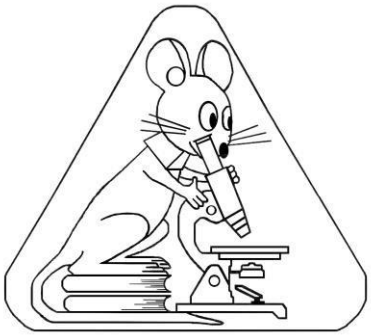


TUCUMAN BIOLOGY ASSOCIATION

(Asociación de Biología de Tucumán)

Abstracts from the

XXXIV ANNUAL SCIENTIFIC MEETING

In memoriam

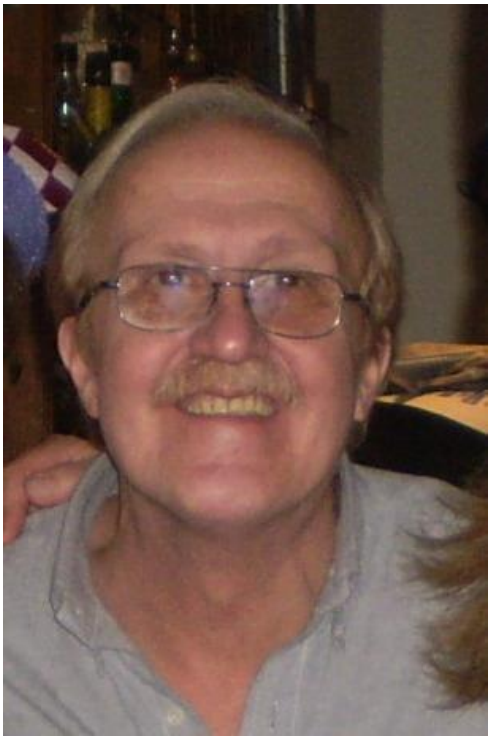
Bioch. Jorge Nelson Valz-Gianinet

October 26 – 27, 2017

Tafí del Valle, Tucumán, Argentina

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

OBITUARY



Biochemist Jorge Nelson Valz-Gianinet

Shortly before the beginning of the 34th Scientific Meeting, Biochemist Jorge Nelson Valz-Gianinet, a member of the Board of Directors of the Tucumán Biology Association, died in this city.

Giorgio, as he was affectionately called by friends and colleagues alike, was born in San Miguel de Tucumán on July 29, 1952. He graduated from the UNT in 1978. As a student he began to be part of the team of Researchers and Teachers of the Biology Institute of the Biochemistry, Chemistry and Pharmacy Faculty, where he later held the post of Chair Professor of Human Anatomy and Laboratory Animals.

He was a model teacher and friend, always willing to help and give advice to his students and colleagues, who will remember him fondly.

Since the beginning of the Tucumán Biology Association, he was a keen collaborator, participating in all the activities promoted by it, and being an almost permanent member on its Board of Directors.

His willingness and dedication to his work as well as his commitment to our Association earned him our love and respect and those of everyone who had the privilege to know him and be in touch with him.

LECTURES

A1
"Miguel Lillo" Lecture
MECHANISMS OF INTRACELLULAR PATHOGEN SURVIVAL: PLAYING A STRATEGIC GAME WITH AUTOPHAGY

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Intracellular pathogens use sophisticated mechanisms to overcome host cell defenses and replicate successfully. Autophagy, a self-degradative process, is a critical cell defense mechanism against invading microorganisms, but certain bacteria avoid or actively subvert autophagy to promote their own replication. We have previously demonstrated that autophagy plays a very important role against *Mycobacterium tuberculosis.* During infection, *M. tuberculosis* secrets proteins to evade host cell defense mechanisms. Two of these proteins CFP-10 and the hemolysin ESAT-6, encoded by the region of differentiation 1(RD1), are key in mycobacteria pathogenesis. We have previously shown that *M. marinum*-containing phagosomes are decorated with the autophagic protein LC3. However, this recruitment was not observed in cells infected with *M. marinum* deleted for RD1, indicating that this region is critical for autophagy targeting. Likewise, our studies indicate that ESAT-6 is critical for autophagy recognition of *M. tuberculosis.* As expected, GFP-LC3 was recruited to phagosomes containing *M. tuberculosis* wt but not the ΔESAT-6 deletion mutant. These and other evidences indicate that *M. tuberculosis* damages the membrane of the mycobacterium-containing phagosome. *Coxiella burnetii*, the etiologic agent of Q fever, is a Gram-negative obligate intracellular bacterium that develops a large *Coxiella* replicative vacuole (CRV) that has late endosome-lysosome characteristics with autophagic features (i.e. LC3 recruitment). Indeed, autophagy activation favors bacterial replication. Our present results demonstrate for the first time that, in a population of *Coxiella*-containing vacuoles, the CRV membrane is damaged and, as a consequence, the CRV transiently loses its acidic pH. We propose that the autophagic pathway favors *Coxiella* infection by contributing to the repair of the damaged replicative compartment. *Staphylococcus aureus* is a microorganism that causes serious infectious processes in humans. After internalization, this pathogen escapes from the phagosome to the cytoplasm. We have shown that before escaping, *S. aureus* resides in a phagosome that recruits LC3. This recruitment depends on the toxin -hemolysin (Hla), secreted by the bacteria. Very recent results from our laboratory indicate that *S. aureus* at early times after infection generates dynamic tubular structures that are labeled by LC3. By using specific markers we have determined that those tubular structures correspond to novel membranous compartments. Interestingly, an *S. aureus* strain deficient in Hla was unable to generate the LC3-labeled tubules.
Taken together, our results contribute to understand the behavior of pathogens with different intracellular life styles that share some common features on the targeting by the autophagy machinery.

A2
Opening Lecture
SCIENCE AND COSMOVISION UNITED AS WINGS OF THE SAME CONDOR. THE ANDEAN CONDOR CONSERVATION PROGRAM (PCCA) INTEGRATES THE LATEST BIOTECHNOLOGICAL ADVANCES WITH THE ANCESTRAL WISDOM OF THE ORIGINAL PEOPLES TO PREVENT THE EXTINCTION OF AN EMBLEMATIC SPECIES…

Jàcome, NL
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For thousands of years, the Andean Condor (*Vultur gryphus),* the largest flight bird in the world, has been honored by native communities who consider it a sacred link between men and the cosmos. During the last few years, the range of this emblematic species decreased rapidly and was pronounced extinct at both ends of its endemic South American range, Venezuela and on the Atlantic coast of P atagonia. The Andean condor is included in Appendix I of the CITES, is listed as in 'Danger of Extinction' by the USFWS and, according to the IUCN, is classified as Near Threatened. In 1991, the Andean Condor Conservation Program (PCCA) was founded in Argentina. The PCCA started performing genetic analyses and documenting the captive condor population in a Latin American Studbook. The PCCA developed artificial incubation and techniques for hand rearing birds, without human contact, and also worked to rescue and rehabilitate wild condors. In relation to the breeding program, 63 chicks were hatched, 4 (6%) of which did not survive the first few months of life, 2 (3%) were transferred to *ex situ* conservation programs, and 57 (91%) were reintroduced in South America. The PCCA's Rescue and Rehabilitation Center took part in the rescue of 237 condors that were victims of hunters, poisoned by the illegal use of toxic baits or had collided against high-tension wires. The PCCA reintroduced 170 condors in South America and post-release tracking studies are being carried out. The systems of identification and tracking include microchips, the use of vinyl wing bands, and radio and satellite transmission. These devices

make it possible to better understand how the birds use their environment and to discover, study and protect nests and roosts, areas of great importance for the conservation of the species. The PCCA carries out programs of education with schools, residents and farmers in rural communities, and publishes papers, numerous documentaries and educational materials. The key to the whole process is the relationship established with the native cultures. The spiritual leaders participate in every stage of the PCCA, performing ancestral ceremonies, and are in charge of praying for the harmonious coexistence of all forms of life.

A3
OVIDUCT PROTEINS AND THE REPRODUCTIVE PROCESS

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Sperm cells migrate through the female tract and arrive at the oviduct, the fertilization site. This organ contains the oviductal fluid, which consists of a mixture of the oviduct epithelium secretion and serum transudate. Some oviduct proteins are *de novo* synthesized from the oviduct epithelium. Numerous studies have suggested different roles for the oviduct in the reproductive process. The oviduct has been postulated to act as a sperm storage site, to participate in oocyte transport to the fertilization site and to favour early embryo development. Once in the female tract, some sperm cells go through the capacitation process. These series of events include molecular, physical and biological changes that allow spermatozoa to acquire the ability to fertilize the oocyte. Oviduct proteins have been proposed to modulate sperm function and sperm fertilizing ability. Our previous studies revealed that two oviduct secretion proteins were able to bind to human sperm. These proteins were identified as lactoferrin (LF) and S100 A9. Our investigations confirmed that both LF and S100 A9 were detected in oviduct epithelium and secretion. Also, both proteins could bind to human gametes, affect sperm capacitation parameters, such as acrosome reaction, and influence gamete interaction *in vitro*. Our results support the current hypothesis of an active role of the oviductal environment in the human reproductive process.

A4
EFFECTS ON THE REPRODUCTIVE SYSTEM OF *Caiman latirostris* NATURALLY OR EXPERIMENTALLY EXPOSED TO ENDOCRINE DISRUPTORS

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Humans and wildlife are daily exposed to contaminants which have the potential to interfere with their endocrine system by acting as endocrine disrupting compounds (EDCs). Plasticizers such as BisphenolA (BPA) and agrochemical compounds such as Atrazine (ATZ) and Endosulfan (END) are recognized as EDCs. The effects of EDCs depend on both the level and timing of exposure, this being especially critical when it occurs during development. *Caiman latirostris*, a species with temperature sex determination, is widely distributed in South American aquatic ecosystems. Caimans spend a large portion of their lives in the water; they are long-lived animals, and they are at the top of the food chain. All these characteristics make them particularly susceptible to EDCs exposure. Regarding natural exposure, we reported a significant negative correlation between clutch size and the burden of organochlorine compounds (OCCs), which behave as EDCs, in *C. latirostris* eggs. Besides that, our results suggested a direct effect of exposure to OCCs on mother oviductal functions evidenced by decreased eggshell porosity. At the lab, we demonstrated that *in ovum* exposure to environmental relevant doses of BPA but not of ATZ or END overcomes temperature effect on sex determination. On the other hand, exposure to BPA, END or ATZ altered gonadal histoarchitecture. The testes of exposed caimans presented tortuous seminiferous tubules with empty tubular lumens and the ovaries exhibited multioocyte follicles and altered follicular dynamics. Moreover, levels of sex steroid hormones were modified. Early post natal exposure to BPA, not only *in ovum*, leads to changes in caiman reproductive organs. Experimental exposure of early post natal *C. latirostris* hatchlings to BPA or E2 induced changes in oviduct histoarchitecture, biomarkers of histofunctional differentiation, and biomarkers of hormone dependence, leading to a precocious oviduct development and differentiation. Exposure to EDCs at critical stages of development affects caiman reproductive system, suggesting organizational changes that could alter *C. latirostris* reproductive health in later life.

A5
EFFECT OF FASTING ON SMALL BODY MASS BIRDS: HOUSE SPARROWS AS A MODEL

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Food restriction is a condition that often affects animals in nature, generating a decrease in nutrient intake as well as stress. Acquisition of energy is one of the most relevant aspects to consider, since starvation affects the maintenance of the vital functions of the organism. House sparrows are a good study model for several reasons: a high metabolic rate, small body mass and non-migratory status. Knowledge about how animals under fasting conditions acquire energy and nutrients would provide information about possible mechanisms and their potential meaning in nature, and it is therefore nutritionally and ecologically relevant. During the last few years we evaluated how fasting affects house sparrows in two main aspects: 1) health status through biochemical and haematological parameters, their variations during fasting, and the possible role of corticosterone in energy balance; 2) gastrointestinal tract, from a morphological (organ mass and histology of the intestine) and a functional (intestinal enzymes) point of view. Results in house sparrows show a classical pattern, similar to other vertebrates in some biochemical and haematological parameters during fasting, except for glucose, where corticosterone could influence its increase. The intestinal structure morphology is diminished, but the simultaneous increase in enzymatic activity could represent an anticipatory mechanism or strategy to optimize acquisition of nutrients during refeeding.

A6.
THE PRESENT OF NATIONAL PARKS IN TUCUMAN AND PERSPECTIVES FOR THE FUTURE

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National parks in Argentina originated from three leagues donated by Perito Moreno in 1903 with which the Parque Nacional del Sur was created, later expanded, and named Nahuel Huapi. The reasons for creating national parks were to protect places of scenic beauty and to consolidate the border areas, mainly the border with Chile in Patagonia. Over time the model was to have parks for the conservation of representative samples of Argentina's ecosystems. Today new parks are being created in the most important relics of threatened ecosystems, and a new law exists to create marine national parks. Today there are 48 national protected areas. In Tucumán, the first and only national park was created in 1995. The initiative was carried out by the Campo de Los Alisos Foundation, which had Dr. Orlando Bravo as its Mentor and where former students of the Instituto Técnico of the Universidad Nacional de Tucumán were also involved. The Campo de Los Alisos National Park has been working for 22 years in the consolidation of the institution with different conservation projects through a system of control and monitoring of valuable species such as the taruca (*Hippocamelus antisensis*), research support, control actions, eradication of livestock and exotic plant species. In 2010, the protected area was expanded to 8,000ha. The National Park Administration in Tucumán is working on the creation of the Parque Nacional Aconquija, which would absorb the Campo de los Alisos, increasing its current 17,000ha to 75,000ha during its first stage and to 100,000ha during the second, thus protecting the environments of the Yungas and high Andes.

A7
TWO-SPEED EVOLUTION OF FLOWER SHAPE

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Morphospaces, or phenotypic spaces in general, are representations of the multidimensional nature of organisms. How much of these spaces is occupied by living or extinct species and how species are distributed in relatively small regions of morphospace are the result of a complex set of factors influencing species evolution. Following S. J Gould, these factors can be summarized into three main causes: functional causes, the result of adaptation to current circumstances; structural causes, arising from physical limitations during development; and historical causes, origin to variational constrictions. The clumped distribution of organisms inside morphospace imposes an outstanding question: Does it mirror the narrow set of solutions to functional problems? Or is it the product of constrictions and channelling in genetic and developmental systems?
Adaptive radiation processes in Angiosperms, mediated by adaptation to different pollinator guilds, offer ideal systems to examine how floral morphospace is filled. Using the Neotropical species of *Salvia* and other groups of incipient speciation, we characterized the floral morphospace and compared it with the space of trait correlations resulting form variance-covariance phenotypic matrix ordination. This approach allows us to study the evolution of morphological disparity, taking into account adaptive optimization as well as historical constrains that arise from trait correlations. The difference in the pace of evolution among those spaces provides clear evidence about the role of historical constraints, but also about how the constraints themselves evolved.

POSTER PRESENTATIONS

A8
VIBRATIONAL STUDY OF THE POWERFUL PESTICIDE DIELDRIN IN DIFFERENT MEDIA

Castillo MV[1], *Iramain MA*[1], *Davies L*[2], *Manzur ME*[1], *Brandán SA*[1]
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Dieldrin is an organochlorine compound widely used as insecticide and pesticide, so that it has toxicological properties. Thus, all studies related to this compound are of great importance for environmental and health human. Recent studies have correlated environmental exposure to dieldrin with the incidence of Parkinson's disease (PD). Experimentally, the detection of dieldrin, due to its toxic characteristics, is normally performed with infrared and Raman spectroscopies because both are useful techniques to analyze trace samples. So far, there are not complete assignments of all bands observed in their vibrational spectra in order to completely identify this substance in all the environments where it can be found. Objectives: To perform the complete assignments of their infrared and Raman spectra and to predict their reactivity in gas and aqueous solution phase. Methodology: To study their most stable structures in gas and aqueous solution phases by using the hybrid B3LYP and WB97XD methods with the 6-31G* and 6-311++G** basis sets while in solution the solvent effects were studied with the PCM and SD models. The Scaled Quantum Mechanical Force Field (SQMFF) approach and the Molvib program were used with their vibrational spectra to perform the complete assignments. Results: the 75 vibration normal modes expected for dieldrin were reported. The frontier orbitals show practically the same behavior in both media than that found for hexachlorobencene.

A9
COMPUTATIONAL STUDY OF AN APROTIC SOLVENT 1,3-DIMETHYL-3,4,5,6-TETRAHYDRO-2 (1H) -PYRIDINONE (DMPU) IN DIFFERENT SOLVENTS

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Solvents determine a very important part of the environmental performance of processes in the chemical industry and also affect costs, safety and health. The application of *green solvents* for extractions, separations, formulations and chemical reactions has become an important area of research with the aim of reducing the use of the most dangerous ones. In this sense, 1,3-dimethyl-3,4,5,6-tetrahydro-2 (1H) -pyrimidinone (DMPU) has demonstrated to be a polar, nucleophilic and basic aprotic solvent for the synthesis of metal-alkyl terminal compounds due to its ability to form cation-ligand complexes because it acts as activator and solvent at the same time. *Objective:* To theoretically predict the behavior of DMPU in acetone, acetonitrile and dichloromethane, by the solvation energies and their reactivities. *Methodology:* The DFT theory, implemented in the Gaussian program, was used and the effects of the solvents were evaluated with the self-consistent field of reaction by using the PCM Model at the theory level B3LYP/6-31G*. *Results:* The stabilizing energies of DMPU in acetone, acetonitrile and dichloromethane are: -1092.94; -1125.01 and -1234.11 kJ/mol, respectively. A direct relationship between the permittivity values ε and the solvation energies was observed, the acetonitrile being the solvent with highest ε= 37.5 and ΔGsolv = -68.84 kJ/mol. The studied solvents showed similar reactivities (the same Gap energy).
Conclusions: The results showed a similar behavior of DMPU in all the solvents proposed and higher reactivity with respect to the isolated molecule.

A10
GREEN SOLVENT: 1,3-dimethyl-2-imidazolidinone (DMI). ITS REACTIVITY IN GAS PHASE AND AQUEOUS SOLUTION

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1,3-dimethyl-2-imidazolidinone (DMI), $C_5N_2OH_{10}$, is considered a green solvent because of its low toxicity. This aprotic polar solvent is widely used in the pharmaceutical industry, especially for topical formulations, because of its similar structure with urea. It is also used as a substitute for the carcinogen HMPT. To study the reactivity of the DMI, in gas phase and aqueous solution, the structure of the molecule

was optimized using the Gaussian Program 09 and the hybrid method B3LYP / 6-31G*. The solvent effect was simulated using the PCM Model. The values of the global electronic descriptors (chemical potential, electronegativity, hardness, softness and electrophilicity index) and the electrostatic potential (MEP) surfaces in both media were calculated in order to predict their electrophilic and nucleophilic reaction sites. The obtained HOMO and LUMO values for DMI in the gas phase were -6.4628 and -0.4055 eV, respectively, while in the aqueous solution these values were -5.875 and -0.133 eV, respectively. The GAP, chemical hardness and electrophilicity values calculated for gas phase for DMI were 6.057; 3.029 and 1.946 eV respectively, whereas for the compound in aqueous solution they were 5.762; 2.871 and 1.570 eV, respectively. From the analysis of the obtained results it is concluded that DMI in gas phase presents greater stability, chemical hardness and electrophilicity, whereas in aqueous solution this compound would reveal a greater reactivity and nucleophilicity. Moreover, these results show complete agreement with the corresponding maps of electrostatic potentials in both media.

A11
MODE OF ACTION OF GRINDELANE BIOINSECTICIDES

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Spodoptera frugiperda is a serious pest affecting corn crops in the Northwest of Argentina. Among the strategies for its control today, synthetic insecticides are toxic for the environment, bioaccumulable, and inefficient in many cases. Indeed, there is an urgent need to develop safe alternatives that have the potential to replace them, plant insecticides being a promising tool for plant pest control in sustainable agriculture. The aim of this study was to elucidate the mode of action involved in the insecticidal effects of *Grindelia chiloensis* grindelanes on *S. frugiperda*. A collection of twenty 2 instar larvae were fed with an artificial diet treated with the natural diterpene **1** (7□,8 -epoxygrindelic acid) or with the derivative grindelane **2** (methyl grindelistrictate) at 100 μg/mL. An experimental lot of twenty 2 instar larvae were fed an untreated diet (control). The results demonstrated that grindelanes have high activity on *S. frugiperda*, reflected in nutritional behavior changes with respect to the control nutritional indexes. Sub-lethal effects such as exuvia retention, mobility decrease, enhance of thorns or mushrooms in the larvae dorsum, and malformations in pupae and adults were observed. Histological tests revealed remarkable alterations in epithelial cells of the mesenteron, responsible for segregating proteins, and causing obvious dehydration sings. Compound **2** inhibited acetylcholinesterase, exerting a probable neurotoxic mode of action. These findings reveal that application of grindelanes as biodegradable insecticides constitutes a strategy to be considered.

A12
CHARACTERIZATION OF THE TOXICITY OF LIQUID RESIDUES OF A CIENEGUILLAS MEAT INDUSTRY, JUJUY

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The management and disposal of liquid waste (effluents) from slaughter houses generates an environmental contamination and public health problem. In the present work, assessments of the toxicity of wastewater from the slaughter of llamas, ovine and caprine animals were carried out. This slaughter plant establishes a system for the use of meat products from sheep, goats and llamas of the region to overcome the historical inconveniences of commercialization of the producers of the Pozuelos Basin. The tests were carried out in *Lactuca sativa* L. and *Artemia salina* (microcrustaceous), through physicochemical, microbiological and ecotoxicological analyzes. Short-term (acute) toxicity tests were observed on seed germination and root extension of *Lactuca sativa* L (lettuce) seedlings, CIg_{50} 36.79% and CIr_{50} 40.21% on *Lactuca sativa*. Lethal trials (mortality) were performed on *Artemia salina*. An LC50 of 58.72% of the evaluated effluent was estimated. The physicochemical analyses carried out on the effluent sample showed high values of pH and high concentration of ammonia, nitrites, carbonates, and copper and a BOD5 58 mg/L. These values would indicate the possible causes of inhibition in the germination and in the prolongation of the root of the evaluated species. The methodologies used present good reproducibility, allowing the generation of reliable information (with respect to the application of biological tests) to evaluate the toxic impact of industrial effluents.

A13
ACUTE TOXICITY BIOASSAY WITH *Lactuca sativa* L. TO EVALUATE THE WATER QUALITY OF AN AREA OF OIL EXPLOITATION

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Biological assays are appropriate diagnostic tools for determining the effect of physical and chemical agents on test organisms under specific and controlled experimental conditions. The objective of this work was to determine the mean inhibition concentration in

germination and inhibition in elongation of the hypocotyl and radicle in *Lactuca sativa* L. in toxicity tests of La Brea (Jujuy) water samples. The bioassay was performed with water samples at concentrations of 100, 50, 25 and 5% and distilled water (negative control). It was determined that the mean inhibition concentration (EC_{50}) of water in lettuce seeds was 17.85%, a value that is found within average confidence limits, within a range between 7.45 and 29.24%. We also determined that the percentage of germination and the elongation of the radicle and the hypocotyl are inversely proportional to the defined concentration range. There were treatments (5%) that had a lower radical growth and hypocotyl elongation with respect to the control. We compared each treatment with the negative control. Treatments with 5% water samples did not present significant differences with respect to the control ($p < 0.05$). However, those with concentrations of 25% showed inhibition in the elongation of radicle and stem. The Germination Index (GI) of *Lactuca sativa* L. was 15.6 and 82.9 at concentrations of 25% and 5% water samples, respectively. Studies with organisms in the laboratory under controlled and standardized conditions are the predominant sources of information for the ecological evaluation of the effects of toxic pollutants.

A14
BIOACTIVITY OF CHLOROFORMIC SUBEXTRACTS FROM *Tithonia tubaeformis*

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Tithonia tubaeformis (Jacq.) Cass. (Yuyo cubano) (*Asteraceae*) is native to Central America. It was introduced in Jujuy in 1956 along with kenaf seedlings (*Hibiscus cisplatinus*). Since 1970, it was dispersed by the action of threshing machines and invaded vast areas of northwestern Argentina, it being declared a national pest in 1983. It invades urban environments, corn, sorghum and beans crops. The aim of this work was to study the in vitro effect of chloroformic subextracts (SEC) of aerial parts from *Tithonia tubaeformis* on germination (G), radicula (LR) and hypocotyl (LH) length of *Triticum aestivum* (monocotyledonous). SECs were prepared from leaves and flowers separately, drying at room temperature. Water (BA) and dimethylsulfoxide (DMSO) were used as controls. SEC (250, 500 and 1000 ppm) were placed on petri dishes with soft agar and 20 seeds. Assays were performed in triplicate for 72 h. The seeds were selected by size and disinfected with hypochlorite solution (2%) and alcohol (70%) for 15 min and finally rinsed with distilled water. G was 92% (BA), 83% (DMSO). Leaf SEC was 38, 72 and 80% with 250, 500 and 1000 ppm respectively. LR and LH decreased in all treatments: 250 ppm (54% and 59%); 500 ppm (52% and 60%) and 1000 ppm (57% and 61.3 %) respectively. Flower SEC reduced G by 90% (250 and 500 ppm) and 92% for 1000 ppm. The SEC flower was a potent G inhibitor.

A15
PRELIMINARY STATISTICAL ANALYSIS OF SOLAR UV ATMOSPHERIC OPTICAL DEPTH ABOVE TUCUMAN

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Optical depth is a measure of beam extinction when aerosol particles in the atmosphere either absorb or scatter solar light. It is calculated as minus the natural logarithm of the quotient between the irradiation on the reference site and the irradiation on the designated site. It is an adimensional number and is related to the amount of aerosol contained in a vertical column of atmosphere above that site. A value of 0.01 indicates a very clear atmosphere, while 0.4 indicates a very foggy atmosphere. Optical depth provides basic information on aerosol size distribution. LEBA operates a 4 radiometer network in the province of Tucumán designed solar UV irradiation monitoring. The reference site is the Ampimpa Observatory; other monitoring sites include INTA Famaillá, the television antenna deployment site of Canal 10 at San Javier hill and the Fiscalización Ambiental facilities at Tucumán city. Radiometer data are furnished in $Volts^{-3}$ (mV). Radiometer readings were taken at different times of the year from these sites. They reflect the presence of different kinds of aerosols from biomass burning, urban or desert dust. The aim of this work is to evaluate statistical differences in optical depth between two data sets from two different sites by using a *t*-Student test. Significant statistical differences at 1% level were observed, while INTA showed lower values.

A16
OBTAINING POTASSIUM FERTILIZER FROM VINASSE

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The rise in the price of oil has increased the importance of bioethanol. Its main renewable source of production is sugar cane, vinasse being the effluent of alcohol distillation. Biological treatments have not been satisfactory for vinasse degradation but electrolytic methods have proved be to be efficient in the treatment of these effluents and they produce the flocculation of a solid, potassium-rich material. The main objectives of this work were to test different conditions of voltage and electric current for the electrolytic treatment, evaluating the different

potassium concentrations in the liquid phase over time and determining the Chemical Oxygen Demand (COD) before and after treatment. We performed experiments with three vinasse samples from three distilleries in Tucumán. The electrolysis was carried out in the laboratory three times, putting the samples under a voltage that produces an electric current value of 0.5A and 1A. Each treatment lasted 150 minutes, with samplings every 30 minutes. After completion, the vinasse and the solid were filtrated to separate them, and then the COD in the filtrates was determined. We calculated the average percentage of removed potassium per unit of power consumed for the 0.5A trials ($\frac{\%K}{Pow} = 29{,}43\ ^{\%}/_{W}$) and 1A trials $\frac{\%K}{Pow} = 15{,}28\ ^{\%}/_{W}$) and we also calculated the average percentage of removed COD, with the following results: %RemCOD = (16.01 ± 3.92)% (0.5A trials) and %RemCOD = (23.10 ± 0.21)% (1A trials).
To conclude, we observed that the potassium content in the liquid decreases with time, so the solid obtained is rich in potassium and organic matter. This solid, after a drying process, can be used as soil fertilizer. The Chemical Oxygen Demand also decreased, which means it is a more degradable effluent.

A17
ANALYSIS OF THE COMPREHENSIVE MANAGEMENT OF EXPIRED MEDICINES IN TWO OPERATING AREAS - SI.PRO.SA. TUCUMÁN

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INTRODUCTION: The correct handling of expired medicines (MV) does not pose a threat to public health or to the environment. They can become a threat to the health of living beings. Inadequate elimination produces adverse effects and genetic alterations by dioxin generation. Law 24051 considers MV as hazardous wastes. Prohibiting incineration prevents the release of persistent organic pollutants (COPs).
OBJECTIVE: To carry out a retrospective analysis of MVs stored between 2004 and 2014, according to Circ. No. 11/DGRS-17. **MATERIALS AND METHODS:** Two surveys were made in 2011 and 2014 in 21 Primary Health Care Centers (CAPS) in Tucumán (Villa Mariano Moreno Operational Area, AOVMM and Southeast Operational Area, AOS) registering units and weight of MV. **RESULTS:** The classification as non-incinerable inputs is the content in its composition of some of the reagents present in the Y3 list of Circ. No. 11. The remaining MV is incinerable. The total MV in the AOVMM (2004 to 2011): 413 kg, 71% are incinerable and 29% are not. The total MV in the AOS (2013 to 2014): 145, 45 kg, 56.17% are incinerable and 43.83% non-incinerable. **DISCUSSION:** The large confiscation of MV, poor information, and inadequate logistics from CAPS to Official Pharmacy and CUS-Medicamentos mean a double economic loss: unused inputs and inadequate disposal. **CONCLUSIONS:** According to the analysis of the MV, they are generated because Remediar kits are standard and arrive without considering the needs of each service. From the operational areas, pharmacy employees are trained on a constant basis, but there is no commission specialized in treating MV. They are managed according to Circular No. 11/DGRS-17.

A18
GENERATION OF A COLLABORATIVE TOOL TO EVALUATE BEEF CATTLE FEEDLOTS SUSTAINABILITY

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Feedlot is a cattle intensification system that anticipates maximizing production in the shortest possible time and space. It is a technology where animals are fed specifically designed diets with high conversion efficiency. The high density of the bovine population impacts the environment in such a way that the environmental impact assessment prior to the execution of projects is currently required by law. In the province of Tucumán, livestock production in feedlot has more than 50 establishments of different productive levels and with different degrees of authorization. All production must be evaluated to determine if it will prevail over time, conserving natural, social and economic resources. The sustainability assessment is of a comparative nature and is carried out through indicators. The objective of this work was to develop a minimum set of sustainability indicators (CMI) applicable to intensified livestock production and to generate a practical tool for data collection. Work was carried out on the four pillars of sustainability using as guide the guidelines of the Commission for Sustainable Development (UN) and Agenda 2030 of ECLAC. As a result, a CMI was obtained from 18 Indicators covering: social, environmental, economic and institutional themes, and an *ad hoc* survey was constructed to obtain sustainability data where each Topic was broken down into sub-themes and areas with four sustainability assessment options. The tool generated in collaboration with different participants in of livestock production is the first practical instrument to carry out the monitoring of the sustainability of this activity with high environmental impact.

A19
OCCURRENCE OF *Salmonella* IN EGGS FOR HUMAN CONSUMPTION IN THE PROVINCE OF TUCUMÁN

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The presence of *Salmonella enterica* serovars Enteritidis, *Salmonella enterica* serovars Thyphimurium and potentially pathogenic Gram-negative bacteria are a constant concern due to their impact on public health because they could contaminate the food chain and affect consumers. Therefore, the aim of this work was to determine the occurrence of S. Enteritidis, S. Thyphimurium and potentially pathogenic Gram-negative bacteria in eggs for human consumption from hen farms and establishments intended for commercialization in Tucumán and to study their growth responses against antibiotics used in human and veterinary medicine. The microbial load of the shell, white and yolk were evaluated using the Salmonella Shigella Agar and Mac Conkey's Medium agar. The selected colonies were identified using biochemical tests (Simmons Citrate, Christensen Urea Agar, and TSI, LIA and SIM media) and their response to different antibiotics was determined by the plate diffusion method according to NCCLS recommendations. No *Salmonella* sp. was detected in the samples from the capital city (n = 360) or from the farms (n = 300). However, the shells were contaminated mainly with *E. coli*, which showed resistance to Norfloxacin, Cephalothin, Ampiclin, Amoxicillin Clavulanic and Colistin. On the egg surface, the data revealed the presence of potentially pathogenic bacteria resistant to commonly used antibiotics, even in the absence of visible signs of contamination (faeces). It is therefore important to promote preventive strategies throughout the production and distribution chain of the product.

A20
VARIATION IN WATER ELECTRICAL CONDUCTIVITY. SALÍ-DULCE RIVER, 2011-2016 PERIOD

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The Direction of Water Resources and the Environment Secretariat of Tucumán sample the waters of rivers that run through the province, analyzing physico-chemical and microbiological parameters to evaluate the annual variation in their quality. In the year 2005 the monthly monitoring of the Sali River began and the quarterly monitoring of the section Rio Dulce-Laguna Mar Chiquita-Córdoba started in 2011. Objective: To determine spatial and temporal variation of the electrical conductivity (EC) of the water of Salí-Dulce river, 2011-2016 period. The EEAOC laboratory analyzed the samples of 16 sites according to Standard Methods. Sali River: Tala-(Ta), Boyero-(Bo), San Vicente-(SV), Salit-highway 305-(SR305), Lucas Córdoba-(LC), Sali-highway 321-(S321), Salí -highway 323-(S323), Los Romanos-(LR); Dulce River: Piletones-(Pi), Termas-(TE); Los Quiroga-(LQ), Caña Tacuara-(CT), Loreto-(Lo), Telares-(LT), Los Oscars-(Po), Paso Cina-(PC). Data were analyzed according to descriptive statistics. Results: Averaging EC values of the water in section Salí-Dulce, period 2011-2016, we found: a) increases in Salí river from Ta (344µS/cm^2)-LR (755 µS/cm^2) and Dulce River from Pi-(586 µS/cm^2) to PC-(861 µS/cm^2); b) The values < occurred during the March-June period and the > (September-December, c) values 2015-2016 higher in all sites, coinciding with the occurrence of higher precipitations. We can conclude that in the period of occurrence of high precipitation the decrease in the values of water EC begins due to the effect of the dilution of salts.

A21
POTENTIAL OF *Vernonanthura nebularum* AS A SOURCE OF INSECTICIDAL SUBSTANCES AGAINST PESTS OF AGRICULTURAL IMPORTANCE

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Vernonanthura nebularum sensu stricto (Cabrera) H. Rob. (Asteraceae) is a species endemic to northern Argentina and a very rich source of elephantopus- type sesquiterpene lactones (SLs). In the present work the insecticidal activity of natural products from *V. nebularum* against *Spodoptera frugiperda* Smith, and *Ceratitis capitata* Wied., insect pests from the northwest of Argentina which cause significant economic losses, were evaluated for the first time. Our results showed that extracts, lactone-rich fractions and four main pure lactones altered the dietary behavior of *S. frugiperda* larvae (intake inhibition of more than 40% in all cases). Nutritional parameters were also affected. Dichlomethane subextract and a fraction II containing a mixture of three SLs caused the highest growth inhibition (35.71 and 38.09%) and consumption (47.59 and 52.5%). In addition, fraction II caused 80% pupal mortality and malformations in those adults that managed to emerge. In trials of oviposition inhibition against *C. capitata*, one of the predominant pure lactones evaluated at the dose of 30 µg / cm^2 presented the greatest deterrent effect (IO = 61.60 ± 5.38). Our results showed that the natural products of *V. nebularum* constitute an interesting source of insecticidal substances and could be considered as bioinsecticides in integrated pest management programs.

A22

PRELIMINARY ESSAY ON THE EFFECT OF ENVIRONMENTAL FACTORS ON Cr (VI) REMOVAL BY *Salvinia minima* IN A LONG-TERM TREATMENT

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Environmental contamination by heavy metals is an often studied problem due to the toxicity of those metals. One option for the cleaning of polluted environments is the use of heavy-metal-resistant plants, so their study is necessary to achieve efficient, economical and environmentally friendly removal technologies. The objective of this work was to evaluate the removal of Cr(VI) by *Salvinia minima* in a long-term treatment under uncontrolled conditions. The essay was conducted outdoors for one month. *S. minima* plants were placed under control conditions in running water and with 20 mg / L of K2CrO7. The remaining Cr in water was determined every 2 days using DFC. The pH and temperature of the treatment solution were measured and tissue damage was estimated on day 31.The results showed that until day 4 the removal of more than 40% of the metal took place, after which the process slowed down and at the end of the test it showed 60% removal. Plants subjected to Cr(VI) showed greater tissue damage than control plants and an evident deterioration. The pH followed a pattern similar to the remaining Cr in the solution and in the controls. Temperature gradually declined throughout the treatment. It is concluded that *S. minima* can remove most of the Cr from the solution in 4 days of treatment, but temperature decrease slows down this process. The presence of *S. minima* alone and in combination with C(VI) altered the pH in the medium, which could be a consequence of the decrease of Cr in the solution and / or some process mediated by the laciniae.

A23

EVALUATION OF THE PRODUCTION OF *Eisenia foetida* AND VERMICOMPOST FROM SHEEP AND LLAMAS

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The objective of this work was to evaluate the production of earth worm biomass and the production of vermicompost from sheep and llama manure used for food for 4 months, considering the conditioning phase of the feed (compost) and the experimental phase. Llama and sheep manure, fed with natural pastures of the Cieneguillas area, Jujuy, and *Eisenia foetida* and as test organism were used as substrate in the juvenil stage and with the presence of clitellum. Four treatments and five replications were performed with fresh (PE) and composted manure (EC). 50 worms were incubated per test and evaluated at 90 days after the start of the study. Density, weight and length of the specimens were determined. A physical and chemical analysis of the vermicompost obtained was performed. A randomized design was used and the means were checked by Tukey's test at 5% probability. The results show that with EC the wormd population density was higher than that of EF by 16% with llama manure and in 51% with sheep manure. In the biomass and length gain, no significant difference was found when comparing the origin of the substrate (llama and sheep) or its treatment (fresh and composted). However, there was a 32% biomass gain and 39% in the length of *Eisenia foetida* during the 90 days of treatment in all treatments. The use of this type of manure and its conditions as worm food allowed us to obtain an excellent compound to improve soils by the contribution of a high amount of organic material, phosphorus, potassium and nitrogen. The vermicompost obtained presents an alternative fertilization for the organic production of a large number of crops in the Puna and Quebrada in Jujuy.

A24

EFFECT OF EQUINE LOMBRICOMPOST AND INORGANIC FERTILIZER ON THE CULTIVATION OF CHICORY *Chichorium intybus*

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The application of fertilizers of chemical synthesis causes a decrease in the quality of the soils so the use of organic fertilizers like vermicompost is proposed in sustainable agriculture. The objective of the present work is to evaluate the effect of a vermicompost obtained from equine manure and an inorganic fertilizer in the chicory crop. Seed sowing was carried out in germination trays with vegetal soil. After the emergence of the seedling, when it presented two true open leaves, it was transplanted to pots. The substrates used were: a) vermicompost made up of horse manure (50%) and vegetal soil (50%) b) 100% vegetal soil to which chemical fertilizer was added, (13-11-27 of NPK) with doses of 11 gr / Pot and c) vegetal soil (control). The variables evaluated were: Leaf height (cm), Root height (cm), Fresh Aerial weight (gr), Fresh weight Root (gr), Dry Air Weight (gr), Dry Weight Root (gr). All variables were analyzed using ANOVA and the comparison of means was performed by LSD Fisher's test ($p < 0.05$) (Info Star, 2010). It can be observed that both the vermicompost and the chemical fertilizer presents differences with respect to the control, so the chemical fertilizer offers better yield in terms of leaf length and fresh root weight while the vermicompost presents better behavior for root length and root dry weight. It can be observed that both

treatments act differentially but in a beneficial way for the plants. It is concluded that the use of vermicompost is an appropriate agroecological strategy to reduce inorganic fertilization with a positive effect on chicory production.

A25
INFLUENCE AND INTERACTIONS OF CATEGORIES AND GENETIC LINES IN THE HEMATOLOGICAL PROFILE OF GESTATING SOWS

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A factorial design was used and its significance was tested, to determine the influence and interactions of categories and genetic lines in the hematological profile of sows in production.
The information was obtained from farms in two littoral provinces in piglets (n=70) and sows (n=72) with different genetic lines; I (n=80) and II (n=62). A hematological counter was used to determine white blood cells, erythrocytes, hematocrit, leukocyte count and erythrocyte hematimetric indexes (MCV, HCM, CHCM), and cyanometahemoglobin for hemoglobin. After ANOVA, a factorial design was applied by randomized complete blocks. The adjusted model was: $Y_{ijkl} = \mu + \beta_i + E_j + S_k + (ES)_{jk} + e_{ijkl}$; where μ is the general mean; β_i is the effect of the i-th farm; E_j is the effect of the j-th genetic line; S_k is the effect of the k-th sow category; $(ES)_{jk}$ is the effect of the interaction of the j-th gene and the k-th category and $e\text{-}_{ijkl}$ is the random error. The effects of sows on production and genetic line influenced white cells, neutrophils, lymphocytes and erythrocytes. The values of hemoglobin (10.829±1.153; 11.815±1.241), Hematocrit (31.347±4.143; 36.213±3.419), VCM (53.899±9.741; 59.260±4.622) and CHCM (35.047±5.322; 32.688±2.582) only stand out in the genetic lines (I, II), respectively. From the interaction between categories and genetic lines, there was a significant difference ($p \leq 0.05$) for hemoglobin, VCM and CHCM. The model corrects the individual influence of the categories of gestationg sows and the genetic lines in the variables erythrocytes, neutrophils, lymphocytes and white blood cells.

A26
HEMATOLOGICAL PROFILE OF PREGNANT SOWS IN INTENSIVE PRODUCTION OF ARGENTINE FARMS

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The hematological profile is a paraclinic test that helps diagnose diseases and nutritional deficiencies such as anemia during gestation. The aim of this work was to determine the hematological profile of pregnant sows in intensive production of farms on Argentine littoral. Information was obtained from commercial farms of two provinces of the littoral region for two years in pregnant sows. For this purpose, blood from 72 animals was extracte by jugular venipuncture and EDTA anticoagulant tubes were used as. White blood cell counts, erythrocytes, leukocyte counts (neutrophils, eosinophils, basophils, monocytes, lymphocytes and hematocrit were performed by hematological counter; the cyanometahemoglobin color method was used for hemoglobin determination. In addition, hematimetric indexes were determined: mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration. Iron was determined by atomic absorption spectroscopy. The analysis of the data were performed with a statistical program, ANOVA was applied. The mean values and standard deviation of hematological parameters and blood iron were: erythrocytes (/mm^3) 5712178 ± 642236 – Hemoglobin (g/dL) 10.982 ± 1.4472, –Hematocrit (%) 32.597 ± 4.7992, –mean corpuscular volume (fL) 56.892 ± 10.2209, –mean corpuscular hemoglobin (pg) 19.322 ± 2.3988, –mean corpuscular hemoglobin concentration (g/dL) 34.052 ± 4.4554, –Iron (µg/dL) 119.602 ± 39.7501, –white blood cells (/mm^3) 10930.6 ± 3612.4, –neutrophils (%) 31.972 ± 6.724, –eosinophils (%) 3.33±2.048, –basophis (%) 0.278±0.451, –lymphocytes (%) 62.917±6,33, –monocytes (%) 1583±0.817. The mean values of all hematological variables were within normal ranges. In our study there were no signs of hypochromic or microcytic anemia.

A27
A CLINICAL CASE: CICATRIZING AND ANTIFUNGAL EFFECT OF A HYDRO-ALCOHOLIC SOLUTION OF PROPOLIS APPLIED TO A LLAMA (*Lama glama*)

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In llamas raised in humid environments, it is common to see lesions (peeling) between the toes caused by fungi, which can be complicated by myiasis. The aim of this work is to evaluate the antifungal and cicatrizing effect of a hydro-alcoholic solution of propolis at 5% with honey at 1.63% (SHPM) on lesions caused by fungi and flies in llamas of extra-Andean zones. We worked with a llama (*Lama glama*) with

two wounds, one in the lower gingiva, in the position of the 2nd and 3rd incisors on the left side where a myiasis was developed and exhibited the root of the second incisor, and another chronic wound located in the interdigital space of the left hind limb, product of a mycosis aggravated by a deep myiasis. The treatment consisted in deep cleaning with hydrogen peroxide applied with pressure in the affected area using a syringe, disinfection with 5% iodopovidone and extraction of all worms. Two daily applications of SHPM were performed locally during the first week of treatment and then continued to be applied only once a week until complete healing was observed. We achieved an efficiency of 100% with SHPM for the treatment of oral and dermal wounds. SHPM is a promising alternative as a cicatrizant and antifungal to treat wounds in animal production.

A28
EVALUATION OF DIETS WITH DIFFERENT SOY RATIONS OF SERVICE HEIFERS

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Livestock rearing is one of the most important activities in Argentina and it is essential to control the cattle feeding at different growth stages. In order to determine the effect of soy on the nutrition of heifers managed for service, 34 *braford* females from INTA-IIACS were used. Two groups of animals were fed for six months with the following diets, BS: low soy content (0.3% based on live weight, LW) and AS: high soy content (0.8% based on LW). For four months, during the management for service period, the BS group was fed without addition of soy in the diet, according to Rhodes grass pasture, while the AS group was fed with 0.6% of soy based on LW and grazing. Productive parameters were evaluated monthly: LW and average daily gain (ADG) and hematological: hematocrit and leukocyte formula. During service, the % of pregnancy of both groups was registered by rectal examination. There were no changes in the parameters evaluated between the animals before the service. During service, the heifers in the AS group showed an increase in the ADG and hematocrit values, while in the BS group lower increases in these parameters were registered. There were no significant changes in leukocyte formulas. It should be noted that despite the differences observed, the females in both groups had a 100% of pregnancy. The data obtained from ADG and hematocrit indicate that supplementation with high soy rations favors the nutritional status of the animals without affecting their reproductive parameters.

A29
EFFECT OF THE COMPOSITION OF PROBIOTIC BACTERIA CULTURE MEDIUM ON THEIR CAPACITY TO ADHERE TO INTESTINAL EPITHELIAL CELLS OF POULTRY

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The use of probiotics in animal production offers a natural alternative to antibiotic suplementation as growth promoters. The efficiency of probiotics depends on the production and preservation technologies applied as well as on their ability to persist in the gastrointestinal tract. The adhesion to intestinal epithelial cells (IEC) plays a vital role in their persistence, but it may be affected by factors that modify superficial structures. Thus, the aim of this work was to study the development of probiotic poultry strains on different culture media and assess the influence of such media components on their capacity to adhere to IEC of BB chicks. Towards this end, probiotic strains *Enterococcus faecium* LET301, *Lactobacillus salivarius* LET201 and *L. reuteri* LET210 were grown at 37ºC in both conventional culture media and a specifically designed medium containing local industries by-products (yeast cream, cane molasse, whey), and adjusted to 1 x 10^8 CFU/ml. IEC were obtained from ileum of fourteen-day-old broilers and their concentration was adjusted to 5 x 10^5cells/ml. The IEC were incubated with the bacterial suspensions and the adhesion percentage and index were determined by microscopy. *E. faecium* LET301 and *L. reuteri* LET210 showed higher adhesion to IEC than *L. salivarius* LET201 in all the studied conditions. These results demonstrate that the evaluated by-products did not significantly affect the adhesion of the probiotic strains. Thus, this medium can be successfully used as an economic alternative for the development of poultry probiotics.

A30
NUTRITIONAL ASSESSMENT OF NON-TRADITIONAL RAW MATERIALS AND THEIR USE AS A FOOD SUPPLEMENT

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Food is one of the most important factors that affect the production costs of pig producers since it represents approximately 75% of such costs. This impact affects the profitability of the pig establishment, especially in small producers. Diets can be formulated with alternative

non-traditional foods of lower cost, with a positive effect on profitability. It is necessary to look for non-traditional foods, which can be used as sources of energy, protein and minerals to replace maize, in the finishing stage. The objective of the following work was to analyze the nutritional content of sweet potato as an alternative food vs. the nutritional content of maize. Samples of sweet potato tubers (*Ipomea batata*) and maize (*Zea mays*) were collected in Gastona Sud, 90 km from San Miguel de Tucumán. Sweet potatoes and grain maize were oven dried at 60-65°C to constant weight. To homogenize, they were ground in a laboratory mill, and analyzed by AOAC methodology (1994): crude protein (CP), ash (Ash), lipids (EtEx). The percentage of crude fiber (CF) was analyzed in ANKOM digester and the free nitrogen extract, was calculated according to AOAC (1994). The results obtained were: Sweet Potato: %DM: 28.88σ±0.38; %CP: 4.34σ±0.47; %Ash: 3.15σ±0.01; %EtEx: 0.21σ±0.05; %CF: 3.54σ±0.01; % NFE: 88.75σ±0.54. Maize: %DM: 11.50σ±1.17; %CP: 6.25σ±1.39; %Ash: 0.89σ±0.06; %ExEt: 4.69σ±0.61; %CF: 1.97σ±0.04; %NFE: 86.2σ±0.75. According to these results, we can conclude that, based on its nutritional value, (close to that of maize), sweet potato can be used as an interesting alternative food to reduce production costs.

A31
REDUCTION OF SOIL SALINITY IN THE TUCUMAN DEPRESSED PLAIN BY SOWING STAR GRASS (*Cynodon plectostachyus*)

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The objective of this work was to evaluate the improvement in the edaphic quality of saline soils through the sowing of Star Grass (*Cynodon plectostachyus*) in the Depressed Plain in the East of Tucumán through the measurement of halomorphism parameters such as pH and C.E. (Electric Conductivity) and M.O. (Organic Matter). The area has awarm semi-arid mesothermal climate. During the first half of March 1997, three plots of 50 x 20 m (1.000 m^2) were seeded. During the study years, pasture was managed rationally with 3 grazings per season. Soil samples were collected at the beginning of the study (1997-98) and at the end (2010) at each of the test sites, at depths of 0-20, 20-40 and 40-60 cm. In the laboratory analyses, pH, M.O. and C.E. were determined in the saturation extract. The percentages of cover of pasture, mulch, weeds and naked ground were surveyed with 10 m long transects at the beginning of each harvesting cycle. Data were analyzed with ANOVA for a completely randomized design, obtaining significant differences through Tukey's test ($p < 0.05$). The results showed that the incorporation of *C. plectostachyus* in highly saline soils significantly reduced the levels of C.E. at 10 to 12 years and a small improvement in the % of M.O was also found. At the same time, the pasture shows great capacity for covering the soil, constituting an interesting alternative in the stabilization, recovery and forage production of this type of soil.

A32
USE OF THE PENN STATE METHOD FOR THE CHARACTERIZATION OF SILAGES IN THE *TUCUMAN PROVINCE*

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The correct use of silages (forage reserves) in animal feed requires the adequate granulometric characterization of the material. The objective of the present work was to evaluate particle size silages from different cattle ranches in Tucumán, using the Penn State Method. Silage samples from three cattle farms were evaluated: a) "CachiYaco" from Leales, b) "Choromoro" from Trancas and c) "Potrerillo" from El Sunchal. All samples corresponded to corn silage (*Zea mays*) minced to milky grain and stored in bag silos. For the determination of the size of the silage particles, the Penn State technique was used, characterizing the silage according to the size of the chopped material. 18 samples of silage were processed (6 from each cattle farm). Statistical analysis was performed through ANOVA for a completely randomized design, obtaining significant differences through Tukey's test ($p < 0.05$). The results showed that the same type of reserve (silage) with identical material (maize) presents different morphometric characteristics with respect to the size of the material and its percentage distribution by size in the different ranches evaluated. Among the analyzed samples, the percentage distribution by particle size of the silage make it possible to differentiate between reserves suitable for feedlot steers and reserves suitable for dairy cows, which allows to rationalize the feeding of the different animal categories based on the characteristics of the reserve.

A33

TOXIC EFFECTS OF EXTRACTS OBTAINED FROM NATIVE PLANTS ON *Orizaephilus surimanensis* (COLEOPTERA: SILVANIDAE)

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Nuts are an important source of income in the province of La Rioja, Argentina. Pest control in nuts storage depends mainly on high-impact fumigants. An alternative is to replace these compounds by others of natural origin and environment friendly. The aim of this study was to evaluate the effect of aqueous (EA) and ethanolic (EE) extracts of native species from western La Rioja on one of the most important stored nuts pest: *Orizaephilus. surinamensis.* The native plants chosen were *Lippia turbinata* (Verbenaceae), *Senecio eriophyton* (Asteraceae), *Argemone subfusiformis* (Papaveraceae), *Clinopodium gilliessii* (Lamiaceae) and *Zuccagnia punctata (*Fabaceae). Topical bioassays were performed with adults and 3rd instar larvae of *O. surinamensis* under controlled environmental conditions(25 ± 1°C, 40 ± 5 %HR and 16/8h L/O). The diet was sterilized crushed nuts at low temperature (-18ºC) for 3 days. One µl of each extract solution at a dose of 1000 mg/L was impregnated on the ventral surface of 15 insects. Insect mortality was evaluated at 72 h. EE of *L. turbinata* caused 40% mortality in adults while EA of *Senecio eriophyton* and *L. turbinata* produced 33.3 and 30% of larval mortality, respectively. Both products are promising as controllers on *O. surinamensis* (adults and larvae), although EA is recommended as it is an aqueous emulsion. Increased doses are now being evaluated to increase effectiveness.

A34

EFFECT OF SUGAR CANE CROP RESIDUE MANAGEMENT ON *Elasmopalpus lignosellus* ZELLER (LEPIDOPTERA: PYRALIDAE) AND DAMAGE IN TUCUMAN PROVINCE

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Sugar cane is a crop with a strong cultural identity and a key production in the regional economy of the Argentine Norhwest. Considering that sugar cane crop residue could change the ecological conditions of the soil, the objective of this study was to evaluate the impact of crop residue management on the damage of *Elasmopalpus lignosellus* and its distribution in the Tucuman province. Three assays were carried out during the 2016 growing season. The managements evaluated were 1) firewall (in five replicates 5 rows without crop residue and 5 rows with crop residue); 2) burning of crop residue (8 rows crop residue burnt and 8 rows without burning (4 plots)) and 3) tillage practice in burnt crop residue (10 rows with tillage and 10 rows without tillage (3 plots)). The effect of treatments on the damage of *E. lignosellus* was significant in all studies. As to the distribution of damage in the province, 26 sites were monitored and mean infestation was 12%, with maximum values in Puesto de Uncos (64%). The ecological conditions present in the burned plots favor the damage of *E. lignosellus* and we suggest continuing the assays of tillage practice as a pest control.

A35

PYRROLIZIDINE ALKALOIDS OF *Senecio rudbeckiaefolious* IN PEST CONTROL OF *Diatraea saccharalis*

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Diatraea saccharalis (Lepidoptera: Crambidae) is the most relevant pest affecting sugar cane crops in Tucumán. The butterflies lay eggs on the leaves, the neonate larvae feed on the pod and then pierce the stem of the cane, forming galleries within, which reduces the flow of water and nutrients and enables the entry of other pathogens. Infestation by this insect produces losses in both farming and manufacturing. Current research aims at seeking natural bioactive products of plant or microbial origin that are able to exert a toxic effect on the crop's pest organisms. The aim of this work is to study the lethal and sublethal effects of pyrrolizidine alkaloids (AP) isolated from *Senecio rudbeckiaefolious* on *D. saccharalis* larvae. Toxicity assays by forced intake were carried out with batches of 32 neonate larvae fed on AP-impregnated diet at 50-200 mg/L concentrations and unimpregnated diet for control. Three replications were performed. After 14 days the number of live larvae, dead larvae and larval stage were recorded and sublethal effects were controlled until pupal formation. Dose-dependent toxic effects were observed with a high percentage of mortality (70-90%) and growth inhibition, which prevented surviving larvae from reaching the pupal stage. These data indicate that this natural product is promising as a potential biopesticide for the control of *D. saccharalis.*

A36

LETHAL AND SUBLETHAL EFFECTS OF PYRROLIZIDINE ALKALOIDS ISOLATED FROM *Senecio rubdeckiaefolius* ON PEST CONTROL OF *Oryzaephilus surinamensis*

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Oryzaephilus surinamensis is a beetle which often infests walnut warehouses of small-scale farmers in the provinces of La Rioja and Catamarca, becoming a serious phytosanitary problem. The use of secondary metabolites obtained from plants as possible biopesticides has aroused great interest due to its low impact on ecosystems. The aim of this paper was to analyse the lethal and sublethal effects of pyrrolizidine alkaloids (AP) isolated from a methanolic extract of *S. rubdeckiaefolius* on *O. surinamensis* larvae. Repellency and toxicity assays were carried out on larvae fed on walnuts impregnated with 10% water-alcohol solution of AP (100, 150, 200 and 250mg/L) as well as on unimpregnated walnuts as control. 3 repetitions were carried out and sublethal effects were checked until pupal formation. The product did not turn out to be repellent at the assayed concentrations. Mortality percentages were dependent on concentration levels; with extracts at 200 and 250 mg/L the mortality rates were 70% and 77% respectively. The surviving larvae exhibited sublethal effects such as malformation and coloration changes. The larvae exposed to lower concentrations exhibited low mortality rates and the surviving larvae did not develop fully. These results show the capacity of *S. rubdeckiaefolius* AP as a pesticide and for growth-impairment on *O. Surinamensis larvae.*

A37

PHYLOGENETIC SPECIES OF THE *Fusarium graminearum* COMPLEX: AGGRESSIVENESS OF STRAINS IN INOCULATION TRIALS ON MAIZE EARS

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Fusarium graminearum (Fg) produces rot in maize ears, reducing the yield of grain yield and contaminating it with trichothecenes, mycotoxins that are toxic when ingested at certain doses by humans or animals. In maize crops located in the Argentine Northwestern Region, several phylogenetic species belonging to the *F. graminearum* morphological species were identified and described. We are not yet aware of their phenotypic behavior, especially as far as their pathogenesis and aggressiveness related to maize is concerned. In this study, pathogenesis and aggressiveness of the Fg complex phylogenetic species on maize genotypes have been studied. Inoculation trials were conducted in CER-INTA Leales plots that had been sown in January (2013/14 and 2014/15 seasons) and in September (2016/17 season). Macroconidial suspensions of the following phylogenetic species strains were prepared and inoculated: *F. graminearum sensu stricto* (Fgss), *F. boothii* (Fb) and *F. meridionale* (Fm). Inoculations were made by injecting 1×10^5 macroconidia/mL suspensions into the silk channel of female ears. Disease severity was assessed in the physiological maturity stage of the grains by means of a scale based on the percentage of the ear surface covered by rot. The followings severity degrees were observed: >75% (Fgss, 2013/14; 2014/15; Fb, 2013/14), 51-75% (Fgss, 2016/17; Fb, 2014/15; Fm, 2013/14; 2014/15), 26-50% (Fb, 2016/17) and 11-25% (Fm, 2016/17). Our results indicate that the strains of all the phylogenetic species were pathogenic, Fgss being the most aggressive one. Maize ears from the 2013/14 and 2014/15 seasons were more susceptible to the studied species than those of the 2016/17 season.

A38

ANTIOXIDANT AND ANTIMICROBIAL POTENTIAL OF ESSENTIAL OILS FROM NATIVE PLANTS OF LA RIOJA

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Essential oils (EOs) are important natural products used as flavours and fragrances. Currently, there is increasing interest in the characterization of biological properties of EOs due to their potential applications. The antioxidant and antimicrobial activity of EOs from *Lippia turbinata, Clinopodium gilliesii, Lippia integrifolia, Zuccagnia punctata* and *Senecio eriophyton* were evaluated in native plants of La Rioja. The EOs were obtained by hydro-distillation. Antioxidant activity was determined using DPPH radical scavenging assay. The EOs were tested using the agar dilution method against six pathogenic bacteria such as *Escherichia coli, Salmonella typhimurium, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus agalactiae* and *Streptococcus pneumoniae*. The antifungal activity of EOs on spore germination of *Verticillium dahliae* and *Penicillium glabrum* phytopathogens was determined. Results of antimicrobial assays were expressed as minimum inhibitory concentration (MIC).
L. turbinata EO was the most active DPPH radical scavenger while the other oils studied showed low potency as antioxidants. EOs from *L. integrifolia*, *C. gilliesii* and *S. eriophyton* were effective against Gram-positive bacteria. The *L. integrifolia* EO was the most active one

against *S. agalactiae* and *S. pneumonia* (MIC =2.5 mg/mL) while the *S. eriophyton* EO was the most effective one against *S. aureus* (MIC =2.5 mg/mL). Only the *C. gilliesii* EO was able to inhibit the growth of *E. coli* and *S. typhimurium* Gram-negative bacteria. The EOs of *C. gilliesii* and *Z. punctata* showed marked inhibitory activity on spore growth of *V. dahliae* (MIC= 3 mg/mL).
Results suggest that native plants from La Rioja would be a good source of natural products of agronomical and pharmaceutical interest.

A39

NEW SPECIES OF *Lactobacillus* sp. INHIBIT IN VITRO FORMATION OF *Candida* sp. BIOFILM

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Candida sp. causes a wide range of superficial and systemic infections, biofilm formation being one of its main virulence factors. Certain probiotic bacteria share the same mucosal niches as candida; therefore, our objective was to isolate, select and characterize strains of *Lactobacillus sp.* with the ability to inhibit planktonic growth and biofilm formation of 6 strains of *Candida sp*. isolated from vaginitis. All strains of lactobacilli had positive catalase activity; seven were classified as heterofermentative and the rest as homofermentative. None of the supernatants affected the filamentationability of *C. albicans* 009 in Spider medium. However, out of 11 supernatants obtained from the lactobacilli tested for biofilm inhibition, two with the highest activity were selected using the O'Tolle & Kolter technique, and subjected to heating at 95°C and / or neutralization to determine if they preserved thei activity on the biofilm. Supernatants of lactobacilli strains IBL 031 and 035 which were neutralized and heated had a greater effect on *Candida tropicalis* IBL 015 than on strain IBL 007. The activity of the supernatants was maintained after being neutralized and treated with heat, indicating the presence of other inhibitory molecules besides organic acids. The sensitivity of candida to lactobacilli supernatants was variable according to species. Further studies are required to identify the molecules responsible for the antifungal and anti-biofilm activity observed. These results suggest that lactobacilli sharing the same mucosa niches as *Candida sp.* may serve to control the overgrowth of this opportunistic pathogen.

A40

CLEANER PRODUCTION: DESIGN OF NEW MEDIA FOR THE BIOTECHNOLOGICAL INDUSTRY

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Production costs are among the main factors in biotechnological production. The trend towards environmental sustainability and development of renewable resources has significantly increased interest in maximizing efficiency and minimizing costs and waste. Cleaner production is a strategy which will contribute to sustainable development.
In this sense, our purpose was to design a non-waste process production line to reuse remnant biomass by transforming it into high added value products, using 4R technologies. Bacterial residual cells (BCR) were submitted to a lysis process by physical techniques in order to release their contents. Then, 20 media were designed by replacing 50% and 100% of proteins from commercial media. In order to define applicability of all new media, growth kinetics were tested at 600 nm with *Lactobacillus plantarum, Lactobacillus alimentarius, Enterococcus faecium* and *Pseudomonas fluorescens*. We tested growth kinetics by using MRS as broth for Lactic Acid Bacteria (LAB) and LB was used as broth for pseudomonas. Out of the media designed, 16 were equal to or better than 10%- 35% of the strains tested in the reference media. The usefulness of these growth media for the growth of probiotic strains and other strains of biotechnological interest allowed us to obtain a patent from INPI N°20170123114.

A41

USE OF CAFAYATE RED WINE MARC IN THE CONTROL OF FOOD CONTAMINANT *Pseudomonas aeruginosa* BIOFILM

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Pseudomonas aeruginosa has the ability to adhere and grow in food and surfaces forming resistant biofilms. These are significantly important in the food industry because they cause problems to operations and processes. Nowadays, research is focused on the use of natural products obtained from the agricultural-food industries to deal with this problem. The objective of this work is to add value to by-products of the wine industry by studying the antibiofilm and antibacterial activity of red wine marc against *P. aeruginosa* PAO1 and water contaminant *P. aeruginosa*. Marc samples from different varieties of grapes grown in Cafayate: Bonarda and Tannat, were subjected to successive extractions with solvents of increasing polarity: chloroform, ethyl acetate (AcOEt) and ethanol. The effect of the extracts (at 100 and 10 μg/mL) on growth and biofilm formation of *P. aeruginosa* was evaluated by microdilution technique and violet crystal staining.

Marc samples did not significantly decrease the development of the studied strains. However, the biofilm of the collection strain PAO1 was inhibited between 29 and 51%, the most active being the polar extracts of Bonarda. The contaminant strain was mainly inhibited by Bonarda AcOEt extract (36%) and Tannat ethanol extract (49%) at100 μg/mL. The waste from the production of Cafayate red wine represents a potential biofilm inhibitor of *P. aeruginosa*, which is an increasing problem for the food industry and human health.

A42
ENHANCEMENT OF GABA LEVELS IN STRAWBERRY JUICE THROUGH FERMENTATION BY *Lactobacillus brevis* CRL 2013

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GABA, a ubiquitous amino acid, is the major inhibitory neurotransmitter of the mammal CNS and exhibits several well-known physiological functions. The aim of this study was to obtain a GABA-enriched fermented berry juice using *Lactobacillus (L.) brevis* CRL 2013 as a starter strain.Thus, organic strawberry (SJ) and blueberry (BJ) sterile commercial juices were centrifuged and the pulp-free supernatants were further supplemented with 267 mM monosodic glutamate and 1% (w/v) yeast extract (YE) or tryptein (T). The initial pH was either adjusted to *ca.* 6.5 with $NaHCO_3$ or left unmodified. Juices were inoculated at an initial OD_{560nm} of 0.1, and cell growth (OD_{560nm}), pH and GABA levels were evaluated at different time intervals. No significant differences in cell density or pH were observed during juice fermentation for the initial pHs tested. The highest values of cell densities after 100 h of fermentation were obtained with YE-supplemented SJ. pH values for both YE juices sharply decreased during the first 24 h (SJ) and 48 h (BJ), reaching values of ca. 4.7. GABA was detected after 24 and 48 h of SJ and BJ fermentation, respectively and in both cases, GABA synthesis was accompanied by an increase in pH. Although T-supplemented juices constituted a satisfactory medium for cell growth, GABA production was not observed. GABA yield was significantly higher in SJ than in BJ. In conclusion, the highest GABA synthesis (266 mM) was evinced in YE-supplemented SJ using *L. brevis* CRL 2013 as the starter without modifying the initial pH.

A43
DESIGN AND DEVELOPMENT OF A SOLID FOOD MATRIX FOR THE INCORPORATION OF BIOACTIVE PHYTOCOMPLEX OF *Sechium edule* (Jacq.) Swartz

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Sechium edule (Jacq.) Swartz, better known as chayote, is a fruit consumed in Mesoamerica. In Argentina it is only known as an exotic species. The literature attributes to it important characteristics that give it beneficial properties for human health, especially against the harmful effects of oxidative stress. The objective of this work was to evaluate a procedure for the design and elaboration of a cereal bar with the incorporation of fluid extract (FE), a hydroalcoholic phytocomplex obtained from chayote seeds. The fluid extract was obtained and characterized, and its phytochemical profile was determined by bioactive metabolite identification assays. The design and development of solid matrices was based on the combination of different percentages of cereals and binders. Acceptability, flavor profile and texture were evaluated to select the optimum formulation. Once the matrix was selected, the FE was incorporated and the sensorial evaluation, nutritional analysis, antioxidant capacity and antihyaluronidase evaluation of the finished product were carried out. All analyses were performed in duplicate. The results obtained confirmed a total concentration of 605.12μg/mL in total polyphenols. *In vitro* assays of the final elaborated product showed that the contribution of the phytocomplex as an antioxidant is optimal, also presenting a moderate antihyaluronidase effect compared to that of the FE alone. Cereal bars have good sensory acceptability after addition of FE.

A44
PROTECTIVE AND GROWTH PROMOTING CAPACITY OF INACTIVATED MICROBIAL EXTRACTS IN STRAWBERRY

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The use of synthetic fungicides in agriculture is currently being replaced by natural compounds (elicitors). The objective of this fungal pathogens in strawberry (*Botrytis cinerea*) and the growth promoting capacity of elicitor complex mixtures obtained from inactivated microbial extracts (IME). IME were obtained from the culture of a virulent isolate of *Colletotrichum acutatum*, the causal agent of anthracnose in strawberry, and from the microbiome isolated from the phyllosphere of strawberry plants. *F.* x *ananassa* cv. Pájaro plants were IME- or water-treated, incubated under controlled conditions, and infected with a *B. cinerea* conidial suspension after 5 days

(induction period). The infected foliar surface was quantified for 28dpi. For the promoting growth assay, plants of cv. Merced, Camino Real and Benicia were IME- or water-treated, maintained in greenhouse and the nº of leaves, leaf green index and nº of runner-obtained plants was evaluated after 35 days. All the extracts induced a significant localized protection against *B. cinerea* even until 28dpi (45 to 95%) with respect to the control. Although no IME induced an increase in the nº of leaves, they induced green index in the 3 commercial strawberry varieties. All the EMI significantly induced the nº of runner-derived plants in Benicia, a little stoloniferous variety. To conclude, we demonstrated that all the inactivated extracts from the phyllospheric microbiome as well as the extracts from the virulent fungus could protect *F.* x *ananassa* plants towards *B. cinerea*, and also promoted their growth, suggesting their potential to be used as phytovaccines.

A45
ISOLATION AND IDENTIFICATION OF ANTIBACTERIAL METABOLITES FROM *Schinus fasciculatus*

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Introduction: *Schinus* is a genus of the Anacardiaceae family widely described for its antibacterial activity. Assays in our laboratory have shown that ethyl acetate extracts leaves and stems of *S. fasciculatus* inhibit the proliferation of phytopathogenic bacteria with adverse impact on horticultural crops. **Objective:** To isolate and identify the antibacterial metabolites of the ethyl acetate extracts from the aerial parts of *S. fasciculatus* and to quantify the inhibitory activity of these substances. **Materials and methods:** The constituents of the ethyl acetate (fAcet) extracts from leaves and stems of *S. fasciculatus* were separated by silica gel column chromatography and identified by NMR. The antibacterial activity of the isolated compounds was tested by the microdilution method in solid medium (2000-62.5ppm) on *Pseudomonas corrugata* (Pc), *P. syringae* (Ps), *Erwinia carotovora* (Ec), *Xanthomonas campestris* (Xc) and *Agrobacterium tumefaciens* (At). Minimum Inhibitory Concentration (MIC) was defined as the lowest concentration required for complete suppression of bacterial growth. **Results:** The bioactive constituents of fAcet were kaempferol (K), quercetin (Q) and the dimer agathisflavone (AF). MIC value of Q was 1000 ppm for Pc and Ps while values of K were 250, 500, 500 and 250 ppm for Pc, Ps, At and Xc, respectively. The MIC values for EQ of Q and K were above 2000 ppm, as were the MICs of Q for Xc and At. **Conclusions:** The constituents responsible for the antibacterial activity of fAcet were flavonoids. Kaempferol was the most active compound identified, followed by quercetin. Further work is being done to determine the inhibitory activity of AF.

A46
MICROSTRUCTURAL ANALYSIS OF CHERRY TOMATOES TREATED WITH LEMON ESSENTIAL OIL AS A SANITIZER

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Tomato, which is popular due to its valuable nutrients content, is consumed fresh or processed. Consumers demand high quality fruit, which is related with the microstructure of the tissues responsible for firmness. The new trend in the food industry is the use of natural antimicrobial substances, including lemon essential oil (LEO). In a previous study, we determined the efficacy of simultaneous treatment with LEO (100ppm) and sodium hypochlorite (NaClO, 200ppm) to eliminate the initial microbial load of cherry tomatoes. The aim of this study was to evaluate the effect of such washing treatment on the microstructure of cherry tomatoes MP and determine the antibacterial effect of treatment on *Echerichia coli* ATCC 25922. Samples were treated using Scanning Electron Microscopy (SEM) technique. The results of this study show that the use of the sanitizing mixture preserved the morphology, size and structure of cell tissues. Only the presence of a greater number of cracks in the cuticle was determined, although these were significantly lower than in tomatoes treated individually with NaClO, which in general affected cell tissues. On the other hand, SEM revealed few *E. coli* cells on the surface and pulp of the tomatoes treated with the study mixture in agreement with their antibacterial effect compared to the control. In conclusion, the washing treatment with AEL:NaClO (75:25) was the most effective way to reduce *E. coli* ATCC 25922 inoculated in ready-to-eat cherry tomatoes without significantly affecting its microstructural characteristics. Consequently, the use of LEO is promising as a potential antibacterial surface treatment for foods such as minimally processed fruits.

A47
VALORIZATION OF POLYPHENOLS FROM PLANT BARKS ACCORDING TO THE INTERACTION WITH PROTEINS EVALUATED BY DIFFUSION ASSAYS

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Introduction: Extractable polyphenols from plant barks are oligomeric constituents with properties due to their chemical-structural diversity such as forming complexes with proteins in solutions; such interaction depends both on molecules structures and the medium characteristics. This aspect makes them interesting substances to be evaluated as biosensors considering proteins with biotechnological applications. In previous works, polyphenolic extracts (PPE) from *Caesalpinia paraguariensis* Burk. were characterized as Condensed tannins, Gallotaninns, Ellagitannins and Complex Tannins. Objectives: to evaluate the interaction between PPE with bovine serum albumin (BSA), quantify the complex formation by diffusion assays on cellulose membranes, and evaluate them according to their sensibility. Methodology: Aliquots of 15 µL of four PPE dilutions (1-1/512) and BSA (20-1000µg/ml) were placed on an FN3 (Munktell) tensed cellulose membranes of 15x15 cm. Controls for solvents, PPE, BSA, and references substances: Tanic acid (TA) and Gallic acid, were included. After that, membranes diffused were fixed (TCA 5%, ethanol 80%), and revealed using Coomassie Blue R-250. Results and conclusions: TA showed interactions with BSA from 10ug/ml, observing a marked diffusion restriction (DRmax: 47%), and greatest sensitivity at 250 µg/ml. PPE showed DR: 3.00-18.32% from 350 µg BSA/ml. The data analysis indicated that PPE had different sensibilities with BSA. New studies about interactions with other proteins are being carried out.

A48
BIOCATALYTIC POTENTIAL OF *Aspergillus níger* ON 7-HYDROXY-4-METHYL-CUMARINE

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The use of enzymes or biocatalysts is one of the most significant advances in the area of white biotechnology. The present work aims to evaluate the potential biocatalytic behavior of the filamentous fungus *Aspergillus niger* isolated from paprika on 7-hydroxy-4-methyl-coumarin extracted and purified in appreciable amounts of *Flourensia blakeana* Dillon (Asteraceae-Heliantheae) from the hexane subextraction. For isolation of the strains, dilutions of the samples were seeded from *Aspergillus níger* in 18% Dichloran Glycerol Agar (DG18), incubated, re-inoculated in Malta Extract Agar (MEA) and seeded in the appropriate culture media according to genus. The biocatalytic evaluation was performed by batch culture to whole cell culture medium, liquid sabouraud; biotransformation times were from 24 h to one week. Structural elucidation of the compounds was determined by one and two-dimensional NMR spectroscopy (^{1}H, ^{13}C, HSQC, HMBC). The application of these strategies made it possible to isolate and subsequently identify by spectroscopic methods two compounds as hydroxylation products at selective positions, from the starting substrate. These results allowed the determination of the biocatalyst effect of *A. niger* on a substrate with a structural nucleus such as coumarin, exhibiting a hydroxylation process. The biocatalytic strategies described above on coumarin proved to be valid as environmentally friendly procedures for obtaining derivatives of these metabolites. We plan to continue activity assays of each of the compounds.

A49
GONADOTROPHIC INFLUENCE ON OVARIAN STEROIDOGENESIS AND MATURATION IN *Rhinella arenarum* OOCYTE

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In the ovary of vertebrates, gonadotrophic action (GA) promotes steroidogenesis and gametogenesis through the activation of the AC-cAMP pathway. In *R. arenarum* there are no studies of the GA connecting both ovarian functions. so in this work we studied its effects on the follicular synthesis of P_4 and T and its relation with oocyte maturation or germinal vesicle breakdown (GVBD). GA was mimicked with activators of the AC-cAMP pathway (db-cAMP, Forskolin = FK) and precursors of steroidogenesis (Cholesterol= Col, P_4). The follicles (Fol) obtained in the reproductive (RP= September-February) and non-reproductive (NRP= March-August) periods were incubated for 6, 9, or 12 h in: A) Amphibian Ringer (AR, control); B) AR + db-cAMP (0.5mM); C) AR + FK (10µM); D) AR + Col (10µg/mL); E) AR + P_4 (10^{-7}M). Follicular secretion of P_4 and T was determined by ECLIA and GVBD was monitored. The results indicated that FK and db-cAMP induced a significant increase in follicular T secretion with respect to basal levels, mainly in PNR (≈ 20 nM/20 Fol), but there was no increase in P_4 or GVBD. In both periods, Col and P_4 induced a significant secretion of T and P_4 with respect to basal levels and GVBD (100%). The results obtained show that steroid secretion in the *R. arenarum* ovary is seasonal and GA dependent: in NRP, T secretion

would be related to estrogen synthesis and follicular growth while in RP the secretion of P_4 would be responsible for GVBD. In the absence of GA, Col promotes steroid synthesis and GVBD, indicating that steroidogenic enzymes would be present in non-stimulated Fol.

A50

SEASONAL CHANGES IN THE SYNTHESIS OF E_2, P_4 AND T IN THE OVARY OF *Rhinella arenarum*

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In amphibians, estrogens have been related to oocyte growth due to their effect on vitellogenin synthesis. In ovarian follicle (Fol), CYP19 (aromatase) catalyzes the formation of estradiol (E_2) from testosterone (T) and can be inhibited by Anastrazol (Az). In *R. arenarum* there are no studies of *in situ* ovarian synthesis of E_2 and its relation to oocyte maturation or germinal vesicle breakdown (GVBD). In this work we intend to evaluate the seasonal changes in follicular secretion of E_2 in relation to the secretion of progesterone (P_4), T and its effects on GVBD. Batches of 20 Fol obtained during the reproductive (RP= September-February) and non-reproductive (NRP= March-August) periods were incubated for 6 h in: A) Amphibian Ringer (AR, control); B) AR + Az (0.5µg/mL); C) AR + hCG (10IU/mL); D) AR + hCG + Az. The follicular secretion of E_2, P_4 and T was determined by ECLIA and GVBD was monitored. The results indicate that in basal conditions the follicular secretion of E_2 is significantly higher at the beginning of the NRP (51.9 ± 3.4pM) and decreases at the end of it (≈ 20pM), whereas in both periods the secretion of T is <2nM and that of P_4 is <1nM (0% GVBD). Under gonadotropic stimulus, follicular secretion of E_2 and T increases significantly during the NRP, whereas that of P_4 increases significantly at the beginning of RP along with GVBD (100%). In NRP, Az induced a decrease in E_2 secretion and increased secretion of T, P_4 and GVBD. The results indicated that the gonadotrophic stimulus regulates the follicular secretion of E_2 in the NRP, when Fol reaches their maximum growth, and P_4 secretion in the RP, when the oocyte matures.

A51

CELLULAR/TISSUE CHANGES IN THE FAT BODY DURING THE POST-EMBRYONIC DEVELOPMENT OF *Phyllocnistis citrella* (Lepidoptera, Gracillariidae) IN CITRUS GROWING IN TUCUMAN

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Phyllonictis citrella, the "leaf miner of citrus," is one of the pests that most strongly affects the citrus sector of Argentina and especially Tucumán, the main producer of lemon worldwide.This species has an intense period of feeding during its larval state, a period of post-embryonic development of holometabolous insects in which the nutrients are incorporated and stored in the fat body to be released during metamorphosis. Considering the importance of the fat body in the development of insects, the objective of this work is to analyse its histological changes during the post-embryonic development of *P. citrella*. The study material was collected from a lemon growing free from pesticides to control of leafminer. The material was fixed in Bouin´s solution, preserved in N-butyl alcohol and stained with hematoxylin-eosin and PAS-hematoxylin. During larval development, two types of fat bodies were identified: parietal and visceral; trophocytes with vacuolar cytoplasm that would indicate synthesis and storage of lipids were observed. In prepupa a decrease in lipid vacuoles, an increase in basophilic granulations and a mild PAS positivity in the cytoplasm of the trophocytes were observed, indicating the beginning of the synthesis and storage of proteins and carbohydrates.During the pupa stage, the fat body loses its cellular limits and the trophocytes are filled with protein granules. The results obtained indicate that during the post-embryonic development of *P. citrella* the fat body synthesizes and stores the reserves required for the formation of new structures of the imago during metamorphosis.

A52

ULTRASOUND DIAGNOSIS OF EGG RETENTION IN SNAPPING TURTLE (*Chelydra serpentina*) IN CAPTIVITY. CASE PRESENTATION

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The Snapping Turtle (*Chelydra serpentina*) is a chelonian of the Chelydridae family. Native to Canada and the USA, it favors muddy bottoms with plenty of vegetation. Females reach maturity at 6-7 years of age, lay 20-30 white eggs and incubate for 9-18 weeks. Egg retention is a pathology that affects individuals suffering from oviduct infection, absence of nesting sites, excessively large eggs or weakness or show signs of bending, lethargy or cloacal discharge. Ultrasonography, considered a low-cost, fast and minimally invasive

diagnostic imaging method, could be used to detect this pathology, which was applied to a *C. serpentina* specimen in captivity. We used a Mindray Z6 ultrasound with a convex transducer 6C2P with a frequency of 6.5 MHz. We detected the presence of rounded structures of a hyperechogenic external zone and hypoechogenic center of 1.88x1.91cm, coinciding with preovulatory vitelline follicles and structures compatible with eggs, of ovoid shape of 2.19x3.46cm, with a hyperechogenic contour of 0.12cm compatible with calcified shell. The interior of the eggs presented a hypoechoic appearance compatible with albumin and a central internal hyperechogenic area compatible with the yolk. The presumptive diagnosis of egg retention was corroborated effectively and rapidly. The use of the ultrasound method for the routine control of captive animals is proposed as a method applicable to all oviparous and ovoviviparous species that present predisposing factors to the pathology.

A53
HISTOLOGY OF THE INTERRENAL GLAND OF *Leptodactylus latinasus*

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Leptodactylus latinasus is a species belonging to the *L fuscus* group, whose species build chambers with foam nets where the organism lays the eggs and the first larval stages develop. This reproductive mode is a tendency toward a terrestrial strategy. In anuran amphibians, the interrenal gland is closely associate with the ventral surface of the kidney, synthesizing glucocorticoids, mineralocorticoids, adrenaline and noradrenaline, which are hormones involved in reproduction and stress response. The present work deals with the histologic description of the adrenal gland of *L latinasus* male during the reproductive stage. The samples were processed following the routine histological technique, and colored with H-E, TB pH7 and AB-PAS. The interrenal gland is formed by anastomosed cords detached by high-caliber sinusoidal capillaries. During the reproductive period, this gland presents interrenal cells (IC), chromaffin cells (CC) and summer cells (SC). The IC are small and polygonal, have a round heterochromatic nucleus and an acidophilic cytoplasm with foamy aspect which correspond to numerous lipid vacuoles.Two CC types were observed, both with a clear nucleus and prominent nucleolus and basophilic metachromatic cytoplasm. The first type of cells are large and polygonal, they are found in smaller numbers and are grouped randomly among the IC. The second type of cells are smaller and abundant and are arranged internally in groups. The SC cells are smaller and few, with excentric nuclei with cytoplasm loaded with acidophilic granules. Conclusions: the interrenal gland exposed histological characters that could be related with seasonal changes that would influence gonadal development.

A54
THE ELLAGITANINN HET INHIBITS THE GROWTH OF MICROORGANISMS BY INTERFERING WITH THE ELECTRON TRANSPORT CHAIN

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Previous reports showed that HeT affected the viability of several bacterial and fungal pathogens of plants and humans. However, little is known about the mechanism by which HeT exerts its antimicrobial activity. The objective of this work was to investigate how HeT exerts its antimicrobial effect. β-galactosidase unmasking experiments carried out with *Enterococcus mundtii* strain CRL35 (*lacZ* +) indicated that the action of HeT does not impair the integrity of the cell membrane. In addition, oxygen measurements showed that the application of HeT considerably decreased the oxygen consumption of *Clavibacter michiganensis* cultures. A similar effect was also observed in suspensions of cell membranes isolated from *C. michiganensis*. Furthermore, enzymatic assays performed on these membranes showed that HeT decreased NADH consumption and MTT reduction when the electron chain was blocked with KCN. These results suggest that HeT produces the interruption of the electron transport chain at the level of the dehydrogenase enzyme.

A55
Colletotrichum acutatum M11 PRODUCES A COMPOUND THAT SUPPRESSES THE BIOCHEMICAL AND MOLECULAR EVENTS INDUCED BY AsES

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The activation of the defense response in plants is accompanied by several physiological changes that provide them with the capacity to resist pathogen attacks. Among those, the accumulation of reactive oxygen species, cell wall reinforcement, and the induction of pathogenesis-related proteins can be mentioned. AsES is an extracellular subtilisin-like protein that provides strawberry plants with

protection against several pathogens. However, when plants were treated simultaneously with AsES and the supernatant of the virulent fungi *Colletotrichum acutatum* M11 (SN-M11), they acquired the disease, suggesting that a suppressive defense effect occurred. In this work we investigated the biochemical and molecular events involved in the suppression of the defense response. Accordingly, plants were treated with a) AsES, b) SN-M11, c) AsES + SN-M11 and d) H_2O. Soluble (SPC) and cell wall-bound phenolic compounds (BPC) were quantified and RNA extraction was performed in order to evaluate gene expression of *FaPR1* (Pathogenesis related protein 1), *FaCHI23* (Chalcone isomerase 23), *FaPRX27* (Peroxidase27) and *FaCAT* (catalase) at 24, 48, 72 and 144 hours post treatment (hpt) by qPCR. Results showed that plants treated with AsES + SN-M11 exhibited lower expression levels of *FaPR1* (72 hpt), *FaCHI23* (72 hpt), *FaPRX27* (72 and 144 hpt) and less accumulation of SPC and BPC with respect to AsES-treated plants, whereas *FaCAT* showed a similar behavior at 24 and 144 hpt. These results confirm that SN-M11 suppresses the biochemical and molecular events induced by AsES.

A56
COMPARATIVE HISTOLOGY OF OVARIES IN DIFFERENT ANURAN SPECIES

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Anurans constitute a group of vertebrates with a large diversity in modes of oviposition, which is characteristic of each species. The objective of this work is to comparatively characterize the histological structure of amphibians ovaries with different adaptations in their environment: *Rhinella arenarum, Ceratophrys cranwelli, Melanophryscus rubriventris* and *Telmatobius pisanoi.* Samples obtained from sexually mature females caught in the summer were fixed in formaldehyde buffered at 10%, processed with routine histological technique and colored with H-E and TB at pH 7. The studied species were found in the preovulatory period, a stage characterized by few ovogonies (OO), few previtellogenic oocytes (OP), and a large amount of vitellogenic oocytes (OV). The OO arranged in peripheral nests, distinguishable by the scarce basophilic homogeneous cytoplasm, present a big oval nucleus, abundant in *R. arenarum*. In OP, the cytoplasm acquires distinctive characteristics, being differentiated into two zones, an acidophilus peripheral and a slightly basophilic perinuclear one. The nuclear contour s becomes irregular, moving towards the animal pole in *R. arenarum*. The OV have a layer of flat follicular cells, one or two thecae, and the vitelline platelets occupy the whole oocyte. The germinal vesicle in process of disassembly is found in the animal pole. The OV are abundant in *M. rubriventris, T. pisanoi and C. cranwelli.* This reveals that in all species this organ reached its maximum structural and functional development, suggesting that the females are physiologically prepared for successful ovulation if climate conditions are right.

A57
EFFECT OF GONADOTROPINS IN STEROID SECRETION IN TESTIS OF *Leptodactylus chaquensis*

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The aim of the present work was to evaluate the effect of gonadotropins on the secretion of testosterone (T) and 17β-estradiol (E_2) in testis of *Leptodactylus chaquensis*. Whole and fragmented testes were incubated in amphibian Ringer solution containing hCG (100 IU / mL), FSH or LH (0.25, 0.5, 1.5, 3 and 5 IU/mL) in a final volume of 1 mL. Control samples were incubated in the same conditions without hormones. After 2hs the incubation medium was centrifuged and the supernatant was used for T and E_2 determination. Our results indicate that hGC induced a significant increase ($p < 0.001$) in T secretion with respect to control, but not in E_2. 1.5; 3 and 5 IU/mL FSH induced a significant ($p < 0.05$) increase in T and E_2 secretion with respect to the control. The highest concentration of FSH tested resulted in a significant ($p < 0.05$) increase in T and E_2 secretion compared to that obtained with hCG, whereas with the lowest dose of FSH the T secretion was significantly reduced ($p < 0.001$) with respect to that obtained with hCG. LH induced a significant increase ($p < 0.05$) in T secretion with respect to the control, in a dose dependent manner. The highest concentration of T was obtained with 5 IU/mL of the LH, while at the dose of 0.25 IU/mL, the concentration was similar to that obtained with hCG. The highest values of E_2 were obtained with LH 1.5; 3 and 5 IU/mL, but no increases ($p \geq 0.05$) were observed with the lowest dose of gonadotropin. These results suggest that: 1- LH is more effective in stimulating the secretion of T, 2- FSH is more effective in inducing E_2 secretion, 3- hCG induces T secretion with less effectiveness than FSH or LH.

A58
CALCIUM ROLE IN ACROSOME REACTION IN SPERMATOZOA OF *Chinchilla lanigera*

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The acrosome reaction (AR) is a synchronized and regulated event. It depends on the variations in the intracellular concentration of the calcium ion, due to the influx or mobilization of the cytosolic reserves. Calcium is capable of activating cascades of signal transduction,

which requires proteins and enzymes such as calmodulin (CaM) and a kinase II (CaMKII). Male infertility is often due to the inability of gametes to respond to external / internal stimuli. The study of the participation, internal mobilization and calcium signaling pathways involved in the AR is an important contribution to the knowledge of the process. The objective of this work is to study the signaling pathways involved in the internal mobilization of calcium and the participation of the Ca^{2+} / CaM / CaMKII system in the AR in *Chinchilla*. The spermatozoa obtained from the tail of the epididymis of adult animals were capacitated (EC) in TH3 medium and the AR was induced with progesterone (P4) 20µM. The CDs were incubated with inhibitors of receptors for IP3 and ryanodine at different concentrations, evaluating the AR by staining with Coomassie Blue. CaM was immunolocalized in non capacitated sperm, EC and AR. Spermatozoa pretreated with Stelazine-Stz (CaMinh) and KN93 (CaMKIIinh) were exposed to P4. A decrease in AR % was observed in the samples treated with R-IP3 inhibitors. CaM undergoes relocation in EC and AR. The use of Stz yielded AR % higher than controls while the assays with KN93 did not show differences with the controls. The mobilization of Ca^{2+} from the reserves is done through the IP3 route. The Ca^{2+} / CaM / CaMKII system participates by relocating CaM after capacitation and kinase II apparently prevents AR.

A59
CAPACITATION EFFECT AND PROTEIN PROFILE OF MEDIA OBTAINED FROM OVIDUCTS CULTURED ON *Chinchilla lanigera* SPERM

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Mammalian sperm must undergo morphobiochemical changes to acquire fertilizing capacity, a process that occurs in the female reproductive tract. Capacitation (C) involves a reorganization of the sperm plasmatic membrane that prepares it for the acrosomic reaction (AR), allowing the fusion of gametes.The oviductal environment has been studied in numerous species in order to mimic *in vitro* the conditions necessary to achieve successful fertilization. The qualitative study of the components of the oviductal fluid and its effect on C would be important to understand the processes that occur during fertilization in this species. The aim of this work is to compare the effect of oviductal media (OM) obtained in different conditions on sperm capacitation and to evaluate the protein profile of these OM. Oviducts were isolated from adult animals and the sperm were obtained from puncture of the caudal region of the epididymis.The OMs were obtained by incubation of the organs in sterile PBS and DMEM / F12 medium (Gibco® [+] L-glutamine and 15 mM HEPES) for 24 hours in a gaseous oven at 37°C and at 4°C.The gametes were incubated with the OMs and C was evaluated at different times, observing the occurrence of AR with Coomassie Blue. The electrophoresis in polyacrylamide gels of the OMs was performed under denaturing conditions.The OM obtained in cold had a greater time-dependent capacitation activity and showed a band of approximately 40 kDa that was absent in the other OM. These preliminary studies suggest a difference in the OM proteins, which could explain their different capacitation effect on *Chinchilla lanigera*'s sperm

A60
EFFECT OF SPERMATIC MORPHOLOGY ON THE RESULTS OF IVF IN A HOSPITAL SERVICE

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Among biological samples, semen has a high variability in its chemical and chemical parameters. In humans, spermatogenesis occurs in 75 days, in the form of waves, involving the regions of the seminiferous tubules, so that often the results of previous sperm do not correlate with the samples used during in vitro fertilization (IVF). The objective of this work was to study the effect of sperm morphology on IVF results in couples undergoing treatment in a hospital service. We included 94 semen samples from couples that were under fertility treatment (IVF). In the semen samples, sperm count and Kruger test were performed. Kruger values between 3-7% (Kruger Criterion) were considered acceptable for IVF. The couples that presented oocyte alterations and severe oligoastenoteratozoospermia, endometriosis, etc. were excluded from the study. A single operator acquired the seminal evaluation and IVF. Out of the total samples studied, 78% presented Kruger values between 5-7% with fertilization rates of 95%. The samples with Kruger = 3 showed a fertilization rate of 66%, while those with Kruger = 4 showed a fertilization rate of 75%. The results showed that a sperm morphology with mild or moderate alterations has no influence of IVF success. Thus, the relationship between seminal morphology (reference values for the region) and the fertilization rate in patients treated in a hospital service in San Miguel de Tucumán is described for the first time.

A61
NEURAL CONTROL OF GONADAL STEROID SECRETION IN AMPHIBIAN FEMALES

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Previous results from our laboratory showed for the first time in amphibians that the female reproductive system is innervated by the sympathetic division of the autonomic nervous system. The aim of this work was to determine the effect of nerve stimulation and adrenergic drugs on the secretion of gonadal steroids in *Rhinella arenarum*.
Two protocols were used: 1- In the same animal, one ovary was used as control while the contralateral one was stimulated with electrical stimuli (intensity: 7 mA, frequency: 10 Hz and duration: 30 sec) applied on gonadal nerves. 2- Ovarian portions of 1 ± 0.2g were incubated for 1 h at 25 ± 1°C in Ringer's solution in the presence of adrenaline, noradrenaline, isoproterenol or propranolol atconcentrations ranging from 10^{-3} to 10^{-8} M. As control, gonadal portions were incubated in Ringer's solution. The concentrations of estradiol (E_2) and progesterone (P_4) were determined by ECLIA in serum samples and in the incubation medium. The results showed that nerve stimulation was effective in inducing a significant increase ($P < 0.01$) in E_2 secretion only during the post reproductive period and P_4 ($P < 0.01$) in reproductive ones. A similar effect was observed with adrenaline (10^{-6} and 10^{-7} M) and the β-adrenergic agonist, isoproterenol (10^{-5} and 10^{-6} M), while the β antagonist, propranolol (10^{-6} M), inhibited the secretion of both steroids. It should be noted that noradrenaline did not modify the pattern of steroid secretion. It is postulated that nerve stimulation induces the secretion of gonadal steroids, that the neurotransmitter released at the nerve terminals would be adrenaline and that its effect would be mediated by β.

A62
MOLECULAR CHARACTERIZATION AND SPERM INTERACTION OF A *Rhinella arenarum* OVIDUCTAL GLYCOPROTEIN

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The *Rhinella arenarum* oviduct secretes a large variety of molecules that are organized into the jelly coat surrounding the oocytes at the time of oviposition. Once the gametes are released into the fertilization medium, some of these molecules diffuse from the jelly coat constituting the diffusible factor (FD) and contact the spermatozoa. It was determined that one of these molecules is the74 KDa glycoprotein (gp74) that induces the acrosome reaction (RA) during fertilization. Although its biological role was demonstrated, at present its molecular identity is unknown. The objectives of the present work were: a) to demonstrate gp74 interaction with homologous sperm using a biotin-labeled gp74, and b) to determine and analyze the identity of this glycoprotein by peptide mass fingerprinting. The gp74 glycoprotein was isolated and purified from the FD and labeled with the EZ-Link Sulfo-NHS-LC-biotin kit. After sperm incubation and fluorescence microscopy analysis, a clear gp74-sperm interaction was revealed by the fluorescence signal on the sperm head. The 74 KDa protein band from denaturing-PAGE gels was processed and analyzed by nano-HPLC and mass spectrometry; a 34-amino acid peptide sequence harboring a partial ZP domain was identified. By using the Proteome Discoverer and the BLAST software, the peptide sequence was compared to NCBI databases. The results revealed homology to ZP4 sperm binding glycoproteins of *Rattus norvegicus* and *Xenopus laevis*, suggesting the evolutionary conservation of the analyzed glycoprotein. Further genomic and functional studies are projected for this glycoprotein

A63
ANALYSIS OF THE PRESENCE OF FOLATE AND EXPRESSION OF ITS RECEPTORS AND TRANSPORTERS IN THE BOVINE OVIDUCT

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Folate (the natural form of folic acid) plays a fundamental role during embryonic and fetal development, and participates as an enzymatic cofactor in the pathways that regulate DNA methylation, impacting on the epigenetic marks of genome. Although several studies were focused on investigating the effect of folate during the postimplantation period, knowledge of its role in the oviductal microenvironment, in which the first stages of embryo development occur, is still limited. The aims of this study were to determine the presence and physiological concentration of folate in bovine oviductal fluid (OF) and to analyze the gene expression of receptors and transporters of this micronutrient in bovine oviduct epithelial cells (BOEC) during the estrous cycle. Folate measurement was performed in OF samples of oviducts from cows slaughtered at different stages of the estrous cycle by biochemical methods and microbiological assays. In addition, gene expression of *FOLR1*, *FOLR2*, *SLC19A1* and *SLC46A1* in BOEC from the ampulla and isthmus regions of oviducts in proestrus, metestrus and diestrus stages was analyzed using RT-qPCR. High folate concentrations in OF were detected (proestrus: □l, metestrus: 0.85ng/□l, diestrus: 1.44ng/□l) with respect to levels detected in preovulatory follicular fluid (<0.01ng/□l). The genes analyzed

showed significant variations in expression levels during the estrous cycle, elevated levels of *FOLR1* expression being observed in the isthmus region. The high concentration of folate in OF and changes in expression levels of its receptors and transporters in bovine oviduct suggest that this micronutrient could play an important role in the oviductal context.

A64
MORPHOLOGICAL ANALYSIS OF MIDGUT IN *Diatraea saccharalis* POPULATIONS SUSCEPTIBLE AND TOLERANT TO Bt-CROPS

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*Diatraea saccharalis (*Lepidoptera: Crambidae) is the pest with the greatest economic impact that affects sugarcane in the Argentinian Northwest and, to a lower extent, corn in the pampas. One strategy to control it is to develop transgenic crops which exhibit toxins with pesticidal properties produced by *Bacillus thuringiensis* (Bt crops). These toxins enter through the midgut's peritrophic membrane and interact with epithelial cells causing cell lysis. Evolution for resistance to this technology has been observed. In the province of San Luis unexpected damage by *D.saccharalis* on Bt hybrid corn was found. The aim of this paper was to comparatively analyse the microscopic characteristics of the midgut in susceptible (LS) and tolerant (LT) to Bt toxins (San Luis case) *D.saccharalis* populations. Assays were carried out feeding larvae of both populations with Bt corn leaves for 7 days and then processing them through histological techniques for optical and electron microscopy. In LS, the midgut showed total destruction of epithelium with partial conservation of the peritrophic membrane and general melanization reaction. In LT the midgut showed three different regions, with features identical to the control larvae. The epithelium is cylindrical pseudostratified with granular, goblet and basal cells. Electron microscopy confirmed the integrity of the plasma membrane of the epithelial cells. The microscopy findings provide useful preliminary information to explain the underlying mechanisms of the resistance phenomenon.

A65
EFFECT OF CHIA OIL ON THE PROTEIN PROFILE OF LIVER DURING EXPOSURE TO LOW CADMIUM DOSES USING A WISTAR RAT MODEL

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Disused electronic devices increase cadmium (Cd) levels in the environment, constituting a public health risk. Chia oil has been reported to benefit health. Previous studies in rats showed decreased expression of total proteins in liver with Cd^{2+} treatment. However, the effects of chia oil on these alterations have not been described yet. The aim of this work was to evaluate the qualitative and quantitative protein expression and esterase activity of esterase type enzymes in liver homogenates. Wistar rats were divided into: Group A: distilled water was administered orally, 1 daily dose 5 times a week for 60 days. Group B: 10mg/kg $CdCl_2$, by the same route and period. Group C: 240µl/kg chia oil by the same route and period. Group D: $CdCl_2$ and chia oil were coadministered at the same doses by the same route and period. Group E: $CdCl_2$ and chia oil were coadministered at the above doses by the same route for 30 days and then given distilled water for 30 days. Group F: Cd/chia were coadministered at the above doses by the same route for 30 days and then chia oil was given for 30 days. Native polyacrylamide gel (PAGE) electrophoresis of liver homogenates proteins was using silver staining. The zymogram with esterase activity was evaluated with 1-naphtyl-acetate and Fast Blue. The GelAnalyzer software was used for the quantification of protein concentration. The results showed that exposure to Cd caused a decrease in the expression of enzymes with esterase activity (Groups B vs A). Chia oil increased expression of the band with esterase activity (Groups C vs B). Co-administration of Cd/chia oil prevented Cd exposure from inducing decreased expression of enzymes with esterase activity (Groups D, E and F vs. B). These results indicate that administration of chia oil could minimize the changes caused by Cd.

A66
ESTIMATION OF ABSORBED AND ACCUMULATED CADMIUM IN *Rhinella arenarum* OVIDUCTAL PARS CONVOLUTA

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The decrease in some amphibian populations has been linked to various anthropogenic activities producing waste that increase the heavy metal content in the environment. It is known that the amphibian oviduct is an organ of fundamental importance in the preparation of the female gamete for fertilization and that the critical concentration of a xenobiotic in an organ is associated with the appearance of lesions in that organ. However, information on this parameter is lacking in oviducts. The objective of this work is to determine the concentration of

cadmium (Cd) and bioaccumulation in the oviductal pars convoluta (PC) of *Rhinella arenarum*. This species was chosen for our toxicological tests because it belongs to the lowest extinction risk category (not threatened). Specimens were injected into the dorsal lymph sac daily and for 15 days with 2.5mg/kg of $CdCl_2$ or Ringer's solution (controls). The oviductal PC was dissected at the beginning and end of the treatment period to quantify Cd by atomic absorption spectroscopy with graphite furnace and to determine by stoichiometry the percentage (%) of absorbed and accumulated metal. Data were analyzed by analysis of variance (ANOVA) followed by Dunn's test. The results showed that after treatment the animals incorporated 2452.80 ± 25.03µg of Cd. A time-dependent increase in the metal concentration was observed in the PC, it being significantly different from the control and registering a 200% increase at the end of treatment. The cumulative % was 3.80. These data demonstrate that the PC is a bioaccumulating organ and that the critical concentration of Cd, determined for first time in oviductal PC, is 93.33 ± 9.71µg/g.

A67
PRECLINICAL TESTS OF A SEMI SOLID FORMULATION OF BLACKBERRIES WITH POTENTIAL TOPICAL ANTI-INFLAMMATORY ACTION

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The fruits of *Morus nigra* (blackberry) were considered as a medicine for mouth problems since blackberry juice, which is sweet and slightly acidic, has astringent, anti-inflammatory and antiseptic effects. The objectives of the present work are the preformulation and preparation of a gel (pharmaceutical form) with blackberry juice and the in vivo determination of its antiinflammatory activity. The gel was prepared with carbopol 940 and blackberry juice (8%). Physical appearance, stability, extensibility and PH were evaluated. Anti-inflammatory activity was assessed using the model of induction of carrageenan plantar edema in Wistar rats. The results showed that the gel formulation did not show changes in physical appearance, extensibility and stability for 40 days compared to the control (base gel). The appearance was bright and dark purple, due to the color of the extract. The pH was between 5.5 and 6.5, it being suitable for topical use since it is similar to the normal pH of the skin. Topical anti-inflammatory activity in rats reveals tha, mulberry juice inhibited local inflammation of the paw for a period of 3 hours post-treatment, reaching maximum anti-inflammatory activityat 90 min (85.71%).
In conclusion, these results suggest the viability of the topical formulation of *Morus nigra* fruit gel for its potential medicinal application as a topical anti-inflammatory product.

A68
EVALUATION OF ANTIOXIDANT ACTIVITY AND PRELIMINARY PHYTOCHEMISTRY OF *Clinopodium gilliesii* (muña muña)

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The proliferation of free radicals in the human body induces oxidative damages that generate various anomalies in the organism. Currently, the search for molecules with antioxidant characteristics is increasing and plants represent one of the main sources of these compounds. The objective of the present work was to evaluate the total antioxidant activity and the preliminary phytochemical study of *Clinopodium gilliesii* (muña muña). Aqueous (EA) and ethanolic (EE) extracts were obtained from aerial parts of muña muña, phytochemical screening was performed and phenols and total flavonoids were quantified. Antioxidant activity was evaluated by the DPPH (2,2-diphenyl-1-picrylhydrazyl) depuration method and inhibition of lipid peroxidation (ß-carotene-linoleic acid method). The alcoholic (EE) and aqueous (EA) extracts showed important antioxidant activity with values higher than 90% (from 400µg/ml) in both methods and similar to the positive patterns, BHT(butylhydroxytoluene) and quercetin. Likewise, a direct proportional relationship was observed between the concentration of total phenols present in the extracts and the antioxidant activity exhibited. The phytochemical study of ethanolic (EE) and aqueous (EA) extracts of *C. gilliesii* revealed the presence of triterpenes, sterols, reducing compounds, alkaloids, tannins, polysaccharides and coumarins as major phyto-constituents. The *C. gilliesii* species is a promising and important source of secondary metabolites with antioxidant capacity. Therefore, further studies are needed to ensure their safety, identify active substances and integrate them into primary health care programs.

A69
ANTIOXIDANT ACTIVITY AND COMPOSITION OF TRADITIONAL EXTRACTS FROM *Senecio nutans* SCH. BIP

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Senecio nutans Sch. Bip., popularly known as "chachacoma", is a species belonging to the Asteraceae family used in traditional Andean medicine. It is sold in regional markets and herbalists of the NOA region; prepared as infusion or decoction, *S. nutans* is used to treat altitude and digestive sickness. The aim of this work was to evaluate the phenolic compounds content and the *in vitro* antioxidant activity of extracts from *S. nutans* obtained by traditional methods.
S. nutans was collected in Huaca Huasi at 4330 masl (Cumbres Calchaquíes, Tucumán). Extracts were obtained as infusion (I), decoction (D) with destilled water, and the hydroalcoholic extract by maceration with 70% ethanol (EE). Total phenols (TP), flavonoids (TF), hydroxycylamic acids (THA) and ortho-dihydroxyphenols (ODPT) contents were determined by spectrophotometric methods. Antioxidant activity, ABTS radical scavenging and reducing capacity of iron and molybdenum were evaluated. EE showed the highest content of TP, TF, THA and ODPT. Both aqueous extracts present similar chemistry profiles but lower than EE. EE was the most effective antioxidant extract according to the three methods above whereas I and D showed a slightly lower antioxidant activity. The extracts exhibited an antioxidant capacity associated with their content of different phenolic compounds.*S. nutans* is used as an infusion or decoction, so it is important to highlight the activity observed for its validation in traditional medicine.

A70
ANTIOXIDANT, ANTIINFLAMMATORY AND HEMATOPROTECTIVE ACTIVITY OF *Lepidium didymum* "QUIMPE" INFUSION

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Lepidium didymum L, a species belonging to the Brassicaceae family, is a cosmopolitan weed with several uses in popular medicine. Prepared as an infusion, it is used for its digestive properties, and also to treat hemorrhoids, gangrene, scurvy, high fever, ulcers and against oropharyngeal diseases. The aim of this work was to evaluate the *in vitro* effect of quimpe infusions on hematoprotective components as well as its antioxidant activity and antiinflammatory effect. We worked with a commercial sample obtained from a herbalist shop in San Miguel de Tucumán and a sample collected from a field in Salta (Argentina). The infusions were prepared with 10g of vegetal material and 100mL of boiling distilled water. The preparations were lyophilized. The content of phenolic compounds was determined by photocolorimetric reactions. Antioxidant activity was evaluated by purification of free radicals and by metal reduction capacity. Human blood from healthy volunteers was used to evaluate hemolytic, coagulolytic and protective effect on red blood cells against hydrogen peroxide. Antiinflammatory activity was assessed by measuring the complement system inhibition. Both Infusions showed low antioxidant activity but inhibited 75.5% and 74.5% of complement system activity, respectively. Both extracts exhibited high erythrocyte protective activity against hydrogen peroxide and were effective in coagulolytic activity tests, exhibiting 26% and 17% reduction in clot size in both samples. No toxic-lytic effect was observed against human red cells. This work is a contribution to the search for new medicinal plant species with potentially beneficial effects on several blood components.

A71
USE OF PHARMACO-MODULATION STRATEGIES IN THE SEARCH OF 1,8-CINEOL DERIVATIVES WITH HIGHER LEISHMANICIDAL ACTIVITY

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1,8-cineol, also known as eucalyptol, is a monoterpene widely distributed in nature. It is present in more than 200 pharmaceutical formulations due to its decongestant, antitussive, antiinflammatory and antiparasitic properties. In previous works we described the leishmanicidal activity of 9-hydroxycineol (1) with encouraging results. In this work, in order to favorably modify the biological activity of 1, the synthesis of a homologous series of 9-hydroxycinineol with saturated monocarboxylic acids (C2→C9) was carried out, using homology as a pharmacomodulation strategy for the structural optimization of the lead compound. *In vitro* leishmanicidal effects on promastigotes and intracellular amastigotes of *Leishmania infantum* and *L. donovani* were also studied. The antiparasitic activity assays showed that the increase in the carbon chain length of the homologous esters synthesized caused reduction of 70-80% in the multiplication of promastigotes. Against intracellular amastigotes, most compunds managed to eliminate almost all of parasites, probably due to the

increased lipophilicity of these derivatives. Thus, the use of homology as a modulation strategy was very useful for the design and synthesis of 1,8-cineol derivatives with improved bioogical activity and bioavailability, this being a convenient alternative for the obtainment of new leishmanicidal agents.

A72
PHYTOCHEMICAL EXPLORATION OF ANALGESIC AND ANTIOXIDANT MOLECULES OF ETHANOLIC EXTRACT OF FRUITS OF *Ziziphus mistol*

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The fruit of *Ziziphus mistol* (mistol) has been widely used for its culinary and medicinal properties since precolumbian times. Its use extends to different areas of our country, mainly in the Northwestern region. The objective of the present work was to perform a bioguided fractionation by the analgesic and antioxidant properties of the ethanolic extract of mistol fruits. Phytochemical screening of the extract was performed using staining or precipitation reactions to determine the presence or absence of phytoconstituents. Chemical fractionation was performed by column chromatography using CH_2CL_2 and MeOH solvents of increasing polarity. The antioxidant and antinociceptive capacity of the fractions obtained were analyzed by the DPPH depuration method and the acetic acid induced abdominal contortion method in rats respectively. Phytochemical screening results revealed the presence of reducing compounds, proanthocyanidins, coumarins, flavonoids, sterols, triterpenes and anthocyanins as major phytochemicals. Five fractions were obtained, fraction 2 (CH_2CL_2: MeOH 10%) showed an important antinociceptive activity against the pain generated by the chemical stimulus by inhibiting the abdominal contortions induced by acetic acid by 85%. Fraction 5 (100% MeOH) showed significant antioxidant activity.
From the obtained results we can conclude that fractions 2 and 5, which preserve the pharmacological activities of extract, are the target of future chemical studies to identify the chemical compounds responsible for these activities.

A73
ISOLATION AND IDENTIFICATION OF AN ANTIFUNGAL METABOLITE FROM *Tessaria dodoneifolia*

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Most fungal infections in humans are due to *Candida albicans* strains. *Tessaria dodoneifolia* (Td), a species with antifungal folk uses, is a potential source of natural antifungal compounds. An ethanolic extract was obtained from Td leaves, and fractionated by with solvents of increased polarity, adsorption chromatography and HPLC, to yield an antifungal compound identified as Naringenin (NAR) through NMR and polarimetric assays. Antifungal activity against *C. albicans* (ATCC10231) was evaluated to obtain minimal inhibitory concentrations (MIC) and fractional inhibitory concentration index (FICI) for NAR and fluconazole (FLU) (alone and combined) by microdilution assay. The MIC for NAR (without FLU) was 40mg/L and the FICI=0.258, which indicated synergistic effect between NAR and FLU. NAR + FLU resulted in a fungicidal combination. These results support the ethnomedicinal applications described for Td.

A74
HYPOLIPIDEMIC POTENTIAL OF *Sorocea bonplandii* AQUEOUS EXTRACT IN AGED RATS

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Hyperlipidemia is one of the main complications associated with aging. Elevated levels of plasma cholesterol (TC), particular ly LDL-cholesterol (LDL-c) and triglycerides (TG), are known to be associated with an enhanced risk of atherosclerosis and coronary heart disease. The aim of this study was to determine if the aqueous leaf extract of *S. bonplandii* leaves has hypolipidemic properties in rodents. In order to determine the activity and the effective dose of two 10% aqueous extracts (infusion and decoction), normal Wistar rats were orally administered with 72mg/kg bw and 140mg/kg bw of both extracts for 30 days (n=4 rats/group). Rosuvastatin (1 mg/kg bw) was used as a positive control. Administration of low and high doses of *S. bonplandii* decoction caused a significant decrease in plasma levels of TG, TC and LDL-c ($p<0.05$) after 30 days of treatment. Groups treated with *S. bonplandii* infusion or vehicle did not show any effect on lipid profile. In a second study, groups of 30 weeks aged rats (n=5 rats/group) were given daily oral doses of 140mg/kg of *S. bonplandii* decoction for 30 days. The administration of the extract did not produce significant changes in water or food intake, body weight or adipose tissue ($p>0.05$). However, it reduced TG, LDL-c, VLDL-c levels and liver weight in treated animals ($p<0.05$). The atherogenic index also decreased significantly in the treated rats compared to the control group ($p<0.05$). Preliminary phytochemical screening revealed the

presence of chlorogenic acid as a major component of *S. bonplandii* leaves. The present study highlighted the potentially beneficial effect of the aqueous extract of *S. bonplandii* on lipid metabolism.

A75
EFFECTS OF *Capparis atamisquea* LEAF EXTRACTS ON GASTRIC EMPTYING. *IN VIVO* ASSAYS

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Atamisqui (*Capparis atamisquea* Kuntze) is an autochthonous plant widely distributed in Chile and northwest Argentina, where traditional medicine attributes different digestive properties to it. Gastric emptying delay has its origin in a motor disorder, anthric stenosis, or diabetic neuropathy gastroparesis, the search for more effective and safe prokinetic drugs being a current pharmacological challenge. The aim of the present study was to evaluate the effect of *C. atamisquea* leaves 5% infusion (I) and 10% hydroalcoholic extract in 70º ethanol (EHA) on *in vivo* gastric emptying. Also, qualitative and quantitative phytochemical studies of the extracts were carried out, phenolics and flavonoids being the main constituents. A gastric emptying test was performed on male Wistar rats using 0.05% (w/v) Phenol Red dye marker. The animal groups (n = 6) were: 1-negative control, 2 and 3: positive controls (Metoclopramide 3mg/kg orally and Cinitapride, 1mg/kg orally) 4 and 5: treated respectively with I and EHA (150mg/kg orally). An *in vivo* blockade using atropine (3mg/kg subcutaneous route) was performed to study the involvement of the cholinergic pathway in the observed effect. Both extracts significantly accelerated gastric emptying ($p \leq 0.05$) in comparison to the negative control. In addition, this effect was blocked by atropine pretreatment. Therefore, these results suggest that Atamisqui leaf extracts have a gastric prokinetic effect and that the cholinergic route would be involved. Additional studies will be needed to determine the active principle (s) and to know more about the underlying mechanisms of the above effects.

A76
ANTIOXIDANT EFFECT OF *Vaccinium myrtillus* L. STEM EXTRACTS ON GASTRIC MUCOSAL LESIONS IN RATS

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The role of oxygen derived free radicals in the development of acute experimental gastric lesions induced by ethanol is well-known. In previous studies we demonstrated that the stem of *Vaccinium myrtillus L.* (*Vm*) presents a promising gastroprotective effect against ethanol damage. The present study was designed to evaluate the antioxidant effect of acetone (EA) and ethanolic (EE) extracts of *Vm* stems on an induced gastric ulceration model in rats. Phytochemical analyses of the extracts were carried out. Dry stems were macerated with acetone: water (70:30) and ethanol (70%), in both cases at 10% (w/v). *In vivo* assays were performed in four groups of six rats each that were given ethanol as an oral inducer of gastric ulcers. The treated group previously received EA and EE (150mg/kg, respectively) while the positive control received sucralfate (100mg/kg). Mucus content and ulceration parameters were determined and histological studies were performed. Glutathione metabolism, lipid peroxidation markers and catalase enzyme activity were evaluated. The phytochemical screening of the extracts showed the presence of phenolic compounds, mainly flavonoids and tannins. EA treatment reduced the number, severity and percentage of ulceration, preserving the mucus content. It also produced an increase in catalase activity and reduced levels of glutathione and malondialdehyde in stomach homogenates, showing protection of the gastric mucosa against oxidative stress. These findings suggest that the gastroprotective effect of the EA of *Vm* stems could be related to its antioxidant potential.

A77
EVALUATION OF THE EFFECT OF *Geoffroea decorticans* FRUIT EXTRACTS ON *Xenopus laevis* EMBRYOS

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In recent years the study of natural compounds found in plants has gained importance. These compounds promise to be a huge source of regulators of different signaling pathways such as wnt/β-catenin. *Xenopus* embryos are a very efficient model to analyze the role of these compounds. In this work fruits of *Geoffroea decorticans* were used to obtain an aqueous extract (EA) whose content of total phenolic compounds determined by the Folin-Ciocalteu method was 3.24mg EAG/g and that of flavonoids 0.133mg EQ/g. An EA acid hydrolysis was performed and a subsequent extraction with $CHCl_3$ and AcOEt, chloroform extract (EC) and ethyl acetate extract (EAc) being obtained. *Xenopus* embryos were treated with different concentrations of the extracts from stage 3 to stage 10.5 and then allowed to develop until stage 32. Treatments with EA (10, 20 and 30mg/mL), EC and EAc (1mg/mL) led to an abnormal development of 10, 47 and

84% of the embryos respectively with ventralized phenotypes. On the other hand, the wnt/β-catenin pathway was activated using LiCl, which produces dorsoanteriorized phenotypes. The embryos were incubated with EA until stage 6, treated with LiCl for 10 minutes, then incubated again with EA until stage 10.5 and allowed to develop to stage 32. The observed phenotypes were classified according to the dorso-anterior index (DAI). A higher DAI indicates a higher rate of dorsoanteriorized embryos. Embryos treated with LiCl showed DAI=10 while embryos treated with LiCl and EA demonstrated a significant DAI decrease (DAI=6.09). These results showed that *Geoffroea decorticans* extracts produce morphological phenotypes compatible with wnt/β-catenin signaling pathway inhibition.

A78
RELATIONSHIP BETWEEN THE GLOBIN BETA GENE AND THE REDOX BALANCE

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Oxidative damage plays a crucial role in the pathophysiology of anemia in patients with beta thalassemic trait (RBT). **Objectives**: To evaluate the influence of oxidative stress and cytoprotective gene expression in relation to frequent mutations present in RBT individuals. **Methodology**: We analyzed 85 individuals with RBT and 95 normal ones at the Institute of Applied Biochemistry of the UNT from September 2013 to July 2017. The molecular characterization of RBT involved the detection of the following mutations: Cd39, IVSI-1, IVISI -110 and IVISI-6. Systemic catalase (Göth technique), reactive thiobarbituric acid species (TBARS) (Beuge and Aust technique) and gene expression of cytoprotective enzymes catalase (CAT) and superoxide dismutase (SOD) were evaluated by real time RetroTranscription-PCR. **Results:** The most frequent mutations detected were Cd39 and IVSI-1 (27% and 33%, respectively). The IVSI-110 and IVSI-1 groups showed significantly higher levels of systemic catalase than the control group (catalysis MU / L: IVSI-110 = 108 ± 39, IVSI-1 = 116 ± 44, control = 93 ± 22). Lipid peroxidation and expression levels of CAT and SOD were similar in all groups evaluated. **Conclusion**: The results suggest a different behavior of the redox balance in the groups that presented the IVSI-110 and IVSI-1 mutations, evidenced by the higher levels of systemic catalase detected. The slight variations observed in the expression of the cytoprotective enzymes constitute a promising preliminary finding to continue the study of oxidative stress in this pathology.

A79
ISOLATION AND CHARACTERIZATION OF PLANT GROWTH PROMOTING BACTERIA FROM SUGAR CANE AND EVALUATION OF THEIR ABILITY TO IMPROVE CROP GROWTH

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Biofertilizers constituted by plant growth promoting bacteria are an environmental and economical alternative for the agronomic management of sugarcane. The objective of this work was the isolation, selection and identification of rhizosphere and endophytic strains, homologous to sugarcane, and the evaluation of their ability to stimulate growth in this crop. Using selective culture media, strains of *Herbaspirillum*, *Gluconacetobacter* and *Azospirillum* genera were isolated and selected by *nif*D gene amplification and indole acetic acid production. With the selected strains *Azospirillum* (FRI3), *Herbaspirillum* (MRE) and *Gluconacetobacter* (MTS) and with a mixture of the three strains together (FRI3 + MRE + MTS), greenhouse bioassays were carried out, where sanitized sugar cane buds of LCP 85-384 variety were bacterial inoculated by immersion. Then, buds were planted in 25 well trays with a mixture of substrate, sand and perlome (3:2:1) and watered periodically with tap water. The experimental design was randomized with three replicates of 25 seedlings each. 30 days after inoculation, height and number of green leaves (phenological state) were evaluated. As a result, it was observed that height and number of leaves of FRI3 inoculated plantlets were significantly higher than the uninoculated control. In the rest of the treatments, there were also an increase in comparison with control plants, but these differences were not statistically significant. In conclusion, the strain *Azospirillum* FRI3 could be used as a potential biofertilizer for the cultivation of sugar cane.

A80
EVALUATION OF GREEN CANE SYSTEM ON SOIL MICROBIAL POPULATIONS AND THEIR MAIN METABOLIC ACTIVITIES

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In the green cane harvest system, large amounts of crop residue (RAC) are left on the ground. RAC can be left as a cover, mixed with the first centimeters of the profile or burned. In this work we evaluated the effect of different RAC management systems on microbial populations and their metabolic activities, before (July) and after harvest (September). The experiment was carried out in Simoca, with

LCP 85-384 variety. Soil samples (0-10 cm) were taken from plots: a) without RAC (post-harvest burning) (RQ); b) with RAC as a cover (RC) and c) with incorporated RAC (RI), and selective culture media were used to count total mesophiles (LB), fungi and yeasts (APG), *Pseudomonas* (AC) and nitrogen fixing bacteria (NFb). In addition, we analyzed total enzymatic activity with fluorescein diacetate (FDA) and nitrate reductase (NR) activity. The assay was randomized with 3 replicates. Before and after harvest, RQ plots showed less FDA and NR activity in comparison with RC and RI treatments, although no differences were observed in the counts of different microorganisms. After harvesting, a comparison of treatments showed that all of them caused a significant decrease in NR and FDA activity, especially RQ plots in which no NR activity was detected, and also showed a significant decrease in nitrogen fixing bacteria. RAC conservation contributes to improved soil functionality, while burning it affects both enzymatic activities and beneficial microorganism populations.

A81
Amorphophallus konjac (ARACEAE) SPONTANEOUS ASIAN PLANT IN JUJUY - ARGENTINA

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Amorphophallus konjac Koch (Araceae) is a plant native to Southeast Asia, Japan, China and South of Indonesia whose tuber is used in Japan and Korea as a diet food due to its high content of glucomannan (a no calorie polysaccharide with high fiber contents). The aim of this work was to report for the first time in Jujuy and Argentina the presence of Amorphophallus konjac and describe it. The key for flowering plant identification (Hutchinson, 1982) was used and a specimen was deposited in the JUA Herbarium. Description: Herbaceous plant, well developed underground tuber. Large leaves, tripartite, up to 1 m in diameter and very split segments; petioles with brown and white macules. Unpleasant odor inflorescence composed of a petaloide spathe, wavy blade, internally purple and externally brownish green, 47 x 30 cm; pedicel of 70 x 5 cm. Spike 90 cm long, with numerous diclinous monoecius aperianth flowers, male flowers with 3 stamens; female flowers with ovary 2-locular, ribs 1-ovulated, subnull style, discoid stigma, located at the base of a purple shaft, sterile distal portion. Fruit, furrowed globose berry, 2 seeds. The presence of spontaneous *Amorphophallus konjac* is registered for the first time in the province of Jujuy and Argentina.

A82
MANDIBULAR CONDYLE BONE MARROW FAT AND ITS RELATIONSHIP WITH LONGITUDINAL GROWTH AND BONE MICROARCHITECTURE OF THE CONDILAR PROCESS

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We analyzed the growth of the mandibular condylar process and bone microarchitecture parameters in relation to bone marrow fat content in a protein restriction model in growing rats. Wistar rats aged 21 days were assigned to one of the following groups: control (Diet 21% protein), and malnourished (Diet 3.5% protein). The animals were sacrificed 35 days after the beginning of the experiment. Mandibles were resected, fixed in 10% formalin, hemisected at the symphysis, and then radiographed. Mandibles were then processed for light microscopy, stained with H&E and histomorphometric determinations were performed on histologic sections of the condylar process subchondral bone. The following parameters were determined in radiographs: Length of condylar process (LPC); and in histological sections: (a) Number of adipocytes per mm2 (NA), (b) Percentage of adipocytes per tissue volume (PA). (c) Bone volume (BV/TV), (d) Trabecular thickness (Tb.Th) (e) Trabecular number (Tb.N) (d) Trabecular separation (Tb.Sp). Statistical analysis was performed using the Mann Withney test. Results: LPC were significantly lower in malnourished group. No adipocytes were observed in the histological sections of the control group. The histomorphometric analysis showed that in the malnourished group the NA was 4.17 adipocytes / mm2 and BV/TV, Tb.Th and Tb.N were significantly lower with respect to the control group, whereas Tb.Sp was significantly higher ($p < 0.05$). These results suggest that increased bone marrow is related to bone growth arrest and microarchitecture of the mandibular condyle with a likely negative impact on facial development.
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A83
NUTRITIONAL STATUS IN SPECIES OF CHRYSOPIDAE (INSECTA: NEUROPTERA)

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Chrysopidae constitute one of the most representative families within the order Neuroptera. In their larval phase these insects are active predators of small phytophagous arthropods present in crops, ornamental plants and vegetation of natural environments. *Chrysoperla* and *Ceraeochrysa* are the most abundant genera in Argentina. To date there are no studies that provide information on nutritional quantification

of these insects at their different biological stages., The present work aims to characterize the nutritional status of four species of Neuroptera, considering the importance of the group as entomophages. Adult individuals were collected on the field and bred in the laboratory under controlled conditions of temperature and relative humidity. Adults were fed with a mixture of honey:pollen:water (1:1:2) and larvae with whitefly adults and nymphs. Biochemical analyses consisting in the determination of carbohydrates, glycogen, lipids (Van Handel's method) and proteins (Bradford's method) were performed on larvae and adults of *Chrysoperla argentina* and *Ceraeochrysa claveri*; and adults of *Ceraeochrysa cornuta* and *Chrysoperla asoralis* Results showed a significantly higher amount of carbohydrates, glycogen, lipids and proteins in *C. argentina*. In addition, a tendency towards a greater amount of these components was observed in adults with respect to larvae and in females with respect to males. The analysis of these components for these species is presented for the first time as a basis to explore nutritional requirements that contribute to the formulation of artificial diets that facilitate the mass rearing of these insects to be applied in biological control programs.

A84
SEMINAL STRUCTURE AND EFFECT OF EXPOSURE TO HIGH TEMPERATURES IN TWO SPECIES OF *Flaveria* (ASTERACEAE)

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Flaveria bidentis and *F. haumanii* are native annual weeds, considered as crop weeds. The aim of this work was to characterize their seminal structure and to evaluate the effect of their exposure to high temperatures. The material was collected in Santiago del Estero. The seeds were subjected to conventional anatomical techniques and exposed to temperatures of 80°C, 100°C, 120°C, 140°C, 160°C, 180°C and 200°C for 5 '/10'; the control was not exposed to high temperatures. Both taxa have seed adnata to the fruit (achene). The morpho-anatomy is similar in both species. The achene are oblong, black, with ribs, glabrous and ornate In cross-section the epidermis unistrata, 2-4 layers of parenchyma cells, interrupted by macrosclereids in columns, a layer of brachyclereid was observed. The seeds presented unistrata epidermis composed of macrosclereids, 1-3 layers of parenchyma, cotyledons with lipids. The highest percentage of germination was observed in the control and the treatment at 80°C for 5' and 10'. In both species, the control showed percentage of germination ≥ 90% while at 80°C it was in *F. bidentis* 91% and in *F. haumanii* 80%. At 100ºC and 140°C for 5 'and 10' percentages fluctuated in F. bidentis and F. haumanii (88-66% and 59-37%respectively). *F. bidentis* at 160°C and 180°C recorded 56.5% and 32% of germinated seeds at both exposure times. At 5' exposure time, the highest percentages of germination in the two species were observed. *F. bidentis* was the most resistant species to the high temperatures although no structural differences were observed in the analyzed species; it is probable that the fruit is strongly adhered to the seed, giving it greater protection.

A85
INDUCTION OF A DEFENSE RESPONSE AGAINST *Colletotrichum acutatum* IN STRAWBERRY PLANTS IN RESPONSE TO TREATMENT WITH BRASSINOSTEROIDS

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Brassinosteroids (BRs) are steroidal compounds that are essential for plant growth and development. It was shown that exogenous applications of BRs induce protection against different pathogens and can give plants tolerance/resistance to different abiotic stresses.The aim of this work was to verify the protective effect of treatment with 24-epibrasinolide (EP24) and a formulation based on a brassinosteroids spirostanic analog DI-31 (BB16) on strawberry plants against the pathogen *C. acutatum*, the causal agent of anthracnose disease, and to study the different biochemical markers involved in the defense response induced by BRs. Results obtained showed that both BRs analogs induced a defense response in strawberry plants against the fungal pathogen *C. acutatum* (M11), they being more effective at the lower concentration in both BRs (0.1 mg/l), although BB16 exhibited a stronger effect than EP24. The biochemical defense markers evaluated were lignin deposition (phloroglucinol test was used), nitric oxide (NO) accumulation (analyzed in cell suspension by fluorometry with the fluorescent probe DAF-FM-DA), stomatal closure and accumulation of calcium oxalate crystals (by microscopic observations). Results showed that plants treated with both BRs evidenced a noticeable lignin deposition in the xylem, accumulation of NO and calcium oxalate crystals. However, stomatal closure was only observed in plants treated with BB16. These outcomes suggest that BRs can be used for the activation of innate immunity in strawberry plants as a new and safer strategy, alternative to agrochemicals, for crop sanitation management.

A86
EFFECT OF HARVEST TIME ON SENSITIVITY TO COLD IN LEMONS

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The aim of this work was to analyze the influence of the harvest time of lemon (*Citrus lemon*) on fruit damage subjected to a quarantine cold treatment, according to the protocol agreed with Japan. Packaged lemons from a commercial plant in the province of Tucumán were used. Sampling was made on June 19, July 3 and July 18, 2017, assays 1, 2 and 3, respectively. The packed lemons were conditioned at 1.7°C for 21 days, then at 7°C for 7 days and finally at room temperature for 2 days, simulating the conditions established in the export protocol to Japan. The following variables were analyzed: weight loss of the lemon boxes, fresh and dry weight of the fruit flavedo and the percentage of external damage caused by cold. Assay 1 boxes presented a 7.0% decrease in weight, while in assays 2 and 3 the percentage was higher, 8.2 and 9.3%, respectively. Dry matter content in the flavedo decreased significantly (17%) between assays 1 and 3. The cold damage increased proportionally with the sampling dates, it being lower in assay 1 (2.5%) than in assay 3 (13.0%). These results showed a greater sensitivity to the cold as the harvest season progressed. At present the industrial parameters of the three assays are being evaluated. From the information obtained it is proposed to adjust the time of export of fruit requiring quarantine cold treatments in order to reduce the risk of losses due to this factor.

A87
KARYOLOGICAL STUDIES IN *Borreria spinosa* (L.) CHAM & SCHLTDL

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Borreria G. Mey. (Rubiaceae-Spermacoceae) has about 100 species, distributed in tropical and subtropical regions of America, Africa, Asia and Australia. In Argentina 18 species are recorded among which is *Borreria spinosa*, a perennial plant native to the NOA, NEA and Centro regions. It is an undergrowth of summer crops mentioned as tolerant to glyphosate. Few investigations have been conducted to determine the chromosome morphology of *Borreria*. Cytological studies cited as basic numbers for Spermacoceae x = 11, 14 or 20, so the aim of this work was to determine the sporophytic number, ploidy level and idiogram in *B. spinosa*. The seeds were collected in El Zanjón (Capital Department, Santiago del Estero Province). Germination assays was carried out in a growth chamber at 35ºC and 12 hours of light. The radicles obtained were pretreated with 8-hydroxyquinoline 0.002M for 8 hours, fixed in Farmer and kept in 70% ethyl alcohol. Mounting and staining were carried out with conventional cytological techniques. *B. spinosa* had a sporophitic number 2n = 56 chromosomes with a karyotype formula of 23m + 5sm; total average length varied between 1.81 and 2.7µm. The presence of satellites in the long arms was observed in the first metacentric chromosome pair. The intra- and inter-chromosomal asymmetry index presented values A1 = 0.22 and A2= 0.13. Considering x = 14 as the basic chromosome number, this species would be tetraploid. The cytogenetic data recorded in this work are novel for the species, as well as its cariotypical formula.

A88
RELATIONSHIP BETWEEN SLEEP DEFICIT AND METABOLISM IN TYPE 2 DIABETIC PATIENTS

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Epidemiological studies associate obesity, diabetes, and cardiovascular disease with deficient rest. Type 2 diabetic patients (DM2) suffer from sleep problems due to risk factors. In addition, due to social jetlag, they accumulate a deficit of hours of rest that they compensate by sleeping on weekends. The aim of this study is to determine if rest deficit affects the metabolism of DM2 patients. A total of 175 DM2 patients (40-80 years), 52 men and 123 women, participated in the study. They were surveyed to determine their rest deficit. Fasting glycemia (FG), glycosylated hemoglobin A1c (HbA1c), triglycerides (TG), total cholesterol (TC), low and high density lipoproteins (LDL and HDL) were analyzed from their medical records. We performed GLMM and Test of Means (LSD) for a level of significance of $p < 0.05$. It was observed that sleep deficiency mainly affected metabolism in diabetic women significantly compared to diabetic women with normal rest, with increases in FG values (146 vs 133mg/dL), HbA1c (8.19 vs 7.66%) and LDL (127.3 vs 120mg/dL). Conversely, in men, significant decreases were observed in TC (167 vs 191mg / dL) and Hb1Ac (7.14 vs 7.59%). The biological clock regulates both sleep cycle and metabolism. Their period varies according to sex, in women being slightly shorter than 24 hours. This makes the circadian system less flexible, with more difficulty in covering sleep deficit, favoring the metabolic deterioration of female DM2 patients. Evidence of this relationship suggests the need to implement healthy sleep guidelines.

A89
CHARACTERIZATION OF THE INTERACTION OF MODIFIABLE RISK FACTORS AND CARDIOVASCULAR RISK IN DIABETIC PATIENTS IN THE PROVINCE OF JUJUY

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Noncommunicable diseases (NCDs) are pathologies resulting from the combination of genetic, physiological, behavioral and environmental factors. The four main NCDs types are cardiovascular disease (CVD), diabetes, chronic respiratory disease and cancer. At present, smoking (S), low consumption of vegetables (LCV) and sedentary lifestyle (SL) are considered modifiable risk factors (MRF). Their combination define patterns of behavior that affect development and / or death by an NCD. It is important to follow these factors in diabetic patients for the interpretation of the evolution of the pathology. Therefore, the objective of this work was to characterize a population of type 2 diabetic patients from the province of Jujuy based on the interaction of MRF and its effect on cardiovascular risk (CR). The sample consisted of 169 patients, 50 men and 119 women, (40-85 years of age). They were surveyed to characterize the presence of MRF (LCV, SL and S). From their medical records, we analyzed Body Mass Index (BMI) and systolic blood pressure to determine CR based on the WHO CR charts for the Americas subregion B. Data were analyzed using descriptive statistics (mean and SD). There were differences in CR according to sex (men 32.1 vs women 18.2%). Likewise, CR increases with age. On the other hand, considering the MRF, the effect of the SL on the CR increased according to age; however, the vast majority of patients (94%) report adequate consumption of vegetables and non-smoking habits (89%), so a protective effect on CR can be expected. We can conclude that the studied population showed a high degree of adherence to healthy habits with the exception of sedentarism, towards which prevention guidelines should be redirected.

A90
EVALUATION OF THE WELL-BEING OF PEOPLE ACCORDING TO SEASONAL PHOTOPERIODS IN JUJUY PROVINCE

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Light is the main environmental stimulus involved in the synchronization of biological rhythms in mammals. The light/darkness cycles perceived by the retina synchronize the neural activity of the suprachiasmatic nuclei, which in turn synchronize the rhythmic production and secretion of melatonin from the pineal gland that acts as a neuroendocrine transducer, acting on the health and well-being of people. Jujuy is divided into four regions: yungas, valleys, quebrada and puna, with a variety of ecosystems, due to the seasonal variation of the photoperiod, could affect well-being in people. The aim of this work was to study the interaction of environmental factors with the well-being of people based on differences in photoperiod according to region and time of the year (seasonal). In different representative localities light intensity and photoperiod were measured, and seasonal curves of light were drawn. WHOQOL-BREF were carried out on local people to determine their well-being according to the seasons. Differences were obtained in the ANOVA ($n = 20$) at $\alpha = 0.10$ for the variable Physical Health between the Summer-Winter seasons, but not for the variables Psychological Health, Social Relations and Environment. Increasing the size of the sample could show statistically significant differences. The trend shows that the values of all the studied variables decrease towards the winter solstice, and increase towards the summer solstice, a trend that agrees with the expected chronobiological models. The results help to deepen the understanding of the direct biological influences of optical radiation on human populations.

A91
DIFFERENCES BETWEEN CALCULATED AND REAL PHOTOPERIOD AND ITS IMPORTANCE IN CHRONOBIOLOGY

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The field of chronobiology showed that light is the main environmental stimulus that regulates the synchronization of circadian rhythms in mammals, determining their physiology. This work is a part of the institutional project (F/B042 Secter) that studies the interaction of environmental factors with melatonin production in the province of Jujuy, from differences in solar radiation according to altitude, latitude and time of the year, in order to investigate the relationship between light, health and well-being. The aim of this study was to determine the relationship between calculated and measured photoperiod in order to further investigate its influence on neuroendocrine processes. Photoperiods can be calculated for a given latitude and time of the year, or measured (real photoperiod) using a lux meter. The photoperiod was calculated for two ecoregions: Valle and Puna. San Salvador de Jujuy (Lat 24º 10'S Long 65º 11'W 1302 asl) and Puesto del Marques

(Lat 22º 31'S Long 65º 42'W 3496 asl). The real photoperiod was measured with an EXTECH HD450 lux meter. There is a variation between these values of the variable. From the statistical analysis, a difference of 3.2% was determined, the measured photoperiod being higher by approximately 23 minutes due to the fact that the civil twilight (6º below the horizon) was used, which omits a portion of crepuscular light that the organisms receive, an index of 1.032 being obtained for the calculation of the real photoperiod from the estimated one. These results allow inferences to be made in various physiological studies.

A92
DETERMINATION OF LIGHT INTENSITY AS AN ALTERNATIVE TO THE HELIOPHANIA REGISTER IN CHRONOBIOLOGICAL STUDIES

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This study is part of the major institutional project (Cod. F / B042 SeCTER) that studies the interaction of environmental factors with melatonin production in the province of Jujuy through differences in solar radiation according to altitude, latitude and time of year in order to determine the relationship between light, health and well-being of people. The chronobiology field have shown that light is the main environmental stimulus that synchronizes circadian rhythms in mammals, determining their physiology. Three aspects related to radiation were studied: photoperiod, heliophania and light intensity. The last two can be related by means of an intensity value, above which the heliophania registration can be carried out. The aim of this study was the determination of this value. No bibiliographical material exists on the subject. Light intensity measurements were made in the Augusto ROMAÍN Meteorological Station of the UNJu (Lat 24º10'S Long 65º11'W 1302 asl), in contrast to the records of heliophania, around the winter solstice, when solar radiation is lower. Statistical analysis of the data was obtained, with average values of 17.01 ± 3.52 kLux as a threshold for the registration of heliophilia, which results in a possible alternative for this last meteorological variable, which makes it a tool for eco-physiology studies. It is also important to study the cloudiness in the regulation of radiation, due to the convective movements of air, the presence of water vapor and the condensation and sublimation nuclei.

A93
INSECTS ASSOCIATED WITH TREES IN PUBLIC SPACES IN DIFFERENT LOCALITIES OF THE PROVINCE OF JUJUY

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Arthropods have been associated with humans since the beginning of history and are important components of anthropobiocenosis. Studies on domestic and peridomestic fauna are very scarce in comparison to wildlife and are targeted at particular groups of health or economic interest. Although there are precedents of investigations on urban and periurban arthropods in San Salvador de Jujuy, the study of the insects associated with trees in public spaces has not been approached until now. The objective of this work is to show the diversity of insects in the arboreal species representative of the trees in public spaces of four localities of the province of Jujuy. The data come from samples made in spring 2016 and autumn 2017 and consisted in aspiration for 5 minutes and cut off of 10 branches of three trees from the periphery and center of each locality (SS of Jujuy, San Pedro, El Carmen and Tilcara). Samples were labeled and taken to the laboratory for further separation and identification at the lowest possible taxonomic level. The orders of insects with their respective families/morphospecies numbers were: Thysanoptera (4/14); Neuroptera (2/3); Lepidoptera (4/7); Hymenoptera (15/86); Hemiptera(24/62); Diptera (10/73); Mantodea (1/1); Blattodea (1/1) and Coleoptera (13/53). Additional information is provided on distribution (urban, peri-urban and seasonality); host plant and trophic role. The results obtained will allow knowledge of harmful and beneficial insects, and of indicators of environmental disturbance.

A94
THRIPIDAE (INSECTA: THYSANOPTERA) FROM THE NORTHWEST OF ARGENTINA; NEW RECORDS FOR THE COUNTRY

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The Thripidae family occupies the second place in importance in the order Thysanoptera, after Phlaeothripidae. It comprises 2109 described species distributed into 289 genera, with representatives in different regions of the world. Many species have anthophilous habits, although a large proportion reproduce only in leaves, some are predators to other small arthropods and very few are associated with mosses. Most of the pest thrips and all vectors of *Tospovirus* are members of this family. Since the publication of the first catalog of Thysanoptera of Argentina in 1980, where 28 genera and 54 species of Thripidae were cited, contributions to the knowledge of this family have allowed an increase in its diversity to 34 genera and 65 species. The objective of the study is to present four new records of Thripidae for Argentina, belonging to the subfamilies Sericothripinae (*Neohydatothrips portoricensis* (Morgan) and *Neohydatothrips hemileucus* (Hood)) and Thripinae (*Chaetisothrips striatus* Hood, and *Scirtidothrips torquatus* Hood) collected in provinces of northwestern Argentina. The specimens studied come from specific samplings carried out in the provinces of Jujuy and Tucumán. The material was deposited in the Entomological Collection of the Institute of High Altitude Biology of the National University of Jujuy. Identification was made on the basis of microscopic preparations. Each treated species is accompanied by a brief diagnosis, collection data and photographic images of the external morphological characters that allowed its classification.

A95
DIVERSITY OF HYMENOPTERA (INSECTA) ON EDGES OF *Chrysanthemum morifolium* CROPS IN JUJUY (ARGENTINA)

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The objectives of this work were to know and analyze the diversity and abundance of the Hymenoptera families present in the spontaneous and wild vegetation of the edges of *Chrysanthemum* crops. The study was carried out in three farms of Las Pampitas (Jujuy) between August and November of 2016. Four Moericke traps of 1L were used, located in spontaneous and wild vegetation around the chrysanthemum plots (N total: 24) and active for four days. A total of 2136 hymenoptera were collected, out of which 904 corresponded to wild vegetation (VS) and 800 to spontaneous vegetation (VE). In the VS, 28 families were identified; the most abundant being Formicidae (23.12%), Ceraphronidae (10.84%), Platygastridae (7.96%) and Vespidae (.63%).In the VE, 23 families were recognized; the most abundant being Encyrtidae (65.88%), Scelionidae (7.38), Apidae (7.25%) and Halictidae (4.13%).The Bray Curtis index for the Hymenoptera of the VS shows that farms 2 and 3 are similar (0.64), but considering VE, similarity was established between farms 1 and 3 (0.59). The Shannon (H') and Simpson (S) indices indicate that there is a greater diversity of Hymenoptera in both VE and VS (VE: H' = 2.039 S = 0.7787; VS: H '= 2.832 S = 0.9185). The most diverse functional groups were parasitoids (SV = 61.28%, VE = 84.20%), followed by the varied feeding (23.12%) in VS and by pollinators (11.32%) in VE. The vegetation at the edges of the C*hrysanthemum* crops favors the maintenance of pollinators and natural pest controllers by acting as refuge sites during times of disturbance and application of agrochemicals.

A96
TEMPORARY VARIATION OF EPIGEUS ARTHROPODS IN THE PREPUNA JUJEÑA (ARGENTINA)

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The phylum Arthropoda contains functional groups that maintain diversity in ecosystems and many of them are sensitive to environmental changes.The objective of this study was to compare arthropod diversity, measured by richness of arthropod families, as well as their seasonal variation along an altitudinal gradient in Prepuna jujeña. Four seasonal samplings were performed (autumn, winter and spring of 2016 and summer of 2017) in Tumbaya, Chucalezna, Coraya and Tres Cruces, whose altitudes above sea level are respectively: 2156, 2787, 3069 and 3693. On each date 36 drop traps of 500ml were placed, with 50% of propylene glycol and 50% of water; active for three days. In each site, the traps were distributed in groups of three, separated from each other by 200m, the nine traps 20 meters away from each other. The collected material was preserved in bottles with 70% alcohol for identification by specific keys. The collected arthropods were 5347 distributed in the classes Insecta (4848), Collembola (395), Arachnida (69) and Malacostraca (35). In the sites of lower and

higher altitudes maximum (2000) and minimum (856) values of arthropod abundance were found, but in the intermediate sites, Coraya exceeded Chucalezna, registering 1542 and 910 individuals respectively. In the spring, 2684 arthropods were obtained and in winter, the smallest amount (745) was found. In all places, Formicidae was the dominant family. The information obtained will allow the identification of focal taxa that can be used in environmental impact assessments in the studied area of the province of Jujuy.

A97
PLANT GUIDE OF "EL MOLLAR", TAFÍ DEL VALLE, TUCUMÁN, ARGENTINA

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El Mollar, located in the department Tafí del Valle of the province of Tucumán, lies in the southern end of the Valleys Calchaquíes 2100 masl. The region has a particular topography, a valley delimited by mountain chains, so it presents a mainly temperate and humid climate in summer, with rainfalls and a marked thermal amplitude. The vegetation is represented by high-grasslands, accompanied by shrubbery mainly of molle and also groves of aliso and queñoa. The floristic inheritance constitutes a good part of the natural collection and is of interest to strengthen the cultural identity of a region. Its knowledge is fundamental to undertake conservation actions and environmental studies. This whole area represents a tourist center with marked population growth. The socio-economic structure, integrated by public and private sectors and the sector constituted by the original communities, inevitably entails a progressive deterioration of the natural environment. The objective of this work is to present a guide with the names of the botanical species that emerged from the surveys and collections carried out for the localities of El Potrerillo, El Rincón and Las Carreras from March 2014 to the present. Thirty-three families and one hundred species of wild plants are presented for the studied localities, along with morphological descriptions and geographical distribution data and illustrations of the most representative ones. The collected material that documents the work was incorporated into the collection of the Herbarium (LIL) and is a contribution to the floristic knowledge of an area subject to a remote and intense human activity.

A98
DESCRIPTION OF THE DIET OF *Asio stygius* (STYGIAN OWL). THE FIRST REGISTRATION IN THE BOTANICAL GARDEN OF THE FOUNDATION MIGUEL LILLO, TUCUMÁN, ARGENTINA

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Raptor birds are at the top level in the food chain so they are important for preserving the stability of the environment. The study of their diet serves not only to know what they eat, but also to demonstrate their role as natural biological controllers of the population growth of their prey. The Stygian owl (*Asio stygius*), is distributed from Colombia, southern Venezuela to northern Argentina. It lives in mountain forests, subtropical mountain forest, open wooded areas, plantations and Parks, between 700-3000 masl. It is solitary, nocturnal, and feeds mainly on birds and bats; during the day it rests on leafy trees. Its hunting strategy consists of moving from one perch to another, seeking to locate its prey. In August and September 2016, we observed for the first time the presence of a specimen of *A. stygius* in the Botanical Garden of the Miguel Lillo Foundation. Twenty pellets (alimentary bolus) were collected and food items were identified, weighed, measured and analyzed. The taxonomic determination was made to the maximum possible level. The food items found in the pellets were mostly birds of the order *Columbiformes* and *Passeriformes*. It was also possible to observe the presence of numerous seeds, which gives us an indication that, in this case, the most consumed items could be granivorous passeriform birds. The presence of the stygian owl in the Botanical Garden corroborates the importance of wild green spaces as reservoirs of biodiversity within urbanizations.

A99
THE SOCIAL ROLE OF BIRDS IN MIXED-SPECIES FLOCKS IN THE SUBTROPICAL MONTANE FORESTS OF YUNGAS, ARGENTINA

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Mixed-species flocks (BM) are associations of different species formed as a strategy to increase the efficiency of foraging and to reduce the risk of predation. The participant species play different roles and receive various benefits from the association. In temperate and subtropical regions they are mainly established in the autumn/winter season, when the climatic conditions are unfavorable and food resources are scarce. We evaluated the social role of species that participated in BM subtropical montane forest of the Argentine Yungas. Sampling was carried out from May to September (2006-2009), at eight study sites along the latitudinal gradient of the Yungas. Based on the behavior

and occurrence of the 72 species participating in BM, seven species were considering leaders (*Chlorospingus flavopectus, Myiothlypis bivittata, Basileuterus culicivorus, Arremon torquatus, Syndactyla rufosuperciliata, Phylloscartes ventrali*s and *Mecocerculus leucophrys*), *C. flavopectus* being the most important in seven out of the eight study sites. In addition, 30 species were identified as secondary and 35 were occasional. In the present study, the seven leading species, besides having an occurrence of 50% or more, presented one or more of the important characteristics considered for their definition (special vocalizations, characteristics of calls and particular behavior) and some of them have already been cited as leaders in other Neotropical regions. There would be a replacement in the social role of species along the latitudinal gradient of the Argentine Yungas.

A100
FUNCTIONAL DIVERSITY IN THE AVIFAUNA OF THE BAÑADOS DE FIGUEROA, AN IMPORTANT AICA IN SANTIAGO DEL ESTERO, ARGENTINA

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Diversity is generally associated with species richness and abundance in the community. In new studies it is recognized, that the activity of organisms transforms the environment. This is a functional component of biological diversity and one of the keys to understanding the mechanisms of processes in ecosystems. The Bañados de Figueroa form a wide surface of marshes and reservoirs along the Salado river, categorized as AICA (Important Area for the Conservation of Birds). In this paper we analyze functional diversity to detect functional groups that serve as indicators of ecosystem quality. The study data were obtained, from 2012 to 2014, of three artificial reservoirs (Cuchi Pozo, El Cero and Figueroa), from which 48 species of birds were selected. The functional groups were established from a multivariate Clusters analysis. The functional diversity index was applied for each site and season of the year. In the dendrogram two functional groups are distinguished: the first, with few species, large body size and elevated weight, looking for food walking on beaches and / or shallow waters belonging to several trophic guilds, and the second group with numerous species of medium to small size, varied weight, with a great variety of feeding strategies and trophic guilds. The greatest value of functional diversity was in the autumn for the Reservoir Cuchi Pozo and the lowest in spring for the Reservoir El Cero. Functional diversity would be useful as a tool in decision-making related to the management of biodiversity and conservation in the region.

A101
HABITAT USE AT A LANDSCAPE SCALE FOR A PARROTS ASSEMBLE IN THE YUNGAS OF ARGENTINA

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The biotic and abiotic characteristics of the different types of habitats that make up a landscape can have important effects on the presence, abundance and density of animal populations. However, the structure of the landscape can be modified as a result of anthropic activity. The Yungas are one of the most threatened environments, parrots being one of the most affected groups in this region. In this work we evaluate if the structure of the landscape influences the presence and abundance of parrot species in the Yungas of Jujuy. The work was carried out in the Premontane Forest for two years (2014-2016). Observations of abundance of parrots were carried out at 71 count points. The structure of the landscape was characterized by geographic information systems. A Redundancy analysis was performed to analyze the response of the species to the composition of the landscape. A total of 3186 parrot specimens were observed (x = 4.95 individuals). *Pionus maximiliani* was the most abundant species (n = 1250), followed by *Amazonas aestiva* (n = 862) and *Pyrrhura molinae* (n = 628). Forest coverage is positively related to the presence and abundance of the total parrot ensemble. Generalist species were more abundant in citrus crops, and sugarcane and soya crops affected most species negatively. In agrosystems, the presence of species is positively related to forest windbreaks. The results emphasize the need to conserve forests, and in agrosystems we recommend keeping the forest windbreaks for the sustainability of the populations.

A102
ANALYSIS OF THE RIPARIAN VEGETATION OF THE RIVER LA PUERTA-AMBATO-CATAMARCA

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Riparian vegetation fulfils specific functions, such as the preservation of watersheds, the contribution of organic matter to rivers, the retention of nutrients and their recycling. The objective of this work was to describe the floristic composition of the riparian areas, the river valley in the town of La Puerta, Department of Ambato, Catamarca. The samplings were carried out in the Villa de la Puerta, located at the foot of the Sierras de Ambato-Manchao. The Valley River divides it into two bands "La Puerta North Band" and "La Puerta Band South". Three points were selected: A-28º11'04.16 "- 65°46'43.65" at 870 masl; B-28º10'17.10"- 65 ° 47' 43.95" at 889 masl and C-28º09' 17.76"- 65°47'43.73" at 909 masl. In each site two linear plots of 50 meters long by 10 m wide were made, on the right and left margins of the river, parallel to the watercourses. The method of absence and presence of families of trees and shrubs was applied, identifying systematically in situ, and then classified into native or exotic. Data analysis was performed by applying the Sorensen coefficient to compare the similarity between the sampled sites. A total of 37 species and 24 families were obtained as a result, with 7 exotic and 30 native species. The data analyzed with Sorensen's coefficient show that there is no similarity between the communities, since the following results were obtained: A-C: 0.47, A-B: O.58 and B-C: 0.59. It can be concluded that the riparian vegetation is good, but it is not continuous, probably due to the multiple human alterations that were observed in the place.

A103
BENTHIC MACROINVERTEBRATES AND WATER QUALITY OF THE VALLE RIVER, STRETCH LA PUERTA BANDA SUR, CATAMARCA, ARGENTINA

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Benthic macro-invertebrates develop in lotic environments. Specimens (immature and/or adult states) have a body size of 300 µm or more and inhabit the bottom of the river. An important aspect of this study is the evaluation of the quality of the water. The objective of this research was to evaluate the quality of the water, using benthic macro-invertebrates as bioindicators, in a section of the Valle River. The sampling place was established in the locality of La Puerta Banda Sur (65º46'42.8"S - 28º11'3.8" W; 861masl). Samples (n = 3) were obtained with a Surber sampler (900cm^2 of area; 300µm of mesh opening) integrated for analysis. Data were obtained about abundance, richness, Shannon's index (log_2) (H') and the biotic Indices: IBMWP' (Iberian Biological Monitoring Working Party) adjusted for the NOA; ASPT' (Average Score Per Taxon) and IBF (Family Biotic Index). In addition, data were obtained on the morphometry of the river: width of the dry bed, width of the wet bed, speed of the current and depth. Physicochemical parameters of water: temperature, electrical conductivity and pH, were determined in situ with a digital multimeter. The flora of the banks was characterized. Abundance was 2,652 individuals; richness, 28 families; H'= 2.96; IBMWP'=171 (very clean waters); ASPT'=6.1 (water without impact); IBF = 5.21 (water with regular organic contamination). The assembly of macro-invertebrates revealed the good quality of the resource. The water can be used for irrigation, recreation, and human consumption after purification. The data obtained are the first for the Valle River stretch La Puerta Banda Sur and can be used in future works of biomonitoring, for the management and conservation of the resource.

A104
MERMITHIDAE (NEMATODA) PARASITES OF SIMULIIDAE (DIPTERA) IN WETLANDS OF CATAMARCA

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Entomoparasites are potential biological controllers since they cause the death and / or castration of their host. The family Mermithidae (Nematoda) parasitizes Diptera of the family Simuliidae (Insecta). Simulids are detrimental as they generate losses both in agro-livestock production and in tourism in summer resorts. Therefore, their control is an urgent need. The objective of this work was to know the diversity and seasonal variation of mermítids that parasitize simuliidae in two rivers of Catamarca and to evaluate the parasite prevalence and the specific relation between the species of both groups. In both rivers 100 simuliidae larvae were collected manually every month for one year. Under stereoscopic magnifying glass the larvae were analyzed and the parasitized ones were separated from those not parasitized to determine their prevalence. The obtained mermithids were raised in Petri dishes with sand and mineral water until their maturation for taxonomic determination. Slices were cut and rinsed with glycerin for observation under an optical microscope. The taxonomic determination was achieved with the use of dichotomous keys. On both El Tala River and Valle River, only *Simulium wolffhuegeli* was found to be parasitized. Six genera of the family Mermithidae: *Mesomermis*, *Gastromermis*, *Isomermis*, *Lanceimermis*, *Hydromermis* and

Paramermis were determined. The highest parasite prevalence was in El Tala River, with a maximum in October with 33.54%, while in the Valle River the highest prevalence was in April, with 25.85%. These are the first results and we will continue working with these potential bio-controllers.

A105
CREATION OF THE SAN PABLO RESERVE OF THE UNIVERSITY OF SAN PABLO – TUCUMÁN

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San Javier hills had two protected areas belonging to the university and Tucuman province. In 2016, the University of San Pablo-Tucumán, added the first reserve of a private university; the San Pablo Reserve (RSP). Its objective is to safeguard the biological, landscape, cultural and architectural heritage. The management plan seeks to integrate the reserve into the Tucuman and Argentina integrated system of protected areas. For this purpose, biological surveys, vegetation and geological mapping were carried out and core areas, corridors and sites of tourist interest were determined and integrated into a geographic information system in order to make management decisions. Mammals were monitored by means of track counting transects and sampling with trap cameras, Sherman traps and, for chiroptera, fog nets. Birds were sampled with observation transects, raptor traps and fog nets. This summer amphibians and reptiles will be surveyed. Vegetation was evaluated by transects, permanent plots and satellite imagery and drones. A 3D map was made, allowing the identification of core areas, corridors, border areas and conflictive areas, such as clandestine dumps. The riverside forests of the watercourses were evaluated using the RQI-Y Index. We mapped the vegetation, georeferenced outstanding specimens and areas invaded by exotic specimens. 155 bird species and 21 mammal species were identified. Seventeen tree species per hectare were observed. The RQI-Y shows conservation states from good to very good. Together with the other reserves of the San Javier hills, the RSP allows the protection of more than 85% of the area. We wish to emphasize its importance for connectivity with other protected areas and the importance of controlling exotic forest and clandestine dumps.

A106
SYNOPSIS OF FERNS AND LICOPHYTES OF SIERRAS DE GUASAYAN (SANTIAGO DEL ESTERO, ARGENTINA)

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The Guasayán Hills mountain range, with an approximate area of 70km long and 4km wide, with a maximum altitude of 717 masl, lies in the center-west of the province of Santiago del Estero. The landscape of this area, constituted by dense forests, presents floristic peculiarities with respect to the rest of the region. Environmental conditions are conducive to the development of ferns and licophytes, which represent a group of interest due to the scarcity of information about them for the flora of Santiago del Estero. The aim of this work was to make an inventory of Pteridophyta diversity in Guasayán Hills. Field trips (2013-2016 period) were carried out. Circular transects of 78 m^2 were defined on both slopes of the hill ranges and presence, habits and abundance of ferns and lichophytes were recorded. Plant material was collected and herborized and later incorporated into the herbarium of the Botanical Garden "Ing. Lucas D. Roic". 24 species and 5 varieties belonging to 12 genera included in 5 botanical families were found. The best represented family was Pteridaceae, with 16 species.The genus with the largest number of specimens was *Cheilanthes* Sw. The data obtained are considered relevant since they contribute to the knowledge of the plant communities of the Guasayán Hills, it being key for the subsequent elaboration of sustainable management measures and protection of the area to safeguard these species.

A107
PREGERMINATIVE TREATMENTS IN *Tecoma tenuiflora* Fabris

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Tecoma tenuiflora is a native shrub that grows in the highlands of Santiago del Estero. Its rusticity, size and abundant red-orange flowering make it suitable for use as an ornamental plant. The objective of this work was to evaluate the incidence of different pregerminative treatments on seeds of *Tecoma tenuiflora* in order to generate useful information for their production in nurseries. Three treatments were tested: 1- Control; 2- Soaking in water at room temperature for 24 hours; 3- Soaking in water at 60ºC until reaching room temperature. The seeds were collected from wild individuals in Guasayán department and kept in special chambers. Seeding was done in paper towels on trays placed in a germination chamber with a temperature range of 25°-30°C and a 12 hour light / dark cycle. The design was completely

randomized with 4 replicates of 25 seeds per treatment. Percentage and mean germination time (TMG) were calculated. The results were analyzed using ANOVA and mean difference test using Tukey's test (α = .05). The highest germination percentage was recorded for soaking for 24 hours (95%), followed by the control (88%) and soaking treatment in water at 60° (23%). TMG was 5.38 for the control, 5.11 for soaking for 24 hours and 6.52 for soaking in water at 60°. The results show that the best pre-germinating treatment was soaking in water at room temperature for 24 hours, so it can be used as an alternative by nurserymen for the production of this species.

A108
TERRITORIAL MANAGEMENT OF TUCUMAN, RE-CLASSIFICATION AND PROPOSAL FOR THE PROTECTIVE FOREST

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The province of Tucumán is characterized by a variety of landscapes from mountain ranges to plains, which causes orographic precipitations, favoring the development of varied vegetation and an extensive hydrographic network. The riparian vegetation, a fundamental condition for the stability of the rivers, is deteriorated in the province. Therefore, recovering it is fundamental to re-establish an environmental and social balance. This work contemplates the heterogeneity of the watercourses of our province, which makes it difficult to define a strict limit, such as the line of maximum increase, required to determine the area of protective forest (riverbank area). Determining these zones allows the definition of category I and II zones to be integrated into the territorial planning of the province. The riverbank area was determined by analysis of Landsat images from 1998/2008/2016. ArcGIS 10.1 digitized the wetland area of rivers and palaeocauses, from which buffer areas were established within the framework of current legislation and territorial planning of the province. The preliminary results show an inconsistency between what is established by law and the reality observed in the province, since the riverbank areas are not adequately protected and therefore do not preserve vegetation and its function. From this survey, the importance of considering changes in the maximum level, course and intensity of rivers arises, so that the proposal for an area of protected or riparian forests is adequate. This work proposes the re-classification of Buffer zones for the establishment of the protective forests, determined based on the characteristic mobility of the rivers of the region.

A109
ACAROFAUNA ASSOCIATED WITH CITRUS GROVES OF COMMERCIAL IMPORTANCE IN THE PROVINCES OF JUJUY AND SALTA.

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Citrus systems in the NOA provide more than 60% of the total national production; however, the stability of the activity, like the rest of the fruit-growing activity in the country, may be affected by biological environmental factors. Mites associated with the citrus industry in the region are poorly studied despite their importance from the point of view of quarantine, as transmitters of diseases or for their beneficial action for agriculture. In view of the agronomic implications of these organisms and the current state of the subject, it is important to review and update the inventory of mite species in Citrus systems of the provinces of Jujuy and Salta. For this purpose, we carried out surveys and samplings of plant material in lemon, orange, grapefruit and tangerine plantations from the towns of Yuto, Ledesma (Jujuy), Colonia Santa Rosa and Apolinario Saravia (Salta) from 2015 to 2017. All captured specimens were extracted in the laboratory and mounted in microscopic preparations for morphometrical identification. The following families were determined: Tetranychidae, Eriophyidae, Tarsonemidae, Tenuipalpidae and Phytoseiidae. The last one is important because it includes other mites and i predatory nsect species. The continuity of the work will advance specific identification of individuals and provide basic and necessary information to plan all integrated preventive management or control strategies considering the potential risks for the production and marketing of fruit or citrus propagation materials.

A110

CAVES OF ANDEAN ARMADILLO *Chaetophractus nationi, SYN. C. vellerosus* (CINGULATA: DASYPODIDAE) IN LAGUNA BLANCA BIOSPHERE RESERVE (CATAMARCA, ARGENTINA): INITIAL CHARACTERIZATION.

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Armadillos burrow in environments they exploit and use caves for shelter, resting and breeding and these constructions usually fit the proportions of the animal's bodies. Indeed, caves are used to determine some ecological an etological aspects of armadillo species and populations. We present preliminary data on the Andean armadillo caves in two different environments of Laguna Blanca. The objective is to obtain an initial characterization of these constructions and to establish if there are significant differences between the morphometry of species in two different local environments. We explored 2 ha in 8 quadrangles of 50 x 50 m, 4 in Iro steppes and 4 others in mixed steppes with *Cortaderia sps*. 89 caves were found and we measured height, width, length, entering angle and opening direction. We found proportion height-width, measurements averages, frequencies of opening direction and entering angle; the averages height-width were compared using *t* test. The values were: height: 11.26±0.46 cm; width: 15.06±0.32 cm; length: 57.36±4.62 cm; height-width ratio: 0.775±0.18; higher frequencies of: opening direction, North; 27.3%; angle of tilt, 20°; 18.2%; the difference between proportion averages of caves was not significant ($p<0.05$). An initial characterization of caves of *C. nationi* in two types of steppes from the Puna ecoregion was made, no significant morphometric differences between environments being found. However, the area should be expanded to include other habitats to assess this aspect and get a better view of how armadillos use different habitats in Laguna Blanca.

A111

FEEDING AND LIVE WEIGHT IN CREOLE GOATS OF THE ANTINACO-LOS COLORADOS VALLEY

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In the Antinaco - Los Colorados Valley, La Rioja, goat production is oriented almost exclusively to the production of goats 30-50 days old, with weights between 4.5 and 9 kg. In the region there is an extensive management based on grazing of the native forest. In these production systems, food is one of the factors that most affect production rates. In this work we propose to analyze the effect of feeding on live weight (LW) and daily gain of weight (DGW) of growing goats under two production systems: intensive and extensive. For the intensive system, a pellet with grape marc was formulated to reduce feed costs and recycle the main co-product of the wine industry. In three-month-old female goats born in the rainy season (summer), the LW (kg) and DGW (g/day) were determined in different management systems: A) 10 Pellet goats for 60 days without grazing (intensive); B) 10 goats kept on pasture for 60 days (extensive). In goats from lot B (extensive) the DGW was 26.79 ± 11.8 g/day, whereas in lot A (intensive) the DGW was significantly higher (93.75 ± 11.0 g/day). In addition, the difference in LW between the end and the beginning of treatment was significantly greater in lot A (6 ± 0.71 kg) than in lot B (1.71 ± 0.76 kg). The results of this work suggest that the feeding with pellet in confinement positively influences the DGW in the region of Creole Goats and allows the incorporation to the pellet of an agricultural co-product that is currently accumulated as a potential contaminant.

A112

FORAGE VALUE OF CO-PRODUCTS OF THE OLIVE INDUSTRY

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The olive-growing activity in the Valley Antinaco-Los Colorados, La Rioja, has grown in recent years due to the strong industrial growth that allows the province to produce nearly 40% of all the olive oil exported by Argentina. This industrial activity generates a significant amount of co-products that are seasonally accumulated without a particular use. Alperujo (olive mill solid waste) and pruning residues are the main by-products that can be used as an ingredient in animal diets. The chemical composition of such diets is influenced by different factors such as variety, procedure used in the extraction of oil, the conditions of the year, the town of production, etc. The use in animal feed is subject to the nutritional quality, so the objective of this study was to assess the quality of different varieties of alperujo and pruning residues. The relative value of forage (VFR) which is estimated to assess the quality of the forage in alperujo is 50, which may be due to the low digestibility of the co-product, attributable to the proportion of bone of the olive, approximately estimated as 30%. No significant differences between species of alperujo (highest value Manzanilla, lowest value Arbequina). In the case of pruning residues, VRF is around

150, comparable to a fodder of excellent quality, without significant differences among species (Picual = 168, Coratina = 148). The results of this work show the importance of the nutritional quality of the co-products analysis to assess their incorporation into animal feed.

A113
GERMINATION AND FUNGUS PRESENCE IN SEEDS OF *Pappophorum vaginatum* UNDER 2 STORAGE CONDITIONS

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Pappophorum vaginatum (*Pv*) is a perennial C4 grass, native to semiarid grasslands, which can be found in Región del Monte, Argentina. Because of its high palatability this species is decreasing in overgrazed situations. In order to conserve germplasm it is important to study of the effect of storage conditions on seed germination and the presence of fungus in seeds. Thus, the effect of 2 storage conditions on seed germination and the presence of fungus were evaluated in 7 populations of *Pv*. After collecting the seeds a germination trial (T1) was conducted. Then, the collected material was stored at laboratory (L) and fridge (4°C) (F) temperatures. Three years later, a 2nd germination trial (T2) was done in order to evaluate the effect of L and F on seed germination and to contrast each treatment against T1. At the end of each trial the presence of fungus on each seed was registered. The experimental design was completely randomized. Petri dishes were used (50 seeds/dish). Cumulative germination (CG%) and the percentage of seeds affected by fungus (SF%) were determined. CG% was analyzed by two-way (T2: Population x Storage Condition) and one-way ANOVA (treatments T2 vs. T1) and Tukey's test. Besides, t test was applied to compare SF% between L and F. After 3 years in L, CG% was 0% for all populations. Under F conditions populations maintained germination capacity, although some of them decreased ($p<0.01$) their CG% with respect to T1. No presence of fungus in T1 was spotted. T2 detected mainly *Alternaria* spp., and SF% was higher ($p<0.05$) at F than at L. The storage of germplasm of *Pv* at low temperatures conserves germination capacity even with a higher fungus presence.

A114
YIELD STABILITY OF MAIZE GENOTYPES (*Zea mays* L.) IN FOUR 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 study was to evaluate yield stability (Rto) of 11 genotypes (G), 8 experimental ones (5 hybrids: H1, H2, H3, H4, H5 and 3 varieties: V0, V1, V2) and 3 controls (2 hybrids: HT1, HT2 and 1 variety: VT), in four environments (A) of northern Argentina; EEA El Sombrero, Corrientes (Co); IIACS Leales Tucumán (Le); EEA Las Breñas, Chaco (LB) and AER Los Altos, Catamarca (Ca), in rainfed plots of $7m^{-2}$; using a randomized complete block design with two replicates. ANOVA for G, A and GA interaction was significant ($pv = 0.0001$). Environmental stability was analyzed through the sites regression model (SREG) using the GGE biplots graph. CP1 and CP2 accounted for 69.1 and 22.3% of total variability, respectively. HT2 had the highest Rto in all A. H2, H5 and V2 had the best adaptation in Co, H1 had good adaptation in Ca and LB, while HT1, H1 and H4 showed the best adaptation in LE. H2, V2 and V0 were the most stable genotypes across environments. Co was the best environment to discriminate genotypes. In conclusion, we identified genotypes with adaptation in specific environments and others that were stable in all four environments.

A115
CATCH OF *Ceratitis capitata* (WIED) WITH DIFFERENT FOOD ATTRACTANTS IN CITRUS PLANTS IN SANTIAGO DEL ESTERO

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The detection and monitoring of fruit flies through the use of traps and attractants is used to determine the variation in magnitude and duration of infestation, the relative number of adults, the extent of infested areas and the progress of the pest. The fruit fly *Ceratitis capitata* is a multivoltin species, a dangerous pest because of its polyphagia, its capacity of adaptability and its high reproductive potential. In the present work, we evaluated the efficacy of five food attractants placed in Mc Phail traps: torula yeast 5%, CPH-39% protein bait, Plus-Trap 89% hydrolyzed protein, TMA amide-based solution and wine vinegar. Monitoring was carried out every fifteen days in sweet orange plantations, *Citrus sinensis* (L), with a randomized design of five treatments and three replications. Data were analyzed using the statistical package InfoStat. Torula yeast and hydrolyzed plus-trap protein showed greatest efficiency in catching the insect, followed by CPH, TMA

and wine vinegar. However, there was no statistical difference between the attractants, with a greater catch of flies during the months of November, December and March. It is concluded that 5% torula yeast is the most effective attractant for the capture of the fly under study.

A116
EFFECT OF FLOODING ON *Chloris berroi* SEEDLINGS

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In the steppe of halophytes of the Flooding Pampas a limited presence of new plants of *Chloris berroi* can be observed. A possible cause may be that floods affect its establishment. The objective of this work was to evaluate the effect of flooding on *C. berroi* seedlings. One seed per cell was sown in speedlings. After 30 days, 120 seedlings were transplanted to 200 cm^3 pots (experimental units) that contained homogenized soil. The experimental design was completely randomized and the factor was the water content. Sixty pots were exposed to flood conditions for two weeks (2 cm of water above the soil surface). The other 60 pots were irrigated with the necessary amount of water for normal seedling growth. At the end of the studied period, the concentration of chlorophyll in leaves was determined with a portable device. After that, each seedling was extracted from its pot and its aerial and radical parts were separated. Then, the length of main stem, leaves and root were measured, and the number of tiller and adventitious roots were counted. Data were analyzed using ANOVA and means were compared with Tukey´s test ($p<0,01$).The flooded seedlings showed shorter main stem (26.1 vs. 27.2 cm) and leaves (17.3 vs. 19.3 cm) and lower tiller number (6.3 vs. 8.9 cm) and chlorophyll concentration (25.2 vs. 32.3) than the non-flooded ones. Besides, the flooded seedlings had a shorter main root (11.9 vs. 20.6 cm) and a higher number of adventitious roots (11.8 vs. 8.4) than the non-flooded ones. The results showed that flood would not affect *C. berroi* seedlings survival during the establishment period and that the species would have adaptive mechanisms to tolerate it.

A117
EFFECT OF VARIETY AND EXTRACTION CONDITIONS ON THE CONTENT OF ANTHOCYANINS IN TUCUMAN BLUEBERRIES

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Anthocyanins are flavonoids responsible for the color of blueberry fruits. These compounds are interesting because of their high antioxidant and antimicrobial activity, and can be used as natural dyes in foods. The province of Tucumán is a major producer of blueberries. The discard generated by the fresh production can be used to obtain high added value products such as anthocyanins, and thus improve the income of producers. In this work, the content of total anthocyanins in different varieties of blueberries cultivated in the province of Tucumán was studied, different extraction conditions (% ethanol and temperature) were evaluated, and values of the process variables were established that maximize the recovery of anthocyanins. To determine the total anthocyanin content, the differential pH spectrophotometric method was applied and absorbance was measured at two wavelengths: 510 and 700 nm. The results were analyzed statistically with Analysis of Variance. The average content of anthocyanins [mg cyanidin / Kg fruit] in each variety was: Emerald (881), Jewell (790), Prima Donna (1033), San Joaquin (1129), Snow Chasser (1172), Spring (977) and Start (729). It was concluded that the Snow Chasser variety is the one with the highest content of anthocyanins, followed by the San Joaquin variety, and that the ethanol composition does not significantly affect the extraction of anthocyanins in blueberries, at the proportions tested, whereas temperature proved to be a significant factor to be taken into account, with the extraction being greater than 50°C.

A118
CHEMICAL CHARACTERIZATION OF YACÓN (*Smallanthus sonchifolius*) LEAVES GROWN IN BELÉN, CATAMARCA

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Yacón (*Smallanthus sonchifolius*), aboriginal to the Andes, is a species that belongs to the Asteraceae family.It is an herbaceous perennial plant between 1 and 2.5 meters high with opposite leaves with a triangular-shaped blade, and truncate, hastate and cordate bases. Its roots show a high content of fructooligosaccharides, the most important of which is inulin. This plant is grown in the high mountains of the Andes, from Venezuela to northern Argentina, in mild mountain weather conditions. Yacón crops can tolerate wide ranges of pH, temperature and water demand. In Catamarca, these crops have been grown experimentally in the locality of Belén, with satisfactory results. The aim of this study was to determine the chemical characterization of Yacón leaves grown in Villa Vil, Belén, Catamarca. The

material collected was dried at room temperature until consistent leaf weight and powder were obtained. The chemical determinations were conducted through the AOAC Official Methods of Analysis for Moisture, Ashes, Fat and Proteins. Polyphenol content was determined using the Folin-Ciocalteau method, and the quantification of concentration was carried out with spectrophotometer Biotraza 722 to 725 nm. The results obtained, expressed on a dry basis, were the following: Moisture 10.08%, Ashes 19.30%, Proteins 25.10%, Ethereal extract 5.23%. As to polyphenols, the result was 889.2µgr polyphenols/ g dry weight. These values match the ones reported for quinoa leaves, which are used as a high protein food.The polyphenol content indicates the presence of antioxidant activity, which could be beneficial for human health.

A119
PRELIMINARY RESULTS FOR THE RAPID MULTIPLICATION OF HIGH QUALITY SUGAR CANE SEEDS

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Seedling production from isolated buds constitutes a sustainable alternative to increase multiplication rate in order to obtain high quality sugar cane seeds and reduce costs. In this study, we evaluated the effect of different soil mixtures, fungicides and planting dates on the initial growth of sugar cane seedlings with the aim of optimizing this new technology. The assay was carried out in greenhouses at EEAOC. Sugar cane buds of TUC 95-10 variety were treated for 10 minutes with: F0 (tapwater-control); F1 (Pyraclostrobin + thiophanate-methyl: 320cc in water 20 l) and F2 (Carbendazim; 40 cc in water 20 l) and then planted in 25-well trays with different soil mixtures: S1 (soil: commercial substrate: perlite, 3:2:1); S2 and S3 (commercial substrate: sand: perlite,3:2:1 and 2:3:1, respectively). The statistical design used was completely randomized with three replicates. Differents planting dates were: Fc1 (May 15th), Fc2 (June 15th) and Fc3 (July 15th). When plantlets showed two green expanded leaves dry and fresh weight of both root and aerial part were evaluated. The results obtained were subjected to analysis of variance by General and Mixed Linear Models and means were compared by DGC test at 5% probability. Dry and fresh weight of root and aerial part were significantly higher when combininf date 2, soil mixture 2 and fungicide 1 or 2. Out of the two fungicides used, we selected Carbendazim (F2) because of its low price. These results contribute to optimize key parameters in order to develop a new system for the rapid multiplication of high quality sugar cane seeds with reduced costs.

A120
CHARACTERIZATION OF THE GROWTH OF NATIVE FERNS *Campyloneurum nitidum* (KAULF.) C. PRESL AND *Niphidium crassifolium* (L.) (*POLYPODIACEAE*) IN FIELD CULTIVATION CONDITIONS

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In the floricultural sector of Argentina the production of cutting plants is scarce and the foliage used is of extractive use, causing the loss of germplasm in nature. The incorporation of new species for use as cutting foliage would cover that unsatisfied demand. The epiphytic species *Campyloneurum nitidum* (CN) and *Niphidium crassifolium* (NC) have a potential use as cutting foliage because of their prolonged postharvest duration so their adaptation to the crop needs to be determined. To characterize the growth of these species under field cultivation conditions, a trial was implemented at EEA Famaillá-INTA (Tucumán, Argentina) in November/2013. Under a DCA with 4 replicates, plots of 10 plants each were placed in stalks under a saram mesh (80%). The substrate consisted of a mixture of soil, peat and composite branches (2:1:1) and mulch pine. The initial number of green leaves / plant (HjsVi) with which the plants were classified into small (sm) and large (lg) was evaluated. With weekly records from November / 2013 to March / 2015, the total number of dead leaves / plant (HjsM), green leaves / plant (HjsVt) and new shoots / plant (BN) were determined. The mean values show that CN has a higher HjsVi (sm 6.9 ± 2.4; lg 17.3 ± 4.5) than NC (sm 5.6 ± 1.5; lg 11.3 ± 2.8). HjsM is higher in CN (sm 6.8 ± 3.3, lg 14.4 ± 3). NC had the highest BN (sm 12.3 ± 5.1, lg 16.5 ± 8.5). Although CN showed a higher HjsVt (sm 13.7 ± 5.5, lg 31.5 ± 5.6), it can be estimated that NC has better productive potential since it lost fewer leaves and produced a greater number of new shoots.

A121

FIRST REPORT OF *Nacobbus aberrans* ON BROAD BEAN WEEDS IN THE PROVINCE OF JUJUY

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Nacobbus aberrans (Thorne, 1935) Thorne y Allen 1944, the false root-knot nematode, determines serious yield losses on economically important crops in Argentina and worldwide. Its presence on broad bean in Jujuy province has been recently reported. This species is very dangerous and one of its most important features is that it can develop on many crop associated weeds. Thus the objective of our work consisted in investigating the presence of *N. aberrans* on weeds from broad bean fields. Roots for analysis came from a black broad bean crop (*Phaseolus vulgaris* L.) cv. 'Leales 10' from El Remate, Palpalá Department. *Nacobbus aberrans* knots were observed in roots from slim amaranth (*Amaranthus quitensis* L.) and bathua (*Chenopodium album* L.). From those roots, females, males and juveniles were isolated. This is the first report of the association between broad bean weeds and *N. aberrans* for Jujuy province. The relevance of the control of these weeds should be clear.

A122

BIOMARKERS IN CHRONIC KIDNEY DISEASE. EARLY DIAGNOSIS OF RENAL INJURY

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Chronic Renal Disease (CKD) is a clinical entity of multiple etiologies that was defined as the progressive loss of renal structure and function. It is asymptomatic in early stages, leads to chronic renal failure and is a premature cause of cardiovascular (CV) morbi-mortality. The aim of the present study was the early detection of CKD in apparently healthy individuals with CV risk factors, using renal injury and function biochemical markers. An observational, analytical and prospective study was developed with 73 volunteers of both sexes, from 20 to 70 years of age. Clinical histories, anthropometric parameters and blood pressure were evaluated. Enzymatic and kinetic creatinine were measured and the following were determined: Glomerular Filtration (GFe), estimated by CKD-EPI; serum and urine neutrophil gelatinase-associated lipocalin by ELISA, urinary creatinine (CrC-U) and albuminuria (Au). Mean age of participants was 43±15 year, and 7% of those had diabetes mellitus, 35% of women reported smoking, 53% were overweight and 23% of them were hypertensive. The smoking rate for men was 27%, overweight over 83% and 50% had hypertension. According to the KDIGO 2012 criteria, 87% of our population was G1A1 and G2A1, 12% had moderate risk (G1A2 and G2A2) and only one of them was a high risk patient, staged (G3aA2). Serum NGAL showed important differences in risk categories, not so urinary NGAL, increasing in agreement with the increase in risk. Detection and staging of asymptomatic patients with modifiable risk factors at early stages, potentially reversible, will allow actions to delay progression to the final stages and the associated cardiovascular disease.

A123

HET ELLAGITANNIN ISOLATED FROM STRAWBERRY LEAVES IS OXIDIZED BY INTERACTING WITH CELL MEMBRANES

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Previous studies have shown that the bioactivity of certain polyphenols and compounds extracted from plants such as totarol, abietic acid and resveratrol is due to the fact that they produce important disturbances in the phospholipid membranes. Our group has earlier reported the isolation of an ellagitannin (1-0-galloyl-2,3;4,6-bis-hexahydroxydiphenoyl-β-D-glucopyranose, HeT) from strawberry leaves, capable of activating the immune response in plants. It has recently been shown that HeT also has antimicrobial activity. The objective of this work was to investigate the possible interaction of HeT with cell membranes (CM). To this end, different assays were performed on cell membranes isolated from *Clavibacter michiganensis*. Using Raman and FT-IR spectroscopy (2000-600 cm^{-1}), we observed a strong interaction among the major HeT groups with CM. It was also observed that the interaction between HeT and CM caused changes in the UV-Visible spectrum of the ellagitannin, producing three new bands at 360nm, 440nm and 490nm. The electrochemical analysis by Differential Pulse Voltametry indicated that HeT is oxidized to a potential of V = + 0.164V vs. Ag/AgCl. Subsequently, a spectroelectrochemical study was performed (V = +0.3) and the spectrum change obtained showed the same three bands observed in the

oxidized state in the interaction with CM. These results suggest that HeT is indeed capable of interacting with cell membranes, and that such interaction involves a redox process in which HeT is oxidized.

A124
MOLECULAR CHANGES IN THE ANTIGENIC DETERMINANTS OF PROTEIN VP7 IN ARGENTINEAN STRAINS OF ROTAVIRUS G1 AND G9

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Rotavirus neutralizing antigenic domains 7-1a, 7-1b, and 7-2 were defined on glycoprotein VP7. Our objective was to study the dominant neutralizing antigenics of VP7 of RV genotype G9 and G1, prior to the introduction of the vaccine in Argentina, to determine molecular modifications that allow the immunological escape. Ninety-four sequences of the gene 9 were obtained from Genbanck, 32 from Rotavirus G1 and 62 from G9. Strains of La Rioja, Mendoza, Capital Federal, Ushuaia, Córdoba and Province of Buenos Aires were included. The G1 vaccine strains were RotaTeQ and RotaRix. The strain of G9 was RotaVac. Molecular analysis was performed with MEGA 7.0.sofware, aligned genes in FASTA using CLUSTALW and Lineage by UPGMA method. Glycosylation sites were studied with NetNgly 1.0 server, the 3D modeling by SWISS-MODELserve and Chimera 1.11.2 software. Antigenic dominants were studied by BioEdit, 7.2.5. The results show that all strains Argentinian RV genotype G9 are Lineage III d, present a single glycosylation site (position 69) and all present 3 differences (positions: 87, 100 and 145) with RotaVac vaccine. The G1 genotypes studied have 3 lineages (1, 2 and 5), 2 glycosylation sites (positions 69 and 238) and 4 nucleotide substitution sites (positions 94, 123, 147 and 217) in the antigenic determinants with the vaccines. In conclusion, the differences of the dominant antigens of VP7 in Argentinean strains of rotavirus G1 and G9 with the strains of the vaccine are low, but the molecular modifications detected could be important for immunological escape.

A125
STUDY OF EXPRESSION OF FOXO3 TRANSCRIPTION FACTOR AND PEROXYROIDOXIN-2 IN ACUTE LEUKEMIA

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Acute leukemias (LA) are accompanied by excessive production of reactive oxygen species (ROS) and / or a deficiency in antioxidant defenses, leading to a state known as oxidative stress (EOx). The forkhead homeobox type O (FOXO) transcription factors are a superfamily of proteins that regulate the expression of genes that are important for various cellular processes, FOXO3 being a key element in the resistance to the EOx since it would stimulate the transcription of EROs purifying enzymes. **Objective:** To study the expression of the FOXO3 gene and its target enzyme Peroxiredoxin-2 (PRX-2) in LA patients. **Methods:** Between June 2015 and 2016, 14 patients with LA and 14 controls were studied at the Institute of Applied Biochemistry of the UNT. The characterization of leukemias was performed by blood count, cytochemistry and flow cytometry. Gene expression was analyzed by real-time Retro Transcription-PCR using glyceraldehyde-3-phosphate dehydrogenase as endogenous control. **Results:** Out of the total LA studied, 43% were of myeloid origin and 57% were lymphoid. The expression of FOXO3 was significantly lower in the LA group than in the control subjects ($p < 0.001$), although the expression of PRX-2 was similar in the groups evaluated. **Conclusion:** The results obtained showed a lower activity of the FOXO3 pathway in individuals with LA without affecting the expression of PRX-2, unlike reported in murine models. Possibly this transcription factor is influencing the expression of other target genes involved in the response to EOx in these neoplasms.

A126
PREVALENCE OF PSEUDOCYSTIC INJURIES IN ORAL CAVITY IN THE 2016-2017 PERIOD

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Mucocele is a tumor-like cystic lesion of traumatic origin, most common in salivary glands. It is more frequent in young adolescents and affects men and women alike. Clinically it is a painless fluctuating swelling with a translucid bluish color. In some cases these lesions resolve spontaneously, others remain chronically and require surgical removal. OBJECTIVE. The purpose of this study was to determine the pseudocystic lesions in soft oral tissues in patients who attended the A. Padilla Hospital during the 2016-2017 period. MATERIALS AND METHODS: This information was compiled through clinical histories, clinical exams, and histopathological studies. We determined the most frequent lesions, age group, gender and localization in the oral cavity. RESULTS: Out of a total of 225 patients in a 2-year period, 25 presented pseudo-cystic lesions, with greater prevalence in females. The most affected age group was between 14 and 24 years of age,

and its location was more frequent in the labial mucosa (84%), secondly the tongue belly (12%) and the third the floor of the mouth (4%). CONCLUSION: Knowledge of these pseudocystic lesions of traumatic origin allows us to implement minimally invasive therapeutic measures for a fast recovery and thus improve the quality of life of the population group.

A127
ALPERUJO INHIBITS BIOFILM FORMATION AND METABOLIC ACTIVITY OF *Pseudomonas aeruginosa* FOOD SPOILAGE

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A strain of *Pseudomonas aeruginosa* isolated from water forms biofilm (BF). This property allows the bacterium to adhere effectively to surfaces and resist antimicrobial agents, which is a serious problem in the food industry. BF inhibition is a new target to control food disease associated with food spoilage. However, inhibition should be carried out using nontoxic compounds. Nowadays, in Argentina, olive oil production generates tons of olive mill solid waste or alperujo each year, which is discarded into the soil without control protocols. The aim of this study was to evaluate the use of this waste as an antipathogenic against *P. aeruginosa* water spoilage, in order to transform alperujo into a product with added value. BF formation and reduction of the metabolic activity of the strain of *P. aeruginosa* isolated from Tucuman water were determined in the presence of 10µg/mL of hexane (HE), chloroform (CE), ethyl acetate (EAE) and ethanol (EE) alperujo extracts. BF formation of the strain is greater than the collection strain *P. aeruginosa* PAO1, which suggests higher pathogenicity. The *P. aeruginosa* BF under study was inhibited by 63% in the presence of EAE and EE as well as 47% with CE extracts. The metabolism of cells in BF was reduced 43% for EA, 53% for EE and 14% for CE, respectively. The results indicate that EA and EE alperujo extracts inhibit BF formation and sessile cell metabolism, and may be considered a natural alternative for the control of this pathogen in the food industry.

A128
CHARACTERIZATION OF A PLANT DEFENSE SUPPRESSOR SECRETED BY *Colletotrichum acutatum* M11

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Anthracnose is a holonecrotic disease that affects strawberry crops. In the NOA region the three species constituting the fungal pathogenic complex have been isolated and characterized, *Colletotrichum acutatum* being the predominant one. Previously, we reported that the isolate M11 of this fungus secretes a compound that suppresses Reactive Oxygen Species (ROS) generated by biotic and abiotic stresses. In this study, we report a partial characterization and purification of this compound. The defense suppressing activity was evaluated using the fluorescent probe H_2DCF-DA, which detects ROS generated by mechanical damage on strawberry leaf disks. For the study, SN-M11 was subjected to different thermal treatments (e.g. boiling for 10 and 30 min at 100ºC, and 10 min at 120ºC), the activity was evaluated at different pHs, and partially purified with an ion-exchange chromatography (Q sepharose, Pharmacia). In all cases the activity was evaluated by analyzing the suppression of ROS production at pH= 4. The chromatographic fraction retaining the activity was analyzed by MS-QTOF. Results obtained showed that SN-M11 is a thermostable compound and active only at acid pHs. The SN-M11 adjusted to pH= 8.0 was retained in the column and eluted with HCl 0,002 M (pH= 2). MS-QTOF analysis revealed three major peaks at m/z: 219.0271; m/z: 318.0816 and m/z: 363.0687 that could not be identified by using the database of chemical compounds available. These results help to get an insight about the nature and physicochemical characteristics of this compound that exerts a suppression effect on the activation of the defense response.

A129
PHYSICO-CHEMICAL AND FUNCTIONAL CHARACTERIZATION OF DIETARY FIBERS OBTAINED FROM CHAYOTE

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In the last decade dietary fiber (FD) has been studied both from a nutritional and technological point of view. This led to the study and use of new sources for obtaining FD. *Sechium edule* (chayote) is a Neotropical species whose fruits have biological variation. It is not cultivated in Argentina and it is only known as an exotic plant species in the north of the country. Previous studies have shown that extracts obtained from different parts of the fruit have antimicrobial, diuretic, antihypertensive and antioxidant properties. The objective of the present work is to obtain FD from domesticated fruits of chayote (*Albus virens* and *Virens levis*) and their subsequent physical and

chemical characterization (humidity, ash, ethereal extract, crude protein) and functional of these fruits. FD analysis was performed using the enzymatic-gravimetric method, AOAC. Functional properties: viscosity, particle size, water retention capacity (WRC), swelling capacity (SC), adsorption capacity of organic molecules (ACOM), cation exchange capacity and *in vitro* fermentability showed significant differences. The two varieties presented higher insoluble fiber content, showed lower WRC values (3.8 and 3.9gH_20/gDM) and higher values of ACOM (11.7 and 10.9goil/gDM). The *Virens levis* variety showed the highest SC (7.1gH_20/gDM). From the results it is concluded that each variety has its own characteristics, knowledge of which makes it possible to make recommendations for its use in the development of food products.

A130
COELIAC DISEASE AND NON-CELIAC GLUTEN SENSITIVITY

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Among the most common gluten-related disorders with similar clinical (digestive and extra-digestive) manifestations the following have been described: Coeliac Disease (CD), anautoimmune-systemic disease, and even more prevalent, Non-Coeliac Gluten Sensitivity (NCGS) resulting from innate immunity. A wide spectrum of clinical presentations makes the differential diagnosis between them complex.Objective: to design an algorithm for the differential diagnosis of CD and NCGS using sensitive and specific biomarkers, omitting endoscopy by biopsy.Experimental design: Cross-sectional, analytical, and retrospective study. Population: adults suspected of suffering from these disorders who attended the Laboratory of Gastroenterology from 2003 to date.Results: Out of 2111 adults, 112 (5%) were seropositive for CD-specific biomarkers: Anti-Transglutaminase-IgA and Anti-Gliadin peptides-IgA and/orIgG, in correlation with symptoms and duodenal biopsy (Marsh II-III). Preliminary studies of 43 seronegative patients with normal or nonspecific histoarchitecture (Marsh 0-I), and clinically persistent symptoms, 15 (34.88%) were seropositive to a marker of innate immunity of the NCGS: AntiGliadin-IgG. All biomarkers were assayed by ELISA (Inova Diagnostic Inc., CA, USA). It is necessary to study a more represenative sample that this one. Strict adherence to a Gluten Free Diet in both groups proved to be effective, constituting another diagnostic strategy. Conclusion: The efficacy of early and non-invasive biomarkers for the differential diagnosis was verified, with respect to the following flowchart: 1) CD research 2) Discarded CD, search for NCGS.

A131
EFFECT OF LABDAN-TYPE DITERPENE 13- EPI-SCLAREOL ON LEMON PATHOGENS AND POME FRUIT MICROORGANISMS

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The aim of this work was study the antifungal effect of the Labdan-type diterpene 13-epi-sclareol on fungi of lemon and pome fruits. The Labdan-type diterpene 13-epi-sclareol was isolated and purified from *Ixorhea tschudiana* Fenzl, collected from Angastaco (Salta, Argentina). The assay to determine antifungal activity of diterpene was conducted according to M38-A (NCCLS, 2002). In 96-well microtiter plates 75µL RPMI 1640 culture medium (GIBCO BRL, Life Technologies) were placed and the inoculum of each fungus was adjusted to 10^6 conidia/mL. The final concentrations of the compound were 1000, 500, 250 and 125ppm. Inhibition growth of *G. citri-aurantii*, *Penicillium digitatum* and *Penicillium expansum* was performed after 24h at 28°C. All assays were performed in triplicate with growth and sterility controls. *G. citri-aurantii* and *P. digitatum* were resistant to all concentrations tested. *P. expansum* was sensitive at 250, 500 and 1000ppm. Treatment with diterpene (250ppm) caused cell concentration to decrease to 10^5 conidia/mL, while at 500ppm and 1000ppm cell concentration was 10^4 and 10^3 conidia/mL respectively. On the basis of these results we observed that Labdan-type diterpene 13-epi-sclareol showed antifungal activity only against pathogenic fungi from pome fruits.

A132
EPIDEMIOLOGY OF VULVOVAGINITIS CAUSED BY YEAST – TUCUMÁN–ARGENTINA

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Symptomatic vulvovaginitis (VVA) by yeast affects 50-75% of women at least once during their lifetime. There are different risk factors associated with this pathology such as pregnancy; use of tight clothing, bidet, sanitary towels, IUD, antibiotics, BCP, etc. The aim of this study was to determine the risk factors and prevalence of yeast isolated from vaginal discharge of women treated in 7 health centres of Tucumán. Between June and October 2016, all strains isolated were referred to the Mycology Service of the Public Health Laboratory of Tucumán. They were seeded in CHROMagar-*Candida* and definitive identification was made using the MALDI-TOF MS®

BrukerDaltonics equipment. A total of 258 women participated in the study. The main risk factors were the use of sanitary towels with 53.8%, followed by 50.8% due to the use of tight clothing and 32.2% due to pregnancy. Out of the total of processed strains, 81.8% were *Candida albicans*, 12.0% were *C. glabrata*, 1.6% were *C. tropicalis*, 1.2% were *C. krusei* and 0.8% were *Sacharomyces cerevisiae*. Based on the results obtained it was observed that the predominant risk factor was the use of sanitary towels. *C. albicans* was the most frequently isolated species. The identification at the species level by mass spectrometry was simple, reliable and allowed us to establish adequate treatments and also to determine the epidemiology in our environment.

A133
CYTOKINES DETECTION BY q-RT-PCR IN NASOPHARYNGEAL ASPIRATE

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Human respiratory syncytial virus (RSV) is the leading cause of severe acute respiratory infection (ARI) in young children. The immune response (IR) associated with RSV infection is complex and no markers of risk and prognosis of severity, such as cytokines, have been identified. Objective: To evaluate the relative expression of cytokines by RT-PCR in real time (rt-PCR) in respiratory samples and analyze the association between viral subtype and expression of specific cytokines. Materials and methods: 36 samples of nasopharyngeal aspirate (ANF) from children <2 years in private health centers of Tucumán, positive for RSV by immunofluorescence, were analyzed. RSV subtyping and the relative quantification (q-RT-PCR) of interferons (INFα, γ, λ), IL-10 and IL-17 were performed by rt-PCR. The gene expression profile was normalized according to gene expression levels for GPDH in the same sample. Results: The analysis of subtypes A and B of RSV showed that 53% of the samples analyzed were positive for A and 47% were positive for B. The analysis of the expression levels of INFs mRNA, showed no significant differences when the viral subtype involved in infection was analyzed. The expression of the gene for IL-17 was variable, although less dispersion was observed than for IL-10. Conclusions: No significant differences were found in the relative expression of the cytokines studied according to the viral subtype. New studies with greater number of samples and the inclusion of new cytokines would be important to evaluate IR induced by RSV. This would allow the potential selection of risk markers of serious illness.

A134
STUDY OF PROBIOTIC STRAINS TO PREVENT *Salmonella* COLONIZATION IN POULTRY

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Due to its low cost and multiple properties, poultry meat consumption has increased, although it remains the leading cause of foodborne diseases (FBD). Therefore, the use of probiotics while rearing poultry could improve FBD control. Combined with prebiotics, they could improve their response; also self-aggregation could allow adhesion to intestinal epithelial cells, as well as co-aggregation with harmful microorganisms, producing an anti-pathogenic barrier as result. The aim of this work was to evaluate the growth of probiotic strains in cecal water (CW), intestinal simil media, supplemented with prebiotics and test their auto / co-aggregation ability against different *Salmonella* serovars. Individual suspensions of: *Lactobacillus crispatus* CRL1453, *L. johnsonii* CRL1452, *L. salivarius* CRL1384, *E. faecium* CRL1385 and *P. acidipropionici* LET105 were inoculated into CW-Rafinose and CW-Inulin to determine CFU / mL, A_{560nm} and pH. The auto / co-aggregation phenotypes were evaluated by spectrophotometric methods. All strains showed higher growth in CW-Inulin. Prebiotic use reduced pH values to 4.5 for CRL1453 and CRL1452 in CW-Inulin. Lactobacilli and propionibacteria presented moderate autoaggregation, whereas *Enterococcus* was scarce. Most strains exceeded 25% coaggregation with *Salmonella*, while CRL1384 and LET105 obtained 50% co-aggregation with *S. enteritidis*. This work allowed the selection of inulin as a growth–promoter, and so demonstrated the ability of these probiotic potentials to prevent colonization of *Salmonella* by auto / co-aggregation. These results are significant in tailor-made probiotic products for the poultry industry.

A135
PRE-ENRICHMENT AS A KEY STAGE IN THE ISOLATION OF BIFIDOBACTERIA FROM POULTRY

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Some anaerobic bacteria of poultry gut are positively associated with animal health, among them the *Bifidobacterium* genus. Up to now no medium or procedures have been reported that allow the almost complete isolation of the genus species. Therefore, this study aimed to evaluate the requirement for a selective pre-enrichment to increase the number of bifidobacteria isolates and to identify the present species.

Broiler chickens (n = 40), laying hens (n = 22) and backyard birds (n = 18) were tested. Two isolation procedures were evaluated: the first included an anaerobic pre-enrichment step in MRS or HHD broths modified with selective agents, followed by passages to MRS, HHD, TPY and TOS modified agar media. The second procedure omitted the pre-enrichment step. A total of 762 isolates were obtained. Only 229 were selected for phenotypic characteristics and evaluated with specific probes for the *Bifidobacterium* genus by FISH. We identified 15 bifidobacteria from samples that had been pre-enriched in modified MRS broth and then in MRS and TPY agar. Finally the 16S rRNA gene was amplified and sequenced and the following species were identified: *B. animalis sp. lactis* (n = 1), *B. pseudolongum* (n = 10), *B. boum* (n = 2), *B. thermacidophilum* (n = 1) and *B. thermophilum* (n = 1). The contribution of this work supports the requirement for pre-enrichment to increase the probability of isolating different species of bifidobacteria through changes in the procedure and use of elective and non-selective media.

A136
HIGH SENSITIVITY C-REACTIVE PROTEIN AND NON-HDL-CHOLESTEROL IN INFANT-JUVENILE TYPE 1 DIABETES PATIENTS

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Diabetes is associated with an increased risk of premature vascular disease and a subclinical inflammatory phenomenon. The objective of this study was to analyze non-HDL cholesterol (non-HDL-C) and high sensitivity C-Reactive Protein (hs-CRP) as risk markers of cardiovascular disease in children and adolescents with type 1 diabetes (T1D) according to the time of evolution of the disease and degree of glycemic control. We studied 42 diabetic children T1D and 20 healthy controls. All patients underwent a complete clinical evaluation and hs-CRP (chemiluminiscence, Immulite 2000, Siemens, EEUU), HbA1c (DCA 2000, Siemens, Germany), fasting glycemia (FG), total cholesterol (TC), high density lipoprotein-cholesterol (HDL-C) and triglycerides (enzymatic methods, Wiener Lab, Argentina) were determined. Low density lipoprotein-cholesterol (LDL-C) and non HDL-C were calculated. The results were expressed as median and interquartile range. The correlations were investigated with Spearman's coefficient. Patients with T1D presented significantly higher values of glycemia, HbA1c and hs-CRP than controls. When grouping diabetics according to the duration of disease (≤ 3 or> 3 years), those with> 3 years had higher values of TC, LDL-C, non-HDL-C. When divided according to the glycemic state (HbA1c <or ≥ 7.5%), there were no significant differences between groups, except for HbA1c and FG. Non-HDL-C was correlated with age (r = 0.37, p = 0.01), duration of disease (r = 0.36, p = 0.01), and FG (r = 0.55; p = 0.0001). In conclusion, non-HDL-C would be a more sensitive cardiovascular risk marker than hs-CRP in diabetic children with more than 3 years of evolution.

A137
HEMOSTATIC ALTERATIONS IN SUBCLINICAL HYPOTHYROIDISM

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Introduction: Thyroid hormone deficiency affects the hemostatic system, manifesting itself with hemorrhagic or thrombotic tendencies. OBJECTIVES To determine changes in hemostasis in patients with subclinical hypothyroidism (HSC) compared to euthyroid individuals (E) **Materials and methods**: 21 patients (15-61 years old) with presumptive diagnosis of hypothyroidism with no other pathologies were dignosed at the Biochemistry Chair Clinic II, 2017. The following were determined a) Thyrotropin (TSHμUI/mL), Free thyroxine (T4Lng/dL) radioimmunoassay b) Lipids(mg/dL): Total cholesterol (TC), LDLc, HDLc, Triglycerides (TG) enzymatic methods c) Platelet count (RP nº/uL) and Platelet Aggregation (AP%) with ADP (M) $2x10^{-6}$, $0.5x10^{-6}$ and Adrenaline (AμM) 50; 25 d) Time (T) of Activated Partial Thromboplastin (APTTseg), Prothrombin Time (TP%). Patients were grouped into E: TSH: 0.30-4.0; HSC: TSH> 4.00, normal T4L. **Results**: 52% were E and 48% HSC. TP% showed no differences. APTT significantly lower in HSC: 38.7±3.9 vs E: 46.7±4.2 p <0.001. VPM increased 4.5% in HSC: 10.4±1.2 vs E: 9.9±0.6 and PDW 5% in HSC: 13.2±2.1 vs E: 12.6±1.1. AP: HSC showed aggregation with A (80%) and ADP (20%) with the minimum agonist dose (non-aggregable) vs E A (20%) ADP (0%). In HSC CT: 216 ±46 HDLc: 61±11 TG: 136±62 vs E CT: 200±33 HDLc: 63±8 TG: 92±39. **Conclutions**: In HSC a lower APTT shows a reduction in T of thromboplastin generation. Higher VPM and PDW indicate platelet reactivity confirmed by high aggregability, which together with dyslipemia induce hypercoagulability, predisposing to thrombotic events. This would indicate the need to start treatment with T4 in HSC.

AUTHORS INDEX

A

Abate PO A123
Abregú AV A136
Agosto M A25 - A26
Agüero A A118
Agüero Aguilera AC A125
Agüero MB A11
Agüero SN A31 - A32
Agüero TH A136
Aguilar FA A73
Ahumada O A121
Ajmat MT A33- A35 –A36 – A64
Albarracin VN A27
Albornoz ER A136
Albornoz P A84
Albornoz PL A85
Alcázar NR A12 – A13 – A23
Alderete M A79 – A80
Ale CA A98
Alegre A A31 - A32
Alejo B A94
Alejo G A93
Alejo GB A95 - A96
Áleman MN A136
Alfaro-Gómez E A89
Alvarez Almirón MV A117
Alvarez AR A16 - A117
Alvarez C A132
Alvarez MB A126
Andrade A A88 - A89
Apella C A19 – A134
Araujo CR A130
Arce MB A62
Aredes Fernandez PA A45
Arena ME A41 – A127
Argañaraz GR A10
Argañaraz Martínez E A19 – A134 – A135
Arias Torres AJ A49 – A50 – A111 – A112
Aristimuño ME A47
Arjona M A48
Arreguéz ML A41
Arrieta J A119
Arroyo D A137
Arruñada C A132
Atanasio Y A90 – A91 – A92
Ávila MN A122
Aybar MJ A70 – A77
Aybar Odstrcil I A66

B

Balderrama Coca ME A68
Baletka MA A56
Banegas FC A34
Barbieri N A38
Bardón A A11 – A21
Barrera AD A63
Barrionuevo MJ A93
Barros J A102 – A110
Bautista R A121
Bazán MC A136
Beleizán F A90 – A91 – A92
Belizán MME A37
Bellezze J A26
Beltrán SE A115
Benavente A A33 – A38
Benavidez A A100 – A101
Benítez LM A15
Benítez SB A15
Benitez-Vieyra S A7
Bertani MS A29
Blanco MJ A30
Bonilla F A60
Borkosky SA A21
Borsetti H A88 – A89
Brandán SA A8
Bravo ML A116
Brizuela L A118
Bustamante MS A109
Buyatti MA A120
Buzzi R A16

C

Cabrera CA A40
Cabrera JC A122
Camino N A104
Campá M A25 – A26
Canelada Lozzia MI A18
Canteros FH A37 – A114
Cap G A121
Carabajal Torrez JA A73
Cartagena E A11 – A41 – A127
Castillo GD A12
Castillo MV A8 – A10
Castro F A70
Cata Sanchez A A88
Catalán CA A37
Catalán CAN A45
Cataldo PG A42
Cata-Sánchez A A89
Cerezuela F A124
Cerusico N A40
Chaila S A84
Chalup A A11
Checa MA A10 – A17
Chediack JG A5
Chocobar Ponce S A22
Cisint S A61
Cisint SB A 57
Coll Y A85
Colombo MI A1
Colombres S A132
Contreras EF A93

Cordoba P A124
Coronel L A86
Corzo FL A33
Cosci R A88
Crespo CA A62
Criado A A79 – A80 – A119
Cruz A A137
Cruz LB A23 – A24
Cruz M A43
Cruz MF A13
Cruz RM A129

D

Davies L A8
de la Quintana L A118
Di TotoBlessing L A40
Díaz AV A27
Díaz E A137
Díaz RA A107
Díaz Ricci JC A44 – A54 – A55 – A85 A123 – A128
Digonzelli P A80 – A119
Di-Peto P A55

E

Echevarria AL A98 – A99 – A100 – A101
Elean M A42
Elías A A137
Entio L A113
Escalante JR A12 – A13 – A23

F

Facciuto GR A120
Fanjul ME A52 – A98 – A99 – A100
Farfan V A132
Feresin GE A11
Fernandez de Gandur S A132
Fernández M A134 – A135
Fernández S A61
Fernandez Salinas ML A93
Fernández SN A57 – A62
Ferrari R A16
Figueroa FR A56
Figueroa M A89
Flores C A108
Flores S A132
Fortuna AM A14 – A131
Frenzel AM A15
Fuentes ME A129
Funes C A94
Furio RN A85
Furque GI A48

G

Galindez JE A56
Gallardo C A121
Gallego MF A114
Gallo JM A114
Galvez C A71
Galvez CE A37
Garat J A82
García DC A28
García Degano F A64
García EV A63
García K A108
Garrido J A71
Garro MS A29
Garzon M A109
Gastaminza G A35 – A64
Genta SB A75 – A76
Giardina J A119
Giorgetti H A113
Giunta AS A23 – A24
Giunta SA A12 – A13
Godoy CJ A74
Gómez C A124
Gomez GC A 93
Gon M A25 – A26
González Coletti A A31 – A32
González EE A40
González J A124
González MC A20
González ME 65 – A66
González Melo MG A48
González Poma E A90 – A91 – A92
González SK A36
Gonzalez SN A129
Gordillo MA A14 – A131
Gramajo Bühler MC A58 – A59
Grancelli SM A18
Grande MV A74
Grande S A134 – A135
Grimolizzi OM A15
Grougnet R A45
Guerineau M A31 – A32
Guillén SC A18
Guzmán MA A69
Guzzetti KA A9

H

Habib NC A75 – A76
Hamity VC A93
Haro C A60 – A78 – A125
Hébert E A42
Heguy B A116
Heredia Ojeda E A56
Hernández de Borsetti N A90 – A91 – A92
Herrera Cognetta AN A12
Herrera HM A136
Hilal M A86
Honoré SM A74

I

Interdonato R A86
Iovane RJ A34
Iramain MA A8
Iriarte ML A47
Iriarte N A132
Iruzubieta Villagra AL A57
Iruzubieta Villagra L A61
Isas MG A34
Issé B A78 - A125

J

Jàcome, NL A2
Jaime GS A68
Jáuregui HS A23 – A24
Jerez EF A120
Jiménez Berarducci M A72
Jorrat S A16
Juliá JP A105
Juri S A18

K

Karbiner S A137
Katz NE A123
Kirschbaum D A117
Klyver S A66
Kritsanida M A45

L

Larrán M A90 – A91 – A92
Layús B A125
Lazarte S A78 – A125
Leal EV A127
LeBlanc JG A63
Ledesma Achem E A78 – A125
Ledesma Harón ML A115
Legorburu MC A130
Lencina I A102 – A103
Linares MA A93
Lissarrague MI A116
Lizarraga E A69 – A70
Lizárraga EF A76
Loandos MH A71
Lobo Gómez J A118
Lopez C A132
López Márquez F A60
López Miranda L A82
López N A137
López Rizo MC A29
López S A137
Lorenzo Pisarello MJ A130
Luciardi HL A122
Luciardi MC A136
Ludueña L A79 – A80
Luján EE A28
Luna ML A25 – A26

M

Madrid AS A22
Maldonado LM A117
Maldonado NI A126
Mamaní AI A54
Mandova T A45
Manni C A25 – A26
Manzur ME A8
Marchetti C A30
Mariani AC A136
Martín A A82
Martin AA A28
Martín GO (h) A31 – A32
Martinez L A38
Martínez MV A98 – A99 – A100
Martínez P A93 – A111 – A112
Martínez PN A96
Martínez S A118
Martínez-Zamora GM A85
Martos GG A54 – A123
Massa E A3
Medina M A119 – A133
Medina MF A59 – A65 – A66
Medina Pereyra P A83
Medrano CM A34
Merep P A35 – A36
Meroño T A136
Mesurado MA A11
Miceli DC A63
Michel AA A51
Mónaco ME A78 - A125
Monferrán MC A110
Montti L A108
Moreno MJ A40
Moyano MA A17
Mujica M A113
Mujica MM A116
Müller MF A39
Muñoz-de-Toro M A4
Muro C A71
Muruaga N A70
Muruaga NB A97

N

Nasca JA A28
Nico A A121
Nicosia MG A31 – A32
Nieva A A137
Noblega L A132
Núñez M A79 – A80

O

Ochoa S A109
Oldano AV A122
Olea LE A31 – A32

Olguín J A112
Oliva ME A63
Ordoñez A A43
Ordóñez AAL A129
Orieta RO A115
Ormeño AG A111
Ormeño I A33
Ortiz D A109
Ortíz F A93
Ortiz FD A105
Padilla Franzotti CL A39
Páez JB A49 – A50
Páez V A84
Páez V de los A A87
Palacio MO A106 – A107
Palazón E A133

P

Pantorrilla M A90
Parrado JD A114
Parrado MF A97
Parravicini O A71
Peña M A28
Peralta F A124
Perato SM A55
Pereira MM A114
Pereyra P A87
Pérez Aguilar RC A122
Pérez Alabarce J A119
Pérez Chaia A| A19 – A29 – A135
Pérez DO A34
Pérez MB A19
Pérez MLP A34
Perotti M A35 – A36
Perreta MG A120
Ponce RI A24
Popich S A33
Popich SB A36
Prado C A22
Prado FE A22
Pucci Alcaide A A53 – A56
Pucci Alcaide F A53

Q

Quintana de Quinteros S A121
Quinteros D A60
Quiroga M A29
Quiroga PA A105
Quispe R A93

R

Ramallo J A86
Ramos I A57 – A61
Raschi AB A9
Rearte M A18
Regadío C A124
Reguera MC A20
Reguilón C A83
Requena-Serra FJ A128
Reynoso AM A68
Reynoso MA A67 – A72
Ríos J A88 – A89
Rocha RM A126
Rodríguez Brito A A30
Rodriguez G A82 – A113
Rodríguez MJ A106
Rodríguez SRT A17
Roger E A106 – A107
Rojas IP A67
Rojas JD A34
Rojas NL A69
Roldán VP A25 – A26
Roldán-Olarte M A28
Romano E A9
Romano S A82
Romero C A65
Romero E A79 – A119
Romero ER A80
Romero M A119
Romero SM A48
Rosa M A22
Rudyk R A10
Ruiz Holgado N A82

S

Saavedra L A42
Saavedra SE A17
Saccone MA A14
Saguir F A46
Saguir PF A130
Sajur S A46
Salas L A102 – A103 – A104 – A110
Salazar SM A44 – A85
Salguero EJ A56
Salvatierra A A132
Salvatore A A21
Sampietro DA A37 – A45 – A73
San Martín S A81
San Román D A14
Sánchez Matías M A35 – A64
Sánchez SS A74
SanchezToranzo G A58
Santillán, JG A6
SavoyG A42
Sayago M A38
Schilman B A20
Schuff C A35 – A36
Serra Barcellona C A76
Sesto Cabral ME A40
Sgariglia MA A47 – A73
Silverio MJ A110
Silvetti J A25
Sisterna M A113
Soberón JR A47 – A73
Sobrero M A84
Sobrero MT A87

Soloaga A A124
Somaini GC A77
Soria DB A43
Sosa AM A21
Soto A ME A118
Soto Ramos Y A102
Stazzonelli JC A52
Storani G A25
Suárez E A88

T

Taboada FF A75 – A76
Taboada L A65
Taboada LN A66
Tapia S A94
Tapia SN A109
Terán Baptista ZP A45
Terán M A78 – A125
Terán P A35 – A64
Toll Vera JR A31 – A32
Tomás M A62
Tomas-Grau RH A55 – A128
Torres Soporsky M A46
Tortora M A79 – A80 – A119
Tríbulo C A77
Turbay SI A131

U

Ullivarri J A80
Unías L A50

V

Vaca C A90
Vaca GV A51
Valdecantos PA A62
Valdez IC A53 – A56
Valdez Jaén G A52
Valdez KL A111
Varas MM A111 – A112
Vattuone MA A47 – A73
Vecchioli SO A107
Velásquez Guzmán EF A13
Vella MA A28
Ventura L A109
Vera NR A21 – A67 – A68 – A72 – A77
Vergara V A104
Vidal JPM A18
Villafañe M A65
Villagra J A72
Villagra M A137
Villecco MB A71
Villegas J A42
Vintiñi E A133
Viola CM A41 – A127
Vizoso Pinto MG A39

Y

Yankelevich C A74
Yurquina A A9

Z

Zamar MI A93 – A94 – A95 – A96
Zamora A A133
Zaragoza Puchol JD A11
Zelarayán LI A49 – A50
Zutara MS A12 – A13 – A23