and *Leymus cinereus* cv. 'Magnar' and 'Trailhead'. The naturalized perennial grass *Eragrostis curvula,* was also investigated. Studies were carried out in the Chacra Experimental de Patagones. Circunference, total tiller number/plant, and aboveground dry matter production were determined in each selected plant. Plants were defoliated to 5 cm stubble height or remained undefoliated. The lower quantitative characteristics in the introduced than in the native or naturalized species could compromise their persistence in the rangelands of central Argentina.

166.

FERTILIZER EVALUATION IN SUBTROPICAL PASTURES IN SANTIAGO DEL ESTERO

Degano C, Catán A, Sarria C.
Fac. de Agronomía y Agroindustrias- UNSE. Avda Belgrano (s) 1912. 4200 Sgo del Estero. E-mail: alecatan@unse.edu.ar

With the objective of cultivating subtropical pastures and consolidating their development for pasturing, a test of suitable mineral fertilization was developed in two pastures: *Panicum maximum* and *Cenchrus ciliaris*. The treatments were: T1: control, T2: NPK, T3: Diamonic phosphate, T4: NPK-urea, T5: Diamonic phosphate-urea, T6: NPK-ammonium sulphonitrate and T7: Diamonic phosphate-ammonium sulphonitrate. The design was composed of random blocks with 3 repetitions for each pasture. Broadcast sowing was carried out in the second week of September in $10m^2$ plots after irrigation. Data sampling was performed in 3-month plants within a 25 cm^2 frame in 3 plots in each block at random. A cut at a fist's height from the ground was made and the green matter was placed in bags. Fresh weight (Fw) was registered and after 10 days of stove at 60ºC dry weight (Dw) was recorded. The amount of dry matter present in each sample of the pastures was calculated according to the formula %DM (dry matter) = (Fw-Dw) /Fw*100. No significant statistical differences were observed between the pastures assayed with the proposed treatments. We concluded that in conditions of semi-dryness fertilization for the implantation of subtropical pastures is not a determining factor when irrigation is available.

167.

BIRD COMMUNITY IN THE QUIRQUINCHO WETLANDS (SALTA, ARGENTINA)

Echevarria AL, Marano CF.
Fundación Miguel Lillo, Miguel Lillo 251, T4000JFE, Tucumán. E-mail: adaechevarria@yahoo.com.ar

The wetlands are areas with complex and dynamic patterns resulting from marked dry and humid periods. The Quirquincho wetlands, which cover a 50,000 ha surface, are lowlands of the Dorado, Del Valle and Bermejito rivers. They are at 24°20'S 63°20'W and belong to the Chaco Seco Ecoregion. The bird community was studied throughout the dry and flood periods in 2006 and 2007, analyzing its composition and variation, to detect resident and migrant species. Censuses were made by transects and fixed points and species, number of individuals and habitats used were recorded. Eighty-five species belonging to 36 families were identified. Diversity values are elevated during flood periods. Species with high relative abundance, importance and frequency values are: *Callonetta leucophrys, Myiopsitta monachus, Zenaida auriculata, Ardea alba, Phimosus infuscatus, Vanellus chilensis, Aramus guarauna* and *Columba picazuro*. These wetlands are important for: a) resting and feeding of migrant species, b) water bird species and c) as nestling sites. These flood areas situated in a mostly dry ecoregion are a permanent source of water for bird species, which increases local biodiversity.

168.

HERMAPHRODITISM IN *ASTYANAX RUTILUS* JENYNS 1842 (CHARACIFORMES, CHARACIDAE) FROM RIO HONDO RESERVOIR, SANTIAGO DEL ESTERO - TUCUMÁN, ARGENTINA

Cancino F, Alcaide de Pucci M, Pucci Alcaide F.
Fundación Miguel Lillo. E-mail: fabianacancino@yahoo.com.ar

The aim of this work was to analyze histologically and morphologically hermaphroditic gonads for their cellular-tissular description. The gonads were processed by routine procedures and stained with Hematoxilin-Eosin (H-E), Masson's trichrome, Toluidin Blue at pH 5.6 (TB). The ovary and the testicle are separated by a thin layer of connective tissue, follicular epitelium and zones with vascular-nerve packages. The ovaries present oocytes at different stages of maturation, especially vitellogenesis. The testicles are arranged in masses located in the ovarian structure or arranged peripherally, with cysts of different sizes and gonadal maturation stages. In addition, acidophilous Sertoli's cells and Leydig's cells are visible in the interstitial zone. *Astyanax rutilus* are structurally and functionally hermaphrodites. We considered that this alteration arises as an adaptive answer to adverse environmental conditions such as the presence of pollutants, which abund in the Rio Hondo Reservoir.

169.

OOGENESIS IN *BAEACRIS PUNCTULATUS* (THUNBERG) (ORTHOPTERA, ACRIDIDAE)

Michel AA.
Instituto de Morfología Animal, Fundación Miguel Lillo, Miguel Lillo 251, 4000 San Miguel de Tucumán, Argentina. E-mail: adrianaazucenamichel@hotmail.com

During the life of an insect, ovaries suffer changes characterized by morphological and physiological cell alterations. Studies of gametogenesis in Acrididae are rare in South America. The objective of this study is to analyze oogenesis during the life cycle of Acrididae and determine states in the development and maturation of female gametes. Captured females were fixed in Bouin and preserved in n-butyl alcohol. They were stained with Hematoxylin-Eosin and Mallory's trichrome. The ovaries differentiate in the embryonic stage X, the germarium with oogonia in mitosis being identifiable at this time. Oogonial meiosis begins before the hatching of the nymphs. Primary oocytes pass through three growing stages. The first one takes place between embryonic stage XI and nymph stage II, from preleptonema to pachynema. During the second period, between nymph stage II and five days of the adult stage, the vitellarium with oocytes in postpachynema and stages of previtellogenesis of the diplonema are distinguished. The third period, between five and fifteen days of the adult stage, starts with three vitellogenesis stages and ends with the synthesis of external covers and cortical granules. The first ovulations occur between fifteen and twenty five days, when sexual maturation is reached. These results will be useful in applying methods for species control.

170.

COMPARATIVE STUDY BETWEEN SIMVASTATIN & DISODIC PAMIDRONATE IN CRITICAL SIZE DEFECT

Territoriale E, Kozuszko S, Juárez J, Borkosky S, Missana L.
Lab. Experimental Path. Lab. Oral Path. Dept. Dental School. Tucumán University & CONICET.

The aim of this study was to evaluate the influence of disodium pamidronate (DPM) and simvastatin (Sv) treatments on critical size defect (CZD) in rat calvaria. Forty-five Sprague Dawley female rats (150 ± 20 gr) received surgical CZD. The animals were divided into Experimental group 1 (EG1), injected with DPM (3mg/kg single dose), Experimental Group 2 (EG2), which received an oral daily Sv dose (10 mg/kg/d) for 6 weeks and a control group (CG) that did not receive any treatment. Animals were sacrificed at 7, 21 and 42 d. Samples were processed in a routine manner for histological and morphometrical studies. GE1 showed collagenization, mineralized areas and scarce bone formation (1.88%, 4.25%, 3%). GE2 showed similar results, but bone formation was 1.20%, 11.46 % and 10.17 %). In the CG bone formation was 0.34%, 3 % and 3.5%. Statistical analyses were performed by the Kruskal-Wallis test. EG1 and GC showed no bone formation (p>0.05). Bone formation showed a statistically significant difference between EG2 and CG at 3 weeks (p=0.025). EG2 demonstrated statistically significant (p=0.045) bone formation at 3 and 6 weeks in contrast to GE1. In conclusion, both drugs scarcely improve bone formation, although Sv showed much better results.

171.

MORPHOLOGICAL CHANGES IN THE FUNDIC REGION OF THE STOMACH IN HORSE FOETUS AT DIFFERENT DEVELOPMENTAL STAGES

Dauria P, Castagnino R, Mac Loughlin V, Sona L, Bonino F.
Histología, Dpto. de Anatomía Animal, FAV-UNRC. (5800) Río Cuarto, Cba. E-mail: pdauria@ayv.unrc.edu.ar

The objective of the present work is to determine the structural changes of the fundic region of the stomach of a horse foetus at different gestation periods. Foetuses belonging to different developmental stages were used. The samples were fixed in phormol buffer and processed using conventional techniques. The fundic region presents an epithelium that changes from a stratified to a simple cylindrical coat, outline of gastric crypts and bigger development. The submucosae chorion has lax to dense connective tissue; a muscle coat first in a single direction and then in two; a serose cover without particularities. We concluded that, at the early stages of development, certain morphological components are present in a transitory way while others have scarce development or are absent. At more advanced periods, certain structures acquire a definite profile and others show a more marked development in agreement with the maturity of the individual. Morphological changes were observed among individuals belonging to the same period.

172.

RESULTS OF TRICHINELLOSIS EPIDEMIOLOGICAL SURVEILLANCE IN CATAMARCA

Malandrini JB, Soria CC, Molina V, Acosta MA, Pizarro MC.
Facultad de Ciencias de la Salud. UNCa - Malbrán- ANLIS. E-mail: brunomalandrini@yahoo.com.ar

The general objective of the project was to increase knowledge of trichinellosis prevention and control, reduce losses and improve the health of the population by reducing the number of cases and providing greater consumer safety.
The existence of anti-*Trichinella spiralis* excretory-secretory antibodies was determined in the collected serums by solid phase ELISA lgG technique. Results were treated according to the ELISA/herd procedure.
All pigs with Optical Density values equal to or higher than 0.117 were considered suspected of carrying larvae. The ELISA positive serums were examined with the Western Blot technique (100% specificity). Positive animals were sacrificed and an artificial digestion was practised to confirm their condition.
The results obtained show the serological distribution of the pigs. Three hundred and forty pigs were examined, 226 of which were negative, 108 indeterminate (9 were higher than the 300 cut off) and 10 positive to ELISA. Six of them were confirmed positive with WB. The percentage of pigs per owner is 3.61%; 64.47% of them were negative, 31.76% indeterminate and 1.76% positive.
The suspected animals were bled every three months. We also determined that 44.68% of the places are trichinellosis free and 55.32% are high risk places for human health.
These data show that Catamarca is an endemic high risk province for the disease. The results indicate that the ELISA test using excretory-secretory antigen (ESA) is a very useful tool for the epidemiological surveillance of pigs, enabling the rapid elimination of positive animals from the herd.

173.
METABOLIC SYNDROME SCREENING IN A YOUNG POPULATION OF LA RIOJA

Corzo C, Mercado ME, Pérez Aguilar RC, Montanaro SB, Velarde MS.
Análisis Clínicos. Cs. Exactas, Físicas y Naturales. UNLaR. E-mail: mvelarde@hotmail.com

The metabolic syndrome (MS), defined by the presence of risk factors that include central obesity, high blood pressure, elevated triglycerides (TG), decreased HDL-c and altered glucose tolerance, plays an important role in the genesis of cardiovascular disease and type 2 diabetes.
Risk factors associated with MS were studied in teenagers attending the San Martin School in La Rioja, Argentina. Diagnosis was established according to WHO criteria. Medical history, weight, body mass index, blood pressure, fasting glucose, cholesterol (C), HDL-c, LDL-c, TG and Fibrinogen were analysed.
In the women 7.4% had overweight (26.75 ± 0.96 kg/m2) and high systolic pressure (130 ± 0.01mmHg). C (228.0 ± 21.3 mg/dl), LDL-c (151.75 ± 20.71 mg/dl) and TG (237.0 ± 33.9 mg/dl) were increased in the female population. 40.7% of the women showed decreased HDL-c (41.9 ± 5.0 mg / dl) values. In the male population 12.5% were overweight (31.7 ± 5.5 kg/m2) and two were obese > 30kg/m2. High systolic pressure (135. 0 ± 7.1 mmHg) and increased C (223.0 ± 0.01 mg/dl), LDL-c (148.5 ± 9.2 mg/dl) and TG (242.5 ± 26.2 mg/dl) were found in the men. Significantly, 100% of them had decreased HDL-c (40.7 ± 4.3 mg/dl). Fibrinogen values were within the normal range in both women and men.
These results showed alterations in clinical and biochemical parameters that, according to ATP III guidelines, defined MS in 18.6% of our students.

174.
LIPIDIC PROFILE AND CONTRACEPTIVES IN A POPULATION OF DENTAL SCHOOL STUDENTS

Torres P, Coromina E, Cardinale M, Olmos Fassi J.
Cátedra Fisiología. Facultad Odontología, UNT. Av. Benjamín Aráoz 800. (4000) S. M. Tucumán. E-mail: plifet@yahoo.com.ar

Many epidemiological studies evaluated the association between the use of oral contraceptives and seric lipids. In out study total population (TP) included 75 women with an average age of 21 yrs old. Total cholesterol (TC), triglycerids (TG) and HDL-Cholesterol (HDL-Co) were determined. Values of LDL-Cholesterol (LDL-Co) were also calculated. The statistical Fisher's test was applied. 17% (13) of the women assayed used oral contraceptives. 28% (21) of the TP had altered HDL-Co values while 4% (3) showed the same proportion of altered CT and TG values. 3% (2) showed altered LDL-Co values. With respect to TC, 5% (3) women who did not use oral contraceptives and none of those who did had this lipid value altered; no significant evidence of association existed ($p \geq 0.99$). HDL-Co values were altered in 31% (19) women who did not take contraceptives and in 15% (2) who did, with no significant evidence of association ($p=0.329$). LDL-Co values were altered in only 3% (2) of the women who did not take contraceptives and there was no possible association between consumption and non consumption ($p \geq 0.99$). 3% (2) women who did not take contraceptives and 8% (1) who did showed altered TG values, although with no statistical association ($p=0.439$). In the population studied dyslipemia would not be associated with the use of oral contraceptives.

175.
DIAGNOSING PREVIOUS KNOWLEDGE OF BIOLOGICAL CHEMISTRY IN STUDENTS OF PHYSIOLOGY IN DENTAL SCHOOL

Erimbaue M[1], Bottcher S[1], Coromina E[1], Cardinale M[1], Schallmach J[2].
[1]Cátedra de Fisiología. [2]Cátedra de Química Biológica. Facultad de Odontología. U.N.T. Av. Benjamín Aráoz 800. (4000) San Miguel de Tucumán. E-mail: martaerimbaue@hotmail.com

Physiology requires a previous knowledge of Biological Chemistry, which is critical for understanding physiological processes. Knowledge of Calcium and Phosphorus, Fluorine, and Saliva was assessed in 103 students who were administered a form with 21 questions. Two categories were established: > 60% correct answers (Satisfactory) and < 60% (Unsatisfactory). Fisher's exact test was used. The results revealed that 92% were ready to take the Biological Chemistry course. Out of these, 77% took the exam and 86% out of them passed it. Only 38% of the population had satisfactory results. The knowledge of Saliva, Calcium and Phosphorus, and Fluorine was satisfactory in 66%, 42%, and 41%, respectively. Forty percent, 50%, and 50% of failing and 49%, 46%, and 79% of passing students performed satisfactorily in Calcium and Phosphorus, Fluorine, and Saliva, respectively. Overall performance showed no significant differences between satisfactory students who passed and those who failed Chemistry ($p > 0.99$). Prior knowledge was demonstrated in 38% of the population.

176.
OPINION OF FIRST YEAR MEDICAL STUDENTS CONCERNING THE FACTORS THAT AFFECT THEIR ACADEMIC PERFORMANCE

Ezquer M, Dantur A, Didziulis A, Rojo HP.
Facultad de Medicina, Universidad Nacional de Tucumán. Argentina. E-mail: heberojo@gmail.com

Multiple factors affect the performance of first year students, the capacity to adapt to university life being among the major ones. Choosing Medicine as a career means for many separation from their family. The objective of this study is to determine the opinion of first year students (2007) concerning: 1) The importance of living with or without their family in order to adapt to university life and 2) The negative factors that affect their academic performance. The data was obtained through a structured and anonymous survey (n=215). 73% of those who live with their family think that this is positive for their adaptation. Among those who live away from home, 40% think this is a negative aspect. The negative factors most frequently chosen among those that affect academic performance are lack of time (among those living at home) and separation from family (among those living away). Nevertheless, separation seems to generate greater commitment and dedication to studying, since fewer failures were observed among students who live away from home.

177.
RESULTS OF SHARED LEARNING PROCESS: EACH STUDENT'S PERCEPTION

Blanca SR, Santillán MR.
Fac. de Medicina; Fac. de Cs. Ecónomicas, UNT. Av. Roca 1900. San Miguel de Tucumán. E-mail: ruthblanca@arnet.com.ar ; mrsantillan@herrera.unt.edu.ar

Introduction: Physiology in Medical School of the National University of Tucumán is taught to Medical and Biomedical Engineering students. Multidisciplinary learning opportunities train students to solve everyday problems in the field of health.
Objectives: to compare to what extent these students profit from shared learning and feel satisfied about it.
Materials and Methods: an opinion survey was handed out to students of both careers towards the end of the subject. The relationship among the students, the learning process and the students' achievements were taken into account.
Results: 92% of the Biomedical Engineering students had a satisfactory experience and 100% of them took full advantage of the subject. On the other hand, 80% of the Medicine students were satisfied and 22% of them did not profit from this experience. Engineering students value fluid communication and integration with their partners; Medical students appreciate defending their ideas. Regarding the learning process, Engineering students showed difficulties while Medical students felt highly motivated to learn. With respect to their achievement, they valued this interdisciplinary experience and modified their stereotypes concerning the role of other professions.
Conclusions: we observed students' differences as regards their knowledge of the subject; the importance they gave to professional competence and to this interdisciplinary experience. Thus, a multidisciplinary approach will help students to become polyvalent, ready for team work and motivated to learn and cooperate.

178.
BIOLOGICAL ACTIVITY OF *LIPPIA JUNELLIANA*, *BACHARIS SALICIFOLIUS* AND *TESSARIA ABSINTHIOIDES* ON *TRITICUM AESTIVUM*

Chain F[2], Fortuna AM[1], Trimarco J[1], Riscala E[1].
[1]Facultad de Agronomía y Zootecnia, UNT.
E-mail: fortuna@unt.edu.ar

This paper discusses the biological activity of chloroform extracts (CE) of *L. junelliana*, *B. salicifolius,* and *T. absinthioides* on wheat seeds at different concentrations (250, 500, and 1000 μg.mg^{-1}). Germination percentage (GP), root and hypocotyl lengths (RL, HL), and dry weight (DW) were assessed. Petri dishes with 25 seeds were used and placed on sterilized soft agar at 25º C for 96 h. The results were analyzed with one factor ANOVA and relative variation rate (RVR). *T. absinthioides* GP decreased 21.05 and 24.21% at 500 and 1000 μg.mg^{-1}, respectively; RL and HL decreased 47.02 and 30.06% at 500 μg.mg^{-1}, respectively. HL and RL decreased 24.82 and 37.17% at 1000 μg.mg^{-1}, respectively. *B. salicifolius*: GP decreased 37.90 and 22.10% at 250 and 1000 μg.mg^{-1}, respectively; HL showed differences compared to controls; RL decreased 24.69 and 33.55% at 250 and 1000 μg.mg^{-1}; DW showed lower reserve transference for the root at increasing extract concentrations. *L. junelliana*: GP decreased 23.16, 42.10, and 93.68% at 250, 500 and 1000 μg.mg^{-1}; RL decreased 22.01% at 250 μg.mg^{-1}; HL decreased 70.20% at 500 μg.mg^{-1}. The *L. junelliana* extract strongly affected the number of germinated seeds and plantlet development.

179.
SIDEROXYLIN BIOACTIVITY ON MONO AND DICOTYLEDONOUS PLANTS

Tracanna MI[1], González AM[1], Poch M[1], Chain F[2], Fortuna AM[1,2], Benavente A[1].
[1]Fac. de Bioq., Qca y Farmacia. UNT; [2]Fac. de Agronomía y Zootecnia. UNT. E-mail: inestracanna@yahoo.com.ar

Sideroxylin bioactivity (4',5 dihidroxi-7 metoxi-6,8 dimetilflavone) isolated from *Miconia ioneura* was studied on one monocotyledonous and two dicotyledonous species. Petri dishes with 25 seeds of each species were placed on sterilized soft agar. Different sideroxylin concentrations (20, 40, 100, and 200 μg.g^{-1}) and controls were performed in triplicate. Agar methanol:water (1:1) was used as control. Germination percentage (GP), weight (W), and root and hypocotyl length (RL, HL) were assessed. ANOVA for one factor and relative variation rate (RVR) were used to analyze the results. Inhibition was considered significant from 20% onward. **Wheat:** RVR yielded no significant decrease for GP; W, HL and RL increased significantly at all concentrations. **Radish:** PG showed inhibition at 200μg.g^{-1}; W, HL showed increments from 13% to 42%, while a small decrease was observed in RL. **Lettuce:** PG decreased at 20 μg.g^{-1}; W decreased at 40, 100, and 200μg.g^{-1}. There was a significant decrease in HL and RL. Sideroxylin showed a clearly different effect in wheat and lettuce. Dissimilar behavior was noted for radish. The compound displays a selective effect between mono and dicotyledonous. However, further studies are necessary to verify our results.

180.
EFFECT OF THE $CHCl_3$ AND MeOH EXTRACTS OF *IXORRHEA TSCHUDIANA* FENZL ON SOIL MICROBIAL ACTIVITY. A CALORIMETRIC ANALYSIS

Sesto Cabral ME, Sigstad EE.
Instituto de Química Orgánica, Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán, Ayacucho 471, CP T 4000 INI, Tucumán, Argentina, E-mail: lizzie@fbqf.unt.edu.ar

Ixorrhea tschudiana (Borraginaceae) is an endemic species in Tucumán, Argentina. The $CHCl_3$ and MeOH extracts from its aerial parts were incorporated into soil to assess their effect on microbial activity. Aliquots of loam soil (110g) were placed in pots (105 cm^3) contained in a plug. Water (25 ml) containing the extract was added to the pots to achieve extract concentrations of 2 x 0 (control), 2 x 100, 2 x 250 and 2 x 500 mg kg^{-1} and left at room temperature. After 2 months soil samples were analyzed for: organic matter (OM), pH, field capacity humidity (FCH), colony formation units (CFU g^{-1}) and calorimetrically to obtain the thermodynamic parameters. An isothermal calorimeter of the heat conduction type was used at 25ºC. The preliminary results indicate that the microbial activity of soil amended with 100 and 250 mg kg^{-1} of $CHCl_3$ and with 250 mg kg^{-1} of MeOH extracts of *I. tschudiana* is altered remaining still unclear if this modification is beneficial or detrimental for the soil.

181.

INTEGRAL REPORT OF THE BIOTA FROM RIO BERMEJO (SALTA, ARGENTINA): BIODIVERSITY AND CONSERVATION

Antelo C[1], Marigliano N[1], Romero F[1], Cancino F[1], Peralta M[1], Brusquetti F[1], Ramallo G[1], Ponssa L[1,2], Aguilera G[1,2], Bulacio E[1], Slanis A[1].

[1]Fundación Miguel Lillo. Tucumán, Argentina. [2]CONICET. Argentina. E-mail: claudiamantelo@yahoo.com.ar

In the upper Rio Bermejo basin, the ecosystems are deteriorated due to agricultural and oil exploitation, and are also endangered by projects of great environmental impact such as the building of hydroelectric dams. It is necessary to determine the resources involved by means of exhaustive inventories and monitories and to divulge that information to prevent future damage to ecosystems. The objective of this work is to provide an integral report of the biota in this basin and its marginal areas during the annual dry season. The sampling was carried out in Rio Grande, Tarija-Bermejo basin, from Madrejones to Ramos (San Martin Department, Salta, Argentina) during September, 2005. A total of 106 species of invertebrates and insects, 5 of nematode parasites, 27 of fishes, 5 of amphibians and reptilians, 118 of birds, 4 of mammals and 70 genus of vascular plants were record. The results revealed that the biodiversity is smaller than that registered for other areas of the subtropical montane forest (Yungas). In Madrejones, where the vegetation is relatively conserved, we found a great richness of species in all groups. This preliminary inventory constitutes the first necessary step to implement monitoring, protection and sustainable handling plans for this border area.

182.

EARTHWORMS AS INDICATORS OF SUSTAINABILITY IN PRODUCTIVE SYSTEMS OF TUCUMAN, ARGENTINA

Guillén SC, Vidal PJM, González M del C, Medina LF, Manzur J. Facultad de Agronomía y Zootecnia de Tucumán, UNT. Av. Roca 1900. San Miguel de Tucumán. CP 4000.

The main objectives of sustainable agriculture are the management and maintenance of resources and the production of goods and services. Tucumán has two fundamental activities for its economy: lemon and sugar cane. In these eco-systems the soil is one of the resources that have suffered an important alteration. Earthworms are closely related to soil health, so the objective of the present work is to study the their incorporation as variables within a set of indicators of sustainability in lemon and sugarcane crops, using the native forest as reference. The study was made in Famaillá in 2002 and 2007. Sample collection was carried out in transects; monoliths 0.25 cm X 0.25 cm and 30 cm deep were obtained. An alteration index with a 0 to 1 range was used (total alteration and absence). The results indicated significant differences, the native forest being the place where the highest density was found, followed, with low values, by sugar cane. In the lemon crops density was minimal. According to the alteration indices, for sugar cane a degree of *extreme* and *very important* alteration for the years 2002 and 2007 was registered. For lemon culture the index was *extreme* for both years. We concluded that earthworms can be included within a set of indicators for the evaluation of sustainability of the crops under consideration.

183.

EFFECT OF DIFFERENT MANAGEMENTS OF SUGARCANE STUBBLE ON THE ABUNDANCE OF ANNELIDA: OLIGOCHAETA

Bustos ME de, *Portocarrero R.*

INTA, EEA-Famaillá, Tucumán, Argentina. Ruta Provincial N° 301 Km. 32 (4132). E-mail: edebustos@correo.inta.gov.ar

This study aims at assessing the influence of different managements of sugarcane stubble on the abundance of *Annelida: Oligochaeta* in two plots of an Acuic Argiudoll soil from Tucumán. The treatments assessed were: 1) more than thirty years of burning practice, 2) three years of stubble conservation. The assessment was made before and after burning, according to the Tropical Soil Biology and Fertility method. The parameters considered were number of earthworms and weight per unit of volume.

Before burning, there were no significant differences between both treatments, but differences were observed between the depths assessed in each. After burning, significant differences between both treatments were identified for all depths and in both parameters, with the exception of the depth between 10 and 20 cm in the parameter gr/m^3. In the burned plot significant differences were observed before and after burning for the parameter ind./m^3 up to 20 cm deep. Only immediately after the fire did different sugarcane stubble managements in the soil modify edaphic factors influencing the abundance of *Annelida: Oligochaeta*. However, the abundance, expressed as individual/m3 and gr/m3, is recovered in one year.

184.

POTENTIAL PROBLEM WEEDS FOUND IN SOYBEAN-WHEAT CULTURES IN THE EAST OF TUCUMÁN (ARGENTINA)

Fernández de Aráoz D[1], De Marco N[2], Roncaglia R[2].

[1]Cát. Morfología Plantas Vasculares; [2]Cát. Botánica Especial. Fac. Agron. y Zoot. UNT. Av. Roca 1900 (4000). Tucumán. E-mail: deliciasfa@hotmail.com

In soybean fields with wheat rotation weeds are common despite preventive controls. When they reach a certain density, related to control resistance or tolerance, they are called "problem weeds". If they complete their life cycle in the crop they are "successful weeds" (De Marco, 2007). When they complete their cycle and their density increases, they are called "emergent importance weeds" (Roncaglia *et al*., 2005). De Marco *et al*. (2007) reported different successful species: *Amaranthus quitensis* (ataco), Sphaeralcea bonariensis (malva), *Talinum paniculaum* (carne gorda), *Leptochloa virgarata* (leptochloa) and *Bromus catharticus* (cebadilla criolla). The purpose of this work is to determine the percentage of plots in which potential problem weeds may appear in the field Los Aluxes, Cruz Alta Department, Tucumán. Plot species and percentages are: *Sphaeralcea bonarensis* (malva): 81% of the plots; *Amaranthus quitensis* (ataco): 38%; *Verbena bonarensis*: 19%; *Trichloris crinita*: 14%; *Heliotropium procumbens*: 14%; Portulaca oleracea: 14% and *Euphorbia postrata*: 9.5%. Results showed the existence of potential "problem weeds" in a large area of the soybean-wheat rotation crop in the East of Tucumán, pointing to the need for strict controls to lessen the contribution of crumbs to the seeds bank.

185.

COMPONENTS OF LEAF AREA AND DRY MATTER PRODUCTION IN NATIVE AND INTRODUCED WARM-SEASON PERENNIAL GRASSES IN RANGELANDS OF CENTRAL ARGENTINA

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur, 8000 Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

The objective of this research was to compare different components of leaf area production between the native, warm-season perennial grass *Pappophorum subbulbosum* and *Leymus cinereus*, cultivars 'Magnar' and 'Trailhead', 2 genotypes recently introduced in Argentina from the U.S.A. Studies were conducted in the Chacra Experimental de Patagones. Half of the plants were defoliated to 5 cm stubble while the other half remained undefoliated (control). Height, number of green and total (dead + green) leaves, leaf length of green blade + sheaths and leaf length of total (dead + green) blade + sheaths were periodically determined on individual tillers. Morphological and demographic variables were greater (p<0.05) in the native than in the introduced cultivars when results are expressed on a plant scale basis.

186.

INFLUENCE OF PHOTOSYNTHETIC ACTIVE RADIATION (PAR) AND ULTRAVIOLET (UV-B) ON FLAVONOID AND CHLOROPHYLL CONTENT DURING LEMON RIPENING

Interdonato R[1], Rosa M[2], Gallardo M[3], Hilal M[2], González JA[3], Prado FE[2].
[1]Becario de la ANPCyT-PICTO. [2]Cat. Fisiol. Veg., Fac. Cs. Naturales, M. Lillo 205. [3]Ins. Ecol., Fun. M. Lillo. M. Lillo 252. E-mail: roqueint@yahoo.com.ar

The increase in solar UV-B (280-320 nm) that reaches the earth severely affects plant metabolism. UV.B-induced changes including photosynthesis alteration and synthesis of secondary metabolites (flavonoids, hydroxycinnamic acids, phenols). In this study was analyzed the effect of PAR and UV-B radiation on flavonoids and chlorophyll content during the ripening of lemon fruits.
Assays were performed between April and May 2007 in the Finca San Pablo farm. Fruits were covered with Mylar (exclude UV-B) and cellulose diacetate (exclude UV-C) during the ripening period (42 days). Fruit controls were not covered.
Results showed highest flavonoid levels in the external face of sun-exposed lemons, whereas in shaded fruits there was no difference between both faces. In addition there was no difference in flavonoid content between both treatments. Chlorophyll content was not affected by either UV-B or UV-A radiation.

187.

MINERAL PROFILE OF MILK FROM DAIRY CATTLE AT DIFFERENT PHYSIOLOGICAL PERIODS

Roldán V, Luna M, Sola JM.
Fac. Cs. Veterinarias, UNL, Esperanza, Santa Fe. E-mail: vproldan@yahoo.com.ar

A descriptive comparative study of milk mineral profile was carried out with Holstein-Friesian cows at different physiological stages (gestation, pre-parturition, post-parturition and lactation) in two dairy fields of the Santa Fe center region. We worked with 30 3 to 4 year-old dairy cows in the Cuenca del Salado and Pilar areas from August 2005 to January 2006. Mineral levels in serum: calcium, magnesium, sodium, potassium, copper, zinc and iron were determined by atomic absorption spectroscophy. For data treatment the ANOVA statistical method was used. Mineral concentrations were within the normal range corresponding to species and physiological period. The values of Cu found when gestation coincided with winter differ significantly (p<0,05) from the ones found for the period of lactation corresponding to summer. This variation in Cu levels in the pasture might be season related. The significant differences found in pre-parturition and lactation calcium could be due to the removal of this macromineral during the lactation, provided that the milk contains an important calcium concentration. The serum values of iron and zinc also diminish along the physiological periods studied as a result of greater mineral requirements during maximum production in dairy cattle.

188.

RELATIVE GROWTH RATES OF WARM-SEASON NATIVE AND INTRODUCED PERENNIAL GRASS SPECIES IN RANGELANDS OF THE SOUTH OF THE PHYTOGEOGRAPHICAL PROVINCE OF THE MONTE

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4]
[1]Dpto. Agronomía, UNSur, 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

Relative growth rates (RGR) for several parameters were compared for the native species *Pappophorum subbulbosum* and 2 genotypes introduced from the U.S.A.: *Leymus cinereus* cultivars 'Magnar' and 'Trailhead'. This study was conducted in the Chacra Experimental de Patagones. Half of these plants were defoliated to 5 cm stubble height without removing apical meristems. The other half of the plants remained undefoliated (controls). Tiller height, green blade + sheath length, and total (green + dead) blade + sheath length were determined to calculate RGR. In general, there were few significant differences between treatments in the RGR for the variables studied. This would indicate that defoliated tillers reestablished the photosynthetic surface area after defoliation rapidly enough to compensate growth of undefoliated controls.

189.

MINERAL CONTENT ANALYSIS OF DAIRY CATTLE MILK IN THE CENTRAL REGION OF SANTA FE

Roldán V[1], Beldoménico H[2], Campagnoli D[2], Luna ML[1], Gasparotti ML[1].
[1]Fac. Cs. Veterinarias, UNL, Esperanza, Santa Fe. [2]Laboratorio Central Fac. Ingeniería Qca. UNL. E-mail: vproldan@yahoo.com.ar

The nutritional contribution of milk and milk products is due to their high mineral conctents. Considering the importance of minerals in nutrition, milk mineral content was studied 15 days post-parturition and advanced lactation. We worked with 15 milk samples of Holstein-Friesian cows, between 3 and 4 years of age of Cuenca del Salado and Pilar areas in Santa Fe central region during the months of October 2005 to February 2006. Minerals: Ca, Mg, Na, K; Fe, Zn were determined by atomic absorption spectroscopy. The ANOVA method for data treatment was applied. The average iron concentration in milk 15 days after post-parturition coincided with reference ranges in the literature but decreased after 60 days of lactation and was below the lower reference levels. Average zinc concentration of at the beginning and end of lactation presented significant differences (p<0.05) with reference values. Average Ca concentration diminished towards 60 days of lactation, significant differences being observed between the two lactation stages (p<0.05), starting with normal values in early lactation. Mg average values throughout the physiological period studied were below reference values, with significant differences (p<0.05). Decrease in Zn, Fe, Ca and Mg towards 60 days of the next lactation was close to maximum milk peaks.

190.

SPARTINA ALTERNIFLORA: ABOVEGROUND BIOMASS AND NUTRIENTS CONTRIBUTION IN A SALT MARSH FROM THE BAHIA BLANCA ESTUARY

Negrin V[1], de Villalobos A[2], Marcovecchio J[1,3,4]
[1]Instituto Argentino de Oceanografía (IADO-CONICET), B.Bca.; [2]Dpto.de Biología, Bioqca. y Farmacia (UNS); [3]UTN-FRBB; [4]Univ. FASTA. E-mail:vlnegrin@criba.edu.ar

Vegetation plays an important role in the cycling of nutrients in salt marshes, nutrient contribution greatly depending on its biomass production. The purpose of this work was to evaluate the production of aboveground biomass of *Spartina alterniflora* Loisel and its input of nitrogen and phosphorus to the system. The aboveground biomass was estimated in two zones in a salt marsh from the estuary: one occasionally flooded (OF) and another usually flooded (UF). The concentration of N and P in the tissues was also analyzed. The average aboveground accumulated biomass for the whole year was significantly greater in the OF (1496,1±51,8 g m^{-2}) than in the UF (351±15,4 g m^{-2}). The ratio live/dead was significantly greater for the UF; that would indicate a greater loss of dead tissues in the UF. No differences in N and P average concentrations in both sited were found for the whole year.These results suggest a major input of the nutrients to the salt marsh by OF, due to its greater biomass production.

191.

AVAILABLE PHOSPHORUS BELOW THE CANOPY OF WARM-SEASON NATIVE AND INTRODUCED PERENNIAL GRASSES IN RANGELANDS OF SOUTHWESTERN BUENOS AIRES

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur, 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

The objective of this study was to determine the soil available phosphorus concentration under the canopy of the native warm-season grass *Pappophorum subbulbosum* and under that of 2 warm-season perennial grasses recently introduced in Argentina from the U.S.A., *Leymus cinereus* cultivars 'Magnar' and 'Trailhead'. All 3 genotypes are palatable to domestic livestock and tolerate water stress. Studies were conducted in the Chacra Experimental de Patagones. Plants were obtained from seeds and then established in experimental plots. Half of the plants were defoliated to 5 cm stubble height while the other half remained undefoliated (control). Apical meristems were not removed by the defoliation treatment. Results suggest that all 3 genotypes present similar palatability characteristics if these are related to soil phosphorus concentrations under their canopies.

192.

ABOVEGROUND BIOMASS IN WARM-SEASON NATIVE NATURALIZED AND INTRODUCED PERENNIAL GRASSES IN RANGELANDS OF CENTRAL ARGENTINA

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur, 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

The rangelands of central Argentina are characterized by the scarcity of warm-season native perennial grasses palatable to domestic livestock. Because of this, 2 cultivars of palatable, water stress resistant, warm-season *Leymus cinereus* were recently introduced from the United Status The objective of this study was to compare forage production of the native warm-season *Pappophorum subbulbosum* with that of *L. cinereus*, cv. 'Magnar' and 'Trailhead'. Studies were conducted under rainfed conditions in the Chacra Experimental de Patagones. A defoliation treatment was applied to half of the plants to 5 cm stubble without removing the apical meristem. The remaining plants were used as undefoliated controls. Dry matter production of controls was exactly compensated by the defoliated plants.

193.

MOLECULAR GENETIC DIVERSITY IN NATIVE FRAGMENTED POPULATIONS OF *CEDRELA LILLOI* FROM THE NORTHWEST OF ARGENTINE

Inza V, Zelener N, Fornes L, Hernández M, Gallo L.
IRB, INTA Castelar – CNIA. Las Cabañas y De los Reseros s.n. Villa Udaondo (1712) Castelar, Bs. As., Argentina. E-mail: vinza@cnia.inta.gov.ar

The explotation of the subtropical montane forest (Yungas) in the Northwest of Argentina, along with the deforestation of the lands for agricultural use has generated forest fragmentation. The genetic diversity is at risk, particularly for the most valuable tree exploited, *Cedrela lilloi* (Meliaceae). The objective of this research is to characterize the genetic variability of this species to identify possible units of germplasm conservation as a potential source of variability for long term breeding and conservation programs. Seventy- two individuals from 7 populations were evaluated with Amplified Fragment Length Polymorphisms (AFLPs). We also tested the cross amplification of microsatellites (SSRs) developed in *C. fissilis, C. odorata, Swietenia humilis* and *S. Macrophylla* (Meliaceae). Two pairs of AFLP primers (*Eco*RI/*Mse*I) generated a total of 52 polymorphic bands with percentages of 29 and 32 polymorphic *loci*. The cluster analysis (UPGMA) showed 2 groups with a similarity coefficient of 0.25 (r= 0.96). Within groups the level of genetic similarity was relatively high ($\geq$ 0.62). Six out of the 36 SSRs screened showed polymorphism. These preliminary results exhibit low polymorphism levels for this species. The extension of the sampling data would enable the assessment of greater genetic diversity levels.

194.

ARTICULATING PHYSIOLOGY WITH CLINIC

Ashworth G, Bianco M, Navarro F, Trotti N, Iglesias R, Paisio C, Berardo D, Poloni L, Rodriguez N, Mayer N, Gauna H, Bertuzzi M.
FCsEF-QyN UNRC. Río Cuarto.

The proposal involves Animal Physiology and Clinic of Big Animals for Veterinary Medicine. Physiology has the role of integrating knowledge of the basic learning cycle, and Clinic that of the higher cycle. The objective was to promote integration between the contents of each cycle to reach a higher level of knowledge construction. The subjects addressed were: affections of respiratory system and gastrointestinal apparatus. It proposed clinical cases derived from the Clinic (etiology, pathogenesis, symptoms) and supported by Physiology (physiological mechanisms involved, alterations, homeostasis). These cases became the conductive thread of the articulation. This way gives a professional foundation to the basic and higher learning cycles. A discussion space arose on the curricular treatment of the subjects involved. Agreement was reached on the vocabulary and the meaning of certain terms, and bibliographical material in book format was elaborated in which Physiology explained the basisfor the clinical aspects of diagnosis and therapy of pathological cases while Clinic provided the context for thematic aspects of Physiology items.

195.

USE OF BIOLOGICAL INDICES FOR HABIT DISCRIMINATION IN *ASTYANAX* SPP. (BAIRD AND GIRARD, 1854) (PISCES, CHARACIFORMES) FROM THE RÍO HONDO RESERVOIR, SANTIAGO DEL ESTERO - TUCUMAN, ARGENTINA

Cancino F[1], Benitez de Parra L[2]
[1]Fundación Miguel Lillo; [2]Fac. de Cs. Naturales e I. M. Lillo. E-mail: fabianacancino@yahoo.com.ar; lidiabenitez@hotmail.com

The comparison of the habits of three species of *Astyanax (A. abramis, A. asuncionensis and A. rutilus*) was made to establish the habits that characterize them. These species are simpatric and sintopic. For each individual the following items were determined: standard length, bodyl weight, gonad weight, stomach weight and liver weight. The biological indices calculated were: gonadosomatic index, condition index, repletion index and liver-somatic index. In order to differentiate the three species a discriminante analysis by means of the "stepwise" method was used. This analysis showed that the three species were significantly different ($p< 0.01$). The variables that showed these differences better were: index of condition, index of repletion, standard length, gonadosomatic index and body weight. The high productivity of the environment allows the coexistence in the dam of the 3 *Astyanax* species. The condition index showed that all of them use the available resources satisfactorily.

196.

CONCEPTUAL CHANGE IN STUDENTS TAKING THE OPTIONAL COURSE ON MATERNAL LACTATION - 2006

Aguirre S, D' Urso M, Rojo HP.
Facultad de Medicina, Universidad Nacional de Tucumán. Argentina. Av. Roca 1900. E-mail: saguirret@arnet.com.ar

The objective of this project was: 1- to determine the previous ideas of the students who took the Maternal Lactation course in April-March of 2006 on different aspects of daily life in relation to maternal lactation and 2- to determine whether the module permitted the students to correct misconceptions and acquire knowledge of the subject. The data was obtained through two anonymous surveys given to the students. one at the beginning of the module and the other at the end. A descriptive, cross sectional analysis was made. As a parameter of conceptual change, the difference between the correct answers of all the students in the first and second survey was studied. The results revealed that most students possess previous knowledge concerning lactation. In all of the questions of the last survey, the percentage of correct answers was greater than in the first. The development of the module permitted the acquisition of correct concepts concerning different aspects of lactation by most students.

197.

PHENOLOGY OF WARM-SEASON FORAGE GENOTYPES IN RANGELANDS OF SOUTHWESTERN BUENOS AIRES

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur¸ 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

This study shows a detailed phenological analysis of the most abundant, native, palatable warm-season perennial grass in southwestern Buenos Aires, *Pappophorum subbulbosum*, and of 2 palatable perennial grasses, *Leymus cinereus* cultivars 'Magnar' and 'Trailhead', recently introduced from the U.S.A. Studies were conducted at the field in the Chacra Experimental de Patagones. Half of the plants were defoliated to 5 cm stubble height (apical meristems were not removed). The other half of the plants remained undefoliated (control). Rainfall can be a major factor in determining phonological stages in the study region. Native species appear adapted to synchronize their phenology to rainfall availability. Since it can be extremely variable in the study semiarid region, *P. subbulbosum* initiates reproductive development early enough as to guarantee their survival in the plant community.

198.

BIRDS OF THE RIO HONDO RESERVOIR, SANTIAGO DEL ESTERO - TUCUMAN

Marano CF, Echevarria AL, Chani JM.
CONICET - Fundación Miguel Lillo, Miguel Lillo 251, 4000, Tucumán. E-mail: clau_marano@yahoo.com.ar

Little is known about the biodiversity, productivity and present situation of the wetlands of the southern hemisphere, which points to the need for studying these environments to value them suitably. We studied the bird community of the Rio Hondo Reservoir (27º30'S and 65º00' W) in 2006 and 2007, analyzing species composition, structure and seasonal variation, in order to detect resident, nesting and migratory species. Census of points of variable radius of 30 min duration and embarked census were made, recording species, abundance and habitat use. 169 species belonging to 48 families were identified (37.8% were migrants). Species with elevated values of relative abundance and importance were: *Himantopus melanurus, Plegadis chihi, Phalacrocorax brasilianus, Fulica leucoptera, Dendrocygna bicolor, Chroicochephalus cirrochephalus* and *Ardea alba.* Frequency showed a variable pattern; species with values between 75 and 40% were *P. brasilianus, A. alba, A. cocoi, Vanellus chilensis, Podicephorus major, Tachicineta leucorrhoa, C. cirrochephalus, H. melanurus* and *Egretta thula.* Due to their displacement capacity, birds constitute a very important group in the colonization of new environments, representing a natural resource of great intrinsic and ecological value.

199.

TINIDAZOLE SOLUBILITY FROM DIELECTRIC AND STRUCTURAL PROPERTIES

Yurquina A, Manzur ME, Ferretti H, Molina MAA.
Cátedra: Química General. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471. 4000-San Miguel de Tucumán. E-mail: ayurquina@fbqf.unt.edu.ar

The experimental model studied was Tinidazole (T) since it possesses antibacterial activity and therapeutic efficacy against anaerobic microorganisms. According to Hildebrand´s theory, a solute is better dissolved in a solvent if both present similar solubility parameters (δ). Since $\delta_{Acetone}$ is 10,00H* and $\delta_{PEG\ 400}$ 10.6H, they must be good solvents of Tinidazole. This magnitude, δ_T= 10,59H, and the respective dipole moment, μ_T= 8,65D**, show the polarity of Tinidazole.
Sets of diluted slutions of T-solvent were prepared and their permitivities were determined in a WTW DM01 model Dipolomete; densities were measured with an Anton Paar DM58 model digital Densimeter previously calibrated at 25ºC.
Although acetone proved to be a good solvent, its pharmaceutical use is not adequate while, from the analysis of the solubility behaviour of Tinidazole in aqueous solutions with high concentration of PEG 400, it can be confirmed that the polymer could be used for therapeutic purposes.
* H: Hildebrand, solubility parameter unity.
** D: Debye, dipole moment unity.

200.

LEVEL OF SATISFACTION OF STUDENTS WHO ATTENDED THE COURSE ON LACTATION- 2007

Aguirre S, Aguirre L, Rojas S, Rojo HP.
Facultad de Medicina, Universidad Nacional de Tucumán. Argentina. E-mail: heberojo@gmail.com

The objective of this study was to assess the efficiency of the optional course on lactation by means of the level of satisfaction of students who attended it. The data was gathered through an anonymous and structured survey. (A) The satisfaction of each student with all the activities as a group and (B) the satisfaction of the student group with each activity were determined. For (A) a global satisfaction index was defined (GSI). The GSI obtained were put together in three corresponding groups: 0-0.32 (little satisfied); 0.33-0.65 (fairly satisfied) and 0.66-1 (very satisfied). For (B) a satisfaction index per activity was defined (ASI). 123 surveys were analyzed. The minimum and maximum GSI were 0.4 and 1. respectively. 90% of the students belonged to the very satisfied group. The ASI values are encompassed between 0.72 and 0.89. The topic triggered great interest and commitment among the medical students. The activity most valued by the students was the analysis and discussion of clinical cases, perhapas because of their close relation to medical practice.

201.

EFFECTS OF SOY MILK ON BRAIN AGING

Albarracín AL, Fontenla R, Pintos S, Cena AM, Orqueda D, Palladini L, Fajre L, Prchal A, F. de Petrino S.
Cátedras de Biología y Neurociencia, Facultad de Medicina, UNT.

We studied the antioxidative effects of soymilk as a complement standard feeding on age related structural changes and neuronal nitric oxide expression and activity. Male Wistar rats were randomly assigned to two diets from weaning: A) balanced food and water (control, N=6); B) balanced food and soymilk (experimental, N=6). At 3 and 15 months animals were intracardially perfused under general anaesthesia and prepared for routine histological analysis or histochemical analysis (NADPH diaphorase). Basal counts of hippocampal neurons at 3 months were 80.27$\pm$ 3.7 neur/field 40x. Fifteen month old experimental rats showed diminished rates of hippocampal neuronal loss (67.78$\pm$ 3.1 neur/field 40x) as compared to controls (57.94$\pm$2.9 neur/field 40x). The NADPH diaphorase reactive cell distribution pattern was similar at 3 and 15 months. However, the number of NADPH diaphorase reactive cells was significantly lower in experimental animals (ANOVA, $p<0.05$). These results could indicate that the antioxidative action of soy decreases neuronal nitric oxide expression and reactivity, diminishing age related neuronal loss.

202.

LARVAL MORPHOLOGY AND BIOLOGYCAL CYCLE OF *Leucochrysa (Leucochrysa) boxi* (NEUROPTERA: CHRYSOPIDAE)

Reguilón C, Medina Pereyra M. del P, Uzqueda GA.
Fundación Miguel Lillo. Miguel Lillo 251. 4000 Tucumán. Tel-Fax: 4346940. E.mail: c_reguilon@yahoo.com.ar

The *Leucochrysa* Mac Lachlan, 1868 genus (Neuroptera: Chrysopidae) is present in the American continent in the Neotropical region extending until the south of the USA, with almost 200 described species. It includes two subgenera: *Leucochrysa* s. str. and *Nodita* Navás, 1916, both well represented in Argentina. The knowledge of the immature stages of the species of both subgenera is scarcel. The objective of this work is to describe the larval morphology of *Leucochrysa (Leucochrysa) boxi* Navás, 1930, not know until now, with data about its biology. The material was collected from different sities of the subtropical montane forest (Yungas) (500-700 m) in Tucuman, associated with natural vegetation. The rearing in laboratory of the immature stages and adults was carried out in plastic boxes using eggs of *Sitotroga cerealella* (Lepidoptera: Gelechiidae) and an artificial diet as food. For descriptions of the preimaginal material, the works of Tauber *et al.* (1998) and Reguilon *et al.* (in press) were considered. The morphological external characteristics of the immature stages of *Leucochrysa (L.) boxi* are described and illustrated. A key for discrimination of the larvae instars and a picture about setation are included.

203.

IDENTIFICATION OF GLYCOCONJUGATES BY THE LECTINHISTOCHEMISTRY TECHNIQUE OF THE STOMACH OF THE BULL FROG (*Rana catesbeiana)*

De la Cruz J,Navarro O, Daita JC, Tissera J, Castagnino R, Corteggiano F, Ledesma C.
Histologia-Zoología. FAV-UNRC. 5800 Río Cuarto.

Preliminary histological studies revealed that *Rana catesteiana* stomach has the basic structural pattern of the digestive tract of vertebrates. Little it is known about the chemical constituents of the large molecules of the epithelial cells. The objective of this work is to identify the presence of glycoconjugates in different stomach regions of the bull frog using lectinhistochemistry. Histological stomach samples were fixed in formalin buffer and processed with routine hstological techniques. The following lectins were used as markers: LCA biotinylated (glucose/mannose), DBA biotinylated (N-acetylgalactosamine/galactose) and UEA-I biotinylated (fucose). Developing was done with streptoavidin-peroxidase complex and diaminobenzidine. In the first portion of the stomach LCA had a positive reaction in mucoid component on the free surface and connective tissue cells could be seen. In the second part of the stomach marked acinar cells of the lamina propria and connective tissue cells. DBA marked acinar cells of boths regions. UEA–I in the first region had a positive reaction in mucoid component on the free surface and lamina propria acinar cells while in the second region goblet cells were also marked. We concluded that the reactivity of various structures to certain lectins varies in different regions of the bull frog stomach.

204.

MORPHOLOGICAL ASPECTS OF THE GASTRO-INTESTINAL TRACT OF THE BULL FROG (*Rana catesbeiana*)

De la Cruz J, Navarro O, Daita JC, Tissera J, Corteggiano F, Ledesma C.
Histología-Zoologia. FAV. UNRC. (5800) Río Cuarto.

The bull frog it is an amphibian that acquired relevance in the last few decades due to its products and sub products. The aim of this study was to provide a histological description of the gastrointestinal tract of the bull frog to be applied in the productive area. Adult specimens were collected in the region of Rio Tercero, Cordoba. Samples of stomach and intestinal tract were extracted and processed with routine histological techniques and stained with H/E and Masson's Trichrome. All the samples showed the following tunics: Mucosa, Submucose, Muscularis, Serosa. The first portion of the stomach shows a mucosa lined by a simple cylindrical epithelium, a chorion with glands and a muscularis mucosa; the submucose is made up of connective tissue. The muscular tunic is composed of an inner circular and an outer longitudinal layer. The serosa completed the organ wall. The second part of the stomach is composed of a pseudostratrified columnar ciliated epithelium with goblet cells. Below this, there is a chorion of connective tissue and glands. The rest of the organ is similar to the first portion. The intestinal tract has folds composed of a pseudostratified columnar epithelium with goblet cells with a submucose-chorion of connective tissue underneath. The muscular tunic is made up of smooth muscle. The serosa is thin.

205.

COMPARATIVE STUDY OF ARSENIC IN THE DRINKING WATER IN TWO DEPARTMENTS OF THE PROVINCE OF TUCUMAN

Sandoval NG, Valdivia M, Guber RS, Arias N, Tefaha L, Romero C, Toledo R, Martínez M, Soria de González A.
"LAPAM" Fac. Bioq., Qca. y Fcia. UNT, Tucumán. E-mail: gonzalez_stojan@uolsinectis.com.ar

The aim of this work was to compare the levels of Arsenic (As) in the drinking water in two departments of Tucumán, Leales (L) and Graneros (G). 57 samples of L and 49 samples from G water wells used for consumption were determined. 87.7% and 71.4% had As concentrations higher than 0.01 mg/L whereas 59.6% and 49% had concentrations higher than 0.05 mg/L for L and G, respectively. In the samples with concentrations higher than 0.01 mg/L, 68% and 8.6% came from wells up to 10 m deep for L and G, respectively. 30% and 71.4% came from wells between 11 and 20 m deep, whereas 2% and 20% were from wells over 20 m deep for L and G, respectively. In the case of samples from water wells with concentrations higher than 0.05 mg/L, 64.7% and 4.1% were taken out of wells as far as 10 m deep for L and G, respectively. 35.3% and 79.2% came from wells 11 to 20 m deep, whereas 0% and 16.7% came from wells over 20 m deep for L and G, respectively. Epidemiological and clinical studies will enable the early diagnosis of pathologies related to chronic As ingestion and strategies should be designed to diminish the risk.

206.

CHRONIC ARSENIC EXPOSURE AND HEPATIC ALTERATIONS IN INDIVIDUALS OF THE PROVINCE OF TUCUMÁN

Guber RS, Arias NN, Valdivia M, Sandoval N, Baca C, Tefaha L, Bellomio C, Monaco ML, Toledo R, Martínez M, Soria de González AG.
"LAPAM" Fac. Bioq., Qca. y Fcia. UNT, Tucumán. E-mail: gonzalez_stojan@uolsinectis.com.ar

The aim of this work was to investigate the relationship between the development of arsenic-induced hepatic lesions and levels of arsenic (As) in drinking water. 59 individuals were selected. An epidemic survey and a clinical examinationwere performed and blood samples were collected for the determination of hepatic enzymes in serum: Aspartate Aminotransferase (AST), Alanine Aminotransferase (ALT), Gamma-Glutamyl-Transpeptidase (GGT), Alkaline phosphatase (ALP) and Lactate Dehydrogenase (LDH). Cholesterol (C), AntiHBc, HBsAg and AntiHCV (Wiener Lab) were also determined. Individuals were divided into two groups. Group 1 included 18 people who drank drinking water containing As levels between 0.01 and 0.05 mg/L. Group 2 included 41 individuals who drank drinking water containing As levels higher than 0.05 mg/L. Hepatomegaly was observed in 38.9% and 41.5%of the subjects in Group 1 and Group 2, respectively. ALP activity was 11.1% and 7.3%; GGT, 16.7% and 17.1%; LDH, 5.5% and 7.3%; C, 38.9% and 19.5% of the individuals in groups 1 and 2, respectively. The results demonstrated that the population exposed to As in the drinking water presented high hepatomegaly percentages without significant alterations in hepatic enzymes.

207.

LIPIDIC PROFILE AND SMOKING IN STUDENTS

Coromina E, Cardinale M, Torres P, Olmos Fassi J.
Cat. de Fisiología FOUNT, Av B. Araoz 800, (4000) S M de Tucumán. E-mail: corominaestela@arnet.com.ar

Dyslipidemia is characterized by alterations in circulating lipid levels associated with various clinical manifestations. The environmental variables involved in lipid values include smoking, sedentary life-styles, and diet. This paper studies the association of the lipidic profile with smoking. One hundred and four Physiology students aged 19 to 26 (mean age 22.2 ± 0.8) with no metabolic alterations were recruited in 2006. Twelve-hour-fast blood samples were collected. Total concentration of serum cholesterol (TC), triglycerides (TG), and HDL levels were determined. Castelli's Index was also estimated. LDL concentration was calculated with Friedewald's Formula. The Fisher's Test and the non-paired t test were used for statistical analysis. The results showed that 6 males and 17 females were smokers. Mean TC, HDL, LDL, and TG values were 161.3 mg/dl ± 6.55 and 161.7 mg/dl ± 2.82; 53.5 mg/dl ± 1.14 and 46.6 mg/dl ± 1.49; 95.3 mg/dl ± 5.17 and 91.4 mg/dl ± 2.24; 90 mg/dl ± 0.9 and 90 mg/dl ± 0.5 for smokers and non-smokers, respectively. Castelli's Index mean value was 3.4 ± 0.17 and 3.2 ± 0.25 for smokers and non-smokers, respectively. Consequently, no significant correlation was found between smoking and altered lipidic profiles. However, preventive measures in the young population should be kept in mind.

208.

PSYCHOSOCIAL CHARACTERIZATION OF DENTISTRY STUDENTS IN THE NATIONAL UNIVERSITY OF TUCUMÁN

Bottcher S, Erimbaue M, Coromina E, Cardinale M.
Cátedra de Fisiología. Facultad de Odontología. U.N.T. Av. Benjamín Aráoz 800. (4000) San Miguel de Tucumán. E-mail: sabinabottcher@hotmail.com

Psychosocial factors may influence knowledge build-up. Thus, this paper studies some psychosocial aspects characterizing the students in the Physiology department in 2007. One hundred and three (103) students currently registered in the Physiology department were recruited. The questionnaire included age, sex, place of origin, entrance year, secondary school orientation, and parents' instruction and occupation. The results showed that the students' ages ranged between 19 and 30; 77% were women; 51% were from San Miguel de Tucumán, 13% from other cities in the province, and 25% form other provinces; 50% of the students have been studying for at least two years and the rest between 8 and 11 years; 41% of the students come from biology-oriented schools and 49% from other orientations; 19% of the students work; 49% of the mothers and 62% of the fathers are not university graduates. Consequently, students' characterization is critical when planning teaching strategies which encourage constructive learning. Therefore, further research is necessary since the multiplicity of factors may vary with the group under study.

209.

BENTHONIC INSECTS FAUNA OF A WATER STREAM OF THE YUNGAS OF CATAMARCA, ARGENTINA: CLASSIFICATION OF FUNCTIONAL TROPHIC GROUPS

Salas L[1], Grosso ML de[2].
[1]FACEN. U.N.Ca. [2]INSUE. UNT-CONICET.
E-mail: lilianasala17@hotmail.com.ar

Functional Trophic Groups (FTG) represent an ecological classification of macroinvertebrates taxa according to their roles in the trophic net and processing of food resources. "Los Pinos" stream begins in Concepción (Capayán-Catamarca) and crosses the southernmost sector of the subtropical montane forest (Yungas) of Argentina; marginal vegetation is composed mainly of *Podocarpus parlatorei*. Benthonic insect fauna is represented by 6 Orders, 30 families and 51 genera. The aim of this work was to classify insects according to the Functional Trophic Groups and to determine abundance, dominance and diversity. The sampling station is located at 1.020 m a.s.l. at 28º 37´15´´S and 66º 02´5´´W. Sampling was carried out during the "low water" station. Six samples from the center of the stream were captured with a "Surber" sampler of 900 cm^2 surface and 200 µm mesh opening and fixed *in situ* with alcohol 96%. Organisms were determined down to the genus level; FTG was assigned following Cummings *et al.* (2005). Five trophic categories were determined: "Filtering Collectors" (42.54%), "Gathering Collectors" (28.69%), "Shredders" (12.87%), "Predators" (10.62%), and "Scrapers" (5.27%*)*.The most varied FTG was "Gathering Collectors", with 16 taxa, 8 of them Diptera. The presence of 5 FTG shows the type of food availably in certain sites of the stream in different seasons. This is a first contribution to the knowledge of the abundance and systematic biodiversity of FTGs in the Yungas of Catamarca.

210.

HISTOCHEMICAL STUDY OF THE GASTROINTESTINAL TRACT OF THE BULL FROG (*Rana catesbeiana*)

De la Cruz J, Navarro O, Daita JC, Tissera J, Castagnino R, Corteggiano F, Ledesma C.
Histología-Zoologia. FAV. UNRC. (5800) Río Cuarto.

Although the gastrointestinal tract of the bull frog presents a structural pattern similar to the one in most vertebrates, little is known about the chemical composition of the large molecules which make it up. The objective of this study was to determine a basic histochemical study of the gastrointestinal tract of the bull frog. Samples of stomach and intestinal tract were fixed in formalin buffer, processed with routine histological techniques and stained using PAS/Hematoxylin and Alcian blue at pH 2.5 technique. In the first portion of the stomach, PAS/Hematoxylin showed strongly positive cells in the epithelium, and some cells in the chorion glands being weakly stained as well. With Alcian blue ph 2.5 there was a positive reaction in the surface mucus. In the second part of the stomach PAS/Hematoxylin revealed some strongly positive goblet cells. Chorion glands presented positive and negative cells. Alcian blue strongly stained epitelial cells and surface mucus. Chorion glands presented a negative reaction. In the intestinal tract PAS/Hematoxylin revealed different degrees of positivism in goblet cells and surface mucus. With Alcian blue pH 2.5 highly positive cells were observed.

211.

PROTOCOL TO CHARACTERIZE AND DETERMINE GLYPHOSATE RESISTANT SORGHUM

Roncaglia RV, De Marco N.
Cát. Botánica Esp. Fac. Agron. y Zoot. UNT. Av Roca 1900. (4000) S. M. Tucumán. E-mail: ronqui@arnet.com.ar

In 2005-2006, in soybean crops in the NE of the San Martín Department, Salta, Argentina, glyphosate resistant sorghum plants were detected. The aim of this work is to design a protocol based on exomorphological characteristics to determine and characterize glyphosate resistant sorghum. We worked on the vegetative and reproductive characteristics of 7 sorghum species: 1-*S. halepense*, 2-*S. almun*, 3-*S. sudanense*, 4-*S. sacharatum*, 5-*S. technicum*, 6-*S. caffrorum*, 7-*S. roxburghii*; considering all of them as possible progenitors of the collected sorghum. The vegetative characters are: habits: perennial/annual/biennial. Rhizome: definite/not definite; absent. Clusters: abundant/scarce/none. Cane: height: 3 m/-3 m/+3 m. Leaf: broad: -2.5 cm/+2.5 cm. The reproductive characters are: panicle shape: pyramidal-oblong lax/oblong-ovoid dense. Spikelet: sessile: 4.5-7 mm long/+7 mm long. Shape: lanceolate/ ovovate-lanceolate/ovovate. With or without awn. With or without pubescence. Caduceus/persistent. Colour: reddish brown/brown/black. Caryopsis: 2-3 mm long/+3mm long. Shape: compressed and aovate, or aovate. Enclosed by the glumes. Color: brown-reddish/ whitish. The selected characteristics enabled us to identify species, new species, a "variety" or an "entity", all of them sharing morphological characteristics of the 7 species above, which will allow us to pursue further studies on the subject.

212.

FISH FAUNA FROM THE EL TUNAL RESERVOIR (SALTA) AND THEIR NEMATODE PARASITES

Cancino F[1], Ramallo G[2].
[1]Inst. de Vertebrados; [2]Inst. de Invertebrados, Fundación Miguel Lillo. Argentina. E-mail: fabianacancino@yahoo.com.ar

Seasonal variations in the fish from El Tunal reservoir and its tributaries were observed and their nematode parasites were characterized. Four seasonal samplings were carried out in El Tunal reservoir, Juramento River and their tributaries. The richness of fish species was 26, Characiform being the most abundant (54%) followed by Siluriform (21.74%), and Cyprinodontiform (23%). Synbranchiform, Atheriniform, and Perciform were the least representative ones (11.53%). In the 349 dissected fishes 5 taxa of nematode parasites (*Contracaecum* sp., *Procamallanus (Spirocamallanus) hilarii, Rhabdochona acuminata, Spinitectus asperus,* and *Cucullanus pinnai pinnai*) were identified. In the reservoir, during the whole year, 4 out of the 5 taxa of nematode parasites were found. In summer we observed maximum intensity and prevalence of infection of *S. asperus* (I=777; P=93%) in *P. lineatus*, minimum intensity of *P. (S.) hilarii* (I=2), and lowest value of prevalence (P=11%) of *R. acuminata* in *Astyanax asuncionensis*, respectively. *C. p. pinnai* (I=7; P=40%) in *Heptapterus mustelinus* was found only in the Juramento river. In the tributary streams low richness and specific diversity of nematode parasites were observed. The areas of greater species richness were the Juramento River and the Medina stream during spring-summer, while in the reservoir highest richness was observed in winter.

213.

SEED PRODUCTION OF *Pappophorum subbulbosum* IN RANGELANDS OF SOUTHWESTERN BUENOS AIRES

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur¸ 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

Pappophorum subbulbosum is among the native, warm-season, high forage value perennial grass species in southwestern Buenos Aires. However, despite the importance of this rangeland species, clear knowledge of its seed production and response to early defoliation is non existant. The objective of this study was to quantify seed production in *P. subbulbosum*. Studies were conducted in the Chacra Experimental de Patagones. A defoliation treatment was applied to half of the plants leaving 5 cm stubble. Apical meristems were not removed. The number of reproductive tillers/plant was determined. Seeds were harvested and quantified at the time of their dispersal. Seed production per plant was not affected, probably because plants had enough time to recover their foliage and could provide sufficient resources for seed production.

214.

TILLERING IN NATIVE AND INTRODUCED WARM-SEASON PERENNIAL GRASSES IN SOUTHWESTERN BUENOS AIRES

Torres YA[1], Busso CA[2], Montenegro OA[3], Giorgetti HD[3], Rodríguez GD[3], Montani T[1], Maidana A[4].
[1]Dpto. Agronomía, UNSur¸ 8000, Bahía Blanca, Pcia. Bs. As.; [2]Dpto. Agronomía-CERZOS (CONICET), UNSur; [3]Chacra Experimental de Patagones, Ministerio de Asuntos Agrarios, Pcia. Bs. As.; [4]Facultad de Ciencias Naturales, U.N.S.J.B. Pto. Madryn, Chubut. E-mail: yatorres@criba.edu.ar

This research evaluated tiller production in the native warm-season perennial grass *Pappophorum subbulbosum* and in 2 cultivars of warm-season perennial grasses introduced from the U.S.A.: *Leymus cinereus* cv. 'Magnar' and 'Trailhead'. Field studies were conducted in the Chacra Experimental de Patagones. A defoliation treatment at 5 cm stubble height was applied to half of the plants, without removing the apical meristems. The other half remained undefoliated (control). Every 21 days, numbers of daughter tillers/parent tiller and basal area were determined. Greater values of daughter tiller production/cm^2, with the subsequent basal area expansion in *P. subbulbosum*, suggest a greater defoliation tolerance in the native than in the introduced cultivars. Height and tiller production reductions in the introduced genotypes could eventually compromise their persistence in the community. This is because vegetative reproduction (tillering) is the predominant way of reproduction in semiarid grasslands.

215.

VEGETATIVE PROPAGATION OF *Prosopis chilensis (Molina) Stuntz.emend Burkart* THROUGH ROOTING CUTTINGS

Tarnowski C.
Estación Experimental de Cultivos Tropicales – INTA Yuto. Ruta Nacional 34, Km. 1286 (4518) Jujuy, Argentina. E-mail: ctarnowski@correo.inta.gov.ar

Carob trees, although considered a multipurpose species, produce very heterogeneous offspring. Agamic propagation techniques would help to generate plants with homogenous and superior phenotype traits. The influence of two types of substrata was investigated and the effect of different concentrations of the rooting hormone IBA was determined. Plants of *Prosopis chilensis* grown in greenhouses were used. Natural organic substratum and peat+sand (3:1v/v) were used in combination with IBA powder at different doses: 0; 5000 and 10000 ppm. Cuttings were distributed randomly into a sub irrigation propagator and both rooting percentages and number of primary roots were evaluated 40 days after the beginning of the trial. The highest percentage of cuttings rooted (54%; p=0.0127) and number of adventitious roots produced (4.71; p=0.0034) was observed with IBA 10000 ppm in the presence of the natural organic substratum. There were no significant differences in all the other combinations between substrata and IBA doses. The preliminary results of this work indicate that this methodology is useful to propagate young plants of *Prosopis chilensis* vegetatively when natural organic substratum in combination with IBA 10000 ppm is used.

216.

OXIDATIVE TREATMENT AGAINST THE CAUSAL AGENT OF CITRUS CANKER *Xanthomonas axonopodis pv. citri*

Cerioni L[1], Volentini SI[1], Prado FE[2], Rapisarda VA[1], Rodríguez Montelongo L[1].
[1]FBQyF and INSIBIO (UNT-CONICET); [2]FCN (UNT) Tucumán, Argentina. E-mail: luirm@fbqf.unt.edu.ar

Canker, a citrus quarantine disease, is endemic in several regions of Argentina. To obtain fruit free of *Xanthmonas axonopodis pv. citri (Xac)*, successive barriers are introduced during the handling of fresh fruit. In our laboratory post-harvest treatments have been developed for the control of *Penicillium digitatum*, an agent that causes mold in citrus fruits. The objective of this work was to determine whether these protocols were able to eliminate Xac. Bacterial suspensions of 106 CFU/ml were treated for 120 s with NaClO, CuSO4, H2O2, either alone or in combination. Minimum inhibitory concentrations (MIC) were determined in each case, they being lower than MIC for fungi. In sub lethal conditions the reactive oxygen species (ROS) production was increased and the cellular oxygen consumption showed a gradual decrease. When bacteria lost viability, ROS production was low and the respiratory activity underwent total loss. Results demonstrate that the treatments that had proved efficient to eliminate Xac caused important oxidative damage. Additional experiments on fruits are necessary to standardize an efficient protocol that could be implemented in packinghouses.

217.

PRELIMINARY ASSESSMENT OF REPRODUCTIVE PHASES AND YIELD COMPONENTS IN NORMAL AND ABNORMAL BEAN (*Phaseolus vulgaris* L.) PLANTS

Romano AS, Teves I, Cazón L.
F.C.A. Alberdi 47. (4600) S. S. de Jujuy.
E-mail: amaliaromano@hotmail.com

While seed quality declines, increasingly abnormal plants appear. This work aimed at evaluating reproductive phases and yield components in normal and abnormal bean plants. For this purpose, sublots of seeds of Paloma INTA (white) and Camilo INTA (black) cultivars were damaged by allowing them to fall 0, 2 and 4 times on a metallic plate from a height of 2 m. The beginning of phases R6, R7 and R9 were assessed, as well as the number of pods and of seeds per plant, seeds per pod, length of pods and the weight of 1000 seeds. Considering the length of the phase, the normal white bean plants of the treatments with 2 and 4 falls as well as those corresponding to abnormal black beans moved phases R6, R7 and R9 forward. Besides, for this cv., normal plants of 2 falls and abnormal ones of the control lot showed delays in beginning phases R6 and R7 with respect to their corresponding controls. As to yields, in the Paloma cv the abnormal plants of the treatment with 2 falls showed significant decreases in the number of pods and of seeds per plant, both components increasing by 14 and 37%, respectively, in the control black bean plants compared with normal plants. These results would indicate an association of abnormal plants with compensatory effects.

218.

PRODUCTION OF *Zymomonas mobilis* ANTIMICROBIAL FACTORS THROUGH DIFFERENT CULTURE METHODOLOGIES FOR BACTERIAL CONTROL

Romero ME, Fogliata GM, Ramallo J, Ploper LD.
Fac. Bqca. Qca. y Fcia. UNT. Estación Experimental EEAOC. Tucumán. Argentina. E-mail: me_romero10@hotmail.com

Zymomonas mobilis (*Zm*) produces antimicrobial factors that were detected in 120-fold concentrated supernatants. These factors have an effect on a wide range of microorganisms. Previous studies showed *P. digitatum* total inhibition by *Zm* factors on PDA. This work aimed at determining the activity of these factors in the solid-phase exudate (PDAS) of a solid medium, comparing it with the activity of potato dextrose broth concentrate supernatants (PDBS) and of standard medium for *Zm* (SMS). Controls were *X. citri* pv. *citri* and *E. coli* AB1133. In all cases, final *Zm* concentration was 3.5-4 g dry weight/l. The supernatants were concentrated 70-fold and their activity was determined through diffusion tests on agar and microtitre dilution. The trial was repeated three times and results showed that minimum PDAS and SMS quantities required to inhibit the bacteria were 1.25 and 5 µl, respectively. These data demonstrate that the solid medium contains the factors produced by *Zm*, which would encourage their production by means of solid state fermentation as well, a methodology that proved to be highly efficient.

219.

ANTIOXIDANT ACTIVITY AND PROTECTIVE EFFECT ON DNA OF ETHANOLIC EXTRACT, 2',4'-DIHYDROXYCHALCONE AND 2',4'-DIHYDROXY-3'-METHOXYCHALCONE FROM *ZUCCAGNIA PUNCTATA* CAV

Vattuone MA, Sgariglia MA, Soberón JR, Sampietro DA, Quiroga EN. Cátedra de Fitoquímica. Instituto de Estudios Vegetales "Dr. A.R. Sampietro". Fac. de Bioq., Quim. y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471. (4000) S.M. de Tucumán. Argentina. E-mail: instveg@unt.edu.ar

Zuccagnia punctata Cav. is used in folk medicine to alleviate illness (dermatitis, arthritis, asthma, rheumatism) and as an antitumoral and antimicrobial agent. The purpose of this work was to study the protective effect on DNA damage produced by ethanolic extracts, 2',4'-dihydroxychalcone, and 2',4'-dihydroxy -3'-methoxychalcone to determine their antioxidative capacity and their influence on lipid peroxidation. The breakdown of DNA (pBR 322) was produced by its UV irradiation in the presence of H_2O_2, suggesting $HO^{\cdot}$ participation. The extract and the chalcones inhibited the DNA linear form formation. They scavenged the superoxide anion and the free radical DPPH. Lipoperoxidation inhibition was demonstrated by TBARS production. In all instances 2',4'-dihydroxychalcone showed more efficiency than 2',4'-dihydroxy -3'-methoxychalcone, and both more than the ethanolic extract. This is the first report on the protective effect of ethanolic extract of *Zuccagnia punctata* and the two identified chalcones on DNA breakdown caused by the products of H_2O_2 photolysis by UV radiation.

220.

PLASMA CHANGES IN SEXUAL STEROIDS, IONS AND TRIGLYCERIDES DURING THE LAYING CYCLE IN ORPINGTON HENS

Ase MS, Fernández SN, Ramos I.
Inst. de Biología. Fac. de Bioquímica, Química y Farmacia. Chacabuco 461. Tucumán.

Knowledge of the reproductive activity of Orpington hens is very limited. The aim of this study was to analyze the plasma changes in sexual steroids during the laying cycle and its relationship to triglycerides, calcium, phosphorus and magnesium concentrations. Blood samples were obtained from the wing vein. Sexual steroids were measured by the ECLIA method and triglycerides and ions by spectrophotometric methods. Estradiol plasmatic levels showed no significant changes, evincing only a small diminution during oviposition. Progesterone reached its highest concentration 6-8 h before egg laying; then it decreased and remained low for 2-3 h post oviposition, when a gradual increase was observed. Plasma calcium did not change during the cycle, however 7-12 hs before oviposition there was a slight decrease. Magnesium levels remained constant throughout the cycle. Phosphorus concentration showed an increase 2-4 h before egg laying, after that a diminution is observed until 6 hs postoviposition. The highest triglycerides levels were observed 2-7 hs before egg laying, lowest values being found close to oviposition. Our results suggest a correlation between estradiol, and triglyceride, calcium and phosphorus levels, indicating that the steroid could be involved in vitellogenesis regulation and eggshell formation. Highest concentrations of progesterone before oviposition suggest its participation in the maturation and ovulation process.

221.

THE PROBLEM OF KNOWELEDGE INTEGRATION IN THE TEACHING OF BIOLOGY

Medina MF, Sánchez Toranzo G, Zapata J, Otero C, Bonilla F, Oterino JM, Bühler MI.
Cátedra de Biología. Facultad de Bioquímica, Química y Farmacia. UNT. Chacabuco 461. (4000) Tucumán.
E-mail: mmedina@fbqf.unt.edu.ar

The rate at which new knowledge is generated in the area of Biology represents a challenge that teachers should face. The aim of this work was to evaluate the capacity of students to integrate two practical activities carried out separately until the previous year. They compared and evaluated similarities and differences in the strategies used by higher organisms such as animals (vertebrates) and vegetables (angiosperms) in order to solve basic life problems. Methodology: lab work consisted of an initial written assessment of the students' capacity to identify common animal and vegetable problems and to comparatively analyze the different solutions that these two groups of organisms provide. They also had to solve problems where it was necessary to apply knowledge of the mechanisms working at the cellular level. At the end of the lab work a written test was given them to determine whether students had improved their capacity to relate and discuss the solutions presented by each group. Results showed that before lab work only 30% of the students were able to identify the different solutions to basic problems of living organisms and to comparatively analyze the processes involved at cellular levels. After lab work 70% showed that this strategy motivated observation, comparison, and the discussion of the solutions presented by each group.

222.

EXOPOLYSACCHARIDE PRODUCTION BY BACILLI ISOLATED FROM SUGARCANE JUICE

Anduni G[1], Gusils C[1,2], Ruíz M[1], Cárdenas G[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av Williams Cross 3150 Tucumán; [2]CONICET.
E-mail: microbiología@eeaoc.org.ar

The synthesis of exopolysaccharides (EPS) by bacteria is detrimental to sugar manufacture The problems are widely known and there is extensive literature on the subject establishing a direct link between dextran production and the presence of *Leuconostoc mesenteroides*. The objectives of this work were to isolate EPS-producing bacilli and to study EPS production kinetics. Four isolates out of 82 were selected (A, C, 20, 47). The C strain was the major EPS producer, with 350 mg/l. EPS production by the C strain started after 4 h of incubation, reaching its highest level after 48 h of growth. pH dropped from 7 to 6 after 10 h incubation and remained constant up to 48 h. A significant number of microorganisms different from *L. Mesenteroides*, with the capacity to produce EPS, were isolated from sugarcane juice. These findings led us to propose experimental designs to establish interactions between polysaccharide-producing strains such as *L. Mesenteroides* and the bacilli selected in this work

223.

TOXICITY OF AN ORGANOCHLORINE PESTICIDE TO BIOMPHALARIA PEREGRINA (GASTROPODA)

Powell PA, Bardón A, Borkosky S.
Fac. de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. 4000 Tucumán. E-mail: sabk@fbqf.unt.edu.ar

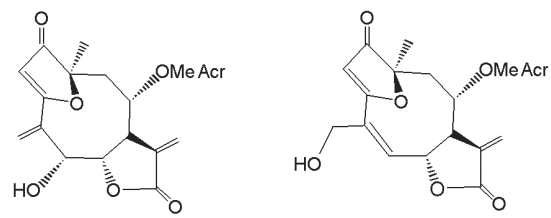
Endosulfan is a pesticide widely used in agriculture with high persistence in the environment. There are some reports related to the presence of organochlorine pesticides in the Río Salí basin (Tucumán, Argentina). The present study was undertaken to determine the endosulfan lethal concentration 50 (LC50) to B. peregrina (Orbigny, 1835) a freshwater snail widely distributed in the wetlands of Argentina.
The acute toxicity test was carried out in 500 mL beakers containing synthetic softwater (pH 6.5-7, conductivity 100±10 μS cm-1, hardness 40-48 mg/L as CaCO3).Twenty adults snails (shell diameter 8-10 mm) per concentration, five per beaker, were exposed to Endosulfan pesticide (100, 50, 25, 12.5, 6.25 mg/L) in the absence of food. Beakers were covered with a net to prevent snails from escaping. Room temperature (20 ± 1°C) and light/dark cycle (light on for 16 h) were kept constant. As negative controls, snails were exposed to synthetic freshwater only. Snail mortality was evaluated at 24, 48, 72 and 96 hours of exposure and LC50 values were determined using the EPA PROBIT Analysis Program V. 1.5.
Our results yielded LC50 values of 20.824 mg/L, 11.642 mg/L, and 9.082 mg/L of pesticide at 48 h, 72 h and 96 h, respectively. Endosulfan toxicity increased at longer exposures, so its persistence in water bodies could drastically modify the snail community.

224.

ANTIFEEDANT AND TOXIC EFFECTS OF FUROHELIANGOLIDES ON *SPODOPTERA FRUGIPERDA*

Paz ML, Falivene C, Castellano MJ, Borkosky S, Bardón A.
Fac. de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. 4000 Tucumán. E-mail: sabk@fbqf.unt.edu.ar

Furoheliangolides **1** and **2** from a chloroform extract of fresh flowers of the American herb *C. punctatum* ssp *punctatum* Cass. were incorporated into the diet of 2nd instar larvae of *Spodoptera frugiperd,* at a dose of 100 μg of compound per g of diet. We evaluated the effects on the feeding behavior (choice test) as well as the actions produced by the treatments on larval growth and diet consumption. Larval mortality was also quantified.



1 **2**

Compared to control, compounds **1** and **2** showed I) Antifeedant effects evaluated with Feeding Rates % (%FR_{50}=100.T/C) of 39 and 30%, where T and C are the amounts of treated and control diets eaten by larvae respectively; II) Larval growth and diet consumption alterations; and III) Larval mortality rates of 35 and 26%, respectively.

225.

IN VITRO PROPAGATION OF SACOILA LANCEOLATA

Enrico EE[1], Enrico RJ[2].
[1]LIEY, Horco Molle, Tucumán. [2]FCN e IML, UNT. E-mail: eugenrico@yahoo.com.ar

This work was carried out to develop an appropriate method for *in vitro* seed propagation of *Sacoila lanceolata* an attractive terrestrial orchid.
Dehisced and green capsules were sterilized in 1.2% sodium hypochlorite solution for 20 min and then flamed after spraying with 96% ethanol. Capsules were cut open and seeds were cultured in half MS medium (Murashige and Skoog, 1962) solidified with TO - 1296 agar (Sigma Chemical) at 7 g. l^{-1} citokinins or auxins was added to the culture medium. Seed germination occurred from dehisced capsules in medium with citokinins (highest percentages were obtained with12 mg.l^{-1} 2iP). Protocorms were grown in medium without GRPs to obtain tuberizated roots.
Auxins inhibited germination and exerted harmful effects on the growth of *Sacoila lanceolata* seedlings.

226.

VARIATIONS IN SPECIES ASSOCIATIONS OF THE SCOTIA SEA SEABIRD COMMUNITY, ANTARCTICA, AS A CONSEQUENCE OF ENVIRONMENTAL FACTORS

Juarez G[1], Esper L[1], Benitez L[1], Benitez S[1], Orgeira J[2].
[1]Cátedra de Matemática, Facultad de Cs. Naturales e I. M. Lillo, UNT- Miguel Lillo 205. (4000) Tucumán. [2]Dpto de Cs. Biológicas, Instituto Antártico Argentino. E-mail: matcat@csnat.unt.edu.ar; grajuarez_6@hotmail.com

The Scotia Sea is an oceanic area located north of the Weddell Sea, between 57º and 63º 59'S and 38º and 49º 59' W. Its avifauna is composed of nesting species in the South Orkney Islands and other pelagic species nesting in the Malvinas, South Georgia and South Sandwich Islands. From 1986 to 1996 the Instituto Antártico Argentino carried out seabird censuses onboard ships as part of an Ecosystem Monitoring Program. The aim of this study is to analyze the behavior pattern of the Scotia Sea seabird community under El Niño effects. Cluster Analyses were performed. We used Complete Linkage and "1-Pearson r". Results showed that behavior patterns of the Scotia Sea seabird community were quite different from those of the Weddell Sea seabird community (Benítez *et al.,* 2006). Differences observed can be explained by the thick ice cover on the Weddell Sea and its almost total absence in the Scotia Sea, confirming previous studies (Orgeira, 2002) that showed ice as a major ecological factor that regulates species associations in Antarctic and sub Antarctic seabirds.

227.

ACOUSTIC PROPERTIES OF VICUNA (*VICUGNA VICUGNA*) VOCALIZATIONS

Hurtado AM, Black P.
Cátedra de Comportamiento Animal, Facultad de Ciencias Naturales e IML (UNT) Miguel Lillo 205.
E-mail: anubisytoht@hotmail.com

Vicuna, an autochthonous South American camelid found in high Andean plains, lives in harems consisting of a territorial male with 4-7 females and their offspring or of non-territorial bachelor male groups. Little is known about its acoustic communication. The objective of this study was to record, analyze and characterize the calls produced by this species. Vicunas were tape recorded with a directional microphone at the Campo Experimental de Altura, INTA Abra Pampa, Jujuy, Argentina, where they are raised in large pastures. Recordings were made of free animals and those captured for treatment or shearing. Out of the 9 calls identified, 4 were tonal and 5 atonal. The tonal calls included bleat 1 and bleat 2, differing in number of harmonics and duration, used by young animals; moan, a low amplitude, short duration, repetitive call used in mother-offspring communication, and the alarm trill, consisting of up to 8 tonal notes, emitted by adult males. The atonal calls were bellow 1, bellow 2, murmur, snort and threat calls, used by adults. The calls are not discrete but form a continuum that is particularly clear as a series ranging from bellow 1 to threat call where intensity increases and pulsed quality diminishes. This type of transition has been described for several other mammalian species.

228.

ATYPICAL MORPHOLOGY OF *CRYPTOCOCCUS NEOFORMANS* IN POST-MORTEM TISSUES

van Gelderen A, Borges de Kestelman I.
Cátedra de Micología. Facultad Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. E-mail: micologia@fbqf.unt.edu.ar

C. neoformans is the agent of cryptococcosis. Infection follows inhalation, but shows a remarkable propensity to spread hematogenously to the brain and meninges. *C. neoformans* is an encapsulated budding yeast, globular to oval in shape, of 4 to 7 μm in diameter, but cells from 2 to 15 μm may occur. The yeasts are surrounded by a large mucopolysaccharide capsule which duplicates or triplicates the cell diameter. Cells are typically single or with one bud, but may be found in short chains of 2 to 3 cells. The yeasts are clearly separated by spaces occupied by capsules. The aim of this work is to report the atypical morphology presented by a *C. neoformans* strain isolated from liver, spleen, kidney and brain tissue. Tissues were obtained through autopsy of a 33-year-old male patient without accurate cause of death. The identification of *C. neoformans* was made by its morphological, culture and phenotypical characteristics. The tissues revealed abundant yeasts with large capsules and numerous buds, clearly associated to the cells, which, without separating from the mother cell, formed odd structures especially in liver, spleen and kidney tissues. Few typical forms of the fungus could be observed, with rudimentary pseudomycelium formations surrounded by a large capsule. Single encapsulated cells were the most frequent ones only in the brain tissue. An unusual characteristic was the large number of cells found in kidney and spleen.

229.

VCAM-1 LEVELS IN TYPE 2 DIABETES PATIENTS

Abregú AV, Velarde M, Prado M, Carrizo T, Fonio M, Pérez Aguilar R, Díaz EI, Klyver MI.
Cátedra Práctica Hospitalaria, Fac Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán.
E-mail: vabregu@fbqf.unt.edu.ar

Type 2 diabetes is associated with increased cardiovascular morbimortality due to accelerated atherosclerosis (ATE). Endothelial dysfunction, the first ATE step, implies the expression/secretion of inflammatory cytokines and adhesion molecules such as vascular cell adhesion molecule-1 (VCAM-1). The objective of this work was to determine the VCAM-1 levels in type 2 diabetes patients, without clinic manifestations of vascular disease, and their relation toh other risk factors of cardiovascular disease (CVD). Thirty-five patients, with an average age of 50.0±10.4 yr and evolution time of disease ≤6 yr were studied and compared to a non-diabetic group of similar ages and sexes. The parameters evaluated were VCAM-1, fasting blood glucose, HA1c, and lipid profile. Diabetic patients presented VCAM-1 levels higher than control subjects (769±181 vs 633±45 ng/ml, p= 0.006). When patients were grouped according the degree of glycemic control, those with poor glycemic control showed VCAM-1 levels higher than those with good control, but differences were not significant. When VCAM-1 was related to other risk factors, only a light correlation with BMI (r=0.176) and triglycerides (r=0.200) was found.
The increased levels of VCAM-1 confirm the existence of endothelial dysfunction in these patients, suggesting that this adhesion molecule is an early marker of CVD.

230.

TRANSPORT OF Ca^{2+} IN *Bufo arenarum* SPERM

Medina MF, Crespo CA, Cisint S, Ramos I, Fernández SN.
Departamento de Biología del Desarrollo. INSIBIO (CONICET-UNT). Chacabuco 461. 4000 Tucumán. E-mail: mmedina@fbqf.unt.edu.ar

In *Bufo arenarum,* previous experiments demonstrated that the sperm acrosome reaction (AR) is induced by the Ca^{2+} present in the jelly coats. However, the transport mechanisms associated with the cation have not been determined in any amphibian species. The aim of this work was to determine the presence of Ca-ATPase, Ca^{2+} channels and Na^{+}/H^{+} and Na^{+}/Ca^{2+} exchangers in *Bufo arenarum* sperm and their participation in AR. Ultracytochemical techniques were used for Ca-ATPase detection. In order to identify voltage dependent Ca^{2+} channels, sperm samples were incubated with Ca^{2+} channels type L (lanthanum chloride 0.1-1.5 mM) or type T (verapamil 0.009-0.08 mM) blockers and amiloride (0.01-0.8 mM), and amiloride 1 mM for the exchangers, adding $CaCl_2$ (6 mM) to the incubation medium as AR inducer. Results demonstrated that Ca-ATPase is located in the plasma and in both acrosomal membranes of the sperm and that all pharmacological blockers tested inhibited Ca^{2+} influx into the sperm, evidenced by high fertilization percentages. These results would suggest that Ca-ATPase would regulate intracellular Ca^{2+}. Na^{+}/H^{+} and Na^{+}/Ca^{2+} exchangers would activate Ca^{2+} channels type L and T, thus allowing Ca^{2+} influx into sperm, which induces exocytosis of the acrosomal vesicle of *Bufo arenarum*.

231.

***Leptodactylus chaquensis* OVARY: HISTOLOGICAL AND HISTOCHEMICAL STUDIES OF EARLY OOGENESIS PHASES**

Cruz López ME, Cisint S, Crespo C, Ramos I, Fernández S.
Fac. de Bioquímica, Química y Farmacia y Fac. de Ciencias Naturales e IML, UNT.

The aim of this work was to analyze the histological and histochemical characteristics of the *Leptodactylus chaquensis* ovary using a routine histological technique for light microscopy. Samples obtained from females captured in the January-March period exhibited oocytes in previtellogenesis, and early and late vitellogenesis stages. Atresic oocytes were present as well. The previtellogenic oocytes showed intense basophilia at cthe ytoplasmic level and a central nucleus or germinal vesicle (GV) with a regular outline and scattered nucleoli. Larger oocytes exhibited plasma membrane invaginations and peripheral cytoplasmatic vacuolization. In the early vitellogenesis stage, the oocytes showed incipient peripheral acidophilia and a GV with a membrane with marked folds. In late vitellogenesis, oocytes exhibited a cytoplasm filled with periodate-reactive and alcianophilic yolk platelets. At this phase a dark animal pole with cortical pigments and irregular nucleus with centralized nucleoli and a light vegetative pole can be observed. Different types of atresic follicles exhibited a diversity of contents which included vacuoles, pigments and/or yolk platelets. These results suggest that the period analyzed would correspond to the early postovulatory phase of the female sexual cycle.

232.

IDENTIFICANTION AND COUNT OF NITROGEN FIXING BACTERIA IN THE ROOT OF GRAMINEANS IN THE SUBHUMID-HUMID PLAIN IN TUCUMAN

Posse S del V, Jaime MA, Andrada Mansilla B, Pérez Carbajal H, Martínez Pulido L.
Facultad de Agronomía y Zootecnia, U. N. T.Av. Roca 1900, C. C. 125. (4000) S. M. of Tucumán.

Panicum maximun Jacquin and *Cenchrus ciliaris* (L.) Link. are species widely spread in the semiarid sub humid regions of northwestern Argentina. The aim of this work was the identification and count of neutrogen fixing bacteria in the root and inner root tissues of *Panicum maximun* and *Cenchrus ciliaris* in grazing fields of the sub humid-humid plains of Tucumán. Sampling was carried out in the grazing fields of El Manantial, Tucumán in June 2007. Climate: dry sub humid hot. Culture medium: For *Azotobacter sp., Derxia sp.* and *Azospirillum sp.,* Döbereiner (1980). For *Beijerinckia sp.*, Girard-Rougieux (1964). Microorganism counts, Fisher- Yates 1963. Identification: Bergey's Manual 1991. Conclusion: *Azotobacter sp, Azospirillum sp*, *Beijerinckia sp* and *Derxia sp* were identified in root surface and inner root tissues of *Panicum maximun* Jacquin and *Cenchrus ciliaris* (L.) Link. in grazing fields of the sub humid–humid plains of Tucumán. The number of microorganisms/g of root was higher in the association *Beijerinckia sp -Panicum maximun* and *Cenchrus ciliaris* (29×10^4; 29×10^3). Lower values were found for *Azotobacter sp* with both vegetable species (85×10^2), indicating different degrees of association between the plants and the microorganisms.

233.

IMPACT OF MICROBIAL POPULATION IN SUGARCANE FACTORY ENVIRONMENTS ON THE MICROBIOLOGICAL QUALITY OF SUGAR

Núñez C[1], Anduni G[1], Gusils C[1,2], Ruíz M[1], Cárdenas G[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av. Williams Cross 3150 Tucumán; [2]CONICET.
E-mail: microbiología@eeaoc.org.ar

During the last crop (2006) we visited six mills in the province of Tucumán, taking sugar and environmental samples in duplicate from centrifuges, dryers and packaging sectors in which Good Manufacturing Practices (GMP) are followed. To determine the presence of aerobic mesophiles (AM), fungi and yeasts, official filtration techniques established by the International Commission for Uniform Methods (ICUMSA) and gravity method were used, respectively. In all the sugar factories surveyed and the sectors specifically analyzed, we noticed a remarkable influence of environmental pollution on the microbiological quality of the sugar. Two of the six factories studied leaked environmental contamination by yeasts from the drying sector to the packaging lines, resulting in high counts of these microorganisms in the sugar handled in these sectors.
Environment and sugar sample yeasts presented similar microscopic and morphological characteristics.
One of the sugar mills surveyed showed better applications of GMP guidelines in the areas analyzed and the sugar produced there had a better microbiological quality.

234.

STUDY OF *LISTERIA MONOCYTOGENES* SENSITIVITY TO FREEZING IN MODIFIED LEMON JUICE CONCENTRATE

Guerrero A[1], Vannini V[1], Gusils C[1,2], Ruiz M[1], Cárdenas G[1].
[1]Estación Experimental Agro Industrial Obispo Colombres, Av. Williams Cross 3150 Tucumán; [2]CONICET.
E-mail: microbiologia@eeaoc.org.ar

L. monocytogenes is an environmental pollutant whose principal transmission to humans is through contaminated food. The objective of this study was to monitor *L. monocytogenes* survival at different pH and salinity levels in Lemon Juice Concentrate (LJC) incubated under freezing conditions. *L. monocytogenes* (10^9 CFU/ml) was inoculated in LJC neutralized at different pH values (3, 3.5, 4, 4.5, 5 and 6) and incubated at - 20°C for 120 days. We also studied the effect of NaCl 10% addition to the LJC samples at the pH levels under consideration. The detection of the inoculated microorganisms was achieved by counting (PCA), enrichment and isolation in selective media and inmunocromatography. The data showed that the more acid the LJC pH is, the more sensitive to freezing *L. monocytogenes* becomes. Thus, at pH 3, 3.5, 4 and 4.5 bacteria survive into the second week, whereas at pH 5 and 6 *L. monocytogenes* survives up to the last week with a decline of 5 logarithmic orders, and with an increase in death and speed rates when adding NaCl.

235.

SURVIVAL STUDY OF PATHOGENIC MICROORGANISMS INOCULATED IN SUGAR SAMPLES

Núñez C[1], Gusils C[1,2], Ruíz M[1], Cárdenas G[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av Williams Cross 3150 Tucumán; [2]CONICET.
E-mail: microbiología@eeaoc.org.ar

Sugar intrinsic physicochemical characteristics, mainly its low water activity, constrain microorganism development. However, if industrial processing and subsequent storage conditions are not adequate, microbiological contamination is likely to occur.
The objetive of this work was to study the survival of pathogenic microorganisms *Escherichia coli, Staphylococcus aureus* and *Salmonella* Enteritidis inoculated into refined sugar samples, simulating exogenous pollution. Concentration of inoculated samples ranged from 10^7 to 10^9 CFU/10g. Samples were stored for 90 days at environmental conditions similar to the ones in industrial warehouses. Trials had three replicates and the count of pathogenic microorganisms was carried out regularly using methodologies (counting techniques, enrichments, inmunochromatography) tested by international agencies (FDA-BAM, AOAC). The study of the survival kinetics of inoculated microorganisms revealed that *S.* Enteritidis and *E. coli* died faster than *St. aureus*. *S.* Enteritidis was detected up to 9 days and *E. coli* up to 15 days after inoculation, whereas *St. aureus* could still be found 60 days after it.

236.

INHIBITION OF BIOFILM-PRODUCING STRAINS OF INDUSTRIAL INTEREST

Dávila Costa M[1], Anduni G[1], Gusils C[1,2], Ruíz M[1], Cárdenas G[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av. Williams Cross 3150, Tucumán; [2]CONICET.
E-mail: microbiologia@eeaoc.org.ar

The presence of biofilms in the food industry implies hygienic problems and economic losses, since products thus polluted are necessarily rejected. The objective of this work was to evaluate the *in vitro* antimicrobial effect, Minimum Inhibitory Concentration (MIC) and Bactericide Minimum Concentration (MBC) of various microbicidal agents. Biofilm-producing strains isolated from regional factories were studied. To determine MIC values, two microbiological techniques were used: 1) E-test with different concentrations of sodium hypochlorite, malic acid, lactic acid and dimethylditiocarbamate-ethyilenebiditiocarbamate (DE); 2) serial dilutions (1:2) of the chemicals. To determine MBC values, the negative tubes from the MIC determination were inoculated in Mueller Hinton agar. The same MIC values for antimicrobial substances were obtained using both microbiological techniques. Out of the four antimicrobial agents tested, DE showed higher MIC values for all strains tested. When MBC was determined, we observed that when using lactic acid, malic acid and sodium hypochlorite, the values obtained were similar to the MIC obtained in the four strains tested or differed only in one dilution. However, in the case of DE, higher concentrations were required to observe a bactericidal effect on the bacterial strains assayed.

237.

MICROBIOLOGICAL STUDY OF THE PROCESS OF WASHING AND FREEZING STRAWBERRY INOCULATED WITH *E. coli*

Anduni G[1], Guerrero A[1], Núñez R[1], Mocoroa F[2], Montivero ML[2], Gusils C[1,3], Ruíz M[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av Williams Cross 3150, Tucumán; [2]Las Lomas del Aconquija, Ruta Provincial 501 Km 20; [3]CONICET. E-mail: microbiologia@eeaoc.org.ar

The objective of this study was to evaluate the effect of washing on strawberry microbial population and inoculation with and without inoculation with *E. coli*. Strawberry samples were inoculated with different doses (10^2 to 10^4 CFU/g) of *E. coli*. The samples were washed with water and sodium hypochlorite following industrial procedures and then frozen at -20°C. Samples were taken in triplicate to count mesophilic microbial flora and *E. coli* using normalized methods.We observed that the degree of decline in the stock of mesophilic microorganisms caused by washing fruit with water and sodium hypochlorite depended on the dose inoculated. Freezing caused a significant decrease in the count with the three doses of *E. coli*. Complete elimination of the pathogen was achieved only with the lowest inoculation dose. Freezing led to total elimination of *E. coli* after washing fruit with water only or with hypochlorite. It is important to monitor the efficiency of strawberry washing processes and freezing conditions to ensure pathogen elimination.

238.

STUDY OF *E. coli* O157H7 and *Listeria monocytogenes* SURVIVAL IN CONCENTRATED CITRUS JUICES

Anduni G[1], Vannini V[1], Pérez Camaño B[3], Paliza E[3], Pérez M[3], Gusils C[1,2], Ruíz M[1].
[1]Estación Experimental Agroindustrial Obispo Colombres, Av Williams Cross 3150, Tucumán; [2]CONICET; [3]CITRUSVIL SA, Ruta 302 Km 7 – Cevil Pozo. Tucumán. E-mail: bcamano@citrusvil.com.ar

The objective of this work was to study *E. coli* O157H7 and *L. Monocytogenes* survival in concentrated citrus juice (CCJ), at pasteurization temperatures and times. CCJ (lemon, orange, and grapefruit) samples were characterized. CCJ samples were inoculated with pathogens after heating at test temperatures. Appropriate amounts were taken at different times to carry out enrichment and bacterial counts in selective media. The tests were conducted at two pasteurization temperatures, 79 and 80°C for lemon samples and 90 and 91ºC for orange and grapefruit juices. The results were checked by inoculating the bacteria in juice samples without heating. CJJ characterization rendered the following: pH: 2-4; conductivity: 2 mS/cm and total solids: between 55 and 62% Brix. *E. coli* and *L. monocytogenes* were detected in inoculated CCJ samples without heating (controls), but not in samples heated at different pasteurization temperatures.
These results were supported by immunocromatography, a technique validated by AOAC.

239.

EFFECT OF VITAMINS A, C AND D ON BLOOD PRESSURE IN LEAD CONTAMINATED RATS

Gandur MJ, Bobillo Odstrcil N, Martínez Riera N, Sant Yacumo R. Dpto. Salud Pública (Or.Toxicología) Fac. de Medicina UNT Av. Roca 2100. CP 4000, Tucumán. E-mail: santyac1402@hotmail.com

Several studies suggest that vitamins are effective in mobilizing lead from many tissues. In this respect, vitamin A would seem to behave as a potent antioxidant, Vitamin C has been shown to neutralize effect of lead, and Vitamin D would improve calcium metabolism. The aim of this study was to evaluate the effect of vitamins A, C and D on blood pressure and other variables in lead contaminated rats. The sample consisted of twelve Wistar stock rats equally divided into three groups: group I was given 500 ppm of lead acetate in the drinking water. Group II was given lead and vitamins A, C and D; Group III was the control group (without lead or vitamins). The treatment lasted for six months. Blood pressure, calcium and fibrinogen were measured at the last stage of the study. Rats in Group II increased their blood pressure values, but this increase was significantly lower than the one in the animals in Group I (136±1.41 mmHg vs. 147.5 ±8.66 mmHg, P <0.01). Calcium levels in Group II were significantly higher than in Group II (8.42±0.05 mg/dl vs. 7.09±0.01 mg/dl, P <0.001). This may be due to either the effect of vitamin D or to the fact that vitamin C increased lead excretion, which improved calcium availability.

240.

AN INNOVATIVE EXPERIENCE IN THE TEACHING OF NUTRITION. DEGREE ON: "OPEN DOOR"

Olaya L, Sant Yacumo R, Neme R, Olaya MA, Passarell N.
Carrera de Especialización en Nutrición, Fac. de Medicina Lamadrid 875, 4000 Tucumán. E-mail: olayalo@uolsinectis.com.ar

Introduction: Practice in the specialization on nutrition has to match efficiency and skills. For this purpose, certain activities called "Open Door techniques" were designed. These activities deal with cooking methods.
The aim of this experience was to carry out methods of elaboration and preparation of food in unconventional places tending to acquire abilities associated with theoretical knowledge.
Methods: Forty-four professional students attended this skills program together with students from the Instituto Americano de Chefs. They carried out methods of elaboration and preparation of meals under the supervision of professional chefs.
Results: The performance of the activities was excellent and was recognized as such by the people responsible for the Institute and the teachers of Nutrition Specialization, since their approval was necessary as part of the activities included in this Unit. Finally, the corresponding results were reported and the compulsory skill exercises were carried out.
Conclusion: this experience created a different scenario where the advantages and virtues of sharing and of interdisciplinary work were supported and the essential skills in the art of cooking were achieved.

241.

STIMULATION OF BIOFILM FORMATION BY HYDROCARBON DEGRADING STRAINS IN THE PRESENCE OF SQUAMOCIN

Rodriguez A[1,2], Riva Mercadal JP[2], Cartagena E[1], Ferrero M[2], Neske A[1], Bardón A[1].
[1]FBQyF, UNT. [2]PROIMI-CONICET. E-mail: aneske@fbqf.unt.edu.ar

Previous studies have shown that annonaceous acetogenins (ACGs) stimulates biofilm formation in a *P. aeruginosa* strain of clinical origin.

ACG squamocin is structurally related to the γ-lactones, a family of bacterial autoinducers that play an essential role in the quorum sensing mechanism to coordinate the biofilm maturation. In this work, 37 polycyclic aromatic hydrocarbon degrading strains were tested for their attachment capability and biofilm development on polystyrene microplates using squamocin as a biofilm inducer.

Out of the 37 strains tested, 22% showed natural formation of bacterial biofilms that increased in the presence of squamocin, in some cases up to 40%. In the remaining 12 strains over 60% showed an increase in biofilm production and were therefore selected for future studies.

242.

CYTOTOXIC EFFECTS OF ACANTHOSPERMAL B ON BLOOD AND TUMOR CELLS

Arena ME[1], Gobbato N[2], Cartagena E[1], Caram MM[3], Gonzalez ML[3], Bardón A[1], Valdez JC[2].
[1]Cátedra de Química Orgánica III; [2]Cátedra de Inmunología. Facultad de Bioquímica, Química, Farmacia y Biotecnología, UNT. Ayacucho 471; [3]Unidad de Citometría de Flujo, UNT. E-mail: arename@fbqf.unt.edu.ar

The main compound of the chloroform extract of the American herb *Acanthospermun hispidum* DC is the sesquiterpene lactone Acanthospermal B (AcB), which displayed bacteriolytic effects on a wild strain of *Staphilococcus aureus* (F7 methicillin-resistent). We investigated the effects of AcB on blood and tumor cells. Polymorphonuclear (PMN) and mononuclear (MN) cells were isolated from human blood. The tumor cells (CTM3) were obtained by enzymatic digestion from a breast cancer (M3) in Balb/c mice. Peritoneal macrophages (PMo) were obtained from normal Balb/c mice. Suspensions of 10^6 cells/ml of each kind were incubated in RPMI 1640 media plus 10% fetal bovine serum and gentamicin 100ug/ml of AcB for 12 h at 37°C in the presence of 0 (control), 10, 50 and 100 µg/ml of AcB. The viability of the human PMN and MN was determined by flow cytometry and iodure propidium and the viability of mice cells (P Mo and CTM3) by trypan blue vital stain. In the presence of 100 µg/ml, a decrease of 45 and 16% in the viability of PMN and MN was observed. Viability decreased 26 and 40% in PMo and CTM3 cells in relation to the control. The highest concentration tested showed a significant but non selective cytotoxic effect on tumor and PMo mouse cells. However, the cytotoxic effect was selective for human leukocytes (PMN are more sensitive to AcB that MN). This selectivity correlates with the effect of other sesquiterpene lactones on human leukemia (HL-60). Further studies are needed to determine AcB cytotoxic effects on different human leukemia.

243.

ENZYMATIC TREATMENT OF THE CONNECTIVE TISSUE COVERING THE NERVOUS SYSTEM OF *Spodoptera frugiperda*

Arena ME[1,4], Popich S[1,2], Planas L[3], Riobo IP[3], Nicola Siri L[3,4], Bardón A[1,4].
[1]FBQF, UNT. Ayacucho 471; [2]Universidad Nacional de Chilecito; [3]Facultad de Ingeniería, UNER; [4]CONICET.
E-mail: sbp@fbqf.unt.edu.ar

The study of the nervous system of insects is an interesting way to regulate insect feeding behavior. The nerve stimulation is transmitted by electrical impulses that generate a membrane potential, inducing biological stimuli such as hunger. In order to measure changes in the nervous system generated for different agents, we established the steps necessary to measure membrane potential in the nervous system of *S. frugiperda*, an important corn pest in Argentina. The central nervous system of insects is covered with a transparent layer of dense connective tissue that presents mechanical resistance to penetration. To penetrate the neural ganglia we manufactured microelectrods with the adequate diameter. In order to disintegrate the connective tissue, we conducted various tests documenting the enzymatic action as a function of time: Test 1) collagenase (0.5%); 2) collagenase (5%), 3) mixture of collagenase (0.6%) and protease (0.06%). The tests were carried out for 10 min and the enzymatic action was photographed at 1 min intervals. Treatment with collagenase (5%) resulted aggressive for the nervous tissue and disintegrated the connective tissue but also the neural ganglion, a fact assessed by observation of single neurons which showed structural discontinuity. Treatments 1 and 3 enabled penetration of microelectrods inside neuronal ganglia. This is the first report on the investigation of electrophysiological responses to stimuli in *S. frugiperda.*

244.

IDENTIFICATION OF AGENTS RESPONSIBLE FOR BIODETERIORATION IN A HISTORICAL MONUMENT

Parrado MF[1], Biasuso AB[1,2], Hladki AI[1].
[1]Fundación Miguel Lillo, Miguel Lillo 251, San Miguel de Tucumán, CP 4000; [2]Fac. de Ciencias Naturales e IML.
E-mail: mfparrado@hotmail.com

This work is part of the project "Restoration and Integral Revaluation of the The Indian Monument", located in the provincial route 307 to Tafí del Valle, Tucumán, Argentina. It is the work of the argentine sculptor Enrique Prat Gay from 1943. Data on preservative restorations is very scarce in South America. In Argentina, we can only refer to the works of Hladki (2000) and Rosato (2006).

With the purpose of identifying the causing agents of biodeterioration, 3 introspections were carried out, 30 samples were also collected taking into account the different levels and orientations of the sculpture. As a result of this study, based on the recognition *in situ* and their later exam in the laboratory, 23 taxa were registered: Dicotyledonae (*Parietaria debilis*, Rosaceae), Monocotiledonae (*Cynodon hirsutus*, *Polypogon viridis, Sporobolus indicus*, *Tillandsia* sp.), Pteridophyta (*Polypodium tweedieanum, Thelypteris hispidula*), Bryopsida (*Bryum* sp.*, Bryum argenteum, Hyophila* sp*, Racopilum tomentosum, Sematophyllum* sp., *Tortula* sp.), Fungi (*Alternaria alternata, Aspergillus niger, Chaetopsis* sp.*, Cylindrotrichum sp., Kylindria* sp., *Mucor* sp.*, Nigrospora* sp.) and lichens (*Leptogium sp., Rhizocarpon sp.*).

245.

IMPROVEMENTS IN RADIOMETER PROTOTYPES BUILT IN TUCUMÁN

Grimolizzi OM, Frenzel de Llomparte AM*.*
**CONICET – Instituto de Riesgo Geológico y Sistematización Territorial, Facultad de Ciencias Naturales e Instituto Miguel Lillo, Universidad Nacional de Tucumán. Miguel Lillo 205, Tucumán. E-mail: grimolizzi@aol.com*

Introduction: In year 2006, two radiometer prototypes for solar ground level UV radiation detection were built and successfully completed field tests. Equipments were redesigned to include automatic data acquisition and recording capabilities.
Objectives: Design, construction and use of solar UV automatic radiometers for use in air transparency and ground radiation measurements between 210 nm and 400 nm.
Materials and methods: Radiometers operate on new UV photodetectors with in- built diffuser lenses and improved signal preamplification. They provide up to 96 hours of automatic acquisition and recording if set to operate every 5‘ interval, with PC or pen driver data discharge. They include a carcass with a turret to avoid albedo errors, data display, and a simplified calibration process. Relative air transparency measurements were obtained by comparison of solar UV radiation data from Tafí del Valle and different air polluted sites in the province.
Results: Radiation data revealed that air transparency for Tafí del Valle was between 2 and 12 times higher than those from other reading sites. There are other improvements in prospect such as multiple band readings of solar UV spectrum and underwater operation.

246.

ANTIBACTERIAL ACTIVITY OF TWO PLANT SPECIES COLLECTED FROM HUACA HUASI, TUCUMAN, ARGENTINA

Solórzano RE[1], Zampini IC[1,2], Cuello S[3], Ordoñez RM[1,2], Isla MI[1,2].
[1]Cátedra Fitoquímica. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Tucumán. Argentina. [2]CONICET. [3]ANPCyT. E-mail: misla@fbqf.unt.edu.ar

In the last few years multiresistant strains to commercial antibiotics havee appeared in Argentina. Considerable attention has been devoted to natural products such as medicinal plants with antibacterial properties. The present study was conducted to investigate the antimicrobial activity of *Tetraglochin cristatum* and *Chiliotrichiopsis keidelii* against multiresistant Gram-negative and Gram-positive bacteria isolated from clinical samples obtained from a hospital in San Miguel de Tucumán.
The plant material was collected at 1500 m above sea level in Tucumán, Argentina and macerated in ethanol 80º for 7 days at room temperature. Minimum inhibitory concentration (MIC) was determined by agar macrodilution assays. The MIC values were 300 to 1200 μg/mL. The *Chiliotrichiopsis keidelii* extract showed greater antibacterial activity against Gram-negative bacteria and *Tetraglochin cristatum* extract showed greater activity antibacterial against Gram-positive bacteria. In previous works we demonstrated that these phytotherapeutic agentsc also present activity as free radical scavengeers. Consequently, these tinctures could be used as antibiotics for topical use.

247.

METAL ANALYSIS IN SUGAR SAMPLES

Arrieta Dellmans R, Mustafa V, Vargas Aquino A, Juárez G, Kamiya N, Ruiz M, Cárdenas G.
Estación Experimental Agroindustrial Obispo Colombres. Las Talitas, Tucumán. E-mail: quimica@eeaoc.org.ar

Markets currently demand quality controls on sugar as a final product or as raw matter for food industries. Constraints specified by the Código Alimentario Argentino (CAA) on white sugar are: <1 mg/kg arsenic, <2 mg/kg copper and <0.5 mg/kg lead, whereas no restrictions are specified for iron. Reference can be made to limits imposed by international soft drink industries, namely 1 mg/kg iron. In this work, arsenic, copper, iron and lead concentration levels in sugar samples from Northwestern Argentina (NOA region) and the European Union (EU) were assessed. Arsenic and lead were assessed with ICUMSA (HGA-AAS) techniques and copper and iron with wet digestion and AAS with air-acetylene flame later on. NOA region samples of both plantation white sugar and white sugar showed arsenic, copper and lead levels within CAA specifications. Iron levels, however, were higher than 1 mg/kg in 60% of the samples. In all EU samples, arsenic, copper, iron and lead levels were lower than those specified earlier.

248.

CHARACTERIZATION AND BIOLOGICAL ACTIVITY OF PROPOLIS

González M, Albornoz AC, Albarracín P, Argañaraz Martinez E, Tereschuk ML, Baigorí M, Guzmán B.
FACET (UNT), FBQF (UNT). PROIMI. Tucumán, Argentina. E-mail: mago@fbqf.unt.edu.ar

Propolis is a resinous bee product. The aim of this study was to characterize propolis samples from different geographical zones produced by various kinds of *Apis mellifera* and test them against gram (+) and gram (-) bacterias. Propolis samples were collected from Cuba, Trancas, Manantial and Amaicha del Valle. Ethanolic extracts were prepared at 100 mg / mL concentration. UV scanning, two-dimensional chromatography and antibacterial activity against *S.aureus, E. coli., S. faecalis* and *P. aeruginosa* were carried out in Müeller Hinton agarized medium. For the Trancas samples the UV scanning showed a peak near 293 nm, Cuban propolis another one near 280nm and Amaicha del Valle bee glue showed an enveloped curve between 294 and 345nm. Chromatographic profile demonstrated high concentration of aglicones, flavonols and chalcones. All propolis showed similar antibacterial activity against almost all the strains studied due to the presence of flavonoids, with proved biological activity.

249.

HISTOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY OF THE STOMACH AND ANTERIOR INTESTINE OF PEJERREY (*Odontesthes bonariensis*)

Castagnino R, De la Cruz J, Dauria P, Sona L, Mac Loughlin V, Bonino F.
Histology-Dpto. of Anatomy Animal, FAV-UNRC. (5800) Río Cuarto. E-mail: rcastagnino@ayv.unrc.edu.ar

The morphology of the digestive tract of fish is very variable. Pejerrey is a species that has acquired great socioeconomic importance, so it is interesting to know its biology and the chemical substances involved in its alimentary process. The objective of this work was to determine the structural and functional characteristics of the stomach and the first portion of the anterior intestine of this species. Samples of the stomach and intestinal region of adult pejerrey were extracted, fixed in formol buffer 10% and processed with conventional histological techniques and with immuhistochemical techniques for the gastrin determination. The stomach presents a mucous simple epithelium and the esophagus a grooved muscular tunic. The region of the anterior intestine changes its epithelium to cylindrical pseudoestratified while the muscular region continues being formed by grooved muscle in the first tract and then changes to flat muscle. Gastrin showed negative reaction in the stomach and positive in the anterior intestine. We concluded that the stomach is probably a simple food passage and that the anterior intestine plays an active role in digestion.

250.

FLAVONOIDS AS PHYTOCHEMICAL PARAMETERS FOR COMMERCIAL SAMPLES OF "SOMBRA DE TORO" (*Jodina rhombifolia*)

Lizarraga E, Quarenghi MV, Tereschuk ML.
Fac. Cs. Naturales e I.M.Lillo. UNT. Tucumán. Argentina. E-mail: qob@csnat.unt.edu.ar

J. rhombifolia (Santalacea), known as "sombra de toro", is considered as a phytotherapeutic medicament by ANMAT. Quality control, with morphological, anatomical, and phytochemical analyses, is necessary to validate it. The aim of this study is to determine the value of flavonoids as phytochemical parameters to distinguish between wild and commercial samples. Both of them were from Salta. Flavonoids were extracted with EtOH. Chromatographic separation was made in cellulose plates with TBA (3:1:1) and HOAc 15% and revealed with UV and NP Reagent.
The chromatographic profiles of flavonoids from both samples were similar. However, there were variations in the concentration of 3-O diglycosylated compounds, while 7-O and 3-O-monoglycosylated compounds presented no changes. This behavior led us to consider that hydrolysis in the disaccharide moiety could be due to an inadeequate drying process, which is necessary for storage. We concluded that flavonoids will be useful tools as phytochemical parameters.

251.

HISTOMORPHOLOGY OF TESTIS IN THE GASTROPOD *Pomacea bridgessii*

Valdez I, Pucci Alcaide A, Winik B, Catalán M.
Fac. Ciencias. Naturales. UNT. E-mail: catalan@csnat.unt.edu.ar

P. bridgessii is a diecious oviparous South American amphibian gastropod. The aim of this work is to study the microscopic structure of *P. bridgessii* testis, processing the samples with routine histological technicque. The testis, covered by a cubic ephithelial monolayer, presents numerous seminiferous tubules formed by Sertoli and germinals. cells The former are irregular in shape and present a voluminous nucleus with one or two nucleoli and a slightly acidophilous cytoplasm. The germinal cells generate simultaneously three types of sperm. Eusperm have an elongated head, helicoidally folded, and a long tail. The apyrene paraesperm have no nuclei and present a fusiform body and a caudal tuft of flagella. The oligopyrene parasperm present a pyriform head with residual chromatine and a long tail with a robust middle piece. Conclusions: The spermatic polymorphism of *P. bridgessii* implies the occurrence of different spermatogenic mechanisms. Eusperm have the typical morphology of introsperm. As in *P. canaliculata*, *P. bridgessii* presents two types of parasperm, although apyrene parasperm have a greater number of flagella.