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Abstracts from the

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**L1.****“Miguel Lillo” Lecture****REGULATION OF NON-GENOMIC SIGNAL TRANSDUCTION CASCADES BY THE HORMONE  $1\alpha,25(\text{OH})_2$ -VITAMIN  $\text{D}_3$  IN SKELETAL MUSCLE***Boland R.**Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur. (8000) Bahía Blanca, Argentina. E-mail: rboland@criba.edu.ar*

Vitamin  $\text{D}_3$  results from the conversion of 7-dehydrocholesterol in the skin during exposure to ultraviolet light. After this photochemical synthesis, the steroid is transported to the liver where it is converted to  $25(\text{OH})$ -vitamin  $\text{D}_3$ , which is subsequently transformed in the kidney into the hormonally active form  $1\alpha,25(\text{OH})_2$ -vitamin  $\text{D}_3$  [ $1\alpha,25(\text{OH})_2\text{D}_3$ ].  $1\alpha,25(\text{OH})_2\text{D}_3$  acts through a genomic mechanism mediated by an intracellular receptor (VDR), typical of steroid hormones, and also elicits rapid effects on intracellular calcium fluxes which are independent of gene transcription. In addition to the regulation of extracellular calcium homeostasis, in concert with PTH and calcitonin,  $1\alpha,25(\text{OH})_2\text{D}_3$  exerts direct actions on skeletal muscle. Weakness and atrophy of proximal musculature are characteristic symptoms of rickets, osteomalacia and chronic renal insufficiency. In agreement with these clinical observations, it has been demonstrated experimentally that  $1\alpha,25(\text{OH})_2\text{D}_3$  regulates the contractility and growth of muscle. As in classic target tissues (e.g. intestine), in muscle cells the presence of the VDR has been detected and the operation of genomic and non-genomic mechanisms which mediate the effects of the hormone has been shown.  $1\alpha,25(\text{OH})_2\text{D}_3$  stimulates growth through activation of proliferation and differentiation of myoblasts. The hormone rapidly regulates muscle contraction by increasing intracellular calcium levels, which trigger this process. In the modulation of the  $\text{Ca}^{2+}$  messenger system,  $1\alpha,25(\text{OH})_2\text{D}_3$  activates voltage-dependent channels through phosphorylation, a process similar to the one in the intestine. However, in muscle, recent evidences have involved the influx of  $\text{Ca}^{2+}$  across SOC (*store-operated channels*), whose regulation implies the participation of the VDR associated to supramolecular signaling complexes, a novel concept on the non-genomic mode of action of  $1\alpha,25(\text{OH})_2\text{D}_3$  and steroid hormones in general. Molecular studies on sequence analysis and transfection of antisense oligonucleotides coupled to microspectrofluorimetric measurements of intracellular  $\text{Ca}^{2+}$  as well as coimmunoprecipitation revealed that the SOC channels are composed of TRPC3 protein, which interacts with the VDR, calmodulin and kinases. Structural and functional data sustain the participation of an assembly macromolecule homologous to INAD protein containing anchorage PDZ domains. In support of the formation of complexes integrated by the VDR, the hormone rapidly induces translocation of the receptor from the nucleus to the plasma membrane. The regulation of skeletal muscle growth by  $1\alpha,25(\text{OH})_2\text{D}_3$  involves the activation of tyrosine phosphorylation cascades. It has been demonstrated that, in myoblasts, the hormone stimulates the signaling pathway Ras/Raf-1/MEK/ERK1/2 (classic MAPK cascade), an effect which requires the participation of the VDR, c-Src,  $\text{Ca}^{2+}$  and the alpha isoform of PKC.  $1\alpha,25(\text{OH})_2\text{D}_3$  activates c-Src, promoting its association to the VDR. ERK1/2 phosphorylated through this mechanism migrates to the nucleus, where it induces the expression of the proto-oncogen c-myc, a potent regulator of cell proliferation. More recent studies have evidenced that the action of the hormone also implies the MAPK p38 and JNK cascades.

**L2.****Opening Lecture****BIOLOGY, SCIENCE AND TECHNOLOGY***Rush AA.**Universidad Nacional de Tucumán. E-mail: alanarthur.rush@gmail.com*

The talk has no dogmatic intention. Rather, it is an invitation to address a presumably very complex and grave set of issues in plural and critical debate. In much recent metascientific literature -of an historical, social, epistemological etc. nature- a historical mutation of the mode of production of knowledge is proposed. Supposed to emerge in the mid-twentieth century, it would have achieved dominance by the XXIst century. “Technoscience”, “postmodern science”, “mode 2” of knowledge production, “postnormal science”, etc. are some of its names. This new mode is supposed to unfold as applied science from the start, and as such it would be contextual, inter- or trans-disciplinary, with a plurality of quality criteria, disseminated in a variety of increasingly private production sites, but involving at the same time a new participation -mostly of a critical nature- of consumers and citizens, etc.

Marie-Monique Robin: *Le monde selon Monsanto* (2008), interests us in at least two ways. First, it throws abundant light -of a most worrying and polemical nature- on the socio-economic, political, and ecological implications of Monsanto’s worldwide hegemony in genetically modified seeds. Second, it can be construed as a case study of the supposedly new “mode of production” of knowledge, the new interrelation of academic and private science; of money, power and society.

**L3.****Lecture 1****METABOLIC ASPECTS OF BOVINE OOCYTE *IN VITRO* MATURATION (IVM)***Cetica PD.**Area of Biochemistry, INITRA, School of Veterinary Sciences, UBA. E-mail: pctetica@fvet.uba.ar*

Bovine embryo *in vitro* production (IVP) consists of three main stages: IVM, fertilization and embryo development. This technique is not only relevant as a trading method for cattle, but also for the development of other derived biotechnologies. However, IVP is not completely effective; one of the most important factors is a deficient IVM. Oocytes are surrounded by cumulus cells, forming a morpho-functional syncytium known as cumulus-oocyte complex (COC). During IVM cumulus cells act as nurse cells sending nutrients and regulatory molecules to the oocyte. Metabolic changes produced during IVM would determine the maturation capacity of the female gamete. Cumulus cells consume glucose from IVM medium and produce metabolites that are used by the oocyte. Although the oocyte was supposed to be selective regarding the use of these compounds (mainly pyruvate), recent evidence supported by enzymatic and IVM studies suggest that it has the capacity to use a wider variety of substrates (lactate, malate, oxaloacetate, isocitrate, amino acids). Metabolic studies based on glucose uptake, product formation and enzyme modulators indicate that glycolysis would be the main fate of the glucose consumed by the COC and its activity would be related to the IVM capacity of the oocyte. However, other metabolic routes for glucose use such as hexosamine and pentose phosphate pathways would also be implicated in IVM. Further knowledge of metabolic requirements of bovine COC during IVM would contribute to optimize embryo IVP.

**L4.****Lecture 2****PARTICIPATION OF THE COELIAC GANGLION IN THE PERIPHERAL NEURAL MODULATION OF THE OVARY PHYSIOLOGY IN PREGNANT RATS***Casais M.**UNSL- CONICET. E-mail: mcasais@unsl.edu.ar*

The ovary receives innervation from the superior ovarian nerve (SON), and the SON fibers undergo synapsis in the coeliac ganglion (CG). Specific purposes: 1- to standardize an *ex vivo* CG-SON-Ovary system that emulates *in vitro* the peripheral neural regulation of the ovary; 2- to investigate the action of adrenergic and cholinergic agents in CG on the release of ovarian progesterone ( $P_4$ ) and androstenedione ( $A_2$ ) during the second half of pregnancy; 3- to investigate the effect of noradrenaline on CG and LH in ovary on the release of  $P_4$  and catecholaminergic neurotransmitters (Nts) on day 15 of pregnancy, and 4- to analyze if  $A_2$ , by the neural pathway, is capable of rescuing the pregnancy corpus luteum from functional regression. The CG-SON-Ovary system was placed in a cuvette with two separate compartments and incubated for 180 min. At 30, 60, 120 and 180 min, the ovarian incubation liquid was extracted to determine  $P_4$ ,  $A_2$ , Nts and nitric oxide (NO). After incubation the corpora lutea were extracted to determine activity and expression of  $3\beta$ HSD and  $20\alpha$ HSD. The histological study showed the existence of CG in the system with its own neural tone, which was modifiable by stimulation. The release of  $P_4$  and  $A_2$  was more affected by the noradrenergic stimulus, which reinforced the inhibitory effect of LH associated with marked changes in the liberation of Nts in ovary. Immunohistochemistry revealed the presence of androgen receptors in neuronal somas of CG. The physiological study demonstrated that  $A_2$  in CG modifies the biosynthesis of  $P_4$  with an increase in NO. This work demonstrated a coordinated action of neural and endocrine signals on the regulation of steroidogenesis and luteal regression in pregnancy.

**L5.****Lecture 3****IMMUNE-ENDOCRINE REGULATORY FACTORS DURING PREGNANCY***Luchetti C, Grosso C, Martinez M, Cuello MF, Vivas A.**Lab. de Radioisótopos -Depto. de Anatomía Animal- FAyV- UNRC. E-mail: avivas@ayv.unrc.edu.ar*

A refined immune-endocrine regulation is required during pregnancy. There are many factors involved such as hormones, growth factors and cytokines in maternal immune tolerance to the fetus. In swines during implantation there was an increase in T CD4<sup>+</sup>CD8<sup>+</sup> and CD4<sup>+</sup>CD8<sup>high</sup> subpopulations in peripheral blood compared to non-pregnant females; at the uterine level there was an increase in T CD4<sup>+</sup>CD8<sup>+</sup> and CD4<sup>+</sup>CD8<sup>high</sup> and a Th2/3 profile at ten days after implantation. During post-implantatory early pregnancy this profile is regulated by progesterone-dependent proteins such as progesterone-induced blocking factor (PIBF), whose lack in murine implantation sites showed a correlation with a Th1 profile, an increase in cyclooxygenase 2 and in prostaglandine F/E rate, an increase in nitric oxide and oxidative stress. Insulin growth factor (IGF) system, IGF-I and II, plays an important role in differentiation, proliferation and metabolism. In swines IGF-I showed to be a placental hystotrophic factor and IGF-II regulated fetal growth and development. Early pregnancy factor (EPF), which is an immunomodulator growth factor, was increased from the preimplantational stage to the end of fetal growth, at 90 days. It was localized in oviduct and placenta and its blocking showed a correlation with a Th1 profile. These results show the important role of maternal immune-endocrine regulation, whose disturbance could be responsible for numerous pregnancy failures observed. A possible strategy for preventing this is the nanostructured delivery of avian antibodies.

**L6.****Lecture 4****METRONOMIC CHEMOTHERAPY: CHANGING THE PARADIGM IN THE TREATMENT OF MALIGNANT TUMORS***Rozados V.**Sección Oncología Experimental, Instituto de Genética Experimental. Facultad de Ciencias Médicas. UNR.*

The introduction of the maximum tolerated dose in usual treatment protocols and its concomitant overt toxicity have made it necessary to impose rest periods between cycles of therapy which not only involve re-growth of tumor cells but also growth of the selected clones resistant to the therapy. In order to avoid the problems caused by the traditional chemotherapeutic regimens, a new modality of drug administration named by Douglas Hanahan: "metronomic chemotherapy" (MCT) has been proposed. MCT refers to the administration of chemotherapy at low, nontoxic doses on a frequent schedule with no prolonged breaks. In our laboratory we studied the clinical efficacy, toxicity and the mechanisms of action of metronomic administration of low-dose cyclophosphamide (Cy) and doxorubicine alone or in combination with Celecoxib in different murine tumor models. The administration of MCT eradicated established tumors or delayed their growth and the treatment showed a very low toxicity profile. We demonstrated not only an antiangiogenic effect but also, when Cy was used, an immunomodulating effect. At present, we are evaluating the effect of MCT with oral Cy (50mg/day) and Cel (400mg/day) in a clinical phase I/II protocol for patients with advanced mammary adenocarcinoma. Also, biomarkers such as circulating endothelial and endothelial progenitor cells, vascular endothelial growth factor and thrombospondin-1 are being studied. Preliminary results suggest a good tolerability without significant toxicity.

**S1-1.****COMPREHENSIVE MOLECULAR STUDIES IN 21-HYDROXYLASE DEFICIENCY: LESSONS DERIVED FROM MORE THAN TEN YEARS OF EXPERIENCE**

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Congenital adrenal hyperplasia (CAH) due to 21-hydroxylase deficiency accounts for 90–95% of CAH cases (New *et al.* 1989; Miller, 1994). This autosomal recessive disorder, which is the most frequent inborn error of metabolism, has a broad spectrum of clinical forms, ranging from severe or classical, which includes the salt-wasting (SW) and simple virilizing (SV) forms, to the mild late onset or nonclassical (NC) one. Gene CYP21A2 encoding active 21-hydroxylase enzyme, and a pseudogene, CYP21A1P with 98% nucleotide sequence identity, are located on chromosome 6p21.3. Due to the high degree of homology between the gene and the pseudogene, most of the disease-causing mutations described are likely to be the consequence of non-homologous recombination or gene conversion events. Due to the great number of mutations in the CYP21A2 gene, most of the patients are compound heterozygotes, with the phenotype of the affected individual dependent on the underlying combination of mutations. The aim of our study is to fully characterize the molecular defects leading to 21-hydroxylase deficiency in a group of Argentine patients. Up to date, more than 350 affected families have been studied for the most frequent mutations in the CYP21A2 gene, and 93%, 89%, and 68% of alleles from SW, SV and NC patients, respectively, were characterized. Compound heterozygosity with a severe mutation was found in almost half of NC patients. In addition, after fully sequencing some of the DNAs from patients with at least one non-determined allele, 5 novel point mutations were found. Relevance of the molecular studies will be discussed.

**S1-2.****PREIMPLANTATION GENETIC DIAGNOSIS**

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Preimplantation Genetic Diagnosis (PGD) of the human embryo begins with *in vitro* fertilization (IVF) and embryo selection before transfer to the uterus. It is estimated that 50% of implanted embryos have chromosomal anomalies and it is thought that analysis of embryo aneuploidy is useful for embryo selection; however, its clinical value is still unclear.

PGD is useful to determine whether an embryo is affected with a disorder with major risk for it. The anomaly may be chromosomal or genetic, and the approach, FISH technique and PCR, respectively. Nowadays, PGD has become for both fertile and infertile couples an alternative to prenatal diagnosis to prevent the birth of children with genetic disorders that can manifest themselves at birth or during childhood or adulthood. In this regard, it could be said that the indications for PGD are similar to those of conventional prenatal diagnosis, but we are also witnessing an increase in PGDs with no medical reason, such as sex selection and HLA typing. Another difference is the more frequent indication of disorders with dominant inheritance, late onset disorders, or predisposition to certain tumors. It has been estimated that around 5000 children worldwide were biopsied during the preimplantation stage. Diagnostic accuracy is high, with an average of above 95%. The achieved ongoing pregnancy rate of 19% is similar to that of fertile couples. There is no greater incidence of malformations associated with embryo biopsy. The majority of the motivations were associated with increased genetic risk and a minority with improving reproductive success in IVF treatments.

**S1-3.****A TUCUMANIAN EXPERIENCE IN THE FIELD OF HUMAN GENETICS**

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The development of Human Genetics in the Faculty of Medicine of the UNT reflects a multifaceted vision. In the '60s the Chair of Biology, Genetics and Embryology was created. Extension activities began in the '70s and continue today. There were human resources to be formed, so the specialization of several professionals was promoted and supported. The Genetics Section was created in 1984, the Chair of Genetics in 1990, and finally the Julio Olmos Medical Genetics Center, in 2000. The author became associated with this enterprise as a student. After graduation, he joined the Genetics Section coordinated by Julio Olmos, defined in 1991 the academic project of the Genetics Orientation, designed and led its research projects since 1998, and directed the Medical Genetics Center until its closure. Starting in 2004, the Genetics Orientation took over most activities of the Center. Project 228 of the PME 2003, cooperation agreements inside and outside the UNT, interinstitutional and international academic work and the GENRED project are some of its ongoing initiatives.

**S2-1.****NUTRITION OF PENAEOID SHRIMP: DEVELOPMENT OF NEW LINES OF RESEARCH***Fenucci JL.**Departamento de Ciencias Marinas, Universidad Nacional de Mar del Plata - CONICET. E-mail: jfenucci@mdp.edu.ar*

Aquaculture is the fastest growing food-producing sector in the world, having grown from a production of 1,000,000 tons in 1950 to 51,063,320 in 2006. Shrimp culture has an increase rate of 16.8% a year. In this activity, feeding is one of the main aspects to be considered because it represents between 40 and 50% of the total production costs. A high percentage of these costs is attributable to fishmeal, a main ingredient in the formulation of pelletized diets. Therefore, investigations have been carried out to replace fishmeal by other ingredients of lower cost such as soy, wheat, corn or products derived from the meat and poultry industries. These ingredients are deficient in some essential amino acids or fatty acids. For this reason, considerable research on the use of additives such as phospholipids, cholesterol, free amino acids, enzymes, etc. was made. Some diseases such as Taura and Taiwan syndromes and the white spot disease showed the inability of antibiotics to solve these problems. So, the use of immunostimulants in diets to increase the resistance of shrimp to bacterial and viral diseases is an important step to solve the problem. These compounds can be classified as a) activators of the immunological system, b) modulators of the immunological response, c) probiotics and prebiotics. In this work we summarized the results obtained using fishmeal as the main source of proteins in feeds for shrimp and the way in which it was replaced by different vegetable and animal meals. The importance of the addition of several additives such as vitamins, especially fat soluble, essential amino acids and fatty acids, cholesterol, phospholipids and several immunostimulants on the growth, survival and physiological condition of tropical shrimp and the species distributed along Argentine coastal waters, *Pleoticus muelleri* and *Artemesia longinaris*, are also discussed.

**S2-2.****INTENSIVE CULTURE OF FISH LARVAE UNDER LAB CONDITIONS***Sánchez S.**Instituto de Ictiología del Nordeste, FCV, UNNE. Sgto. Cabral 2139, Ctes., Argentina. E-mail: sanchez@vet.unne.edu.ar*

The culture of native freshwater fish represents an ever-increasing productive alternative in different northeastern Argentine regions. One of the fish species widely distributed is pacu (*Piaractus mesopotamicus*), whose annual production reaches approximately 1000 tons. Another species showing an adequate technological development is the South American catfish (*Rhamdia quelen*). Juvenile fishes of high quality and produced on a large scale are needed to guarantee the development of fish farming. In order to achieve this aim, nurseries have started to replace extensive culture in ponds by intensive lab culture or mixed systems with an initial intensive phase, increasing survival and reducing production costs. These activities are carried out at the INICNE laboratory, where different researches are developed, focused on fingerling production in high density systems under lab conditions. In the case of *R. Quelen*, it was possible to dispense with the use of live food by using artificial diets, reaching development levels higher than those obtained with *Artemia*. In the case of pacu, food rations enabling the replacement of live food have been developed. Nevertheless, the best growth was obtained with native zooplankton. In this species, the lab phase extends from 10 to 45 days, allowing us to program the rearing phase according to fingerling demand from the productive sector. Recently, assays to evaluate the probiotic effect of yeasts (*Saccharomyces*) were started. These studies will continue to use strains of others microorganisms isolated from different aquaculture systems.

**S2-3.****ADVANCES IN THE DESIGN OF PROBIOTIC PRODUCTS FOR APPLICATION IN RANICULTURE***Nader-Macias ME<sup>1</sup>, Pasteris SE<sup>2</sup>, Otero MC<sup>2</sup>, Bühler MF<sup>2</sup>**<sup>1</sup>CERELA - <sup>2</sup>INSIBIO-CONICET. Universidad Nacional de Tucumán. Argentina. E-mail: fnader@cerela.org.ar*

Lactic Acid Bacteria (LAB) are the dominant microorganisms in many human or animal ecosystems. Those showing beneficial properties can be included in the formulation of probiotic products for the restoration of the indigenous microbiota and prevention of infectious diseases. The objective of our research group is the design of probiotic products for application in raniculture. Based on the species-specificity exhibited by the indigenous microbiota, the isolation of LAB, *Bifidobacterium* sp., and spore-forming bacilli from different areas of a *Rana catesbeiana* hatchery and from the environment was performed. The beneficial properties related to the colonization ability together with the production of antagonistic molecules and exopolysaccharides were evaluated. The functional and technological properties were also studied. Some LAB that share some beneficial properties were selected and freeze-dried by using different cryoprotectors. The survival time and the maintenance of their beneficial properties during storage are being evaluated. The results obtained allowed us to have available certain LAB strains that share some beneficial properties. Further studies are necessary to know if the administration of potentially probiotic strains does not produce adverse effects on animals when administered by different routes (skin or gastrointestinal tract). It should also be evaluated if they are able to prevent infections, especially those related to the red-leg syndrome.

**Co1.**

**BIOGUIDED ISOLATION OF AN ELLAGIC ACID DERIVATIVE FROM *Caesalpinia paraguariensis* BARK INFUSION**

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In previous works we demonstrated the antioxidant activity and absence of toxicity of *Caesalpinia paraguariensis* bark infusion commonly used in popular medicine. The aims of this work were the bioguided isolation and purification of antioxidant (AO) components of *C. paraguariensis* bark infusion. The infusion was prepared according to FA VI Ed. AO activity was assayed by the DPPH method and expressed as 50% effective concentration (EC<sub>50</sub>). Lyophilized infusion was successively extracted with ethyl ether, chloroform and methanol (MF). The AO potential was determined in the fractions. Components of the MF were fractionated by Sephadex LH-20/methanol. The obtained fractions (I-XII) were analyzed by TLC autographic DPPH assay to detect AO components. Two compounds were isolated from FIII by RP-HPLC and analyzed by TLC and UV-Vis spectroscopy. Identity was confirmed by internal standards, HPLC (DAD) - MS (ESI) and NMR. Infusion and MF showed marked activity (EC<sub>50</sub>: 5.0 and 4.5 ppm, respectively). Gallic acid (1.15 ± 0.01 % p/p FIII) and 3,3'-di-O-methyl ellagic 4-O-β-D-xylopyranoside were identified. Their EC<sub>50</sub> were 0.5 and 0.2 ± 0.01 ppm, respectively. The identified compounds are reported for the first time for this species. Further studies of the AO activity of these compounds will be carried out.

**Co2.**

**STIMULATION OF PHAGOCYTES BY *Lactobacillus* STRAINS IN IMMUNOCOMPROMISED HOSTS**

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We evaluated the effect of different probiotic *Lactobacillus* (Lb) strains on the number and activity of phagocytic cells in mice immunosuppressed by cyclophosphamide (Cf). Lb *rhamnosus* CRL1505 (LR5), Lb *rhamnosus* CRL1506 (LR6) and Lb *casei* CRL431 (LC) were selected previously in immunocompetent mice. Adult mice were given LR5, LR6 or LC. After each treatment, these groups and the control mice (C) received an intraperitoneal (ip) injection of Cf (150 mg/kg) and were sacrificed at different times post-chemotherapy (for 15d). We studied: a) peritoneal macrophages (PMf) phagocytic activity, b) neutrophil number and peroxidase activity (Px) in blood, c) expression of Gr-1 in blood by flow cytometry, and d) *Candida albicans* (Ca) clearance after an ip challenge. Mice treated with the Lb strains showed a higher PMf activity compared to the C group (P < 0.05). Cf induced severe neutropenia and reduced the number of Px+ and Gr-1+ cells in blood. LC, LR5 and LR6 groups showed a less pronounced decline and earlier recovery of blood neutrophils, Px+ and Gr-1<sup>low</sup> cells (P < 0.05). In addition, treatments with Lb increased resistance to Ca challenge, since in these groups Ca counts in infected tissues were lower than in the C group (P < 0.05). Preventive administration of probiotic Lb strains was able to stimulate phagocytic cells in immunocompromised hosts. The increase in phagocyte activity would be able to improve resistance to infections.

**Co3.**

**SURVIVAL OF *Salmonella* Typhimurium IN CITRUS JUICE CONCENTRATES**

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All interested parties in the food system share the responsibility of insuring innocuous and nutritious foods throughout this chain. The aim of this work was to perform survival tests of *Salmonella* Typhimurium in citrus juice concentrates at the actual pasteurization temperatures/times used in citrus industries.

FDA and AOAC standardized methods were used for the detection of pathogens by microorganisms counts, enrichment and immunochromatography techniques. Samples of concentrated juices previously warmed up at different temperatures (79, 80, 90 and 91°C) were inoculated with the pathogen, collecting a volume adapted to different times (7, 15, 20, 24, 30 and 60 seconds). A control for each sample was performed by inoculating juice samples with no warming up.

No presence of the pathogen inoculated in the citrus juice concentrates was detected by microorganism counts or enrichment technique in the samples collected at the different times and temperatures. To confirm the effect of warming on the samples, the presence of *Salmonella* was analyzed in juice samples without previous warming up (controls), positive results being obtained. These results were confirmed by immunochromatography.

We can conclude that the conditions used would be the proper ones to eliminate the presence of *S. Typhimurium* in lemon, orange and grapefruit juice concentrates using a thermal process.

**Co4.**

**DETERMINATION OF PATHOGENIC STRAINS OF *Escherichia coli* AND ROTAVIRUS IN DAIRY CALVES IN THE VILLA MARIA BASIN (CORDOBA)**

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In Cordoba, bovine production is of foremost importance. One of the main etiologic agents of diarrhea is *E. coli*. Some bovine bacterial strains could infect humans and may be associated with other enteric pathogens such as Rotavirus (RV). The use of SDS-PAGE analysis showed the existence of a new viral genome, Picobirnavirus (PBV), whose pathogenic potential is unknown. The aim of this study was to obtain current data concerning neonatal diarrhea caused by pathogenic strains of *E. coli* and RV in newborn calves from Villa Maria. Samples of rectal swabs (n=77) transported in Stuart's medium were cultured in MacConkey agar and analyzed. Lac + colonies compatible with *E. coli* were biochemically characterized and DNA was extracted by heating. Virulence factors (LT, STb, STa, F17, eae, F5 and VTg) were identified by PCR. RNA extracted from fecal samples (n=96) was analyzed by SDS-PAGE with silver staining. 33.8% of *E. coli* strains were pathogenic (16.9% VTG-eae; 15.6% LT-STa-F17-F5, 1.3% eae). 66.2% were non-pathogenic intestinal *E. coli*. 2.1% of RV and 7.3% of PBV were found in fecal samples. The circulation of pathogenic *E. coli* could affect the productive capacity in artificial breeding and could have an impact on public health. The association between RV and PBV with diarrhea caused by *E. coli* should be studied in order to decrease mixed infections that cause great losses in newborn calves.

**Co5.****EFFECTS OF MEDICINAL HERBS ON THE SERUM COMPLEMENT ACTIVITY OF TURTLE (*Chelonis chilensis*)**

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Herbal medicines (HM) contain many active principles, some of which have been isolated and are used in the pharmaceutical industry. Others were never isolated but are used empirically. On the other hand, the serum of vertebrates has a defense mechanism (complement system) against pathogens able to kill bacteria through three pathways: the classical, the alternative and the lectin pathway. In a previous work we reported the spontaneous activation of the alternative pathway by the serum of amphibians and reptiles against mammalian erythrocytes. The aim of this work was to test the effects of infusions of HM on the serum complement activity of chelonians. The materials used were 28 HM with verified authenticity and turtle (*Chelonis chilensis*) serum. The methods consisted of hemolytic tests with blood serum collected from turtles and human erythrocytes as a target. Hemolysis was read in a spectrophotometer. The results showed that out of 28 herbs tested, 2 had no effect on lysis, 3 inhibited more than 75% complement activity, 3 inhibited between 75% and 50%, 5 inhibited between 50 and 25% and in five of them inhibition was <25%. Ten samples seemed to increase activity. We conclude that the alternative pathway of the turtle complement system can be differently affected by the active substances of the infusions tested, which opens an interesting field of research on how each of them carry out their effects on this experimental model.

**Co6.****PREPARATION AND VALIDATION OF PHARMACEUTICAL FORMS FOR TOPICAL USES WITH ACTIVE PRINCIPLES PURIFIED FROM *Tripodanthus acutifolius***

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Soaps and oil in water (O/W) emulsions are widely employed as preparations for topical uses. The active compounds incorporated should enable the obtainment of products with proved stability and biological activity. Two pharmaceutical forms (soap and O/W cream) with antibacterial activity and an O/W facial cream with free radical scavenging activity were prepared. Tripodantoxide [purified from *T.acutifolius* (Ruiz & Pavón) Van Tieghem leaves infusion] was the active substance incorporated. Organoleptic parameters (colour, odour, brightness), stability (in accelerated and non accelerated conditions), pH, extensibility and contamination tolerance were evaluated. Antibacterial activity was assayed on *Staph. aureus* (ATCC 25923) strains, while DPPH assay was employed for free radical scavenging activity assessment. Pharmacotechnical, organoleptic, pH and stability parameters were acceptable. No microbial contamination was observed over 6 months after preparation. *In vitro* assays showed antibacterial and free radical scavenging activities present in the products. The results showed that natural bioactive compounds could be incorporated into stable and bioactive pharmaceutical forms.

**Co7.****EFFECT OF POLYPHENOLS ISOLATED FROM *Baccharis incarum* AGAINST HYALURONIDASE ACTIVITY**

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*Baccharis incarum*, widely distributed in the American continent, is popularly used as an anti-inflammatory agent, as a protective agent against liver, prostate and stomach diseases, in burns, skin wounds and ulcers, and to alleviate gout and arthritic pain. The aim of the present work was to evaluate the inhibiting capacity of the alcoholic extract of aerial parts of *B. incarum* and seven compounds isolated from it on the activity of hyaluronidase, an enzyme involved in chronic inflammatory processes such as rheumatoid arthritis.

Hyaluronidase activity was assayed by estimating the amount of N-acetylglucosamine released from the potassium hyaluronate substrate. The results expressed as percentage of residual activity were compared with those obtained with commercial anti-inflammatory drugs and antioxidant phenolic compounds.

The extract of *B. incarum* showed a dose-dependent inhibitory effect on the enzyme, with a percentage of residual activity of 43% with 300 µg of phenolic compounds. Among the seven pure compounds investigated, chlorogenic acid showed an inhibitory effect on the enzyme activity (8% of residual activity with 300 µg). The effect was higher than the one observed for the crude extract and the positive controls (indomethacin and quercetin). The results obtained would validate the popular use of *B. incarum* as an anti-inflammatory agent.

**Co8.****ABILITY OF THE DOMESTIC BEE (*Apis mellifera*) TO FACILITATE PLANT BREEDING PROCEDURES IN *Lotus tenuis***

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*Lotus tenuis* is a component of the natural grasslands of the Depressed Plateau (Pampa Deprimida, Buenos Aires Province). It is an allogamous forage legume with entomophilic pollination. Its small flowers make hand hybridization difficult. Besides, it is interesting to explore the role of bees to facilitate genetic investigation and plant breeding procedure in *L. tenuis*. The aim of this work was to test bees manipulation in confinement to achieve descendants among selected genotypes. The experience was carried out in the open air. We evaluated seed/plant yield, umbels/plant, pods/umbel and weight of 200 seeds, in 2 groups of 6 genotypes each of *L. tenuis* under 2 situations during the reproductive period: (A) inside a cage with a baby beehive (bbh) and (B) exposed to outside space pollinators. The cage was 1.5 x 1.5 x 1m with an iron frame and covered with a plastic mosquito net. The bbh was 17 x 27 x 15 cm with 3 empty manufactured squares, each with 10 x 19 cm of wax surface, without honey, nectar or pollen and with an empty feeder. The bbh population was 100 gr of bees and a fertilized queen. At the end of the experiment the bee population was 110 gr. Two squares showed eggs, larvae in different stadiums, brood, nectar and pollen. The seed/plant yield in B was higher than A ( $p \leq 0.05$ ) as well as the number of pods/umbel ( $p \leq 0.05$ ). The seed obtained in A involved obtaining a numerous progeny from each participant genotype. The results show the ability of the domestic bee to facilitate genetic studies and plant breeding procedures in *L. tenuis*.



### 1. CATALOGING THE CARDENAS COLLECTION IN THE LIL HERBARIUM

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Dr. Martín Cárdenas (1899 – 1973) is considered as one of the most important botanists of Bolivia. He was a tireless researcher who spent over 50 years of uninterrupted work in describing the floristic richness of his country. In 1973 he bequeathed his valuable herbarium of nearly 6000 specimens to the Fundación Miguel Lillo. It being a unique collection of great historical value, the herbarium should be separated from the rest of the collection and its specimens appropriately recorded and digitized. Among the activities of systematization of data and digital imaging of the LIL Herbarium Collection, this work was carried out with the objective of making a catalog that will contribute to its diffusion and serve as a reference source for botanical studies. Because Cardenas materials were distributed in the general collection, we proceeded first to reunite them and, after taxonomic ordering, the information was recorded in a database. Results to date: 3902 specimens of vascular plants (Pteridophytes, Gymnosperms and Angiosperms). Families with a greater number of specimens are the Compositae with 574 (15%), followed by the Fabaceae with 269 (7%), the Solanaceae with 258 (7%), the Poaceae with 228 (6%), the Scrophulariaceae with 136 (3%) and the Cactaceae with 113 (3%), within which there are 64 nomenclatural types. The rest of the specimens correspond to different families, with a percentage of less than 3%. In conclusion, 3902 specimens of vascular plants have been catalogued, representing 65% of the total collection.

### 2. *Stictis radiata* (L.) PERS. (STICTIDACEAE, OSTROPALES), A NEW SEARCH IN NORTHWESTERN ARGENTINA (NOA)

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*Stictis* Person: Fries is a worldwide saprobe discomycete gender with more 300 specific epithets. *S. radiata* is characterized by its erumpent ascocarps, torn, whitish, star-like edges. The hymenia layer is totally imbibed in woody substrate of *Picea*, *Populus*, *Salix*, *Ulmus* or herbaceous stems; it shows thin filiform paraphyses; cylindrical, unitunicate, and thick apical cap perforated by a narrow pore ascis; hyaline, filiform, multiseptate, 180-200 x 10-16 µm ascospores. Gender study in the country is restricted to the works of Spegazzini (1887) and Gamundi *et al.* (2004), who collected *S. arundinacea* Pers., *S. lichenoides* Speg., *S. pusilla* Speg. and *S. radiata*, all of them from the Tierra del Fuego province, Argentina. Fresh collections were studied with special attention to the study and structural analysis of fungal communities, from a phytogeographical Yunga province sector (Dios *et al.*, 2007; Agüero *et al.*, 2008), Paclín, Catamarca. Spring, summer and autumn seasonal samples were made and 5 collections were obtained. In order to secure conservation and optimum microscopic observation, standard lab protocols were applied to the collected material. The objective of this work is to contribute to the identification of Catamarca mycobiota. This work helps to widen the distribution area of *S. radiata* to the NOA.

### 3. THE CEPARIUM (LIL C) OF THE MIGUEL LILLO FOUNDATION. TUCUMÁN, ARGENTINA

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Knowledge of the Argentine mycobiota is scarce; however, The Miguel Lillo Foundation owns the “Antonio Digilio” Mycological Herbarium where 14,500 collections are deposited. Due to the significant loss of biodiversity because of the destruction or fragmentation of their habitats, the need arose to preserve the fungi *in vitro*. This represents an important genetic reservoir and a valuable complement to the Digilio Herbarium. Efforts have been directed towards the creation of the Ceparium (LIL C), so that during the 2008-2009 period we made trips to various locations in the province of Tucumán and the Iguazú National Park (Misiones province), where we collected pieces of wood, branches, leaves and fruits in which fungal structures were visualized. We attempted the isolation of 267 specimens, mainly wood-destroying fungi, in culture media such as Agar-Oat, Potato-Dextrose Agar and Water Agar. Eighty strains were obtained, out of which 80% were Ascomycetes, 10% Basidiomycetes and 10% Deuteromycetes. The conditions and characteristics of the strains are being computerized in tables using the Excel program in order to provide comprehensive information. The database is complemented with the data collected. This work constitutes the first step to preserve those fungi, which play a role in recycling wood in forests of the Yungas and the jungle.

### 4. *Cyperaceae* FROM THE JUJUY PROVINCE, ARGENTINA. FIRST PART

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**Introduction:** *Cyperaceae* is a cosmopolitan family: in Argentina there are 28 genera and 372 taxa. The **aims** of this work were: 1- to investigate the morphology and delimit genera and species of this family; 2- to solve nomenclatural problems; 3- to describe genera and species of the Jujuy province; 4- to make keys to genera and species; 5- to make geographical distribution maps and characterize the habitat of the species; 6- to illustrate *Cyperaceae* species from Jujuy. **Materials and methods:** *Material used:* Investigated specimens collected by the author since 1981 incorporated into the JUA herbarium and those from LIL, MCNS and SI herbarium. *Methodology used:* Collection and processing of the specimens collected. Analysis of herbarium specimens. Description of morphology and solving of nomenclatural problems of genus and species. Making of keys to genera and species. All taxa have their figures, geographical distribution maps and habits. **Results and Conclusions:** Approximately 101 taxa and 17 genera grow in Jujuy. The first part includes the study and analysis of 9 genera. This first report includes 8 genera and 19 species: **1-*Albidgaardia***:1 sp; **2-*Bulbostylis***:4 spp.; **3-*Fimbristylis***:2 spp.; **4-*Isolepis***:1 sp.; **5-*Kyllinga***:2 spp.; **6-*Pycreus***:2 spp. **7-*Rhynchospora***:5 spp. **8-*Uncinia***:2 spp. *Cyperus*, the ninth genus, will be studied later.

5.  
**THE GENUS *PILOPOGON* (DICRANACEAE, BRYOPHYTA) IN ARGENTINA**

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During the revision of samples recently collected in the Calilegua National Park (Jujuy Province) certain plants were identified as *Pilopogon guadalupensis* (Brid.) J. -P. Frahm, a species that had not been reported previously among the available collections of Northwestern Argentina.

*Pilopogon* Brid. is a genus of the subfamily Campylopodioideae, Dicranaceae. It is represented by 8 species, with the largest diversity in the Neotropics (Central and South America), and the remaining one occurring in Tropical Africa. The distinctive characters of this genus are the long perichaetial leaves that wrap a great part of the seta up to the capsule; the capsules are erect to slightly inclined, flat, oblong-cylindrical, without stoma, straight seta and the peristome teeth are filiform, undivided and papillose.

*Pilopogon guadalupensis* grows in the upper montane forest, on rocky and exposed bank, together with *Polytrichum juniperinum* Hedw., *Campylopus pilifer* var. *lamellatus* (Mont.) Gradst. & Sipman and *C. trivialis* Müll. Hal. ex E. Britton.

Until now, the genus is represented in Argentina by two taxa: *P. schilleri* Herzog & Thér. and *P. guadalupensis* (Brid.) J. -P. Frahm.

6.  
***Noteochordodes talensis* (GORDIIDA NEMATOMORPHA) FROM CATAMARCA (ARGENTINA): SEASONAL OCCURRENCE, SEX RATIO AND MORPHOLOGICAL MEASUREMENTS**

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The aim of this investigation was to present new information about distribution, relationship between sexual size, seasonal occurrence and sex ratio between males and females in one year cycle of this species from El Simbolar stream of *Noteochordodes talensis* (Gordiida). All specimens were collected in different rivers and streams of the Catamarca province. Studies of abundance, seasonal occurrence and morphological characteristic were carried out in El Simbolar stream (28° 40' 37.6'' S- 66° 03' 18.0'' W). Specimens were collected in the four seasons, in area of 200m along the stream from coast to coast. One hundred and forty-three specimens were studied. Body measurements were made with outstretched worms using a ruler. The sex of all worms was determined under a microscope. Highest abundance ((54 specimens) was found in summer and spring and lowest (23 specimens) in winter. The occurrence of sex showed differences in the frequency of males and females, statistically significant ( $\chi^2$ ,  $p < 0.000$ ) in the four seasons. The sex dimensions revealed that the mean length of the females was 279.89 ± SD 73.94mm with a minimum value of 179mm and a maximum of 460mm. Measurements of the male specimens ranged from 55mm to 215mm and mean length was 135.40 ± SD 33.62mm. The difference in body length between males and females was significant (t,  $p < 0.000$ ). This study also enabled a widening in the distribution of this species to ten streams in Catamarca.

7.  
**INSECTICIDAL AND TOXIC EFFECTS OF EXTRACTS FROM *Elephantopus mollis* AND *Azorella compacta* ON *Spodoptera frugiperda* LARVAE**

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The polyphagous *S. frugiperda* is a major insect pest of stored grains worldwide. As with most insect pests, control is usually attempted by means of synthetic insecticides. The application of synthetic insecticides holds special risks since most of them are not very selective. Continuing with our search for botanical pesticides derived from plants, we conducted experiments to investigate the feeding behavior (choice test) as well as the toxic effects on *S. frugiperda* larvae produced by the chloroformic extracts from *A. compacta* (AcE) and *E. mollis* (EmE). The extracts were added at 300 and 200 µg/ gram of diet. We observed 66% and 45% feeding deterrence at doses of 300 and 200 µg respectively for AcE. EmE caused 30% pupal mortality. Adults which survived showed a high percentage of malformations. These extracts would be a suitable natural source of insecticidal principles to be applied in agrochemical formulations.

8.  
**MICROCALLIS NEGII (CHAETOTHYRIALES, ASCOMYCOTA): A NEW RECORD FOR ARGENTINA IN THE *Podocarpus parlatorei* FOREST**

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Since 2001 a study of ascomycetes in the forest of *Podocarpus parlatorei* Pilg. in Argentina has been carried out (Catania, 2004; Catania & Romero, 2001, 2008, among others). *Microcallis* Syd. is a genus often found in tropical zones, formed by approximately 10 morphospecies (Kirk *et al.*, 2008). It is characterized by small, subglobose, superficial ascomata with apical pore, brown setae, and olive-brown branched hyphae over the surface of the ascomata. There is no previous record of the genus in Argentina. The objective of this work is to present for the first time *Microcallis* in leaves of *P. parlatorei*. The specimens were collected in the forests in the provinces of Tucumán and Catamarca. The material was dried and preserved in the LIL herbarium. The microscopic preparations and observations were made with conventional methods. In conclusion, *Microcallis negii* (E. Müll. & S. K. Bose) E. Müll. was identified, this being the first record of this morphospecies for Argentina. *M. negii* and species of the order Coryneliales were frequently found in green leaves.

**9. FISH FAUNA FROM THE QUIRQUINCHO SWAMP (SALTA, ARGENTINA)**

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The Quirquincho swamp is located in the Chaco Region, between the Anta and Rivadavia departments (Salta, Argentina). This wetland is characterized by seasonal and permanent environments formed from the summer rains and overflowing Dorado, Teuquito and Del Valle rivers. There are few studies on the ichthyofauna of the region. The aim of this study was to make inventories of fishes in this wetland and its river tributaries. Two samplings were carried out per wet season from 2006 through 2008. The material will be deposited in the Ichthyological Collection of the Miguel Lillo Foundation. The number of fish species recorded for the rivers was 18, with two orders: Characiformes (98.95%) and Siluriformes (1.05%). In the ponds there were 28 species: Characiformes (85.7%), Siluriformes (4.66%), Perciformes (0.71%), Gymnotiformes (0.19%), Synbranchiformes (0.29%) and Cyprinodontiformes (9.09%), typical of seasonal environments. Characiformes was the prevalent order in both habitats in ponds, Cyprinodontiformes being the second order in importance. This order, as well as Synbranchiformes, is dependent on the seasonal regime of the marshes and makes the studied area a region of great interest for conservation, against the anthropic activity observed in the region.

**10. LEECHES (HIRUDINEA) IN PARQUE SIERRA SAN JAVIER (UNT)**

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The objectives of this work are the study of the fauna of leeches and the populations conditions. Three permanent lakes were sampled at Parque Sierra San Javier: Lake San Javier (LSJ), Lake Taficillo (LT) and Lake Reserva Experimental Horco Molle (LHM). Extraction was done manually among vegetation and rocks, and hematophagous species were obtained by feet immersion. Narcosis was carried out with alcohol 70° and fixation with alcohol 96°. Eighteen samples were collected, approximately 145 mature specimens and numerous juvenile and immature ones. The samples were separated and organized taxonomically to be deposited in the Helminthologic Collection of the Fund. M. Lillo with geographical and environmental data. Staining techniques were used according to López-Jiménez (1985). The animals were identified using the dicotomic key of Ringuet (1985). We found specimens of the order Glossiphoniiformes: of the genus *Helobdella*, represented by *H. sp.*, *H. similis*, *H. longiscollis*, *H. triserialis*, *H. stagnalis*, and *H. adistola*; and of the genus *Haementeria* identified as *Haementeria sp.* and 5 samples that presented problems for identification. We also identified a sample of animals belonging to the order Hirudiniiformes, of the genus *Orchibdella*. These data are important due to the limited information on leeches in Argentina and to a growing interest in research on biodiversity, endemism and phylogenetic relationships in the Neotropical region.

**11. CHANGES IN THE NAME AND PURITY OF MEDICINAL HERBS FOR COMMERCIAL USE IN THE PROVINCE OF TUCUMAN**

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One aspect that requires study because of its real and potential importance for health is the degree of authenticity of medicinal herbs that are marketed as health food products not subject to control. They are available as mixtures of leaves, peels, stalks, flowers and fruits, and are labeled with common names and only in rare cases with the scientific name. Packages also include the name or names of the ailments for which the plant is considered suitable or effective. However, botanical information is required concerning the plant species that has been used, since some plants are similar in both their vulgar names and in their morphological characteristics, which can result in the adulteration of species. This study analyzed the content of commercial samples in order to determine their identity and check whether the label on the packages or attached literature agrees or not with the material they contain. The 58 products were purchased from herbal shops and the methods used consisted in stereoscopic microscope studies of the different parts of the samples and the recognition of morphological characteristics that allow the identification of a taxonomic group. The results showed that 38% properly corresponded to the species listed, 17% corresponded to the genera mentioned, and the remaining 45% contained mixtures of organs belonging to different taxonomic groups. In conclusion, these results clearly show that only 38% are pure botanical products and 62% are undefined mixtures.

**12. PHYTOPLANKTON IN A STREAM EXPOSED TO AGRICULTURAL, STOCKBREEDING, INDUSTRIAL AND URBAN POLLUTION (TUCUMÁN, ARGENTINA)**

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The aim of the present work was to analyse the abundance of phytoplankton in relation to the pollutants during the sugar cane harvest in the Mista stream (Leales). Three places were selected: S1, S2 and S3. The temperature ranged between 16.1 and 19.3°C and the pH between 8 and 8.6; the highest register of conductivity corresponded to S3 with 4.070  $\mu\text{S cm}^{-1}$  and the lowest to S1 with 2.250  $\mu\text{S cm}^{-1}$ ; the content of OD ranged from 0.7 to 9  $\text{mg L}^{-1}$  and the one of  $\text{DBO}_5$  from 2.4 to 37.5  $\text{mg L}^{-1}$ . In S1 and S2 the diatoms (*Cocconeis plancetula* with 7 ind  $\text{mL}^{-1}$  and *Surirella brebissonii* with 4 ind  $\text{mL}^{-1}$ ) were dominant. In S3 the Cyanophyta (*Anabaena flos-aquae* and *Lyngbya sp.* with 6 ind  $\text{mL}^{-1}$  respectively) were prevalent and the absence of Chlorophyta in all the places studied was evident. It can be said that place 3 presented bad water quality as shown in the high values of conductivity and  $\text{DBO}_5$  and in the anoxic conditions of its water as well as in the prevalence of blue seaweeds associated with the greater content of dissolved pollutants. S1 and S2 presented a better ecological state in relation to S3. This contribution describes for the first time the phytoplankton of the Mista stream.

**13. BIRDS OF THE FIGUEROA WETLANDS, SANTIAGO DEL ESTERO**

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The Bañados de Figueroa are a large area of wetlands located along the Salado River, Santiago del Estero. Our objective was to study the composition, structure and variation of the bird community in these wetlands. Censuses were made using line transects, fixed points and observations from vehicles. Species, number of individuals and habitat use were recorded. Diversity, (Shannon-Wiener diversity index), relative abundance, index of relative importance and frequency were calculated. Rank abundance curves were used to exhibit changes in the abundance of different species and the variation between sampling periods. Species were classified in trophic assemblages according to feeding strategies and tactics. One hundred and twenty-one species were identified between November 2008 and July 2009 in 45 samples (75 in spring 2008, 59 in summer, 67 in autumn and 76 in winter, 2009). The highest Shannon-Wiener diversity index was found for spring ( $H' = 1.08$ ) and the lowest for autumn ( $H' = 0.66$ ). The community structure was analyzed by placing species in 6 trophic assemblages. The prevalent species were those foraging for food among the vegetation (19 species) and in beaches and shallow waters (15 species). Results suggest that the Bañados de Figueroa wetlands represent an important migrant and resident bird concentration site.

**14. FIRST RECORD OF TWO SPECIES OF COLEOPTERA IN A QUINOA CULTIVAR IN AMAICHA DE VALLE, TUCUMÁN (ARGENTINA)**

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This research was carried out in an experimental cultivar of quinoa (*Chenopodium quinoa* Willd) in the fields owned by INTA in Encalilla (Amaicha de Valle, 1978 m a.s.l.) with the intention of reintroducing it as a feeding alternative in the intermontane valleys of the Northwest of Argentina (NOA).

Information already exists about the insect fauna associated with quinoa, but it corresponds to the high Bolivian plateaus (3500 m a.s.l.) and to ecologically equivalent regions of Peru and Ecuador, while in the case of the northern region of Argentina information is very limited.

Manual collection of specimens was carried out monthly with a basic insect net at day time. After their identification and comparison with the existing data from the research area, the results obtained indicated the following coleoptera: *Epicauta adspersa* Klug, *Epicauta langei* Borchmann, *Astylus astromaculatus* Blanch., *Eriopsis connexa* Germ., *Eriopsis* sp., *Hippodamia convergens* (Guerin-Meneville) and species belonging to the Curculionidae family.

The following species were recorded for the first time for this culture: *Tetraonyx* sp. (Coleoptera: Meloidae) and *Ancistosome vittigerum* Erichson, 1847 (Coleoptera: Melolonthidae). Both species were registered in the preflowering and flowering stages.

**15. CALORIMETRIC STUDY OF SOYBEAN AND RADISH SEED GERMINATION. TOWARDS THE VALIDATION OF A NEW MONITORING METHOD**

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Nowadays there are two methods to monitor seed germination: imbibition and oxygen uptake. Calorimetry measures the rate of heat flow (thermal power,  $P$ ) in all processes involved in seed germination. With the aim of developing a new monitoring method based on calorimetry we germinated two soybean cultivars: cv. A7636AR and Munasqa, as well as radish cv. Sparkler. A heat conduction type of calorimeter was used. Ten to fifteen seeds were germinated individually in the calorimeter and imbibition curves were obtained at 25°C. Soybean cv. A7636AR and Munasqa required 74 and 50% water, respectively and radish 64% water to start metabolic activity, which was acquired after 110, 90 and 128 min of imbibition, respectively. The differences observed in water requirements between both soybean cultivars was probably a parameter of water stress tolerance; Munasqa might be more tolerant than A7636AR. Both soybean cultivars showed a similar thermal behavior, producing much less energy than radish to achieve germination. Calorimetry proved to be an excellent tool to monitor seed germination.

**16. DIFFERENCES IN SOLUBLE ACID AND CELL WALL-BOUND INVERTASE ACTIVITY OF LEMON PEEL BY THE EFFECT OF UV-B LIGHT IN RELATION TO INTERSEASONAL CHANGES OF ACTIVITY**

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UV-B light induces changes in flavonoids and other phenol compounds present in lemon peel. Since these compounds use soluble sugars as a carbon skeleton, the aim of this work was to analyze the effect of different doses of UV-B light on both soluble (InvS) and cell wall-bound (InvI) acid invertase in lemon peel (albedo and flavedo). Fruits from winter and summer irradiated with UV-B light (1, 2, 3, 4, 5 min) were used. After UV-B treatment albedo and flavedo were cut and processed for invertase determinations. Summer InvS showed for albedo a significant decrease induced by UV-B light, but it was smaller at a 3-min time dose. In contrast, winter activity showed a different behaviour with increases in flavedo tissue at 1- and 5-min time doses. Furthermore, winter InvI showed for both tissues a single increase at a 1-min time dose; however, it was 2 orders of magnitude higher in flavedo than in albedo. In non-irradiated lemons, InvS for both tissues was higher in summer, whereas InvI was higher in winter. This fact would suggest that in both seasons different carbon fluxes act, in winter being directed to flavedo to increase the carbon skeleton to sustain the secondary metabolism in this tissue.

**17. INTERSPECIFIC CROSSES BETWEEN WILD SPECIES OF THE GENUS *FRAGARIA***

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In the Active Germplasm Bank for Strawberry (AGB-UNT) crosses were made between wild species, relatives of the cultivated strawberry. Successful fertilization events in interspecific crosses are difficult because of pre-zygotic and post-zygotic barriers to the genus *Fragaria* species. For compatibility relations between local *Fragaria* species and their reproductive characteristics, the pollen-pistil interaction and the viability of achenes from *Fragaria vesca* (2n=14) and *Fragaria chiloensis* (2n=56) are discussed. Interspecific crosses between *F. vesca* x *F. chiloensis* were made in both directions. Post-pollination pistils were harvested, fixed in FAA, clarified, stained with aniline blue and observed under a UV light microscope. The achenes were sown in sterile soil. Pistils analysis of *F. vesca* showed pollen germination and pollen tube penetration at different levels into the style. This cross yielded conocarpos with achenes which showed a single seedling that died shortly after. In the reciprocal cross, there was no pollen tube development or achenes formation. The achenes obtained by selfing of *F. vesca* germinated into plants. Prezygotic studies revealed pollen-pistil compatibility in *F. vesca* x *F. chiloensis*, but not in reciprocal crosses. However, the non germinated achenes suggested post-zygotic barriers. These results provide new information about the reproductive behavior of local genotypes of *Fragaria*.

**18. ARBUSCULAR MYCORRHIZAE IN *Duchesnea indica*, *Fragaria vesca* AND *Potentilla tucumanensis* (ROSACEAE) IN THE PROVINCE OF TUCUMÁN**

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Arbuscular mycorrhizae are widely distributed in the plant kingdom (Newman & Reddell, 1987). This association increases the mineral nutrition of plants (Azcón-Aguilar *et al.*, 2002). In the cortex, fungi present two forms of development: *Arum* and *Paris* (Gallaud, 1905). The aims of this work were to analyze the morphology of mycelium and to make a quantitative analysis of the association of these species. The samples were collected in different habitats. Five individuals were collected per species and conventional techniques were used. The results showed arbuscular colonization morphology of the *Arum* and *Paris* type in the three host plants. In the *Arum* type two different thicknesses were observed in intercellular hypha: thin with terminal intercellular vesicles in *D. indica* and *P. tucumanensis*. *F. vesca* also has intercellular vesicles. Hypha of greater thickness with lateral arbuscles and an "H" structure were found in the three hosts. In the *Paris* type, hypha were thick and intracellular with "hypha coils". In *D. indica* and *P. tucumanensis* another intracellular septed endophyte was found. *D. indica* and *F. vesca* presented *Gigaspora* and *Glomus* spores and sporocarps. In conclusion, the three species showed the coexistence of the *Arum* and *Paris* morphological type. The percentage of mycorrhization is significantly greater in *D. indica* for pasture and forest habitats.

**19. PHYTOTOXIC POTENTIAL OF SECONDARY METABOLITES OF A *FLUORENSIA* SPECIES**

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This aim of this work was the isolation and identification of secondary metabolites in the hexane fraction of *Flourensia blakeana* Dillon and the evaluation of the possible phytotoxic activity of the isolated metabolites. Vegetable material -flowers and leaves- was processed using the classical drying, grinding and ethanol-extraction method. Raw extract was re-suspended in MeOH-H<sub>2</sub>O 20% and partitioned with hexane, methylene chloride (Cl<sub>2</sub>CH<sub>2</sub>) and ethyl acetate (EtAcO). In the hexane fraction two compounds were isolated and identified as sesquiterpenes whose structures were elucidated through diverse UV, IR, RMN <sup>1</sup>H and <sup>13</sup>C spectroscopic methods. Activity assays were performed with concentrations of 10, 75 and 150 mg/L of the pure compounds. *Lactuca sativa* and *Sorghum saccharatum* seeds were used. Germination inhibition and root growth were determined. Data were analysed using ANOVA tests for a randomized design with three repetitions. Isolated sesquiterpenes produce inhibitory effects on the seed of *Sorghum saccharatum* at a rate of between 45% and 30%, while in *Lactuca sativa* the inhibition rate was between 62% and 42% for the different concentrations. Results obtained in the phyto-chemical study enabled the isolation of secondary metabolites with sesquiterpene cores presenting allelopathic activity.

**20. PRELIMINAR RESULTS OF THE EFFECTS OF LIGHT QUALITY ON PEPPER (*Capsicum annum* L.) POST-HARVEST RIPENING**

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Changes in chloroplast structure, chlorophyllase and superoxide dismutase activity take place during postharvest in pepper fruits. Northern blot analysis showed that several ripening stages are regulated by the phytochrome system. Phytochrome A RNAm increases during fruit ripening.

This work was carried out to evaluate the effects of light quality on *C. annum* L. postharvest ripening.

Treatments: *C. annum* L. green fruits were placed in storage conditions with different light sources at room temperature as follows: 1. blue, 2. dark, 3. red, 4. white, 5. green.

Changes in fresh weight and in color from green to red were determined. Fruit surface showing the presence of carotenoids was calculated. After 45 days, the highest fresh weight loss was found in treatment 1, while treatment 2 showed the lowest one.

At 7 days, treatment 1 showed carotenoids in 65.95% of the fruit surface.

Results showed that red light was the most effective one for delaying storage damage.

**21. ESTABLISHMENT OF *Sicyos polyacanthus* Cogn. FROM DIFFERENT EMERGENT POPULATIONS IN THREE LOCALITIES OF SUGARCANE PRODUCTION IN TUCUMÁN**  
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Knowledge of *S. polyacanthus* emergent populations enables the determination of management strategies for this important weed which has a special reaction to chemical control. The objective of this work was to determine *S. polyacanthus* plants with weed-establishment potential. We worked in three Tucumán localities with 30 furrows of 100 m long in three-year ratoon cultivar LCP 85-384, without herbicides, watering, with mechanical labor and nitrogenous fertilization. A population follow up was made in ten central furrows: a) initial plants were determined in November 2007; b) plantlets apparition in December 2007; c) in March 2008 established plants were registered. Determinations were: establishment percentage, gross mortality rate (TBM), gross natality rate (TBN), survival (Sv) and survival probability (PSv). ANOVA test was used to determine differences. Results indicated an increase from 1.06 pl.m<sup>-2</sup> to 1.23 pl.m<sup>-2</sup>; from 6300 pl.ha<sup>-1</sup> to 12,300 pl.ha<sup>-1</sup>; TBM of 996.99%, TBN of 3.31‰; Sv of 0.33‰ and PSv of 0.003‰. These are average rates for the localities. *S. polyacanthus* capacity for establishing its emergent populations is 0.32% of the total species emerged. In conclusion, the species has slow establishment capacity in commercial crops owing to a high mortality rate and a very low survival probability.

**22. RELATIONSHIP BETWEEN INFESTATION POTENTIAL AND THE SURVIVAL PROBABILITY (PSv) OF *Sicyos polyacanthus* Cogn. IN THREE LOCALITIES OF SUGARCANE PRODUCTION IN TUCUMÁN**  
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*S. polyacanthus* (Cucurbitaceae) causes serious damages to sugarcane in the competition for resources. The aim of this work was to establish relationships between infestation potential and weed survival in sugarcane crops. Assays were made in high infestation areas (Famaillá, Lules and Los Nogales) on two-year ratoon cultivar LCP 85-384. Sampling was carried out in 50 furrows of 200 m long each. Crop management was mechanical and manual with nitrogenous fertilization. We determined: 1) initial weed population (October 2007), density, real plantlet population; 2) seed production (May 2008); 3) viability and germinative capacity; 4) total plants (December 2007), live and dead plants (February 2008); survivor plants (March 2008); 5) demographic rates (TBM, TBN, Sv, PSv). Results: a) individuals with reproductive capacity (ICR) of 281.44 and 517.58; b) infestation potential: the lowest value in Los Nogales (173.55 m<sup>2</sup>/pl), the highest in Lules (311.24 m<sup>2</sup>/pl); c) TBN: Los Nogales (903.07), Famaillá (873.40) and Lules (834.01); d) PI-PSv relationship: the highest infestation potential in Lules descendants from one plant will occupy a 311.24 m<sup>2</sup> area with a survival probability of 0.067‰ (Sv = 678‰). The lowest potential was found in Los Nogales (PI = 173.5 m<sup>2</sup>/pl) where population has the greatest survival (Sv=804.7‰) with a high survival probability (PSv=0.08‰). It is concluded that there is an inverse relationship between PI and PSv. When infestation potential is higher, survival and survival probability of all plant populations is lower.

**23. PRESENCE OF GOMOSIS (*Phytophthora* sp) IN COMMERCIAL CITRUS FARMS OF SANTIAGO DEL ESTERO**  
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The presence of the fungal disease gomosis (*Phytophthora* sp) was observed in citrus farms in the area irrigated by the Rio Dulce in the province of Santiago del Estero. Fifty-one citrus farms with areas between 2 and 300 hectares were evaluated and different oranges, tangerines and grapefruit cultivars were grown there. Natural infections were evaluated monthly in plants aged 3 to 20 years for two consecutive years starting in 2008. The degree of infection was evaluated as severe when dead or unproductive plants were found; medium when more than 50% of stem or main branches were affected; mild, with less than 50% of infected plants, and absent when no symptoms of disease were found. Other variables were also observed. We concluded that the infections are conditioned by environmental factors, age, cultural practices and the size of the cultivated area. Pruning, thinning and fertilization were not carried out in 92% of the cases, this situation being made worse by the inappropriate use of implements (dredging beneath the tree canopy). The attacks were more frequent in sick or weak trees as well as in injured specimens, those displaying discoloured leaves, yellowish veins, small limbs, underdeveloped shoots and small fruits. The most tolerant rootstock were Citrange and Cleopatra, while Rangpur lime proved to be the most sensitive.

**24. SURVIVAL PROBABILITY (PSv) OF *Sicyos polyacanthus* Cogn. IN THE SUGARCANE-MULCH RELATIONSHIP IN SANTA BÁRBARA (TUCUMÁN)**  
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It is difficult to understand the competition for resources of *S. polyacanthus* (Cucurbitaceae) and its serious effects on sugarcane production, since it is a C<sub>3</sub> weed on a C<sub>4</sub> crop. Survival probability (PSv) is a demographic estimation based on live plants that remain in a crop causing maximum competition. The aim of this work was to find the survival probability of *S. polyacanthus* when mulch is used on sugarcane. Work was carried out in Santa Bárbara (Tucumán) in 2006-2007, in two-year ratoon cultivar LCP 85-384, in randomized blocks with three replications in plots of 160 m<sup>2</sup>. Total plantlets were determined in November 2006, live ones in December 2006 and survivors in May 2007. Calculated rates were: TBN (gross natality rate); TBM (gross mortality rate), Sv (survival rate) and PSv (survival probability). Parametric statistical analyses (ANOVA and other tests) were used. Results: Total plants = 44280, live plants = 14760, dead plants = 29520. Survivors = 3850. TBM = 660.66‰. TBN = 339.34‰. Sv = 260.84‰. PSv = 0.26. Natality and mortality rates were calculated on the basis of the initial population registered. Survival rate was determined from the established live plants at the end of the crop cycle. It is concluded that because of the mulch covering effects, natality and survival rates are low. The survival probability of *Sicyos* is very low but high enough to continue infesting and invading the crop.

**25. PRELIMINARY TESTING OF WHEAT SEEDS FOR RHABDOVIRUS TRANSMISSION**

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Cereal rhabdovirus (genus *Cytorhabdovirus*), first detected in 2006/07, affects wheat yield in Argentina. It can be transmitted experimentally to barley, oats and triticale by insects of the family Delphacidae, including *Delphacodes kuscheli* Fenah, *Delphacodes haiwardi* Muir and *Toya propinqua* (*Methadelfax propinqua*). The aim of this study was to determine whether this new viral disease spread by seeds. For this, threshed wheat spikes from two cultivars, one that had proved resistant to disease and another vulnerable, in which an infection of 80 to 100% had been found, were used. From these samples 838 and 860 seeds were obtained respectively. The seeds were sown on trays, in rows, separated by about two inches and kept in greenhouses until the emergence of seedlings. Eight hundred and thirty-two emerged from the resistant and 826 from the vulnerable cultivar. The plants of both cultivars were observed frequently to determine the presence of symptoms. None of the plants showed symptoms of Rhabdoviridae, so this preliminary study would indicate that this new viral disease is not transmitted through seeds, or does so to a very limited extent.

**26. QUANTIFICATION OF THE PROCESS OF EDAPHIC DEGRADATION IN SOYBEAN-WHEAT CULTIVARS IN THE CHACO-PAMPEANA REGION. TUCUMÁN, ARGENTINA**

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The Chaco-pampeana region presents different qualities of soil associated with different management practices, some of which have resulted in the loss of edaphic properties. The aim of this work was to quantify soil degradation by calculating the loss of macro elements and the decrease in physical fertility in a soybean/wheat cultivar. The work was carried out in: 1) productive lot of soybean/wheat S/T (4 years conventional tillage and last 5 years not tilled, 2) native forest. Composite samples were taken at 0-5 cm and 5-20 cm depth. Organic Carbon (CO), Walkley and Black; Total Nitrogen (N), Kjeldahl; available Phosphorus, Bray II; Potassium (K), Morgan; pH measured in water (1:2.5) and bulk density (DA), cylinder were analyzed. The results demonstrated a loss of 12 tn.ha<sup>-1</sup> of organic matter (MO), 7 tn.ha<sup>-1</sup> of CO, 648 kg ha<sup>-1</sup> of N; 10 kg ha<sup>-1</sup> of P and 16 kg ha<sup>-1</sup> of K in the first 5 cm of soil. Considering the values of the loss to be 15 cm of soil, they were 18 tn.ha<sup>-1</sup> of MO, 10 tn.ha<sup>-1</sup> of CO, 820 kg ha<sup>-1</sup> de N, 11 kg of P and 20 kg of K, in relation to the native forest. As for the physical and physico-chemical properties, there was an increase in DA and pH. Having expressed the loss in the arable layer it is possible to become aware of the ecological significance of the degradation process.

**27. THE DAY-WORKSHOP AS A TOOL FOR THE TRAINING OF SMALL AND MEDIUM FRUIT GROWERS IN THE SANITARY CONTROL OF FRUIT TREES**

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In the Valley of Tafí small and medium producers prevail and production is based on family agriculture. In general, problems of low quality of the fruits and vegetables produced were observed due to inadequate use and little information about technological practices and management of the orchards. This endangers the productivity and sustainability of the productive systems involved. The aim of this work was the training of small and medium producers of the upper valleys in the different technologies of the Integrated Fruit Management that ensure the obtainment of high quality fruits with scarce or no pesticide residues. Training activities were carried out in day-workshops, with theoretical and practical areas. The producers received basic knowledge and training in the proper technology adapted to the local conditions and were shown the integrated management of plagues and diseases with the necessary regard for human health and environment. From the results obtained, it is possible to conclude that the proposed subject matters were interesting for the participants and that performance was very satisfactory.

**28. VEGETABLE DIVERSITY AND VEGETABLE COMMUNITIES IN THE CALILEGUA NATIONAL PARK. JUJUY, ARGENTINA. SECOND PART**

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**Introduction:** The Calilegua Park has 76.306 hs. and belongs to the Yungas province. The **aims** of this work were to collect vascular plants species and to continue investigating vegetable communities from this park with a view to correct management in the future. **Materials and methods:** Vascular plants were collected and incorporated to the JUA herbarium. Using teledetection techniques, we tried to determine vegetation physiognomical units. Preliminary survey trips were made and some communities were examined. We estimated a minimum area and carried out an inventory of each community. **Results:** We identified vascular plants species collected. Eight vegetation inventories were made from 5 types of communities from the south section of the park. **Conclusions:** 1- Approximately 900 species were collected. 117 families, 359 genus and 547 species were identified. *Pteridophyta*: 13 families, 25 genus, 39 species; *Gymnospermae*: 1 family, 1 genus, 1 species; *Magnoliopsidae*: 83 families, 289 genus, 447 species; *Liliopsidae*: 20 families, 44 genus, 60 species. 2- The communities in the South Sector of the park were: Forest of cebil alterado trees; Forest of cebil and garabato trees; Quina forest; Mixed Forest and Shrub islet.

**29. TAXONOMIC AND NOMENCLATURAL NOVELTIES OF MOSSES IN THE ANDEAN REGION**

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In the course of the study of the bryological diversity in Argentina we found some nomenclatural and taxonomic novelties, and a few new records for various Neotropical countries.

*Barbula uncinicoma* Müll. Hal. is transferred to *Gertrudiella*, and *Cyrtio-hypnum sharpii* (H. A. Crum) W. R. Buck & H. A. Crum to *Pelekium*.

*Gertrudiella uncinicoma* (Müll. Hal.) G. Suárez & M. Schiavone comprises plants with a strong central strand and hyaloderms in the stem, acute leaves with base sheathing, costa with one stereid band and a multilayered cylinder of thick-walled guide cells. The laminal cells are bulging ventrally and flat dorsally but marginally bulging on both sides in several rows. This species has been found in Bolivia and Argentina and it is recorded for the first time for Peru and Chile. *G. uncinicoma* is found in the dry forest (Bosque Chaqueño Serrano, Bosque Chaqueño and Monte) of Argentina and Bolivia, in the central valley of Peru and in central Chile.

*Pelekium sharpii* (H. A. Crum) G. Suárez & M. Schiavone is mainly recognized by unipapillose leaf cells and paraphyllia abundant on stems, 2-3 cells long, ending in a truncate, pluripapillose cell. This is a frequent species in Central America (Mexico, Guatemala, Dominican Republic and Puerto Rico), but in this work it is recorded for the first time for South America in Argentina.

**30. THE USE OF FOREST PLANTS: MEDICINAL SPECIES IN ABRITA GRANDE, SANTIAGO DEL ESTERO**

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Abrita Grande inhabitants, most of them small goat producers, use native plants for several purposes, especially medicinal ones. This aim of this work is to report the medicinal uses to which local inhabitants put the local flora species. To collect information, semi-structured interviews and meetings with the people of La Abrita Grande were held whereas known species were collected in ethnobotanical field trips. Experiences and knowledge of the use, name and availability in the area of the species collected were discussed in plenary sessions. Nineteen species are used to treat diseases, the most widely used among them being *Acacia aroma*, *Sphaeralcea bonariensis* and *Geoffroea decorticans*. The people from this rural community also use plants to treat disorders of the digestive tract (stomachache, indigestion), of the airways (coughing, bronchitis, colds), liver and kidney problems, cholesterol, and so forth; a species is used as a galactogenic agent. The results obtained showing the importance of these plant species for the local people will be used to generate domestication- and production-oriented guidelines tending to their commercialization.

**31. BENTHONIC INSECTS IN EL TALA RIVER: THEIR COMMUNITY STRUCTURE BASED ON A LONGITUDINAL GRADIENT**

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The aim of this work was to determine the structure of the benthonic entomofauna of El Tala River (Catamarca, Argentina) and its longitudinal variation. Five sampling stations were established along the river. The following were determined *in situ*: altitude, latitude and longitude; dry bedstream width; wet bedstream width; river depth; river current speed; water and air temperature. Benthonic insects were collected during the dry season, using a square parcel sampler with a 0.09 m<sup>2</sup> surface and 300 µm net opening. Samples were fixed *in situ* with 96° alcohol. Insects were identified to their Family taxon in the laboratory. Density, fauna richness and diversity exhibited longitudinal variation. Sampling station II was the most abundant. From sampling station I to III a decreasing trend in the number of orders and families was observed, whereas sampling stations IV and V showed an increasing trend. Sampling station V showed the highest Family richness (17), the highest value in Shannon's index (2.74) and the lowest value in Simpson's dominance index (D=0.22). Sorenson's quantitative index indicated that sampling stations I and V were the most similar (76%). Variations found could be attributed to the interaction between the water physico-chemical variables, environmental variables and anthropic factors.

**32. MORPHOLOGICAL CHARACTERIZATION OF FISH FINS IN A SUBTROPICAL RIVER SYSTEM, SALTA, ARGENTINA**

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There is a great diversity of shapes and anatomical peculiarities among continental fishes. Thus, it is possible to differentiate various types or environmental groups taking into account their habitat, conformation and behavior. This paper studies the morphology of the paired fins of fishes as an alternative to infer their ecological niche. We analyzed a total of 54 small-sized individual fishes, very common in rivers in the province of Salta: characins: *Parodon tortuosus* (n=8) and *Characidium fasciatum* (n=9) and silurids: *Heptapterus mustelinus* (n=8); *Trichomycterus spegazzinni* (n=10); *Ixinandria steinbachi* (n= 11) and *Corydoras paleatus* (n=8), all belonging to the collection of the Natural Sciences Museum, UNSa. Three variables were measured: morphometric pairs of fins, both pectoral and pelvic fins: longest radial length (mm), length of base (mm) and area (mm<sup>2</sup>), using a digital caliper. We found highly significant differences in all parameters examined, *Corydoras paleatus* (a species that thrives at the bottom) being the most different species ( $P < 0.005$ ).



33.

***Elephantopus mollis*: MOLLUSCICIDAL ACTIVITY**

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*E. mollis* is a native herbaceous plant widely spread in temperate regions of Argentina. From this plant cytotoxic antitumor agents were isolated. The aim of this work was the investigation of the molluscicidal effects produced by the extracts of the flowers, leaves and roots obtained with different solvents. The World Health Organization has given plants molluscicides a high priority as tools for the integrated control of schistosomiasis because of their low cost and rapid biodegradability. The snail *Biomphalaria peregrina*, directly implicated in the transmission of the disease, was employed for the bioassay. The snails were placed in contact with the test extracts (dissolved in MeOH-H<sub>2</sub>O 2:98) at concentrations of 200, 100, and 50 ppm. After an exposure of 24 h, snail mortality was evaluated.

The analyses by IR-FT and GC-MS of the hexanic extracts indicated the presence of sesquiterpenes, fatty acids and their methyl and ethyl esters, triterpenes and phytosterols. On the other hand, the chloroformic extracts revealed the presence of sesquiterpene lactones. Those obtained from flowers and leaves showed the strongest activity, with an LD<sub>50</sub> = 18 ppm and 15 ppm respectively. It is evident that the activity observed is closely related to the chemical composition of the extracts.

34.

**EFFECTS OF VARIOUS DEFOLIATION INTENSITIES ON SOYBEAN (*Glycine max* (L.) (Meril) IN THE PHENOLOGICAL STADIUM OF FLORAL INITIATION (R<sub>1</sub>)***Boldrini CA, Cardozo RM, Tejerina HS.*Faculty of Natural Sciences, Box 207, National University of Salta (UNSa), Avenue Bolivia No. 5150 - C.P. 4400 Salta. E-mail: [cboldrin@unsa.edu.ar](mailto:cboldrin@unsa.edu.ar)

**Introduction and Objectives:** The aim of this work was to quantify the performance of a soybean crop subjected to different levels of defoliation during the phenological stadium of floral initiation (R<sub>1</sub>) (Walter R. Fher and Charles Caviness, 1977), using cultivar A 6406 RR ripening Group VI and a particular growth habitat.

**Materials and Methods:** The experiment was conducted in the Pucara farm in Buena Vista, (65° 26' W, 24° 43' S). Each therapy had five repetitions and blocks were distributed at random. The following treatments were identified: A (one defoliation leaf), B (two defoliation leaves), C (three defoliation leaves), D (four defoliation leaves), E control (without defoliation). **Results:** Best performance of 2.837 kg/ha corresponded to the control without defoliation. In treatment A there was a 27.68% decrease, in B 43.69%, in C 48.24% and in D 58.37% with respect to the control.

**Conclusions:** Defoliation in the R<sub>1</sub> stadium at different intensities will cause a decrease in the performance of soybean crops.

35.

**FOLIAR ANATOMICAL COMPARISON of *FRAGARIA X ANANASSA* VAR. OSO GRANDE AND US-159 WITH DIFFERENT DEGREES OF RESISTANCE TO *COLLETOTRICHUM***

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The "anthracnose" or black spot is a fungal disease caused by *Colletotrichum* pathogens. We analyzed the leaves of susceptible and resistant plants of *F. x ananassa* in order to identify potential physical barriers that prevent the entry of pathogen. The plants were selected according to the Disease Severity Rating Scale (Oso Grande with DSRS=4.45 and US-159 with DSRS=1.45). Cross sections of leaf and histochemical staining tests were carried out. Densities of trichomes and stomata were estimated. Different leaf parameters (thickness of epidermis, cuticle, mesophyll and cross sections) were measured. Both varieties presented hypostomatic and dorsoventral structure; monostratified epidermis with morphological differences between abaxial and adaxial cells; anomocytic stomata and glandular (unicellular head and foot), uniseriate (3 cells) and simple (unicellular) trichomes. Petioles were half-circular with parenchyma partially or completely colenchimatic (annular type) with scattered druses and 3 vascular bands. Anatomical differences observed in both cultivars were: higher density of simple trichomes; thicker epidermis and cuticle and lower density of stomata. The values obtained for the thickness of mesophyll cross-section were higher in the susceptible variety than in the resistant one. The results suggest that anatomical differences would be directly involved in the incompatibility response in US-159 and in the compatibility response in Oso Grande.

36.

**FOLIAR MORPHOLOGY AND ANATOMY OF *Pleopeltis squalida* (POLYPODIACEAE)**

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*Pleopeltis* is a genus of small epiphytic ferns found in the NOA, NEA and center of Argentina. The aim of this research was the anatomical and morphological characterization of *Pleopeltis squalida* (Vell.) de la Sota. It grows in the piedmont, in the Chaco forest and in the cities of San Miguel de Tucumán and Yerba Buena in Tucuman Province. The work was carried out with fresh material. Conventional anatomy techniques were applied. Stomatic index, size of the stomata and thickness of the blade were calculated for n= 12 with 5 replications. The results showed pinnate fronds with opposite pinnules, glabrous adaxially and scaly abaxially, hypostomatic and dorsiventral. Stomata 47.05 µm x 40.14 µm; stomatic index 16.20. Mesophyll has 1-3 palisade and 3-5 spongy parenchyma strata. Circular, scaly sori with glandular paraphyses. Petiole scaly with two wings. Protostelic vascular bundles. Cortex with 3-4 layers of subepidermic sclereids except in the wings. Dictyostelic rhizome with brown scales. Diarch roots, pericycle with macrosclereids, cortex with 4-8 layers of pneumatodes. Anatomical characteristics such as thick cuticle, the presence of a dense layer of scales, the ability to attract atmospheric humidity and the presence of pneumatodes favor the success of these epiphytic ferns and allow them to survive during prolonged droughts.

**37. INFLUENCE OF PREVIOUS TREATMENT WITH VERMICOMPOST ON THE VIABILITY AND VIGOR OF BEAN SEEDS WITH MECHANICAL DAMAGE**

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This research was aimed at studying the influence of a previous treatment with a vermicompost on the quality of bean seeds. For this purpose, sublots of seeds of the cultivars Paloma INTA (white) and Camilo INTA (black) were damaged by letting them fall on a metal plate 0, 2 and 4 times from a height of 2 m. Then, samples of each lot were submerged for 20 min in an extract of a 1:5 vermicompost/water suspension. Previous treatment with vermicompost extract induced significant decreases in the vigor of normal seedlings of white bean with 2 and 4 falls, but it also caused a shortening of their mean emergence time in the field. Nevertheless, seedlings produced from previously treated seeds of the control, with 2 and 4 falls, showed in all cases significant loss of vigor compared to the untreated material. In the case of black bean, a significant reduction in mean time for performance in the field was caused by the vermicompost suspension for all three damaged lots tested compared to their controls. With respect to yield, vermicompost contributed to an increase both in the number of pods/plant of white bean and in the size of grains produced in all the treatments assayed. For black bean the increase in the size of the grains was observed only with 2 and 4 falls. Under our working conditions, both bean cultivars studied responded differently to the effect of the vermicompost extract.

**38. EFFECTS OF SEED OSMOPRIMING ON THE HARVEST TIME AND YIELD OF *Cucurbita pepo* L.**

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Osmopriming treatments are useful to increase seed germination percentages, seedling emergence and growth. These kinds of treatment can also enhance early flowering, maturity time and yield. Priming control: seed water uptake and imbibition injury by inducing early plasma membrane organization. This work was carried out to evaluate the effect of ascorbic acid solutions on *C. pepo* L. seed germination and seedling growth. Treatments were as follows: 1.- Control, unprimed seeds, 2.- Priming in ascorbic acid 1g/100 ml solution for 24 hours. Treatments were carried out in Petri dishes. Germinated seeds were transplanted to sand-filled pots and later to hydroponic solutions until flowering took place. Water absorption (at 24 hours), germination percentages and growth were evaluated at 39 days. Primed seeds water absorption was 14.08% lower. Priming treatments did not increase seed germination percentages, but enhanced speed germination. It also improved root growth and fresh weight was higher. No effects on flowering were found.

**39. EFFECT OF SALINITY ON THE PRODUCTIVITY OF CITRUS FARMS IN SANTIAGO DEL ESTERO**

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The aim of this work was to assess the effects of soil salinity on the productivity of citrus plants. Fifty-three commercial farms in the area of irrigation of Santiago del Estero were studied from which 19 were selected with soil pH between 7.5 and 9.2. The citrus varieties evaluated were Hamlin and Valencia late oranges as well as common Tangerine. We measured: 1. Productivity: a) Number of fruits and fruit weight per plant; b) Canopy volume ( $V=0.5236xHxD$ ); c) Number of fruits/canopy diameter, and 2. Fruit quality: a) Fruit diameter; b) Shell thickness; c) Juice content; d) Total soluble solids (SST) expressed as citric acid content, and e) Ratio (SST vs Acidity ratio). The results demonstrated that in 65% of the farms studied there were soluble salts accumulated in the area of concentrated roots which were at the same time associated with poor drainage conditions. In fifty percent of the farms these problems were caused by the presence of high levels of groundwater (154 cm to ground surface) and by an irrational use of irrigation water. Productivity conditions in some farms caused a decrease of up to 34% in canopy volume and a drop in the productive efficiency of 28%. The quality parameters of the fruit were extremely affected: juice decreased 14% and fruit diameter up to 1.18 cm. Among the rootstocks used in the farms, Rangpur and Cleopatra proved to be the ones most tolerant to salinity.

**40. REPRODUCTIVE CAPACITY (ICR-RCR) AND INFESTATION POTENTIAL (PI) OF *Sorghum halepense* (L.) Pers. IN LA TALA (TUCUMÁN) SUGARCANE CROPS**

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*S. halepense* (Poaceae) is the most important sugarcane crop weed because of its aggressiveness, infestation capacity and permanent competition for resources. The aim of this work was to determine the infestation potential from the seed production of one plant and its reproductive capacity. Work was carried out in La Tala (Tucumán) in 2007-2008, on four-year ratoon sugarcane cultivar CP 65-357, in seven completely randomized plots of 80m<sup>2</sup>. Initial plant density was determined in December 2007. Average seed production per plant was calculated by counting 5 isolated plants of each plot, the weight of 100 seeds being set as a pattern. A loss of 60% (Chaila, 2001) was considered as factor of seed missing from the soil bank. Viability and germinative power were analyzed. From those values we obtained the ICR (individuals with reproductive capacity), RCR (real reproductive capacity) and PI (infestation potential) (Chaila, 2001, 2003). Rhizome reproductive characteristics were not considered. Non-parametric statistical analysis was used. Results: density=12 pl.m<sup>-2</sup>., seeds per plant=23741. Factor des= 14244,60. Entering seeds= 9496,90, viability= 76%, PG = 81%. ICR=7217,26, RCR = 5845,98. PI = 487,16 m<sup>2</sup>.pl<sup>-1</sup>. A great percentage of the original seeds did not enter the bank and only few of them germinated. The infestation potential will be the expression of invasion that determines the surface that will be occupied by the offspring of one-plant seeds.

41.

**SURVIVAL RATE OF *Talinum paniculatum* (Jacq.) Gaertn. FOR DIFFERENT SUGARCANE CROP MANAGEMENT SYSTEMS AT COLONIA LOLITA (TUCUMAN – ARGENTINA)**  
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The adoption of new sugarcane management practices such as mulching permitted the elimination of some weeds and the growth of others such as *T. paniculatum* (Portulacaceae). There are few studies on the competence of this weed in sugarcane crops. The objective of this work was to find the survival characteristics of the weed for three different management practices. We worked in Colonia Lolita (Cruz Alta – Tucumán) on a two-year ratoon cultivar LCP 85-384 in 2007-2008, in three macro-plots with three replications of 10 furrows-200 m long each. Treatments used were: T1: total mulch; T2: burning and T3: Incorporation. Herbicides were not used. Watering and fertilization were used as in the commercial crop. Randomized samples in each plot were used. Total plantlets (October), live plants (December) and survivors (April) were determined. Demographic rates were: TBN (gross natality rate); TBM (gross mortality rate); Sv (survival rate) and PSv (survival probability). TBN was intermediate or low, it being lowest for the mulch system (T1:TBN = 380.84‰). TBM was higher than average, mulching having the highest mortality. There were no differences between them (T1:TBM=619.15‰). Survival rate was intermediate to low. There were no differences among the three systems. T3 (incorporation) had a higher value (T3: Sv = 366.42‰) due to the larger number of survivor and live plants. PSv was low, the highest being T3 (PSv = 0.366). In conclusion, the species has low survival in the culture systems assayed.

42.

**INTERACTION BETWEEN GROSS MORTALITY RATE (TBN) AND INDIVIDUALS WITH REPRODUCTIVE CAPACITY (ICR) OF *Sorghum halepense* (L.) Pers. IN SUGARCANE CROPS OF FRONTERITA (TUCUMÁN)**  
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*S. halepense* (Poaceae) is a high photosynthetic capacity weed that causes serious damage to sugarcane crops. There is no demographic data of its populations. The objective of this work was to establish the relationship between Gross Mortality Rate (TBN) and Reproductive Capacity (ICR) of *S. halepense* in crops. Work was carried out at Fronterita on four year ratoon cultivar CP 65-357. Ten completely randomized plots of 40 m<sup>2</sup> (October 2007) were used. Plant density and seed production per plant were determined. A loss of 60% was considered as a factor of missing seeds from the soil bank (Chaila, 2001). In the study, plants from rhizomes were not considered. In each plot viability and germinative power were determined. Chaila (2001) models were used to determine ICR, real reproductive capacity (RCR) and infestation potential. Total plants were counted in October 2007, live and dead ones by difference in December 2007, survivors in May 2008. Plant values were transformed to hectares and rates in ‰. Demographic rates were: TBN (gross natality rate), TBM (gross mortality rate), Sv (survival) and PSv (survival probability). Parametric statistical analysis was made at initial population, live, dead and survivors by ANOVA and Tukey's test ( $\alpha=0.05$ ). Total plants in October were 488.917 pl.ha<sup>-1</sup>. Survivors in May 176.350 pl.ha<sup>-1</sup>, TBM 328.28 ‰; TBN 671.72‰; Sv 360.28‰ and PSv 0.36. ICR-TBN ratio was 3:1. The number of individuals from seeds with reproductive capacity was three times higher than that of individuals that grew during the crop cycle.

43.

**PRELIMINARY TESTS OF THE EXPERIMENTAL TRANSMISSION OF CEREAL WITH PYROPHAGUS TIGRINUS RHABDOVIRIDAE REMES LENICOV & VARELA (HEMIPTERA: DELPHACIDAE)**  
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Cereal Rhabdoviridae affects wheat crops in Argentina as shown by the chlorotic stripes on the flag leaf and yellowish, empty ears. This virus is transmitted experimentally by insect vectors of the family Delphacidae. The presence of *P. tigrinus* in areas with viruses suggests that it might play a role as disease vector. The aim of this work was to demonstrate the vector capacity of *P. tigrinus* to transmit Cereal Rhabdovirus to barley in experimental conditions. Insect rearing started in the laboratory under controlled conditions of temperature and humidity. The experimental transmissions were made from barley seedlings (cv, Goldie). For the trials third-instar nymphs were used. Diseased barley plants were used as inocula and transmissions were carried one by one to healthy plants. After 10 days the plants were evaluated for the presence of symptoms characteristic of this disease. Rhabdovirus transmission by *P. tigrinus* was determined experimentally. The plants showed symptoms of chlorotic stripes, yellowing, dwarfing and stunting. Thus began the first studies to demonstrate the vector capacity of *P. tigrinus* to transmit Cereal Rhabdovirus, which could have strong implications for the epidemiology of this disease.

44.

**EMERGENT POPULATIONS OF *Sicyos polyacanthus* Cogn. FROM SEED CONTRIBUTION IN SUGARCANE CROPS IN THREE LOCALITIES OF TUCUMÁN**  
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*S. polyacanthus* has become the most important magnoliatae weed of sugarcane crops in the last two decades. Its control requires integrated management practices mainly based on bioecological tools. The objective of this work was to study the emergent populations from the production and contribution of seeds. We worked at Santa Bárbara, Villa Quinteros, and Soldado Maldonado localities, on two years ratoon cultivar CP 65-357 in 50 furrows with plots 100 m long. Initial plants were counted in December 2007, establishment in January 2008, seed production in May 2008 and emergent populations in November 2008. Mechanical culture without herbicides, without watering, with nitrogenous fertilization was used. Parametric statistical analysis was made at initial, intermediate and final populations (ANOVA, Tukey's test). A seed production average of 13.203.640 seeds.ha<sup>-1</sup> from the original plants was found. They produced an emergent population of 226.983,27 pl. ha<sup>-1</sup>; 11.266,66 pl. ha<sup>-1</sup> survived. Mean rate values are: TBM 950.36 ‰, TBN 49.63‰ Sv 4.96‰. This indicates a poor production of seeds per plant, a great number of them missing or not entering the bank due to different causes. In conclusion, the emergent populations are small and come from seeds with high mortality, low natality and low survival rates.

**45. INFLUENCE OF INOCULATION WITH *Mesorhizobium ciceri* ON THE CULTURAL PERFORMANCE AND ACTIVITY OF PHOSPHATE SOLUBILIZER MICROORGANISMS IN CHICKPEA (*Cicer arietinum* L.) IN THE PROVINCE OF TUCUMAN**

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The expansion of chickpea cultivation (*Cicer arietinum* L.) in the northwest and center of the country is a possible alternative with good to high profitability. The interaction between the microorganisms of the rhizosphere is of vital interest because they affect the growth and performance of the plant as a coordinating group of elements. A qualitative and quantitative change is produced in the radical exudates, and this also produces a new balance that affects the activity and diversity of the microorganism population; some interact, with a beneficial effect on the development and nutrition of the plants and quality of soil. The influence of the roots is important for the multiplication and diversification of the microorganisms that grow in association with this environment. The aim of this work was to evaluate the incidence of inoculation with *Mesorhizobium ciceri* on the performance of the cultivation and the activity of phosphate solubilizer microorganisms. The assay was carried out in El Manantial, Tucumán. We used a block design with four repetitions and the treatments were T<sub>1</sub>: control and T<sub>2</sub>: inoculated with commercial formula label dose. The results showed an increase of 25% in the performance and 21% in the activity of phosphate solubilizer microorganisms in T<sub>2</sub>

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**46. EVALUATION OF SOIL PARAMETERS IN A BOVINE PASTORAL SYSTEM**

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The depressed saline plain (DSP) presents a mosaic of soils with high spatial variability. Their location, shape and size are determined by the combination of climatic, edaphic and topographic factors. The aim of this paper was to evaluate soil properties in relation to soil contours. The experiment was carried out on a fluvioaquatic Haplustoll in Los Puestos in DSP. We worked in a pastoral system with *Chloris gayana* cv Finecut (GR). The pasture was grazed rotationally controlling the times of occupation and return. We identified two sampling areas: Low GR and High GR and evaluated four indicators: organic matter (OM) by the Walkley-Black method, pH in water (1:2.5) by a potentiometric method, electrical conductivity (EC) of the saturation extract at 25°C, and cation exchange capacity (CEC) by saturation sodium acetate at pH 8.2. Soil samples were taken in 2009 at 0-20 and 20-50 cm depths. The design was completely randomized. Low GR 0-20 cm: pH 7.89a, EC (dS/m) 5.17c, OM (%) 3.01b, CEC (cmol/kg) 10c, 20-50 cm: pH 8.18a, EC 5.83d, OM 1.65a, CEC 6.7a; High GR 0-20 cm pH 7.67a, EC 2.64a, OM 3.07b, CEC 9.5c, 20-50 cm: pH 8.12a, CE 3.58b, OM 1.65a, CEC 8.6b. Different letters indicate significant differences ( $p < 0.05$ ) between sites and depths. The pH showed no significant differences between areas and depths. The OM and CEC were significantly higher in the first 20 cm of soil in both areas showing a close relationship between these parameters. The EC was higher in the Low GR area. In general, the depressed areas have a higher salt content than the higher areas. The presence of salts is related to capillary rise processes linked to a water table close to the surface.

**47. CHARACTERIZATION OF LEMON BLOSSOM HONEY IN TUCUMAN**

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Honey is a concentrated solution of sugars that also contains other carbohydrates, phenolic compounds, enzymes, amino acids, minerals, pigments and pollen grains that define its main physical, chemical and sensory characteristics. Floral origin is an important determination that is used for differentiation to add value. In monofloral honeys, citrus pollen must be between 10 and 20%. Worldwide efforts are under way to develop other indicators of botanical origin based on physical properties and chemical composition. The aim of this paper is to study both the physical characteristics and the chemical markers of botanical origin of lemon blossom honey in Tucumán. Eighteen samples of honey were analyzed. The analyses included moisture, color, electrical conductivity, pH, free acidity, glucose and fructose and hesperidin and hesperetin as chemical markers. The results obtained for the studied parameters and the range of variation are as follows: moisture (16-18%), free acidity (24-39 mEq/kg), electrical conductivity (0.18-0.30 mS/cm), color (9-22 mmpfund), pH (3.1-3.2), glucose (25-37%), fructose (24-42%), hesperidin (3.8-5.2 mg/kg) and hesperetin (0.1-0.2 mg/kg). Physicochemical characterization and floral origin determination through chemical markers of lemon blossom honey in Tucumán will establish quality parameters and enable differentiation and added value.

**48. COMPARISON OF TOTAL POLYPHENOLS IN INFUSIONS AND VARIETAL WINES**

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Free radicals catalyze oxidative reactions that occur in cell membranes and tissues. Free radicals are present in many diseases and cell aging processes. Polyphenols have the ability to reduce free radicals levels. They are antioxidant compounds that reduce the risk of many diseases. The present work aims at making a quantitative comparison of total polyphenols present in Malbec Red Wine, Tea, Green Tea, and Yerba Mate infusions (the concentration was expressed in parts per million-ppm of equivalent gallic acid). Determinations were made by measuring the absorbance of the colored complex formed by the Folin-Ciocalteu reactive with polyphenols. Total polyphenols content was determined spectrophotometrically at a wavelength of 765 nm. The absorbance vs gallic acid concentration curve (concentration was expressed as mg gallic acid/L or ppm) was previously drawn. The analysis of the different samples showed the following values: Tea: 551.3 ppm, Green Tea: 924.3 ppm, Yerba Mate: 1516.7 ppm, Malbec: 2059.3 ppm. We conclude that Malbec Red Wine has the highest concentration of total polyphenols. With respect to the comparison of the content of total polyphenols in infusions, Yerba Mate was more concentrated than the other infusions. We recommend the inclusion of Yerba Mate, Green Tea or Tea infusions in the daily diet as well as the restricted consumption of varietal wines.

49.

**CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF *Lippia grisebachiana* M. ESSENTIAL OIL BELONGING TO THE FLORA OF CATAMARCA***de la Quintana L, Luna G, Agüero Á.**School of Exact and Natural Sciences, National University of Catamarca. E-mail: leiladlq@hotmail.com*

The aim of this work was to qualitatively determine the antimicrobial activity and the chemical composition of essential oils in the *Lippia Grisebachiana* M. species.

For the determination of antimicrobial activity and chemical composition of essential oils, vegetable material was collected in the district of Paclín, in the province of Catamarca, during the summer.

The essential oil was obtained by distillation of water vapor, determining performance and refraction index. Chemical characterization was carried out by gas chromatography together with mass spectrometry. Antimicrobial activity in the essential oil was tested over gram positive and gram negative bacteria, following the radial diffusion method in an agarised medium.

The essential oil obtained had a performance of 1.7%, its refraction index being 1.5003 at 20°C. Major constituents identified: Isomenton 34.64%, Menton 15.37%, Pulegone 5.47%,  $\beta$ -caryophyllen 2.46%,  $\alpha$ -caryophyllen 0.58%.

The oil showed antimicrobial activity, generally stronger for gram-positive germs. Further research will allow the identification of the components that are possibly responsible for this antimicrobial effect.

50.

**ACYCLIC DITERPENIC ACIDS FROM *Smallanthus sonchifolius* LEAVES***Mercado MI, Coll Aráoz MV, Catalán C, Grau A.**<sup>1</sup>INQUINOA-CONICET, Inst. Qca Org. Fac. Bioqca, Qca y Farm. UNT. <sup>2</sup>IER Instituto de Ecología Regional. S.M. Tucumán, Argentina. E-mail: mainesmer@yahoo.com.ar*

*S. sonchifolius* (Asteraceae), commonly known as “yacon”, is an Andean crop with tuberous roots rich in phenolic antioxidants and fructooligosaccharides. It is used as a dietary supplement and as a functional food suitable for diabetics and obese people. Aqueous extracts of the leaves show a significant hypoglycaemic effect on normal and diabetic rats.

Yacon leaves produce sesquiterpenes and diterpenes that act as a deterrent to herbivores and provide resistance against pathogens. We analyzed the surface of yacon leaves to obtain information about the molecular factors involved in the defense mechanisms of this species.

Seventeen sesquiterpene lactones were identified, i.e. sonchifolin, its propionate (Prop), isobutyrate (Ibu), methacrylate (Mac) and tiglate (Tig) analogs at C-8 and its aldehyde and carboxyl analogs at C-14; polymatin B, its Mac and Tig analogs at C-8 and its analog with an aldehyde group at C-14; fluctuadin; polymatin A; uvedalin and its aldehyde analog at C-14; fluctuanin and enhydrin. Two new acyclic diterpenic acids were also identified. Recently Dou *et al.* (2008) reported four closely related acids which could be artifacts produced by the extraction method (boiling water). The structure of the isolated compounds was determined by spectroscopic methods, mainly 1D and 2D NMR.

51.

**PRELIMINARY STRUCTURAL ANALYSIS OF ANTIFUNGAL METABOLITES OF LEAF ALCOHOLIC EXTRACT FROM *Phoradendron liga****Selis de Orsi A<sup>1</sup>, Sgroi N<sup>2</sup>, Sgariglia M<sup>3</sup>, Soberón R<sup>3</sup>, Quiroga E<sup>3</sup>, Vattuone MA<sup>3</sup>.**<sup>1</sup>Cát. Física II, <sup>2</sup>Cát. Qca. Anal. From Fac. Agr. y Zoot., UNT, <sup>3</sup>Cát. de Fitoquímica, Fac. Bioq., Qca. y Fcia. - UNT.Tucumán, Argentina. E-mail: lorsi@arnet.com.ar*

Citrus (lemons) are attacked by fungi that produce great losses during the post-harvest period. It is possible to use extracts from regional plants as an antifungal treatment. In previous works the antifungal activity of the alcoholic extract from *Ph. liga* against lemon pathogenic fungi was reported. This study describes preliminary analyses to determine the chemical composition of purified fractions obtained by bioguided fractionation.

The alcoholic extract was fractionated with three different solvents (ethyl ether, dichlorometane and methanol). The dichlorometane fraction was found to be more effective against *Penicillium digitatum* by bioautography. Then, this fraction was fractionated by Sephadex LH20/ methanol. The sub-fractions obtained (G1-G5) were analyzed by TLC (Silica gel 60 F254 plates) and bioautography. G2 and G4 were the most active. G2 showed three spots and these suggest: G2<sub>1</sub> diglycosylated phenolic compounds, G2<sub>2</sub> phenolic acid esters and G2<sub>3</sub> non-glycosylated phenolic compounds. G4 showed a phenolic compound spot. Additional analysis techniques are needed to confirm these results.

52.

**ANTIBACTERIAL ACTIVITY AND MODE OF ACTION OF METABOLITES PURIFIED FROM *Tripodanthus acutifolius****Soberón JR, Sgariglia MA, Sampietro DA, 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) San Miguel de Tucumán, Argentina. E-mail: jrsrody@yahoo.com*

*Tripodanthus acutifolius* (Ruiz & Pavón) Van Tieghem leaves have water-soluble phenolic metabolites with antibacterial activities. Five antibacterial phenolic compounds (against *Staph. aureus* ATCC 25923 and *Ps. aeruginosa* ATCC 27853) were purified from an infusion and identified as rutin, nicotiflorin, isoquercitrin, hyperoside (flavonoids), and tripodantoside (an unusual phenylbutanoid glycoside). Bioautography and broth microdilution assays were used to assess the antibacterial activity of samples on TLC plates and to obtain MIC and MBC values respectively. Tripodantoside and its aglycone showed high antibacterial activity against the strains assayed (MIC/CBM = 2.98/2.98  $\mu\text{mol} \cdot \text{mL}^{-1}$  for both strains). Flavonoids showed low antibacterial activity against the strains assayed (MIC/CBM ranging from 6.02-8.61/6.02 to 13.46  $\mu\text{mol} \cdot \text{mL}^{-1}$ ). Spectrophotometric assays, Sytox green staining and transmission electron microscopy studies suggested a bacteriolytic effect for tripodantoside aglycone against both strains. The structural knowledge of antibacterial substances and their mode of action represents a contribution to the current antibacterial therapies and to the development of new leader drugs.

**53. EVALUATION OF ANTIINFLAMMATORY ACTIVITY OF PLANT EXTRACTS**

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Hyaluronidases (HYAL) are enzymes that depolymerize hyaluronic acid of the extracellular matrix of mammalian tissues during inflammatory processes. Infusions and decoctions from *Caesalpinia paraguariensis* bark and *Cestrum parqui* leaves and flowers are popularly used because of their antiinflammatory properties. We investigated the HYAL inhibitory activity of extracts from the above species and determined the chemical nature of compounds present in bioactive extracts. HYAL inhibitory activity was assayed by the Reissig method and expressed as inhibition percentage (%I); aspirine, gallic acid and (+)-catechin were used as controls. *C. paraguariensis* infusion was successively extracted with ethyl ether, chloroform and methanol. The methanolic fraction (MF) was bioactive and was then fractionated through Sephadex LH-20/ Methanol. Bioactive sub-fractions were analyzed by two-dimensional TLC and UV-Vis spectroscopy. The content of tannins and anthocyanidins of the bioactive fractions was determined. The % for Infusion, MF and MF without tannins were: 99.97±0.03 (50 ppm), 73.90±2.3 and 71.30±1.30, respectively. The inhibitory activity was partially attributable to anthocyanidins (30.30±0.55; pelargonidin and delphinidine) and flavones and isoflavones (51.30±2.00). At present the isolated compounds are being identified by MS and NMR.

**54. EFFECT OF THE CITRUS LIMON VARIETIES ON FLAVONOIDS CONTENT IN LEMON JUICE IN TUCUMAN**

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Flavonoids profile is a parameter that allows the characterization of lemon juice from a certain geographical region and provides information about flavonoids, which are nutritional components that reduce the risk of cardiovascular disease. The aim of this work was to determine the effect of Citrus Limon varieties on flavonoids content, evaluating the five varieties most used in Tucumán Province: Lisboa, Genova, Limoneira 8A, Eureka and Santa Teresa. Fruit samples were harvested from the collection of varieties in the Estación Experimental INTA, Famaillá. Juice samples were clarified using Carrez solution and then filtered. Determination of flavonoids was carried out with a gradient reversed-phase C-18 HPLC assay of 150 mm of length and 4.6 mm of diameter with particles of 5 µm, and as mobile phase water/acetic acid (A) (99:1, v/v) and methanol (B), with UV detection at 273 nm. The flavonoids identified were: hesperidin, eriocitrin, neohesperidin and diosmin. The results obtained for eriocitrin ranged between 69 and 177 mg. L<sup>-1</sup>, for hesperidin between 70 and 163 mg. L<sup>-1</sup>, for diosmin between 22 and 59 mg. L<sup>-1</sup> and for neohesperidin between 3.3 and 18 mg. L<sup>-1</sup>. The results allow us to conclude that Lisboa and Santa Teresa are the best varieties to obtain juices with highest flavonoids content.

**55. ACUTE PHASE PROTEINS AND ACTIVATION OF COAGULATION IN AN EXPERIMENTAL PNEUMONIA MODEL IN MALNOURISHED MICE. EFFECT OF *Lactobacillus casei***

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Aim: to evaluate the capacity of *Lactobacillus casei* CRL 431 (Lc) to modulate the behaviour of acute phase proteins (APP) in an experimental pneumonia model in malnourished mice. Malnourished mice received for 7d a balanced conventional diet (BCD) or BCD with Lc for the last 2d (BCD+Lc). BCD, BCD+Lc, malnourished (MNC) and well nourished controls (WNC) were infected with *Streptococcus pneumoniae*. Results: At 0 h post infection (hpi) malnutrition altered all the parameters and renutrition with Lc normalized them. In MNC the infection induced a decrease in Total protein (TP) and Albumin (A) and an increase in Thrombin anti-thrombin complexes (TATc), Fibrinogen (F) and α-Acid glycoprotein (AGP), while BCD+Lc normalized TP, A, TATc (TATc<sub>120hpi</sub> MNC=25±0.08 mg/L; WNC= 13.99± 1.20; BCD=25.50±1.53; BCD+Lc=7.6±1.53), F (F<sub>120hpi</sub> MNC= 180.12±4.96 mg/dL; WNC=304.61±2.12; BCD=260±1.18; BCD+Lc= 239.50±6.92) and showed lower AGP concentrations. **Conclusions:** a renutrition diet supplemented with Lc modulated the behaviour of the APP tested, leading to a lower activation of coagulation. As a consequence, Lc contributed to the modulation of the inflammation-hemostasis balance in a pneumonia model in malnourished mice.

**56. WETTABILITY OF ALOE SAPONARIA SOLUTIONS IN VIVO AND IN VITRO**

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Wettability is an important property in drug development since it is expressed through absorption capacity or drug penetration. It is important in the development of dental products (mouth rinses, gels). Aim: to determine the wettability of Aloe saponaria solutions through the angles of attachment to glass and skin. Materials and Methods: We used physiological solution (PS), a commercial oral rinse (OR), liquid vaseline (VL), distilled water (DW), saliva (SA) and extracts of Aloe saponaria (AS). We separated the pulp from fresh leaves, blended and filtered. From the resulting solution, 10-50% dilutions were made with distilled water. In order to determine the adhesion angle (ADA) we took digital photographs of 10 ul of the solutions with a Nikon Coolpix 4600 camera located 20 cm away. Glass plate and the sanitized index finger were used. The ADA was measured with the MB-ruler program and the data analyzed with the Graph Pad Software. Results: For ADA on glass no statistically significant differences ( $p < 0.001$ ) between AS, PS, DW and OR were obtained, while there were between LV and SA ( $p < 0.001$ ). On skin AS solutions and OR did not significantly differ, while DW had the highest ADA ( $p < .001$ ). No statistical differences ( $p < 0.001$ ) were obtained in PS, SA or LV.

Conclusion: Aloe saponaria solutions have an influence on wettability. No differences in its concentration were obtained. The development of oral moisturizers requires further studies.

57.

**AN EXPERIMENTAL ENDOTOXEMIA MODEL. PRELIMINARY RESULTS**

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In animals, challenge with a bacterial lipopolysaccharide (LPS) leads to pathophysiological changes similar to the septic shock syndrome in humans. The aim of this work was to set up a model of LPS-induced endotoxemia in mice to study inflammatory and haemostatic alterations. BALB/c adult mice were separated in two groups according to the LPS dose administered by intraperitoneal injection (ip): 0.5mg of LPS/kg of body weight (LPS<sub>0.5</sub>) and 2.5mg of LPS/kg of body weight (LPS<sub>2.5</sub>). Control mice were injected with saline solution (C). At different times postinjection (hpi) samples of plasma, whole blood and tissue were taken up to determine: a) Prothrombin Time (PT); b) Activated Partial Thromboplastin Time (APTT); c) plasmatic Fibrinogen (F); d) Platelets count; e) Total and differential leukocytes count; f) bacterial translocation (TB) to the liver and spleen. Results: the ip of LPS induced a decrease in prothrombinic activity (PT C= 100±1.0%; LPS<sub>0.5</sub> 6hpi= 74±1.0%; LPS<sub>2.5</sub> 6 hpi= 79±0.8%), APTT prolongation, an increase in F (C=280±21.9mg/dL; LPS<sub>0.5</sub> 12hpi=364±0.0mg/dL; LPS<sub>2.5</sub> 12hpi=393±0.0mg/dL), a decrease in platelets and leukocytes counts, and passage of bacteria to liver and spleen. Conclusion: the different LPS doses showed a similar behavior. We also found haemostatic alterations accompanied by passage of bacteria to liver and spleen. However, evaluation of other LPS doses would be important in order to obtain an experimental model with higher haemostatic alterations.

58.

**GLUCOSE/MANNOSE AND N-ACETYLGALACTOSAMINE/GALACTOSE IDENTIFICATION IN THE SMALL AND LARGE INTESTINE OF NANDU (*Rhea americana*)**

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Nandu (*Rhea americana*) is a species found only in South America. The industry of ratites is a new activity in many countries of the world. The aim of this work was to identify glucose/mannose and N-acetyl galactosamine/galactose in the intestinal tract of nandu. Samples of the small and large intestine were collected, fixed in buffered formol and included in paraffin. Con A and RCA-I lectins were used for glycoconjugates determination. The data obtained were: \*with Con A reaction a moderate reaction was found in the brush border and base of the duodenum hair follicle and an intense reaction in jejunum-ileon, while in cylindrical and goblet cells reaction was negative. In the large intestine there was great reactivity on the apical surface of the lining and glandular epithelium; \* with RCA-I, along the small intestine, intense reaction was visualized in the brush border, weak in cylindrical cells and negative in goblet cells. There was no reaction in the large intestine. In conclusion, both the small and the large intestine showed the presence of glucose/mannose, mainly in the brush border and base of the hair follicle epithelium, while N-acetyl galactosamine/galactose was found especially in the brush border of the small intestine.

59.

**ADMISSION TO THE SCHOOL OF MEDICINE AND ACADEMIC PERFORMANCE OF 1st YEAR STUDENTS**

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Admission to the School of Medicine of the National University of Tucumán (U.N.T.) considers high-school average (SA) plus the total score obtained in the Admission Test in 4 subjects: Biology, Reading Comprehension, Chemistry and Physics, to obtain the Final Admission Score (FAS). **Objective:** To associate 1st year Academic Performance (AP) with SA, Admission Test (AT) score and FAS. A cross-sectional descriptive study was carried out. The population were students admitted in 2002 and 2003 (665 students). AP was obtained by averaging number of failed exams, number of subjects passed and their average test score, and categorizing it into "Very Good", "Good", "Fair" and "Bad". ANOVA was used and the level of significance was 5%. **Results:** In the 2002 cohort the SA of students with "Very Good" AP was significantly better than those with "Fair" AP ( $p < 0.0001$ ). The same applies to 2003 but between students with "Very Good" AP and "Bad" AP ( $p < 0.0001$ ). No significant association was found between AP and SA in 2002 and 2003 ( $p = 0.5948$  for 2002 and  $p = 0.9338$  for 2003). In 2002 the FAS of students with "Very Good" AP was significantly higher than those with "Fair" or "Bad" AP. No significant association was found in 2003. **Conclusions:** At the School of Medicine (UNT), the better the SA of admitted students, the better the AP in the 1st year of the career.

60.

**PROPER SPELLING IN AN EDUCATIONAL COMMUNITY**

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Spelling is fundamental in the writing of the texts used in a community. However, this aspect is underestimated during the teaching-learning process or in professional practice. The aims of this work were: 1-To analyze the attitudes of Dentistry students towards spelling. 2- To detect the most frequent spelling mistakes. A non-structured questionnaire was applied and the written answers of 37 students were evaluated. 100% considered that spelling is important because it reflects the degree of education of the members of a community; it facilitates communication and permits an adequate interpretation of texts. 68% claimed to have good spelling. Among their most frequent difficulties, they mentioned the use of orthographic accent and of some graphemes with phonetic approximation and punctuation. These statements agree with the evaluations analyzed. 57% stated that they paid attention to spelling when reading whereas 78% said that they revised their written work. 97% would like to improve their spelling. These results reveal favorable attitudes of the students towards proper spelling, so it would become a valuable element to be considered in the formation of competent professionals both in the career of their choice and in their integral formation from the beginning of their higher education.

**61. GENERAL CHEMISTRY LEARNING IN BIOLOGY**

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The aim of this work was to identify the conceptual learning acquired by General Chemistry students of the Biology Career in the Faculty of Natural Sciences.

The online methodology to conduct this work had an orientation with a predominantly qualitative descriptive approach. A non-experimental, observational and transversal design was proposed. The population under study consisted of 40 students reading for their Bachelor's Degree in Biological Sciences who passed the General Chemistry course for the 2006 academic cycle.

The first results revealed that the students had no difficulties in the study and application of conceptual contents: atomic structure and periodic table. They used rote learning for formula writing and nomenclature of inorganic compounds. Difficulties arose when they applied the concepts or any procedures in thermodynamics and thermochemistry. Students said that the most difficult subject in the General Chemistry course was chemical equilibrium.

In conclusion, it is generally accepted by teachers and students that learning in General Chemistry is difficult, the hardest items being solutions, thermodynamics, chemical equilibrium and buffer solutions. These difficulties can be explained taking into account the students' ability to process information and the nature of the subject involved.

**62. A QUALITATIVE STUDY OF THE PERCEPTION OF PROSTATE CANCER (PC) IN MEN OF A RURAL COMMUNITY IN TUCUMAN**

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The aim of this work was to evaluate the perception of PC in men in a rural community. This will help design future educational resources to increase screening rates. We conducted a survey of 25 adult participants (>50 years of age) to determine their perception of the prostate gland (PG), their knowledge of cancer and PC, questions pertaining to feelings and personal attitudes and beliefs about PC, their knowledge of prostate specific antigen levels or the findings from digital rectal examination (DRE) and their attitudes towards PC screening. Based on preliminary analysis of the data, we found that knowledge of PG and PC is quit low. They said that they were afraid of developing PC, and did not identify prostate exam for early detection. They were pessimistic about the possibility of curing PC. They said that embarrassment and the pain of DRE were primary barriers to seeking screening. Carefully designed interventions aimed at educating men about PC and delivered through community-based mechanisms have the potential to increase knowledge. Given the complexity and importance of educating people about PC, interventions to increase knowledge that can be used in community settings are required.

**63. ANALYSIS OF THE BEGINNER TEACHERS' PREOCCUPATIONS AND NEEDS IN THE FACULTY OF DENTISTRY OF THE UNT (FOUNT)**

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**Introduction:** The process of teacher formation and professional development takes place during the whole of a teacher's life and implies the development of cognitive and affective qualities. It means that the process of teacher formation involves not only the development of knowledge and abilities but also the motivations and values that allow teachers to act ethically and responsibly (G. Maura). There are three different moments in this process: initial formation, beginner teacher formation and experienced teacher formation. **Objective:** The aim of this work was to analyze the problems and preoccupations that beginner teachers of the FOUNT find in their daily practice in relation to the seven dimensions developed in this study. **Materials and Methods:** CBAM shown by the teachers in relation to the seven dimensions was used. A survey was carried out with 65 teachers of the Faculty of Dentistry and the surveys that indicated less than 5 years' experience (a total of 6 surveys) were chosen. There were 42 questions with 5 categories. **Results:** in four categories there were no significant differences between the different levels of questions  $p > 0.05$  (most of the teachers produced similar answers). However, in the category "disagreement" there were significant differences. **Conclusion:** beginner teachers in the FOUNT showed concern for the students and commitment to their own personal and professional growth.

**64. THE RURAL TEACHER. CONCEPTIONS OF HEALTH CARE**

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**Objective:** To identify the conceptions of health care in teachers of the rural school 291 "Victoria Rodríguez."

**Material and Method:** The investigation was carried out in the Cruz Alta department in 2008. School teachers in the rural area of Los Bulacios were interviewed using a self-administered questionnaire with 29 items. To process the information, absolute and relative frequencies were calculated.

**Results:** The teachers, aged between 37 and 49, had been in the educational system for more than 15 years. Only one of them had received training in Education for Health (EDSA). They used complementary material, especially writing (80%), blackboard (40%) and paper (40%). They said that EDSA contents were integrated into the areas of Natural Sciences.

Only one identified the manuals recommended for EDSA. They said that the most urgent requirement in order to develop EDSA was formation in teaching methodologies.

**Conclusion:** Teachers are aware of the benefits of health care. It would be important to persuade them to treat it as a strategy in order to facilitate the choice of healthy alternatives during their entire lives.



65.

**METHODOLOGICAL STRATEGY FOR THE TEACHING OF PHARMACEUTICAL TECHNOLOGY***Arias M, Sesto Cabral E, Nieva Moreno MI, Gómez Morton T, Ordoñez A, Gómez JD.**Tecnología Farmacéutica II. Fac. de Bioquímica, Química y Farmacia. E-mail: marias@fbqf.unt.edu.ar*

**Objective:** To actively involve students in the acquisition of their own knowledge and to develop cognitive and cooperatives abilities to improve their personal and professional training.

**Materials and Methods:** the teaching strategy of Problem-Based Learning (PBL) in the teaching of pharmaceutical technology was used. A plant species with known therapeutic activity or a synthetic drug was assigned to each group. Students researched, designed, developed and produced an efficient, stable and safe pharmaceutical or cosmetic preparation, which was thoroughly analyzed in terms of the components of the proposed formulation, equipment and instruments necessary for manufacturing controls, packaging and storage conditions.

**Results:** Students presented and defended a paper on their product, following the guidelines required by the local health authority for approval and subsequent commercialization of a product.

**Conclusion:** Students were actively involved in resolving the problem. The methodology adopted was highly beneficial because it could establish a feedback process enriching the student-teacher relationship.

66.

**MOLECULAR PHARMACOLOGY TEACHING STRATEGIES***Gerbán J, Mitre P, Basualdo M.**Department of Pharmacology FOUNT.**E-mail: joalge@yahoo.com.ar*

The teaching of Pharmacology through interactive resources favors students' learning and creative thinking, especially in topics related to molecular Pharmacology.

The subject chosen for research was Pharmacodynamics. The students who took the subject Pharmacology in 2008 were divided into three groups. Group A (Ga) did their practical assignments (TP) from visual cinematic images used by the teacher as a demonstration. Group B (Gb) used written sources (taken from the "self-learning module") and Group C (Gc) did their assignment in the traditional way. All the students attended non compulsory lectures on the subject 15 days before doing their TP. At the beginning and end of the TP, the students sat for anonymous assessments of non structured questions about Molecular Pharmacology. The data was analyzed with a generalized linear model with repetitive measures (GLM). The studied groups, which were formed randomly, did not show significant differences in: a) age (ANOVA  $p=0.3955$ ), b) number of years of study in this university (ANOVA,  $p=0.2845$ ), c) whether the students were taking all the subjects or not ( $c2.p=0.1085$ ). Taking the variable group as explanatory, significant differences were found between the number of correct answers before and after each methodology was applied. There were differences between animation and text methodologies, and between animation and traditional methodologies, but not between traditional and text methodologies (GLM  $p < 0.0001$ ).

67.

**EVALUATION OF THE PRACTICAL ASSIGNMENTS OF HISTOLOGICAL TECHNIQUES FROM A STUDENTS' SURVEY***Mac Loughlin V, Grosso C, Dauria P, Sagripanti G, Castagnino R, Sona L, Navarro O, Martínez R.**Histología. FAV-UNRC. E-mail: rcastagnino@ayv.unrc.edu.ar*

Traditionally the classes of Histological Technique for Laboratory Technician and Microbiology Licenciante were only linked to a theoretical activity. Since 2008, in view of the requirements of professional practice, compulsory laboratory practice was added. After finishing the course, the students are given anonymous voluntary questionnaires to evaluate the activity. The objectives were to determine weaknesses and strengths of this practical laboratory work and its relationship with professional practice. The modality used was based on open and closed questions, in order to obtain quantitative and qualitative information. The results obtained were: 59.61% considered the activity as very good; 31.2% as good and 2.9% as bad; 91.47% understood the histological technique completely and 8.53% understood it partially; 91.5% were able to relate the activity developed to professional practice and 2.3% were not; 50.28% said that the combined participation of a teacher with the Laboratory Technician was appropriate; 41.19% said that it was useful and 2.27% that it made no difference; 80.72% said that this activity should continue without modifications and 13.02% suggested modifications. In conclusion, it is beneficial to continue with this activity, improving some of its aspects.

68.

**APPROACH DE ACREDITACION IN A MODEL OF WRITTEN EXAM FOR APPLICANTS TO THE CAREER OF DENTISTRY IN THE COURSE OF LEVELING ODONTOLOGICO***Meheris H, Ruiz Holgado N, Romano S, López Miranda L, Martín A, Rodríguez G, Pani M, Garat J.**Dep. of Histology School of Dentistry National University of Tucumán. E-mail: giyahe@uolsinectis.com.ar*

The Introductory Course of Leveling Odontológico, it is an instance in the curricula of the Ability of Dentistry that contemplates all applicant to enter to the career of Odontologist. In this opportunity the dictation of the module Basic Cytology is developed", and carried out by the educational personnel of the Class of Histology under the modality of Theoretical-practical. In the teaching process learning, the evaluation is a key moment as much for the educational one as for the student. This work is to know and to meditate if the evaluation instrument is valid and reliable and if the approach of fixed acreditación, guarantees a significant learning. They were evaluated 278 students applicants. 20 structured questions were made that responded pedagogically to the categories taxonómicas established. The applied evaluation approach was adjusted to requirements outlined by the Institution and not to the traditional pattern: (60% = at 4 of the total of formulated questions). The student applicant that was able to gather 4 points, product of the sumatoria of the puntaje assigned to the questions, it was considered approved and promoted for the entrance to the career. Of the 278 evaluated students they approved the exam 221 alumnos, postponed 58, and be absent 13. The analysis of the results reveals the following values: 54 students applicants approved with 4 points (19,36%); 60 with 5 points (21,51%); 46 with 6 points (16,49%); 35 with 7 points (12,54%); 22 with 8 points (7,86%); 2 with 9 points (0,72%); and 1 with 10 points (0,36%). Total 1.517,84. average: 5,47956679. Of the obtained results, it is inferred that the applied evaluation instrument is valid and reliable; but I didn't seize the acreditación approach that doesn't favor to the process teaching.

**69. INFLUENCE OF COLD ON THE ARTISANAL ELABORATION OF SWEET OLIVES**

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Traditionally, olives are consumed as a salty food. In Catamarca, sweet olives are made as an alternative regional economic activity. The elaboration process, which is repeated several times, consists in baking olives in sugar syrup and later drying them at room temperature. The objective of this work was to determine the nutritional composition (carbohydrates, proteins, total fats, saturated and trans fats, nutritional fiber, sodium and power value) of sweet olives samples. The values obtained agree with those established by the Argentine Food Code; the absence of trans fats was observed. No significant nutritional differences between the samples of cold conserved olives and those elaborated directly were observed, so that the seasonal character of olives would not be a problem for continuous production.

**70. ESTABLISHMENT EVALUATION OF *Lotus tenuis* IN A NATURAL GRASSLAND WITH THREE DIFFERENT SOWING SYSTEMS**

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Incorporation of *Lotus tenuis* (*Lt*) to natural grasslands is fundamental to improve their quality and productivity. A successful implantation, which is difficult due to the low seedling vigour of this species, is of great importance. The aim of this work was to evaluate *Lt* establishment in a natural grassland with three different sowing systems: direct sowing (DS), interseeding (IS) and broadcast seeding (BS). The trial was established on May 16, 2009, at the Facultad de Agronomía- UNLP Experimental Station in a completely randomized block design ( $t=4$ ). Plot size was 2.4m x 5m. Commercial seeds of the cultivar “Aguapé” (UNLP) (9kg/ha) were used. DS and IS were simulated by means of handmade tools. DS was done in lines spaced 15 cm (depth  $\geq$  3cm) while for the IS, the seeds were seeded after a superficial removal of the soil (depth  $\leq$  3cm). Glyphosate (4 lt/ha., 48% with 100 lt/ha. of water) was applied 10 days before the sowing for DS, while for IS and BS a low cut was done. Establishment was evaluated by counting established seedlings (with at least 1 leaf)/m<sup>2</sup> 60 and 90 days after sowing with a round frame (0.962 m<sup>2</sup>) (n=6). ANOVA and Tukey's test were performed. DS was significantly higher at both evaluation times ( $p<0.01$ ). There were no significant differences between IS and SV. These preliminary results suggest that DS would be a promising sowing system in order to achieve a greater number of plants/m<sup>2</sup>, at least during the first stage of the implantation of *Lt* in a natural grassland.

**71. EFFECT OF MINERAL AND ORGANIC NUTRITION ON MORPHO-PHYSIOLOGICAL CHARACTERS OF FRESH STRAWBERRY PLANTS IN A HIGH-ELEVATION NURSERY, TUCUMÁN, ARGENTINA**

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The aim of this work was to determine the effect of mineral and organic nutrition on the morpho-physiological characters of fresh strawberry plants, cv. Camarosa, in Tafi del Valle in 2008/09. The treatments were: 1. Control; 2. Nutribacter 3l./ha<sup>-1</sup>; 3. Manure (20t.ha<sup>-1</sup>); 4. Nutribacter 3l./ha<sup>-1</sup>+Manure (20t.ha<sup>-1</sup>); 5. Nutribacter 3l./ha<sup>-1</sup>. 130UFN/ha<sup>-1</sup>+159 PFU/ha<sup>-1</sup>; 6. Manure (20t.ha<sup>-1</sup>)+130 UFN/ha<sup>-1</sup>+159 UFP/ha<sup>-1</sup>; 7. 130 UFN/ha<sup>-1</sup>+159 UFP/ha<sup>-1</sup> and 5 repetitions. We determined in the plants: Number of leaves.pt<sup>-1</sup> (LN), crown diameter (CD), root length (RL), leaf area index (LAI) and Plant Harvest Index (IHP). ANOVA, Tukey's test and correlation were made. There were no differences in LN; differences were detected in: (CD) between 7 (1.4), 6 (1.3875), 5 (1.36), 3 (1.3467) on 2 (1.1867) and control (1.1438); in (RL) between 6 (17.5), 4 (16.833), 7 and control (13.438); in (LAI) in 6 (152.30), 7 (150.89), 5 (131.73), 3 (116.39), 4 (112.33) on 2 (92.946) and control (84.298); in (IHP) between 3 (48.257) and control (38.269). Positive correlation was obtained between (LAI) and (CD) (0.598). We concluded that mineral with organic amendments promotes greater vigor with increased leaf area and therefore the fate of assimilates to the storage organ which is reflected in the increased size, earliness and physiological maturity of fresh strawberry plants cv. Camarosa nursery in high valleys.

**72. COTYLEDON ANATOMY OF FOUR VARIETIES IN *Chenopodium quinoa* (Willd.) YOUNG PLANTS UNDER SALT STRESS**

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*C. quinoa* Willd. is a pseudocereal with high quality nutritive proteins native to the Peruvian Andes. Some species of the genus tolerate high salt concentrations (Mackersie & Leshmen, 1994). Knowledge of resistance mechanisms and structural strategies adopted by the plant is necessary to choose varieties for cultivation. The aim of this work was to evaluate the anatomy of young plant cotyledons on four varieties: *witulla*, *wariponcho*, *pasancalla* and *cica*, exposed to salinity stress. Seeds were germinated in nutritive media at 0 and 200 mM of NaCl concentration, under controlled conditions. Fixed material was treated using conventional techniques. Number of palisade parenchyma cells, palisade parenchyma cell layers, stomatal size and density were measured. The four varieties present a dorsiventral structure, anfstomatic, unistratified and papillose epidermis, sunken stomata, smooth cuticle. Collateral vascular tissues. On the upper epidermis, cells are isodiametric with straight to curved cell walls, on the lower epidermis they are rectangular. Stomata are of the anomocytic type. Calcium oxalate crystals were detected. Although there were no significant structural changes, variations were observed among the variables measured, evidencing different strategies against salt stress. *Pasancalla* variety responded more efficiently, as reflected by an increase in the parameters measured. This agrees with the physiological results reported by Ruiz *et al.* (2009).

73.

**PRELIMINARY STUDIES OF WHEAT SUSCEPTIBILITY TO MAL DE RIO CUARTO VIRUS IN RELATION TO PHENOLOGICAL STAGES OF INFECTION***Sagadin M, Truol G.**Instituto de Fitopatología y Fisiología Vegetal (IFFIVE- INTA) Camino 60 cuadradas km. 5°, B° Cárcano, Córdoba. E-mail: moniksagadin@yahoo.com.ar*

Due to the symptoms and the losses in yield it produces, the Mal de Rio Cuarto is considered the main maize-affecting disease in Argentina. Wheat is an important reservoir of this disease because of its susceptibility and viral concentrating capability. Besides, during its crop cycle, the vector insect colonizes this species, playing an important role in the epidemiology of the disease, hence the importance of determining the susceptibility of crops to infection at different phenological stages, which is the aim of this work. For this, artificial transmissions using its principal vector, the leafhopper *Delphacodes kuscheli* Fennah were carried out. Uninfected laboratory raised *D. kuscheli* insects were used. These underwent a 2-day-acquisition period on diseased wheat plants, after which they were placed on healthy plants for a latency period of 19 days. At the end of that period, they were placed on cv ProINTA Federal wheat plants which had been sown 5 and 20 days earlier. Two insects were laid per plant, allowing two days for infection. Then, plants were transplanted and placed in a greenhouse under optimal conditions. After 40 days they were processed and analyzed through DAS-ELISA tests. Plants infected at 5 days and 20 days after sowing were affected 50% and 56%, respectively. These are preliminary studies, showing evidence of a similar susceptibility of wheat at different phenological stages to artificial infections with MRCV.

74.

**Foxtail Millet (*Setaria italica* L.): A NEW RESERVOIR SPECIES OF THE WHEAT STREAK MOSAIC VIRUS (WSMV) IN THE PROVINCE OF BUENOS AIRES***Truol G, Sagadin M, Rodríguez S.**Instituto de Fitopatología y Fisiología Vegetal (IFFIVE) - INTA. Camino 60 cuadradas Km. 5° (5119), B° Cárcano, Córdoba, Argentina. E-mail: gtruol@correo.inta.gov.ar*

The wheat streak mosaic virus (WSMV) is the agent of a disease of great importance for wheat crops, producing chlorotic grooves as symptoms. It is transmitted by the mite *Aceria tosichella* Keifer and through seeds as well, at an average percentage of 1.58. In Córdoba province, strong outbreaks were also detected during the 2008 campaign, although with a lower incidence. A fundamental role in the epidemiology of this disease is played by cultivated and reservoir species. Maize, growing spontaneously in wheat lots, has been included among the cultivated species identified as important reservoirs of the WSMV. The aim of this work was to identify other species with reservoir capability.

Foxtail millet plants displaying striped mosaic symptoms were observed at the Barrow Farm (Miramar, Buenos Aires) during the summer of 2009. Collected samples were analyzed by serology to WSMV and transmission by vectors to the wheat cv Baguette 21 (very susceptible). The results of serology and vector transmission determined the presence of this virus in the plants. This is the first work reporting the presence of this disease in foxtail millet in the province of Buenos Aires. This should emphasize its importance in the epidemiology of the disease in this province.

75.

**PRODUCTION AND HEALTH PRACTICES AS EDUCATIONAL STRATEGIES AND LINKAGE BETWEEN UNIVERSITY AND COMMUNITY***Villagra EL<sup>1</sup>, Minervini MG<sup>2</sup>, Juri S<sup>3</sup>, Giuliano S<sup>2</sup>, Díaz E<sup>3</sup>, Toledo R<sup>4</sup>.  
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The University Volunteer Program (MECyT) promotes the construction of increasingly strong links between University and Society (U-C). The Universidad Nacional de Tucumán (UNT) participated in the 2008 national competition with the project "Production of vegetable crops, nutritional education and health care in San Pablo-Tucumán". Its aims were to improve living conditions and local community development through production practices and health and education strategies and linkage between U-C. For its implementation a network of institutions and integration was formed: services, local government and social organizations, with interdisciplinary teams from the UNT: Faculty of Agronomics, Medicine and School of Nursing -5 teachers and 30 students-. During the process a Center for the Increase in Vegetable Crops (Chair of Horticulture -Fac. of Agronomics) was set up, with the production of 6500 young plants for the community (schools/families) and horticultural research activities. At the same time, health-related services were promoted and provided for different age groups; educational material was distributed and workshops were carried out on the conservation of vegetables and fruits. In the UNT these practices of production and health stimulate teacher/student connections and the relationship between theory and practice, teaching, research and knowledge transfer. It is an educational strategy, the real integration/linkage between University and Community.

76.

**ALTERATION OF *Bufo arenarum* OVARY BY CADMIUM***Medina MF, Guido C, Cisint S, Crespo CA, Ramos I, Fernández SN. Departamento de Biología del Desarrollo. INSIBIO (CONICET-UNT). Chacabuco 461. 4000. Tucumán. E-mail: mmedina@fbqf.unt.edu.ar*

Anthropogenic activities have been linked to the decline of some amphibian populations. Taking into account that cadmium ( $Cd^{2+}$ ) present in the environment as a contaminant could affect the reproductive system, the objective of this work was to study the action of this cation on *Bufo arenarum* ovary. Adult females (100-150g) collected during the reproductive period were injected in the dorsal lymphatic sac with  $CdCl_2$  at doses of 0.5 or 5 mg/kg every day for 15 days. Controls were injected with Ringer's solution. Ovary samples were processed with the routine histological technique and stained with haematoxylin-eosin. Observations indicated that ovarian histological features from animals treated with 0.5 mg/kg  $Cd^{2+}$  are similar to those of the controls. However,  $Cd^{2+}$  at a dose of 5 mg/kg produced a significant increase ( $p < 0.05$ ) in the percentage of atretic follicles as well as alterations in the interstitial tissue: dilation of capillary vascular lumens, edema and fibroblast proliferation and clusters of cells with hyperchromic to pyknotic nuclei probably linked to focal necrosis. The early stages of oogenesis showed nuclear and cytoplasmic alterations such as changes in shape, size and number of nucleoli and cytoplasmic vacuolization. These data indicate that *Bufo arenarum* ovary is a target organ for cadmium and that the effective dose is 5 mg/kg.

77.

#### IMMUNOPREVENTION WITH A MULTIPLE DOSE VACCINE APPLICATION SCHEME IN AN EXPERIMENTAL M3 MURINE ADENOCARCINOMA. EVALUATION OF TUMOR VOLUME

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**Introduction:** Therapeutic vaccines stimulate antitumoral response and could be useful in controlling tumoral growth. **Objectives:** To evaluate the efficacy of a multiple dose vaccine application scheme in the control of tumor volume growth in a murine breast adenocarcinoma. **Material and Methods:** 6-8 weeks-old female Balb/c mice weighing 20-25 gr were inoculated with tumoral cells on day 1 and later divided into 4 groups: Control Group (C), Doxo-Vaccine Group (DV), which received IV Doxorubicin on days 3 and 10 and IM vaccine on day 5, Doxo group (D), which received IV Doxorubicin on days 3 and 10, and Vaccine Group (V), which received 5 doses of IM vaccine. The tumor volume (TV) in all groups was analyzed with 7 measurements throughout apparition, growth and tumoral regression. Two-way ANOVA test was used. **Results:** TV showed a statistically significant difference between groups (C) and (V) on days 18 and 21, with 43% and 47% reduction in (V). **Conclusions:** In an experimental breast murine adenocarcinoma, the use of a multiple dose vaccine application scheme caused a significant reduction in tumor volume.

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78.

#### COMPARATIVE STUDY OF DECALCIFICATION METHODS FOR HARD TISSUES. PRELIMINARY STUDY

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**Background:** Decalcification is the current method for microscopy examination of bone tissue. The aim of this study was to assess morphological quality on bone samples obtained using different methods of decalcification. **Materials and methods:** We used 22 bone pieces (tibiae and 12 hemi-mandible) obtained from Wistar rats. The samples were fixed in 10% buffered formol divided in two groups: A) for 24 hours and B) for 7 days. In all cases, we used modified Morse's solution as a decalcifying agent. Both groups were also divided: 1) activated through microwaving for 5 minutes. 2) activated through microwaving for 10 minutes; and 3) activated through intermittent shaking under heat for 15 hours. The samples were submitted to routine histological techniques for light microscopy. They were assessed by semi-quantitative methods using technical and morphological parameters. The values were established at 0, 1 and 2. A) Technical parameters were thickness, wrinkles, and uniformity of color; and B) cell and tissue maintenance morphology. Technical results: Groups A and B were 0° (100%), and B2 Group was 2° (75%). Morphological results: no differences were observed between groups. **Conclusion:** in these experimental conditions we can conclude that Morse's solution using microwaving for 10 minutes showed good technical and morphological results.

79.

#### COMPARATIVE STUDY OF BONE PROMOTION IN POST-EXTRACTION DENTAL POCKETS

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Bone graft used in dental pockets after tooth extraction is a priority in dental clinic. **Objective:** to compare polylactic acid-polyglycolic acid (PLA-PGA) application techniques in post-extraction dental pockets in order to evaluate a suitable method. **Materials and method:** Twelve post-extraction dental pockets requiring titanium implants were selected. All patients agreed to follow Helsinki Clinical Rules. After dental extraction, pockets were divided into: 1) Control (CG) without graft; 2) Experimental a (EaG): with PGA-PLA placed using a Freer spatula and gauze and 3) Experimental b (EbG): with PGA-PLA placed using an *ad hoc* device. Three months later a 2mm diameter bone cylinder was obtained. Titanium implants were placed in the cavity. Samples were subjected to histological processing. **Clinical results:** Intraoperative bleeding in CG and EbG (100%). At EaG abundant bleeding (100%). Immediate Post surgery: In CG and EaG slight swelling (100%) and in EbG severe swelling were observed (100%). **Histological results:** CG: Bone (16%); fibrotic tissue (14%), EaG: Bone(29%); fibrotic tissue (23%), granular substance with PLA-PLGA (4%). EbG: Bone (27%); fibrotic tissue (7%), Granular matrix with PLA-PLGA (13%). **Conclusion:** PLA-PLGA is osteoconductive with both techniques and showed initial inflammatory reaction. Technique B improved patients' initial comfort. Technique A caused hemorrhage and made handling of material difficult.

**Key words:** PLA-PLG, extraction, dental pocket, bone formation.

80.

#### SIMVASTATIN ACTION ON RAT INTERRADICULAR BONE

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**Introduction:** Simvastatin is a potent inhibitor of cholesterol biosynthesis with a hypocholesterolemic effect. According to Mundy *et al.* (1999), it stimulates new bone formation *in vitro* and *in vivo*. Numerous studies in rats showed increased trabecular bone mineral density in various bones, but its action on jaw bone has been little studied. **Aim:** to assess the biological action of simvastatin on rat interradicular mandible bone. **Materials and Methods:** We used 10 Wistar rats weighing 150±20 g. They were separated in two groups: control (CG) and experimental (EG). EG received Simvastatin 10 mg/kg /day orally for 3 weeks. Then, all animals were sacrificed. The mandibles were dissected, subjected to slow decalcification and processed with a routine histological technique. The samples were serially cut at the first molar level and stained with H & E. Furthermore, histometrical evaluation was done. **Results:** CG composite bone. Osteocytes were regularly arranged, and normal marrow hematopoietic cells were observed. In EG composite bone showed similar characteristics to the CG. However, bone marrow spaces were tight by the trabecular bone. Statistics: no statistically significant differences were observed using the Levene F test. The data followed a normal distribution ( $p=0.085$ ). **Conclusion:** In view of the results, simvastatin administration under these experimental conditions produces a slight increase in trabecular bone volume and bone marrow spaces decreased.

**81. GLUCOSE, MANNOSE AND FRUCTOSE IDENTIFICATION IN OVOTESTIS OF SNAIL**

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*Helix aspersa* is the most common snail species in Argentina, as well as the best adapted for breeding production. The aim of this work was to identify mannose/glucose and fructose in the ovotestis of the earth snail. Samples were extracted and fixed in buffered formol and included in paraffin. Determination of glycoconjugates was carried out by the lectin-histochemical technique and the biotinylated lectins used were *Concavalline ensiformes* (ConA) and *Ulex europeaus-1* (UEA-1), while for detection and later development the complex used was avidin-biotin-peroxidase (ABC) and diaminobenzidine (DBA) respectively. The analysis and interpretation of histological samples resulted in the following: with Con A a moderate to weak reaction was observed on the cover of the oocytes and in some cysts in seminiferous tubules; on the other hand, with UEA-1, a moderate to intense reaction was observed on the cover of oocytes of different sizes or at different stages of development and in cysts of seminiferous tubules. It is thus concluded that mannose/glucose as well as fructose are present in the ovotestis of the snail and that the rate of activity increases in relation to the maturity and size of the oocytes.

**82. MALNUTRITION, TOOTH SIZE AND ARCH LENGTH IN RAT**

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Protein malnutrition affects the size and shape of bones. Then, we speculated that alterations in tooth size and arch length could occur. This study analyzes the effects of a protein- and mineral-deficient diet on these parameters in a rat model.

Weaned Wistar rats were assigned to one of the following groups: Control fed a diet containing 23% protein and 10% total mineral and malnourished fed a diet with 7% protein and 0.6% total minerals. Animals were sacrificed at 5 weeks and direct measurements of the following parameters were made: Arch width, upper molars length, mandibular arch length, lower molar length.

Malnutrition significantly decreased mandibular arch length. No differences in mesiodistal dimensions of the molars occurred. This may result in malocclusions.

*Sponsored by CIUNT.*

**83. BIOLOGICAL EVALUATION OF NONUNION BONE DEFECTS REPAIR *IN VIVO*. PRELIMINARY STUDY**

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**Introduction:** The repair of long bone fractures is a sequence of events that includes bleeding, blood coagulation, mesenchymal cells activation, induction of cartilage and bone callus, and callus bone remodelling. This healing process could have certain complications such as pseudoarthrosis, hypertrophic callus and osteomyelitis. The **aim** of this study was to evaluate the process of repair-regeneration in experimental nonunion bone defects of tibiae bone in rats (NUBD). **Materials and methods:** Fifteen female Wistar rats weighing 200 (50+/-) g received NUBD in the left tibia. They were sacrificed on the 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> week (w) after surgery. Radiological and histological studies were performed. **Results.** Radiological: 1<sup>st</sup> w: radiolucent area (3n), 3<sup>rd</sup> w: radiolucent and radiopaque (3n), 6<sup>th</sup> w: radiolucent (1n), radiopaque (2n) radiolucent and radiopaque (1n). Histological: 1<sup>st</sup> w: cartilaginous procedures callus (1n); connective fibrous tissue at fracture area (1n), a combination between both tissues (1n), 3<sup>rd</sup> w: combination between connective and cartilaginous tissues; 6<sup>th</sup> w: hypertrophic bone tissue in all samples. **Conclusion:** From these results we concluded that the absence of immobilization at NUBD developed various repair processes: true pseudoarthrosis, false pseudoarthrosis, and a new situation called combined pseudoarthrosis.

**84. SCANNING ELECTRON MICROSCOPY EVALUATION OF THE SOLVENT EFFECT OF CALCIUM HYDROXIDE PASTE ON UNINSTRUMENTED ROOT CANAL**

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Calcium hydroxide (CA) paste has been used as a root canal dressing with successful results. Andersen described the solvent ability of CA in human pulp tissue and concluded that its effect could be stronger than that of sodium hypochlorite. The aim of this study was to evaluate the solvent effect of CA pastes with irrigants through scanning electron microscopy (SEM). Fourteen single-root teeth recently extracted were used. The crown was removed, each tooth was longitudinally divided and pulp tissue removed. Then they were randomly divided into 7 groups. The control was immediately fixed. The other teeth were filled with CA pastes: saline solution; propyleneglycol; propyleneglycol and camphorated p-monochlorophenol; sodium hypochlorite; 1% chlorhexidine digluconate, iodine potassium iodide 0.1/0.2%. Teeth were kept at 37°C and 100% humidity and removed after 7 and 14 d. They were ultrasonically washed for 10 min, fixed in glutaraldehyde and examined with SEM. Organic rests were evaluated with a mm grid. Data were analyzed using an ANOVA test. With saline solution and propyleneglycol there were more holes without organic rests ( $p \leq 0.05$ ) and with the rest of the pastes the canal walls had fibers, cells, and calcophorites. In the control group there were no differences ( $p \geq 0.05$ ) between the 7 and 14 d; in both cases there were cells and fibers. This study shows that the CA pastes with saline solution and propyleneglycol have a stronger solvent effect on the canal walls than the other pastes assessed.

**85. ACCURACY OF CHRONOLOGICAL AGE ESTIMATION USING THE RADIOGRAPHIC METHOD OF LILLENQUIST AND LUNDBERG**

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The study of dental development is widely used to determine degree of maturation and chronological age. In Archaeology and Forensic Odontology these methods help to identify the age of dead children and the history of a population. Several radiological methods are used in children under 14. Comparisons applied to Anglo-Saxons showed that the Willems method is the most accurate, whereas Demirjian's technique overestimates chronological age and Haavikko's method and Nolla's classification method underestimate it. The Lillenquist-Lundberg method uses the mandibular germs of children 6 to 14 yrs old. There are no works verifying its accuracy in our population. Thus, the aim of this study was to determine the accuracy of the Lillenquist-Lundberg method in the estimation of the chronological age of a sample of our population. Twelve female and 8 males 4-12 yrs old were randomly selected. Panoramic X-rays were taken and images were digitized. Dental age was calculated by evaluating the calcification of 7 permanent teeth, excepting third molars. Chronological age was obtained from the date of birth and that of the study. Data were analyzed with the paired t-test. The chronological age for boys was  $10.15 \pm 0.97$  whereas their dental age was  $10.5 \pm 0.95$ . For girls, chronological age was  $8.6 \pm 0.41$  and dental age  $8.20 \pm 0.48$ . No significant differences ( $p > 0.05$ ) between chronological and dental ages were obtained. The Lillenquist and Lundberg method showed a high degree of accuracy in the estimation of chronological age.

**86. EFFECTS OF SULFHYDRYL TREATMENT ON BONE ALTERATIONS CAUSED BY LEAD**

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Bone tissue has become an important element in the study of lead poisoning. Lead is deposited in bones after calcium exchange. There is no evidence of bone action of sulfhydryl donors, which are drugs used in the treatment of lead intoxication. This work aimed at assessing, using digital radiology and mamographic board, the action of a sulfhydryl donor in the bone of rats treated with 500 ppm lead. Two groups of adult Wistar rats with n: 6 each were used, one group with intake of water with lead acetate 500 ppm and the other treated with lead acetate 500 ppm and a sulfhydryl donor (Acetylmethionine 1 mg/kg/day) for two months. Lead determination was carried out. TOSHIBA team 500 mA and 125 kV and VCR, a system using digital Radiology and x-ray mammography with bone filter, were used to assess bones. In rats treated with lead (500 ppm), mammography showed increased bone density in the compact of large bones and severe invasion of the spinal canal by calcium. Lead (average) of 11.5 2 µg/dl. These alterations were not present in the group treated with sulfhydryl donor and lead. Lead (average): 4.6 2 µg/dl. Sulfhydryl donors would be able to prevent lead deposits in bones.

**87. MAXIMUM NORMAL VALUES (MNV) OF THE TOTAL PROSTATIC SPECIFIC ANTIGEN (TPSA) IN MEN EXPOSED TO ARSENIC (As)**

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TPSA is the most useful marker currently available in the field of oncology for the early detection, management and follow-up of patients with prostate cancer (PC). However, its sensitivity and specificity are not fully satisfactory. For example, a high serum PSA level does not definitively indicate prostate cancer, while a normal serum PSA level does not guarantee the absence of prostate cancer. The aim of this work was to investigate the MNV of the TPSA, analyzing the influence of the high levels of As consumption on the serum concentration of this marker. The TPSA serum levels of 154 healthy men were studied. They were divided in two groups. Group A included 94 and group B 40 men who drank drinking water containing As levels lower than 0.01 mg/L and higher than 0.01 mg/L, respectively. The average concentration  $\pm$  standard deviation was  $1.19 \pm 0.87$  ng/mL for group A and  $0.89 \pm 0.66$  ng/mL for group B. The MNV calculated with the percentile 95% was 2.7 ng/ml for group A and 1.8 ng/ml for group B (statistically significant differences). TPSA was higher than MNV in 6 and 3 individuals in groups A and B, respectively. Free PSA/TPSA ratio was assessed in these men. 83% and 66% had F/TPSA ratios higher than 17% for each group, respectively. The results demonstrated that men exposed to As in the drinking water presented lower MNV serum values of TPSA than those found in unexposed individuals.

**88. EVALUATION OF THE HEPATIC DAMAGE CAUSED BY CHRONIC TOXICITY WITH ARSENIC (As) IN MICE**

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The aim of this work was to study the toxic effects caused in the liver of Balb/c mice exposed to chronic As consumption in the drinking water. Thirty-six mice aged 8 weeks were divided into 4 lots: A) 9 mice in the control group; B) 9 mice given As III; C) 9 mice given As III and injected with a single dose of 20-Methylcolantren; D) 9 mice given As III and administered topically 12-O-tetradecanoyl phorbol-13-acetate. They were sacrificed at 24 (1M), 36 (2M) and 44 (3M) weeks. Lysosomal enzymes, Hexosaminidase (Hex), B-Galactosidase (Gal), Acid Phosphatase (Fac) and Aspartate aminotransferase (AST) and Alanine Aminotransferase (ALT) in liver homogenates were determined. The values of Hex, Gal and Fac in 1+2M were similar in all the studied lots. The levels of Hex obtained in 3M of lot D were significantly higher than in lot A (A:  $176.8 \pm 15.5$  nmolPNP/mgProt/h; D:  $224.3 \pm 5.1$  nmol PNP/mg Prot/h  $p < 0.02$ ). ALT values obtained in 3M of the lot D were significantly higher than in lot A (A:  $88.3 \pm 7.6$  U/L; D:  $110.3 \pm 7.1$  U/L  $p < 0.04$ ), no differences being found in the levels of lots B and C of 3M in relation to lot A. The hepatic damage caused by the chronic consumption of As in the drinking water can be demonstrated after 11 months of treatment in the Hex and in the ALT in the group treated with the tumor promoter.

89.

**ISOLATION AND IDENTIFICATION OF PYRROLIZIDINE ALKALOIDS OF *Senecio rudbeckiaefolius* MEYEN & WALPERS (ASTERACEAE)**

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*Senecio rudbeckiaefolius* is a shrub that grows in the mountains of southern Peru, Bolivia and northwestern Argentina. *S. rudbeckiaefolius* is considered toxic for livestock but is used in Peruvian traditional medicine for its diuretic, healing, anti-rheumatic, antiinfective and menstrual period regulatory effects. The aim of this work was to identify the pyrrolizidine alkaloids of its aerial parts.

The plant material was collected in Tafí del Valle, Tucumán province. Aerial parts were extracted with methanol in a Soxhlet equipment and the solvent evaporated in rotavap. The residue was acidified (H<sub>2</sub>SO<sub>4</sub>, 1N) and extracted with ethyl acetate. Zinc dust was added to the aqueous phase, the mixture was magnetically stirred for 24 hours, then alkalized to pH 10-11 and extracted with chloroform. The chloroform extract was tested by TLC (detection with Dragendorff reagent), analyzed by gas chromatography coupled to mass spectrometry and <sup>1</sup>H- and <sup>13</sup>C-NMR.

Two major alkaloids were isolated and identified: integerrimine and senecionine (ratio 8:1) with a yield of 1.14 mg and 0.14 mg per gram of dry plant material respectively.

Two very minor additional alkaloids which are still under study were detected in the chloroform extract.

90.

**THYROID DYSFUNCTION IN A TRANSVERSAL STUDY WITH TYROTROFIN (TSH) IN TUCUMAN**

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Hypothyroidism affects a considerable number of people, it being more common in adult females. The TSH test is reliable to screen for thyroid dysfunction. **Aim:** a) Thyroid dysfunction prevails through the dosage of TSH in first time patients; b) Associations among TSH values and age, sex, body mass index (BMI) and waist proportions. One thousand and five patients (1081 women and 124 men), aged 10-82, who attended public hospitals in 2007-2008. The exclusion criterium was thyroid dysfunction or under treatment. Height, weight and waist width were measured. It was stratified according to TSH (μUI/mL) as: **I**) ≤0.29; **II**) 0.3-2.5; **III**) 2.6-4.9 and **IV**) ≥ 5. TSH was measured through an immunoradiometric method (IRMA). Reference values were 0.3-5.0μUI/mL. The study was transversal, retrospective and exploratory and evaluated by a one-way ANOVA test. **Results:** **I**) (3.8%): 98% female(f); BMI:25.4±5.2; cc:90.5±15.9; **II**) (67.6%): 88%(f); BMI: 28.4±7.2; cc:95.3±17.7; **III**) (18.3%): 89%(f); BMI:29.1±7.8; cc: 97.5±18.3; **IV**) (10.4%): 96%(f); BMI:29.5±7.2; cc:98.7±15.8. The predominant ethereal band in **I**) 74% between the ages of 20-50; **II**) 47% (20-40); **III**) 41%(20-40); **IV**) 57% (51-82). An increase in TSH was observed with waist width. Significant differences were found between GI and GIII, GIV (*p*=0.018). The BMI was similar and differences were found between GI and GII, GIII and GIV (*p*=0.008). **Conclusions:** An increase in TSH was observed together with increased waist width and BMI. TSH ≥5 was prevalent in the group >50, justifying the presence of hypothyroidism and the TSH determination.

91.

**EFFECT OF DIFFERENT ENDODONTIC IRRIGATING SOLUTIONS ON THE ORGANIC AND INORGANIC CONTENT OF ROOT CANAL DENTIN**

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Different irrigating solutions were proposed to remove both organic and inorganic components, but they would induce changes in the mechanical properties of dentin. The aim of this study was to determine proteins, calcium and phosphor removal of root canal dentin after treatment with irrigating solutions. Eighteen segments of the medial third of recently extracted mandibular premolars were sectioned and immersed for 5 min at 37°C in 1 ml solutions: distilled water (control), 1% sodium hypochlorite (NaOCl), 17% EDTA and 1% citric acid, singly or combined. Extracted proteins were determined by Lowry's method and calcium (except for the EDTA solution) and phosphor by spectrophotometry with commercial kits (Wiener Lab). Results were expressed as μg/ml sample/g of tissue. Proteins elimination was significantly greater (*p* ≤ 0.05) with NaClO-EDTA than with the other solutions, even with those employed singly. NaClO reduced the effect after citric acid. The greatest calcium elimination (*p* ≤ 0.05) occurred with citric acid at 5 min. No variations occurred with the other solutions (*p* ≥ 0.05). Citric acid and citric acid-NaClO were the solutions that best eliminated phosphor (*p* ≤ 0.05), their effect being smaller at 2.5 min than at 5 min. EDTA showed a similar behavior (*p* ≥ 0.05) to distilled water. NaOCl extracted the greatest amount of proteins, this effect increasing when the solution was combined with citric acid or EDTA. Citric acid extracted the greatest amount of calcium and phosphor, showing a time-dependant effect.

92.

**DETERMINATION OF COLLAGENASE IN THE CREVICULAR FLUID OF PATIENTS WITH GINGIVO-PERIODONTAL DISEASE**

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In all fields of health sciences researchers look for biological markers of pathological processes before clinical damage occurs. Gingivo Crevicular Fluid (GCF) is an inflammatory exudate that leaks to the gingival sulcus or periodontal bags. Collagenase is a biochemical marker that can be measured in GCF and identifies tissue degradation. The aim of this work was to determine levels of collagenase in the GCF of patients with Gingivitis (G), Aggressive Periodontitis (AP) and Chronic Periodontitis (CP). We worked with 25 patients with a clinical diagnosis of AP and results were compared with previous studies made in patients with G and CP. Periodontally healthy subjects made up the control group (C). GCF samples were taken from the six most affected sites. The periodontal diagnosis was made by a single calibrated examiner and included: plaque index (Silness & Loe, 1964), gingival index (Loe & Silness, 1963), probing depth, insertion and bleeding. The inclusion criteria for all individuals were: absence of systemic diseases, previous periodontal therapy and use of antibiotics or antiinflammatory steroids or non-steroids during the last six months. The data were analyzed with the SPSS program. Type IV collagenase was determined by the method of Ingman *et al.* (1994). Results showed significant differences in all groups with gingivo-periodontal disease with respect to the control. Collagenase detection is a useful marker for the diagnosis of gingivo-periodontal affections.

**93. VARIATIONS IN THE HEMATOLOGICAL PROFILE DURING PERIPARTUM IN MILK ROUNDUPS IN THE CENTRAL REGION OF THE PROVINCE OF SANTA FE**

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The objective of this work was to determine variations in the concentrations of the hematologic profile during peripartum in dairy cows in three fields in the Santa Fe Central Region, Department Las Colonias. We worked with forty-five multiparous cows aged 3-4 years during the 2007-2008 period. ANOVA was used for statistical determinations. The average values and SD were: Hto(%) 30.27±2.40; 34±3.74; 41.63±3.04. Hb(g/dL) 9.65±0.65; 10.0±50.66; 8.83±0.5. GB(mm3) 8.360±2.213; 8.940±2.451; 8.809±2.976. Eosinophils (%) 3.40±2.13; 3.67±1.72; 1.9±0.94. In postpartum, values were: Hto(%) 29.47±2.44; 32.8±2.51; 40.27±2.65. Hb(g/dL) 9.30±0.61; 10.15±0.65; 8.9±0.42. GB(mm3) 8.213±2.232; 8.137±2.787; 7.092±1.82. Neutrophils (%) 32.07±4.86; 28.93±7.51; 31.54±3.54. Eosinophils (%) 3.6±2.2; 4.0±1.07; 3.09±2.94; for Pilar, Cuenca del Salado and Esperanza respectively. The hematologic parameters were considered within the normal range in the literature in both physiological conditions. Significant differences were observed in the Hto and Hb during peripartum. Hto during prepartum in the animals of the region of low concentration of edaphic copper was smaller, as reported by other authors. There was also a slight increase in the white blood cell count corresponding to the prepartum period, as mentioned in the literature. In the leukocytary formula an increase in the number of eosinophils was observed during postpartum. This increase was not significant and could be due to an allergic phenomenon of sensitization of cows to their own milk.

**94. HIGH SCHOOL AVERAGE SCORE IN THE ADMISSION TO MEDICAL SCHOOL**

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In the School of Medicine of the National University of Tucumán (U.N.T.), the admission process takes into consideration high school average (SA) plus the total score obtained in 4 subjects: Biology, Reading Comprehension, Chemistry and Physics. **Objectives:** 1) To compare the SA between admitted and rejected applicants; 2) To infer the predictive ability of the SA. **Materials and Methods:** A cross-sectional descriptive study was carried out. The population were the students admitted in 2002 and 2003 (665 students). t test and  $\chi^2$  test were used. **Results:** In the admitted group, the highest frequency for the SA was 7.8 (2002) and 7.6 (2003), and the distribution shifted slightly towards higher scores. In contrast, in the rejected group, distribution shifted towards lower averages. The SA of admitted students was significantly higher in both cohorts (t test,  $p < 0.0001$ ). In 2002, the proportions of admitted applicants with SA higher than 7.61 was significantly higher than the proportion admitted with lower SA ( $\chi^2$  test  $p < 0.0001$ ), while in 2003, candidates with an SA above 7.73 were admitted ( $\chi^2$  test,  $p < 0.0001$ ). **Conclusions:** SA would be a good predictor for applicants to Medical School.

**95. PROBLEM SOLVING AND IMPROVEMENT IN KNOWLEDGE ACQUISITION STRATEGIES IN VEGETABLE PHYSIOLOGY STUDENTS**

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Since learning activities constitute real problems, students have to face them in a strategic way in order to resolve them. The objective of this work was to explore the relationship between problem solving and the improvement in knowledge acquisition strategies in students of Vegetable Physiology in the Agronomic Engineer career (FAZ-UNT). During the 2008 study cycle a closed-question inquiry was applied to a randomized sample of 64 students. Problem solving is used as a methodology in Theoretical-Practical activities. Data were analyzed by means of absolute and relative frequency distribution. Fifty percent of the students improved their capacity for analysis and 40% the capacity to use and transfer knowledge. From the interpretation of the results we concluded that when the students acquire knowledge acquisition strategies, they use procedures to analyze, understand, organize information and make decisions in solving concrete agronomical problems.

**96. SOCIOCULTURAL PROFILE AND CAREER CHOICE IN THE FACULTY OF MEDICINE-UNT**

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**Introduction:** The Faculty of Medicine -UNT- offers Kinesiology and Nursing to the community. **Objectives:** to compare the socio-cultural features of first year students in both study courses. **Methodology:** A structured survey to 60% of first year students was carried out in order to collect the following information: **I- Students:** sex, age, marital status, background, job, private or state education and **II- Parents:** educational background and occupation. **Results:** **I- Students:** female: 67%- 75%; average age: 26-35 years old; background: Province of Tucumán 82%-88%; marital status: single 97%-91%; working people: 39%-26%; state school graduates: 55%-62% for Kinesiology and Nursing, respectively; **II- Fathers:** level of Education: high school graduates: 40%-24%; college degree: 8%-2.6%; working people: 97%-80%; mothers: high school graduates 38%-24%; college degree: 2.6%-2.5%; university first degree: 22%-5%; working people: 80% and 46% for Kinesiology and Nursing, respectively. **Conclusion:** Most first year students of Kinesiology are women under 30, single and state school graduates, whereas the age average of students of Nursing is above 30. A great percentage of students work in both groups although Kinesiology students are better qualified. Differences were observed in their parents' educational background. It is higher among students of Kinesiology. Both parents work. These results would indicate that choosing a career is influenced not only by the students' vocation but also by socioeconomic factors.



**97.**  
**THE INTERVIEW AS A STRATEGY FOR THE ACQUISITION OF KNOWLEDGE**

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**Objective:** To use interviews as a qualitative technique to identify social representations of teachers concerning health care.

**Material and Method:** The key informants were interviewed in the school, according to the "interview plan". The speeches were analyzed in their textual, contextual and space order, and the results were collected in analysis categories.

**Results:** The key informants formed the totality of the teachers in charge. They believed that the teaching of health care is very important for the formation of children and that these topics help to form them. They recognized its usefulness in the prevention of disease. They accepted the commitment of the school in general, and of teachers in its implementation. However, educators did not consider themselves capable of developing it. In relation to the improvement in health habits, they revealed a certain lack of confidence in their ability to carry it out. To enhance health care, they proposed training, working with the family and developing activities within the framework of a project involving different areas.

**Conclusion:** The interview proved to be an excellent strategy to approach knowledge in a field that allows connecting practices and meanings in relation to health care.

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**98.**  
**DEVELOPING AND IMPLEMENTING INTERDISCIPLINARY WRITTEN MATERIAL**

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For many years, teachers involved in the Anatomy and Animal Physiology course taught in the second year of Agronomic Engineering at the Universidad Nacional de Río Cuarto, Argentina, have carried out multiple activities to improve the teaching-learning process. These efforts have involved the training of teachers in pedagogy and the developing of innovative investigation projects. Each of these experiences triggered revisions of the course. More specifically, they evidenced the need for a more interdisciplinary-based teaching approach. However, the lack of appropriate texts, taking into consideration the time that students devote to reading and the complexity of the contents, emerged as a difficulty. Consequently, we decided to work on the design of materials that would favour both interdisciplinary integration and meaningful learning. In order to achieve these two aims, teachers from the different areas held meetings in the form of seminars. The working agenda included defining the structure, the contents and the design of the textbook as well as selecting a suitable pedagogical framework and appropriate visual support. Nowadays, the project is at an advanced stage of development, as a result of the work done by specialists from the Neuro-endocrine and Reproductive areas. The material developed includes interdisciplinary texts, vocabulary used in both areas, and contents developed from the different areas. It is time the disciplines ceased to be parallel, narrow constructs and became more interrelated, thus facilitating significant and collaborative learning in the classroom.

**99.**  
**STUDENT INTERVIEWS: EVALUATION OF THE THEORETICAL AND PRACTICAL ACTIVITIES OF HISTOLOGY FOR STUDENTS OF THE MICROBIOLOGY LABORATORY TECHNICIAN CAREER**

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Histology (1st year of the Microbiology Laboratory Technician) has optional theoretical classes and compulsory practical activities in microscope practice. The students are divided into groups according to the career of their choice. In 2008 an anonymous voluntary survey model was designed to be answered by the students upon completion of the course. The objective was to determine the students' opinion and to use this survey in future courses. With respect to the theoretical activities, didactic resources, contents, punctuality, ability to integrate contents, teachers' dynamics and attitude were evaluated. As to the practical activities, students were interviewed on the subjects of use of didactic resources, contents, punctuality, teachers' dynamics and attitude, quality of the histological slides and guidelines for practical activities. For theoretical activities, the results were: 58.6% of the students qualified them as very good, 32.6% as good, 3.9% as standard and 4.9% did not answer. For practical activities, the results were: 82.3% considered them as very good, 17.09% as good and 0.56% as standard. We concluded that most students made observations concerning teachers' dynamics in the classroom. Practical activities were qualified as very good for organization, dynamics, methodology and materials used.

**100.**  
**IMPACT OF CADMIUM ON *Bufo arenarum* TESTIS**

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It is known that pollution affects the reproductive cycle of many animal species. Cadmium ( $Cd^{2+}$ ) is a heavy metal that accumulates in the environment as a result of industrial pollution. It is a bioaccumulative toxic because of its high chemical stability to biodegradation processes. The aim of this work was to study the effect of  $Cd^{2+}$  on *Bufo arenarum* testis, correlating sperm viability, concentration and motility with the histomorphology of the organ. Adult males collected during the reproductive period were injected in the dorsal lymphatic sac with  $CdCl_2$  (0.5 or 5 mg/kg) every day for 15 days. Controls were injected with Ringer's solution. One testis was dissected to obtain a sperm suspension to analyze: a) sperm viability with eosin stain b) sperm concentration (cells/ml) using a Neubauer chamber. c) sperm motility, classified as immobile, progressively motile or non-progressively motile. The other testis was processed with a routine histological technique and stained with hematoxylin-eosin. In animals treated with 5 mg/kg  $Cd^{2+}$  we observed that the viability, concentration and progressive motility of sperm was significantly lower ( $p < 0.05$ ) compared to the control and a significant increase ( $p < 0.05$ ) in immobile sperm. The histological studies revealed dilated seminiferous tubules, disorganization and disappearance of cysts with a small sperm number at the luminal area. In contrast, the analysis of these parameters in animals treated with 0.5 mg/kg  $Cd^{2+}$  did not show significant differences in relation to the controls. Our results indicate that *Bufo arenarum* testis is hardly affected by  $Cd^{2+}$  at doses of 5 mg/kg.

## 101.

**DENTAL ENAMEL TYPES IN HUMAN MOLARS: BIOMECHANICAL FUNCTION**

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Enamel types relate to tooth biomechanical function. Radial enamel presents higher resistance to wear and both enamel with Hunter Schreger bands and irregular enamel prevent fracture propagation. The aim of this work was to identify the enamel types and their combination in human molars. Twelve inferior molar crowns were embedded in epoxy resin, longitudinally cut, grinded, polished, etched with acid and observed under a Scanning Electron Microscope. Micrographs were identified on the free faces and cusps. Results showed that in the medial third of the free faces enamel was of the radial type in the outer zone and with bands in the inner zone. On both faces bands occupied the thickest portion of the enamel, while radial enamel thickness was not significant. Radial enamel was the only enamel type present in the cervical third of the free faces. In the lingual cusp the inner enamel was of the irregular type with marked prism intercrossing and it was completed with radial enamel as far as the outer surface. In the vestibular cusp the inner enamel showed bands and the outer enamel was of the radial type. We conclude that the presence of different enamel types as well as their combination within the same tooth group constitute a biomechanical adaptation of the functional areas.

## 102.

**HISTOMORPHOMETRIC STUDY AND REACTIVITY TO KI-67 IN CENTRAL AND PERIPHERAL GIANT CELLS LESIONS OF THE JAW**

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Giant cells lesions have histological similarities that make differential diagnosis difficult. Mononuclear stromal cells (MSC) are a mixture of hard-to-identify spindle and ovoid cells that would be responsible for the biology of these lesions. The aim of the present study was to identify elements in the differential diagnosis and analysis of immunoreactivity for Ki 67, in the variants studied. A total of 18 biopsies were evaluated: CGCG (n=3), BT (n=3) and PGCG (n=12). Tissue samples were fixed in formol, processed in a routine manner and stained with H&E and Masson trichrome. Immunohistochemistry for Ki 67 was used. The following parameters were assessed: number of giant cells, number of nuclei and cell proliferation index.

The analysis of the distribution of giant cells, the density of the MSC, the internodal connective stroma, vascularization and the presence of newly formed bone showed differences in the formation of connective stroma, this being only poorly cellular and fibrous in PGCG. The histometric analysis of the number of giant cells was  $12 \pm 6.89\%$  in the CGCG,  $10 \pm 4.2$  for BT and  $6.2 \pm 4.9$  for PGCG. The average number of nuclei was  $6.2 \pm 0.87$  for CGCG,  $8.7 \pm 5$  for BT and  $5.5 \pm 2\%$  for PGCG. The immunoreactivity for Ki-67 was demonstrated only in the MSC, was higher in the BT and mild CGCG in GGCP. The percentage of immunoreactive cells was 4.46% for CGCG, 14% for BT and 0.67% for PGCG. The proliferating stromal cells were reactive to Ki-67, although no statistically significant differences were found in them in the cases under consideration.

## 103.

**HYSTOMETRIC ANALYSIS BY MEANS OF TUMORAL NECROSIS AND MITOTIC INDEX IN AN M3 MURINE ADENOCARCINOMA TREATED WITH IMMUNOPREVENTION AND CYTOSTATICS**

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**Introduction:** The Nottingham Prognostic Index (NPI) is a valuable tool in human breast cancer, but could only be partially used in non-metastatic M3 murine adenocarcinoma (M<sub>3</sub>MA<sub>d</sub>). **Objectives:** To analyze histological gradation by means of tumor necrosis (TN) and mitotic index (MI) in an M<sub>3</sub>MA<sub>d</sub> treated with vaccines and cytostatics. **Material and Methods:** 6-8 weeks-old female Balb/c mice weighing 20-25 gr were inoculated at day 1 with tumoral cells and divided later into 4 groups: Control Group (C), Doxo-Vaccine Group (DV), which received IV Doxorubicin on days 3 and 10 and IM vaccine on day 5, Doxo group (D), which received IV Doxorubicin on days 3 and 10, and Vaccine Group (V), which received 5 doses of IM Vaccine. TN related to tumor area (TA) (%) and MI were evaluated in whole groups. **Results:** TN/TA was  $34.01 \pm 7.38\%$  in (C),  $17.16\% \pm 0.58$  in (DV),  $27.44\% \pm 12.1$  in (D) and  $17.32\% \pm 6.49$  in (V), with no statistically significant differences between groups ( $p > 0.2$ ). MI showed no differences when comparing groups ( $p > 0.137$ ). **Conclusions:** In an experimental breast adeno-carcinoma, both Tumor Necrosis and Mitotic Index as markers of histological gradation showed no changes when animals received treatment with vaccines and cytostatics.

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## 104.

**INTERSTITIAL CELLS OF CAJAL IN THE COLON OF COW, HORSE, PIG AND CAT**

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The distribution of interstitial cells of Cajal (ICC) was compared in the colon of cow, horse, pig and cat. Samples from sound animals were prepared according to the standard histological technique. A primary antibody against c-kit was used in the immunohistochemical method: anti-vimentin antibodies as positive control and anti-desmine antibodies as negative one. Three populations of ICC were compared. ICM-MP was present in all the species studied. Horse and cow ICC-MP were the most developed cell populations arranged as a continuous net surrounding ganglia between the circular muscle fibers coat and the longitudinal muscle fibers layer. In pig, ICC-MP was the only cell population observed. ICC-IM was found in the circular and longitudinal muscle fibers layers. ICC-SMP was evident in cat. Colon ICC of the four studied species showed the characteristic morphology of each type of these cell populations. According to the literature, the slow waves originate in colon ICC-SMP, but our observations were not conclusive with respect to their presence in pig, horse and cow; however, ICC-MP are constant and extend their slender projections in the muscular layer, which could suggest their main role in the basal electrical rhythm in these species.

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105.

**FUCOSE DETERMINATION IN THE STOMACH OF HORSE FOETUS AT DIFFERENT STAGES OF DEVELOPMENT**

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The Creole horse belongs to the species *Equus caballus*. The aim of this work was to determine the presence of fucose in the stomach of horse foetuses at different developmental stages. Foetuses corresponding to G1 and G2 gestation periods were used. Stomach samples were fixed in buffered formol and included in paraffin. The lectin histochemistry technique (*Ulex europaeus*-I lectin) was used for glycoconjugate determination. The data obtained was: in the stomach samples of the foetuses at an earlier stage of development (G1), intense reaction was observed on the luminal surface of the lining epithelium, of the crypts and their base, while in the samples of foetuses at a more advanced stage of development (G2), not only an intense reaction was observed on the surface of the lining epithelium, of the crypts and their base, but also marcation in some sectors of the gastric glands. A weak reaction was observed in the apical region of the lining epithelium. In conclusion: fucose is present in the gastric region of foetuses belonging to the two periods of gestation; there is a positive relationship between the degree of fetal development and the distribution pattern and degree of reactivity of fucose glycoconjugates.

106.

**EXPERIMENTAL CARCINOGENESIS AND SOYMILK INTAKE**

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The effects of soymilk as a dietary complement on colonic carcinogenesis were studied. Carcinogenesis was induced by 1,2-dimethylhydrazine (DMH) inoculation (20 mg/kg, twice a week, for 8 weeks) in male Wistar rats (N=38, 6 weeks old). In animals with a control diet displasic crypts appeared three months after the last inoculation and since the 4<sup>th</sup> month we observed macroscopic metastatic processes in liver, kidney, pancreas, spleen and diaphragm. In the group with soy milk, we observed carcinogenesis disturbances without metastasis only since the 5<sup>th</sup> month. We also measured malonildialdehyde (MDA) levels in liver as the final product of low density lipoproteins oxidation. In control rats, MDA levels were 4-fold higher than normal since the 4<sup>th</sup> month whereas in the soymilk diet group MDA was only three times higher since the 5<sup>th</sup> month. These results could indicate that prolonged soymilk consumption would delay colonic carcinogenesis and metastatic processes.

107.

**INDUCTION OF METABOLIC SYNDROME IN LEAD TREATED RATS**

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Environmental agents such as lead can cause alterations in the glucidic and lipid profile. The generation, by direct (endothelium) or indirect (renal) injuries and high blood pressure, of components of the metabolic syndrome. Objective: to assess the presence of biochemical, anthropometric components of the metabolic syndrome and the increase in blood pressure in rats treated with 500 ppm lead (Pb). Wistar rats were treated with 500 ppm lead acetate in the drinking water and controls with water *ad libitum* (n = 6 in each of the groups). Determination: triglycerides, cholesterol, HDL cholesterol, Glicosid hemoglobin, glucose and lead. Determination of weight and systolic blood pressure was performed in both groups. Results: Lead average 2.8 g/dl: 11.6 g/dl. control vs 500 ppm lead rats. Rats treated with 500 ppm of Pb presented a 72% weight gain. Weight average control rat 166 g vs 500 ppm Pb 217 g; glucose increase was found in the lead-treated group: blood sugar control 88 g/l vs 118 grs/l 500 ppm rats. Glicosid hemoglobin, cholesterol and triglycerides had a significant increase in the treated group with HDL cholesterol decrease. Blood pressure control group was 90 mm Hg and Pb 500 ppm group presented a 135 mm Hg pressure. Lead is a toxic capable of inducing components of the metabolic syndrome.

108.

**EARLY DETECTION OF PROSTATE CANCER (PC) IN MEN EXPOSED TO HIGH LEVELS OF ARSENIC (As) IN THE EAST OF TUCUMAN**

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Diagnosis of early stage PC is fundamental in patient prognosis. The aim of this study was to determine early stage PC in individuals exposed to high levels of As in the drinking water (levels higher than 0.01 mg/L in inhabitants of the east of Tucuman). One hundred and forty-eight individuals aged 50 and above were included in the study. A semi-structured epidemic survey, a urologic clinical examination and image diagnoses were performed and blood samples were collected for the determination of total prostatic specific antigen (TPSA) in serum. The men were divided in two groups. Group A included 69% men (61.68±8.6 years old) who drank drinking water containing levels allowed by the CAA (Argentine Food Code). Group B included 31% men (62.3±12.2 years old) who drank drinking water containing As levels higher than 0.01 mg/L. CP was diagnosed in 2.9% and 4.3% of the individuals in Group A and Group B, respectively. A total of 10.8% and 15.2% patients in Groups A and B, respectively, underwent Free PSA (FPSA) and calculated ratio F/TPSA due to PSAT range of Maximum Normal Values-10 ng/ml. A cut-off of F/TPSA ratio was 17%. F/TPSA ratio was below 17% in 45.5% and 71.4% of the patients in Groups A and B, respectively. The results demonstrated that the risk of developing PC increased in men exposed to As in the drinking water. Likewise, patients with moderately high TPSA (less than 10 ng/ml), showed a higher probability of suffering from PC.

109.

**EUDESMANOLIDES AND OTHER CONSTITUENTS OF *Critonia arachnoidea***

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*Critonia arachnoidea* (Legn.) King & Robinson is the second largest genus in the subtribe Critoniinae, tribe Eupatorieae (Asteraceae). This species is very similar to *Critonia morifolia* Mill. from Mexico, differing only in the smaller number of flowers, so that it could be a pauciflora variety (Legname, 1975). Aerial parts of *C. arachnoidea* were collected in the province of Jujuy. Hexahydrofarnesylacetone, neofitadiene, fitol, hopenol,  $\alpha$ - and  $\beta$ -amyrin, stigmaterol, sitosterol, campesterol, sitostenone, 3-oxoisocostic acid, 1-desoxyivagustin and its 11,13-dihydroderivative were identified in the hexane extract. Three new, i.e., 4,5- $\beta$ -epoxyeudesma-11(13)-en-8 $\beta$ , 12-olide, 3-cetoeudesma-4,11(13)-dien-8 $\alpha$  12-olide, and 3 $\alpha$ hidroxyeudesma-4,11(13)-dien-8 $\alpha$ 12-olide and four known eudesmanolides were identified in the chloroform extract. Alkaloids gave positive tests. The chemistry of sesquiterpene lactones of *C. arachnoidea* is very similar to *C. quadrangularis* while *C. morifolia* produces eudesmanolides closed towards C-6 instead of C-8 and contains pyrrolizidine alkaloids (Weidenfeld & Andrade, 1998). Our results support the view that *C. arachnoidea* and *C. morifolia* are two different species.

- Legname PR. 1975. *Lilloa* 34(5): 51.- Weidenfeld H, Andrade-Cetto A. 1998. *Phytochemistry* 49(5): 1463.

110.

**PLASMA MYELOPEROXIDASE LEVELS IN PATIENTS WITH METABOLIC SYNDROME**

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Metabolic Syndrome (MS) is a combination of metabolic disorders associated with insulin resistance and high risk of developing type 2 diabetes and cardiovascular disease. Myeloperoxidase (MPO) is the main component of azurophil granules of leukocytes that has emerged as a potential factor in the promotion/propagation of atherosclerosis. The objective of this work was to study plasma MPO levels in MS patients. Thirty-seven patients with MS, aged 42 $\pm$ 11, were compared with a similar age and sex control group. Waist circumference (WC), body mass index (BMI), fasting blood glucose (FBG), lipid profile, plasma MPO, plasma insulin and HOMA index were determined in both groups. Data were analyzed using an SPSS program and expressed as X  $\pm$  DS, a value of  $p < 0.05$  being considered significant. The patients with MS with respect to the control group presented increased values for WC (116 $\pm$ 24 vs. 83 $\pm$ 12 cm,  $p=0.0001$ ); BMI (37 $\pm$ 10 vs. 22 $\pm$ 3 kg/m<sup>2</sup>,  $p=0.0001$ ); plasma insulin (23 $\pm$ 16 vs. 7.8 $\pm$ 3.2 uUI/ml,  $p=0.001$ ), HOMA index (5.0 $\pm$ 3.7 vs. 2.1 $\pm$ 1.5  $p=0.03$ ) and total cholesterol (223 $\pm$ 47 vs. 187 $\pm$ 22 mg/dl,  $p=0.04$ ). MPO levels in MS patients showed no significant differences with control subjects (1.02 $\pm$ 0.10 vs 0.95 $\pm$ 0.11 uUI/ml,  $p=0.11$ ). Our preliminary results suggest that plasma MPO is not a sensitive marker of atherosclerosis in these patients.

111.

**QUALITATIVE AND QUANTITATIVE ANALYSIS OF THE EFFECT OF Ca(OH)<sub>2</sub> AND CHLORHEXIDINE ON HUMAN AND BOVINE DENTIN**Salas MM<sup>1</sup>, De la Casa ML<sup>2</sup>, López ME<sup>1</sup>.<sup>1</sup>Cát. Química Biol., <sup>2</sup>Cát. Endod., Fac. Odontol., UNT. Av. B. Aráoz 800. Tucumán. E-mail: mercedes.salas@odontologia.unt.edu.ar

Bovine teeth are a useful resource due to the limited size of human teeth. Aim: To compare the effect of two irrigation solutions on human and bovine dentin. For this *in vitro* study 8 human (17-33 yrs old) unrooted teeth and recently sacrificed bovine (2-4 yrs old) teeth were used. The crown was removed and teeth were longitudinally sectioned. The dental pulp was extracted. The half roots were submerged for 30 min in 5 ml of 1% Ca(OH)<sub>2</sub> and 0.2% Chlorhexidine (CHx) and the remaining root in distilled water. Assays were carried out in triplicate. The roots were rinsed with water and dried. They were fixed in glutaraldehyde and processed for BME. Dentin surface morphology and number of tubules per area in  $\mu\text{m}^2$  (T/A), intertubular density (ITD), greater diameter of tubule light (TD) and intertubular spaces (ITS) were observed (1500x and 4000x) and analyzed using Image Tool software. Twenty measurements per parameter and tooth were made. The SPSS program was used for statistical analysis. In human dentin, surface and orifices without tissue remains and with increased TD were observed with Ca(OH)<sub>2</sub>; with CHx no changes with respect to the control were observed. In bovine dentin Ca(OH)<sub>2</sub> partially cleared the surface and it was modified with calcium deposits and a TD slightly larger than that of the control. CHx did not show changes. ITD, TD and ITS increased in human dentin ( $p < 0.05$ ), as ITD did in bovines ( $p < 0.05$ ). Ca(OH)<sub>2</sub> would have a solvent effect on human and a mineralizant effect on bovine dentin. CHx did not produce changes in either human or bovine tissue.

112.

**CHARACTERIZATION OF THE METABOLIC PROFILE OF A JERSEY-HOLSTEIN MILK FLOCK DURING THE TRANSITION PERIOD**

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The objective of this work was to characterize the metabolic profile of a flock of Jersey-Holstein dairy cows during the transition period. Thirty samples of jugular blood from multiparous cows were analyzed between the months of October and November. The ANOVA statistical method was applied. Hematologic profiles were within the normal ranges mentioned in the literature; hematocyte levels diminished toward postpartum and eosinophil percentage was increased due to an allergic phenomenon of sensitization to their own milk. A decrease in serum urea values in postpartum was observed. Serum urea levels are related to the smaller food consumption of animals near parturition. These concentration variations reflect a nutritive prepartum deficiency and are therefore related more to physiological conditions than to milk production. In postpartum, an increase in proteins was observed, because the mammary glands stop gamma globulins reception and also possibly because of proteins substitution of its extravascular deposits. In prepartum, cholesterol blood levels higher than in postpartum were observed due to fat mobilization. Significant differences ( $p < 0.05$ ) in zinc and potassium were observed between both periods under study. Serum copper values in both periods were below the optimum value (1 $\mu\text{g}/\text{mL}$ ) without observed clinical response, characteristic of copper deficiencies.

113.

**ACTION OF MOUTHRINSES ON SALIVARY CALCIUM AND PHOSPHOR***Vargas C, López ME.**Cát. Química Biológica, Fac. Odontol., UNT.**E-mail: carmen.vargas@odontologia.unt.edu.ar*

One of the functions of saliva is to protect teeth through remineralization. It is known that mouthrinses act on dental plaque, but little has been studied with respect to their action on salivary ions. Aim: To compare the *in vitro* and *in vivo* effect that 3 buccal rinses produce on calcium and phosphor of non stimulated saliva. Total saliva was obtained by salivation from 6 healthy subjects. The active principle of the rinses were: 0.05% sodium fluoride, 0.09% salicylate/0.06% timol/0.06% methyl eucaliptol and 0.12% chlorhexidine digluconate. Distilled water was used as a control. *In vivo* samples were collected before and after the rinses at 1-60 min. *In vitro*, saliva and an equal volume of the rinse were incubated at 37°C with agitation for 1-15 min. Saliva was centrifuged and calcium and phosphor were quantified in the supernatant ((Wiener-Lab). The data were analyzed by ANOVA. The rinse with fluoride produced a significant variation for calcium *in vivo* at 5 and 30 min; it did not show differences *in vitro*. Phosphor showed differences *in vivo* at 10, 15 and 30 min, but not *in vitro*. The rinse with aromatic alcohol produced significant differences for calcium in both tests at 10 min, for phosphor *in vitro* at 10 min, with no significant differences *in vivo*. The rinse with chlorhexidine did not produce significant variations *in vitro* for calcium, whereas *in vivo* it showed differences at 1, 10 and 15 min. For phosphor significant differences were found *in vivo* only at 10 min. In the presence of aromatic alcohol, calcium would diminish because of the formation of insoluble complexes with proteins. The rinse with fluoride would be responsible for entrapping salivary phosphates.

114.

**CLINICAL PARAMETERS IN PATIENTS WITH AGGRESSIVE AND CHRONIC PERIODONTITIS***Castro CE<sup>2</sup>, Koss MA<sup>1</sup>, López ME<sup>1</sup>**<sup>1</sup>Cát Quím Biológ, <sup>2</sup>Cát. Period., Fac. Odontol., UNT. E-mail: ccastro62@hotmail.com*

Introduction: Periodontal diagnosis and its pursuit mainly depend on clinical parameters. Clinical diagnosis directly affects the decision to initiate therapy, to select the methods and to define the topographic area of application. Aim: To compare the clinical parameters from patients with Aggressive and Chronic Periodontal Disease and its different degrees of severity.

Material and Methods: A sample of 81 patients who attended the class of Periodontics of the Faculty of Odontology of the UNT was selected: 41 with a diagnosis of Aggressive Periodontitis and 40 with Chronic Periodontitis; 40 individuals without Periodontal Disease constituted the control group. Patients were classified according to the severity of Periodontal Disease through clinical and radiographic parameters. Results: Probing depth and insertion level were significantly higher ( $p < 0.05$ ) in Aggressive Periodontitis that in Chronic Periodontitis and both were higher with respect to the control group ( $p < 0.001$ ). Gingival and Plaque indices did not allow the determination of the stages of Aggressive Periodontal Disease. In Chronic Periodontitis only Plaque index made possible the diagnosis of the different degrees of severity.

Conclusion: The different clinical parameters are a suitable tool for the diagnosis of Chronic and Aggressive Periodontal Disease.

Key words: Chronic Periodontal Disease, Aggressive Periodontal Disease, Clinical Parameters

115.

**CHEMICAL MARKERS IN THE DIAGNOSIS OF GINGIVO-PERIODONTAL DISEASES***Koss MA<sup>1</sup>, Castro CE<sup>2</sup>, López ME<sup>1</sup>**<sup>1</sup>Cát. Química Biológica, <sup>2</sup>Cát. Periodoncia. Fac. Odontología, UNT. Av. B. Aráoz 800. San Miguel de Tucumán. E-mail: myrkoss@hotmail.com*

Gingivo crevicular fluid (GCF) is an inflammatory exudate that circulates around the gingival crack; its analysis offers a tool that can be partially used for the diagnosis and pursuit of gingivo-periodontal affections. The aim of this work was to analyze the results of chemical determinations made in 115 patients: 25 with gingivitis and 90 with chronic periodontal disease; 40 systemically, periodontally healthy subjects formed the control group. The chemical determinations included: total volume, proteins (Lowry *et al.*, 1951), aspartate aminotransferase (AST), lactate dehydrogenase (LDH), alkaline phosphatase (ALP), (Wiener Lab), elastase (Nakajima *et al.*, 1979), collagenase (Ingmar *et al.*, 1994), and hydroxiprolin (Jamall *et al.*, 1981). The results allowed us to deduce that ALP levels  $< 300$  UI/L and LDH  $< 3300$  UI/L would be associated with periodontal health and gingivitis. Volumes of FGC  $> 0.25$  ul/30 seg, values of hydroxiprolin (0.20 ug/ul and elastase  $> 0.04$  U/min and bands of molecular weight  $< 97$ kDa obtained by the action of collagenase would be particularly associated with gingivitis. Levels of AP  $> 300$  UI/L and of LDH  $> 3300$  UI/L could be associated with periodontal disease. The chemical analysis of the GCF would be a tool for the diagnosis of gingivo-periodontal affections.

Key words: chemical determinations, GCF, gingivo-periodontal diseases

116.

**PHENOLIC COMPOUNDS AND ANTIOXIDANT ACTIVITY OF EXTRACTS OF *Senecio argophylloides* Griseb. (ASTERACEAE)***Farizano J<sup>1</sup>, Lizarraga E<sup>2</sup>, Merep A<sup>1</sup>, Schuff C<sup>1</sup>, Perotti M<sup>1</sup>.**<sup>1</sup>Facultad de Bioquímica, Química y Farmacia. <sup>2</sup>Facultad de Ciencias Naturales e Instituto Miguel Lillo. Universidad Nacional de Tucumán.*

*Senecio argophylloides* (c.n: "tola blanca" or "monte blanco") is a whitish branched shrub endemic to the upper mountains of northwestern Argentina. It is traditionally used for the preparation of "llista" or "yista" and, combined with other medicinal plants, is used as a bath to calm muscular pains. The aim of this study was to determine the content of phenolic compounds (phenols and flavonoids) and evaluate the antioxidant potential of organic and aqueous extracts.

The hydroalcoholic extract showed a higher content of phenols and the methanolic extract presented a higher content of flavonoids. The DPPH· radical scavenging assay showed that extracts had an activity ( $IC_{50}$ ) of 137- 495 ppm compared to 30 ppm of the synthetic antioxidant (BHT). The  $\beta$ -carotene bleaching test showed that aqueous extracts had more activity than organic extracts.

**117. PURIFICATION AND PARTIAL CHARACTERIZATION OF A LIPASE FROM *Brevibacillus agri* MIR-E12**

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Microbial lipases show potential for the development of commercial applications due to their stability, selectivity and wide substrate range. The objective of this work was the characterization of a lipase from the bacterium *Brevibacillus agri* MIR-E12, purified from cell-free supernatant. The strain, identified by rDNA 16S sequencing, was cultured aerobically in LB broth at 37°C for 24 hs. After a first precipitation of the cell-free supernatant with ammonium sulphate and a second precipitation step with acetone, the protein extract was fractionated by anion exchange chromatography and the enzyme was purified to homogeneity. The lipase possesses a  $K_m$  of 0.17 mM and a  $V_{max}$  of 0.935 nmol min<sup>-1</sup> µg<sup>-1</sup>. We analyzed the effect of different cations, organic solvents and tensioactive agents on the enzyme activity. We found that *B. agri* MIR-E12 produces a lipase of 30 KDa, which shows an optimal temperature of 40°C and an optimal pH of 9. Although the enzyme is not thermostable, the addition of Ca<sup>2+</sup> improved thermal stability. It should be noted that dimethyl sulfoxide increased lipase activity, which is in contrast with the decreases produced by Tween 80, Tween 20, SDS and Triton X100. Among the cations, a noteworthy feature was the increase caused by Ca<sup>2+</sup> that correlates with the diminished values measured after supplementation with EDTA. The results showed that *B. agri* MIR-E12 produces a lipase with important biotechnological features.

**118. EVALUATION *IN VITRO* OF THE ANTIFUNGAL ACTIVITY OF *Baccharis* EXTRACTS ON YEASTS**

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The discovery of new substances with antifungal properties is of interest because of the wide action of fungi as impairing or infective agents. The native flora of the NOA includes plants popularly used as antimicrobial agents. The genus *Baccharis* (Flia. Asteraceae) are perennial shrubs of the Argentine Puna. In folk medicine it is used for its medicinal properties. In a previous work we demonstrated that ethanol extracts of *B. boliviensis* and *B. incarum* have wide antibacterial activity against Gram positive and Gram negative antibiotic-resistant bacteria. However, there are no studies that evaluate the antifungal activity of extracts of these species. We studied the antifungal activity of alcoholic extracts of *B. boliviensis* and *B. incarum* to provide information leading to an increase in their potential application as antimicrobial agents. We determined the sensitivity of 30 strains of yeasts of the genera *Candida*, *Rhodotorula* and *Saccharomyces* against both extracts. The antifungal activity of the extract of *B. boliviensis* is slightly higher than the extract of *B. incarum*. After 48 hours of incubation there was no development in 96.66% of the strains against *B. boliviensis* and 70% of the strains against *B. incarum*. The extract of *B. boliviensis* showed total fungicidal activity against 40% of the strains and *B. incarum* 20%, which was observed after 7 days of incubation. Only *C. glabrata* and *C. tropicalis* showed isolates resistant to both extracts.

**119. MELAMPOLIDES BIOACTIVITY ON RICE INSECT PESTS**

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Our investigations are aimed at the discovery of metabolites isolated from plants that could be an environmentally safe alternative for insect pest control. *Oryzaephylus surinamensis* L. (Coleoptera, Cucujidae) is a cosmopolitan pest capable of feeding on a variety of stored grains and dried goods. In Tucumán it is often found attacking rice (*Oryza sativa*). We conducted feeding preference bioassays to study the bioactivity of four melampolides isolated from chloroform extracts of *Acanthospermum hispidum* DC. and *Enydra anagallis* Gardner (Heliantheae, Asteraceae).

The melampolides showed no antifeedant effects but were toxic. Mortality in all cases was 45 to 50%. These results mark a clear difference with the bioactivity of *A. hispidum* extracts (rich in volatile constituents) investigated previously, which were repellents but not toxic. They provide a potential application for melampolides as adjuvants in bio-repellent formulations designed to reduce grain infestation.

**120. BACTERIAL BIOFILMS INDUCED BY ANNONACEOUS ACETOGENINS IN THE PRESENCE OF NAFTHALENE**

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Four annonaceous acetogenins (ACG) isolated from the seeds of *Annona cherimolia* and *A. montana* (Annonaceae) were evaluated for their ability to stimulate biofilm production in polyaromatic hydrocarbons (PAHs) degrading bacteria, J26, on polystyrene microplates. ACG carry a  $\gamma$ -lactone moiety in their structure. This structural feature is similar to the lactone moiety present in *N*-acyl homoserine lactones, which are compounds that play the important role of "quorum sensors" in the mechanisms of biofilm formation observed in many gram-negative bacteria. The most significant result of biofilm formation was obtained in the presence of ACG, laherradurin, with the bacterial strain in LB50 medium, which showed a production of 124% over control in an aqueous medium, followed by squamocin (123%). In the presence of naphthalene in the culture medium there were no major differences at 1 hour of incubation with respect to the control without naphthalene.

121.

**ANALYSIS OF LACTIC ACID BACTERIAL GENOMES: RIBOFLAVIN BIOSYNTHESIS GENES***LeBlanc JG<sup>1</sup>, Savoy de Giori G<sup>1,2</sup>, Sesma F<sup>1</sup>*<sup>1</sup>CERELA-CONICET. Tucumán, Argentina. <sup>2</sup>UNT. Fac. Bqca., Qca. y Fcia. Cát. Microbio. Superior. E-mail: leblanc@cerela.org.ar

Riboflavin is an essential component of the basic cellular metabolism since it is the precursor of the coenzymes flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD). Although riboflavin is found in a wide variety of foods, its deficiency is common in many parts of the world, not only in developing countries.

The object of this work was to analyse the genomes of LAB to identify strains that have the capability to produce *de novo* riboflavin.

Some strains of *Lc. lactis*, *Lb. brevis*, *Lb. fermentum*, *Lb. plantarum* and *Lb. reuteri* possess all the riboflavin biosynthesis genes whereas *Lb. casei*, *Lb. delbruecki*, *Lb. gasseri*, *Lb. helveticus*, *Lb. johnsonii*, *Lb. rhamnosus* *Lb. sakei*, *Lb. salivarius* and *St. thermophilus* do not. However, preliminary results in our laboratory show that riboflavin production is a strain dependant trait.

These results will help in the search for novel LAB strains that can produce riboflavin as a first step in the development of novel fermented foods with increased levels of this essential vitamin.

122.

**COMPARISON OF DIFFERENT SUBSTANCES IN PERICORONARITIS TREATMENT. PRELIMINARY ASSAY***Cajal JC, Budeguer AN, González M, Morales Abújder M, Ferro M, Gutiérrez S, Chelala M.*

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Pericoronaritis is an acute infectious process observed in young patients that usually affects the lower third molar. Trichloroacetic acid 30% is used for the local treatment of pericoronaritis but it is caustic. The aim of this study was to evaluate *in vitro* the antimicrobial effect of different substances that are not aggressive for periodontal tissues. Trichloroacetic acid at 30% (TCA 30%) and at 10% (TCA 10%), chlorhexidine digluconate 0.12% solution (CL) and propolis 5% (P) were used on *E.coli* ATCC 25922 (Ec1), *E.coli* ATCC 35218 (Ec2), *E.faecalis* (Ef), *S.aureus* ATCC 29213 (Sa R), *S.aureus* ATCC 25923 (Sa) and *P.aeruginosa* (Pa) strains. The radial diffusion test was used. All the strains showed sensibility to TCA 30%, TCA 10% and CL. Pa was resistant to CL. The two Ec strains were resistant to propolis while the other strains showed susceptibility to it. The results indicate that the solutions of TCA 10%, CL and Propolis can be an alternative in the treatment of pericoronaritis.

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123.

**EFFECT OF pH ON AMINOTRANSFERASE ACTIVITY IN *Lactobacillus plantarum* STRAINS FROM ORANGES***Pérez MB, Saguir FM.*

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Amino acids conversion to aroma compounds in lactic acid bacteria (LAB) is usually initiated by a transamination reaction catalyzed by aminotransferases (AT). In a previous work we demonstrated AT activity in *Lactobacillus plantarum* N4 and N8 from oranges during growth in fresh juice. The aim of this work was to evaluate the influence of pH on AT enzymes production in the N4 and N8 strains during growth in orange juice at different times. Cell extracts (CEs) were prepared from cells growing in the natural medium at pH 3.6 or 7 during the exponential growth phase. AT activity was measured using the amino acid-AT test coupled with the colorimetric L-glutamic acid assay. One unit of AT (U) was defined as nmol of glutamate per minute. Specific activity was related to mg of protein. Both strains showed the highest specific AT activities in CEs obtained from orange juice at pH 3.6, reaching values between 9.72 and 1621.2 U/mg. In this condition, the N4 strain exhibited the highest specific AT in the middle of the exponential growth, which was 97% higher than the one detected for the N8 strain. In the neutralized medium the AT activities were significantly lower than in the acid one. The results indicated that in the N4 strain the conditions of the natural medium could favour AT production and consequently its ability to efficiently degrade amino acids and to produce aroma compounds, which could affect the sensorial properties of the final product.

124.

**SEROLOGICAL PREVALENCE OF *Toxoplasma gondii* IN PREGNANT WOMEN IN SAN MIGUEL DE TUCUMÁN***Tua M, Barbaglia A, Aragón F, Paz C.*

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Since September 2008, analyses of antenatal checks were carried out in the Municipal Laboratory in Action Community Center (CAC) N° 11 intended for a toxoplasmosis survey in pregnant women in the southwest of San Miguel de Tucumán. A cross sectional study was conducted in which 66 blood samples were tested for antibodies against *Toxoplasma gondii*, from September 2008 to August 2009, using a commercial indirect hemagglutination test. Twenty-nine (43.9%) samples were positive. Titers were grouped as follows: Negative: titer  $\geq 1/16$ : 39 (43.9%); Low positive: positive reaction with 1/32 to 1/128 dilutions: 22 (33.3%); Medium-positive: 1/256 and 1/512 dilutions: 8 (12.1%); High positive: titers  $\leq 1/1.024$ : 7 (10.6%). The most frequent titer was 1/64: 15%. Cumulative rate of titers  $\geq 1/32$ : 77.2%. Patients with high positive titers were derived to a more complex lab for determinations of anti-toxoplasma IgM in order to diagnose acute infection. People were classified according to age in 2 groups: Group 1: 15-29 years; Group 2: 30 to 45 years. Seropositivity rates were as follows: Group 1: 36.3%. Group 2: 19.7%. By comparing the groups studied we noticed a decreasing trend in seroprevalence with age. We found a prevalence of toxoplasmosis seropositivity similar to those found in other cities in Argentina.

**Key words:** *Toxoplasma*, antibodies, hemagglutination, Tucumán.

125.

**PREVALENCE OF *Cryptococcus neoformans* IN URBAN PIGEONS OF THE CITY OF SAN MIGUEL DE TUCUMÁN, R. ARGENTINA***Alvarez C<sup>2</sup>, Runco R<sup>1,2</sup>, Salim R<sup>1</sup>.*<sup>1</sup>*Cát. de Micología. Fac. de Bioq; Qca. y Fcia. (UNT).* <sup>2</sup>*Lab. de Micología del Hospital del Niño Jesús.**E-mail: bqco\_chal@hotmail.com*

*C. neoformans* is an opportunistic pathogenic fungus that causes Cryptococcosis, an exogenous mycosis, with a marked tropism for the central nervous system. It is found in the dried excreta of birds, fundamentally those of urban pigeons (*Columba livia*). This study was made in order to determine the presence of *C. neoformans* in the excreta of pigeons that inhabit the public spaces of the urban perimeter of San Miguel de Tucumán, to identify the variety of the fungus and to determine the antifungal sensitivity of the recovered isolations. One hundred and nineteen samples of dried excreta were collected from the grounds of 5 public spaces. Samples were cultured in agar seed. *C. neoformans* was identified based on established criteria such as thermotolerance, hydrolysis of urea, assimilation of sugars and nitrates. The variety *neoformans* was determined using a culture in L-canavanine-glycine-blue bromothymol (CGB). *C. neoformans* was isolated in 59 samples (49.6%) from all the public spaces studied: Independence square presented the greatest percentage of recoveries: 65%, followed by Rivadavia square: 60%, Avellaneda Park: 55%, Urquiza square: 50% and Irigoyen square: 45%. This reveals that the fungus is widely distributed in the city and that there is a greater probability of finding it in the accumulated excreta.

126.

**ESSENTIAL AMINO ACIDS FROM DIFFERENT SEED VARIETIES OF QUINOA IN AMAICHA DEL VALLE (TUCUMAN, ARGENTINA)***González JA<sup>1</sup>, Konishi Y<sup>2</sup>, Bruno M<sup>1</sup>, Valoy M<sup>1</sup>, Rosa M<sup>3</sup>, Hilal M<sup>3</sup>, Prado FE<sup>3</sup>.*<sup>1</sup>*Instituto de Ecología, Fundación Miguel Lillo. Miguel Lillo 251, (4000) Tucumán;* <sup>2</sup>*Graduate School of Human Life Science, Osaka City University, 3-3-138 Sugimoto, Sumiyoshi-ku, Osaka 558-8585, Japan.* <sup>3</sup>*Cátedra de Fisiología Vegetal, Fac. de Cs. Naturales e IML. Univ. Nac. de Tucumán. E-mail: lirios@cgcet.org.ar*

The aim of this work was to evaluate the protein content and amino acid composition (essential and non-essential) of 10 quinoa varieties from the Bolivian highland region (Patacamaya, 3750 m a.s.l.) growing in Amaicha del Valle (Encalilla, 2000 m a.s.l.). All the analyses were performed in the Graduate School of Human Life Science Laboratory (Osaka-Japón). Results showed that 60% of the varieties found in Encalilla had a higher protein content than those in Bolivia. Mean values were 12.7% and 12.3% for Encalilla and Bolivia, respectively. "Ratuqui" and "Kancolla" varieties grown in Encalilla showed the highest values: 15.53% and 15.17%, respectively. Tryptophan content showed an increase of 30.1% and 14.7% for both varieties in Encalilla, whereas methionine content increased by 21.2% and 4.8% for both varieties. Results could indicate that quinoa, because of its nutritional properties, would be a good feeding alternative for the Amaicha del Valle region.

*(PICT 23.153)*

127.

**BACTERIAL RECOLONIZATION IN STERILE SOIL BY INTESTINAL MICROORGANISMS OF ENANTIODRILUS BORELLI (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: cristina\_picon202@hotmail.com*

The activity of microorganisms in the gut of earthworms favors the role they play in the properties of the soil. The aim of this work was to recolonize sterile soil with *Enantiodrilus borelli* intestinal microorganisms.

Collection was performed in the Chicligasta Department of the Tucumán province. Soil samples previously distributed into 4 glass jars were sterilized in an autoclave. The earthworms were identified and sterilized by washing with sterile distilled water. The animals, placed in jars closed with parafilm, were put in a sterile chamber with UV light (controlled conditions): 1 control jar (no earthworms) and 3 experimental jars (with earthworms). Samples were taken at different times. Then, identification was carried out according to Bergey's Manual (1994).

We identified the following bacterial genera: *Kurthia* spp., *Marinococcus* sp., *Planococcus* sp., *Azomonas* sp. and *Acidiphilium* spp.

We conclude that *Enantiodrilus borelli* presents a diverse bacterial flora in the gut that can recolonize sterile soil. It is noteworthy that all strains of microorganisms were identified during the first 24 hours. This result highlights the important role of earthworms in the remediation of soils altered by intensive farming practices.

128.

**MEASURE OF POLLUTION BY MINERALIZATION (ICOMI) IN RIVERS OF TUCUMAN, ARGENTINA***González M del C<sup>1,2</sup>, Pourrieux J<sup>1,2</sup>, Guillén S<sup>2</sup>, Vidal PJM<sup>2</sup>, Reguera MC<sup>2</sup>.*<sup>1</sup>*Dirección de Recursos Hídricos de la Provincia.* <sup>2</sup>*Facultad Agronomía y Zootecnia. UNT. Tucumán, Argentina. E-mail: carminaglez16@yahoo.com.ar ; sguillen@faz.unt.edu.ar*

The aim of this work was to determine the quality of two rivers with different characteristics using the Index of Pollution by Mineralization ICOMI with the following ranges: medium (<0.5), high (0.5-0.8), very high (> 0.8). The information of the year 2008 was analyzed in the Salí River (route 305) and Lules River (route 157). The studied sites were: Salí River 26°43'31.1887"S 65°9'44.78"W and Lules River 26°46'13.98"S 65°27'50.16"W. The variables and methodology used were: conductivity (APHA QPT 35\_17), hardness (APHA QPT 35\_22) and alkalinity (APHA QTP 35\_25). With monthly values the following results were obtained: in 2008 both rivers had ICOMI values above 1; the highest value (3) in April, therefore both rivers have a "very high" range; during the greatest rainfalls, values for the Lules River were higher than those for the Salí River. Anthropogenic activity, mainly agricultural livestock production, produces changes in the soil that affect the quality of the surface water and causes economic losses so that investment is required to replace soil losses and improve the quality of the water.



129.

**ACOUSTIC ANALYSIS OF THE WHISTLE IN PUMA (*Puma concolor*) AND YAGUARUNDI (*Puma yaguerundi*)**

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Puma and yaguarundi share a common ancestor and now belong to the same genus. Previous acoustic analysis of some vocalizations has been done only for puma. The aim of this work was to analyze the whistle vocalization found in both species. We recorded whistles from 4 yaguarundis and 5 pumas in captivity in two reserves in Tucuman. We measured 24 variables, out of which 18 were significantly different. Correlation analysis allowed us to narrow them down to 6 variables, with which we made a PCA. A discriminative analysis correctly assigned the calls to the two species in 97% of the cases. The variables which best discriminated between the two were duration, frequency with maximum intensity and numbers of harmonics. The whistle is derived from the mew and shows certain differences in puma and yaguarundi. In both species the bandwidth is greater than 10 KHz and thus it is a long distance call. It also shows considerable frequency modulation which permits it to travel greater distances without distortion. In 50% of the cases the whistle was emitted in response to the whistle of another individual. The whistle is exclusive to puma and yaguarundi but shows differences in each species. Thus, it can be used as evidence for the phylogenetic relationships of these species.

130.

**EFFECTS OF AIR POLLUTION ON THE ANATOMY AND MORPHOLOGY OF *Pleopeltis tweediana***Hernández M<sup>1</sup>, Varela O<sup>2,3</sup>, Mata M<sup>1</sup>, Terán L<sup>1</sup><sup>1</sup>Instituto de Morfología Vegetal, Fundación Miguel Lillo (FML);<sup>2</sup>Instituto de Ecología (FML). <sup>3</sup>Univ. Nac. Chilecito. E-mail: mteran@csnat.unt.edu.ar

There is evidence that city air pollution can have a detrimental effect on plants. The aim of this study was to compare the anatomy and morphology of *Pleopeltis tweediana* (Hook.) A.R. Sm. (Polypodiaceae) in two urban areas with different levels of pollution in the province of Tucumán: El Corte, Dpto. Yerba Buena and the center of the city of San Miguel de Tucumán. Twelve individuals of *P. tweediana* were randomly chosen in both places and sixteen morphoanatomical variables were studied. The sampling procedure was standardized. The study was based on fresh material. Reference specimens were deposited in the LIL Herbarium. Conventional anatomical techniques were applied. Tissue distribution in leaf blade, petiole and mid nerve as well as their size were analyzed. The parametric Student's t-test was used to evaluate differences between habitats. The results showed that plants growing in non polluted areas registered significantly higher values in frond size, diameter of petiole and mid nerve and palisade parenchyma strata. The comparative anatomical analyses of both groups revealed less development of the palisade parenchyma in plants that grow in polluted areas, as is the case in shade leaves. The particles of atmospheric pollution probably act as a filter to sun radiation, negatively affecting the normal development of the tissue.

131.

**CALORESPIROMETRY OF SOILS TREATED WITH EXTRACTS OF *Brachiaria platyphylla***

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*Brachiaria platyphylla* (Munro ex C. Wright) Nash has invaded cultivated fields in Tucumán province, Argentina, with the consequent economic damage to producers. To understand its invasivity EtOAc and MeOH extracts of its aerial parts were incubated with soil to further investigate chemical, microbiological and calorimetric modifications. Also, soil samples from invaded (IS) and non invaded (NIS) areas were studied. An isothermal heat conduction calorimeter was used to obtain the curves of microbial growth. Invaded soil had higher values of organic carbon (OC), extractable phosphorus (P), pH and microbial biomass (MB) than the non invaded one. This coincided with the lower evolution of CO<sub>2</sub> g<sup>-1</sup> MB for the invaded soil, indicating a more efficient metabolism. A concentration of 250 mg kg<sup>-1</sup> of the EtOAc extract selectively inhibited microbial activity reflected by the lowest MB together with a lower mineralization of organic matter. The same concentration of MeOH extract activated microorganisms with poor efficiency to convert substrate into biomass with respect to the control soil. Thus, both extracts have a negative effect on the soil microbial activity so that the improvement in soil quality observed in IS with respect to NIS is probably due to root exudates that will be studied further.

132.

**PHENOLIC COMPOUNDS AND MORPHOANATOMIC CHARACTERS AS QUALITY PARAMETERS IN COMMERCIAL SAMPLES OF "CHACHACOMA" (*Senecio nutans* Sch. Bip)**Lizarraga E<sup>1,2</sup>, Ponessa G<sup>3</sup>, Perotti M<sup>1</sup>, Catalán C<sup>1</sup>.<sup>1</sup>INQUINOA – CONICET, Facultad de Bioquímica, Química y Farmacia. <sup>2</sup>Facultad de Ciencias Naturales e Instituto Miguel Lillo.<sup>3</sup>Instituto de Morfología Vegetal, Fundación Miguel Lillo.

*Senecio nutans*, known as "chachacoma", is a member of the Asteraceae family widely used in folk medicine. It is sold in health stores and local markets of northwestern and central Argentina. The aim of this study was to evaluate the phenolic content and to identify distinctive morphological characters of the aerial parts of authentic *S. nutans* for comparison with the herbal medicine sold in local markets under the name "chachacoma".

The phenol and flavonoid content of commercial and fresh samples was determined. In addition, the chromatographic profile on TLC of some extracts was recorded. For anatomical studies, the plant material was sieved and analyzed at macro- and microscopic levels using conventional techniques. Certified fresh plant material and commercial samples showed a similar chemical profile, with the exception of one sample that showed an altered chromatographic profile in agreement with a significant degree of contaminants detected in the morphological study.

The results can be useful for establishing identity and quality parameters of the vegetable drug.

133.

**FRUCTIFICATION AND BLOOMING PHENOLOGY TO DEVELOP *IN VITRO* PROTOCOLS FOR *Cyrtopodium punctatum* (L.) LINDL., FAM. *Orquidaceae***

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*Cyrtopodium punctatum* (Lindl.) is an orchid with medicinal and ornamental value. It is found in the Americas from Florida (U.S.A.) to Northern Argentina. Loss of its habitat and permanent extraction make necessary the development of *in vitro* protocols to preserve it. The objective of this paper was to determine the blooming and fructification phenology of *Cyrtopodium punctatum* in Tucumán, Argentina, by means of herbarium sampling in order to establish harvesting methods and determine seed parameters to develop *in vitro* protocols. Argentinean specimens from the Fundación Miguel Lillo Herbarium were evaluated. Picking place and date, presence of flower and/or fruit and classification authors were recorded. Blooming and fructification periods were determined as well as the month of higher occurrence. Seventy-six percent of the specimens were picked in Tucumán, where blooming extends from October to January, showing higher occurrence (58%) in October. Fructification occurs from April to August with highest frequency (40%) in May. Even though this is a preliminary study, the information obtained will be useful to orientate the development of harvesting methods and the determination of *Cyrtopodium punctatum* (Lindl.) seed parameters in Tucumán Province.

134.

**BIOREACTOR DESIGN FOR PROTEIN ENRICHMENT OF LEMON PULP**

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Lemon pulp causes serious environmental problems. One solution is to use it as a substrate for the development of microorganisms so as to increase the protein content and use it as animal food. The aim of this work was to design a bioreactor and study protein production using *Aspergillus niger*.

A reactor with a horizontal drum with continuous aeration (0.005 L air/gr min.) was designed and conditions were modified. In reactor 1, we worked with intermittent agitation and in reactors 2 and 3, without agitation. Reactor 3 has a grid at the bottom of the drum. We used pulp with 70% humidity and KCL (0.5g/l), urea/(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, KH<sub>2</sub>PO<sub>4</sub> was added to obtain a C:N:P ratio of 100:5:1; pH 4.5. Fermentation was carried out at 25°C for 60 h.

With bioreactor 1, after 48 h, 33% (dry weight) of total proteins, yield ( $Y_{p/s} = 0.64$  g/g) and productivity ( $P_d = 7$  mg/g h) were obtained. These values were higher than the ones obtained with reactors 2 ( $Y_{p/s} = 0.6$  g/g and  $P_d = 5$  mg/g h) and 3 ( $Y_{p/s} = 0.6$  g/g and  $P_d = 5.5$  mg/g h) after 60 h. In conclusion, bioreactor 1 enabled an effective aeration and agitation. The design eliminated the heat and the CO<sub>2</sub> produced by the metabolism of the fungus during fermentation.

135.

***IN VITRO* BIOACTIVITY OF SILICEOUS SPICULAE OF FRESHWATER DEMOSPONGES**

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The aim of the present work was to evaluate the *in vitro* bioactivity of siliceous spiculae of freshwater demosponges. Spiculae were obtained from *Drulia brownii* (Porifera:Metaniidae) and *Uruguayia corallioides* (Porifera:Potamolepidae). The specimens were placed in a 5.25% NaClO solution for 1 h. Residual material was rinsed with bi-distilled water and then treated with HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> (1:4) overnight. In order to remove the remaining organic matter, the spiculae were then treated with H<sub>2</sub>O<sub>2</sub> 100 vol for 14d, replacing the solution every 48 h; they were subsequently rinsed with bi-distilled water and dried. Their chemical composition was determined by X-ray fluorescence. Two replicates of spiculae of each species were incubated in DPBS saline solution (1mg/mL) (Gibco, pH 7.3) at 37°C for 10d, replacing the solution after 3, 5 and 7d of incubation. The spiculae were evaluated pre- and post-incubation using SEM-EDX. Ten days after incubation, SEM-EDX evidenced the formation of a homogeneous CaP (Ca/P=1.71±0.01) layer (7±2 μm) on the surface of *D. brownii* spiculae, indicating that they present a bioactive behavior. However, the spiculae of *U. corallioides* analyzed did not exhibit *in vitro* bioactivity. The differential behavior observed between the species studied is probably the result of *D. brownii* spiculae presenting 60% more Si, as well as Ca and P ions in their composition, which determined their bioactive response in a simulated physiological medium.

136.

***Lactobacillus casei* CRL431 REDUCES BONE MARROW HISTOLOGICAL ALTERATIONS INDUCED BY CYCLOPHOSPHAMIDE**Herrera M<sup>1</sup>, Villena J<sup>2</sup>, Salva S<sup>2</sup>, Barbieri N<sup>2</sup>, Alvarez S<sup>1,2</sup>.<sup>1</sup>UNT. <sup>2</sup>CERELA-CCT-CONICET. E-mail: salvarez@cerela.org.ar

We evaluated the effect of *L. casei* CRL431 (Lc) administration on bone marrow (BM) histological and cytomorphological changes induced by cyclophosphamide (CF) in mice. A group of mice was fed Lc for 2 d; this group and the untreated control mice (C) received an intraperitoneal injection of CF (150 mg/kg). Before and after CF injection we carried out total and differential cell counts in BM and histological studies. CF administration significantly decreased BM cell numbers in both groups, affecting mainly non-mitotic pool cells. Lc mice showed a lower decrease in BM leukocytes and higher levels of mitotic pool cells when compared to the C group. Histological studies showed that CF decreased BM myeloid and lymphoid series (1-3d post-CF). In the C group, eritroblasts, adipocytes and megakaryocytes were the predominant cells. In addition, accumulation of acidophilic material and sinusoids alteration were observed (3-4 d post-CF). The BM architecture was recovered on d 10. In mice treated with Lc the myelo/erythroid ratio was higher than in the C group and myeloid, lymphoid and mature red cells were less affected than in the C group (1-3 d post-CF). In the Lc treated mice, the BM architecture was normalized on d 7. According to these results, the preventive administration of probiotic lactic acid bacteria could be able to reduce BM histological alterations associated with chemotherapy treatments.

137.

**PROTEIN MALNUTRITION AFFECTS THE DEVELOPMENT OF B LYMPHOCYTES IN BONE MARROW AND SPLEEN**Salva S<sup>1</sup>, Merino C<sup>2</sup>, Villena J<sup>1</sup>, Gruppi A<sup>2</sup>, Alvarez S<sup>1</sup>.<sup>1</sup>CERELA-CCT-CONICET. <sup>2</sup>Fac. Ciencias Químicas-UNC. E-mail: salvarez@cerela.org.ar

Protein malnutrition decreases resistance to infection due to the alteration of various physiological processes, including hematopoiesis. This work evaluated the effect of protein malnutrition on the ontogeny and function of spleen and bone marrow (BM) B lymphocytes (BL). Weaning mice were malnourished by protein deficiency for 21d (M). Control mice (C) received a balanced conventional diet. In the M and C groups the following were evaluated: expression of B220, HSA and IgM in BM and spleen cells by flow cytometry, total IgM and IgG levels in culture supernatants of spleen BL, stimulated with LPS or CpG, and proliferative capacity of spleen BL. Malnutrition significantly decreased the total cell number in BM and spleen, mainly affecting the BL population (B220<sup>+</sup>). In BM, the M group showed a marked decrease in immature BL population (B220<sup>low</sup>HSA<sup>high</sup>IgM<sup>+/+</sup>) ( $p < 0.01$ ), whereas the spleen showed a decrease in mature LB (B220<sup>high</sup>HSA<sup>low</sup>IgM<sup>+</sup>) ( $p < 0.05$ ) with respect to the C group. Levels of total IgM and IgG in the M group were not different from the C mice. BL proliferative capacity in response to LPS and CpG was similar in both groups. Malnutrition affects B lymphopoiesis in spleen and BM, decreasing production and number of BL without affecting the functionality of these cells. According to these results, the increased susceptibility to infections in malnourished mice would be due, at least partly, to quantitative rather than qualitative alterations in BL.

138.

**NASAL ADMINISTRATION OF *Lactobacillus rhamnosus* CRL1505 IMPROVES HUMORAL IMMUNITY IN MALNOURISHED MICE**Barbieri N<sup>1</sup>, Herrera M<sup>2</sup>, Salva S<sup>1</sup>, Villena J<sup>1</sup>, Alvarez S<sup>1,2</sup>.<sup>1</sup>CERELA-CONICET. <sup>2</sup>UNT. E-mail: salvarez@cerela.org.ar

We evaluated the effect of *Lactobacillus rhamnosus* CRL1505 (Lr05) nasal treatment on the recovery of humoral immune response in malnourished immunocompromised mice. Weaning mice were malnourished with a protein free diet for 21d. Malnourished mice were fed a balanced conventional diet (BD) for 7 days or BD for 7 days with Lr05 nasal treatment on days 6 and 7 (BD+Lr05). On day 8 we studied B lymphocytes population in blood, spleen and bone marrow. Expression of B220 and HSA were determined by flow cytometry. Total lymphocytes counts and B220<sup>+</sup>HSA<sup>+</sup> cells in BD+Lr05 mice were significantly higher than those in the BD group. To assess whether changes induced by BD+Lr05 treatment modified the resistance to infection and the humoral immune response, we performed an intranasal challenge with *Streptococcus pneumoniae* (Sp). BD mice showed lung and blood positive cultures throughout the studied period. Treatment with BD+Lr05 increased resistance to infection, prevented the dissemination of Sp into blood and improved lung clearance. Levels of specific IgG in the serum of BD+Lr05 mice were higher than in the BD group. In addition, mice treated with BD+Lr05 showed higher levels of specific respiratory IgA. Nasal administration of Lr05 improved humoral immunity and increased resistance against Sp infection. Nasal treatments with lactic acid bacteria would be an interesting alternative to improve defenses in immunocompromised hosts.

139.

**POSSIBLE SOURCES OF MICROBIOLOGICAL CONTAMINATION IN A CITRUS PROCESSING PLANT**Loi J<sup>1</sup>, Pérez Camaño B<sup>1</sup>, Pérez M<sup>1</sup>, Guerrero A<sup>2</sup>, Ruíz M<sup>2</sup>, Gusils C<sup>2,3</sup>, Cárdenas G<sup>2</sup>.<sup>1</sup>CITRUSVIL SA, Ruta 302 Km 7, Cevil Pozo; <sup>2</sup>Estación Experimental Agroindustrial Obispo Colombres, Av. Williams Cross 3150, Tucumán; <sup>3</sup>CONICET. E-mail: jloi@citrusvil.com.ar

Securing food innocuity is of fundamental importance for the satisfaction of clients and consumers. The objectives of this work were: 1) to analyze the possible points of contamination of final products in a citrus processing plant; 2) to evaluate the effectiveness of the juice pasteurization process.

Official techniques (FDA, AOAC) were used. Soil and lemon samples from Tucuman city farms were analyzed as well as water and lemon juice samples collected at different stages of the industrial process. Samples were analyzed before the thermal effect and after it. In the soil and fruits samples, the growth of TAB (termophilic acidophilic bacteria) was detected, but not of *Alicyclobacillus* strains, which can modify the organoleptic quality of the juice. In the packing sector, the general microorganisms counts decreased as the fruits passed through the different stages of the washing process. In condensate water samples and concentrated citrus juices, TAB were not isolated. The presence of yeasts and coliform bacteria was detected in single strength juices but not in the juice obtained after the thermal process.

We can conclude that: 1) the microbiological control of raw materials which cause alteration of the product quality and/or innocuity of foods should be taken into consideration; 2) the thermal conditions used are adequate to obtain the proper pasteurization of citrus juices.

140.

**ADHERENCE STUDY BETWEEN DIFERENT STRAINS OF *E. coli* AND PORCINE ENTEROCYTES IN VITRO**Bellingeri R<sup>1</sup>, Alustiza F<sup>1</sup>, Picco N<sup>1</sup>, Luchetti C<sup>1</sup>, Moreis M<sup>2</sup>, Vivas A<sup>1</sup>.<sup>1</sup>FAV (UNRC). Ruta 36 Km 601- Río Cuarto. <sup>2</sup>Frig. Penny Lane. E-mail: rominabellingeri@yahoo.com.ar

*Escherichia coli* is one of the most important ethiological agents of porcine neonatal diarrhea. This pathology is mainly caused by enterotoxigenic *E. coli* (ETEC) with adhesins F4 (K88) or F18 and enteropathogenic *E. coli* (EPEC), which possess the eae gene. The aim of this study was to evaluate the adhesion of three strains of *E. coli* with different virulence genes on primary porcine enterocyte cultures. The cells obtained from primary porcine enterocyte cultures from duodenum and jejunum were grown at 37°C under 5% CO<sub>2</sub>. When the cultures reached semiconfluent growth, F18 (ETEC), F4-F18 (ETEC) and eae (EPEC) strains were added (1x10<sup>8</sup> CFUs) for 2 hours. The monolayers were lysed in 1% Triton X-100 for 20 min in order to release the bacteria. The suspensions were serially diluted and 100 µl of each dilution was plated on Mac Conkey agar. The percentages of attached bacteria were calculated based on numerical CFU values. A Kruskal-Wallis test was used.  $p < 0.05$  was considered significant. There were no significant differences between the three strains analyzed for adherence degree to porcine intestinal epithelial cells. Perhaps the strains used were attenuated due to successive picks. Other factors that could have an influence on the degree of pathogenicity should be analyzed.

## 141.

**E. coli AND ENTERIC VIRUSES IN PIGLETS**

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Neonatal porcine diarrhea causes significant economic losses. One of the main agents is *E. coli*, which may be associated with other pathogens such as rotavirus (RV) and/or Picobirnavirus (PBV-pathogenicity still unknown). The aim of this work was to molecularly characterize strains of pathogenic *E. coli*, PBV and RV in an intensive breeding pig farm in Cordoba. Faecal samples were collected from 7-day-old piglets without clinical symptoms. Ninety-one samples were analyzed by PAGE after RNA extraction, and 76 rectal swabs, cultured in MacConkey agar. Lac<sup>+</sup> colonies compatible with *E. coli* were biochemically characterized and DNA was extracted by heating. Virulence factors (LT, STb, STa, F18, eae, F4, VTg) were identified by PCR. 5.5% of electropherotypes were PVB compatible, none with RV. *E. coli* strains (23.6%) were pathogenic: eae<sup>+</sup> 2.6%, LT-STb-Sta-F18-F4 18.4% and 2.6% VTg. Non pathogenic intestinal strains: 76.4%. There was a predominance of potential ETEC and presence of eae<sup>+</sup> (EPEC or EHEC). The use of PAGE showed the genome of a new viral agent PBV. It is necessary to continue the study of PBV associated with other pathogens. The presence of pathogenic strains of *E. coli* could trigger disease in animals in insanitary conditions.

## 142.

**PREVALENCE OF BACTERIAL PATHOGENS IN OTITIS MEDIA**

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Acute otitis media (AOM) is one of the most common bacterial infections in children. **Objective:** To determine the frequency of isolation of pathogenic bacteria from samples of tympanocentesis in children 1 to 12 months old diagnosed with AOM. **Material and Methods:** Twenty-one samples were processed according to conventional bacteriological germ isolation and identification tests. The antibiogram was performed according to NCLSI standards. **Results:** 90% of the samples were positive. In 74% of cases one germ was isolated: *S. aureus* 50%, *S. pneumoniae* 28%, *H. influenzae* 15%, *M. catarrhalis* 7%. In 26% of the samples two pathogens were isolated: *S. aureus* + *S. pneumoniae*, *S. aureus* + *H. influenzae*, *S. pneumoniae* + *H. influenzae*. **Conclusions:** We found a high frequency of *S. aureus* instead of *S. pneumoniae*. This could be due to a different schedule of antibiotics administration and vaccine (administration of vaccine against *H. influenzae* is massive but not against *S. pneumoniae*). Nasopharyngeal colonization probably involves a complex interaction between the pathogens and the host defense response. These factors would determine the prevalence of one or another species in the development of the disease.

## 143.

**BIOPROCESSES DESIGN TO INCREASE THE VALUE OF INDUSTRIAL EFFLUENTS: Pichia pastoris PRODUCTION IN VINASSE AND CHEESE WHEY MEDIA**

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In this work two recombinant *P. pastoris* strains were used: PGK-alpha-glycol produces a fusion protein (*Bacillus subtilis* alpha-amylase and *Aspergillus awamori* glucoamylase) and PGK-OPP produces a human osteogenic protein precursor OPP1 under the constitutive promoter *PGK1* in both cases. The strains were grown in non-conventional carbon sources: M1 (vinasse 10%v,v); MEL (whey 10 g/L); MEL10 (vinasse 10% v/v; whey 10 g/L) and MEL10D (vinasse 10% v/v; whey 1g/L). All the media were supplemented with KH<sub>2</sub>PO<sub>4</sub> 1g/L and MgSO<sub>4</sub> 0.1 g/L. Batch cultures were performed at 30°C, pH 4.5 and 400 rpm, inoculated with 10<sup>2</sup> cfu/ml and incubated for 72 h. Biomass concentration was evaluated by OD<sub>540nm</sub> and number of colonies/ml in YPD agar plates. Both strains reached a biomass concentration of about 10<sup>9</sup> cfu/ml. Results demonstrated the feasibility of non-conventional substrates for biomass production as well as an increase in value of the residual organic matter in effluents and by-products.

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## 144.

**DIFFERENT TRICHINELLA GENOTYPES IN WILD ANIMALS OF CATAMARCA**

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Having proved that the domestic cycle of *Trichinella spiralis* is present in endemic regions of our province, coexisting in narrow affinity with wild animals, it is necessary to determine if they are parasitized and participate in the cycle. The main objectives of the present paper were to confirm the presence of *Trichinella spp* larvae in wild species and determine if different genotypes of the parasite exist among the isolated larvae. The enzymatic digestion method was used for the study of the muscles of animals, all captured in the department of La Paz, province of Catamarca. They were processed individually. The isolated larvae were replicated in mice and then sent to the Malbrán Institute, where they were subjected to the molecular technique of PCR-Multiplex of repeated sequences of ribosomal ADN. As a result of the isolation, 11 larvae were detected in pecari muscles, 7 larvae per gram in a puma and 18 larvae of *Trichinella* per gram in the tongue of another animal of this species. The ADN sequence of the first puma was a wild genotype. Consequently, it was confirmed that *Trichinella spp* circulates among wild hosts of our province. Molecular identification showed a different pattern of *Trichinella spiralis*, thus proving the existence of two different genotypes.

145.

**METALLOPROTEASE-1 AND METALLOPROTEASE-2: IDENTIFICATION IN LAMA GLAMA AND THEIR EXPRESSION IN THE OVIDUCT**

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Sperm transport, fertilization and early embryonic development take place in the mammalian oviduct. It is known that proteolytic systems have an important participation in the reproductive process. Matrix metalloproteases (MMPs) would be involved in the matrix remodeling and cell migration that occur during the sexual cycle and pregnancy. Though the presence of certain MMPs was described in the mammalian oviduct, no information has been reported for camelids. The aim of this work was to identify the sequences of MMP1 (collagenase) and MMP2 (gelatinase) in llama and to study their expression in the oviduct. Primers for MMP1 and MMP2 were designed from nucleotide sequences already known in other mammals. Amplified products were analyzed by RT-PCR from the total ARN of llama oviducts. Then they were amplified, cloned and sequenced. The bio-informatic analysis of the sequences confirmed that they correspond to MMP1 and MMP2 and are preserved in the class Mammalia. The expression pattern of MMPs in the oviductal epithelium of ampulla, isthmus, utero-tubal junction and papilla showed the presence of MMP-2 in the four oviductal segments, while MMP1 was only detected in the papilla. These results suggest that MMP1 and MMP2 might be involved in the reproductive events that take place in the oviduct.

146.

**EXPRESSION OF UROKINASE-TYPE PLASMINOGEN ACTIVATOR RECEPTOR (u-PAR) IN BOVINE OVIDUCT**

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Plasminogen activators are serino-proteases that activate plasminogen into plasmin, the active enzyme. The urokinase-type plasminogen activator (u-PA) participates in the remodeling of the extracellular matrix during the reproductive process. U-PA can bind to its receptor (u-PAR) in the plasmatic membrane, focusing its proteolytic activity on the surroundings of the cell and activating intracellular signal pathways. It is known that u-PA is expressed in the oviduct of mammals and that it is active in the oviductal fluid. The aim of this work was to study the presence of u-PAR in the bovine oviduct. Oviducts from cows in the diestrus stage of the estrous cycle were obtained from a local slaughterhouse. Total RNA from the oviductal mucosa and muscle of ampulla and isthmus regions was isolated and u-PAR gene expression was analyzed by RT-PCR. The amplified fragments were visualized in 1.5% agarose gels dyed by Sybr Safe. The expression levels of u-PAR were compared with a constitutive expression gene,  $\beta$ -actin. The results showed that u-PAR is expressed in both the epithelium and the muscle cells of the ampulla and isthmus regions. The presence of u-PAR in the oviductal epithelium suggests a possible u-PA/u-PAR interaction that would be involved in the transduction of intracellular signals during the reproductive events that take place in the oviduct.

147.

**DESIGN OF A POST-TANNING EMULSION**

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**Objective:** In cosmetics and toiletries, new challenges are frequently required, especially the use of ingredients from natural sources. The aim of this work was to formulate an attractive and safe product.

**Materials and methods:** An oil-in-water emulsion was formulated to provide hydrating properties to the skin after sun exposition. Glycolic extract of carrot and tomato was prepared to add to the formula. Both vegetables are rich in pro-vitamin "A" components and were obtained by mixing the respective juices with propilenglycol (1:1). After a seven day maceration process, they were filtered. Then, this extract was added to a non-ionic-wax self-emulsion formula to obtain the designed product. Liquid paraffin, glycerin, deionized water and methyl-propylparaben were used. A high-revolution mixer was used to prepare the emulsion.

**Results:** Pharmacotechnical, physical and microbiological tests were performed for three months. After this period, no change was found in the main characteristics of the designed product.

**Conclusion:** It is possible to formulate and elaborate toiletry products using natural and low-cost ingredients with beneficial effects. Further *in vivo*, *ex vivo* assays will be carried out to demonstrate their beneficial use in humans.

148.

**DEVELOPMENT AND FORMULATION OF A POST-TANNING COSMETIC WITH CARROT AND TOMATO EXTRACT**

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**Objective:** To design and develop a post-tanning cosmetic formulation using affordable and accessible natural active ingredients and to carry out pharmacotechnical and microbiological controls of the products obtained.

**Materials and Methods:** Glycolic extract, obtained from carrot and tomato juice and the addition of glycerin at a 1:1 ratio, was incorporated in base hydrogel. The final formulation was subjected to various steps to ensure that there was no degradation such as phase separation, discoloration, development of strange odors or bacterial growth. For six months, the following controls were performed: pH, color, odor, weight loss, extensibility and microbiological controls.

**Results:** The formulation, whose characteristics meet the criteria of marketing and consumer preferences, remained physically and microbiologically stable during the test period.

**Conclusion:** There is currently a great demand for economic and effective formulations. This work allowed natural ingredients from the cupboard to enter the world of creams and cosmetic treatments.

## 149.

**EFFECT OF SESQUITERPENIC LACTONES (STL) ON MEIOSIS REINITIATION IN AMPHIBIAN OOCYTES**

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Sesquiterpene lactones are a large and structurally diverse group of plant metabolites. Several biological activities of sesquiterpene lactones have been reported, including anti-tumor and anti-migraine activity and inhibition of smooth muscle cells and meristematic cells proliferation. These activities are mediated principally by the alpha-methylene-gamma-lactone function. This chemical group is a powerful alkylating agent due to a Michael-type addition to suitable nucleophiles as sulfhydryl groups of cysteine residues. It has been previously shown that Dehydroleucodine (DhL) and its hydrogenated derivative (2H-DhL) selectively induces the inhibition of progesterone-induced meiosis reinitiation in *Rhinella arenarum* oocytes.

The aim of this work was to analyze the effect of several lactones on meiosis reinitiation. The lactones used belonged to different groups (guainolides, germacranolides and melampolides) extracted from different plants of the Asteraceae family. Fully grown oocytes of *Rhinella arenarum* matured *in vitro* were pre-incubated with different concentrations of STL. Meiosis resumption was induced with progesterone (2.5  $\mu$ M). The results showed that oocytes pre-incubated with Estafietin, Minimolide and Enhydriin were unable to reinitiate meiosis. **Conclusions:** 1) STL belonging to different groups with different molecular structures was able to inhibit meiosis resumption in a dose-dependent manner; 2) the presence of the  $\alpha$ -methylene- $\gamma$ -lactone function by itself is not enough to confer inhibitory activity to STL.

## 150.

**PULSIOXIMETRIC ASSESSMENT OF THE USE OF BIOEQUIVALENCE IN LOCAL ANESTHETICS**

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The aims of this work were: to determine the response of two bioequivalent local anesthetics commonly used in dentistry containing Carticaine 4% and to observe the changes in blood oxygen concentration and the possible adverse effects on CNS, cardiovascular equipment and structures in the area of infiltration.

We included 20 patients attending the surgery chair of dentomaxillo-facial surgery. Patients were randomized in two groups of 10 and received 2 equivalent commercial pharmaceutical preparations: Totalcaína Forte® (group A) and Anescart Forte® (group B) (Carticaine 4% with epinephrine at a concentration of 1:100,000). A digital pulse oximeter BCI was used to determine blood oxygen saturation before and after the application of the local anesthetic and at the beginning and end of tooth extraction

The statistical analysis of independent variables (anesthesia: totalcaína, anescart) showed no significant differences between groups ( $p > 0.05$ ). When the analysis was performed between initial oximetry and end of the treatment, significant differences were found ( $p < 0.05$ ).

There were no gross abnormalities in the control of oxygen saturation. Reduction in the values of minimum oxygen saturation was possibly due to the increase in catecholamines induced by stress.

## 151.

**VARIATION IN MOTHER' MILK MICELLES PROTEINS EXPRESSION DURING THE FIRST DAYS OF LACTATION**

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Human casein micelles (Cn) are made up of two calcium sensitive Cns ( $\alpha$ s1,  $\beta$ ) and  $\kappa$ -Cn. They also contain Cn oligomers and associated proteins (MAP). We observed some notorious variations in micelles protein composition among different mother's milk samples, so we considered it necessary to investigate the origin and pattern of these variations to find out the influence of lactation time. No references in the literature describing the above changes were found. The aim of the present work was to determine the way in which constituent patterns of micelles caseins vary during the first four days of lactation. Thirty samples belonging to healthy mothers were subjected to PAGE-SDS analyses; gels were scanned or photographed and images were analyzed with densitometry assays. Results showed that: a) there is a marked reduction in the number of micelle associated proteins types during the first days; b) there are individual differences in the relative amount of casein; c) bands (proteins) exist that are not mentioned in literature. Due to the open like structure of Cns and their amphipathic nature, changes in micelle composition may evidence the probable stabilization function of MAP in an environment (colostrum) with high protein concentration. Conclusion: the high number of associated proteins during the first week may represent a protective mechanism against structure destabilization.

## 152.

**RELATIONSHIP BETWEEN  $\beta$ -GLUCURONIDASE AND  $\gamma$ -GLUTAMIL TRANSPEPTIDASE ACTIVITIES IN HUMAN MILK**

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Milk proteins have different degrees of expression. Some of them co-vary in different lactation circumstances. There is no information on the way in which  $\beta$ -glucuronidase and GGT alter their relationship. Knowledge of these enzymes in maternal milk is important because it would improve comprehension concerning the functions of milk enzymes and other compounds in relation to the newborn. The aim of this study was to analyze the change in  $\beta$ -glucuronidase and GGT activities in milk from healthy mothers. Milk samples were collected from mothers at the "Instituto de Maternidad" (Tucumán).  $\beta$ -glucuronidase activity was measured by Fishman's method and GGT activity by a commercial kit. Results showed a normal distribution of the data. The correlation analysis of the two enzymes activities showed to be no statistically significant. No correlations were found between separate enzymes expression with milk proteins or milk sugars. Results showed that healthy babies and babies with respiratory deficiency syndrome do not differ in enzyme expression. Conclusion: the expression of both enzymes does not co-vary under the influence of shared variables.

153.

**PGF<sub>2α</sub> CAPACITY TO INDUCE MATURATION IN *Rhinella arenarum* OOCYTES***Zelarayán LJ, Ortiz ME, Unías L, Ajmat MT, Hermosilla C, Bonilla F, Sánchez Toranzo G, Buhler MI.**Inst. de Biología-INSIBIO. Fac. de Bioq., Qca. y Farm. UNT. Chacabuco 461. Tucumán. E-mail: lzelarayan@fbqf.unt.edu.ar*

The role of arachidonic acid (AA) cascade and prostaglandins during oocyte maturation and ovulation is not fully understood in amphibians. We demonstrated that prostaglandins induce maturation in *Rhinella arenarum* oocytes and follicles in a dose and time dependent manner. The aim of this work was to study the ability of *Rhinella arenarum* oocytes matured by PGF<sub>2α</sub> to be activated and undergo pronuclear development.

Denuded oocytes were matured *in vitro* by PGF<sub>2α</sub> (200 ng/ml) and progesterone (control). Oocyte activation by electric stimulation and pronuclear development by homologous sperm microinjection were studied in matured oocytes. Exocytosis of cortical granules and pronuclear formation were analyzed by routine histological preparations.

The results obtained indicated that 50% of the PGF<sub>2α</sub> matured oocytes and activated by electric pulses or by microinjection of homologous sperms showed activation signals after 20 or 40 min. These oocytes were able to develop pronucleus after 2 hr of sperm microinjection in way similar to progesterone matured oocytes. These results suggest that PGF<sub>2α</sub> induces genuine maturation in *Rhinella arenarum* oocytes.

154.

**WHEY PROTEINS IN PERINATAL AND MATURE MILK OF TAPIR (*Tapirus terrestris*)***Pérez ME<sup>1</sup>, González P<sup>3</sup>, Zalazar R<sup>3</sup>, Rodríguez G<sup>2</sup>, Fernández F<sup>2</sup>.**<sup>1</sup>Fundación Miguel Lillo; <sup>2</sup>Fac. Cs. Naturales, UNT; <sup>3</sup>Fundación Temaikén. E-mail: maeuge75@hotmail.com*

Colostrum has many different proteins. Whey proteins are the more heterogeneous part, immunoglobulins, seroalbumin, and α-lactalbumin being dominant. The presence and abundance of other proteins depends on the species. Most of them have not been identified yet and their functions are still unknown. There is no information available on tapir milk proteins. The aim of this work was to identify the main perinatal proteins and to determine the way in which their concentrations change during the first month of lactation. The samples were colostrums and mature milk from three females, one of which was milked following an ongoing protocol. Major components were analyzed and the samples were subjected to SDS-PAGE analysis. The results showed that tapir colostrum presented more than 25 protein bands of molecular masses ranging from 14 KDa to 150 KDa. Most of them decreased their concentrations with time, while others quickly disappeared and new ones appeared. The disappearance of some minor bands and their subsequent reappearance opens a very interesting field of research. Conclusions: tapir colostrum has a higher number of proteins than the colostrum of other known species. Regardless of the Igs, not all proteins follow similar expression kinetics.

155.

***Bufo arenarum* SPERM EXTRACT ABLE TO INDUCE OOCYTES ACTIVATION: IDENTIFICATION OF A PHOSPHOLIPASE***Bonilla F, Minhak C, Ajmat MT, Sánchez Toranzo G, Zelarayán L, Buhler MI.**INSIBIO-UNT. E-mail: bonilla@fbqf.unt.edu.ar*

During fertilization, sperm release a soluble factor in the ovular cytoplasm which induces oocytes activation. The aim of this paper is to characterize the components of the active fraction of *Bufo arenarum* sperm extract. Motile sperm were obtained by Swim-Up and lysed by freeze-thaw cycles. The lysate was centrifuged for 30 min at 15,000 rpm for 30 minutes and the supernatant was collected as sperm extract. The sperm extract with a final protein concentration of 9mg/ml was subjected to gel filtration and FPLC. The fraction with biological activity (18) was used for the assays. Electrophoresis revealed a band of 24kDa. Phospholipase activity was determined by incubating the active fraction for 1 hour at 37°C in the presence of phosphatidylcholine or egg yolk. The type of phospholipase present in the active fraction was determined by treatment with n-butanol, neomycin and D-609. Results showed enzymatic activity of the active fraction indicating the presence of a phospholipase that is inhibited by treatment with D-609 but not with n-butanol or neomycin, showing that they would not be a phospholipase D or a phosphatidylinositol-specific phospholipase C. Moreover, the observation that the enzyme does not produce lysophosphatidylcholine from phosphatidylcholine rules out the presence of a phospholipase A2. Our results suggest that the biologically active fraction of *Bufo arenarum* sperm extract has phosphatidylcholine-specific phospholipase C activity.

156.

**EFFECT OF ARACHIDONIC ACID ON *Bufo arenarum* OOCYTE ACTIVATION***Ajmat MT, Bonilla F, Hermosilla C, Zelarayán L, Buhler MI.**Inst. de Biología Fac. de Bioq., Qca. y Farmacia, UNT. Chacabuco 461. Tucumán. E-mail: mtajmat@fbqf.unt.edu.ar*

Regulation of intracellular calcium is pivotal to oocyte activation and subsequent development, but the underlying signalling pathways have not been clarified yet. Within intracellular calcium changes at least two families of intracellular receptors have been identified: inositol trisphosphate receptors (IP<sub>3</sub>Rs) and ryanodine receptors (RyRs). Among its several regulatory effects, calcium is able to act as an activator of a cytosolic phospholipase A<sub>2</sub> (PLA<sub>2</sub>). Once activated, PLA<sub>2</sub> releases arachidonic acid from phospholipids of the endoplasmic reticulum. Previous studies suggested that arachidonic acid and/or its metabolites might be able to modulate the activity of several ion channels. We have previously reported the existence of interdependent IP<sub>3</sub>Rs and RyRs in *Bufo arenarum* oocytes. The aim of this work was to investigate the effect of arachidonic acid on *Bufo arenarum* oocyte activation and its interrelation with IP<sub>3</sub>Rs and RyRs. Arachidonic acid treatment induced up to 50% egg activation. We found that IP<sub>3</sub>Rs and RyRs are differently regulated by arachidonic acid: IP<sub>3</sub>Rs were inhibited by arachidonic acid, whereas RyRs were activated by it. This mechanism might be of physiological relevance for calcium homeostasis in cells expressing both types of ion channels.

157.

**PARTICIPATION OF THE GABA<sub>A</sub> RECEPTOR IN THE ACROSOME REACTION OF *Chinchilla lanigera* SPERM**

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The production of fur and reproducers are the objective of the intensive breeding of *Chinchilla lanigera*. Parameters to evaluate the quality of semen of the reproducers do not exist. In this sense, the establishment of standards for semen in this species that will allow the characterization of the best reproducers is of great interest. The aim of this study is to determine the participation of the GABA<sub>A</sub> receptor in the acrosome reaction of sperm obtained from epididymus tail. The samples were suspended in HTFm+hSA (tubercular human fluid + synthetic human albumin -IRVINE SCIENTIFIC). As agonist and antagonist of the GABA<sub>A</sub> receptor we used muscimol and picrotoxin respectively. Vitality was determined by means of eosin 0.05% in PBS. Motility was evaluated over 200 cells. The acrosome reaction was evaluated with the Papanicolaou stain modified for sperm. Results indicated that the stimulation of GABA<sub>A</sub> receptors by muscimol induced the acrosome reaction in a dose dependent manner, an effect which was inhibited by treatment with picrotoxin. Vitality and motility were not significantly affected. These results suggest the participation of the GABA<sub>A</sub> receptor in the acrosome reaction of *Chinchilla lanigera* sperm.

158.

**SEASONAL EVOLUTION OF NOSEMA INFESTATION LEVELS IN EL MANANTIAL, TUCUMÁN PROVINCE**

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Bees are exposed to numerous diseases that threaten the productive characteristics of economic importance in beekeeping. The diseases with highest incidence are American foulbrood, Varroasis, European foulbrood, Nosemosis, Acariosis and chalkbrood. Nosema disease is linked to environmental conditions at different times of the year. We analyzed the evolution of Nosemosis infestation levels in colonies of *Apis* bees throughout the different seasons. Field surveys were conducted according to the methodology of SENASA and spore counts by bees using the method of Cantwel. The sampling stations covered the spring, summer and autumn. We worked with three hives chosen at random from a fixed apiary located in the town of El Manantial, taking samples every 15 days. The results showed that throughout the year there were all levels of infestation (negative, low, medium and high) with two peaks of high infestation (November and February, March), it being highest in February, negative in January, medium and low in December in spring. The optimum conditions for the development of Nosema disease occurred from February through the first week in March. Producers should be aware of these findings to realize the importance of conducting two samplings per year in order to know infestation levels and carry out preventive and control measures to obtain a product that is healthy, safe and free of contaminants.

159.

**CONTROL OF THE MITE *Varroa destructor* (VARROIDAE) IN HONEYBEE COLONIES OF *Apis mellifera* (HYMENOPTERA; APIDAE) BY AMITRAZ**

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The aim of this work was to evaluate the acaricide efficacy of amitraz in honeybee colonies of *Apis mellifera* against the mite *Varroa destructor*. Work was done at La Plata city during April and May 2009. A total of 10 colonies was divided into 2 groups: a) treated and b) control. Two plastic strip were impregnated with amitraz for 30 days. After that, colonies received 2 plastic strips with coumaphos for 45 days to eliminate remanent mites. Samples were taken weekly from special floors of each colony, removing dead mites. Acaricide efficacy was calculated as number of mites killed by amitraz divided by the total number of mites collected (amitraz + coumaphos). Results presented an average acaricide efficacy of 93.82% ± 3.13, significantly higher than the control group (11.11% ± 2.3;  $p < 0.05$ ). These results show amitraz as a useful control agent of Varroa disease.

160.

**COUNT AND IDENTIFICATION OF GASTROINTESTINAL PARASITES IN TWO SHEEPFOLDS IN TUCUMAN PROVINCE**

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Gastrointestinal parasites are a significant threat to domestic animals and to production because of the numerous negative effects they produce. In extensive systems of goat meat production, animals are exposed to infection with nematodes and coccidia (including parasites) during grazing. The aim of this work is to provide information on the degree of infestation in two sheepfolds in the province of Tucuman. We worked with goats from INTA (Leales) and from a private farm located in La Esperanza, Graneros. Each group had 10 adult goats. We collected faecal samples to perform parasitological studies, identified and counted the number of eggs per gram of faeces. *Haemonchus contortus* nematodes and coccidia genus were identified. The studies showed the following values: 1) Goats (INTA Leales): *Haemonchus*: 2090 eggs per gram of faeces and little coccidia infestation 2) Goats (La Esperanza): *Haemonchus*: 190 eggs per gram of faeces and high coccidia infestation. The results suggest that the slight coccidia infestation in INTA animals is due to the use of antiparasites insecticides, but failed to effectively control nematodes. In La Esperanza goats without antiparasites treatment coccidia infestation is very important while nematode infestation is low. These animals graze on native species that apparently exert a natural control for *Haemonchus* parasite.



161.

**NUTRITIONAL EVALUATION OF RESIDUES OF THE CITRUS INDUSTRY IN TUCUMÁN**

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Citrus factories process around 756,000 tons of lemon in Tucumán, registering an annual growth in the last decade of 8% of the amount of industrialized lemon. Essential oils, juice concentrates and dehydrated peel are the commercial products of the citrus industry. No usable residues (discarding) are generated; and at the moment they are dumped in sacrifice lands or on the basin of the Salí River, having already caused environmental problems. An alternative solution is to transform the solid residues into balanced cattle feed, thus adding economic value to them. Consequently, the objective of this work is to study the nutritional value of the residues: peel, fine powder and filtrate of liquid effluents, to be able to use them in the formulation of balanced cattle feed. Analyses of determination of total carbohydrates, proteins, fats, nourishing fiber and power value, according to AOAC techniques, were made. High fiber content and low content of proteins and carbohydrates were found in all the samples analyzed. As a conclusion, it would be possible to turn these residues into balanced cattle feed by adding to them the nutrients they lack.

162.

**MINERAL CONTENT OF SEEDS FROM QUINOA VARIETIES IN AMAICHA DEL VALLE (TUCUMÁN, ARGENTINA)**

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The aim of this work was to evaluate the seed mineral content of 10 quinoa varieties from the Bolivian highland region (Patacamaya, 3,750 m asl) growing in Encalilla (Amaicha del Valle, 2,000 m asl). Potassium is the element found in highest proportion with an average of 9.80 g/KgDW, CICA being the variety with the highest content (12.6 g/KgDW) and Kamiri the one with the lowest (8.62 g/KgDW). The second more important element is phosphorus, with average value of 2.67 g/KgDW, Kancolla being the variety with the highest content (4.53 g/KgDW). Interestingly, calcium content (708 mg/KgDW) was higher than in other cereals such as rice, wheat, and maize. Consequently, quinoa would be an ideal substitute for calcium supply. Ferrous content is also high (78.9 mg/KgDW), it being twice as high as that in rice (2.8 mg/KgDW). In conclusion, the reintroduction of quinoa crops in the Argentinean Northwest would be quite promising in terms of minerals provision for the inhabitants of the region, whose staple diet consist only of rice and wheat. (PICT 23.153).

163.

**CHARACTERIZATION OF OIL USED IN FRIED FOODS FOR ITS USE IN SOAP PRODUCTION**

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The food industry uses vegetable oils in cooking and frying processes. When the process is finished, the burned oil is poured down drains without previous treatment. Oil is thus dumped as waste because it does not have a recycling alternative use. The characteristics of edible oils were studied for its recycled use in soap production. Index of acidity and saponification were measured in six samples of commercial oils, three from corn and three from sunflower, which were subjected to fried food processes and compared with values obtained from the same oils without use. T-tests statistical analyses on averages of two samples showed significant differences of above 5% between used oils and oils without use. Although the analyzed indices are different in used oils samples, they could be used in the formulation of mixtures with other fats for the obtainment of raw material for soap elaboration.

**Keywords:** cooking food, fried food, industry, recycling.

164.

**CHANGES IN VIGILANCE LEVELS IN THE PRESENCE OR ABSENCE OF INFANTS IN CAPUCHIN (*Cebus apella*) GROUPS**

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Predator defenses such as vigilance are the main influence on the evolution of sociality. In groups with infants we expect animals to increase vigilance to protect their progeny. Our objective was to study the time each individual spends in vigilance in the presence and absence of infants and whether this depends on the presence of predators (using models and playbacks) or the dominance hierarchy (alpha or beta pair) in the group. This study was carried out in the Iguazu National Park, Misiones, Argentina, with capuchin monkeys. The Macuco group with 23 individuals was followed for 24 days per month for 7 months. Vigilance was studied with the focal animal technique, measuring sec of vigilance per 10 sec of observation under natural and experimental conditions. Ocelots, eagles and snakes were used as experimental models with non-predatory animal models as controls. Experimental and natural conditions were significantly different (t test,  $T=-8.59$ ,  $p<0.0001$ ). Under natural conditions the group was significantly different with and without infants ( $T=6.04$ ,  $p<0.0001$ ); in the experiments there was more vigilance with predator models with ( $T=4.80$ ,  $p<0.0001$ ) than without infants. In conclusion, we find 1) more vigilance in groups with infants than in those without infants, 2) alpha individuals were more vigilant than betas in groups with infants and 3) no differences in vigilance between control models and natural situations.

165.

**YIELD IMPACT OF PHYTOPHAGOUS INSECTS ON AN IRRIGATED MULTI-CROPPED MAIZE-PUMPKIN PLOT IN SANTIAGO DEL ESTERO**Jorge EJM<sup>1</sup>, Helman SA<sup>2\*</sup>, Zalazar N<sup>2</sup><sup>1</sup>EEASE-INTA. <sup>2</sup>FaYA, UNSE. E-mail: e Jorge@intasgo.gov.ar silhema@unse.edu.ar; \* (ex aequo).

The “cerco” is a multi-crop agroecosystem, adopted traditionally by peasant families, surrounded by typical natural vegetation of the Chaco semi-arid region. Despite the fact that many studies show that multi-cropped systems are less vulnerable to plagues, little study has been done on the correlation between reduced pest populations and the increase in crop productivity. The objective of this work was to analyze the impact of phytophagous insects on inter-cropped maize and pumpkin regarding mono-cropped systems of each of the species in equal-sized plots. The following treatments were analyzed: T1=50% maize and 50% pumpkin, T2=interspersed (2 rows of pumpkin and one row of maize), T3=mono-cropped maize and T4=mono-cropped pumpkin. The experimental design consisted of random plots repeated four times. Weekly, insects and damages above 2 m were counted. The following phytophagous insects were found: *Spodoptera frugiperda* S. in maize and *Bemisia tabaci* G. and coreidae bugs in pumpkin. The impact of damage by *S. frugiperda* was relatively low, it being comparatively lower in interspersed associated plots. White flies only exceeded damage levels during the start of shoot development. Pumpkin yields in associated maize plots (T1 and T2) were similar to those of mono-cropped plots of the same crop. As to maize in combination with pumpkin, yields were the same as for mono-cropped plots of that crop. Yields, however, were lower in interspersed plots, probably due to competition between the two crops.

166.

**DIPTERA TAXOCENOSIS IN A YUNGAS STREAM: SEASONAL VARIATION AND ITS RELATIONSHIP WITH PHYSICO-CHEMICAL WATER PARAMETERS**Salas L<sup>1</sup>, Lizarralde de Grosso M<sup>2</sup>, Rodríguez Garay G<sup>1</sup>, Gómez P<sup>3</sup>.<sup>1</sup>Diversidad Animal I. Fac. de Cs. Ex. y Nat. UNCA. <sup>2</sup>Insue. Fac. de Cs. Nat. UNT-CONICET. <sup>3</sup>Quím Anal. Fac. de Cs. UNCA.

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The aims of this study are to describe Diptera taxocenosis in a Yungas stream, to determine the seasonal variation of their community parameters and ecological indexes, and to find a relationship with physico-chemical water variables. Samples from the Los Pinos Stream (Catamarca, 1020 m asl) were obtained seasonally using a Surber sampler (900cm<sup>2</sup> in area and 300µm net opening). Diptera were identified up to subfamily or genus level. Water samples were taken in the center of the stream, upstream, with a 1,500 ml jar. Conductivity, pH, alkalinity, hardness, oxidation, as well as calcium, magnesium and chlorine rates were determined using normalized Standard Methods. Density was 10,011-1,044 ind/m<sup>2</sup>; faunistic richness was 21-9 taxa; Shannon-Wiener index values were 3.21-2.66. Simpson's dominance index was 0.20-0.15, maximum and minimum values for community parameters and H' index corresponded to winter and spring respectively. Sorenson's quantitative coefficient indicated that winter and summer are similar (62%), with 17 genera in common. Spearman's correlation coefficient indicated significant (positive or negative) correlation between taxa density and physico-chemical water variables. Results indicated an interesting contribution to the study of the Diptera community and structure variation and their relationship with environmental variables within the Yungas lotic habitats.

167.

**TOTAL PHENOLS AND FLAVONOIDS IN FLOWERS OF *Tabebuia SP.*; THEIR RELATION WITH ANTIOXIDANT ACTIVITY**Annan S<sup>1</sup>, Lizarraga E<sup>2,3</sup>, Gaudioso C<sup>1</sup>, Perotti M<sup>2</sup>.<sup>1</sup>Cátedra de Bacteriología. <sup>2</sup>Cátedra de Química Orgánica II. Facultad de Bioquímica Química y Farmacia. UNT. <sup>3</sup>Cátedra de Elementos de Química Orgánica y Biológica, Facultad de Ciencias Naturales e Instituto Miguel Lillo. UNT.

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Phenolic compounds are potent antioxidants with antimutagenic and anticarcinogenic effects. The *Tabebuia* genus, with numerous properties, is used in traditional medicine. The aim of this work was to evaluate the content of phenols (P) and flavonoids (FL) and the antioxidant activity (AA) of the extracts of the corolla of “lapacho amarillo” (LA) and “lapacho rosado”(LR) in the city of San Miguel de Tucumán.

The alcoholic extracts (AE) were prepared with ethanol 96% and the hydroalcoholic extracts (HAE) with ethanol 80% and 50% from the corolla of LA and LR. The content of P was determined by the method of Folin-Cicolteau and the content of FL by the method of Arvouet-Grand with slight modifications. AA was evaluated using the method of DPPH free radical scavenging activity in the individual extracts and in pools of the AE and HAE of both species. HAE showed a higher content of P, FL and AA than AE. The extracts of LA were more active than the extracts of LR. The pool of extracts showed a higher AA than the individual extracts.

168.

**FRUCTIFICATION AND BLOOMING PHENOLOGY TO DEVELOP *IN VITRO* PROTOCOLS FOR *Encyclia oncidoides* (LINDL.) SCHLTR. FAM. ORQUIDACEAE**

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*Encyclia oncidoides* (Lindl.) Schltr. is an epiphyte orchid with ornamental value endemic to Salta and Jujuy Provinces, Argentina. The loss of its habitat and permanent extraction make it necessary to develop *in vitro* protocols to preserve it. The objective of this paper is to determine the blooming and fructification phenology of *Encyclia oncidoides* in Tucuman, Argentina, by means of herbarium sampling in order to establish harvesting methods and determination of seed parameters aimed at developing *in vitro* protocols. Argentinean specimens from the Fundación Miguel Lillo Herbarium were evaluated. Picking place and date, presence of flower and/or fruit and classification author/s were recorded. Blooming and fructification periods were determined as well as the month of highest occurrence. In Salta, blooming occurs from July to December with highest occurrence (44%) in November, while fructification occurs from April to October with highest occurrence (37%) in October. In Jujuy, blooming occurs from July to December, with highest occurrence (48%) in November. No fruit bearing specimens were found in Jujuy. The information obtained will be useful to orientate the development of harvesting methods and the determination of *Encyclia oncidoides* seed parameters.

169.

**PRODUCTION MEDIA OPTIMIZATION: ITACONIC ACID BY *Aspergillus terreus* MJL05 AND SURFACTIN BY *Bacillus subtilis* O9**

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In this work optimization of itaconic acid (IA) production by *Aspergillus terreus* MJL05 and surfactin (Sf) production by *Bacillus subtilis* O9 was carried out. Experimental assays were performed in 250ml Erlenmeyer flasks with glycerol as the sole carbon source for IA. Stirred tank fermentor (3L Applikon) with 1.3 L of working volume and automatic controls with temperature, pH, dissolved oxygen concentration and agitation was used for Sf production with sucrose. Growth and product kinetics were analyzed in both processes. For IA fermentation C/N 18; N/P 10.8 and C/P 195 allowed the obtainment of 27.6 g/L IA and Yx/s 0.27 (g d.w.biomass/g glycerol); Yp/x 1.63 (g IA/g d.w biomass) and Yp/s 0.43 (g IA/g glycerol). For Sf fermentation, C/N 10; N/P 0.9 and C/P 9.0 allowed the obtainment of 1.09 g/L Sf and 98.6% was collected with the foam, with the following yields: Yx/s 0.21(g d.w.biomass/g sucrose); Yp/x 0.31 (g Sf/g d.w biomass) and Yp/s 0.06 (g Sf/g sucrose). Both processes showed the feasibility of scaling up in a Pilot Plant.

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170.

**DISCARDED PULP USED IN THE PREPARATION OF CULTURE MEDIA FOR THE GROWTH OF *L. rhamnosus***

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**Introduction:** The citrus industry produces waste that is potentially hazardous for human health and environment, producing 2Tn/day of discarded pulp (DP) that produces acids and organic waste matter. **Aim:** To use DP generated in our city as a source of nutrients to grow *L. rhamnosus*. **Materials and Methods:** Liquid waste (LW) was obtained from citrus DP. With this LW a 10% w/v solution was prepared as the basic culture medium (M), pH:7.5. Five culture media were prepared with the LW. Glucose (G), peptone (P) and yeast extracts (YE) were added at different percentages: M1 = LW + 0.5% P + 0.3 G; M2 = LW + 0.25% P + 0.3 G; M3 = LW + 0.5% YE + 0.3 G; M4 = LW + 0.5% YE + 0.3 G and M5 = LW + 0.5% YE. *L. rhamnosus* ATCC 7469, a producer of diacetyl from citrate, was inoculated 2% in the media and CFU/mL, pH and diacetyl formation were evaluated at 0, 6, 12, 24, and 48 hours of incubation at 35°C. Diacetyl was determined by King's method. **Results:** *L. rhamnosus* was able to grow in all culture media except in M. In media M<sub>1</sub> to M<sub>5</sub> the biomass reached after 48 h of incubation was the same (7.76±0.33 to 6.50± 0.28); however, growth rates were higher in M<sub>1</sub> and M<sub>3</sub> and lower in M<sub>5</sub> and M<sub>4</sub>. Final values of pH were between 4.97 and 4.80 for M<sub>1</sub> to M<sub>4</sub>, except for M<sub>5</sub>, which increased to 7.60. Diacetyl was detected in M<sub>1</sub>. **Findings:** The design of culture media from industrial waste will be an additional benefit to environmental problems arising from agro-industrial activities.

171.

**A NEW COLORIMETRIC METHOD FOR THE ANALYSIS OF ALKYLRESORCINOLS BASED ON THE USE OF FAST BLUE RR SALT**

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Intake of whole grains affords health benefits for people with chronic diseases. Whole grain foods can be detected through analysis of alkylresorcinols (ARs). However, new methods are required for fast and inexpensive detection and quantification. The aim of this work was to develop a new method for ARs analysis based on the use of Fast Blue RR (FBRR) salt. The influence of different concentrations of FBRR salt, organic solvents and basifying reagents was assayed at several temperatures and light conditions. Olivetol and orcinol were used as standards. Good linearity was observed for olivetol in the range of 1–10 µg with methanol as a solvent (λ max = 480 nm) and 1–7 µg with butanol as a solvent (λ max = 530 nm). The sensitivity obtained in butanol was comparable to the one obtained in the Fast Blue B based method (methanol as a solvent, λ max = 520 nm). In the new colorimetric method described here, incubation time was reduced to 20 min and the stability of the reaction products was as long as 3 h. The method appears promising for the analysis of 1,3-dihydroxybenzene derivatives in samples from plant breeding and food analyses.

172.

**INCIDENCE OF DERMATOPHYTES IN CHILDREN: NINE YEARS OF STUDY IN TUCUMÁN, ARGENTINA**

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Dermatophytes are queratinophilic fungi that can invade the corneus layer and colonize queratinized structures. In order to determine their incidence among children in Tucumán, 712 clinical samples from patients of both sexes (413 males and 299 females) from 0 to 14 years old, with a presumptive diagnosis of mycosis in hair, scalp, skin and nails were studied. Clinical samples were processed by the usual techniques for fungal detection. Cultures in Sabouraud Glucose Agar with chloramphenicol (0.5 mg/ml) were incubated at 28°C for 15 days. Fungal identification was carried out following Rabel and Taplin (1979) keys, including macro- and micromorphological studies of the cultures, hydrolysis of urea and the *in vitro* production of drilling organs in hairs. The study, carried out for 9 years (2000-2008), showed 487 positive results (68.4%). The rate of frequency of the isolated fungi was: *M. canis* (78.4%), *T. mentagrophytes* (6.4%), *T. rubrum* (6.2%), *T. tonsurans* (4.5%), *M. gypseum* (3.9%), *T. mentagrophytes var interdigitalis* (0.4%) and *E. floccosum* (0.2%). *M. canis* was the main pathogenic agent, which clearly indicates that the zoophilic species are prevalent in our area. The group of 0-3 years old was the group of highest incidence followed by the group of 4-6 years old. It is important to indicate the need for the systematic search for fungi in all patients with presumptive mycosis, to confirm the diagnosis and to establish an early and adequate therapy that will ensure effective treatment.

**173. EPIDEMIOLOGICAL SITUATION OF WHOOPING COUGH IN TUCUMÁN, ARGENTINA. 2009**

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Pertussis is an acute infectious disease with worldwide distribution that specifically compromises the respiratory tract and is characterized by paroxysms of dry cough. Currently this disease remains a major epidemiological problem, frequent and severe in children, especially in infants under 7 months with incomplete or no vaccination. The present study was made in order to establish the number of pertussis cases diagnosed in children from 0 to 15 years old treated at the Hospital del Niño Jesús, Tucumán, between Feb/06 and Jun/09. We processed 761 nasopharyngeal aspirate samples. For the confirmatory diagnosis of *Bordetella pertussis* (BP) we analyzed the promoter region of the gene coding for pertussis toxin (PT) and the repeated insertion sequence IS48 through polymerase chain reaction. Out of the total samples tested, 30.2% tested positive for BP. The age group of highest incidence was 1 to 3 months (50%) followed by the group of 4 to 7 months (23.5%). These results demonstrate the need to strengthen immunization programs, or identify potential operational failures in them such as lack of vaccination, inadequate dose, or no response to the vaccine, and reveal the importance of an active epidemiological surveillance to reduce the risk of transmission to other children in our province.

**174. ISOLATION AND SELECTION OF RHIZOBACTERIA AS POTENTIAL PLANT GROWTH AND BIOLOGICAL CONTROL AGENTS IN SOILS OF SALTA PROVINCE**

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In Salta province, soybean and tobacco production is vital for regional economy. Unfortunately, this kind of activity produces soil deterioration. In order to preserve soil quality, sustainable management practices should be appropriately applied. The use of alternative practices such as bacterial biofertilizers constitutes an option. The aim of this work was to select and promote rhizobacteria (PGPRs) with biological control capacity. Soil samples were collected from field crops at 10cm depth from the crop roots during the growth season. Populations of selected bacteria were determined by the dilution plate method. The following culture media were used: PGA, TSA, organic and inorganic phosphorus Agar, King A and B Agar. The selected strains were evaluated according to their capacity to produce cyanhydric acid, AIA, siderophore production and phosphate solubilization. From all the selected bacteria analyzed only 3% produced cyanides while 60% produced AIA. Siderophores production was observed in 44% while only 15% were able to solubilize phosphorus. The results showed that only two of the strains analyzed have the capacity to control *Fusarium* spp and *Rhizoctonia solani* (Khun). Studies of potential biocontrol agents and plant growth promotion are extremely difficult. Therefore, a more exhaustive analysis of different crops, soils and agrosystems is required in order to confirm their beneficial effects.

**175. FUNGAL BURDEN AND PRESENCE OF *Aspergillus* IN ROOM 12 OF THE HOSPITAL DEL NIÑO JESUS - TUCUMÁN**

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The detection of *Aspergillus* spores in hospital settings is considered a risk factor for health especially in immunosuppressed patients. The aim of this study was to determine the fungal burden and the presence of *Aspergillus* in rooms for immunocompromised children (Room 12) in the Hospital del Niño Jesús from Oct/08 to Feb/09. Sampling was performed 1 time per week in 4 different locations in each room for spontaneous seeding of 10 min exposure in Petri dishes with Sabouraud-Glucose-Agar and antibiotics. Samples were incubated at 25 °C and the CFU count of fungi was recorded after 7 days of incubation. Identification of *Aspergillus* genus and species was performed by micro- and macromorphology characteristics of strains. The highest number of CFU was found in October 2008 (31.1%) with an average in the remaining months of 18-24%, except for February 2009 (2.6%). Out of a total of 21 strains of *Aspergillus*, the following were isolated: *A. fumigatus* (48%), *A. niger* (33%), *A. flavus* (9.5%) and *A. terreus* (9.5%). Fungal isolates of clinical significance in hospital areas for immunosuppressed patients should be monitored routinely so that steps can be taken to reduce the presence of *Aspergillus* spores.

**176. ALLELOPATHIC EFFECT OF *Capsicum annuum* L. SECONDARY METABOLITES**

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The aim of this work was to study the activity of the compounds present in the red fraction (capsanthin and capsorubin) of the hexane extract of *Capsicum annuum* fruit. Fruit extracts, dried and ground, were obtained through hexane at room temperature and protected from the light. Red fraction separation was performed using TLC (Thin-layer chromatography) semi-preparatory plates, in a solvent mix of hexane/ethyl acetate/ethanol/acetone. Activity assays were carried out with concentrations of 50, 100 and 200 mg/L in seeds of *Lactuca sativa* and *Sorghum saccharatum*. ANOVA variance analysis was performed with three replications per treatment. In *Sorghum saccharatum*, inhibitory effects within a 24% to 33% range were found. *Lactuca sativa* showed an inhibition rate of 27% to 32% for the various concentrations. These results reveal the presence of secondary metabolites in the red fraction, with a moderate phytotoxic activity. We will continue our research with further assays tending to determine the activity of compounds present in other isolated fractions of *Capsicum annuum*.

177.

**IMPORTANCE OF ORAL BACTERIAL ECOLOGY IN ACUTE OTITIS MEDIA IN CHILDREN OF SAN MIGUEL DE TUCUMAN**

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The normal flora of the nasopharynx has protective ability against the development of otitis media in school children. **O:** To study the balance of commensal oral flora in children from different social strata: good (B), regular (R) and regular otitis (O). On this basis we determined the balance of the commensal flora and pathogens in children with acute otitis media (AOM) and in healthy children to establish their role in pathogenesis. **MM:** The commensal oral flora in the saliva of 80 healthy children and the flora from the pharyngeal swabs of 110 children with AOM (n=46) and without otitis (n=64) was studied according to standard rules. **R:** The number of *S. mutans* is higher in group B than in R ( $p < 0.01$ ) and both are higher than in group O ( $p < 0.0001$ ). The number of lactobacilli was similar in B and R and higher than in O. In children with otitis, neither *S. mutans* nor *S. salivarius* were isolated. *M. catarrhalis* was isolated in healthy children but not in children with otitis ( $p=0.06$ ). *S. pneumoniae* is more common in children with otitis ( $p=0.0005$ ). **C:** Commensal flora varies with socioeconomic level. AOM is related to the decrease in the commensal flora.

178.

**LACTIC ACID BACTERIA AND BIFIDOBACTERIA FROM A BULLFROG HATCHERY IN CORDOBA: EVALUATION OF BENEFICIAL CHARACTERISTICS**

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*Rana catesbeiana* is the most appropriate species for raniculture, where diseases such as the red leg syndrome (RLS) contribute to animal mass mortality with a high impact on production costs. The use of probiotics is becoming increasingly popular in aquaculture, Lactic Acid Bacteria (LAB) being the most suitable microorganisms for this purpose. In this work we evaluated the beneficial properties (production of antagonistic compounds and surface properties) of 52 LAB and 5 *Bifidobacterium* sp. isolated from a hatchery in Córdoba and their differences with the LAB isolated from a Northwestern hatchery. Results showed that all the strains inhibited at least one of the pathogens assayed by organic acid (agar well diffusion method). Sixteen strains were found to produce H<sub>2</sub>O<sub>2</sub> in a specific medium (MRS+TMB+peroxidase). Only one strain produced a bacteriocin active against *S. epidermidis* and *L. monocytogenes*. Surface properties assays showed that most of the strains were hydrophilic. However, 8 strains exhibited a high hydrophobicity percentage, while 5 were autoaggregative. Bifidobacteria presented hydrophilic properties and only one showed antagonist activity. LAB isolated from a Northwestern hatchery have inhibitory and surface properties similar to those from Córdoba. However, the percentage of H<sub>2</sub>O<sub>2</sub>-producing strains was higher. The results obtained allow us to select some potential probiotic strains to be used in different aquaculture areas according to the biodiversity found.

179.

**CHROMOSOMAL ANALYSIS OF MEIOSIS IN *Diplotaxis tenuifolia* (BRASICACEAE) FROM AMAICHA DEL VALLE, TUCUMÁN PROVINCE**

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*Diplotaxis tenuifolia* (Brassicaceae) is a native aromatic plant widely spread in the Amaicha del Valle area (Tucumán province). It presents possible toxicity to cattle and its ability to advance into crops turns it into a potential weed. The objective of this work was to analyze the chromosomal behaviour in meiosis of *D. tenuifolia* (Brassicaceae) to study its cytogenetic characteristics. The material was collected in Amaicha del Valle, Tucumán province (1870 m asl). For the analysis of meiotic chromosomes randomly selected young flowers were fixed in Newcomer's solution. Preparations were made by squashing anther samples between slides and cover slips and using haematoxylin 2% as a stain and ferric citrate 1% as mordant. About thirty pollen mother cells (PMC) were observed. The analysis of the results showed that the species has a chromosomal number of 2n=22, so it would be a diploid species if the basic number of x=11 reported for the genus is taken into account. In meiosis, regular behaviour of the chromosomes at the different division phases was observed, with the formation of 11 bivalents in Metaphase I, normal production of tetrads and abundant pollen grains. The regularity of meiosis and the high pollen viability (99%) explains the formation of fertile gametes. The results obtained will contribute to the cytogenetic characterization of this species.

180.

**KERATINS SEQUENCE IDENTIFICATION IN THE LLAMA GENOME**

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The production of fabrics from llama fiber represents an important economic activity for the Andean communities of Argentina. The quality and possibilities of industrialization of the fiber are influenced by its physico-mechanical characteristics. In sheep it is known that these properties would be related to the type of keratins in the wool. Five types of keratin intermediate filaments are known. Type I and type II keratins are present in wool and hair. There is no available information about keratins gene sequences of South Americans camelids in biological databases. Our objective was to study some sequences of llama in order to relate the gene expression to fiber quality parameters. DNA was isolated from anticoagulated blood samples of llamas. Primers were designed from sequences of the human keratins genes that are expressed in the hair follicle, specifically type I keratins: K32 and K34. The llama DNA templates obtained were used in the PCR reaction. Human DNA was used as a positive control. A 1200pb fragment was obtained with the K32 primers, whose size corresponds to the one observed in the control, and two fragments of approximately 800pb were obtained with the K34 primers, larger than the control. The three amplified products were sequenced. Knowledge of these sequences will enable the study of keratin expression in the llama hair follicle.

**181.**  
**IMPLICATION OF ANS GENE EXPRESSION IN FRUIT COLORATION**

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Flavonoids play important roles in flower and fruit color generation. The red colors of flowers are mainly caused by Anthocyanins and Betacyanins. The Chalcone synthase (CHS), Chalcone isomerase (CHI), Flavanone-3-hydroxylase (F3H), Dihydroflavonol 4-reductase (DFR) and Anthocyanidin synthase (ANS) were considered the core enzymes involved in the main branch of the anthocyanin pathway. Total RNA was extracted from mature fruits of *Fragaria x ananassa*, *F. vesca*, *Duchesnea chrysantha*, red-fruit *D. indica* and white-fruits *D. indica*. The cDNA obtained was used as a template to perform PCR, using specific primers obtained from the Genbank. Glyceraldehyde-3-phosphate dehydrogenase (*GAPDH*) was used as a control gene. An equivalent level of *GAPDH*, *CHS*, *F3H*, and *DFR* genes expression was found in all the fruits analyzed. However, a significant reduction in the *ANS* expression of white-fruits *D. Indica* with respect to red fruit species was observed. *D. chrysantha* presented lower levels of *ANS* gene expression, indicating that this enzyme would also be underexpressed. Our results indicate that the expression of *ANS* is strongly associated with the red-fruit character, therefore the lack of red pigmentation in fruits can be easily attributed to the lack of *ANS* activity.

**182.**  
**COLOSTRUM WHEY PROTEINS OF SABLE ANTELOPE (*Hippotragus niger*): SIMILARITIES AND DIFFERENCES WITH OTHER BOVIDS**

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Bovidae are a large family in which most work on whey proteins has been carried out, mainly in domesticated species: *Bos taurus*, *Ovis aries* and *Capra hircus*. However, there is no information concerning the characteristics of whey proteins in antelope, which also belongs to the Bovidae Family. Comparison of the composition and proteins of antelope and species belonging to other Subfamilies is useful for a better understanding of their evolution in order to improve their management. The aim of this work was to identify major proteins present in sable antelope colostrum. We used colostrum samples from a female of this species belonging to the Temaikén Foundation. Comparison was carried out using goat colostrum and sheep milk. Methods consisted in major components determination, PAGE-SDS analysis and digital gels imaging. Results showed that the overall composition of sable antelope colostrum is quite similar to goat and sheep milk. Whey protein electrophoresis allowed us to identify the presence of the following proteins: serum albumin, lactoferrin,  $\alpha$ -lactalbumin,  $\beta$ -lactoglobulin, heavy chain of IgG, light chains of Igs and nine other bands similar but not identical to those of other bovids. Caseins PAGE-SDS showed two main bands:  $\beta$ -Cn and  $\alpha$ s1-Cn, and two minor bands: casein monomers and micelle associated proteins. Sable antelope showed colostrum whey proteins similar to those of other bovids and less similar than the ones from other mammalian Families.

**183.**  
**MAMMALS CASEIN MICELLES HAVE GLYCOSYLATED ASSOCIATED PROTEINS**

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Caseins (Cn) micelles are made up of calcium sensitive caseins ( $\alpha$ s1,  $\alpha$ s2,  $\beta$ ) and  $\kappa$ -Cn. They also have casein oligomers (OCn) and proteins associated with casein micelles (MAP). There is very little knowledge of these proteins and none in wild mammals. In previous works we observed variations in glycosylation in a group of nine mammalian species. We did not find any references on this subject in the specialized literature. The objective of this study was to determine the association between casein micelles glycosylation and the presence of MAP, oligomers of caseins and the partial contribution of each to total micelles proteins. PAGE-SDS, image digitalization/quantification and comparison analyses were carried out. Results showed that: 1) there are significant positive correlations between glycosylation of micelles and MAP concentration ( $p=0.010$ ); 2) MAP showed positive and noticeable PAS reaction on gel detection, while casein monomers showed a weaker reaction; 3)  $\kappa$ -casein represents a small fraction of total micelles proteins. On the other hand, interspecific variation of  $\kappa$ -caseins proved smaller than the one corresponding to MAP. **Conclusion:** variation in MAP glycosylation may account for a great part of micelles glycosylation. It is probably a homeostatic milk stability mechanism.

**184.**  
**INFLUENCE OF THE DIET ON RABBIT PLASMATIC LIPIDS**

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Cholesterol and fatty acid intake influence cardiovascular diseases development. The aim of this work was to determine the influence of a high cholesterol and fat diet on rabbit plasmatic lipids. Flander rabbits were separated in 3 groups fed with a commercial diet (Control), a commercial diet supplemented with 1% cholesterol (DH), a commercial diet supplemented with 10% of fat (DG). Blood was collected from the carotid artery and plasma was obtained for triglycerides (TG) and cholesterol (CT, LDL, HDL) analysis (kits) and fatty acid by gas chromatography. Higher CT and LDL levels were determined in DH than in the Control group (5.24 vs 0.55 and 2.86 vs. 0.22g/l, respectively). Atherogenic index (CT/HDL) was higher in DH (11) than in the Control (1.75) and DG (1.5) groups. Higher palmitoleic (1.0 vs 3.0%), linolenic (1.0 vs 1.8%) and arachidonic (3.0 vs 6.3%) acid contents were observed in the Control than in the DH group. The DG group differed from the Control in arachidonic (5.6 vs. 3.0), eicosapentanoic (EPA) (0.17 vs 0.24%) and docosahexanoic (DHA) (3.7 vs. 1.97%) acid. The  $\Delta^6$  desaturase index was higher in DH (0.25) than in DG (0.23) and Control (0.11) rabbits. This index indicates an increase in enzymatic activity that converts linoleic acid into arachidonic acid. DHA increase and EPA decrease in the DG group may be related to vascular regulation. **Conclusion:** a diet rich in cholesterol or fat modified plasmatic lipids. The model shown here may be useful for other determinations.

185.

**VARIATION IN BLOOD GLUCOSE AND CHOLESTEROLEMIA IN MICE FED WITH LACTIC ACID BACTERIA WITH CINNAMYL ESTERASE ACTIVITY**

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Cinnamyl esterases (CE) are enzymes that hydrolyze hydroxycinnamate esters present in cereal bran, releasing hydroxycinnamic acids (ferulic, sinapic, caffeic, and *p*-coumaric acids) with antioxidant and hypolipemiant properties. CE activity in the intestinal microflora is critical for the bioavailability of hydroxycinnamic acids such as ferulic acid. Previous studies showed that the oral administration of *Lactobacillus fermentum* CRL 1446 and ATCC 4931 increased intestinal feruloyl esterase activity and decreased plasmatic lipoperoxides, improving the oxidative status of mice. Objective: to determine variations in blood glucose and cholesterol levels in mice with oral administration of *L. fermentum* CRL 1446 and ATCC 14931 with CE activity. Assays were performed *in vivo* in adult Swiss albino mice fed with the strains in two doses (10<sup>7</sup> and 10<sup>9</sup> CFU/ml/day) in the drinking water and sacrificed at 2, 5, 7 and 10 days. Glucose, cholesterol and triglycerides were determined in blood serum obtained by cardiac puncture from mice with 16 hours of fasting. Glucose levels decreased (50%) in mice that received both lactic acid bacteria and decreased with increased feeding time. Cholesterol decreased 58% in mice fed with the ATCC strain with respect to the control group. Triglycerides showed no statistically significant changes with respect to the control.

186.

**EFFECT OF POSTNATAL STRESS IN PRENATALLY STRESSED ADULT RATS ON ADRENAL CORTEX APOPTOSIS**

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Alterations induced by prenatal stress in the hypothalamic-pituitary-adrenal axis (HPA) could affect apoptosis in the adrenal cortex. The objective of this work was to investigate the effect of postnatal stress on apoptosis in the fascicular area of the adrenal cortex in adult rats prenatally stressed (EP). Males of three months of age were used, the offspring of mothers stressed (EP) by immobilization (IMO) during pregnancy, and their control (CP). All groups were under acute postnatal IMO stress (20 min). Rats were divided into four groups: prenatal stress-postnatal control (EPC), prenatal stress-postnatal stress (EPE), prenatal control-postnatal stress (CPE), prenatal control-postnatal control (CPC). Corticosterone (COR) and plasmatic levels were determined before and after stress. Adrenal glands were extracted, processed with TUNNEL and counterstained with methyl green. Results: Prenatal stress produced HPA axis hyperactivity in basal conditions and habituation under the same postnatal stress. Forty-five percent of marked cells was observed in the fascicular area in group CPC, 53% in group EPC, 37% in group CPE and 25% in group EPE. In conclusion, the hyperactivity of the HPA axis under basal conditions as well as habituation under postnatal stress is reflected in apoptosis values what would indicate that the glucocorticoid would affect programmed cell death generation in the fascicular layer.

187.

**RELATIONSHIP BETWEEN MYOSIN ISOFORMS AND MEAT QUALITY IN PIG SEMITENDINOSUS NEUROMUSCULAR COMPARTMENTS**

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Previous investigations have failed to determine a clear relationship among parameters that evaluate meat quality and morphological muscle characteristics. The aim of this work was to compare the heterogeneous distribution of myosin isoforms of pig semitendinosus muscle (ST) reported in a previous regional study according to the distribution of the primary branches of the nerve, with significant differences in the variables that estimate meat quality. Muscle samples were taken from four ST regions of INTA-MGC pigs slaughtered at body weight of 100 kg to evaluate characteristics of I, IIA, IIB and IIX fiber types, pH, L\*, a\*, b\*, and WB. Fiber types were identified by using monoclonal antibodies. The hypothesis was that meat quality traits vary significantly according to characteristics of the muscle. Significant differences were observed in L\*, a\*, b\*, WB and pH, fiber percentages and percentage sum of fiber types I, IIA and IIB when considering R1 + R4 vs R2 + R3 regions (*p*=0.05). No significant differences were found for IIX fiber type. Correlation was statistically significant between meat quality parameters and fiber types when pH and IIX type were evaluated (0.44). We concluded that samples with a high content of myoglobin and hemoglobin (I, IIA) influence pH and color. Higher WB values could be related to higher cross sectional area and higher IIB fiber type percentage in glycolytic ST regions (R2 - R3).

188.

**EVALUATION OF THE INCREASE IN THE LAND WORM *Eisenia andrei* POPULATION WITH DIFFERENT ORGANIC SUBSTRATA**

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Lombriculture is a farming activity that includes important aspects of the biology of the species. We evaluated the population behavior of the land worm *Eisenia andrei* in the solid residues of hens, goats and horses as substrata. For the preparation of the cradles a layer 10 cm of maize (*Zea mays*) stubble was placed at the bottom of wooden boxes that were then refilled with fermented horse, goat or hen manure. The boxes were closed and placed outdoors. Six different substrata were prepared: T1 = horse manure (EE)100%, T2 = EE + maize stubble (RM) (4:1), T3 = goat manure (EC) 100%, T4 = EC + RM (4:1), T5 = hen manure (EG)100% and T6 = EG + RM (4:1). The results obtained showed that no statistically significant differences were found between the treatments assessed with horse or goat manure in relation to number of cocoons and number and weight of worms. Nevertheless, in the substratum prepared with hen manure, a smaller production of cocoons and number of worms were found compared to the previous ones. In all cases, the mixtures of manure + maize stubbles were the best (4:1). With respect to pH in the lombricomposts obtained, values were 7.89 for hen, 7.63 for goat and 7.14 for horse manure.

**189.**  
**POLLEN AND CHEMICAL EVALUATION OF HONEYS IN THE CENTRAL REGION OF THE PROVINCE OF CATAMARCA**

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Catamarca aims at honey production on a nationwide scale, so it is of fundamental importance to determine honey quality. The requirements of international markets require a detailed consideration of the characteristics, properties and profiles of commercialized honeys. The objective of this work is to provide an insight into the honey flora of the Central Region of the province of Catamarca and to determine the total content of proteins and reductive sugars with the aim of evaluating the quality of the honey produced. The phyto-geographical area of the study extends from arid Chaco to mountainous Chaco, an arid and bolsos climate. Soil dryness is evidenced in a xerophilous vegetation made up mostly of small woody and thorny bushes. Twenty-two samples from beehives in the Central Region (2005-2006 and 2006-2007 seasons) were analyzed. Flower origin was tested using the pollen composition of each sample. Reductive sugar determination was carried out with the Fehling-Causse-Bonnans method and total proteins with Biuret's method. Out of the total samples analyzed, 80% were monofloral honeys. Sominant species were *Prosopis* sp, *Larrea* sp. and *Atamisquea amarginata*. Reductive sugar values were between 69.49% and 80.4%, and total proteins ranged from 0.2% to 0.45%. In conclusion, nectar sources are native species, from which mostly monofloral honeys are originated. The parameters considered showed values that comply with the current quality regulations for floral honeys.

**190.**  
**NUTRITIONAL EVALUATION OF GRAIN SORGHUM. QUANTIFICATION OF ITS TANNINS CONTENT**

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The fiber fraction and the presence of secondary metabolites are a limitation to the nutrition of herbivorous animals. Phenolic compounds such as tannins have both positive and negative effects on the animals. Two positive effects are the increased bypass protein (in ruminants) and the reduction in the production of eggs of gastrointestinal parasites. The use of the grain of brown or black sorghums with tannins may be an alternative for animal feed and it can also be used as a biological parasite control. The aim of this work is a nutritional assessment of three sorghum grains. We worked with sorghum samples from farms in the Lules department and with samples from a commercial source. The nutritional parameters analyzed were: dry matter (% DM), crude protein (% CP) by AOAC, neutral detergent fiber (% NDF) by Van Soest and % of tannins by the method of Lowenthal. The results were: Sample D4 (Lules): % DM: 97.10; % CP: 14.78; % NDF: 23.54; % tannins: 0.4. Sample L2 (Lules): % DM: 98.97; % CP: 41.80; % NDF: 14.83; % tannins 0.6. Sample 14 (commercial): % DM: 98.70; % CP: 22.44; % NDF: 28.5, % tannins: 1.5. According to these results, sample L2, with low NDF content, higher crude protein content and medium tannins would be the best choice for animal feed and parasite control. In contrast, the commercial sample with high tannins content can have a detrimental effect on protein utilization by animals.

**191.**  
**COMBINED METHODS APPLIED TO THE CONSERVATION OF SQUASH PUREE (*Cucurbita maxima* L.)**

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Tucumán has a great variety of soils and climatic conditions for the cultivation of crops that are important for the family diet such as squash. Combined method technology applied to product processing is the hurdle combination as solute aggregation (sugars, salts, organic acids, thermal treatment) to reach microbial stability and safety to maintain the organic properties of the product. The objective of this work was to use combined method technology for the conservation of plumb squash (*Cucurbita maxima* L.. Var. Typical) puree and analyze the quality and useful life of the obtained products. The material was cut in pieces, peeled and steam cooked at 120° for 5 min. Then it was processed to obtain the puree and the preparation was formulated. It was placed in 380 ml bottles, sterilized at 100°C for 20 min and cooled to ambient temperature. Different formulas were studied. After sensorial analysis the formulation that better preserved the fresh squash characteristics was selected: squash puree 100%, ascorbic acid 0.30%, lactic acid 0.20%, citric acid 0.25%, salt 0.5%, saccharose 1%. Analyses were made with fresh material as well as puree in bottles at 3 and 6 months after processing. The following values were found: pH=4.30, °Bx=12, dry matter 17%, carbohydrates 4.6%, proteins 1.1%, Vitamin C 12 mg/100 g. We also found negative enzymatic activity and absence of bacteria, fungi or yeasts. After the experimentation stages a flux diagram was made for the design of the processed product. Combined methods enabled the obtainment of bottled squash puree that can be conserved for 6 months at ambient temperature.

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**STUDY OF *Lactobacillus plantarum* DEVELOPMENT IN THE PRESENCE OF ARGININE AND ORNITHINE**

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Biogenic amines (BA) are by-products of microbial metabolism. Bacteria responsible of BA formation could be from different sources, the starter culture used in a fermentation process or due to inadequate hygienic practices during product manufacture. The objective was to evaluate the potential of lactic acid bacteria (LAB) isolated from apple to yield BA in pH conditions similar to natural environments. Arginine (arg) is one of the major aminoacids (aa) found in fruits, therefore we study its effect in bacterial development in a culture media containing in g/l: peptone, 5; yeast, 3; glucose, 0.5; tomato juice, 2%v/v. The cultures were added with arg and ornithine 1g/l, pyridoxal phosphate, 0.006 g/l, pH 4.5. Strains of *Lactobacillus plantarum* were selected and identified biochemically and genetically. All the strains studied present a greater rate of development in the media supplemented with arg if compared with the control. This could be related with aa decarboxylation and the generation of additional metabolic energy. Bacterial development presents no difference with the control when ornithine was added to the culture media. This indicates that in the conditions assayed, the isolates are not able to obtain additional energy from this aa. Apple juice is the natural substrate to produce cider. No control over LAB is carried out during its elaboration. This preliminary study shows the necessity to control native microflora and the substrate to avoid liberation of toxic compound for consumer.



<b>A</b>						
Abal A	101		Barril P	Co4, 141	Cohen de Chervonagura E	60
Abdala GC	23, 39		Bartolucci C	96	Coll Aráoz MV	50
Abeijón Mukdsi MC	185		Basualdo M	66, 150	Colla MF	31
Abregú AV	110		Batista S	101	Colqui Garay F	163
Acevedo C	93		Bautista N	107	Contreras CM	30
Acevedo CO	112		Bedascarrasbure B	152	Corbella R	46
Affricano O	187		Bedascarrasbure EL	47	Corbella RD	26
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