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LECTURES

A1

“Miguel Lillo” Lecture

A GABAergic SIGNALING WITHIN THE BASOLATERAL AMYGDALA COMPLEX MODULATES THE INFLUENCE OF STRESS ON FEAR MEMORY

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There is consensus that stress promotes fear memory consolidation. Previous pharmacological, behavioral and electrophysiological findings from our laboratory suggest that prior stress attenuates inhibitory GABAergic control in the Basolateral Amygdala Complex (BLA), enhancing BLA excitability and promoting the induction of LTP in BLA, a neural plasticity process associated with fear memory formation. Furthermore, using whole-cell patch clamp we observed no inhibitory postsynaptic current (IPSC) in stressed animals, suggesting that stress-induced GABAergic disinhibition in BLA is due to attenuation or suppression of feedback inhibition. Additional findings showed that prior stress enhanced spine density in the Dorsal Hippocampus (DH) associated with contextual fear memory. Intra-BLA infusion of Midazolam (MDZ) prevented the facilitating influence of stress on hippocampal dendritic spine remodeling. In contrast, the blockade of GABA-A sites within the BLA induced structural remodeling in the DH, suggesting that GABAergic transmission in BLA modulates the structural plasticity in the DH associated with stress-induced promoting effect on fear memory.

It is known that a consolidated memory can return to a labile state and become transiently malleable following reactivation. This instability is followed by a restabilization phase defined as reconsolidation. Our results revealed that prior stress lead to a memory trace that was insensitive to the disrupting action of diverse drugs on fear memory reconsolidation. Moreover, prior stress prevented the enhancement of reactivation-induced expression of Zif-268 and the GluN2B sites, two molecular markers of the labilization/reconsolidation process. In summary, prior stress limited both the occurrence of the reactivation-induced destabilization and restabilization. Further results showed that MDZ administered intra-BLA before stress prevented the induction of resistance to the interfering effect of drugs on reconsolidation, whereas the blockade of amygdalar GABA-A receptors by Bicuculine (BIC) before memory encoding induced resistance to interference.

Overall, these results suggest that GABAergic signaling in the BLA at the moment of memory encoding is determinant for the fate of the fear memory trace. Encoding the information under this circumstance may induce neurobiological changes that limit the dynamics of fear memory.

A2

Opening Lecture

BAT CONSERVATION: A DAILY CHALLENGE

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Bats are a group of mammals with a strong negative image for a large part of the human population due to the myths and legends that surround them. Contrary to these assumptions, these animals play positive ecological roles, essential and fundamental for the environment and for man. The Argentine Bat Conservation Program (PCMA), associated with programs from 22 countries that are part to the RELCOM (Latin-American and the Caribbean Bat Conservation Network), has as its mission the spreading of information concerning the ecological importance of this group of mammals. Since 2007, when the PCMA was born, it has grown in members and delegations, thus allowing a greater scope in its activities. Currently, the PCMA has 16 delegations in different provinces throughout Argentina, made up of students, researchers and members of the community. The aim of the PCMA is to provide knowledge with respect to the benefits that bats exert on the environment and on humans, such as helping in the renewal of forests, contributing to the pollination of plants of ecological and economic importance, and playing a major role as biological controllers of insect pests, to mention just a few. On the other hand, we analyze, study and broadcast information about the threats suffered by bats as a consequence of anthropic activities, ignorance being among the most important ones. In order to achieve these goals, actions are carried out in three main lines of work: research, education and dissemination of knowledge, and conservation and management. Investigations in these areas contribute to knowledge of the distribution and population status of the species in Argentina, which is fundamental for the proper application of management and conservation actions. The management actions, such as the establishment of natural sites and priority areas for the conservation of the species, allow the generation of an

appropriate framework for bats and their habitats. Finally, the area of education and knowledge dissemination works mainly on the interpretation and explanation of myths and legends, with the aim of raising awareness among the human population so that they support the conservation of these animals.

A3

FUNCTIONAL AND STRUCTURAL PROPERTIES OF CHIA PROTEINS

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Chia is a Mesoamerican plant whose grains are rich in omega-3 and omega-6 fatty acids. Chia production in Argentina is carried out in the provinces of Salta, Jujuy, Catamarca and Tucumán. In recent years, the properties of other components of the grain such as the mucilaginous coating and proteins have begun to be studied. Their content varies between 16 and 25% and they have high nutritional quality. According to the FAO/WHO, chia proteins have a good amino acid balance and a high content of essential amino acids. The food industry has a growing interest in producing vegetable protein isolates since they offer interesting functional properties, which are usually superior to those of the flour. Properties such as formation and stabilization of emulsions as well as solubility, viscosity and gelation are profoundly influenced by protein physicochemical properties such as conformation, hydrophobicity and thermal stability. The most important factor affecting protein conformation is pH, since it modifies the charge and degree of unfolding of proteins. In particular, alkali and acid treatments during protein extraction through isoelectric precipitation are known to induce structural changes in proteins. This work focuses on the effect of the extraction pH on the functional properties of chia protein isolates.

SYMPOSIUM: “CHRONOBIOLOGY”

A4

CIRCADIAN DESYNCHRONIZATION IN A MURINE MODEL OF CHRONIC JET-LAG: EFFECTS ON METABOLISM AND IN MELANOMA TUMOR GROWTH

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Chronic circadian misalignment may lead to pathological states. We have characterized a C57BL/6J mice model of behavioral desynchronization generated by a 6-h advance every 2 days of the light:dark (LD) cycle, simulating chronic jet-lag (CJL). We found abnormal body weight gain in animals exposed to CJL compared to those housed under normal LD cycles. This phenotype was not observed when animals had voluntary access to a running wheel, as well as when they were restricted to feeding during the dark phase of the cycle. We also found certain alterations in the lipid metabolism such as increased circulating triglycerides, perilipin expression, and adipocyte size. This loss of circadian homeostasis of energy balance could emerge from desynchronization between behavior, food assimilation and metabolism. In addition, in a melanoma model in C57BL/6J mice, we studied the effect of CJL on tumor development and its regulation by immune and cell cycle factors. We found enhanced tumor development in mice under CJL, with higher growth rates and lower latency compared to controls under LD cycles. An LD variation (higher diurnal levels) of pro-inflammatory cytokines Interleukin 1 β , 6, and Tumor Necrosis Factor (TNF α) was determined in tumor tissue, but not in animals under CJL. We also found a daily pattern in the percentage of M1 (pro-inflammatory) and M2 (anti-inflammatory) macrophages in both spleen and tumor under LD, which were inverted under CJL. In addition, the rhythmic expression pattern of circadian clock genes, as well as cell cycle genes, was altered in this group. Desynchronization of immune variables, as well as peripheral circadian and cell cycle genes deregulation, may be part of the pathological context implicated in enhanced tumor growth under chronic desynchronization.

A5

BIOLOGICAL RHYTHM AND SLEEP: EFFECTS ON THE METABOLISM OF DIABETIC PATIENTS

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The biological clock (BC) regulates the sleep cycle, synchronizing our physiology with the environment. In humans, the period of the BC is related to the chronotype. There are differences at the level of BC genes, as well as environmental components, which determine our chronotype or diurnal preferences for our sleep/wake cycles (Morning, Neutral or Evening). Recent findings show that the Evening chronotype is related to changes in eating behavior that are detrimental to the metabolism of type 2 diabetic patients (DM2). Numerous epidemiological studies show the connection between sleep and metabolism. Metabolic alterations, obesity, diabetes and cardiovascular disease are associated with sleep problems. DM2 patients, in turn, are susceptible to sleep problems due to factors such as aging, obesity, nocturia and neuropathy. In our research group we decided to assess the chronotype frequency distribution in DM2 patients, characterizing the prevalence of sleep problems from the perspective of the patient himself to determine how it affected the metabolism. In a sample of slightly over 500 DM2 patients, we observed that the evening chronotype showed an altered carbohydrate metabolism, with higher levels of Fasting Glycemia, Postprandial Glycemia and Glycosylated Hemoglobin A1c in comparison with other chronotypes. We also observed that sleep problems were more frequent in females, as well as the consumption of sleep medication (mainly benzodiazepines). Patients reporting sleep problems (reduced rest, insomnia, etc.) also showed altered metabolism of carbohydrates (higher levels of fasting blood glucose and glycosylated hemoglobin A1c). This may be due to a reduced plasticity of the BC in women, since its intrinsic period is shorter than 24 hours. Therefore, sleep deficit is more difficult to cope with, favoring metabolic deterioration. This relationship shows the need to implement healthy sleep guidelines as part of an integral treatment of DM2.

A6

REPRODUCTION OF THE EARED DOVE (*Zenaida auriculata*). SEASONAL VARIATION IN PLASMA LEVELS OF SEX HORMONES

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In bird species that live at large latitudes, reproductive events are mainly controlled by photoperiods. This is perceived through encephalic photoreceptors located in the hypothalamus. During long photoperiods, the information transmitted by brain photoreceptors triggers the metabolism of thyroid hormones leading to an increase in the activity of the hypothalamic-pituitary-gonadal axis. This greater axis activity leads to gonad development and growth and the production of reproductive modulating hormones (testosterone and estradiol). These events allow birds to maintain an adequate synchronization of their physiology and reproductive behavior with the annual cycle. Seasonal variations in plasmatic concentrations of testosterone and estradiol have been widely reported in birds. During the non-reproductive period (short photoperiod), plasmatic concentrations of testosterone and estradiol are low. These concentrations increase as the photoperiod begins to lengthen (reproductive period), generating changes in the physiology and reproductive behavior in both sexes. Within this theoretical framework, the Eared Dove (*Zenaida auriculata*) is an interesting avian model for the study of the endocrine basis of avian reproduction, since it has been considered a plague for several decades and apparently has continuous reproduction. This reproductive characteristic could be due to the fact that the males may always be physiologically prepared to reproduce, due to the little seasonal variability in their testicular weight and size, that is, they do not suffer a sharp gonadal retraction. Our results indicate that despite the lack of gonadal retraction, gonadal functionality is seasonal and synchronized with the photoperiod. Plasma testosterone levels (determined by RIA) were minimal during the winter and reached maximum values during spring-summer. This would indicate a photoperiodic control of reproduction, constituting an exception to the classical model of the initiation of reproduction in birds

ORAL COMMUNICATIONS

A7

PRESENCE OF *Varroa destructor* IN DRONE CONGREGATION AREAS (DCA) OF *Apis mellifera* OF TWO ECO-CLIMATIC REGIONS OF ARGENTINA

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Apis mellifera has a mating system in which drones and queens are in Drone Congregation Areas (DCAs). These are also places of disease transmission. Parasites such as *Varroa destructor* may also be found in DCAs, causing an impact on the health of the colonies. The objective of the present study was to locate DCAs in two eco-climatic regions of Argentina (Buenos Aires (BA): temperate, and Tucumán (T): subtropical), analyze the landscape, determine genetic variability, evaluate the impact of parasitism and measure the load of mites in the surrounding apiaries and DCA. We found six DCAs in all. The average distance from the DCAs to the apiary was 500m. The dominant coverage in the DCAs was (56%-94%), which showed more connectivity and patches in more regular ways than forest and urban coverage. We found four haplotypes in the DCAs of T, A1 (Africanized) being the most representative. In BA the four haplotypes were found in the same DCA. Apiary infestation with *Varroa* was 2.4% for Alberdi, 4.4% in Timbó Viejo, 0.9% in Castelar and 1.5% in Luján. *Varroa* infestation in the DCAs was 4.3% in T and 0% in BA. Locating and describing the genetic variability and landscape of DCAs is important for the development of conservation and disease control strategies for honeybees.

A8

BIODEGRADATION OF SILOBAGS BY THE WAX MOTH LARVAE OF *Achroia grisella* F. AND *Galleria mellonella* L. (Lepidoptera, Pyralidae)

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Human consumption leads to an excess of plastic waste on the planet that results in 5,700 million tons not recycled per year. Some insects are able to consume and degrade plastics. In Tucumán, we recorded larvae of the moths *Achroia grisella* F. and *Galleria mellonella* L. (Pyralidae, Lepidoptera) consuming silobags (SB). Although we do not know the origin and mechanisms of plastic degrading enzymes, they could be related to bacteria on the body surface or in the digestive tract of larvae. The objectives of our work were to determine if the degrading agents are on the surface of the larvae and to evaluate differences in SB consumption among larvae bathed with antibiotics. To eliminate the superficial microbiota, we washed larvae with 6 (*A. grisella*) and 7 (*G. mellonella*) antibiotics plus a control group (n=6-10 per treatment, respectively). We monitored the development of each larva in Petri dishes containing previously weighted SB disks. Comparing the initial vs. final SB weights, we did not find significant differences in SB consumption by species between treatments and control, but the larvae completed their development. We conclude that the degrading bacteria are not found in the body surface of the larvae and that this activity would be due to agents in the digestive tract. We are currently isolating the microbiota of the digestive tract for identification and studying the chemical composition of larval feces.

A9

RESPONSE OF SPEARMINT (*Mentha spicata* L.) TO DIFFERENT LEVELS OF NITROGEN FERTILIZATION ON THE YIELD AND ESSENTIAL OILS QUALITY

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The synthesis of essential oils is determined by genetic and environmental factors such as photoperiod, temperature and the availability of nutrients in the soil. A field study was conducted to determine the effect of nitrogen fertilization on the yield and quality of essential oils in *Mentha spicata*. The assays were carried out in El Zanjón,

Santiago del Estero, under irrigation conditions. Four treatments were evaluated: a non-fertilized control and doses of 150, 200 and 250kg ha⁻¹ of urea. The crops were harvested during the flowering stage (March 2018) and the plant material was dried at room temperature. The essential oils were extracted by steam distillation and their chemical composition was determined by gas chromatography and mass spectrometry. The results were analyzed with ANOVA and Tukey's test. The three levels of urea significantly increased the yield in essential oils with respect to the control, and did not differ among themselves. The same trend was observed in the contents of carvone and limonene, which determine the quality of essential oils. We concluded that nitrogen fertilization increases the yield and quality of essential oils in *M. spicata*. Thus, for the area under study, the recommendation for an increase in upper plant biomass and essential oil quality in spearmint is to employ 150kg ha⁻¹.

A10

HISTOCHEMICAL AND ULTRASTRUCTURAL STUDY OF THE MIDDLE INTESTINE OF A Bt-CROPS-RESISTANT POPULATION OF *Diatraea saccharalis*

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Development of transgenic crops through *Bacillus thuringiensis* (Bt) technology has been a significant advance in the substitution of agrochemicals and represents one of the solutions most respectful to the environment. Bt-derived Cry toxins are insecticidal proteins and their target is the insect middle intestine (MI) epithelium. The evolution of resistance to this technology is alarming; such is the case of unexpected damages by *D. saccharalis* in Bt maize detected in San Luis province (Argentina) in the 2012/2013 campaign. The objective of this work was to study histochemically and ultrastructurally the morphological characteristics of the intestinal epithelium of Bt-resistant larvae and to compare them with those of susceptible larvae, as a basis to explain the resistance mechanism. A toxicity bioassay was carried out feeding neonate larvae of both populations on Bt maize during 48 hs. Larvae were fix at 0, 6, 12, 24 and 48 hours for optical and electronic microscopy. PAS, Alcian Blue pH2.5 and Toluidine Blue stains were use. The progressive cellular damage of the MI epithelium of the susceptible larvae was descript. In contrast, the resistant larvae preserved the integrity of the intestinal epithelium and an increase in goblet cells was observe accompanied by the secretion of a thick peritrophic membrane of a glycoprotein nature.

These morphological findings allow us to postulate that the production of the thick layer may interfere in the interaction between the toxin and the plasma membrane of the epithelial cells of the MI of resistant larvae.

A11

DIVERSITY AND STRUCTURE OF WOODY VEGETATION ON THE WESTERN SLOPES OF THE SIERRA DE SAN JAVIER, TUCUMÁN

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From a botanical perspective, the western slope of the Sierra de San Javier is a little-known area. The objective of this study is to analyze the composition, diversity and structure of woody vegetation at two altitudinal sites (LT: 1.088 masl; QT: 1.380 masl) on the western slope of the Sierra de San Javier. An inventory of woody plants (DBH \geq 2.5cm) was carried out at each site, using 2x50m plots (10/site). We analyzed the richness, floristic similarity, density, basal area, importance value of species (IVI) and families (IVF). A total of 539 woody plants of 19 families, 29 genera and 31 species represented by trees (78.2%), shrubs (3.7%) and climbers (17.8%) were registered. The proportion of species observed with respect to the theoretical expectation was 90% per site. The richness and density of plants per plot was similar between sites, but the basal area was notably higher in QT. The species with highest density were *Ruprechtia apetala* in LT and *Parapiptademia excelsa* in QT. There were 11 shared species (57.5%) and 7 exclusive species on each site. The three most important species in LT (64% of the total IVI) were *Pisonia zapallo*, *Anadenanthera colubrine* and *Ruprechtia apetala*. In QT, the five species with the highest IVI (55%) were *Parapiptademia excelsa*, *Ruprechtia apetala* and *Terminalia triflora*. Fabaceae was the family with greatest ecological importance in each site. The results show that both sites are similar in species composition, differ principally in the basal area (higher in QT) and correspond to an ecotone between Yungas and the Chaco serrano.

A12

CHARCOAL ANATOMY OF SPECIES FROM THE ARGENTINE PUNA

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The Antofagasta de la Sierra (Catamarca) locality lies in the southern sector of the Argentine Puna; its landscape presents wavy plains, mountains and many volcanoes. The climate is cold, dry and frequent winds blows from the Southwest. Fitogeographically speaking, it belongs to the Provincia Puneña where the genus *Fabiana*, *Parastrephia*, *Acantholippia*, *Senecio*, *Baccharis* and *Junellia* are.

The locality has many archaeological investigations and charcoal remains are often found. In the study of charcoal remains it is essential to have contemporary reference material in order to obtain accurate taxonomic identifications. This reference material should undergo the same processes than the archaeological remains in order to reproduce the same conditions in both samples. In this context, the aim of this work was to start a charcoal collection that will be useful for the identification of archaeological charcoal remains obtained in the locality. The stem of the following species were carbonized: *Acantholippia deserticola*, *Adesmia erinaceae*, *A. horrida*, *A. minor*, *Artemisia copa*, *Atriplex imbricata*, *Baccharis incarum*, *Chquiraga atacamensis*, *Ephedra breana*, *Fabiana bryoides*, *F. punensis*, *Jumellia seriphoides*, *Mulinum crassifolium*, *Parastrephia lucida*, *P. quadrangularis*, *Senecio santelisis*, *S. viridis*, *Neosparton ephedroides* and *Neuontobotrys tarapacana*. The charcoal obtained was studied under binocular loupe and the three typical wood sections were photographed with SEM. The binocular anatomy of each species was described. The results show the permanence of diagnostic features of each species even under the effect of temperature as well as anatomical modifications due to it.

A13

PERFORMANCE OF LAYING HENS AND FATTY ACIDS COMPOSITION OF THEIR EGGS AFTER FEEDING WITH RAPESEED 00 (CANOLA®) EXPELLER

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Eggs are an excellent human food source of high quality proteins and can be a source of omega 3 fatty acids that are important for health and development. A non-transgenic variety of rapeseed (*Brassica nappus*) that does not contain significant amounts of antinutritional substances and is rich in omega 3 fatty acids is called Canola® or rapeseed 00. The objective of this study was to evaluate the effect of substituting soybean extrusions, common in rations, by Canola expeller on the performance of classic Lohmann laying hens and analyze the impact of the substitution on the fatty acid composition of the egg. We worked with 100 laying hens, which were 30 weeks old at the beginning of the trial. They were divided into 2 groups, one group received standard food and the other received the one in which 8% Canola expeller was used. The food was supplied *ad libitum*. The test was carried out for 3 months. The fatty acid composition of the lipids of the eggs and the food was analyzed by gas chromatography. The food with canola contained 60% more alpha linolenic acid (18:3 omega 3), than the standard food. The content of omega 3 fatty acids in the eggs increased significantly. Egg production and conversion increased significantly. The weight of the eggs decreased significantly, although the values were found within those that appear in the manual of the line. The canola expeller seems to be useful for layer hen's food and generate an enriched product from the point of view of the human nutrition.

A14

THE VEGETAL DEFENSE INDUCING ACTIVITY OF HET DEPENDS ON ITS REDOX STATE

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It was previously reported that the ellagitannin HeT, obtained from strawberry leaves, has antibacterial properties and is also an inducer of the plant defense response. It was also shown that the antibacterial activity is due to a strong interaction with the plasma membrane that affects the flow of electrons and causes the oxidation of the HeT molecule. In this work we investigated whether, as with bacteria, HeT is oxidized by the interaction with plant cell, and if the redox state of HeT influences its activity as an inducer of plant defense. First, tests were carried out by UV-Vis spectroscopy where it was demonstrated that the interaction of HeT with isolated strawberry cells causes the oxidation of HeT. Subsequently, biochemical, molecular and phytopathological tests were carried out with HeT in the

reduced state (HeT-red) and in the oxidized state (HeT-ox), in order to study the relationship between the capacity to induce the defense and the redox state of the molecule. The results obtained showed that the isolated strawberry cells treated with HeT-red produced a biphasic accumulation of H₂O₂ with peaks at 2 and 5 hours post treatment, whereas in the cells treated with HeT-ox there was no accumulation at all. In the same way, molecular studies showed that only HeT-red is able to induce over expression of the genes: *FaCAT*, *FaAPX*, *FaPRI*, *FaChi2-2*, *FaERS1* and *FaETR1* associated with the activation of the immune response in strawberry plants. Finally, a phytopathological test was carried out where it was demonstrated that only HeT-red is able to induce a protective effect in strawberry plants against the virulent pathogen *Colletotricum acutatum*.

A15

FUNGAL SUPERNATANT INDUCES DEFENSE RESPONSES IN STRAWBERRY PLANTS AGAINST *Botrytis cinerea*, THE CAUSAL AGENT OF GREY MOLD

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The global trend towards sustainable agriculture aims at reducing the use of agrochemicals and replacing them by natural products. In this sense, the Plant Biotechnology Laboratory at INSIBIO together with INTA-Famaillá study biological alternatives to control grey mold caused by *Botrytis*, which is one of the main diseases that affect strawberry crops. The aim of the present study was to evaluate the potential of a culture supernatant of *Colletotrichum acutatum* M11 isolate (M11-CF) to biocontrol *B. cinerea* in *Fragaria x ananassa* cv. Pájaro plants. M11-CF was obtained by filtration through 0.2µm pore-size membrane of the 10 d-static fungal culture. M11-CF was applied on one leaf by spray until run-off. Induced plants were challenged towards *B. cinerea* 1, 2 or 5 days post treatment (dpt). Water, Switch (0,0008%, commercial botrycide, Syngenta) and flg22 (200 nm) were used as controls. Grey mold symptoms were quantified over time and it was observed that when plants were induced 1 d prior to infection the maximum local and systemic defense were achieved. M11-CF did not inhibit *B. cinerea in vitro* germination or mycelial growth in comparison to Switch control. It neither inhibited *Arabidopsis* seed germination nor *in vitro* growth when compared to flg22 treatment, which inhibited 60% of seedlings growth. In conclusion, M11-CF induces protection against *B. cinerea* in strawberry plants and the defense response induction is not in detriment of plant growth, as many elicitors do.

A16

EVALUATION OF *Azospirillum* FRI3 ABILITY TO PROMOTE THE INITIAL GROWTH OF SUGAR CANE

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Biofertilizers containing plant growth promoting bacteria are a sustainable, eco-friendly and inexpensive alternative for integrated management in sugarcane. The objective of this work was the selection and identification of *Azospirillum* rhizosphere strains, and the evaluation of its ability to colonize and promote the initial growth of this crop. The Az-FRI3 strain, isolated from local sugarcane fields, was selected because of its capacity to produce indole acetic acid, solubilize phosphorus and fix nitrogen. Strain identification was carried out by 16S DNAr amplification and later digestion with the enzyme *AluI*, comparing the profiles obtained with that of *A. brasilense* Az39 reference strain. On greenhouse bioassays, isolated and healthy buds of TUC 95-10 variety were inoculated by immersion on a bacterial suspension (10⁶ CFU/ml) for 15 minutes. Then, the inoculated buds were planted on 25 well seedlings containing a mixture of substrates and watered periodically with tap water. Plant height was evaluated at 30 days after inoculation (DPI), and fresh and dry weight at 60 DPI. As a result, we observed an increase in plantlet height treated with Az-FRI3 in comparison with non-inoculated control plants and an increase in both aerial and root system dry weight. Az-FRI3 colonization during the initial growth of sugar cane plantlets was evaluated by bacterial quantification on NFB semisolid medium at 70 DPI. We observed a significant increase in the counts made from stems and leaves of Az-FRI3 inoculated plants compared to control plants. In conclusion, *Azospirillum* Az-FRI3 strain could be used as a potential biofertilizer for sugar cane cultivation.

A17

UPDATE IN DIAGNOSIS OF ARBOVIRUS: ALTERNATIVE SAMPLES TO SERUM FOR VIRAL DETECTION. TUCUMAN 2018

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Dengue, the most frequent viral infection transmitted by mosquitoes, Chikungunya, Zika and Yellow Fever reemerging virus are a permanent threat to public health. Clinical presentation is non-specific, making clinical diagnosis difficult. Rapid decline in viremia and the serological cross-reactivity between viruses in same family, make it necessary to emphasize molecular diagnosis in acute samples. The objective of this work is to report the local experience of the use of alternative samples to the serum for the search of arbovirus nucleic acid, which will allow extending the detection time. Methods: Serial samples of whole blood, serum, urine and saliva were collected at intervals of 48-72 hrs and detection times were analyzed until they were negative. Results: From January to September 2018, 167 patients were studied, out of which 5 were positive: 4 Dengue (one type 3 and three type 1) and 1 Zika. In serum and plasma they were detected up to the 6th day of evolution. Dengue 3 was detected in whole blood up to the 8th day, while Dengue 1 and Zika did not differ from serum. In urine, Dengue was detected from the 3rd to the 11th day and Zika from the 3rd to the 22nd day. The saliva samples were negative. Conclusions: urine was the sample with the highest detection range by Real Time PCR over time. A larger number of patients is needed to determine the frequency and duration of detectable nucleic acid for each sample. Early diagnostic confirmation is important for clinical management, surveillance strategies, focus control and prevention.

A18

MONITORING OF *Culicoides* (CERATOPOGONIDAE), PARASITE AND ARBOVIRAL VECTORS IN INTERVENED FOREST ENVIRONMENTS, TUCUMÁN- ARGENTINA

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Culicoides (biting midges) are recognized vectors of protozoa, nematodes and viruses worldwide. In Argentina, transmission to humans of mansonellosis and oropouche fever, and bluetongue in animals have been reported. The biological cycle of these dipterans and the hosts that participate in the transmission chain are strongly related to the environmental dynamics of the ecosystems in which they live. The aim of this study was to determine the richness, abundance and seasonality of *Culicoides*, as well as the influence of meteorological variables on their fluctuation. Specimens were collected in 2016 (January-December) with CDC light traps fitted with incandescent white light and ultraviolet LED (Prototype TDLED15), installed in intervened forest environments. 3411 specimens were collected, and nine species were identified, *C. debilipalpis*, *C. calchaqui*, *C. crescentis*, *C. guttatus*, *C. insignis*, *C. lahillei*, *C. paraensis*, *C. venezuelensis* and *C. willinki*. *Culicoides paraensis* (71%) was the most abundant species, followed by *C. insignis* (15%) and *C. debilipalpis* (6%). A greater abundance was recorded in localities of Yánima (46%), Escaba (20%) and Potrero de las Tablas (18%), with population peaks in summer, with the influence of temperature and precipitation variables. UV LED traps were more effective than incandescent white light. Among the species collected, *C. lahillei*, *C. debilipalpis* and *C. paraensis* are vectors of mansonellosis, and *C. insignis* of bluetongue. Determining ecological parameters that influence the activity of the vector allows establishing the risk of disease transmission and optimizing control and prevention measures.

A19

LACTATION IN CHIROPTERA

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The Chiroptera order has a wide geographical distribution that ranges from the poles to the temperate regions. Various factors such as temperature, humidity, precipitation, photoperiod, and food availability influence their reproductive patterns. Breastfeeding represents the period of greatest energy demand in reproduction, since the female has to cover her own energy demands and produce milk that ensures the growth and survival of the offspring. Bats have small litters and long periods of lactation during which the offspring have to reach almost the size of an adult at the time of weaning. The great diversity of diets and ways of life make them an ideal group for comparative studies on the characteristics of milk. The aim of this work was to study the composition of bat milk taking into account their dietary habits, stage of lactation and type of habitat (urban, rural or wild). The concentration of total proteins was determined by spectrophotometry. The samples were subjected to SDS-PAGE under reducing and

nonreducing conditions. Whey proteins, micellar proteins and proteins that make up the fat globule membrane were studied. The electrophoretic patterns show differences between the frugivorous and insectivorous species studied, and also according to the lactation period. The great heterogeneity of the results leads us to think that there are many factors that influence the milk protein composition, the phylogenetic aspect possibly being the least determinant one. These are the first studies, at least with this level of depth, which have been carried out for this group of mammals as exciting as they are atypical.

A20

FIN WHALES IN ANTARCTICA: A STUDY OF ENVIRONMENTAL VARIABLES THAT DETERMINE THEIR SPATIAL DISTRIBUTION

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Fin whales (*Balaenoptera physalus*) are some of the most abundant cetaceans in Antarctica. In 2010, the Argentine Antarctic Institute started a program targeted to study top predators in the South Orkney Islands, Antarctica, with an emphasis on cetaceans. The aim of this study is to determine the conditions under which species develop their life cycles, which allows us to predict their vulnerability under environmental changes. In 2014 and 2016 summer seasons, cetacean observations were made on board RV Puerto Deseado around South Orkney Islands.

We used Generalized Linear Models with Poisson error distribution and logarithmic link function to investigate the variables that determine whale distribution. Our results indicate that the following variables, distance to nearest coast and sea surface temperature (SST), were significantly predictive (1% and 5% respectively). These variables may be related to the influence of the Antarctic Circumpolar Current, which transports nutrients under a specific SST range north of the islands, where the highest fin whale concentrations were recorded.

POSTER PRESENTATIONS

A21

COMPARISON OF QUALITY PARAMETERS BETWEEN TWO VARIETIES OF OLIVE OIL: ARBEQUINA AND CORATINA FROM THE ANTINACO - LOS COLORADOS VALLEY - LA RIOJA

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The Mediterranean diet is associated with a lower incidence of pathologies of cardiovascular origin and with greater longevity. These health benefits have been attributed, to some extent, to the consumption of olive oil. Despite the relevant biological effects of this oil, in Argentina and particularly in La Rioja, there is little data available on the content of compounds with antioxidant potential. In this study, we measured and compared some quality and purity parameters of two varieties, Arbequina and Coratina, analyzing the correlations between their compositions, both varieties being produced in the Antinaco-Los Colorados Valley, in the department of Chilecito - La Rioja. We worked with three samples of each variety, which belong to three oil manufacturers of the Valley. Quality tests were carried out such as acidity (AOCS Cd 3d-63.), peroxide index (AOCS Cd 8b-90), ultraviolet absorbance (COI / T.20 / Doc. No 19 / Rev. 4), and purity parameters, profile of fatty acids (COI / T.20 / Doc. n° 24), total polyphenols (Folin-Ciocalteu test), pigments (absorbance at 472 and 670nm), flavonoids (Popova, 2004), and antioxidant potential (DPPH method). After the tests were conducted, we found a difference between the two oil varieties analyzed. Coratina has a higher content of polyphenols and flavonoids. With respect to quality parameters, both varieties are within the allowed values to be considered extra virgin olive oil. The Coratina variety also has a higher antioxidant content, which associates it with better nutritional qualities.

A22

EFFECT OF INOCULATION WITH MYCORRHIZA-FORMING FUNGI ON THE GROWTH OF OLIVE TREE SEEDLINGS

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Arbuscular mycorrhizae (AM) are symbiotic associations between fungi and plant roots. In this symbiosis fungi have a positive effect on plant growth in environments with water and nutrient limitations. The effect of native mycorrhizae mixed inoculum from an olive field on the vegetative growth of olive seedlings subjected to dry conditions was studied. The presence of mycorrhiza structures was determined, 87% of hyphae, 6% of arbuscles and 36% vesicles being observed. When the seedlings were 8 months old, they were divided into two groups, in one of which the seedlings were watered till the end of the treatment and in the other group watering was suspended for seven days, before being measured. At the time of collection the number of leaves, fresh weight of roots and stems were evaluated by ANOVA. The results obtained demonstrated that plants with mycorrhizae had a greater average number of leaves and heavier stems and roots than those without mycorrhizae. These results suggest that mycorrhizae might exert a favorable effect under hydric stress conditions, which would allow plants inoculated with micorrhizae to be more resistant in arid regions.

A23

PHYSIOLOGICAL CHANGES IN *Anastrepha fraterculus* AND *Ceratitis capitata* ASSOCIATED WITH PLANT VOLATILES

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Anastrepha fraterculus and *Ceratitis capitata* are pests of economic and quarantine importance in Argentina. Biopesticides are considered as eco-friendly control alternatives. Few studies exist on the physiological changes generated by exposure to plant volatiles (PV) in insects. The objective of this study was to examine physiological parameters of both species in the presence of PV. Twenty-one adult couples were exposed to volatiles of: 1- *Baccharis dracunculifolia* oil (BdO), 2- *Pinus elliottii* oil (PeO), 3- *Baccharis dracunculifolia* hydrolate (BdH), 4- *Solanum granulosoleprosum* + *Ricinus communis* extract (S.g+R.c), 5- Alcohol 50% (OI50%) and 6- Water (Control) for 1, 12 or 24h. After exposure, the content of carbohydrates, glycogen, lipids and proteins was determined for each individual using conventional methods. The results, analyzed by MANOVA, showed significant differences among compounds according to treatment, species, sex and time. The lipid and protein content in both sexes for the two species differed among treatments and according to the duration of the treatments ($F_L=4.90$, $p=0.01$ and $F_P=38.84$, $p=0.01$). Glycogen content for both species varied notably between treatments and exposure time ($F_G=1.88$, $p=0.04$). The content of carbohydrates for both sexes varied among treatments and according to the duration of the treatments ($F_C=2.07$, $p=0.02$). The results show that exposure to PV of different tested products triggers physiological changes in both species, which could affect their reproductive behavior.

A24

EFFERENT DUCT IN AMPHIBIAN TESTIS: HISTOLOGICAL AND SUBCELLULAR STUDY

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The aim of the present work is the histomorphological, histochemical, immunohistochemical and ultra-cytochemical analysis of the efferent duct in *Leptodactylus chaquensis* testis. Adult male specimens obtained during the breeding period were used. Sample testes were processed and the following techniques were applied: -histomorphological with Hematoxylin-Eosin stain; -histochemistry with periodic acid-Schiff (PAS)-H and alcian blue (AB)-PAS; -immunohistochemistry with anti-calbindin (anti-CaB) and anti-calmodulin (anti-CaM) monoclonal antibodies, and ultra-cytochemical with potassium pyroantimonate, for the subcellular localization of Ca^{2+} . Sample observations and analyses were made with optical and transmission electron microscope. The observations demonstrated the presence of electron-lucid vesicles in the cytoplasm of the ductal cells, filled with different glycoconjugates revealed by histochemical technique. The Ca^{2+} deposits were observed in the cytoplasm and in the membrane of the electron-lucid vesicles. Moderate reactivity was detected for CaM and CaB in the cellular cytoplasm. These results show for the first time in anurans the presence of Ca^{2+} and of its binding proteins CaB and CaM in the cells of the ductal epithelium. Considering that Ca^{2+} has an important role in exocytosis, its presence and that of its binding proteins in

the cells of the efferent duct, associated with the presence of vesicles with positive PAS and AB content, suggest a secretory function of these cells, a finding not yet reported in amphibians. The secreted product could possibly be involved in the maintenance, motility and viability of the gametes during their passage through the male tract.

A25

AMPHIBIAN SPERM QUALITY: EVALUATION OF MORPHOLOGICAL PARAMETERS

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The decrease in *Leptodactylus chaquensis* populations due to the fragmentation of their natural habitat requires a systematic study of sperm quality, a fundamental aspect for applying *in vitro* fertilization techniques contemplated in species conservation programs. The aim of this work was to evaluate morphological parameters in spermatozoa of *L. chaquensis* in order to establish sperm quality standards. The samples were obtained by dilaceration of testicles collected during the breeding period of the species (November-February). Cell vitality was determined with eosin 0.05% w/v. Morphology was analyzed with PAP and Diff Quick staining, the acrosomal state by Coomassie blue, nuclear maturation with aniline blue, and DNA integrity with the acridine orange test and the TUNEL technique (apoptosis). Our results indicated 82.58%±0.6 of live and mobile gametes. 4.67%±1.30 showed morphological anomalies in the flagellum. 92.67%±0.49 exhibited intact acrosome, while 7.33%±0.49 were found at different phases of the acrosome reaction (AR). The percentage of nuclear maturity obtained did not exceed 7.17%±1.01. It was also established that sperm have a high percentage of DNA integrity (96%±0.57) and there were no records of gametes in apoptosis. These data show that: Testicular dilaceration quickly provides a high number of viable and potentially fecundating gametes. -A low percentage of sperm has spontaneous AR. -Despite the high percentage of nuclear-immature gametes, no DNA damage was observed, suggesting that there would be a good packaging of the genetic material. These preliminary studies contribute to the determination of the standards of sperm quality in anurans.

A26

INNERVATION OF THE *Leptodactylus chaquensis* OVARY: HISTOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY

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In most amphibian species, reproductive activity is potentially limited to the spring - summer months during which environmental factors provide optimal conditions for offspring survival. The coordination of physiological processes with environmental changes suggests that the nervous system would act as a receptor and transducer of external signals. On the bases of these data, the aim of the present work was to study the innervation of the ovary of *Leptodactylus chaquensis*.

Samples of the gonad were dissected, fixed and analyzed by observations with stereoscopic microscopy, which allowed us to determine the presence of nerves that enter the gonad through the hilum next to blood vessels. The nerves run through the interlobular space and project towards the surface of the lobes. The histological analysis of stained sections with hematoxylin-eosin revealed the presence of nerve fibers in the neighborhood of ovarian follicles and smooth muscle fibers. There are also neuronal somas, isolated near muscle fibers or associated in small ganglia, close to blood vessels. The immunohistochemical study, using the antiperipherin and antineurofilament 200 neuromarkers, revealed the intermediate filaments of the cytoskeleton of the nerve structures observed in the gonad. The results showed the presence of neural components in the ovary and their topographic location suggests a probable nervous control of gonadal activity.

A27

ORAL ADMINISTRATION OF *Zuccagnia punctata* EXTRACT IMPROVES VASCULAR FUNCTION IN A MODEL OF NORMAL WEIGHT OBESITY

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Previously, we characterized a high fat diet (HFD)-induced metabolically obese and normal weight rabbit model. This model was characterized by endothelial dysfunction and increased vascular reactivity to angiotensin II (AngII). We also demonstrated a beneficial effect of a standardized extract from *Zuccagnia punctata* (ZpE) on endothelial function in hypercholesterolemic rabbits. Objective: to determine the effect of the oral administration of ZpE on

vascular dysfunction induced by HFD. Methods: male rabbits were separated into three groups: fed on regular diet, fed on HFD and fed on HFD orally administered 2.5mgGAE/day ZpE (HFD+Zp). To check endothelial function, acetylcholine (Ach) relaxation in aortic rings and plasma nitrites concentration by Griess reaction were measured. To check vascular reactivity to AngII, aortic rings were exposed to the agonist in the absence (control) or presence of tetraetilamonium (TEA, K_{Ca} channel blocker) or Bay K8644 (Ca^{2+} channel activator, L-type, Ca_v). Results: oral administration of ZpE: -improved Ach relaxation and plasma nitrites levels (HFD 12 ± 9.5 , HFD+Zp 120 ± 31 nmol/mg proteins; $p<0.05$); - decreased maximal response to AngII (HFD 3880 ± 542 , HFD+Zp 2574 ± 272 mg; $p<0.05$). TEA and Bay K8644 reversed the ZpE-effect on the contractile response to AngII. In conclusion, ZpE improved vascular function by increasing nitric oxide bioavailability and by decreasing the contractile response to AngII. This latter mechanism would imply activation of K_{Ca} channels or inhibition of Ca_v . Therefore, ZpE may be used to prevent vascular dysfunction in normal weight obesity.

A28

EFFECT OF DIETS ENRICHED WITH CHIA OIL AND DIFFERENT ENERGETIC CONTRIBUTION ON VASCULAR FUNCTION

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Previously, we observed that a diet supplemented with chia oil (Ch) at 10% has beneficial effects on vascular function in conditions of hypercholesterolemia, but produces glucose intolerance. Our objective was to evaluate if by reducing the % of Ch with which the diet is enriched, the beneficial properties are maintained without altering the metabolism of glucose. Rabbits were fed a control diet (DC), DC plus 3% Ch (Ch 3%) and DC plus 10% Ch (Ch 10%) for 6 weeks. Biochemical, clinical parameters and glucose tolerance test (TTG) were determined. Abdominal visceral fat (AVF) was weighed. Endothelial function was evaluated in isolated aorta by measuring relaxation to acetylcholine (Ach 10^{-8} - 10^{-6} M) and vascular reactivity by stimulation with angiotensin II (AngII 10^{-9} - 10^{-6} M) or noradrenaline (NA 10^{-8} - 10^{-5} M). Ch 10% and Ch 3% added 25% and 7.5% of calories to DC. No changes were observed in the lipidogram, clinical parameters or in the GVA. Ch 3% did not modify the TTG with respect to DC [(mg/dl), DC: Basal 112 ± 7 ; 60min 186 ± 5 ; 120min 140 ± 3 - Ch 3%: Basal 116 ± 9 ; 60min 153 ± 15 ; 120min 133 ± 11], however the % of relaxation decreased to Ach (%): DC: 60 ± 7 vs Ch 3%: $38\pm 6,6$ vs Ch 10%: 60 ± 4 . Both diets enriched with chia decreased: - RMax to AngII (mg), DC: 4117 ± 114 ; Ch 3%: 2539 ± 843 ; Ch 10%: 2755 ± 521 ($p<0.05$) - the response to NA (mg), DC: 11237 ± 1234 ; Ch 3%: 8969 ± 967 ; Ch 10%: 7042 ± 1008 ($p<0.05$). Considering that Ch 3% desensitizes the arteries to vasoconstrictors and does not alter the glucose metabolism, we can conclude that 3% would be the % and the optimal energy contribution of Ch to improve vascular function and prevent cardiovascular risk.

A29

ARCHITECTURAL ANALYSIS OF *Flaveria haumanii* (ASTERACEAE)

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Flaveria haumanii is a native annual weed species in crops. It is used as a dyeing, ornamental and medicinal plant. Plant morphology studies the forms of plants and it is a useful approach to investigate how they interact. For this, the aim of this work was to identify the development sequence, growth mode and ramification of *F. haumanii*. Seedlings was collected from Isla Verde ($28^{\circ}38'27,87''S$ $64^{\circ}05'12,35''W$, Sgo. del Estero, AR) which were transplanted to plantpots. The assays were performed in the experimental campus of the Faculty of Agronomy ($27^{\circ}52'$, $23^{\circ}63''S$ $64^{\circ}14'28'$, $34''W$). Every two weeks, qualitative (growth mode, type and branch location) and quantitative (height, number of internode, ramification and reproductive structure) observations were performed. The data were analyzed by ANOVA and linear regression. Seven types of axes (A0 to A6) could be distinguished in the species. A0 has as a function the support of the aerial system of the plant. It is of defined growth and erect bearing. Axis A1 arises from the development of axillary buds located on the main axis; the remaining axes arise from the immediately previous one and they have sympodial branching, type of ramification sylleptic, anfitonic and mesotonic. The axes that reached maximum length were A0 (0.44m) and A1 (0.23m) and the remaining ones presented values lower than 0.1m. The average value of internodes was lower or equal to 3. The flowering is terminal and successive in time. From the quantification of the data, it is possible to elaborate models that allow the interpretation of the laws that govern growth.

A30

A NEW ENTITY OF *Talinum* (PORTULACACEAE) FROM THE NORTHWEST OF ARGENTINA REVEALED BY ITS2 DNA BARCODING REGION

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The *Talinum* genus was placed in the family Portulacaceae but recent works included phylogenies based on the *matK* and *ndhF* chloroplast genes which allowed the authors to replace the genus in a new family named Talinaceae. *Talinum* anatomy backgrounds are scarce; two base chromosome numbers $x=6$ and $x=12$ and for *T. paniculatum* $2n=24$ chromosome were reported. . In the province of Tucumán (Argentina), these species have two morphotypes: one of them presents pink-purple colored flowers, opposite or sub-opposite leaves and red-yellow colored fruits; the other plant shows white-yellow colored flowers, alternate leaves and green colored fruits. Morphoanatomical and cytogenetic studies performed by our work group revealed differences between these two morphotypes. The aim of this work was to perform a phylogeny of *Talinum* using the ITS2 sequences to establish if this molecular marker shows significant differences between both morphotypes. For that purpose, total DNA of leaves from different populations of Tucumán was obtained by DNA extraction kit (Qiagen). The primers used were: Fw-ITS2 5'ATGCGATACTTGGTGTGAAT3'; Rv-ITS4 5'TCCTCCGCTTATTGATATGC3'. Polymerase chain reactions (PCRs) and visualization in agarose gel were performed with slightly modified standard protocols. This contribution confirmed that *Talinum* is a monophyletic group and the ITS2 sequences revealed that there are significant differences between these two morphotypes studied. This white-yellow colored flower morphotype could represent a different not yet described species or variety in the Argentine flora.

A31

DETERMINATION OF HOLOCINETIC CHROMOSOMES THROUGH THE CID SEQUENCE (CEDP) IN DERMAPTERA AND NEUROPTERA (INSECTA)

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During cell division, the centromere is an indispensable chromosomal region to ensure the segregation of genetics information. In most eukaryotes, the identity of the centromere is determined by the presence of the CENP protein (CID in Diptera). Some groups of animals have chromosomes that lack localized centromeres (holocentric); a clear example of this is Dermaptera, although the holocentricity of their chromosomes is questioned since structures similar to centromeres were observed in them. It is also believed that neuroptera carries chromosomes with localized centromeres (monocentric), but recent studies have questioned this assertion since *Chrysoperla* presents chromosomes lacking centromeres. The aim of this work was to determine the holocentricity of chromosomes of *Doru lineriae*, *D. luteipes* (Dermaptera) and *Chrysoperla externa* (Neuroptera) by amplifying the CENP gen. Using the Quiagen extraction kit, total DNA was obtained from *Drosophila melanogaster*, *Zaprionus indianus gupta* (Diptera) and *Astylus atromaculatus* (Coleoptera) species with monocentric chromosomes and the target species. The primers used were: Fw-5'GAGAACGGAGCTTGGGTT3'; Rv5'CGTCGGCGAACAACCTCAAG3'. PCR amplification was performed with conventional protocols. The final product was identified in 1% agarose gel. The PCR reaction was positive for Diptera and Coleoptera. The lack of amplicons of CENP gen in *Doru* and *Chrysoperla* is another fact that demonstrates the holocentricity of their chromosomes.

A32

FOLIAR ANATOMY OF *Tillandsia albertiana* (BROMELIACEAE-TILLANDSIOIDEAE)

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Tillandsia L. is the most frequent genus of the Tillandsioideae (Bromeliaceae) in Argentina, with species known as "clavel del aire". In the Catálogo de las Plantas Vasculares del Cono Sur (Argentina, southern Brasil, Chile, Paraguay and Uruguay) 50 species are cited for Argentina. *Tillandsia albertiana* Verv., endemic to the province of Salta, grows in a compact form rooted in the rock in the Yunga environment at 1100 masl. It is a lithophytic herb with distichous leaves up to 15 cm long, with a uniflora inflorescence of red flowers. Because epiphytes are able to absorb moisture from the environment by developing particular anatomical structures, the aim of this work is to describe the leaf

anatomy of *T. albertiana*. Freehand cuts were made in the middle third of the sheet, macerated and diaphanized with epidermis of fresh material. In a surface view, the epidermis is constituted by rectangular cells with wavy and thickened walls and the cuticle is striated; on both faces they present peltate, symmetrical and differentiated scales on scutum and wings. In cross section, the contour is concave-convex. The epidermis and hypodermis are unistrified, with abaxial, anomocytic stomata. The mesophyll is differentiated into adaxial aquifer parenchyma and chlorophyll abaxial parenchyma that alternates with closed collateral beams; idioblasts are not observed. It is concluded that *T. albertiana* presents xeromorphic anatomical characters at the leaf blade level, which are useful both for taxonomy and ecology within the Tillandsioideae subfamily.

A33

SAWDUST EXTRACTS FROM QUEBRACHO COLORADO (*Schinopsis balansae*): INHIBITORY EFFECTS ON YARARÁ VENOM (*Bothrops diporus*)

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Several natural products and their derivatives (phenols, sesquiterpenes and alkaloids, among others) are evaluated for their inhibitory properties on the toxic effects of snake venoms. The venom of *B. diporus* (yará chica) has proteolytic, coagulant and vasculotoxic action. Among the poisonous snakes of greater medical importance in Argentina, the *Bothrops* species are responsible for approximately 98% of ophidic accidents. The aim of this work was to evaluate the presence of anti-snake compounds in quebracho colorado sawdust and to evaluate its effect on yará venom proteins. Aqueous and hydroalcoholic extracts were obtained from *S. balansae* sawdust, which were lyophilized and chemically characterized (total phenols and total tannins). A pool of *B. diporus* venom was used, and its minimum hemolytic dose was determined. Inhibition of its haemolytic activity was evaluated with different doses of extracts and an SDS-PAGE of the treated venom was carried out. At a ratio venom:extract (1:10), total inhibition of the *in vitro* haemolytic effect of the venom was observed. Sawdust extracts presented between 11% and 30% tannins. Analysis by SDS-PAGE showed changes in the protein profile of the venom when they are treated with the extracts. The sawdust extracts of quebracho colorado at low doses were active in the inhibition of the haemolytic activity of the yará venom. Modifications in the protein profile of the venom suggest the interaction between tannins and the venom proteins.

A34

CHARACTERIZATION OF SECONDARY METABOLITES OF VARIOUS VEGETATIVE ORGANS FROM *Senecio rudbeckiaefolius* Meyen & Walp

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Senecio rudbeckiaefolius is a shrub native to Argentina, Bolivia and Peru, popularly known as maicha or amaicha. It is considered toxic for livestock, although in Peru it is used in traditional medicine. In Argentina there are no ethnomedicinal reports for this plant, which is considered as hepato- and pneumotoxic. The aim of this work was to perform a qualitative and quantitative chemical profile and identify pyrrolizidine alkaloids in various vegetative organs of *S. rudbeckiaefolius*. Plant material was collected in Tafi del Valle and extracted with ethyl alcohol 96 ° by heating at 65 °C. A general analytical run was carried out on the dry extract and the content of different phenolic compounds and total alkaloids was quantified by photocolorimetric reactions. The identification of alkaloids, which were extracted from each ethanolic extract, was performed by GC-MS. The common metabolites detected in all organs were alkaloids and phenolic compounds. For both flowers and leaves, the alkaloid content was 15.24 and 16.21 mg equivalents of atropine per gram of plant material, and the content of total phenols was 2.78 and 12.61 mg gallic acid equivalents per gram of plant material. The major alkaloids detected in all the organs were identified as senecionine and integerrimine. This work reports for the first time a qualitative and quantitative chemical profile of the species that will serve as a basis for potential applications in agroecosystems.

A35

**CHARACTERIZATION OF RESIDUES OBTAINED FROM THE MECHANICAL
CLEANING OF QUINOA GRAINS**

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For quinoa grains commercialization it is necessary a saponin removal because its bitter taste. Saponins accumulate in the epispem and are traditionally partially removed by abrasion and washing. A modern process of saponin elimination (desaponification) consists in the mechanical removal of the surface of the grain. The obtained pulverized powder is call "mojuelo" and not commercialized.

The objective of present work is to establish the chemical composition, evaluate the antioxidant and cytotoxic capacity of "mojuelo". The powder obtained from the Regalona Baer variety was sieved and extracted by maceration with 50 and 80% ethanol, the extracts were collected and taken dry. A qualitative analysis was carry out using simple reactions. A qualitative analysis of phenolic compounds, saponins, sugars and proteins were carry out.

The antioxidant activity was measured by the scavenging of ABTS radical and by FRAP method, while the cytotoxicity was determined using the brine shrimp test. Saponins were the principal constituents (6.9%) followed by proteins (1.88%), phenolic compounds (0.45%), flavonoids (0.37%) and sugars (0.03%). The extract no exhibits antioxidant and cytotoxic activities. Our results indicates that "mojuelo" is rich in triterpene saponins and, considering its industrial applications, reaffirms that the quinoa should be considered a multipurpose species and not only producing grain for food.

A36

**PHYTOCHEMICAL SCREENING AND QUANTIFICATION OF ANTIOXIDANT
CAPACITY IN EXTRACTS OF *Morrenia odorata***

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Introduction: *Morrenia odorata* Lindl. (Asclepiadaceae), known as doca or tasi, is a vine used for medicinal purposes in the NOA. It is geographically located in the North of Argentina, Brazil, Paraguay and Uruguay. It is a usual food of the Tobas, Pilagas and Wichis and its root is used in folk medicine as a galactogen. **Objective:** To determine the components present in extracts of *Morrenia odorata* by phytochemical screening and quantify their antioxidant capacity. **Materials and methods:** the fruit comes from Burruyacú, Tucumán. The trials to determine the phytochemical screening were: total phenols, flavonoids, anthocyanins, tannins, triterpenes and/or steroids, saponins, cardiotonic, free anthracenes, alkaloids, volatile coumarins. The antioxidant capacity was determined by quantification of phenols, anthocyanins, flavonoids, reduction of molybdenum Mo⁺⁶ to Mo⁺⁵ and depuration of ABTS radical. **Results:** The results of the tests showed the presence of the components studied. The antioxidant capacity was determined by total phenols 150.19mg EAG/100g e.s., RSD: 1.59. Anthocyanins 116.60mg EM3Glu/100g e.s., RSD: 1.29. Flavonoids 55.80mg EQ/100g e.s., RSD: 1.10. Reduction of molybdenum Mo⁺⁶ to Mo⁺⁵: 26.41mg EAA/g e.s., RSD: 1.14. Depuration of the ABTS radical: 95.03 IC₅₀ (µg/mL), RSD: 1.59. **Conclusions:** The analysis allowed us to determine that the extracts of *Morrenia odorata* present a moderate antioxidant capacity, with potential for use with nutritional or pharmaceutical applications.

A37

**DETERMINATION OF PHENOL, ANTHOCYANIN, FLAVONOID, AND TANNIN
CONTENT AND EVALUATION OF THEIR ANTIOXIDANT ACTIVITY IN
Chenopodium quinoa EXTRACTS**

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Introduction: *Chenopodium quinoa*, a species cultivated by the Andean peoples of America for thousands of years, is a product of great cultural value that also has a high nutritional value. Its fruit is an achene containing only one seed of variable coloration, with a diameter of 1.5 to 4mm.

Objective: To quantify phenols, anthocyanins, flavonoids, tannins and determine their antioxidant capacity in extracts of *Chenopodium quinoa* seeds.

Materials and Methods: The seeds come from Tafí del Valle, Tucumán. In 2 seeds extracts (I, hydro-alcoholic and II, acetic), we quantified phenols, anthocyanins, flavonoids, tannins and determined their antioxidant capacity by FRAP, purification of the ABTS radical and reduction of molybdenum.

Results: Quantifications showed: Phenols in I: 771.30mg EAG/100g e.s.; II: 793.80mg EAG/100g e.s. Anthocyanins I: 28.50mg EM3Glu/100g e.s.; II: 22.60mg EM3Glu/100g e.s. Flavonoids in I: 173.80 mg EQ/100g e.s.; II: 91.70 mg EM3Glu/100g e.s. Tannins in I: 341.40mg EC/100g e.s.; II: 406.30mg EC/100g e.s. Antioxidant Capacity: FRAP in I: 278.10mg AA/100g e.s.; II: 182.80mg AA/100g e.s. Depuration of the ABTS radical in I: 97.86 IC₅₀ (µg/mL), II: 72.90 IC₅₀ (µg/mL). Molybdenum reduction Mo⁺⁶ to Mo⁺⁵ in I: 92.50mg EAA/100g e.s., II: 142.40mg EAA/100g e.s.

Conclusions: The analyses allowed us to determine that extract I, hydro-alcoholic *Chenopodium quinoa*, has a moderate antioxidant capacity greater than extract II, acetic, showing potential for use with nutritional and / or pharmaceutical uses.

A38

CONVENTIONAL AND ORGANIC NUTRITION EFFECTS IN LETTUCE (*Lactuca sativa* L.)

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The agrochemicals used for lettuce production generate negative environmental impact and are a risk to the health of consumers. In view of this situation, we aimed at using organic nutrition from a different source. Objective: to evaluate the effects of nutrition or conventional fertilization -chemical- and organic fertilization in lettuce. Work was carried out in the grounds of the Chair of Horticulture-FAZ-UNT in El Manantial-Tucumán. Soil, vermicompost and manure analyses were carried out. We used loose leaf lettuce, transplanted in a double row (0.30m x 0.30m). With BCA design, we tested: T1=goat guano (11,320Kg.ha⁻¹); T2=chicken litter (5,882Kg.ha⁻¹); T3=vermicompost (851Kg.ha⁻¹); T4=diammonium phosphate (8.32Kg.ha⁻¹). After harvest, morphological and physiological parameters were evaluated: number of leaves (NH); fresh plant weight (PFP); root length (LR); fresh root weight (PFR) and foliar area (AF). With ANVA and the Tukey's test, the organic treatments showed better results in terms of biomass: highest PFP was reached with T2 (108.0g) compared to T4 (60.8g). Highest NH was obtained with T1=30.0; T2=27.6; T3=23 with respect to T4=21. In AF there were no significant differences. The LR of T4 (12.8cm) was greater with respect to T1=10.5cm; T2=8.9cm and T3=10.0cm. The vermicompost (T3=10.2g) and chicken litter (T2=9.7g) showed higher PFR compared to T4=5.2g. Based on the parameters evaluated, organic fertilizers exceeded the results of the chemical fertilizer. A medium term evaluation of the sustainability of the lettuce production system with the use of organic fertilizers should be conducted.

A39

LARVAL MORPHOLOGY AND BIOLOGICAL CYCLE OF *Chrysoperla* spp. (NEUROPTERA: CHRYSOPIDAE), A NEW SPECIES FOR ARGENTINA

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Chrysopidae is one of the useful groups in the biological control of phytophagous, particularly aphids, coccids, whiteflies, thrips and mites present in crops of economic importance. Most species of green lacewings are active predators of this pest. The morphology of the immature stages of many species remain unknown. In Argentina three *Chrysoperla* Steinmann species are registered: *Chrysoperla externa* (Hagen), *C. asoralis* (Banks) and *C. argentina* (González Olazo - Reguilón). Knowledge of the species immature stages is important in taxonomy and for use in biological control programs. In this work the larval morphology and biological cycle of a new *Chrysoperla* species are described. In the lab, a breeding was established under control conditions starting with a 45 eggs cohort. Larvae were reared individually in plastic tubes and fed *ad libitum* with aphids (Hemiptera: Aphididae). First, second and third instar larvae were described after being fixed in KAAD solution and preserved in 65% glycerinated alcohol. Measurements were made with an ocular micrometer and expressed in millimeters. In this work, morphology of the three larval instars of a new species of *Chrysoperla* are described and illustrated. A key for the larval identification of the *Chrysoperla* species present in Argentina is also provided.

A40

A NEW SPECIES OF *Chrysoperla* (NEUROPTERA: CHRYSOPIDAE) FOR ARGENTINA

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Chrysoperla Steinmann is one of the best-known genera among green lacewings. It includes approximately 40 species. The systematics of *Chrysoperla* is particularly difficult, since there are morphologically similar species, although clearly distinct in their biological characteristics. To identify species, a set of external characters, wing venation and genital structure of the male and female are used. Several *Chrysoperla* species have been successfully used in the biological control of pests present in a wide variety of crops. In the Neotropical region there are eight species of *Chrysoperla*. For Argentina, three species of the genus have been cited: *Chrysoperla externa* (Hagen), *C. asoralis* (Banks) and *C. argentina*, Gonzalez Olazo-Reguilón. In this work, a new species of *Chrysoperla* is described for Argentina. The specimens studied were captured with an entomological net and manual vacuum cleaner in Rosario de la Frontera, Salta, Argentina, in vegetation surrounding a field of fruit trees. The collected specimens were kept alive for breeding and reproduction. In the laboratory, adults were fed with a mixture of honey: pollen: water at a 1:1:2 ratio. The description follows the nomenclature used by Brooks, 1994, and the key for identifications of Gonzalez Olazo & Reguilón, 2002. The fixed material is preserved in the entomological collection of Instituto Fundación Miguel Lillo (IFML). A new species of *Chrysoperla* is presented. It belongs to the carnea group. Both adults and larvae differ in characters of taxonomic importance from other species of the genus. The adult's morphological description with illustrations is presented. A key for Neotropical *Chrysoperla* species is also provided.

A41

ANTIFUNGAL POTENTIAL OF NATIVE PLANTS IN LA RIOJA

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Plant diseases caused by fungi cause large economic losses. Fungi develop resistance due to the prolonged use of synthetic fungicides, generating concern about their possible adverse effects on environment and human health. The study of natural compounds such as ethanolic extracts derived from plants is an interesting option as a phytopathogenic fungi control method. The antifungal activity of ethanolic extracts observed in La Rioja native plants species *Lippia turbinata*, *Lippia integrifolia*, *Clinopodium gilliesii*, *Zuccagnia punctata*, *Caesalpinia gilliesii*, *Argemone subsiformes* and *Senecio eriophyton* was evaluated. Ethanolic extracts were obtained through a 24-hour maceration of dry vegetable material in ethyl alcohol and total phenols content was determined with the Folin-Ciocalteu technique. Antifungal activity was evaluated using percentage of inhibited spore germination in *Verticillium dahliae* and *Phaeoacremonium parasiticum*. As a positive control, the commercial antifungal Benomil was used. *C. gilliesii* EE inhibited spore germination in *V. dahliae* at a minimum inhibitory concentration of 100% (MIC) of 3mg/mL. *Z. punctata* EE inhibited spore germination in *P. parasiticum* at a MIC of 0.75mg/mL and *V. dahliae* at a MIC of 0.4mg/mL. The EE MIC of this plant stands out because it is a value very close to the MIC of the available product (0.3mg/mL). The result of the total phenol content indicated high values for *Z. punctata* and *C. gilliesii* EE, which explains a possible correlation between phenol content and spore germination inhibition. The results suggest that native plants in La Rioja would be a good source of natural products with antifungal potential.

A42

MODULATION OF *Salmonella bapA* GENE EXPRESSION BY RCSCDB SYSTEM ACTIVATION DEPENDS ON GROWTH MEDIA AND CONTACT SURFACE

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Biofilm is described as a polymeric matrix of extracellular substances in which microorganisms are embedded, and attached to a living or artificial surface. It has been reported that the RcsCDB regulatory system participates in biofilm development. This system responds to cell surface stresses affecting the membrane integrity and producing the system activation. Here, we studied the regulation of *Salmonella typhimurium* biofilm formation under different growth media and surface conditions. For this purpose, we used the transcriptional *lacZY* fusion expression to chromosomal *bapA* gene, an RcsB-dependent gene required for this bacterial lifestyle. β -galactosidase activity was quantified under LB, LB without salt (LBsS), LBsS supplemented with biliar salts, planktonic or biofilm culture conditions. In addition, we tested *bapA* expression by β -galactosidase activity from biofilm developed on glass and polystyrene surfaces. We observed that the dissimilar expression levels of *bapA* on different media, growth and

contact surface conditions are controlled by the RcsCDB system. These findings contribute to the understanding of biofilm development and the important role of the RcsCDB system in this bacterial phenotype.

A43

PHYSIOLOGICAL ADAPTATIONS IN *Lactobacillus paraplantarum* CRL 1905 INDUCED BY DIFFERENTIAL CONCENTRATIONS OF PHOSPHATE IN THE MEDIUM

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Lactic acid bacteria (BL) are a heterogeneous group of microorganisms that present industrial and probiotic applications. Polyphosphate (polyP) is a linear polymer formed by orthophosphate (Pi) residues that plays an important role in response to stressful conditions in bacteria. In our laboratory, the ability of *Lactobacillus paraplantarum* CRL 1905 to maintain high polyP levels in the stationary phase was evidenced in a chemically defined media (CDM) with high Pi content. The aim of this work was to expand the studies with respect to the modulation of polyP in this BL and its survival against different environmental conditions to which it is usually exposed. The assays were performed in CDM containing sufficient and high Pi concentrations (2 and 60mM, respectively). Flow cytometry showed a higher percentage of dead and damaged cells in sample grown with sufficient Pi with respect to those grown with high Pi. An analysis by scanning microscopy showed that cells grown in Pi 2mM had a larger size than the ones grown in 60mM, and revealed the presence of superficial membrane vesicles in them. Finally, the cells grown for 48 hours in differential media were exposed to different stressors (pH and bile sales) for 3 and 6 hours, and greater tolerance in the medium with 60mM Pi was observed. These phenotypes could be related to the maintenance of polyP in the stationary phase. This study contributes to a better understanding of alternative mechanisms by which beneficial bacteria can counteract several stress conditions and colonize different niches.

A44

Aloe saponaria (Ait.) Haw HYDROLYZED PRODUCTS: ANTIBACTERIAL PROPERTY AND CYTOTOXIC EFFECT

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Aloe saponaria (Ait) Haw. is a naturalized plant species in the province of Córdoba. The objective of the present work was to evaluate the antibacterial activity and cytotoxic effect of hydrolyzed products obtained from its mucilaginous gel. Sugar content was determined by chromatography on hydrolyzed samples of fresh lyophilized mucilage. Minimum inhibitory concentration and minimum bactericidal concentration was determined. The cytotoxic potential was evaluated by osmotic erythrocytic fragility. Mannose was the predominant sugar. Freeze drying allowed the obtainment of stable samples. MIC values were between 100 and 120mg/mL and MBC between 300 and 360mg/mL. No erythrocyte membrane deformation was observed in the concentrations in which it presents bioactivity. Hydrolyzed products are an alternative to urinary tract infections.

A45

EVALUATION OF ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY OF HYDROALCOHOLIC EXTRACTS OF *Polylepis australis* (QUEÑO A)

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Medicinal plants have been the basis of health care since the early days of mankind, although only a small percentage of species have been studied for their potential therapeutic applications. The bark of *Polylepis australis* (queñoa) is used in traditional medicine as a hypoglycemic, antihypertensive and in the treatment of infectious diseases of the respiratory tract, which are pathologies that cause pain and inflammation. The aim of the present work was to evaluate *in vivo* the anti-inflammatory and analgesic properties of alcoholic and aqueous extracts of *P. australis*. Extractions were carried out serially using 96° alcohols (EE) and boiled distilled water (EA). Analgesic activity was evaluated using the formalin test. The induction model of plantar edema with carrageenan in Wistar rats was used to evaluate the acute anti-inflammatory activity. The dose tested was 1000mg/kg v.o. Morphine and ibuprofen were the positive controls. In the formalin test, only EA produced a significant inhibition of pain in the neurogenic phase (41.18%) with respect to the positive control (Morphine). In the inflammatory phase, EE, EA (1000mg/Kg) and ibuprofen (100mg/Kg) induced a pain block of 67.78%, 58.60% and 61.37% respectively. These results correlate

with those obtained in the carrageenan test, where EE showed the highest anti-inflammatory activity (58.62% inhibition of edema) at two hours of treatment. Our results suggest the feasibility of using the alcoholic extract of queñoa as an anti-inflammatory in an oral pharmaceutical formulation. Therefore, further studies are required to ensure its safety and identify the active substances responsible for the therapeutic properties observed.

A46

PHYTOCHEMICAL ANALYSIS AND EVALUATION OF EXTRACTS OF *Clinopodium gilliesii* (MUÑA MUÑA) FOR *IN VIVO* ANTINOCICEPTIVE ACTIVITY

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Clinopodium gilliesii (Benth) Kuntze belongs to the family Lamiaceae (synonymous with *Satureja parvifolia*). In Argentina, it is popularly known as "muña-muña". The infusion of its aerial parts is used as a digestive, antispasmodic, anti-inflammatory and antifungal medicine; its decoction is used as an emmenagogue, antispasmodic, antidiarrheal, astringent and febrifuge and its essential oils as an antibacterial agent. However, there are no data on the antinociceptive activity of this species. The aim of this work was to study the analgesic properties of aqueous and alcoholic extracts of *Clinopodium gilliesii* (muña-muña) collected in Guanchin (La Rioja) and Taff del Valle (Tucumán). Extractions were carried out serially using 96° alcohol (EE) and boiled distilled water (EA). The formalin test (experimental pain model) was used. Female Wistar rats were given EA and EE at doses of 500 and 1000mg/kg were administered orally half an hour before the induction of pain. The results of the antinociceptive activity obtained in the formalin test showed that EA and EE *C. gilliesii* (Tucumán and La Rioja) at doses of 500 and 1000mg/kg did not inhibit pain during the first phase of the experiment. When analyzing the results during the inflammatory phase (second phase), the EA Tucumán presented the highest analgesic activity (42.48%) at a dose of 500mg/Kg. The results obtained by thin-layer chromatography reveal that muña muña EE is a more complex mixture of substances than EA. Reductive compounds, polysaccharides, sterols, triterpenes, catechin tannins or proanthocyanins gave a positive reaction for EE in the analytical process. It is important to conduct in-depth chemical studies that will allow the identification of the active substances.

A47

PATHWAYS INVOLVED IN THE GASTROPROTECTIVE EFFECT OF TUSCA LEAF EXTRACTS

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Gastric ulcers are caused by an imbalance between protective and aggressive factors on the mucosa. Tusca, *Acacia aroma* Gill ex Hook & Arn, is an autochthonous plant from northwestern Argentina previously studied by our working group. Five percent infusion (I) and 10% hidroalcoholic extract (E) from tusca leaves showed an effective gastroprotective property. The aim of this study was to evaluate the pathways involved in this effect. The ethanol-induced ulceration model was developed in male Wistar rats (n = 6 animals/group). The inhibitors Indometacin (10mg/kg) and L-nitroargininemethyl ester (70mg/kg) were used to study the participation of Prostaglandins (PG) and nitric oxide (NO), respectively. The blocker N-methylmaleimide (10mg/kg) was used to evaluate the intervention of the non-protein sulfhydryl compounds (NP-SH) in the gastroprotective effect. The experimental groups were: 1- Ulcer control (0.9% NaCl), 2- Positive control (Sucralfate 100mg/kg, orally) 3- I (150mg/kg, orally), 4- E (150mg/kg, orally). The ulceration area in the stomachs of each group was determined. The blockages of the evaluated routes produced a significant increase in the ulceration area (p≤0.05). This indicates that the gastroprotective effect of both tusca leaf extracts is partly mediated by the PG synthesis, NO release and NP-SH. Further studies will be necessary to define the molecular mechanisms involved and determine the compound (s) responsible for this effect.

A48

ANTIBACTERIAL ACTIVITY, TOXICITY AND PHYTOCHEMICAL ANALYSIS OF FRACTIONS OBTAINED FROM *Caesalpinia paraguariensis* TINCTURE

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Previous works reported the antimicrobial activities of *Caesalpinia paraguariensis* Burk. extracts. The tincture also showed toxicity, but the bioactive constituents have not been identified yet. Objectives: to fractionate components of

C. paraguayensis bark tincture and to determine its antibacterial (AB) activity and toxicity, and analyze the secondary metabolites profile of the bioactive fraction/s (fr). Tincture (5) obtained by percolation was dried and suspended in water, and Liq-Liq. extractions were applied with CH₂Cl₂ (1) and AcOEt. (2); soluble (3) and insoluble (4) components from aqueous fr were separated by centrifugation. All frs were dried, weighed and dissolved in methanol; then between 50-500µg were loaded in sterile discs. AB activity was determined against ATCC strains at 10⁸ufc/mL, *E. coli* 25922, *Ps. aeruginosa* 27853, *St. aureus* 25923, and *E. faecalis* 29912, by disc diffusion on solid MH medium. Ciprofloxacin was (+) control, and all plates were incubated at 37°C for 24h. Toxicity was determined by the *Brine shrimp* test (10-1000µg/ml), using DMSO and anthracene as controls. Frs were analyzed by TLC (silicagel; Toluene/AcOEt/Formic/Methanol 3:4:1:2) and revealed under UV 254/365nm light, NP/PEG, p-AS and Dragendoff reagents. 1, 2 and 3 frs were active against *St. aureus* (Ø: 8-13mm, 500µg); 2 and 3 frs were active against *E. faecalis* (Ø: 7-10mm, 250µg). Lethal concentrations 50% (µg/ml) were: 131.82 (5), 892.25 (1), 131.82 (2), 478.63 (3), 100.00 (anthracene). Bioactive frs. (1 and 2) revealed different profiles of phenolic and triterpenoid compounds. These results justify the purification of 2 in order to separate its AB constituents from toxics.

A49

MEDICINAL PROPERTIES EVALUATION OF MONOFLORAL HONEY FROM ATAMISQUI

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Honey from Atamisqui is a highly appreciated product because of its delicate aroma and flavor. *Atamisquia emarginata* is an herb widely used for its analgesic, digestive and antibacterial properties. The floral origin of hives is an important factor since they influence the chemical composition of the honey and its nutritional and medicinal value.

The objective of the present work was to determine the anti-inflammatory and antioxidant properties of monofloral honey from Atamisqui (HA). Wistar rats were used, and the method of induction of edema by carrageenan and the method of formation of granuloma induced by cotton disc were used to evaluate anti-inflammatory activity. Antioxidant potential was determined with the depuration method of DPPH and the inhibition of lipid peroxidation.

The results showed that the rats pretreated with the HA (1000mg/kg bw, orally) decreased the inflammation induced by carrageenan, maximum inhibition (74.5%) being reached at 1.5 hours, similarly to ibuprofen (100%). The daily oral administration of ibuprofen (100mg/kg), meprednisone (5mg/kg) and MA (1000 mg/kg) significantly reduced the weight of the exudate and the granuloma induced by the cotton disc. With respect to the antioxidant activity, HA showed an activity percentage above 70% in both trials. The findings of these properties in the honey from Atamisqui will allow the gathering of tangible scientific antecedents that will provide added value to the product so that it can be considered as a functional food.

A50

PHYTOTOXICITY TESTS OF EUPARIN AND 2α-HYDROXY-COSTIC ACID ISOLATED IN *Flourensia blakeana* D

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Flourensia blakeana Dillon is an endemic species frequently found in arid streams of the eastern mountain range of Tucumán and western Catamarca. The objective of the present work was to evaluate the phytotoxic potential of a compound with nuclei benzofuran (euparin) and eudesmane (2α-hydroxy-costicacid) isolated from hexane subextract of aerial parts of *F. blakeana* D. Structural elucidation of the compounds was determined by one- and two-dimensional NMR spectroscopy (¹H, ¹³C, HSQC, HMBC, IR, UV). The bioassays were performed in Petri dishes in triplicate and with concentrations of 15, 75 and 150mg/L of each compound. Euparin showed in *S. saccharatum* a germination index (GI) of 90% and a slight stimulation in radicle growth (CR) at all concentrations, while in *L. sativa* 80% GI and an inhibition in CR at 75 and 150ppm were evidenced. The 2α-hydroxy-costic acid test showed in *S. saccharatum* an IG index of 75%, stimulation in CR, while in *L. sativa* GI was 60% and exhibited an inhibitory effect in CR at all concentrations tested. In *S. saccharatum*, the 2α-hydroxy-costicacid test showed an IG index of 75%, stimulation in CR, while in *L. sativa* GI was 60% and showed an inhibitory effect in CR at all concentrations tested. Both metabolites exerted a selective effect with the seed. The results obtained for the 2α-hydroxy-costic acid test suggest that the eudesmane nucleus presents greater phytotoxic potential with respect to the benzofuran nucleus and has a selective effect against *L. sativa*.

A51

ANTIFUNGAL ACTIVITY OF A METABOLITE PURIFIED FROM *Terminalia triflora*

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Current human fungal infection therapies due to *Candida albicans* are limited by fungistatic action, toxicity or development of resistance. *Terminalia triflora* (Tt), a species used as an antifungal in traditional medicine, is a potential source of natural antifungal compounds. Tt leaves were extracted with ethanol, and successively fractionated with solvents with increased polarity, chromatography, solid phase extraction and HPLC to yield an antifungal compound (P1). P1 antifungal activity against *C. albicans* (ATCC10231) was tested. Minimal inhibitory concentration (MIC) and fractional inhibitory concentration index (FICI) were obtained through microdilution and cell viability assay for P1 alone and in combination with fluconazole (FLU). P1 (100µg/mL) was active against *C. albicans* only in combination with FLU (0.5µg/mL). FICI=0.258 indicated synergistic effect between P1 and FLU. P1 + FLU resulted in a fungicidal combination. These results support the ethnomedicinal applications described for Tt.

A52

ANTIBACTERIAL ACTIVITY AND TOXICITY OF Cu(II), Ni(II) AND Co(II) SULFADIAZINE COMPLEXES

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Introduction: Sulfadiazine (SDZ) was used primarily to treat urinary tract infections. Although this is fairly well tolerated, its use is associated with adverse effects. The interaction of SDZ with metallic ions could improve its bioactive profile, which would allow a reduction in the therapeutic dose and in its unwanted effects as well. **Objectives:** To evaluate the antibacterial activity of SDZ/Cu(II), Ni(II) and Co(II) complexes against *Escherichia coli*, to determine its toxicity, and to compare them with SDZ. **Methodology:** *E. coli* ATCC 25922 was used at $2.5 \cdot 10^5$ UFC.mL⁻¹. Minimal Inhibitory Concentration (MIC) were determined by microdilution in MH broth supplemented with Ca²⁺ and Mg²⁺. The SDZ and complexes were assayed between 2.0-0.001µg·mL⁻¹, with ciprofloxacin as a control. They were incubated at 37°C for 24h. Minimal bactericidal concentration (MBC) was determined by sub-culturing aliquots of the microdilution assay on MH agar plates. They were incubated at 37°C for 24h. *Brine shrimp* lethality bioassay was used to determine Lethal Concentration 50% (LC₅₀). **Results:** The three complexes inhibited the growth of *E. coli* up to 90%, at 8µg·mL⁻¹, while SDZ showed MIC/MBC: 1µg·mL⁻¹. LC₅₀ of Cu(II), Ni(II) and Co(II) complexes (1,000µg·mL⁻¹) were greater than SDZ (10µg·mL⁻¹). **Conclusions:** No significant differences were found among antibacterial activities of Co(II), Ni(II) and Cu(II) complexes, but differences were observed with respect to SDZ. However, the noteworthy low toxicity of complexes with respect to SDZ indicates that complexation decreases its toxicity. These results indicate that the complexes might be viable alternatives that should be tested against other microorganisms.

A53

SPATIAL DISTRIBUTION OF SEMI-CAPTIVE MAMMALS IN THE RESERVA EXPERIMENTAL HORCO MOLLE

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The Reserva Experimental Horco Molle lies in the foothills of the Sierra San Javier, Tucumán. *Mazama gouazoubira*, *Pecari tajacu*, *Lycalopex gymnocercus* and *Myrmecophaga tridactyla* specimens share the 14Ha semi-captivity area. The area consists of secondary forest and shrub habitats, dominated by *Lantana camara*, with a hiking trail on its outer northeast edge. We analyzed the spatial distribution of the mammalian fauna by observing habitat preferences and possible effects caused by human presence. A survey was carried out using camera traps distributed at a 40m radius for 1 month per site. The photos were organized by animal and grouped into 3 places – Scrub brush, Forest and Close to Hiking areas. In the hiking areas, a higher observation frequency was obtained for *Pecari* (89.8%), *Lycalopex* (65.3%) and *Mazama* (37.4%), and in Scrub brush, for *Myrmecophaga* (50.3%). Statistical analyses were performed and positive correlations (Pearson) were obtained for all animals in Hiking areas and Forest, while in Scrub brush the values for *Mazama* were negative (*Pecari-Mazama* -0.61; *Mazama-Lycalopex* -0.22). The greater number of observations of animals near people may indicate habituation to their presence and association with food (*Pecari* and *Myrmecophaga* receive supplementary food). The negative correlation of *Mazama* with *Pecari* and *Lycalopex* in Scrub brush could be related to the characteristics of this environment (low visibility and food) and the solitary habits of *Mazama*. Coexistence of species with different territorial and gregarious habits can generate

biological barriers with few environmental differences, and human presence does not necessarily exert a negative influence.

A54

HABITS AND INTERESTING BEHAVIOR TOWARD ODORS IN A FEMALE ANTEATER IN THE EXPERIMENTAL RESERVE HORCO MOLLE

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The anteater (*Myrmecophaga tridactyla*) is a locally extinct species. It is solitary and eats only ants and termites which it finds using olfaction, its most highly developed sense. General knowledge of anteater habits in the wild is limited. The REHM is a protected area run by the Facultad de Ciencias Naturales e IML, UNT, located in the foothills of the Yungas. It has a semi-captivity area of 14Ha that is used for the development of conservation strategies and in situ management. The aim of this study was to observe the habits of an anteater in semi-captivity, its habitat preferences and interactions with other animals. The semi-captivity of the REHM consists of secondary forest and scrubland where small and medium-sized mammals coexist. Camera traps were placed in the area for 1 month, next to baits with lemon, grapefruit, mango or apple smells during summer - autumn 2017 -2018. The photographs were classified and their data transferred to spreadsheets. The highest frequency of observations was recorded in scrubland (50%). Peak activity was at 10pm with a secondary peak at 5pm. The anteater appeared wet on 3 occasions when it was not raining, in areas surrounding the dam, where she may have bathed. She investigated, rubbed her head and the rest of her body over certain baits. No preference for a particular environment was recorded, nor were there interactions with other species. The activity period corresponds to crepuscular-nocturnal summer habits, as do the baths. The interest shown toward the smell of lemon and mango in baits has not been mentioned before. Furthering our knowledge about odor baits and activity schedules of this species will be continuing subjects of investigation in the REHM.

A55

ELECTRICAL SIGNALS IN TWO SPECIES OF ELECTRIC FISH (GENUS *Gymnotus*)

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Gymnotus is the largest gymnotiform genus with 34 species described. These fishes use electric organs and electroreceptors to navigate and communicate, producing electrical pulses. They are solitary, territorial and aggressive. Electrical signals consist of frequency changes and discharge cessations (offs). In Argentina, 5 species occur in the Parana River. The aim of this study was to compare electrical signals in 2 species, *G. sylvius* (S) and *G. omarorum* (O), in 2 fish contests. Three individuals of S and 5 of O were used, in an aquarium divided in half by a partition, with 2 pairs of electrodes to record electrical signals. Two conspecific fish of similar size were introduced, 1 in each compartment. They interacted for 15min, after raising the partition; video and electrical signals were recorded simultaneously. They fought and one fish became dominant; during the interaction, frequency changes and offs were recorded. At this time only offs have been analyzed, but differences exist between species. S produced 58 offs in 5 encounters while O produced 41, in the 5 encounters with offs. The median duration for offs was 6sec in S and 26sec in O. The median time for the first off was 19sec in S and 102sec in O. The offs possibly have different functions in the 2 species. They seem to be a submissive signal in O and may have more than one function in S. In studies in Uruguay, it was concluded that offs were a submissive signal; on the other hand, in *G. carapo*, short offs seemed to function as threats, long offs, as submission. In conclusion, these preliminary results suggest that these 2 species have similar, but not identical, electrical signals.

A56

ENVIRONMENTAL ENRICHMENT IN *Salvator merinae* (Squamata: Teiidae) IN CAPTIVITY

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The genus *Salvator* (ex *Tupinambis*) exhibits a wide geographical distribution in South America. The southernmost representatives are *S. merinae* (iguana overa) and *S. rufescens* (red iguana). Although there is a great deal of literature about the application of environmental enrichment to welfare improvement in species in captivity and production, there are few studies in reptiles. The objective of this study was to evaluate the responses of individuals

of *Salvator merianae* to the incorporation of environmental enrichment. The activities were carried out in the Criadero Experimental de Lagartos belonging to the Cátedra de Biología del Desarrollo of the Facultad de Agronomía y Zootecnia (UNT). We filmed 7 specimens of *Salvator merianae*, 2 males and 5 females, housed in a shared enclosure. The following enrichments were tried: food, structural and sensory (olfactory). The frequency of behaviors before and after enrichment was recorded on spreadsheets. A decrease in time in shelter (65% to 34%) and in sunning (70% to 30%) was observed. There was an increase in exploration (44% to 56%) together with increased marking with the femoral glands (33% to 67%) and sniffing (40% to 60%). Physical activity was increased (25% to 75%) and new behaviors appeared, such as scratching surfaces, removing elements and sunning in elevated positions. The success of enrichment was demonstrated with the appearance or increase of natural behavioral patterns, and the increase in physical activity and exploration is in agreement with their omnivorous diet. An improvement in welfare could be manifested in an improvement in production.

A57

DIPTEROUS VECTORS OF *Filaria* (NEMATODA) AND PARASITOLOGICAL DETECTION PROTOCOL IN TUCUMÁN (ARGENTINA): PRELIMINARY STUDY

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Filariasis caused by *Mansonella ozzardi* is a parasitic disease that, in Argentina has a characteristic distribution in the Yungas. The vectors are female diptera of Ceratopogonidae, Simuliidae and Culicidae. Although this parasitic disease is endemic and of relevance, it is found within the framework of neglected diseases, and previous records are scarce in the province. The objective of the work was to identify the dipterous vectors of *M. ozzardi* and to determine the presence or absence of filaria using parasitological techniques. Diptera collection was carried out in three locations in Tucumán during spring and summer (2016-2017), with CDC light traps modified with LED (prototype TDLED15). The specimens were separated and identified through taxonomic keys. Three protocols for the detection of filaria were prepared (Hematoxylin 24-12 hours and Giemsa 30 minutes). Out of the 1559 specimens collected, the genera *Culicoides* and *Forcipomyia* (Ceratopogonidae), *Culex* and *Anopheles* (Culicidae) and *Simulium* (Simuliidae) were identified, the greatest abundance being recorded in Reserva La Florida, followed by Cochuna and Villa Batirua. Out of the 18 specimens dissected, one specimen (*Simulium* sp.) was positive for filarial. The Giemsa protocols (30 minutes) and hematoxylin (12 hours) allowed a better observation of the structures (head and thorax) that harbor the parasite. Parasitological detection of the remaining specimens collected is expected to continue with improved microscopic detection technique. The study will also include molecular analysis for the rapid detection of the parasite.

A58

CDC TRAP PROTOTYPE WITH LIGHT EMITTING DIODES (LED) USED IN THE COLLECTION OF DIPTERANS VECTORS

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The location hosts by hematophagous insects involves several physico-chemical signals such as smell and sight sense. In dipteran vectors, vision also allows recognition of shapes, sizes, contrasts, colors and speed of movement of a potential host. CDC traps (with or without bait) represent one of the most common techniques for collecting dipteran of sanitary relevance. Because of its cost and the number to be used for sampling, these were modified. In this study, a CDC trap prototype (TDLED15) is presented using more economical and resistant materials, and adapted with LEDs of different wavelengths (colors). Each prototype adapted with ultraviolet, blue and green LED was evaluated in three sectors of Yungas Tucumán, and compared with a commercial trap (control). The traps were active from 17 to 8 hours during the warm months (2017 and 2018). 60% of samples were quantified, with a total of 2327 specimens belonging to the order Diptera, Lepidoptera, Coleoptera, among others. A greater proportion of Ceratopogonidae (47%), Culicidae (39%) and other Diptera (14%) were determined based on identification of hematophagous dipterans. It was observed that UV light (370-390 nm) and blue light (450-470 nm) were the most effective. The wide biodiversity and distribution of dipterans vectors in Argentina makes it necessary to design entomological control and surveillance methods, so having economic traps will facilitate the monitoring and control of urban and wild populations of these vectors, and subsequently evaluate the response of these to different wavelengths.

A59

BIOLOGICAL QUALITY OF RIVER VALLEY WATER EVALUATED BY THE BIOTIC INDEX OF FAMILIES

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The River del Valle (Catamarca, Argentina) is 140km long and has an area of 5,910km². On its way, it passes through localities where water is used for human consumption, irrigation and recreation. It is a lotic environment, where the assemblage of benthic macroinvertebrates is abundant and diverse. Currently, biotic indices based on benthic macroinvertebrates are widely used in bioindication. The objective of this research was to evaluate the biological quality of the river del Valle water through the Biotic Family Index (IBF). Seven sampling stations were established: Huaycama (H), La Puerta (LP), Isla Larga (IL), Las Pirquitas (LPi), Pomancillo Oeste (PO), Collagasta (C) and Banda de Varela (VB). At each station, three samples were obtained, with a Surber type sampler (900cm² surface area, 300µm mesh size), preserved in 96° ethanol. In the laboratory, the samples were processed to obtain macroinvertebrates, determine them up to the family taxon and apply the calculation protocol for the IBF; the water was classified by comparison with reference values. In order to describe the physical environment, at each station, we obtained data on georeferenced location, height above sea level, river morphometry, riparian flora and water samples for physicochemical analysis. The value of the IBF and the water quality varied longitudinally: H=5.18 (Medium quality); LP=5.47 (Medium quality); IL=5.02 (Medium quality); LPi=3.03 (Excellent quality); PO=2.10 (Excellent quality); C=0.59 (Excellent quality); BV=4.71 (Good quality). The biological quality of the water is better in the middle part of the basin.

A60

DIPTEROFAUNA OF NATURAL BREEDERS OF THE YUNGAS IN TUCUMÁN, ARGENTINA

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There are different types of sites that serve as breeders for immature stage dipterans such as some species of flies and mosquito vectors of diseases of sanitary relevance (malaria, yellow fever, dengue, filariasis, Oropouche fever, among others). Among natural breeding sites are bodies of water (rivers, streams, lakes and lagoons), holes in rocks and phytothelms (e.g., bromeliads and tree holes). The latter constitute temporary aquatic microenvironments of biological importance, taking into account ecological, evolutionary and health aspects. A preliminary list of Culicidae and Ceratopogonidae collected in natural breeding sites of the southern patch of the Yungas of Tucumán is presented. Immature specimens were collected with pipettes in water accumulated in Bromeliaceae (*Aechmea distichantha* and *Vriesea friburgensis* var *tucumanensis*), Apiaceae (*Eryngium* L. sp.) and tree holes; and with dipper in bodies of water (bed or edge and between rocks in rivers and streams). Five genera of culicids were recognized, *Aedes* (*Ochlerotatus*) *crinifer*, *Aedes* (*Stegomyia*) *aegypti*, *Anopheles* (*Anopheles*) *pseudopunctipennis*, *Anopheles* (*Nyssorhynchus*) *argyritarsis*, *Culex* (*Culex*) *coronator*, *Culex* (*Culex*) *fernandezii*, *Culex* (*Culex*) *maxi* and *Toxorhynchites* (*Lynchiella*) *guadeloupensis* being identified, and six genera of Ceratopogonidae with a specimen identified at the species level (*Culicoides paraensis*). Greatest wealth was recorded in bromeliads, followed by bodies of water and tree holes. Since phytothelms represent high structural complexity and habitat persistence, they support communities of aquatic insects, particularly dipterous vectors such as Culicidae and Ceratopogonidae.

A61

PROTEIN PROFILE VARIATIONS OF JELLY COAT THROUGHOUT THE SEXUAL CYCLE OF *Rhinella arenarum* BY EFFECT OF 17 β ESTRADIOL AND PROGESTERONE

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The oviductal pars convoluta (PC) of *Rhinella arenarum* has a differential secretion pattern of proteins and glycoproteins (gp) throughout the sexual cycle. During the reproductive stage of this species, the PC secretes all the components of the jelly coat that are necessary for fertilization. The objectives of this work were to analyze and establish, in the reproductive and post-reproductive stages of the cycle, the variations of the profiles proteins secretion of jelly coat by the exogenous effect by 17 β estradiol (E2) and progesterone (P). Profiles were analyzed by SDS-PAGE electrophoresis from the product secreted by the PC of animals: ovariectomized with and without

hormonal treatment and without ovariectomization. Results reveal that ovariectomy induces modifications of the proteins secreted by the PC, the 74KDa protein being the only one revealed in the reproductive stage. At this stage, P induces abundant mucous secretion, with a high protein concentration and an electrophoretic profile identical to that of jelly coat, the 74KDa protein being the most secreted one. The protein with greater relative mobility of jelly coat of 300KDa is not secreted by the action of this hormone. E2 promotes the secretion of a mucous material, not very dense, with the property of spinnbarkeit and with a higher protein concentration. Unlike P, it only induces the secretion of the 300KDa proteins. In the post-reproductive stage, coincidentally with the hibernation period, P induced the secretion of the 74KDa proteins. These results allow us to infer that gp 74KDa, with the action of inducing the acrosome reaction, is regulated by P throughout the cycle; however, gp 300KDa is induced by E2 at the stage in which it is required to generate the jelly that surrounds the oocytes.

A62

EFFECT OF HANDLING ON BEE SURVIVAL *Apis mellifera* IN MARKING METHOD WITH NUMBERED LABELS

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When experimenting with animals, a fraction of the individuals will die due to the stress caused by manipulation. Capturing organisms, numbing and exposing them to pesticides can cause death by stress. In this study, we intended to determine the survival rate in the handling and marking of bees for behavioral studies. The experiment was carried out in the School of Agriculture and Sugar Technology of the UNT, Horco Molle, (26°47'28.6 "S 65°19'33.9" W) Tucumán; Argentina. An observation hive, with 120,000 bees, with young, drones and a queen was used. Groups of 10 bees were placed in individual cells in a cooler with ice to lower their metabolic rate and mark them with a paper tag. One group was not fed and after being marked they were released (n=29, 96% sv (survival)). In the second group the bees were fed with a sucrose solution 1:1 p/v; due to the viscosity of the solution the bees ended up stuck together, which decreased their survival rate (n=50, 72% sv). In the third group, sucrose solution was used at 1:0.25 p/v, which increased survival (n=21, 86% sv). Finally, a fourth experiment was carried out with bees fed in confinement for one night (n=30, 74% sv). The results obtained allow an improvement in the marking methodology to adjust the survival rate and obtain more accurate data.

A63

EFFECTS OF IONIC DISSOLUTION PRODUCTS FROM STRONTIUM-DOPED 45S5 BIOACTIVE GLASS ON BONE REGENERATION AND MINERALIZATION IN ZEBRAFISH

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It has been shown that the incorporation of strontium (Sr) to bioactive glass (BG) particles has a stimulatory effect on osteoblast-mediated bone formation *in vitro* and an inhibitory effect on the activity of osteoclasts in culture. The aim of the present study was to evaluate the effects of ionic dissolution products (IDPs) from the 45S5 BG doped with 2% of SrO (45S5.2Sr) on the regeneration and mineralization of the tail fin of zebrafish. IDPs were obtained from the incubation of microparticles (<5 µm) of 45S5 BG and 45S5.2Sr BG in an embryonic medium (EM) at 37°C for 72h. Under anesthesia, the distal half of the caudal fins of wild-type juvenile zebrafish (11 mm standard length) was amputated. Zebrafish were incubated for 5 days at 28.5°C in six-well plates (one fish/well) containing 5mL of EM enriched with the IDPs and were not fed. Four repetitions were performed with 10 animals per treatment. Mineralization was examined using 0.5% Alizarin red staining. Stained fish were photographed with a stereoscopic microscope with a digital camera. The regenerated area (RA) and mineralized area (MA) in each group were measured using the Image J program. After 5 days of treatment with 45S5.2Sr IDPs, fish showed higher RA (13%) and higher MA (30%) than animals incubated with EM enriched with 45S5 IDPs. The positive effects evidenced in regenerating fins of juvenile zebrafish treated with 45S5.2Sr IDPs were attributed to the presence of 22µM Sr in the EM.

A64

**BIOTECHNOLOGICAL POTENTIAL OF CHLOROPHYTES ISOLATED FROM
CELESTINO GELSI DAM - TUCUMÁN**

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Microalgae are eukaryotic photosynthetic microorganisms present in all type water reservoirs, efficient in the fixation of CO₂ and use of solar energy to produce biomass, which is composed of proteins, carbohydrates, lipids, and pigments. These characteristics aroused interest as feedstock for the production of pharmaceutical and food products. Phycological studies conducted in Tucumán reported a rich biodiversity of microalgae, whose biotechnological potential has not been determined yet. Objectives: to describe native microalgae species present in phytoplankton samples; to isolate cultivable ones under defined conditions and to determine population parameters from the growth curve of an isolated species. Sampling was carried out with phytoplankton net (30µm) at different places in the Celestino Gelsi dam. They were kept in BBM culture medium, 3000lux, photoperiod 12:12h, 24-26°C. Purification and isolation were performed combining liquid BBM and solid BBM culture techniques. One species was isolated and taxonomic keys were used for morphological analysis under optical microscope. The species isolated was *Chlorella* sp. The growth curve was determined by taking aliquots every 48 hours, for 21 days, from cultures (n = 3) in 150ml of liquid BBM under the above conditions. Its growth was estimated by counting in a Neubauer chamber and total chlorophyll concentration was determined. Cell density in the exponential phase was 3.29x10⁶cells/mL, and growth rate 0.26 day⁻¹. Scenedesmus, Chlamydomona and Monoraphidium, also identified in the samples, grew under the same conditions as *Chlorella* sp, but their isolation is still ongoing.

A65

**EVALUATION OF THE ANTIMICROBIAL ACTIVITY OF THE SUPERNATANT OF
A BACTERIAL CULTURE GROWN IN A MINIMUM MEDIUM**

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Diseases in crops can cause significant economic losses. Many diseases are controlled with agrochemicals, which may cause damage to the environment and human health if incorrectly applied. Nowadays, the tendency is to investigate and use products of natural origin (innocuous) to control plant pathogens. The supernatant of static (Sa) and agitated cultures (Sa_{op}) of a GRAS bacterium grown in standard medium (SM) has been reported to inhibit fungal pathogens of grain crops such as *Cercospora kikuchii* and *Fusarium verticillioides*. The objective of this work was to evaluate the antimicrobial activity of the optimized supernatant (Sa_{op}) of the GRAS culture in minimal medium (MM). This medium would facilitate the characterization and preliminary identification of the active compounds. Fermentations were performed with agitation (260rpm) of GRAS in SM and MM (in which the yeast extract was replaced by biotin and calcium pantothenate 0.01g/L) at 27±2°C for 48h. Cell concentration (dry weight: g/mL), pH and antimicrobial activity (AU/mL) were determined and specific antimicrobial activity (AU/gh) was then calculated. In cultures shaken with SM, cell concentration was 0.0023g/mL, activity 40AU/mL (pH 4) and specific activity 362AU/gh. In cultures shaken with MM, cell concentration was 0.0009g/mL, activity 20AU/mL (pH 3) and specific activity 463AU/gh. Cultures optimized by agitation reached greater specific activity in MM, probably because cellular concentration was lower than in SM. The implementation of MM would facilitate the purification of active compounds for their subsequent characterization. These partial results encouraged us to continue with the investigation in order to obtain a "phytosanitary product" feasible to be used in biological control, within integrated pest management (IPM) programs.

A66

**PHYSICOCHEMICAL FACTORS AFFECTING THE PRODUCTION OF TANASA BY
*Aspergillus niger***

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Tanasa (Tanin-acyl-hydrolase, EC 3.1.1-20) hydrolyzes links ester of hydrolysable tannins and gallic acid esters. It is used in the food, pharmaceutical and chemical industry. However, its lack of *in situ* availability in the field makes its importation extremely expensive. The objective of this work was to study the physicochemical factors that affect the production of the enzyme. A strain of *Aspergillus niger* from the Biotechnology Institute was used. The production medium contains, g/L: NaNO₃, 3; MgSO₄.7H₂O, 0.5; KH₂PO₄, 1; KCl, 0.5. We studied: 1) concentration of tannic acid (5-10g/L); 2) pH (4, 4.5 and 5); 3) temperature (25, 30, and 35°C); 4) shaking speed (150, 200 and 250rpm); 5)

incubation time (12, 24, 36, 48, 72h). The results showed that the maximum units of enzyme (324U/mL) were found at 36h of incubation when using 10g/L of tannic acid and 250rpm. At pH 5, the enzyme units decreased by 64.5% and 12% less at pH 4.0, with respect to pH 4.5. Temperatures higher than 30°C produced a decrease in enzyme production of 49%, reaching a maximum of 30°C. In conclusion, the maximum performance in enzymes with respect to the development of cell mass was $Y_{U/X}=253U/g$ and productivity, $P_{dv}=9U/mL\ h$ at 36h of incubation, at pH 4.5 and 250rpm with 10g/L of tannic acid, with respect to 5g/L acid ($Y_{U/X}=182U/g$ and $P_{dv}=7U/h\ mL$). The conditions of production obtained can be used in future studies using agro-industrial waste containing tannins, in order to reduce the cost of the substrate and of the total process.

A67

POPULATION DYNAMICS OF POTENTIAL PREDATORS OF *Tetranychus urticae* KOCH (ACARI: TETRANYCHIDAE) ASSOCIATED WITH AGROECOLOGICAL MANAGEMENT IN STRAWBERRY CULTURE, VAQUEROS-SALTA

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Tetranychus urticae is considered the main pest of strawberry cultivation throughout the world since its reproductive potential causes high population densities and crop damage. Currently, the management of this mite is based on chemical control, which reduces its natural enemies and destabilizes the agroecosystem. The aim of this study was to analyze the relationship and behavior of different predators against this phytophagous mite. The study was developed in a strawberry plot for 2 years, applying *Trichoderma* sp., *Bacillus subtilis*, *Beauveria bassiana*, FFO and Biospam, tending to an agroecological management. Samples were taken every 15 days from June to December with a G-Vac aspirator and were preserved in 70% ethanol for later identification. In 2015, 303 specimens of *T. urticae* were collected and we identified different predators: *Geocoris* sp. (90), Phytoseiidae (68), *Hyppodamia convergens* (27), *Orius insidiosus* (24) and *Eriopis connexa* (19). The highest correlation coefficient recorded was with *E. connexa* (0.46). In 2016, 1463 red spider mites and natural enemies were counted: *Geocoris* sp. (98), Phytoseiidae (81), *E. connexa* (34) and *O. insidiosus* (30). High records of Pearson coefficient were found with *O. insidiosus* (0.91), *E. connexa* (0.89), Phytoseiidae (0.80) and Coccinellidae (0.80). During those two years, there was an increase in the number of predators and an increase in the correlation with the red mite due to the population balance achieved with the agroecological management.

A68

CARVONA CONTENT AND ANTIOXIDANT CAPACITY OF ESSENTIAL OILS FROM *Mentha spicata* L. FERTILIZED WITH UREA

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There is a growing demand for natural antioxidants by the food industry, since many synthetic compounds are harmful to health. The essential oils of aromatic species can be a source of antioxidants, based on their chemical composition. The objective of this work was to determine the effect of fertilization with urea on the content of carvone and the antioxidant properties of essential oils of *Mentha spicata*. The tests were carried out in El Zanjón (Santiago del Estero) under irrigation, with urea doses of 0, 50, 100 and 150kg/ha. The crop was harvested in flowering, and the oils were extracted by steam distillation. The chemical composition was determined by gas chromatography and mass spectrometry. Its antioxidant capacity was evaluated spectrophotometrically, with the β -carotene/linoleic acid system, and expressed as IC_{50} values (concentration of the sample that produces a 50% inhibition in oxidation). The results were analyzed with ANOVA and Tukey's test. The control showed carvone contents of 54.31% and IC_{50} of 36.6 μ g/ml, the same as those obtained in the treatment with 50kg/ha of urea. Higher doses of fertilizer significantly increased carvone content and antioxidant capacity (< IC_{50} values). Thus in 100 and 150kg/ha of urea the contents of carvone were 60.4 and 70.9% and the IC_{50} 30.2 and 26.5 μ g/ml, respectively. We concluded that fertilization with 100 and 150kg/ha of urea increases the values of the 2 indicators evaluated in this job for *M. spicata*.

A69

YIELD STABILITY OF MAIZE GENOTYPES (*Zea mays* L.) IN THREE ENVIRONMENTS IN NORTHERN ARGENTINA

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In breeding programs it is necessary to evaluate the environmental stability of the genotypes. The aim of this work was to evaluate the yield stability (Rto) of 15 genotypes (G), 12 experimental (6 hybrids: HE1, HE2, HE3, HE4, HE5, HE6 and 6 varieties: VE0, VE1, VE2, VE3, VE4 and VE5) and 3 controls (2 hybrids: HT1, HT2 and 1 variety: VT), in three environments (E) of northern Argentina: IIACS-INTA, Leales, Tucumán, 27°11'41,1''S, 65°14'51,8''W, EEA Santiago del Estero, experimental station "Francisco Cantos" INTA 28°01'21,6''S, 64°13'50,1''W and AER Santa Rosa INTA, Catamarca, 28°05'29,9''S, 65°27'53,1''W, in rainfed plots of 7 m². The experiment was a randomized complete block design with two replications. ANOVA showed that there was a significant effect of G (pv <0.0001), while E and GE interaction did not exhibit significant effects (pv = 0.3862 and pv = 0.2942 respectively). Environmental stability was analyzed through the sites regression model (SREG) using the GGE biplots graph. CP1 and CP2 accounted for 90.8 and 6.6% of total variability, respectively. According to the GGE biplots graph, two mega-environments were established, on the one hand Santiago and Catamarca with similar conditions and on the other hand, Leales. HE1, HE3, HE4 and VE1 showed better adaptation to the mega-environment comprising Santiago and Catamarca. Genotypes HT1 and HT2 showed better adaptation in Leales, followed by HE2, while HE5 was the most stable genotype. In conclusion, genotypes could be identified with adaptation to specific E and stable genotypes could be identified through the three E.

A70

POPULATION AT RISK FOR CHRONIC RENAL DISEASE IN TUCUMAN

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Chronic Renal Disease (CKD), defined as a progressive loss of renal structure and function, is a chronic non-transmissible clinical entity with multiple etiologies. Health indicators, both global and national, show a progressive increase in CKD. Ten percent of the world population has symptomatic CKD, increasing to 20-40% in individuals with risk factors. At the national level, Tucumán ranks third with diagnosed symptomatic CKD, but the prevalence of asymptomatic patients is yet unknown. The aim of this study is the early detection of CKD in healthy patients with progression and disease initiating factors, using injury and renal function biomarkers. We studied 306 volunteers of both sexes, from 20 to 70 years, with a history of hypertension, diabetes, overweight and smoking. Clinical histories, anthropometric parameters and blood pressure were evaluated. We analyzed serum creatinine with enzymatic and kinetic methods, estimating glomerular filtration rate (eGF) with CKD-EPI, MDRD-4 and MDRD-IDMS, urinary albuminuria and creatinine. CKD risk was classified according to KDIGO 2012. We found 66 patients (21%) with low risk condition, 21 (8%) with high risk condition and 219 (71%) patients with no risk. Albuminuria allowed us to define CKD risk as low or high, even with normal glomerular filtration. Only 10% of low risk patients and albuminuria >30mg/g had eGF<60mL/min, while 52% with high risk and albuminuria >300mg/g evidenced eGF>60mL/min. Albuminuria, a sensitive and early injury marker, together with eGF, define CKD progression risk in an asymptomatic population. Early detection of CKD allows addressing actions on modifiable risk factors, delaying associated complications and progression to advanced stages of the disease.

A71

LIPOPEROXIDATION AND CYTOPROTECTING SYSTEMS STUDY IN ACUTE LEUKEMIA

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The complex interaction between the generation of reactive oxygen species and cytoprotective signaling pathways plays an important functional role in acute leukemia (LA), favoring its perpetuity. The aim of this work was to evaluate the cytoprotective systems gene expression involved in lipoperoxidation response in LA. 17 samples from patients with LA and 14 control subjects (C) were studied at the Institute of Applied Biochemistry of the UNT (August 2016-2017). The gene expression of *forkhead homeobox O* transcription factor (FoxO3) and *nuclear factor 2 erythroid-related factor 2* (Nrf2), and their respective target genes, *catalase* (CAT), *superoxide dismutase* (SOD) and *peroxylreductase-2* (Prx-2) was evaluated by real time PCR. Thiobarbituric acid reactive species (TBARS) and CAT

activity were determined in serum. Lipid peroxidation was similar in both groups evaluated. However, a different behavior was observed according to the origin of LA, lower TBARS levels being detected in lymphoid LA compared to myeloid LA ($p < 0.01$). Among the cytoprotective genes evaluated, only SOD expression was significantly lower in the LA group compared to C ($p < 0.05$). The expression of evaluated genes did not reflect a synergistic activity of the FoxO3 and Nrf2 antioxidant systems in response to the oxidative microenvironment. However, the results obtained reveal a different basal redox state according to the lymphoid or myeloid origin of LA.

A72

HFE GENE MUTATIONS AND IRON METABOLISM IN HEREDITARY ANEMIAS

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The HFE protein (Human hemochromatosis protein) is encoded by the *HFE* gene and participates in the regulation of iron metabolism. The aim of this study was to establish the prevalence of the most frequent mutations in the *HFE* gene in a population with hereditary anemia [beta-thalassemic trait (BTT), hereditary spherocytosis (HS) and hemoglobinopathy S (HbS)] and in healthy subjects and to explore its relationship with iron metabolism. One hundred and thirty-eight individuals were analyzed (68 normal, 64 BTT, 3 HS and 3 HbS) during the September 2015-May 2018 period. Red blood count (Sysmex KX-21N), hemoglobin electrophoresis at alkaline pH and HbA₂ quantification, erythrocyte osmotic resistance test, serum iron, transferrin, and saturation (Cobas c311, Roche), and ferritin (electrochemiluminescence) were measured. HFE gene mutations were analyzed by real-time PCR. Prevalence in the control group was 29% (20/64, 95% CI=20-41%); 30% (6/20) presented heterozygous mutation in codon 282 (C282Y), and 70% (14/20) in codon 63 (H63D). Prevalence in the BTT group was 31% (20/64, 95% CI=21-43%). Four carriers (6%) were heterozygous for C282Y, 15 (23%) had H63D mutation, one (2%) was double heterozygous for H63D and C282Y, and 1 (2%) was heterozygous for codon 65 mutation. In the HS and HbS groups, only one subject from each group had a heterozygous H63D mutation. Only the BTT group with mutation in H63D had higher ferritin levels than the controls with the same mutation ($p < 0.05$). The simultaneous presence of H63D mutation in the *HFE* gene increased iron storage in BTT carriers.

A73

REDOX BALANCE IN BETA TALASEMIA MINOR

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Excess of reactive oxygen species generates an oxidative imbalance that leads to a shorter survival of red blood cells, aggravating the anemic state in patients with beta thalassemia trait (RBT).

Objectives: To evaluate the balance redox at a systemic and transcriptional level in RBT patients.

Methodology: Sixteen individuals with β -thalassemia minor and 12 apparently healthy subjects were analyzed in the Universidad Nacional at Tucumán between 2016 and 2017. Malondialdehyde (MDA) and superoxide dismutase (SOD) were determined at the systemic level. The expression of the transcription factors Forkhead BoxO3 (FoxO3) and Nuclear Factor Erythroid 2-related factor (Nrf-2) and SOD by RetroTranscription-PCR were evaluated at the gene level. **Results:** At the systemic level, significantly higher MDA and SOD levels were found in the RBT patients compared to the control group, which indicates an increase in lipid peroxidation and high SOD activity as a consequence of their purifying response to the oxidation-reduction imbalance. At the gene level, the RBT group showed significantly higher levels of expression for Nrf-2 and SOD compared to the control group ($p < 0.05$). In the FoxO3 gene, no significant differences were found between the groups studied ($p > 0.05$).

Conclusion: The results obtained suggest an increase in oxidative stress which would act as an important factor in the behavior and severity of anemia in subjects with β -thalassemia. Our results shed new light on the mechanisms of adaptation against oxidative stress mediated through the Nrf-2 pathway which together with SOD could reduce the oxidative damage present in this pathology.

A74
ORIGIN OF THE CATION SURPLUS SODIUM IN THE TORRONTÉS RIOJANO WINE

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The Chilecito department, in the Antinaco-Los Colorados Valley, has the largest implanted vine area in the province with a total of 6059.7 hectares and a total of 2,144 hectares of Torrontés Riojano. The aim of this study was to investigate different parameters related to sodium content at various stages of maturity of the Torrontés Riojano variety, the wine produced, the soil and the irrigation water. Sodium control is necessary since its presence is limited under Argentine (limit of 230ppm of surplus Na) and European regulations (limit of 80ppm of surplus Na). Fifteen soil samples from a depth of 30 to 60cm from the different study areas and water samples from five wells with which the plots were irrigated were taken. Electrical conductivity, pH, sodium, calcium, magnesium and sodium adsorption ratio were analyzed. °Brix, surplus sodium, chlorides and pH in the grapes harvested in veraison and during harvest were analyzed. Microvinifications were carried out with the must obtained and the variables surplus sodium, chlorides and pH were analyzed. The results indicate obtained that surplus sodium did not increase significantly, but remained constant in the three stages measured. This is because variables would not be significantly affected by the winemaking processes. It should be noted that the soils of plots with high sodium values are the ones where high sodium values were found in the grapes analyzed. This indicates the direct influence of the soil components on the must.

A75
ORGANIC AND CHEMICAL FERTILIZATION RESPONSE IN RADISH (*Raphanus sativus* L.)

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The radish is a vegetable-crop of short cycle. The commercial product is a fleshy root, varied in shape, size and color. Fertilization increases yields and new trends with less use of agrochemicals are interesting. Objective: to determine the response of radish to organic and chemical fertilization through growth parameters and yields. Work was conducted at the Experimental Field of Horticulture Chair (26°55'S. and 65°20' W). The organic fertilizer was commercial vermicompost with the following composition (per100g of product): humidity 35-40%; Ash 40-45%; pH 4-6.2; C/N: 7.7; CE 1.1mmhos/cm. We used Cv seed Round Pink White Tip. Seeds were sown broadcast in five plots (0.50m wide and 2m long) in BCA and density=1.5g.m⁻². The treatments were: T1=soil -without fertilization-control; T2=200g of commercial vermicompost; T3=300g of commercial vermicompost; T4=100g of urea/plot (100kg.ha⁻¹-46%N-); T5=100g of diammonium phosphate/plot (100kg.ha⁻¹-18-46-0-). Parameters evaluated: number of leaves and fresh weight; diameter, weight, number of roots and yields. With statistical package R and ANOVA we determined that there were significant differences in fresh weight between T1(90g), T2(116g) with respect to T3(282g), T4(191.5g) and T5(225.9g). T4 and T5 had the largest number of leaves. As to yields, differences were found between T1(141.3g.m⁻²) and T2(155.0g.m⁻²) with respect to T3(230g.m⁻²), T4(220.30g.m⁻²) and T5(210.71g.m⁻²). This response is linked to physiological effects, given the differential capacity of photoassimilate partitioning in cultures, according to the availability of soil nutrients and plant destinations.

A76
RADICAL ANATOMY OF *Borreria spinosa* (RUBIACEAE)

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Borreria spinosa is a perennial herb, native to the NOA, NEA and Center with sexual and asexual reproduction. The aim of this work was to characterize the radical anatomy of this species. The radical system of 5 individuals was collected in Zanjón (Santiago del Estero). Conventional anatomical techniques and stains were applied. The root system presents a main root with knots and internodes; the lateral roots that will generate buds originate from the knots. The main root shows characteristic secondary growth, the lateral with primary and secondary growth at different stages. The primary structure has unistrata epidermis, cortical parenchyma with 2-3 strata, endodermis, unistrata pericycle and diary stele. The early and typical secondary structure have periderms with suber, felogen and felodermis with lenticels, cortical parenchyma with 8-12 strata and xylem with 3 growth rings. Solitary xylemata vessels and 1-2 paired rays. Compound starch grains and raphides in idioblasts are frequent in the cortical

parenchyma. In the portion near the neck, the main root shows more secondary xylem, fewer layers in the cortical parenchyma and peridermis, unlike the middle and apical areas. The presence of secretory channels in phloem and cortical parenchyma of roots with secondary growth was observed. Knowledge of the radical anatomy provides relevant information on the survival of this species in agricultural systems.

A77

BONE MICROARCHITECTURE ALTERATIONS CAUSED BY INCREASE IN BONE MARROW FAT. A HISTOMORPHOMETRIC STUDY

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An experimental work in which bone microarchitecture of the tibia in relation to bone marrow fat content is presented in an experimental model of dietary restriction in growing rats. Sprague Dawley rats were adapted for 2 days to a balanced diet (DB) in pellets after weaning. The animals were weighed and divided into 2 groups called Control group: fed *ad libitum* with DB (the amount of food consumed was recorded daily), and Experimental group: fed with 75% of the amount of DB consumed by the Control group on the previous day. Body weight was recorded periodically. The animals were sacrificed at 25 days of experience. Tibias were removed, fixed in 10% formalin and processed according to the usual technique for paraffin embedding, after decalcification in 10% EDTA at pH 7.2. Frontal sections of the proximal tibial metaphysis were obtained and stained with H&E. The following determinations were made in the secondary spongy subchondral bone: (a) BV/TV, (b) Trabecular Thickness (Tb.Th), (c) Trabecular Number (Tb.N), (d) Trabecular Separation (Tb.Sp), (e) Number of adipocytes per mm², (f) Percentage of adipocytes per tissue volume, (g) Total Area of adipocytes. Data were analyzed using the Mann Whitney test. Results: alterations in bone microarchitecture were observed in the experimental group with a significant reduction in Tb.N. Number of adipocytes per mm², Percentage of adipocytes per tissue volume and Total Area of adipocytes were significantly higher in the experimental group (p <0.05). These results might suggest that the increase in the percentage of bone marrow fat adversely affects bone microarchitecture.

A78

BONE REMODELING IN RAT MAXILLA: EFFECT OF ALENDRONATE AND VITAMIN E

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Bone balance is mediated by an immunoendocrine regulation, this being a complex process. Among the actions carried out to maintain the density and structure of the skeleton varied pharmacotherapies are used. Several studies have shown that both Alendronate (AL) and Vitamin E (E) contribute to the inhibition of bone resorption. **Objectives:** To study the effect of combined administration of (LA) subcutaneously and (E) on bone regeneration. **Materials and Methods:** The pharmaceutical formulation was 0.5mg/kg body weight for AL and 20mg/kg vitamin E administered subcutaneously. The effect was evaluated in male Wistar rats (n=108), 90 ± 20g, divided into 4 groups: Control (C), AL, AL-E and E. Extraction of the first lower molars was performed. The drug was injected at the following experimental times: 0, 7, 15 and 30 days post-surgery. The images of the jaws were acquired by radiovisiograph at each experimental time and were analyzed with Image ProPlus Software version 4.1 of Media Cybernetics. Statistical studies: non-parametric: Kruskal-Wallis test. **Results:** Group C (which recorded the lowest mean intensity) was significantly different from the E and AE groups (p<0.001), but not from the group that used only Al (p=0.070, p>0.05). The Al, E and combined Al-E groups did not differ significantly from each other (p>0.05 in any of the cases). **Conclusions:** The data evaluated serve to show a favorable trend in relation to the beneficial effect of the combination of AL and vitamin E.

A79

HISTOLOGY AND HISTOCHEMISTRY OF FAT BODY DURING LARVAL DEVELOPMENT AND METAMORPHOSIS OF *Phyllocnistis citrella* (LEPIDOPTERA, GRACILLARIIDAE) IN LEMON IN TUCUMAN (ARGENTINA)

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Growing citrus in Argentina is one of the most important fruit-related activities in the country, with Tucumán being the main lemon producer worldwide. The “citrus leaf miner” is one of the most worrying pests in the citrus growing sector. Insect fat body is an important tissue where numerous metabolic processes take place. Such processes include the use of the substances absorbed by the intestine and their assimilation and oxidation to obtain energy and tissue genesis. Fat body is the main storage source of fats and carbohydrates. The objective of this work was to analyse histological and histochemical changes during the post embryonic development of this species. The study material was collected in a pesticide free lemon growing orchard. Samples were fixed in specific solutions to keep proteins, lipids and carbohydrates and stained with Hematoxylin-Eosin, Schiff Peryódic Acid, Nile Blue, Sudan III and Black. During larval development, vacuole-like trophocytes with lipidic content were observed. In prepupa a decrease in lipid vacuoles and an increase in basophilic granulations and mild PAS positivity in the trophocyte cytoplasm were observed, indicating the beginning of the synthesis and storage of proteins and carbohydrates. In pupa the fat body accumulates protein granules with low glycogen content. The lipid content decreases with a predominance of acid lipids. Changes in the fat body chemical composition during the post-embryonic development of *Phyllocnistis citrella* are related to lysis of larval tissues and the formation of adult structures during metamorphosis.

A80

APPLICABILITY OF MATHEMATICAL METHODS TO QUANTIFY THE LAG PHASE IN *Rhinella arenarum* OOCYTE MATURATION

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The Gompertz model fits the dynamics of biological processes, as we demonstrated for the steroid-induced maturation of *Rhinella arenarum* oocytes. The Gompertz curve explains the behavior of the different phases of the maturation process. The lag phase is the period of time elapsed from the oocyte hormonal induction to the morphological signs of the rupture of the germinal vesicle. The aim of this study was to quantify the duration of the lag phase in the *R. arenarum* oocyte maturation induced by different hormones. The experimental data were obtained from ovarian follicles of *R. arenarum* treated *in vitro* with progesterone (P₄) and prostaglandins PGE₁ and PGF_{2α}. In order to estimate the lag time (λ), the experimental data were subjected to modeling and simulation with MATLAB and corresponding parameters were estimated with NLIN. In addition, two traditional mathematical methods were applied to the Gompertz growth curve: tangent at the inflection point and the third derivative. Experimental data indicate that λ varies according to the induced hormone, around 4 hours (h) for PGE₁ and PGF_{2α} and only 3h for P₄. However, the mathematical methods applied showed that the lag phase is greater when the maturation is induced with P₄ ($\lambda \approx 4:47$ h) than with PGE₁ ($\lambda \approx 3:30$ h) or PGF_{2α} ($\lambda \approx 3:46$ h). The methods fit the effect of the PG more accurately than that of P₄. This is explained by the formulation for the calculation of λ that depends on the growth rate in the exponential phase, given by of the parameter r (PG with $r < 0.50 \text{ h}^{-1}$ and P₄ with $r \approx 0.52 \text{ h}^{-1}$). These results raise the issue of the limitation of the wide use of these mathematical methods and provide a criterion for their applicability to the estimation of the lag time in the dynamics of the oocyte maturation in amphibians.

A81

IS THE LYSIS OF THE OVARIAN FOLLICLES OF AMPHIBIANS AN INDICATOR OF ENDOCRINE DISRUPTION? A STATISTICAL APPROACH

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Amphibians develop in aquatic environments and can be considered biological indicators of environmental degradation caused by endocrine disruptors (ED). Among ED effects, defective development of oocytes and interference in their hormonal signaling processes have been reported. In this study we statistically analyzed the maturation of the ovarian follicles of *Rhinella arenarum* and their lysis during the last three decades as possible indicators of the effects of ED. The experimental data obtained from ovarian follicles of *R. arenarum*, treated *in vitro* with Ringer's solution (RM) and progesterone (P₄) (10⁻⁶ M), were subjected to statistical analysis by means of the Chi-square test for comparison of proportions, to Marascuilo procedure to determine differences between decades and

to the T-test for paired data. A level of significance of 0.05 was set. The chi-square test indicates that the lysis of *R. arenarum* follicles increased significantly ($p < 0.0001$) from the 90's to 2010, regardless of whether the follicles were incubated in RM (5% - 22%) or in P₄ (5% - 24%). However, the seasonal lysis of the follicles revealed no significant differences between the three decades, either for follicles incubated in RM ($p = 0.29$) or in P₄ ($p = 0.1$). T-test for paired samples did not show significant differences between the average of the proportion of lysis in experiments performed with P₄ (0.091 ± 0.133) and with RM (0.097 ± 0.122) in the three decades considered (90, 2000 and 2010). According to the Chi-square test ($p < 0.0001$), the competence of the oocytes to mature has decreased in the last decade (91%, 92% and 77%). This statistical analysis provides new data on the susceptibility of amphibians to the effect of ED observed in recent years.

A82

HEMATOLOGICAL ASPECTS OF *Trichomycterus spegazzini* AS A TOOL FOR ENVIRONMENTAL MONITORING

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Trichomycterus spegazzini is a benthic species of small size distributed in rivers and streams of Salta, which is why it would be an excellent indicator of its status. In fish, blood parameters indicate their physiological state, which in turn serves for evaluation and control of infectious diseases, nutritional status, toxic effects and other stressors, indirectly monitoring the health of the ecosystem. For accurate diagnosis, normal blood values must be determined first in order to establish variability under these conditions. In 2014, adults of *T. spegazzini* were captured ($n = 47$) from cesspools (Río La Caldera) and their morphometric measurements and weight were determined. The Fulton condition factor ($KF = P/Lst^3$) was calculated. After 72h, they were anesthetized with lidocaine (2%), 0.3mL, obtaining the blood by dripping at the caudal end. An extended blood count of 4 to 7 was performed ($n = 7$) and stained with May Grünwald-Giemsa. The cellular elements of the peripheral blood were identified with cytological criteria. The leukocyte formula was determined by proportion of leukocyte types per 100 counted white blood cells. For microhematocrits, blood was drawn ($n = 20$), centrifuged and read, including plasma and red blood cells separately. Urea, cholesterol and glycemia values were characterized with a single blood sample ($n = 20$) using a spectrophotometer. Erythrocytes were detected; erythroblasts; ghost cells; mature and immature thrombocytes; small and large lymphocytes; monocytes; neutrophils; eosinophils; basophils; macrophages. Six erythrocyte dyscrasias were evidenced, due to dimensional and / or morphological variations.

A83

ANTIMICROBIAL ACTIVITY OF AQUEOUS EXTRACTS OF *Jodina rhombifolia* AGAINST *Xantomonas axonopodis* pv *citri*

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Plants are a potential source for the development of new alternatives in pest control due to the wide biological activity they present. In particular, the study of the biological activity of the species *Jodina rhombifolia* (Santalaceae) is interesting since it is used in folk medicine for its various anti-inflammatory, antidiarrheal, and antitussive properties. On the other hand, citrus cultivation in northwestern Argentina is an activity of great importance in the socioeconomic system of the region. The presence of the bacterium *Xantomonas axonopodis* endangers citrus production by affecting the external quality of the fruits and their commercialization. The objective of this work was to evaluate aqueous extracts of *J. rhombifolia* as alternatives for the control of microorganisms in citrus plants. The aerial parts of the plant material were extracted by maceration in hot water (55°C), filtered and evaporated. A portion of the aqueous extract (EA) was hydrolyzed, obtaining the hydrolyzed aqueous extract (EAH). Both extracts were tested against *X. axonopodis* by the Bioautography technique. The chromatographic plates were developed in a solvent system consisting of Toluene:Ethyl acetate (1:1). The results obtained showed that the apolar compounds (low Rf) of the EAH present activity against *X. axonopodis*, whereas EA does not. This would indicate that the aglycones released during hydrolysis would be responsible for the activity.

A84

COMPARISON OF ANTIMICROBIAL ACTIVITY OF *Jodina rhombifolia* EXTRACTS OBTAINED WITH SOLVENTS OF DIFFERENT POLARITY AND WITH SUPERCRITICAL FLUID.

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Jodina rhombifolia (Santalaceae), the only species of its genus, grows in South America. Despite its wide use in folk medicine, chemical and biological studies are scarce. On the other hand, citrus canker caused by *Xanthomonas axonopodis* pv. *citri* is considered a threat to the citrus industry since it affects the quality of the products, reducing its commercial value. The aim of our work is to search and identify active components of *J. rhombifolia* against *X. axonopodis*. A part of the vegetal material was extracted by maceration with ethanol and later partition with solvents of different polarity. Another batch was extracted with CO₂ under supercritical conditions at 40°C and at 200, 300 and 400bar, avoiding the use of solvents that pollute the environment. The antimicrobial activity of the extracts was comparatively evaluated by bioautography employing the solvent system Cyclohexane:Acetone (3:0.5). Activity was revealed by the appearance of an inhibition halo after the incubation of the system and its development with tetrazolium salt solution. The inhibitor effect was observed only on the apolar components of the extracts obtained by supercritical extraction. The results indicate that extraction with CO₂ allows the obtainment of active compounds, which could not be done with the method of extraction by traditional partition.

A85

***Xanthomonas axonopodis* pv. *citri* INHIBITION BY *Aloysia gratissima* ESSENTIAL OIL**

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Pathogenous agents such as insects, bacteria and fungi can affect the crop and commercialization of citrus. One of them, the bacterium *Xanthomonas axonopodis* pv. *citri*, is the causative agent of canker in citrus and causes important economic and biological losses, as it affects the growth and development of the plants, decreasing the quality of the fruit. Plants represent a potential resource in the attempt to reduce the use of synthetic agrochemicals and replace them by natural compounds that do not affect the environment. For this reason, we evaluated the chemical composition and antibacterial properties of the essential oil of *Aloysia gratissima* against *X. axonopodis* pv. *citri*. The essential oil was obtained by steam distillation and analyzed by gas chromatography coupled to a mass spectrometer (GC-MS). Inhibitory activity was evaluated by bioautography and the agar diffusion method. The analysis by GC-MS allowed the identification of the components of the essential oil of *A. gratissima*, β -terpinene, sabinene and β -fellandrene being the main ones. The oil showed significant inhibitory activity against the bacteria. According to the results obtained, it would be possible to suggest the use of oil as a microbial agent against a phytopathogenic bacterium of agronomic interest. In a further step, we intend to determine the minimum concentration of the oil against the bacteria.

A86

APPLICATION OF SPRAY DRYING FOR THE PRODUCTION OF A DEHYDRATED HONEY BEE PROBIOTIC

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Spray drying is an economic option to obtain dehydrated bacterial cultures or biological active compounds. *B. subtilis* subsp. *subtilis* Mori2 showed a beneficial effect on bee hives, reducing pathogen incidence and increasing honey production. The aim of this work was to evaluate the potential use of cheese whey powder as a thermo-protectant to obtain *B. subtilis* subsp. *subtilis* Mori2 dried cultures. The strain was inoculated (1% v/v) in an inexpensive culture medium, previously designed in our laboratory, and incubated at 37°C for 72h. Maltodextrine, gum arabic and modified starch were used as standard thermo-protectant carriers, while cheese whey powder was added as a feasible option. Each matrix was added (10% w/v) to 200mL of the culture. The drying process was carried out in a Buchi B-290 Mini Spray Dryer. Water activity (a_w) and cell viability were determined after the process (24h). Powder stability was analyzed at different temperatures (-20°C, 8°C and 25°C) by CFU counts (day 7, 15 and 45). The results were expressed in CFU/g. A_w values were below 0.36 for all the thermo-protectants assayed, while cell viability (24h) was

10⁹CFU/g. Cell viability of the dried products was stable, independently of the storage temperature, with counts of 10⁸CFU/g for 45 days. These results show that the spray drying process using cheese whey powder as a thermo-protectant is suitable for the production of *B. subtilis* subsp. *subtilis* Mori2 dehydrated cultures.

A87

WALNUT PASTE ENRICHED WITH CLA. POTENTIAL BENEFITS

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Due to the growing interest in healthy diets, industry focuses its research on developing potentially beneficial products. Health foods consist of water, carbohydrates, proteins, fats, lipids, vitamins, salts and minerals. One of the constituents of fats is Linoleic acid (LA), a polyunsaturated fatty acid found in sunflower, corn, soy, sesame, almonds, hazelnuts, walnuts and their oils. Conjugated linoleic acid (CLA) polyunsaturated fatty acid includes a mixture of positional and geometric isomers of LA. The objective of this work was to microbiologically transform the LA content of walnut paste into CLA, using conjugating lactobacilli. Pecan nuts were selected because of their high fat content. Walnut paste, ashes, free fats and proteins were determined in walnut paste; the fatty acid profile was characterized by Gas Chromatography. 10% and 20% dilutions of the walnut paste were made and a culture of *Lactobacillus casei* CRL431 with conjugating capacity was added, determining CLA by chromatographic techniques. The bromatological results obtained from the walnut paste were: humidity 3.26±0.03g%; ashes 1.67±0.01g%; fat 58.55±0.04g%; proteins 13.93±0.02g%. A 34.3mg LA/g sample was obtained. In walnut pulp 10% dilution the LA conjugation in CLA was 1.50mg CLA/g sample while with the 20% dilution the value obtained was 4.51x10⁻² mg CLA/g sample. Conclusions: the high content of LA in walnut paste and the conjugation in CLA obtained microbiologically would allow its incorporation into a food matrix, thus making it possible to increase its nutritional value, resulting in benefits for the health of the population.

A88

ENZYMATIC SYNTHESIS OF PHARMACOLOGICAL INTEREST BIOACTIVE COMPOUNDS WITH CALB

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At present, the use of enzymes in the pharmaceutical industry has increased because of their excellent selectivity. Moreover, enzymes reduce the use of not environmentally friendly reagents and solutions and allow the obtainment of semi-synthetic products, which is difficult to achieve using classical chemical methods. Previously, we made modifications in the structure of cineol using PLE and obtained derivatives with enhanced antimicrobial activity. Continuing in the search for new organic compounds of pharmacological interest, we prepared esters from 9-hydroxycholesterol (**1**) and metronidazole (**2**) by enzymatic acylation, using immobilized *Candida antarctica* lipase (CALB, Novozym 435®) because of its capacity to catalyze esterification and transesterification reactions in non-aqueous media. CALB (55mg) and the carboxylic acid (C3, C5 and C9) (0.06mL) were added to each solution of **1** and **2** (0.06mmol) in Hexane (3mL). They were stirred in a shaker at 300rpm and at 50°C. The reactions were followed by CCD, the isolation and purification of the products was performed by CC and identification by GC-MS chromatography.

Three new esters derived from metronidazole as yellow solids and three from 9-hydroxycholesterol as oils were obtained, with good yields (78-91%). The antimicrobial activity of the compounds obtained is currently being investigated. The easy isolation of products, the absence of toxicity and the lower costs (re-usable enzyme) fully justify the use of enzymatic methodology in the organic synthesis of potentially useful compounds in the pharmaceutical industry.

A89

WHEAT CULTIVARS RESISTANCE EVALUATION TO INFECTION WITH MAIZE YELLOW STRIATE VIRUS

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Wheat (*Triticum aestivum* L.) is winter cereal of greatest economic importance in Argentina. Since Maize yellow striate virus (MYSV) constitutes an emerging virus for wheat crops, the aim of this study was to evaluate the behavior of different wheat genotypes to this pathogen in artificial infections. The viral inoculum was obtained from Río Cuarto (Córdoba) in 2013 (RC-2013) and is maintained by periodic transmissions with the vector. In

transmission assays, third-instar nymphs of *Delphacodes kuscheli* Fennah were used with acquisition times of 48hs, 10-day latency and 24hs of transmission. Three insects per plant were used to inoculate wheat seedlings. Ten plants were evaluated for each cultivar out of a total of 12 cultivars (MS Inta116, MS Inta 416, MS Inta 316, Ceibo, Biointa 3006, MS Inta B 215, Lapacho, MS Inta 816, Algarrobo, MS Inta 415, Biointa 1006 and ACA 908). Number of MYSV positive plants and severity of symptoms was registered. Positive plants to MYSV showed symptoms of dwarfism, chlorotic streaks and yellowing. Eight cultivars tested positive for MYSV infection. Algarrobo, MS Inta 415 and MS Inta 416 were the most susceptible cultivars to MYSV, as demonstrated by both the greater number of diseased plants (40%) and the marked dwarfing and plant stunting. Cultivars MS Inta116, MS Inta 416, MS Inta 316, Biointa 3006 and MS Inta B 215 were negative to the virus infection. These results are a potential tool for the selection of the best performing genotypes in this productive context.

A90

WHEAT STREAK MOSAIC VIRUS DETECTION IN TWO ERIOPHYID MITE VECTORS POPULATIONS KEPT UNDER EXPERIMENTAL CONDITIONS

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The eriophyid mite *Aceria tosichella* Keifer (Wheat Curl Mite = WCM) transmits at least three important viruses in wheat, *Wheat streak mosaic virus* (WSMV), *High Plains wheat mosaic virus* (HPWMOV) and *Triticum mosaic virus* (TriMV). This viral complex represents a risk for countries that produce this cereal. One of the main management measures for these diseases is the use of tolerant or resistant materials. Our research group routinely carries out WSMV transmission assays through different populations of the vector under experimental conditions in order to assess the reaction of different materials against this virus. In order to confirm the presence of the pathogen in the vector used for these experiments, we aimed at detecting WSMV in two populations of WCM kept under experimental conditions. Eriophid mites were collected in two populations of Monte Buey and Marcos Juárez, both from the province of Córdoba. The colonies were kept in a breeding room under conditions of $25 \pm 3^\circ\text{C}$ and a photoperiod of 16 hours of light. The mites were analyzed individually and in groups of 25 and 50 individuals. They were placed in tubes and crushed with extraction buffer, and then analyzed by ELISA with commercial antisera specific for WSMV. The results showed the presence of WSMV in the groups of 25 and 50 individuals, unlike the mites analyzed individually, in which the virus was not detected. The same results were obtained in the two populations studied. The presence of WSMV was confirmed in the two studied populations of WCM maintained under experimental conditions.

A91

COLLECTION OF *Solanum betaceum* NATIVE TO THE YUNGAS AND CONSERVATION EX SITU IN A NURSERY

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The loss of biodiversity mainly due to human activities shows the need for strategies aimed at the conservation of native species *in situ* and *ex situ*. The latter seeks to keep germplasms out of their original environments and preserve them. The rescue, valuation and introduction of new crops is of great interest since it would serve to promote their quality and productivity. In this sense, Chilto (*Solanum betaceum*), a fruit native to the Yungas, is recognized for its economic potential. The objective of this work was to search for and collect native plant material from Chilto to form a first *ex situ* collection. In 2016 and 2017, natural populations of Chilto (Tafí Viejo, Chicligasta, Monteros and San Javier) were collected. Each individual was documented with an identification code, georeferencing, type of sample and phenotypic aspects. Fruits and stakes were stored in identified polyethylene bags. Leaflets were packed in bags with an airtight seal and silica gel. The material was taken to the EEA INTA Famaillá-Tucumán, where the stakes were grafted and rooted in perlite and hormone (IBA 3%). The seeds were used to obtain seedlings with Kekkila that are being employed to test management techniques and nursery cultivation and producer fields. The leaves will be used for studies of genetic diversity. The accessions were digitized on maps. As a result, a first collection of Chilto with 22 accessions was created, which is being characterized and evaluated for its aptitude and productive potential and will be useful for improvement programs in order to increase its competitiveness.

A92

SOIL NEMATODES ASSOCIATED WITH THE CORN CULTIVATION

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The strong expansion of cultivated areas in the country, especially those with inadequate or non-existent crop rotation practices, has increased the incidence of nematodes. In this work, corn production systems with three hybrids were periodically analyzed in the locality of Isca Yacu, Santiago del Estero, in order to identify the soil nematodes associated with it, its frequency and population density. Sampling was performed using basic techniques of agricultural nematology. The nematodes with the highest population density and highest frequency belong to the genera *Pratylenchus*, *Helicotylenchus* (phytoparasites) and representatives of the families Rhabditidae, Aphelenchoididae and Dorylaimidae. In soil samples, it was possible to observe the population variation over time, highlighted in the months of May: *Pratylenchus* (83 individuals) and *Helicotylenchus* (264 individuals), and April: Rhabditidae (58 individuals) and Aphelenchoididae (41 individuals). The relative importance of *Helicotylenchus* increased due to its fluctuation. In root samples, the temporal fluctuation was greater in May, especially for Aphelenchoididae (70 individuals), *Pratylenchus* (47 individuals), and Dorylaimidae (26 individuals). In April, greatest fluctuation occurred in the *Helicotylenchus* species (30 individuals). The most frequent genera and those of major importance were *Pratylenchus* and *Helicotylenchus* in Hybrid 1. There is insufficient information about the diversity of nematodes for our region; therefore, the results of this work represent an important advance in the knowledge of soil nematodes in a production area of relevance, in the northwest of the country.

A93

PREGERMINATIVE TREATMENTS IN *Capparis atamisquea* KUNTZE

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Capparis atamisquea Kuntze, a shrub indigenous to Santiago del Estero locally known as "atamisqui", is widely used in folk medicine for its digestive properties. In order to evaluate the incidence of different pregerminative treatments on the seeds, a germination test was carried out under controlled conditions and in nursery, defining 4 treatments: control, soaking in water at room temperature for 24 hours, soaking in water at 60°C and soaking in 70% sulfuric acid for 10 minutes and then washing with tap water for 20 minutes. The design was completely randomized with 4 replications per treatment, each with 25 seeds. In a germination chamber, the seeds were placed on moistened paper towels with 12h of light/dark cycles and temperature ranging between 25° and 30°C. In the nursery, planting was carried out in seedlings of 288 cells using mulch as a substrate. The results were analyzed by ANOVA and mean difference test using Tukey's test ($\alpha=0.05$). In chamber, the highest percentage of germination corresponded to the acid treatment (36.25%) while the highest TMG corresponded to the control (7.5). In nursery, the highest percentage of germination and the average time of germination were found with soaking in water for 24 hours (11% and 33.3 respectively). The results show the effects of different pregerminative treatments and it is expected that the information can be transferred to people interested in the production of this plant and serve for new studies to improve the germination of this species.

A94

***Salta triflora* (GRISEB.) ADR. SANCHEZ GERMINATION**

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The growing interest in the use of native plants in urban trees requires information regarding their domestication. *Salta triflora*, locally known as "duraznillo del campo", "rulo" or "pelichador", is a tree often found in the mountain forests of Santiago del Estero, with recognized forestry and forage uses and ornamental potential. Since there is no information about its domestication, the objective of this study was to know aspects of its germination and to evaluate the incidence of pregerminative treatments. A germination test was carried out under controlled conditions. The fruits were collected in the field and kept in glass jars at low temperatures. Three treatments were tested: control, achenes without tepals and achenes without tepals soaked in water at 40°C until reaching room temperature. Planting was carried out in a germination chamber with a temperature range between 25°-30°C and a 12-hour light/dark cycle. The design was completely randomized with 4 replications with 25 seeds in each one. Germination percentage, germination index, germination speed and mean germination time were calculated. The results were analyzed using Analysis of Variance and Mean Difference Test with Tukey's Test ($\alpha=0.05$). The highest germinative power and

mean germination time corresponded to the Control, with no significant differences between the treatments. Germination aspects related to type of germination, shape and size of the cotyledons, time of emergence and first nomophiles are described. The information obtained will serve those interested in the production of this species and new studies related to the germination of this species.

A95

EFFECT OF NATURAL PRODUCTS OF VEGETABLE ORIGIN AND SYNTHETIC PESTICIDES ON OOCYTE MATURATION

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Synthetic pesticides (SP) application causes imbalances in ecosystems, so research on the insecticidal properties of bioactive natural products (NP) of vegetal origin has become relevant. One of the undesirable side effects of the indiscriminate use of SP is their ability to act as endocrine disruptors altering the reproductive functionality of humans and/or animals. Previous studies of our group have proven interesting lethal and sublethal effects of plant extracts obtained from regional flora on pest insects of economic importance. In this work, we comparatively evaluated the endocrine disruption capacity of natural products (NP) of known toxicity and commonly used SP with an *in vitro* maturation bioassay on *Rhinella arenarum* oocytes. Ovarian follicles obtained from *R. arenarum* females were exposed to NP or SP for 2 hours and maturation was induced with progesterone (P₄) 10⁻⁶M. Germinal vesicle breakdown (GVBD) was controlled at 20 hours and experimental data were analyzed with Friedman test. NP used were pyrrolizidine alkaloids isolated from a methanol extract of *Senecio rudbekiaefolius* (100-400 mg/L) and aqueous and ethanolic extracts from *Senecio eriophyton*, *Nicotiana noctiflora* and *Clinopodium gilliesii* (250-1,000 mg/L); the SP chlorantranilprole and dimethoate were diluted from the concentrations used for application on foliage. Pretreatment of follicles with the tested NP did not affect the P₄-induced oocyte maturation percentages (75-100% GVBD). In contrast, the SP significantly inhibited the P₄-induced GVBD in a dose-dependent manner. These results provide a scientific basis for the implementation of these NP as potential biopesticides in the control of important pests in the region.

A96

ANTINOCICEPTIVE, ANTIINFLAMMATORY AND ANTIOXIDANT ACTIVITIES OF ALCOHOLIC AND AQUEOUS EXTRACTS FROM *Lepidium bonariense*

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In our country, the use of medicinal plants is the dominant attribute of the traditional ethnomedical system of rural populations. *Lepidium bonariense* L. (rucula, rosqueta) is a weed traditionally used in folk medicine as an antiscorbutic and digestive agent. The objective of the present work was to evaluate the antinociceptive, antiinflammatory and antioxidant activity of aqueous (EA) and alcoholic (EE) extracts of *L. bonariense*. Wistar rats were used in the method of plantar edema induced with carrageenan (acute anti-inflammatory activity), and in the formalin test (analgesic activity). The antioxidant activity was evaluated *in vitro* by the method of depuration of DPPH and inhibition of lipid peroxidation (β-carotene-linoleum acid method). The results showed that, in the carrageenan test, rats pre-treated with EA and EE showed decreased inflammation, reaching an inhibition percentage greater than 70% at 1000mg/kg after 60 minutes of treatment. In the formalin test, only AD produced a significant inhibition of pain in the neurogenic phase (41.18%), with respect to the positive control (Morphine). In the inflammatory phase, both extracts (1000mg/kg) induced a pain block of 67.78%, 58.60% respectively. The antioxidant activity of EE and EA was important with values higher than 50% (from 250µg/ml) in both methods. *L. bonariense* is a promising source of secondary metabolites with therapeutic potential, which requires further studies to ensure its safety, identify active substances and integrate them into primary health care programs.

A97

PRELIMINARY BACTERIOLOGICAL STUDY OF WATER CONSUMPTION IN LAS CARRERAS-TAFI DEL VALLE-TUCUMÁN

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Safe access to drinking water and sanitation is a basic human right. However, Las Carreras community (Tafí del Valle-Tucumán-Argentina) lacks access to this resource. The water consumed by this population comes from Los

Alisos River. At more than 2440 m.a.s.l. there is a water point for irrigation that is conducted through a channel from which, by means of a bypass, it is taken to a decanter and then to a sand filter. Then, the water is distributed to households through high density polyethylene hoses. Considering that the degree of microbial contamination is related to anthropogenic activities, the objective of this work was to evaluate the presence of coliform bacteria from the source of water supply of Las Carreras community. Eight samples were taken between June 2017 and April 2018 in two sampling points corresponding to Los Alisos riverbed and the decanter, both geolocated. Total coliforms bacteria were analyzed. The bacteriological analysis did not show differences in the values found between both sampling sites. Both samples, June and August of 2017, showed no presence of coliforms, while in November 2017 and April 2018 the presence of total coliforms and fecal coliforms was evidenced. These results indicate a health risk for Las Carreras population so we emphasize the need to promote public awareness about the care and conservation of the water quality of Los Alisos River.

A98

PHYSICOCHEMICAL PARAMETERS DETERMINATION OF WATER FOR HUMAN CONSUMPTION IN LAS CARRERAS, TAFÍ DEL VALLE, TUCUMÁN, ARGENTINA. A PRELIMINARY STUDY

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Los Alisos River, whose water is used by Las Carreras population for human consumption, flows through Tafí del Valle (Tucumán). The water is led from the irrigation channel to a decanter and then to a sand filter, thus applying physical cleaning treatments. The water is distributed to households through high density polyethylene hoses. The objective of this work was to evaluate physicochemical parameters of the water consumed by Las Carreras community. Two sampling sites were chosen, one corresponding to Los Alisos riverbed and another to the decanter. Eight samples were taken between June 2017 and April 2018. The following parameters were determined: color, odor, turbidity, sediments, pH, water temperature, conductivity, total solids dissolved, ammonia, nitrites, nitrates, chlorides, sulphates, total hardness and total alkalinity. The studies carried out did not show significant differences between the two sampling sites. The values obtained for each parameter were within the values allowed by the Argentine Food Code for drinking water, so it is concluded that the quality of the evaluated surface water is acceptable for human consumption. However, complementary bacteriological and chemical studies are needed to define it as safe water.

A99

DIVERSITY AND DISTRIBUCIÓN OF EPIPHYTES OF THE GENUS *Tillandsia* (BROMELIACEAE) IN PHOROPHYTES OF THE SIERRA DE PAIMÁN, LA RIOJA, ARGENTINA

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In arid ecosystems, mountain areas provide microenvironments with the highest humidity for the development of epiphytes. The orientation of the slopes is determinant of the availability of water in arid areas. The objective of this study was to compare the effect of the slope orientation of the Sierra de Paimán on the specific diversity and abundance of the genus *Tillandsia* (Bromeliaceae). Sampling was carried out in the southern sector of the Sierra. On each slope, east (E) and west (O), three linear transects of 100m were drawn perpendicular to the slope, with points at 5m intervals. At each point, the largest phorophyte of five dominant species (*Larrea cuneifolia*, *Prosopis torquata*, *Acacia gillesii*, *Trichocereus terscheckii* and *Zucagnia punctata*) was sampled, considering the orientation of the epiphytes in the crown (E-W). The vertical distribution of the epiphytes on the phorophytes was analyzed considering three zones. In total, 150 phorophytes of five species were sampled, and 762 reproductive individuals of *Tillandsia* were counted. In slope E, 469 epiphytes of six species (*T. duratii* 63%, *T. aizoides* 22%, *T. capillaris* 9%, *T. gillesii* 4%, *T. xiphoides*, 1% *T. minutiflora* 1%) were recorded, while in slope W 293 epiphytes of five species (*T. aizoides* 37%, *T. duratii* 33%, *T. minutiflora* 17%, *T. capillaris* 9%, and *T. gillesii* 4%) were found. The main phorophytes of *Tillandsia* were *A. gillesii* (39%) and *P. torquata* (27%). In the vertical zoning of the phorophyte, zone II concentrated the highest abundance of epiphytes on both slopes. The abundance of *Tillandsia* did not differ significantly between hillsides, but was relatively greater towards the east sector of the crown of the phorophytes on both slopes.

A100

VINASSE DISPOSAL BY TUCUMAN SUGAR AND ALCOHOL COMPANIES IN COMPLIANCE WITH ENVIRONMENTAL POLICIES. YEAR 2018

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Vinasse, the liquid effluent of the sugar industry, by dispositions of the State Secretariat for the Environment (SEMA) and Water Resources Directorate (DRH) of Tucumán, cannot be poured into waterways, its disposal being allowed only for soil fertigation. Current regulations are Resolution N°148/SEMA: it establishes where it should be applied: productive/non-productive land; methodology: furrow or sprinkler; type of vinasse: pure or diluted, respecting for each case of disposal, watering sheet and overturning.

Soil and water sampling is required before and after vinasse application, with the presence of technicians from the relevant agencies. Objective: to describe the type of vinasse disposition that alcohol companies in Tucumán used in 2018. We worked with official data that were analyzed according to descriptive statistics. The results show that in this campaign in Tucumán, 10 sugar and alcohol companies worked on distillation, with the following vinasse provision per company: a) productive soil 06(60%); -furrow/diluted 01(10%);-spray/pure 04(40%); -furrow and spray/pure 01(10%); b) unproductive soil 04(40%): -furrow/pure 01(10%); -furrow and furrow/pure 02(20%); -spray/pure 01(10%). 60% of the companies have pure vinasse in productive soil by sprinkling, a methodology according to which minor sheets are applied once a year, according to current regulations. Conclusion: there is a growing awareness of the care of soil and water resources by employers and control agencies. This is being achieved by weekly inspections of controller technicians and the obligation to monitor each farm where vinasse was applied, as well as from the prepared freetimeters. Annual monitoring in soil and water allows verifying if the methodology used in the properties is environmentally sustainable.

A101

PHYSICO-CHEMICAL CHARACTERIZATION OF THE COLORADO RIVER WATER - PROVINCE OF TUCUMAN

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The Colorado River is located 25 km southwest of San Miguel de Tucumán. The study of the physicochemical composition of this river is important because, although it belongs to a small tributary basin of the Salí River, it contributes a large amount of organic load as a result of the overturning of effluents in its channel from the main industries of the region. Organic load produces in the water conditions of hypoxia and even anoxia, generating an imbalance in it and the consequent death of the fish fauna. At present, no data exist with respect to the influence of this load on amphibians in the region. The objectives of this work were to analyze the physicochemical characteristics of the river water at its junction with the RN 157, before its outflow into the Salí River, during the harvest and inter-harvest periods (January 2016 to May 2018) and to establish the quality of the water. The parameters analyzed were: hydrogen potential (pH), electrical conductivity at 25°C (CE), dissolved oxygen (DO), biochemical oxygen demand 5 days (BOD) and chemical oxygen demand (COD). During the harvest, the results revealed values of BOD, increased COD and decreased DO due to the overturning of industrial effluents with a high organic load, in comparison with months in which there is no effluent (inter-basin) tipping. EC remained high during the entire period of analysis and pH remained within a constant range of values. The results show the physicochemical modifications that the river undergoes when receiving the contribution of the industrial effluents with a high organic load and consequently the loss of quality of the water. These results allow us to continue with the study of water in an experimental model in fertilization, using *Rhinella arenarum* as a possible biosensor of contaminated effluents.

A102

ANALYSIS OF THE *Trichomycterus corduvensis* DIET IN TWO STREAMS OF THE RÍO SALÍ BASIN, TUCUMÁN, ARGENTINA

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The study of fish feeding and its trophic relationships help us to understand the energy flow, the ecology of the species and the interactions between them. The feeding of the pencil catfish *T. corduvensis* in Tucumán was studied on populations over 2100 m a.s.l., but there is a gap in information below this range, so the aim of this work was to

analyze the fish diet and compare it in two streams. Two locations were sampled by electro-fishing. Stomachs and intestines were dissected, identifying food items and relative abundance was recorded. A Mann-Whitney analysis was performed in order to compare the diet of the pencil catfish between streams. The diet was composed mostly of macroinvertebrates, along with fine and thick organic matter. The food consumed by the catfish included 5 matching items for both sites and 6 ones exclusive for each place. Staphylinidae, which were found exclusively in the Siambón stream, represented 43% of the total of elements included in the diet, Baetodes 33.2% and Chironomidae 12.1%. In Las Conchas stream the relative abundance of Baetidae represented 59.2% (Baetodes + undetermined specimens), and Chironomidae 12.2%. Significant differences were detected in the mean value of the relative abundance of Baetodes and Staphylinidae between sites. Ongoing studies on the composition of benthonic macroinvertebrates will help to understand if these differences respond to environmental offers or to feeding preferences of the pencil catfish.

A103

DOES THE BODY SIZE OF TACHINIDAE PARASITOID FLIES (DIPTERA) CHANGE IN THE DRY CHACO LANDSCAPE OF TUCUMÁN?

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The configuration and composition of the natural or anthropic landscape are related to biodiversity patterns and ecosystem services such as the control of herbivores. Changes in the landscape determine changes in biotic communities, including the diversity and composition of animal body sizes. In this study, our objective was to examine the differences in body sizes of tachinid parasitoid flies between agricultural, natural, and mixed plots of 1ha in an area of Trancas, Tucumán. In addition, we explored the wing / thorax ratio of flies among plot types. We measured flies of all species collected using Malaise traps in the study area (n=90). We characterized the landscape from satellite images and analyzed the data using ANOVA. On average thorax width measured 2.35mm (SD=0.87) and wing length measured 5.67mm (SD=2.06). Both thorax and wing were less variable in natural plots than in mixed plots and in agricultural plots (thorax: F=2.864, df=2, p=0.06, wing: F=2.388, df=2, p=0.09). The wing / thorax ratio did not vary among the plots, suggesting that functionally the fly communities do not change (F=0.6231, df=2, p=0.5387). At present we are measuring more individuals, examining both the diversity and composition of fly sizes in the plots, and taking detailed metrics of the landscape to relate them to fly sizes. Studying body sizes at the community level will allow us to determine the value of this variable to describe the structure of herbivore controlling communities in regions of the world where there are still undescribed species.

A104

SEASONAL ABUNDANCE OF THE PHLEBOTOMINAE SPECIES IN THE SOUTH OF TUCUMÁN PROVINCE

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Phlebotomines (Diptera: Psychodidae) have a wide range of distribution and health importance due to their vectorial capacity. The abundance and species richness of the subfamily were studied in Autumn (A), Winter (W), Spring (Sp), and Summer (Su) in the Escaba Dam – Río Marapa. Sampling was carried out from April 2014 to May 2016 in three localities of the Alberdi Department (Escaba, Batiruaana and Corralito). In these places, two sites were selected, and REDILA-BL light traps were placed for three consecutive nights. The abundance variation of phlebotomines in the four seasons within each locality was analyzed with the ANOSIM test. A SIMPER analysis was used to determine which species contributed the most in each season. Significant differences between seasons were found. The most different seasons were (A) - (Su) and the most similar were (W) - (A). The species abundance was distributed unevenly. In (W), *Migonemyia migonei* and *Pintomyia salomoni* were the most abundant species in the Escaba locality. The dominant species in (A) were *Mi. migonei* and *Nyssomyia neivai* both for Corralito. In (Sp), *Mi. migonei* was the most frequent species in the three localities, and *Ny. neivai* only for Corralito. In (Su), *Ny. neivai* and *Mi. migonei* were the main species in Corralito. Anthropogenic, environmental and climatic variables may influence the abundance and dispersion of phlebotomines, increasing the probability of effective contact between man and the vector. Therefore, it is important to study the dynamics of these insects to determine control measures and epidemiological surveillance.

A105

STUDY OF THE BIRDS COMMUNITY OF THE MONTANE FOREST OF THE QUEBRADA DEL PORTUGUÉS, TUCUMÁN, ARGENTINA

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The Quebrada del Portugués, which is a part of the Aconquija National Park, is an Important Bird Area (IBA). The sector studied corresponds to the District of the Montane Forests, which is characterized by its diversity. The aim of the present work was to determine the composition and seasonal structure of the assemblage of birds that frequent a sector of that area. The 161 samplings were made at fixed radio points of 30m and 15 minutes, where all the species seen or heard were recorded, from August to November 2014 and from February to June 2015. 93 species from 31 families and 16 orders were registered. The seasonal richness was 59 species in autumn, 39 in winter, 38 in summer and 36 in spring. The most abundant species throughout the year were *Zonotrichia capensis* (15.6%), *Turdus chiguanco* (13.4%), *Mecocerculus leucoprhyus* (6.9%), *Cypseloides rosthchildi* (6.9%) and *Vanellus chilensis* (6.6%). Six species observed are considered Globally Endangered and/or Restricted Distribution Species: *Vultur gryphus*, *Cypseloides rosthchildi*, *Scytalopus superciliaris*, *Elaenia strepera*, *Cinclus schulzii* and *Atlapetes citrinellus*. This first survey of a sector of the montane forests would provide an indication of the biological potential that this protected area has for the entire region. It would be important to carry out seasonal, long-term studies in different environments, which would allow for an adequate management and conservation plan of bird species.

A106

DISTRIBUTION OF RISK FOR ARBOVIRUSES TRANSMITTED BY *Aedes aegypti* (DIPTERA: CULICIDAE) IN SAN MIGUEL DE TUCUMÁN

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Abundance and expansion of both *Aedes aegypti* and the arboviruses that they spread are limited by micro- and macrovariables. The aim of this study was to detect potential areas of health interest by estimate the distribution of the risk for arboviruses in San Miguel de Tucumán. Ten sites were georeferenced, and five ovitraps were placed weekly from September 2013 to September 2014 in each. Egg abundance was related to the variables: population, population density by censal radio, normalized difference vegetation index, distance to vegetation, temperature (Thermal band L8_B11) and elevation. A LANDSAT-8 image was obtained and the information layers were “stacked” to identify the most productive sites. A supervised classification was made to estimate the probability of detecting the mosquito. A risk map based on temperature, distance to vegetation and population density was made and priority action areas were identified. Risk was greater in lower geographical areas and decreased towards the foothills forest. The following were observed: 1) low risk in areas of the downtown with high buildings, 2) medium risk in areas with tall buildings, parkland landscapes, and periurban areas, and 3) high risk in urban areas with low buildings and gardens. Identifying risk areas could help carry out more efficient vectorial control efforts. This tool is useful to improve the response of health systems during outbreaks as well as prevention and surveillance measures of the vector during inter-epidemic periods.

A107

DYEING PLANTS FLORISTIC RELEVANCE OF SAN PEDRO DEPARTMENT. JUJUY, ARGENTINA

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Introduction: The Department of San Pedro presents great biological diversity in which floristic communities with dyeing characteristics are important. Dyes can be obtained from the organs of some plants, such as leaves, flowers, barks, fruits, seeds and roots. Currently, interest in plant products has been revalued and designs of garments with natural dyes are in high demand. The objective of this work was the floristic survey of dyeing plants of the Department of San Pedro. **Materials and Methodology:** Plant species were collected in La Mendieta, Sauzal, El Quemado, San Pedro and Arroyo Colorado. Taxonomic identification of the species was carried out and a list was drawn up taking dyeing characteristics into account. **Results and conclusions:** We collected 123 vascular plants including original specimens and duplicates. Up to now, we identified 39 dyeing taxa, distributed into (17) seventeen families, (15) fifteen of them belonging to Magnoliopsida with 37 taxa and (2) two families of Liliopsida with (2) taxa. The literature on the subject shows a wide variety of colors ranging from brown, gray, yellow, red and green to

intermediate colors. The vegetable organs with dyeing characteristics are stems, leaves and flowers, but these characteristics were also found in other plant structures such as fruits, roots and seeds. Based on the results obtained, the importance of the floristic dyeing resources of the Department of San Pedro is highlighted, as well as the contribution of information to future research on local flora and its application in ethnobotany or other sciences.

A108

PRELIMINARY STUDY OF THE DIVERSITY OF MACROHETEROCERA (LEPIDOPTERA) IN THE RESERVA EXPERIMENTAL HORCO MOLLE

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Reserva Experimental Horco Molle (REHM) is a protected area of 200ha, located on the Lomas de Imbaud and belonging to the Yungas, the second most biodiverse ecoregion in the country. Within it, the REHM is located in the pedemontana forest, a unit that was completely transformed by agricultural activities. The subsequent abandonment of these activities gave way to a process of secondary succession. In this process, the different environments were invaded by numerous exotic plants that together with the native flora have contributed to the existence of a high number of species of butterflies. The biodiversity of the REHM has been investigated but there are large gaps in information regarding invertebrate fauna, particularly with regard to lepidoptera. In 2004, a tentative list of the lepidopteran fauna of the REHM was presented, with a total of 26 species of macroheteroceros (nocturnal moths), this number being much lower than the one we obtained as a result of this work. That is why the objective of this study is to publicize the species systematically surveyed in the REHM. The choice of sampling sites was made according to different types of vegetation within the wildlife enclosure and the Botanical Garden. Based on the collected material, a total of 51 species belonging to 5 families were recognized: Geometridae (20), Noctuidae (15), Erebidae (9), Cossidae (3) and Sphingidae (4). This preliminary study shows the importance of the REHM as a refuge for these species due to the growing urbanization and constant anthropic pressure suffered by these insects.

A109

PRESENT STATE OF THE FAUNISTIC COMPOSITION OF LARENTIINAE (LEPIDOPTERA: GEOMETRIDAE) IN THE FML COLLECTION

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Geometridae constitute the second most diverse group within the Lepidoptera with approximately 23,000 species distributed in eight subfamilies: Archierinae, Oenochrominae, Geometrinae, Sterrhinae, Larentiinae, Ennominae, Desmobjathrinae and Orthostixinae. Larentiinae is the second subfamily in number of representatives around the world; it includes around 6200 species and is more diverse in temperate zones and high altitudes in the tropics. The first denomination of the group "Larentites" was made by Duponchel in 1845 and only in 1997, Holloway recognizes it as a subfamily. Different authors used the alar venation and tympanic structure to diagnose Larentiinae. Recent research considers that the number of tribes of the subfamily is 23, but it is thought that this number may increase due to a significant number of genera that have not yet been assigned to any of them. The objective of this work is to present a complete review of the material deposited in the entomological collection of the Fundación Miguel Lillo (IFMLA). We worked with the geometrids deposited in the above collection, which amount to approximately 2500 specimens, out of which 600 belong to Larentiinae. As a result, 7 tribes could be identified for Tucumán, with 48 species included in 20 genera, out of which 7 still do not belong to any tribe and whose tribal assignment should be dealt with in the near future.

A110

A NOVEL BREEDING TECHNIQUE FOR THE PREDATOR *Doru luteipes* (DERMAPTERA: FORFICULIDAE)

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The earwig *Doru luteipes* is a species of economic importance, since it includes generalist predators of soft-bodied insect pests. This species is very frequent and abundant in corn and sugarcane crops in the Northwest of Argentina. The aim of this contribution was to develop an experimental breeding technique providing information about its

biology. The colony was founded with 10 couples captured in a corn crop at El Manantial (Lules, Tucumán). Adults were transferred to plastic boxes (30x10x20 cm) containing overlapping sheets of moistened corrugated cardboard. The earwigs were feed with honey diluted in water (50% vol/vol) and pieces of artificial diet (Ozores, 1982). Females with egg masses were isolated in individual boxes till the eclosion of nymphs; then, the neonate nymphs were transferred to grass tubes (15x3 cm) containing pieces of tissue paper and covered with moistened cotton to reach the adult stage. The mating of *D. luteipes* is preceded by courtship. Once the females oviposit, they display the sub-social behavior of "maternal care" of the eggs. The mean number of eggs was 31.2 ± 8.1 per mass, the incubation period lasted a mean of 8.7 ± 1 days, with four nymphal instars: N1= 7.1 ± 1.8 days, N2= 8.3 ± 2.3 days, N3= 8.6 ± 2.8 days, N4= 9.0 ± 3.2 days. The sex ratio was $1\text{♀}:0.88\text{♂}$. The registered biological traits allow us to assert that it is possible to maintain experimental offspring of the predator, which would allow us to evaluate its potential as a biological control agent.

A111

DIFFERENTIAL RESPONSE IN CARBOHYDRATE PROFILES OF TWO SALVINIA SPECIES GROWING UNDER Cr (VI) AT DIFFERENT pH VALUES

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Cr (VI) commonly appears in many effluents that have different physicochemical characteristics (pH, T°C, etc.) that affect its availability. When contaminants mobility increases, their effect on plant physiology reveal damage to the photosynthetic apparatus, cell wall and plasma membrane. This leads, among other things, to alterations in photosynthates production and growth. Therefore, the objective of this work was to comparatively analyze the effect of Cr(VI) on the carbohydrate content in *Salvinia minima* and *Salvinia rotundifolia* exposed to Cr(VI) and grown at different pH values. Plants were cultured for 7 days in K₂Cr₂O₇ solutions buffered at different pH. Carbohydrates were determined spectrophotometrically. In fronds of *S. rotundifolia* an accumulation of hexoses was observed under chromium, but the Cr-pH combination inhibited this accumulation, producing minor changes in sucrose content. As the pH increased, the fructose levels decreased. On the other hand, the lacinias accumulated both hexoses (particularly glucose) and sucrose. All these variations were supported by alterations in the starch content. In *S. minima* a similar pattern was observed, but the major hexose was fructose. In this case, the starch accumulated from pH 4 and in the presence of chromium. We concluded that both species respond differentially to chromium and pH, modifying the profiles of soluble sugars that would be directed to different pathways. This would partly account for the metabolic differences observed in previous work with both *Salvinia* species.

A112

COLORIMETRIC CHARACTERIZATION OF QUINOA GRAINS (*Chenopodium quinoa* Willd.) PRODUCED IN AMAICHA DEL VALLE, TUCUMÁN

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Quinoa, an Andean ancestral crop, has all the essential amino acids required by humans, as well as other properties. A conspicuous feature of quinoa grain is color, which varies among genotypes, and has commercial importance. The colorimetric characterization has been typological and without considering spectrometry. This study characterized the postharvest grain color of 10 genotypes ("varieties") cultivated in Encalilla, INTA Amaicha del Valle (CICA, CO 407, Cuchihuila, Hornillos, Kancolla, NL 6, Ratuqui, Real, Regalona Baer, SA16, San Antonio). Sowing was made in November 2016, harvest in February-March 2017 (3 rows of 3 meters per genotype, 50cm between rows), with drip irrigation, application of urea (post-sowing) and chemical control of fungi and insects. Color was measured in the visible spectrum of human perception with a JAZ-EL-200 spectrometer (N=30 per genotype). All varieties showed peaks (hue) in a long wave (ca. 700 nm), with brightness between 8.6 and 42.7, and saturation between 1.4 and 1.7. There was a wide variation within and between varieties. The Cuchihuila variety (dominance of dark, low reflectance) was significantly different from the others (MANOVA on CIElab components). Color based Identification of varieties would be useful only in particular cases.

A113

PROTHROMBOTIC MOLECULES STUDY IN CHILDREN WITH TYPE 1 DIABETES

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Hyperglycemia contributes to molecular changes that alter hemostasis and induce a proinflammatory, prothrombotic and antifibrinolytic state. **OBJECTIVE:** to study molecules that can detect a prothrombotic state in children with type 1 diabetes (T1D). **PATIENTS AND METHODS:** Thirty five children with T1D, age 11.0 ± 2.5 years, without vascular complications and 20 controls were studied. The parameters evaluated were: plasminogen activator inhibitor 1 (PAI-1), von Willebrand factor antigen (FvW: Ag) and soluble CD40 ligand (sCD40L) (ELISA methods), platelet count, prothrombin time (PT), activated partial thromboplastin time (APTT) and Fibrinogen (Fg) (ACL 300 auto analyzer); fasting blood glucose (enzymatic method) and A1c (DCA 2000, Siemens). The data were expressed as the mean \pm SD and the Pearson coefficient was used to investigate correlations between the variables. **RESULTS:** Diabetic children had higher PAI-1 values (41.6 ± 12.0 vs. 11.7 ± 1.0 ng/mL, $p = 0.0001$); VWF: Ag (284 ± 55 vs. 121 ± 19 %, $p = 0.0001$), sCD40L (1608 ± 109 vs. 149 ± 17 pg/mL, $p = 0.0001$) and Fg (308 ± 66 vs. 246 ± 18 mg/dL, $p = 0.0001$). However, global hemostasis tests did not show significant differences between both groups. PAI-1 and sCD40L correlated with glycemia and A1c, as well as with Fg and FvW: Ag. **CONCLUSION:** Elevated levels of PAI-1, sCD40L, Fg and FvW:Ag suggest the presence of a prothrombotic state in the infant-juvenile population with T1D. Early detection of these molecules would contribute to implement strategies to prevent early vascular anomalies since childhood.

A114

MOLECULAR MODELING STUDIES OF NEW ESTROGEN RECEPTOR LIGANDS

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Estrogen receptors ER α and ER β are transcription factors that regulate many physiological processes in mammals. ERs play an important role in several pathological processes including cancer, inflammation and cardiovascular and metabolic diseases. Thus, they are of great importance for the study of these disorders at the molecular level. In particular, ERs inhibitors are commonly used as hormonal therapy in ER-positive breast cancer patients. Several crystal structures of ERs in complex with natural and synthetic ligands have been published in the last years. This allowed *in silico* studies to become a powerful tool for studying ERs structure and dynamics and also for the rational design of new ERs inhibitors. In order to better understand the molecular interactions that occur between estrogen-type ligands and ERs, we performed a molecular modelling study for a series of compounds structurally related to the natural agonist 17 β -estradiol. First, we performed a docking analysis using Autodock Vina program. The crystal structure of the ER α -estradiol complex, code 1QKU available at Protein Data Bank, was used. In the second stage of this study, we carried out molecular dynamics (MD) simulations using AMBER software package. Finally, employing the trajectories obtained from MD simulations, we performed an analysis of the per-residue free energy decomposition for all complexes. Our calculations suggested that derivatives considered would be located in the same active site of the enzyme. The interactions observed in the complexes of ER α with estrone, acetylestrore and sulfoestrore are similar to those that occur in the ER α -estradiol complex. This information could be useful in the search and design of new ERs inhibitors.

A115

EFFECTS OF A HIGH FAT DIET ON TEMPORAL PATTERNS OF METABOLIC PARAMETERS

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The worldwide prevalence of obesity has increased dramatically during the last decades. The etiology of obesity is multifactorial, and includes genetic, environmental and dietary factors, where hypercaloric diets play a central role in the development of the disease. Recent studies have linked metabolic homeostasis with the circadian clock at the molecular, physiological and behavioral levels. The objective of this work was to investigate the effects of a high saturated fat diet on daily patterns of metabolic parameters in Holtzman rats. The animals weaned at 21d of age were randomly separated and fed with a normocaloric diet (ND group) and a high saturated fat diet (HFD group) for 12 weeks. Rats were maintained under 12h-light:12h-dark conditions during the treatment period. On the experiment day, they were sacrificed every 6hs and blood samples were collected. Serum glucose, triglycerides, total cholesterol, HDLc and LDLc+VLDLc were determined by colorimetric assays. We found that glucose and triglyceride levels did

not vary throughout the day in any of the experimental groups. However, HDLc and LDLc+VLDLc cholesterol levels oscillated in antiphase in the serum of the ND rats over a 24h period. Twelve weeks of HFD feeding increased circulating total cholesterol and cholesterol associated with the LDL-VLDL lipoprotein fraction at the beginning of the light period, while HDLc levels decreased during the dark phase. Thus, we can conclude that a diet based on saturated fats modifies the daily patterns of lipid parameters, increasing risk-associated LDLc+VLDLc levels at the beginning of the rest period and decreasing safe-related HDLc levels during the activity period in rats.

A116

SEARCH FOR ANTIMICROBIAL PRODUCER STRAINS IN CLINICAL ISOLATES FROM PATIENTS SUFFERING FROM GASTROINTESTINAL INFECTIONS

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The aim of the present work was to look for antimicrobial producer strains in clinical isolates (CI) from patients suffering from gastrointestinal infections. The strains analyzed in this study were isolated in the 2013-2018 summer period from patients with acute diarrhea in northwestern Argentina. The samples obtained were collected from three hospitals of the five provinces in this region, Catamarca, Santiago del Estero and Tucumán. We analyzed the ability of these CI to produce growth inhibitory compounds using the plate diffusion method and *E. coli* AB1133 as a sensitive indicator strain. The results obtained demonstrated that the *Shigella* genus was the most common pathogen isolated in all provinces of our region, followed by *Salmonella*. According to different phenotypes of these CI, we conserved a total of 650 strains for our next studies. We found that 60 out of 500 CI analyzed were able to produce an antimicrobial agent that inhibits the growth of the *E. coli* AB1133 sensitive strain. These antimicrobial compounds were classified according to thermotolerance, molecular weight, cross immunity and spectrum of antimicrobial action. On these bases, we selected and characterized the antimicrobial substances using a cell free supernatant obtained after the culture of the producer strains in LB during the stationary phase that allowed us to identify various bacteriocin groups.

A117

BIOACTIVE COMPOUNDS DETERMINATION AND ANTIOXIDANT ACTIVITY OF PLASMA FROM HEIFERS DESTINED FOR SERVICE FED WITH SOYBEAN EXPELLER

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Soybean is a very nutritious legume used in cattle feeding. It is a source of various flavonoids such as genistein, which plays an important role in protecting the organism (cells or biomolecules) against oxidative damage. The objective of this work was to evaluate the effect of soybean expeller supplementation in the diet of heifers destined for service on the content of plasma antioxidant compounds. Two groups of 15-month-old Braford females were served naturally for three months. One group was fed with grazing Rhodes grass, and the other was also supplied with soybean expeller at a proportion of 0.6% based on live weight. Then, flavonoids and total phenolic compound concentrations were determined in plasma samples. Antioxidant activity was evaluated by two methods: bleaching of 2,2'-azinobis (3-ethylbenzthiazolin) -6-sulfonic acid and β -carotene bleaching induced enzymatically. Significant differences were observed between both groups in all determinations tested. The heifers that were supplied with soybean expeller in the diet had higher levels of bioactive components, both flavonoids and total phenolic compounds in plasma, and antioxidant activity increased. The results obtained suggest that the incorporation of soybean expeller to the diet of heifers destined for service has the potential to increase plasma antioxidant capacity, which could contribute to maintain adequate conditions against oxidative damage.

A118

MACROMINERALS EFFECT ON PARITY NUMBER OF GESTANT SOWS IN FARM WITH INTENSIVE SYSTEM

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The physiological needs of calcium and phosphorus increases during the last stage of gestation, if this is not covered with the daily share, there are in use the reservations of bony minerals. The aim was to analyze effect of concentration in serum of calcium, phosphorus and magnesium on parity number in sows gestant a Entre Rios farm with intensive system. There was extracted blood of 55 females of genetic commercial line (Yorkshire x Landrace and Pietrain); selected at random in 2017. The method used for determination in serum calcium (Ca), magnesium (Mg) and phosphorus (P), was the Spectrometry of atomic absorption (AA). There appeared a model of Poisson's regression, in minerals (Ca, Mg, P) concentrations were considered to be independent variables, P and Mg and as dependent variable parity number. It was possible to observe that alone variable Ca turned out to be significant in construction of model ($p < 0.0001$) and variable happiness contributes negatively in parity number with a coefficient $\beta -0.207$, which indicates an inverse relation between Ca concentration and parity number.

It is possible to say that the animals with Ca minor level present occurrence of major parity number ($\exp B = 0.815$, $IC_{95\%} 0.73-0.89$). Than minor parity number Ca concentration belongs bigger in sow and the proposed model explains 81.5% of association of concentration calcium with regard to parity number. It would be interesting to study this effect in transition to possess more information of behavior of minerals in porcine pregnancy.

A119

CALCIUM, MAGNESIUM AND PHOSPHORUS DETERMINATION IN SERUM OF GESTANT SOWS IN A SANTA FE FARM

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About 50% of total minerals are retained in the body for fetal development during the last 14 days of pregnancy. The aim of this work was to determine the levels of calcium, magnesium and phosphorus in the serum of gestating sows on a Santa Fe farm. Blood was extracted from 69 gestating sows selected at random in 2016 and 2017 from a commercial line Topigs (Yorkshire x Landrace x Pietrain). The method used for the determination in serum of calcium (Ca), magnesium (Mg) and phosphorus (P) was atomic absorption spectrometry (AA). As to the balanced diet of maize and soybean expeller, the managing was realized on the basis of the mineral requirements for category in production. Atypical values were identified and eliminated before the statistical analysis with where ANOVA, with an Infostat program. Average values and standard deviation of calcium (mg/dL), phosphorus (mg/dL) and magnesium (mg/dL) were, respectively: In 2016: 10.95 ± 1.86 ; 5.60 ± 0.83 ; 1.79 ± 0.30 and in 2017: 9.18 ± 1.65 ; 6.99 ± 1.49 ; 2.14 ± 0.52 . During the two years studied, the average values of the parameters calcium, magnesium and phosphorus were within the normal range. Calcium, phosphorus and magnesium were lower during the first year, with significant differences in phosphorus ($p < 0.05$). In 2017, serum calcium and phosphorus concentration were lower, both minerals with significant differences ($p < 0.05$). This may be due to the handling of the sows and to different nutritional changes during the two years of the investigation.

A120

SUSTAINABLE LIVESTOCK: NUTRITIONAL VALUE OF HARVEST RESIDUES AND THEIR USE AS SUPPLEMENTS IN ANIMAL FEEDING

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In regions of extensive livestock production, the irregular distribution of rainfall throughout the year determines variation, quantity and quality of forages. Animals have periods of good weight gain followed by periods of weight loss or in the best case, of maintenance. An alternative to this problem is the conservation through haymaking or silage or supplement with grains. Due to the increase in the price of grains (corn, soy, wheat, etc.), the use of alternative foods such as agro-industrial byproducts and crop residues was considered. They constitute an interesting alternative for the new paradigm of economically and ecologically sustainable production. In order to design efficient strategies in the feeding of ruminants, we used their capacity to convert the agricultural byproducts and residues into food. The objective of the present work was to analyze protein and energy value of five harvest and industrial sub

products as an alternative to non-traditional animal supplement feed. We worked with samples of ground maize (polenta), corn flour, black bean, white bean and corn bran. We determined crude protein (%PB) AOAC method (1994) and gross energy (EB) by adiabatic calorimeter (Parr, Illinois, USA). The following results were obtained: ground maize: %PB=8.24 $\sigma\pm 0.03$, EB=4.96kcal/gr $\sigma\pm 0.01$; Corn flour: %PB=10.16 $\sigma\pm 0.92$, EB=4.4kcal/gr $\sigma\pm 0.05$; Black bean (*Phaseolus vulgaris*): %PB=24.2 $\sigma\pm 0.15$, EB= 4.22kcal/gr $\sigma\pm 0.02$; White bean (*Phaseolus vulgaris*): %PB=24 $\sigma\pm 0.25$, EB=4.2kcal/gr $\sigma\pm 0.02$, Corn bran: %PB=11.32 $\sigma\pm 0.18$, EB=4.82kcal/gr $\sigma\pm 0.01$. *Phaseolus vulgaris* is a good protein supplement, followed by bran and corn flour. The energy values of the samples are low.

A121

FORAGE PLANTS IN SILÍPICA DEPARTMENT LOCATIONS

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The main resource for livestock feeding in the Silípica department comes from native forest species. In order for these systems to be sustainable, knowledge of the possible sources of food by the producers is essential.

The aim of this work was to study popular knowledge about the plants with which cattle are fed in localities of the Silípica department. Semistructured interviews were conducted with inhabitants of 6 villages; we asked about the plants that their animals eat, the parts of the plants that are consumed, the type of cattle fed and the use of supplements. Twenty-two species distinguished as forage belonging to 10 botanical families were mentioned, out of which the most representative one was Fabaceae. The most often mentioned plants belong to the genus *Prosopis* (*P. alba*, *P. nigra*, *P. kuntzei*) in addition to *Geoffroea decorticans* and *Ziziphus mistol*. Producers stated that goats are the animals that most often use forest plants, that in general no supplementation is used, and that the most often consumed parts of the plants are fruits and leaves. The results show that the inhabitants know the plants of their environment and apply this knowledge to activities such as livestock rearing, which contributes to provide food and improve family economy.

A122

PRELIMINARY EVALUATION OF THE SUITABILITY OF LACTIC ACID BACTERIA FOR THEIR USE AS INOCULANTS IN FORAGE SILAGES

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Silage inoculants are widely used in the cattle industry; those with fibrolytic activity constitute a recent innovation. The aim of this work consisted in the evaluation of two fibrolytic *Lactobacillus* ability to beneficially transform both chemical and microbiological profiles of inoculated maize silages. *Materials and Methods*: hybrid maize was chopped and hand sprayed according to the corresponding experimental group with *L. sp.* ETQ27 (homolactic, 1×10^6 CFU/g forrage), *L. sp.* CRL1669 (heterolactic, 1×10^6 CFU/g forrage), or with an equal amount of sterile suspension medium. Mini silos of 3kg were prepared in bags (duplicates for each opening day) and were opened for analysis at 5, 30, 60 and 90 days. *Results and Discussion*: ETQ27 reduced silage pH faster and produced more lactic acid than control and CRL1669 groups. On the other hand, CRL1669 produced higher concentrations of acetic acid, which could be the cause of the significantly lower amount of yeasts and consequently, of ethanol. Lactic acid bacteria and total culturable bacteria counts followed similar patterns. *Conclusions*: Both strains induced changes in the fermentation patterns of maize silages. ETQ27 showed a better inoculant ability, as the most important factor for preservation is lactic acid production. CRL1669 might be beneficial to improve silage aerobic stability. These assays are considered the first steps in the development of *third generation* inoculants.

A123

FIRST HISTOLOGICAL CONTRIBUTIONS OF *Semiscolex similis* (Weyenbergh, 1879) (HIRUDINEA, SEMISCOLECIDAE): BODY WALL

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Semiscolex similis is a hirudinean haematophagous freshwater endemic to South America. It is characterized by presenting a body of uniform width, with narrow and long anterior suction cup and a specific coloring pattern. The leeches are known for their medicinal use and in our province, cases of application of *S. similis* have been reported to reduce venous congestion. However, the species is captured in wastewater and is used without medical supervision,

thus constituting a potential risk for dwellers. This work proposes to histologically analyze the body wall of *S. similis* for the purpose of contributing the first histological data related to its biology. The samples (n = 10) were processed with the routine histological technique, colored with H-E, TB pH 7 and AB-PAS. Results: the body wall is formed by an epidermis, dermis and a tunic of smooth musculature, internally circular and externally longitudinal. The epidermis has a thin acidophilic cuticle and below it a simple cylindrical epithelium. The dermis, composed of dense connective tissue, contains two glandular types (G1 and G2), intraepidermal capillaries and sinuses, circular and oblique muscle fibers. The G1 are serous, pyriform glands with cytoplasm loaded with acidophilic granules whose ducts reach the epithelial base. The G2 are tubular glands of basophilic cytoplasm, AB+ and metachromatics. In the deep dermis and the muscular tunic, chromatophores are found, basophilic cells whose cytoplasmic projections reach the epithelial base. Conclusion: the results obtained reflect a great adaptability of *S. similis* to skin respiration as well as to locomotion.

A124

POTENTIAL ANTIFUNGICAL EFFECT OF KILLER YEAST ON THE HUMAN PATHOGENIC FUNGI *Candida* AND *Cryptococcus*

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Candida and *Cryptococcus* are cosmopolitan opportunistic yeasts that grow at 37°C and cause mycosis in humans. Currently available drugs are scarce and not very selective. The objective of this study was to evaluate the antifungal activity of 3 killer yeasts: *Wickerhamomyces anomalus* strain 1026, *Metschnikowia pulcherrima* strain 1010 and *Vishiniacozyma victoriae* strain 1263 against 8 clinical isolations: *Candida albicans* (2), *Candida parapsilopsis* (2), *Candida tropicalis* (2) and *Cryptococcus neoformans* (2). The assays were performed using the YPD-MB agar growth inhibition technique. 1×10^6 cell/ml suspensions of each pathogenic microorganism were inoculated. Then, three perforations were made in the agar and 20 µL of each killer yeast was inoculated. Incubation was conducted at 28°C for 48-72 h. The presence of halo inhibition of pathogen growth was considered as a positive sensitivity to killer toxins. The three yeasts studied showed inhibition of *C. albicans*, *C. parapsilopsis*, *C. tropicalis* and *C. neoformans*. These results demonstrate the relevance of studying the nature of the compound produced by killer yeasts with inhibitory effect on the growth of opportunistic pathogens and the need to continue with trials in order to optimize the production process in fermenter to achieve high yields and productivity in order to demonstrate their technical feasibility and commercial viability.

A125

VINASSE AMOUNT REDUCTION BY ETHANOL FINAL CONCENTRATION INCREASING OF *Saccharomyces cerevisiae* FERMENTATION

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Introduction: The sugar and alcohol industry in Tucuman produces ethanol, sugar, bagasse, solid waste from milling to obtain paper and electricity and vinasse, which is the main liquid effluent generated during the production of ethyl alcohol. The discharge of this type of untreated effluent produces pollution of the rivers. The objective of this work is to obtain lower amounts of vinasse using yeast strains isolated from molasses that produce high alcohol percentages. Materials and Methods: Molasses samples were taken from different Tucuman sugar mills to carry out yeast isolations using YPD and YPS media with antibiotics. For the propagation of the microorganisms, YPS medium with 50 g/l of sucrose was used. Incubation was made in thermostatic bath at 30°C with agitation. Fermentations were carried out in duplicate in flasks with 200 ml of YPS medium starting from 250 g/L of sucrose incubated at 30°C. ART and ethanol concentration were determined. Results and Conclusions: Three strains of high fermentative power were isolated: A2, A10 and A11, which produced 11.74; 12.81 and 13.20% ethanol respectively. From the environmental point of view, the use of the strain *Saccharomyces cerevisiae* A2 isolated in this work would allow a reduction in the vinasse levels generated by 30%, going from an average of $13 \text{ L}_{\text{vinasse}}/\text{L}_{\text{alcohol}}$ to $9 \text{ L}_{\text{vinasse}}/\text{L}_{\text{alcohol}}$. Producing the *Saccharomyces cerevisiae* A2 strain on a large scale and using it in the mills will bring benefits for production, energy consumption and environmental benefits, reducing pollution in rivers.

A126

***Plectranthus* GENUS: COMPARATIVE CYTOGENETICAL ANALYSIS
OF TWO SPECIES**

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Plectranthus genus (Lamiaceae family) has about 300 species, among them: *Plectranthus barbatus* Andrews (Brazilian boldo, big pulpy leaves, and unpleasant intense smell) and *Plectranthus madagascariensis* (Pers.) Benth (incense, small variegated leaves and pleasant smell). Both species, naturalized in several Argentina regions, are aromatic and of tropical origin. Brazilian boldo is native to India and incense to Asia and Australia. They are rich in essential oils and are used both in folk medicine and as ornamental plants. The species of *Plectranthus genus* have different basic (from $x=6$ to $x=8$) and chromosomal numbers, cases of aneuploidy and euploidy having been reported. The objective of this work was to make a comparative cytogenetics analysis between these species in order to increase information about their biological characteristics. The material came from two localities in the Tucumán province, boldo from San Pedro de Colalao and incense from Yerba Buena. For mitosis and meiosis analyses, traditional techniques were employed. A diploid number of 32 chromosomes was observed for both *P. barbatus* and *P. madagascariensis*. According to a basic number of $x=8$, the $2n$ of two species would correspond to tetraploid genomes. For both cases, irregular meiosis was observed which correlated with the low pollen grain viability and consequently, with the scarce formation of fertile seeds, which would account for their frequent vegetative propagation. The above characteristics would indicate that the two are autotetraploid species. Because of that, clonal propagation is recommended as an alternative to preserve their germplasm.

A127

**REPRODUCTIVE ASPECTS OF *Pelargonium citrosum* VOIGT EX SPRAGUE FOR ITS
DIFFUSION AS A NATURAL BIOCIDES**

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Pelargonium citrosum Voigt ex Sprague (sin. *Pelargonium graveolens* L'Hérit) belongs to the *Geraniaceae* family, native to South Africa and neighboring countries. They are ornamental plants with great variation in leaf morphology, an herbaceous hairy stem, and decorative foliage. They also present axillar and terminal flowers in compact umbels. An intense citric smell flows from the entire plant because of the citronella substance. It is commercialized as an "anti-mosquito geranium" due to its natural biocide properties. From the cytogenetics point of view, very little is known about this species. For *Pelargonium* genus different ploidy levels are mentioned (diploid, tetraploid, hexaploid, etc.), also reporting the small size of its chromosomes (about $1.5\mu\text{m}$). Knowledge of the species reproductive aspect is important to determine its fertility and consequently its diffusion mechanism. Auto incompatibility cases have been reported. The aim of this work is to analyze its cytology, the meiosis stages and the pollen grain viability. Material of *Pelargonium citrosum* came from San Miguel de Tucumán city. The cytogenetics analyses of meiosis and pollen viability were made with conventional techniques. Result showed normal meiosis and very small sized chromosomes, which agreed with the literature on the subject. Pollen viability was high. Nevertheless, the absence of fertile seeds can be related to auto incompatibility phenomenon which impedes the selffertilization. We can conclude that clonal multiplication is an important diffusion alternative for the species as it would ensure the preservation of its germplasm for further studies.

A128

**PRELIMINARY STUDIES OF PROTEIN INVOLVED IN PELLUCID ZONE
RECOGNITION OF *Chinchilla lanigera* SPERM**

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There is evidence that the interaction between gametes occurs through complexes of complementary receptor-ligands in them. In sperm, these complexes could relocate and facilitate the presentation of receptors. The sperm adhesion molecule -SPAM1- is a protein with hyaluronidase activity present in these complexes. Male infertility is often due to the inability of the gametes to recognize the oocyte. In spite of its biological importance, this subject has not been completely clarified yet and there are no previous data on chinchilla. The objective of this work was to locate SPAM1 in *Chinchilla* sperm and study its role in gamete interaction. Sexually mature animals were used. Epididymal sperm were fractionated: uncapacitated (UC), Capacitated (C) in TH3 media (2.30 hours, 37°C, 5% CO₂) and reacted (R) progesterone-induced 20µM. Samples fixed with acetone at 4°C were processed for immunofluorescence. Oocyte-cumulus complexes were co-incubated with C pretreated with anti-SPAM1 at 37°C. Hyaluronidase activity was

observed at different times (0, 15, 30, 60 minutes) and binding to the pellucid zone (ZP). Controls were not exposed to anti-SPAM1. The UC and C fractions showed a signal in the acrosomal region while no fluorescent signal was recorded in R. In the co-incubation assays, the dispersion of the cumulus mass was a function of time, it being much higher in the controls. A lower binding to ZP was obtained by blocking SPAM1. These results show a participation of SPAM1 in the interaction, although it is not indispensable in the process. Its enzymatic activity is time-dependent and does not represent a single mechanism of dispersion of the cumulus mass. Further studies are required to better understand how communication is established between gametes.

A129

IMMUNOHISTOCHEMICAL CHARACTERIZATION OF LYMPHOID STROMA IN SALIVARY GLAND WARTHIN TUMOR

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Warthin tumor (TW) is the second most common benign salivary gland neoplasm. It usually appear in men and on the parotid gland. Histologically, it is composed of papillae and cystic structures lined by biphasic oncocytes cells

over a lymphoid stroma. In general, the tumor shows balanced distribution between epithelial and lymphoid stroma. Lymphoid component histogenesis remains unknown. Studies revealed a B immune reaction CD20 positive in follicles with germinal center reaction. T cells were stained with CD3 without classification of their components. Objectives: to analyze T cells immunophenotype and its distribution in a series of cases to contribute to the knowledge of TW histogenesis. Material and methods: 10 parotid TW cases were studied with routine stains. Five cases were selected for T cells immunostaining with CD4 and CD8. Automatic Benchmark system, Optiview detection system and Roche-Ventana antibodies were used. Results: CD8: All cases showed 20% average marginal and subepithelial positive staining. CD4: All cases showed 40% marginal and central positive staining. Epithelial lymphoid infiltration was not detected. Conclusion: Our study shows polyclonal B lymphoid reactivity and T helper (CD4) lymphocytes proliferation.

A130

GENE DOSE COMPENSATION MECHANISM IN *Xenopus laevis*

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Throughout evolution, polyploidization events have shaped various eukaryotic genomes. Polyploidy provides raw material for evolutionary diversification because gene duplicates can support new functions. However, the component subgenomes of a polyploid must cooperate to mediate potential incompatibilities of gene dose, regulatory controls and protein-protein interactions. Redundant functional elements in a polyploid are expected to rapidly revert to single copies through the fixation of disabling mutations and/or loss unless prevented by neofunctionalization, subfunctionalization, or selection for gene dose. Recent studies have demonstrated that *X. laevis* is an allotetraploid organism whose genome is partitioned into two distinct homoeologous subgenomes (L and S) which, despite sharing the same nucleus the subgenomes, do not recombine with each other and have evolved asymmetrically. In this work, we cloned and functionally characterization the *uncx.S* and *uncx.L* transcription factors of *X. laevis*. The comparative analysis of the protein sequences showed that *uncx.L* gene is truncated, lacking the C-terminal domain (similar to dominant negative). Through the *in situ* hybridization technique, we found that these homologous pairs are expressed in the sclerotome and in the pharyngeal pouches; additionally, *uncx.S* is also expressed in the pronephros. On the other hand, we conducted experiments of gain and loss of function of *uncx* homologs. In these assays we demonstrated that both *uncx* genes play an important role in sclerotome development and showed a novel mechanism of regulation of gene dose in which *uncx.L* antagonizes with *uncx.S* function, possibly through a competitive inhibition of binding to target genes.

A131

GENISTEIN EFFECT ON INVOLVED GENES EXPRESSION OF OVIDUCTAL EPITHELIUM CELLS MIGRATION

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An optimal oviductal microenvironment is essential for the early stages of reproduction in mammals. It can be modified by the presence of molecules supplied by the diet. Genistein (GNT) is an isoflavone present in soy, used in cattle feed. It is known that GNT affects migration in bovine oviductal epithelial cells (BOEC), while other oviductal molecules such as urokinase-type plasminogen activator (uPA) favor this process. In this work the effect of the GNT on the expression of genes involved in the BOEC migratory activity was evaluated. The cells were obtained by mechanical pressure of slaughtered heifer oviducts. Primary cell cultures were stimulated with GNT (0.2µM, 2µM, 5µM and 10µM) and a combination of 10nM uPA plus 5µM GNT (uPA+GNT) for 24h. The expression of focal adhesion kinase (*FAK*), paxilin (*PXN*), *uPA* and its receptor (*uPAR*) was evaluated by RT-PCR. The migration of stimulated cells with 5µM GNT and uPA+GNT was also studied by means of wound healing assays. A decrease in the expression of *FAK* and *uPAR* in cells incubated with GNT at all concentrations tested was detected, while *PXN* and *uPA* were only affected by 10µM GNT. In the wound closure assays, the cultures with uPA+GNT showed a progressive decrease in the open area as well as the controls, whereas in the presence of only GNT, the cell-free surface remained constant over time. It is concluded that GNT affects migration by inhibiting the expression of genes involved in the formation of focal contacts and of components of the uPA / uPAR system.

A132

CLONING OF THE F FUSION PROTEIN GENE FROM HUMAN RESPIRATORY SYNCYTIAL VIRUS IN *Escherichia coli*

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Human Syncytial Respiratory Virus (HRSV) is the main cause of acute respiratory infection in young children. The F fusion protein is responsible for the penetration of the virus into host cells. This protein is antigenically conserved in the 2 viral subtypes (A and B) of HVRS and "in vivo" induces a neutralizing antibody response capable of limiting viral replication. Thus, it is an excellent candidate for the development of vaccines. Objective: To perform the cloning of the F protein gene (F gene) of HRSV in *E. coli* XL1 using pGEM as the cloning vector. Materials and methods: The LONG A strain of HVRS was propagated in Hep-2 cells. Cell monolayers were infected with the virus and incubated at 37°C in a 5% CO₂ incubator for 3-4d until most of the cells showed a cytopathic effect. Infected cells were harvested and frozen at 70°C. RNA purification was carried out from an aliquot of this culture using a commercial kit. Then, viral RNA retrotranscription and *F gene* amplification by PCR were performed. The *F* amplicon was cloned into pGEM Easy vector-T by ligation with T4 ligase. The transformation of *E. coli* XL1 with the plasmid vector was done by electroporation. Results: Positive F clones were obtained by transformation of *E. coli* with recombinant plasmid: *E. coli* XL1-F. The identity of the cloned fragment was confirmed by PCR, restriction profile analysis and sequencing. Conclusions: The *F gene* of HVRS was successfully cloned and recombinant strain *E. coli* XL1-F was obtained. This will allow the subsequent cloning of this gene in an expression vector to produce the recombinant protein F in *E. coli*.

A133

LIPID PEROXIDATION EFFECT ON SPERMATIC PARAMETERS IN REPRODUCTIVE AGE MEN

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Reactive oxygen species (ROS) play an important role in a variety of cellular processes such as sperm maturation, chemotaxis, pellucid zone junction and acrosome reaction. An excessive production of ROS and/or a deficiency in the antioxidant defense generate a state known as oxidative stress, which damages proteins, lipids and nucleic acids. At the level of the spermatozoon, the ROS produce lipid peroxidation, reducing the fluidity of the plasma membrane and affecting its motility, a condition that would affect its fertilizing capacity. In order to determine the influence of lipid peroxidation on motility and sperm morphology in men of reproductive age, 25 semen samples of men aged between 25 and 45 years were studied. They were divided into two groups: Men with Reproductive Disorder (HTR),

and apparently healthy controls (C). Seminal parameters were evaluated according to the criteria established by the WHO 2010. In seminal plasma, reactive species of thiobarbituric acid (TBARS) were determined using the technique of Beuge and Aust. The HTR group showed significantly higher levels of TBARS compared to group C (TBARS $\mu\text{mol/L}$ HTR= 2.6 ± 0.6 , C= 1.8 ± 0.2), although the progressive motility and the sperm count were similar in both groups. The strict Kruger morphology was significantly lower in the HTR group compared to the control individuals ($p<0.05$). Conclusions: The results obtained showed higher levels of EROS in the HTR, which would negatively affect the morphological characteristics of their gametes, conditioning their fertilizing capacity.

AUTHOR INDEX

A

Abdala ME A68
Abeijón-Mukdsi MC A122
Abregú AV A113
Abrigato MB A54
Adera MN A81- A95
Agosto M A118
Agüero Aguilera A A71
Agüero TH A113
Aguilera G A102
Aguirre MG A12
Aguzzi A A78
Aiello I A4
Ajmat MT A10 - A34 - A95
Albo GN A13
Albornoz PL A30 – A76
Alderete M A16
Ale Levin S A18 – A57 – A58
A60
Alegre Porto CM A75
Áleman MN A113
Alemandri V A89 – A90
Alfonso J A115
Alvarez Asensio N A72 - A73 -A133
Alvarez C A124
Alvarez M A107
Álvarez RE A31
Alzamendi A A4
Andrada AR A30 -A31
Andrada E A122
Andrada Mansilla B A126 - A127
Angos A A51
Antelo CM A105
Anzulovich A A115
Araoz M A43
Arce MB A61
Arcos NA A117
Argüello Caro EB A89 -A90
Arjona M A50
Asensio C A21
Audisio MC A86
Auil AF A70
Ávila MN A70
Ayarde H A11
Aybar Odstreil IM A129
Aybar V A59
Ayup MM A7

B

Balderrama CME A46
Barbieri N A21 - A41
Baricco M A18 -A57 - A58 -A60
Barrera ML A48 -A64
Barros J A59
Basualdo MM A78
Bazán MC A113
Bellezze J A118 -A119
Bellido C A98
Beltrán RE A9 - A68

Benavente A A21 -A41
Benítez LM A20
Benzal MG A80 - A81
Black P A53 - A54 - A56
Black-Décima PA A55
Blanco MJ A120
Bombasaro JA A114
Bonetto M A22
Bonilla F A128 - A133
Borsetti HM A5
Bortnyk P A21
Brandán Fernández ZJ A105
Brizuela A A37
Brodkiewicz IY A46 - A49 - A96
Brodkiewicz Y A45
Budeguer C A126 - A127
Buedo S A35 - A112
Bulacia MM A109
Burgos CA A36 - A37
Busellato LI A97 - A98
Buthruille dos Santos NM A38

C

Cabrera JC A70
Caillou S A17
Calonge R A13
Calvo F A22
Campa M A119
Canteros FH A69
Cardozo AG A65
Careno SP A53
Carino S A129
Carrizo E del V A121
Casiraghi LP A4
Castillo MA A83 - A84 - A85
Castro E A92
Castro F A35
Castro JF A33
Castro Lema M A59
Cerviño S A122
Céspedes FN A121
Chacoff N A62
Chagra Dib EP A122
Chaila S A29
Chalup A A8
Chalup AE A108 - A109
Chamut S A56
Chiesa JJ A4
Chocobar Ponce S A111
Choque F A61
Cisint S A26
Claps GL A57 - A106
Colina M A67
Córdoba L A77
Coronel RS A51
Costas D A17
Crespo CA A25 – A61 - A101
Criado A A16
Cruz RM A87

D

Daniele R	A44
Dantur G	A56
Daruich T	A75
Dávila E	A41
De Bonis M	A59
de Cristóbal R	A8
Delgado MA	A42 - A116
Díaz Alfaro M	A124
Díaz Briz LM	A104 - A106
Díaz C	A92
Díaz EI	A113
Díaz ER	A87
Díaz Juárez MI	A83
Díaz MA	A97 - A98
Díaz N	A92
Díaz RA	A93 - A94
Díaz Ricci JC	A14
Díaz, M M	A2
Díaz-Ricci JC	A15
Direni JM	A104 - A106
Domínguez G	A53
Dumón AD	A89
Dumón AD	A90
Dus Santos M	A132

E

Echevarria AL	A105
Eluk D	A118 - A119
Eraso Di Giuseppe MF	A38
Erazzu L	A35
Erazzú LE	A112
Escalante K	A7 - A62

F

Fanjul ME	A105
Farfán Torres EM	A85
Ferella A	A132
Fernández L	A80
Fernández SN	A24
Fiol M	A38
Flores LV	A82
Fornes L	A91
Frías A	A91
Fuenzalida AD	A104 - A106

G

Galindo-Cardona A	A7— A8 - A62
Gallo JM	A69
Galvez C	A88
Ganem M	A107
Garat J.	A77
García DC	A117 - A131
García Degano F	A10
García EM	A117
García R	A63
Garrido J	A88
Gastaminza G	A10
Genta SB	A47

Geréz Polzoni CE	A36 - A37
Geria M	A7
Geria Reinés M	A62
Gil DM	A52
Giovambattista A	A4
Golombek DA	A4
Gómez Bello R	A54
Gon M	A118
Goncebat JM	A98
Gonzalez F	A132
González JA	A35 - A112
González MC	A100
González ME	A97
González R	A91
González RC	A129
Gordillo F	A99
Gorustovich A	A63
Gramajo Bühler MC	A25 - A128
Grignola J	A91
Griguol R	A74
Grillo Puertas M	A43
Gutián MV	A86
Gumusheff E	A54
Guzmán M	A11

H

Habib NC	A47
Hael-Conrad V	A15
Haro C	A71- A72 - A73 - A133
Hebert EM	A43
Heredia A	A50
Hernández MB	A19
Hernando PM	A98
Herrera HM	A113
Hurtado A	A56
Hurtado AM	A55

I

Ibarguren C	A86
Ibarra A	A62
Imoberdorf C	A122
Interdonato R	A43
Iruzubieta Villagra AL	A24 - A25
Isla MI	A27
Issé B	A71 - A72 - A73
Ixtaina V	A28

J

Jerez S	A27 - A28
Jimenez G	A62
Jiménez R	A112
Jozami AC	A103
Juárez MC	A102

L

Landi L	A7
Lasbaines ML	A108
Lazarte MA	A130

Lazarte S	A71 - A73
Lazarte SS	A72
Leccese Terraf MC	A42
Ledesma Achem E	A71 - A72 - A73
Ledesma Haron ML	A9
Leguiza HD	A122
Lencina I	A59
Lenz RM	A86
Lepori N	A62
Lescano JA	A9 - A68
Liendo MC	A7
Lizárraga E	A33 - A34 - A35
Lizárraga FA	A110
Lizarraga S	A11
Loandos MH	A88
Longo JF	A13
Lopez M	A115
López Miranda L	A77
Lucca ME	A124
Luciardi HL	A70
Luciardi MC	A70 - A113
Luna C	A22
Luna ML	A118 - A119

M

Maldonado GE	A48 - A64
Malizia A	A8
Manni C	A119
Manni D	A118 - A119
Marchetti C	A120
Marcinkevicius K	A49
Margagliotti M	A39
Margagliotti Reguilón M	A39
Mariani AC	A113
Marigliano NL	A105
Marín EM	A84
Marín ME	A83
Márquez P	A26
Martín AA	A117
Martín Alzogaray F	A28
Martín E	A8
Martínez M	A74
Martínez MV	A105
Martínez Pulido L	A126 - A127
Martínez V	A82
Martos GG	A14
Matas ME	A81 - A95
Matías E	A54
Mattio MF	A89 - A90
Max JA	A38
Medina AL	A28
Medina FA	A49
Medina M	A27 - A28 - A132
Medina ME	A75
Medina MF	A97
Medina Pereyra P	A23
Medina R	A122
Meloni DA	A9 - A68
Menduni F	A22
Mentel E	A92
Merep AP	A34
Merep P	A95

Michel AA	A79
Miotti MD	A19
Mir M	A77
Martín A	A77
Molina AI	A101
Molina VA	A1
Molineri C	A102
Mónaco ME	A71 - A72 - A73
Monmany AC	A103
Monmany-Garzia AC	A7 - A8
Morales J	A53
Morend S	A94
Moreno Ruiz Holgado MM	A31
Moreno Ten R	A112
Moschen S	A15
Moura Silva D	A68
Moyano MA	A36 - A37
Mul Fedele ML	A4
Muntaabski I	A7
Murillo Dasso S	A23
Muruaga MG	A125
Muruaga ML	A125
Muruaga NB	A32

N

Nasca JA	A117
Nasif A	A126 - A127
Navarro CI	A105
Navigatore Fonzo L	A115
Nazareno MA	A117
Neira Avila FE	A67
Nicotra V	A83
Nicotra VE	A84
Nieva L	A82
Núñez M	A16

O

Occhionero MA	A8
Oldano AV	A70
Olivo VI	A67
Ordano M	A112
Ordoñez A	A44
Orgeira JL	A20
Orphèe CHN	A87
Ortega ES	A18 - A57 - A58 - A60
Ortiz Mayor SM	A129
Ostengo S	A126 - A127
Oviedo A	A23
Oviedo AF	A31

P

Pacciaroni A	A50
Pacheco M	A66
Paco N	A107
Páez Paz IM	A42
Páez VA	A29 - A30
Palacio MO	A93 - A94
Paladino N	A4
Palazón E	A132
Palomares E	A11
Parrado JD	A69

Parrado MF A32
Parravicini O A114
Pastoriza A A126 - A127
Pastoriza AC A52
Pedraza E A62
Pedraza Kobak C A39
Peralta DR A117
Pereyra D A44
Pereyra PB A29 - A76
Pérez Aguilar RC A70
Pérez ME A19 - A33
Pescaretti MM A42 - A116
Peterson GB A13
Ploper LD A65
Ponssa M A39
Posadino G A53
Prado C A111
Prado F A111
Pucci A A123 - A128
Pucci Alcaide FJ A79

Q

Quintana MG A104 - A106

R

Ramos I A24 - A25 - A26
Rapisarda VA A43
Reguera MC A100
Reguilón C A39 - A40
Renjifo Flores BE A97 - A98
Renteria J A116
Requena-Serra FJ A15
Reverberi G A75
Reyes MG A83 - A84 - A85
Reynoso M A45 - A49 - A96
Rocha M A52
Roco J A28
Roda CF A25
Rodríguez A A78
Rodríguez Brito A A120
Rodríguez FP A53 - A54
Rodríguez G A77
Rodríguez GA A104 - A106
Rodríguez MI A97 - A98
Rodríguez MJ A93
Rodríguez MR A12
Rodríguez SM A90
Roger E A93 - A94
Rojas IP A45
Rojas Villena R A67
Roldán VP A118 - A119
Roldán-Olarte ER A117
Roldán-Olarte M A131
Román FR A4
Romaní MR A69
Romano S A77
Romero ER A16
Romero ME A65
Romero Sueldo GM A110
Romero Sueldo M A31
Rosa M A111
Rosa R A122

Rubio MC A66
Ruíz AI A30 - A36 - A37
Ruiz Barrionuevo JM A55
Ruiz de Bigliardo GE A31
Ruiz J A8
Rull J A23
Russo R A7

S

Sagadín M A22
Salas L A59
Salazar SM A15
Salguero EJ A123
Salvatierra C A78
Sampietro DA A51 - A64
Sánchez Matías M A10
Sánchez RS A130
Sánchez SS A130
Sangorrín M A124
Saravia P A91
Sayago M A41
Scannapieco A A7
Schefer ES A121
Schuff C A34
Seoane MC A129
Serrano H A11
Setti W A122
Sgariglia MA A48 - A51 - A52 - A64
Sierra L A28
Silenzi Usandivaras GM A30 - A31
Silva DM A9
Silva Ramos G A38
Silverio Reyes M A59
Silvetti J A118
Slanis AC A32
Sleiman CA A125
Soberón JR A48 - A51 - A52 - A64
Sobrero MT A29 - A76
Soria Mayer A A129
Soria MC A86
Soto Ramos Y A59
Spelzini D A3
Stivala G A66 - A119
Suárez RA A128

T

Taboada FF A47
Tagaschira C A28
Terán M A71 - A73
Terán MM A72
Terán P A10
Tomás M A61
Tomas-Grau RH A14 - A15
Torres MC A97 - A98
Torres P A78
Torrez Lamberti MF A116
Tortora M A16
Trapani A A91

U

Uriburu ML A83 - A84 - A85

Urueña LA A80

V

Vaca GV A79
Valdez IC A123
Valdez, DJ A6
Valoy A A27
Van Nieuwenhove C A23
Van Nieuwenhove G A23
Varela O A11 – A99
Vargas GE A63
Vargas JH A34
Vattuone MA A48
Vecchioli SO A94
Vega M A13
Veggiani Aybar CA A18- A57 - A58 - A60
Vella MA A117 - A131
Venzal PJ A110
Vera Mesones R A63

Vera MS A97 - A98
Vera NR A45 - A49
Vera RN A46 - A96
Videla C A132
Viera dos Santos PH A38
Villagra EL A38 - A75
Villagra J A96
Villarreal C A91
Villico MB A88
Villegas JM A43
Vintiñi E A132
Virga C A78

Z

Zacur JL A84
Zamora A A17 - A132
Zampini C A27
Zelarayán LI A80 - A81 - A95