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L1.**“Miguel Lillo” Lecture****MEMBRANE FUSION DURING FERTILIZATION***Mayorga LS, Tomes CN, Belmonte SA, Michaut MA.**IHEM (CONICET-UNCuyo), Facultad de Ciencias Médicas, Universidad Nacional de Cuyo, Casilla de Correo 56, (5500) Mendoza.**E-mail: lmayorga@fcm.uncu.edu.ar*

During the last few years, fertilization in breeding mammals and human beings has been extensively studied and manipulated to improve or prevent reproduction. These experimental procedures have had a strong impact on animal breeding and human fertility, and have been the center of discussions on ethics and economics in society. However, the molecular mechanisms of fertilization are only partially understood. Among the several cellular processes involved, exocytosis is a key event for fertilization. Sperm must undergo acrosomal exocytosis to fertilize the egg and the fertilized egg must release the content of the cortical granules to prevent polyspermy. These fertilization-related secretions have some particular characteristics. Gamete encounter is unique; it only occurs once during the lifetime of these cells; consequently, secretory events are tightly regulated to be triggered at the right time and place. Moreover, gametes are transcriptionally inactive cells (sperm are in addition translationally inactive); therefore, these processes are not regulated at the transcriptional level.

Our group has identified several factors involved in acrosomal exocytosis and characterized several stages in the secretion process. In some aspects, the spermatozoon is an ideal system to study exocytosis. Sperm are highly differentiated cells with a reduced set of functions. Specifically, most organelles of the endocytic and secretory pathways are absent. In contrast, they harbor a single large secretory granule (the acrosome) and exocytosis is mediated by the opening and expansion of hundreds of fusion pores. Because of their size, exocytosis of individual granules can be assessed by time-lapse fluorescence microscopy. Dramatic changes in membrane topology can be explored using electron microscopy to understand several aspects of membrane interaction and fusion.

From these studies, a complex pathway involving proteins that participate in neuroendocrine cell secretion, structural and signaling lipids and ion fluxes has been inferred. However, we are still far from understanding how all these molecules interact to render a fully fertilizing sperm at the right time and place.

L2.**Opening Lecture****THE OLDEST BIOTA IN NORTHWESTERN ARGENTINA. FOSSIL REGISTER IN 540 MILLION YEAR OLD ROCKS***Aceñolaza FG.**INSUGEO. Universidad Nacional de Tucumán-CONICET. Miguel Lillo 205. 4000 San Miguel de Tucumán.**E-mail: facenola@infovia.com.ar*

The core of many mountain ranges in the provinces in northwestern Argentina consists largely of shales and sandstones that represent the bottom of a sea that covered the region 540 million years ago. Successive orogenic movements occurred, crushing, breaking and raising these ancient sediments and exposing them as found today in the ranges of Tucumán, Catamarca, La Rioja, Salta and Jujuy. It is noteworthy that these rocks record a special event in the history of life around the world, and also in northern Argentina. Major structural changes took place in the organisms living at the time. This was the time of the apparition of organisms with skeletal structures whose presence we find on the bedding planes of sedimentary rocks on the planet. It is known that the first signs of life are recorded in rocks about 4000 million years old, with early biostructures generated by bacteria. It took about 1500 million years for the oceans to cool down and generate better conditions for sea life, then characterized by further expansion of stromatolites and algal structures. In rocks formed about 2400 million years ago (Mya), the first record of glaciation resulted in the generation of ocean currents that helped the spread of life in the seas. A German author, Adolf Seilacher, acknowledges that about 542 Mya a significant revolution occurred the conditions in which life developed. The dominance of organisms that moved on the sea surface began when they started to penetrate the substrate by removing sediment. This time span was called “the Agronomic Revolution» or “the Verdun Syndrome”, which is the time when skeletal bodies helped on a more efficient lifestyle. The rocks in our mountains belong to this period, and in some of them we find evidence of this dramatic moment in the history of life on earth. Geological studies carried out in various parts of the northern and western provinces of Argentina allow us to interpret an age span between 600 and 500 Mya, with a Proto-Pacific Ocean flooding the continent that resulted in a sea that extended from southern Bolivia to La Rioja. With shallow clear waters, photic conditions must have facilitated the construction of bacterial and algal mats that would serve as food for higher forms. There are several locations where fossils have been found in the northwestern provinces of Argentina. In Tucumán, in the area of Choromoro, impressions of soft bodies were found together with traces of other organisms belonging to the early Cambrian. In Salta, these fossil forms are found in the vicinity of the capital city, in the Valle Calchaquí, in the Quebrada del Toro and the San Antonio de los Cobres area. Various sectors have been recognized in Jujuy, the Quebrada de Humahuaca and surrounding areas, while in Catamarca they have been recognized in the area of Sierra de la Ovejera. In Famatina, La Rioja, some fossil materials have been recognized as well. These locations demonstrate that in this ancient sea, also «fossilized», there was a wide biological diversity, as in other parts of the world, showing the relevance of this moment to understand what happened at a critical moment in the history of life. There are many examples of traces left by bacteria and algae as well as of those that show traces of living activity such as displacements on the surface of the layers and disruption of stratification by soil removal in search of food, caves, etc. Finally, it is necessary to highlight the fact that the northwestern region of Argentina is an area where we can see some of the characters of extinct primitive life printed on the rocks of our mountains.

L3.**Lecture 1****IMPACT OF ICE MELTING ON THE ANTARCTIC MARINE ECOSYSTEM***Orgeira TJJ.**Cátedra Ecología General, Fac. Cs Naturales e Inst Miguel Lillo, Univ Nac Tucumán. Inst Antártico Argentino – Dirección Nacional del Antártico. E-mail: joseluisorgeira@yahoo.com.ar*

A key feature of the Southern Ocean is its almost permanent ice cover, which plays an important role in the global energy balance and ocean-atmosphere interactions in the Polar Regions. Ice is one of the most important physical factors in the Antarctic Ocean with strong biological implications on the marine ecosystem: it regulates the amount and quality of sunlight in the underlying water with the consequent impact on photosynthetic activity. Ice melting is a process that releases large marine plankton community. These areas of melting become food sources that are used by all forms of marine plankton, birds and mammals. But what happens when the melting of large masses of ice takes place in a shorter time than usual? In oceanographic terms, the delicate balances between the currents is broken, because they release enormous amounts of fresh water and, consequently, alter their speed, depth and temperature control capability. In biological terms, the most obvious immediate consequence is the loss of the microhabitats of millions of marine invertebrates that live under or within the ice, changing to unprecedented levels the extremely complex Antarctic marine food web. These processes are taking place in Antarctica. The complete disappearance of glaciers or the breakdown of large ice shelves are a dramatic example. The alarming fluctuations in the populations of Antarctic birds and mammals identified during the last 15 years are another proof that “change” has begun to take its toll on the Antarctic continent.

L4.**Lecture 2*****Pseudomonas putida* A ATCC 12633 STRATEGIES TO COMBAT STRESS CAUSED BY SURFACTANT Br-TETRADECYLTRIMETHYLAMMONIUM***Lucchesi GL.**Facultad de Ciencias Exactas, Físico-Químicas y Naturales, Universidad Nacional de Río Cuarto, Ruta 36 Km 601, Río Cuarto, Argentina.**E-mail: glucchesi@exa.unrc.edu.ar*

The Br-tetradecyltrimethylammonium (TTAB) degradation by *P. putida* A ATCC 12633 is initiated by N-dealkylation catalyzed by a TTAB-monoxygenase activity resulting in the formation of tetradecylalkanol and trimethylamine (TMA). Tetradecylalkanol is oxidized to tetradecanoic acid and metabolized by β -oxidation. TMA is partly metabolized to NH_3 through oxidation and demethylation and also accumulated inside the cell, affecting bacterial growth, an effect counteracted by the addition of AlCl_3 . Al^{3+} acted as a Lewis acid, playing a role in the control of TMA intracellular levels by the formation of the $\text{Al}^{3+}:\text{TMA}$ complex, and the TTAB was fully consumed without accumulation of undesirable compounds. The major bacterial response in TTAB-containing media was to produce a highly negatively charged membrane by an increase in phosphatidic acid and phosphatidylglycerol to neutralize the positive charge of TTAB. In the presence of AlCl_3 , phosphatidylcholine (PC) increased and should be viewed as a temporary reservoir of available Al^{3+} through the formation of $\text{Al}^{3+}\text{-PC}$ complexes. These complexes are used as a reservoir of Al^{3+} in the membrane and *P. putida* A ATCC 12633 can obtain the ion to reduce the TMA accumulated inside the cell, in concordance with the total degradation of TTAB.

L5.**Lecture 3****VEGETATION DYNAMICS FOLLOWING ABANDONMENT OF AGRICULTURAL FIELDS IN SOUTHERN SANTA FE (ARGENTINA)***Boccanelli SI.**Fac. Cs. Agrarias, UNR (College of Agricultural Sciences, National University of Rosario). E-mail: sbocane@unr.edu.ar*

The Pampas region in Argentina has been used for farming for more than one hundred years. This long history of disturbance has brought about deep changes in the native vegetation, and native communities have been replaced by different crops, especially by soybean and its accompanying weeds, during the last thirty years.

As a consequence, some of the species that made up the native vegetation have disappeared or are found as relicts confined to undisturbed areas, such as abandoned railways or roadsides, which create networks of semi-native vegetation corridors. In this work, we studied the vegetation dynamics in an enclosed field set up at the Experimental Field at the College of Agricultural Sciences (UNR) under the assumption that, if left alone, the vegetation would return to a flechillar similar to the native community. Twenty-five years after the abandonment, the process of secondary succession that developed has converged into a *Sorghum halepense* with *Carduus acanthoides* community and a *Baccharis salicifolia* community. Since no propagules/disseminules of the species from the native grassland were found in the analysis of the seed bank, we concluded that the situation is almost impossible to revert. Therefore, the biome characteristic of the Pampas region –the grassland– stands no chance of being restored.

L6.**Lecture 4****CELLS AND TISSUES AS ASYMMETRIC CATALYSTS: A STRATEGY FOR THE DEVELOPMENT OF GREEN CHEMISTRY**

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Bacteria, fungi and plants are sources of potentially useful enzymes to catalyze specific chemical reactions in biocatalytic processes. Bio-reactions are mostly stereo-, chemo- and/or regioselective, these being very attractive characteristics in the field of organic synthesis. No less important is the fact that this kind of processes has low environmental impact and that they are developed in mild conditions of temperature, pH and pressure. The diversity of microbial metabolic pathways has been successfully exploited in organic chemistry. Notable progresses have been achieved using the concept of catalytic promiscuity. Less attention has been paid to plant secondary metabolite pathways, which offer the possibility to perform original reactions hardly found in other organisms. In this regard, organs and tissues from wild or cultivated plants as well as undifferentiated cell cultures and hairy roots have been used as biocatalysts. Despite the methodological advantages that the use of isolated enzymes and cofactor recycling systems has demonstrated, these tools are of little potential for application in developing countries. In contrast, enzymes used in their natural environment as whole cell catalysts offer the benefit of preserving stability and the possibility to realize the auto-regeneration of the expensive cofactors involved in the majority of the bio-reactions of interest. This speech discusses several works oriented to the expansion of the available “enzyme tool kit” exploitable to access to high value compounds. These methodologies, which make a rational use of renewable resources, aim at cooperation in the development of green chemistry strategies for new sustainable and environmentally friendly industries.

L7.**Lecture 5****DECLINE AND DISSAPEARANCE OF AMPHIBIANS IN ARGENTINA. CHALLENGES AND OPORTUNITIES**

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Early awareness of the state of conservation of amphibians in the world occurred three decades ago. The first comprehensive assessment of the conservation status of the species in 2004 showed that one third of the world's amphibians were threatened with extinction. Amphibians have been traditionally viewed as “canaries in the coal mine”, that is, as environmentally sensitive animals that predict the effects that other groups will suffer if the situation is not reversed. Recent evidences possibly indicate that this definition should be revised. The study of the causes of decline and disappearance of populations and species has undergone a remarkable increase, making progress on issues such as habitat loss and conversion, “new” pathogens, introduced species and effect of environmental pollutants. Although Argentina is not considered an amphibian megadiverse country, there are important endemic species and species with remarkable peculiarities. We know very little about the conservation status of many of the species in Argentina and the causes for the decline of a large number of them are beginning to be studied. Research arising not only from herpetologists can help to increase knowledge about this group. Transdisciplinary studies can result in a faster and more effective progress towards direct action to conserve species and reverse the global trend. This work describes the progress and potential of research from disciplines usually less related to conservation such as biochemistry, physiology, morphology, microbiology, toxicology and geography.

Co1.**PROBLEM BASED LEARNING FOR DIDACTIC TRANSPOSITION OF CONTENTS ABOUT DENTAL ENAMEL**

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Didactic transposition is the passage of precise knowledge to an educational version of that object of knowledge. The purpose of this study was to integrate knowledge conceived in the line of research about the microstructure of dental enamel to the Histology curriculum contents by a didactic experience. The methodology was Problem Based Learning (PBL), where students compared the knowledge produced in research with the conceptual content of the literature suggested. Students worked in groups with research publications and textbooks. The watchwords were: reading, watching of dental enamel with a magnifying glass, analysis of microphotographs obtained by light and electron microscopy; group discussion and a comparative table of concepts according to the definitions of the various authors. Finally the evaluation of the experience was realized. The results indicated that PBL is a resource that enables didactic transposition that challenges students to engage in the search for knowledge and to find answers to their own questions, not only to those suggested by a teacher or textbook. **Key-words:** *didactic transposition - PBL*

Co2.**CONTROL OF THE MITE *Varroa destructor* (VARROIDAE) IN HONEYBEE COLONIES OF *Apis mellifera* (HYMENOPTERA; APIDAE) BY FLUMEVAR®**

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The aim of this work was to evaluate the acaricide efficacy of flumetrine in honeybee colonies of *Apis mellifera* against the mite *Varroa destructor* applying the commercial product Flumevar®. Work was done at La Plata city during March and June 2010. A total of 10 colonies were divided into 2 groups: a) Flumevar® and b) control. Each colony received 2 plastic strips impregnated with flumetrine according to the Laboratory recommendation. After that, colonies received 2 plastic strips with amitraz for 30 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 flumetrine divided by the total number of mites collected (flumetrine+amitraz). Results presented differences in the total efficacy. Flumevar® showed an average acaricide efficacy of $89.01\% \pm 10.5$, which was significantly higher than the control group ($11.11\% \pm 2.3$; $p < 0.05$). These results show that Flumevar® can be used to control *Varroa* disease successfully.

Co3.**ANALYSES OF DIFFERENT ARTIFICIAL DIETS TO REAR *Musca domestica* L. UNDER LABORATORY CONDITIONS**

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The housefly is an important pathogen vector, so knowledge of its life cycle is useful to achieve a biocontrol strategy. The aim of this work was to select a reliable and inexpensive diet for the development of a cohort of *Musca domestica* L. in the laboratory. Three different diets were assayed: milk diet (MiD): wheat bran plus whole milk powder; alfalfa diet (AD): wheat bran, yeast, alfalfa and malt extract, and molasses diet (MoD): wheat bran, whole milk powder, molasses and salts. The following parameters were studied: total life cycle, longevity of larvae, pupae and adults, percentage of pupation and adult emergence, length/diameter/weight of 96-hour old pupae at $65 \pm 1\%$ humidity and $26 \pm 1^\circ\text{C}$ temperature, in quadruplicate. We determined that the 3 diets produced a 33 days cycle and the longevity of larvae and pupae was close to 7 days. The maximum percentage of pupation was reached at day 12 (80%, 60% and 46% for MiD, AD and MoD, respectively). The length, diameter and weight of 96-hour old pupae was similar for MiD and AD, but lower for MoD. The maximum percentage of adult emergence was 45%, 18% and 42% for MiD, AD and MoD, between the 15th and 17th day. The longevity of adults was similar among diets (19 days) as well as death kinetics. MiD was chosen for housefly breeding due to its low cost and reliability.

Co4.**STUDIES OF THE RELEASE OF ACTIVE PRINCIPLES FROM HYDROGELS CONTAINING *B. incarum* EXTRACTS**

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B. incarum is a species that grows in the Argentine Puna in areas subjected to different types of abiotic stress. Infusion and maceration of the plant are popularly used by Andean communities for their antiseptic, anti-inflammatory and digestive properties. Previous studies in our laboratory demonstrated antimicrobial and antioxidant properties and semisolid forms for topical use were formulated. The objective of this study was to evaluate the release of the active principle with antimicrobial and antioxidant activity from hydrogels containing *B. incarum* extracts. Samples were taken at different times. The content of total phenolic compounds released was quantified and identified by thin layer chromatography (TLC) and high pressure liquid chromatography (HPLC). Antibiotic and antioxidant activity of the compounds released was demonstrated by bioautographic and autographic methods, respectively. Bioactive profiles showed a fairly good release during the first 12 hours. Two of the bioactive compounds released were identified. The active compounds of the extract of *B. incarum* were released from the semi-solid pharmaceutical preparations developed, which would ensure their therapeutic effect.

Co5.**DETERMINATION OF THE EQUATION OF THE DISSIPATION CURVE OF IMAZALIL IN LEMON THROUGH EMPIRICAL MODELS**

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The pesticide imazalil is used in lemon production during the postharvest stage to combat fungi of different genera. Toxicological tests with imazalil carried out in animals showed symptoms such as lack of muscle coordination, shaking, dermatitis and vomiting. The maximum limit value of residues of imazalil in lemon established by the Codex Alimentarius is 5 mg/kg, which is the one used in Argentina. In this work we experimentally determined the dissipation curve of imazalil in lemon from the Province of Tucumán in simulated conditions of transportation, and evaluated empirical mathematical models to determine the equation of the dissipation curve. Imazalil was applied during the packing process. The simulation of the transportation conditions was carried out by keeping the sample for 2 days at room temperature and then in a cold storage chamber. Samples were taken at 0,1,2,7,14,21,28 and 35 days after application and analyzed by HPLC. The empirical mathematical model that presented a better fit was the model of square root of second order, with a correlation coefficient equal to 0.86. The mean dissipation time calculated was 97 days. The fruits showed an imazalil concentration that did not exceed the maximum limit established for Argentina as well as by the Codex Alimentarius.

Co6.**ANTIOXIDANT AND HAEMOLYTIC ACTIVITIES OF *Senecio* SPECIES USED IN TRADITIONAL MEDICINE**

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Senecio nutans Sch. Bip., *Senecio spagazzinii* Cabrera and *Senecio viridis* Phil. var. *viridis* are native species used in traditional medicine in northwestern Argentina. The aerial parts of these herbs are usually used as infusion or decoction. In the present work, the total phenolic, flavonoids and caffeoylquinic acids contents, radical scavenging (DPPH[•]), antioxidant (β -carotene / linoleic acid bleaching method) and haemolytic activities of infusions and decoctions of the three species above were determined. Both the decoction and the infusion of *S. nutans* exhibited the highest content of phenolic compounds, respectively: 25.2 and 20.5 mg of gallic acid equivalents (GAE) per gram of plant material (gpm); flavonoids: 7.1 and 8.7 mg of quercetin equivalents (QE)/gpm and caffeoylquinic acids: 18.6 and 15.9 mg of chlorogenic acid equivalents (CAE)/gpm. They also showed a higher radical scavenging activity than *S. viridis* var. *viridis* and *S. spagazzinii*. The three species were very effective as antioxidants in the β -carotene bleaching assay with inhibition percentages above 65% at 47 ppm (BHT produced 94% inhibition at 47 ppm). The extracts did not show haemolytic activity on human and rabbit erythrocytes.

Co7.**EVALUATION OF THE ANTI-INFLAMMATORY ACTIVITY OF A CATALASE PRODUCING STRAIN OF *Lactobacillus casei* IN A TNBS INDUCED COLITIS MURINE MODEL**

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Reactive oxygen species (ROS) concentrations are abnormally elevated during inflammatory processes. The local delivery of antioxidant enzymes such as catalase (Cat), using Lactic Acid Bacteria (LAB) could decrease ROS levels in the gut and be used in the treatment of certain inflammatory bowel diseases (IBD). The anti-inflammatory activity of a Cat producing strain of *Lactobacillus (Lb.) casei* BL23 was tested in an experimental IBD model. This genetically modified strain contained the Cat gene (*mnKat*) of *Lb. plantarum* ATCC 14431 cloned in the expression vector pLEM415. Mice received this strain or the native Cat- strain for 24 days. IBD was induced by intrarectal TNBS inoculation after 10 days of LAB supplementation and body weight, liver microbial translocation, gut histology, Cat activity, IFN γ and IL-10 levels were evaluated. Mice that received the Cat+ strain showed faster weight gains, lower liver microbial translocation, lower extent of gut inflammation and increased Cat activity in the gut. IFN γ and IL-10 concentrations were not increased in these animals, demonstrating that the anti-inflammatory response of the Cat+ strain was not due to an immune regulatory mechanism. The Cat producing LAB was effective in the prevention of a chemically induced IBD due to its antioxidant activity.

Co8.**ARTERIAL HYPERTENSION INCREASES INSULIN VALUES AND ALTERS HOMA INDEX IN NON DIABETIC PATIENTS**

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Diabetes mellitus increases the risk of cardiovascular morbimortality. Arterial hypertension (ATH) would alter hormonal control. We observed an association between ATH and fasting and postprandial glucose and insulin increase. Few studies evaluate ATH as a risk factor for diabetes. **Objectives:** To investigate alterations in the glucidic metabolism in a hypertensive non diabetic population by assessing basal glycemia, insulin and HOMA index. **Materials:** We worked with 129 non diabetic non smoking patients (111 women, 18 males) divided into two groups: hypertensive n: 56 and non hypertensive n: 73, age 36.1 \pm 1.2 years. We determined height (m), weight (K), waist circumference (WC, cm), glucose (mg/dl) and insulin (uU/ml), body mass index and HOMA index (glucose x insulin/405). Student's t-test. **Results:** The ATH groups presented values similar to the non ATH group: BMI (35.8 \pm 1.6 vs 34.5 \pm 1.0 pNS), WC in women (109.1 \pm 1.9 n:45 vs 108.9 \pm 1.8 n:54 pNS). Glucose and insulin were normal in both, but higher in the ATH group (glucose 86.7 \pm 3.6 mg/dl vs 71.6 \pm 1.0 p<0.001 and insulin 18.3 \pm 2.7 vs 12.6 \pm 0.9 p< 0.05). HOMA index was altered in the hypertensive group (ATH: 4.3 \pm 0.8 vs no ATH:2.4 \pm 0.2 p<0.01). **Conclusions:** There would be an altered glucose state in ATH patients. Although insulin and glucose values were within reference levels, they were increased with respect to normotensives. HOMA index indicated insulin-resistance in ATH. It would be important to evaluate glucose control mechanisms in ATH patients in order to prevent diabetes.

Co9.**DETECTION OF ROTAVIRUS IN HOSPITALIZED DIARRHEIC CHILDREN IN NICOLAS AVELLANEDA HOSPITAL**

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Rotavirus is the most common cause of severe diarrhea among children, with an estimated 111 million diarrhea episodes, 25 million outpatient healthcare facility visits, 2 million hospitalizations, and 600000 deaths among children < 5 years worldwide attributable to the disease each year. Objective: To examine the frequency of rotavirus-associated gastroenteritis in pediatric hospitalized children in the Nicolas Avellaneda Hospital, Tucuman and to describe clinical and epidemiologic profile. Materials and methods: stool samples from 143 patients were studied between June 2009 and August 2010. Antigen presence was evaluated with a commercial kit (OXOID – IDEIA TM Rotavirus). Results: in 2009 and 2010, rotavirus was detected in 40% (34/84) and 71% (42/59). No significant differences in incidence were observed between male and female patients. Rotavirus infection mostly affected children under 2 years of age with a peak incidence in children 1 to 2 years of age. The clinical manifestations were diarrhoea (incidence 100%), vomiting (incidence 90%), and fever (incidence 50%). Conclusions: Results suggest the need for permanent surveillance of rotavirus and other enteric viruses for the prevention of childhood infections.

Co10.**INHIBITION OF Herpes suis virus type 1 BY AQUEOUS EXTRACTS OF *Achyrocline satureioides***

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Herpes suis virus type 1 (HSV) is the etiological agent of Pseudorabies disease in pigs. It represents an important sanitary problem in Argentina. Up to now there is no Argentine vaccine adapted to control the disease, so an alternative would be medicinal herbs. Previous studies revealed strong inhibition of the Western Equine Encephalitis virus by *A. satureioides*. The aim of this study was to evaluate antiviral and virucidal activities of aqueous extracts of *A. satureioides* against HSV. Cold (CAE) and hot aqueous extracts (HAE) were prepared by sequential extraction with water at 4°C and 70°C for 48 h. Toxicity in Vero cells was determined by neutral red uptake (RN) and MTT reduction. Antiviral and virucidal activities were quantified by plaque reduction assay at different non cytotoxic concentrations (CAE: 0.2-0.8 mg/ml and HAE:0.1-0.4 mg/ml). Selectivity Index (SI) was calculated. CAE and HAE inhibited 80% and 96%, respectively, at maximum concentrations assayed. SI were 2.4 (RN) and 5.5 (MTT) for CAE, and 1.9 (RN) and 2.8 (MTT) for HAE. These values indicate that both extracts, particularly the hot one, have a selective action against HSV. Both extracts showed weak virucidal activity. Conclusion: The results allow us to consider the applicability of EAF and EAC as natural antiherpetic chemotherapeutic agents.

Co11.**EFFECT OF THE PROGESTERONE RECEPTOR BLOCKER AGLEPRISTONE ON CANINE MAMMARY GLAND**

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Studies of the proliferative effect of progesterone on canine mammary gland (MG) are scarce. Its effect on canine MG was described using aglepristone (progesterone receptor [PR] blocker) and Ki-67 (nuclear proliferation marker) during the luteal phase. The animals were randomly divided in two groups: Aglepristone (n=4; 10 mg/kg, SC) or Placebo (n=2; saline SC). The determination of PR and Ki-67 was carried out by immunohistochemistry on the right and left inguinal MGs before (d 0) and 7 days after treatment (n=3) or on days 0 and 14 (n=3). Immunoeexpression was calculated by counting the positive nuclei. Percentages of positive PR and Ki-67 results were compared by Student's t- test for paired samples. In the aglepristone treated group PR immunoeexpression diminished on days 7 ($p<0.01$) and 14 ($p<0.01$). In the Placebo group, PR increased on day 7 ($p<0.01$) and remained high on day 14 ($p<0.01$). The immunoeexpression of Ki-67 diminished on days 7 ($p<0.01$) and 14 ($p<0.01$) in the treated females, while in the Placebo group Ki-67 did not vary on days 7 ($p>0.05$) and 14 ($p>0.1$). These results further show the proliferative role of progesterone on MG, which is mediated through the expression of its receptors. Aglepristone has an antiproliferative effect, thus emerging as a potential contributor for the treatment of dysplastic and tumoral disorders.

Co12.**MORPHOMETRY OF POSITIVE KIT BOVINE CELLS IN MUSCULAR TUNIC OF JEJUNUM AT THREE DIFFERENT AGES**

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Interstitial Cells of Cajal are kit positive cells which establish a three-dimensional network that connects enteric neurons to smooth muscle cells. Immunohistochemical technique (anti-c-kit/CD117) was used to identify ICC specifically in the jejunum of fetus (20±2 weeks), calf (1 week) and adult bovine. The morphometric analysis was performed using the ImagePro Plus v6.3 program. ANOVA and Tukey's test were applied. The kit positive cell bodies showed an area of 67.93±6.41 µm², major axis 15.02±1.43 µm, minor axis 5.94±0.43 µm, perimeter 36.00±2.90 µm in fetus; area 57.59±6.32 µm², major axis 13.79±1.01 µm, minor axis 5.44±0.29 µm, perimeter 33.05±2.32 µm for calf and area 41.84±2.50 µm², major axis 12.71±0.73 µm, minor axis 4.35±0.28 µm, perimeter 29.80±0.86 µm in adult. All the parameters showed statistically significant results in all ages except for the major axis of calf and adult animal. According to the bibliography and considering that the body or middle portion of the cells were measured, it seems likely that these differences are due to a redistribution of the cell material during the development of the cytoplasmic extensions while the animal is growing up.

Resources: UBACYT V403 and Pontificia Universidad Católica Argentina.

Co13.**MOLECULAR DIAGNOSIS OF TOXIGENIC FUSARIUM SPECIES ISOLATED FROM CEREAL GRAINS OF ARGENTINA**

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Molecular biology techniques were assayed for species diagnosis and toxigenic potential of *Fusarium* isolated from cereals of Argentina. DNA was extracted from *Fusarium* isolates previously identified by morphological characters and/or mating type. PCRs based on intergenic spacer sequences (IGS) of rDNA and genes involved in fumonisin (FUM1) and trichothecene (TRI13-TRI7) synthesis allowed us to detect and differentiate fumonisin producers (*F. verticillioides* and *F. proliferatum*). Non-fumonisin producers from the *Gibberella fujikuroi* complex (*F. subglutinans*, *F. andiyazi* and *F. thapsinum*) and trichothecene producers from the *F. graminearum* complex (*F. graminearum sensu stricto*, *F. meridionale* and *F. boothii*) were identified by the sequence of TEF 1- α gene. *F. meridionale* and *F. boothii* were detected for the first time in northwest Argentina. PCRs based on TRI13-TRI7 indicated that *F. meridionale* and *F. boothii* were nivalenol and deoxynivalenol producers, respectively. Molecular tools performed a reliable diagnosis and determination of toxigenic risk in the main species of *Fusarium* isolated from Argentinean cereals.

Co14.**SURFACE PROPERTIES OF LACTIC ACID BACTERIA FROM *Lithobates catesbeianus* HATCHERY FROM CORDOBA**

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Adhesion, exopolysaccharide (EPS) production and biofilm formation are characteristics related to the colonization of host surfaces and used to select microorganisms to be used as probiotics. Lactic acid bacteria (LAB) are members of Argentinean bullfrog hatcheries and some genera were pre-selected for their beneficial properties. To go further in the design of probiotics for raniculture, the above characteristics were studied in pre-selected LAB strains by using standardized methods. Most of the 130 isolated LAB were hydrophilic and only 10 strains showed autoaggregation (>50%), *L. garvieae* CRL 1828 and *Lactobacillus* spp 363 being the only ones that showed 100% autoaggregation. The hydrophobicity/autoaggregation ratio indicated that cocci with high hydrophobicity showed medium to high autoaggregation, but the autoaggregating lactobacilli were hydrophobic. Only *Lb. plantarum* CRL 1816, CRL 1819, *Lactobacillus* spp 85, *L. garvieae* CRL 1828 and *Pediococcus* spp 402 produced low EPS concentrations (1.93×10^{-8} to 1.46×10^{-6} mg/CFU) during growth. However, both hydrophobicity and autoaggregation properties were similar at all the growth stages studied. Only *Lb. plantarum* 304 and *Ent. gallinarum* CRL1584 showed low biofilm formation. These results will allow us to advance in the selection of beneficial microorganisms to be included in the design of probiotics for raniculture.

1. SPECIES OF FINE-GRAIN CEREAL SUSCEPTIBLE TO MIXED INFECTIONS WITH MAL DE RÍO CUARTO VIRUS (MRCV) AND CEREAL RHABDOVIRUS

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MRCV and *Cereal Rhabdovirus* (*Cytorhabdoviridae*) are cereal viruses transmitted by insects of the *Delphacidae* family. In 2008, mixed infections of these two viruses were found in barley fields in Río Cuarto (Córdoba). The aim of this work was to determine which cereal species are susceptible to mixed infections in experimental conditions. Third instar *Delphacodes kuscheli* nymphs were placed for 48 hs on *Rhabdoviridae* diseased plants and for another 48 hs on MRCV diseased plants. After 20 days of latency, insects were placed for 24 hs on barley, oat and triticale plants for transmission. Plant samples for serological test were collected at 10 and 20 days post transmission. Only 27 and 32% of the total evaluated plants were found to be infected with both viruses ("mixed infections") at 10 and 20 days post transmission respectively. Fifty percent of oat plants showed mixed infections while barley and triticale showed infection rates of 33 and 39% respectively. In simple infections, barley showed the highest ELISA titer for Rhabdovirus, with highest virus accumulation. We concluded that oat is the most susceptible species to mixed infections and barley the one most susceptible to rhabdovirus.

2. EXPERIMENTAL TRANSMISSION OF GEMINIVIRUSES BY *Bemisia tabaci* (Gennadius) IN SEVERAL CULTIVARS OF *Phaseolus vulgaris*

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During the last two decades, the whitefly *Bemisia tabaci* Gennadius and the geminiviruses it transmits have become a problem of great economic importance worldwide. The aim of this study was to experimentally transmit geminiviruses by *Bemisia tabaci* whiteflies in several bean cultivars. The test was performed by placing healthy *B. tabaci* whiteflies (S.J Dormida population) on geminivirus infected *Sida rhombifolia* plants (detected by molecular hybridization probe). After 24 hours (acquisition period) these insects were placed on healthy plants of 11 bean cultivars for 4 days (latency and transmission period) under free-choice conditions. Experimental design was a randomized complete block with three replications. We determined the presence of viruses in plant tissues by molecular hybridization probe. The ANOVA test showed significant differences among bean cultivars Borlotti LF, Coral and Cer 99/17 (0% transmission), which differed significantly from Alubia and Cannellini (50% and 40% respectively). The other cultivars, Tuc 500, LRK, DRK, Borlotti Busch, Cer 99/15-12 and Borlotti Clio had an intermediate behavior between these two groups (10% to 28%).

3. LOSSES CAUSED BY THREE DENSITIES OF *Panicum maximum* Jacq. IN PERMANENT COMPETENCE WITH SUGARCANE CROPS

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P. maximum (PANMA) is one of the ten most important sugarcane weeds in the Argentine Northwest. It causes serious damages to budding and growth; it affects yield and harvest and increases trash. The objective of this work was to measure the effects of stem numbers of 3 densities in crop production. Experience was made at Los Nogales (Tucumán) in cv LCP 85-384, 3 year-ratoon, in 2009 at high densities, 2,1 stump/m² (151.20 stem/m²), intermediate, 1,2 stump/m² (51.84 stem/m²), low, 0,42 stump/m² (12.60 stem/m²). Plots of 5 furrows, 10 m long randomly chosen inside infested area with 5 replications for each density. Herbicides and watering were not applied. Mechanical labor and fertilization with nitrogen (90 kg.ha⁻¹) were used. A non-parametric statistical analysis (Kruskal-Wallis test, a 0.05) was performed. Losses at high density were 54.16% cane and 51.83% sugar, at intermediate density, 36.23% cane and 34.10% sugar, at low density 23.12% cane and 21.65% sugar. Registered losses for sugarcane were between 22,232.99 kg/ha and 52,081.88 kg/ha. Sugar losses were 2,910.19 kg/ha to 6,966.98 kg/ha. Losses caused by *P. maximum* weed at all densities are significant in cane and sugar.

4. SEED PRODUCTION AND INFESTATION POTENTIAL OF *Panicum maximum* Jacq. IN SUGARCANE cv LCP 85-384

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P. maximum (PANMA) has acquired great importance as a weed in Tucuman sugarcane crops during the last ten years due to changes in management systems. The objective of this work was to determine its infestation potential from seed production per plan in 3 Tucuman localities. Work was carried out (2009) at Los Nogales, Santa Bárbara and Garcia Fernandez with five random replications. In each plot (32 m²) we determined stump number, stem number, seed production; 35% of entering seeds were taken into consideration. Viable seeds were determined by tetrazolium test, 2000 seeds per plot, germination capacity in chamber. ICR (individuals with germination capacity), RCR (real reproductive capacity), PI (infestation potential) were calculated. Parametric statistical analysis by ANOVA for Tukey's test, α 0.05 test. The results obtained for the localities of Los Nogales, Santa Barbara and Garcia Fernandez were: 154 stem/m², 106 stem/m² and 63 stem/m² respectively. Seeds per plant were 815, 943 and 997. Seeds/m²: 125,510; 99,958; 62,811. ICR: 9,924.98; 6,297.35 and 5,715.80. RCR: 3,473.74; 1,889.20; 1,600.42. PI 22.55; 17.82 and 25.40m²/pl. Average PI was 21.92 m²/pl. Descendants of one plant will occupy this surface during the next reproductive cycle.

5. SPATIAL AGGRESSIVENESS INDEX OF *Panicum maximum* Jacq. IN SUGARCANE Cv LCP 85-384 AND cv TUC 77-42

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P. maximum (PANMA) is an important weed in sugarcane crops all over the world, causing great losses in production and affecting mechanical harvest tasks. The spatial aggressiveness index (Iea) indicates distribution, establishment and colonization advances. The objective of this work was to determine the spatial aggressiveness index at 2 commercial cultivars. Work was carried out at Los Nogales (2009-2010) in 2 plots, 6000 m² (150mx 1.6mx25) for cv LCP 85-384 3-year ratoon and cv TUC 77-42 2-year ratoon, 5 samples for cv. A simple model was used considering height of the tallest plant, dry biomass, invading plant number around the tallest plant, average dry biomass, height and surface. Non-parametric statistical analysis was made, Kruskal-Wallis test, α 0.05. Cv LCP 85-384 mother plant height; 3.60 m; 312 daughter plants, 1.92 m average height and 115 g average dry matter, Index; 22.17. Cv TUC 77-42: 3.10 m of mother plant height; 115 daughter plants with 1.82 m height, 96 g average dry biomass. Index was 19.86. Significant differences between cv indexes and the higher the tallest plant, the greater the seed dispersion. The indexes were high due to the great distribution surface and to the height of the tallest plant.

6. INCIDENCE OF SUGARCANE HARVEST RESTS ON *Panicum maximum* Jacq. CONTROL

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P. maximum (PANMA) is an important weed that causes damages during sugarcane growth and production. Mulching produces weed control depending on the species, ecological region and management strategies. The objective of this work was to measure mulching effects at 2 consecutive harvests. The work was carried out (2008-2009) at Los Nogales in cv LCP 85-384 3-year-ratoon. Five plots, 3200m² each were randomly marked at high infestation area and 3 controls. Mulching effects were measured in July harvest considering: a) Cane stem number. b) Stump number and stems. c) Weed biomass, d) Cane weight and control. Measurements were carried out on 5 and 6 furrows. Data were transformed to ha. Herbicides were not applied. Mechanical tasks were performed, without watering, fertilization (90kg.ha⁻¹), non-parametric statistical analysis Kruskal-Wallis, α 0.5 test was made. In 2008 for cane: 75,590.35 stem.ha⁻¹, 66,472.24 kg.ha⁻¹; for PANMA 15,430 stump.ha⁻¹; 652,170 stem.ha⁻¹; 4,106.21 kg.dry biomass.ha⁻¹. In 2009 for cane: 806.63 stem.ha⁻¹, 58,645.31 kg.ha⁻¹; for PANMA 22,140.8 stump.ha⁻¹; 1,486,320.23 stem.ha⁻¹; 2,895.06 kg.dry biomass.ha⁻¹. Losses from 2008 to 2009, for cane 6.32 % of stems, 11.77% in height. PANMA increases 30.30% in stumps; 56.12% in stump stems and 29.41% in dry biomass. Mulching for cv LCP 85-384 did provide significant control for *P. maximum*.

7. COMPETITIVE CAPACITY OF *Pennisetum purpureum* Schumach IN SUGARCANE CROPS

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P. purpureum (elephant grass) is a sugarcane crop weed used as forage. The objective of this work was to determine the competitive capacity of *P. purpureum* in sugarcane crops and to establish production losses. The work was carried out at El Manantial (FAZ-UNT) in cv LCP 85-384, three year-ratoon during the crop-harvest cycle 2009-2010. Essay was randomly blocks with 3 replications. Plots were 80 m² (5 furrows x 10 m long x 1.6 between lines). Treatments were 6.14 and 32 stem.m² of *Pennisetum*. Herbicide was not applied; culture was mechanical without watering, with 90 kg.ha⁻¹. Evaluations were made at the central furrow (3rd). In plots we determined: stem number and cane and sugar production. Determination of brix, pol and purity was made. ANOVA with Tukey's test α 0.05 was used. For 6 stem.m² there were 12% cane losses (9,749.24 kg.ha⁻¹) and 15.4% sugar losses (1,538.91 kg.ha⁻¹). For 14 stem.m² there were 25% cane losses (20,310.92kg.ha⁻¹) and 27% sugar losses (2,498.24 kg.ha⁻¹). For 32 stem.m² there were 36.7% cane losses (29,816.43 kg.ha⁻¹) and 42.1% sugar losses (4,207.04 kg.ha⁻¹). Cane and sugar losses by *P. purpureum* competence were significant at all levels. The species is considered as a dangerous weed for sugarcane crops so its use as a safe control method should be avoided.

8. EFFECT OF SOWING CONTAINER SIZE ON LETTUCE (*Lactuca sativa* L.) QUALITY DURING TRANSPLANT AND HARVEST

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Seed container size affects vegetable production. The aim of this study was to evaluate these effects on lettuce during transplant and harvest, depending on the size of the containers used for sowing. We worked in a greenhouse with cv. Green Waldmans (P: 99% PG: 85%). Four treatments were tested with the same substrate, T1: Trays (25cm3), T2: Trays (46cm3), T3: Flowerpots (80cm3) and T4: Bags (180cm3). We worked with BCA with 5 replicates, with ANOVA and LSD (0.05). Parameters evaluated were: number of leaves (NL), plant length (LP-cm-), shoot height (AA-cm-), root length (LR-cm-); stem/root ratio, fresh weight (FW) and dry weight (DW) of leaves, stems and roots of plants at transplanting. T4 and T3 showed greater growth of plants with higher costs and higher amounts of substrate used in pre-transplant. T2 showed a reasonable amount of substrate used for handling before and after transplanting with quality plants, fast adaptation to transplant and harvest with similar values compared to T3 and T4.

9. STUDY OF ESSENCIAL MINERALS FOR MILK SYNTHESIS DURING THE TRANSITION PERIOD

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Minerals are essential for the synthesis of milk and of other nutrients. We evaluated the levels of Ca, P, Mg (mg/dL; UV-spectrophotometer), K and Na (mmol/L; flame photometer) in blood during the transition of autumn 2009, in the center region of Santa Fe. We worked with 143 Holstein cows, in samples of blood from the jugular vein. Data were analyzed by ANOVA. The average values and SD of concentrations in Ca, P and Mg were: Santa Ana: Prepartum 8.41±0.52; 5.78±1.12; 1.98±0.20. Partum 8.47±0.55; 4.87±0.62; 1.64±0.26. Postpartum 8.14±0.32; 5.10±1.33; 1.80±0.10. La Erminda: Prepartum 9.82±0.96; 5.96±0.86; 1.94±0.36. Partum 8.45±0.82; 4.9±0.68; 1.62±0.30. Postpartum 9.09±0.72; 4.1±0.91; 2.39±0.91. Minetti: Prepartum 8.46±0.54; 6.21±2.64; 1.98±0.24. Partum 6.05±1.15; 6.71±2.13; 2.17±0.10. Postpartum 8.57±0.94; 4.49±1.17; 2.07±0.37. El Carmen: Prepartum 6.66±1.13; 5.18±0.75; 2.35±1.71. Partum 5.78±1.25; 4.38±0.19; 1.08±0.71. Postpartum 6.89±1.45; 3.31±0.78; 1.83±1.15. El Chañar: Prepartum 7.45±1.45; 5.43±0.93; 2.03±0.23. Partum 4.96±0.83; 4.85±0.15; 1.35±0.21. Postpartum 7.83±0.80; 3.74±0.92; 1.88±0.51. With the exception of El Carmen, the slight decrease in P during postpartum can be attributed to high milk production. In prepartum, Ca was below normal and failed to reach normal values during postpartum. In partum Mg decreased and returned to former values during postpartum. Mg absorption was also altered by Ca and K. The behavior of Ca and Mg was due to endogenous loss in the milk.

10. ULTRASTRUCTURAL STUDY OF SPERMATOGENESIS IN *Leptodactylus chaquensis*

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The aim of this work was to study the ultrastructural characteristics of the cell types involved in *Leptodactylus chaquensis* spermatogenesis and their correlation with the histological features described previously. Testes of adult males obtained in the breeding season were processed for transmission electron microscopy. Secondary spermatogonia (G2) presented polymorphic and electro lucent nuclei with dispersed heterochromatic clusters and nucleolus located towards the periphery. Secondary spermatocytes (C2) showed a round nucleus with varying degrees of electron density and clumps of heterochromatin associated with the nuclear envelope. The C2 showed the presence of cytoplasmic bridges. Spermatids (T) at different development stages were observed. At the beginning, heterochromatin showed different arrangements, and during later stages it became a very electron dense homogeneous mass. The acrosome exhibited a homogeneous structure of medium electron density that in T surrounded the entire nucleus and in the sperm occupied the apical sperm head. Mitochondria were observed at the sperm neck. The process of spermatogenesis took place in contact with the Sertoli cell that presented well-developed rough endoplasmic reticulum, lipid droplets and lysosomes at different maturation stages. The results obtained in the sub cellular observation were closely correlated with the observations made by optical microscopy.

11. FOLIAR MORPHOANATOMIC VARIABILITY IN POPULATIONS OF *CHENOPODIUM AMBROSIOIDES* FROM TUCUMAN

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Chenopodium ambrosioides L. (Chenopodiaceae) is an herbaceous species found all over the world and used as a medicinal plant. The aim of this work was to determine its intraspecific variability in populations of Tucuman based on morphoanatomical traits. Vegetal material came from Lules, Leales, Horco Molle, Raco, El Naranjo, El Sunchal and Trancas. The parameters studied were leaf architecture, index, density and stomata length, and palisade index. Epidermal peel stained with safranin and blue bromophenol. Nervation pattern and foliar architecture were similar to those described by other authors and there were no differences between locations. For stomata index in adaxial peel, Lules differed significantly from Raco and El Sunchal. Other locations presented intermediate values. On abaxial peel, El Naranjo differed significantly from Raco and El Sunchal. Raco and El Sunchal showed higher stomata density in adaxial peel. In other locations the parameters showed similar values. The index, length and stomata density were more important than foliar architecture to determine variability within the species. Multivariate analysis of data showed that relationships between variables were different for both peels.

12. *FLOURENSIA FIEBRIGII* BLAKE METABOLITES DISRUPT *STAPHYLOCOCCUS AUREUS* BIOFILM

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The genus *Flourensia* DC comprises 25 species distributed throughout the Americas. The genus is characterized by the occurrence of bioactive aromatic metabolites. This study describes the antibiofilm properties of a chloroform extract of aerial parts of *F. fiebrigii* against two pathogenic strains of *Staphylococcus aureus* (ATCC 6538 P and methicillin resistant). The disruption of the biofilm formed by cells phenotypically different from the planktonic bacteria was measured by a colorimetric method (560 nm). The spectroscopic data of the chloroform extract was consistent with the chemical constituents of *F. fiebrigii*. Considerable disrupting effects (60-51%) were observed on the biofilm architecture of both strain of *S. aureus* at 100 µg/mL and 50 µg/mL. These preliminary results open a new path in the search for natural coadjuvants of antibiotics to increase their bioavailability to the resistant bacterial strain.

13. NATURAL ANTIOXIDANTS FROM BEE PRODUCTS

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The aim of this study was to determine the antioxidant capacity of propolis from two phytogeographical regions of Argentina: Santiago del Estero (SE) and Chaco (CHA). Phenolic compounds and flavonoid content were determined in Gallic acid equivalent (GAE/ml) and quercetin equivalent (QE), respectively. Different *in vitro* assays were used to determine the free radical scavenging activity and inhibitory activity on β -carotene bleaching (linoleic acid/ β -carotene/H₂O₂). The scavenging concentration of 50% of free radical (SC₅₀) was calculated. All propolis extracts showed free radical scavenging activity with SC₅₀ values lower than 10 and 1 μ g GAE/ml for SE propolis and CHA propolis, respectively. Also, the propolis extract showed scavenging capacity on HO[•] with SC₅₀ values of 100 μ g GAE/ml. It also showed protective activity against lipid oxidation. In view of the results obtained, the propolis from SE and CHA could be used as functional foods against oxidative stress oxidative and as food preservatives.

14. ACUTE TOXICITY AND GENOTOXICITY ASSAYS OF PHYTOTHERAPICS FROM *FABIANA PUNENSIS*

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The inhabitants of the Argentine Puna use many of the shrubs that grow in the region to relieve the oxidative stress generated by the altitude, or even as anti-inflammatory and antimicrobial agents for the treatment of skin infections. Previous studies showed that extracts of *F. punensis* exerted antimicrobial activity against human pathogenic bacteria and yeasts and also had antioxidant and anti-inflammatory activity. The aim of this study was to evaluate the toxicity of decoction and maceration of *F. punensis* to ensure safe use. Maceration and decoction were standardized based on content of phenolic compounds, flavonoids and antioxidant and antimicrobial activity. Toxicity was determined using the acute toxicity test of *Artemia salina* and genotoxicity tests with two strains of *Salmonella typhimurium* TA98 and TA100 with and without metabolic activation. Mutagens were used as positive control. The extracts showed no acute toxicity. None of the extracts showed toxicity or genotoxicity on TA98 and TA100 strains until 1000 μ g GAE / plate in the presence and absence of exogenous metabolic activation. Within the ethnopharmacological context, our results justify the popular use of extracts of *F. punensis* as a natural product without genotoxic effects.

15. ACTIVITY OF HYDROALCOHOLIC EXTRACTS OF *NARDOPHYLLUM ARMATUM* ON MICROORGANISMS OF INTEREST IN PLANT FOOD

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Nardophyllum armatum (Wedd.) Reiche is widely distributed in the Argentine Puna. Previous studies demonstrated that aqueous and alcoholic extracts of this species, collected at 4200 and 3650 masl, have antioxidant and antibacterial properties against human pathogenic bacteria. The aim of this study was to evaluate the antimicrobial capacity of *N. armatum* extracts on pathogenic microorganisms of interest in agriculture. The antimicrobial activity of extracts was evaluated using the macrodilution method in agar on *Erwinia carotovora*, *Agrobacterium tumefaciens*, *Xanthomonas campestris*, *Pseudomonas syringae*, *Geotricum candidum* and *Penicillium digitatum*. The extracts were standardized on the basis of their phenolic compounds content (1131 and 2246 μ g GAE/ml for the species collected in Jujuy and Catamarca, respectively). Both extracts of *N. armatum* were effective in inhibiting the growth of *P. digitatum* and *G. candidum*. The MIC values of all pathogenic bacteria were around 400 μ g GAE/ml. The results showed the potential use of extracts from *N. armatum* as a natural strategy, unconventional and environmentally acceptable, for crop protection against diseases caused by pathogenic microorganisms.

16. ACTIVITY OF CHUQUIRAGA ERINACEA EXTRACTS AGAINST PLANT PATHOGENIC BACTERIA

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The aim of this study was to determine the total phenolic content and antibacterial activity against plant pathogenic bacteria in ethanol extracts of the aerial parts of *C. erinacea*. The phenolic content was determined by the method of Singleton *et al.* (1999). The antibacterial activity was determined qualitatively by bioautographic assays. By agar and liquid dilution tests, the MIC (minimum inhibitory concentration) and MBC (minimum bactericidal concentration) were determined according to the recommendations of Clinical Laboratory Standard Institute. The pathogenic strains assayed were *Erwinia carotovora* pvar *carotovora*, *Pseudomonas syringae* pvar *syringae* and *Xanthomonas campestris* pvar *vesicatori*. At least two phenolic compounds had antibacterial activity against *P. syringae*. The order of sensitivity of the three strains with alcoholic extract was as follows: *E. carotovora* > *P. syringae* > *X. campestris*. MIC values were 500-250 μ g/ml, whereas MBC values were 200-400 mg/ml. These results constitute the first report of the effect of extracts of aerial parts of *C. erinacea* against plant pathogens. This plant would be a source of antibacterial compounds that could be used as a natural tool for the control of agricultural pests.

17. A NEW DASYPODIDAE (MAMMALIA, XENARTHRA) FROM THE PALEOGENE IN THE PROVINCE OF JUJUY

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The aim of this contribution is to report the discovery of a new dasypodid, its morphology and its evolutionary and biostratigraphic implications. The material was found at Casa Grande Formation, near Mina Aguilar, Jujuy Province. It has been assigned to the Middle Eocene, Barrancan subage (Casamayoran). The material includes isolated dorsal movable osteoderms. The anterior articular surface shows two and more often three very distinct longitudinal elevations, separated by deep furrows, the free posterior (caudal) surface is irregular and slightly rough. The main central figure is subrectangular with rounded anterior and posterior corners, reaching the posterior edge of osteoderms. The central figure is bounded by two lateral grooves poorly defined with five to seven small openings each. Posterior and lateral edges of the osteoderms with small and scarce foramina. These peculiar characters, clearly different from other known dasypodids, allow us to interpret this taxon as a member of a new clade of the Dasypodidae. The new dasypodid is relevant in biostratigraphy because it has a restricted temporal range and its geographical distribution is limited to the northwest of Argentina.

18. COMPOSITION OF THE FISH FAUNA OF LA CALDERA RIVER, PROVINCE OF SALTA, ARGENTINA

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In our country there is growing concern about the management and redistribution of water resources. Rivers in the region are not uniform in their course, defining an environmental heterogeneity that influences biological communities. Abiotic factors, seasonal patterns and habitat complexity affect the interactions that are important in controlling population size. The fish community was assessed at 4 sites on the basin of the La Caldera River, northern section of the Lerma Valley between October 2009 and March 2010, covering the periods of drought and rainfall. One hundred and fifty-nine individuals were collected using different fishing gears and then identified, recorded and returned. Environmental parameters were measured with digital equipment and laboratory water quality was determined. We obtained seven species, *Jenynsia sp* (24%) being the most abundant, present at all the sites, followed by *Corydoras micracanthus* (21%), *Astyanax chico* (20%), *Bryconamericus thomasi* (13%), *Trichomycterus spegazzini* (12%), *Heptapterus mustelinus* (7%) and *Synbranchus marmoratus* (2%). At sites I and IV, with similar physical-chemical conditions, all species were represented with high frequency. Sites II and III, which have great anthropic activity, showed the lowest values. We checked the effect of environment on fish communities and updated registration, richness data and relative abundance.

19. SPATIAL AND TEMPORAL VARIATION OF THE ICTHYOFAUNA OF THE MARAPA RIVER SUB-BASIN, ALBERDI DEPARTMENT - TUCUMÁN

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The ichthyofauna of the Marapa river sub-basin, located in the southern part of the province of Tucuman, belongs to the central endorheic ecoregion. The ichthyofauna distribution in this sub-basin is little known. The objective of this study was to perform a fish survey and investigate the spatial and temporal variation of the species present. Five seasonal samplings were made in the Escaba reservoir, the El Chorro, Las Moras and Los Naranjos creeks, and the Singuil, Chavarria and Marapa Rivers. Species richness and both spatial and temporal constancy were calculated. A total of 2207 specimens were collected. Species richness totaled 21 species. The order Characiformes was the most representative (52.38%), followed by Siluriformes (33.33%), Ciprynodontiformes (9.52%) and Atheriniformes (4.76%). Species spatial constancy indicated that most of them are not constant at all the sites sampled, while temporal constancy showed that most of the species were present during all seasons. The highest values of both species richness and abundance were recorded in spring and summer. This study may represent an important contribution to future management and conservation plans for current tourism and urban development policies implemented in the region.

20. TRICHOPTEROFAUNA OF ELARBOLITO WATER STREAM AND ITS RELATIONSHIP WITH WATER PHYSICAL-CHEMICAL AND BACTERIOLOGICAL PARAMETERS

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This work aims at determining the structure of the trichopteroфаuna of El Arbolito water stream (28°37'13"S-66°02'05"W; 1.040 m.a.s.l., Catamarca) and to relate it to physical-chemical and bacteriological water parameters with a year cycle. Seasonal sampling ("Surber" net of 0,09m² surface, 300µm mesh) was done *in situ* (alcohol 96°); once at the lab, specimens were determined using a binocular magnifier. At the sampling station water temperature, pH and stream morphometry were registered. Alkalinity, electrical conductivity, hardness, calcium, magnesium, sulphates, chlorides and organic matter were determined using Standard Methods techniques. Bacteriological analysis included Most Probable number of total and fecal coliforms (multiple tube test); count of total aerobic mesophilic heterotrophs (plate), and presence of *Pseudomonas aeruginosa* and *Escherichia coli*. 6,214ind/m², six families and ten Trichoptera genera were collected. Autumn was the most abundant season (2,710ind/m²) and spring the most diverse (six families, nine genera, diversity index 2.02). Seasonal variations are produced in community structure and in physical-chemical and bacteriological parameters, positively or negatively co-related ($p < 0.01$), always within the limits allowed for surface waters.

21. PRELIMINARY STUDY OF FUNGAL DIVERSITY IN RESERVA HORCO MOLLE AND ADJACENT AREAS OF PARQUE BIOLÓGICO SIERRA DE SAN JAVIER (TUCUMÁN, ARGENTINA)

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Reserva de Horco Molle and Parque Biológico Sierra San Javier are protected natural areas (65° 19' W and 26° 48' S). From the phytogeographical point of view, they belong to the "Yungas" Province, Amazonian domain, in the Neotropical region, where the vegetation is predominantly forest. Because this region has an important reservoir of fungal species poorly known, the aim of this work was the study of the mycobiota found in these protected areas. The samples were taken during April and May of 2010; the material was dried and preserved in the LIL herbarium. The microscopic preparations and observations were made with usual methods. A total of 172 collections belonging to Ascomycota (88%) and Basidiomycota (12 %) were obtained. Eleven taxa of various orders were identified: Boliniales, Coronophorales, Diaporthales, Helotiales, Hypocreales, Pleosporales, Pezizales, Xylariales, Lycoperdales, Phallales and Polyporales. The families *Diatrypaceae*, *Xylariaceae* and anamorphic ascomycetes were the ones most frequently found in this area. *Acrodictys stilboidea* J. Mena & Mercado, *Byssosphaeria rhodomphala* (Berk.) Cooke and *Camarops tubulina* (Alb. & Schwein.) Shear were recorded for the first time for Argentina.

22. FAUNAL COMPOSITION OF COLEOPTERA ASSOCIATED WITH SOYBEAN IN TUCUMÁN, ARGENTINA

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Beetles, especially phytophagous species, are an important component of the insect fauna associated with soybean crops. The aim of this work was to determine the specific richness of beetles in soybean crops and their surrounding vegetation in Tucumán. Samples were taken weekly from plots located at two different sites, Leales and Burreyacu, during the 2006/07 agricultural season. A total of 2,666 specimens belonging to 29 families, 35 genera and 40 species were collected and studied. Chrysomelidae, Coccinellidae and Curculionidae were the most representative families. Sixteen species were found in the two sampled sites, and were present both in the crops and the surrounding vegetation. At the Leales site, a high number of species were collected from the crop's surrounding vegetation whereas in Burreyacu the specific richness measured for the crop and the wild vegetation were similar. Nine families are cited here for the first time inhabiting soybean crops in Tucumán: Mycetophagidae, Anobiidae, Heteroceridae, Lampyridae, Bostrichidae, Alleculidae, Dermestidae, Anthicidae and Rhizophagidae and 12 genera: *Phaedon* sp, *Chrytocephalus* sp, *Myochrous* sp, *Disonycha* sp, (Chrysomelidae), *Anthonomus* sp, *Listroderes* sp (Curculionidae); *Blasptinus* sp (Tenebrionidae); *Psyllobora* sp (Coccinellidae); *Ethemon* sp (Cerambicidae) *Lebia* sp (Carabidae); *Agrylus* sp (Buprestidae) and *Acyllamus* sp. (Phalacridae).

23. OCCURRENCE OF MALARIA CASES IN SAN RAMON DE LA NUEVA ORAN: EFFECT OF ENVIRONMENTAL VARIABLES

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Malaria is a disease caused by protozoa of the genus *Plasmodium* that is transmitted to humans by mosquitoes of the *Anopheles* genus. Environmental variables play an important role in influencing the life cycle of the vector and parasite. In northwestern Argentina, malaria is an endemic disease and constitutes a public health problem. The aim of this work was to analyze the effect of climatic variables such as maximum and minimum temperature, accumulated rainfall and relative humidity on the occurrence of malaria cases in San Ramón de la Nueva Orán, from January 1996 to December 1998. The recorded data were analyzed using Poisson regressions. There was a significant increase in the rate of incidence of the disease when the relative humidity was greater than or equal to 67.8%, when cumulative rainfall was equal to or greater than 52.33 mm and when the minimum temperature was equal to or greater than 14.4 °C. The influence of environmental conditions on the vector-disease cycle will establish preventive and control measures against possible disease outbreaks.

24. FISH COMMUNITIES ALONG PROVINCIAL ROUTE 13 AND THEIR DISTANCE FROM THE BERMEJO RIVER. RIVADAVIA DEPARTMENT, SALTA

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Inland aquatic ecosystems may be permanent or temporary. In Argentina they include wetlands. One of them is the Quirquincho swamp (Salta Province). The hydrological cycle depends on the spring-summer rains and floods of the Bermejo River. This work aims at determining the relationship between fish communities in a wetland and their distance from the Bermejo River. The study was conducted with data for the years 2006-2008, on Provincial Route 13, Rivadavia Department, Salta. We performed a non-metric multidimensional scaling (NMDS) to order determine the sampling points based on the species. Spearman's correlation was used to examine the relationship between the distance to the river and the scores (obtained by NMDS). The years 2006 and 2008 showed no spatial order and there was no statistical significance (2006, $p = 0.19$; 2008, $p = 0.43$). During these years there were rains and major floods that connected and mixed fish communities. For 2007 we obtained a spatial arrangement and statistical significance was good ($p = 0.0196$). The correlation was positive ($r = 0.75$) and tended to be significant ($p = 0.07$). This year was drier, preventing fish communities to be mixed. Our system groups the temporary environments, separated from the permanent ones, showing that distance to the river in the wetlands has a direct influence on fish communities living there.

25. DIVERSITY, ABUNDANCE AND ECOLOGY OF *Culicoides* GENUS (DIPTERA: CERATOPOGONIDAE) IN URBAN AREAS OF TUCUMÁN

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Knowledge of biological and ecological aspects of *Culicoides* is important because they are known filariasis vectors. The aim of this work was to determine the diversity, abundance and ecological aspects of *Culicoides* in San Miguel de Tucumán. Samplings were conducted during 2005-2006 in two areas, Jardín Botánico of the Fundación Miguel Lillo and Parque Guillermina, using CDC traps. 815 specimens were collected and five species were identified: *C. debilipalpis*, *C. insignis*, *C. lahillei*, *C. paraensis* and *C. venezuelensis*. *C. paraensis* (50.3%) and *C. debilipalpis* (9.2%) were the most abundant species in the Jardín Botánico, and *C. paraensis* (47.8%) and *C. venezuelensis* (26.4%) in the Parque Guillermina. Multiple regression analysis determined that in the Jardín Botánico wind speed was the climatic variable most closely related to *C. paraensis* and *C. debilipalpis* ($r^2=0.48$ $p<0.02$, $r^2=0.44$ $p<0.02$) while the ones for *C. lahillei* ($r^2=0.68$ $p<0.01$) were humidity and rainfall. In Parque Guillermina, humidity was related to *C. debilipalpis* and *C. lahillei* ($r^2=0.57$ $p<0.001$, $r^2=0.44$ $p<0.03$), while mean minimum temperature was related to *C. venezuelensis* ($r^2=0.48$ $p<0.01$). The presence of these potential vectors of filariasis in urban areas is important, thus increasing the number of insects that are harmful to human health.

26. AVERAGE HIGH SCHOOL SCORE IN THE ADMISSION TO THE MEDICAL CAREER ACCORDING TO TYPE OF SECONDARY SCHOOL

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The School of Medicine should make sure that applicants are qualified to study a career such as Medicine. Thus, it is important to consider the secondary school they come from since the entrance process considers high school average (SA). **Objectives:** 1) to study the frequency of admitted students according to the secondary school they come from 2) to compare the SA of admitted students according to the secondary school where they graduated from. **Material and methods:** A cross-sectional descriptive study was done. The population were those admitted in 2010 (240 students). The secondary schools were divided into: University, State and Private. The results of the categorical variables were shown as ratios the quantitative variables were shown with their averages and confidence intervals. The associations were made using the analysis of variance (ANOVA) with a significance level of 5%. **Results:** 66% of admitted students came from Private schools and 5% from University schools. The average of the SA of the admitted students from State schools was significantly higher than that of the others. No significant association was found in SA between the other schools (ANOVA, $p=0.004$). **Conclusions:** Most admitted students came from Private schools but those from State schools had a higher SA.

27. DENTAL CARIES: DISCOURSE OF NEW STUDENTS IN A UNIVERSITY DENTAL COMMUNITY

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Students who enter a university dental community display a discourse on dental caries built only out of social and cultural knowledge, values and beliefs. This knowledge is insufficient at the beginning of their studies and, consequently, it often interferes with an optimum development of the teaching-learning process. The aim of this work was to analyze the discourse of new students at the Faculty of Dentistry-UNT in relation to dental caries. A questionnaire was applied to 50 new students of the Career of Dentistry-UNT. 76% of informants admitted that dental caries is one of the most common oral diseases. 74% pointed out some conditioning factors for the development of this pathology such as bacteria, diet and/or teeth. However, a sustainable scientific argument that describes the association among these factors was absent. 28% stated that wearing, corrosion, damage and break occur but none of them used the word demineralization. 94% agreed that it was dangerous based on the fact that it causes pain, infection, teeth loss and other diseases. Their social environment helped to build this discourse. The results obtained revealed the urgent need to implement effective teaching strategies to exert a positive influence on the discourse of the students so that they can incorporate new knowledge and appropriate scientific language.

28. ACADEMIC PERFORMANCE OF THE STUDENTS IN SYSTEMATIC AND SPECIAL BOTANY IN SPECIAL EXAMINATION BOARDS AT THE FACULTY OF AGRONOMY AND ZOOTECNIA, UNT

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Systematic and Special Botany courses are taught in the 1st and 2nd year of the Agronomy and Zootechnical Engineering careers, respectively. Even though it is a 5-year career, the students require 8-10 years to graduate. The faculty has 3 examination dates per year with 2-3 ordinary boards. In spite of this, the Faculty has numerous special boards in May, June, September and October. The special boards were implemented to minimize the over-extended time of the students' careers. The aim of the present work was to analyze the academic performance in the special boards. The record was made by year and course; board type: ordinary or special; n° of students registered; n° of students who took the exam: failed or passed and their marks. In the 22 special boards, 70 students registered, 20 took the exam: 9 passed and 50 were absent. In the 41 ordinary boards for the same period, 459 students registered: 344 took the exam, 50% passed and 115 were absent. The large n° of special boards did not succeed as expected; they generated situations that affected the students' performance during the course. We consider that it would be interesting to investigate the reasons why the students do not use special examination boards responsibly.

29. VIEWS ON THE NATURE OF RESEARCH. A STUDY WITH TEACHERS OF THE SCHOOL OF DENTISTRY

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Objective: To use the ORQ (Questionnaire of Opinions on Research) as a strategy to identify the opinions of teachers of FOUNT with respect to research. **Material and Methods:** The study is descriptive. Data were collected on a Likert type questionnaire designed to ascertain the views of teachers on research. Twenty-seven graduates answered questions from the IOC, an adaptation of the Questionnaire of Opinions on Science, Technology and Society (Vazquez and Manassero, 1997). To process the information we calculated absolute and relative frequencies. **Results:** a group of educators were part of the teachers in charge of existing courses in the preclinical and clinical areas. 65% believed that research is a process limited to the university; only 10% said that an investigator could use intuition and imagination in this process. Teachers recognized (50%) that research was based on achieving individual goals oriented to promotion and prestige, while 20% believed that it played an important place in their lives. **Conclusion:** The IOC proved to be valid as a first approximation and an excellent strategy for gaining knowledge in a field that connects practices and meanings in relation to the characteristics of research in the FOUNT. *Research funded by the SeCyT, UNT (Resolution 1206-008).*

Keywords: reviews, teaching, research, FOUNT.

30. SUSTAINABILITY. DEGREE OF KNOWLEDGE AMONG THE UNIVERSITY TEACHING POPULATION OF TUCUMAN, ARGENTINA

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Higher education is a basic tool to reach sustainable development, forming professionals capable of acting on a scientific basis and providing answers to social and environmental requirements. The aim of this study was to conduct an exploratory diagnostic of exploratory nature on the degree of knowledge of the concept of sustainability and its assessment among the university teaching population. A survey was applied to a sample of the university teaching population in careers in agricultural engineering, zoonengineering and veterinary medicine of the FAZ-UNT and to teachers from the Technical University of Tucumán (UTN). Results for FAZ-UNT showed that 82% claimed knowledge of the concept of sustainability; 53% gave an approximate answer; 27% clearly stated which the bases of sustainability are; 8% said they knew what an indicator of sustainability (IS) is; 14% gave an approximate definition of IS and 1% of population said they knew and used IS for teaching purposes. The corresponding results for the UTN were: 61%, 14%, 11%, 7%, 4% and 0%. In conclusion, it is essential to spread and internalize concepts and practices related to sustainability and all relevant facts concerning sustainability assessment systems.

31. SYMPTOMATIC CHARACTERIZATION OF THREE CEREAL RHABDOVIRUS ISOLATES

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A high incidence of a *Cereal Rhabdovirus* was detected in Argentina in 2006. It is transmitted by delphacid insects and its characteristic symptoms are the presence of dark green stripes on the flag leaf together with yellowish and empty ears. The aim of this work was to evaluate three geographical isolates by symptoms and incidence rate. Experimental transmissions were done with rhabdovirus isolates from Miramar, Rosales and Rio Cuarto. Third-stage nymphs of *Delphacodes kuscheli* were placed on diseased oats for acquisition for 48 hs and then placed on healthy wheat plants for latency (10 days). After this period, 1:1 transmission test were done using barley as a susceptible host. Five replicates of 20 plants were performed. Infected plants were identified by symptoms and incidence was evaluated using ANOVA and Tukey's test. There were no differences concerning symptoms or time of onset of symptoms (10 days) among the isolates. Infection rates were 35, 33 and 31.2% for inoculums of Miramar, Rio Cuarto and Rosales respectively, with no significant differences between them ($p = 0.95$). These preliminary results showed no difference in pathogenesis among the isolates.

32. CLIMATIC CHARACTERISTICS OF PLACES WITH *Wheat streak mosaic virus*-INFECTED WHEAT CROPS IN THE PROVINCE OF BUENOS AIRES

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The purpose of this study was to analyze the climate data of places with *Wheat streak mosaic virus*-infected wheat crops. We worked with 25 georeferenced points, which correspond to places where the virus infection was detected in 2007/08/09 in the province of Buenos Aires. FloraMap v.1.02 was used. This software contains an interpolated data set from about 10,000 Latin American weather stations and a normal elevation model. Height, Maximum and Minimum Monthly Temperature Average (MaxMTA and MinMTA), Maximum and Minimum Monthly Precipitation Average (MaxMPA and MinMPA) and the number of months with less than 80 mm of precipitation (dry period) for each point were considered. In this study, maximum height was 182 meters above sea level (masl) to Bordenave and Tandil. Minimum height was 5 masl to General Madariaga. The highest MaxMTA was 23.4°C (Pergamino y 25 de Mayo) and the lowest MinMTA was 6.3°C (Tandil). The highest MaxMPA was 117 mm (Pergamino) and the lowest MinMPA was 21 mm (Bordenave). All places showed a dry period that varied between 5 and 11 months.

33. AGGRESSIVENESS DESCRIPTORS OF WEED SPECIES IN SUGARCANE CROP

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Aggressiveness defines weed species characteristics. The objective of this work was to define quantitatively the aggressiveness determined in qualitative form. We worked at El Manantial, Los Nogales, with *Panicum maximum*, *Penisetum purpureum*, *Sorghum halepense*, *Saccharum spontaneum* and *Rotboellia exaltata* (2008-2009-2010). Descriptors: a) Biomass (low, intermediate, large, very large); b) plant height (low, intermediate, large, very large); c) Plant density (low, intermediate, large, very large); d) Place occupation in time, surface (long time, small occupied surface, intermediate time, surface, little time, large occupied surface, little time, very extensive occupied surface); e) Weed height with respect to crop (very low, intermediate, equal, higher); f) Reproductive elements (seed, seeds-shoots, seeds-shoots-rhizomes, seeds-shoots-rhizomes-nodal buds, g) Dispersion (poor, intermediate, large, very large); h) Crop production losses (low, intermediate, large, very large); i) Vegetative growth (low, intermediate, fast, very fast); j) Habitat changes Adaptation (little, intermediate, high, very high). Points for descriptor were 10, 20, 30, 40. Points: *P. maximum*, 320; *S. halepense*, 310; *Saccharum spontaneum* 280; *P. purpureum*, 270; *R. exaltata* 260.

34. Ipomoea nil L. ESPECIFIC COMPETENCE WITH COTTON CROPS (*Gossypium hirsutum*). SANTIAGO DEL ESTERO, ARGENTINA

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Ipomoea nil (IPONI) is a Convolvulacea that interferes with cotton crops from emergence to harvest in the Santiago del Estero watering area. The objective of this work was to evaluate the incidence of different IPONI densities on cotton crops. Work was done during the 2008-2009 cycle in Campo Experimental, EEA INTA, with cv Guazuncho INTA. Seeding was carried out on November 15, 2008. Distance among lines was 0.50 m and it was adjusted to plant number, 10 per lineal meter. Treatments were: T1: 3 plant.m⁻¹; T2: 5 plant.m⁻¹; T3: 8 plant.m⁻¹; T4: 0 plant.m⁻¹; T5: spontaneous density. Plot was 6 m², design was blocks with 4 replications. Harvest was on April 15, 2009. We determined yield (kg.ha⁻¹) in the crop and total biomass (g.plot⁻¹) in weeds. Data were analyzed by ANOVA and Tukey's test. There were no significant differences in mean yield for IPONI densities and clean control was 3868.75; 3731.25; 4293.75 and 3831.25 for densities of 3, 5, 8 and 0 plants.m⁻¹. There were differences between spontaneous density treatment (1650 kg.ha⁻¹) with respect to the others where crop yield decreased to 58%. IPONI mean biomass was significantly greater in T5 (1801.93 Kg.ha⁻¹) with respect to the densities assessed in this assay. Weed biomass at 3 and 5 densities IPONI plants⁻¹ was not statistically different. The densities assayed did not affect crop yield sown at 0.50 m.

35. INFESTATION POTENTIAL OF *Wedelia glauca* FROM FRUITS AND RHIZOMES

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W. glauca can multiply by seeds and rhizomes. Infestation potential (PI) alludes to actual reproductive capacity related to area density and shows the next covering in the species studied. The PI of a species propagated by seeds and rhizomes is obtained by integrating both potentials. We considered the fruit or bud number/ m², density, loss factor (predation, labor), viability, germination power, budding capacity, propagates entering the bank. Fruit information was obtained from 100 plants at the end of the growth cycle and that of rhizomes from growth and development essays under semi controlled conditions. Seed PI was 11.14 m². pl⁻¹, rhizome Pi was 312.82 m². pl⁻¹. Descendants of one plant will occupy 323.96 m². pl⁻¹ next cycle. The PI from seeds determines the infesting capacity of one plant and defines the surface it will occupy during the next cycle. Seeds of one *W. glauca* plant will occupy a density of 347.55 plant/m²: 0.032 m²/plant; for 3 plants/m²: 3.72 m²/plant; for 200 plants/m²: 0.05 m²/plant. Infestation potential of rhizomes is associated to present species density (density dependence). At a real density of 347.55 plants, PI is 1.02 m²/plant. For 200 plants density, PI is 1.77 m²/plant; for 7 plants/m², PI is 50.73 m²/plant. We concluded that *W. glauca* PI will permit establishment and survival in the fields infested by it.

36. EFFECTS OF LEVEL OF SUPPLEMENTATION WITH WHEAT MIDLINGS ON APPARENT TOTAL TRACT DIGESTIBILITY IN GOAT DIETS

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The aim of this study was to evaluate the effect of feeding increasing proportions of wheat middlings on the apparent total tract digestibility of diets fed to goats during maintenance. Eight goats (Creole x Nubian) from the Universidad Nacional de La Plata experimental herd were used. Goats were housed in individual stalls and fed one of four experimental diets: alfalfa hay (D₀), alfalfa hay + wheat middlings at 0.5% of BW/day (D₁), alfalfa hay + wheat middlings at 1% of the BW/day (D₂) and alfalfa hay + wheat middlings at 1.5% of BW/day (D₃). In all treatments alfalfa hay was offered ad libitum. In vivo apparent total tract digestibility was done by total fecal collection. Diets were fed for an adaptation period of 15 days followed by a 4-day collection period. Fecal excreta were weighed daily and DM% was determined. Apparent total tract digestibility of the diet was calculated from the percentage difference of the total ration and fecal matter, expressed on a DM basis. Data were analyzed by a factorial ANOVA. No differences were observed in apparent total tract digestibility in any of the treatments. Results indicate that the levels of supplementation with wheat middlings were not sufficient to alter ruminal digestive function and negatively affected the apparent total tract digestibility of the diets.

37.

COPPER AND ZINC: TRACE ELEMENTS OF IMPORTANCE IN THE NUTRITION OF MILK COWSRoldán VP¹, Luna ML¹, Bértoli JG².¹Cátedra de Química I-II. ²Producción Animal. F.C.V. U.N.L.

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Trace elements are enzymatic cofactors that participate in oxygen transport, regulate ruminal microbial enzymatic reactions and maintain fetal development, reproductive function and immune activity. We decided to evaluate the blood levels of the trace elements copper (Cu mg/L) and zinc (Zn mg/L) during the periparturition period in the autumn and spring of 2009 in the center region of Santa Fe. We worked with 143 Holstein cows (five fields) and took blood samples from the jugular vein. Flame atomic absorption spectrometry was used. Data were analyzed by ANOVA. The average values and standard deviations of concentrations were: Cu 0.68±0.18; 0.56±0.12 and Zn 0.64±0.14; 0.65±0.19, for autumn and spring, respectively. Copper and zinc were within the range reported by INTA Balcarce as reference values for Holstein cows. There were significant difference ($p < 0.05$) in Cu values between two seasons studied. During lactogenesis, important metabolic changes take place. For instance, there is an increase in the use of nutrients by the mammary gland, in this case of the micronutrient zinc. In view of the above, the study of the composition of microminerals throughout gestation is important because of the impact it has on production and the economic losses it may cause.

38.

INFLUENCE OF INTEGRATED MANAGEMENT OF HIVES OF HONEYBEE (*APIS MELLIFERA* L.) ON THE CONTROL OF THE SPORULATION OF *NOSEMA* SPP.Pérez RC¹, Reynaldi F², Dimena S¹, Tomaselli S¹, D'Alessandro L¹, Leveratto D¹.¹FCyF UNLP calle 60 y 119, ²CONICET La Plata, Bs As, Argentina. E-mail: zooamg@agro.unlp.edu.ar

Nosemosis is the most widespread disease of adult honey bees. The aetiological agent is *Nosema* spp., a unicellular Microsporidia, now classified as fungi. The objective of the present work was to determine the influence of the Integrated Management of Hives (IMH) of honeybee (*Apis mellifera* L.) on the control of the sporulation of *Nosema* spp. Integrated management of the apiary consists of control of spaces, breeding, genetics and health of the colony together with hygiene and prophylaxis of inert material. The field study was carried out in Delta, Buenos Aires, Argentina, from May 2008 to May 2009. Every month 35 adult honey bees of 5 different hives were preserved in 4% formaldehyde until processing. The results were interpreted with a scale (1 to 5) proposed by Cornejo Rossi (1974) according to the severity of the infestation. At the beginning of the study, infestation levels were between 3 and 5. These levels indicated pharmacological treatment in spring but, as it was winter, we implemented IMH as an alternative to reduce the spore charge in the hives under study. Spore charges were high until the beginning of the summer, when they decreased because of the IMH proposed. These results allowed us to avoid the use of antibiotics and confirm the efficacy of IMH in the reduction in the spore charge of *Nosema* spp.

39.

CACTACEA FRUITS IN NATIVE FORESTS OF NORTH-WESTERN ARGENTINA: A NEW OPTION FOR FUNCTIONAL FOODSZampini IC^{1,4}, Ordoñez R^{1,4}, Giannini N³, Blendinger P^{2,3}, Isla MI^{1,4}
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Fruits are a good source of phytochemicals that prevent degenerative diseases such as cancer and cardiovascular diseases. Comparative studies were carried out between the antioxidant activity (AOA) and nutritional properties of hydrophilic preparations of four Cactaceae fruits (*Lepismium lorentzianum* (Griseb.) Barthlott, *Lepismium lumbricoides* (Lem.) Barthlott, *Rhipsalis floccosa* spp *tucumanensis* (F.A.C. Weber) Barthlott & N.P. Taylor and *Pfeiffera ianthothele* (Monv.) F.A.C. Weber) that grow in the Argentine Yunga. *L. lumbricoides* and *L. lorentzianum* had the highest sugar content. All fruits accumulated reducing sugars (glucose and fructose). Protein content was 1.5 to 5 mg/g fresh fruit. *L. lorentzianum* showed a higher content of phenolic compounds. All fruits showed antioxidant capacity; however, *L. lorentzianum* had the highest antiradical capacity ($SC_{50} = 2.4 \mu\text{g} / \text{ml}$) and this activity was similar in all forms of extraction (with and without heating). There was a positive correlation between the AOA and the phenolic content of fruits. Conclusions: The fruits of epiphytic cacti of the Tucuman Yungas would be a new option for functional foods to promote health and prevent diseases related to oxidative stress.

40.

GERMINATING XIMENA AMERICANA (OLACACEAE), A MULTIPLE-USE NATIVE SPECIESPalacio MO¹, Carrizo E del V², Sobrero MT², Müller HJ².¹Facultad de Ciencias Forestales; ²Facultad de Agronomía y Agroindustrias - UNSE. Avda. Belgrano (s) 1912, Santiago del Estero. CP 4200. E-mail: mpalacio@unse.edu.ar

The rural inhabitants of Santiago del Estero resort to *Ximena americana* L. because of its multiple uses and medicinal, dyeing, and nourishing properties, although the former are limited today because of its decrease in natural environments.

The aim of this paper was to evaluate the effect of pre-germinative treatments upon the germination and emergence rate of *Ximena Americana* L. under controlled conditions. Four treatments were carried out: untreated blank, 10' scarification by sulfuric acid, 24 hour water-soaking and mechanical scarification by sandpapering. Ten seeds with each treatment were sown in speedling-type containers, placed in a growth-chamber at 25°C with a 12 hour light/dark cycle for 60 days and counted weekly. Both emergence percentage and rate were calculated and results analyzed statistically using ANOVA. The soak-treated seeds registered 70% of emergence while acid-scarified and untreated ones showed no significant differences as to emergence percentages (50% and 55% respectively). The average emergence time was similar for both soaked and untreated seeds (37.38 and 30.15) while that for those acid-scarified seeds was the highest (50.34). The 24 hour water-soaking proved to be the most suitable treatment for germinating *X. americana* L. seeds.

41. CHROMOSOMIC STUDY OF MEIOSIS IN CHENOPODIUM AMBROSIODES FROM FOUR LOCATIONS IN TUCUMÁN
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In Tucumán, the natural populations of aromatic species are exploited because of their alimentary and medicinal properties. Its irrational extraction shows the need to study and preserve its genetic variability. *Chenopodium ambrosioides* L., “paico” (Chenopodiaceae), is a naturalized species in Argentina. It is an annual aromatic herb, a secondary crop weed. The essential oil has antiparasitic, analgesic, and anti-inflammatory properties. In Tucumán this species is widely distributed. Cytological studies from different authors report a chromosome number for the sporophyte of $2n=2X=32$. Darlington and Wyle (1955) cite the basic number of the genus $x=9$ (?). The aim of this work was to study the meiotic behavior of *C. ambrosioides* L. in four locations of Tucumán. The material came from Horco Molle, Leales, Lules and Raco. Young flowers were fixed in Newcomer’s solution. The microscopic preparations were made squashing anthers in a slide, with haematoxylin 2% and ferric citrate 1%. Analyzing observations, the chromosome number is $2n=32$, so it is a diploid. During meiosis, we observed a regular behavior of metaphase I, normal tetrads and abundant pollen grains. During cycle II of meiosis, we observed asynchrony between phases. The regularity of meiosis and high viability of pollen confirm this way of multiplication of the species. The same results were found in the four locations. This study will contribute to the knowledge of species.

42. EL SIMBOLAR STREAM. WATER FOR TODAY, WATER FOR THE FUTURE

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The objectives of this work were to describe the ecological status of El Simbolar water stream and to spread knowledge of healthy practices for its preservation and sustainable use. Both margins were analyzed ($28^{\circ}40'37.6''S-66^{\circ}03'18.0''W$, 780 m.a.s.l.). Riverside vegetation was surveyed through line transecta, determining presence/absence of trees and bushes. Benthic macroinvertebrates were collected with a “Surber” net (900cm², 300µm mesh), later preserved in alcohol 70%. With the organisms determined up to the family taxonomy, BMWP’ index was calculated for Argentina’s NW. Water physical-chemical parameters were temperature, pH, electrical conductivity, alkalinity, chlorides, sulphates, magnesium, calcium and hardness, following Standard Methods techniques. The diffusion of the stream’s ecological status and of healthy practices for its preservation was done through signs and posters at site, while the water was cleaned. Riverside vegetation corresponded to Chaco Serrano. 23 insect families were reported, with a family of molluscs, oligochaeta and hydracarinae. BMWP’ (Biological Monitoring Working Party) reached 159, very clean waters. Physical-chemical parameters were within the accepted range for surface waters destined to irrigation, recreation and human consumption. Ecological status of the stream was found to be very good, and its preservation and sustainable use recommended.

43. PORONIA OEDIPUS (XYLARIACEAE-ASCOMYCOTA), FIRST RECORD FROM CATAMARCA PROVINCE, ARGENTINA

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Poronia Willd. is a coprophylous genus, stromata stipitate, fertile part with flat disc, surface whitish with prominent papillate ostioles. For our country, Dennis (1958) cited *Poronia punctata* (L.) Fr.; Spegazzini (1880) cited *P. macrorhiza* Speg. and Hladki (1997) cited *P. oedipus* (Mont.) Mont. in Buenos Aires, Entre Ríos, Santiago del Estero and Tucumán. The objective of this study is to contribute to the knowledge of the species biodiversity in Catamarca province. The specimens were collected in two localities: El Potrero (Andalgalá department) and Icaño (La Paz department). Specific techniques and keys were used in the taxonomic identification. *P. oedipus* specimens were found growing on equine and bovine dung. The sample specimens show 135-205 x 15-27 µm asci with IK+ apical ring; ascospores dark brown, inequilaterally ellipsoid, 21-27 x 23.5-31 µm, germ slit straight. *Poronia oedipus* is first reported for Catamarca, thus enlarging its distribution area in Argentina.

44. FIRST REPORT OF *Chrysomya megacephala* (DIPTERA: CALLIPHORIDAE) FOR NORTHWESTERN ARGENTINA

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Chrysomya Robineau-Desvoidy (Diptera: Calliphoridae) is considered one of the most important medical veterinary genus of calliphorids since some species are involved in disease transmission to humans. *Chrysomya megacephala* (Fabricius) is involved in the transport of important human pathogens such as poliovirus types 1, Coxsackie virus, *Salmonella* sp., *Entamoeba histolytica*, *Escherichia coli* and cestode eggs. This species was previously cited for the provinces of Buenos Aires, Santa Fe and Misiones. In the survey of Calliphoridae species in the province of Tucumán, monthly captures from October 2009 to April 2010 were carried out in three locations: Nueva Esperanza and Taficillo, Tafi Viejo Dept., and Jardín Botánico of the Fundación Miguel Lillo, Capital Dept. These places belong to semi-rural, rural and urban areas, respectively. Ferreira traps baited with cow liver, which remained active for five consecutive days, were used for capture. As a result of this work, *C. megacephala* was identified, which was registered only for November in Taficillo. This report not only allows us to extend the geographical range of this species in the country, but it is also of great importance due to its implication in the transmission of diseases to humans.

45.

STRUCTURE OF A SECONDARY FOREST IN TUCUMAN NATIONAL UNIVERSITY'S SIERRA DE SAN JAVIER PARK, ARGENTINA*Mainardi LV¹, Malkind S, Consilvio F, Ovejero G.*¹*Facultad de Agronomía y Zootecnia de la UNT. Av. Roca 1900. (4000) San Miguel de Tucumán, Argentina.**E-mail: victoria.mainardi@gmail.com*

Tucuman National University's Sierra de San Javier Park protects environments of great diversity. A progressive dominance of exotic species in the secondary forest has been observed. Arboreal mass structure and floristic composition were characterized to determine the need for intervention. Individuals with DBH ≥ 10 were surveyed in two 1 ha plots located in the Park East section. Individuals DBH and species were recorded. Species richness, abundance, absolute and relative dominance –in terms of basal area and diametric distributions of present species were evaluated. 18 native and 7 exotic species belonging to 19 botanical families were recorded. The species with more abundance and relative dominance were *Morus sp.*, *Ligustrum lucidum*, *Cinnamomum porphyrium*; *Tecoma stans*, *Rapanea laetevirens*, *Blepharocalyx salicifolius* and *Tipuana tipu*. Another exotic species of lesser importance were *Citrus sinensis*, *Citrus aurantium*, *Citrus aurantifolia*, *Persea americana* and *Acer negundo*. *Morus sp.*, *L. lucidum*, *R. laetevirens*, and *C. porphyrium* were represented in all diametric classes while the typical species in this area such as *T. tipu* were concentrated within 30 to 50 cm DBH. This structure will justify the use of management measures.

46.

QUALITY OF THE SALI RIVER, TUCUMÁN, ARGENTINA, 2009*González MC, Pourrioux J, Montalván U, Guillén S, Reguera MC, Vidal J.**Facultad de Agronomía y Zootecnia – UNT.**E-mail: carminaglez16@yahoo.com.ar*

The Tucumán Water Resources Division monitors water courses monthly, analyzing physical, chemical and biological parameters. The aim of this study was to compare the values of the following parameters at two points in the Sali River: dissolved oxygen (DO), Biological Oxygen Demand (BOD₅) and Chemical Oxygen Demand (COD) for the 2009 period, identifying the months when the water changes quality. The choice of points was based on the fact that on Route 305 (Point A, S26° 43' 18.87''; W 65° 9' 44.78'') the Sali river does not undergo industrial or urban impact, in contrast with Route 323 (Point B, S27° 8' 0.21'' W65° 18' 49.75''). The samples were analyzed at the Laboratory of the Estación Experimental Agroindustrial Obispo Colombes. The following methods were used: DBO₅: APHA QPT 35-40; OD: APHA QPT 35-29 and DQO: APHA QPT 35-28. Considering permissible values: OD > 2 mg/l; DBO₅ < 50 mg/l and DQO < 250 mg/l, the results indicated that Sali River point A has values higher than 2 all the year round; B is within acceptable ranges in November, December and January. DBO₅ (A) showed values below 7 throughout the year, while in (B) July, August, September and October they were above 100 mg/l. DQO (A) was within acceptable ranges all year round, and (B) had values > 300 mg/l in July, September and October. We can conclude that the Sali River on route 305 has the lower impact with respect to the parameters analyzed. During the period of citric and sugar industry activity, in the route 323 site the parameters diverged from normal values, but returned to normal in periods with no industrial activity and with summer rainfalls.

47.

BIOLOGICAL ACTIVITY OF EXTRACTS FROM VERNONANTHURA NEBULARUM*Díaz M¹, Costa C¹, Salvatore A², Murua G², Bardón A¹, Vera N¹, Borkosky S¹.*¹*I.Q.O. FBQF. UNT. Ayacucho 471. Tucumán. ²EEAOC. Av. W. Cross 3150. Tucumán. E-mail: sabk@fbqf.unt.edu.ar*

Plants continue to be the subject of novel and straightforward applications as biological control agents, with high safety levels and low environmental impact. Following this interest, we present here the insecticidal and molluscicidal activity of different extracts from *V. nebularium*, an endemic plant from the northwest of Argentina. The extracts were incorporated into the diet of 2nd instar larvae of *Spodoptera frugiperda*, at a dose of 300 µg of extract per g of diet. We evaluated the effects on the feeding behavior (choice test). Methanol and methylene chloride extracts were the most active ones, with 79% and 83% antifeedant effects, respectively. The acute toxicity molluscicidal test was undertaken to determine the lethal concentration 50 (LC₅₀) to *Biomphalaria peregrina*, the potential vector of the parasitic disease schistosomiasis in Argentina. The snails were placed in 20 mL beakers containing aqueous solutions of the extracts (100 and 50 µg /mL) in the absence of food. Snail lethality was evaluated after 24 hours of exposure. Our results yielded LC₅₀ values of 97, 47, and 43 µg /mL for methylene chloride extract, and ethyl acetate and methylene chloride subextracts, respectively.

Previous phytochemical studies carried on *V. nebularium* revealed the presence of sesquiterpene lactones that could play a significant role in the activities observed.

48.

BIOLOGICAL ACTIVITY OF TWO DITERPENES EPIMERIES FROM GRINDELIA PUBERULA*Mesurado M de los A¹, Corzo L^{1,2}, Bardón A¹, Ybarra M¹.*¹*Instituto de Química Orgánica, Facultad de Bioquímica, Química y Farmacia, UNT, Ayacucho 471. 4000. Tucumán. ²Dpto. de Cs Básicas y Técnicas, UNDeC, 9 de Julio 22. 5360. La Rioja. E-mail: mesumar@fbqf.unt.edu.ar*

The used of synthetic plaguicides has caused the water and field pollution. New natural agents that overpass these disadvantages are still needed to control plagues. Being biodegradable, they could be an environmentally safe alternative for insect pest control. Previous studies indicated that labdane-type diterpenes isolated from genus *Grindelia* exhibited antifeedant and toxic effects against insects. Continuing with our search for bioactive compounds from this genus, we conducted experiments to investigate the feeding behavior (choice test) as well as the toxic effects on *Spodoptera frugiperda* larvae produced by two diterpenes isolated from the chloroformic extract of *G. puberula*: 17-acetoxy-18-hydroxycaticic acid methyl ester (1) and its C-4 epimer (2). Additionally, larval and pupal mortality was quantified. Choice test: The incorporation of 100 µg of 1 and 2 per g of larval diet produced 45.6 and 57.4% of feeding dissuasion, respectively, compared to control. Toxicity: The incorporation of 100 µg of 1 and 2 per g of diet retarded larval growing up to 50%. Additionally, at the same concentration, both compounds caused 50 and 40% of larval and pupal mortality, respectively.

49. CALORIMETRIC STUDY OF THE EFFECT OF ORGANIC SOLVENTS ON SOIL MICROBIAL ACTIVITY

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In many cases, when the effect of hazardous materials on soil is investigated, organic solvents are used to incorporate the material. In this work the effect of DMSO, CHCl_3 , MeOH and EtOAc on soil microbial activity were investigated using calorimetric techniques. Aliquots of loam soil were placed in pots contained in a plug. Water containing the solvents was added to the pots to achieve solvent concentrations of 1.0, 3.0 and 5.0 ml kg^{-1} and left at r.t. Control soil contained only water. Two replicates per treatment were performed. After 2 months soil samples were analyzed for organic carbon (OC), pH and available phosphorous (P), and calorimetrically to obtain the thermodynamic parameters and soil microbial biomass (SMB). An isothermal calorimeter of the heat conduction type was used at 25°C. Results indicated that the use of EtOAc, MeOH and CHCl_3 should be avoided. Even 1.0 ml kg^{-1} decreased SMB. On the other hand, DMSO could be used at concentrations lower than 5 ml kg^{-1} only when evaluation of soil microbial activity is required. Chemical properties varied with DMSO. Soil pH and OC decrease whereas P increased with respect to control with the increase in DMSO concentration.

50. ANTIFEEDANT ACTIVITY OF PLANT EXTRACTS ON LARVAE OF SPODOPTERA FRUGIPERDA

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Plant extracts have been used as insecticides since ancient times. In many regions, this practice has continued across generations and represents a renewable resource, more accessible and cheaper than synthetic chemical insecticides. *Spodoptera frugiperda* (Lepidoptera: Noctuidae) is a polyphagous pest that causes severe damage to crops in our region. The purpose of this study was the investigation of the antifeedant activity of chloroform, ethereal, ethyl acetate, petroleum ether and methanol extracts from the aerial parts and roots of 15 plant species on *S. frugiperda* larvae. We evaluated the insect feeding behavior in choice and no choice conditions, at a concentration of 300 $\mu\text{g/g}$ diet. Choice tests showed a strong antifeedant effect of chloroform and ether extracts of aerial parts, resulting in inhibition of food intake in percentages above 60%. *Parastrephia lepidophylla* ether extract was the most active, with values of IIA (antifeedant index) = 90%. In feeding trials with no choice, the inhibition of intake was significantly lower. Our results suggest that studies on isolation and identification of plant extracts constituents should be undertaken to obtain additional information about the natural products responsible for the activity observed. This is an important step in developing rational methods of pest control.

51. SURVEY OF OF CONTRACEPTIVE METHODS IN APPLICANTS TO THE SCHOOL OF MEDICINE OF THE NATIONAL UNIVERSITY OF TUCUMÁN (U.N.T.)

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Studies carried out in different maternity wards in public hospitals of Argentina reflect the alarmingly high rate of unplanned pregnancy among adolescents, a high percentage of whom claim to have received sexual education at school before becoming pregnant. Thus, it is important to be aware of contraceptive methods (MAC) in populations with a completed high school education. The aim of this work was to analyze this in a group of applicants to the School of Medicine of Tucumán (U.N.T.). A descriptive study was done with a sample of 234 students of both sexes from the year 2006 (n=981). The data was obtained from structured, voluntary, anonymous interviews. The categorical variables were shown as ratios. **Results:** The best-known contraceptive is the condom (98%), followed by the pill and injections (88%); only 1% declared to know no method. While 13% used no contraceptives during their first sexual relation, the condom (80%) is the most popular method. The main source of information on MAC was the school (66%) followed by the family (46%); 5% claimed having received no information on the subject. 59% of the students had fair or no knowledge of MAC, 39% good and 2% very good knowledge. **Conclusions:** Although the percentage of students who know no MAC is low, most show fair or no knowledge of them, a reason for concern since they are future med students.

52. LABORATORY OBJECTIVES REACHED BY STUDENTS OF BIOLOGY SUBJECTS IN THE AGRONOMIST CAREER

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The educational system should help students to reach strategic, attitudinal and conceptual domains. Higher education should promote learning to learn. The aim of this work was to assess the objectives of knowledge, and the affective and motor objectives reached in the laboratory practice by students of biology subjects in the Agronomist Career (UNT). Before the beginning of the Vegetable Physiology course (3rd year of the study plan,) in 2009, an anonymous self-administered questionnaire with closed questions was submitted to 70 students. 82.9% developed observation capacity, 30.0% capacity for analysis and 45.7% the ability to apply and transfer acquired knowledge. 47.1% practiced responsibility, cooperation, respect and tolerance. 61.4% were able to handle experimental devices. Data were analyzed by descriptive statistics for each variable. Frequency distribution showed that observation was the best obtained objective during laboratory practice. Students showed difficulties in problem solving. They used rote learning during the first two years of the career. This reflects the relationship between the didactic model and the learning procedures used by the students. The chair of Vegetable Physiology uses pedagogical and innovative practices aimed at meaningful learning. Students should understand key concepts and develop strategies related to critical thought, question making and searching for answers aimed at comprehension.

53. AGROTOXIC CONTAMINATION – REMEDIAL ACTIONS FROM THE CLASSROOM

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The present communication belongs to the project “Alterations in learning and their relationship with the presence of agrochemicals in the students’ environmental context in the Santa Rosa Department in Catamarca Province”. This aim of this report is to analyze the effect of agrotoxics on health and the potentially remedial actions to prevent poisoning that are taught at school for application in the family homes of the producers. The current research is descriptive and transversal and the qualitative and quantitative measurement instruments used were the Bender-Gestalt test (BGT), semi-structured interviews and questionnaires to neighbors, producers and students from the area. The presence of individuals with extreme rigidity was detected from the results when interviewing the inhabitants of Los Altos, Aljijlán, Bañado de Ovanta and Lavalle, who showed lack of dynamism or plasticity and anxiety in their behaviour. BGT focused on Figure A showed individuals with little social integration and difficulties to establish interpersonal relationships, since the figure was predominantly drawn in the center and, in some cases, below the top margin or on the left side of the page. In view of these results, it seems necessary to form multidisciplinary teams to carry out remedial actions, especially from the school, to prevent neurobehavioral problems related to agrotoxic pollution.

54. EVALUATION OF APPROACHES TO LEARNING

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This work reports the results of the research project CIUNT R-401 approved and financed by grants of the UNT. The study of the learning process is increasingly important since it is the students the ones that give sense to the learning materials, process them, and decide what and how to learn. Therefore, it is important to understand the way in which learners face the learning process and the acquisition of knowledge, and to recognize attitudes and behaviors towards learning. The aim of this study was to understand how university students learn and to understand the most frequently used learning strategies and approaches by the students attending the first year of the career of Dentistry in the University of Tucumán. The CEPEA questionnaire, which allows delimiting between superficial and deep approaches to learning, was applied to 98 volunteer students. Analysis of the data showed that 66% of the students adopted superficial approaches while 25% adopted a deep approach and 9% did not fit into either category. These features contribute to have a global image of the learning processes in the population studied.

55. CONTRIBUTION TO THE IMPROVEMENT OF NATURAL SCIENCES LEARNING THROUGH SUPPORTIVE ACTION

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Natural sciences are one of the disciplinary areas with greater comprehension and assimilation difficulties. This is the reason why this study tries to meet these problems. The aim of this work was to strengthen the teaching-learning process by means of support lessons to students who had difficulties in the acquisition of knowledge. The methodology applied was personalized teaching and, in some cases, group activities in order to reinforce the cooperative relationships among students, also bringing them closer to teachers. 54 students had support lessons in Natural Sciences classes (Biology, Physics and Chemistry), and 43 of them passed the subject during the normal given period. 11 students had to take a resit exam in December and 9 passed, while only 2 of them failed. We noticed that the level of difficulties in knowledge acquisition was similar in the three subjects which are part of the above area of learning. The conclusion is that all actions taken to reinforce the teaching-learning process will tend to improve the students’ academic performance, and making equality of opportunities for learning possible could optimize their quality of life.

Key words: teaching, learning, support, students.

56. EVALUATION OF NEW EDUCATIONAL STRATEGIES TO IMPROVE THE TEACHING-LEARNING PROCESS

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After the 2007 teaching-learning process of the Subject “Elements of Organic and Biological Chemistry” evaluation, it became evident that it was necessary to implement strategies to foster dynamic and constructive learning and improve the students’ ability for analysis, observation, result evaluation, reasoning and critical thinking. **Objectives:** From this assessment, modifications were made in order to improve the quality of education. **Methods:** a) Seminars, consisting of the group analysis and discussion of a scientific work; b) Practical work: learning was proposed as a small research project between teachers and students from the isolation to the characterization of biomolecules; c) Organic chemistry practice work was reorganized; d) Bibliography: Bibliographic material was published (Serie Monografica didáctica, Vol 47). In order to evaluate the results, the percentage of students who regularized and/or promoted the subject from 2006 to 2009 was analyzed. **Results:** An increase in the number of students who regularized the subject was observed of about 20% from 2006 to 2007, 40% from 2006 to 2008 and 50% in 2009. The percentage of promoted students remained the same. The results indicate that the strategies used contributed to improve the teaching-learning process.

57. WOLBACHIA PREVALENCE IN MAL DE RÍO CUARTO VIRUS (MRCV) VECTORS FROM ARGENTINA

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The most important disease of maize in Argentina is caused by *Mal de Río Cuarto virus* (MRCV), only transmitted by delphacid insects. The species listed as natural vectors are: *Delphacodes kuscheli*, *Toya propinqua*, *D. haywardi* and *Caenodelphax teapae*, and *Pyrophagus tigrinus* as experimental vector. Recent studies on biological control propose *Wolbachia*, an alpha-proteobacteria commonly present in arthropods, as a potential control agent for insect pests. We aimed at determining the prevalence of *Wolbachia* in populations of MRCV vectors from the corn production area. Delphacids were sampled from Río Cuarto and Jesús María (Córdoba), Pergamino (Buenos Aires) and Famaillá (Tucumán) during spring of 2008 and 2009. DNA was extracted individually and the presence of *Wolbachia* was tested by PCR with bacteria specific genes (wsp and 16S rDNA) and 12S rRNA insect gene (to check template quality). A total of 216 specimens were analyzed: 169 *D. kuscheli*, 28 *T. propinqua*, 10 *D. haywardi*, 8 *P. tigrinus* and 1 *C. teapae*. For *D. kuscheli* populations, only one female was positive for *Wolbachia* infection (Río Cuarto 2009). No positive specimens were found for *D. haywardi*, *C. teapae* and *P. tigrinus*. High prevalence was observed in all *T. propinqua* populations, 100% of collected specimens being infected with *Wolbachia*.

58. MULTILOCUS SEQUENCE TYPING (MLST) APPLIED TO THE IDENTIFICATION OF WOLBACHIA PIPIENTIS STRAINS IN MAL DE RÍO CUARTO INSECT VECTORS

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The endosymbiont *Wolbachia pipientis* (or simply *Wolbachia*) causes reproductive alterations such as cytoplasmic incompatibility, male killing and parthenogenesis in insects, spiders, scorpions and terrestrial crustaceans. Such phenotypes make it a potential biocontrol agent of pests. Nowadays, supergroup designation is used to describe diversity in this bacterial genus. The aim of this work was to characterize the *Wolbachia* strains infecting some Mal de Río Cuarto vector species, which might improve the management of this maize virus in Argentina. DNA from *Delphacodes kuscheli*, *Pyrophagus tigrinus* and *Tagosodes orizicolus* was extracted. Five specific housekeeping genes (full MLST) were amplified and sequenced using degenerated primers. Sequences were compared with genotypes from the *Wolbachia* MLST database. New alleles were identified and multilocus genotypes were determined. Parsimonious phylogenetic tree from the concatenated data set was built. In conclusion, all the vector species were infected by different *Wolbachia* strains from the B supergroup. A population of *P. tigrinus* showed two different lineages (A and B), an evidence of horizontal transfer. This is the first survey of *Wolbachia* diversity in South American *Delphacidae* species.

59. ENERGY BALANCE OF SWEET SORGHUM UNDER A CONSERVATIONIST PRODUCTION SYSTEM IN TUCUMAN-ARGENTINA

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Sweet sorghum is an ideal crop for bio fuel production, since it produces easily convertible sugars in stems and leaves, provides important quantities of cellulose biomass and can be grown in areas marginal for corn and sugarcane. Alternative production systems and different genotypes are being evaluated in Tucumán, Argentina. The objective of this work was to determine the energy balance of sweet sorghum under a conservationist production system. This system was determined with data from trials conducted in Leales, Tucumán, and from national and international literature. By using the Life Cycle Analysis (LCA) methodology, four stages were determined: soil preparation, planting, crop management, and harvest and transport. An inventory of inputs and labours required at each stage was made, and data converted to energy units per area unit (Mj/ha) to calculate energy balances. The system studied has an energy input of 3,503.07 Mj/ha due to the use of agrichemicals and of 3,924.63 Mj/ha in harvest and transport (68% and 78% of total energy use in inputs and labours respectively). Energy efficiency was 9.76.

60. DETERMINATION OF ENERGY BALANCE OF SWEET SORGHUM CROP UNDER A CONVENTIONAL PRODUCTION SYSTEM IN TUCUMAN PROVINCE, ARGENTINA

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Energy crops became relevant because of the need for the replacement of fossil fuels with bio fuels. Sweet sorghum is a complementary crop for the sugarcane production system. Agronomic studies and genotype evaluations of sweet sorghum are conducted in Tucumán province. The objective of this work was to determine the energy balance of sweet sorghum under a conventional production system. Data from trials conducted by Estación Experimental Obispo Colombres (EEOC) in Leales, Tucumán, were used. By using Life Cycle Analysis (LCA) methodology, four stages were defined: soil preparation, planting, crop management, and harvest. An inventory of inputs and labours was made, and data were converted to energy units (Mj) per unit area in order to calculate the energy balances. The conventional production system has a total energy input of 9,597.74 Mj/ha. The stage of crop management has the largest energy use (3,507.25 Mj/ha) due to the inputs required. Energy efficiency (Energy output/Energy input) is 10.29. It is concluded that this system is highly dependent on agrichemicals and fuels.

61. SOYBEAN SEED HEALTH IN TWO CULTIVARS IN TUCUMÁN, ARGENTINA. 2009/2010 CYCLE

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Soybean (*Glycine max* (L.) Merrill) is attacked by a great number of fungi and bacterial diseases, which can affect the performance and quality of seeds. The aim of this paper was to study the health of the soybean seeds of two cultivars (A8000 RG and Munasqa RR) during the 2009/2010 cycle in Monte Redondo, Tucumán. 100 seeds were sown by treatment (5 seeds/Petri's dish), using a totally randomized design with 20 replies per each treatment (with and without superficial disinfection and lactic acid). Identification and counts were performed at 8 days. In both cultivars, *Phomopsis* spp. showed that it had been disinfected (11% in A8000 and 18% in Munasqa RR). *Fusarium* spp. showed similar percentages in all treatments (12-18%). *Cladosporium* spp. strongly increased its incidence in seeds without superficial disinfection in both cultivars (95%). Bacterial incidence in seeds without superficial disinfection was 47% and 9% in disinfected seeds. *Alternaria* spp., *Nigrospora* spp. and *Chaetomium* spp. showed low percentages (equal to or below 8%) in both cultivars. Results showed that the health of soybean seeds produced in both cultivars during the last cycle was similar.

62. FORMATION OF DIACETYL, ACETOIN AND 2,3-BUTANEDIOL BY *OENOCCOCUS OENI* IN MEDIUM CONTAINING GRAPE JUICE AND ORGANIC ACIDS

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In addition to the biodeacidification of wine, lactic acid bacteria (LAB) may also influence aroma and flavor. Diacetyl produced by LAB (5-7 mg/l) and in combinations with other wine compounds can impart nutty and toasty aromas. In a previous work, we selected the MS29 and MS49 strains of *Oenococcus oeni* based on β -glucosidase activities. In this study we investigated the diacetyl, acetoin and 2,3-butanediol production during growth of the MS29 and MS49 strains in MRS medium, pH 4.8, control, and supplemented with 2 g/l, L-malic acid, 0.7g/l, citric acid and 10% grape juice. The combined addition of organic acids and grape juice stimulated the growth parameters, especially the final biomass of the MS29 strain (30%), and L-malic acid utilization was accompanied by a pH increase of about 1.5 units. In the control medium, the MS29 and MS49 strains produced maximum levels of diacetyl, acetoin and 2,3-butanediol at the end of exponential growth (3.24 ± 0.46 and 5.58 ± 0.15 mg/l, respectively). The combined addition of the above substrates increased aroma compounds formation only in the MS29 strain to a maximum value of 5.28 ± 0.35 mg/l. In conclusion, aroma compounds formation varied depending on the strain and culture medium composition. In both strains the maximum values found could favor the sensory qualities of the final product.

63. ANTIFUNGAL EFFECT OF *Baccharis boliviensis* AND *Baccharis incarum* ON YEAST: MINIMUM INHIBITORY CONCENTRATION DETERMINATION

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The study of plants for antimicrobial activity has increased during the last decades, revealing the potential source of new metabolites, some of interest as anti-infective agents. *B. boliviensis* and *B. incarum* are used in folk medicine for many medicinal purposes. We showed that extracts of both species have antifungal activity against yeasts. The aim of this study was to determine the Minimum Inhibitory Concentration (MIC) of alcoholic extracts of *B. boliviensis* and *B. incarum*. Twenty-seven strains of yeast (*Gros. Candida*, *Rhodotorula* and *Saccharomyces*) and standard strains were used. MIC was determined by the agar dilution method with double serial dilutions of the extracts containing from 50 to 3.200 μ g/ml of phenolic compound. The inoculum used was 5×10^3 colonies forming units/ml and incubation was carried out at 28°C. 26% of the strains were killed by 200-3,200 μ g/ml dilutions of the extract of *B. boliviensis*. Equal concentrations of *B. incarum* inhibited 30% of the strains. The remaining strains were inhibited at concentrations higher than 3,200 μ g/ml. Low concentrations of both extracts inhibited *C. guilliermondii*, *C. dubliniensis* and *S. cerevisiae* while most *C. albicans*, *C. tropicalis* and *C. glabrata* required high doses.

64. IDENTIFICATION OF VITAMIN B₂ PRODUCING STRAINS OF LACTIC ACID BACTERIA FOR THE DESIGN OF NOVEL BIO-ENRICHED FERMENTED FOODS

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Riboflavin (vitamin B₂) is involved in energy metabolism, and is an integral component of the coenzymes (FAD) and flavin mononucleotide (FMN). Vitamin B₂ deficiency is common in many parts of the world. The aim of this study was to examine native lactic acid bacteria (LAB) belonging to *Lactobacillus* (*Lb.*) *bulgaricus* (22 strains), *Lb. rhamnosus* (1), *Streptococcus* (*St.*) *thermophilus* (21) and *Lactococcus* (*Lc.*) *lactis* (1) to identify strains that have the capability to produce riboflavin. The growth in the absence and presence of B₂, and concentration of extracellular, intracellular and total B₂ were evaluated. Vitamin concentration was determined by the microbiological assay technique using *Lb. rhamnosus* ATCC7469 as the test organism. Approximately 50% of the LAB (12 *Lb. bulgaricus*, 8 *St. thermophilus* and 1 *Lc. lactis*) grew in the absence of B₂ and produced a mean total concentration of 40.0 ± 0.1 mg B₂/l. *St. thermophilus* CRL1766, *Lb. bulgaricus* CRL543 and CRL865 secreted significant amounts of B₂ ($>80.0 \pm 0.1$ mg/l), whereas *St. thermophilus* CRL417 retained the highest vitamin concentration (63.4 ± 0.1 mg/l). The results show the presence of wild-type strains of LAB able to produce and secrete B₂ in significant amounts, enabling their use in the design of riboflavin bio-enriched fermented products.

65. POLYGALACTURONASES DIFFERENTIATION USING A COLORIMETRIC METHOD

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Polygalacturonases catalyze the hydrolysis of polygalacturonic acid (PGA). Endo-PGases hydrolyze PGA by a random mechanism of attack, whereas exo-PGases hydrolyze PGA by a terminal mechanism. The methods currently used to determine PGase activity are based on the measurement of the rate of increase of reducing groups released after PGA hydrolysis. But these assays cannot distinguish between the two types of PGases. Objective: To develop a method to quantify and differentiate endo- and exo-PGases. Methods: Activities of endo-PGase (*Geotrichum candidum*) and exo-PGase (*Daucus carota*) were determined by Somogyi-Nelson and Ruthenium Red (RR) methods. RR method: after enzyme reaction the mixture was supplemented with distilled water up to 6 ml, 40 µl of RR 0.5% (w/v) and centrifuged. The absorbance of the supernatant was read at 535nm. Results: The addition of RR to PGA solutions resulted in the formation and precipitation of a dye-PGA complex. In the presence of an endo-PGase PGA was hydrolyzed to smaller fragments that could not be precipitated by the RR, causing an increase in dye in the supernatant. The mechanism and kinetics of PGA hydrolysis by exo-PGase did not allow us to determine the activity in terms of initial velocity, which could be used to differentiate these two activities. Conclusion: The RR method is a fast and easy way to discriminate and quantify endo-PGase activity.

66. NARINGINASE PRODUCTION BY *Aspergillus niger* USING LEMON PULP AS A SUBSTRATE

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Naringinase is important in the food industry to eliminate bitter compounds of citrus juice. There are few reports on naringinase production by fungi and agricultural waste such as lemon pulp. The aim of this work was to examine the optimal conditions of naringinase production by *Aspergillus niger* using lemon pulp as a substrate. The medium was prepared with 30% pulp with 2×10^6 *A. niger* conidia / ml was used. The assays were 1) Addition of salt, g/l: NaNO₃, K₂HPO₄, 0.5 KCl and Mg₂SO₄ 7H₂O; 2) Level of inoculum: 10, 20, 30% v/v; 3) pH: 4, 4.5, 5; 4) Temperature: 20, 25, 30°C; 5) Rate of agitation: 100, 200, 250 rpm; 6) Time of incubation. Naringin (Habelt) and reducing sugars (Somogyi) were determined. One naringinase unit was defined as the amount of enzyme that releases 1 µmol of reducing sugars per min. Highest naringinase production was obtained in the medium with salt, inoculum at 0%, pH 5, 30 °C, 250 rpm and 72 h. In these conditions the highest yields were obtained, Yp/s = 0.7 U/mg and Productivity, Pd= 0.06 U/ml h, with respect to medium without salt (Yp/s=0.1 U/mg, Pd= 0.01 U/ml h). In this process we used a low cost substrate such as lemon pulp and *A.niger* for naringinase production, which has important applications in the food industry.

67. IMMUNE RESPONSE INDUCED BY NASAL IMMUNIZATION WITH PppA ASSOCIATED TO A DEAD LACTOBACILLUS

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Few studies have investigated the use of dead LAB in the protection against pneumococcal infection. Some pneumococcal proteins are serotype independent, so they are important candidates for use in new vaccines. **Objective:** To assess the effect of nasal immunization (NI) with pneumococcal protective protein A (PppA) associated to heat-killed *Lactobacillus casei* (LcM) on humoral and cellular Th1, Th2 and Th17 immune response in both systemic and mucosal compartments. Swiss albino mice (3 weeks of age) were immunized with 3 doses of PppA+LcM. Control mice received LcM, PppA and PBS. Samples of bronchoalveolar lavages (BAL) and serum (S) were harvested on days 14, 30 and 45 after the third inoculation (IN 3°). Determinations: 1) IgA and IgG anti-PppA by ELISA; 2) IL-4 (Th2), INF-γ (Th1) and IL-17 (Th17) by ELISA; 3) Colonization: At 3d post NI 3°, mice were challenged with Sp (10⁶cell/mouse) and after 3d, nasal colonization (NC), colonization in lung (LC) and hemocultures (H) were evaluated. LcM+PppA induced anti-PppA IgA and IgG antibody levels in BAL and IgG in S significantly higher than PppA. IL-4, INF-γ and IL-17 in BAL increased in group LcM+PppA. In this group, LC and NC were lower than in controls and H were negative. LcM exerted an important adjuvant effect so it could be used in the development of a safe and effective nasal vaccine for at-risk populations

68. IMPORTANCE OF *Lactobacillus rhamnosus* ADMINISTRATION ROUTE IN THE ACTIVATION OF THE HUMORAL IMMUNE RESPONSE IN MALNOURISHED MICE

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We evaluated the effect of oral and nasal treatment with *L. rhamnosus* CRL1505 (Lr) on the humoral immune response against *Streptococcus pneumoniae* (Sp) in malnourished mice. Malnourished mice were fed a balanced diet (B) for 7d, or B for 7d with Lr oral or nasal treatment (Lr_O and Lr_N). At the end of each treatment, these animals, together with well-nourished (W) and malnourished (M) controls were challenged with Sp. We evaluated the resistance to infection and humoral immunity through B lymphocytes (BL) study in spleen by flow cytometry (B220⁺CD24⁺) and levels of IgA and IgG anti-Sp in serum and bronchoalveolar fluid (BAF). Both treatments with Lr prevented the dissemination of Sp into blood. Lr_O treatment decreased the Sp count in lung, whereas nasal treatment was able to remove it on day 5. Malnutrition significantly decreased the BL number in the spleen. Lr_O and Lr_N groups were able to improve this parameter with values of BL similar to W mice. Levels of specific IgG in the serum and BAF of mice treated with Lr were higher than in the M mice. Only the Lr_N mice reached the values of the W mice. In addition, mice treated with Lr showed higher levels of specific respiratory IgA, and the values of the Lr_N were greater than the Lr_O. Hence, the nasal route of administration of Lr proved to be the more effective one against respiratory challenge.

69. COMPARATIVE STUDY OF THE EFFECT OF NASAL AND ORAL *Lactobacillus rhamnosus* ADMINISTRATION ON INNATE IMMUNITY IN MALNOURISHED MICE

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The aim of this work was to study the effect of different routes of *L. rhamnosus* CRL1505 (Lr) administration on the improvement of the innate immune response (local and systemic) in malnourished mice. Different groups of malnourished mice were repleted with a balanced conventional diet (BD) for 7d, or BD for 7d with Lr by oral (OLr) or nasal route (NLr). At the end of each treatment, repleted groups, well-nourished (W) and malnourished (M) controls were challenged with *Streptococcus pneumoniae* (Sp). Before and after challenge, we studied: lung and blood infection, leukocyte counts in bronchoalveolar fluid (BAF), phagocytic activity in alveolar macrophages, total and differential cell counts and myeloperoxidase activity (Px+) in blood and bone marrow (BM). Before infection, NLr mice showed higher leukocyte and Px+ cell numbers than OLr group in BM. After challenge, NLr group had the lowest pathogen numbers in lung and the highest phagocytic activity in blood and BAF. In BM, both Lr treatments induced increased total cell numbers, mitotic pool cells and Px+ cells, but the NLr group showed higher values than OLr mice in these parameters. Hence, during a renutrition treatment, the nasal administration of Lr is more efficient than the oral way to improve the innate immunity against Sp respiratory infection.

70. GOATS FED WITH PROBIOTIC SUPPLEMENTS OBTAINED FROM FERMENTATION OF SUGAR CANE RESIDUE

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We developed an animal food supplement probiotic using a solid residue, sugar cane. Ruminant livestock breeding is one of the major industries in the north of Argentina. These animals can produce meat and milk of higher quality than that of bovines. Goats consume pastures usually unfit for other purposes. Gastrointestinal tract microbial ecology has an important effect on goat health and performance. In order to use sugar cane residues, we fermented them with lactic acid bacteria isolated from healthy animals. The work was carried out with six batches of 20 animals. They were kept in individual pens and feed and water were supplied *ad libitum*. Six groups of animals were fed for one month with natural fermented sugar cane, and the same sample was fermented individually with *Lactobacillus reuteri* DDL 19 (T1), *Lactobacillus alimentarius* DDL 48 (T2), *Bifidobacterium bifidum* DDBA (T3), *Enterococcus faecium* DDE 39 (T4) and a combination of all these strains (T5). Fecal flora and mammal health were evaluated. T5 showed the best microbiological balance of fecal flora with a significant increase in lactic acid bacteria and a remarkable diminution in Enterobacteriaceae. On the other hand, under these conditions, highest increased in goat weight was observed after T5 administration. The probiotic mix seems to be an appropriate probiotic for goats.

71. CLA-ENRICHED PEANUT PASTE, SESAME AND SUNFLOWER FOR THE DEVELOPMENT OF FUNCTIONAL FOODS

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Introduction: Conjugated linoleic acid or CLA is a long-chain polyunsaturated fatty acid with two conjugated double bonds, a mixture of positional and geometric isomers of linoleic acid. Isomers cis-9, trans-11 and trans-9, cis-11 are responsible for biological functions. The beneficial properties of CLA are: anticarcinogenic, antiatherosclerotic, immunomodulator, reduces body fat and increases muscle mass. Nowadays there is interest in increasing CLA in raw foods, in transforming linoleic acid to CLA in sunflower, sesame and peanut. **Objectives:** to determine CLA production after fermentation of sunflower seeds, sesame and peanut (*C₁₄-Lactobacillus rhamnosus*) and determine the linoleic acid/CLA ratio. **Materials and methods:** pastes were obtained by grinding the 4 samples of sunflower seeds, sesame and peanuts. Lipids were extracted (technique of Folch *et al.*, 1957) and derivatization by the method described by Chin *et al.*, 1992). The derivatized fatty acids were extracted with hexane and identified by GC. Calibration curves and % recovery: standards (Sigma 99%) **Results:** in all samples tested the strain was capable of combining CLA from LA present in the seeds, its concentration being significantly higher ($p < 0.05$) in sesame paste. **Conclusion:** the results obtained show that it would be possible to use conjugant strains in the processing of food based on oilseeds enriched with CLA.

72. EFFECT OF DIFFERENT CULTURE MEDIUM COMPONENTS ON THE FORMATION OF BIOFILM BY VAGINAL LACTOBACILLI

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One of the mechanisms that lactobacilli exert to prevent pathogen entry is the formation of a protective biofilm. The effect of different components of culture media on the biofilm formation by vaginal lactobacilli (VL) was evaluated. 15 VL strains were cultured in MRS broth at 37°C until the late exponential phase, and subcultured in different broths: a) standard MRS and with individual omission of Tween 80, MnSO₄ or glucose, and MRS without the three components; b) LAPTg with or without Tween 80. Biofilm formation was performed (O'Toole) with 200 mL of cultures diluted in each medium; 200 mL were transferred to polystyrene microplates and incubated for 72 h at 37°C. The biofilm was stained with 1% crystal violet and dissolved with 95% ethanol for optical density (OD) measurement at 570 nm. MRS without Tween 80 allowed the formation of biofilm in *L. reuteri* CRL1324 (OD=1.10), *L. rhamnosus* CRL1332 (OD=0.24) and *L. delbrueckii* CRL1510 (OD=0.22). In LAPTg without Tween, *L. rhamnosus* CRL1332 (OD=0.65) showed highest biofilm formation. In MRS without the three components, the results were: *L. reuteri* CRL1324 (OD=0.2), *L. rhamnosus* CRL1332 (OD=0.2) and *L. delbrueckii* CRL1510 (OD=0.15). The technique used enabled quantification of the biofilm produced by VL. These results are promising to advance in the knowledge of VL and their mechanisms of action.

73.
MICROBIAL DYNAMICS IN FECES OF SHEEP FROM BIRTH TO WEANING

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Introduction: The intestinal tract of sheep has microbial ecosystems that exert a protective effect. An alteration in their stability can cause pathogen colonization. There are numerous ovine diseases that can affect human health, so that action should be taken to enable products to reach consumers with the bacterial load required by current standards. **Objectives:** We investigated qualitative and quantitative variations in the intestinal flora from birth to two months, which is the longest vulnerability period. **Materials and methods:** We worked with 55 animals (healthy, well-bred Texel and Hampshire Down). Sampling was performed by rectal swabbing. We made dilutions and samples were seeded in the following media: agar Rogosa, (Lactobacilli); modified HHD (Bifidobacteria); KF (Enterococci); BHI (Strict aerobes) and Mac Conkey (Enterobacteria). **Results:** These results allowed us to know part of the intestinal ecology. Few significant increases were found. Lactobacilli, Bifidobacteria, Enterococci and total anaerobes were 1.63%, 6.33%, 4.03% and 2.24% respectively. We observed a decrease in Enterobacteriaceae of 12.74%. It is important to perform further studies until adulthood, comparing these with other races in other climates under stress and pathological conditions.

74.
ADJUVANT ACTION OF PHYSICAL ACTIVITY IN SOY-BASED FOOD IN AN EXPERIMENTAL MODEL OF GLOMERULONEPHRITIS

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We investigated the influence of physical activity and a soy-based diet in an experimental model of glomerulonephritis (GN) using male Wistar rats. GN was induced by bovine serum albumin (BSA) immunization. One half of the animals were housed in cages especially designed to stimulate physical activity (EXP) and the other half was housed in standard cages (CTRL). All animals had a balanced diet ad hoc with 20% soy protein and water. To induce immune-complexes production, BSA was intravenously injected daily. 5 weeks after the onset of proteinuria, plasma lipid profile and malonaldehyde (MDA) in liver and kidney were studied. Animals with physical activity showed a significant decrease in MDA in both liver and kidney (CTRL MDA liver: $298 \pm 29 \mu\text{m}/\text{ml}$; EXP: $135 \pm 18 \mu\text{m}/\text{ml}$. CTRL MDA kidney: $220 \pm 15 \mu\text{m}/\text{ml}$; EXP $161 \pm 12 \mu\text{m}/\text{ml}$). Lipid profile showed a significant decrease: total cholesterol (CTRL: $1.56 \pm 0.13 \text{g}/\text{l}$; EXP: $0.75 \pm 0.10 \text{g}/\text{l}$), LDL-cholesterol (CTRL: $0.56 \pm 0.09 \text{g}/\text{l}$; EXP: $0.25 \pm 0.04 \text{g}/\text{l}$), triglycerides (CTRL: $0.88 \pm 0.09 \text{g}/\text{l}$; EXP: $0.39 \pm 0.05 \text{g}/\text{l}$), while HDL-cholesterol had a marked increase (CTRL: $1.48 \pm 0.11 \text{g}/\text{l}$; EXP: $1.95 \pm 0.10 \text{g}/\text{l}$). The combination of a soy-based diet and moderate exercise could significantly reduce the oxidation of lipoproteins, which would be associated with a significant improvement in renal pathology.

75.
IDENTIFICATION OF BOMBESINE IN THE STOMACH OF HORSE FOETUS AT DIFFERENT DEVELOPMENTAL STAGES

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Gastrointestinal hormones exert a great effect on the regulation, mobility and growth of the digestive process. This reflects their importance during the different stages of growth, including the fetal period. The aim of this work was to determine bombesine in the stomach of horse foetus at different stages of development. Foetuses (periods of gestation G1, G2 and G3) were obtained from Aimar-Río Cuarto. Stomach samples were fixed in formol and included in paraffin. For bombesine determination, an immunohistochemistry technique was used; for the detection and later development the complex ABC and DAB was used. The following results were obtained in stomach; in foetus (G1), a moderate reaction was observed in epithelium and in glandular sketches, in foetus (G2) a moderate to intense reaction was observed; in foetus (G3) an intense reaction was identified in the glandular epithelium, nervous plexus and muscle. We concluded that bombesine is present in the stomach of foetuses (G1, G2 and G3) and there is a positive relationship between the degree of fetal development, pattern of distribution of the hormone and degree of reactivity of the structures involved.

76.
CD11c+ DENDRITIC CELLS EXPRESSION IN AN EXPERIMENTAL M3 ADENOCARCINOMA MODEL TREATED WITH IMMUNOPREVENTION AND CYTOSTATICS

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Introduction: Dendritic Cells (DC) are essential in cancer associated specific immune response and related to a favorable prognosis. Immunoprevention could revert cytokine mediated-immunosuppression induced by tumors. **Objectives:** To evaluate the presence of DC in lymph nodes (LN), spleen (S) and tumor (T), in an experimental M3 murine mammalian adenocarcinoma treated with immunoprevention and cytostatics. **Material and Methods:** Female Balb C mice were inoculated on day 1 with tumor cells and divided into 4 groups: Vaccine Group (VG) received 5 doses of IM vaccines (V). Doxorubicine Group (DG) received IV cytostatic on day 3 and 10. Doxo Vaccine Group (DVG) received Doxorubicin (D) on day 3 and 10 plus 5 doses of IM Vaccine. The remaining group (CG) was used as a control. Mice were sacrificed on day 21 and DC collected from target organs were marked with anti CD11c+ plus FITC and analyzed by flow cytometry. **Results:** In LN, there were no statistically significant differences between groups in the number of DC. When T were analyzed, VG presented a significant DC increase of 50% with respect to CG. Likewise, spleen specimens showed more DC in VG (70.87%) and in DVG (39.25%). **Conclusion:** Most DC expressions found in vaccine groups suggest an immunostimulating effect in spleen and tumor, but not in lymph nodes, probably by the action of suppressant cytokines.

77.

VALIDATION AND ADJUSTMENT OF MODIFIED GRIESS ASSAY IN RAT NERVE TISSUE

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Nitric Oxide (NO) is a ubiquitous gas in many tissues of the organism. NO is extremely reactive and it rapidly oxidizes to nitrite and nitrate. NO measurement is important to evaluate many physiological and pathological processes. In this work, we present the validation of the modified Griess assay to quantify nitrite in rat peripheral nerve and central nerve tissue. The changes introduced in the method were: alkaline deproteinization and a reduction with solid cadmium. The tests we carried out include almost the whole international parameters of validation. Measurement of nitrite resulted in an excellent linearity ($r=0.9979$) in the range of 0.005-0.0012 $\mu\text{mol/mL}$. The products of forced degradation would not affect the results, showing an appropriate specificity of the method. This assay was precise since it is repeatable (relative standard deviation: 1.79%) and was reproducible by two different analysts. Measurement of nitrite showed an appropriate exactitude because there was no difference between media recovery (99.23%) and 100%. Finally, the changes introduced showed high sensitivity. The present study presents a modified method that is applicable, reliable, adaptable and accessible.

78.

IDENTIFICATION OF N-ACETYL GALACTOSAMINE/ GALACTOSE IN THE STOMACH OF SNAIL (*Helix aspersa*)

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In Argentina, *Helix aspersa* is the most widely found edible species and the one best adapted for breeding, so it is important to have a basic histophysical knowledge involved in the productive-alimentary aspect and in the reproductive aspect. Our aim was to identify the N-acetyl galactosamine/galactose glycoconjugate in snail stomach. Animals were collected from a hatchery in Río Segundo, Córdoba. Serial samples were extracted, and fixed in formal and included in paraffin. The determination of the glycoconjugates was carried out by means of the lectin histochemistry technique (DBA lectin). For detection and later development the ABC and DAB complex was used, respectively. The following results were obtained: intense reaction on the apical surface of the epithelium and moderate reaction in some cells of the gastric epithelium. We concluded that the N-acetyl galactosamine/galactose glycoconjugate is present with different reactivity degrees in the stomach of the earth snail.

79.

ANATOMY AND MORPHOLOGY OF *Trachypteris pinnata* (PTERIDACEAE)

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Trachypteris pinnata (Hook, f) C. Christensen is a fern that is found in the northwest of Argentina, where it grows in Chacoan dry forests environments. The aim of this work was to analyse its anatomy and functional morphology. This research was done with fresh material collected in Santiago del Estero. Frond diaphanization, free hand sections and specific staining were applied. Stomatic index, size, frequency and trichome size were calculated for 12 individuals with 5 repetitions. *T. pinnata* has an erect rhizome, covered with scales. This fern presents dimorphic fronds, the sterile ones are sessile, entire, densely covered with scales in the abaxial surface and form a rosette on the ground. The fertile frond is erect with a long petiole. The adaxial epidermis is glabrous with rectangular lobated cells; abaxial epidermis presents sinuate cells and glandular trichomes. Hipostomatic lamina with anomocytic stomata of 54,11 $\mu\text{m} \times 46,29 \mu\text{m}$. In cross section the lamina has 2-4 layers of palisade and 4-6 of spongy parenchyma, protostelic vascular bundle. Solenostelic rhizome. Adventitious roots with primary diarch structure and sclerenchymatic tissue surrounding the vascular cylinder. The presence of trichomes, scales and sclerenchymatic tissue enable this fern to resist water loss and endure desiccation resulting from high temperatures and low water supply.

80.

MORPHOLOGY AND ANATOMY OF *Trismeria trifoliata* (PTERIDACEAE)

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Trismeria is a monotypic fern genus. The aim of this work was to carry out the morphological and anatomical characterization of *Trismeria trifoliata* (L.) Diels. The material was collected in Monteros and Trancas, Tucumán, Argentina, and was deposited at Herbario LIL. The work was done with 20 individuals. Standard anatomical techniques were used. It presents erect to prostrate rhizome covered with brown scales. Fronds pinnate to bipinnate, margins serrate. Petiole and rachis grooved, scaled at the base. Fronds up to 150 cm. The superior pinna are fertile, covered with yellow or white wax in the abaxial surface while the inferior pinna are sterile and without wax. Hipostomatic leaves with presence of anomocytic stomata. Two types of trichomes: glandular with a unicellular head and 1-4 cells foot and eglandulars with 2-6 cells. In cross sections 1-2 palisade and 4-5 spongy parenchyma layers. Homogenous parenchyma next to the principal nerve. Protostelic vascular bundle surrounded by macrosclereids. Petioles with 2 C-shaped bundles. Rachis with V-shaped xylem surrounded by phloem, pericycle and endodermis. Solenostelic rhizome with starch. Diarch roots. The presence of homogenous parenchyma in leaves has never been reported for this species. The starchy tissue and mucilage in rhizome and base of petiole enabled the survival of this fern in unfavorable conditions.

81. TRANSMISSION EFFICIENCY OF Mal de Río Cuarto virus (MRCV) AMONG DIFFERENT POPULATIONS, SEX AND WING FORMS OF *Delphacodes kuscheli*

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Mal de Río Cuarto is the most important virus disease in corn production in Argentina and is mainly transmitted by *D. kuscheli* (Hemiptera, *Delphacidae*). We intended to determine transmission efficiency of different *D. kuscheli* populations depending on origin, sex and wing form (brachypterous / macropterous). Specimens of *D. kuscheli* were collected from Río Cuarto, Jesús María and Cavanagh (Córdoba) and Pergamino (Buenos Aires) during the 2008 spring. Artificial breeding of the different populations was started with field adults. Populations were evaluated with three replicates of 1:1 transmission tests. Second instar nymphs were placed on MRCV symptomatic wheat for 48 hours for acquisition. After 20 days of latency, 15 males and 15 females of each population were placed individually in wheat seedling (cv Federal ProINTA) for transmission. Diseased plants were identified by serology (DAS-ELISA) 30 days post transmission. Transmission efficiency values were 16, 17, 30 and 34% for Río Cuarto, Pergamino, Jesús María and Cavanagh, respectively, without significant differences between populations ($p = 0.068$). No differences were found between males and females. A strong association between transmission and brachypterous cases ($p = 0.016$) was observed.

82. INFLUENCE OF STORAGE TIME OF MAIZE (*Zea mays* L.) SEEDS ON PLANTULE GERMINATION AND GROWTH

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Maize (*Zea mays* L) is a social and economically relevant culture for settlers in Jujuy's Andean valleys. The aim of this work was to evaluate morphological alterations in Capiá Blanco maize (*Zea mays* var. Starchy) fresh and aged seeds inoculated with two growth promoter pseudomonas strains to determine the vigor and viability of the seeds. The samples used were seeds stored from 6 months to 1 year and recently harvested seeds. The following treatments were used: control (seeds without inoculation), T 1 (0.5ml/100g of seeds of the H6 strain) and T 2 (0.5/100g of seeds of the H6 strain + D3). Storage time seems to be an important factor associated with germination and growth since influence was found on the characteristics assessed. Germination and growth in plants inoculated with T1 were higher. In view of the beneficial effect of storage time on fresh seeds and of inoculation with pseudomonas, these factors should be taken into consideration in future studies to obtain better performance in maize production.

83. SUSCEPTIBILITY OF ALABAMA ARGILLACEA TO PHYSIOLOGICAL INSECTICIDES IN COTTON CROPS

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One of the main reasons for yield reduction in cotton crops is the complex of insect pests in which the leafworm Alabama argillacea takes part. Its chemical control is usually performed with insect growth regulators (IGR) belonging to the chitin inhibition group. Several control failures were detected in crops, which led us to evaluate more accurately the efficacy of physiological insecticides in the control of this leafworm. The bioassays were conducted in the Plant Protection laboratory of the Faculty. Third instar larvae collected in the INTA-María (Silipica Department) were fed with chopped cotton leaves sprayed with the insecticide solution. Control larvae were fed with leaves sprayed with sterile distilled water. Treatments were Triflumuron, Lufenuron and Novaluron. Three different concentrations were used for each product, starting with the dose recommended by the manufacturer. Each treatment was conducted with 40 larvae placed in plastic cups containing the treated leaves for 48 hours. Later, they were changed to a medium with untreated leaves. Mortality was assessed 96 hours after application. The results obtained showed an efficiency of 40% for Triflumuron, 55% for Lufenuron, and 82% for Novaluron. These results show a change in susceptibility to the active substances tested.

84. EVALUATION OF STEM POPULATION IN SUGAR CANE TESTS USING MIXED MODELS

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Sugar cane residues after harvest can be left on the ground or be eliminated by means of fire. The latter should be avoided for environmental reasons. The aim of this work was to evaluate the effect of keeping residues on the population of stems of the sugar cane variety LCP85384. Treatments were compared with and without residues. We worked in macro parcels, each with 5 furrows of 30 m. All the stems in 10 m in the three central furrows were counted, totalizing 30 m. The stems in twelve equidistant observations in time were counted. Generalized linear models were used with Poisson's distribution analysis. Deviance values were high since the data showed great variability. Random effect was incorporated and quasi-probability was used for residues. In this way, a decrease in variability was observed. The results showed a homogenous number of stems with both treatments. Significant differences were found in the different observation dates, interaction between treatments and dates not being significant. We may conclude that variety LCP85384 has the same amount of stem production with both treatments.

85.

SELECTION OF CELLULOLYTIC FUNGI IN AGAR MEDIUM SUPPLEMENTED WITH POST-HARVEST SUGARCANE RESIDUESMaza M¹, Romero E^{1,2}, Amoroso MJ^{3,4}, Yasem de Romero MG¹.¹Facultad de Agronomía y Zootecnia. UNT. F. Ameghino S/N.²EEOC. ³PROIMI-CONICET. ⁴Facultad de Bioquímica, Química y Farmacia. UNT. Tucumán. Argentina.

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An alternative to avoid the use of fire in sugarcane crop is the use of fungi that penetrate and degrade cellulose substrates. The aim of this paper was to evaluate potential cellulolytic fungi in agar medium supplemented with post-harvest sugarcane residues (RAC) as the sole carbon source using the diffusion plate assay. Discs of *Fusarium* (FUS), *Trichoderma* (TRI), *Penicillium* (PEN), *Bipolaris* (BIP), *Rhizoctonia* (RHI) and *Alternaria* (ALT) were placed individually on RAC agar. A standard cellulase solution was used as control. The diameter of each colony and cleared zone was recorded using Gram's iodine. Index of Relative Enzymatic Activity (I_{RAC}) was calculated as clear zone diameter/colony diameter. In addition, cellulase activities were expressed as the total surface of clearing zone in mm². The clearing zone produced in RAC agar evidenced cellulases secretion. $I_{RAC} \geq 1$ was determined for ALT1.21, PEN2.12 and RHI2.14. Standard cellulase clearing zone was 273 mm². FUS4.1 developed a higher clearing area than control, but FUS2.5 did not show this behavior. ALT1.21, RHI2.14 and BIP2.7 produced a smaller clearing surface but PEN2.12 increased 17.7% compared to the control. *Trichoderma* strains grown on complex medium showed highest activity.

86.

INCIDENCE OF PATHOGENS ON SOYBEAN SEEDS FROM DIFFERENT CULTIVARS IN THREE CYCLES IN TUCUMÁN, ARGENTINA

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The aim of this study was to evaluate pathogen incidence on soybean seeds from five cultivars (DM 5.5 RR, A 8000 RR, DM 8002 RR, Munasqa RR, A 6401 RG) from EEOC in three localities (Monte Redondo, La Cocha and La Cruz) in the province of Tucumán during three cycles (2006/07, 2007/08, 2008/09). Ten seeds were sown in Petri dishes with APG 2% and 25% lactic acid after surface disinfection, using a totally randomized design with ten replications per treatment. Incubation was at 25-28°C with a 12-hour photoperiod. Identification and counts were performed after seven days. In 2006/07 there was a greater incidence of *Fusarium* spp in all cultivars in La Cruz and *Phomopsis* spp was present in all cultivars in La Cocha, although with low levels. In 2007/08 *Fusarium* spp was present in the three localities, showing higher incidence in La Cruz and La Cocha. The 2008/09 cycle was characterized by the reduced presence of fungi in general and the high incidence of bacteria in five cultivars and in the three localities. *Fusarium* spp was the pathogen most frequently isolated in the 2006/2007 and 2007/2008 cycles, especially in La Cocha and La Cruz. Results showed that Munasqa, A8000 and DM5.5 cultivars were the ones with the best health in three cycles and in the three localities.

87.

VERMICOMPOST EVALUATION IN THE GERMINATION AND GROWTH OF *Solanum lycopersicum* L

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The production of tomato (*Solanum lycopersicum* L.) in protected conditions increases the performance and the quality of fruit. Vermicomposts meet the nutritional demands of horticulture and significantly reduce the use of synthetic fertilizers. The aim of this work was to evaluate the effects of three vermicomposts obtained using cow, horse, and hen manure on different germination and growth parameters of *Solanum lycopersicum* L. Manure was mixed with black soil at the following ratios: T1: 0% worm humus + 100% land; T2: 50% worm humus + 50% soil, and T3: 100% worm humus + 0% soil. Seeds of *Solanum lycopersicum* L were sown on trays that were placed under controlled light and humidity conditions. Seeds were counted after 5 days of the beginning of the treatment and leaf and root length were measured after 21 days. The results obtained indicated that in hen, horse and cow vermicompost, in that order, positive effects were found in the germination and growth of *Solanum lycopersicum* L.

88.

EFFECT OF NUTRITION MANAGEMENT ON THE DEVELOPMENT OF BLOOD VESSELS IN GOAT PLACENTA. A PRELIMINARY STUDYConiglio MV¹, Romanini MC², Turiello MP¹, Mgrtis MC³, Pastorino P¹, Rolando A².¹Animal Nutrition. FAV. UNRC. ²Cell Biology and Embryology. FAV. UNRC. ³Electron Microscopy. FAV. UNRC.

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Maternal nutrition affects not only the development and growth of the offspring but also the development of the placental vascular bed. The aim of this work was to study the effect of food restriction and monensin supplementation on the development of blood vessels in placentas at term. 19 Anglo Nubian goats were assigned to one of 3 groups: control (C: *ad libitum* fed, n = 5), restricted (R: 55% of intake for C, n = 7) and monensin (M: R + 12.5 mg / an / day of monensin, n = 7). At delivery, the placentas were collected and processed by conventional histological techniques. Five fields were taken at random from three cuts of each of the 19 placentas obtained. Morphometric variables were evaluated: perimeter and area of blood vessels using the AxioVision software Release 4.6.3 and statistical analysis was performed using ANOVA. Vessel perimeters were higher in M with respect to C and R (45.9 ± 21.78, 53.1 and 48.2 ± 28.75 ± 30.18 μm for C, M and R, respectively). Area did not differ between groups (171.4, 176.39 and 193.5 μm² for C, M and R, respectively). These results indicate that dietary supplementation with monensin would support an increase in blood vessel perimeter.

89. CYCLIC VOLTAMMETRIC ESTIMATION OF OXYGEN CONSUMPTION BY OVARIAN FOLLICLES

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In this work we explored a fast alternative method to assess concentration and cellular activity of ovarian fully grown oocytes as a function of oxygen consumption. In previous works a variation in oxygen consumption by ovarian *Bufo arenarum* oocytes was detected during the reproductive period [L. Zelarayán *et al.*, (1997)]. The experiment was carried out in a conventional three-electrode cell with a gold rotating disc as the working electrode. An electrochemical workstation Zahner IM-6 was the instrumentation used for this application. The voltammetric response was recorded at fixed time intervals of 1, 2 and 3 hours with a sample of ovarian follicles (kindly provided by Dr. L. Zelarayán) in Ringer's solution prepared with Tris-buffer. Voltammograms were recorded for 100, 200 and 300 ovarian follicles at different times by employing triangular potential sweeps between preset cathodic ($E_{s,c} = -0.8$ V) and anodic ($E_{s,a} = 0.9$ V) switching potentials run at 0.100 V s^{-1} . During the negative sweep the oxygen was electroreduced following a reaction that could be associated with a peak at -0.3 V. The peak current values decreased according to the variation in oxygen consumption.

90. DESIGN AND FORMULATION OF FUNCTIONAL FOODS

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Global trends indicate a growing consumer interest in foods that benefit physiological functions. Enriched foods are those to which essential nutrients are added in order to solve dietary deficiencies. 42% of the population in Argentina suffer from iron deficiency anemia. The aim of this work was to design and formulate functional foods for the prevention and treatment of nutritional deficiencies caused by iron deficiency. Sugar was used as a vehicle for inorganic and organic iron salts. Several alternatives were designed to formulate the functional foods. Iron micronutrient was added according to the required daily intake. Formulations were studied for iron bioavailability, product stability (solubility, light and temperature) and sensory tests. Seven formulation alternatives were studied; 3 of them were selected to be potentially added to sugar. The enriched functional food formulated with iron mineral salt showed that it regained its organoleptic properties for a year (the iron micronutrient added did not modify the sensory properties); it was stable during preservation and storage and did not undergo granulometry stratification. It maintained high iron bioavailability, which ensured proper assimilation and fast uptake by the organism. The functional food designed is helpful for the prevention and treatment of iron micronutrient deficiency diseases, especially facilitating iron intake by different age groups suffering from iron deficiency anemia.

91. IN VITRO ESTABLISHMENT OF YACON (*Smallanthus sonchifolius*)

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Smallanthus is an American genus with the ability to store Fructooligosaccharides in its tuberous roots. Commercially it is propagated clonally, resulting in the frequent spread of systemic diseases that affect crop productivity. *In vitro* propagation potentially ensures rapid and mass multiplication of genetically uniform individuals free of pathogens. We used leaf explants disinfected with 70% ethanol and 1.2% sodium hypochlorite in association with ascorbic acid and biocides (such as agrimycin and benomyl), testing different concentrations and times. IAA, NAA, IBA and 2,4-D were used to stimulate explants growth. Explant infection ranged from 16 to 40% of explants depending on treatments. The lowest rates of infection were obtained with the combination with ascorbic acid. However, this increased the oxidized explants number. The biocides used reduced the infection rate when applied before the surface disinfectants. All 2,4-D levels produced calluses in the clones tested. NAA and IBA induced callus in a smaller proportion, but with roots organogenic production. IAA showed no response. The observed hormone responses varied depending on the clones used.

92. REMOVAL OF NICKEL IONS BY *Aspergillus niger* FROM AQUEOUS SOLUTIONS

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Industrial activity produces effluents that contaminate the environment with heavy metals such as Ni²⁺. There are different physical-chemistry methods to remove the metal, but the use of microbial biomass is a technological alternative of low cost and easy application. The objective of this work was to use *A. niger* to remove nickel ions from an aqueous solution. The medium containing glucose (1%) plus inoculum with 2×10^6 conidia/ml of *A. niger* was used. We studied different pH values (4.5 and 5.5) and concentrations of Ni²⁺ (1.5 and 3.0 mg/l). The assays were carried out in a rotary shaker at 28°C, 200rpm, for 96 h and we used a control without Ni²⁺. Fungal biomass was determined by drying at 105°C and Ni²⁺ concentration was assessed by atomic absorption spectroscopy. The results showed that at pH 4.5 *A. niger* removed 63.3 and 66% of Ni²⁺ from the culture media corresponding to concentrations of 1.5 and 3.0 mg/L Ni²⁺, respectively. In contrast, bioremediation was lower at pH 5.5 (60 and 16.7%). Finally, *A. niger* is capable of removing Ni²⁺ from an aqueous solution at pH 4.5.

93.

PRODUCTION OF NARINGENIN BY *Aspergillus niger* AND WITH PARTIALLY PURIFIED NARINGINASE*Rubio C, Alurralde T, Suárez S, Navarro A.**Instituto de Biotecnología, Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. 4000 Tucumán. Argentina. E-mail: m1rubio25@hotmail.com*

Naringenin is important in the pharmaceutical industry by its anti-oxidant characteristics. Enzyme production has a 100% yield, but its disadvantage is the high cost of purification of the enzyme. One alternative is to use a microorganism that hydrolyzes naringin and assimilates the sugars of the medium to facilitate purification of the flavonoid. The aim of this work was to compare the yields of naringenin production by *A. niger* and partially purified naringinase. In assay N°1: *A. niger* was previously cultivated for 24h in a medium with lemon pulp at 30% (w/v). Assay N°2: Naringinase was precipitated with 50% (NH₄)₂SO₄ and resuspended in acetate buffer (0.2M). The assays were carried out in a reactor with naringin solution (5 g/l) at pH 4.5 at 30°C and 250 rpm. Reducing sugars (Somogyi), total flavonoid (Davis, 1947), naringin and naringenin (Habelt, 1983) were determined. In the assays using *A. niger* we obtained a yield of Yp/s= 0.40 g/g, productivity Pd=0.1 g/lh and efficiency = 85% after 24 h of incubation, similar to the results found with naringinase (Yp/s=0.45 g/g; Pd=0.12 g/lh and Ef= 94%), the last being 9.5% higher with respect to the one obtained with *A. niger*. In conclusion, the use of *Aspergillus* will lower the purification cost of naringenin.

94.

RECOVERY OF CARIOGENIC MICROORGANISMS IN DIFFERENT PRESERVATION MEDIA*Torres S, Gutiérrez de Ferro M, Gutiérrez S.**Microbiology Dept. School of Dentistry. UNT. Av. B Araoz 800. 4000 Tucumán. Argentina. E-mail: mgferro58@gmail.com*

Oral ecosystems are colonized by a large number of microorganisms, some of them related to dental caries, e.g. *Streptococcus mutans*, *Streptococcus sobrinus*, *Lactobacillus casei*, *Candida albicans*, *Actinomyces viscosus* and *Actinomyces naeslundii*. The techniques for the preservation of these microorganisms are complex. The aim of this study was to compare different preservation media to keep these organisms viable and determine which of them affords greatest recovery. The strains studied were *S. mutans* (Sm), *S. sobrinus* (Ss), *L. casei* (Lc), *C. albicans* (Ca), *A. viscosus* (Av) and *A. naeslundii*. Preservation media tested were: saline (SF), Skim Milk Medium without glycerol 20% (LD 20% s / g) and Skim Milk Medium with Glycerol 20% (LD 20% c / g) kept at -70° C. The viable cells were determined by agar plate count. The results were expressed in Log CFU / ml. **Results:** 1) The number of viable cells recovered from Sm, Ss and Lc after 3 months was significantly higher in LD 20% s / g; 2) The best recovery of Ca was in the LD 20% c / g; 3) for An and Av there was a significant recovery in LD 20% s / g and c / g. **Conclusions:** We propose LD 20% s / g as a preservation media for Sm, Ss, Luke, An and Av, while Ca recovered better in LD 20% c / g. The use of these preservation media, preserve viable strains for use as reliable inocula in essays.

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95.

EFFECT OF CORTISOL LEVELS DURING WEANING STRESS ON LYMPHOCYTE T PROLIFERATION IN PIGS WITH ANTIGENIC STIMULATION*Sacchetta R, Berardo D, Poloni L, Alustiza F, Vivas A, Ashworth G, Greco C, Gauna H, Rodriguez N, Mayer N.**Inmunología y Fisiología Animal. UNRC. Ruta 8 Km 601. Río Cuarto. Córdoba. E-mail: nmayer@exa.unrc.edu.ar*

Stress causes alterations in the hypothalamic-pituitary-adrenal (HPA) axis and in innate and adaptative immunity. Stress is one of the factors that generates important economic losses associated to infections in intensive piggy systems.

The objective of this work was to investigate the effect of weaning stress on plasma cortisol levels and its influence on lymphocyte proliferation at 14 days of age of vaccinated and control mothers. Blood samples from pig offspring were taken before, during, and after weaning to measure plasma cortisol levels. Mononuclear cells were collected for use in lymphocyte proliferation assays. Plasma cortisol levels during weaning increased significantly (10.77 ± 0.94) compared with the preweaning group (1.39 ± 0.24). These levels remained for 24 hours after weaning. The offspring not vaccinated post-weaning (NV-POST) group showed a significant decrease (26862 ± 5063) in lymphocyte proliferation compared with the vaccinated post-weaning (V-POST) group (44828 ± 7582). In conclusion, in post-weaning, stress increases plasma cortisol levels, which would decrease the functional response of cellular immunity.

96.

SERUM IgG IN POST-WEANING PIGLETS AND ITS RELATIONSHIP WITH THE PASSIVE TRANSFER OF COLOSTRAL IMMUNITY*García G¹, Rodríguez N², Ashworth G², Berardo D², Alustiza F³, Mayer N², Vivas A³, Greco C¹.**¹Inmunología, ²Fisiol Animal, e ³Histología UNRC. E-mail: cgreco@exa.unrc.edu.ar*

Post-weaning is a critical period in porcine production because piglets cannot successfully resolve infections and depend on colostrum ingestion. The aim of this work was to determine the levels of IgG in colostrum and serum of post-weaning piglets and its relationship with the transfer of passive immunity. The study was carried out on 50 piglets born from 10 mothers (5/litter) Large White x Landrace housed in an intensive indoor system. Sows were divided into two experimental groups: vaccinated (n=5) and non-vaccinated (n=5). The piglets were weaned on day 14 of life and post-weaning blood samples were obtained (22 days old). A quantity of colostrum was manually and aseptically collected within the first 24 hours after delivery and centrifuged at 18,000 rpm for 90 min at 4°C to remove the fat fraction. Total IgG in serum and colostrum was measured by Pig IgG ELISA (Bethyl Laboratories Inc.USA). Colostral IgG was similar in both groups of sows, whereas the levels of IgG in serum of piglets born from vaccinated sows (13.004 ± 3.53 mg/ml) was significantly higher ($p < 0.05$) than in piglets born from non-vaccinated sows (8.209 ± 2.226 mg/ml). Our results showed that immunostimulation of the sows could improve the quality of colostrums, allowing IgG levels in piglet serum to remain high for a longer period.

97. ANTIALLERGIC AND IMMUNOMODULATING EFFECTS OF *Arnica montana*

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The flowers of *Arnica montana* (*Am*) family Compositae (Asteraceae) have anti-inflammatory properties and stimulate phagocytosis, increasing oxygen and nitrogen reactive intermediaries. Our objective was to determine whether *Am* had antiallergic and immunomodulating properties. The cells of 11 allergic patients and 8 controls, aged 5 to 45 years old, were evaluated. Basophils and mononuclear cells of peripheral blood (PBMC) were isolated with Histopaque 1119/Histopaque 1077. Basophils were challenged with allergen or *Am* or the allergen plus *Am*. Enzyme β -hexosaminidase (BH) released was evaluated by EIA. PBMC were cultured without stimulus or with PHA or the allergen or *Am*, or the allergen plus *Am*. The colorimetry test with Vybrant® MTT Cell Proliferation Assay Kit USA equipment was performed. Basophils with allergen reached higher BH indices than without stimulus: $p < 0.0001$. BH release by the allergen was inhibited by *Am* $p < 0.01$. Proliferation indices (IP) were similar with PHA or *Am* in allergic patients and controls. *Am* reduced the IP reached by the allergen to the IP without stimulus. *Am* inhibited BH liberation produced by the allergen, stimulated the proliferation of the PBMC and modulated the proliferation induced by the allergen, demonstrating *in vitro* antiallergic and immunomodulating effects.

98. POTENTIALLY TOXIGENIC FUNGI ISOLATED FROM PAPRIKA SAMPLES IN SANTA MARIA, CATAMARCA PROVINCE, ARGENTINA

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Paprika has been reported as one of the most susceptible spices to contamination with carcinogenic mycotoxins such as aflatoxins and ochratoxin A (OTA). These secondary metabolites are produced by species of *Aspergillus* frequently isolated from vegetable foods. There are not data on mycotoxin contamination in Argentinian paprika. The aim of the present study was to study the mycobiota present in paprika samples (*Capsicum annum* L.) from Catamarca Province, Argentina, with special interest in potentially toxigenic fungi.

Six samples from four different producers from Santa María Department were analyzed by the dilution method using 5 Petri dishes with Dichloran 18% Glycerol Agar. The strains were isolated in Malt Extract Agar and the genera recognized as potentially mycotoxigenic were identified down to the species level.

Predominant genera in the mycobiota were *Aspergillus* (52%), *Cladosporium* (14%), *Rhizopus* (11%), *Alternaria* (10%), *Penicillium* (7%) and *Eurotium* (7%). *Aspergillus niger* (678 cepas) was the main species isolated and represented 90% of the *Aspergillus* strains. This species is capable of producing OTA. The presence of moulds capable of producing mycotoxins in this product should be considered as a potential hazard for public health.

99. INFLAMMATORY TINEA CAPITIS BY *Trichophyton tonsurans* DERMATOPHYTES

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Dermatophytes are keratinophilic and keratinolytic fungi that cause lesions in skin and its annexes in animals and man. *Trichophyton tonsurans* is an anthropophilic fungus, highly contagious, of rare presentation in our environment. Infection is acquired by interpersonal contact. Noninflammatory ringworm occurs in children and adults. Very rarely, it causes highly inflammatory reactions and suppurative ringworm of the scalp (Celsi kerion) associated with immunocompromised states. Kerion is caused by zoophilic dermatophytes. It represents an exaggerated host immune response to the presence of the fungus. This paper presents a case of *T. tonsurans* Kerion in a 4-year-old non-immunocompromised patient living in a rural area in the province. This is the first local case of inflammatory tinea capitis caused by this agent. The purpose of this was to demonstrate that *T. tonsurans* can cause Kerion not associated to immunocompromised patients. The diagnosis was made by observation of spores of the fungus in scalp hair and isolation in Sabouraud agar medium with yeast extract, morphological studies and physiological properties. The strain was identified as *T. tonsurans* sulfureum variety. Furthermore, it shows its existence in the medium, which requires immediate diagnosis of the diseases caused by it and increased hygiene and disease control to prevent the spread of the fungus.

100. PREVALENCE OF HUMAN FASCIOLIASIS IN AN ENDEMIC ZONE OF WESTERN CATAMARCA

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The aim of this study was to determine the prevalence of fascioliasis in humans living in an endemic area of western Catamarca. We studied samples (n=51) in the towns of Medanitos and Taton, north Fiambalá Valley, including people of both sexes and different age groups. All agreed to be assessed with written consent and minors signed parental consent in June 2010. Sera were analyzed with ELISA using the antigen of the parasite protein rproCL1 to evaluate the detection of anti-Fh at the Institute Malbrán and liver function laboratory of the San Juan Bautista Hospital. The samples belonged to 19 men and 32 women aged between 3 and 69 years of age. The ELISA technique revealed eight (15.68%) positive cases. Six were female and two males, including a child. The results of liver function evidenced a very high presence of direct bilirubin and alkaline phosphatase, these being the most important findings, with 23 (45.09%) and 21 (41.17%) sera respectively. An increase in total bilirubin was found in eight (15.68%) people and moderate increase in liver enzymes, GOT in four (7.84%) and GPT in two (3.92%). Fascioliasis constitutes an important health problem in the studied zone and our findings reflect a hyperendemic infection by *Fasciola hepatica*.

101. HUMAN PAPILLOMAVIRUS GENOTYPES OF HIGH-RISK (HPV-HR) 16, 58 and 31 IN VALLE DE TAFÍ

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Infection with oncogenic human papillomavirus (HPV) types is a necessary cause of cervical cancer, the second most frequently occurring cancer in women worldwide. HPV-DNA is found in approximately 12% of all human cancers. Genital HPV types have been subdivided into low-risk types and high-risk types, which are frequently associated with invasive cervical cancer. The aim of this study was to evaluate the prevalence of human papillomavirus (HPV) in women living in Valle del Tafi, Argentina. A structured questionnaire collected information on risk factors for HPV infection and cervical cancer (according to IARC-WHO). Fresh cervical specimens from 84 patients were collected. Detection and typing of the viral DNA genome was performed by polymerase chain reaction, combined with a restriction fragment length polymorphism assay (PCR-RFLP). HPV DNA was detected in 44% of the clinical samples. The most common viral types in the infected population were HPV 16 (33%), HPV 58 (8.3%) and HPV 31 (5%). This research may be useful to select a specific vaccine targeting the population examined.

102. IDENTIFICATION OF FUCOSE IN THE INTESTINAL TRACT OF ÑANDÜ (*Rhea americana*)

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The ratite industry has reached different degrees of development in many countries of the world. Numerous studies have been carried out on ratite feeding and diet. It is believed that the glycoconjugates that include carbohydrate molecules in their structure play an important role in the feeding process. The aim of this work was to identify fucose in the intestinal tract. Nandus from the Aimar meat processing plant in Río Cuarto were used. Samples of the small and large intestine were extracted and fixed in formalin and included in paraffin. Fucose determination was carried out by means of the lectin histochemistry technique. For detection and later development we used complex ABC and DAB. The data obtained were the following: in the small intestine, a moderate to intense reaction was observed in the brush border; weak reaction in enterocytes and negative reaction in goblet cells. No reaction was observed in the large intestine. In conclusion, fucose was identified only in the small intestine, mainly in the brush border of the ciliated epithelium.

103. PROGNOSIS FACTORS IN AN EXPERIMENTAL M3 ADENOCARCINOMA MODEL TREATED WITH IMMUNOPREVENTION AND CYTOSTATICS

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Introduction: Nottingham Prognostic Index (NPI) based on tumoral size (TS), histological grade (HG) and lymph nodes state (LN) is useful for prognosis in different tumors. **Objectives:** To analyze HG by means of quantitative tumoral necrosis (TN), mitotic index (MI) and nuclear area (NA) in a non-metastatic experimental M3 murine mammalian adenocarcinoma treated with immunoprevention and cytostatics. **Material and Methods:** Female Balb C mice were inoculated on day 1 with tumor cells and separated into 4 groups: Vaccine Group (VG) received 5 doses of IM vaccines (V). Doxorubicine Group (DG) received IV cytostatic on days 3 and 10. Doxo Vaccine Group (DVG) received Doxorubicin (D) on days 3 and 10 plus 5 doses of IM Vaccine. The remaining group (CG) was used as a control. Mice were sacrificed on day 21. TN related to total tumoral area (TN/TTA) was measured in 100x 5 microscopic screening (MS). MI was calculated on 400x 10 MS. NA was estimated in 30 randomly selected nucleuses in 400x 10 MS. **Results:** there was a statistically significant diminution in TN and NA in all treated groups when compared with CG (TN $p < 0.001$; NA ($p < 0.05$), but not in MI ($p = 0.137$). **Conclusion:** The diminution in the Nuclear Area in treated groups (as a pleomorphism indicator) could be correlated with a less aggressive behavior of the tumor related to cytostatic and vaccine treatment.

104. MICROHARDNESS OF THE TYPES OF ENAMEL IN POSTERIOR HUMAN TEETH

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The type of radial enamel with parallel prisms presents high abrasion resistance. However, the microhardness of the enamel types has not been studied although it is in direct relation to wear resistance. The aim of this study was to relate microstructure of human dental enamel with biomechanics function. Six premolar crowns PM and six inferior molar crowns M were sectioned, included, ground, etched with acid and metalized to be observed with a Scanning Electron Microscope. The micrographs were taken from the vestibular cusps CV and lingual CL, in the external third (A) and in the internal third (B). Microhardness was measured in (A) and (B) with Vickers penetrators, loads of 100 g for 5 min. In both cusps of PM we observed in (A) radial enamel, irregular enamel in (B); the mean of microhardness ($Hv_{100} = V_k$): CV (A) 314.9; (B) 309.6; in CL (A) 326.9; (B) 312.3.) In M in CL in (A) radial enamel, (B) irregular; in CV in (A) radial enamel, (B) with bands; microhardness CV (A) 390.8; (B) 326.31; in CL (A) 380.59; (B) 316.27. Radial enamel and the highest values of microhardness in the outer zone of the cusps constitute biomechanics wear adaptation.

Keywords: enamel – biomechanics - microhardness - wear

105. PANORAMIC TECHNOLOGY STANDARDIZED FOR BONE EVALUATION OF THE MAXILLARY SINUS

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The planning and diagnosis for surgical insertion of implants requires the study of the bone anatomy of the maxillae, of their air cavities and of the neurovascular conduits. The primary method towards this end is Panoramic X-ray photography. The reading and interpretation of the images obtained is fundamental for the success of the treatment. Since in the image obtained the relationship between the distances area - object and object - film are not the same at all points, different factors of magnification and distortion appear that prevent the correct relationship between the anatomical structures considered. The aim of this work was to standardize the techniques for the obtainment of panoramic X-ray photographs to acquire their degree of distortion in the sinus sector of the facial clump compared to the dry bone. We used 50 crania obtained from the Osteoteca of the Faculty of Odontology. The results demonstrated a statistically significant magnification for this sector of the facial clump. We may conclude that, given the magnitude of the distortion found, some kind of "tutor" or known measurement reference would be necessary for the arithmetical calculation of the real measures of the elements to be analyzed.

106. EXPERIMENTAL MODEL OF HEPATIC STEATOSIS: HISTOLOGICAL ALTERATIONS IN LIVER

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Hepatic steatosis is a disease characterized by lesions similar to those produced by alcohol. This study evaluated whether a high fat diet (experimental group N: 10 - male and female mice) induced hepatic alterations compared to a standard chow diet (control group N: 10 - male and female mice). Both groups were fed for 20 weeks. Mice were sacrificed to remove liver. Fixed livers were paraffin embedded and stained with haematoxylin and eosin and Gallego's trichrome. Histological samples were observed using optical microscopy. The experimental group showed micro- and macrovesicular steatosis, infiltration by neutrophils and mononuclear cells associated focal necrosis, cytoplasmic inclusions and Mallory's hyaline. The control group showed no histological alterations. In conclusion, our results showed nonalcoholic steatohepatitis in mice fed a high fat diet.

107. SPECTRAL KARYOTYPING OF HUMAN CHROMOSOMES

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Introduction: Spectral Karyotyping (SKY) is a molecular cytogenetics technique that enables the simultaneous visualization of all human chromosomes in different colors. The aim of this study was to optimize the SKY technique. **Method:** We analyzed metaphases of human lymphocytes. The chromosomes were denatured separately from the probe by heating the sample in a hot formamide solution, while the specific chromosome probes were denatured in a hot bath. We added the denatured SKY reagent to the denatured chromosome preparation and placed them in an incubator for 48 hs to allow hybridization. Then, we proceeded to the detection of the probes using antibodies labeled with Cy5 and Cy5.5. For contrast staining we used DAPI. The samples were studied in the epifluorescence photomicroscope Olympus BX61 from the Microscope Spectral Station, fitted with an interferometer head and with the SKYView software of ASI. **Results:** We were able to visualize the human chromosomes, each with a different color, to karyotype them automatically, to give a pseudocolor to each chromosome based on spectral analysis and to edit the images to optimize the reports. **Conclusion:** We were able to visualize, automatically classify, pseudocolor and identify unambiguously members of each of the 23 pairs of human chromosomes.

108. ANATOMY AND MORPHOLOGY OF *Cheilantes pilosa* (PTERIDACEAE)

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Cheilantes pilosa Goldman is a cheilanthoid fern that can be found from Perú to Argentina between 1500 and 4000 m a.s.l. In Argentina it grows on rock ledges, cliffs, canyon walls and in rock cavities in the northwestern and central regions. The aim of this work is to analyze its anatomy and functional morphology. Frond diaphanization, free hand sections and specific staining were used. Stomatic index, size and frequency were calculated for 11 individuals collected in El Infiernillo, Tucumán. Creeping rhizome with narrow scales. Fronds 8-30 cm terete and pilose petiole. Bipinnate fronds. Adaxial epidermis with sinuous cell walls and abaxial isodiametric cells with lobulated walls. Fronds covered with 1-5 cell glandular trichomes with globose head. Hipostomatic lamina with anomocytic stomata of 38.83 μm x 30.91 μm . Stomatic index 18.87; frequency 78 stomates/mm². Lobulated reflex margin with rectangular cells and trichomes. The mesophyll has 2-3 layers of palisade and 4-6 of spongy parenchyma with protostelic vascular bundle. Petiole has a protostelic vascular bundle with V-shaped xylem. Soleno-dictiostelic rhizome. Adventitious roots with primary diarch structure with sclerenchymatic cortex surrounding the vascular cylinder. Anatomical and morphological characters that allow the survival of this species, reducing water loss, are discussed.

109.

FOLIAR ANATOMY OF *Boehmeria caudata* (URTICACEAE) IN THE PROVINCE OF TUCUMÁNFernandez RD¹, Cabrera CN¹, Albornoz PL^{1,2}, Arias ME¹.¹Facultad, UNT. ²Fundación Miguel Lillo. Miguel Lillo 205. 4000. Tucumán. E-mail: arias@csnat.unt.edu.ar

Boehmeria caudata Sw. is a native Argentine species (Zuloaga *et al.*, 2009). It is a tree of 1.20 to 5 m high, elliptic-ovate, 3-nervate, opposite leaves, pubescent with punctiform cystoliths (Soraru, 1972). The aim of this work was to analyze the foliar anatomy of *B. caudata* in the province of Tucuman. The material was treated using conventional techniques (D 'Ambrogio de Argüeso, 1986). The foliar blade is simple, asymmetric base, attenuated apex, dentate-serrate margin, acrodromous venation, pentagonal areola. The epidermal cells are polyhedral with straight walls on the adaxial surface and lobed walls in the abaxial epidermis. Stomata anomocytic and anisocytic. Trichomes on both surfaces: eglandular unicellular with a straight or curved apex, and glandular hair with 2-4 cells in the head. In cross sections the blade is dorsiventral, hipostomatic, both epidermis and palisade tissue unistrate; 3-4 layers of spongy tissue. Spherical cystoliths in the adaxial epidermis. Primary vascular bundles are collateral. Petiole is circular to subcircular with trichomes similar to the ones in the blade; unistrate epidermis, thin cuticle, subepidermal collenchyma, 5 collateral vascular bundles. The diagnostic value characters that can be used for identification of *B. caudata* are leaf architecture, stomata, trichomes, cystoliths and crystals types.

110.

ENZYMATICALLY SYNTHESIZED ESTERS USED AS BIODEGRADABLE COVERS FOR STRAWBERRIESColqui Garay M¹, Llanos C¹, Escordamaglia S¹, Di Bacco V¹, Genta H^{1,2}, Albarracín P¹.¹Dep. Ing. de Procesos y Gestión Industrial, Fac. C. Exac. y Tecnol., UNT. ²Fac. Bioq., Qca. y Farm., UNT.

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Strawberries represent 0.1% of the fruit consumed in Argentina. Tucumán is the second national producer. The problem of strawberries storage is the weight loss by sweating, with alterations in texture, flavor and nutritional value. In this paper glycerol esters (synthesized by enzymatic methods) used as biodegradable covers for fruit were studied. Weight loss, soluble solids (Bx%) and maturity index (% sugar/acidity) were determined. *Fragaria x ananassa* Duch *Camarosa* strawberries were selected by color and size. They were washed in chlorinated water and dried. Samples were treated: (1) strawberries lots washed and air dried; (2) strawberries lots placed in aqueous solution of 2% glycerol esters and later dried. Lots were cooled to 2- 6°C for 15 days, simulating commercial cold chain conditions. Loss of weight of 35% in control and 15% in treated lots, Bx% of 12% in control and 8% in treated lots and maturity index of 14% in control and 6% in treated lots were observed at the end of the tests. These results suggest that glycerol esters would be an alternative treatment for the conservation of post harvest strawberries to diminish the quality losses that take place during storage and commercialization.

111.

VARIETY AND TRANSPLANT PROPAGATION SITE AFFECT EARLY STRAWBERRY PRODUCTIONBrandan Santana PC¹, Agüero JJ¹, Borquez AM², Salazar SM², Miserendino EE², Jerez EF², Larrouy JM¹, Salerno AC², Berra JL², Argente R², Reguilón C², Kirschbaum DS².¹Fac. Bioq., Qca y Farmacia UNT. Ayacucho 471. (4000) Tucumán.²INTA Famaillá. Ruta Prov. 301. Km 32. (4132) Tucumán. Argentina. E-mail: dkirschb@correo.inta.gov.ar

Strawberry (*Fragaria x ananassa* Duch.) production in Argentina is moving from a monovarietal to a multivarietal system. Variety and nursery location effects on early fruit production were studied. Tested varieties were 'Camarosa' (CR), 'Camino Real' (RE) and 'Ventana' (VE), propagated in El Maitén (Chubut-CH), Plottier (Neuquén-NQ) and Tafi del Valle (Tucumán-TV), with plants dug on Apr 12, 13 and 19 (2010), respectively. Experimental plots were established in Famaillá (Tucumán) for fruit production evaluation. Planting dates were April 17 (CH and NQ plants) and 19 (TV plants). The experimental design was completely randomized with 5 replications of 40 plants each. Fruit were harvested from Jun-30 to Aug-13. The most productive variety was VE (>150 g/pl), followed by CR (100 g/pl) and RE (70 g/pl). Regarding to plant origin, CH plants had the highest yield, followed by NQ. In conclusion, the three varieties are candidates to be included in a multivarietal production system, with VE as an early variety, CR intermediate and RE a late one, allowing the extension of the cropping cycle. An effect of the latitude on plant vigor was observed.

112.

FRUIT QUALITY OF NEW STRAWBERRY VARIETIES GROWN IN TUCUMAN, ARGENTINALarrouy JM¹, Jerez EF², Brandan Santana PC¹, Monserrat S³, Mocoora S², Kirschbaum SD².¹Fac. de Bqca, Qca y Farmacia. UNT. Ayacucho 471 (4000). Tucumán. ²INTA Famaillá. Ruta Prov. 301, Km 32. (4132) Tucumán.³Fac. de Agron. y Zoot. UNT. Av. Roca 1900. (4000) SM de Tucumán. E-mail: jealarrouy@hotmail.com

The recent expansion of strawberry (*Fragaria x ananassa* Duch.) varietal spectrum in Tucumán (Argentina) made it necessary to characterize the new cultivars in terms of fruit quality. Experimental plots were set in Famailla (Tucumán) during the first 2 weeks in April, 2010. Tested varieties were 'Camarosa' (control), 'Camino Real', 'Carmela', 'Elyana', 'Festival', 'Fortuna', 'Macarena', 'Palomar' and 'Sabrosa'. The experimental design was completely randomized with 5 replicates of 40-70 plants each. Samples were taken on July 14, August 8 and August 23, and consisted of 10 marketable fruits with $\geq 75\%$ red color. Measurements taken were fruit weight (Pi), total soluble solids (TSS), titratable acidity (A), pH, firmness (F), TSS/A or ratio (R) and red color luminosity (L) and intensity (I) of the juice. The variety with the best Pi and I was 'Macarena', with 32.03 g and 62.02 Chroma, respectively. 'Camarosa' had the highest F (3.04 N), 'Carmela' was rated first in TSS (10.4 °Brix), and 'Elyana' had the highest values of L (57.15), pH (3.61) and R (16.78). It is preliminarily concluded that the new varieties have better organoleptic characteristics than the control, although future studies should be performed to confirm these results.

113. EFFECTS OF CONVENTIONAL AND ORGANIC FERTILIZATION ON THE DEVELOPMENT OF MYCORRHIZAE AND MORPHOLOGICAL ASPECTS OF STRAWBERRY IN NURSERY PLANTS OF TAFÍ DEL VALLE, TUCUMÁN, ARGENTINA

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The aim of this study was to determine the effect of conventional and organic fertilization on mycorrhizal native and morphological aspects of strawberry plants, cv. Festival, in 2009/2010 in Tafi del Valle. The experimental design was randomized blocks with treatments: T1, Control, T2, Manure and T3, 130 UFN/ha⁻¹+159 UFP/ha⁻¹ and 5 repetitions. Samples were taken from roots preserved in 50% alcohol, treated with the method of Philips and Hayman discoloration and stained with triple Gueguen. In T1 we observed the presence of mycorrhizal fungal structures with three types of vesicles and hyphae morphology of different thickness and 50% colonization. In T2 we detected vesicles and hyphae were in rootlets at a lower percentage compared to the control with 20-30% of colonization. In T3 we observed the presence of vesicles and arbuscules and 10% colonization. The number of crowns per mother plant in T1 was 1.5 and 1.7 in T2 and T3. The amount of primary stolons in T1 was 3.6, 5.5 and 4.5 in T2 and T3. The number of runners per mother plant was 1.2 in control, 3.1 in T2 and 2.7 in T3. T3 had a lower incidence of *Micosphaerella fragariae*. Fertilization promoted greater production of plants but affected the decrease in the amount of mycorrhizal roots.

114. EFFECT OF ACETONE-WATER EXTRACT OF *Tibouchina paratropica* (Melastomataceae) ON MONO AND DICOTYLEDON SEEDS

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The aim of this work was to evaluate the influence of acetone-H₂O extract of the aerial parts of *Tibouchina paratropica* (Griseb) Cogn. (*Tp*) on the seeds of monocots *Triticum aestivum* L. (T) and *Panicum miliaceum* (P) and dicots *Lactuca sativa* L. (L) and *Raphanus sativus* (R) under controlled laboratory conditions. 20 seeds of each species were placed in Petri dishes containing aqueous solutions of 1000, 500 and 250 ppm of *Tp* extract included in soft agar. Tests were performed in triplicate. We evaluated % of germination (PG), weight (W), root length (LR), length of hypocotyl (LH) and cytotoxic effect on meristematic cells. Data were analyzed statistically. PG: no significant differences were found. LR: at 1000 ppm it decreased significantly in all species. LH: (P) showed a decrease at all concentrations; (T) (P) and (R) no significant differences were found between 500 and 1000 ppm or between control and 250 ppm, except for (P); (L) showed a decrease until 500 ppm. W: (L) decreased significantly at all concentrations, (T) decreased at 1000 ppm, (P) presented a significant weight loss up to 500 ppm, (R) decreased at 250 ppm and remained constant at higher concentrations. No chromosomal alterations were observed in meristematic cells. *Tp* extract showed a uniform decrease of seedling growth in mono- and dicotyledonous seeds.

115. SCREENING OF ANTIFUNGAL ACTIVITY IN NATIVE PLANTS FROM NORTHWESTERN ARGENTINA

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The aim of this work was to evaluate the antifungal activity of native plants from northwestern Argentina. Aerial parts of *Zuccagnia punctata*, *Larrea divaricata* and *L. cuneifolia* were collected in Tucumán. Plant material was extracted with water (infusion, decoction) and ethanol (tincture). Inhibitory activity of plant extracts was assayed on hyphal growth of *Fusarium verticillioides*, *F. subglutinans*, *F. thapsinum*, *F. bothii*, *F. meridionale*, *F. graminearum sensu stricto*, *F. oxysporum* and *Macrophomina phaseolina*. Extracts were diluted in agar-malt-peptone-sucrose. Dilutions of 0.1 to 1.6 mg ME/ml were placed on Petri dishes that were inoculated with the pathogens. Then, Petri dishes were incubated for 4 days at 30°C. Extracts from *Larrea* inhibited 100% mycelial growth of *F. subglutinans*, *F. thapsinum*, *F. bothii*, *F. meridionale* and *F. graminearum* at 0.8 and 1.6 mg ME/ml. *F. verticillioides*, *M. phaseolina* and *F. oxysporum* were less susceptible to these native plants. At the same concentration and plant species, tinctures inhibited fungal growth more than aqueous extracts. Extracts of *Larrea* showed a high antifungal activity and a selectivity that was dependent of the phytopathogenic species assayed. Tinctures were the most strongly bioactive. More work is needed to isolate and identify the active principles.

116. PHENOLIC COMPOUNDS, FLAVONOIDS AND PHENOLIC LIPIDS IN NATIVE ANACARDIACEAE FROM NORTHWEST ARGENTINA

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The aim of this work was to establish total contents of phenolic compounds, flavonoids and phenolic lipids in native species of *Schinus* and *Schinopsis* from northwestern Argentina. Leaves of *Schinus fasciculatus*, *Schinus gracilipes*, *Schinus molle*, *Schinopsis haenkeana* and *Schinopsis lorentzii* were sequentially extracted with dichloromethane (DcM), ethyl acetate (AcEt) and methanol (Met). Extracts were evaporated to dryness. Dry matter was determined and residues were dissolved in Met. Total contents of phenolic compounds (CFTs), flavonoids (Fs) and phenolic lipids (LFs) were determined by colorimetric reactions using Folin Ciocalteu, aluminum chloride and Fast Blue B reagents, respectively. p-coumaric acid, quercetin and orcinol were used as standards. CFTs of *S. haenkeana*, *S. gracilipes*, *S. molle*, *S. fasciculatus* and *S. lorentzii* participated with 70, 68, 45, 43 and 20% leaf ME (p/p), respectively. In each plant species, contents of Fs were always higher than those of LFs. Met extracted the highest levels of CFTs, Fs and LFs. *S. gracilipes* and *S. haenkeana* had the highest contents of Fs and LFs, respectively. Phenolic compounds were found at high levels in ME from leaves of most Anacardiaceae investigated. They may be involved in plant defense against microorganisms.

117. PROTOCOL TO IDENTIFY EIGHT POACEAS WEEDS OF EMERGENT IMPORTANCE IN ANNUAL CROPS IN TUCUMÁN

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Variations in productive regional models have brought about changes in weed control strategies. Weed success is based on the ability to survive herbicide control and culture practices. Roncaglia *et al.* (2005) registered surviving weeds of emergent importance in soybean crops in Tucumán. De Marco *et al.* (2007) studied 7 different emergent importance weeds. The aim of this paper was to create protocols to identify eight emergent importance Poaceas weeds in annual crops in Tucumán. We evaluated the exo-morphological, vegetative and reproductive characters of *Echinochloa colona*, *Leptochloa mucronata*, *Leptochloa virgata*, *Bromus catharticus*, *Trichloris pluriflora*, *Trichloris crinita*, *Urochloa lorentziana* and *Urochloa platyphylla*. The characters selected were radical system, stem type, nodes and internodes, spatial distribution in the field, sheath, foliate appendix and leaves. Total inflorescence, stalk, total and ramification length; elemental inflorescence, stalk articulated, n° of flowers, pedicel, antecius' characters, presence or absence of awn. Caryopsis. Biological cycle. We made 8 protocols for every species and 2 taxonomic keys using those characters. The proper identification of these weeds species will contribute to effective and successful strategies for their control in order to preserve crops.

118. DIFFERENT KINDS OF ORGANIC CARBON IN TWO TYPES OF SOIL CULTIVATED WITH SUGARCANE IN THE FLAT PLAIN OF TUCUMAN – ARGENTINA

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In Tucumán province, sugarcane planted area is about 217,000 ha. 50% of this area lies in the Flat Plain. This region has alluvial soils, spatially heterogeneous. Textures vary from sandy loam to clay loam. Among the chemical properties, organic carbon and its fractions are components easy to lose or decrease due to aggressive soil management. The aim of this work was to determine in soils with sugarcane and several textural classes fractions with organic carbon, as a key criterion to assess its store in the sugarcane production system. This experiment was carried out in Aquic Argiudolls (A) and Fluvacuentic Haplustols (B) soils. Mixed samplings were used at 0-2.5, 2.5-5, 5-10 and 10-20 cm soil depth. Total Organic carbon (TOC), Heavy Organic carbon (HOC) and Particulate Organic Carbon (POC) were assessed. There were no significant differences in the amounts of TOC in A, but the highest value of TOC was found in B. Mean values of POC were very similar to TOC in B; however, in A there were very important decreases in TOC with increasing depth. The reason for this could be the composition of the soil fraction. Values of POC were higher in A and lower in B. Results confirmed that the fine soil fraction has a higher carbon sequestration capacity and protects the more stable fraction.

119. FORMS OF POTASSIUM AND ITS RELATION WITH EDAPHIC PROPERTIES OF THE CHACOPAMPEANA PLAIN IN TUCUMÁN-ARGENTINA

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The forms of soil potassium are potassium solution (Ks), exchangeable (Ki), not interchangeable in interlayer spaces of secondary minerals (Kni) and structural (Ke) in primary minerals. The percentages of the reservoirs are 1-2%, 1-2%, 1-10% and 90-98% respectively. K availability for plants depends on the interaction between the forms. This interaction is governed by weathering, cation exchange, fixation and release. Availability index is usually Ki. The aim of this study was to determine the forms of potassium in the soils of the Chacopampeana plain and find the variables that explain its dynamics. Composite samples were taken at a depth of 0-40 cm. Granulometric fractions, cation exchange capacity (CEC), Kt, Kni, Ki, Ks were determined, Ke (Ke=Kt-Kni) and soluble potassium on the sum of soluble cations (KSR = Ks.SCS⁻¹) were estimated. For statistical analysis we subtracted Ki-Ks and Kni-Ki. % Ks was lower than 1%. The Ks was significantly correlated with silt (0.715**) and clay (-0.58*). Silt was the explanatory variable Ks and Ki. KSR was correlated with clay (-0.588*), CEC (-0.519*) and AMF (0.52*). Clay and Ki had a non significant fit. Increased Ki did not depend on changes in CIC. No explanatory variable was found for Kni or Ke. The low concentration of Ks could be explained because Ki is found in high affinity sites in clay. Ks and Ki depended on the percentage of silt, which releases into the soil solution the exchange potassium retained in less specific sites.

120. IMPROVING SUGARCANE GROWTH BY INOCULATING BACTERIA ISOLATED FROM SPORES OF ENDOMYCORRHIZAS

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Sugar cane requires large amounts of chemical fertilizers which are costly and can affect the environment. This has led great interest being shown in studying the symbiotic association between fungus and roots. This colonization of the roots is called mycorrhizae. Endomycorrhizas present different structures such as spores, vesicles, arbuscules and auxiliary cells. The spore can be found in the soil and inside the roots cells. The aim of this work was to evaluate the effect on sugarcane of the inoculation with bacteria isolated from spores. In the present study the spores were isolated from the rhizospheres of sugarcane plants, *Gigaspora* sp. and *Glomus* sp. being the two genera found. The bacteria were isolated by placing the spore into specific media. 15 strains were found. The genera *Burkholderia*, *Pseudomonas* and *Beijerinckia*. In order to observe the impact of microorganisms on sugarcane all the strains were used to inoculate, and the following growth parameters were analyzed: ramifications, number, length, diameter, and volume of roots. The strains that showed significant results were *Burkholderia*, *Beijerinckia indica* and *Pseudomonas fluorescens*. Our results demonstrated that these strains produce auxin, present a colonization of 10⁵ cfu/ml, and were found inside the spores.

121. STUDY OF DIFFERENT CRYOPROTECTANTS USED IN THE FREEZING OF *CHINCHILLA LANIGERA* EPIDIDYMAL SPERMATOZOA: INFLUENCE ON PHYSIOLOGICAL PARAMETERS AND SPERM QUALITY

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Chinchilla lanigera is a species of high livestock value. The aim of this paper was to study the effect on some physiological parameters of different protectors used in the cryopreservation of epididymal sperm in order to select the most appropriate one for this technique, affecting as little as possible the sperm quality of the samples. We worked with sexually mature adult specimens recently slaughtered. Sperm was obtained by tail epididymis puncture. The following were assessed: vitality, eosin test, membrane integrity by Hos test, fragmentation of DNA (acridine orange) and nuclear maturity (aniline blue). The acrosome reaction in capacitated sperm was induced with 20 μ M progesterone. The cryoprotectants used (Yolk Buffer Test® 20%, glycerol 6% + 62.5 mM sucrose, and 6% glycerol) were mixed with sperm suspension. The samples were centrifuged and pellets were frozen by vitrification with liquid nitrogen and thawed at 37°C. The results indicated that the Yolk Buffer Test affects motility and membrane integrity of spermatozoa to a lesser degree compared to glycerol and sucrose. With respect to vitality, no significant differences were observed among the cryoprotectants tested. Based on the above and on their possible application in breeding, the cryoprotectant of choice is the Yolk Buffer Test since it best preserved sperm quality.

122. HOT AQUEOUS EXTRACT OF *Achyrocline satureioides*: PRELIMINARY CYTOGENOTOXIC STUDIES

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The toxic effects of *Achyrocline satureioides* are little known. The aim of this work was to determine the cytogenotoxic activity of hot aqueous extract (HAE) of *A. satureioides*. Human lymphocytes were exposed to HAE (50-1000 μ g/mL) for 18-24 h. Cell viability was determined by trypan blue dye exclusion (TBDE) and MTT reduction. DNA fragmentation in agarose gel electrophoresis was analyzed. Genotoxicity was evaluated by micronucleus test. Balb/c mice were injected with HAE (500, 200 and 100 mg/kg), saline solution and cyclophosphamide as negative and positive controls, respectively. Bone marrow samples from animals sacrificed 24 h post-injection were fixed and stained. One thousand polychromatic erythrocytes (PCE) were counted to determine number of micronuclei (MN) and PCE/250 normochromatic erythrocytes (NCE) to calculate toxicity index (TI). Both methods demonstrated dose-dependent toxicity of HAE (CC_{50} =670 μ g/mL and CC_{50} >200 μ g/mL by TBDE and MTT, respectively). Agarose gel electrophoresis did not show typical DNA laddering. Number of MNPCE for negative control: 5(\pm 1), positive control: 62(\pm 13) and HAE: 28(\pm 8), 12(\pm 3), 4(\pm 1). TI for negative control: 1.38(\pm 0.35), positive control: 3.1(\pm 1.06) and HAE: 0.30(\pm 0.05), 0.22(\pm 0.08), 0.23(\pm 0.02). HAE should not induce apoptosis or mutagenicity. However, the decrease in PCE/NCE would indicate a toxic effect on precursor cells from bone marrow.

123. AQUEOUS EXTRACTS OF *Baccharis articulata*: VERO CELL TOXICITY

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Baccharis articulata ("carqueja" Asteraceae), abundant in the hills of Córdoba, is used in beverages (bitter) and in folk medicine to treat digestive, respiratory and urinary disorders and in skin diseases. The interest of the population in herbal products and the increased research in the field of medicinal plants has stimulated the search for plant compounds as potential phytotherapeutic agents. The aim of this study was to evaluate the potential toxicity of aqueous extracts of *B. articulata* in Vero cells. Cold (CAE) and hot aqueous extracts (HAE) were obtained by subjecting the plant material to water at 4°C and 70°C for 48h, respectively. Treatment of cell cultures with different concentrations of extracts allowed us to determine maximum non cytotoxic concentration (MNCC) by microscopic observation and cell viability by Neutral Red uptake (NR) and MTT reduction techniques by optic density. From dose-response curves, 50% cytotoxic concentration (CC_{50}) of both extracts were determined. These values were 2.4 (NR) and 2.1 mg/ml (MTT) for CAE and 0.7 mg/ml (NR) and 0.5 mg/ml (MTT) for HAE. Microscopy examinations of treated cultures revealed MNCC values of 1 and 0.6 mg/ml for CAE and HAE, respectively. Conclusion: CAE was less cytotoxic than HAE of *B. articulata*. CC_{50} values obtained in Vero cells showed that mitochondrial activity was more affected than lysosome by both extracts.

124. EXPRESSION OF BONE MORPHOGENETIC PROTEINS BMP2, BMP4, BMP5 AND BMP7 IN THE AMPULLARY AND ISTHMIC REGIONS OF BOVINE OVIDUCT DURING THE OESTROUS CYCLE

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Bone morphogenetic proteins (BMPs) act as multifunctional regulators of embryonic development and play crucial roles in mammalian reproduction. Our previous studies showed that BMP family members, receptors and their signaling pathway components are present in the oviduct, although their functions are still unknown. In this study, we analyzed the expression of these factors during the oestrous cycle in the ampullary and isthmic regions of the bovine oviduct, considering that they play different functions during the reproductive process. The expression of BMP2, BMP4, BMP5 and BMP7 mRNA was studied by semiquantitative RT-PCR in epithelial cells obtained from the ampulla and isthmus at proestrus, metestrus and diestrus. β -actin mRNA was used as internal reference gene in order to define the relative expression levels of each mRNA studied. The results showed the expression of BMP2, BMP4 and BMP7 mRNA in the region of ampulla and isthmus during the oestrous cycle. However, the expression of BMP5 mRNA was specific to epithelial cells from the isthmic region, suggesting certain function for this factor in the processes that occur in the isthmus.

125.

DNA METHYLTRANSFERASES EXPRESSION IN BOVINE EMBRYOS CULTURED IN THE PRESENCE OF OVIDUCTAL FLUID

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Early development of bovine embryo requires a coordinate gene expression. During this period, gene transcription is regulated by epigenetic modifications. One of these includes DNA methylation by DNA methyltransferases (DNMTs). These modifications can be inherited but some are reversible and could be affected by the environment. Considering this fact, the study of the influence of oviductal microenvironment on embryo could be used to develop optimal culture media. The aim of the present work was to analyze mRNA expression of DNMT1, DNMT3a and DNMT3b in bovine embryos cultured in medium supplemented with oviductal fluid (OF). Ovaries and oviducts were collected from an abattoir. OF was obtained by aspiration from oviducts at metestrus and early diestrus stages. Cumulus-oocyte complexes were aspirated from ovarian follicles, matured and fertilized using standard procedures. Presumptive zygotes were cultured in TCM-199 + BSA (6 mg/ml) (A) and TCM-199 + OF (6 mg/ml) (B) media at 38.5°C and 5% CO₂. Total RNA isolated from pools of 20 four-cell embryos was used to synthesize cDNA. Real time-PCR analysis showed that expression levels of DNMT1, 3a and 3b were increased in embryos cultured in TCM-199 + OF compared with those of embryos cultured in TCM-199 + BSA.

126.

DETECTION OF THE G196A (V66M) POLYMORPHISM IN THE BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) GENE

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Introduction: BDNF is involved in neuronal differentiation and survival and in neuroplasticity. The G196A (V66M) substitution in the BDNF gene is a single nucleotide polymorphism (SNP) present in 20-30% of the Caucasian population. It impairs intraneuronal trafficking and secretion of BDNF. **Aim:** To optimize the molecular detection of G196A(V66M) SNP in BDNF gene and obtain heterozygous controls to investigate its association with normal and abnormal features. **Materials and Methods:** Part of exon 2 of the BDNF gene was amplified by PCR using primers of published sequence, and digested with Hsp92II. This enzyme always cuts the PCR product in one site, while the SNP creates another cutting site. The reactions were electrophoresed on ethidium bromide-containing 2% (original technique), 3.5% and 5% agarose gels. **Results:** The undigested product was seen as a fragment of 274 base pairs (bp). After digestion with Hsp92II, the wild-type allele yielded two fragments, 217 and 57 bp. The G196A(V66M) allele showed three fragments: 140, 77 and 57 bp, and had a frequency of 10% in our sample of n=10 individuals. The 3.5% agarose gel allowed optimal visualization, and two heterozygous controls were obtained. *This work was supported by funding by CIUNT - Project 26/I403, Genetic Factors in Human Diseases.*

127.

PARTICIPATION OF THE POU FAMILY GENES IN THE EARLY DEVELOPMENT OF *Xenopus* NEURAL CREST

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The neural crest (NC) is a cell population present only in vertebrate embryos. It gives rise to a wide variety of cell types and tissues. This population originates in the embryonic ectoderm through the interaction between different signals that activate a genic cascade that determines the identity of the NC. At the moment, only a few genes and signaling pathways that participate in the NC development have been identified, and their relationships remain still poorly understood. POU family transcription factors of subclass V are involved in the maintenance of pluripotency in the embryos of some animal species. To investigate the role of the POU family genes in the early NC development of the frog *Xenopus laevis* we analyzed the expression pattern and the function of the genes *Oct25* and *Oct91*. These genes are expressed in the dorsal area of the embryonic ectoderm. The gain-of-function approaches through the microinjection of *Oct25* and *Oct91* mRNAs showed an increased expression of *FoxD3* and *Snail2* gene markers, indicating that both genes participate in the early induction and maintenance of the NC. Furthermore, the overexpression and activation of *Oct25* just before the migration of the NC delayed the NC cell migration. Our results suggest that *Oct25* could be able to extend the period of NC specification in embryos of *X. laevis*.

128.

$\Delta Np63$ IS REQUIRED IN THE EARLY DEVELOPMENT OF *Xenopus laevis* EPIDERMIS

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The *p63* gene is a transcription factor of the *p53* gene family. In mammals, this gene has two promoters that generate two different protein isoforms, *Tap63* and $\Delta Np63$. In *Xenopus laevis* only the $\Delta Np63\gamma$ isoform was identified, its role in embryonic development still being unknown. In mammals and zebrafish, $\Delta Np63$ appears to be required for epidermal development. Previously, we determined that $\Delta Np63$ is expressed in the prospective epidermis of *Xenopus laevis* embryo. We analyzed the *in vivo* role of $\Delta Np63$ in the specification of the epidermis. First, we carried out $\Delta Np63$ gain of function experiments in ectoderm explants. We observed an increase in epidermal markers and a decrease in neural markers analyzed by RT-PCR. Then, we built a chimeric fluorescent protein (dn $\Delta Np63$ GFP) that acts as a dominant negative of $\Delta Np63$. We carried out loss of function experiments overexpressing dn $\Delta Np63$ GFP and a Morpholino antisense oligonucleotide. The $\Delta Np63$ inhibition led to a lower expression of epidermal marker genes (*XK81a*, *rexp52*) and to an increase in the expression of neural markers (*Slug*, *FoxD3*, *Sox2*). The same results were obtained when the expression of these marker genes was analyzed in ectoderm explants. These results suggest that the $\Delta Np63$ gene is involved in the early induction of the epidermis and is required for the proper development of this tissue.

129.**HERPES VIRUS AND PRECURSOR MOUTH INJURIES**

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Several epidemiological studies associated herpes virus infections with an increase in the incidence of uterine carcinoma. Although its role in carcinogenesis has not been totally demonstrated, scientific evidence makes it a risk factor. HVS infection might induce chromosomal ruptures and mutations of cellular genes. In the prevention of oral cancer factors related to it have been taken into consideration such as smoking, precursor injuries and oncogenic virus. Squamous cell carcinoma is the most frequent malignant pathology at the level of the mouth epithelium. The aim of this work was to determine the presence of HVS in precursor injuries of the mouth mucous membrane. Material and method: with a population of 17 patients with precursor injuries (leukoplakia 15, lichen 2) we used polymerase chain reaction (PCR) for the detection of the viral genome, and the variant LIS-SSCP for type determination. Results: out of 17 cases, 3 leukoplakias turned out to be positive for HVS 1 and 2 for HVS II. In the lichens, the distribution was similar (HVS 1 and 2). We concluded that, although scientific evidence points to HVS 1 as the prevailing virus in mouth mucous membrane pathology, HVS 2 can also be found.

130.**TOXICITY OF CADMIUM IN *Bufo arenarum* KIDNEY**

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The aim of this work was to study the effect of Cd²⁺ on the renal histomorphology of *Bufo arenarum* and determine its concentration in the organ. Adult males collected during the reproductive period were injected in the dorsal lymph sac with CdCl₂ (0.5 or 5 mg/kg) every day for 15 days. Controls were injected with the vehicle. After treatment one the kidneys was dissected and processed with the routine histological technique and stained with hematoxylin-eosin and PAS. The accumulation of Cd²⁺ in the remaining kidney was determined by atomic absorption spectrometer with graphite oven. Results showed a renal preserved structure in control animals. Animals exposed to 0.5 mg/kg Cd²⁺ showed mixed inflammatory infiltrate with predominance of polymorphonuclear leukocytes and glomerular congestion. Cells of the proximal tubule were altered, showing no cell boundaries and presence of amorphous substance in the cytoplasm. A different group of tubule cells showed hydroscopic tumefaction, tubule necrosis and presence of protein cylinders. The PAS technique did not show thickening of glomerular or tubular basal membrane. A dose of 5 mg/kg lesions were more marked. These results were correlated with the amount of Cd²⁺ found in this organ, which evidenced significant differences ($p < 0.05$) in cation concentration between the control and the treated kidney. The results showed that the kidney is a target organ for the toxic at both Cd²⁺ doses tested.

131.**IAP IN CROSSBRED SWINES**

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Apoptosis is a physiological mechanism that allows the maintenance of tissue homeostasis, especially during placental/fetal development. Understanding its role in porcine gestation is essential for pecuary activity in the future. Our purpose was to study the cellular remodelling of porcine placenta during early (± 30 days), mid (± 60 days) and late pregnancy (± 114 days). Apoptotic nuclei were detected by TUNEL technique. The quantification of cellular apoptosis was determined by the apoptotic index (IAp). IAp was significantly different in placental villi throughout gestation ($p < 0.05$). Increased IAp at Day ± 30 ($p < 0.05$) would allow a suitable cellular remodelling of the interface favoring maternal/fetal contact. IAp decrease ($p < 0.05$) at Day ± 60 was related to the greater placental growth. Moreover, the highest IAp ratio detected at Day ± 114 ($p < 0.05$) would contribute to the loss of intraepithelial contact in the interface. This is especially relevant to trigger farrowing in this species having an epitheliochorial and adeciduate placentation pattern. In conclusion, placental cellular remodelling by apoptosis in pigs plays a fundamental role in the maintenance of the physiological balance of the placenta during gestation, favoring the mechanisms involved in farrowing.

132.**LEVELS OF PROSTATE SPECIFIC ANTIGEN (PSA) IN MEN EXPOSED AND NOT EXPOSED TO ARSENIC (As)**

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The aim of this work was to analyze the serum levels of PSA in men in a rural zone, asymptomatic, exposed (GEx) and not exposed (GNoEx) to high concentrations of As in the drinking water. In this study, 161 men were subjected to PSA dosages. The GEx and GNoEx were divided: GA (<4 ng/ml), GB (4.1-10 ng/ml) and GC (>10.1 ng/ml). The GA was subdivided into GA1 and GA2: without and with prostate pathologies. 70.6%, 17.6%, 8.8% and 3.0% of GEx and 78.0%, 12.6%, 6.3% and 3.1% of GNoEx corresponded to GA1, GA2, GB and GC respectively. The average values of PSA were 0.91 \pm 0.57; 0.70 \pm 0.49; 1.14 \pm 0.81; 1.17 \pm 0.94 ng/mL for GA1Ex, GA2Ex, GA1NoEx and GA2NoEx respectively. We did not find differences in the PSA of GBNoEx and GBEx. Based on the ROC curve analysis a cut-off was 1.4 ng/ml. PSA was not capable of differentiating in the GA the presence of prostate pathologies in the GEx and GNoEx. The reference range would increase the sensibility of PSA but may have limited usefulness as a diagnostic test for PC. Complementary methods seem necessary to improve the effectiveness of PC screening.

133.

ANIMAL MODELS OF CARCINOGENESIS INDUCED BY INORGANIC ARSENIC (As) IN THE DRINKING WATER*Soria A, Arias N, Guber RS, Sandoval N, Olivera V, Tefaha L, Toldo R, Martínez M.**Patología Molecular. Fac. de Bqca. UNT. Balcarce 747. (4000) Tucumán. Argentina. E-mail: draanaliasoria@yahoo.com.ar*

The aim of this work was to evaluate the toxic effect of As in an animal model of BALB/c mice and its relationship with biochemical and histology tissue changes in liver (L) and kidney (K). 126 mice were divided into 6 lots: A) without treatment; B) given water contaminated with As III; C) given water with As III and injected with a single dose of 20-MCA. D) given water with As III and externally 12-O-tetradecaonil forbol; E) given water with As III and injected with Lapachol. F) given water with As III and injected with olive oil. Animals were sacrificed at 24, 36, 44, 56 and 66 weeks. We performed lysosomal enzyme counts, Hexosaminidase (Hex), B-Galactosidase (B-Gal), Acid Phosphatase (AP), and Aspartate (AST) and Alanine Aminotransferase (ALT) in L and K homogenates. The levels of Hex at week 44 of lots D and E increased significantly compared to A (A: 176.8 ± 15.5 ; D: 224.3 ± 5.1 ; E: 232.3 ± 6.8 nmol/mgProt/h). ALT in D lots was higher than A (A: 88.3 ± 7.6 UI/L; D: 110.3 ± 7.1 UI/L). Histology revealed hepatocellular necrosis. The levels of Hex and Gal in K (66week) were increased; kidney histology showed tubular cystic expansion and necrosis. The development of these animal models should advance our understanding of the mechanisms of TPA or Lapachol with inorganic arsenic in the drinking water.

134.

PRE- AND POST-TREATMENT CYTOLOGICAL ANALYSIS OF THE PERIODONTAL POCKET IN PATIENTS WITH AGGRESSIVE PERIODONTITIS*Castro CE, Koss MA, López ME.**Cát Periodoncia, Qca Biol. FOUNT. Av. B Aráoz 800. SM Tucumán. E-mail: ccastro62@hotmail.com*

Methods in the clinical diagnosis of periodontal disease record changes late, so it is difficult to know exactly what is happening within the tissues. This is why exfoliative cytology may be coadjuvant in periodontal diagnosis. The aim of this work was to analyze pre- and post-treatment cytological changes in the periodontal pocket in patients with chronic and aggressive periodontitis in mild, moderate and severe stages. Samples were taken from 41 patients with aggressive, 40 with chronic periodontitis and 40 healthy individuals, under basal conditions and within 30 d and colorized using PAP staining. Semi-quantified results were analyzed with the Kruskal-Wallis test. Superficial, intermediate and basal cells, histiocytes, PMNN and microbial flora significantly decreased ($p < 0.001$) after treatment in aggressive and chronic periodontitis. Semi-quantitative values in mild and moderate chronic periodontitis were similar to those in controls ($p > 0.001$). The parameters analyzed in patients with severe chronic periodontitis did not reach control values; the same was true for patients with mild, moderate and severe aggressive periodontitis ($p < 0.05$). Pre- and post-treatment cytological analyses of periodontal pocket showed changes which could contribute to the diagnosis and monitoring of patients with chronic and aggressive periodontitis at different clinical stages.

135.

PROINFLAMMATORY STATE AND TNF- α LEVELS IN OBESE ADULTS*Abregú AV, Velarde MS, Díaz EI, Prado MM, Carrizo TR, Fonio MC, Valdez R.**Cát Práctica Profesional, Fac. Bioq, Qca y Farmacia (UNT). E-mail: vabregu@fbqf.unt.edu.ar*

Obesity is associated to insulin resistance and pro-inflammatory state, it being a risk factor of diabetes and cardiovascular disease. Adipose tissue in obese individuals expresses an increased amount of inflammatory cytokines such as tumor necrosis factor alpha (TNF- α) and inflammatory markers such as reactive c protein (RCP). TNF- α is implicated in the pathogenesis of secondary complications of obesity. Our objective was to study plasma TNF- α and other inflammatory molecules in obese patients. Forty-three obese patients (26F/17 M), age 41 ± 10 years, and 30 non-obese subjects were studied. In both groups we determined: body mass index (BMI), waist circumference (WC), fasting blood glucose, insulin, HOMA index, fibrinogen, high sensitivity CRP (hs-CRP) and TNF- α . Data were expressed as $X \pm DS$ ($p < 0.05$ was significant). Pearson's coefficient was used to analyze correlations between variables. Obese patients presented significantly elevated values of BMI, WC, fibrinogen, hs-PCR, insulin and HOMA index with respect to the control group. Inversely, plasma TNF- α levels in obese patients were not different from non-obese subjects (14.1 ± 18 vs. 13.6 ± 5.2 ng/ml, $p = 0.89$). BMI and WC were correlated with fibrinogen ($r = 0.40$ and $r = 0.38$), insulin ($r = 0.49$ and $r = 0.47$), HOMA index ($r = 0.46$ and $r = 0.50$) and hsCRP ($r = 0.51$ and $r = 0.44$). However, TNF- α was not related to any of the variables studied. Increased values of hs-CRP and fibrinogen evidenced a proinflammatory state in obese patients, but plasma TNF- α levels did not.

136.

EFFECT OF DIFFERENT LEAD CONCENTRATIONS ON GLYCOSYLATED HEMOGLOBIN*Martínez Riera N, Bautista N, Soria N, Granger S, Feldman G.**Cát. de Toxicología.-Facultad de Medicina UNT. E-mail: norymar@arnet.com.ar*

Lead is heavy metal that can cause polymorphous chronic poisoning. It can produce alterations in carbohydrates and lipids by biochemical mechanisms. The percentage of hemoglobin protein linked to glucose is called glycosylated hemoglobin (HbA1). It is used for diabetic patients control and has prognostic and treatment value. The aim of this work was to determine if lead at different concentrations was able to modify glucose and HbA1 levels in an experimental model. Wistar adult rats with lead acetate doses of 25 and 50 ppm (4 months), 100 ppm (3 months); 250 ppm (2 months); 500 and 1000 ppm (1 month) in the drinking water and controls with lead-free water (n: 6 each group), Determination in all groups: glucose and HbA1 (chromatographic-Spectrophotometric). Results: Rat control lead-free: glycemia, 0.98 ± 0.08 gr/l; HbA1 2.33%; glycemia and HbA1, 25 ppm: 1.18 \pm 0.08 g/l and 5.4%; 50 ppm: 1.18 \pm 0.07 g/l and 6.8%; 100 ppm: 1.19 \pm 0.13 gr/l and 7.2% 250 ppm: 1.28 \pm 0.20 g/l and 9.25%; 500 ppm: 1.36 \pm 0.29 gr/l and 13.4%; 1000 ppm: 1.62 \pm 0.14 gr/l and 11%. Groups treated with different concentrations of lead demonstrated increase in levels of glycemia and HbA1 compared to controls. Lead would be a diabetes inducer.

137. ANEMIA IN PREGNANCY. A DESCRIPTIVE OBSERVATIONAL STUDY IN THE MATERNITY INSTITUTE OF TUCUMAN

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In Argentina, iron deficiency anaemia (IDA) is the most prevalent disease in the mother-child group. IDA occurs at different stages: silent (ferritin <20 ng / mL), latent (ferritin <12 ng / mL and transferrin saturation <16%) and evident (ferritin <12 ng / mL, transferrin saturation <16 % and hemoglobin <110 g / L). An exploratory study of the presence and aetiology of anaemia in pregnant women who checked in for prenatal control during the 1st or 2nd trimester of pregnancy at the Maternity Institute (Tucumán) was conducted between October (2009) and May (2010). Blood count, serum iron, transferrin, ferritin, vitamin B₁₂, folic acid and hemoglobin electrophoresis were carried out in 122 pregnant women. 7.4% of the pregnant women were anaemic: 4 had IDA, and 5, non-IDA. 29.5% of the population had a certain stage of IDA (evident, latent, silent), 4.4% had vitamin B₁₂ deficiency, and folic acid level was normal. Hereditary anaemia was not found. The diagnosis of IDA should include the determination of hemoglobin and ferritin in order to provide appropriate treatment to pregnant women.

138. INTRANASAL ADDITION OF A PROBIOTIC BACTERIUM: EFFECT ON INFECTED MALNOURISHED MICE

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The aim of this work was to evaluate the effect of intranasal addition of *Lactobacillus casei* CRL 431 (Lc) on tissue damage and coagulation activation in lung in a respiratory infection model in malnourished mice. Malnourished mice (MN) received for 7d a balanced conventional diet (BCD) or BCD with intranasal addition of Lc during the last 2d (BCD+Lc). BCD, BCD+Lc, MN and Wellnourished (WN) groups were infected with *Streptococcus pneumoniae*. Results: Malnutrition altered all the parameters but renutrition with Lc normalized them, except Activated Protein C (APC). The infection induced an increase in Thrombin Antithrombin complexes (TATc) and a decrease in Antithrombin, APC, LDH activity and Albumin concentration in bronchoalveolar lavage. The pathogen was detected in lung and blood samples. However, BCD+Lc had negative hemocultures and significantly lower bacterial counts and lung damage, but they did not reach the TATc levels of WN (TATc_{24 h post infection} MN= 5.25±0.90 µg/l; WN= 3.50±0.51; BCD= 3.50±0.45; BCD+Lc= 6.54±0.40). Conclusions: Intranasal addition of Lc to a renutrition diet contributed to pathogen clearance and decreased lung damage. However, Lc did not influence the recovery of haemostatic parameters altered by the challenge, which could be associated with the Lc doses used. It would be convenient to evaluate other Lc doses to modulate coagulation in lung.

139. GLYCEROL EVOLUTION DURING YEAST-LACTIC BACTERIA INTERACTION OF OENOLOGICAL RELEVANCE

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Glycerol contributes to the sensorial quality of wines. During malolactic fermentation of wine, lactic acid bacteria can utilize glycerol due to lack of other substrates. We evaluated the influence of nutritional conditions on the ability of non-*Saccharomyces* yeast and *Oenococcus oeni* from wine to metabolize glycerol. Pure cultures of *K. apiculata* and *O. oeni* were inoculated (10⁶ CFU/mL) in grape juice (GJ) medium and in GJ supplemented with growth factors to bacterium. *K. apiculata* 2 and *O. oeni* A, D and F strains were selected because of their appropriate growth kinetics in GJ medium, the natural ecological niche of both microorganisms. During sequential inoculation of the bacteria in yeast fermented broth, while strain F consumed 0.75 g/L and D strain did not show changes, *O. oeni* A produced 1.94 g/L of glycerol. However, when strain A was inoculated in GJ medium with growth factors, there was a reversion of this behavior. The results indicated that the glycerol metabolism in *O. oeni* would be strain-specific. The glycerol production by *O. oeni* A in yeast fermented broth could be related to a metabolic shift to obtain NAD⁺, probably due to lack of pantothenic acid, a growth factor involved in the regeneration of this cofactor. These studies aim at the selection of strains and optimal conditions for glycerol production to design starter cultures for the wine industry.

140. BIOCHEMICAL AND PHYSIOLOGICAL FLEXIBILITY IN THE EURYHALINE SEMITERRESTRIAL CRAB *Neohelice granulata* FROM CONTRASTING HABITATS

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Biochemical-physiological adjustments allowing the occupancy of contrasting habitats by *N. granulata* are unknown. We determined hemolymph (HL) osmolality, and muscle (M) and hepatopancreas (HP) triglycerides concentration (TG) in crabs from mudflat (MF) and saltmarsh (SM) of Mar Chiquita coastal lagoon (Bs. As. Province). Adult male crabs were acclimated for 10 days to 6, 10, 35, 45 and 60‰ salinity (S). HL and medium (m) osmolality (mOsmxkg⁻¹) were determined with cryoscopic osmometer. TG (mgxg tissue⁻¹) were determined (Kit Wiener-Lab AA) in homogenates from M (sucrose 0.25M/EGTA-Tris 0.5mM, pH7.4, 8 mlxg tissue⁻¹) and HP (Tris-HCl 0.1M, pH7.4, 4mlxg tissue⁻¹). MF and SM crabs showed similar osmoregulatory pattern: hiperegulation: 6 (m:144±31, HL:MF=620±45;SM=725±21) and 10 S (m:316±5,HL:MF=660±34,SM=704±17); osmoconformation: 35 S (m:932±21; HL:MF=837±31, SM=829±17); hyporegulation: 45 (m:1191±12;HL:MF=868±40,SM=795±22); 60 S (m:1708±17; HL:MF=1158±84, SM=1112±61) (n=6, *t-test*, p<0.05). MF crabs: TG in M was lower upon hyper and hyporegulation (0.5±0.2) (35 S=1.4±0.1), and not affected in HP (115±51). SM crabs: TG were not affected by S (n=5, ANOVA, p<0.05). The results suggest the occurrence of intrapopulation variability in biochemical adjustments secondary to osmoregulation in relation to habitat.

141. SUCRASE ACTIVITY IN THE HEPATOPANCREAS OF THE EURYHALINE CRAB *Cyrtograpsus angulatus*: RESPONSE TO ENVIRONMENTAL SALINITY

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The underlying digestive adjustments (i.e. activity of key digestive enzymes) in relation to osmoregulatory status in euryhaline crabs are unknown. Moreover, knowledge of digestive biochemical characteristics of euryhaline crabs is still scarce and fragmentary. The aim of this work was to determine the occurrence, biochemical characteristics and response to low salinity of sucrase (suc) activity in the hepatopancreas (HP) of *C. angulatus*. Adult males crabs were acclimated 10 days in 35‰ salinity (S) (characterization) or 35‰ (osmoconformation) and 10‰S (hyperregulation). The supernatant (10000xg 15min) from a HP homogenate (0.1M Tris-HCl, pH 7.4) (4ml buffer x g of tissue⁻¹) was used. Suc activity ($\mu\text{gglucose} \times \text{min}^{-1} \times \text{mgprotein}^{-1}$) was assayed by hydrolysis of sucrose in 0.1 M maleate/OHNa 30°C (pH curve: 3.5-8.3, sucrose=28mM; substrate curve: sucrose=2.8-42mM, pH=5.2; salinity: sucrose=42mM, pH=5.2). Suc activity were high over a wide range of pH, exhibited Michaelis-Menten kinetics ($K_m(\text{mM})=14.26 \pm 5.81$) and was lower (about 86%) in 10‰S than in 35‰ S (183.85 ± 40.31) (Kruskal-Wallis; H= 6.8; p = 0.008). The results showed the existence of a high sucrase activity sensitive to salinity in the hepatopancreas of *C. angulatus*, suggesting a role in adjustments at the biochemical level underlying osmoregulation.

142. STUDY OF BIOCHEMICAL-PHYSIOLOGICAL PARAMETERS IN THE EURYHALINE CRAB *Neohelice granulata* FROM MAR CHIQUITA COASTAL LAGOON (BS.AS.) EXPOSED TO ZINC

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In Mar Chiquita coastal lagoon zinc (Zn) reaches levels up to 1224 μgL^{-1} . We studied the effect of Zn exposure of *N. granulata* upon different osmoregulatory status on key biochemical-physiological parameters: Total, (T), levamisole-insensitive:(LI) and levamisole-sensitive:LS alkaline phosphatase (AP) activities in chela muscle and hemolymphatic glucose (HG). Adult male crabs acclimated for 10 days upon hyper or hyporegulatory conditions were exposed for 96h without (control) or with Zn (Zn- exposed) (1224 μgL^{-1}). AP activities ($\text{nmolpNP} \times \text{min}^{-1} \times \text{mgprotein}^{-1}$) were assayed in muscle homogenates (0.25 M sucrose/EGTA-Tris 0.5 M pH 7.7) by hydrolysis of pNPP (9.5mM) in 4mM MgSO₄/100 mM Tris/HCl (pH 7.7) with and without 16mM levamisole. HG ($\text{mg} \times \text{ml}^{-1}$) was assayed in supernatant (10000xg) (Kit GlicemiaAA Wiener-lab). Upon hypo or hyperregulation, T, LI and LS AP activities were similar in the chela muscle of Zn exposed and control crabs (ANOVA, $p>0.05$). Upon hyporegulation, no differences were found in GH (ANCOVA $p>0.05$). Upon hyperregulation, a higher GH (100%) was found in Zn-exposed crabs, although values were no significantly different ($p<0.077$). The results suggested that short-term exposure to Zn did not affect biochemical parameters involved in key physiological processes in *N. granulata*.

143. LYSOZYME ACTIVITY IN CASEIN MICELLES IN HUMAN MILK

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Casein micelles in breast milk are constituted by two calcium-sensitive caseins, α_{s1} -casein, at very small concentrations and β -casein, which is the prevalent one. They also contain κ -casein, caseins oligomers, formed by combinations between α_{s1} -casein and κ -casein linked by disulfide bridges. In addition, they form part of micelles, micelle-associated proteins (MAP). In previous works we observed that one of these MPA had a molecular weight of approximately 15 kDa, which agrees with the molecular weight of lysozyme (LZ). It is known that LZ is a bacteriolytic enzyme of great activity present in whey. The aim of present work was to measure the activity of this enzyme in whey and casein micelles both in the colostrum phase (three days after parturition) and in mature milk. The samples belonged to healthy mothers of Instituto de Maternidad de Nuestra Señora de las Mercedes, Tucumán, Argentina. In both phases LZ activity was assayed using turbidimetric methods against *Micrococcus luteus* as a substrate. The greatest lytic activity was registered in colostrum whey and micelle proteins of mature milk. These data suggest the existence of a casein-LZ association directly proportional to casein concentration. Apparently, the active site of the molecule was not involved in this association. At the present time this line of investigation is being developed in our laboratory.

144. PRESENCE OF OSTEOPONTIN IN MILK OF TAPIR (*Tapirus terrestris*)

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In almost all studied mammals, the main milk proteins are the caseins group, α lactalbumin, β lactoglobulin, immunoglobulins and lactoferrin/transferrin. The presence of other specific proteins and their functions in the milk of wild animals are little known. Recently we confirmed the presence of large amounts of osteopontin (OPN) in human milk, and there are data of its presence in some species of dairy cattle. The aim of this work was to search for the presence of OPN in tapir milk and determine its distribution in the main milk compartments. In order to do this we carried out SDS-PAGE, Western blot and immuno dot. The results showed a protein in tapir milk with a M_r similar to OPN which reacts with specific antibodies and, similarly to human milk, presents additional bands of minor M_r , indicating the presence of molecular forms that would have been produced by milk proteases. Unlike human milk, tapir OPN was found at greater concentrations in whey than associated to casein micelles. These results indicate that tapir milk secretion contains OPN protein, a fact not previously mentioned in the existing literature.

145. ROLE OF THE ENZYMES INVOLVED IN PROSTAGLANDINS SYNTHESIS DURING OOCYTE MATURATION

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The role of arachidonic acid (AA) cascade and prostaglandins (PGs) during oocyte maturation is not fully understood in amphibians. We demonstrated that PGs induced maturation in *Rhinella arenarum* oocytes. Prostaglandin F₂ matured oocytes were able to be activated by electric pulses and by microinjection of homologous sperms and to develop pronucleus in a similar way to progesterone (P₄) matured oocytes. The aim of this work was to study the role of AA and the enzymes involved in PGs synthesis: PLA₂ and LOX during *Rhinella arenarum* oocyte maturation. Denuded oocytes and follicles were obtained from animals captured during the non reproductive period. Maturation was induced by adding melittin (PLA₂ activator) (0.05-0.20 µg/ml); AA (12.5-200 µM) or PGF_{2α} (25-200 ng/ml). P₄ (1 µg/ml) was used as a control. Quinacrin (PLA₂ inhibitor) (0-20µM) and lysine clonixinate (LC) (LOX inhibitor) (12.5-25µM), were used. Meiosis resumption was scored by germinal vesicle breakdown (GVBD). Our results showed that PLA₂ activation induced oocyte maturation. The maximum response (78±6% of GBVD) was scored at a dose of 0.20 µg/ml. However, in follicles, this effect was not significant. Melittin induced maturation was inhibited by quinacrin, but P₄ induced maturation was not affected by the inhibitor. AA induced oocytes and follicles maturation, showing 25±2% and 36±5% of GBVD, respectively. LOX inactivation by LC had an stimulating effect on oocytes and follicles maturation.

146. CHANGES IN THE ABSORPTION SPECTRUM OF HEMOLYMPH FROM *Spodoptera frugiperda* PRODUCED BY PHENOLOXIDASE ACTIVITY

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The prophenoloxidase (PPO) system is a complex mechanism of defense of insects that produces melanogenesis and darkness of hemolymph (HL) minutes after adequate triggering. Our goal was to measure changes that occur in the absorption spectrum (AS) when phenoloxidase (PO) is activated in the HL of *Spodoptera frugiperda* in the absence of external substrates. Final instar pupae and larvae were used. HL was diluted with buffer and the AS was determined between 290 nm and 1050 nm at regular lapses. Results showed: a) A greater activity in pupae HL than in larvae HL; b) Increase in absorbance was produced with maximums of ≈297 and ≈306nm, corresponding to products from PO activity on HL natural substrates and its derivatives; c) A wide band that extends between ≈500 to ≈850nm, with a maximum at ≈600nm, corresponding to melanin polymers, evidencing growth at first and decline later; d) Brief and low intensity variations were only evidenced during the first minutes of the observations; e) Individual variations in PO activity; f) Analysis of kinetics of melanin bands showed that they are composed of different absorbent molecules due possibly to diverse molecular mass polymers. The observations about most important individual peaks of AS resulting from PO activity agreed with the bibliographic data.

147. EFFECT OF *Lepidium didymum* INFUSION ON LYTIC ACTIVITY OF RABBIT COMPLEMENT AGAINST HUMAN ERYTHROCYTES

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The classical pathway of the complement system is activated by antibodies. We previously reported the activity of medicinal herbs on turtle complement. The aim of this work was to test the effect of Quimpe infusion on the classical pathway of the complement in rabbits immunized with human erythrocytes (HRM). Aliquots of a) immune serum (SIA), b) heat inhibited SIA (SIC) and c) unimmunized serum (SNI) were used. To test if any components of Quimpe infusion could bind to immune serum antibodies affecting them, SIC was dialyzed against the infusion in iso-osmotic conditions, obtaining SIC treated with infusion (SID). SNI were also dialyzed against the infusion, SNID being obtained. The results showed that SIA lysed GRH. SNI and SIC separately did not lyse HRM, although SNI agglutinate them. When SNI and SIC were mixed, they lysed erythrocytes. Previous dialysis of SID and SNID did not affect their ability to lyse the HRM when they were mixed, although SNI dialysis halved the rate of lyses compared to controls. Incubation of lytic fractions (SIA; SIC + SNI; SID + SNID) together with infusion caused a marked decrease in lysis. Tests of mixed SNI + SIC showed that lysis was produced by the classical pathway. Dialysis assays of these fractions would demonstrate that active components of Quimpe infusion responsible for lytic effect do not bind with high affinity to complements components before its activation occurs.

148. PEROXIDASE ACTIVITY IN FLAVEDO OF LEMON FRUITS UNDER UV-B RADIATION

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Peroxidase (POD) is a ubiquitous enzyme with several functions in plants, one of them being H₂O₂ decomposition, which takes place in a series of reactions closely related to catalase and superoxide dismutase activities. The aim of this work was to evaluate peroxidase activity in flavedo of lemon under different UV-B doses. Lemons were harvested in 2008 and 2009 winters and irradiated for 30 sec, 1, 2, 3 and 5 min with a UV-BBE 22 kJ m⁻² day⁻¹. After 24 hs, flavonoids and malondialdehyde (MDA) content and POD activity were determined spectrophotometrically. Flavonoids content increased 42% with a 30 sec dose with respect to the controls. MDA content increased from 1 min of UV-B, and it reached a maximum value at 2 min. POD activity increased at 30 sec, while 1 and 5 min doses reduced this activity five times. We concluded that UV-B produced a rise in H₂O₂ levels, causing the increase observed in POD activity, and probably also the flavonoids increase at 30 sec. Lipidic peroxidation increase detected at 2 min could indicate that, at this dose, POD activity was insufficient to eliminate H₂O₂. Consequently, we could assume that POD is part of the early stages of the prevention strategy against tissue damage when fruits are exposed to UV-B.

149.

INDEPENDENCE OF PHYLLOCRHON OF THERMAL UNITS IN PEPPER (*Capsicum annum* L.) HYBRID 04 APL GROWN IN GREENHOUSESAlderete G, Rodríguez Rey JA, Vidal JL, Amado ME, Budeguer R, Bahaas Nhas S.

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In the case of pepper, the influence of the addition of thermal units on the phyllochron index (which indicates the time interval in the emergence of successive leaves) has not been registered. The determination of this index allows the prediction of the emergence of new leaves, an important event for growth simulation models. The assays were carried out at CEAL, INTA, in the town of Lules. We determined heat summation between sampling dates using the formulas described in the method of Gilmore and Rogers (1958). To perform the accumulation of heat units, the following formula was used: thermal units WB = (Temp) Max. + Temp (Min.) 2 TB was taken as a reference temperature at 10°C in Vidal J.L. (M.A. thesis). The results found showed great variability among the phyllochron and the heat units (r correlation coefficient = 0.021); this independence was already observed in other species such as garlic (Portela, J.A. and Lucero, C. worksheet N° 12 pilot station INTA, La Consulta, Mendoza), making it difficult to predict on mathematical models since it shows a change in the growth pattern in the cultivation of pepper (APL 04). This could be due to the fact that the pepper plant constantly varies its source/transfer/destination relation according to the crops existing in the cultivation.

150.

LOCAL ANESTHETIC INFLUENCE ON ARTERIAL PRESSURE (AP) DURING DENTAL TREATMENTMalica ML, Aybar A¹, Luna S¹, Aragon H², Basualdo MM¹.¹Cátedra Farmacología y Terapéutica. ²Servicio de Radiología. Centro Odontológico F.O.U.N.T. Tucumán. Argentina. E-mail: basualdomm@hotmail.com

Local anesthetics (AL) are compounds that block nervous conduction in a reversible way. Anesthetics are able to act on an uncertain point of a neuron, center or neuronal group, even the muscular membrane and myocardium. **Objectives:** -To evaluate the influence of two local anesthetics used in dentistry. -To compare AP and heart rate (HR) before and after infiltration of AL during dental treatment. **Materials and Methods:** the sample consisted of n=20, 13 (65%) females and 7 (35%) males. The AL used was Carticaina 4% with L-adrenaline 1:100.000 (Totalcaina and Anescart). **Results:** 100% of the patients in the two groups showed loss of sensibility. As for motor function loss, the Totalcaina group showed 20% function loss and the Anescart group 5% function loss. According to independent tests, these anesthetic solutions did not show significant differences between both groups ($p > 0.05$). AP analysis at the beginning or end of the treatment using t-test for related samples showed significant differences ($p < 0.05$) while initial and final HR did not show significant differences. **Conclusion:** We can conclude that the AL used associated to vasoconstrictors can be considered appropriate and safe and that the AP alterations that take place can be induced by stress and fear of the dental treatment situation.

151.

ANTIBACTERIAL ACTIVITY OF PROPOLIS FROM RINCÓN, CATAMARCA, ARGENTINA. ISOLATION OF BIOACTIVE COMPOUNDSSolórzano E¹, Vera N^{2,4}, Maldonado L⁴, Bedascarrasbure E⁴, Ordoñez R^{1,2,3}, Isla M^{1,2,3}.¹INQUINOA-CONICET. ²Facultad de Bioquímica, Química y Farmacia. ³Facultad de Ciencias Naturales e IML. UNT. ⁴INTA. EEA. Famaiyllá. Tucumán. Argentina.

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Previous paper reported the antioxidant and antimicrobial activities of different NOA propolis extracts but very little has been reported about their chemistry. The aim of this study was the isolation and identification of bioactive compounds from ethanolic extracts of propolis from "Del Monte" phytogeographical region (Catamarca, Argentina) against *Staphylococcus aureus* resistant to methicillin (MRSA). Through high-resolution chromatographic techniques (HPLC), twelve flavonoids with different degrees of hydroxylation and methoxylation were isolated and their structures were elucidated by spectroscopic analysis. Isolation was bioguided by antibacterial activity against MRSA. The compounds 2',4'-dihydroxychalcone, 2',4'-dihydroxy-3-methoxychalcone, 2',4',4-trihydroxy-6'-methoxychalcone, 5-hydroxy-4',7-dimethoxyflavone, 4',5-dihydroxy-3,7,8-trimethoxyflavone and 7-hydroxy-5,8-dimethoxyflavone were the most active with values of minimal inhibitory concentration (MIC₅₀) of 10 µg/ml. This is the first report of the isolation of metabolites with antibacterial activity of propolis from Catamarca, Argentina.

152.

LOSS OF THE DIURETIC EFFECT OF *Amaranthus muricatus* INFUSION DUE TO CHRONIC ADMINISTRATIONBlanes S¹, Cuello S², de la Rocha N¹, Vera N^{1,2}.¹Cátedra de Farmacoquímica y Farmacotecnia. UNLAR. Av. Dr. Rene Favaloro S/N La Rioja 5300. ²Cátedra de Farmacoquímica. FBQF. Ayacucho 471. ³Facultad de Ciencias Naturales e IML. Miguel Lillo 205. UNT. Tucumán 4000.

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Amaranthus muricatus is widely used for its diuretic properties in La Rioja, Argentina. In this study we evaluated the biochemical parameters necessary to determine the possible alterations in the renal function of rats that ingested infusion and decoction of 2% of the aerial parts of *A. muricatus* every day for 30 days. Female Wistar rats aged 60 days old were divided into 3 lots of 6 animals each, called batch control, infusion and decoction. After administration, they were given with food and water *ad libitum*. Urine volume was measured at 4, 7, and 24 hours after the first administration and then daily at 9 am for 30 days. The diuretic effect was considered as increase percentage in urine volume compared with the control group at each measurement. Results were statistically analyzed using the Dunnett test. The diuretic effect was only observed in the group that received the infusion from 7 h to 48 h after administration with percentages of 31.40% $p < 0.05$, 69.44% $p < 0.01$ and 56.25% $p < 0.05$, respectively. After 48 hours there was a loss in diuretic effect in this group. Previous phytochemical studies indicated the presence of anthraquinones, flavonoids, sterols and ammonium bases.

153.

FORMULATION AND *IN VIVO* EVALUATION OF THE EXTRACT OF FLOWER OF "CORPO" GEL FOR TOPICAL APPLICATION

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The flowers of *Thrypodanthus acutifolius* (corpo) are commonly used in folk medicine for the treatment of pain and inflammation associated with musculoskeletal disorders. Recently, we demonstrated antiinflammatory and antinociceptive activities. The aim of the present research was to develop a transdermal gel formulation of the flower aqueous extract. The *in vivo* antiinflammatory activity of the gel formulation was studied using a rat model. The gel was prepared with carbopol 940. The physical appearance, homogeneity, stability, extensibility and pH were tested. The antiinflammatory activity was performed using carrageenan induced rats hind paw oedema model. From the results it is evident that the gel formulation showed good homogeneity, extensibility and stability for 60 days. The physical appearance of the gel formulation was bright and brown like the extract. The pH was in the range of 5.5 to 6.5, which lies within the normal pH range of the skin and would not produce skin irritation. The antiinflammatory topical activity in rats revealed that the corpo extract inhibited the inflammation sited at a controlled level over a period of 4.5 hours of treatment. These results suggest the feasibility of the topical gel formulation of the flower of *Thrypodanthus acutifolius*.

154.

ABSENCE OF MICRONUCLEI IN THE BONE MARROW OF MICE TREATED WITH ESSENTIAL OIL OF *Minthostachys verticillata*

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Minthostachys verticillata (peperina) is a plant of great ethnobotanical, pharmacological and commercial interest. Different extracts of this vegetable showed antimicrobial and immunomodulatory activities *in vitro*. However, its genotoxic effects have not been investigated. This study evaluated the genotoxic activity of essential oil (EO) of *M. verticillata* after administration in mice. BALB/c mice were injected intraperitoneally with 0.2 mL of a single dose of EO (25, 50, 100, 250 and 500 mg/Kg) diluted in saline solution and Tween 80 (0.5% v/v). The positive control group received Cyclophosphamide (20 mg/kg). The animals were sacrificed at 24h and 48h. One thousand polychromatic erythrocytes (PCE) were counted to determine number of micronuclei (MN) and PCE/normochromatic erythrocytes (NCE) was calculated by counting 250 PCE to determine toxicity index (TI). Statistical analysis was performed. The average percentage of EPCMN in the negative control group was 0.23(±0.05) and 0.18(±0.14) at 24h and 48h respectively. These values were similar to those induced by EO. Cyclophosphamide revealed a significant increase with respect to the control group. The estimated ratio of PCE/NCE showed no statistically significant alterations in hematopoiesis as a result of EO treatment. Data suggest that EO at these concentrations is innocuous since it does not exert genotoxicity.

155.

EVALUATION OF CYTOTOXICITY INDUCED BY ORGANIC EXTRACTS OF *Achyrocline satureioides* IN VERO CELLS

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Achyrocline satureioides ('marcela del campo', Asteraceae), native of South America, presents pharmacological, therapeutic and medicinal properties. Consequently, it is important to study its toxicity to provide a safety framework and define a selective action. The aim of this study was to evaluate the toxic action of organic extracts from *A. satureioides* on Vero cells. Organic extracts (OE): n-hexane (N-H), chloroform (CL) and methanol (M) were obtained. Cells were exposed to increasing concentrations of OE (5-1 mg/mL) in DMSO at 1% (v/v) at 37°C for 48h. Maximum non-cytotoxic concentration (MNCC) was determined microscopically by daily observations. CC₅₀ was determined by neutral red uptake (NR) and MTT assays. Statistical analysis was performed. For CL, values of MNCC and CC₅₀ by RN and MTT were 40, 120 and 149 µg/mL, respectively. For M, values were 50, 105 and 109 µg/mL. Cytotoxic values of N-H were not determined. Each extract had similar values of CC₅₀ by RN and MTT, indicating a similar sensitivity of both colorimetric techniques. The chemical components of extracts responsible for the toxicity would simultaneously damage mitochondria and lysosomes. These results are fundamental to define selectivity of action of the extracts in antimicrobial treatments and particularly in antiviral activity studies.

156.

TGF-BETA/SMAD SIGNALING AND GANGLIOSIDES IN DIABETIC INTESTINAL DYSFUNCTION

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Intestinal disorders are common complications in the diabetic state. However, the cellular and molecular mechanisms leading to intestinal dysfunction are not yet fully understood. In this study, we investigated the involvement of cell surface gangliosides and TGF-beta1/Smad signaling pathway in the alterations of the large intestine in a model of experimental diabetes in rodents. Morphological and functional studies indicated that diabetes causes a deregulation of proliferative and apoptotic processes in the mucosa and muscular layers of the bowel. Immunohistochemical and western-blot analysis indicated a significant increase in the expression of TGF-beta1 ligand, type 1 receptor (TGF-RI) and phosphorylated Smad2/3 protein in the muscle layer of the diabetic animals. These results suggest an increased activity of this signaling pathway. The ganglioside analysis by HPTLC showed quantitative changes in the expression pattern of these molecules with a significant increase in GM1, GM2, GD3 (pro-apoptotic), GT1b gangliosides and a decrease in GD1a ganglioside. We propose a regulatory role for these molecules in the pathogenesis of diabetic intestinal dysfunction.

157.
FUNCTIONAL ANALYSIS OF THE *Hairy* GENE FAMILY IN *Xenopus laevis* DEVELOPMENT

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Neural crest cells (NCC) belong to a population of proliferative, migratory and multipotent progenitor cells found only in vertebrate embryos. Recently, the yuxtacrine signaling pathway *Notch/Delta* has been involved in the induction process of NCC in experimental vertebrate animal models. The *Hairy* genes family has been described as direct targets of *Notch/Delta* signaling in vertebrates and invertebrates. *Hairy* genes are transcription factors containing a basic helix-loop-helix (bHLH) domain of union to the DNA molecule. In the present work, in order to analyze the role of *Hairy* genes during NCC development by conditional gain- and loss-of-function, we prepared chimeric inducible proteins. The overexpression of antisense oligonucleotides or chimeric inducible proteins and their dominant negatives by microinjection of *in vitro* transcribed mRNAs into developing embryos demonstrated that *Hairy* genes are involved in the induction and migration of NC cells. The transcriptional activity of the *Hairy* genes was evaluated for a better understanding of the molecular mechanisms involved in the control of these developmental processes. Our findings show that *Hairy* genes are key players in the regulatory network controlling *Xenopus* NCC development.

158.
IMMUNOHISTOCHEMICAL ANALYSIS OF RYANODINE RECEPTORS DURING *Bufo arenarum* OOCYTE MATURATION AND ACTIVATION

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Transient increases in the concentration of cytosolic calcium are essential to trigger egg activation events. The increase in intracellular calcium is caused by its release from intracellular stores, mainly mediated by one or both intracellular calcium channels: the inositol trisphosphate receptor (IP₃R) and the ryanodine receptor (RyR). We previously reported the effect of specific RyR agonists and antagonists on mature *Bufo arenarum* oocytes. The aim of this work was to analyze RyR expression in immature, mature and activated *Bufo arenarum* oocytes by immunohistochemistry. Using a mouse monoclonal antibody against RyR (34C-SIGMA) we were able to confirm the existence of RyRs in *Bufo arenarum* oocytes. Results showed different patterns of distribution of the RyRs at different functional stages, suggesting a correlation with ultrastructural modifications of the endoplasmic reticulum and cortical granules during oocyte maturation and activation.

159.
EXPRESSION OF THE UROKINASE-TYPE PLASMINOGEN ACTIVATOR RECEPTOR AND ITS LIGAND IN THE BOVINE OVIDUCT

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The urokinase-type plasminogen activator (u-PA) is a serineprotease that converts plasminogen to plasmin, which is important in extracellular matrix remodeling. The interaction of u-PA with its receptor (u-PAR) takes place in the cell surrounding and activates intracellular signaling pathways. In this work we studied u-PAR and u-PA expression in bovine oviductal epithelial cells during the estrous cycle. Oviducts were obtained from slaughtered cows and classified in different stages of the estrous cycle. Samples from ampulla and isthmus were used to obtain total RNA and were analyzed by RT-PCR. The semiquantitative analysis demonstrated that u-PA and u-PAR co-expressed in the epithelial cells at all stages of the estrous cycle. By indirect immunohistochemical analysis we studied the localization of u-PAR. Positive reaction was observed in the epithelium and muscle. The most intense signal was detected in the apical part of epithelial cells, mainly in the isthmus, during diestrus. Our results suggest that u-PA present in the oviductal fluid would join u-PAR to activate the plasminogen near the epithelium and u-PA/u-PAR would initiate the transduction of intracellular signals that would promote the synthesis and secretion of molecules involved in reproduction events that take place in the oviduct.

160.
DETECTION OF mRNA SEQUENCES OF PLASMINOGEN ACTIVATION SYSTEM COMPONENTS IN VICUÑA OVIDUCT

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The mammalian oviduct is involved in the first stages of the reproductive process. In previous studies we analyzed the activity of components of the Plasminogen Activation System in porcine oviduct, showing that plasminogen activators (PA) are expressed in it. One of them, the urokinase-type PA (u-PA), plays a key role in pericellular proteolysis by binding to its receptor (u-PAR). In this work we analyzed if components of this proteolytic system are present in the vicuña oviduct. Total RNA was obtained from a primary oviductal epithelial cells culture. The expression of u-PA and u-PAR was performed by RT-PCR, using primers designed from sequences corresponding to other mammalian species. Amplification fragments were cloned, sequenced and analyzed with BLAST programs, confirming that they had high percentages of identity with sequences of u-PA and u-PAR in pig and cattle. Since not many vicuña codifying sequences exist in the databases, the sequences determined are an important contribution to the knowledge of the vicuña genome. The detection of u-PA and u-PAR mRNA fragments demonstrates that these genes are co-expressed in vicuña oviductal cells. It suggests the participation of these components in the activation of molecules present in the oviductal lumen, involved in the events that take place in the oviduct.

161. DETERMINATION OF IL-6, PROGESTERONE AND ESTROGENS DURING EARLY PREGNANCY IN PIGS

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The aim of this study was to determine the relationship between IL-6, estrogens and progesterone in serum and in maternal (HoMP) and fetal (HoFP) placental extracts during early pregnancy. Samples (n=21) from empty sows and in sows at different gestation periods (days 5, 15, 17, 20, 32, 35, 40, 44 and 50) were used. IL-6 determination was performed with an ELISA kit (Quantikine® Porcine IL-6, R&D) while that of progesterone (P4) and estrogens (E2) was performed by chemiluminescence. IL-6 was found at a peak only on day 32 in HoFP (878.29 pg/ml). The 23-49 days gestating sows had lower concentrations of serum P4 than those with 15-20 days of gestation (34.70±6.88 vs. 70.65±7.53, $P<0.01$). P4 concentrations in HoFP were higher to those in HoMP (62.16±3.67 vs. 1.97±3.70, $P<0.01$). The 23-49 days gestating sows had greater serum E2 concentrations than those with a 15-20 days of gestation (24.04±4.41 vs. 10.56±4.83, $P<0.06$). E2 concentrations in HoFP were higher to those in HoMP (3864.26±501.43 vs. 895.42±515.17, $P<0.01$). In conclusion, during porcine gestation IL-6 would be regulated by estrogen and would depend on the establishment of pregnancy, showing its presence at the beginning of the development of the immune system and of fetal ossification.

162. DETERMINATION OF ASYMMETRIC ANTIBODIES IN PORCINE PLACENTAL EXTRACTS

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The placenta is an essential organ for successful pregnancy. Four immunoglobulin isotypes have been described in swine. The aim of this study was to determine the presence of asymmetric IgGs in homogenates from fetal and maternal placental extracts at different gestation periods. The presence of asymmetric IgGs was determined by dosage of total and symmetric IgGs using differential ELISA techniques. Half of the samples were processed with buffer and half with Concanavalin A to determine the presence of symmetric antibodies. The reaction was revealed using 1,2-orthophenylenediamine (OPD) as a substrate. Values were calculated mathematically as to asymmetric IgGs and data were statistically analyzed using the Newman Keuls Multiple Comparison Test. In maternal placental extracts higher values ($p<0.05$) were obtained at day 71 of gestation (46.28%) compared to those found at days 5: 26.14%, and 17: 24.37%. Only 9% of asymmetric IgGs were obtained at day 90. Asymmetric IgG values could only be determined in placental fetal homogenates at day 71 (41.33%). In conclusion, the presence of asymmetric IgGs was determined in maternal and fetal placental extracts.

163. LIPASE ACTIVITY IN HEPATOPANCREAS OF THE EURYHALINE CRAB *Neohelice granulata*: RESPONSE IN RELATION TO OSMOREGULATORY STATUS

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Studies on lipase activity in hepatopancreas (HP) of euryhaline crabs are lacking. We determined the occurrence, biochemical characteristics and response in relation to osmoregulatory status of lipase activity in the HP of *N. granulata*. Adult male crabs (n=4) were acclimated for 10 days in 35‰ salinity (S) (characterization) or in 35‰ (osmoconformation), 10‰ (hyperegulation) and 45‰ S (hyporegulation). The supernatant (10000xg 15min) from a HP homogenate (0.1 M Tris-HCl, pH 7.4; 4ml x g of tissue⁻¹) was used. Lipase activity (μmol pNPx min⁻¹x mgprot⁻¹) was assayed by hydrolysis of pNPPalmitate (substrate curve: 0.09-0.9 mM; Tris/HCl 50mM, pH 8.5, 37°C) (pH curve: phosphate 5.4-6.4; Tris/HCl 7,2-8,5; glycine 10.0; pNPP 0.7 mM, 37°C) (temperature curve: 4-45°C, pNPP 0.7 mM, pH 8.5). Lipase activity was higher at pH 8.5 (activity at pHs 5.4-7.2= 50-70%, and at pH10.0= 27% of the activity at pH8.5); maximal at 37°C (activity at 4-20 and 45°C= 40-50% lower); exhibited Michaelis-Menten kinetics (Km=0.18 mM; pH 8.5, 37°C), and it was lower in 10 S (55±35) and 45 S (63±18) than in 35‰ S (120±39) (ANOVA $p<0.05$). The results showed the occurrence of lipase activity in the HP of *N. granulata* and suggest a role in biochemical-physiological adjustments in relation to osmoregulatory status.

164. LIPASE ACTIVITY IN THE HEPATOPANCREAS OF THE EURYHALINE CRAB *Neohelice granulata*: SHORT AND LONG TERM POSTFEEDING RESPONSE

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The modulation of key digestive enzymes activities after feeding in euryhaline crabs is still unknown. The aim of this work was to determine lipase activity in the hepatopancreas (HP) of *N. granulata* at different times after feeding (AF). Adult male crabs from Mar Chiquita lagoon (Bs. As. Province) were acclimated for 10 days (d) upon salinity (10‰), photoperiod (12 h) and feeding (three times a week; Wadly, 0.07gxind⁻¹) controlled conditions and then starved for 5 d before experiments (pre-ingestion, PI). After this period, crabs were fed and lipase activity was determined immediately (t0), and at 1, 8, 24, 48, 72 and 120 h AF. The supernatant (10000xg 15min) from a HP homogenate (0.1 M Tris-HCl, pH 7.4; 4ml x g of tissue⁻¹) was used. Lipase activity (μmol pNPxmin⁻¹xmg prt⁻¹) was assayed by measuring the hydrolysis of 0.7 mM pNPPalmitate in Tris-HCl 0.05M pH 8.5. PI (28.3±7.1) and t0 (33.6±7.2) activities were similar and lower at 1h AF (8.6±2.8). In the long term (8-120h), the activity was higher than at 1h, but similar to PI and t0 values (8h:25.2±5.3, 24h:41.9±8.4, 48h:36.3±4.4, 72h:21.6±1.9, 120h:18.2±0.9; n=3, ANOVA, $p<0.05$). The results suggest differential short and long term modulation mechanisms (i.e. secretion and recovery, respectively) after feeding of lipase activity in the HP during the digestive cycle of *N. granulata*.

165.

DETERMINATION OF THIOCYANATE IN MILK. ADAPTATION OF EXTANT METHODS*Silenzi Usandivaras GM¹, Medina P², Fernandez FM².**¹Fundación Miguel Lillo; ²Facultad de Ciencias Naturales e IML. E-mail: gabrielasilenzi@hotmail.com*

Thiocyanate (SCN) determination in biological fluids using ferric nitrate is a very specific and simple method. However, its application in milk assays implies some complications and laboriousness, and even more so if only a scarce amount is available. These conditions are common in milk samples of maternal and wild species origin. The aim of present work was to adapt and fit an adequate method to measure samples with low volume (< 500-300 µl). Necessary modifications of classical methods included avoiding of TCA precipitation and chloroform lipids subtraction due to its associated volume problems: excessive sample amounts. The modifications introduced allowed us to use 250 µl of milk per determination. In brief: to a certain amount of milk the same volume of 2.5% ferric nitrate in nitric acid 20% was added. After that, centrifugation at 12000 rpm for 30 min was carried out. Controls included assays without samples, without ferric nitrate, etc. To prevent light scattering due to caseins and fat globules not eliminated by centrifugation, samples were read at two wavelengths, 473 and 750 nm. Absorbance corresponding to the latter value was deducted from the one generated by SCN-Fe-(H₂O)₅ molecular complex absorbance read at 473 nm. Pattern and control curves provided values of $r = 0.99$; individual replications produced variation coefficients lower than 1%.

166.

LOCATION OF PHOSPHOLIPASE C IN SPERM OF *Bufo arenarum* ABLE TO INDUCE ACTIVATION OF HOMOLOGUS OOCYTES*Bonilla F, Ajmat MT, Sánchez Toranzo G, Zelarayán L.**Institute of Biology. UNT. Chacabuco 461. Tucumán. E-mail: fedebonilla@yahoo.com*

The mechanism by which sperm activate the egg during fertilization has not yet been fully clarified. A cytosolic sperm factor that is released into the egg during gamete fusion has been proposed. In our laboratory we demonstrated the presence in sperm extract purified by FPLC of a 24 kDa protein with PLC activity able to induce activation when it was microinjected into the oocytes. The aim of this study was to establish what type of PLC this enzyme is and to determine its location in sperm by immunocytochemistry. The acrosome reaction was induced using hypotonic medium and sperm were lysed by cycles of freezing/thawing (-196°C/25°C). The biologically active fraction obtained from FPLC was microinjected into mature oocytes in the presence of different phospholipase inhibitors. The location of the enzyme was determined in reacted sperm with antibodies directed against PC-PLC from *Bacillus cereus*. Our results indicated that the 24 kDa protein is a PLC specific for phosphatidylcholine. Immunostaining revealed that the enzyme is located exclusively in the sperm head. These data suggest that the hydrolysis of phosphatidylcholine induced by sperm would be involved in the oocytes activation pathways.

167.

APOPTOSIS IN TERM PLACENTA OF GOATS SUBJECTED TO TWO NUTRITIONAL LEVELS*Turiello P¹, Merkis C², Cristofolini A², Sanchis G², Coniglio V¹, Cufré G¹.**¹Nutrición Animal. ²Área de Microscopía Electrónica. FAyV UNRC. E-mail: acristofolini@ayv.unrc.edu.ar*

The aim of this study was to identify and quantify apoptotic cells in term placenta of goats previously subjected to two nutritional levels. Twelve prepuberal does were randomly assigned to one of two groups: control (C, n = 5) fed *ad libitum*, and restricted to 50% of C (R, n = 7). Restriction lasted 250 days, and then the R group was refed until the end of the trial. At day 160 of refeeding, all does were pregnant. Term placental samples were subjected to TUNEL assay (TdT-mediated-dUTP Nick End Labeling) and rate of apoptosis was calculated (IAp) as the ratio between the number of cells with fragmented DNA and the number of total cells. Apoptotic cells were identified without a definite distribution in placental villi through the visualization of nuclei with marginalized chromatin. While some binucleated cells were observed with TUNEL positive marks, most of them were found viable. The rate of apoptosis (IAp) was statistically different between groups (R = 0.28 ± 0.02 , C = 0.23 ± 0.01 , $p < 0.0001$). We concluded that there is an association between peripuberal feed restriction and reduced cell viability of the placental villi. Further studies of apoptotic cell remodelling throughout pregnancy and of the pathways involved in the induction of this process would help to determine aspects of apoptosis and nutrient stress.

168.

MICROVESICULAR STEATOSIS IN RABBITS WITH METABOLIC SYNDROME*Scacchi F, Sierra L, Peral de Bruno M, Jerez S.**INSIBIO (UNT-CONICET). Tucumán, Argentina. E-mail: fabrizioscacchi@yahoo.com.ar*

Microvesicular steatosis refers to the accumulation of fat microvesicles in hepatocyte cytoplasm. Macrovesicular steatosis is characterized by a large bubble of fat that displaces the nucleus to the edge of the cell. The risk factors associated with steatosis are varied and include insulin resistance and metabolic syndrome (MS). The aim of this work was to study whether a high fat diet (FD) could induce MS and hepatic morphological changes. Rabbits were fed with either normal rabbit chow (CD) or FD for 12 weeks. Before sacrifice rabbits were weighed and intraperitoneal tolerance glucose test was performed. PAM, CT, LDL, HDL and TG were measured. The liver was extracted. Formaldehyde fixation and histoplast inclusion were assessed. 3mm cuts were stained with hematoxylin and eosin. FD rabbits developed obesity (weight FD: 2952 ± 90 vs CD: 2172 ± 178 gr; $n=12$, $p < 0.05$). Glucose tolerance curves were abnormal (Glu.Basal: 108.5 ± 2.4 ; 60' 265 ± 20 ; 120' 180.5 ± 10.5 mg/dl). PAM was greater in FD (FD 75 ± 2 vs CD 62.7 ± 5.1 mmHg; $n=12$; $p < 0.05$). There were no differences in lipids levels between CD and FD rabbits. FD rabbits showed microvesicular steatosis. Neither hepatocytes deformity nor peripheral nucleus displacement or inflammation was observed. Conclusions: A fat diet induced MS, characterized by obesity, glucose intolerance and hypertension. This pathology is related to early hepatic alteration (microvesicular steatosis).

169.

A COMPARATIVE STUDY OF THE EFFECT OF MECHANICAL DAMAGE ON THE PHYSIOLOGICAL QUALITY OF SEEDS OF TWO BEAN (*Phaseolus vulgaris* L.) CULTIVARS

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The aim of this work was to compare the effect of several levels of mechanical damage on the physiological quality of two bean cultivars. Our hypothesis was that seed damage promotes degradative changes in membranes, differentially altering the activity of the alpha amylase involved during germination in the mobilization of reserve polysaccharides. For this purpose, sublots of Perla INTA (white) and NAG 12 (black) were damaged by dropping seeds 0, 2 and 4 times on a metallic plate, from a height of 2 meters. For both cultivars, electrical conductivity was determined in embryos, whereas enzymatic activity was measured in cotyledons as well. Decrease in seed quality was shown by persistent increases in electrolytes release and a greater delay in the activity of alpha amylase in white bean axes, which was not observed in black beans. On the other hand, a pronounced delay in enzymatic activity was observed in the cotyledons of white beans dropped 4 times, as well those of black beans dropped 2 and 4 times. We concluded that, under the assayed conditions, the seed portions most sensitive to deterioration are embryos in white beans and cotyledons in black beans.

170.

SEED GERMINATION DYNAMICS IN TWO VARIETIES OF *Chenopodium quinoa* Willd. (QUINOA)

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Quinoa germination in the field is relatively low (around 20%), which requires a large number of seeds to achieve an acceptable germination in terms of plant density. The aim of this investigation was to quantify the dynamics of quinoa germination to obtain information concerning environmental constraints on this process. Two varieties were used: "Sajama" from Oruro (Bolivia) and CICA from Peru. Germination dynamics was determined according to ISTA standards. Seeds were sterilized with 0.5% NaOCl solution for 1 min and rinsed with sterile distilled water. 100 seeds were placed on humidified filter paper in Petri boxes under controlled temperature conditions. Experiments were performed in quintuplicate. Germination response was analyzed by time to 50% germination (T_{50}) and final germination percentage (PG). To illustrate germination dynamics, counts were made every 2h until the end of the experiment (22h).

The results showed that T_{50} and PG were 8h and 86.75% for Sajama and 10h and 87.3% for CICA respectively. Knowing the PG, we can adjust the amount of seeds required for good germination in the field. Germination began at 4h for Sajama and at 6h for CICA. Maximum germination was observed at about 16 hs, after which peak germination was constant.

171.

BIODIRECTED FRACTIONATION OF AN ETHYL EXTRACT OF NABON (*Raphanus sativus* L.). ITS ACTION AGAINST STRAWBERRY PATHOGENOUS FUNGI

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Strawberry beds in Tucumán are attacked by microorganisms, mainly by fungi. An ecological alternative for their control is the use of plant extracts adequate for organic culture requirements tending towards sustainable agriculture. We showed that the ethanolic extract of nabon siliques inhibited *in vitro* the growth of the fungi that attack plantlets and fruits during growth and postharvest. The purpose of this work was to isolate the substances responsible for the antifungal activity of the ethanolic extracts. The dried (10% (v/v) ethanol extract was dried and fractionated with ethyl ether, dichloromethane and methanol, successively. The sub-extract eluted with dichloromethane showed the highest antifungal activity. Then TLC (silica gel 60 F254) was performed, mobile phase: petroleum ether / ethyl acetate, 5:1 (v/v) showing three fractions (F1, F2, F3). Bioautographies of each of them with *Colletotrichum acutatum*, *Colletotrichum fragariae* and *Alternaria alternata* showed that F1 was the most active fraction. New fractionations will be performed.

172.

ANTIINFLAMMATORY ACTIVITY AND IDENTIFICATION OF MOLECULES ISOLATED FROM *CAESALPINIA PARAGUARIENSIS* (D. PARODI) BURK

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Previous reports showed the anti-inflammatory activity of *C. paraguariensis* bark infusion by Hyaluronidase inhibition assay. AIF (anti-inflammatory fraction) was obtained by bio-guided fractionation of the extract. The aims of this study were to isolate bioactive constituent(s), to assay enzymatic inhibition, and to structurally identify the bioactive molecules. AIF was analyzed by RP-HPLC and its components were isolated and purified. Hyaluronidase inhibition assay was carried out by Reissig's method. Identification was achieved by spectrometric techniques (UV-Vis, MS-ESI and ¹H-RMN).

Two eluates were isolated from AIF (M25 and M29), which showed inhibitory concentration 50% (IC₅₀ at µg/ml): M25 1.5±0.1 and M29 2.3±0.1. Spectral analysis allowed us to identify them. M25= ellagic acid: MS-ESI: [M-H]⁻ mass/ charge (m/z) 301.14; Exact mass: 302.1480 atomic mass units (u). Elemental composition: C₁₄H₆O₈. ¹H-NMR in DMSO-*d*₆ δH (ppm): H_{5,5}, 7.51 (s, 2H). UV spectrum: λ_{máx} (MeOH) (nm): 255.5, 358.0. M29= 3-*O*-Methyl ellagic acid: MS-ESI: [M-H]⁻ m/z 315.0142. Exact mass: 316.0141 u. Elemental Composition: C₁₅H₈O₈. ¹H-RMN in DMSO-*d*₆ δH (ppm): H₅, 7.51 (s, 1H), H₅, 7.48 (s, 1H), 3-OCH₃, 4.06 (s, 3H). UV spectrum: λ_{máx} (MeOH) (nm): 249.9, 346sh, 367.2.

173.

ANTIFUNGAL ACTIVITY OF RAW EXTRACTS AND PURIFIED COMPOUNDS FROM LORANTACEAE AGAINST PLANT PATHOGENS*Soberón JR, Sgariglia MA, Sampietro DA, Vattuone MA.**Cátedra de Fitoquímica, Instituto de Estudios Vegetales "Dr. A.R. Sampietro" (IEV), Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán. Ayacucho 471 (4000) SM de Tucumán. Argentina. E-mail: jrsrody@yahoo.com*

Phytopathogenic fungi cause diseases that diminish harvest yields around the world, causing economic losses harmful effects on health through mycotoxin contamination. *Tripodanthus acutifolius* (Ruiz&Pav) Tiegh and *Ligaria cuneifolia* (Ruiz&Pav) Tiegh contain phenols with known antibacterial activities, although there are no data concerning their antifungal effects. The antifungal activities of *L. cuneifolia* methanolic extract from the aerial parts (MeOH_L), the methanolic extract (MeOH_T) and tripodantoside (main constituent) from *T. acutifolius* infusion were assayed against phytopathogenic fungi. *Fusarium* strains from Graminearum and Gibberella Fujikuroi complexes and other genera strains were tested. These strains are very resistant to commercial antifungals. Inhibition of hyphal radial growth was evaluated using sterile disks loaded with 1 and 5 mg of samples. Ketoconazole was used as a reference drug. MeOH_L and Tripodantoside showed antifungal activity against *F. graminearum* (24) and *F. thapsinum* (18), although other strains (*F. verticillioides* (4), *F. proliferatum* (20) and *Macrophomina phaseolina*) were not inhibited. The results justify further studies of these strains as antifungal compounds sources.

174.

ISOLATION OF ANTIMICROBIAL COMPOUNDS OF *Fabiana punensis*, AN EXTREMOPHILE SPECIES*Cuello S², Schmeda-Hirschmann G¹, Isla M^F.**¹Laboratorio de Química de Productos Naturales, Instituto de Química de Recursos Naturales, Universidad de Talca, Talca, Chile.**²INQUINOA (CONICET) Facultad de Bioquímica, Química y Farmacia. Facultad de Ciencias Naturales e IML. Universidad Nacional de Tucumán. (4000) S.M. de Tucumán. Tucumán. Argentina. E-mail: misla@fbqf.unt.edu.ar*

Fabiana punensis is a plant species (Solanaceae) that grows in the Puna and Prepuna in Northwestern Argentina between 2200 and 4200 meters a.s.l. Previous studies showed that hydroalcoholic extracts of the aerial parts of this species have antimicrobial activity against human antibiotic-resistant pathogenic bacteria. The aim of this study was to isolate the antibacterial compounds. The purification of bioactive metabolites was performed by chromatography. Structural elucidation was performed by analysis of NMR, UV-visible spectra and MS. The analysis of the antimicrobial activity of different fractions was performed by bioautographic tests and their minimum inhibitory concentration (MIC) was determined according to CLSI. Flavones with antimicrobial activity were identified as 3,5,7,4'-tetrahydroxy-3'-methoxyflavone (CIM: 50 µg GAE/ ml) and 3,5,7-trihydroxy-4'-methoxyflavanone (CIM: 100 µg GAE/ ml). This is the first report on the chemical constituents of *Fabiana punensis*. The isolated compounds showed antimicrobial activity against Gram positive bacteria so that the extract and the flavonoid-enriched fractions may have a potential application for topical skin infections.

175.

ANTIBACTERIAL ACTIVITY OF SUBEXTRACTS OF *Tibouchina paratropica* (Melastomataceae)*Tracanna MI, Fortuna M, Amani S, González A, Poch M, Benavente A. Facultad de Bioquímica, Química y Farmacia. Universidad Nacional de Tucumán. Ayacucho 471. Tucumán. Argentina. E-mail: inestracanna@yahoo.com.ar*

The aim of this work was to study the effect of subextracts of *Tibouchina paratropica* (Griseb) Cogn. (Tp) against *Staphylococcus aureus* (St.a.) ATCC 25923 and ATCC 29213 and a clinically isolated sample and *Escherichia coli* (E. coli) ATCC 25922. The aerial parts of Tp were extracted with acetone-H₂O (7:3). The extract concentrated under vacuum was successively partitioned liquid-liquid - liquid CH₂Cl₂, EtOAc (SAcOEt), n-BuOH (Sn-Bu) and aqueous fraction (SAF). Antimicrobial activity was evaluated by the agar diffusion method (MH). Minimal inhibitory concentration (MIC) values were determined by the tube dilution method. The tests were performed in triplicate. All subextracts were active against St.a. ATCC 25923, ATCC 29213 and clinically isolated sample. Only SAcOEt showed activity on *E. coli* ATCC 25922.

MIC of SAcOEt was 312.5 µg/ml for St.a. 25923 and St.a. 29213 and 1250 µg/ml for St.a. clinical sample. Sn-Bu presented a MIC of 625 µg/ml for St.a. 29213, while for the other strains of St.a. it was 2500 µg/ml. The MIC of SAF was 1250 µg/ml for St.a. 29213 and 2500 µg/ml for St.a. 25923. These results show that SAcOEt was the most active subextract against the strains tested.

176.

DITERPENES AND ANTIMICROBIAL ACTIVITY OF *Gochnatia polymorpha*, *Gochnatia glutinosa* AND *Gochnatia haumaniana**López ME¹, de Pedro A¹, Vega M², Catalán CAN², Schuff C².**¹Facultad de Agronomía y Zootecnia. ²Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán, Tucumán. Argentina. E-mail: runylopez@hotmail.com*

Gochnatia polymorpha (Gp) (Mutisieae, Compositae), known as "cambará" in Paraguay and "candela" in Brazil, is used in folk medicine to treat respiratory disorders. Decoctions of the bark are used for the treatment of sores and ulcers. The hexane extract (HE) of Gp was analyzed by GC-MS. The main constituents were spinacene, spathulenol, sitosterol, stigmasterol, campesterol, β-amyrin, lupeol, vitamin E, lupeol acetate, sitostenone, heptadecanol, phytol and cycloeucaenol. HE showed no activity against *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923, *S. aureus* (SAMS), *Salmonella* sp. *Pseudomonas aeruginosa* or *Enterobacter* sp. (BLEE). Diterpenes were not detected in the HE of Gp. On the other hand, the essential oil of *G. glutinosa* (Gg) and the HE of both Gg and *G. haumaniana* (Gh) showed good activity against *S. aureus* 25923, *S. aureus* (SAMS) and *P. aeruginosa*. The following diterpenes were identified in these plants: epymanoyl oxide, kaur-16-ene, 8,13-epoxy-15,16 dinorlabdane and 3-α-hydroxy-manool in both essential oil and HE from Gg, while kauran-16-ol, kaur-16-en-3-ol and kauran-19-oic-acid methyl ester were identified in Gh. These results suggest that the antibacterial activity could be related to the presence of diterpenes.

177.

BIOACTIVITY OF MEHANOLIC EXTRACT, HEXANE AND CHLOROFORM SUBEXTRACT OF *Trichocline reptans* (WEED)*Turbay S, Trimarco J, Gordillo A, Chain F, Del Pero A, Guardia G, Fortuna M.**Facultad de Agronomía y Zootecnia. UNT.**E-mail: sturbay959@yahoo.com*

The aim of this work was to study the effect of hexane subextract (HSE), chloroform subextract (SEH) and mehanolic extract (EM) from the aerial parts of *Trichocline reptans* (Asteraceae) on the germination (G), radicle length (RL) and hypocotyl (LH), dehydrogenase activity (DA) and conductivity (C) of *Triticum aestivum* (T) and *Lactuca sativa* (L). Three concentrations (250, 500 and 1000 mg.L⁻¹) of each extract were tested. *L.* germination was 100% inhibited by SEC 1000 mg.L⁻¹ and partially inhibited (37 and 21%) at lower concentrations (500 and 250 mg.L⁻¹). Control RL was 20.3 mm and control LH was 16.6 mm. Treatments showed RL and LH values of 7 and 5 mm respectively. DA was increased in all extracts, except for SEC 500 mg.L⁻¹. On T assays, SEC showed maximum values of RL and LH (6 and 5 mm) at all concentrations. HSE exhibited 13 mm RL and 11 mm LH. With EM, *Triticum* RL was 10.7 mm and LH 9 mm. DA increased 50% with SEC, decreased 31.3% with HSE 1000 mg.L⁻¹ and decreased over 40% with all concentrations of EM. C increased over 55% at all concentrations, except at 250 mg.L⁻¹. The greatest effect (67.4%) was observed with SEC 1000 mg.L⁻¹. The extracts had no significant effect on G of T, but they did on the further development of the seedlings, probably because of metabolic disturbances (DA) and cell membrane damage (C). G of L was strongly affected by all treatments.

178.

EFFECT OF VARIETY ON POLYPHENOL CONTENT IN BERRIES CULTIVATED IN TUCUMÁN*Alvarez AR^{1,2}, Mistretta MG², Chemes ED², Alvarez PS², Maldonado LM¹, Kirschbaum DS¹, Genta ML².**¹INTA EEA Famaillá, Ruta 301 km 32, Famaillá. ²FaCET, UNT, Avda. Roca 1800, S.M. de Tucumán.**E-mail: aalvarez@correo.inta.gov.ar*

Polyphenols are widely distributed in vegetables. They possess antioxidative, antiinflammatory and anticarcinogenic properties. The aim of this work was to determine total polyphenols content in the main varieties of strawberry and blueberry cultivated in Tucumán. Berries samples, in suitable conditions of maturity, were provided by INTA. The determination of total polyphenols was performed by spectrophotometry using Folin-Ciocalteu's reagent and they were expressed in Equivalent Gallic Acid (EGA). ANOVA was realized to evaluate possible significant differences between varieties. Total polyphenols concentrations expressed in mg.kg⁻¹ of EGA determined in varieties of strawberry were 3895 in Camarosa, 3845 in Royal Way, 3623 in Festival and 3582 in Albion. The statistical analysis showed that polyphenols content was significantly higher in the varieties Camarosa and Royal Way, no significant differences being found between them. Total polyphenol contents determined in blueberry varieties, expressed in mg.kg⁻¹ of EGA, were 444 in Misty and 1082 in Jewel, the latter being significantly higher. It is possible to conclude that the varieties with greater polyphenol content are Camarosa and Royal Way in strawberry, and Jewel in blueberry.

179.

A NEW GUAIANE DERIVATIVE AND OTHER CONSTITUENTS FROM *Ameghinoa patagonica* SPEGAZZINI*Díaz F, González SB, Perottli M, Catalán CAN.**INQUINOA-CONICET, FBQF, UNT and Depto Química, Fac. Cs Naturales, UNPatagonia SJB, Ruta 259 - km 4; 9200 Esquel, Chubut, Argentina. E-mail: ferdinandor@hotmail.com*

Continuing with our investigations on the subtribe Nassauviinae (Mutisieae, Compositae), we analyzed the monotypic species *Ameghinoa patagonica* Spegazzini. From the aerial parts, a sesquiterpene C₁₇H₂₆O₃, [M]⁺ 278, was isolated. Its structure was established by mono and bidimensional ¹H and ¹³C NMR, IR and mass spectrometry. ¹³C NMR showed 17 signals, four of them corresponding to methyl groups at δ 19.6 (C-13), 21.1 (acetate methyl), 21.7 (C-14) and 23.5 ppm (C-15); four methylenes at δ 24.6 (C-2), 35.3 (C-6), 41.2 (C-3) and 111.5 ppm (C-12); five methynes at δ 46.5 (C-1), 49.5 (C-7), 53.8 (C-5), 74.5 (C-8) and 128.3 ppm (C-9) and four quaternary carbons at δ 80.0 (C-4), 140.2 (C-10), 147.3 (C-11) and 170.3 ppm (acetate carbonyl). ¹H NMR, COSY, HSQC, HMBC and NOE experiments established the structure of the new guaiane as 9,11-guaiadien-4β,8β-diol 8-monoacetate (1α,5α,7α form). Tricosane, pentacosane, heptacosane, nonacosane, untriacosane, 1-octadecanol, 1-eicosanol, 1-docosanol, phytol, sitosterol, campesterol, α-amyrin and β-amyrin were also identified. Trixane derivatives, characteristic metabolites of the subtribe Nassauviinae, were not found.

180.

ACTION OF BUCCAL RINSES ON SALIVARY PROTEINS WITH A DEFENSE FUNCTION*Vargas CF, Oliva MA, López ME.**Cát. Quím Biológ. Fac. Odontología, Univ Nac Tucumán. E-mail: carmenf_vargas@hotmail.com*

Non stimulated total saliva is important in the protection of buccal cavity tissues through certain defense proteins. The benefits of mouthwashes are known, but little is known about their influence on these components. The aim of this work was to analyze the *in vivo* effect of salivary rinses on secretory IgA and collagenase in non stimulated total saliva. We worked with 6 healthy individuals. Total saliva was obtained by salivation. The active principles of the rinses were sodium fluoride (FS) 0.05%, aromatic alcohol (0.06% Timol/0.09% Eucaliptol/0.06% methyl salicilate) and 0.12% chlorhexidine digluconate. Distilled water (DW) was used as a control. Samples were taken before and after each rinse at 1, 5, 10, 15, 30, 45 and 60 min and centrifuged and total proteins were quantified by the Lowry method, secretory IgA by radial immunodiffusion and collagenase by zimography according to Jamall *et al.* Data were analyzed by ANOVA *p* < 0.05. For secretory IgA all rinses showed a significant diminution with respect to time 0, at 1, 5 and 10 min, similarly to DW. Zimography demonstrated a greater inhibiting collagenase activity with FS. The effect of fluoride on salivary defense proteins would be beneficial, IgA secreted by the glands would not be affected, and collagenase, doubtless of microbial origin, was diminished. The other buccal rinses tested would not exert any action on secretory IgA or collagenase.

181.

VARIATION OF SALIVARY PHYSICAL PARAMETERS BY THE EFFECT OF BUCCAL RINSES*Vargas CF, Oliva MA, López ME.**Cát Quím Biológ. Fac Odontología, Univ Nac Tucumán. E-mail: carmenf_yargas@hotmail.com*

Saliva participates in the physical-mechanical cleaning of the buccal cavity and elimination of planktonic flora. As a buffer, it maintains the integrity of teeth and mucosae. The aim of this work was to study the influence of buccal rinses on salivary flow rate, pH and buffer capacity. We worked with 6 healthy individuals. Total saliva was obtained by salivation. Rinses contained sodium fluoride (FS) 0.05%, aromatic alcohol (AA) (0.06% Timol/0.09% Eucaliptol/0.06% methyl salicylate) and 0.12% chlorhexidine digluconate (CL). Distilled water (DW) was the control. Samples were taken before and after each rinse at 1, 5, 10, 15, 30, 45 and 60 min and centrifuged and volume, flow rate, pH (Altronix® TPA IV) and buffer capacity (Ericsson) were determined. Data were analyzed by ANOVA $p < 0.05$. Flow rate and pH significantly increased with respect to the control and to time 0 during the first 15 min for FS and AA, whereas for CL differences between 1 and 30 min were observed. The buffering capacity was significantly diminished for all rinses, it being greater for FS and AA with respect to the control. Significant differences were observed for FS and AA at 1, 5 and 10 min and for CL at 1, 5, 10 and 15 min. The tested rinses would be beneficial since they increased salivary flow rate, which purified the buccal cavity. Nevertheless, buffering capacity may be affected, and with it, the mineralization of teeth.

182.

EVALUATION OF PROSTATE SPECIFIC ANTIGEN VELOCITY (PSAV) FOR EARLY DETECTION OF PROSTATE CANCER (PC)*Soria de González A, Arias N, Tefaha L, Guber RS, Martínez M, Valdivia M, Sandoval NG, Romero C, Toledo R, Czejack ML, Olivera V.**Patología Molecular, Fac Bca, Qca y Fcia. Fac Medicina. UNT. E-mail: draanaliasoria@arnet.com.ar*

The aim of this work was to evaluate the usefulness of PSAV in asymptomatic men for early detection of PC. In this study, 67 men above 50 years of age who had a clinical evaluation and two or more PSA tests taken over $> \text{ or } = 12$ months were included. Without Prostate Pathology (WPP), Benign Prostatic Hyperplasia (BPH) and CP were detected in 73.1%, 23.9% and 3% of the patients respectively. The average values of PSAV were 0.23 ± 0.44 ; 1.01 ± 1.34 ; 1.98 ± 1.73 ng/mL/year for WPP, HPB and CP patients, respectively. There were significant differences between BPH and PC patients compared to WPP. PSAV had a sensibility, specificity, positive predictive value (PPV) and negative predictive value of 100%, 82.1%, 14.3% and 100%, respectively. The ratio positive verisimilitude was 5.6, which indicated that men with high PSAV were 5 times more likely to develop PC. The area below a ROC curve was 0.90 IC 95% (0.76-1.0). The estimated PPV of PSAV greater than or equal to 0.75 ng/mL/year was low. PSAV may have limited usefulness as an early diagnostic test for prostate cancer.

183.

EFFECT OF ARSENIC (As) ON HEXOSAMINIDASE (Hex) AND B-GALACTOSIDASE (Gal) IN MEN WITH AND WITHOUT PROSTATE DISEASE*Soria A, Arias N, Guber RS, Sandoval N, Tefaha L, Toledo R, Martínez M, Valdivia M, Baca C, Mónaco L, Olivera V.**Fac. de Bqca. UNT. Balcarce 747. (4000) Tucumán. Argentina. E-mail: draanaliasoria@yahoo.com.ar*

The aim of this work was to evaluate the serum activity of the lysosomal enzymes Hex and Gal in men older than 50 years of age exposed (Ex) and not exposed (Not Ex) to water with high or allowed levels of As, respectively. Subjects were divided according to clinical evaluations, prostate specific antigen (PSA), vesicle-prostate ultrasound scan and anatomopathologic study into Group A1: (n=28) and Group A2: (n = 83) patients Without Prostate Pathologies (WPP), Group B1: (n=11) and Group B2: (n=19) patients with Benign Prostatic Hyperplasia (BPH), and Group C2: (n=5) patients with Prostate Cancer (CP) Ex and Not Ex to As, respectively. Average values of Hex were 120.4 ± 51.8 ; 92.6 ± 50.3 ; 129.2 ± 60.1 ; 95.9 ± 50.45 and 140.6 ± 52.2 nmolPNP/ml/h for Groups A1, A2, B1, B2, and C2 respectively. Average values of Gal were 53.2 ± 27.0 ; 26.6 ± 15.1 ; 46.6 ± 26.4 ; 36.9 ± 20.6 and 29.7 ± 17.2 nmolPNP/ml/h for Groups A1, A2, B1, B2 and C2 respectively. Statistically significant differences were found in Hex and Gal between Group A1 and Group A2 ($p=0.013$ and $p=0.001$ respectively). On the basis of our results, serum Hex and Gal would be useful markers to differentiate WPP Ex from Not Ex individuals.

184.

TOXICITY OF CADMIUM IN AMPHIBIAN LIVER*Aybar Odstrcil I, Juárez M, Cosci A, Fernández S, Medina MF.**Depto de Biol del Desarrollo. INSIBIO (CONICET-UNT). Chacabuco 461. 4000 Tucumán. E-mail: imaybar@yahoo.com.ar*

Since amphibians are good sentinels of environmental toxics, we analyzed structural changes induced by cadmium (Cd^{2+}) in the liver of *Bufo arenarum* after exposure to the toxic. CdCl_2 was injected into the dorsal lymph sac of adult males for 15 days at 0.5 or 5 mg/kg. Control animals were injected with the vehicle alone. Then, one lobe of the liver was dissected, fixed and embedded in paraffin. The sections (5-7 μm) were stained with hematoxylin-eosin and Masson Trichrome. The amount of Cd^{2+} accumulated in the liver was determined by atomic absorption spectrometer with a graphite oven. In control animals results evidenced preserved hepatic parenchyma, while treated animals showed dose-dependent histopathological changes. At a dose of 0.5 mg/kg, we could see sinusoidal dilatation, swollen hepatocytes and regenerative changes in these cells. Inflammatory processes, portal infiltration with lobulillar compromise was also found. Marked hyperplasia of Kuffer's cells was observed together with an increase in the amount of iron deposits compared to control. At a 5 mg/kg dose, lesions were more marked, also showing focal peri-vein central hepatocyte necrosis. Masson's technique did not show fibrosis. The content of Cd^{2+} in the liver of animals treated with both doses was significantly higher ($p < 0.05$) than in the control. These results showed that Cd^{2+} at both doses assayed is toxic to the liver.

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Abdala M	74		Bahaas Nhas S	149	Carrizo SL	63
Abilleira E	105		Banegas NR	118	Carrizo TR	135
Abregú AV	135		Barbeito CG	Co12	Cartagena E	12
Aceñolaza FG	L2		Barbieri N	68, 69	Casanova Jesus G	21
Adagio L	Co11		Bardón A	12, 47, 48, 50	Casen S	59, 60
Agüero AN	43		Barrera D	125	Castagnino R	75, 78, 102
Agüero G	69, 138		Barrionuevo M	53	Castillo SE	76, 103
Agüero JJ	111		Barrionuevo MG	128	Castro CE	134
Aguilar MF	54		Basualdo MM	150	Castro F	Co6, 143, 147
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Alberto MR	15		Beltrán RE	83	Cena A	74
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Alderete G	149		Benvenuto S	77	Centeno N	44
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Andrada R	114		Budeguer R	149	Correa CM	126
Apas AL	70		Budeguer RF	52	Corteggiano F	78, 102
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Aragon H	150		Bühler MI	Co14, 145, 158	Cosci A	130, 184
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