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LECTURES

A1
"Miguel Lillo" Lecture
ROLE OF KLF6 TRANSCRIPTION FACTOR IN TUMOR SUPPRESSION TRIGGERED BY ACTIVATED RAS ONCOGEN

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KLF6 protein is a member of the Krüppel-like factors family of transcription factors which have diverse roles in the regulation of cell physiology including proliferation, apoptosis, differentiation and development. KLF6 is ubiquitously expressed and mutations within the *klf6* gene, decreased expression and/or loss-of-heterozygosity were associated with the development of different human malignancies.
In this work, we investigate the ability of KLF6 to regulate the oncogenic activation triggered by the Ras pathway, focusing on the signal transduction cascades involved in the regulation of KLF6 expression. It is noteworthy that gain-of-function mutations within the Ras genes are associated with more than 30% of cancer in humans. Herein, we demonstrate that KLF6 behaves as a tumor suppressor, restraining the spontaneous onset of the transformed phenotype and reducing cell proliferation rate and tumor growth driven by mutated H-Ras. Loss of function analysis using *sh*RNA-mediated KLF6 depletion resulted in the formation of transformed foci and allowed the spontaneous conversion of NIH3T3 cells to a tumorigenic state. We also showed that KLF6 was up-regulated by H-Ras^{G12V} expression in a Jun N-terminal Kinase-dependent manner, correlating with enhanced *klf6* promoter activity. Moreover, we demonstrate that ectopic KLF6 expression induced a G1-phase cell cycle arrest, thereby decreasing cell proliferation rate. Additionally, constitutive KLF6 expression was able to impair some capabilities of the Ras-transformed cells like loss of density-dependent growth inhibition and anchorage-independent growth potential. Furthermore, growth of H-Ras^{G12V}-driven tumors was reduced in mice challenged with cells stably expressing KLF6. However, KLF6 silencing did not modify the malignant phenotype triggered by H-Ras^{G12V}. KLF6 levels correlated with increased expression of p21, whereas neither p53 induction nor apoptotic cell death was detected. Further, p21 knockdown impaired KLF6-induced cell cycle arrest. This cytostatic response was associated with resistance to apoptosis mediated by DNA damaging chemotherapy drugs, suggesting that these drugs would not be effective for treatment of tumors expressing high levels of KLF6, but simultaneously raising the need for the development of new alternative therapies.
These findings provide novel evidence highlighting KLF6 function in response to oncogenic stress, suggesting a relevant activity of KLF6 in controlling cell proliferation and hindering tumorigenesis.

A2
Opening Lecture
IT HAS THE BODY OF AN OX, AND IT IS NOT AN OX…

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The title of this presentation alludes to the beginning of the description of the *tapir* or *anta* made by Petrus Martyr D'Anghleria in 1511. An emblematic beast of the New World, the tapir and its description challenged the chronicler, who had found nothing like it before since the so-called *orbe novo* was new in every sense. The newcomers found, together with a new geography, a new fauna, another flora, different products and men who, being neither black nor white, were not the "slaves by nature" mentioned by Aristotle. Even the sky was new, without the Pole Star to guide sailors, as Vespucci complained.
This fauna, which surpassed fiction, became the protagonist of another literature, more natural and exciting, made up of the detailed chronicles that accompanied the discovery of America. Thus, beyond numerous anecdotes, something will be said about the development of the zoological knowledge in the New World, in a mixture in which myths, legends, beliefs and pure knowledge were burnt in the pyres of the Inquisition.

A3
POLLUTION AND AGROCHEMICALS: GLYPHOSATE IMPACT ON FRESHWATER

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Agricultural practices carried out worldwide are mainly based on agrochemicals. Glyphosate is a non-selective, broad-spectrum, post-emergent herbicide mainly used for weed control; it is considered harmless and safe for the environment due to its low toxicity. Glyphosate is the world's best-selling agrochemical due to the large intensive cultivation of genetically modified crops that can tolerate it. Also, no-till practices that favor soil integrity include the use of glyphosate for weed control. In Argentina, the use of glyphosate rocketed since the 90s and today more than 180 million kg/ha is applied each year. According to our studies, the herbicide is far from being harmless to the environment due to its negative impact on fresh water. The contribution of phosphorus from glyphosate and its availability mediated by biodegradation processes enrich the water favoring the eutrophication process. We demonstrated, at ecosystem scale using outdoor mesocosms, its direct effect on microbial communities such as phytoplankton, bacterioplankton and periphyton, which constitute the basis of the community structure of freshwater ecosystems. Some algal groups decreased while certain other components such as cyanobacteria seemed to be favored. In some cases, such as picocyanobacteria, they started to dominate the water column, causing changes in the overall turbidity of the system. We showed that water quality has deteriorated due to glyphosate impact, which is a matter of concern because freshwater systems provide important ecosystem goods and services to humanity. Considering that anthropogenic stressors act jointly in the environment, we evaluated how glyphosate interacts in water with an invasive species, the golden mussel *Limnoperna fortunei*, which arrived in Argentina almost simultaneously with the emergence of glyphosate. Our results show that the joint action of both stressors still generates major alterations in biological communities and water quality due to their synergistic interaction.

A4
ASPECTS TO CONSIDER FOR THE IDENTIFICATION OF *Opuntia* SPECIES (CACTACEAE) FROM ARGENTINA

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The genus *Opuntia* Mill. (Cactaceae-Opuntioideae-Opuntieae) is one of the largest genera of cacti, and has a widespread distribution from northern Patagonia to southern Canada. Its species, widely known as 'prickly-pear', 'tuna' or 'nopal', are typical for presenting a combination of traits: flat rounded articulated stem segments (cladodes), very small early caducous leaves, large smooth fixed spines andareoles with glochids, beautiful rotaceous flowers with inferior ovaries surrounded by the pericarpels, plurilobed stigma, stamens with thigmonasty, reticulate semitectate pollen and seeds covered by a hard funicular aril. Its systematics is complex mainly because species have high phenotypic plasticity and vegetative reproduction (by apomixes and stem or sterile fruits forming adventitious roots). As a consequence, many populations are clonal. In Argentina there are 14 native species –with several infraspecific taxa-, and four adventitious ones. The present contribution provides keys for the correct identification of taxa based on morphological and reproductive features.

A5
SPECIES DISTRIBUTION MODELS AND SPATIAL PRIORIZATION FOR CONSERVATION IN ARGENTINA

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During the last few years, along with the progress of bioinformatics and geographic information systems, several methodological approaches or biodiversity conservation have been developed. Nevertheless, their application for addressing conservation problems in Argentina is scarce. Even worse, articulation between these scarce applications and decision makers in the country is virtually inexistent. In this dissertation, examples of applications of species distribution models and spatial prioritization approaches for the prevention, assessment and addressing of specific conservation problems in Argentina will be shown. First, I will present some models associated with the determination of suitable areas for the establishment and expansion of alien (and potentially alien) species, specifically the cases of the American Bullfrog and the most legally imported freshwater turtles in the country. Then, I will present examples of the determination of priority conservation areas in regions of the country that are heavily threatened by agricultural expansion, such as the Gran Chaco ecoregion and Córdoba province. It is clear that these kinds of methodological procedures for supporting conservation decisions in Argentina are incredibly useful.

SYMPOSIUM: "New prospects in biodiversity preservation"

A6
ECOSYSTEM SERVICES PROVIDED BY BIODIVERSITY: THE CASE OF POLLINATORS THAT PROMOTE FOOD PRODUCTION

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It is common to hear about conservation of species that are at risk of extinction; however, conservation also implies inconspicuous species such as insects. Insects are important for the well-being of humans; they participate in the formation of soils and are also pollinators for wild and cultivated plants. Pollinators are mainly insects like butterflies, bees, beetles, flies and ants. A large portion of our food comes from crops that are pollinated by animals. Moving male towards female gametes is the way in which these insects provide a pollination service. Natural and seminatural ecosystems represent the source habitat for these species while plantations are the sink during the flowering period. This service takes place at the local scale. We studied grapefruit and lemon plantations in Salta and Tucumán and found that the distance and quality of natural habitats were related to the diversity of pollinators within plantations. Also, the presence of pollinators increased the production of seeds and pods in 14 varieties of soybean that we cultivated in a greenhouse. On a global scale, in a study with more than 30 different species, we showed that the diversity of pollinators was directly related to crop production. The maintenance of natural habitats and the generation of corridors within plantations can help the conservation of insects that promote food production.

A7
BIODIVERSITY CONSERVATION OF SPECIES OF INTEREST FOR THE PRODUCTION OF BIOACTIVE METABOLITES

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The chemical diversity of plants offers unlimited opportunities for the development of new drugs and/or phyto-pharmaceutical preparations. Knowledge of traditional medicine allows the discovery of active ingredients useful for human health. The literature describes bioprospecting, based on the systematic search and/or documentation of knowledge of traditional medicine in order to discover useful bioactive molecules with potential commercial value, giving these traditional practices a scientific basis through different disciplines,. Based on the concept of "biodiversity conservation" as well as the responsible use of natural resources, modern society has become aware of the contribution of traditional knowledge to science and society, coupled with the economic importance of this aspect. Argentina offers a varied endemic flora, with 9,938 species distributed in 274 families, with high potential for the development of bioprospecting. Many of them are used in traditional medicine for their therapeutic properties, mainly to treat digestive and liver disorders associated with infectious inflammatory conditions such as fever, cough and colds. This encourages the collection of many species for sale in markets and health food stores, as well as for chemical and biological studies. Experiences of bioprospecting and species collection to obtain bioactive metabolites are presented using ecological and conservation strategies such as vegetative propagation and micropropagation.

A8
PROTECTED AREAS SYSTEM OF TUCUMAN - A REVIEW OF THE BICENTENNIAL

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The ideas of nature conservation and diversity in Tucuman began in the early twentieth century and gained momentum during the centennial. They were solidified just two decades later, with the creation of the provincial reserve of La Florida, in 1936. At the end of the second century, the province has 15 state and private protected areas, covering about 180,000 Ha. On paper, it represents a significant step forward, considering the small size and high population density of the province. In practice, several of these reserves have not passed the stage of paper, with no administrative structure and lack of control. Fortunately, the state of conservation and biodiversity in most areas generally ranges from good to excellent. The presentation will discuss future prospects in the province and in Argentina, with increasingy demanding natural resources, with strong transforming forces, but also in a biological context that is remarkably resilient to human impact, and with a society that seems to increasingly value natural areas and nature itself.

ORAL COMMUNICATIONS

A9

Xylella fastidiosa IN OLIVE: CHARACTERIZATION OF AN ARGENTINE ISOLATE

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The olive production is seriously affected by several factors (abiotic and biotic agents). Among the latter, different microorganisms are involved, most of which are soil fungi. Recently, *Xylella fastidiosa* was also identified; the precedents of this bacterium are scarce in olive trees, it having been detected in the US, Italy and recently in Brazil. In Italy (Puglia Region), this pathogen could be causing the Olive quick decline (QDOS), producing the death of a large number of production plants in a short time. In Argentina, *X. fastidiosa* was first detected in plum, while at present it is found in citrus and almond orchards. Recently, in traditional olive orchards of the Argentine Northwest, this pathogen was found in plants with marked decline, dry branches and apical necrosis in leaves. The objective of this work was to perform a molecular characterization through multilocus sequence typing (MLST) that allows the characterization of bacterial isolates. Total DNA extraction was performed from petioles of symptomatic leaves of var. Arauco from La Rioja province. Seven housekeeping genes (*leuA*, *petC*, *malF*, *cysG*, *holC*, *nuoL* and *gltT)* were amplified and the amplified products were sequenced and analyzed through different bioinformatics programs. The corresponding sequences of these genes were confronted with the *X. fastidiosa* MLST database, assigning to the allelic profile a sequence type ST=69. Currently, we are performing studies to analyze nucleotide similarities between our isolates and those previously reported. These results will allow us to elucidate the role played by *X. fastidiosa* in the symptoms described in olive trees.

A10

THE EFFECT OF METHANOLIC EXTRACT FROM *Senecio rudbeckiaefolius (*MESr) ON WALNUT TREE-INFESTING INSECT

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The culture of walnut tree and its commercialization as dried fruit are important economic activities in the province of La Rioja. *Plodia interpunctella* is one of the pests that decrease nut quality and thus its profitability. Many investigations are focused on the application of natural products as pesticides, although in most cases target structures and/or systems of their action have not been identified.
The aim of this work was to evaluate the lethal and sublethal effects of MESr on *P. interpunctella* and its mode of action. Toxicity and repellency bioassays with MESr (50 – 200 mg/L) on *P. interpunctella* larvae were carried out. To determine the modes of action a test of oxygen consumption was performed using a modified Warburg respirometer and the histological study of digestive membranes was performed as they have been suggested to be a target of action of insecticides in other Lepidoptera.
High values of mortality (75-85%) were obtained in essays with MESr 150 and 200 mg/L and a dose-dependent repellency effect was recorded. Morphological changes were observed during the development of larvae and pupae, which prevented the complete life cycle (sublethal effects). It was found that MESr immediately alters the cellular respiration process but it does not affect the integrity of the peritrophic membrane of the midgut.
In conclusion, it is proposed that MESr is effective in controlling *P. interpunctella* interfering at some step of the respiratory chain and that the peritrophic membrane is resistant to the action of the product at the concentrations used.

A11

RIVER WATER QUALITY BEFORE ENTERING RIO HONDO RESERVOIR. 2012-2015 PERIOD

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At the request of the Sali-Dulce Basin Committee, the State Secretariat for the Environment of Tucumán (SEMA), which manages provincial public waters, is testing an index with parameters that determine quality deterioration. Objective of the work: year-month comparitive behavior of Salí River sites: routes N321, N323 and locality Los Romanos, 2012-2015, using quality index. We used ICA-NSF index determining hydrogen potential, turbidity, biological oxygen demand; total dissolved solids; nitrates; phosphates; dissolved oxygen; total coliform bacteria; environment - sample difference (monthly data analyzed in an EEAOC (Experimental Agricultural Station “Obispo Colombres”) laboratory according to a Standard Method) temperature value calculated by mathematical formula ICA range 1-100 (0-25 poor quality, average quality 51-70).
Results: lower ICA values, poor quality, observed in the sugar-alcohol-citrics harvest and low rainfall period (July-October): Sali RN321 (27.28) August-2013; RN323 left (27.58) September-2013; Los Romanos (26.49) September-2013. Maximum values, average rating, were found in the summer period: Sali RN321 (56.76) February-2014; RN323 date (58.3) March-

2013, Salí RN323 (63.88) January-2014. The year 2015 showed a lower standard deviation (data with little variation compared to the baseline average). Comparing ICA results such as value and number of months, the best values were found in Los Romanos and the worst in Sali RN321; however, no site or period showed lower quality. We can conclude that improvement was observed in the section Salí RN323 - Los Romanos, possibly by self-purification and control measures of the provincial agency on companies during the last year analyzed.

A12
FISH FAUNA FROM AÑATUYA SWAMP, SANTIAGO DEL ESTERO, ARGENTINA

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The Añatuya swamp arises from the overflowing of the Salado River and presents a seasonal behavior. It is located in the Santiago del Estero Province, in Taboada and Avellaneda Department. It belongs to the Parano-Platense ictioregion. The swamp is retreating due to the construction channels used for irrigation, flood control and drinking water supply, which alter the normal functioning of the wetland. The aim of this work was to survey fish in the swamp, channels and river during period of rains and drought. 4 samplings were conducted from October 2012 to June 2014. The samples were collected by hand nets, trawl net and cast net depending on the type of environment. All materials will be deposited in the Icthyological Collection of the Fundación Miguel Lillo.
A total of 2081 fishes were sampled, out of which 52.7% were from lagoons or flood ponds, 30.1% from channels and 17.3% from the Salado River. The richness recorded in all environments was 34, the most abundant being Characiformes (50%) followed by Cyprinodontiformes (42.2%), Siluriformes (4.6%), Percyformes (3.1%) and Symbranciformes (0.1%). Greater richness (28) was found in the channels and smallest in the lagoons and pools (17), with predominance of livebearers and tetras. The Salado River presents a richness of 21 with marked predominance of tetras. The building of new irrigation channels on the Salado River caused a decrease in the water flow and consequently the lagoons and ponds did not receive enough water to support aquatic biota during the 2014 period.

A13
STRUCTURAL RESPONSE OF A NATURAL PASTURE IN SOUTHERN CORDOBA TO CHANGES IN TEMPERATURE AND RAINFALL

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Biodiversity is one of the challenges in the management and conservation of nature. Natural grasslands relicts are an important source of plant diversity. In this paper a survey was performed of a natural pasture located in Rio Cuarto city, on the banks of Chocancharava River, in order to characterize the natural grassland and determine whether plant diversity varied with the seasons, depending on temperature and precipitation. Monthly 10 samples (August 2015-September 2014) of 0.25m2 were performed, surveying floristic list and coverage and classifying species according to life cycle and growth, family and classification according to Raunkiaer. Diversity indices (H), prevalence (P) and evenness (E) were calculated and statistical analyses were performed with the INFOSTAT program. 47 species (66% spring-summer and autumn-winter 34%) belonging to 20 families represented mainly by poaceaes (34%) and asteraceae (19%) were recorded; out of them, 47% are annual and 53% perennial (32% hemicryptophytes, 15% and 9% geophytes nanophanerophytes). The values for diversity were: Fall: H=1.16 P=0.07 E=0.93; Spring: H=1.08 P=0.10 E=0.9; Summer: H=1.13 P=0.085 E=0.92, with average temperatures and accumulated rainfall of 18.4 °C and 111mm; 18.4 °C and 207 mm; 22° C and 422mm, respectively. Winter punctually showed the lowest diversity (H=1.06 P=0.12 E=0.88) and (11.7 °C and 23 mm) and generating statistically significant differences between seasons. With these results we can say that temperature and rainfall would condition plant diversity in the pasture studied.

A14
RELATIONSHIP BETWEEN AERIAL BIOMASS AND SEASONAL VARIATION OF PRECIPITATION AND TEMPERATURES IN PASTURES IN SOUTHERN CORDOBA

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Rangelands are important reservoirs of flora and wildlife, providing ecological and economic benefits. In order to maintain and improve the condition of the rangelands it is necessary to study them and know their composition and evolution over time. In this paper we proposed to analyze the behavior of climatic variables (temperature and rainfall), the biomass of a natural grassland and check if there was a significant relationship between them in natural grassland located on the banks of Chocancharava, in Rio Cuarto city. Monthly 10 random samples of 0.5 x 0.5 m (0.25 m2) were taken, from September 2014 to August 2015, by cutting at a height of between 5 and 7 cm with scissors. The samples were separated into: green

biomass (BMV), dry biomass (BMS) and mulch (M), and dried in oven to constant weight. Aerial biomass was determined. An Infostat program was used for statistical analysis with a completely randomized design (DCA). Seasonal mean values were: BMV summer 1429kg/ha, autumnal 782kg/ha, winter 293kg/ha and spring 819kg/ha, with 8772 kg /ha throughout the cycle. BMS summer 263kg/ha, autumnal 700kg/ha, winter 872kg/ha and spring 527kg/ha, with a total contribution of 6663kg/ha. Mulch summer 822kg/ha, autumn 493kg/ha, winter 348kg/ha and spring 613kg/ha, with an annual total of 6004kg/ha. Given that the higher temperatures and rainfall are recorded in summer (mean 22°C and 422 mm), we can say that these variables account for a significant portion of the variability in the production of total aboveground biomass of grassland.

A15
NEW REGISTERS OF *Chlamyphorus truncatus* (DASYPODIDAE; CINGULATA) IN CATAMARCA PROVINCE

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Chlamyphorus truncates, called “pichi ciego menor,” is an Argentine endemic armadillo species that inhabits sandy soils in arid Chacoan ecoregions. It is a fossorial and nocturnal animal that is usually hidden from view; that is why it is a rare species and scientific knowledge about it is so scarce as to place it in the “Insufficient Data” Red List category. Indeed, a lot of the species registrations have neither descriptions nor documented data, with the exception of several verbal references of local people living in the species habitat. The pichi ciego was registered in Catamarca province at La Guardia village in the south; this report marks the norther boundary of the distribution area of the species. The objective of this work is to report the finding of two *Chlamyphorus truncatus* specimens whose locations extend this area to the north. Registers were obtained from institutional and individuals that had conserved individuals. The sites of the findings were obtained with a Garmin GPS in the reported places; photos were taken using a 13 mp Lumix camera. The first specimen was captured in May 2016 at the Police Sporting Center in the Capital Department, 28º31’08.26’’S and 65º47’12.84’’W, near Route 38 in the city’s southern access; the dead animal was handed over to the Biodiversity Direction of the Provincial Environment Secretary, where it was identified and examined. The specimen is adequately conserved now in the Fauna Collection of the above institution. Also in May, the second specimen was given to us by a student; it was kept in salt because it was collected in 2010. The collection site was near the Miraflores locality, at 28º36’06.24’’S and 65º53’28.43’’W in the north of the Capayán Department. The new *Chlamyphorus truncatus* recorded in Catamarca shows that the northern limit of the specimen’s distribution area is situated at 01º02’12.36’’, which is further south than the the one registered up to now.

A16
NEW EVIDENCE OF THE PHYSIOLOGICAL ROLE OF PROGESTERONE IN *Rhinella arenarum* OOCYTE MATURATION

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For years, progesterone (P_4) synthesized by the follicle has been considered the inducer of oocyte maturation in amphibians. However, in some species, testosterone (T) plays a central role in this process. The aim of this study was to elucidate the role of the follicular secretion of P_4 and T in *R. arenarum* oocyte maturation.
During the reproductive period, 2 lots of adult females of *R. arenarum* were used: a batch of females was ip injected with 200 IU/mL/animal of hCG while the other batch was left untreated and used as control. Hormonal determinations were carried out by TLC and ECLIA in follicles obtained from both lots at 3, 6 and 9 h. Batches of 20 follicles in 1 mL Ringer (RA) were incubated for 1 h and P_4 and T levels were determined. For the analysis of secretion by TLC 100 follicles were used. Maturation (RVG) and ovulation were monitored at each time. The results obtained *in vivo* by TLC showed that under basal conditions the follicles secreted T while under the action of hCG they secret P_4. The ECLIA results showed that the basal follicular secretion *in vivo* of P_4 is kept below 1 nM, whereas T increases up to 4 nM at 9 h. Under these conditions RVG not observed. Under follicular stimulation *in vivo* P_4 secretion increased between 3 and 9 h while T decreased at this time. Maturation occurred after 6 h and ovulation at 9 h. These *in vivo* results confirm the physiological significance of the follicular secretion P_4 in RVG and ovulation in *R. arenarum*.

A17
MEAT PRODUCTION IN CASTRATED VERSUS UNCASTRATED CATTLE

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Inefficiency of cattle, limiting land by agriculturization, urbanization and degradation have led to intensive feeding practices of uncastrated cattle in search for more meat and less fat through testicular hormone effect. A change was observed in animal welfare such as an attempt to jump or fight that could affect organoleptic quality. The aim of this study was to assess productivity, beef quality and behavior. 150 Braford calves 3/8 castrated weighing 178±7.7Kg, and uncastrated calves weighing 181±5.5kg ($p>0.05$) were locked up. They were fed on grain corn, chopped silage corn plant, pellet sunflower, urea and minerals for 120 days. Attempts to jump or fight were observed for 2 hours/day. Feed conversion efficiency (FCE) was measured in kg feed/kg live cattle and daily gain of live weight (DGLW) in kg. Immediately after slaughter, weight of carcass (HWC) in kg, carcass production (CP) in %, back fat (BF) in mm, blemishes and color of beef were determined. The design was randomized complete blocks, with 25 heads per treatment (castrated and uncastrated) and 3 repetitions; results and minimum mean square were analyzed by ANOVA and Duncan with Statgraphics Plus for Windows. A non significant average of 3 attempts to jump and 1 to fight was observed during the last month. Final weight was 311±7.2 and 328±4.7kg; DGLW 1.110±0.122 and 1.230±0.098kg; FCE 5.97 and 5.41kg/kg; HWC 186±3.8 and 201±2.6kg; CP 59.8±3.1 and 61.2±3.1%; and BF 6.4±0.93 and 4.7±0.73mm for castrated and uncastrated cattle respectively ($p<0.05$). The beef showed no dark color or shock. We concluded that the uncastrated animal is a natural alternative to increase the efficiency of meat production without affecting its quality.

A18
COMPARATIVE ANALYSIS OF *bdnf/trk2a* GENE EXPRESSION DURING EARLY DEVELOPMENT OF *Xenopus laevis*

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The Trk/BDNF cell signaling pathway has been implicated in cellular processes of neural precursors selection and in the development of neural crest derivatives in the amphibian *Xenopus laevis*. The activation of this signaling pathway could be involved in the development of cells derived from neural crest in mouse, chicken and fish embryos. It has been postulated that the Trk/BDNF signaling pathway exerts its action through a number of signaling molecules such as PLC-gamma, PI3K, and proteins of the Ras-MAPK pathway. In this work, in order to establish the spatial and temporal relationship between the expressions of different components of the pathway, we comparatively analyzed the spatiotemporal expression of *bdnf* genes and *trk2a* in *Xenopus laevis* embryos. Wholemount in situ hybridization was carried out for each gene under study during the early stages of development. It was observed that BDNF gene is expressed from early stage 11 at the neural plate border. The trk2a gene expression initiates stage 10, in the domain of the neural plate. In order to accurately delimit ectodermal domains expression of the Trk/BDNF pathway genes, double in situ hybridizations were carried out with neural plate, neural crest and epidermis markers. We found that *bdnf* is expressed overlapping neural crest markers genes expression. The results suggest that genes of the Trk/BDNF pathway might be involved in neural crest induction, defining the neural crest/epidermal and neural crest/neural plate boundaries.

A19
EVALUATION OF PRETREATMENTS FOR BLUEBERRY DRYING

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Blueberry production that cannot be marketed as fresh fruit has several conservation possibilities, many of them, such as freezing, implying high energy consumption. Dehydration saves energy and reduces volume and storage cost. The objective of this work was to determine the pretreatment that affected to a lesser extent the bioactive components of blueberries during drying. A trial was conducted to evaluate four drying pretreatments in an oven with forced air circulation at 60 °C for 7 days. The treatments performed were: control (variety Snow Chaser, sized between 10 and 14 mm), scarifying, drilling and dewaxing. As the heating of fruit affects bioactive components, polyphenols and anthocyanins content was measured in fresh fruit and for each treatment and humidity was determined to evaluate drying efficiency. The scarification treatment was performed in plastic trays with of 60-mesh sandpaper stirring in a shaker for 4 minutes at 230 rpm. The dewaxing treatment was performed on the same tray with a cloth on its base, also in a shaker for 4 minutes at 230 rpm. Drilling was done by hand with a pin in the "shoulder" of the fruits. A daily sample from each treatment was collected and weighed and then 10 g of fruit was separated and macerated with ethanol/water solution 80% v/v for 2 hours in a magnetic stirrer. Then the sample was filtered and polyphenols and anthocyanins were determined in the alcoholic extracts. The determination of total polyphenols and anthocyanins was carried out by Visible Spectrophotometry. It was observed that the scarifying treatment

caused faster dehydration and reduced to a lesser extent the polyphenols and anthocyanins content compared to other treatments, so we concluded that this would be the more suitable pretreatment for blueberry dehydration.

A20
EFFECTS OF CHEMICAL FERTILIZATION AND BIOFERTILIZATION ON GREEN ONION (*Allium fistulosum* L.)

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Domestic horticultural supply has an important complement: green onions during autumn and winter. We evaluated the effects of chemical fertilization and biofertilization on green onion. The experiment was conducted at the Chair of Horticulture - Finca El Manantial. It was propagated asexually -by means of runners- in lines measuring 10m by 0.50m; with a planting distance of 0.25m and depth of 0.05m. With a BCA design, the 3 treatments were: T1: without fertilization; T2: chemical fertilizers (urea in soil); T3: liquid biological fertilizer (aspersion). Irrigation and phytosanitary monitoring were identical for all treatments. Fertilization was conducted one month after transplant and harvest after 90 days. The parameters evaluated were: number, weight and diameter of bulbs, number and length of leaves and roots, fresh weight of roots and leaves. After variance analysis: no significant differences were found in terms of number, weight or diameter of bulbs; root length; fresh weight of roots or leaves between the treatments. There were significant differences in the number of leaves between T1 (11.6) and T2 (16.40) with p=0.03978, and between T1 and T3 (18.20) with p=0.000617. There were also significant differences in length of leaves between T1 (25.50) and T2 (31.14) with p=0.01268, and between T1 and T3 (33.14) with p=0.00121. In terms of number and length of leaves, chemical fertilization and biofertilization treatments had similar behaviors. These effects on green onion trials justify continuing them, considering the scarce local systematized information available.

A21
EFFICIENCY OF FUNGICIDE MIXING IN THE CONTROL OF BROWN SPOT IN SOYBEAN

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The brown spot caused by the fungus (*Septoria glycines Hemmi*) is one of the most important leaf diseases in soybean; it may damage about 8-15% from natural infection, initial symptoms being displayed mainly on the lower leaves., and evolving into a general yellowing in affected leaves, which may fall prematurely from the base to the top of the plant, directly impacting yields. Disease management is based mainly on the use of fungicides. The objective of this work was to evaluate the efficacy of mixing fungicides in the handling of brown spot during the 2016 campaign. Six double and triple mixtures in a commercial lot located in the City of Virginia (Department of Burruyacu, Tucuman) were tested. Four replications for each treatment were made, which were applied in the phenological stage R4. Severity of the disease was evaluated at 15, 30, and 40 days after application in 5 plants per plot. At the end of the trial, the yield (kg / ha) of the two central lines of each plot was determined. The brown spot appeared with maximum severity levels of about 24%. A decrease in severity levels is determined around 20 to 35%, under the action of double and triple mixtures. Significant differences between treatments were observed, emphasizing the cyproconazol + azoxystrobin mixture, followed by trifloxystrobin + prothioconazole. As to yield, the best mixture was fluxapyroxad + epoxyconazole + pyraclostrobin. In this work it is shown that the chemical management of foliar diseases in soybean is an effective strategy which is reflected in better yields.

A22
EFFECT OF PLANTING DATE ON THE PERFORMANCE OF A COMMERCIAL VARIETY OF BLACK BEAN

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The common bean (*Phaseolus vulgaris* L.) represents an important regional agricultural activity for the northwest of Argentina (NOA). In Tucuman and its surrounding areas, planting occurs from mid-January to late February, the most frequent date being the first half of February. This could determine, among other factors, differences in the final production obtained. The aim of this study was to evaluate the influence of three planting dates (early, normal and late) in the performance of a commercial variety of black bean (TUC 510) in 2016. This experiment was conducted in Monte Redondo Substation, in San Agustin (Cruz Alta, Tucumán, Argentina). The experimental unit consisted of plots of four lines of four meters at 0.52 cm from each other. Four replications for each treatment were performed. During the crop cycle weekly evaluations were conducted to determine the different phenological stages. At the end of the cycle, the number of nodes,

branches and pods of four plants per experimental unit were quantified. Yield (kg/ha) for each treatment was determined. Early planting date produced a greater number of pods and branches, significantly differing from the other two planting dates. Late planting date produced lower yields and fewer nodes, also differing significantly from the other two dates. These differences would be correlated with a shorter reproductive period of the plants planted on the late date and with lower rainfall toward the end of the crop cycle in this season.

POSTER PRESENTATIONS

A23

DETERMINATION OF PHOSPHINE SORPTION IN CHIA (*Salvia hispanica* L.) SEEDS FUMIGATED WITH ALUMINUM PHOSPHIDE (PHOSTOXIN® DEGESCH)

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Chia (*Salvia hispanica* L.) seeds production in the NOA is a new activity in the region. For export to international markets, chia requires quarantine fumigation with phosphine generated from aluminum phosphide to control insect complex attacking. The dry matter present in the proximal composition of the seed has the ability to sorb the phosphine generated during the fumigation process. There are no references in research concerning chia seeds sorption. The objective of this work was to determine the percentage of phosphine sorbed by chia seeds during fumigation and recommend the necessary dose of aluminum phosphide for effective insect control.
This test was conducted on chia seeds with a dose of 2 grams of phosphine / ton. The treatment was carried out with 4 repetitions and a control sample. Seed samples of 1 kg each were packaged in sealed plastic containers Exposure time was 120 hours and phosphine concentration was measured every 24 hours with a Forsafe pump and colorimetric tubes ranging from 50 to 2000 ppm. The phosphine concentration measurements achieved in the control and treatment sorption showed 82.5% of the applied concentration. Statistical analysis indicated significant and highly significant differences in relation to the control.
We concluded that chia seeds have a phosphine sorptive capacity of 82.5% of the applied concentration of the fumigant, so that the dose must be increased in equal value to compensate the effect. The dose of aluminum phosphide should be increased from 2 g to 3.65 g / ton of grain, equivalent to 11 pills of Phostoxin 3 g each per ton of chia.

A24

EFFECT OF MAIZE PLANT DETASSELING ON GRAIN YIELD

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Detasselling is recommended to increase yields in maize (*Zea mays* L.), but there is controversy between different authors on its effect. The objective of this work was to evaluate the effect of detasselling on grain yield of maize (GY). The experiment was conducted at INTA, Leales, Tucumán, Argentina (27º03'S; 64º15'W; 330 m a.s.l.]) during the 2015/16 growing season. A randomized complete block design was conducted with 3 replications where the trait GY in maize hybrid KW 3800 was measured under two treatments, detasselling (DP) and without detasselling (SDP).The experimental unit was 1 row of 6 m. The ANOVA test for GY showed no significant differences between DP and SDP treatments (pv = 0.6535). The CV of the test was 12.71. LSD treatment test showed that the GY for SDP was 5.57% higher than DP (6228.91 vs. 5900.11). In conclusion, no significant differences between treatments were found.

A25

EFFECT OF NITROGEN FERTILIZATION ON THE BIOMASS PRODUCTION OF *Mentha spicata* IN SANTIAGO DEL ESTERO

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Species of the genus Mentha are mainly exploited for their essential oils produced in leaves and flowers, especially menthol and carvone, which are highly demanded by the cosmetic, food and medical industry. Although Santiago del Estero shows optimal conditions for the production of this crop, there are no local references on its response to nitrogen fertilization. The aim of this study was to evaluate the effect of increasing doses of N on the production of fresh and dry biomass of *Mentha spicata*, grown in the irrigation area of Rio Dulce.Trials were conducted under irrigation in the experimental field of the Facultad of Agricultura and Agroindustrias-UNSE during the 2015-2016 season. Fertilization was performed after irrigation to ensure adequate soil moisture. Urea 46% N was applied at the beginning of the vegetative stage of the crop, evaluating

three doses and unfertilized control. The treatments were: T1 (control), T2 (50 kg N / ha), T3 (100 kg N / ha), and T4 (150 kg N / ha). An experimental randomized block design with 4 replications was used. The harvest was made on 04.03.16, when the percentage of flowering of each plot reached 70%. The harvest was made manually, 10 cm to simulate harvest in a commercial farm, and fresh and dry biomass was quantified. The results show that nitrogen fertilization increases the production of fresh and dry biomass, although no significant differences between urea doses were observed.

A26
EVALUATION OF HEAVY METALS CONTENT IN HONEY FROM THE ARGENTINE NORTHWEST

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Heavy metals are major food contaminants due to their high toxicity, even at very low concentrations, and their acumulative effect on the human body. The presence of heavy metals in soil, water or air is responsible for the contamination of foods. Bees could incorporate some heavy metals in honey from the nectar of contaminated flowers, so that honey is a bioindicator of environmental pollution with heavy metals. The objective of this work was to evaluate the heavy metals content in honey harvested from differently floral origin in order to establish maximum limits for these pollutants in INTA Quality Honey Protocol. 36 honey samples produced in the Argentine Northwest were analyzed during 2013, 2014 and 2015. The samples were burned in muffle furnace at 400 ºC, and then the ashes were diluted in nitric acid 20% v/v. Lead and cadmium content were determined by Atomic Absorption Spectrophotometry with Graphite Furnace atomizer. Lead concentrations varied between 8.24 and 39.3 $\mu g.kg^{-1}$ with a mean of 26.7 $\mu g.kg^{-1}$. Cadmium concentrations varied between 0.32 and 5.93 $\mu g.kg^{-1}$ with a mean of 2.22 $\mu g.kg^{-1}$. The values obtained for lead are lower than the maximum limits set by the Argentine Food Codex (2 $mg.kg^{-1}$), and those obtained for both metals are lower than the maximum limits set by the Honey Quality Protocol from the Argentine Ministry of Agro Industry (50 $\mu g.kg^{-1}$ for Lead and 10 $\mu g.kg^{-1}$ for Cadmium). It could be concluded that the levels of environmental contamination with heavy metals are reduced in beekeeping regions in the Argentine Northwest.

A27
EFFECT OF VARIETY AND EXTRACTION CONDITIONS ON POLYPHENOL CONTENT IN BLUEBERRIES GROWN IN TUCUMAN

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Polyphenols are plant secondary metabolites that have been shown to have antioxidant, antimicrobial and anticancer properties. The current diet in developed countries is very low in fruits and vegetables, and therefore it requires the input of dietary supplements, including polyphenols. The Tucuman province is a major producer of blueberries, and the fruit selection for packaging generates large amounts of discard products, which could serve as raw material to obtain a polyphenols extract with high added value. The aim of this work was to evaluate polyphenol extraction in different varieties of blueberries with ethanol / water at different ethanol concentrations and at two temperatures (25 °C and 50 °C) in order to determine optimum process conditions. The samples of blueberry varieties were obtained from producers receiving assistance from INTA, namely: Emerald, Jewell, Prima Donna, Festing, San Joaquin, Spring High, Star and Snow Chaser. Total polyphenol content was determined by a spectrophotometric method using the Folin reagent, and gallic acid was used as polyphenols standard. A statistical analysis of variance was performed on two factors. The best extraction conditions were a mixture of ethanol/water 50%/50% and 50 °C, and the polyphenol concentration varied between 1151 $mg.Kg^{-1}$ and 2123 $mg.Kg^{-1}$ gallic acid equivalent for different varieties. San Joaquin was the variety with the highest polyphenol content.

A28
ASSESSING THE QUALITY OF GRAPEFRUIT (*Citrus paradisi* MAD.) var. HENNINGERS RUBY IN COMMERCIAL FARMS IN SANTIAGO DEL ESTERO

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In NOA, grapefruit cultivation is substantially increasing with respect to demand and planted acreage due to its excellent organoleptic quality. Since estimates of fruit quality in the province are scarce or non existent, assessment was conducted in 4 commercial farms of grapefruit (*Citrus paradisi* Mad.) Var. Ruby Henningers grafted on Cleopatra mandarin (*Citrus reticulata* Swingle), of 15 years of age. Two of the farms are located in the Robles Department and two in the Capital Department. Epicarp color was used as harvest index, since in May the fruits reach their commercial maturity color. Five plants/farms were selected at random with good production and sanitary condition and 10 fruits/plant were randomly extracted. In each fruit the following were determined: weight, color (RSH scale Colour Chart), polar and equatorial diameter, number of segments and seeds, shell thickness, juice weight and volume, soluble solids, acidity and Ratio. The variables

studied were submitted to the hypothesis test to see if they meet the requirements for Ratio and % juice as established by the regulations for the marketing of fruit. According to the results of the t test, the ratio and percentage of juice variables for four farms, fruits can be used for the internal and external market because they meet the condition of null hypothesis (ratio between 1 to 5 and % juice above 30 or 35%). It is concluded that cultural and sanitary handling of farms is adequate for the province. Regular fertilizer applications are recommended in view of certain symptoms of foliar deficiencies as well as irrigation during droughts.

A29
EVOLUTION OF LEMON-PACKING INDUSTRY SUSTAINABILITY. TUCUMÁN, ARGENTINA

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Sustainable production is based on environmental, institutional, economic and social equity. The evaluation of sustainability is of comparative character and performed by indicators. Lemon culture is one of the most important agricultural activities in Tucumán, so for more than ten years we have been working on the evaluation of different sustainable aspects. The aim of this paper was to make a comparative analysis of lemon packing-industry sustainability. The work was done with a minimum set of fourteen indicators within the above four sustainability pillars. *Ad hoc* surveys were applied to one lemon packing-industry, which produces large quantities of fresh fruit, in the years 2009 and 2016. The results showed that 29% of the studied indicators improved, 35% showed less sustainability and 36% showed no changes. We can say that there was no clear positive tendency of sustainability and it is necessary to intensify activities tending to improve sustainability of this agroindustry.

A30
IMPROVED METHODOLOGY APPLIED TO THE STUDY OF TRANSOVARIAL TRANSMISSION OF A CEREAL RHABDOVIRUS

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Delphacodes kuscheli Fennah transmits a cereal rhabdovirus to wheat, oat, barley and corn in Argentina. Some rhabdoviruses are transovarially transmitted to the vector insect progeny. In order to test the cereal rhabdovirus vertical transmission, it is necessary to adjust a methodology to obtain eggs of plant hoppers, avoiding eggs contamination with infected plant tissues (*transovum* transmission). The main goal of this work was to optimize an oviposition technique to get a suitable number of *D. kuscheli* eggs avoiding transovum transmission. Artificial oviposition devices were designed using a paraffin film (*Parafilm*®) on a 5% saccharose solution. After 24h of acquisition on infected plants (2013 isolate) and a 10 days latency period, rhabdovirus-infected females (*n*=60) were individually set in the devices to allow oviposition for 72h. After 9 days, eggs were removed from the saccharose solution by Pasteur pipette and stored at -80ºC for subsequent molecular analyses. An average of 20 eggs/female was obtained, showing 25% of mortality. This methodology avoided *transovum* transmission compared to the collection of eggs from plants. This is an important point because infected females lay eggs on the same plant where they feed, increasing the probability of rhabdovirus eggs contamination. With this optimized technique, we will continue assays to study transovarial transmission. Transovarial transmission requires special attention because, in the absence of a plant host, the insect vector constitutes the main reservoir of the virus in nature.

A31
EFFECT OF THREE SOWING DATES IN THE CYCLE AND PRODUCTIVITY OF CHICKPEA (*Cicer arietinum* L.) GROWN IN EL MANANTIAL FIELD, TUCUMÁN PROVINCE

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Chickpea (*Cicer arietinum* L.) is a high food value legume. In Tucumán province, sowing is made between the second fortnight in April and the first in June. The objective of this work was to evaluate different sowing dates in the occurrence and duration of the phenology phases and their incidence on production. Assays were made at El Manantial Field (FAZ-UNT) using the *Norteño* variety. Sowing dates were 4th, 19th of June and 8th of July, 2015. Sowing distance was 0.52 m between rows and 33 seeds per m^2. Phenology stages were defined as: Emergence (Ve), Flowering initiation (R1), Capsule formation initiation (R3), Filled-grain initiation (R5) and Physiology maturity (R7). Each phenology stage was determined when more than 50% of the population had reached that stage. Yield was evaluated by means of the seed weight of the plants in one m^2 for each date. Data were analyzed by means of Variance Analysis and means were compared with Tukey's test ($p<=0.05$). There were no differences in days from sowing (DDS) to Ve, but significant differences were observed for the three dates from DDS to R1 (87 DDS, 1st date; and 67 DDS, 3rd date) and in filled-grain period (R5 a R7) the longer period being for the

1st date (24 days) and the shorter one for the 2nd and 3rd (11 days). The three dates assayed showed differences in yield: the 1st date 2,000 K.ha^{-1} and the 3rd 948 K.ha^{-1}. The variation in sowing dates had a negative effect on yield due to the shorter stage Ve to R1 and a shorter period R5 to R7.

A32
ESTIMATION OF THE BASE TEMPERATURE FOR THE DEVELOPMENT OF A CHICKPEA CROP (*Cicer arietinum* L.) NORTEÑO VARIETY

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Temperature is one of the most important abiotic factors influencing the physiological and biochemical growth and development of plants. The base temperature (bT) has a great importance in the calculus of the day-degrees or heat units (DG, d°C). The objective of this work was to estimate the bT for development of a chickpea crop, Norteño variety. The assay was made at El Manantial Field, FAZ-UNT. Chickpea was hand sown in 5 l pots with typical Argiudol soil, maintained within the easily available water range; 5 seeds (8 mm) were put into each pot at 5 cm deep. Mean temperatures were registered daily. We considered that the emergence stage (Ve) was reached when more than the 50% of the seedlings emerged with respect to total emergence in each pot. Development rate was calculated as the inverse of chronological duration (in days) from sowing to Ve (1/days) for different sowing dates. A correlation and lineal regression analysis was made between development rate and daily mean temperature. The graphic data showed a positive relationship. The analysis presented a R^2=0.74 ($p<0.001$) and a Pearson coefficient of ρ=0.86 ($p<0.001$). It is concluded that the variation in the development rate is accounted for up to 74% by the variation in temperature. High association intensity was observed among variables. The bT value of 3.85 ºC was estimated from the lineal regression equation obtained, a value similar to that reported by other authors.

A33
BEHAVIOR OF LETTUCE PLANTS TREATED WITH DIFFERENT SUBSTRATES WITH *Azospirillum* sp. IN COLD GREENHOUSE IN THE FIELD COMMERCIAL PRODUCTION

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The commercial production of lettuce depends on the physiological and sanitary quality of the plants obtained in seedling nurseries. The aim of this work was to compare the effect of lettuce plants cv. Grand Rapids in cold greenhouse obtained with different substrates and *Azospirillum* sp. or not. 1:100% 0% earth-sand (no *Azospirillum*) (seed without immersion in *Azospirillum* 2: 100% 0% earth-sand (no *Azospirillum*) (seed immersed in *Azospirillum*) 3: 100% 0% earth-sand (with *Azospirillum*) (seed immersed in *Azospirillum*). 4: 80% land-20% sand (with *Azospirillum*) (seed immersed in *Azospirillum*). 5: 60% land-40% sand (with *Azospirillum*) (seed immersed in *Azospirillum*) 6: 40% land - 60% sand (with *Azospirillum*) (seed immersed in *Azospirillum*) 7: 20% 80% earth-sand (with *Azospirillum*) (seed immersed in *Azospirillum*), transplanted 32 days to field planting in double rows and drip irrigation, in commercial production plant in Finca El Manantial, Faculty of Agriculture. The experimental design was randomized block with 7 treatments and 9 replications, fresh weight of aerial part (FWAP), root (FWR) and number of leaves/plant at 41 days after transplantation in September 2015 was determined. The results were analyzed by ANOVA, Tukey' test (> 0.05) and correlation test. We determined that lettuce cv. Grand Rapids plants obtained with 20% substrate land-80% sand (with *Azospirillum* and seed immersed in *Azospirillum*) increased fresh weight and number of leaves/plant, with important economic advantages and environmental preservation.

A34
PRODUCTION EVALUATION OF SUGAR CANE STEMS POPULATION WITH AND WITHOUT COVERAGE WITH AGRICULTURAL RESIDUES

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After sugar cane harvest, agricultural residues can be either left on the ground or burnt, a practice employed every season that causes health problems and environmental damage. The objetive of this work was to determine if there were significant differences with and without residues. During the growing population period there is strong competition between units, therefore stem number is very variable, increasing until maximum values and then decreasing, with little variation at the end. Stems production was recorded during the whole production period. Weather conditions generated unequal time intervals. We analyzed the RA 87-3 variety during four production periods on plot with and without residues. Prediction variables were treatment, with presence or absence of residues coverage, and days, the number of days betwen the final harvest and the

time of measurement. The dependent variable was the number of stems. Observations were discrete longitudinal data. The generalized linear model was fitted with negative binomial distribution for over-dispersion modeling. During the first, thirth and fourth seasons, no significant differences between production practices were found. During the second sseason, p-value was close to the highest significant production value without coverage. Conclusions: in general, there were no differences between the two types of practice, so that burning can be avoided. Key words: sugar cane, generalized lineal model, agricultural residues.

A35
MEASUREMENT ERROR IN ESTIMATES OF SUGAR CANE PRODUCTION WITH AND WITHOUT AGRICULTURAL RESIDUES

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The number pf stems included in the crop residues after the sugarcane harvest was determined. In order to evaluate the population, stems were counted using unequal intervals on the time due adverse weather conditions. Ii is possible that the variable days after harvest were subjected to measurement error. In this work, we used the RA 87-3 variety of sugar cane on four periods. Prediction variables were treatment, the presence or absence of residues coverage and days, the number of days between the end of the harvest and the time of the measurement. The dependent variable was the number of stems. Observations were discrete longitudinal data. A generalized linear model was fitted with negative binomial error distribution for modeling over-dispersion. The aim of this work was to determine if the parameter estimates of the predictor variable should be modified. The classic method for measurement error was used, it express that the predictor variable is the sum of the real variable and variable measurement error. The simulation extrapolation method SIMEX was used. The corrected estimate for the variable days differs from the estimator of the adjusted model. We concluded that measurement erros was introduced into the variable days after the harvest. Key words: Measurement error, agricultural waste, longitudinal data, SIMEX, sugar cane stems.

A36
LOCATION OF *Helicoverpa armigera* HUBNER (LEPIDOPTERA) ON BEAN CROPS IN LAS VARAS, PROVINCE OF SALTA

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Helicoverpa armigera or bollworm is a pest of worldwide importance, causing million dollar losses in various crops. Traditionally associated with cotton, its relevance is given by its polyphagia and ability to develop resistance to insecticides, whether chemical or genetically modified suchas *Bacillus thuringiensis*. The earliest records of the insect in South America are from the year 2013 in the Brazilian States of Goiás, Mato Grosso and Bahia on cotton, and in 2014 in the NOA on chickpea, Tucumán and Santiago del Estero, and in Chaco, in places close to cotton and legumes areas. This work aimed at determining the state of *H. armigera* in the town of Las Varas, North of Salta with respect to bean cultivation. Weekly samples were conducted in white bean lots during the campaigns 2015 and 2016 campaigns. We used 18 traps delta of sexual attraction for the capture of males, three per plot (of about 15ha) and total nine per campaign. They were examined weekly, with bait replacement every month. In the laboratory the insects were removed and the collected morphospecies were separated. Taxonomic identification was based on the observation of the genitalia of the males and the insulated aedeagus with 96°alcohol, while the specific confirmation was made using dichotomous keys. As a result of this monitoring, the presence of *H. armigera* on bean in Las Varas, North of Salta, was verified and *Helicoverpa zea* specimens were identified in both campaigns.

A37
NATURAL ENEMIES IN BEAN (*Phaseolus vulgaris* L.) CROPS IN NORTHERN SALTA

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Argentina is a leading bean producer on the continent. Animal pests cause losses due to the direct and indirect damage they cause to crops, or to the amount of economic resources that farmers must use to control them. These organisms can reduce the action of bio controllers. It is fundamental to know the diversity of natural enemies of pests associated with this production. The aim of this work was to determine the diversity and abundance of these beneficial organisms during their reproductive stage.150 bean plants from a commercial farm of Las Varas (Salta) were obtained on three occasions during the productive period until the developed pods in 2015. Species of parasitoids, predators and entomopathogens were registered. Among parasitoids, the following prevailed: 72 larvae of *Rachiplusia nu* (Lepidoptera: Noctuide) parasitized by

Copidosoma sp. (Hymenoptera: Encyrtidae). Subsequently, predators with 17 specimens of family Reduviidae and 15 Nabidae of suborder Heteroptera, less than 10 specimens of *Franklinothrips sp.* (Thysanoptera: Aeolothripidae), *Chrysoperla sp.* (Neuroptera: Chrisopidae), *Orius sp.* (Heteroptera: Anthocoridae), Geocoridos (Heteroptera: Geocoridae) and Araneae. Finally, there were scarce entomopathogens: *Nomuraea rileyi* Farlow (Samson) (Ascomycota: Hipocreales), *Baculovirus sp.* (Baculoviridae) and *Entomophthora sp.* (Zygomycota: Entomophthorales) attacking *R. nu* larvae and *Pseudoplusia includens* Walker (Lepidoptera: Noctuide); and *Beauveria sp.* (Ascomycota: Hipocreales) on larvae of phytophagous thrips. These results provide basic tools for the design of strategies for biological control of pests associated with bean cultivation.

A38
LIFE CYCLE OF *Oryzaephilus surinamensis* IN STORED NUTS UNDER CONTROLLED ENVIRONMENTAL CONDITIONS

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Oryzaephilus surinamensis (Coleoptera) is one of the insects which frequently infest stored nuts from small-scale farmers in the La Rioja and Catamarca provinces, which constitutes a great phytosanitary issue.The aim of this work is to describe the biological cycle of *O. surinamensis* using nuts as a host under controlled environmental conditions. *O. surinamensis* specimens were collected from infested walnuts provided by producers from Chilecito and Famatina, La Rioja. The insects were kept in a breeding chamber, with a temperature range of 25±1 °C and relative humidity of 40±2%; and fed ground nuts. Every 48 hours the number of eggs and their viability were registered; larval stages were determined and morphologically characterized; pupal formation and emergence of adults was controlled.
The full life cycle of *O. surinamensis* lasted between 36 and 45 days in the above conditions. The egg stage took up 3-5 days. Four larval stages were described and the full larval period lasted 14-21 days. Pupal stage lasted 3-16 days. The adult is long-lived: this stage can last up to three years under these conditions.
Knowledge of the biological cycle of *O. surinamensis* on nuts under similar environmental conditions to those of warehouses in the area will serve as the basis for the design of preventive treatment of this species with vegetable essential oils and extracts.

A39
EFFECT OF Cd ON ENZYMATIC ACTIVITY OF SUCROSE METABOLISM ON ALFALFA SEEDLINGS

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During germination and early seedling stages, carbohydrates should be mobilized from storage tissues to sink tissues to be used as structural components or metabolic components. To withstand stress conditions during this stage, plants should regulate the C partition toward both protection and growth. Enzymes directly involved in this process are sucrose synthase (SS) which catalyzes the reversible breakdown of sucrose, invertase (INV) which catalyzes the irreversible breakdown of sucrose, and Sucrose-6-phosphate synthase (SPS) which catalyzes its biosynthesis. The aim of this work was evaluate the activity of these enzymes in alfalfa seedlings subjected to cadmium stress. Alfalfa seeds were grown in the presence of 50 and 100 µM $CdCl_2$ for 2, 4 and 6 days. After homogenization, both embryionic axes and cotyledons in phosphate buffer were centrifuged to obtain enzyme extracts. Results showed, in general, that SS activity was higher than other enzymes in both cotyledons and axes. In the presence of 50 µM Cd, SS, INV and SPS activities were higher than in the presence of 100 µM Cd. Likewise, it was observed that the temporal patern of the three enzymes was affected by the metal. The high SS activity observed in plant tissues could be related to its physiological role to provide UDP-glucose either for the synthesis of cellulose or to produce the necessary metabolites to counteract stress. On the other hand, higher activities observed at 50 µM in relation to 100 µM concentration could mark the tolerance limit, or be part of the alarm response to stress induced by the metal.

A40
FARINOSE FERNS. HISTOCHEMISTRY AND MOLLUSCICIDAL ACTIVITY

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Pteridaceae is a cosmopolitan family that inhabits a broad range of niches and shows a great ecological diversity. It comprises over 50 genera, with more than a 1000 species. The genera *Agyrochosma, Notholaena, and Pityrogramma* exhibit a waxy exudate called ¨farina¨ on the abaxial surface of the fronds. This farina is exuded by glandular hairs and is

either white or yellow. Glandular trichomes seem to be the primary production sites of many bioactive secondary metabolites. The yellow farina includes chalcones and flavonols whereas the white farina contains mainly dihydrochalcones and flavanones. Many of these products have significant value for humans and are used as antifungals, antibacterials and antioxidant agents.
One of the aims of this work was the localization *in situ* of flavonoids on the fronds of *Argyrochos manivea* var. *nivea* and *flava, Notholaena sulphurea* and two chemotypes of *Pityrogramma trifoliata*. The second aim was the molluscicidal effects evaluation of the farinose exudates against the snail *Biomphalaria peregrine*, the potential vector of schistosomiasis in Argentina.
Fresh leaf material was sectioned and stained using Benedict´s reagent and $AlCl_3$ under UV and Vainillin/HCl. Molluscicidal activity of farinas were determined using an *in vitro* acute toxicity assay.
Results of the histochemical tests showed that flavonoids are localized in the glandular tricomes. The farinose exudates displayed strong to medium toxicity against the snails with LD_{50} values in the range of 5.3-50 µg/mL. The farinas studied are promising bio- molluscicides for schistosomiasis vectors control.

A41
CHEMICAL COMPOSITION AND ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS FROM KAZAKHSTAN MEDICINAL PLANTS

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The composition and antifungal activity of essential oils (EO) from leaves of Kazakhstan medicinal plants was investigated. Composition was analysed by GC-MS while antifungal activity was determined by the microdilution method in YES medium. The major compounds identified were 1,8-cineole (34.2%), myrcene (19.1%) and α-pinene (9.4%) in *Ajania fruticulosa*; 1,8-cineole (21.0%), β-thujone (11.0%), camphor (8.5%), borneol (7.3%) and α-thujone (6.5%), in *Achillea nobilis*; camphor (47.3%), 1,8-cineole (23.9%), camphene (9.8%) and β-thujone (6.0%) in *Artemisia terrae-albae*; 1,8-cineole (55.8%) and β-pinene (6.2%) in *Hyssopus ambiguus*; α-thuyene (46.3%) and δ-cadinene (6.3%) in *Juniperus sibirica*; sabinene (64%) in *Juniperus sabina*; and α-pinene (51.5%), β-phellandrene (11.2%) and δ-cadinene (6.3%) in *Pinus sibirica*. The essential oils did not show antifungal effects (MIC>1.20 mg/mL) on *Aspergillus carbonarius* or *A. niger* while the oils from *A. nobilis*, *A. terrae-albae*, *H. ambiguus* and *J. sabina* exhibited antifungal activity on *Fusarium verticillioides* (MIC=0.60 mg/ml) and *F. graminearum* (MIC=0.60-1.20 mg/ml). The antifungal activity was associated with the presence of borneol, camphor, camphene, 1,8-cineole,α- and β-thujone, and of the oxygenated monoterpenes. The weak to moderate antifungal activity observed suggests that the EO are not useful for the development of botanical fungicides.

A42
ANTIBACTERIAL ACTIVITY OF NATIVE APOCINACEAE, ANACARDIACEAE AND BIGNONIACEAE SPECIES FROM TUCUMAN

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Convencional practices are the main strategy for the prevention of bacterial diseases in crops. The narrow spectrum of chemicals available for curative and preventive control of bacterial diseases is often unable to completely suppress them. New antibacterial compounds are needed. The aim of this work was the identification of plant extracts with antimicrobial activity over phytopatogenic bacteria with a negative impact on agricultural production. Sequential extraction of leaves and stems from *Aspidosperma quebracho-blanco*, *Schinus fasciculatus, S. gracilipes, Amphilophium cynanchoides* and *Tecoma stans* with dichloromethane, ethyl acetate and methanol yielded fCH_2Cl_2, fAcet and fMeOH fractions, respectively. The antibacterial activity was evaluated by the microdilution and the bioautographic methods on *Pseudomonas corrugata* (Pc), *P. syringae* (Ps), *Xanthomonas campestris* (Xc), *Erwinia carotovora* (Ec) and *Agrobacterium tumefaciens* (At). The average diameter of inhibition and the concentration needed to inhibit 50% of bacterial growth (CI_{50}) were calculated. fAcet anf fMeOH fractions of *S. fasciculatus and S. gracilipes* were active against *Ps*, *Xc, Ec* and *At* (IC_{50}: 800-1700ppm; D: 1.90-4.79 mm) while fCH_2Cl_2 of *S. Fasciculatus* only against Xc (IC_{50}: 900-1100 ppm; D= 2.10-3.45 mm). The growth of *Pc* and *At* was inhibited by fAcet of *A. cynanchoides* (IC_{50}: 1600-2100 ppm; D= 2.35-2.60 mm). Ten fractions with antimicrobial activity were identified. Those with medium and high polarity from the *Schinus* species were the most active ones.

A43

Nomuraea rileyi INHIBITS GROWTH AND BIOFILM FORMATION OF *Xanthomonas citri* subsp *citri*

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Nomuraea rileyi ARSEF 4094, an entomopathogenic fungus (EF) isolated from *Spodoptera frugiperda*, produces secondary metabolites (SM) that interfere with the development of infectious insects and bacteria from the insect body. It is known that the addition of insects to the fungal growth medium stimulates the production of SM. SM are known to affect bacterial growth in their planktonic and biofilm (BF) states. Therefore, the aim of this study was to evaluate the inhibitory capacity of *N. rileyi* in the presence of *S. frugiperda* on *Xanthomonas citri* subsp*. citri* (*Xcc*) growth and BF formation. This bacterium causes citrus canker, the main crop in Tucumán.
EF was cultured in SMY medium with *S. frugiperda* and incubated at 28 °C for 15 days, at 180 rpm. Fungal and insect controls with the same treatment were made. Ethyl acetate extracts from biomass and supernatant from each condition were obtained. *Xcc* growth inhibition was determined by the microdilution method at 48 h and the inhibition of BF formation was quantified by a colorimetric method. The extract from fungal-insect biomass was the most efficient in inhibiting BF formation (38%), affecting *Xcc* growth in only 15%, while the extract from fungal biomass inhibited the growth of the bacteria in 32% and only 9% the formation of BF. According to this, the presence of insects could stimulate the production of SM, which interferes with the synthesis of BF. The results showed the potential use of extracts from *N. rileyi* as a natural strategy that is environmentally acceptable for crop protection against diseases caused by pathogenic microorganisms.

A44

PHYTOCHEMISTRY OF WASTE FROM ANDEAN TUBERS. HISTOCHEMICAL LOCATION AND POTENTIAL ON LACTIC ACID BACTERIA

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Introduction: *Oxalis tuberosa* Mol., "papa goose" (Oxalidaceae) and *Ullucus tuberosus* Caldas, "smooth potato or melloco" (Basellaceae) are Andean tubers rich in starch, proteins and carbohydrates, among others constituents, widely used for their nutritional importance in the regional cuisine, currently revalorized. They grow between 2000 and 4000 meters above sea level in Peru, Bolivia, Colombia, Venezuela, and northern Argentina. Objective: To determine the phytochemical composition of both species by specific histochemical techniques and evaluate the action of extracts from peelings on the growth and biofilm production of lactic acid bacteria. Materials and Methods: Microscopic observations of transverse and longitudinal sections of fresh tubers from Salta province were made. Histochemical detections were performed with a solution of iodine (starches), Benedict (flavonoids), Dragendorf (alkaloids), Orange G (fats), ferric sulfate (tannins), and safranin (lignin). The screening of the different extracts was performed to evaluate the effects on growth and bacterial biofilm (600 and 540 nm) by a micromethod in liquid medium at a final concentration of 100 µg/mL against *Lactobacillus acidophilus* and *paracasei*. Results and Conclusions: The histochemical tests gave positive reactions for starches, flavonoids, alkaloids, tannins and lignin in both species. The extracts from wastes stimulated the growth and biofilm production in both bacterial species with potential health use.

A45

LEAF CONSTITUENTS FROM *Zuccagnia punctata*: TOXICITY ON SEEDLINGS AND THE ENDOGENOUS FUNGAL FLORA OF MAIZE GRAINS

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Leaf tincture (TZP) of *Zuccagnia punctata* Cav.(*Fabaceae*) and its constituents 2´,4´-dihydroxychalcone (DC),2´,4´-dihydroxy-3´-methoxychalcone (DMC) and 7-hydroxy-3´,4´-dimetoxyflavone (HF) suppress the growth of *Fusarium verticillioides* responsible for seedling blight in maize in microdilution assays. In this work, we evaluated the phytotoxicity and the control performance of endogenous fungal flora of the tincture and its contituents on maize grains. Horsetooth grains disinfected with NaClO 0.02% were embebed for 50 min in suspensions of TZP, DC+DMC or HF at concentrations of 20xCIM. The germination of the grains disinfected with NaClO (control), or treated with TZP or its constituents, was evaluated in the rolled towel test for 7 days at 25°C. Then, germination power (PG), and radicle and shoot length were determined. The development of the endogenous fungal flora of the grains was evaluated after 7 days at 30°C in agar-malt-peptone-sucrose medium. The percentages of grains infected with *Fusarium* and with other fungi were determined. TZP, DC+DMC, HF and control showed a PG=80%. DC+DMC increased by 20% the radicle and shoot length. HF reduced 50% the length of both organs. TZP, DC+DMC and HF increased more than 20% the number of adventitious roots and did not affect the emergence of secondary roots. 97% of the grains treated with these suspensions did not present fungal

contamination. In the controls, 40% and 20% of the grains were contaminated with *Fusarium* sp. and other fungi, respectively. TZP and DC+DMC showed an efficient control of the endogenous fungi and had no adverse effects on germination or seedling growth.

A46
ANTIFUNGAL ACTIVITY OF ANAGALLISIN C AGAINST *Candida albicans*

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C. albicans is an opportunistic pathogenic yeast responsible for infections that could affect various organs. The drug for most often used against candidiasis is fluconazole (FLU), an azole drug with fungistatic action, an aspect that favors the development of drug resistance. To overcome drug resistance a combination of drugs is suggested. Anagallisin C (AnC) is the main secondary metabolite isolated from *Anagallis arvensis L* aerial parts and could be an alternative for fungal infection treatments, alone or in combination with FLU. AnC antifungal activity against *C. albicans* (ATCC10231) was preliminarily evaluated by disk diffusion assay with and without FLU (6 mg/L) to statistically analyze synergistic, indifferent or antagonistic effects. Minimal inhibitory concentrations (MICs) and fractional inhibitory concentration (FIC) of AnC and FLU (alone and combined) were obtained by microdilution assay. The interpretation of FIC was: ≤0.5, synergistic effect; >0.5 to< 4.0, indifferent effect; ≥4.0, antagonistic effect. There were significant differences ($p<0.05$) between growth inhibition zones diameters for AnC against *C.albicans* with and without FLU (9.5 ± 0.2 mm and 8.0 ± 0.1 mm respectively). MIC for AnC (without FLU) was 10 mg/L and the FIC=0.251, which indicated a synergistic effect between AnC and FLU. AnC (2.5 mg/L) + FLU (0.062 mg/L) is a fungicidal combination that could overcome the occurrence of fungal resistance derived from FLU fungistatic action.

A47
ANALYSIS OF CYTOTOXIC EFFECTS OF 1,8-CINEOLE DERIVATIVES

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Introduction: 1,8-cineol is the main constituent of many essential oils, especially those produced by *Eucalyptus* spp. It is usually found in pharmaceutical preparations because of its biological properties. In order to find more active compounds or with a wider bioactivity range, mantaining the bicyclic ether structure of 1,8-cineole, we synthesized ten polyoxynegenated and nitrogen derivatives. Currently, the studied bioactivities have interesting fields of applications in the pharmaceutical and food industries. *Aims*: to determine the cytotoxic characteristics of 1,8-cineole derivatives on human a monocytic cell line as an *in vitro* model.
Methodology: ten 1,8-cineole derivatives with keto, -OH, oxime, -OAc, epoxy and lactone functions were synthesized according to previously published techniques. The assayed concentration range was 10-500 µg/ml on cell line U937 ($2.5X10^4$) activated with LPS in complete RPMI1640 culture medium. Viability was determined after 24 h incubation at 37°C, 5% CO_2, with Trypan blue by microscopy, and by formazan production (from MTT), which was detected at 570 nm.
Results and conclusions: 1,8-cineole and its carbonyl derivatives showed >70% viability; monoacethylated derivatives and derivatives with –OH and epoxy groups> 60%; lactone, oxime and di-acetate substituents decreased cell viabilitity between 40 and 60 %. The greatest cytotoxic effects were observed for compounds with highest number of oxygenated functions. Derivatives with –OH, –OAc and oxime substituents were more cytotoxic than carbonyl compounds.

A48
IN VITRO EVALUATION OF THE ANTIMICROBIAL ACTIVITY OF BACTERIAL METABOLITES IN PLANT PATHOGENIC BACTERIA

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Crop diseases involve a complex interplay among factors associated with the pathogen, host and environment. The disadvantages and damage caused by improper use of agrochemicals have led to the development of new technologies. Among them is biological control, which constitutes a beneficial environmental option for controlling plant pathogens. It was observed that a supernatant obtained from a bacterial culture (SC) had *in vitro* antimicrobial activity on different phytopathogenic bacteria and fungi. This study aimed to broaden the spectrum of action of SC on plant pathogenic bacteria affecting important crops in the region: *Xanthomonas albilineans* (a sugar cane pathogen resistant to pH 5) and *Pseudomonas syringae* pv. *tomato* DC3000 (a tomato pathogen resistant to pH 6). The bacteria were treated with different SC concentrations (80 activity units (AU/ml) diluted in LB broth medium in a range between 1 and 5 AU/ml. These were contrasted with a control with inhibition by acidity and a water control. CFU/ml were determined at time zero (after inoculation) and at the end of incubation to evaluate growth differences. At the concentrations studied, SC was bacteriostatic for *P. syringae* pv. *tomato* (3 AU/ml) and bactericidal for *X. albilineans* (3 AU/ml). The results of this study showed that SC

had antibacterial action on the pathogens evaluated, which would support its use as a biological control agent. It is worth noting that the supernatant presented a broad action spectrum, as it proved to be active against both bacteria and fungi.

A49
METHODS TO ENHANCE THE BIOLOGICAL ACTIVITY OF A BACTERIAL CULTURE SUPERNATANT FOR ITS POTENTIAL USE IN FIELD TRIALS

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Microorganisms produce different kinds of metabolites by fermentation. They may have the ability to inhibit or affect the development of other metabolites. In an attempt to find new natural products to replace commercial agrochemicals either partially or totally, new methodologies are being tested to improve and enhance the effectiveness of bioproducts used in field trials. It was found that a supernatant from a culture of a GRAS (Sa) bacterium had antimicrobial activity with a wide spectrum (*in vitro* assays). This work aimed to increase SC antimicrobial activity by means of different techniques, so as to obtain a product that could be used *in vivo*. The techniques assayed were: 1) drying in a rotary evaporator until dry and subsequent resuspension in distilled water; 2) freeze-drying (vacuum drying) and 3) removal of active metabolites with organic solvent (ethyl acetate) and subsequent concentration (100 times) on rotavap (50 ° C). The residual activity (remaining activity in the extract after the concentration process) in all these cases was assessed by agar diffusion tests with *E. coli* AB1133 as a control strain. The residual activity in the drying and lyophilization techniques was about 10% of the initial activity of Sa, while on the concentration of Sa treated with organic solvents the residual activity in the aqueous phase was 30 fold the original activity. It is concluded that after organic solvent treatment, evaporation preserved metabolites and increased their antimicrobial activity. This methodology should be studied further, together with other alternative methods.

A50
DETECTION AND IDENTIFICATION OF ANTIFUNGAL ACTIVITY COMPOUNDS IN EXTRACTS OF *Prosopis ruscifolia* GRISEB VERSUS *Aspergillus* sp. STRAINS

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Introduction: *Aspergillus sp*. includes toxigenic strains which grow and contaminate corn, a grain of commercial interest in the NOA. Plants are an important source of compounds with potential antifungal effect, allowing the replacement of natural chemicals with decreasing damage to the environment and risk to human and animal health. Objective: To detect and identify compounds with antifungal activity on *Aspergillus sp*. strains in extracts of *Prosopis ruscifolia Griseb.* Methodology: A successive extraction of compounds from the aerial parts of *P. ruscifolia Griseb* (Vinal), with increasing polarity solvents (hexane, dichloromethane, ethyl acetate and methanol) was performed. The antifungal activity of the extracts obtained was analyzed by Agar diffusion assay versus six strains of *Aspergillus sp.* on Silica Gel 60 F254 plates. IC_{50} and MIC were determined by microdilution assays. Bioactive compounds were identified with thin layer chromatography on Silica Gel 60 F_{254} plates by bioautography and specific developers for different chemical groups. Thin layer chromatography was performed to isolate the compounds and their bioactivity was studied. Additional tests allowed their identification.
Results: Bioactivity was detected only in the methanol extract of *P. ruscifolia Griseb*. IC_{50} was between 60 and 297 ug / mL and MIC between 750 and 3000 µg /mL. The compounds responsible for antifungal activity were triterpene saponins. We will continue with the isolation and structural elucidation of these compounds by column chromatography, HPLC and GC-MS.

A51
BIOASSAY-GUIDED FRACTIONATION BY ANTIBACTERIAL ACTIVITY OF EXTRACTS OF *Melia azedarach* L. LEAVES

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Introduction: *M. azedarach* (MA) is a tree native to India and naturalized in Argentina. In folk medicine, its leaves, fruits and flowers are used against dermatitis and intestinal disorders. There are few data concerning the antibacterial activity (ABA) of MA leaves.
The objectives of this study were to evaluate the ABA of the infusion (MAI), decoction (MAD) and tincture (MAT) of MA leaves and the fractions derived from MAT against human pathogenic bacteria, and to characterize the bioactive components obtained by bioassay-guided fractionation.
Methodology: MAI, MAD and MAT10% were prepared. The extraction yield (EY, %w/w) was calculated. The ABA was tested by bioautography. MAT was extracted with hexane (HF), dichloromethane (dCMF), ethyl acetate (EAF) and methanol (MF). EAF chromatography on Sephadex LH-20 (CC) was performed. The elution profile was constructed with OD 280, 310, 350 and 475nm and thin layer chromatography (TLC).

Results: The highest EY was achieved with MAI (37.50%); however, the purification of MAT was continued since it presented ABA against *E. coli* ATCC29212 and ATCC25922 and *E. faecali* with 1,200 and 127 µg of extracted material (EM), respectively. EAF inhibited the growth of *E. coli* (500 µg EM) and *E.faecali* (50 µg EM). 53 fractions were collected from CC and were pooled (I-III). Group I inhibited the growth of both strains. Chemical development showed that ABA could be due to terpenes.
Conclusions: MA is a source of compounds with ABA against *E. coli* and *E. faecali*. MAT and EAF presented ABA against the strains tested, *E. faecali* being the most susceptible one. The identification of compounds responsible for ABA is being studied, as well as ABA against indigenous strains.

A52
INHIBITORY EFFECTS OF BY-PRODUCTS FROM THE WINE INDUSTRY ON *Staphylococcus aureus* BIOFILM FORMATION

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Staphylococcus aureus is a Gram-positive bacterium widely distributed in nature as well as in food industries due to its resistance to conventional disinfection processes. The ability to form biofilm on different surfaces is the main reason to considerer this bacterium as a food poisoning agent. The aim of this study is to provide added value to by-products from the regional wine industry, so we studied the anti-bacterial and anti-biofilm activities of pomace and stems (escorbajo) from Torrontés wine (Cafayate, Salta) against *S. aureus* ATCC 6538. Extracts were obtained by successive extractions with increasing polarity solvents: hexane, chloroform, ethyl acetate (EtOAc) and methanol (MeOH). In order to determine the antibacterial and antibiofilm effects of the extracts at different concentrations, a liquid micro-dilution method and a violet crystal staining technique were employed.
MeOH and EtOAc extracts from stems and pomace, at 10 and 100 µg/mL, were the most active inhibitors of biofilm development (between 53 and 86%), while biofilm inhibition caused by stem extracts would be related to lower bacterial growth. Pomace extracts did not affect microbial growth, indicating a specific inhibition on biofilm production. These results demonstrate that natural grape extracts from by-products obtained as waste from the wine industry have inhibitory properties on biofilm formation, an increasing problem for the food industry that affects human health.

A53
CYTOTOXICITY, GENOTOXICITY AND PROLIFERATION EVALUATION OF 3T3-L1 CELL CULTURES IN CONTACT WITH POLY(N-ISOPROPYL ACRYLAMIDE) HYDROGELS

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Hydrogels are crosslinked polymers with high affinity for aqueous solutions that have shown great potential for biomedical applications. The aim of the present research was to evaluate cytotoxicity, genotoxicity and proliferation of the 3T3-L1 cell line exposed to PNIPAM hydrogel. The hydrogel used was synthesized via free radical polymerization of the monomer N-isopropylacrylamide (NIPAM). Cellular toxicity of cultures exposed for 96 hours to hydrogel was evaluated by 3-(4,5-dimethylthiazol-2-yl)2,5-diphenyl tetrazolium bromide (MTT), neutral red and trypan blue. In addition, genotoxicity was assessed using the single-cell electrophoresis assay (comet assay) after 4 days of contact. Finally, cell proliferation was studied by incorporation of tritiated thymidine (H^3) in the 3T3-L1 cells exposed for 24 and 48 hours to hydrogel. No significant differences were found in cytotoxicity and genotoxicity assays between cells exposed to the hydrogel and those not exposed to it. Cell proliferation was not affected by the presence of the hydrogel. These preliminary results indicate that the PNIPAM hydrogel is a candidate for use as a surface for cell culture in 2D and for future applications in the field of regenerative medicine and tissue engineering.

A54
ANALYSIS OF HYDROGEL SURFACES FOR SPERM SELECTION IN CATTLE

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Fertility failures attributed to males contribute significantly to low reproductive efficiency. *In vivo* selection of a subpopulation of sperm with the best features for fertilization is regulated by the female reproductive tract. Most assisted fertilization techniques obviate natural sperm selection processes, which partially accounts for the low efficiency of these techniques. The aim of this research was to develop new polymeric biomaterials that serve as support and substrate for bovine sperm selection with the best fertilizing capacity. Polymeric hydrogel surfaces with positive, negative or neutral net charges were synthesized. Sperm-surface interaction was analyzed by phase contrast microscopy and motility of the adhered sperm

observed. Results indicated that a greater number of sperm cells became attached to positively charged hydrogels. Sperm binding to hydrogels occurred mainly through the equatorial region and cells maintained good motility. These preliminary results indicate that polymer surfaces could be used to select high-quality sperm for use in assisted fertilization techniques.

A55
EVALUATION OF THE ANTIMICROBIAL ACTIVITY OF EXTRACTS FROM *Flourensia blakeana* Dillon

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Many strategies are applied in the search for new molecules with antimicrobial activity. Nature itself is one of the options to find various bioactive compounds such as antimicrobial drugs. The aim of this study was the evaluation of the antimicrobial activity of different extracts of *Flourensia blakeana* Dillon (Asteraceae-Heliantheae) against Gram positive and Gram negative bacteria. The plant material was collected in Tafí del Valle, Tucumán. Three extracts were prepared by extraction with ethanol, chloroform and acetone from dried flowers and leaves. The antimicrobial activity of these extracts was evaluated by the plate diffusion method. The test was carried out with Gram positive control strains: *Staphylococcus aureus* ATCC 25923, *Staphylococcus aureus* ATCC 29213 and *Bacillus subtilis* 168 and Gram negative control strains: *Salmonella enterica* ser. enteritidis ACC PA03, *S. enterica* ser. Newport, *Escherichia coli* ATCC 38218 and *E. coli* ATCC 25922. The three extracts tested showed antimicrobial activity against *B. subtilis* and *Salmonella enterica* ser. Enteritidis ACPA03 and minimun inhibitory concentration (MIC) were determined against both strains. The MIC of acetone and chloroform extracts was 250 µg/mL against *B. Subtillis* 168 and 100 ug/mL against *S. enterica* ser. ACC enteritidis PA03, while the ethanol extract was 500 µg/mL against both bacteria. The results showed the presence of at least one metabolite with antimicrobial activity in *Flourensia blakeana* Dillon. For this reason, we will continue working in order to isolate and identify this antimicrobial compound.

A56
ANTIOXIDANT COMPOUNDS OF *Achyrocline satureioides* INHIBIT *HERPES SUIS TYPE 1* VIRUS

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Herpes viruses represent a high impact health problem. *Herpes suis type 1* virus causes Aujeszky's disease and results in significant economic losses to swine breeders. Medicinal plants can be useful to solve this problem. *Achyrocline satureioides*,"marcela del campo", has antimicrobial, immunomodulatory and antiviral properties. Phytochemical analysis of *A. satureioides* cold aqueous extract indicated the presence of luteolin (L), quercetin (Q), chlorogenic acid (CHLA) and caffeic acid (CA). The purpose of this study was to evaluate the *in vitro* antiviral action of the compounds (C) of *A. satureioides* against the *Herpes suis type 1* virus. Cytotoxicity was assessed on Vero cells by Uptake of Neutral Red (UNR) and MTT reduction assays. Then, the antiviral activity of C throughout the viral replication cycle was evaluated by plaque reduction assay. Further, the action stage during the replication cycle was determined. Finally, the selectivity index (SI) was calculated.
Cytotoxicity studies revealed low toxicity of all C. Antiviral ability studies indicated that *H. suis type 1* virus was inhibited in 66% by L at 15 µg/ml. In contrast, CA, Q and CHLA were not active against the virus. The action stage study indicated that L exerts its action in the post-viral adsorption and penetration stage. Selectivity indices of L were 105.3 (NRU) and 72.6 (MTT). In conclusion, L showed strong selective inhibitory ability against *H. suis type 1* virus and it may be useful for herpes virus infections treatment.

A57
POTENTIATION OF THE PROBIOTIC EFFECT OF *Saccharomyces cerevisiae* RC016 STRAIN WITH *Minthostachys verticillata* ESSENTIAL OIL

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This study potentiates the effect of a *S. cerevisiae* RC016 strain against aflatoxin B_1 (AFB_1) damage when the strain was included in the rat diet with *Minthostachys verticillata* essential oil (Mv-EO). The probiotic and Mv-EO were orally administered to Wistar rats. Animal were assigned to eight groups (n = 5): feed, probiotic, Mv-EO and probiotic + Mv-EO controls, one level of AFB_1-contaminated feed (40 µg/kg) and three treatments including the probiotic and the toxin; Mv-EO and AFB_1; and the probiotic, Mv-EO and the toxin. Food and water were available *ad libitum* throughout the experimental period (45 days). There was no mortality, adverse effects on general conditions or changes in body weight, food

consumption or feed conversion efficiency throughout the study. However, rats administered the probiotic and Mv-EO exhibited 10% increase in body weight in comparison with other groups. Subchronic administration of probiotic and Mv-EO did not alter the weight, morphological or histopathological analyses of liver and kidney. Genotoxicity was tested by micronucleus on bone marrow cells. Rats treated with AFB_1 showed a significant increase in micronucleated erythrocytes (MNE) compared to other groups. However, rats treated with the probiotic and/or MV-EO decreased the genotoxic damage caused by the toxin; a similar average value of MNE compared to the negative control group was observed. Conclusion: Incorporation of MV-EO enhances the probiotic effect of *S. cerevisiae* RC016 strain in the formulation of feed additives and increases animal productivity.

A58
APPLICATION OF BACTERIOCINS PRODUCED BY LACTOBACILLI AS A STRATEGY TO REDUCE *Listeria monocytogenes* GROWTH IN MILK

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In recent years, there has been a growing interest in the application of bacteriocin-producing lactic acid bacteria as a safe and natural approach for food biopreservation. The objective of this work was to investigate the antilisterial activity of bacteriocins produced by *Lactobacillus fermentum* L23 and *L. rhamnosus* L60 and their combination in whole milk during conservation at refrigeration temperatures. *L. monocytogenes* was inoculated into whole milk at a final concentration of 10^4 CFU mL^{-1}. Neutralized cell free supernatants and those treated with peroxidase (NCFS and NPCFS) were obtained. They contained bacteriocins L23 and L60, respectively. Each of them and a mixture of both at a concentration of 160 AU ml^{-1} were added to the inoculated milk and incubated at 4°C for 14 days. Listerial growth was measured by viable cell counts at different times. A control culture of *L. monocytogenes* without NCFS/NPCFS was used. The same experience was performed by adding a second dose of NCFS/PNCFS after 7 days of incubation. The results of this work showed that one dose of L23, L60 or both antimicrobial substances combined were able to significantly decrease *L. monocytogenes* growth. Proportionally, the reduction in bacterial population ranged from 30.47 to 35.07%. There were no significant differences between the assays using one or two doses of NCFS/PNCFS. These bioactive substances could be used as a natural alternative to control *L. monocytogenes* growth in milk.

A59
BIO-OVULES CONTAINING *Lactobacillus fermentum* L23: *in vitro* STUDIES OF VIABILITY, ANTIMICROBIAL ACTIVITY AND ADHESION PROPERTIES DURING STORAGE

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In Argentina, the limited availability on the market of vaginal bioproducts containing probiotics deserves special scientific attention. The objectives of this study were i) to investigate the potential variations in the viability of freeze-dried *Lactobacillus fermentum* L23 recovered from ovules, and ii) to evaluate the maintenance of their antimicrobial activity, biofilm production and surface hydrophobicity during storage. Viable cell count was performed by the dilution method in MRS plates (initial concentration: 10^7 $CFUmL^{-1}$). To evaluate antimicrobial activity against *E. coli* strains by the agar well diffusion method, the pure and neutralized cell-free supernatants, CFS and NCFS, were previously obtained. During the storage time (90 days) at 4 °C, different measurements were conducted every 30 days (t_0, t_{30}, t_{60} and t_{90}). Both biofilm production and surface hydrophobicity were determined at t_{90} by spectrophotometry (OD_{540nm}) and the SAT method, respectively. Average counts of L23 at t_{90} showed a slight decrease (3×10^5 $CFUmL^{-1}$ ± 0.5). The antimicrobial activity produced by the CFS (organic acids + bacteriocin) and the NCFS (bacteriocin) was maintained until the end of the experience, and their average inhibition values were 24 mm ± 1 and 19 mm ± 2, respectively. The L23 strain showed a high level of surface hydrophobicity and biofilm-producing ability (OD 0.198± 0.012). In conclusion, the maintenance of viability of L23 strain in the ovules and of their antimicrobial activity, biofilm production and adherence properties would indicate the high technological potential of this microorganism for the development of a vaginal bioproduct.

A60
HIGH LEVELS OF LINOLEIC ACID INDUCED BY DIETS RICH IN VEGETAL OILS CORRELATES WITH PARAMETERS DEFINING THE METABOLIC SYNDROME

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High-fat diets are associated with obesity and metabolic syndrome (MS). However, the type of fat consumed may be a determining factor to state whether the diet improves or triggers risk factors for cardiovascular disease (CRF). The aim of this study was to evaluate the consumption of vegetal oils rich in fatty acids (FA) n-6 and n-3 related to the parameters defining MS. Rabbits were fed a normal diet (CD), CD + 1% cholesterol (HD), CD + saturated fat (8% fat pork) and

unsaturated (10% corn oil, rich in n-6) (HFD), CD + 10% chia oil, rich in n-3 (CD-Ch), DG + 1% cholesterol (HD-HFD), HD + 10% chia oil (HD-Ch). Hemodynamic and biochemical parameters [blood pressure, heart rate, fasting glucose (GB), glucose tolerance, lipid profile, plasma FA] were determined. Visceral abdominal fat (VAF) was weighed. Animals with diets rich in oils showed: 1) increased GB, VAF and glucose intolerance, 2) high plasma levels of linoleic acid, LA (n-6), and saturated FA and reduced levels of monounsaturated FA, 3) reduced stearoyl-CoA desaturase (SCD-18) activity. Regression analysis showed that LA but not linolenic acid (n-3) is significantly and positively correlated with GB, glucose intolerance and GVA. LA is strongly and negatively correlated with the activity of SCD-18. These results show that consumption of vegetable oils rich in n-6 can trigger CRF and that LA plasma levels or SCD-18 activity may be good biomarkers of CRF.

A61
DIETARY CHIA OIL INTAKE INCREASES RETROPERITONEAL FAT RICH IN OMEGA 3 FATTY ACIDS

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In previous works we showed that a diet enriched with 10% chia oil improves vascular function in conditions of hypercholesterolemia. The aim of this study was to analyze whether the accumulation of fatty acid (FA) n-3 in retroperitoneal fat (RF) may account for the beneficial effect of chia oil. Male rabbits were fed either a control diet (CD), or a high cholesterol diet 1% (HD), or CD enriched with 10% chia oil (CD-Ch) or a high cholesterol plus 10% chia oil diet (HD-Ch) for 6 weeks. Nutritional and FA composition of each diet were analyzed. Hemodynamic: blood pressure, heart rate and biochemical: total cholesterol, HDL, LDL, and triglycerides parameters were measured. After animals were euthanized, RFwas extracted and FA was measured by gas chromatography. CD-Ch and HD-Ch added 25% calories to CD, increased RF, did not modify final weight, blood pressure, heart rate, total cholesterol, HDL or LDL levels and decreased triglycerides. RF-analysis showed decreased saturated and monounsaturated FA and increased total polyunsaturated FA with high levels of linolenic acid (n-3) and reduced levels of linoleic acid (n-6). Therefore, a significant reduction in the n-6/n-3 ratio was found. Taking into account that cardiovascular risk factors are positively correlated with n-6/n-3 ratio, results from this work imply that the reservoir of FA n-3 in the RF may contribute to the protective effects of dietary chia oil intake.

A62
ANALYSIS OF HORMONES EFFECT ON SPERMIATION IN AMPHIBIAN TESTES

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The aim of the present work is to evaluate the effect of endocrine stimulation on *Leptodactylus chaquensis* testis spermiation. Experiments were performed under *in vivo* and *in vitro* conditions. For *in vivo* treatment, hormones were injected into the dorsal lymph sac, and at different times (0-180 min) urine samples from the cloaca of the animal were collected. The hormones used were: 17β-estradiol (E2) dihydrotestosterone (DHT) and testosterone (T) (1-4 mg/mL); human chorionic gonadotropin (hCG) 20, 30 and 100 IU/mL; follicle stimulating hormone (FSH) and luteinizing hormone (LH) (0.5; 1; 2; 3 and 4 IU/mL) at a final volume of 500µL. Under *in vitro* conditions the testes or fragments of them were incubated for 240 min with: E2, DHT and T (1-4µg/mL); hCG (30 and 100 IU/mL); FSH and LH (0.25, 0.5, 1.5, 3 and 5 IU/mL) at a final volume of 1mL. The results show that, under *in vivo* conditions, hCG was effective only at the dose of100 IU/mL, while the effect of FSH and LH was observed at 1, 2 and 3 IU/mL dose. The response to all gonadotropins assayed was time dependent. Under *in vitro* conditions, although both hCG doses used were able to induce spermiation, the highest response was obtained with 100 IU/mL. LH and FSH were effective only at the dose of 0.5 and 1.5 IU/mL. At both experimental conditions the sperm number obtained with FSH was significantly higher ($P<0.050$) than with LH and hCG. No response was observed with the sexual steroids assayed.

A63
EFFECT OF 17 β ESTRADIOL (E2) ON OVIDUCTAL SECRETION

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Rhinella arenarum oviductal pars convoluta (PC) secretes protein and glycoprotein components forming jelly coats surrounding the oocytes at the time of oviposition. Our research showed that the PC has a pattern of differential secretion protein throughout the sexual cycle. Induction with progesterone (P) at the mucosa level has a secretagogue effect of a dense, opalescent, sticky material that is stored in the ovisac and an electrophoretic profile of 11 protein bands with relative mobilities similar to those characterized in oocyte jelly during ovulation, in the order of 140-15 kDa. We showed that the band of 74 kDa (gp74) is secreted at higher percentage and induces the acrosome reaction in the sperm. This work studies the secretory function of PC caused by the effect of E2 on the secretory product of animals: controls, ovariectomized, and ovariectomized and treated with the hormone. The results demonstrated that treatment with E2, unlike the controls and the

ovariectomized specimens, induced a secretory product which is separated into two fractions: one that is aqueous and transparent (fraction 1) and another non aqueous fluid that typically forms a crystalline, dense and stringy mucus capable of stretching between 10 and 12 cm in length (fraction 2). E2 also induces an increase in total protein secretion (twofold compared to control and sixfold compared to ovariectomized animales). The protein profile of fraction 1 showed three bands (130, 74 and 60 KDa), while fraction 2 revealed only a 300 KDa band. While all these are present in the controls, the ovariectomized specimens only revealed the 60 and 74 kDa bands. At present, we are analyzing the participation of the 300 and 130 KDa bands in fertilization.

A64
AMPHIBIAN OVULATION: RESPONSE TO NERVOUS STIMULATION

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The aim of this study was to evaluate the participation of the nervous system in *Rhinella arenarum* ovulation and to establish its relationship with endocrine inductors.
In the same animal, one ovary was used as control, while the other (experimental) received electrical stimulation (intensity: 7 mA, frequency: 10 Hz and duration: 1 min) applied on gonadal nerves. The results, expressed as percentage of ovulated oocytes at 12 and 24 hours, revealed that only the ovaries of females in the reproductive period were able to respond to nerve stimulation. A strong ovulation response was obtained when the nervous stimulation interacted together with endocrine inductors such as homologous pituitary homogenate (HPH), hCG and $PGF_{2\alpha}$. Taking into account that previous studies from our laboratory indicated a sympathetic gonad innervation, the participation of the adrenergic neurotransmitters adrenaline and noradrenaline was analyzed in *in vitro* ovulation. The results showed that both catecholamines were effective in inducing this process in a dose-dependent manner. Morphological analysis, carried out in ovarian samples processed with the routine techniques for scanning electron microscopy, demonstrated that the outer epithelium of the control ovary remained intact throughout the experimental period. In contrast, in the electrically stimulated gonad, epithelial alterations followed by the rupture of the follicular wall were observed. All these modifications led to gamete release into the coelomic cavity surrounded only by the vitelline envelope. The results indicate that nerve stimulation induces ovulation in females in the breeding period by releasing adrenergic neurotransmitters.

A65
INCIDENCE OF ORAL CANCER IN STOMATOLOGICAL PATIENTS DURING THE 2015-2016 PERIOD

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According to global statistics, cancer in the oral cavity represents 5% of malignant neoplasms. This condition, which leads to frequent consultation at advanced stages, appears more often in males in their fifties and sixties. Risk factors such as tobacco, alcohol, oral sepsis, nutritional status and trauma determine a higher incidence of oral cancer. The most frequent location is tongue edges followed by gums. Objective: To determine the incidence of oral cancer through a retrospective study, stomatological patients, who attended the Emergency Service of the A. C. Padilla Hospital, SM City, Tucuman, during the 2015-2016 period. Materials and Methods: This study has a descriptive, observational, non-experimental design. The selected population corresponds to the patients who attended the Emergency Service of the Hospital A. C Padilla, province of Tucuman, between June 2015 and June 2016. The information was collected using standardized medical records and clinical and histopathological studies, taking into account age group, gender, risk factors and localization in the oral cavity. Results: Out of a total of 141 stomatological patients studied for one year, we found 5 squamous carcinomas, predominantly in males. The age group was above 40, and the most frequent location was the gums. Conclusion: Early detection of oral cancer through proper stomatological examination is essential as it has a favorable prognosis before the disease has spread.

A66
BONE MARROW FAT AND ITS RELATIONSHIP WITH LONGITUDINAL BONE GROWTH. A HISTOMORPHOMETRIC STUDY

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An experimental work in which the longitudinal growth of the tibia in relation to the bone marrow fat content is presented in an experimental model of dietary restriction in growing rats. Sprague Dawley rats were adapted for 2 days to a balanced diet (DB) in pellets after weaning. The animals were weighed and divided into 2 groups called Control group: fed ad libitum with DB (The amount of food consumed was recorded daily), and experimental group: fed with 75% of the amount of DB consumed by the Control group the previous day. Body weight was recorded periodically. The animals were sacrificed at 25

days of the experiment. Tibias were removed, fixed in 10% formalin and processed according to the usual technique for paraffin embedding after decalcification in 10% EDTA at pH 7.2. Frontal sections of the proximal tibial metaphysis were obtained and stained with H & E. The following determinations were made in the subchondral bone: (a) Epiphyseal growth plate total thickness. (B) Hypertrophic cartilage thickness. (C) BV/TV. (D) Number of adipocytes per mm2. (E) Percentage of adipocytes per tissue volume. Data were analyzed using the Mann Whitney test. Results: Epiphyseal growth plate total thickness was significantly lower in the experimental group ($p < 0.05$). Number of adipocytes per mm2 and Percentage of adipocytes per tissue volume were significantly higher in the experimental group ($p < 0.05$). These results might suggest that the increase in the percentage of bone marrow fat adversely affects longitudinal bone growth.

A67
ALBUMINURIA: EARLY MARKER OF INJURY AND CHRONIC KIDNEY DISEASE STAGING

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Chronic Kidney Disease (CKD) is defined as a heterogeneous group of diseases that affect renal structure and function. Asymptomatic in its early stages, but with a progressive course leading to renal failure and replacement therapy in the end-stages, CKD is associated with premature cardiovascular disease (CVD), hence the importance of its early detection.
The aim of this study is early detection and CKD staging, of those apparently healthy individuals with cardiovascular risk factors, using renal function and premature and specific injury markers. An analytical, prospective, longitudinal, observational study was made with 30 volunteers, between 20 and 61 years old, since July 2016. Clinical history and anthropometric assessment were realized and blood pressure was measured. Enzymatic Creatinine (ECr), estimated Glomerular Filtration Rate-CKD EPI (eGFR-CDK-EPI), high sensitive Reactive Protein C (hsRPC), Fibrinogen (F) and other biochemical analytes were analyzed in blood samples. Albuminuria (Au), Urinary Creatinine (UCr) and Ratio Au/UCr (RAC) were measured in urine samples. The data analyzed showed that 86% (25) of the patients evaluated were women. Despite normal GFR for their age and sex, 4 patients (13%) were staged as at moderate risk for developing CKD, by RAC greater than 30 mg/g. These results show that albuminuria is the biochemical marker of injury and staging of KDIGO 2012. Its early detection in asymptomatic patients with risk factors will allow premature interventions that could delay the progression of CKD and CV complications.

A68
ADHERENCE TO A GLUTEN FREE DIET IN CELIAC DISEASE: BIOMARKER DYNAMICS

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Celiac disease (CD) is an autoimmune gluten dependent disorder that develops in genetically susceptible individuals carriers of HLA-DQ2 / HLA-DQ8. Clinical manifestations, seropositivity of biomarkers (BM) and specific histopathological changes confirm its diagnosis. Strict adherence to the gluten-free diet (GFD) is the only effective treatment. This work described the effects of adherence to the GFD in confirmed CD adult patients. It also shows the dynamics of BM, clinical biochemistry and endoscopic biopsy in a strict adherence situation for 13 years. Between 2003 and 2014, 1568 adults suspected of having CD were treated at the Gastroenterology Laboratory. In 17% (267), CD was confirmed by tissue transglutaminase- Isotype IgA greater than 20 U (cut-off manufacturer), ELISA method (Inova Diagnostics Inc, CA, USA). Only 16% (43) reported adherence to the GFD. In a retrospective cohort study, the dynamics of the BM was analyzed. Descriptive statistical analysis was applied. We found a significant decrease in the titles of BM, other biochemical markers and histological changes in an adult with confirmed CD (HLA - DQ2) at diagnosis and referral for strict adherence to the DLG was compared. Early diagnoses, strict adherence to GFD and monitoring of specific BM allows a redefinition of CD as a "celiac condition."

A69
PEROXIDASE ACTIVITY IN *Spodoptera frugiperda* LARVAE (LEPIDOPTERA: NOCTUIDAE)

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Peroxidasin is an enzyme with peroxidase activity, which is present in insects and whose function is connected with the attack on external agents in a nonspecific way. The aim of this work was to determine peroxidase activity in *S frugiperda* larvae in the presence or absence of bacteria. Peroxidase activity was measured in *S. frugiperda* hemolymph (HL) using tetramethylbenzidine and hydrogen peroxide. Three groups of 20 larvae at the last stage were used. One group was injected with 10 µl of a *Micrococcus luteus* suspension. Another group was punctured without inoculation while no treatment was performed on the third group. HL was extracted at 24 hours. At 48 hours post-injury assay, we proceeded in the same way

with three other groups. It was statistically analyzed. SDS PAGE was also performed from HL *S. frugiperda* larvae belonging to different treatments in different conditions. The results of the peroxidase activity showed that 24 hours after treatment with bacteria, this activity decreased compared to the control. At 48 hours after inoculation, we found similar values to those of the control group. The electrophoretic profile of the inoculated group haemolymph showed a different pattern of bands than in the control group. Two bands of 160 and 240 kDa were observed and remained stable after 48 hours post injury and inoculation, while in the presence of reducing agents the bands disappeared, showing that they were polymers.
This paper highlights the presence of peroxidase activity in HL of *S. frugiperda* attributable to peroxidasin, which increases knowledge of the unspecific immune system activity in this insect.

A70
CONVERSION OF P_5 TO P_4 IN FOLLICULAR COMPONENTS AND ITS ROLE IN THE MATURATION OF *Rhinella arenarum* OOCYTES

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The two-cell model was proposed to describe ovarian steroidogenesis in *Rana sp*. In contrast, this process also includes the participation of the oocyte in *X. laevis.* There is no data about steroid biosynthesis in the components of the ovarian follicle of *R. arenarum*. The aim of this work was to recognize follicular components and to analyze the conversion of pregnenolone (P_5) to progesterone (P_4) in each of them.
Pieces of *R. arenarum* ovary were histologically processed and stained with H-E and Mallory trichrome. Ovarian follicle components were separated by microdissection (complete follicles = CF, without theca follicles = WTF, follicular cells= FC, theca = T and naked oocytes = NO) and P_4 synthesis was measured in all of them by ECLIA. Determinations were carried out at: baseline, gonadotropin stimulation (hCG 10 IU / mL) and in the presence of P_5 (100 ng / mL). Reinitiation of meiosis (GVBD) was monitored.
Topographical stains allowed us to observe that the CF are formed by a NO surrounded by a single layer of FC and a thin layer of connective tissue which corresponds to T. All the components secreted < 1nM of P_4 at baseline, except for the CF (≈ 2.4 nM) and GVBD was not found. P_4 secretion increased significantly in CF (≈ 80 nM) under stimulation with hCG and it increased in all components (≈ 50-80 nM) in the presence of P_5 and the matured oocytes. These data suggest that the main source of P_4 is follicular cells. The oocyte could be engaged in this process or be a reservoir of this steroid in the *R. arenarum* ovary.

A71
HISTOLOGICAL ANALISIS OF THE OVARY OF *Physalaemus biligonigerus* AND *Pleurodema borellii*

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In anuran amphibians, during the reproductive period, sexually mature females present a well developed gonad with follicles in different stages of growth. We analyzed for the first time the structural features of the ovarian follicles of two species of anura: *Physalaemus biligonigerus* and *Pleurodema borellii*. The ovaries of the two species were fixed in buffered formalin at pH 7 and included in Histowax. 4 µm cuts were stained with hematoxylin-eosin (HE) and Toluidine Blue (TB) at pH 7.
In the parenchyma of the ovarian cortex of both species we observed follicles in different stages of growth: previtellogenic, vitellogenic and postvitellogenic. No oogonia were observed in the analyzed cuts. In the ovarian follicles the following structures were observed: the theca, a layer of flat follicular cells and the vitelline envelope surrounding the oocytes. Follicles in different stages of growth were immersed in a connective tissue matrix (including fibroblasts, collagen fibers and blood vessels) and showed variations in size and structure (position and size of the germinal vesicle, vitelline platelet accumulation and appearance of pigment in the animal pole). In the postvitellogenic oocytes we observed migration of the germinal vesicle to the animal pole with retraction of the nuclear envelope. The predominance of vitellogenic and postvitellogenic follicles indicates that the ovaries of these females were in a period of immediate ovulation.

A72
OOCYTE MATURATION DYNAMICS IN REGIONAL AMPHIBIANS: MATHEMATICAL MODELLING AND EXPERIMENTATION

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In amphibian oocytes, sexual steroids induce the maturation or resumption of meiosis (Prophase I) to Metaphase II as a consequence of the activation of the maturation promoting factor (MPF). The germinal vesicle breakdown (GVBD) is used as its morphological evidence. Oocyte maturation can be analyzed biologically, determining GVBD percentage of oocytes

incubated *in vitro* in response to different sex steroids; and from mathematics, analyzing the dynamics of GVBD through mathematical models of growth that circumscribe ovarian oocytes to a *population* of cells that crosses the different stages of the GVBD curve. This work shows results arisen from experimentation, modeling and simulation of the dynamics of oocyte maturation induced with Progesterone (P_4) and Testosterone (T) in the ovarian follicles of amphibian species not yet studied: *Scinax fuscovarius, Pleurodema borellii and Physalaemus biligonigerus. Rhinella arenarum* was considered a control species. In this study we proposed the Gompertz mathematical model to simulate the maturation dynamics of these amphibians. This explains the behavior of the experimental data, allowing us to estimate parameters of the model; one is associated with the maximum percentage of GVBD reached and the other to the process speed. The model includes three phases with biological significance: Lag phase, exponential phase and stationary phase. The lag phase is associated with MPF activation and in this phase, the GVBD of the three species studied is initiated before that for *R. arenarum*, with both steroids. The exponential phase is associated with the maturation speed (Prophase I until the beginning of Metaphase II). We concluded that *S. fuscovarius* is the only species in which T is the most efficient steroid inductor. Finally, the stationary phase is associated with the alignment of the chromosomes in Metaphase II, which is achieved earlier than in *R. arenarum* in the three species studied.

A73
RENAL NITRIC OXIDE BIOAVAILABILITY. EFFECT OF CHRONIC TREATMENT WITH VITAMIN D

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Vitamin D (VitD) has a protective effect at the vascular level, increasing levels of nitric oxide (NO) produced by NO synthases (NOS, isoforms: inducible (iNOS) and constitutive (endothelial: eNOS, and neuronal: nNOS)). A renovascular protective role is attributed to constitutive NOS. At the renal level, they are differentially distributed in cortex and medulla (iNOS predominates in medulla). **Objective**: To evaluate the role of VitD on renal NOS, differentiating its effect on the cortex and medulla. **Methods**: Wistar Kyoto male rats were divided into two groups: without (CR) and with VitD (DR: D3=750UI/kg/day for 4 weeks). Blood pressure (BP) was measured by the direct method. In kidneys, bioavailability of NO (nitrites) was evaluated by the Griess reaction differentiating cortex and medulla. NO source was evaluated by preincubation with inhibitors: Krebs without calcium plus EGTA ($0Ca^{++}$: eNOS and nNOS), dexamethasone (iNOS), L-NAME (all of them); and stimulators: angiotensin 1-7 (Ang1-7: eNOS and nNOS). **Results**: No significant differences were observed in the BP. DR increased levels of nitrites in cortex and medulla. $0Ca^{++}$ completely inhibited nitrites in CR and DR cortex, and DR medulla. The release of nitrites in CR medulla was inhibited by dexamethasone. L-NAME completely blocked the nitrites of CR and DR. No further increases were observed in the levels of nitrites in RD incubated with Ang1-7.
Conclusions: In non-hypertensive animals, VitD showed a protective role, increasing values of NO in renal cortex and medulla, mainly from the constitutive NOS. The lack of greater effect of Ang1-7 is another finding that reinforces the protective effect of VitD.

A74
DETERMINATION OF IRON AND HEMATOLOGIC PROFILE IN WEANED PIGS FROM INTENSIVE PRODUCTION FARMS IN SANTA FE

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The aim of this work was to determine iron and hematologic profile of weaning pigs in intensive production farms in Santa Fe. We extracted blood from 50 pigs from two farms in 2015, in samples paired with EDTA for the determination of hematologic profile and tubes without anticoagulants for serum extraction. A Neubauer chamber was used to determine red blood cells (GR), micro technique for hematocrit (Hto); cyanmethemoglobin method for hemoglobine (Hb) and atomic absorption spectrophotometry for iron (Fe).
The erythrocyte indices determined were: mean corpuscular volume (VCM), mean corpuscular hemoglobin (HCM) and mean corpuscular hemoglobin concentration (CHCM). The ANOVA test was used for analysis of variance. Mean values and SD of hematological parameters and blood iron levels in weaned pigs were 1 and 2, respectively: GR (/mm3) 4077963 ±1367348; 5896402±338885 –Hb (g/dL) 6.63±3.88; 9.53±1.46 –Hto (%) 21.07±6.42; 31.96±1.98 –VCM (fL) 52.99±7.87; 54.27±3.15 –HCM (pg) 15.11±4.74; 16.06±1.71 –CHCM (g/dL) 28.98±9.64; 29.89±4,7 –Fe (µg/dL) 98.21±36.58; 119.40±53.85. Average iron values were within the normal range. GR, Hto and Hb counts were lower in farm 1; there was a significant difference ($p< 0.05$) between both farms. This may be due to the fact that Fe concentration in serum does not always reflect Hb concentration or iron deposit. No evidence of hypochromic or microcytic anemia was found in out study.

A75
ASSESSMENT OF IRON CONCENTRATION IN BLOOD SERUM OF NEWBORN PIGLETS UNDER CONFINEMENT IN ARGENTINA LITTORAL PROVINCES

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Iron is an important nutrient for pigs: at birth, it constitutes from 20 to 30 ppm; it participates in enzymatic processes and its main function is gas exchange between oxygen and carbon dioxide, which takes place in lungs by hemoglobin and in muscle by myoglobin. Iron deficiency anemia for lack of iron represents one of principal diseases nutritional that concerns pigs in confined systems. The aim of this work was to determine iron concentration in serum in newborn piglets in confinement systems in pig farms in provinces of the Argentine Litoral. The study was conducted in 22 animals randomly selected in a farm in Santa and another in Entre Ríos with different lineages in 2015. For the determination of iron (Fe) in serum, 5 mL of blood was extracted from vena cava with 25x0.9 mm needless Serum was separated by centrifugation at 6000g, carried in a refregerator with dry ice and kept at –20 ºC. The method used for serum samples was Atomic Absorption Spectrometry (AA). ANOVA was used for statistical analysis.
Average values and SD of Fe concentration in µg/dL were: for Santa Fe 66.82±37.77 and for Entre Ríos 126.91±0.39, respectively. These results are within the reference rangee. The difference in the values found between the two farms is due to different handling and to animal genetics. This w ork will be completed with the determination of other minerals in different categories of pigs as part of a project CAID of the UNL.

A76
ESTIMATE OF METABOLIZABLE ENERGY IN TUCUMAN SCRUBLAND (TACO RALO) SPECIES

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In extensive goat production and on family farms, animal feeding is a critical factor, especially in during seasonal periods such as the beginning of winter. The FAO reports that the productivity of animals depends on their energy intake. The objective of the present work was to estimate the content of metabolizable energy of species mostly consumed by goats in Tucuman scrubland (Taco Ralo area). A survey was made of samples of four species in order to estimate the energy content and assess if they fulfill the energy requirements of the animals. The % FDA (acid detergent fiber) was evaluated by the method of Van Soest ANKOM equipment. Based on this data, we estimated % D (digestibility) and ME (metabolizable energy) by AFRC Standards (Agricultural Food Research Council).
Results: a) Hediondilla (*Solanum nitidum*): %AFD=43.52 σ=0.259; %D=55 σ±0.20; ME=198.56 Mcal σ±0.74. b) Garabato (*Acacia praecox Griseb*): %AFD=37.28 σ±6.84; %D=59.86 σ±5.33; ME=225.09 Mcal σ±28.24. c) Yuyo negro (*Eupatorium laevigatum*): %AFD=28.94 σ± 0.37; %D=66.36 σ±0.28; ME=239.55 Mcal σ±1.045. d) Mistol (*Ziziphus mistol*): %AFD=46.27 σ±0.72; %D=52.86 σ±0.56; ME=381.64 Mcal σ±2.02.
Conclusions: The daily energy requirements for maintenance of the animals are 1.91Mcal, for a metabolic weight of (WM= Live weight ^{0,75}) =18.80, and an average consumption of 0.95 kg/day. The lactation requirements are =1,21Mcal/day. We conclude that the species considered fulfill the animals' needs for maintenance and lactation..

A77
STRESS PARAMETERS IN INTENSIVE PIG FARMING IN SHEDS WITH STRAW BEDS VS FULL SLAT FLOORS

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The work was performed in two intensive pig farms in shed, with two types of floor: straw bed (CP, bed of dry plant) versus full Slat (FS, synthetic material). We worked with finishing pigs (60 to 70kg P /V). The genetic basis for each kind of breeding was the same. Blood samples were taken from the jugular vein with heparin by puncture. Blood glucose was measured at the time of extraction as a stress parameter. The blood was transported to the laboratory, refrigerated, centrifuged to obtain the plasma, divided into aliquots and stored in Eppendorf at --25ºC for further processing. The samples whose extraction time exceeded three minutes or whose blood glucose values were above 110 mg./dl.were rejected. Level of malondialdehyde (MDA) was measured as an oxidative stress parameter and plasmatic cortisol as a parameter of chronic stress with a commercial kit for Radio Immuno Analysis Coat-A-Count Siemen. MDA plasma levels were measured with thiobarbituric acid reactive (TBARS).
Cortisol levels were higher in CP (p = 0.00003) 5.61 ng / dl (± 1.77) vs. 2.99 ng / dl (± 0.19). For MDA they were also higher in CP 0.26 nmol / ml (0.0003) vs 0.16 nmol / ml in FS. Cortisol parameter indicates chronic stress and MDA, oxidative stress which can be associated with chronic stress. Intensive farming systems under shed in CP increase the level of chronic stress compared to those with floor FS. The hardest floors could lead to plomb problems and pain; this is not reflected in the parameters analyzed, which did not indicate that there are better housing conditions in soft floors CP compared to FS.

A78
SURVEY OF ARTHROPOFAUNA FROM RIPARIAN AREAS IN A SECTOR OF THE TAPIA AND VIPOS RIVERS (TAPIA-TRANCAS WATERSHED, TUCUMAN, ARGENTINA)

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Riparian habitats allow the maintenance of water quality, protecting wildlife and the formation of natural corridors. Currently, terrestrial arthropofauna is poorly known in these kinds of habitats and, even more, the lack of information is higher for riparian areas belonging to the Semi-arid Chaco ecoregion. Therefore, the aims of this study were to conduct a survey of arthropods present in habitats associated with Tapia and Vipos rivers (Tucuman); and to identify at the family level the two most abundant orders within the Insecta class, diversity for each group being estimated. Sampling was conducted during the months of April and May 2014, in two sections of the Tapia and Vipos rivers. Specimens were collected with Moericke traps (yellow pan traps). A total of 1,861 individuals were surveyed, Collembola being the most numerous taxa (37.5%). Within the Insecta class, 994 individuals belonging to nine orders were collected, out of which the most abundant ones were the Hymenoptera (38.9%) and Diptera (31.7%) orders. In the Hymenoptera, a total of 24 families were recorded, Formicidae being the prevalent frequent family (96 individuals followed by Encyrtidae (52 individuals). In the Diptera order, a total of 23 families were identified, the Phoridae family being the bestl represented (96 individuals), followed by Dolichopodidae (59 individuals), and thirdly Sciaridae (50 individuals). This study represents the first descriptive work for terrestrial arthropofauna associated with riparian ecosystems of Semi-arid Chaco ecoregion of the Tucuman province.

A79
COMPOSITION AND ABUNDANCE OF UNDERGROWTH BIRDS AND BATS AND FLESHY-FRUITED PLANT RICHNESS IN A SECONDARY FOREST OF THE SOUTHERN YUNGAS

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Secondary forests are important sites for biodiversity of birds and bats and are increasingly common in contemporary landscapes of the Yungas. This study describes bird and bat composition and abundance, and fleshy-fruited plant richness in a secondary mountain forest of “Reserva Provincial La Florida”, Tucumán. In 2007, birds and bats were monthly captured with mist nets (12 x 2.6 m) between 7-20 hs and 20-3 hs. Sampling effort was 2,320 net-hour-day and 1,820 net-hour-night. In addition, fleshy-fruited plants (FFP) in fruit were recorded in an area of ≈ 4 x 0.6 km. A total of 663 birds of 18 species and 50 families, and 454 bats of 6 species of 2 families were captured. 59% of the captured birds belonged to the families Tyrannidae (11 sp), Thraupidae (8 sp) and Turdidae (5 sp), *Thraupis sayaca* accounted for most of the captures. 98% of captured bats belonged to the genus *Sturnira* (Fam. Phyllostomidae), with strong dominance of *S. erythromos*. The proportion of species observed with respect to the expected theoretical (completeness) was 67% for birds and 91% for bats. FFP included 40 species of 24 families, with Solanaceae as the dominant family (11 sp). The abundance of nectarivorous and frugivorous birds was highest in spring and summer, respectively. The abundance of frugivorous birds and bats were positively related to FFC richness. Multivariate analysis (NMDS) revealed that the higher the FFP richness, the higher the proportion of frugivorous birds and bats. The diversity of birds and bats is an important component of secondary forests of the RPLF.

A80
EVALUATION OF WATER QUALITY OF THE VALLEY RIVER, COLLAGASTA SEGMENT, THROUGH THE ASSEMBLY OF BENTHIC MACROINVERTEBRATES

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Macroinvertebrates (>300µm) are used as biological indicators of water quality of river ecosystems. The objective of this research was to make a list of the benthic macroinvertebrates in a stretch of the Valley River and use the assembly to evaluate water quality. The sampling station was at Collagasta (28º21'18.8"S-65º42'41.5"W; 547m a.s.l.). The water there is normally is collected for human consumption, irrigation and recreation. Sampling was conducted in June 2015. The samples (n = 3) were obtained with "Surber" type sampler (0.09m_2; 300µm mesh width), integrated for analysis. Taxonomic determinations were made down to the taxon family.The Shannon-Wiener (log_2) (H ') and biotic indices were obtained: IBMWP' (Iberian Biological Monitoring Working Party) was set for the NOA; ASPT '(Average Score per Taxon) and IBF (Family Biotic Index). In addition, we obtained morphometry data of the river: width of dry bed, wet bed width, current velocity, depth: The following were determined *in situ*: water physico-chemical parameters: temperature, electrical conductivity and pH, with digital multimeter. 3,172 bodies were collected. The faunal wealth was 16 families. H’ reached a value of 2.71 (2-3) Condition: Light Pollution. IBMWP' was 111, Class I (101-120): unpolluted waters or altered sensitively.

ASPT' recorded a value of 6.17 (> 5.1): Water without impact. IBF had a value of 0.59 (0.00 to 3.75): excellent water, without organic contamination present. The set of indices calculated shows quality resource. The data obtained are the first for the river in its stretch through the town of Collagasta.

A81
BENTHIC MACROINVERTEBRATES COMMUNITY IN A STRETCH OF THE VALLEY RIVER, CATAMARCA-ARGENTINA

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The Valley River is the main watercourse in the Central region of the province of Catamarca and, as in all lotic environments, benthic macroinvertebrates can be found. The objective of this research was to characterize the benthic macroinvertebrate community through community parameters and ecological indices in the Valley River in its course through the town of Collagasta. The sampling station is located at 28º 21'18.8"S-65º42'41.5"W and 547m a.s.l. Sample collection took place in June 2015. A type "Surbe|r" sampler (0.09m_2 and 300µm mesh width) was used. The bodies were determined to family taxon (except for Oligochaeta, Acari and Odonata). Three samples were taken along a stretch of 30m. For each we obtained: abundance, mean (x), standard deviation (SD), faunal wealth (RF), Shannon-Wiener index (log_2) (H ') and Simpson Dominance (DSi); the similarity between the samples was determined by calculating the Jaccard (IJ). 3,172 bodies of 16 taxa were collected in all. Sample I had an abundance of 233 organisms (x = 17.92; SD = 25.9); an RF of 13 taxa; H '= 2.54 and = 0.22 DSi. Sample II had an abundance of 2,007 organisms (x = 125.44, SD = 198.47); an RF of 16 taxa; H '= 2.69; DSi = 0.21. Sample III had an abundance of 932 organisms (x = 62.13, SD = 94.14); an RF of 15 taxa; H '= 2.71; DSi = 0.21. The Leptohyphidae Family (Insecta: Ephemeroptera) was the dominant taxon in the three samples. Samples II and III were the most similar, where the IJ was 0.82. The set of parameters and ecological indices community allowed us to determine the structure of the macroinvertebrates under study, this being the first data for the Valley River on its course through Collagasta.

A82
ABUNDANCE OF COCCINELLIDS AS NATURAL ENEMIES OF *Diaphorina citri* (HEMIPTERA) IN YUTO LOCALITY- JUJUY - ARGENTINA

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HLB is a lethal citrus disease transmitted by *Diaphorina citri*. Currently, Argentina is considered free of this disease, although the insect vector was found. Coccinellids (Coleoptera: Coccinelidae) are predators, which for reproduction and development need to consume more than one individual or "prey", so that they would be considered effective in reducing the number of pest organisms specimens.
The aim of this study was to determine the abundance of representatives of the Coccinelidae Family, as natural enemies of *D. citri*. Two citrics production systems were evaluated: the first is a traditional system (TS) and the other a low impact environmental system (ES). Sampling was conducted during the 2014-2015 period. Each tree was considered as a sampling point. Captures were made by net-blows on the botanical species associated with each system and on the tree tops the observation was made without removing the species. For detection of *D. citri*it we extracted buds of up to 10 cm to determine number of nymphal stages.
Cycloneda sanguine and *Coccinella montícola* were registered for the traditional system and *C. sanguinea*, *C. montícola*, *Hyperaspis festiva* and *Eriopis connexa* were registered for the low impact environmental system.
With respect to the vector, abundance was significantly higher in the TS. Coccinellids were found consuming nymphs and eggs of *D. citri* on the tree tops. During winter, coccinelids were found in the adult phase taking refuge in botanical species associated with ES while *D. citri* was detected only in favorable conditions of T° and RH near the summer months; such behavior will be evaluated in future studies as a biocontrol strategy.

A83
ARTHROPOD DIVERSITY IN PHYTOTELMATA OF *Aechmea distichantha* (BROMELIACEAE) IN YUNGAS OF CATAMARCA

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Phytotelmata are aquatic environments naturally formed by modified leaves, leaf axils, flowers, trunks, etc, that store water and organic matter, creating a favourable environment for the habitat, growth and development of various organisms. The aim of this research was to determine the diversity of arthropods present in phytotelmata of *Aechmea distichantha*. Plants were analyzed from the locality of Las Higuerillas (Paclín, Catamarca), in a zone of Selva Montana of the Yungas. Sampling was carried out in summer (rainy season). Thirteen samples were collected at two sampling points. Organisms were

separated and determined taxonomically. Abundance, faunal richness and diversity indices were reported: Shannon-Wiener index (H'), Simpson's Dominance index (D) and Sorensen's Similarity index. 255 individuals were registered from 12 taxa. The best represented group was Insecta (55.29%), followed by Acari (41.57%). The most abundant sample was 13 (53 individuals), followed by samples 8, 11 and 6 (42, 32 and 31 individuals, respectively). The most diverse samples were: 10 and 13 with 7 taxa and morphospecies in each one. The most abundant taxon was Acari (morphospecie 1) (22.4%), followed by Chironomidae (morphospecie 1) (21.2%). The H' index was 3.5. The D index was 0.13. Samples 1 and 2 were the most similar (67%). The arthropod diversity found shows a high and new faunal richness. The report of adults and immature stages (larvae and pupae) suggests the importance of the community as definitive habitats of some organisms and as a temporary habitat for others. The results obtained contributed to the knowledge of fauna phytotelmata in Yungas environments of Catamarca.

A84
THE EFFECT OF PESTICIDES ON MICROORGANISMS

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The quality and safety of fruits is a fundamental aspect in their marketing which is directly affected by their management. The diseases that affect the quality of peaches are numerous. In order to reduce this effect, it is necessary to perform integrated management, eventually using fungicides that have low environmental impact. The soil has an intense microbial life that leads to the degradation of organic matter and mineral elements, contributing to soil fertility and promoting plant growth. Pesticides can affect the beneficial fauna of the soil, reducing the mineralization of organic matter as well as the content of soil nutrients. The objective of this study was to evaluate the effect fungicides commonly used in the cultivation of peach trees have on soil microorganisms. The study was conducted in Rio Cuarto during the 2014/15 season. The impact of fungicides on soil was analyzed by observing the vegetable material deterioration, using bags with mesh apertures of 0.2 mm, filled with 50g of medicago hay. The bags, which were filled with soil taken from the area surrounding the peach trees, were buried in pots of 20 litres capacity. The treatments used were copper oxychloride (OCC), Bordeaux mixture (BM), captan (CAP) and carbendazim (CA) as well as their control plots. Four applications with the recommended dose in the label were conducted. RCB was the design used, with 5 treatments and 12 repetitions. After the bags were removed on 12/14, the dry weight of the undegraded material was obtained in order to measure the edaphic biological activity by weight difference. It was also analysed using ANAVA ($p < 0.05$). It was found that there were no significant differences between the treatments. The fungicides that had greater effect were OCC, CAP and BM, which presented 16, 21 and 27.5% less degradation than the control plots.

A85
ABUNDANCE OF PREDATORY INSECTS IN A CORN-CUCURBITACEAE ASSOCIATION IN SANTIAGO DEL ESTERO– ARGENTINA

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Polyculture systems are rooted in subsistence farming aimed at maximum utilization of agricultural land and their practice has developed historically among farmers with few resources and inadequate availability of agricultural land. A major reason why some farmers have adopted this production system worldwide is the increase in the importance of predators and parasitoids as natural controllers of pest insect populations. The objective of this work is to determine the relative abundance of predatory insects in corn-anquito association during the agricultural years 2013/14 and 2014/15. The treatments evaluated were corn monoculture (T1), anquito monoculture (T3) and polyculture (striping). In order to determine the abundance of predators 15 soil traps soil per treatment were used (45 in all), uniformly distributed in the lateral edges and in the center of each culture. During the evaluated agricultural years the predators represented between 47-54 % of the total of captured arthropods. The class Insect represented 81% of the total of captured arthropods, out of which 46-53 % are predators. Coleopterous insects were the most abundant ones, between 46 and 48 % of the total. Carabids (Carabidae: Coleoptera) were the most abundant in the evaluated period, the main species being *Calosoma argentinensis* (Csiki, 1927) and *Gallerita collaris* (Dejean, 1826).

A86
INCUBATION PERIOD AND LARVAL STATE OF *Rhigopsidius* sp. (COLEOPTERA: CURCULIONIDAE) UNDER LABORATORY CONDITIONS

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In our country, potato is a staple food with an annual consumption of 55 kilograms per capita. Farmers normally use seed potatoes, mostly of poor quality due to diseases and insect pests. Potato weevil, which is part of the "Andes weevil

complex", is the most important pest. These insects are difficult to control because most of their life cycle is developed in underground organs of cultivated plants. Knowledge of the life cycle of a pest is important for the development of effective management strategies. In our country there is no information related to the biological parameters of potato weevil. The aim of this study was to determine its incubation period, the number and duration of its larval stages, and its larval state. The ovipositions obtained from laboratory reared weevils in collareja variety potato tubers were placed in Petri dishes; they were observed daily and incubation period and hatching time were recorded. Neonate larvae were individually placed in Andean potatoes (*Solanum tuberosum L spp. Andigena*) and reviewed periodically for this stage. This was done in a breeding chamber at 20 °C and with a photoperiod of 12:12. *Rhigopsidius* sp had an incubation period of 51.78 ± 12.26 days. The duration of the larval stage was 102.93 ± 27.15 days. Four stages whose durations were presented were: 1nd 14.87 ± 2.25; 2nd 16.35 ± 4.67; 3rd 18.11 ± 3.76; 4nd 50.59 ± 12.61.

A87
WHITEFLY *Bemisia tabaci* LIFE CYCLE IN BEAN *Phaseolus vulgaris*

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Whitefly *Bemisia tabaci* (Gennadius) (Hemiptera: Aleyrodidae), one of the most important pests affecting agriculture, is a polyphagous insect. It has a wide distribution and a great impact on the horticultural areas of the country. One of its most significant dangers is the transmission of viral diseases. Its incidence throughout the year and its population aggressiveness require many applications to keep it below the threshold of economic damage. However, the emergence of an increasingly demanding market requires sustainable management to preserve the environment and human health. The aim of this work is to evaluate the development of *B. tabaci* on *P. vulgaris* "bean". Healthy leaves of beans without pests were selected, to which capsules where 40 adults (20♂ and 20♀) of *B. tabaci* were were previously attached, being in intimate contact for oviposition; at 72 hours eggs oviposited were counted. An average of 73.3 eggs per capsule oviposition was obtained. Development from egg to adult was monitored by microscope observation every 24 hours through stages L1, L2, L3, Pr and P. The cycle from egg to adult lasted an average of 31. 3 days on *P. vulgaris.* The duration of the egg stage was 10.3 ± 1 days, the L1 stage lasted 12.3 ± 1 days L2 lasted 11 ± 1 days L3 10.3 ± 1 days Pr 7.6 ± 1 days. The pupa stage lasted 8.3 ± 1 days under conditions of 27 ± 0.5 °C, 70% RH and photoperiod 12/12 (light / dark). It is concluded that the whitefly develops favorably on beans. Whitfly is a convenient species for the establishment of a breeding laboratory to have a permanent fly population.

A88
INVENTORY OF GLYPHOSATE TOLERANT AND RESISTENT WEEDS IN A SOYBEAN AREA FROM NORTHWESTERN ARGENTINA (SALTA)

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Investigations on weeds in cultures in northwestern Argentina exist though taxonomic information on tolerant and resistant weeds affecting soybean is still scarce. The object of this work is to contribute to the knowledge of weeds in the cultures in this region and their relevance by analyzing their tolerance or resistance to glyphosate. In order to carry out this work, nine soybean farms in the lowlands in the Sierra of Metán were studied during the crop years of 2013-2014, collecting the weeds from fallow to harvest. The species were grouped taking into account their presence or absence during the initial, mid and final phase of the culture. The results showed a richness of 38 species of weeds belonging to 17 botanical families (Poaceae 10, Asteraceae 7, Solanaceae 3, Brassicaceae 2 and the remaining 16 families with only one and two species). During the fallow period, 13 species were identified; they disappeared during the first phases of the culture and can be considered tolerant. The species of the fallow period that persisted at the end of the cycle were 21; these can be considered as glyphosate resistant.

A89
DIVERSITY OF PARASITIC NEMATODES OF FISHES FROM THE BERMEJO AND JURAMENTO BASINS, SALTA, ARGENTINA

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Knowledge about freshwater parasitic nematodes in Salta province is limited. Thus, an analysis of nematodes assemblage composition in a section of the basins of rivers Bermejo and Juramento was carried out and parasitic infection indicators were calculated. From June 2014 to March 2016 Siluriformes, Characiformes and Cyprinodontiformes fishes were captured. Nematodes were fixed in 10% formalin, cleared in lactophenol and identified. Richness (S), abundance (N); similarity of Bray-Curtis, equitability (J) and diversity (H) indices; prevalence (P) and mean intensity (IM) were calculated. The following were obtained: 100 *Procamallanus (Spirocamallanus) hilarii* in *Astyanax* spp. (P=13.9%; IM=1.7) and 1 in *Characidium*

fasciatum (P=7.7%; IM=1); 41 *Procamallanus (Spirocamallanus) pintoi* (P=46.9%; IM=1.8) in *Corydoras paleatus*; 18 *Rhabdochona (Rhabdochona) acuminata* (P=8.8%; IM=2.6) and 3 *Cucullanus (Cucullanus) pinnai pinnai* (P=1.3%; IM=3) in *Trichomycterus spegazzini*; 2 *Contracaecum* sp. (P=1.4%; IM=2) in *Jenynsia alternimaculata* and 2 in *Astyanax* spp. (P=0.5%; IM=1) and 21 *Raphidascaris* sp. (P=11.3%; IM=2.6) in *Rineloricaria steinbachi*. The Bermejo basin had higher species richness (S=5) than the Juramento basin (S=3). Diversity, abundance and equitability were significantly higher in the Bermejo basin (H=1.38; N=100, J=0.86) than in the Juramento basin (H=0.78; N=88, J=0.71) (*P=0.001*); this could be due to greater fish diversity in the Bermejo basin. The similarity between basins was 62%: they share *P. (S.) hilarii* and *P. (S.) pintoi. Raphidascaris* sp*., R. (R.) acuminata* and *C. (C.) pinnai pinnai* were found only in the Bermejo basin and *Contracaecum* sp. only in the Juramento basin.

A90
NATIVE WOODY SPECIES GROWN IN GREEN SPACES IN SANTIAGO DEL ESTERO CITY, ARGENTINA

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Interest in the culture of native species in urban environments has increased lately because of the functionality of these species in the ecosystem, their reduced demand for inputs and resources for maintenance and their resistance to pests and diseases.The aim of this work was to catalog the native woody species present in green spaces in Santiago del Estero city in order to provide information about their presence in urban areas, which is scarce at present. Native plants growing in main squares, parks and boulevards were inventoried, taking into accout trees, shrubs and woody creepers. The term "native" includes those species listed as such in the specific literature that were found in province of Santiago del Estero. A total of 61 native woody species are grown in green spaces, including 22 botanical families and 44 genera. The Fabaceae family is the prevalent one, with 18 species and 40 individuals. Out of the total, 30 species are trees, 21 are bushes and 10 woody vines. 150 individuals were recorded. The most common species are *Ceiba chodatii, Lantana camara* and *Tecoma stans*.
The information collected is considered valuable for use in future urban planning, landscaping ecology, while stressing the presence of native species grown in the green spaces of the city.

A91
FUNGAL BIOPESTICIDES P OBTAINED FROM CULTURES OF *Fusarium* sp. 3300 (ENTOMOPATHOGENIC FUNGUS)

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Entomopathogenic fungi (HE) are the main biological agents used in integrated pest management (IPM). More than 13 species of *Fusarium* were described as insect pathogens. The aim of this study was to evaluate the insecticidal activity of extracts from culture *Fusarium* sp. 3300, on *Spodoptera frugiperda* (Lepidoptera), *Ceratitis capitata* (Diptera) and *Tribolium castaneum* (Coleoptera), insect pests that generate serious economic losses in northwestern Argentina. Fungal development was performed in a 1% glucosed potato cultivation medium (CPG) inoculated with 3% of spores (w / v) (107 spores / mL) of HE and with and without the addition of 1% (w / p) insect remains. The extracts were obtained by extracting the biomass with ethyl acetate (AcOEt) and methanol at a 1:1 ratio and the supernatant with AcOEt. Supernatant's ethyl acetate extract of Fungus-insect (FSHIAc) produced the greatest intake inhibition in conditions of choice on *S. frugiperda* (IIA 83%). High percentages of pupal mortality (35-50%) were observed. All tested extracts were moderate to strong inhibitors of oviposition of *Ceratitis capitata*, the most active extract FSHIAc (IIO 61%). The Fungus-Insect biomass extracts showed repellent action against *T. castaneum*, he most active extract being tFBHIMe, with IR values of 26%. Our results indicate that the extracts of *Fusarium sp*. 3300 are promising for the development of control agents, insect pests and as a potential source of bioactive substances.

A92
FIRST MENTION OF *Wolbachia* IN WHITEFLIES FROM ARGENTINIAN NORTHWEST BEANS

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Wolbachia is the prevalent endosymbiont bacteria in nature, it having been detected in arthropods and nematodes. It is a biological control agent candidate as it may, among other things, affect host reproduction by changing the male:female ratio. It may also inhibit pathogenic virus replication, protecting to the insect. *Bemisia tabaci* is a vector of global importance and has several symbiotic microorganisms inside. Depending on the combination of bacteria existing in the insect, its response

against insecticide can vary. Even more, one of the differences between the most invasive and destructive *B. tabaci* species (MEAM1 and MED) is the composition of their microflora. Although the background screening of *Wolbachia* is mainly focused on MEAM1 and MED whiteflies species, scarce information exists about native species. In adittion to these two species, NW2 was identified in beans from Argentina, but their microbial diversity is still unknown. In previous analysis with local populations the endosymbiont species *Halmintonella, Rickettsia, Cardinium* and *Fritschea* were detected although the *Wolbachia 16S*rDNA gene amplification was negative. Thus, in this study, *wsp*gen was considered in nested PCRs, because conventional PCR did not allow detection. DNA of adult whiteflies collected in Yuto (Jujuy) from bean plants was extracted. 53 specimens were analyzed and 32 were *Wolbachia* positive (60.4%). This is the first work reporting *Wolbachia* in an Argentinian population of *B. tabaci* and strengthens the knowledge about whitefly harbored microbial diversity affecting the Argentinian Northwest bean crops.

A93
HAPLOTYPE DIVERSITY OF *Diaphorina citri* FROM THE ARGENTINIAN NORTHEAST (NEA)

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Huanglongbing (HLB) is a devastating citrus disease worldwide. In Argentina, the first positive cases of HLB were reported in 2012. HLB is caused by *Candidatus* Liberibacter asiaticus and its main vector, *Diaphorina citri* Kuwayama (Hemiptera, Liviidae), is present in different citrus-growing areas in our country. Transmission efficiency and/or effectiveness of biological control by parasitoids can be affected by the genetic variability of vector populations. In the context of the characterization of *D. citri* populations in Argentina, the genetic variability in two locations in the NEA citric production area was studied using mitochondrial haplotypes. For this purpose, field collections of *D. citri* specimens were made in Bella Vista (Corrientes) and Concordia (Entre Rios). Individual DNA extraction was performed and then a fragment of the mitochondrial gene *Cytochrome Oxidase I* (COI) was amplified and sequenced. The sequences were edited and compared with *D. citri* haplotypes proposed by Boykin et al. (2012). As a result, we detect the haplotype "Dcit-2", which in turn was the most common in both locations. This haplotype has been reported as the most abundant in Southeast Asia and Brazil. Future studies may elucidate the biological implications of this finding regarding transmission efficiency and effectiveness of biological control of this vector in the NEA.

A94
DESCRIPTION OF THE BURROWING OWL (*Athene cunicularia*) DIET IN LA ANGOSTURA RESERVOIR, TAFÍ DEL VALLE, TUCUMÁN, ARGENTINA

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The Burrowing owl (*Athene cunicularia*) has been widely studied in terms of its eating habits both in Argentina and in other countries in North and South America. However, there is little information about it in areas adjacent to aquatic environments. The aim of this work was to determine the feeding habits of *A. cunicularia* through the study of its pellets in the lakeside of La Angostura Reservoir for one year. The study area is located in Tafí del Valle, in the western part of the province of Tucumán, Argentina, at approximately 26° 55'S, 65° 41'W, at about 2000 meters above sea level. The reservoir, with an area of 980 ha, has a perimeter of 12 km, including peripheral bodies of flooding. Five nests (caves) and places where the birds nest and perch were identified. Samplings were conducted from April 2013 to March 2014. During this period 626 pellets were collected, weighed, measured and analyzed. Taxonomic determinations were made up to the highest possible level. A total of 15430 items (preys) including mammals, birds, amphibians, insects and chelicerates were identified. The most abundant were insects of the Order Coleoptera with 6081 items followed by mammals with 463 items and finally by the insects of the Family Acridae (grasshoppers) belonging to the Order Orthoptera with 416 items. *A. cunicularia* showed a generalist food and variation of items throughout the year. This work could help to assess the role of the Burrowing owl as a biological controller of the population growth of its prey.

A95
BIRD COMMUNITIES OF THE AÑATUYA MARSHLANDS, AN IMPORTANT BIRD AND BIODIVERSITY AREA (IBA) IN SANTIAGO DEL ESTERO, ARGENTINA.

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The Añatuya marshlands are located in the departments of Taboada and Avellaneda, 270 km from Santiago del Estero (28°48'33.1" S; 62°38'39.7" W). They are formed by flood and waterlogging from the Salado River. The wetland, of

approximately 90,000 ha, presents areas of shallow waters with marshy vegetation and also deeper open waters. The aim of this work was to carry out a preliminary study of the bird community in this site, considered as an import Bird and Biodiversity Area (IBA). Strip transect surveys, fixed point radius and vehicle tours between the 2012 to 2014, divided into the four seasons, were performed. The number of individuals, species and habitats used was recorded. The relative abundance (RA) and the index of relative importance (RI) were calculated. There were 56 species and 6686 individuals, the two most abundant being*Tachycineta leucorrhoa* and *Progne tapera*, followed by *Netta peposaca*, *Dendrocygna bicolor*, *Plegadis chii*, *Fulica leucoptera* and *Himantopus melanurus*. Both regional and Nearctic-Neotropical migratory and resident species were identified. The richness and abundance of bird species is low compared to other natural wetlands in the dry Chaco. This could be due to changes in the environment such as intensive agriculture, overgrazing, logging, sport hunting and infrastructure. Since birds are an indicator of the quality of the environment and since the Añatuya Marshlands an IBA, it is important that studies be continued to obtain a baseline from which to consider guidelines for the management and conservation of the region.

A96
GERMINATION OF *Vallesia glabra* (CAV.) LINK.

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Vallesia glabra (Cav) Link. is a native shrub popularly known as "ancohe" that the rural population use for various purposes, including ornamentation. Its evergreen character and resistance to shape pruning make it suitable for use as a living fence. The aim of this study was to evaluate the effect of different scarification treatments on the germination of "ancoche" seeds in order to increase useful information for nursery growers.
Four treatments were tested: 1) control, 2) soaking in water at 60°C, 3) acid scarification and 4) sanding. The seeds were obtained from wild individuals from different sites of the Santiago del Estero province and plated on paper towels on trays, which were placed in germination chambers at 30-25ºC, with alternating 12/12 h light-dark cyces. The design was completely randomized, with four replicates per treatment, with 25 seeds each. Germination percentage and mean germination time (TMG) were calculated. The results were analyzed by ANOVA and mean differences by Tukey's test (α = .05).
The highest germination percentage was recorded for the control (73.75%), followed by the acid scarification treatment (72.50%). The highest TMG corresponded to treatment 3 (29), followed by treatments 2 (16.67) and 4 (16.33). The results indicate the low incidence of pre-germination treatments on the germination percentage, although there are significant differences in TMG. It is advisable to assess the effect of other treatments in order to improve germination percentage.

A97
GERMINATION OF *Acacia albicorticata* BURKART

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Acacia albicorticata Burkart is a native tree with potentially ornamental use in urban spaces, whether by its particular bark that emerges in plates or its abundant yellow fragrant flowering. The aim of this study was to evaluate the effect of different physicochemical treatments on seed germination as basic information for nursery production. Four treatments were defined: 1) control without scarifying; 2) sanding; 3) soaking in water for 24 hours; 4) soaking in water at 60°C and 5) immersion in sulfuric acid for 10 minutes.The seeds, obtained from trees grown in the Botanical Garden of the FCF-UNSE, were seeded on paper towels moistened with distilled water and then in trays in plastic bags placed in a germination chamber at temperatures between 25°C and 30°C with alternating 12 h light / dark cycles.The design was completely randomized with 4 replications of 25 seeds each per treatment. Percentage and mean germination time (TMG) were calculated. The results were analyzed by ANOVA and mean differences by Tukey's test (α = 0.05) using INFOSTAT 2010.
The highest germination percentage was recorded for treatment 5 (97%), followed by treatment 4 with 79%; the lowest percentage was for the control (57%). TMG was highest for treatment 4. There are significant differences between soaking in water at 60°C and acid scarification. These treatments are recommended for nursery production, especially the soaking treatment, due to its lower cost and simplicity. The information obtained will be the basis for future experiments of species propagation.

A98
IMPORTANCE OF NATURAL CORRIDORS ON INSECT POLLINATORS DIVERSITY IN CITRUS PLANTATIONS FROM THE SOUTHWEST OF THE TUCUMAN PROVINCE

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The decline in the diversity of wild pollinators by habitat loss and fragmentation affects an essential ecosystem service: pollination (transport of pollen from the stamen to the stigma in flowers) of crops and native plants. Corridors (forested strips)

within lemon plantations are common in citrus plantations and are connected with the continuous forest of Yungas in the southwest of the Tucumán province. The potential value of these corridors as providers of pollination service is unknown. Therefore, the objective of this study was to determine how the richness and the frequency of visits of pollinator insects vary between lemon plants *(Citrus limon (L.) Burm)* near the forest, in wide corridors (90-250m), and narrow corridors (25-90m), considering average width of corridor and percentage of forest cover (radius: 250m). Five-minute flower observations were made to record the number of visits and determine the pollinator. 1756 insects were observed from 41 species (bees: 13, diptera: 10, butterflies: 7, and other insects: 11). Species richness and frequency of visits in general increased linearly with corridor width and percentage of coverage. There were no significant differences between forests and wide corridors and they showed greater similarity of species than narrow corridors. Thus, these results show evidence for the value of conservation of corridors above 90m in plantations for their value as providers of pollination service, as they represent a similar source to forest pollinators and can help to minimize the effects of habitat degradation.

A99
PRELIMINARY STUDY OF NEUROPTERA INSECTS ASSOCIATED WITH THE MIGUEL LILLO FOUNDATION'S BOTANICAL GARDEN

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In an area of just over one hectare, a few blocks from downtown San Miguel de Tucumán, lies the Botanical Garden of the Miguel Lillo Foundation. This site, now a major center for study and research, was in the late 1800s a farm belonging to the Lillo family. It has approximately 80 shrubs and herbaceous species from the NOA and NEA regions, cactuses, succulents and aromatic plants. Almost the whole garden consists of native species, a colorful mixture of leaves and flowers that provide a colorful attractive to birds and insects that live there. Neuroptera are insects that play an important ecological role in ecosystems as natural biocontrols for small phytophagous insects. Their larvae, which are active predators of aphids, scale insects, whiteflies, thrips and mites and, during adulthood become pollinators. The aim of this work was to carry out a first survey of neuropters associated with the Botanical Garden of the FML. An entomological net, vacuum cleaner bags, and manual search were used. Eggs, immature forms (different larvae instars), pupae and adults were found. The specimens belong to two families: Chrysopidae with genera *Chrysoperla* and *Ceraeochrysa* and *Leucochrysa* and Hemerobidae with *Hemerobius, Nomerobius, Megalomus,* and *Nusalala*. It is important to strengthen the study of the wealth of neuropterous associated with this green lung of the city represented by the botanical garden of the FML due to their important role in nature as biological control agents.

A100
A PRELIMINARY SURVEY OF PLANT SPECIES IN AMAICHA DEL VALLE

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Mountains are important plant diversity areas where plant species might be vulnerable to climate change. Thus, numerous species survive near their physiological bound of development; such as temperature or water and nutrient availability. Basic information concerning vegetal species and long-term monitoring allow the detection of changes caused by climate. Ground cover and vegetal richness were analyzed in Los Cardones (2725 m.a.s.l.), Amaicha dell Valle, Tucuman. This study was conducted in two seasons: February 2015 (summer) and May 2016 (fall). The classic method of point interception was used, by setting points (every 50cm) along a line (50m) and recording the first plant or soil contact in each mark. The results of the points show the percentage of different species and ground cover. In a preliminary analysis, a higher percentage of bare ground was found in the fall compared to the summer, while stony soil was similar in both seasons. 43 plant species (35 vascular and 8 non-vascular) were identified in summer, whereas only 14 vascular species were recorded in May. The organic cover (manure) was registered at 15% in February and at 1% in May. These differences would reflect the climate conditions in both seasons (dry and rainy). This work represents a firsthand inventory of plant biodiversity for this region. We consider this study as the beginning of a long term monitoring of the flora of the region which will assess the potential impact of environmental changes.

A101
SPONTANEOUS VEGETATION AS HOST OF THRIPS (INSECTA: THYSANOPTERA) IN CROP FIELDS IN THE JUJUY PROVINCE (ARGENTINA)

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Many thrip species that affect crops are found in spontaneous vegetation where they can develop their life cycle or use it as a source of food or shelter. The aims of this study were to present the first contributions to the knowledge of the composition of thrips species associated with the main spontaneous plants of Jujuy. The data, obtaiined from samplings conducted between 1996-1997 in Tilcara and Yavi, and between 2013-2016 in El Carmen (Jujuy), consisted of 23 species of spontaneous plants belonging to seven families (Amaranthaceae, Asteraceae, Brassicaceae, Fabaceae, Portulacaceae, Solanaceae and Poaceae) randomly extracted from 10 branches. The specimens were obtained from the borders of plots of horticultural crops, tobacco, strawberry and chrysanthemums. The identification of thrips was conducted on the basis of microscopic preparations, which are deposited in the entomological collection of INBIAL-UNJu. 17 species of thrips were identified, distributed in families Heterothripidae, Thripidae and Phlaeothripidae. The most common species were *Frankliniella australis*, *F. schultzei*, *F. occidentalis*, *F. gemina*, *Thrips tabaci* and *Caliothrips phaseoli*, while plants with the greatest number of thrip species were *Rapistrum rugosum*, *Raphanus sativus*, *Brassica rapa* and *Melilotus albus*. This information will guide the plans for the management of spontaneous vegetation, especially of those host plants of thrips that act as Tospoviruses vectors such as *F. occidentalis* and *F. schultzei.*

A102
PRELIMINARY STUDY OF PREY AVAILABILITY IN TWO LIZARD SPECIES OF *Liolaemus* (IGUANIA: LIOLAEMIDAE) IN AMAICHA DEL VALLE, TUCUMÁN, ARGENTINA

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Information about the foraging habits of a species allows us to determine its interactions with the environment and with other organisms. The relationship between diet and the availability of food resources is an important ecological parameter. *Liolaemus pacha* and *Liolaemus ramirezae* are two syntopic lizard species from northwestern Argentina. Both species are insectivorous (insects and small arthropods) and occasionally eat flowers and leaves. The aim of this work was to conduct a survey of arthropods associated with vegetation at the site "Los Cardones", Amaicha del Valle. Pitfall traps, sweeping net on vegetation and manual search were used. 141 individuals belonging to 6 orders of insects, and two orders of Arachnida class (Araneae and Acarina) were captured. Hymenoptera was the best order represented (Formicidae) (n = 96), distributed in at least 6 genus, *Acromyrmex sp* (cutting ants) being one of the most representative. Secondly, Hemiptera order (n = 28) with Tingidae, Cicadellidae, Membracidae and Aphididae family. Coleoptera were represented by Scarabaeidae, Carabidae, Curculionidae, Anthicidae, Cerambicidae, Meloidae, and Coccinellidae (n = 11). Diptera, Orthoptera (Proscopidae and Acrididae) and Collembola orders were represented to a lesser extent. Further study of the food/prey availability of these lizards will be necessary in order to define trophic relationships and ecosystem interactions.

A103
SURVEY OF FERNS (SUBCLASS POLYPODIIDAE) AT EL RINCON (TAFI DEL VALLE-TUCUMÁN-ARGENTINA)

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The subclass Polypodiidae comprises the “Leptosporangiate ferns” clade, distributed worldwide, with 123 species cited for Tucumán province in Argentina. In the western side of the province, in the Tafi del Valle department, lies the Valle de Tafi. Our study area, El Rincón, is located to the west of this Valley. In its area a wide range of habitats can be found, from rocky open places with great sun exposure to closed forest areas with high air humidity. The aim of this study was to survey the subclass Polypodiidae at El Rincón. To do so field trips were made during 2014 and geographic coordenates along with altitud data were taken into account for each location. The collected samples were stored at the Pteridologic Herbarium of Fundación Miguel Lillo for further analysis such as identification of taxa using the specific literature and optical instruments to observe morphological characters. A study of the flora stored at the herbarium was carried out and the final outcome included 26 species collected at El Rincón; 6 of them were not registered at the herbarium for our study area: *Asplenium formosum, Asplenium lorentzii, Blechnum sprucei, Cystopteris fragilis, Elaphoglossum lindbergii* and *Hypolepis poeppigii.* The survey of El Rincón showed the presence of species that inhabit xeric places at mountain’s slopes, others that do so at humid places in closed forests and also epiphytic species on native trees were found. We hope to achieve a better understanding of part of the flora native to this area that offers a great variety of habitats and, at the same time, faces the

advancement of anthropic activities together with an increased awareness of its appreciation and the need of its conservation.

A104
A PREDICTIVE MODEL OF SUN UV RADIATION FOR THE PROVINCE OF TUCUMÁN

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LEBA is currently operating a 4 radiometer network for sun ultraviolet (UV) radiation monitoring in the province of Tucumán. Present (real) and future time data are provided. The reference site is the Ampimpa Observatory (26° 36' 44.89" S, 65° 50' 30.65" W, altitude 2458 m a.s.l.). Other sites are INTA Famaillá (27° 01' 08.85" S, 65° 22' 49.99" W, altitude 373 m a.s.l.), TV Channel 10 (26° 50' 38.79" S, 65° 22' 51.83" W, altitude 1467 m a.s.l.) in San Javier hill and the Faculty of Natural Sciences, UNT (26° 49' 52.79 S, 65° 13' 18.97º, altitude 452 m a.s.l.) in the capital city. Data are expressed in milivolts (mV), but they can be converted to J/m^2 using software developed in this Laboratory. The Box and Jenkins time domain modeling technique was used for the data, which exhibited annual seasonal component attributed to the Earth's eccentric orbit around the sun. For model identification we used series autocorrelation and partial autocorrelation functions. For prameter estimation we used a maximum verosimilitude method. We started from the general model:

$$(1-\alpha_s B^s)^c(1-\alpha_{12} B^{12})^d y_t = \mu + \sum_{j=1}^{\gamma}\alpha_j\ y_{t-j} + \sum_{j=1}^{q}\beta_{t-j}\ \epsilon_{t-j}+\epsilon_t$$

s>1; c,d =0.1; q>1; B= difference operator. Two seasonal components were considered: order s and 12 (annual). α, β: AR and MA coefficients. An ARMA model for the differenced series w_t can then be constructed. An annual seasonal and a first order MA component were identified. Time series were differentiated, first for seasonality and, later on, for MA first order stationary process. Models for Ampimpa and Famaillá were then estimated using:

$$(1-\alpha_{12} B^{12})y_t = w_t = \mu + \beta\ \epsilon_{t-1}+\epsilon_t$$

A105
RESPONSE OF *Bradyrhizobium japonicum*-SOYBEAN SYMBIOSIS TO NITROGEN FERTILIZATION

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In the symbiotic association rhizobia-soybean (*Glycine max* (L.) Merr.), nitrogen fertilizers can alter the nitrogenous state of the plant and regulate N_2 fixation. Our objective was to determine if nitrate addition affects the distribution of nitrogen compounds in this symbiosis. A completely randomized design was used and KNO_3 was supplied at 0-5 mM according to treatments. Plants were harvested at R2 (full bloom), nodules extracted to perform bacteroidal nitrate reductase (NR) activity. Aminoacids nitrate and ureides content were assayed in the aerial part. Treatments were: control (non-inoculated) and inoculated with the strains of *Bradyrhizobium japonicum* USDA110, USDA110/CC41 (defective mutant in nitrate reductase enzyme), USD110 and Per 3.61 (native soils strain of Pergamino, Argentina). Per 3.61 showed a higher content of amino acids with respect to control and inoculated plants with the strains (USDA110, USDA110 / CC41) only in the absence of nitrate. Nitrogen addition had no effect on nitrate or ureides content in plants inoculated with Per 3.61.USDA110 and Per 3.61 showed no difference in the specific activity of NR in the different growth conditions (0 and 5 mM nitrate).These results suggest that the NR bacteroidal of both strains was not affected by treatment. Ureide content as an indicator of the relative contribution of N_2 to the plant allowed us to conclude that the biological N_2 nitrogen fixation was not affected by the adition of nitrate to the growth medium in Per 3.61 inoculated plants.

A106
OPTIMIZATION OF REAL-TIME PCR ASSAY FOR THE DETECTION OF *Brucella abortus* IN MILK

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Bovine Brucellosis is a zoonotic disease that affects animals and humans. This infection has a negative economic impact on cattle development due to abortions, decrease in milk and meat production, and fertility problems. In our country, Bovine Brucellosis is under the National Control and Eradication Plan. Traditional methods for diagnosis of this disease such as bacterial culture and serology can give false positive (cross-reaction) and false negative (low antibodies level) results. Therefore, it is necessary to apply alternative methods to improve diagnosis. Objectives: a-To optimize the detection of *Brucella abortus* (Ba) and vaccinal Ba S19 (BAS19) in milk by amplification of specific genomic sequences using real-time

PCR (rt-PCR) with intercalating fluorochrome, b- To establish the detection limit of Ba (CFU/ml) in milk. Materials and Methods: The live lyophilized vaccine S19 Ba was used for the assays. To evaluate the detection limit, serial vaccine dilutions in commercial whole milk were performed; then, DNA was purified using a commercial kit. rt-PCR was carried out using specific primers for vaccine Ba and S19. In addition, tests were performed to detect whether milk calcium was able to interfere with Taq polymerase activity. Results: The optimal conditions for specific detection of Ba by rt-PCR were stablished. The detection limit of Ba in milk was 1X102 CFU / ml. Calcium did not affect polymerase activity. Conclusion: The rt-PCR technique for the diagnosis of *Brucella abortus* in milk was optimized.

A107
IMPACT OF CADMIUM ON CALCIUM AND Ca-ATPase IN THE *Rhinella arenarum* OVIDUCT

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Various anthropogenic activities increase cadmium (Cd^{2+}) tenor in the environment, contributing to the decline of amphibian species. Cd^{2+} in the organism is hazardous due to bioaccumulation. In *Rhinella arenarum* we showed that calcium (Ca^{2+}) contained in the jelly coats surrounding the deposed oocyte induces the sperm acrosome reaction. The epithelial (ESC) and glandular secretory cells (GSC) of the oviductal pars convoluta (PC) are involved in the secretion of this cation. Although the oviduct plays an important role in fertilization, the potential interference Cd^{2+}-Ca^{2+} has not been evaluated yet. The aim of this work was to study the effect of Cd^{2+} on the distribution of Ca^{2+} and Ca-ATPase activity in the PC. *R. arenarum* specimens were injected into the dorsal lymph sac with $CdCl_2$ 2.5 mg/kg and controls with Ringer solution for 15 days. After treatment, oviducts were sectorized into pars preconvoluta (PPC) and pars convoluta (pc). Ca^{2+} and Ca-ATPase activity were identified as electron opaque deposits by ultrahistochemical techniques. In treated animals, we observed colocalization of Ca^{2+} and Ca-ATPase and a marked reduction in their deposits in all the areas analyzed compared to the controls. Scarce Ca^{2+} deposits were found in the secretory granules (SG) of the ESC and GSC while they increased in cytoplasm and intercellular space. The Ca-ATPase of controls and treated animals were located in the granular and plasma membranes. In control animals, we found a larger amount of Ca^{2+} and Ca-ATPase in the PPC than in the pc, and abundant Ca^{2+} deposits in the SG. The results showed that the Cd^{2+} could lead to alterations in Ca^{2+} metabolism

A108
EVALUATION OF THE EFFECT OF LOW DOSE CADMIUM EXPOSURE ON PROTEIN EXPRESSION USING A WISTAR RAT MODEL

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Cadmium (Cd^{2+}) is extracted from the earth's crust for the manufacturer-lived mass-produced electronic devices. When they are discarded, they cause an increase in Cd^{2+} levels in the environment, constituting a public health risk. Previous studies in rats showed steatosis after Cd^{2+} treatment for 60 days. However, the possible role of esterases in response to xenobiotic poisoning has not been described yet. The aim of this work was to evaluate protein expression and esterase activity in liver homogenates. Wistar rats were subjected to oral treatment with 10 mg/Kg Cd^{2+} as $CdCl_2$ for 60 days. Controls were treated with vehicle only. Native polyacrylamide gel (PAGE) electrophoresis of liver homogenates proteins was assessed at 14, 21, 30 and 60 days using silver staining. The zymogram with esterase activity was evaluated with 1-naphtyl-acetate and Fast Blue. The results showed a change in protein expression during exposure to Cd^{2+} not only in total protein but also in esterase activity (zymogram) since day 30. Dissapearance of protein bands and a decrease in the expression of esterase activity were observed. Thus, a loss in esterase activity could be associated with hepatic steatosis during exposure to low Cd^{2+} doses.

A109
MOLECULAR IDENTIFICATION OF LYMNAEID IN THE ANCASTI DEPARTMENT, CATAMARCA

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Fasciolosis is a food zoonosis whose ecology is closely related to molluscs of the family Lymnaeidae that serve as intermediate hosts during their life cycle. For the determination of the species, sequence markers in both nuclear rDNA and mitochondrial DNA were used. The aim of this study was the molecularl identification of the species *Lymnaea* spp. in watercourses that run east (28°48'22"S 65°32'53"O) in the Ancasti Department, Catamarca.

Molluscs (n=60) were collected with classic malacological methods, fixed with alcohol 70° and transported to the laboratory of Animal Anatomy for their study. Each of the DNA markers, rDNA ITS-2 and ITS-1 and mtDNA, 16S and cox1 genes used in the identification of species were amplified by polymerase chain reaction (PCR) using 4-6 uL genomic DNA per each 50 uL PCR reaction. The sequences are performed using all mollusc ribosomal and mitochondrial data downloaded from the GenBank.
Fifty-three snails of the genus *Lymnaea*, 4 *Physa*, 2 *Chilinidae* and 1 *Planorbidae* were found. The sequences obtained showed the presence of *L. neotropica* in streams and confirmed the first discovery of this species in the Ancasti Department in all specimens collected in the area, representing a new species for the mollusk fauna of the area.

A110
CHARACTERIZATION OF TWO SPECIFIC MICROSATELLITE SEQUENCES OF *Tritrichomonas fetus*

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Tritrichomonas foetus is the etiologic agent of the sexually transmitted disease limited to cattle urogenital tract known as "Bovine Trichomonosis" (TB). It is considered endemic in many countries, including Argentina, where extensive livestock with natural service is common. TB, which causes uterine infection and abortions, is an important health problem causing significant economic losses. Biological intraspecies variability of TB has been poorly studied so that its knowledge could provide valuable information concerning its diagnosis and treatment. Microsatellite molecular markers (STR) are considered a useful tool for the study of population variability and genetics. Although the genome of *T. foetus* is not available yet, *Trichomonas vaginalis* genome, another member of the *Trichomonadidae* family, is available. The aim of this work was to identify and characterize specific microsatellite sequences of *T. foetus* from STR characterized for *T. vaginalis*. From the extraction of DNA from *T. foetus* isolates by PCR with *T. vaginalis* primers, purification and sequencing of products, two STR sequences specific for *T. foetus* were characterized. From these sequences, specific primers for markers called STR9 and STR10 of 277pb and 350bp respectively were designed. These tools will allow us to study variability betweenisolates with different biological characteristics.

A111
Arachis hypogaea L.: CYTOTOXICITY STUDIES OF ETHANOLIC EXTRACTS WITH ANTIVIRAL POTENTIAL

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The dengue virus (Flaviviridae family) infects 50-100 million people each year worldwide. It causes different clinical symptoms: dengue fever, dengue hemorrhagic fever and dengue shock syndrome. Currently, there are no effective antiviral drugs to treat these diseases. The peanut plant (*Arachis hypogaea* L) is a legume that has antioxidant and antiviral properties. The aim of this work was to evaluate the cytotoxicity of *A. hypogaea* L extracts to determine safe concentrations for the host, to be tested against the dengue virus. Ethanolic extracts were obtained from seeds (SEE) and peanut skin (PSEE). Vero cell monolayers were treated with increasing concentrations (0-1600 µg/ml) of PSEE and SEE. Cytotoxicity was assessed at 2 and 7 days with three assays: Maximum Non-Cytotoxic Concentration (MNCC), Neutral Red Uptake (NRU) and MTT reduction.
MNCC values were 50 µg/ml for PSEE and 1000 µg/ml for SEE when cells were treated for 2 days. In the treatment for 7 days, MNCC were 10 and 300 µg/ml for PSEE and SEE, respectively. CC_{50} values at 48 h were 600 µg/ml (MTT) and >1600 µg/ml (NRU) for PSEE, while SEE showed CC_{50}>1400 µg/ml (MTT) and CC_{50}=1600 µg/ml (NRU). Moreover, in the treatment for 7 days, PSEE showed a CC_{50}= 65 .µg/ml (MTT) and CC_{50}>1400 µg/ml (NRU) and, for SEE CC_{50}= 636 µg/ml (MTT) and CC_{50}> 1400 µg/ml (NRU).
In conclusion, it was possible to determine safe concentrations of extracts of *A. hypogaea* L, which is useful for evaluation due to its potential anti-dengue properties. SEE showed very low toxicity against Vero cells. Conversely, PSEE showed greater toxicity.

A112
EFFECT OF KCl AND VINASSE ON THE EXPRESSION OF MSN2 AND MSN4 *Saccharomyces cerevisiae*

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MSN2 and MSN4 transcription factors in stress conditions can form dimers and translocate to the nucleus where they bind to the STRE element of the promotor region of a large set of genes and activate their transcription in response to different types of stress (heat shock, oxidative or osmotic stress, nutrient starvation, etc.). In normal conditions, MSN2/4 do not participate in cell viability. Vinasse is a corrosive and contaminant industrial liquid residue of the sugar-alcohol industry due to its high DBO, high potassium levels and dissolved organic matter. It contains average amounts of nitrogen compounds and phosphorus among others components. In this work we analyzed the effect of osmotic stress generated by KCl and vinasse on the growth and viability of *S. cerevisiae* ATCC 32051. Under these culture conditions, the levels of expressions MSN2/4 were evaluated at different times by semiquantitative RT-PCR. We observed that osmotic stress affected the grownth of *S. cerevisiae* in cultures with vinasse or KCl compared to control. The yeast cells grown in a medium with KCl showed greater osmotic tolerance than the cells in medium with vinasse. As the concentration of KCl or vinasse in the medium increased, the adaptation time period increased also, and a delay in the growth phases was observed. The expression level of MSN2/4 varied according to the time and conditions evaluated. These results suggest that MSN2/4 play a key role in osmotic stress response and that their expression, which is necessary since the initiation of the culture, is required for long time periods to maintain viability under adverse culture conditions

A113
Flaveria bidentis AND *F. haumnaii* (ASTERACEAE) STEM ANATOMY

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The American genus *Flaveria* Juss has 23 species that live in warm regions of the Americas. In Argentina, *F. bidentis* and *F. haumanii* are native annual grasses that are widespread in the north, center and south of the country. The aim of this study was to characterize the stem anatomy of these species. The material was collected from Zanjón (S 27º5223.63" W 64º14'28.34") and Negra Muerta (S28 55.916' O 063º58.621) localities in the province of Santiago del Estero. Conventional techniques and stains were used. The results showed that the stem anatomy in both species was similar. In the seedling stage, the transverse section presents an undulating contour but in the adult stage it is circular to hexagonal. Primary growth has unistrata epidermis with striated cuticle, subepidermic angular colenchyma (2-5 layers), cortical parenchyma (5-9 layers) with secretory ducts whose number varies from 7-8 in *F. bidentis* and from 16-18 in *F. haumanii*. In the inner portion of the cortex one starch sheath was observed. The vascular tissue is organized in collateral vascular bundles, 12-15 in *F bidentis* and 22 in *F. haumanii*. Internally there is a medullar parenchyma. Early secondary growth presents continuous cambium, xylem and phloem. Next to the phloem, discontinuous sclerenchyma was observed, while the rest of the tissues are similar to the primary structure, with variations only in the number of layers of different tissues and secretory ducts. The typical secondary structure was not observed; however, periderm was found in isolated portions. In this work, the anatomical characterization of the *F. bidentis* stem was completed and the stem of *F. haumanii* was described for the first time.

A114
MEIOTIC ANALYSIS AND POLLEN VIABILITY OF *F. bidentis* AND *F. haumanii* (ASTERACEAE)

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The American genus Flaveria Juss (Tribe Helenieae) comprises 23 species, only two of which are represented in the Argentine Northwest, *F. bidentis* (L.) Kuntze, and *F. haumanii* Dimitri & Orfila. Both of them are native annual crop weed grasses. The aim of this work is to contribute to the cytological knowledge of both species concerning gametophyte number, meiotic behaviour and pollen viability. The material was collected from Zanjón (27º5223.63" S 64º14`28.34" W) and Negra Muerta (28° 55.916' S 063º58.621 W) localities of the province of Santiago del Estero. Flower buds were subjected to conventional techniques for cytogenetic studies. The viability of pollen grains was estimated through Mützing and fluorochrome fluorescein diacetate (DAF). Both species showed the same gametophyte number n = 18. During the first stage of meiotic division 18 bivalent were clearly observed. Cell division in pollen mother cells (CMP) was normal, metaphase I-II with chromosomes outside the equatorial plate and lagging chromosomes in anaphase I–II in low frequency were observed. In both species, the viability of pollen grains estimated with Mützing was 95.2% in *F. bidentis* and 90% in *F .haumanii*, whereas the value of viable pollen grains obtained with DAF were 90% in *F. bidentis* and 74% in *F. haumanii*. The background for the Helenieae tribe showed a basic number x = 18, therefore the results of this study agree with the

information specified for the tribe. Diploidy of both species was noted. The gametophyte number for *F. haumanii* and the meiotic behaviour and viability of pollen in both taxa were reported for the first time.

A115
FUNCTIONAL ANALYSIS OF *uncx* GENE IN *Xenopus laevis* ANURAN DEVELOPMENT

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During embryonic development, the vertebral elements are formed from the sclerotome cells as they migrate from somites to the periphery of the neural tube and notochord, where they proliferate and differentiate into bone and cartilage tissue. In most vertebrates, the vertebral column (VC) has a highly conserved structural plan. However, in anurans, the architecture of the VC diverges widely from this plan and is characterized by a great reduction in the number of vertebrae. Currently, the cellular and molecular events involved in the establishment of this divergent body plan are unknown, so we find that it would be important to study the genes involved in the formation of this organ.
UNCX is a transcription factor that is expressed in the somites and sclerotome. Studies carried out in mouse showed that loss of function of this gene causes severe malformations in VC. In a previous work carried out in our laboratory, a cDNA of *uncx* on *Xenopus laevis* anuran was cloned and characterized and we found that it corresponds to a gene encoding a smaller protein in comparison with other vertebrates. Considering this feature, we found it interesting to analyse the role of the *uncx* gene during the development of the sclerotomal tissue in anurans. In this work, we cloned the *uncx* gene of *X. tropicalis* and carried out comparative studies with the protein sequence of different vertebrates, finding that the smaller size of *uncx* in *X. laevis* is an exclusive characteristic of this species. Additionally, we conducted experiments of gain- and loss-of-function of *uncx* through embryo microinjection with an mRNA corresponding to an inducible chimeric protein and a specific antisense morpholino for this gene. We found that *uncx* regulates sclerotome development and that it is required for the proper formation of the anteroposterior axis.

A116
GENISTEIN AND UROKINASE EFFECT ON THE SURVIVAL AND MIGRATION OF BOVINE OVIDUCTAL EPITHELIAL CELLS

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Urokinase type plasminogen activator (uPA) is a protease involved in extracellular matrix remodeling processes and intracellular signaling pathways, activated through its receptor. Intracellular uPA signaling can be regulated by tyrosine kinase inhibitors. It is known that uPA is expressed in bovine oviduct and that genistein (GNT), a soy isoflavone, is present in the bovine oviductal fluid as it is incorporated in cattlefeed containing soy. In order to study the effect of uPA and GNT on the survival and migration of bovine oviductal epithelial cells (BOEC), cell cultures were performed, and culture media were supplemented with 10 nM uPA and 0.2-10 µM GNT. To evaluate BOEC survival, expression levels of *BCL-2* and *BAX* were determined by real time RT-PCR in cells cultured for 24 h under uPA or GNT and then the relationship between the mRNA expressions of *BCL-2/BAX* was calculated. The *BCL-2*/*BAX* ratio was greater in cells under 10 nM uPA whereas a significant decrease was observed in the presence of 10 µM GNT with respect to controls. The addition of 10 nM uPA + 10 µM GNT generated a reduction in *BCL-2/BAX* with respect to cultures induced with uPA only. Cell migration was assessed by using wound healing assays in BOEC monolayer cell cultures under uPA or GNT, at 0, 6, 12 and 24 h. Stimulation with 10 nM uPA favored wound closure in BOEC at 24 h, while 0.2 and 10 µM GNT significantly inhibited this process since 12 h. These results confirm that uPA contributes to survival and migration of oviductal cells while GNT inhibits the studied processes.

A117
DEVELOPMENTAL PROGRESSION OF BOVINE EMBRYOS CULTURED *IN VITRO* IN MEDIUM SUPPLEMENTED WITH OVIDUCTAL FLUID

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The supplementation of the *in vitro* culture medium with factors present in the natural milieu in which embryo develops could mimic the *in vivo* developmental environment in *in vitro* conditions. The aims of this study were to: (1) evaluate the developmental progression of bovine embryos cultured *in vitro* in the presence or absence of bovine oviductal fluid (OF), and (2) determine changes in epigenetic marks in blastocysts derived from embryos cultured with OF to examine the response of the embryo to maternal factors *in vitro*. Presumptive zygotes were cultured in control medium and medium supplemented with 1.25% OF for three time periods: from zygote until the16-cell stage, from zygote until the 8-cell stage and from the 8-cell to the 16-cell stage. Methylation levels of different genomic regions were analyzed by bisulfite sequencing in blastocysts developed from the experimental groups. No differences were registered for cleavage rate (52 hpi), proportion of embryos at 52 and 98 hpi or blastocyst yield (D7-8) among analyzed groups. The genomic regions showed low methylation levels in

blastocysts derived from embryos cultured from zygote to the 16-cell stage compared to control group and other OF treated groups. In conclusion, OF did not modify developmental kinetics *in vitro*. However, OF induced changes in the epigenetic marks of specific regions of the embryonic genome. This fact suggests a response of the embryo to oviductal factors during early development. Thus, the use of OF as a supplement during *in vitro* embryo culture represent a strategy for the study of the interaction between oviduct and early embryo.

A118
STUDY OF MATERNAL-EMBRYONIC COMMUNICATION IN THE BOVINE OVIDUCT USING AN *IN VITRO* CO-CULTURE SYSTEM

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During the preimplantation period, maternal-embryonic communication plays a critical role in the establishment and maintenance of pregnancy. Considering that the oviduct provides the first microenvironment that makes contact with the embryo, this study aimed to: 1) establish an *in vitro* model to evaluate the interaction of the oviduct with the embryo in early stages of development, 2) evaluate the effect of this system on embryonic development and 3) identify genes whose expression varies during embryo-oviduct interaction. Primary cell cultures of epithelial cells obtained from the isthmus region of postovulatory oviducts were cultured in SOF+5% fetal calf serum (FCS) in the presence or absence of embryos from the 2-cell to the 8-cell stage and from the 8-cell to the 16-cell stage. As control, embryos were cultured in the absence of oviductal cells in medium SOF+5% FBS and SOF+3 mg/mL BSA. At the end of the co-culture period, embryos were transferred to medium SOF+BSA and cultured until day 9. In all experimental groups, different parameters of embryonic development were evaluated and the expression of candidate genes was evaluated by qPCR in oviductal cells and embryos. The co-culture system established did not affect the developmental rate up to the blastocyst stage. Embryo-oviduct interaction in the two periods analyzed produced an increase in the expression levels of BMP signaling genes in the embryos and reduced them in the oviductal cells. This *in vitro* co-culture model provides a new strategy for studying embryo-oviduct interaction and provides new evidence of potential signaling pathways involved in this early cross-talk during the preimplantation period.

A119
FOXO3 GENE EXPRESSION IN BETA THALASSEMIA TRAIT AND IRON DEFICIENCY ANEMIA

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Introduction: Subjects with iron deficiency anemia (IDA) and with beta-thalassemia trait (BTT) manifest increased oxidative stress (OxS). Murine erythrocytes studies have shown that the FoxO3 transcription factor is required for the induction of proteins that regulate the response to OxS. Our objective was to assess FoxO3 gene expression in normal, BTT and IDA individuals.
Methods: 46 subjects (18 normal, 20 with BTT and 8 with IDA) were analyzed during the September 2013-June 2014 period at the Institute of Applied Biochemistry, National University of Tucuman
The diagnosis was made with hematologic parameters (Sysmex KX-21N), hemoglobin electrophoresis, quantification of HbA2, and iron status (Wiener Lab). The FoxO3 gene expression was determined by reverse transcription and real time PCR (RT-qPCR). The data obtained by RT-qPCR were compared with the gene expression of beta-actin as an endogenous control (relative quantitation)
Results: 5th and 95th percentiles of FoxO3 expression results for the normal group were determined in order to establish the normal range, which was 0.19 to 9.47. No significant differences ($p > 0.05$) among the 3 groups studied were observed, although 2 subjects with BTT (2/20, 10%) and 2 IDA (2/8, 25%) exceeded the normal limit
Conclusion: The results show a FoxO3 gene expression increase in some individuals with BBT (10%) or IDA (25%), respectively. However, it would be appropriate to extend the number of patients in the study in order to improve knowledge of OxS in these pathologies.

A120
IN VITRO CITOTOXICITY OF ACACETIN, A FLAVONOID IDENTIFIED IN AQUEOUS EXTRACT OF *Baccharis articulata*

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Secondary metabolites, of phenolic nature, from different species of vegetables are responsible for various pharmacological properties used in traditional or complementary medicine. *Baccharis articulate* is a common plant in Córdoba hills and is

often used in traditional medicine because of its hepatoprotective and cholagogue properties. In previous works we showed the antiviral action of the hot aqueous extract of *B. articulata* at non cytogenotoxic concentrations. Acacetin is relevant among the flavonoids found in this extract. Flavonoids are substances with multiple positive effects on human and animal health but information about their general toxicity is scarce. So the objective of this work was to determine the cytotoxic action of acacetin in the Vero cell line. Cytotoxic Concentration 50% (CC50) was determined by tetrazolium salt reduction (MTT) and Maximum Non Cytotoxic Concentration (MNCC). Assayed concentrations varied from 1 to 500 µg/ml. Acacetin altered cells morphology at most concentrations tested, producing monolayer retraction and cell lysis. The NCMC was 15 µg/ml and CC50 was 8.42 µg/ml. The present work provides preliminary results on the toxicity of acacetin.

A121
ANTIGENOTOXIC ACTION OF *Minthostachys verticillata* ESSENTIAL OIL AGAINST DAMAGE INDUCED BY AFLATOXIN B_1 IN RATS

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Aflatoxin B_1 (AFB1) is the most toxic mycotoxin and it is a common contaminant in foods. *M. verticillata* (peperina) is a plant of great ethnobotanical interest with multiple demonstrated bioactivities. The objective of this work was to determine the antigenotoxic activity of *M. verticillata* essential oil (EO) against injury induced by AFB_1 in rat bone marrow. Wistar rats were divided into four groups with 5 rats per group: group 1 common food (negative control); group 2 common food + EO (EO control); group 3 food with AFB_1 [4 µg/kg] (toxin control); group 4 food with AFB_1 + EO. The EO was dissolved in water at 0.04% (phospholipids emulsifying agents) to be administered in the drinking water. Food and water were available ad libitum throughout the experimental period (45 days). At the end of the study, the rats were decapitated and the femurs were immediately excised from the body. For each animal 2000 erythrocytes were counted to determine the frequency of micronuclei (MN). The average micronucleated erythrocytes (MNE) was 2.66‰ for the negative control group and 2.41‰ for the group treated with EO at 0.04%. In contrast, rats treated with AFB_1 showed a significant increase in MNE compared to other groups, with mean values of 4.67‰*. The antigenotoxic effect of EO was observed in group 4 (AE + AFB_1). In this group, a decrease in the number of MN was observed compared to the group treated only with the toxin. A similar average value of MNE compared to the negative control group was observed (3.01‰).These results suggest that *M.verticillata*EO exerts an antigenotoxic action against damage induced by AFB_1 in hematopoietic bone marrow cells of rat.

A122
Achyrocline satureioides PROTECTS FROM GENOTOXIC AND OXIDATIVE DAMAGE INDUCED BY ZEARALENONE IN BALB/C MICE

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Mycotoxicoses are caused by ingestion of food contaminated with fungal toxins. Zearalenone (ZEA), produced by *Fusarium* species, induces toxic and genotoxic effects in humans and animals. *A. satureioides* has several medicinal effects such as antioxidant, antimicrobial and antiviral properties. The objective of this work was to evaluate the ability of the cold aqueous extract (CAE) of *A. satureioides* to afford protection against genotoxic and oxidative damage induced by ZEA in mice. Obtainment of CAE: plant material was extracted with distilled water at room temperature for 48 h and then lyophilized. Protection studies: groups of 4 Balb/C mice (20 g) were inoculated by intraperitoneal injection with different treatments: 1-CAE (50mg/kg body weight) + ZEA (40 mg/kg bw); 2-CAE (100 mg/kg) + ZEA (40 mg/kg); 3-Negative control: saline solution; 4- Positive control: cyclophosphamide 30 mg/kg; 5- ZEA Control: 40 mg/kg. At 24h post-injection mice were sacrificed and antigenotoxicity was evaluated by micronucleus test in mouse bone marrow according to *Schmidt W. (1975)*; then, the antioxidant capacity of CAE was determined by thiobarbituric acid reactive substances (TBARS)s according to *Buege and Aust (1978)*, modified by *Marcincak et al., (2003)*. Antigenotoxicity results indicated that the groups ZEA+ CAE at 50 and 100 mg/kg showed significant difference with ZEA control group ($p<0.0001$). Anti-oxidative stress study indicated that CAE at 100 mg/kg was able to protect the liver from oxidative damage exerted by ZEA ($p<0.001$). In conclusion, CAE from *A. satureioides* is able to afford protection against genotoxic and oxidative damage induced by ZEA *in vivo*.

A123
PROTECTIVE EFFECT OF CHLOROGENIC ACID AGAINST GENOTOXIC DAMAGE INDUCED BY OCHRATOXIN A IN RATS

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Ochratoxin A (OTA) is a mycotoxin with nephrotoxic, genotoxic and immunosuppressant properties. Some research indicates that the damage caused by OTA in the kidney may be associated with carcinogenic potential. In a previous study

we confirmed that OTA induced DNA damage in mice bone marrow cells and that chlorogenic acid (ChlA) exerted a protective effect on this action but not through an antioxidant mechanism. The aim of this study was to characterize in vivo the ability of ChlA to reverse the genotoxic effects induced by OTA in a subacute toxicity test. Wistar rats were fed orally for 28 days with OTA (0.4 mg/kg), ChlA (5 mg/kg) or a combination of OTA (0.4 mg/kg)+ChlA(5 mg/kg). As control vehicle PBS/DMSO (0.03%) was used. The micronucleus assay on bone marrow and comet assay on blood were performed. Increase in micronuclei (MN) in polychromatic erythrocytes (PCE) from OTA-treated animals was observed ($p<0.01$). No MN increase in rats treated with ChlA was observed. In animals treated with OTA+Chla the PCEMN number was significantly lower than in the group treated with OTA ($p <0.01$). Toxicity indices were not altered in any group. Furthermore, in the group of animals treated with OTA, an increase in the tail moment of blood cells was observed ($p <0.0001$). DNA integrity was not affected by treatment with ChlA. In cells of animals treated with the combination OTA+ChlA a decrease in DNA damage was found ($p <0.05$). The results demonstrate the protective effect of ChlA against DNA damage induced by OTA.

A124
EVALUATION OF CHRONIC ANTI INFLAMMATORY ACTIVITY AND PHYTOCHEMICAL PRELIMINARY STUDY OF *Tripodanthus acutifolius* FLOWERS (CORPO)

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The inflammatory response has generated renewed interest during the last few decades since many diseases start as an inflammatory process. The search for new anti-inflammatory drugs with fewer side effects is a challenge for researchers. The aim of this study was to evaluate the chronic anti-inflammatory activity of aqueous extract (AE) and ethanol extract (EE) from*Tripodanthus acutifolius* flower (corpo) at doses of 100, 200 and 400 mg / kg. Wistar rats were used, the method of granuloma formation induced by cotton pellets being employed to assess chronic inflammatory activity. For the chemical study, a phytochemical analysis was made.
The results revealed that daily administration (7 days) of ibuprofen (100 mg / kg), meprednisone (5 mg / kg), AE and EE (1000 mg / kg) significantly reduced the weight of exudate and granuloma induced by cotton pellets. Inhibition of the proliferative phase of the inflammatory process directly correlates with the decrease in weight of the granuloma formed. EE, EA and ibuprofen inhibited the formation of granulomatous tissue without affecting thymus weight, but nevertheless, meprednisone produced a significant decrease in thymus weigth. A preliminary phytochemical analysis of EA showed the presence of reducing compounds, polysaccharides, tannins, anthocyanins and coumarins as major phytoconstituents.
In conclusion, the results show that the extracts of corpo flowers have chronic and acute anti-inflammatory activity, constituting an important natural therapeutic resource for many diseases where the inflammatory process is the basis of its pathophysiology.

A125
EFFECT OF *Ziziphus mistol* AQUEOUS EXTRACT ON *Xenopus laevis* EMBRYOS

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The canonical wnt/β-catenin cell signaling pathway controls many aspects of embryonic development. *Xenopus laevis* embryos are an efficient experimental model to screen the role of different compounds that could affect this pathway. In this work an aqueous extract (AE) obtained from *Ziziphus mistol* fruits was used. The fitochemical analysis of EA showed the presence of high polarity compounds. With the aim of evaluating the effects of EA in *Xenopus* embryos, we treated them with different amounts of EA from stages 3 to 10.5. Some embryos were fixed at this stage and the remaining ones were developed until stages 26-32. Embryos at stage 10.5 showed a decrease in the expression of the dorsal lip marker gene *chordin* (*chd*). In advanced stage embryos, treatment with EA (2, 5 and 20 mg/ml) led to an abnormal development in 14, 35 and 68% of the embryos, respectively, which showed a ventralized phenotype. On the other hand, wnt/β-catenin pathway was activated using LiCl that resulted in strong dorsoanteriorized phenotypes. Embryos were treated with EA until stage 6, when they were treated with LiCl for 10 min, and then were treated again with EA until stage 10.5 when EA was removed and embryos were cultured until stage 32. Axis phenotypes were scored by dorso-anterior index (DAI). A higher DAI indicates a higher rate of dorsoanteriorized embryos. Embryos treated with LiCl showed DAI=7.06 while embryos treated with LiCl and EA demonstrated a significantly DAI decrease (DAI=5.5). These results showed that *Ziziphus mistol* EA induces molecular and morphological phenotypes compatible with wnt/β-catenin signaling pathway inhibition and rescues the effect of this pathway activation.

A126
VALIDATION OF DIFFERENT PARAMETERS IN ANIMAL MODELS OF GASTRIC ULCER

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Peptic ulcer is a pathology caused by an imbalance between offensive and defensive factors in the gastric mucosa. Considerable progress has been made in the understanding of gastric ulcers pathophysiology, treatment and prevention using animal models. The aim of this work was to validate the applicability of the determination of gastric mucus content (GMC) and total acidity (TA) in relation to the presence of ulcer in a pylorus ligation gastric ulcer model (PLUM) and an ethanol induced gastric ulcer model (EUM). We also evaluated the influence of the animal's sex in these studies. Two ulcer models (EUM and PLUM) in male and female Wistar rats (200-250 g) were developed. Experimental groups were: 1- treated group, which received sucralfate (100 mg/kg) or omeprazole (40mg/kg) according to the model requirement, and 2- control group (n= 6 animals/ group). GMC was determined according to the Alcian Blue method and TA was determined by titrating gastric contents. Statistical analysis was performed using ANOVA and ROC curves methodology. In EUM, validation of GMC results in relation to the presence of ulcers was AUC=0.888. In PLUM, AUC were 0.667 for GMC and 0.972 for AT. Comparative analysis between these determinations produced a significant difference ($p < 0.05$). The relationship between the sex of the animals and the presence of ulcer was not significant ($p > 0.05$). In conclusion, GMC determination in EUM and TA in MULP are statistically efficient. In MULP, determination of the GMC was not appropriate to assess the presence of ulcers. Animal sex did not determine the presence of ulcers in the models analyzed.

A127
PROTECTIVE EFFECT OF *Vaccinium myrtillus* L. STEM ON GASTRIC ULCER IN RATS

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Vaccinium myrtillus L. leaves (*Vm*) are used as a folk medicine to treat gastric diseases. However, there are no data concerning the use of their stems for therapeutic purposes. The aim of the present study was to evaluate the potential gastro-protective effect of an aqueous extract (AE) of *Vm* stems in an induced gastric ulcer model in rats. Complementary studies included *in vitro* cytotoxicity analysis (cell line LC5) of AE and evaluation of its chemical components. Fresh stems were used for histolocalization of the major chemical constituents, and also to prepare an AE (infusion 5%). The experimental groups of ethanol-induced gastric ulcers in Wistar rats were: 1-control group, 2- positive control group (sucralfate 100mg/kg) and 3- AE treated group (150mg/kg) (n=6 animals/group). Mucus content and ulceration parameters (number of ulcers, severity and ulcerated area percentage) were determined, and histological studies were carried out. AE treatment significantly decreased the ulcerated area, the severity and number of ulcers relative to negative control, conserving the mucus content. Cortical, medullary and xylem stem parenchyma presented phenolic compounds and tannins (T); T content in the AE was 17.55±0.88 µgEqAT/mg. These results suggest that AE of *Vm* has gastroprotective effects possibly related to the T content. I*n vitro* toxicity studies showed a value of LD50> 800ug/ml. *In vivo* additional studies are required to verify the absence of toxicity.

A128
IMPROVED METABOLIC CONTROL BY POLYMATIN A IN DIABETIC RATS

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Diabetes mellitus is a complex disease characterized by gross derangement in carbohydrate, fat and protein metabolism due to a deficiency in insulin secretion and/or action. In a recent work we demonstrated that decoction of *Smallanthus macroscyphus* (Baker ex Martius) A. Grau leaves was effective to reduce postprandial glucose and useful in the treatment of diabetic animals.
In the present study we evaluated the improvement of biochemical parameters in diabetic rats after treatment with Polymatin A, a sesquiterpene lactone of *S. macroscyphus* leaves. Thirty days' treatment with Polymatin A by the oral route significantly decreased blood levels of glucose, HbA1c, triglycerides, cholesterol, LDLc and aterogenic index in comparision with untreated diabetic rats. Immunofluorescent staining of the pancreatic tissues in diabetic rats presented weak insulin immunoreactivity in the Langerhans islets compared to the intense staining observed in diabetic rats treated with Polymatin A. These results provide a scientific basis supporting the efficacy of Polymatin A treatment to improve metabolic control in diabetes.

A129
HUMAN PAPILLOMAVIRUS GENOTYPE 58 IN TAFI DEL VALLE. TUCUMÁN

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Infection with oncogenic human papillomavirus (HPV) types is a necessary cause of cervical cancer, the second most frequently occurring cancer in women worldwide. Among the over 150 HPV types described, HPV-16 predominates,whereas the prevalence of HPV-58 varies according to the geographic region.The aim of this work was to establish the DNA of HPV 58 in women living in Tafí del Valle. Cervical cell specimens obtained from 90 women aged 15-67 years attending routine gynaecological control in the public hospital "Médici" located in Tafí del Valle were included in the study and written informed consents were obtained from all study participants. (Helsinki Declaration) Detection and typing of the viral DNA genome was performed by polymerase chain reaction with primers My 09/11 specific for the L1 region of the HPV genome, combined with a restriction fragment length polymorphism assay (PCR-RFLP) or PCR and reverse line blot hybridization (PCR-RLB) for 36 genotypes of HPV. The performance of this assay was validated by the WHO. HPV DNA was detected in 44% of the clinical samples, with 25% high risk types. The most common viral types in the infected population were HPV-16 (33 %) and HPV-58 (8.3%). HPV-58 was the second most prevalent type in this study and should be confirmed by molecular characterization of the variants in Tucumán to analyze its possible association with the severity of the lesions. This study helps in the identification of women at high risk of developing invasive CC.

A130
CD40 LIGAND (CD-40LAND ITS RELATIONSHIP WITH HEMOSTATIC PARAMETERS IN OBESE CHILDREN

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Childhood obesity is associated with increased cardiovascular risk in adulthood. Adipose tissue of obese individuals causes an increase in molecules that alter vascular function. The aim of this study was to evaluate CD40L levels in obese children and their relationship with hemostasis parameters. Forty-eight obese children (BMI > percentile (p°) 97 for age and sex) and 20 children with normal weight (BMI between p° 15-84) of both sexes and 10 ± 2 years old were studied. In both groups BMI and waist circumference (WC) was measured and sCD40L, Platelets account (PA), Prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen (Fg), von Willebrand factor (vWF) and PAI-1 were determined. Data were expressed as median and interquartile range and Spearman's coefficient was used to investigate correlations.
Obese children had statistically higher levels of sCD40L [947 ± 268 pg/ml vs. 109 ± 17 pg/mL (p = 0.0001)], APTT [45 ± 4 vs. 42 ± 4 sec (p = 0.04)], Fg [370 ± 80 vs. 246 ± 18 mg/dL (p = 0.0001)] and PAI-1 [5.9 ± 1.1 vs. 3.6 ± 0.7 U/mL (p = 0.0001)] compared with controls. BMI correlated with WC, Fg, CD40L and PAI-1, while WC was correlated with Fg, CD40L and PAI-1. The sCD40L correlated with Fg and PAI-1. Elevated levels of sCD40L, Fg and PAI-1 in obese children evidence a prothrombotic and an inflammatory state associated with obesity, which involves increased cardiovascular risk.

A131
AND ALL THE VIRUSES CAME TOGETHER… CHALLENGES FOR THE NEW PUBLIC HEALTH LABORATORY IN TUCUMÁN

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Currently the role of laboratory surveillance of infectious diseases is considered very important and with that goal in mind there is in Argentina a National Laboratory Network. Virology Division (VD) is part of this network since 1998 and since 2015 it works in the new Public Health Laboratory of Tucuman. Objective: To present and evaluate the response of VD to five outbreaks during the first half of 2016: Dengue Virus (DENV), Respiratory Syncytial Virus (RSV), Influenza A (IA), Hantavirus (HV) for the first time in Tucuman and Zika (ZIKV) first outbreak in Argentina.
Materials and Methods: 3836 patients from Public and Private Services were studied, 2413 for respiratory viruses, 1370 DENV, Chikungunya (CHIKV) and ZIKV and 53 HV. The samples arrived with clinical and epidemiological sheets for "Nonspecific Febrile Syndrome" or "Influenza Surveillance and other Respiratory Viruses". Antigen, IgM and genome detection were performed for DENV; genome for ZIKV, CHIKV and IA; antigens for RSV and IA. Samples for HV research were sent to the National Institute of Human Viral Diseases. VD has laboratories Biosafety Level 2 with Level 3 practices. Results: DENV: 248 positive, Chikungunya: all discarded, ZIKV: 41 positive, 30 confirmed and 11 probable, 252 IA and 818 VRS. Two cases of HV were diagnosed postmortem and 51 were discarded. Conclusions: Staff training, adequate facilities and equipment availability provided the competence for timely diagnosis and characterization of the causal agents of five

outbreaks in Tucuman: LSP's key role. This allowed the generation of reports to effectors so they could implement adequate responses to the situation.

A132
INFLUENCE OF TICs IN LEARNING BIOMEDICAL SCIENCES

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Introduction: TICs represent a key to carry out actions that lead to the formation element and learning, such as content submission, implementation of activities and learning assessment. Objectives: - To assess the student in the subject Hemostasis by using multimedia (interactive videos). - To determine the influence of TICs in the rapid acquisition of knowledge. Materials and Methods: We worked with a sample of 50 students, which was divided into two groups: Group 1 (control), Group 2 (multimedia material). Students attended classes of the subject Hemostasis. Group 1 had only oral exposure of the subject while Group 2 also received support from the lecture with multimedia material. Immediately in both groups a written evaluation of the subject was made consisting of ten multiple choice questions related to the topic and to the interactive video. SPSS version 23 for the statistical treatment of the data was used. Results: written assessment of only four responses were statistically significant, difference favoring learning in the group that received a lecture with the support of interactive videos over the group that only received a conventional lecture ($p < 0.05$). It could be determined that learning was facilitated by the use of TICs in group 2. Conclusions: Promoting the use of TICs together with lectures could a useful resource for the rapid incorporation of knowledge.

A133
ANALYSIS OF THE CONTENTS OF ENVIRONMENTAL EDUCATION IN SECONDARY LEVEL CURRICULAR DESIGNS OF THE PROVINCE OF CATAMARCA

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Environmental education is a permanent construction space in which no unified criteria exist concerning teaching strategies for the subject nor its inclusion in the school curriculum. Objective: To analyze how Environmental Education contents are addrerssed from the curricula of the Province of Catamarca, framed in environmental education, determining its complexity. Methodology: A qualitative, exploratory, descriptive and cross-addressed study, supporting a diagnosis for later comparison with teaching practice. A documentary analysis technique was used in the curricula of secondary school level. They triangulated data from the theories. The following analytical categories were determined: curricular areas and teaching courses related to current environmental education. Results: content were developed in the areas of the basic cycle of geography, ethics and civic education, and biology. In the cycle there is a more oriented approach towards tourism, agri-environment and natural sciences guidelines, while the spaces containing general training of all orientations in general biology, regional geography and local geography are all oriented in conservation, scientific, eco-education and sustainability trends. Conclusions : The secondary level curricula in the province of Catamarca address the content of environmental education from a transversal perspective, preferably from the analysis of local and regional issues, as well as real national and global problems, meaningfulness promoting the learning of students.

A134
EVALUATION OF THE IMPLEMENTATION OF A NEW COURSE SYSTEM

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Introduction: University assesses knowledge through written and oral tests. Our course has implemented an evaluation system that allows us to obtain information and assessment of proposed learning outcomes effectively and reliably. In 2011 we applied changes, introducing the term competition (strategic mobilization of the knowledge elements, skills and attitudes) as resources available and necessary to respond to a given situation.
Objective: to evaluate course system change and train students in the generation of criteria, development of attitudes and skills, in the resolutions of situations that may appeart in professional life.
Methods: the new system design consists of theoretical chronological classes concatenated with theoretical practical classes, lab practice and 3 tests including knowledge with a passing grade of 7. This method was used since 2011. In previous periods, the course was passed with final exams after regularization. Results: since 2011, 187 students were enrolled, where 83.96% was promoted with 9 to 7, 10.70% regularized and 5.35% failed. Previous periods until the proposed change (2001 to 2010), 26.09% out of 874 exams passed with 10 to 7, 41.76% were absent. But with the current system, 90.60% of the students passed the exams and only 10% were absent.
Conclusions: This system allowed us to see in the student knowledge, skills and attitudes that apply to daily situations in their professionally future. Academic performance was optimized, and absenteeism decreased.

A135
COMMUNICATIVE STRATEGIES USED BY DENTISTRY STUDENTS IN PATIENT CARE IN A CLINICAL CLASS

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Introduction: Dentistry students introduced to contact with patients in clinical classes ought to make use of communicative strategies that will allow them to establish a positive relationship with the patient and thus accomplish a successful teaching-learning process. Aim: To analyze strategies employed for patient care by students of the Prosthetics Clinic I course – Dentistry School – UNT (CPIC-FOUNT henceforth). Materials and Methodology: A descriptive. cross-sectional survey was carried out by means of a structured questionnaire to 65 students taking CPIC-FOUNT, the options for each question being 'always', 'rarely', 'never'. Data were analyzed using STATA 11 software, establishing frequency of use for each variable. Results: 98% of students always greet patients at the start of consultation and 100% claim to do it at the end too. 53% maintain that they always talk to their patients while working on their mouth. While treating patients, they state they rarely gesture (62%) or overuse pet-words (54%). They claim to always explain to their patients how to take care of their oral cavity (97%), follow-up treatment (98%), cost and benefits of the treatment (77%). 48% rarely write down instructions. 51% assert they rarely use code words with co-workers to obscure information. Conclusion: Although respondents use appropriate communicative strategies with their patients, it is vital to promote and strengthen the teaching of such strategies in order to reach an ideal teaching-learning process in clinical classes.

A136
EVALUATION OF TARGET ATTAINMENT IN THE DENTISTRY LEVELLING CYCLE. UNT

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The Levelling Cycle in Dentistry (CINO) 2016 is destined to everyone wishing to enroll in Dentistry in the FOUNT. It seeks to help the aspirant in responsible studying culture in order to improve his/her academic performance in the college degree. As a fundamental principle, unrestricted entry has to provide equal opportunities of access to the university for all highschool graduates. But there is a great percentage of students who drop out of the system. Enrolment increase as a consequence of unrestricted entry does not mean a higher quantity or quality of graduates. Objective: to evaluate the accomplishment of the proposed objectives in CINO 2016. Materials and Method: the written tests of Physics, Chemistry, Macroscopic Biology and Microscopic Biology of 344 applicants were used for this investigation. The tests consisted in 10 closed questions and estimated time for conclusion was 60 minutes. Results: out of the 344 applicants, 30 (8.72%) passed all tests; 86 (25%) failed all the exams; 194 (56.42%) failed between one and three tests and 34 (9.88%) were absent. Conclusion: The results obtained in the test prove that the targets for this levelling cycle were not attained, for the aim of the test is not to reduce the number of enrollments, but to create the necessary tools to apply the knowledge acquired in high school in university environments, thus increasing study quality and decreasing dropouts. Key Words: objectives, evaluation, CINO.

A137
EVALUATION OF BIOPHYSICS STUDENTS' ACADEMIC PERFORMANCE POST MODIFICATION OF HIGHER EDUCATION LAW

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The last amendment to the Higher Education Law (Law No. 24,521) established in Art. 7 the unrestricted admission of students to all universities in the country to ensure higher education as a universal right. This implies admission by non eliminatory test. Until 2015, the condition to enroll in the FOUNT was the approval of the Levelling Cycle in Dentistry (CINO) 4 subjects. This meant admission through eliminatory test, without a quota. Objective: To assess the performance of students of Biophysics FOUNT after the amendment of the Higher Education Act. Material and Methods: academic tracking was made through midterm exams in the Department of Biophysics of the 310 students who enrolled in the FOUNT in 2016. Results: Out of the 310 students who took General Physics in the CINO, 73 passed (23.5%) and 237 failed (76.5%). Those who failed took the first midterm exam (with the same contents of CINO): 50 passed it (21.1%) and 187 failed (78.9%). In the second midterm exam, with Biophysics content, 118 students took the test, 74 passed it (62.71%) and 44 failed (37.29%). Conclusion: the large proportion of students who failed in the first instance shows the importance of maintaining an eliminatory admission test, such as the CINO 2016, without restricted examination did not improve previous knowledge of the related subjects, necessary for the development of Biophysics. Therefore, the results were reversed in the second midterm exam, where students had already acquired such knowledge. Keywords: academic achievement, assessment, eliminatory test.

A138
PHILOSOPHY BETWEEN ENGINEERS: CONSOLIDATION AMONG STUDENTS OF THE FAZ

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Voluntary or mandatory demand for the subject Epistemology in the FAZ was consolidated since 2015. The aim of this paper was to analyze their differential impact in Agronomics (2nd year, optional) and Animal Husbandry (3rd year, obligatory). The schedule provides eleven common theoretical and practical classes and an anonymous survey about the course. The results reflected academic performance and student contributions. Students who attend courses vs. enrolled students increased: 51% (2007), 74% (2010), 92% (2013) and 80% (2016). In 2014 60% of them completed, in 2015 only 58% of those who chose (Agronomics) and 100% of the obligatory enrolled (Animal Husbandry); this value was repeated in 2016, when only 74% of Agronomics was completed. In 2015 those who chose (Agronomics) regularized and/or promoted 48% and 90% of the required (Animal Husbandry). In 2016 82% regularized and/or promoted in Agronomics and 100% among Animal Husbandry students. According to the survey in 2015, 50% out of those considered the course as interesting or very interesting and 27% recommended it to other students; in 2016, 75% sought to expand knowledge beyond scientific and technical data; 100% of zootechnicians mentioned the compulsory carracter of the curriculum. 41% of the students prioritized better theoretical and methodological training in science and another 41% ethical reasons; more than 80% of texts were read and 88% considered their inclusion good. Conclusion: a better awareness with the option of the course among Agronomics students; a better performance and institutional commitment among Animal Husbandry students (100% of them complete), who in 2015 and 2016 required by the curriculum had a better performance to achieve their goals.

A139
COMPARATIVE STUDIES ON THE QUANTIFICATION OF EXOPOLYSACCHARIDES PURIFIED FROM *Streptococcus thermophilus* CRL1190

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Streptococcus thermophilus CRL 1190 is a lactic acid bacterium that produces extracellular sugar polymers (EPS) with a preventive and therapeutic effect against gastritis. Different gravimetric methods have been developed to quantify EPS resulting in prolonged procedures with low reproducibility that generate large volumes of chemical wastes. In contrast, the colorimetric method that uses periodic acid-Schiff reagent (PAS) constitutes a standardized and simple procedure that presents high sensitivity, specificity and reproducibility against different carbohydrates, using small volumes of sample and reagents. This work aims to evaluate the applicability of the PAS method in purified EPS of CRL1190 in order to establish a close comparison against the traditional gravimetric method. CRL 1190 was cultivated in 10% reconstituted skim milk for 2, 4, 6, 12 and 16 h at 37°C. At the end of the incubation period, EPS production (mg/L), bacterial growth (CFU/mL), acidification (pH, TTA) and residual sugar (HPLC) were determined. The EPS sensitivity to PAS (A_{550nm}, Biopur diagnostic kit) was evaluated in solutions between 0.0-1.0 mg/mL. CRL1190 grew to 3 log units, acidified (pH: 4.36) and consumed sugars (lactose and glucose) gradually according to each fermentation. The EPS productivity increased during the fermentation from 2 to 16 h (23.5-70.7 mg/L), mainly during the exponential phase. Applying the PAS method to purified EPS, lines that showed a positive linear relationship with high coefficients R^2 (>0.99), but with marked differences in their values slopes (0.86-.31) were obtained. The PAS colorimetric microtechnique allows the obtainment of standard curves for each purified EPS with a high reproducibility within the range of concentrations tested.

A140
CLINICAL EVALUATION OF ALVEOLAR PROTECTIVE PLAQUE AFTER DENTAL EXTRACTION

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One of the greatest challenges nowadays in oral and maxillofacial surgery is how to avoid the natural involution of alveolar bone after dental extractions. Alveolar bone resorption (ABR) causes both physiopathological and aesthetic changes that can be prevented by guiding bone regeneration using different kind of materials. The aim of this work is to evaluate the use of post extraction *ad hoc* alveolar protective plaque (APP) using a preventive method for ABR. Material and Method: 13 patients of both sexes with tooth extraction indication were selected. Non traumatic extractions and subsequent placement of an ad hoc alveolar protective plaque (APP) for a month were made. Both height and width of post extraction socket was measured by Cone Beam CV (CBCV) in order to obtain ABR values. Results: The analyzed areas were: Anterior–Upper area: Vestibular Bone (VB): 22.9%, Palatal Bone (B): 8.5% and width (V-P): 23.6%. Posterior-Upper: VB: 8.7%, PB: 11.8% and V-P: 5.1% and Posterior-Lower: VB: 5.4%, Lingual Bone (LB): 8.3%, V-L: 5.5%. Conclusion: ABR post extraction total percentage (15%) was lower compared with those accepted by literature (Araújo MC; Sukekava F; Wennström JL; Lindhe J) of 33% after the first three months post extraction. From the results obtained, we suggest that APP showed to be an adequate preventive technique of dimensional bone resorption and we consider it necessary to increase evaluation of a

greater number of cases one month post extraction. Keywords: Non traumatic extraction, bone regeneration, Cone Beam CV (CBCV), alveolar protective plate (APP).

A141
BIOSTIMULANTS FOR PEANUT SOWING. 1. YIELD AND QUALITY

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Seed treatment is an alternative to reduce risks in crop emergence. The aim of this study was to evaluate the effect of biostimulants on crop emergence and yield of groundnut (*Arachis hypogaea* L.). The experiment was conducted in Rio Cuarto (Cordoba) with seeds treated with biostimulants (ml/100 kg seed) according to the following treatments: T0: Control; T1: Seed Power™ (SP: Cobalt chelated 1.5%) 20ml; T2: SP 40ml; T3: SP 60ml; T4: Stimulate™ (0.005% indole butyric acid + 0.005% gibberellic acid + 0.009% kinetin) 300ml; T5. Bioforge™ (2% nitrogen (N 'diformyl urea) + 3% potassium (K_2O) 250ml. At 20 and 40 days after sowing (DAS), the number of emerged plants, secondary roots and leaves per plant, and the length of tap root were recorded. At harvest time, crop yield components and commercial quality were recorded. In general, the biostimulants improved plant growth at 20 and 40 DAS, as shown in a greater length of the taproot and an increase in the number of leaves at 20 DAS, and a greater amount of secondary roots at 40 DAS. That is, during the first days the biostimulants improved the deepening of tap root and later, lateral soil exploration. They also increased the yield of fruits and seeds compared with the control, although they were only statistically higher in T2, T3 and T4. This effect can be attributed to the greater number of plants and fruits per surface, the average weight of a fruit and the largest proportion and weight of large seeds (38-42 and 40-50). The positive effect of biostimulants on crop establishment resulted in increased crop yield and commercial quality.

ABSTRACT INDEX

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