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(Asociación de Biología de Tucumán)

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LECTURES

A1
"Miguel Lillo" Lecture
TIME WAITS FOR NO ONE: TOWARDS A TEMPORAL BIOLOGY

Dr. Diego A. Golombek
Interdisciplinary Time Laboratory (LITERA)
Universdad de San Andrés – CONICET

The "time" variable is often ignored or underappreciated in experimental science. In particular, the biological sciences tend to focus on "where" phenomena occur, their duration and intensity ("how much"), and, occasionally, on the underlying mechanisms ("how"), while the "when" tends to get lost in the design or statistical analysis. However, time can provide an undeniable source of independent variation in our data, across all areas of brain and behavioral research. Therefore, considering the time of day, light patterns, seasonality, or the alert/rest state of subjects or experimental preparations is essential to fully understand our object of study.
Chronobiology studies the periodic variations in the physiology and behavior of organisms, based on the functioning of autonomous biological clocks that synchronize with specific environmental variables. This talk will provide examples of such biological rhythms in various species, including humans, with a focus on recent findings about the chronobiological variation of various cognitive aspects, taking into account subjects' alertness and prior sleep. Furthermore, it will explore the analysis of variables and public and personal datasets that can offer a view of the hidden circadian rhythms in human behavior (circadian proxies). The general goal is to share with the biological sciences community the need to incorporate the temporal dimension into their protocols and conclusions so that… time is on their side.

A2
Opening Lecture
BIOCOMPATIBLE MATERIALS: AN OVERVIEW OF THE CORRELATION BETWEEN DESIGN AND FUNCTION

Dra. Carla E. Giacomelli
Universidad Nacional de Córdoba. Facultad de Ciencias Químicas. Departamento de Fisicoquímica. CONICET. Instituto de Investigaciones en Fisicoquímica de Córdoba (INFIQC).

Life-compatible materials or biomaterials must meet a series of requirements to achieve the desired function once in contact with biological systems. Consequently, new generations of biomaterials are designed with the idea of strongly correlating composition, morphology, surface properties and functionality. To this end, it is necessary to combine components of diverse nature, giving rise to hybrid materials that allow to largely replacing the functions that are intended to be replaced or improved once in contact with tissues. These biomaterials are by no means inert to biological functions but exactly the opposite; they have bioresponsive capacity and allow triggering a series of reactions necessary for their therapeutic action. In this way, the aim is to obtain synergistic responses between the functions of biological systems and those that can be tuned from the design in the synthesized biomaterials. In the Nanobiointerfaces research team (https://infiqc.conicet.gov.ar/grupo-11/) we focus on the design of next-generation biomaterials that present properties such as controlled biodegradation, bioactivity and stimulation of biological functions. In general, we focus on bone tissue, such that the design is inspired by the hybrid composition of natural bone and its multiscale architecture. Likewise, we focus especially on the surface properties of the prepared biomaterials, which are essential for their interaction with molecules of relevant physiological media. This approach to the design and development of biomaterials involves an exhaustive characterization at various scales and a comprehensive evaluation of their interaction with biological media and cells.

SYMPOSIUM: "NANOTECHNOLOGY INNOVATION IN BIOLOGICAL SYSTEMS: MULTIDISCIPLINARY PERSPECTIVES"

A3
NANOSTRUCTURED BIOSENSORS: NEW FRONTIERS IN THE STUDY OF CELL BIOLOGY

Dr. Diego Pallarola
Investigador Adjunto CONICET. Instituto de Nanosistemas. Escuela de Bio y Nanotecnologías. Universidad Nacional de San Martín
(On behalf of Sociedad Argentina de Biología)

Cells interact with their microenvironment by constantly sensing mechanical and chemical features, which are converted into biochemical signals. These processes allow cells to respond and adapt to changes in their environment and are crucial for most cellular functions. Understanding the mechanisms underlying these complex interactions is critical to unraveling the key biochemical and mechanical factors that regulate cell fate. The combination of materials science and surface chemistry enables the creation of synthetic cellular interfaces and functional materials with integrated sensing capabilities. These biologically inspired materials, designed for the detection of specific bioactive molecules, are highly advantageous for the study of cell behavior. In this talk, I will present recent results on the development of biointerfaces that mimic the structure, properties and function of the cellular microenvironment, and that are capable of providing quantitative information on how cells sense and explore specific adhesive cues from the extracellular domain.

A4
NANOSTRUCTURED ALUMINA (NSA): IMMUNOMODULATORY EFFECTS

Dra. Bettina Bongiovanni
Instituto de Inmunología Clínica y Experimental de Rosario, IDICER CONICET-UNR. Facultad de Cs Médicas, UNR. Facultad de Cs Bioquímicas y Farmacéuticas, UNR. ROSARIO
(On behalf of Sociedad de Biología de Rosario)

Nanostructured alumina (NSA) has different applications, ranging from contact insecticide to thermal insulator. In previous work we observed that high doses (<100 µg/ml) produced cytotoxicity in macrophages derived from the THP-1 line (MF-THP-1). While, low doses (>25µg/ml) stimulate the IL-1β release. For this reason, we decided to analyze how the effect that NSA has on the immune system at low doses could affect MF-THP-1 challenged with *Mycobacterium tuberculosis* (Mtb), the causative agent of Tuberculosis (TB).
In this regard, Mtb is phagocytosed by resident macrophages at the pulmonary level inducing, for example: activation of the transcription factor NFκB, production of proinflammatory cytokines and host defense peptides (HDPs). Thus, we analyzed the immunomodulatory NSA at 2.5, 5, 15 and 30 µg/ml on MF-THP1 stimulated or not with irradiated Mtb (Mtbi) for 18 and 24 hours. For this purpose, we quantified: a) the production of cytokines (IL-1β, IL-6, IL-10) and HDPs (LL37, HBD-2 and -3) in the culture supernatants (ELISA); b) the expression of inflammation-related transcripts (IL-1β, NLRP-3, Caspase-1 and NFkB1 by RT-qPCR and c) the phagocytic activity of MF-THP1 (microscopy) in the cultures. We found that, Mtbi increased the production of the three cytokines, observing a high production of IL-1β and IL-6, without modifications in HDPs. NSA only increased the production of IL-1β in a dose-dependent manner, in cultures with and without Mtbi. The expression of IL-1β and NFkB1 transcripts, although modified against Mtbi, did not change with NSA. The expression of Caspase-1 was only found to be increased in cultures stimulated with Mtbi and treated with 2.5 or 15 µg/ml of NSA. No changes were observed in the expression of NLRP-3 or peptides. Finally, phagocytic activity increased significantly in those cultures with NSA. In summary, the results suggest that exposure to NSA would induce an inflammatory profile in MF-THP1 related in part to NFkB, which would manifest itself when the cells face Mtbi

(increase in inflammatory cytokines and phagocytic capacity). Therefore, low concentrations of NSA could be useful in the development of immunostimulant formulations.

A5
NANOMATERIALS IN BIOMEDICAL RESEARCH: INNOVATION FOR 21ST CENTURY THERAPY

Dra. Inés Yslas
IITEMA-CONICET, FCEF-QyN. Dpto. Biología Molecular, UNRC, Río Cuarto, 5800, Argentina.
E-mail: eyslas@exa.unrc.edu.ar
(On behalf of Sociedad de Biología de Córdoba)

The presented research provides a broad overview of the biomedical applications of nanocomposites and nanomaterials, highlighting their potential in antimicrobial and advanced therapeutic applications. Significant progress has been demonstrated in the design of materials against bacterial infections either per se or through the application of photothermal inactivation. One example is a hydrogel nanocomposite with silver nanoparticles (AgNPs) that exhibits prolonged antimicrobial activity due to the controlled release of Ag+. Furthermore, silver nanoclusters (AgNC) have been synthesized using polyacrylic acid (PAA) and polymethacrylic acid (PMAA) as stabilizers, showing high antimicrobial activity against *Staphylococcus aureus* at low doses (MIC: 0.2 µg/mL and MBC: 2 µg/mL) and without cytotoxicity (hemolysis less than 10%) in rat red blood cells at concentrations between 0.05 and 1 µg/mL. Another relevant study explores the irradiation of graphene oxide in the near-infrared (NIR) spectrum, which enhances bactericidal efficacy against *Pseudomonas aeruginosa*, a pathogen that represents a challenge in medicine due to its resistance to multiple drugs. Additionally, polyaniline nanoparticles (NpPANI) have been synthesized, which induce bacterial lysis under NIR irradiation. It was also demonstrated that NIR-irradiated NpPANI modified with dansyl not only exhibit useful optical properties as a fluorescent probe but is also effective in bacterial destruction through photothermal effects, opening new opportunities for the development of multifunctional diagnostic and therapeutic tools. Finally, the development of semi-interpenetrating nanogels of polypyrrole loaded with gentamicin (NG-PPy-Gen) is highlighted. These nanogels combine photothermal properties with gentamicin release, enhancing their bactericidal effect. This nanotechnology platform is presented as an advanced multifunctional solution for treating hard-to-eradicate bacterial infections. Conclusion: These studies demonstrate the broad potential of nanomaterials in biomedical applications. The combination of antimicrobial and photothermal properties provides a solid basis for the development of safe and effective technologies in medicine and biotechnology. The integration of nanoparticles into polymer matrices and the use of conductive polymers represent innovative approaches to addressing critical challenges in 21st-century medicine.

A6
NANOPHARMACOLOGY: THE NEW MULTIDISCIPLINARY FRONTIER TO REVOLUTIONIZE THE MANAGEMENT OF HYPERTENSION, ATHEROSCLEROSIS AND NEUROINFLAMMATORY DISEASES

Dr. Walter Manucha
Investigador Principal CONICET. Director del IMBECU CCT Mendoza. Director CCT CONICET Mendoza. Prof. Área Farmacología, Facultad de Cs. Médicas, UNCUYO. Prof. Fisiología Humana, Facultad de Cs. Agrarias, UNCUYO
(On behalf of Sociedad de Biología de Cuyo)

Nanopharmacology is an emerging discipline that combines nanotechnology and pharmacology to revolutionize the treatment of chronic diseases such as hypertension, atherosclerosis, and neuroinflammatory diseases. Nanoparticles and nanomicelles, which are tiny structures with unique properties, are being designed to more precisely and efficiently deliver drugs. By manipulating their size, shape, and composition, we can significantly improve drug bioavailability, reduce side effects, and increase therapeutic efficacy. Nanopharmacology also

provides new opportunities for combination therapies, where multiple drugs can be encapsulated in a single nanoparticle or nano micelle, enhancing the synergy between them and optimizing the treatment of complex diseases. This field encompasses recent advances in nanoparticle design and synthesis, mechanisms of action, and basic, translational, and clinical applications, with a special emphasis on hypertension, atherosclerosis, and neuroinflammatory diseases. Despite the challenges, nanopharmacology represents an exciting frontier in biomedical research with the potential to transform the treatment of numerous diseases for the betterment of human health.

A7

MICROBIOLOGICAL BIOMOLECULES IN NANOTECHNOLOGY: NEW FRONTIERS FOR THE AGROINDUSTRIAL SECTOR

Dra. Cintia M. Romero
Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. PROIMI-CONICET. Avenida Belgrano y Pasaje Caseros. Tucumán, Argentina
E-mail: cintia.romero@fbqf.unt.edu.ar
(On behalf of Asociación de Biología de Tucumán)

Nanotechnology applied to the agro-industrial sector has opened up new possibilities, especially through the use of microorganisms as biofactories for the biosynthesis of nanoparticles. These organisms can produce nanoparticles in a sustainable manner, which represents an alternative to traditional techniques. The generated bionanoparticles, formed by an inorganic core surrounded by biomolecules, have proven to be effective as antifungal agents, especially against phytopathogens resistant to conventional agrochemicals. The increasing resistance of these pathogens poses major challenges for agriculture. In this context, biosynthesized nanoparticles offer an innovative solution that combines the physical properties of nanomaterials with the biological benefits of producing microorganisms. By using biological products, the dependence on synthetic agrochemicals can be reduced and a more sustainable and efficient agriculture can be promoted. There are several bionanoparticles that have demonstrated great efficacy against pathogens that affect key crops. By integrating nanotechnology and microbiology, an interdisciplinary approach is generated capable of solving problems in the agroindustrial sector. These advances open new avenues for pest control and the development of biological products that can reduce the environmental impact in agriculture. These emerging technologies have major implications for more resilient and productive agriculture, with less environmental impact and greater benefits for the sector.

POSTER PRESENTATIONS

A8

THE ZOOLOGY DEPARTMENT (UNSa) IN THE NORTHERN NEIGHBORHOODS OF THE CITY OF SALTA CAPITAL: KNOWLEDGE AND PREVENTION

Portelli S, Rodríguez Artigas S, García R, Marás G, Benítez R, Medrano Suarez N, Ávila Vega C, Osorio A, Coraita A, Medina R, Vargas G
Cátedra de Zoología, Fac. de Cs. Naturales, UNSa, Av. Bolivia 5150, Salta, Argentina.
E-mail: bio_gabriela@yahoo.com.ar

This work was conducted as part of a university extension project with student participation entitled "Dangerous Animals in My Neighborhood: Knowledge and Prevention." The aim was to raise awareness of the morphological characteristics of animals that pose a threat to human health in neighborhoods near the Community Integration Center (CIC) and to promote preventive measures to avoid accidents involving these animals. The project was conducted at the CIC in Barrio Unión, where a survey was carried out to gather information on the level of awareness regarding dangerous animals observed in the area. Workshops were implemented, featuring preserved biological specimens from the Zoology Department, such as arachnids, snakes, mosquitoes, rodents, and bats. A survey was conducted at the end of each workshop. Regarding the analysis of awareness of dangerous animals,

95% of participants reported never having received information sessions on venomous animals, and 50% highlighted that the most frequently observed animals were mosquitoes, flies, and rats. Regarding ophidians, 80% felt that the information provided was very adequate to characterize venomous and non-venomous specimens. For the arachnid workshop, 90% of the participants found the topic suitable, interesting, and didactic, as these are the specimens most commonly observed in their homes. In the case of mosquitoes, 80% considered the information provided as adequate, and 90% valued it as very important due to the current epidemiological relevance of the topic. For rodents, 80% considered the information important and adequate. Regarding bats, 90% found the information important and didactic. The activities developed made it possible to transfer knowledge where there was none about animals dangerous to health, to avoid accidents and to facilitate a rapprochement and link with the University.

A9

A GLIMPSE INTO THE BIOGEOGRAPHICAL HISTORY OF THE ANNUAL FISHES OF GENUS GROUP *AUSTROLEBIAS*

Portelli S[1], Alonso F[1], Serra W[3], Van Dooren T[4], Terán G[5], Montes M[6]
[1]IBIGEO-CONICET. Rosario de Lerma Salta. [3]Museo Nacional de Historia Natural. Montevideo, Uruguay. [4]Universidad de la Sorbona - Facultad de Ciencias - iEES París. [5]Fundación Miguel Lillo, San Miguel de Tucumán. Tucumán. [6] Centro de Estudios Parasitológicos y de Vectores CEPAVE. La Plata. Buenos Aires.
E-mail: sabrina.portelli@gmail.com

The *Austrolebias* Genus Group (AGG) comprises killi species, which are seasonal fishes inhabiting the South American Neotropics, characterized by their small body size, restricted geographic ranges, and their dependence on seasonal aquatic habitats. This study focused on comprehensively identify and analyze the biogeographical patterns that have influenced the diversification and current distribution of species within this genus group. To understand the biogeographical history of *Austrolebias*, a phylogenetic reconstruction was conducted based on a combination of morphological and molecular characters, which included 90% of the known species in this group. This calibrated phylogenetic hypothesis provided an essential temporal framework for subsequent biogeographical analyses. Using predefined areas determined for this analysis, the Dispersal-Extinction-Cladogenesis (DEC) and DEC+j models in R were applied in order to reconstruct the historical events that have shaped the distribution of *Austrolebias* species. The results revealed that throughout its evolutionary history, the AGG was influenced by several geomorphological and climatic changes in the environment. The diversification of this group began approximately 13.70 million years ago, during the late Miocene, a period marked by significant marine introgression that reshaped the drainage patterns of several basins. These geomorphological changes promoted both the dispersal and diversification of AGG species. Our findings underscore the crucial importance of geological and climatic events in the evolution and distribution of species within the *Austrolebias* Genus Group, providing deeper insight into the biogeographical processes that have shaped biodiversity in the Neotropics.

A10

DETERMINATION OF THE STABILITY OF THE ARROYO TAFÍ BASIN IN ORDER TO SUPPORT THE DEVELOPMENT OF THE SUSTAINABLE CITY PROGRAM OF TAFÍ VIEJO MUNICIPALITY

Báez M[1,2], Sidán M[3], Fernández R[1,2], Cecotti M[1,3], González ME[4], Marrades CA[4], Medina M[4]
[1]FCsN e IML-UNT. [2]FRT-UTN. [3]Fundación Miguel Lillo. [4]FBQF-UNT.
E-mail: mbaez@csnat.unt.edu.ar

Tafí Viejo is the second most populated city in Tucumán province (85,548 inhabitants, census 2022). It is supplied with water from three surface intakes: Caínzo, El Nogalar, and Tafí. The latter belongs to the hydrogeological basin of the Arroyo Tafí (430 Ha). The stability of the basin is affected by phenomena that erode rocks and displace debris to lower areas. Weathering is one of these phenomena, which alters and separates rock from soil

through chemical, physical or biological decomposition. The aim of the work was to determine the stability of the Arroyo Tafí basin by evaluating chemical weathering as a fundamental factor, in order to support the development of the sustainable city program promoted by Tafí Viejo municipality. Weathering was assessed using the Chemical Index of Alteration (CIA) of the suspended material in the stream water. A CIA value between 45 and 55 indicates an absence of chemical weathering, while values close to 100 suggest maximum weathering with complete removal of alkaline and alkaline-earth metals. Sediment samples were taken from water for 60 days in June and July 2023, by submerging glass jars at a depth of 10 cm (26°42'55"S, 65°17'45"W). The cations Al, Ca, Na, and K in the sediment were analyzed by X-ray fluorescence. Soil loss was measured through runoff batches in the same foothill area, determining the annual sediment production (Quantification and Assessment of Water Erosion in the Foothills) and these data were cross-checked with CIA. The obtained CIA was 49.5 and the annual sediment production was 2,300 Tn/Km²/year. The results indicate soil stability and a state of dynamic equilibrium in the Arroyo Tafí basin. This work will be included in the technical report of the sustainable city program of Tafí Viejo. It will be reported that, although the low degree of weathering is a good indicator, other factors such as soil management and exceptional rainfall must be considered in an integrated management plan.

A11
ASSESSMENT OF ARROYO TAFÍ USING THE RIPARIAN FOREST QUALITY INDEX: PRELIMINARY RESULTS

Cecotti M[1,2]; Sidán M[2]; Báez M[1,3]; Fernández R[1,3]; Barrios A[4]; González ME[4]; Raimondo EE[4,5]; Marrades CA[4]
[1]FCsN e IML-UNT. [2]Herbario Fanerogámico-Fundación Miguel Lillo. [3]FRT-UTN. [4]FBQF-UNT. [5]PROIMI-CONICET
E-mail: mariocecotti@gmail.com

Tafí Viejo (Tucumán) is aligned with the Sustainable Development Goals (SDG). A water source for its community is Arroyo Tafí, which runs through the southern part of the city from west to east. In the moist soils along the watercourse, there are deciduous species constituting what are known as riparian forests, essential for conserving watersheds and water quality. The Riparian Forest Quality index (RFQ) is useful for quantifying and assessing the ecological quality of riparian systems and includes aspects such as vegetation cover, structure of the riparian vegetation, and the degree of human intervention. The aim of the study was to evaluate the quality of the riparian forests of the Arroyo Tafí through the application of the RFQ index. Ranges ≥ 95 indicate unaltered riparian forest (natural state); 75-90, slightly disturbed riparian forest (good quality); 55-70, beginning of significant alteration (acceptable quality); 30-50, strong alteration (poor quality); ≤ 25, extreme degradation (very poor quality). In March 2024, three sampling points were analyzed along 2 km of the stream: P1, Toma La Nina (26°43'4.40"S, 65°17'48.49"W); P2, Balneario La Toma (26°43'27.5"S, 65°17'24.07"W); and P3, Toma Vieja (26°43'37.83"S, 65°17'8.01"W). In P1, the RFQ index was 15, and the stream was modified by sediment movements, the construction of gabions for water capture, exotic species, and recreational use. In P2, the RFQ index was 0, with alterations due to a defense gabion construction, settlements, exotic plants and a local road. In P3, the RFQ index was also 0, with defense gabions colonized by vegetation, a pedestrian bridge, urban solid waste, and an elevated road altering the alluvial terrace level. These sites showed values corresponding to very poor quality and extreme degradation, showing the intervention of these sites. It is recommended that the local authorities restore the vegetation on the banks of the stream to mitigate flooding and protect the community's vital infrastructure.

A12
ESSENTIAL OIL BIOCIDAL ACTIVITY AND ITS MAJOR CONSTITUENTS FROM *ROSMARINUS OFFICINALIS*

Galván L[1], Chagra F[1], Ale C[1], Abud C[1], Turpo M[1], Ribó M[2], Rodríguez AM[2], Amani S[2]
[1]Laboratorio de Bacteriología. Hospital Nicolás Avellaneda. Catamarca 2000.
[2]Cátedra de Farmacognosia. Facultad de Bioquímica, Química y Farmacia. Ayacucho 471 Tucumán. UNT.
E-mail: sara.amani@fbqf.unt.edu.ar

Healthcare Associated Infections (HAIs) are the most frequent adverse event in hospital patients. Environmental surfaces accumulate bio-load which serves as a reservoir for pathogenic microorganisms that can cause infections in patients. For this reason, cleaning and disinfection are very important strategies in the prevention and control of HAIs. Many of the disinfectants used in these processes develop microbial resistance; therefore, alternatives are constantly being sought to avoid this problem. Essential oils and their components are widely used for their antimicrobial properties. This work evaluated the antimicrobial activity of *Rosmarinus officinalis* L. (Lamiaceae) essential oil (RoE) and its three major components (camphor, 1,8-cineole and α-pinene) on surrogate bacteria clinically isolated from the Dr. Nicolás Avellaneda Hospital: *Staphylococcus aureus* (Sa)*, Enterococcus faecalis* (Ef)*, Pseudomonas aeruginosa* (Pa)*,* and *Escherichia coli* (Ec). The essential oil from the fresh aerial parts of *Rosmarinus officinalis* was obtained by hydrodistillation using Clevenger apparatus. The major components of RoE reported in the bibliography are: 1,8-cineole (15-50%), camphor (15-25%) and α-pinene (10-25%) which were commercially acquired. The antimicrobial activity of the different samples was evaluated by the microdilution method in a 96-well plate. All strains were sensitive to the tested samples with a MIC between 0.250 and 2 mg/mL. RoE inhibited the development of Ec with a MIC of 0.375 mg/mL. α-pinene showed the highest antimicrobial activity against Ec and Pa (MICs of 0, 250 and 0.500 mg/mL respectively). Camphor was the one that showed the least activity against the strains tested. The final results suggest that it would be interesting to test the addition of α-pinene to hospital disinfectant formulations to improve their effectiveness.

A13
COMPATIBILITY STUDIES OF MYRTLE EXTRACTS AGAINST EXCIPIENTS AND QUANTIFICATION OF METABOLITES WITH ANTIOXIDANT ACTIVITY

Velarde A, Checa MA, Brizuela A, González ML, Michel A, Moyano MA
Faculty of Biochemistry, Chemistry and Pharmacy. National University of Tucumán. Ayacucho 471. Tucumán. Argentina. E-mail: maría.moyano@fbqf.unt.edu.ar

Myrtle (*Eugenia uniflora L.*) grows in the Yungas of Tucumán and produces fruits that are a natural source of antioxidant compounds that have been used for medicinal purposes as they may lower the risk of cancer and cardiovascular disease. Objective: to quantify the metabolites with antioxidant activity and study the compatibility of myrtle extracts with different excipients. Materials and methods: Extracts obtained by sequential leaching of hydroalcoholic mixtures, usingh fresh fruits (E1) and frozen fruits (E2). In the extracts, total phenols, flavonoids, anthocyanins, and tannins were quantified spectrophotometrically. Antioxidant capacity was assessed using ABTS and DPPH radicals, as well as the inhibitory capacity of polyphenol oxidase. Compatibility between extracts and excipients: 1st stage: determinations by Differential Scanning Calorimetry (DSC), on individually and in binary mixtures with starch, lactose, kaolin, vitamin C, carboxymethylcellulose, magnesium stearate, silica. 2nd stage: thermal stress testing on individual samples and in binary mixtures. 3rd stage: Infrared (IR) of the extracts and excipients individually and in binary samples. Results: expressed in mg Equivalents/g dry extract: (mgE/ g d.e.). Total phenols (mgE Gallic acid/g d.e.), E1: 54.44; and E2: 51.44. Flavonoids (mgE Quercetin/g d.e.) E1: 60.54 and E2: 52.15. Anthocyanins (mgE Malvidin-3-glucoside/g d.e.) E1: 13.75; and E2: 9.28. Tannins (mgE Catechin/g d.e.) E1: 25.94 and E2:13.98. Mean inhibitory concentration (IC_{50}) with ABTS in E1: 39.35 and E2: 31.36. Percentage reduction of DPPH E1: 37.94%; E2: 34.54%. Polyphenoloxidase inhibition in E1: 35.93% and E2: 31.53%. Extracts showed incompatibilities with kaolin, starch and talc. The analytical protocol for preformulation: DSC, thermal stress and IR allows the study of compatibility between extracts and potential formulation components. Conclusions: The extracts showed a similar phenolic compound profile and moderate

antioxidant activity. The results are promising for potential use in the formulation of herbal medicines, as they were compatible and complementary.

A14
INFLUENCE OF AGE AND RESPONSE TO OVARIAN STIMULATION ON THE REDOX PROFILE OF FOLLICULAR FLUID DURING *IN VITRO* FERTILIZATION

Álvarez Asensio NS[1], Haro C[2], Oliva P[3], Delgado C[3], Estrada M[3], Bonilla F[1,3]
[1]Inst de Biología. Chacabuco 461. [2]Inst de Bqca Aplicada. Balcarce 747-Fac Bqca, Qca y Fcia-UNT. [3]Inst de Maternidad y Ginecología. Av Mate de Luna 1551-Tuc. CP4000
E-mail: nataliasofiaalvarez@gmail.com

Follicular fluid (FF) forms the microenvironment in which the oocyte develops, playing a crucial role in oocyte maturation, quality, and early embryonic development. This environment is also influenced by the age of patients undergoing fertility treatment. Understanding the biochemistry of FF, particularly the oxidative-antioxidant status, is essential for analyzing reproductive outcomes. Objective: To evaluate redox parameters in FF and their variations according to age and the number of oocytes retrieved in patients undergoing *in vitro* fertilization (IVF) treatment. Methods: 52 samples from women undergoing IVF were analyzed and classified according to ovarian stimulation response into low responders (LR) and normal responders (NR), and by age in two groups <33 years, and ≥33 years. The following was determined a) malondialdehyde and nitrites as markers of damage b) antioxidant defenses superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx), and c) the proinflammatory cytokine TNF-α. Statistical analyses were performed using InfoStat software. Results: The LR and <33 years group showed significantly higher nitrite concentrations compared to older patients [µmol/L <33 years= 4.21(2.55-5.84); ≥33 years= 2.36(1.28-3.51)], along with lower levels of SOD and TNF-α [pg/mL <33 years= 4.55(0.62-6.19); ≥33 years= 6.77(5.08-20.24)]. Clinical pregnancy rates per cycle (CPR) were higher in younger women. In the NR group, no significant differences in redox balance, fertilization rates or CPR were observed, regardless of age. Conclusions: The results reveal a distinct biochemical profile of redox parameters in FF, highlighting an oxidant-antioxidant dynamic influenced by age and ovarian stimulation response. These findings could aid in optimizing clinical strategies based on the redox profile and age of the patients.

A15
DISCRIMINATIVE CAPACITY OF MENTZER INDEX AND IRON PROFILE IN THE DIFFERENTIAL DIAGNOSIS OF MICROCYTIC ANEMIAS

Agüero Aguilera A, Álvarez Asensio NS, Terán M, Ledesma Achem E, Zelaya H, Mónaco ME, Haro C
Inst. de Bqca. Aplicada. FBQF, UNT. Balcarce 747. 4000 Tucumán. Argentina.
E-mail: ana.haro@fbqf.unt.edu.ar

Iron deficiency anemia (IDA) and beta-thalassemia trait (BTT) have similar clinical manifestations despite their different etiologies. The overlap of hematologic parameters makes the differential diagnosis of these microcytic anemias difficult, so it is crucial to evaluate the accuracy of different tools to make an accurate diagnosis and determine the appropriate treatment. Objective: To evaluate the accuracy of iron profile and Mentzer Index (MI) in the differential diagnosis between IDA and BTT. Methodology: Between the years 2023 and 2024, forty-seven patients were studied. They underwent a complete blood count, reticulocyte count, MI, determination of iron deficiency, total transferrin iron binding capacity, % transferrin saturation, ferritin and quantification of hemoglobin (Hb) fractions by capillary electrophoresis (Capillarys 2 flex-piercing, Sebia). Statistical analysis was performed using the SPSS V.25 software, with significant values: $p < 0,05$. Results: 20 subjects with IDA were identified (16 children and 4 adults) and 27 with BTT (12 children and 15 adults). In the BTT group, there was a moderate correlation between HbA2 and MI (rs= -0,47). In the IDA group, there was a strong association between HbA2 and iron deficiency (rs= 0,73) as well as with ferritin (rs= 0,60). Among the 34% of patients with ferritin < 11 ng/mL, MI correctly diagnosed 13% of cases as IDA (true positives), while the remaining 21% were misclassified as BTT (false negatives). In addition, 11% of patients with HbA2 ≥ 3,5 were misclassified as IDA. Conclusion: The results reflect the limitations of using MI and iron profiling as screening tools for the diagnosis

of microcytic anemia. Although quantification of the Hb fractions is a more accurate method, it should be performed after correction of the patient's iron deficiency, as HbA2 levels may be affected by iron deficiency, leading to misdiagnosis.

A16
FROM CHEMOTYPE TO NATURAL PRODUCTS: STRATEGY FOR THE IDENTIFICATION OF BIOACTIVE LACTONES FROM *VERNONANTHURA NEBULARUM*

Urtubey MN[1], Laime RF[1], Frías MA[2], Cartagena E[1], Sosa AM[1,2]
[1]Cátedra de Química Orgánica III, FBQF, UNT. Ayacucho 471. Tucumán. [2]CIBAAL-CONICET. Ruta 9 Km 1125. Sgo. Del Estero, Argentina. E-mail: natyurtubey@gmail.com

Vernonanthura nebularum sensu stricto (Cabrera) H. Rob. (Asteraceae) is an endemic species from northern Argentina and a rich source of elephantopus-type sesquiterpene lactones. Our research group previously reported its insecticidal, antiparasitic, and cytotoxic activities. The objective of this work was to propose a rapid strategy for obtaining a sesquiterpene lactone (SL)-rich phytocomplex from a *V. nebularum* chemotype collected in San Francisco, Jujuy, and evaluate its anti-pathogenic properties. Dried flowers and leaves were analysed directly and separately by FTIR-ATR to confirm the presence of SL in the collected chemotype through diagnostic spectroscopic signals. Chloroform extracts (E) were then obtained from surface-washed leaves (EH) and flowers (EF), with yields of 5.07% and 2.07%, respectively. These extracts were characterized by UV, FTIR-ATR, and ^{1}H-NMR spectroscopy. Both E extracts were cleaned by dewaxing (MeOH at 0˚C) followed by fast column chromatography. SL-enriched fractions were selected by TLC, and combined (F). E and F were evaluated against *Staphylococcus aureus* ATCC 6538 and a hospital-acquired multidrug-resistant strain. FTIR-ATR analysis of leaves and flowers showed bands associated with OH (3328), C-H (2914), and C=O (1732) cm^{-1}, and the spectra of the E recorded characteristic C=O bands of α-methylene-γ-lactone (1770 cm^{-1}) and the methacrylate group (1715 cm^{-1}). These data were correlated with a UV-absorbance maximum at 227 nm and typical ^{1}H-NMR signals confirming the presence of SL in E and F. *V. nebularum* natural products were active against *S. aureus* biofilms. Specifically, EH at 50 µg/mL inhibited the ATCC strain by 70%, while at 100 µg/mL, reduced the biofilm of the multidrug-resistant bacteria by 66%. These effects were linked to inhibited growth.

A17
BIOPROSPECTING OF NATIVE PLANT SPECIES OF THE MONTE DESSERT TO PHYTOREMEDIATION OF AREAS CONTAMINATED BY TANNERY EFFLUENTS

Albornoz B[1], Chocobar Ponce S[1], Olmedo C[2], Ceberio de León I[2], Rosa M[1]
[1]INBIOFIV (UNT-CONICET).
[2]Instituto de Investigaciones sobre Sociedad, Conocimiento y Desarrollo (IISCD). UNdeC, La Rioja.
E-mail: bruaalb@csnat.unt.edu.ar

In Nonogasta (Chilecito, La Rioja), there is a chromium contamination process caused by a tannery, now closed, which dumped its effluents for more than 30 years, with little or no treatment in pools built without safety standards. Tannery effluents are complex and highly polluting, mainly due to the presence of Cr(VI). An alternative treatment for this waste could be phytoremediation. This environmental remediation technology stands out for being economical, easy to implement, and versatile due to the plasticity that plants exhibit in adapting to stress conditions, such as the presence of pollutants. Nonogasta is located in the Monte ecoregion, where environmental conditions are extreme (wide thermal amplitude, high incidence of UV rays, strong winds, and droughts), so the plant species used for remediation must be tolerant to these climatic conditions, a characteristic met by the native species of the region. In this regard, the objective of this study was to select two plant species suitable for use in the phytoremediation of hexavalent chromium. For this, a floristic survey was carried out in the areas surrounding the tannery, and the IVI of the species found was estimated. Additionally, leaf samples were taken from the species found closest to the pools. In these samples, the Cr(VI) content was determined by spectrophotometry. Larrea cuneifolia and Nicotiana glauca were chosen for further testing, as both species

contained Cr(VI) in their tissues but had a healthy appearance. L. cuneifolia was chosen for its high IVI and because previous studies indicate it is tolerant to heavy metals, while N. glauca was selected because it had the highest Cr(VI) content in its tissues and rapid growth.

A18

ANALYSIS OF SURFACE WATER QUALITY IN TRIBUTARIES OF THE SALÍ RIVER BASIN – TUCUMÁN

Molina AI, Ulloa Kreisel ZE, Cisint S, Arce MB, Crespo CA
Inst. de Biología (FBQF- UNT) e Inst. Superior de investigaciones Biológicas (INSIBIO- CONICET- UNT). Chacabuco 461.Tuc Arg, CP 4000. E-mail: aines.molina@gmail.com

Our previous research using surface water samples (WS) collected from the Calimayo and San Miguel streams - two tributaries receiving industrial effluents that discharge into the Colorado River in the Salí Basin - demonstrated *in vitro* morphological alterations in *Rhinella arenarum* embryos during fertilization and subsequent embryonic development. The objective of this study was to assess water quality through physicochemical analysis of WS1 (influent supplying the paper industry), WS2 and WS4 (diversions of industrial effluents into the Calimayo stream), and WS3 (a diversion of industrial effluent into the San Miguel stream). The parameters analyzed included pH, electrical conductivity (EC), total phosphorus, chemical oxygen demand (COD), biochemical oxygen demand (BOD), dissolved oxygen (DO), total solids (TS), total suspended solids (TSS), total dissolved solids (TDS), chlorides, nitrites, and nitrates. In WS1, the fixation of the dissolved oxygen (DO) in the sediment revealed an intense orange precipitate due to the high concentration of DO (11.1 mg/L), indicating good oxygenation. In the remaining samples, a very pale yellow precipitate was observed with low DO values (< 0.2 mg/L), indicative of poorly oxygenated waters. Correspondingly, WS2 showed high values for EC, BOD, and COD, while WS3 had high EC and total phosphorus levels. All the samples were within the standard parameters for pH, chlorides, nitrites, nitrates, TS, TSS, and TDS. The application of the Simplified Water Quality Index (SWQI), calculated for each sample based on COD, TSS, DO, EC, and temperature, revealed good water quality for WS1, poor water quality for WS4, and very poor water quality for WS2 and WS3. Consistent with these findings, WS1 was clear and odorless, while WS2, WS3, and WS4 were turbid and had a strong irritant odor in the respiratory mucosa and solid residues on the surface. These results suggest that the tributaries receiving industrial effluents exhibit poor water quality, which may affect the reproductive function of this species.

A19

CHARACTERIZATION OF THE OVIDUCT OF *CHINCHILLA LANIGERA*: MORPHOMETRIC, HISTOLOGICAL, AND EPITHELIAL SECRETION ANALYSIS.

Medina MF[1], Pucci JF[2], Gramajo-Bühler MC[1,3].
[1]Faculty of Biochemistry, Chemistry, and Pharmacy, UNT. [2]Miguel Lillo Foundation. [3]INSIBIO-CONICET. Chacabuco 461, Tucumán, Argentina. E-mail: maria.medina@fbqf.unt.edu.ar.

The mammalian oviduct plays a vital role in reproductive success, encompassing gamete transport, fertilization, and early embryonic development. A key factor in establishing optimal oviductal conditions is the epithelial lining and the secretory activity of its cells. Under natural conditions, chinchillas exhibit defined reproductive periods followed by gonadal recesses, reflecting seasonal variations. Understanding oviductal physiology is critical for the development of artificial insemination protocols under captive conditions. This study aimed to analyze morphometric and histological parameters of chinchilla oviducts and to evaluate epithelial secretions in animals subjected to controlled photoperiods. Oviducts from 20 multiparous females were dissected, weighed, and measured. Samples were fixed in 4% buffered formaldehyde, 2.5% glutaraldehyde in 0.1M PBS at pH 7.4, and 2% osmium tetroxide in 0.1M PBS at pH 7.4. Histological techniques, including Hematoxylin-Eosin, Mallory's trichrome, toluidine blue, and PAS-AB staining, as well as electron microscopy, were used for processing. Oviduct length and weight values ranged from 47-59 mm and 34-43 mg, respectively. The ampulla displayed greater tubular and luminal diameters than the isthmus. Layer thickness and overall wall thickness were measured,

revealing values of 64.51 ± 12.48 µm in the ampulla and 105.73 ± 23.03 µm in the isthmus. The relative distribution of ciliated cells was higher in the ampulla (65.75%), whereas secretory cells predominated in the isthmus (44.74%). Apocrine secretion of mucoproteins and proteoglycans with acidic residues, along with glycoproteins (both acidic and neutral), was observed in the ampulla. In contrast, the isthmus showed merocrine secretion of only mucoproteins and proteoglycans with acidic residues. The oviduct of *Chinchilla lanigera* exhibits regional differences in wall thickness due to varying histological layers, as well as in cell distribution and secretion composition. These characteristics may indicate functional differences between the ampulla and isthmus during fertilization.

A20

HISTOMORPHOMETRIC CHARACTERIZATION OF MATURE TOOTH ENAMEL IN RATS FED WITH A KETOGENIC DIET

Córdoba ML, Mir M, Romano S, Garat J
Faculty of Dentistry. UNT. Av. Benjamín Araoz 800. 4000 Tucumán, Argentina.
E-mail: juan.garat@odontologia.unt.edu.ar

According to international literature, ketogenic diet has long been used for the treatment of epilepsy in growing children. Given that tooth enamel is actively forming during growth, the objective of this work was to determine the effects of a ketogenic diet on mature tooth enamel using the rat's continuously erupting incisor as an experimental model. 21-days-old Wistar rats were assigned to one of the following groups: control (C) (regular diet) and experimental (E) (ketogenic diet) for 30 days. Body weight and the amount of food consumed were recorded periodically. After ketonemia determination euthanasia was performed. The mandibles were resected, separated in the midline and processed according to the usual technique for inclusion in paraffin or methacrylate. Oriented histological preparations were obtained from the continuously growing incisor at the level of the mesial root of the first molar, allowing us access to the maturation area of the developing enamel. The following histomorphometric parameters were determined: height of the ameloblasts, thickness and volume of enamel. Statistical analysis was performed with the Student "*t*" test. Body weight and the amount of food consumed was statistically lower in group (E), while ketonemia was statistically higher in group (E). The histomorphometric evaluation determines in group (E) atrophy of the ameloblasts, significant reduction in enamel volume and reduction in enamel thickness in some sectors. These results suggest that the ketogenic diet negatively influences mature tooth enamel, inducing alterations compatible with adamantine hypoplasia.

A21

IMPORTANCE OF DYNAMIC HISTOLOGY OF THE KIDNEY IN *PHYLLOMEDUSA SAUVAGII*: NEW INSIGHTS INTO ANURAN ADAPTATION

Vitale MV, Valero JR, Rivas JE, Valdez IC, Pucci Alcaide A
Facultad de Ciencias Naturales e IM. Miguel Lillo 205. Tucumán, Argentina.
E-mail: anapuccialcaide@csnat.unt.edu.ar

The *Phyllomedusa* genus is distinguished from other amphibians by its uricotelic nitrogen metabolism, an adaptation that allows it to thrive in arboreal habitats. The organs involved in this process are the kidneys, as they participate in homeostasis and osmoregulation, consisting of a nephron with a renal corpuscle and a tubular system divided into five segments: neck, proximal tubule, transition segment, distal tubule, and collecting duct. Objective: to perform a histomorphological analysis of the kidney of *Phyllomedusa sauvagii* to provide data for understanding its natural adaptation to the environment. Materials and Methods: samples were obtained from sexually mature specimens of *P. sauvagii* during the reproductive season. They were fixed in 10% buffered formalin and processed using routine histological techniques, stained with Hematoxylin-Eosin and Mallory's Trichrome. Results: *P. sauvagii* has an elongated mesonephric kidney, with a thin capsule of regular dense connective tissue; in some samples, interrenal tissue can be observed. The renal corpuscles are located in the medullary region, and externally to the parietal layer of Bowman's capsule, collagen fibers can be observed, corresponding to loose connective tissue. The corpuscle continues with a short neck of small diameter, with low

cuboidal simple epithelium, whose cells have heterochromatic nuclei and acidophilic cytoplasm. The star-shaped proximal tubule has high cuboidal simple epithelium with microvilli, acidophilic and vacuolated cytoplasm, indicating an active secretion process. The transition segment was not observed. The distal tubule is formed by cuboidal cells with a striated cytoplasmic appearance, ending in the collecting duct, which has a simple cylindrical epithelium, with a narrow and collapsed lumen. Conclusion: the histological adaptations of the kidney of *P. sauvagii* are intrinsically related to its ability to live in arboreal habitats, where water conservation is essential.

A22
IMMUNOHISTOCHEMISTRY OF ESTRADIOL (ERB H-150) AND PROGESTERONE (PR-130) RECEPTORS IN THE OVIDUCT OF *RHINELLA ARENARUM*

Arce MB, Cisint SB, Molina AI, Crespo CA
Inst. de Biología (FBQF-UNT)-Inst. Superior de investigaciones Biológicas (INSIBIO-CONICET-UNT).Chacabuco 461.Tuc Arg, CP4000. E-mail: maria.arce@fbqf.unt.edu.ar

In mammals, numerous studies indicate that the oviductal secretion process is dependent on sex hormones: Estradiol (E2) and Progesterone (P). While both hormones act as positive regulators of secretory function during the reproductive stage in females, E2 promotes an aqueous secretion (mucins and water), whereas P induces a viscous fluid containing glycoproteins and proteins. Our results, developed in the amphibian *Rhinella arenarum*, determined that during ovulation, the Pars Convoluta (PC) of the oviduct secretes oocyte jelly, composed of proteoglycans, glycoproteins, and proteins, which surround gametes as they pass through the oviduct. It was found that ovariectomy followed by exogenous E2 treatment induces the secretion of a 300 kDa mucin, while P induces the secretion of other glycoproteins and proteins, with a 74 kDa protein being the most representative. The aim of this study was to identify, during the ovulatory period and localize in the PC, the presence of steroid receptors for E2: ERβ H-150 (ERβ) and P: PR-130 (PR) using indirect immunohistochemistry. The results show immunolabeling for ERβ in the apical and basal regions of secretory epithelial cells in the pseudostratified epithelium, and only in the luminal area and cilia of ciliated cells. At the level of the glandular layer, composed of simple tubular-acinar glands, immunolabeling is detected in the basal region of glandular secretory cells. A secretory product is characteristically observed in the lumen of each glandular acinus, indicating that the secretory process is functionally active. Immunolabeling for PR is detected in epithelial cells. Both receptors show immunolabeling in the subepithelial plexus, with ERβ also found in the submucosa. The muscle layer surrounding the oviductal mucosa exhibited highly reactive immunolabeling for ERβ. These results demonstrate the presence of these receptors in the PC of the oviduct, regulating its secretory function and motility as oocytes transit and are covered by the jelly secreted by the glandular and epithelial mucosa.

A23
ILLEGAL WILDLIFE TRAFFICKING IN TUCUMÁN PROVINCE AND THE IMPLEMENTATION OF NEW DISSEMINATION STRATEGIES

Mendez MV[1,2], Veggiani Aybar CA[1]
[1]Facultad de Ciencias Naturales e IML. UNT. Miguel Lillo 205. Tucumán. [2]Dirección de Flora, Fauna Silvestre y Suelos, Ministerio de Economía y Producción de la Provincia, Córdoba 1039. Tucumán. Argentina.
E-mail: marivimendez2022@gmail.com

Illegal wildlife trade poses a serious threat to biodiversity and species conservation. In the province of Tucumán, the agency responsible for regulating illegal wildlife trade is the Directorate of Flora, Wildlife, and Soil (DFFSyS) under the Ministry of Economy and Production of Tucumán. A descriptive analysis of illegal wildlife trafficking in the province of Tucumán was conducted, and new dissemination strategies were developed and implemented to raise public awareness about wildlife trafficking and environmental conservation. The analysis was based on data from the DFFSyS database for the period 2020-2023. The dissemination strategies included the development

of resources, identification of media channels, and specification of target audiences. The results indicated that during the study period, 2,130 wild animals were admitted to the Wildlife Rescue and Rehabilitation Centre of the DFFSyS: 90% were birds, 8% mammals, and 2% reptiles. Most admissions were due to confiscations (78%), followed by rescues (22%) and births (1%). The majority of trafficked animals fell into the "Least Concern" category according to the International Union for Conservation of Nature (IUCN), with the exceptions of *Alouatta caraya* (Near Threatened) and *Chelonoidis chilensis* (Vulnerable). Most of the animals came from San Miguel de Tucumán. Publicity strategies included infographics, leaflets, QR codes, audiovisual materials, press releases, training sessions, educational workshops, and the creation of didactic materials. These strategies proved to be highly effective in reaching diverse sectors of society. The results reflect the seriousness of illegal wildlife trafficking in the province of Tucumán and underscore the importance of continuing environmental education and promoting practices that encourage respect for nature and the conservation of biodiversity.

A24

SURVEY OF BENEFICIAL INSECTS AND POTENTIAL PESTS AT THE PERCY HILL BOTANICAL GARDEN-PARK, YERBA BUENA, TUCUMÁN

Acosta CM[1], Salas GM[1,2], Veggiani Aybar CA[1,3]
[1]Facultad de Ciencias Naturales e IML. UNT. Miguel Lillo 205. Tucumán. [2]Jardín Botánico-Parque Percy Hill. Yerba Buena. Tucumán. [3]Instituto Superior de Entomología "Dr. Abraham Willink", Facultad de Ciencias Naturales e IML. UNT. Tucumán. Argentina.
E-mail: contiacosta91@gmail.com

The Percy Hill Botanical Garden-Park represents a remnant of the Yungas Montane Forest, located in the city of Yerba Buena, Tucumán, Argentina. Based on the concept that it is impossible to protect what is not known, the Arthropod Section of the Invertebrate Survey Project at the Percy Hill Botanical Garden-Park aims to expand knowledge of the insect fauna in the area. In this context, from August to November 2023, field and laboratory activities were carried out, including the survey, identification, and preservation of insects of ecosystem and health importance. Five sampling sites were selected for specimen collection, using direct collection techniques (entomological net, entomological aspirator, killing jar) and indirect techniques (pitfall traps, Moericke traps, baited traps, and CDC-type light mini-traps). A total of 2,782 arthropod specimens were collected from the Chelicerata and Atelocerata subphyla. Among the study group, 2,618 specimens of the class Insecta were quantified, belonging to the orders Blattodea, Dermaptera, Orthoptera, Embioptera, Hemiptera, Coleoptera, Neuroptera, Hymenoptera, Diptera, and Lepidoptera. A preliminary taxonomic list of the insects of the Percy Hill Botanical Garden-Park is presented, highlighting those of ecosystem and health importance. Additionally, as an educational proposal, a thematic workshop for children on insects and other arthropods was implemented, focusing on the biodiversity and importance of these in the garden, with the participation of the attendees as small field assistants. The results obtained broaden the appreciation and offer of the tour of the Percy Hill Botanical Garden-Park, emphasizing its importance as a natural habitat for insects, in the midst of an urbanized matrix, which must appreciated and preserved.

A25

COMPARATIVE STUDY OF ENVIRONMENTAL ENRICHMENT IN PUMAS IN THE HORCO MOLLE EXPERIMENTAL RESERVE

Barón MF, Bertolino MG, Caresani Daruich CE, Méndez MV, Palacios N, Rodríguez FP, Hurtado AM
Facultad de Ciencias Naturales e IML (UNT). Miguel Lillo 205, 4000, Tucumán. Argentina.
E-mail: flaviarodriguez@csnat.unt.edu.ar

Captivity tends to reduce the activity of animals, limiting their opportunities for interaction with other individuals and their environment, leading them to display abnormal behaviors related to stress. The reduction of such behaviors is achieved through environmental enrichment, an important strategy in improving the welfare of animals through various techniques that stimulate behaviors similar to those of an animal in its natural

environment. The objective of the work was to compare the results of enrichment in two *Puma concolor* individuals of different ages and sexes from the Horco Molle Experimental Reserve. Cognitive, sensory and feeding activities were carried out through the use of balls, bones, brushes and cardboard boxes. The same ethogram was used on forms and the behaviors observed with and without enrichment were recorded. The results showed that without enrichment the individuals presented a greater amount of passive behaviors, such as *sleeping* or *lying down* (33/38%), and these decreased during enrichment (20/28%). Similarly, a reduction in *aggressive* behaviors (3%) and *pacing* (2%) was observed. Displacement activities such as *jumping*, *running* and *walking* also showed an increase with enrichment (4/10%). Likewise, an increase in exploratory activity, *sniffing* and *observing* (30%) was observed in both individuals; which implies greater attention and connection with the environment by the individual. *Play* increased significantly in both pumas (10%) and *other behaviors* as well (9%), that is, new behaviors were incorporated, extending the behavioral repertoire observed in captivity. The applied environmental enrichment was positive and effective in promoting natural behaviors and reducing those related to stress, helping to improve the well-being of these animals in captivity, and at the same time attending to their different needs. We consider it necessary to highlight the importance of personalizing enrichment practices according to the individual needs of each animal.

A26
ITEMS CONSUMED BY THE BURROWING OWL (*ATHENE CUNICULARIA*) IN URBAN AND PERI-URBAN AREAS OF GREATER SAN MIGUEL DE TUCUMÁN, TUCUMÁN, ARGENTINA

Martínez MV[1], Echevarria AL[1], Fanjul ME[1,2]
[1]Fundación Miguel Lillo, Tucumán, Argentina. [2]Facultad de Ciencias Naturales e Instituto Miguel Lillo, UNT, Tucumán, Argentina.
E-mail: mvmartinez@lillo.org.ar

Urbanization can be defined as an anthropic occupation process that gradually transforms natural environments and includes the presence of relatively permanent human populations in a site. This land use has generated pressures that have influenced the structure and behavior of communities in natural ecosystems, directly affecting many animal species. These alterations can lead to population declines to the point of local extinction, as well as persistence or even expansion. Such is the case for some species of raptors, which have successfully adapted and benefitted from these changes, such as certain species of owls. This study describes the food items found from the analysis of 204 pellets collected from the nests and perches of the Burrowing Owl (*Athene cunicularia*) in 13 urban and peri-urban areas of Greater San Miguel de Tucumán, Tucumán, Argentina, during the summer of 2022. The most abundant items found were invertebrates of the Sacarabaeidae family, followed by the Curculionidae family, among others. In the case of vertebrates, the most consumed were amphibians (*Rhinella arenarum*) followed by rodents (*Mus domesticus* and *Rattus* S/P), and in very low proportion reptiles (Anphisbaenia) and birds (Passeriformes). *Athene cunicularia* demonstrated a generalist and opportunistic diet, fulfilling its role as a natural biological controller of the population level of its prey, preventing them from becoming pests, which is why its conservation and protection is of great importance.

A27
EVALUATION OF THE ANTISECRETORY ACTIVITY OF *VACCINIUM MYRTILLUS* L. EXTRACTS IN A GASTRIC HYPERSECRETION MODEL IN WISTAR RATS

Rubis RA, Taboada FF, Genta SB, Habib NC
Instituto de Biología, Facultad de Bioquímica Química y Farmacia, INSIBIO-CONICET-UNT. Chacabuco 461. Tucumán. Argentina. E-mail: natalia.habib@fbqf.unt.edu.ar

Acid-related diseases are disorders characterized by excessive hydrochloric acid production in the stomach. Conventional treatment includes proton pump inhibitors and antacids, although prolonged use may lead to side effects. Therefore, there is growing interest in phytomedicines as a therapeutic alternative. We previously demonstrated that 10% hydroethanolic (HET) and 10% hydroacetonic (HAC) extracts from the stems of

Vaccinium myrtillus L. (bilberry) exhibit an *in vitro* inhibitory effects on the gastric H^+/K^+ ATPase enzyme. The aim of this study is to evaluate whether HET and HAC extracts from bilberry stems have antisecretory activity using a gastric hypersecretion model in Wistar rats. The pyloric ligation technique combined with bethanechol stimulation was employed in five experimental groups (n=5 each): Group 1 (pyloric ligation control without bethanechol), Group 2 (pyloric ligation control with bethanechol, 0.5 mg/kg, oral), Group 3 (treated with omeprazole, 20 mg/kg, intraperitoneally), Group 4 (treated with HET, 150 mg/kg, orally), and Group 5 (treated with HAC, 150 mg/kg, orally). Measurements of pH, volume, and total acidity of the gastric content were taken for each group. Treatments with HET and HAC produced a significant increase in gastric pH (2.25±0.14 and 2.28±0.25, respectively) and a reduction in total acidity (3.10±0.38 and 3.13±0.35 mEq [H+]/L/4h, respectively) compared to the pyloric ligation control with bethanechol (1.31±0.37 and 4.60±0.14 mEq [H+]/L/4h). Gastric volume significantly decreased in the HET and HAC-treated groups (0.83±0.11 mL and 0.98±0.25 mL, respectively) compared to the pyloric ligation control with bethanechol (1.50±0.20 mL). These findings suggest the promising potential of *V. myrtillus* L. stem extracts for the complementary treatment of acid-related diseases, although further identification of bioactive components and safety assessment are necessary.

A28
SEMISOLID FORMULATION OF *TRIPODANTHUS ACUTIFOLIUS* FLOWERS: ANTIOXIDANT POTENTIAL AND SAFETY

Luque C, Villagra J, Bejarano G, Rojas P, Balderrama E, Reynoso M, Vera N
Farmacoquímica. Instituto Estudios Farmacológicos. FBQF. UNT. Ayacucho 471.Tucuman, Argentina.
E-mail: mcotiluque@gmail.com

Tripodanthus acutifolius (Corpo) grows in the Calchaquí Valleys, Tucumán province. The flowers are traditionally used to treat inflammatory processes, in which free radicals promote oxidative stress, causing damage to biological molecules. The objectives of the study were to evaluate the antioxidant properties and cytotoxicity of the aqueous (AE) and alcoholic (EE) extracts, to pre-formulate and prepare a pharmaceutical gel form and to evaluate its irritant potential. The extracts were obtained by maceration in sterile distilled water and 70% ethanol. The in vitro antioxidant activity was evaluated using DPPH radical scavenging, lipid peroxidation and reducing power assays. The *Artemia salina* viability bioassay was used to study cytotoxicity. The gel was prepared with carbopol 940 and 5% extracts. Six parameters were evaluated (pH, homogeneity, color, texture, extensibility and air absence). The irritant potential was studied using the *in vitro* HET-CAM method. The extracts presented an IC_{50} of 9.6±0.1 µg/ml-EE and 24.5±1.5 µg/ml –EA in DPPH and their capacity to inhibit lipid peroxidation was 68.60% and 79.30% for EA and EE respectively. They did not present toxicity (LC_{50}>1000 µg/ml). The gel formulation did not show changes in physical appearance at 25 and 4°C, nor in extensibility and stability for 40 days compared to the control (base gel). The appearance was shiny and brown. The pH values ranged from 5.0 to 6.5 and were non-irritating. These results suggest the feasibility of topical formulation of Corpo flower gel for potential use in the cosmetic and pharmaceutical industry.

A29
EFFECT OF A DRINK PREPARED FROM BLUEBERRIES AND CHIA FOR THE PREVENTION OF METABOLIC SYNDROME

Martin Alzogaray MF, Alarcón G, Jerez SJ
Faculty of Natural Sciences and IML (UNT). Miguel Lillo 205, San Miguel de Tucumán, Tucumán, Argentina.
INSIBIO (CONICET-UNT). Av. Independencia 1800, San Miguel de Tucumán, Tucumán, Argentina.
E-mail: mfma@csnat.unt.edu.ar

Salvia hispánica (chia) seeds and its derivatives are foods rich in omega 3 (n-3) fatty acids, and *Vaccinium corymbosum* (blueberries) is a fruit rich in anthocyanins, with demonstrated lipid-lowering and hypoglycemic properties, respectively. Objective: To determine the effect of a drink prepared from both regionally relevant products on alterations that characterize metabolic syndrome (MS), in an experimental model of obesity with

normal weight (normal weight obesity model). Methodology: A drink was prepared with chia mucilage and blueberries maceration (B), and its anthocyanin content and phenolic compound was determined. 16 rabbits were separated into 4 groups: control diet (CD, fed with balanced feed), MS (CD with the addition of 8% corn oil and 10% pork fat), CD+B (CD with oral administration of B), MS+B (MS with the drink under study). After 5 weeks of treatment, clinical and biochemical variables were measured. Comparisons were made by one-way ANOVA. Results: No differences in weight or visceral abdominal fat were observed in the animals at the end of the study. In the MS-B group, compared to the MS group, a decrease in basal glucose levels in mg/di was observed (CD: 112.3±2.9; MS: 125±5; CD-B: 94±16; MS-B: 79±14; $p<0.05$), triglycerides in mg/dl (CD:114±14; MS: 191±30; CD-B: 120±0; MS-B: 131±11; $p<0.05$), total cholesterol in mg/dl (CD: 59.6±6.1; MS:70±6; CD-B: 33±0; MS-B: 49±2; $p<0.05$) and the TyG index (biomarker of insulin resistance): CD:8.3±0.2; MS: 9.3±0.1, DC-B: 8.53±0; MS-B: 8.48±0.3; $p<0.05$. Conclusion: The preliminary results allow us to infer that the prepared drink may have beneficial effects for preventing some alterations of MS.

A30

COMPARISON BETWEEN MODELS OF DIET-INDUCED OBESITY WITH AND WITHOUT BODY WEIGHT GAIN AND ASSOCIATED RISK FACTORS

Alarcón G[1,2], Scacchi F, Martin F[1,2], Peral M[1,3], Jerez S[1,2]
[1]Faculty of Natural Sciences and IML, UNT; [2]INSIBIO (UNT-CONICET); [3]Faculty of Medicine, UNT.
E-mail: gabydeljesus@csnat.unt.edu.ar

Obesity is a chronic multifactorial disease. Animal experimental models allow the study of the pathophysiology associated with this condition. One of the most commonly used models is diet-induced obesity caused by high-fat diets. The aim of this study was to compare two models of diet-induced obesity with different fat percentages and administration periods. Twenty-four rabbits were divided into four groups: Control 1 and 2 (C1, C2), fed a balanced diet; DG1, fed a balanced diet with 10% added fat; and DG2, fed a balanced diet with 18% added fat. C1 and DG1 were treated for 12 weeks, while C2 and DG2 were treated for 5 weeks. At the end of the treatment, the animals were euthanized, and clinical and biochemical measurements were taken. Both models showed increased abdominal visceral fat (AVF, C1: 0.92±0.3 g; C2: 1.12±0.25 g; DG1: 5.16±1.2 g; DG2: 2.31±0.14 g; $p<0.05$, ANOVA), basal glucose levels (mg/dl, C1: 98.5 ± 3.2; C2: 113±6; DG1: 138 ± 14; DG2: 132.8±8.8; $p<0.05$, ANOVA), and glucose intolerance. Additionally, DG1 exhibited increased body weight (Kg, C1: 2.2 ± 0.2; C2: 1.9±0.8; DG1: 3.2 ± 0.2; DG2: 2.0±0.5; $p<0.05$, ANOVA), mean arterial pressure (mmHg, C1: 62.7 ± 5.1; C2: 56±2.6; DG1: 75.8 ± 2.3; DG2: 62 ± 7.1; $p<0.05$, ANOVA), and reduced/oxidized glutathione ratio (µg/mg, C1: 0.3±0.12; C2: 0.2±0.004; DG1: 3.9±0.11; DG2: 0.12±0.1; $p<0.05$, ANOVA). DG2 showed increased triglycerides (mg/dl, C1: 92 ± 14; C2: 113±14; DG1: 104 ± 19; DG2: 191.8 ± 40; $p<0.05$, ANOVA) and non-HDL cholesterol (mg/dl, C1: 23.8 ± 3.1; C2: 19.5±3.6; DG1: 20 ± 7; DG2: 53.5±9.2; $p<0.05$, ANOVA). Conclusion: both models exhibit characteristics of metabolic syndrome, including insulin resistance and increased AVF. However, DG1 represents an obesity model with body weight gain and hypertension, without dyslipidemia, whereas DG2 represents an obesity model with normal body weight and dyslipidemia. These models are indicative of different human obesity phenotypes and may be useful in studying the pathophysiological mechanisms that characterize each phenotype.

A31

INFLAMMATORY MODULATION EFFECT ON HUMAN MACROPHAGES CELLS BY PHENOLIC PHYTOCOMPLEXES FROM *GEOFFROEA DECORTICANS*, AND ANALYSIS OF THEIR BIOACTIVE CONSTITUENTS

Pastoriza AC[1], Soberón JR[1,2], Sgariglia MA[1,2]
[1]CONICET; [2] Cát. Fitoquímica, FBQF- UNT. Ayacucho 471. Tucumán, Argentina.
E-mail: acpastoriza@gmail.com

In previous work we demonstrated the absence of cytotoxicity of phenolic phytocomplexes (FCXs) from *Geoffroea decorticans* bark on human lymphocytes. In this study, we determined the inhibition of NO production by iNOS in activated human macrophage cultures, as well as the antioxidant capacity in the same cell model; and we analyzed the chemical composition of the most active FCX. Methodology: The methanolic extract obtained by Soxhlet (1 g) was dried and treated with acetone to separate the phenolic compoundsThese were further fractionated by SPE C18 with methanol:water (4:6 v/v) and methanol (100%) to obtain two FCXs (PGF1 and PGF2). These were dried, weighed and dissolved in DMSO, and tested at concentrations between 0.25-5.00 µg/mL (subcytotoxic concentrations tested with MTT) on HL-60 macrophages (ATCC CCL 240) (10^5 cells/mL) cultured in RPMI 1640, 5% CO_2, 37 °C with LPS, 48 h, along with the corresponding controls. The NO^{2-} concentration in the culture supernatant was measured (Griess, 540 nm). Intracellular antioxidant activity (ICAOA) was measured with a fluorescent probe (DA-H_2DCF, Ex/Em 485/530nm) after inducing oxidative stress with 100 µM H_2O_2. The most active FCX was analyzed by 2D TLC and UHPLC(DAD)-ESI-MS(Q-TOF).
Results: Both FCXs inhibited NO production at the evaluated concentrations, showing better effects at 1 µg/mL (PGF1: 85.20%; PGF2: 74.70%). Additionally, they exhibited good ICAOA; at 1 µg/mL (PGF1) and 5 µg/mL (PGF2) they reduced oxidation by 100%. Phytochemical analysis of PGF1 (the most active FCX) allowed the detection of 5-hydroxybowdichione; galloyl malonyl citrate, and the acids 8-hydroxy-9-oxo-9H-xanthene-1,3-dicarboxylic, methylene gallic, protocatechuic, chlorogenic and gallic; reported for the first time from *G. decorticans* bark. Conclusions: PGF1 stood out as the most effective FCX, modulating LPS-induced inflammation by reducing the overproduction of NO (iNOS) and induced cellular oxidative stress. The effect is likely due to one or more of the compounds identified in PGF1, which is subject of ongoing researches.

A32

BIOLOGICAL PROPERTIES OF A MICROPROPAGATED CULTURE OF *CISSUS SICYOIDES* (L)

Díaz Miranda EN[1], Sánchez SS[1], Mamani LM[2], Alderete MJ[2], Yankelevich C[3], Honoré SM[1,2]
[1]INSIBIO (CONICET-UNT). [2]FBQF-UNT. [3]Biofabrica Misiones.
E-mail: smhonore@gmail.com

Cissus sicyoides (L), known as vegetable insulin, is a species belonging to the Vitaceae family that has been used in traditional medicine to treat various diseases, including diabetes. The aim of this study was to evaluate the biological properties, particularly the hypoglycemic and hypolipidemic activities, of aqueous extracts from leaves of a micropropagated genotype of *Cissus sicyoides* in a rodent-induced diabetes model, in order to characterize the quality of the culture and assess the safety of its consumption. Aqueous extracts (infusion, decoction at 5, 10, and 15%) were analyzed to study the effects of *C. sicyoides* leaves on the glycemia of normal Wistar rats, rats with transient hyperglycemia and streptozotocin-induced diabetic rats (50 mg/kg pc). The study in diabetic animals included the administration of 10% *C. sicyoides* decoction in controlled doses (100 and 300 mg/kg bw/day) or glimepiride (5 mg/kg) for 10 days, and the *ad libitum* administration of the decoction for 30 days. Clinical and biochemical parameters were analyzed in the different groups of animals. Acute and subacute toxicity tests were performed. *C. sicyoides* extracts did not modify the basal glycemia of normal animals. However, both preparations (particularly the 10% decoction) showed a significant anti-hyperglycemic effect ($p \leq 0.05$) in normal rats with transient hyperglycemia. In addition, it showed a strong hypoglycemic effect in diabetic rats in a dose-dependent manner, similar to the effect shown by the reference drug glimepiride and was accompanied by a significant improvement in the lipid profile of the treated animals. Acute and subacute toxicity studies demonstrated that oral administration of 10% C. *sicyoides* decoction did not alter the clinical, hematological,

biochemical, or histopathological parameters in the animals studied. Our findings support using the *C. sicyoides* genotype obtained by micropropagation techniques as a promising source of antidiabetic compounds.

A33

DETERMINATION OF VIABILITY IN MUNG BEAN *VIGNA RADIATA* SEED USING THE TETRAZOLIUM TEST

Cruz L[1], Giunta S[2], Duran RFL[1], Ponce RI[2]
[1]Facultad de Ingeniería. UNJu. Mario Ítalo Palanca N°10. Jujuy. Argentina
E-mail: lilianafabiani@hotmail.com.

The production of this crop is influenced by the use of low- or high-quality seeds; therefore, it is important to have a variety that offers good preservation to achieve high germination rates, vigor, and productive harvests. The objective of this study was to evaluate the viability of seeds using the tetrazolium test at different storage times and concentrations. Mung bean seeds were used, which were hydrated with paper for 18 hours to soften the tissue in an incubator at 25°C. They were then placed in Petri dishes with tetrazolium solution in an incubator at 35°C for 3 hours at various concentrations. After that, the seeds were washed, and the viability was assessed under a magnifying glass. The treatments were as follows: a) T1- 50 seeds stored for 1 year at 0.1% with 3 hours of tetrazolium b) T2- 50 seeds stored for 1 year at 0.5% with 3 hours of tetrazolium. c) T3- 50 seeds stored for 2 years at 0.1% for 3 hours with tetrazolium. d) T4- seeds stored for 2 years at 0.5% for 3 hours in tetrazolium. The evaluated variable was seed viability, with intense red coloration of the embryo indicating viability, while pale pink coloration or lack of coloration indicated low viability or embryo death. All variables were analyzed using ANOVA, and mean comparisons were conducted using Fisher's LSD test ($p < 0.05$) (InfoStat, 2010). The results showed that T2 exhibited better seed viability than T1, and T4 exhibited better viability than T3. The tetrazolium test proved to be an extremely useful tool for quickly determining seed viability. It is concluded that the viability test for mung bean seeds using tetrazolium is optimal at a concentration of 0.5%, and the best results were observed for seeds stored for 1 year.

A34

ANATOMICAL AND TOXICOLOGICAL STUDY OF LEAVES OF *PSYCHOTRIA CARTHAGENENSIS* JACQ. (FALSE COFFEE)

Correa NL[1], Reynoso MA[1], Jaime GS[1,2]
[1]Instituto de Estudios Farmacológicos, Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán. [2]Universidad Nacional de Chilecito.
E-mail: nancy.correa@fbqf.unt.edu.ar

Psychotria carthagenensis Jacq., belonging to the *Rubiaceae* family, is a species widely used for its hallucinogenic properties as a component of the ayahuasca drink by inhabitants of the Amazon rainforest. The objective of this study was to anatomically characterize the leaves of *P. carthagenensis* for identification and quality control purposes, and to evaluate its acute *in vitro* toxicity. For the anatomical characterization, cross-sections and paradermal sections of fresh, dried, and powdered material were prepared using classical histological techniques, 5% KOH dissociation, and histochemical tests for the detection of alkaloids, tannins, oils, and starch. The toxicity study was carried out through a bioassay using *Lactuca sativa* seeds, at doses of 1-10,000 ppm of alcoholic and aqueous extracts, as well as Copper and Zinc (used as positive toxicity controls). Parameters such as lethal dose 50 (LD_{50}) and inhibitory concentration 50 (IC_{50}) were determined. Transverse sections of the leaf revealed a dorsiventral structure, with unistratified upper and lower epidermis, and bistratified epidermis at the level of the veins. The mesophyll consisted of a unistratified palisade parenchyma on the adaxial side, containing idioblasts with raphides, and a spongy parenchyma with three to four layers on the abaxial side. The upper epidermis exhibited isodiametric cells with a thick cuticle, while the lower epidermis presented paracytic, anomocytic, and anisocytic stomata, with simple trichomes on the veins. Positive histochemical reactions were observed for alkaloids, tannins, and oils. The LD_{50} values were 16,666 ppm for the alcoholic extract, 18,181 ppm

for the aqueous extract, and 125 ppm and 18 ppm for copper and zinc, respectively. No significant effects on radicle or hypocotyl length were observed. Anatomical studies provide valuable diagnostic information for the identification and quality control of this species. Exposure of lettuce seeds to the tested extract doses did not produce significant signs of toxicity, with LD50 values being notably higher than those of the reference toxicants. This is one of the first toxicological studies conducted on this species.

A35
ISOLATION AND CHARACTERIZATION OF MICROORGANISMS PRESENT IN SPERM URINE OF AN AMPHIBIAN FROM A TOWN IN TUCUMÁN

Castillo NA[2], Vargas JM[2], Pidutti AM[2], Cipolatti L[1], Iruzubieta Villagra AL[1]
[1]Inst. de Biología "Francisco D. Barbieri". Chacabuco 461. [2]Inst. de Microbiología "Dr. Luis. C. Verna". FBQF-UNT. Ayacucho 471. Tucumán. E-mail: ana.iruzubietavillagra@fbqf.unt.edu.ar

It is known that in wild animals, particularly amphibians, their associated microbiomes are influenced by environmental variations. However, knowledge of the interaction between microbiomes and the host's reproductive biology is limited. This study aims to characterize the cultivable microbiota present in the spermatic urine of *Leptodactylus chaquensis*, an anuran amphibian native to the NOA region. Adult male specimens (n=5) were collected from their natural habitat in the town of Agua Azul (Leales Department) during the species' reproductive period. To induce spermiation, the animals were injected with hCG (100 IU/mL) into the dorsal lymphatic sac, and spermatic urine was collected aseptically from the cloaca. The samples, containing 82.58% ± 0.6% live and motile gametes, were plated on Blood, MacConkey, CLED, and Azide agar for bacterial detection, and on Sabouraud agar for fungal identification. All morphologically distinct colonies were re-isolated on Blood agar for later identification using MALDI-TOF MS. Twenty-nine isolates were obtained, of which 15 were identified at species level as: *Pseudomonas (P.) fulva*, *P. monteilli*, *P. guariconensis*, *P. stutzeri*, *P. putida*, *Enterobacter bugandensis* (2), *Citrobacter (C.) freundii* (3), *C. gillenii*, *Ochrobactrum anthropi*, *Serratia marcescens*, *Acinetobacter (A.) bereziniae* and *A. shindleri*. Five isolates were confirmed at genus level as *Pseudomonas spp*., *Acinetobacter spp*. and *Salmonella spp.* (3). Nine isolates could not be identified using this methodology. No fungal isolates were obtained. This data allows us to: - Establish, for the first time, the characterized composition of the cultivable urogenital and cloacal microbiota of *L. chaquensis*. - Evaluate the influence of the isolated microbiota on the creation of a suitable microenvironment for sperm survival, as well as its impact on the health status of this anuran species.

A36
EVALUATION OF SURFACE PROTEIN VARIABILITY IN DIFFERENT CLONES OF *TRICHOMONAS VAGINALIS*

Krat YA[2], López LA[1, 3], Abdala ME[1,2,3], Rivero MB[1,3], Poggi O[3], Di Lullo D[3], Luna BE[3], Chara MA[1], García S[2], Diosquez M[2], Maldonado D[2], Cáceres J[1], Domínguez MA[1], Luque ME[1,2,3], Volta BJ[1,2], Carranza PG[1,2,3], Rivero FD[1,2,3]
[1]Facultad de Ciencias Médicas. UNSE. [2]Facultad de Agronomía y Agroindustrias. UNSE. [3]Instituto Multidisciplinario de Salud Tecnología y Desarrollo (IMSaTeD)-UNSE-CONICET
E-mail: frivero@unse.edu.ar

Trichomonas vaginalis (Tv) is a sexually transmitted protozoan that infects the human urogenital tract and can cause pelvic inflammatory disease, perinatal morbidity, neoplasia, and susceptibility to other sexually transmitted infections (HIV). This disease remains underdiagnosed because 50-75% of those infected are asymptomatic. Although the reference diagnostic methods, culture and live observation, have a high sensitivity (>90%) they depend on factors such as clinical manifestations, parasitic load, and the experience of the observer. In recent years, diagnostic alternatives have been developed, but they have not been able to replace conventional methods. There is also no effective vaccine against this parasitosis. Surface proteins represent an important target for the generation of diagnostic methods and vaccines, but they often present antigenic variation. For this reason, we have proposed to evaluate whether there is variability in surface proteins between different clones of the same Tv

isolate. Clones were obtained by limiting dilution, mice were immunized and polyclonal sera were obtained against the surface proteins of each clone. In parallel, the surface proteins of each clone were purified by culture and differential ultracentrifugation and immunoassays (IFI and WB) were performed comparing the sera and purified proteins of the different clones. As a result of the IFI, we observed differential patterns in intensity that ranged between 30-70%. In the WB assay, we detected variable patterns in proteins that ranged from 25 to 60 KDa and others conserved with bands >60 KDa. The results showed that although clonal variability is observed in Tv, conserved antigens were also detected that could be used as targets for the development of new diagnostic methods and/or vaccines.

A37

PREVENTATIVE APPLICATION OF HYDROALCOHOLIC EXTRACT OF *CENTAUREA DIFFUSA* OVER *XANTHOMONAS ARBORICOLA* PV. *JUGLANDIS*

Hidalgo LE, Ale CE, Guardia GA, Fortuna AM
Cátedra de Química Orgánica-FAZyV-UNT
E-mail: cesar.ale@faz.unt.edu.ar

Walnuts are produced in the NOA (Argentine North-West), primarily in Calchaquies Valleys of Catamarca and Tucumán provinces. Among the various phytosanitary issues affecting this crop, bacterial blight is a significant concern. One of the main strategies for controlling it is the use of copper salts, which have harmful effects on ecosystems. This has led to research into alternative therapeutic options, such as extracts from plants like *Centaurea diffusa* (Cd). The main goal of this study was to assess the antimicrobial activity of a hydroalcoholic extract of Cd (HEC) on *Xanthomonas arboricola* pv. *juglandis* (XJ). The HEC (70°) was obtained, and an aqueous suspension (1500 µg/mL) was prepared and inoculated in an APG medium, followed by seeding with XJ (10 µL, 10^6 UFC/mL). Controls used included $CuSO_4$ at 2.4 mM (SC) and cnicin at 250 µg/mL (CN), an antimicrobial molecule predominantly found in Cd. Viability and biofilm formation were evaluated. Additionally, HEC, CN, and SC were applied preventively to walnuts of Castile (WC) and pecans (WP) and monitored over 21 days post-infection. Results indicated that HEC reduced 10^2 UFC/mL compared to the *in vitro* control at 48 hours, with no live cells detected. The combination of HEC and SC at 1.2 mM eliminated live cells after 24 hours. Biofilm production under the applied treatments showed variations of 1 mg/mL compared to the control when HEC, CN, and SC were applied. In WC and WP, bacterial populations reached 10^7 and 10^4, respectively, and HEC reduced these populations by 10^6 and 10^3 CFU/mL, demonstrating greater effectiveness compared to CN and SC. The results obtained allow us to propose the HEC as a product with potential for the development of low-cost ecological strategies to prevent the emergence of bacterial blight in walnut trees.

A38

CONTROL OF PHYTOPATHOGENIC BACTERIA ISOLATED FROM *PHASEOLUS VULGARIS* CROPS USING WASTES

Cattaneo-Tarifa VA[1], Saguir FM[1,2], Rodríguez-Vaquero MJ[1,2]
[1]Microbiology Institute of Faculty of Biochemistry, Chemistry and Pharmacy, National University of Tucumán. Ayacucho 471. 4000. Tucuman. Argentina. [2]National Council of Scientific Technical Investigation (CONICET).
E-mail: maria.rodriguezvaquero@fbqf.unt.edu.ar

The objective of this work was to isolate and identify phytopathogenic bacteria present in infected bean plant leaves in Tucumán province; to evaluate the antibacterial activity of ethanolic and fatty extracts from sugarcane filter cake waste (SFCW), white grape pomace, red grape pomace, olive pomace and grape stalk against isolated bacteria. And finally the growth parameter modifications of bean plants in their early stages with the addition of a selected extract were evaluated. The bean crop samples were obtained from Las Talitas, Tucumán province. Leaf samples with disease symptoms were taken at random from 5 different plants. The leaves were washed with sterile distilled water and placed on agarized nutrient broth added with cycloheximide, cetrimide medium and YDC for 1 min and then incubated at 28°C-48 hours. The yellow, convex colonies with entire edges and mucoid

appearance, obtained in YDC medium, and the round, mucous, green colonies developed in cetrimide medium were analyzed for macro and microscopic characteristics, sugar fermentation, citrate utilization, urea, catalase, nitrates and mobility, among others. The antibacterial activity of ethanolic and fatty extracts of wastes (500 µg/ml) was studied on the bacteria isolated using the agar diffusion method. Modifications in germination time, stem length, rigidity and number of leaves of the plants in their first 15 days were evaluated with the addition of the extract that presented the greatest antibacterial activity. The results of the phenotypic analysis indicated that the isolates presumably belong to the genera *Pseudomonas* and *Xanthomonas*. Ethanolic and fatty extracts of SFCW were the most effective in inhibiting the growth of both bacteria and the extracts do not modify the growth of the bean plant in its early stages. These results suggest that these extracts could be considered and evaluated as control agents for these phytopathogens; however, additional studies should be carried out.

A39

NATURAL PRODUCTS FROM *OXALIS TUBEROSA* AS BIOFILM PROMOTERS OF *LACTICASEIBACILLUS CASEI* OF OVINE ORIGIN AND THEIR SURFACTANT AND DETOXIFYING POTENTIAL

Orphèe CHN[1], Torres Briceño S[1], Cruz M[1], Mercado MI[2], Cartagena E[1,3]
[1]Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. [2]Fundación Miguel Lillo. Miguel Lillo 251- [3]INBIOFAL-CONICET-UNT. Av. Kirchner 1900. Tucumán. Argentina.
E-mail: cecilia.orphee@fbqf.unt.edu.ar

Oca rosa (*Oxalis tuberosa*) is a tuber highly appreciated by the Andean population for its nutritional properties. Our previous studies demonstrated that the superficial tissue or *peels* represent a promising reserve of phenolic compounds, flavonoids, coumarins and triterpenes. EtOAc phytoextract (FEX), obtained by partitioning a crude extract, increases the *Lacticaseibacillus casei* CO1 biofilm, as an adaptive strategy. On the other hand, the bacteria isolated from sheep of our province had the capacity to degrade phenol. The first objective of this study was to design a protocol for incorporating lactic acid bacteria stimulated with small amounts of FEX into a medium contaminated with 100 µg/mL of *O*-phenylphenol (OPP) to evaluate bacterial response. The second objective was to investigate volatile and lipophilic metabolites in FEX using GC-MS to establish a relationship between the chemical composition and the determined bioactivity. In the experimental part, the oil spreading test and oxidase test were implemented to determine the mode of action. The quantification of OPP was carried out by the external standard method, using GC-MS with a quadrupole analyser, a DB-5 capillary column (5% phenyl-95% dimethylpolysiloxane) and the following instrumental conditions: injector at 280°C, ramp Column temperature: 60°C (3 min) to 300°C with temperature gradient of 10°C/min. The results demonstrated that FEX enriched in the triterpene lupenone increased the *L. casei* surfactant activity in a medium contaminated with OPP from 80 mm to 320 mm (mineral oil dispersion halo) and, consequently, the OPP degrading capacity mediated by oxidases was increased from 20% (un-stimulated culture) to 73% (FEX-stimulated culture). The investigation acquires environmental relevance since OPP is applied massively in disinfection and veterinary hygiene and is very toxic to aquatic ecosystems.

A40

USE OF CITRUS RESIDUES FOR THE GROWTH OF LACTIC ACID BACTERIA

Scherf E, Cruz RM, Orphèe CHN
Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. Tucumán. Argentina.
E-mail: cecilia.orphee@fbqf.unt.edu.ar - stefy_scherf_@hotmail.com

Introduction: The citrus fruit industries of Tucumán, during the peak-activity period, achieve a production of discarded pulp (PD) approximately of 2 Tn/day. If not treated properly, they produce acid residues that reduce the pH of surface waters and originate effluents with a high amount of organic matter. When they are discharged into the water basins, they cause a serious ecological problem. Objective: to design culture media for microorganisms of livestock interest from citrus discarded pulp, in order to recycle this waste. Materials and Methods: from lemon

discard pulp, a Liquid Residue (M1 base culture medium) was obtained, from which 5 culture media were designed with aggregates in different proportions of glucose (G), peptone (P) and yeast extract (EL): M2= M1 + 0.5%P; M3= M1 + 0.3%G; M4= M1 + 0.5%P + 0.3%G, M5= M1 + 0.5%EL + 0.3%G and M6= M1 + 0.25%P + 0.25%EL. The microorganisms *Lactobacillus amylovorus* LB 31 and *Lactobacillus reuteri* DDL 19 (probiotic strains of the animal gastrointestinal tract) were inoculated at 2% (v/v) in the 5 detailed media; UCF/mL and pH were evaluated between 0 and 48 h of incubation. Results: *L. amylovorus* LB 31 and *L. reuteri* DDL 19 grew in all culture media. For *L. amylovorus* LB 31 (M1 to M6) biomass 24 h: $6x10^8 \pm 0.14 – 7.5x10^9 \pm 0.51$ UFC/mL; *L reuteri* DDL 19, biomass 24 h: $2x10^7 \pm 0.57 – 1.6x10^9 \pm 0.71$ UFC/mL. The final pH values (48 h) for all strains decreased to values between 5.21-2.69. Conclusions: The design of Culture Media for the development of microorganisms of livestock importance from citrus Pulp Discarded from the province of Tucumán, would contribute to recycling these wastes, providing a significant additional benefit to environmental pollution problems.

A41
DIVERSITY OF NATIVE YEASTS IN GRAPES AND MUST IN VINEYARDS OF THE QUEBRADA DE HUMAHUACA

Soruco AS[1,2], Bernal ML[1], Gómez N[1], López Curia V[2], Hernández NE[1,2], Maldonado MJ[1,2]
[1]Instituto de Estudios Celulares, Genéticos y Moleculares, Universidad Nacional de Jujuy. Av. Bolivia 1269, San Salvador de Jujuy. Jujuy. [2]Facultad de Ciencias Agrarias, Universidad Nacional de Jujuy, Alberdi 47, San Salvador de Jujuy. 4600. Jujuy. Argentina. E-mail: antosoruco13@gmail.com

Grape and wine production are of significant economic importance in Jujuy. The Quebrada de Humahuaca, due to its climatic conditions, is ideal for high-quality winemaking. The winemaking process depends on the interaction of microorganisms, with yeasts playing a central role in the transformation of must into wine. Determining the diversity and taxonomic identity of autochthonous yeasts in winemaking regions and wineries is essential. During the 2023 harvest, grapes and must from 14 vineyards in the Quebrada de Humahuaca were sampled. Grape samples were placed in YPD liquid medium at room temperature for 5 days to promote yeast growth, while must samples were processed directly. Dilutions of the obtained pellets were plated on Sabouraud agar plates and incubated for 5 days. Thirty-one colonies with morphological characteristics typical of yeasts were observed under the microscope. They were subsequently inoculated into YPD liquid medium. After 7 days, pellets were prepared for DNA extraction, and PCR amplification of the 5.8S rRNA gene, ITS1 and ITS2 spacers, and the D1/D2 region was performed using ITS1 and NL4 primers. The samples were preserved at -20°C in a culture collection as a source of genetic resources. From a total of 20 isolates, 3 yeast species were identified in both samples: *Hanseniaspora uvarum, Metschnikowia pulcherrima*, and *Pichia kluyveri*, with a similarity index of 0.25. Additionally, the species *Aureobasidium pullulans, M. chrysoperlae, M. bicuspidata, P. kudriavzevii, Rhodotorula babjevae, Wickerhamomyces anomalus*, and *Saccharomyces cerevisiae* were found, 9 of which were found in grapes and 6 in must. These findings underscore the importance of understanding yeast biodiversity in this region to optimize the quality of locally produced wine.

A42
BIOINFORMATIC CHARACTERIZATION OF CODING GENES FOR DEGRADING PROTEINS OF ORGANOPHOSPHORATE COMPOUNDS, FROM DNA OF *TRICHODERMA* STRAINS ISOLATED FROM SOILS OF QUEBRADA DE HUMAHUACA, JUJUY (ARGENTINA)

Gómez N, Maldonado MJ, Hernández NE
Instituto de Estudios Celulares, Genéticos y Moleculares, Universidad Nacional de Jujuy. Av. Bolivia 1269, San Salvador de Jujuy. Jujuy. Facultad de Ciencias Agrarias, Universidad Nacional de Jujuy, Alberdi 47, San Salvador de Jujuy. 4600. Jujuy. Argentina. Email: nicolasgomez1989@gmail.com

Genes involved in the degradation of organophosphorus compounds (OPs) have been characterized in the DNA of *Trichoderma* strains isolated from soils of the Quebrada de Humahuaca, Jujuy. OPs, widely used as pesticides,

pose environmental risks due to their toxicity, persistence, and bioaccumulation. In this context, fungi from the genus *Trichoderma* emerge as key organisms in bioremediation due to their ability to tolerate and degrade these compounds. Through BLAST, sequences corresponding to genes involved in OP degradation, such as *tapdr2*, *hex1*, and *TaPon1-like*, were identified. Specific primers were designed using Primer-BLAST for the amplification of these genes. The PCR-amplified products were evaluated through agarose gel electrophoresis and subsequently sequenced. *In silico* characterization of the hypothetical protein likely encoded by the obtained sequence was performed using ProtParam, Pfam, SWISS-MODEL, PyMOL, and CHARMM-GUI. This characterization allowed the analysis of physicochemical properties, cellular localization, and the most probable molecular structure and function of the hypothetical protein, showing relationships with other enzymes from fungi of the genus *Trichoderma*. The results confirm that the isolated *Trichoderma* strains have a high potential to be used in bioremediation processes. It is concluded that the bioinformatic characterization of genes coding for organophosphorus degrading proteins in Trichoderma offers new perspectives for the development of biotechnologies applied to environmental remediation, opening the door to future research aimed at optimizing the use of genetically modified microorganisms.

A43
EVALUATION OF DIFFERENTIAL EXPRESSION OF *BspA* PROTEINS UNDER NORMAL AND STRESS CONDITIONS IN DIFFERENT ISOLATES OF *TRITRICHOMONAS FOETUS*

Poggi O[3], Abdala ME[1,2,3], López LA[1,3], Rivero MB[1,3], Krat Y[2], Di Lullo D[3], Luna BE[3], Chara MA[1], García S[2], Diosquez M[2], Maldonado D[2], Cáceres J[1], Domínguez MA[1], Luque ME[1,2,3], Volta BJ[1,2], Carranza PG[1,2,3], Rivero FD[1,2,3]
[1]Facultad de Ciencias Médicas. UNSE. [2]Facultad de Agronomía y Agroindustrias. UNSE. [3]Instituto Multidisciplinario de Salud Tecnología y Desarrollo (IMSaTeD)-UNSE-CONICET
Email: frivero@unse.edu.ar

The parasite *Tritrichomonas foetus* (Tf) is a sexually transmitted microorganism with a global incidence that causes infections in the urogenital tract of bovines. It is the causal agent of Trichomonosis, a disease with a high prevalence that results in significant economic losses. Currently, there is no effective treatment that can control this parasitosis. Differentiation processes, including antigenic variation (AV), are considered the primary mechanisms of pathogenicity and virulence in this parasite. The proteins involved are of interest in identifying antigenic targets to develop diagnostic methods and vaccines. Among these is the BspA-like family, which comprises homologous proteins of bacterial adhesins. This study aimed to determine whether BspA proteins exhibit variability in the expression of their transcripts under normal and stress conditions in different Tf isolates. Five Tf isolates were analyzed. Primers were designed for the BspA1, BspA2 and BspA3 genes. The presence of the selected genes in the Tf DNA was evaluated by PCR. RNA extraction was performed on the isolates, followed by cDNA synthesis and expression analysis using RT-PCR. Subsequently, the isolates were subjected to various stress conditions (metronidazole, antibodies, temperature, etc.), and the expression of the genes encoding BspA was assessed. As a result, variation was observed both between isolates and between BspA proteins from the same isolate under normal and stress conditions. This study demonstrates that the BspA surface proteins exhibit variability in Tf isolates, which may explain the difficulty in designing 100% effective diagnostic and treatment methods.

A44

EFFECT OF NICOTINAMIDE ON ISOLATES OF *TRITRICHOMONAS FOETUS* AND ITS APPLICATION AS A STRATEGY FOR THE IDENTIFICATION OF NEW THERAPEUTIC TARGETS

Garcia S[2], Rivero MB[1,3], Volta JB[2,3], Domínguez MA[3], Poggi O[2], Diosquez M[2], Maldonado D[2],Abdala ME[1,2,3], López LA[1,3], Krat Y[2], Di Lullo D[3], Luna BE[3], Chara MA[3], Rivero FD [1,2,3], Carranza PG [1,2,3]
[1]Multidisciplinary Institute of Health, Technology and Development (IMSaTeD, CONICET-UNSE). [2]Faculty of Agronomy and Agroindustry, UNSE. [3]Faculty of Medical Sciences, UNSE
E-mail: pgcarranza@gmail.com

Tritrichomonas foetus is a protozoan that causes Bovine Trichomoniasis (TB), a sexually transmitted disease that causes significant economic losses in our region due to chronic infections for which there is no effective treatment. Parasites such as *T. foetus* evade the host immune response by constantly varying their surface antigens, which contributes to the chronicity of the infection. Our group has demonstrated in related parasites that epigenetic mechanisms control or regulate antigenic variation. Nicotinamide (Nt) is an inhibitor of sirtuins *(Sir)*, a family of NAD^+-dependent deacetylase enzymes that regulate the ability to adapt to environmental changes by modifying gene expression in these parasites. The objective of this work was to evaluate the *in vitro* susceptibility of different *T. foetus* isolates to Nt using a new method validated by our group. Trophozoites were incubated in culture plates with various concentrations of Nt under anaerobic conditions for 48 hours. The half-maximal inhibitory concentration IC_{50} was determined using fluorescein diacetate (FDA) as a viability marker. Structural and/or morphological effects induced by Nt were analyzed by indirect immunofluorescence, showing changes in the cytoskeleton and nuclear structure. The IC_{50} values ranged from 1.25 to 5 mM. These preliminary results lead us to conclude that NAD^+- dependent deacetylase enzymes could be further studied as new therapeutic targets against TB, where Nt or analogues could be used because of their low adverse effects as they are derived from vitamin B_3.

A45

SIGNALING PATHWAYS IN ALPACA EMBRYOS: IMPLICATIONS FOR EARLY DEVELOPMENT

Buglio Ballesteros MG, Castro XA, Argañaraz ME
Instituto Superior de Investigaciones Biológicas (CONICET-UNT), Instituto de Biología FBQF-UNT, San Miguel de Tucumán, Argentina.

Most gestational losses in production animals occur during the first 3 weeks of pregnancy, specifically during the embryonic elongation period, which spans days 10-15 in alpacas. In this work, alpaca embryos at 12-13 days post-conception were analyzed, preserved in RNAlater at –80ºC at the time of slaughter. Then, total RNA extraction was performed using the SV Total RNA Isolation System, its quantification at 260 nm in Nanodrop and cDNA synthesis using MMLV. Through PCR, the genes of the growth factors β-NGF, TrKA, VEGF-A, and NODAL were amplified from the cDNA of the embryos, yielding unique amplicons of 147, 114, 168, and 146 bp, respectively. In addition, total protein from the embryos was extracted and analyzed by SDS-PAGE and mass spectrometry (LC-MS/MS). Bioinformatic analysis, using Metascape software, revealed enrichment in the VEGFA-VEGFR2 signaling pathway (WP3888) with a score of LopP -32,390. Remarkably, 10% the total proteins identified by LC-MS/MS were associated with this signaling pathway. It is known that β-NGF increases VEGF-A (angiogenic factor) mRNA in llama granullosa cells, and that in alpaca endometrium β-NGF and TrKA increases at 15 days of pregnancy. These results, along with the detection of β-NGF, its receptor (TrKA), and a potential target such as VEGF-A, that this signaling pathway may play a crucial role in the elongation phase of camelid embryos. Furthermore, Nodal, a ligand of the TGFβ superfamily, is considered an essential signal for early embryo organization. Our study reveals for the first time the presence of molecular pathways of growth factors crucial for alpaca embryonic development. The detailed study of signaling pathways will allow for a deeper understanding of embryonic development in camelids during early pregnancy, thus leading to improved reproductive and development strategies used in livestock production of the species.

A46
IGF2 AND NOS2 TRANSCRIPT LEVEL VARIATION IN HUMAN SPERM WITH DIFFERENT MOTILITY

Choque FS[1], De Boeck M[1,2], Bonilla F[1,3], Roldán Olarte EM[1,2], Valdecantos PA[1,2]
[1]Instituto de Biología, Fac. de Bioq., Qca. y Fcia, UNT. [2]Instituto Superior de Investigaciones Biológicas (INSIBIO, UNT-CONICET). [3]Servicio de Medicina Reproductiva, Instituto de Maternidad y Ginecología de Tucumán. E-mail: franco.choque@fbqf.unt.edu.ar

Infertility is defined as the inability of couples to conceive or sustain a pregnancy after one year of regular, unprotected intercourse. Male factors are estimated to contribute to 30–50% of cases of infertility. The diagnosis of infertility in men is mainly based on semen analysis, as sperm quality reflects the condition of the germinal epithelium and is a key predictor of fertilisation success. Large amounts of RNA are lost during spermatogenesis; therefore, minimal RNA contents are present in mature sperm. Evidence shows that the sperm transcriptome may play regulatory roles in spermatogenesis, fertilisation, and embryonic development. Therefore, studying the sperm transcriptome is crucial for identifying fertility biomarkers. This study aimed to compare the mRNA levels of three genes in sperm with different motility characteristics: NOS2 (inducible nitric oxide synthase), involved in nitric oxide production during inflammatory responses; IGF2 (insulin-like growth factor 2), a paternally expressed imprinted gene; and GAPDH (glyceraldehyde-3-phosphate dehydrogenase), a gene linked to metabolic function. Two sperm groups were isolated by density gradient centrifugation from a semen sample of a healthy male, with a sperm count of 70 x10^6/ml: group 1 (rapid, progressive, and linear motility) and group 2 (slow progressive, non-progressive, and immotile). Total RNA was extracted from each group, and transcript levels were evaluated by RT-qPCR. The results showed that IGF2 and NOS2 transcript levels were higher in group 2, while GAPDH showed no significant differences between the two groups. Differences in the transcript levels of the analysed genes may provide valuable insights into spermatogenesis, male fertility, and embryonic development.

A47
MEDIUM LETHAL DOSE OF ESSENTIAL OILS FOR HONEYBEE

Albo GN[1], Leniz D[1], Grattoni A[1], Córdoba SB[2]
[1]Facultad de Ciencias Agrarias y Forestales. UNLP. 60 y 119. La Plata. Buenos Aires. Argentina. [2]Facultad de Ciencias Veterinarias. UNLP. 60 y 118. La Plata. Buenos Aires. Argentina.
E-mail: albo.graciela@yahoo.com.ar

Chalkbrood is a mycosis caused by *Ascosphaera apis*, leading to the mummification of honey bee larvae (*Apis mellifera*, L.). Essential oils (EOs) are secondary metabolites of plants known for their antimicrobial properties. This study aimed to determine the acute oral toxicity of eight EOs on adult bees, whose *in vitro* effectiveness had been previously assessed. EOs from *Elionorus muticus*, *Cymbopogon citratus*, and *Acantholippia seriphioides* were evaluated at doses of 0.25 to 8 micrograms of active ingredient per bee (µg p.a./bee). EOs from *Lippia alba* chemotypes (qt.) carvone and linalool, *Lippia junelliana*, *Lippia turbinata*, and *Schinus molle* were tested at 1 to 32 µg p.a./bee, formulated in a 50% (w/v) sucrose solution (sol. sac.) with 2.5% 70° alcohol (70° alc.) as a diluent. The control diluent used was the 50% sucrose solution with 2.5% 70° alcohol. Dimethoate (high toxicity) was tested at a range of 0.02 to 0.64 µg p.a./bee, and ketoconazole (high effectiveness) at a range of 0.005 to 0.16 µg p.a./bee. Adult bees were collected from field colonies and anesthetized for treatment, with 10 bees per flask and 10 replicates per treatment. After fasting for two hours (h), they were fed with 200 µL of the 50% w/v sucrose solution along with the EO concentration and diluent. Each bee was allowed to consume 20 µL of the formulation *ad libitum* over 5 hours to ensure adequate consumption. They were then fed with the sucrose solution. The flasks were kept in darkness under controlled environmental conditions. Bee mortality was evaluated at 24, 48, and 72 hours. The Median Lethal Dose (LD_{50}) was calculated using PROBIT Regression. The LD_{50} for dimethoate was 0.20, 0.18, and 0.12 at 24, 48, and 72 hours, respectively, which is considered normal for *"highly toxic"* products. All EOs studied had LD_{50} values higher than 100 µg w.a./bee, categorizing them as *"virtually nontoxic"* products.

However, for *A. seriphioides* and *L. alba* carvone, it was shown that the EOs were dose-time dependent, significantly reducing the LD_{50} value at 48 and 72 hours.

A48

TOXIC EFFECT OF ESSENTIAL OILS ON LARVAL STAGES OF HONEY BEE

Albo GN[1], Altamirano PR[1], Juárez M[2], Córdoba SB[3]
[1]Facultad de Ciencias Agrarias y Forestales. UNLP. 60 y 119. La Plata. Buenos Aires.[2]IRB-INTA. Las Cabañas and Los Reseros. Hurlingham. Buenos Aires. [3]Facultad de Ciencias Veterinarias. UNLP. 60 y118. La Plata. Buenos Aires. Argentina.
E-mail: albo.graciela@yahoo.com.ar

Ascosphaera apis is the fungus that causes chalkbrood in honey bee larvae (*Apis mellifera*, L). Essential oils (EOs) are complex compounds with antifungal activity. This study aimed to determine the larval toxicity of EOs. Three toxicity experiments were conducted on open and capped broods in honeybee colonies. High, medium, and low doses were used, equivalent to ten, five, and two times theMIC_{50} (µg/mL) of the EOs *Elionorus muticus*, *Cymbopogon citratus*, *Acantholippia seriphioides* (200), *Lippia alba* chemotypes (qt.), carvone (800) and linalool, *Lippia junelliana*, *Lippia turbinata* (1,600) and *Schinus molle* (3,200). During the first inspection (day zero), a section of 180 cells was marked on a frame with open brood containing eggs, small and large larvae, as well as empty cells with pollen or nectar. The EOs were administered in candy form. On day 7 post-treatment (second inspection), the following were considered viable brood: capped brood (from 1st to 6th instar larvae noted in the first inspection); large larvae (from eggs observed on day zero); and empty cells that previously contained eggs or small larvae (which had been counted as replaced). On day 21 (third inspection), the number of hatched broods (empty cells with eggs or small larvae) or newly emerged brood (with colored eyes) was measured in the areas marked during the first inspection. If large or capped larvae with clear eyes were observed, larval mortality was inferred to have occurred between the first and second weeks, indicating replacement of laying. The only EOs with mortality rates below 14%, which is considered "normal" for honeybee larvae, were *A. seriphioides*, *E. muticus*, *L. turbinate* and *L. alba* qt. carvone at low and medium doses; *C. citratus* at low, medium and high doses; *L. alba* linalool at low; and *L. junelliana* and *S. molle* at medium doses. In capped brood, only the EOs of *A. seriphioides*, *E. muticus* and *C. citratus* were non-toxic at any dose. The EOs in this study should be applied at low or medium doses to avoid toxicity.

A49

BREEDING OF PASTORIC HENS

Casanova H[1], Albo G[1], Schwemler E[2], Insaurralde A[2], Altamirano R[1]
[1]Facultad de Ciencias Agrarias y Forestales. UNLP. 60 y 119. La Plata. Buenos Aires. [2]Productor. Florencio Varela. Buenos Aires. Argentina.
E-mail: horacio.9011@gmail.com

Poultry farming is a strategic sector for boosting regional economies. The management of cage-free hens that produce eggs for consumption, with access to pasture, improves animal welfare. The aim of this study was to evaluate the uniformity of rearing Brown Nick H&N pullets to achieve the appropriate pre-lay weight, optimizing their laying cycle. From 1 to 21 days of age, 300 pullets from alternative systems were placed in 3 boxes (100 pullets per box), each equipped with wood shavings, a brooder, an infrared lamp, two tray feeders, and two baby drinkers. At the 4th week, the pullets were moved to an 18 m² shed, with wood shavings, six large hoppers (10 kg each), six drinkers for rearing pullets, and four warm LED lights installed on the ceiling. In the 9th week, perches and boxes with ashes were added inside the shed. Music was played outside to minimize the birds' fear of noise, and the birds were allowed to graze in a 144 m² area enclosed by bird-proof perimeter fencing and partial shade for 3-4 hours. The weight of 60 birds was monitored weekly from the 2nd to the 16th week. The weights were then fitted to a logistic growth model using non-linear regression. The results showed an excellent fit to the growth model (R^2=0.988) with significant parameters, estimating an average weight of 1,353.9 grams (g) by the 16th

week of the flock, similar to the 1,367 g suggested by the line manual. The weekly weighing ensured that the birds reached the appropriate pre-lay weight.

A50
MANAGEMENT INCIDENTS IN CAGE-RAISED AND FLOOR-LAYING HENS

Cardaci PP[1], Benavidez EO[1], Altamirano PR[2], Albo GN[2]
[1]Facultad de Ciencias Veterinarias. UNLP. 60 y 118. La Plata. Buenos Aires. [2]Facultad de Ciencias Agrarias y Forestales. UNLP. 60 y 119. La Plata. Buenos Aires. Argentina.
E-mail: pcardaci@fcv.unlp.edu.ar

Consumers have increasingly demanded eggs from hens raised in alternative cage-free systems. The objective of this study was to compare the mortality rates of layers in different rearing systems. Two groups (G) of 900 Lohmann Brown layers, aged 20 to 100 weeks, were analyzed in Berazategui, Buenos Aires, Argentina. G1 consisted of chicks raised on the floor. At week 17, perches and nests were added in the same shed where they continued to lay eggs. G2 was reared in cages in an automatic shed with a controlled environment. At week 16, they were moved to another shed, remaining on the floor until the end of their productive life. The number of dead birds per day was recorded, and the mortality percentage was calculated. Data were analyzed using the Wilcoxon test (Mann-Whitney U). G1 (floor) had an accumulated mortality of 147 birds (average: 0.27 deaths/week), compared to G2 (cage), which had an accumulated mortality of 177 birds (average: 0.31 deaths/week) over the same period. The maximum number of deaths per week was 14 birds in G1 versus 22 in G2. No significant differences were found between groups (p value = 0.0944). When analyzing the effect of mortality over time, two different behavioral models were fitted for each group. In both cases, the same number of layers was used. For G2 (cage), bird mortality began earlier and increased over the weeks, with productive animals being removed weekly. In G1, the initial hens remained alive longer before mortality began, losing hens towards the end of the productive period. Chicks raised in cages faced difficulties adapting when transferred to the floor-laying house. Future studies should focus on optimizing floor-laying rearing to minimize management stressors caused by transferring hens from cages to the floor.

A51
EVALUATION OF RESISTANCE OF *AMARANTHUS HYBRIDUS* L. TO GLYPHOSATE HERBICIDE IN THE PROVINCE OF SANTIAGO DEL ESTERO

García JM[1,2], Abdala GC[1,2], Pereyra P[1,2], Lescano JA[1,2], Ochoa MC[1,2], Rivero FD[1,2,3], Abdala ME[1,2,3]
[1]Facultad de Agronomía y Agroindustrias, (UNSE). [2]Instituto para el Desarrollo Agropecuario del Semiárido (UNSE). [3]Instituto Multidisciplinario de Salud, Tecnología y Desarrollo (UNSE-CONICET).
E-mail: abdalaeuge@gmail.com

The strong selection pressure exerted by the use of herbicides led to the evolution and emergence of resistance in weeds. The herbicide glyphosate (N-(phosphonomethyl) glycine) inhibits 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS), a critical enzyme in the synthesis of aromatic amino acids, and *Amaranthus hybridus L*. is one of its resistant weeds. It has several mechanisms of action to generate resistance, including the triple amino acid substitution TAP-IVS of the EPSPS gene. In the agricultural area of Santiago del Estero (SDE), this weed is problematic and presents resistance mechanisms to glyphosate that have not been elucidated, so our objective was to evaluate them. Specimens of *A. hybridus* from Roversi (R), Quimilí (S) and El Zanjón (Z) were collected and botanically identified. Dose-response curve assays for glyphosate were developed for each biotype, and survival and the effect on biomass reduction were determined. ANOVA and Duncan's test were performed, and the log-logistic model was used for the dry weight of plants/glyphosate dose relationship. Genomic DNA was extracted from seeds with the DNAzol reagent, and specific primers of the EPSPS gene were analyzed by PCR. Finally, the gene segments of each biotype were sequenced and mutations were detected by bioinformatics analysis. The results of the curves, survival percentages, and statistical analysis and the sequencing of the EPSPS gene of each

biotype were consistent. There is resistance to glyphosate in SDE in *A. hybridus*, in S and R, and susceptibility in Z. This work represents the first study in the province to determine the presence of the TAP - IVS mutation of the EPSPS gene in *A. hybridus* resistant to glyphosate. It represents a major advance in the development of dose-response curves for the species in question with this herbicide, allowing statistical and phytotoxicity data to be compared with molecular results.

A52

WELL-BEING AND ENVIRONMENT: A STUDY ON INHABITANTS OF THE JUJUY´S RAMAL IN CONTRASTING CLIMATIC SEASONS

González Poma EC[1,2], Hernández NE[1,2,3]
[1]Instituto de Estudios Celulares, Genéticos y Moleculares (ICeGeM)-UNJu. Av. Bolivia 1269. [2]Facultad de Ciencias Agrarias-UNJu. Alberdi 47. [3]INECOA-CONICET-UNJu. Gorriti 237. S. S. de Jujuy.
E-mail: emanuelcgonzalez@fca.unju.edu.ar

Jujuy´s province is environmentally heterogeneous. Part of it consists of the so-called *Ramal*, which contains the areas with the lowest altitudes in the province, characterized by a dry and cool winter season, and a hot humid summer season. To study the relationship between environment and perceived well-being (PWB) among inhabitants of Jujuy´s Ramal, Climatic Comfort (CC) and PWB were determined using the WHOQOL-BREF (W-B) instrument, hypothesizing that there is a relationship between PWB and CC. To accomplish this, 67 volunteers of neutral chronotype (Horne-Ostberg questionnaire), aged between 18 and 40, were studied. Data were collected during contrasting seasons of the year (around the solstices), obtaining a four-dimensional profile (mental health -MH-, physical health -PH-, social relationships -SR- and environment -E-) and two individual topics regarding the perception of quality of life (Q1) and personal health. The results obtained on PWB showed psychometric resolving power, effectively distinguishing between contrasting seasons of the year. The statistical analysis (Non-parametric: Kruskal Wallis, Parametric: (ANOVA–Fischer Test) revealed significant differences for the variables Q1 p=0.0299 and MH (p=0.0064), and highly significant differences for E (p=0.0001), whose means showed higher values for the winter season, aligning with the CC, which is notable for being a unique case in the province, as higher-altitude regions typically show the opposite summer-winter relationship.

A53

RELATIONSHIP BETWEEN THE RS57875989 POLYMORPHISM OF THE PER3 GENE AND SLEEP DISORDERS IN DIABETIC PATIENTS

Borsetti HM, Llampa SC,Vale AA, Vilte JC, Rios JJ
Instituto de Biología Celular, Molecular y Genética. Universidad Nacional de Jujuy. Av Bolivia 1269. CP4600. Jujuy. Argentina.
E- mail: hborsetti@yahoo.com.ar

The biological clock (BC) regulates the sleep cycle and metabolism. The *Period3* (*Per3*) gene, a component of the molecular BC, modulates sleep architecture. The Per3 gene has a polymorphism, rs57875989, a tandem repeat in exon 18 (VNTR 4-5 repeats), which affects phosphorylation sites in the protein and, consequently, the functioning of the clock. *Per3*VNTR is associated with circadian typology or chronotype: 4 repeats are linked with an Evening chronotype, while 5 repeats are linked with a Morning chronotype. Previous reports associate the Evening chronotype with metabolic alterations in type 2 diabetic (T2D) patients. The objective of this study was to characterize the sleep habits of T2D patients and determine their relationship with *Per3*VNTR. The study involved 452 T2D patients (124 men and 327 women, aged 46-90 years) who were randomly surveyed in a doctor's office to determine sleep habits, self-reported sleep disorders (ASA), and consumption of psychotropic medications. Allele and genotype frequencies were calculated from DNA samples obtained from saliva and analyzed by PCR. A higher frequency of allele 4 (0.89) compared to allele 5 (0.11) was observed, with genotype 4/4 (0.81) predominating over genotypes 4/5 (0.17) and 5/5 (0.02). There was no significant difference in genotype

distribution by sex. ASA affected the majority of T2D patients (56%), being more frequent among women (65.2%) than men (38.7%). Additionally, the consumption of psychotropic drugs was higher among patients with ASA, with women consuming more than men (38.2% vs. 20%). A higher frequency of ASA was also observed in T2D patients with *Per3*VNTR 5 compared to *Per3*VNTR 4 (73% vs. 55%). The results indicate that ASA are more frequent in women, potentially due to their slightly shorter circadian period. There was also a higher consumption of sleep medications among women, predominantly benzodiazepines. Despite the marked predominance of Per3VNTR 4 in the sample, ASA were more prevalent in *Per3*VNTR 5 genotypes (X2 $p<0.05$), suggesting an important role of this allele in the pathophysiology of T2D patients.

A54

FIRST MOLECULAR SCREENING AND BIOAUTOGRAPHIC DETECTION OF ANTIFUNGAL AGENTS IN *JUSTICIA MANDONII* AND *JUSTICIA SQUARROSA*

Aristimuño Ficoseco ME, Maldonado GE, Sanchez Matías MH; Sampietro DA
Faculty of Biochemistry, Chemistry, and Pharmacy. National University of Tucumán, Ayacucho 471, Tucumán.
E-mail: maldonadoguillermo@live.com

Fusarium graminearum causes rot in wheat and corn ears, affecting grain yield and quality, particularly by contaminating it with deoxynivalenol and other mycotoxins, which pose a risk to human and animal health. The chemical control of *F. graminearum* is currently challenged by fungal resistance, the toxicity of the fungicides used, and the increased incidence of the disease due to climate change, necessitating new antifungal agents. This study conducted a first molecular screening and bioautographic detection of antifungal principles in native NOA plants (*Justicia squarrosa* and *J. mandonii*), which have not yet been characterized for their antimicrobial properties. Metabolites were sequentially extracted from the leaves and stems of both plants using dichloromethane, ethyl acetate, and methanol. These extracts were tested against *F. graminearum* through point-seeding bioautography at doses of 500 µg and 1000 µg, with podophyllotoxin as a positive control, determining inhibition zones (IZ). The dichloromethane extracts were then filtered through florisil. The filtrates underwent silica gel thin-layer chromatography with chloroform-dichloromethane, revealing secondary metabolites with specific reagents, and TLC bioautography. Point-seeding bioautographies indicated antifungal activity in the dichloromethane extracts of *J. mandonii* (IZ = 2-1.3 cm, 1000-500 µg, leaves; IZ = 1.3 cm, 500 µg, stem), and in the dichloromethane and ethyl acetate extracts of *J. squarrosa* (IZ = 0.8-1.5 cm, 1000-500 µg). Clean-ups with florisil allowed the recovery of higher levels of non-chlorophyllous compounds in the dichloromethane extract of *J. mandonii*. TLC bioautographies of this extract indicated antifungal principles against *F. graminearum* at Rf = 0.25 and 0.5, which may be lignans. Further separation and identification of the bioactive agents will continue.

A55

COMBINED ACTION OF *LARREA DIVARICATA* EXTRACT AND MONENSIN ON LACTIC ACID BACTERIA CONTAMINATING BIOETHANOL FERMENTATIONS

Maldonado G, Irina K, Sampietro DA, Aredes Fernández PA
FBQF. UNT, Ayacucho 471, Tucumán. Email: maldonadoguillermo@live.com

Tucumán is the largest producer of bioethanol in the country. The production is carried out through the fermentation of sugar-rich substrates, such as molasses and sugarcane juice, using *Saccharomyces cerevisiae*. The fermented liquid is then distilled and dehydrated to obtain anhydrous ethanol. Lactic acid bacteria (LAB) are contaminants in this process. They reduce ethanol production by competing for available carbon and producing lactic acid, which inhibits yeast growth. The presence of LAB is controlled by antibiotics such as monensin (MO). However, antibiotics are expensive and have a negative environmental impact. This could be minimized by using extracts from readily available plant sources, such as *Larrea divaricata*. In this study, we investigated the combined action of the ethanolic extract of *L. divaricata* (EE-LaDi) and MO against four LAB species isolated from fermentation tanks. Microdilution assays were performed using MRS medium. 96-well plates were loaded with serial dilutions of EE-LaDi and MO using a checkerboard design, followed by the addition of bacterial inoculum. The bacterial density in each well was 5×10^5 CFU/ml. The plates were incubated at 30°C for 12 hours,

after which the optical density at 630 nm was measured using a microplate reader. The fractional inhibitory concentration index (FICI) was calculated from the minimum inhibitory concentration values obtained for EE-LaDi and MO tested separately, as well as in combination. EE-LaDi demonstrated an additive effect in combination with MO against all evaluated LAB, with FICI values ranging from 0.54 to 1.03. Our results suggest that it is possible to develop a prototype that minimizes the use of MO, based on EE-LaDi/MO mixtures, for control of LAB contamination in the bioethanol production.

A56
CHARACTERIZATION OF ACETIC BACTERIA OF TECHNOLOGICAL INTEREST DESTINED FOR VINEGAR PRODUCTION.

Stivala MG[1,2], Maldonado G[1], Apud GR[1], Aredes Fernandez PA[1,2]
[1]Facultad de Bioquímica, Química y Farmacia. UNT. Tucumán. [2]CONICET.
E-mail: maria.stivala@fbqf.unt.edu.ar

Currently, vinegar has gained popularity for having bioactive compounds derived from raw material and microbial metabolic activity. Acetic acid bacteria (AAB), especially those of *Acetobacter* genus, tolerate high ethanol concentrations, which is essential for the efficient production of acetic acid (AA) in alcohol-rich substrates (wine or cider vinegar), optimizing the performance of industrial processes. This work aims to isolate, to select and to identify BAA from artisanal vinegar and from a spoiled wine, both of regional origin. Vinegar and wine samples were inoculated in 3 enrichment broths (I, II and III) (30±1°C, 72 h). Then, they were streaked on GEY- $CaCO_3$ agar medium (30±1°C, 10 d). Colonies were isolated and phenotypically characterized (cells morphology, catalase activity and cytochrome c oxidase). Genotypic identification was carried out by 16S ribosomal RNA sequencing. A screening was performed based on the AA production capacity and the acetification rate (AR). For this purpose, the BAA were inoculated in RAE broth, added with AA (0.5% w/v) and ethanol (6% v/v) and they were incubated (30±1°C, 72 h, 200 rpm). Total acidity was determined by titration (g/L AA). VA was determined by difference in AA concentrations (g AA/L) as a function of difference in incubation time. A total of 21 bacteria were isolated from vinegar (BAA_1) and 18 from spoiled wine (BAA_2). Two genera and three different species were identified, yielding 18 *Acetobacter aceti*, 16 *A. pasteurian*us, and 5 *Gluconobacter oxydans*. The AA production values were ranged from 3 to 26 g/L and 7 to 9 g/L for BAA_1 and BAA_2, respectively. In conclusion, *A. aceti* produced the highest concentrations of AA, resulting in a higher AR under the assayed conditions. For the first time, autochthonous BAA that tolerate the presence of ethanol and acetic acid were isolated and they could be used as starter cultures, by improving both quality and yield in industrial processes.

A57
POTENTIAL OF *NELTUMA RUSCIFOLIA* EXTRACT IN PRESERVING ANIMAL FEED: ANTIFUNGAL ACTIVITY AND NUTRACEUTICAL PROPERTIES

Gómez AA[1], Sanchez Matías MH[1], Colombres MS[1], Belizán MME[1], Bueno DJ[2], Sampietro DA[1]
[1]FBQF. UNT, Ayacucho 471, Tucumán. [2]EEA Concepción del Uruguay, INTA, Casilla de Correo N°6, 3260, Entre Ríos. E-mail: diego.sampietro@fbqf.unt.edu.ar

This work investigated the potential of the ethanolic extract (EE) of *Neltuma ruscifolia* leaves and its alkaloid fraction (AF), analyzing antifungal activity, nutraceutical properties, and general toxicity. Phenolic content (Folin-Ciocalteu) and antioxidant capacity (DPPH) were determined for EE. EE, AF, and potassium sorbate (PS) were tested in microdilution (72 h, 30°C, YES medium) against *Fusarium verticilliodes*, *F. graminearum*, *Aspergillus parasiticus*, *A. nomius*, and *A. flavus*, and their combined effects using a checkerboard assay. Toxicity was also assessed using *Artemia salina*. The antifungal activity of EE, EE+PS, and PS was evaluated in feed used for starter/pre-starter chickens, inoculated with *A. flavus* (2 weeks, 30°C), measuring fungal viability (FV), biomass (B), and aflatoxin accumulation (AF) on days 7 and 14. Lipid oxidation (TBARS) and antioxidant activity (DPPH) in the feed were also determined. EE was high in phenolic compounds and antioxidant activity (332±18 mg gallic acid equivalent/g and $IC_{50\ DPPH}$=125±5 µg/ml). Microdilution tests showed the lowest MICs for AF (375-750

µg/mL), followed by EE (750-1500 µg/ml) and potassium sorbate (PS, 1500 µg/ml). EE and AF synergized with PS (2:1, w/w). EE and EE+PS showed no general toxicity (LC_{50} > 1000 µg/ml) and were selectively fungitoxic. Applied to feed at MIC and 2xMIC, EE and EE+PS reduced FV by 93-99% and B by 60-70% on day 14, similar to PS (94% viability; 60% biomass). EE and EE+PS reduced AF by 90%, while PS reduced it by 76-78%. All three agents completely suppressed fungal growth at 2xMIC. Broiler feed treated with EE or EE+PS at MIC levels reduced lipid oxidation for 14 days and improved antioxidant activity for 7 days. EE and EE+PS are promising preservatives and deserve further investigation.

A58
JUSTICIA XYLOSTEOIDES STEM EXTRACT: PRELIMINARY ANALYSIS OF ITS ANTIFUNGAL CONSTITUENTS

Sanchez Matias MH[1], Gómez AA[1], Tanguy Guillo S[2], Kritsanida M[2], Sampietro DA[1]
[1]LABIFITO, Facultad de Bioquímica, Química y Farmacia, UNT, Ayacucho 471 (4000), Tucumán. [2]UMR CNRS 8038 CiTCom, Faculté de Pharmacie, Université Paris Cité, 4 avenue de l'Observatoire, 75006, París, Francia.
E-mail: diego.sampietro@fbqf.unt.edu.ar

Fusarium species cause rot in cereal grains. Currently used commercial fungicides have multiple drawbacks, making it necessary to develop new antifungals. Previously, we determined that several extracts of *J. xylosteoides* obtained with dichloromethane and ethyl acetate are antifungal. This study quantitatively evaluated the activity of the stem extracts and preliminarily analyzed their antifungal principles against *F. graminearum*. Ground stems of *J. xylosteoides* were sequentially extracted with dichloromethane and ethyl acetate. The extracts were evaporated to dryness and dissolved in reduced volumes, and tested against *F. graminearum* using point-seeding bioautography to determine the minimum inhibitory dose (MID). Both extracts were applied to silica gel thin-layer chromatography plates, which developed with different mobile phases, and the separate constituents were visualized under $UV_{254\text{-}365\ nm,}$ and UV_{365nm} light, after spraying with 2-aminoethyl ester of diphenylboric acid (NP). Subsequently, thin layer bioautographs were carried out in silica gel. MID values of 62.5 µg (dichloromethane extract) and 125 µg (ethyl acetate extract) were obtained. The mobile phase that provided the best separation of constituents was dichloromethane-methanol, showing similarities in the composition of both extracts, with coinciding antifungal active constituents. The latter was located at Rf = 0.89 and Rf = 0.12-0.35, visualizing colors suggesting lignans and flavonoids, respectively. The results obtained suggest that the constituents causing antifungal activity are similar in both extracts, and are phenolic compounds, so further isolation and elucidation will be carried out.

A59
PHYTOTOXICITY TESTS OF NATURAL PLANT-ORIGIN PRODUCTS IN HYDROPONIC CROPS

Hernández ML[1], Terán P[1], Merep P[2], Ajmat MT[1], Bonilla F[1]
[1]Instituto de Biología. Facultad de Bioquímica, Química y Farmacia, Chacabuco 461. UNT. Tucumán.
[2]Instituto de Química Orgánica. Facultad de Bioquímica, Química y Farmacia, Ayacucho 471. UNT. Tucumán.
E-mail: luz89he@gmail.com

Phytotoxicity studies are essential to assess the acute and chronic effects of potential insecticides on plant species; they allow their impact to be examined to ensure that they do not adversely affect growth, development or productivity. Hydroponic crops offer several advantages, such as optimizing water use and space, recycling materials, and avoiding soil pathogens. The objective of this work was to evaluate the phytotoxic effects of a plant extract derived from the genus *Senecio* (ethanolic extract of *S. rudbeckiaefolius* (EE) on the germination and vegetative development of two plant varieties and to compare them with a synthetic insecticide currently used in the field. For this purpose, a monocotyledonous species, maize (*Zea mays*), and a dicotyledonous species, arugula (*Eruca vesicaria*), were cultivated using the Kratky hydroponic system. The following treatments were applied for germination tests: EE (1, 2 and 4 mg/mL), chlorantraniliprole (0.05, 0.1, and 0.2 mg/mL), and the synergic effect of EE 4 mg/mL + chlorantraniliprole (0.1 mg/mL). Germination percentage was determined, and at 30 days

post-germination, the following parameters were quantified: root and leaf length and stomatal density. Regarding germination percentage, no significant differences were found (p=0.67). In the study of stomatal density, significant differences were observed between treatments (p<<0.001): EE at 4 mg/mL showed a higher number of stomata, followed by the control group, and finally, chlorantraniliprole. Leaf and root length were significantly greater (p<<0.001) in seedlings treated with EE compared to the control and chlorantraniliprole groups. These results indicate that the natural product tested is promising as a potential biopesticide, as it positively impacts plant development without phytotoxic effects, maximizing agricultural yield.

A60
MITOCHONDRIAL ACTIVITY FLUCTUATIONS DURING *IN VITRO* MATURATION OF PORCINE OOCYTES

Camporino A[1,2], Madrid Gaviria S[1,2], Cetica P[1,2], Morado S[1,2]
[1]Universidad de Buenos Aires, Facultad de Ciencias Veterinarias, Instituto de Investigación y Tecnología en Reproducción Animal (INITRA), Buenos Aires, Argentina. [2]Universidad de Buenos Aires - CONICET, Instituto de Investigaciones en Producción Animal (INPA), Buenos Aires, Argentina.
E-mail: acamporino@fvet.uba.ar

In vitro maturation (IVM) is a biotechnology applied in the *in vitro* production of porcine embryos. It involves cytoplasmic and nuclear changes in the oocyte which are related to fluctuations in the electron transport rate and ATP synthesis in the mitochondrial respiratory chain, as well as protein synthesis. The objective of the present work was to evaluate active mitochondrias, inner mitochondrial membrane potential (IMMP) and flavin adenine dinucleotide (FAD) levels during the IVM of porcine oocytes. Cumulus-oocyte complexes (COCs) were obtained by aspirating follicles from slaughtered females, which were then selected and incubated in medium 199, supplemented at 39°C, 5% CO2 and 100% humidity for 44h. At 0, 12, 24, 36, and 44h groups of COCs were extracted and denuded with a fine Pasteur pipette. Using epifluorescence microscopy, the levels of FAD autofluorescence, active mitochondrias stained with MitoTracker Green, and the IMMP stained with JC-1 were evaluated, obtaining digital microphotographs that were processed with the IMAGE J software to calculate the fluorescence intensity. Results were analyzed with ANOVA followed by Bonferroni test. The IMMP showed an increase between 0 and 12h ($p<0.05$), followed by a decrease between 12 and 36h ($p<0.05$) and finally an increase towards 44h ($p<0.05$). MitoTracker Green levels fluctuated in a similar way, but only demonstrated a significant decrease between 24 and 36 hours ($p<0.05$). FAD levels also accompanied the fluctuations in IMMP, with a decrease observed from 12 hours onward ($p<0.05$). The variations observed in the mitochondrial parameters analyzed in this work would be related to the change in oocyte metabolism from a quiescent state to an active one until meiosis II is completed at 44 hours.

A61
DESIGN AND PRODUCTION OF SNACK-TYPE MATRICES BASED ON *SECHIUM EDULE* (JACQ.) SWARZT FRUIT FORTIFIED WITH CALCIUM AND COATED WITH A BIOFILM ENHANCED WITH CHAYOTE EXTRACT

Nicosia P[1], Valdez F[1], Orphèe C[1], Ordoñez A[2], Cruz R[1]
[1]Cátedra de Salud Pública. Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471, Tucumán. Argentina. Email: andriana.ordonez@fbqf.unt.edu.ar

The growing demand for nutritionally enriched, fortified and functional foods has boosted the interest in applied food science to obtain products that provide health benefits. The objective of the present work is to obtain snacks from chayote fruits, *Sechium edule* (Jacq.) Swartz variety *virens levis* and *albus levis* calcium-fortified and coated with biofilm enhaced with chayote antioxidant extract. Disks of 6cm diameter and 1cm thick were obtained from fresh fruits, and then immersed in 2.5% calcium lactate/gluconate solution for 60 minutes. Subsequently, they were subjected to convection air drying. To standardize the temperature and drying time, they were dried at 80, 100 and 120°C for 60 min. After drying, an immersion process was carried out, each snack was coated with a

chitosan biofilm with antioxidant extract of chayote standardized in previous works, the excess extract is removed and packaged in hermetically sealed sterile bags. The weight of each snack was determined before and after immersion. The appropriate salt for calcium fortification was determined. The tests were carried out in triplicate. The product obtained was characterized for external appearance, color, odor, flavor, pH and microbiological quality for 6 months. The results showed that the snacks obtained from the *virens levis* variety were the most stable from the microbiological point of view, and that fortification with calcium lactate/gluconate was the best option, in addition to maintaining their original organoleptic characteristics, unlike the snacks made from the *albus levis* variety, which did not show integrity after 3 months of processing. In conclusion, we can express that the new products elaborated, snacks made from chayote fruits, variety *virens levis*, constitute a food alternative fortified with calcium.

A62

CONTROL OF TOXIGENIC FUNGI CAUSING BLACK ROT IN GRAPES

Belizán MME, Gómez AA, Colombres MS, Terán Baptista ZP, Aredes Fernández PA, Sampietro DA
Facultad de Bioquímica, Química y Farmacia, UNT. Ayacucho 471. Tucumán. Argentina.
E-mail: melina.belizan@fbqf.unt.edu.ar

Argentina is a major world producer of wine and grapes. One of the main issues in wine industry is contamination with ochratoxin A (OTA), produced by *A. carbonarius* and *A. niger*. OTA is a neurotoxic, immunosuppressive, carcinogenic, and teratogenic mycotoxin; and wine is its primary source of daily intake. Sodium metabisulphite ($Na_2S_2O_5$) is commonly added to stored grapes, or during winemaking process to prevent the growth of ochratoxigenic fungi. However, this preservative can negatively impact wine organoleptic properties, delay fermentation, and cause adverse reactions in consumers. Strategies are needed to minimize the use of $Na_2S_2O_5$. One alternative is the use of ethanolic extract (EE) and/or the alkaloid fraction (AF) from the aerial parts of vinal (*Prosopis ruscifolia*). This work evaluated the inhibitory effects of EE, AF, and their mixtures with $Na_2S_2O_5$ on *A. carbonarius* and *A. Niger* strains, determining the minimum inhibitory concentration (MIC) of EE, AF, and $Na_2S_2O_5$ using microdilution (72 h, 30°C) in culture medium and organic grape juice. The combined effect of EE + $Na_2S_2O_5$ and AF + $Na_2S_2O_5$ was then tested using the checkerboard method. EE generated an MIC of 3000 µg/mL, AF 1500 µg/mL, and $Na_2S_2O_5$ 1250 µg/mL against both species, in both culture medium and organic grape juice. The combined effect tests showed FICI values = 2.0 for EE + $Na_2S_2O_5$ and 1.5 for AF + $Na_2S_2O_5$, indicating additivism for both species. The two *Aspergillus* species were more sensitive to AF than to EE. In grape juice, both EE and AF maintained the inhibitory capacity previously demonstrated in culture medium. It is concluded that mixing EE or AF with $Na_2S_2O_5$ reduces the undesirable effects of the latter while preserving fungal control. Further research is needed to determine whether EE and AF and their mixtures with $Na_2S_2O_5$ are able to affect the winemaking process.

A63

***IN VITRO* PROPAGATION OF CITRUS ROOTSTOCK 61AA3**

Ledesma VA, Castellano Rengel MS, Romero AL, Castagnaro AP, Noguera AS, Enrique R, Sendín LN
Instituto de Tecnología Agroindustrial del Noroeste Argentino (ITANOA, EEAOC-CONICET). Av. William Cross 3150. 4101, Tucumán, Argentina.
E-mail: ledesma@eeaoc.org.ar

The *in vitro* micropropagation of citrus rootstocks is a challenge for agrobiotechnology due to the complexity of the factors involved in tissue culture. Shoot regeneration from internodal segments was previously optimized with genotypes released by EEAOC, using a protocol that resulted in the recovery of only one plant per regenerated shoot. In this work, we evaluated the effect of adding gibberellic acid (GA3) and 6-benzylaminopurine (BAP) on the in vitro multiplication efficiency (number of shoots multiplied from an initial shoot) of rootstock 61AA3, to obtain clones before moving on to the rustication stage. For this, internodal segments were incubated in vitro following the previous protocol. Regenerated shoots of 1 cm were separated, measured, and placed vertically in a

basal medium (MS, 3% sucrose, 7% agar) supplemented with: A) 2 mg/l BAP + 0.5 mg/l GA3; B) 1 mg/l BAP+0.5 mg/l GA3; C) 1 mg/l BAP + 0.2 mg/l GA3; and D) 2 mg/l BAP + 0.2 mg/l GA3. Ten shoots per flask were incubated for each treatment, and two replicates were carried out. After 30 days, growth rate, survival, and shoot multiplication were determined. Treatments A and B showed higher growth rates (28.5% and 24.8%, respectively) and multiplication rates (10 and 30%). Treatment C had the lowest survival rate (68.2%), and treatment D negatively affected shoot growth (-12.3%). These results contribute to the development of a citrus rootstock propagation protocol, which will impact on the success of tissue culture-based technologies such as transgenesis.

A64
GENETIC TRANSFORMATION OF CITRUS ROOTSTOCK 61AA3 FOR ABIOTIC STRESS TOLERANCE

Castellano Rengel MS[1], Ledesma VA[1], Romero AL[1], Castagnaro AP[1], Noguera AS[1], Enrique R[1], Filippone MP[2], Sendin LN[1]
[1]Instituto de Tecnología Agroindustrial del Noroeste Argentino (ITANOA, EEAOC-CONICET). Av. William Cross 3150. 4101, Tucumán, Argentina. [2]FAZyV, UNT. El Manantial, Tucumán, Argentina.
E-mail: mcastellano@eeaoc.org.ar

Citrus is the most important fruit crop in the world, with Argentina being the sixth largest producer of fresh fruit. Environmental factors such as drought and salinity affect the productivity and distribution of the crop. Genetic transformation through *Agrobacterium tumefaciens* (*At*) is a tool employed in citrus improvement. The aim of this work was to generate transgenic rootstocks with greater tolerance to abiotic stress of 61AA3, a hybrid generated by the EEAOC breeding program. For this purpose, the HaHB11 transcription factor was used, which confers drought, waterlogging, and salinity tolerance in transgenic maize and alfalfa without yield penalties, A transformation vector was constructed with the PCAMBIA2301 plasmid, which contains the 35SCaMV promoter, the gene of interest, the nptII kanamycin resistance gene, and the *gus* reporter gene. The vector was introduced into *At* strain EHA105, with which internodal segments of 6-week-old *in vitro* germinated seedlings were inoculated. After 60 days, the expression of the *gus* reporter gene was verified in the regenerated shoots, and a transformation efficiency of 1.4% was attained. The positive shoots are in the process of rooting and acclimatization to be evaluated for drought and salinity tolerance. These results imply an advance towards the generation of transgenic rootstocks, on which non-transgenic rootstocks could be grafted and produce unmodified fruit, which could improve public perception of these GMOs.

A65
DIFFERENTIAL RESPONSE OF SUGARCANE VARIETIES TO SOMATIC EMBRYOGENESIS AND PLANT REGENERATION

Díaz Santillán GV[1], Di Pauli V[3], Cutuli FLA[2], Zalazar NO[3], Canseco MA[3], Fontana PD[3]
[1]FBQF, UNT, Argentina. [2]FAZyV, UNT, Argentina. [3]EEA Famaillá, INTA, Argentina.
E-mail: vicky.scc@gmail.com

In vitro culture is a crucial tool for generating genetic variability, supporting the application of advanced techniques such as mutagenesis, gene editing, and transgenesis, which enable the development of improved cultivars with desirable traits. The efficiency of *in vitro* culture techniques is inherently dependent on the genotype, highlighting the importance of selecting genotypes with high *in vitro* competence to maximize the breeding process efficiency and effectiveness. The aim of this study was to assess the embryogenic potential and regeneration capacity of elite sugarcane genotypes developed by INTA. The experiment was conducted using plant material from the three most recent elite cultivars developed by INTA Sugarcane Breeding Program, two advanced elite clones, and a reference genotype used as a control. Two protocols for inducing embryogenic calluses with 2,4-D were evaluated. Regeneration was induced under photoperiod conditions, and the plants were subsequently acclimatized in a greenhouse. All genotypes tested showed a high ability in *in vitro* establishment

capacity (>90%), with callus formation observed on explants within one week of culture. After eight weeks, four of the genotypes exhibited high callus survival rates, higher than 80%. In terms of embryogenic capacity and percentage of embryogenic callus, the genotypes showed differential responses ($P<0.05$), with two varieties standing out for their high capacity to form somatic embryos (>80%) and the high proportion of these in the callus (50-100% of callus volume), compared to the reference material. These genotypes also showed high plant regeneration capacity (16 and 20 plants/callus), comparable to the reference material (22 plants/callus), and an acclimatization rate in the greenhouse higher than 90%. In conclusion, genotypes with high *in vitro* competence were identified and can be used as a basis for generating genetic variability in the breeding program.

A66
EFFECT OF PICLORAM AND 2,4-D ON SOMATIC EMBRYOGENESIS IN SUGARCANE VARIETIES

Díaz Santillán GV[1], Di Pauli V[3], Cutuli FLA[2], Zalazar NO[3], Canseco MA[3], Fontana PD[3]
[1]FBQF, UNT, Argentina. [2]FAZyV, UNT, Argentina. [3]EEA Famaillá, INTA, Argentina.
E-mail: vicky.scc@gmail.com

In vitro culture is a key tool for applying biotechnological improvement techniques in sugarcane. However, some genotypes show a low response to embryogenic callus formation. This variability suggests the need to explore alternative hormonal treatments for callus induction. 2,4-D is the most commonly used callus inducer in sugarcane, although some genotypes are recalcitrant. On the other hand, picloram has proven to be an effective option, promoting embryo formation in certain genotypes. This work evaluated the embryogenic capacity and regeneration of three elite sugarcane genotypes from INTA, using protocols with 2,4-D and picloram as callogenesis inducers. Four protocols for callus induction were assessed: two with 2,4-D and two with picloram. Regeneration was induced with photoperiod, and the plants were acclimatised in the greenhouse. More than 90% of the explants of INTA 03-663 and INTA 08-900 responded positively to both hormones for callus induction after one week; whereas INTA 01-1505 had a 97% callus induction with 2,4-D but only 50% with picloram. After eight weeks, more than 90% of the calluses of INTA 08-900 survived with both hormones, as did those of INTA 03-663 with picloram and INTA 01-1505 with 2,4-D, whereas the other combinations showed low survival (<20%). Regarding embryogenic capacity and the percentage of embryogenic callus, INTA 08-900 responded to both hormones, with a better response to picloram. INTA 01-1505 also formed embryos with both hormones, but only at higher concentrations of picloram, whereas INTA 03-663 did not form embryogenic callus with any inducer. Finally, the calluses of INTA 08-900 and INTA 01-1505 regenerated about 7 plants per callus with picloram and 2,4-D, respectively, indicating a medium regeneration capacity. In conclusion, the use of 2,4-D and picloram revealed differences in the *in vitro* response of the studied sugarcane genotypes, highlighting the effectiveness of picloram in certain genotypes.

A67
TOWARDS A CIRCULAR ECONOMY IN TUCUMÁN: FEASIBILITY ANALYSIS OF A BIOMATERIALS STARTUP USING LOCAL AGRO-INDUSTRIAL BYPRODUCTS

Barrionuevo AM[1], Rada JVH[1], Pajot HF[2]
[1]Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. [2]PROIMI-CONICET Av. Belgrano y Pasaje Caseros, 4000, Tucumán.
E-mail: agustina.barrionuevo1d@gmail.com

Filamentous fungi not only have the ability to break down and digest complex organic matter, but are also able to bind and connect these components, resulting in the creation of firmer materials. This capability has opened up the possibility of recycling lignocellulosic wastes and by-products from industrial and agricultural processes into mycelium-based composite materials (MBC). The latter have great potential to replace petroleum-based materials, thus contributing to a more sustainable economy. The aim of this paper is to analyze the feasibility of a start-up in Tucumán to produce MBC from by-products of the local sugar-alcohol industry. To this end, a bibliographic

analysis of mycelium-based compounds and the details of their production is carried out. In addition, the market for fungal-based packaging and its exponential growth is reviewed. Based on this information, a business model, an intellectual property protection strategy and the calculation of the appropriate economic and financial indicators, among other aspects, are proposed. This work shows that MBC production is possible in Tucumán due to the availability of raw materials and sources of financing. Finally, the economic-financial analysis of the project yields positive values, demonstrating that the production of these materials is not only viable from a technical point of view, but also from the monetary benefits it would bring to the province, thus promoting a circular economy in Tucumán.

A68
INFLUENCE OF BLUE LIGHT ON NATIVE *CHLORELLA* SP. CULTURES FROM TUCUMAN AND THEIR METABOLIC PRODUCTS

Influence of Blue Light on Native *Chlorella* sp. Cultures from Tucumán and Their Metabolic Products

Armando CH[2], Iriarte ML[2], Soberón JR[1,2], Rearte TA[2,3], Sampietro DA[1,2], Sgariglia MA[1,2]
[1]Cath. Phytochemistry FBQF-UNT, Ayacucho 471 (4000) Tucumán – [2]CONICET- [3]FA-UBA
E-mail: melina.sgariglia@fbqf.unt.edu.ar

Introduction: Microalgal biotechnology is a promising tool for generating high-value products (HVP) in a sustainable way. Modification of variables, such as illuminance, influences microalgal metabolism, optimizing the production of compounds as polyphenols and some pigments, used in food, pharmaceutical, and other industries. This strategy highlights the potential of native microalgae and enhances their value as a natural resource. In this work, the growth, production, and biomass composition of native *Chlorella sp*. (PHYK02) were evaluated under two illuminance conditions to know its potential as source of HVP. Methodology: Unialgal batch cultures of PHYK02 (Dam C. Gelsi, Tucumán) in F2/G medium under a 12:12 h photoperiod with white light (C1: 400-700 nm; 48.5 µmol.m-².s-¹) and blue light (C2: 450nm 200 µmol.m-².s-¹). Cell density (CNB; DO_{620nm}), total dry weight in exponential and stationary phases (MGC 1 µm) were determined. Biomasses were harvested in the stationary phase (9520.g), freeze-dried, weighed (b.a.), and extracted by ultrasound and chemical hydrolysis. Total proteins (TP) were determined according to Lowry (750 nm; BSA); total carbohydrates (TCH) by sulfuric phenol (490 nm; glucose); total lipids (TL) by gravimetry; pigments by spectrophotometry (480, 510, 647, 664 nm); and total phenolic compounds (TPC) according to Singleton (750 nm; ferulic acid). Results: The specific growth rate (µ.days^{-1}) under white light was 0.13, and 0.15 under blue light. C1 showed higher contents of TCH (22.4%), TL (23.8%), and pigments (8.12%) with high carotenoid content (> 40%) in both conditions; while C2 presented a higher concentration of TPC (14.4 µg/mL). The protein contents were comparable (~35%). Conclusions: *Native Chlorella sp*. grew more efficiently under blue light, and an inducing effect on CFT biosynthesis was also evident. The chemical characterization of these compounds is subject of ongoing researches.

A69
DESIGN AND PRODUCTION OF ALMOND-BASED CREAM-TYPE FOOD DISPERSIONS FORTIFIED WITH CALCIUM

Valdez FCJ[1], Nicosia PE[1], Orphèe CHN[1], Ordoñez AA[2], Cruz RM[1]
[1]Cátedra de Salud Pública, [2]Cátedra de Tecnología Farmacéutica I. Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. Tucumán.
E-mail: cecilia.orphee@fbqf.unt.edu.ar - florsc8925@gmail.com

Plant-based edible products such as fluid emulsions or creams have gained relevance in recent years as an alternative for consumers who are lactose intolerant or those who follow a vegan diet. This study aimed to produce stable, almond-based food dispersions with a cream-type consistency, enriched with calcium at concentrations equivalent to cow's milk. The production process was validated on the basis of the effect of agitation and temperature change on stability. Sweet almonds, *Prunus dulcis var* were used, from plantations in Arrúbal region, La Rioja. Formulations were designed and prepared with 5% and 10% of almond powder, varying concentrations

of the lipid phase (sunflower and almond oil), calcium carbonate, and with or without xanthan gum as a viscosifier. The different dispersions obtained were subjected to controlled agitation cycles of 100 – 200 and 300 rpm, each speed range maintained for 15 minutes, accompanied by temperature cycles of 60 – 70 and 80°C, respectively. All tests were performed in triplicate. Our results indicated that the 5% almonds formulation, with and without xanthan gum were unstable 24 hours after processing under the different cycles. However, optimal behavior was observed in the formulations made with 10% almonds and with the addition of xanthan gum under the action of the different temperature and agitation cycles. The stability over 90 days is particularly notable in those maintained under an agitation cycle of 100 to 200 rpm, for 15 to 30 minutes, and within a temperature range of 60 to 70 °C. In conclusion, the results validated the process of producing almond-based cream-type dispersions by controlling critical phases (agitation and heating), resulting in a stable product with a three-month shelf life.

A70
ISOLATION, CHARACTERIZATION AND PRESERVATION OF A ATRAZINE-RESISTANT FUNGUS

Tali LG, Sosa García RA, Gordillo MA, Luzuriaga MB, Mendez D, Chaves S.
Instituto de Biotecnología. FBQF. UNT. Ayacucho 471. Tucumán. Argentina.
E-mail: lemisgabrielatali@gmail.com

Atrazine is an agrochemical widely used in Argentina, with over 100 million liters of this compound released into the environment annually, making it the third most used agrochemical in the country. Atrazine is considered a moderately mobile and leachable substance in soils, which makes it an important factor in the contamination of surface and groundwater. The aim of this work is to isolate atrazine-resistant fungi from soils treated with this herbicide, specifically soil from the locality of Leales, Tucumán. Additionally, the macroscopic and microscopic evaluation for its characterization and preservation will be carried out. The use of fungi for degrading or removing pollutants through mycoremediation is well known. Prior to the isolation of microorganisms, it was determined physicochemical characteristics of soil samples. Fungal isolation was performed by the plate dilution method in minimal salt medium (MS) with the addition of lactic acid and supplemented with 250 mg/L of the herbicide, incubated at 28°C for 5 days. The isolated colonies were transferred under axenic conditions to APG agar medium and incubated at 30°C for 72 hours. Macroscopic and microscopic observations of the isolates were conducted for their subsequent characterization. The fungi were preserved in APG medium with a pH of 5.5 at 4°C in slant subculture and also by the filter paper strip method stored at -20°C. During a 2-month incubation period, the Atrazine-degrading capacity of the isolated fungi was evaluated monthly using solid MS supplemented with 250 mg/L of the herbicide. The results obtained showed that was soil with a C/N (8.2), pH 5.5, phosphorus (73 ppm) and of all the microorganisms isolated only two isolates demonstrated were resistant to 250 mg/L of Atrazine during the preservation period. The fungi isolated with potential mycoremediation capacity for Atrazine will be subject to molecular studies to determine their genus and species.

A71
ISOLATION AND CHARACTERIZATION OF PHENOL-TOLERANT OLEAGINOUS YEASTS IN TUCUMÁN PROVINCE (ARGENTINA)

Alancay Rojas ND[1,2], Dominguez FG[2], Pacheco MS[2], Fernandez PM[2], Pajot HF[2]
1Faculty of Biochemistry, Chemistry and Pharmacy. UNT.
[2]Pilot Plant for Microbiological Industrial Processes (National Council for Scientific and Technical Research). Belgrano and Pasaje Caseros. Tucumán. Argentina. E-mail: natalia.alancayrojas@gmail.com

Basidiomycetes oleaginous yeasts are emerging as ideal candidates for the production of second-generation biofuels due to their high tolerance to inhibitors such as phenols and aromatic hydrocarbons generated during biomass pretreatment. The aim of this work is to isolate and characterize native oleaginous yeasts from Tucumán that are tolerant to phenol, present in agro-industrial waste. 69 yeasts were isolated from soil and bark of *Podocarpus parlatorei* (Pino del Cerro) in the Yungas of Tucumán (Río Nío, Tucumán, Argentina) using LBM

(Ligninase Basal Medium) agar supplemented with 0.5 g/L phenol. After urease tests and staining with Diazonium Blue B, the isolates were identified as Ascomycetes and Basidiomycetes. Twelve Basidiomycete isolates were selected based on their resistance to phenol, anthracene, and α-naphthol, with three demonstrating notable lipid accumulation in GYM (Glucose Yeast Extract Medium). Isolates F2AS1 and F6BS1 were further selected for accumulating over 60% of their dry weight in lipids (g/g) and exhibiting optimal growth in the presence of phenol. Fatty acid profiling through gas chromatography-mass spectrometry (GC-MS/MS) highlighted their potential for biodiesel production. Phylogenetic analysis of the Internal Transcribed Spacer (ITS) region and the D1/D2 domain of the large subunit ribosomal DNA (LSU rDNA) identified these isolates as members of the genus *Soliccocozyma*, known for its lipid accumulation capacity and tolerance to phenolic compounds. This study represents the first report of this genus in Tucumán. These results underscore the potential of the Yungas soil microbiota, particularly Basidiomycete yeasts, for lipid accumulation from agro-industrial waste. Furthermore, they emphasize the importance of preserving these ecosystems as a valuable resource for the development of a sustainable circular economy.

A72
ISOLATION, CHARACTERIZATION AND PRESERVATION OF ATRAZINE-RESISTANT BACTERIAL STRAINS

Sosa García RA, Tali LG, Gordillo MA, Chaves S, Andina ML
Instituto de Biotecnología. FBQF. UNT. Ayacucho 471. Tucumán. Argentina.
E-mail: rodrigososagarcia88@gmail.com

Atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine) is a selective pre and post-emergent herbicide extensively used in farmland for production of corn, grain sorghum and sugarcane. It is one of the most widely used herbicides worldwide and, due to its high chronic toxicity and potential accumulation in the environment, its use is restricted in the United States and banned in several EU countries. Atrazine is known to be susceptible to degradation by soil bacteria as a source of carbon and nitrogen under aerobic conditions. Enzymes involved in the metabolic pathway of atrazine degradation have been identified in both Gram-negative and Gram-positive bacteria. The aim of this work was to isolate atrazine-resistant bacteria from roots of corn plants cultivated in soil treated with this herbicide, to characterize its phenotype and to evaluate its preservation. Bacterial isolation was performed by the plate dilution method in minimal saline (MS) medium, supplemented with 250 mg/L of the herbicide and incubated at 28°C for 3 days. The isolates were transferred in axenic conditions onto Luria-Bertani (LB) media and incubated at 30ºC for 48 hours. Gram stain, biochemical tests and microscopic observation of the isolates were performed. The bacteria were conserved in LB broth at 4ºC, in 20% glycerol at -20ºC and in a pH 7 phosphate buffer solution at room temperature. During the incubation time of 4 months, the atrazine degrading capacity of the isolated strains was evaluated monthly using solid DM added with 250 mg/L herbicide. The results showed that all four isolates preserved in the different conservation media were resistant to 250 mg/L atrazine during the storage period. The strains are Gram-negative, non-fermentative, catalase-positive and mobile bacilli. Strains isolated with potential bioremediation capacity for atrazine will be subjected to molecular studies to determine genus and species.

A73
LIPID PROFILE VARIATIONS IN PREPARTUM AND POSTPARTUM SOWS ON A FARM IN SANTA FE, ARGENTINA

Luna ML[1], Campa ME[2], Eluk D[1], Mansilla GE[1], Storani G[1], Demarchi C[2], Agosto MA[2]
[1]Cátedra de Química I y II. [2]Producción de Cerdos. FCV-UNL. Esperanza–Santa Fe. Argentina.
E-mail: mluna@fcv.unl.edu.ar

Lipid profile is used in medicine to monitor the metabolic status and health of animals. Metabolites such as cholesterol, no esterified fatty acids, triglyceride and β-hydroxybutyrate are key indicators associated with fat and energy metabolism, which indicates adaptive changes during gestation as responses to complex physiological

readjustments. The objective was to determine total cholesterol and triglyceride values of adult sows during the peripartum period in a commercial farm in Santa Fe. Sampling was performed on 16 prepartum and postpartum adult sows from a commercial farm in Santo Domingo, Santa Fe. Blood was obtained by venipuncture and the samples were centrifuged to separate the sera. The methods used to determine total cholesterol and triglycerides were enzymatic, and the readings were taken using the Metrolab 1600 DR equipment. In the variance analysis, the arithmetic mean (x) and standard deviation (SD) were included, after verifying homogeneity. The calculations were carried out by computer (Minitab). The values of x and SD were obtained for the periods a-prepartum and b-postpartum for: *cholesterol (g/L) a- 1.242±0.34 and b- 1.302±0.32 and *triglyceride (g/L) a- 2.361±1.7 and b- 0.875±0.43. The triglyceride results presented here are higher than those reported by Coppo *et al.* and Swindle *et al.* (2003) in both periods, with significant differences ($p<0.05$), a similar situation observed by Duque *el al.* (2013) in sows, behavior attributed to the uptake of the mammary gland for milk production; is probably due to intracellular lipolysis of triglycerides as a fat source in composition of milk. Cholesterol values are within the normal ranges cited in the literature for breeding sows.

A74
DETERMINATION OF UREA AND TOTAL PROTEINS SERUM CONCENTRATION DURING PERIPARTUM PERIOD OF SOWS ON A SANTA FE FARM

Luna ML[1], Campa ME[2], Eluk D[1], Mansilla GE[1], Storani G[1], Demarchi C[2], Agosto MA[1]
[1]Cátedra de Química I y II. [2]Producción de Cerdos. FCV-UNL. Esperanza–Santa Fe. Argentina.
E-mail: mluna@fcv.unl.edu.ar

Protein profile depends on hormonal balance, nutritional status, water balance, and other factors that affect an animal's health. Urea and total protein are parameters that are part of the protein profile, and their analysis in blood can help diagnose metabolic problems. Therefore, objective was to determine concentrations of urea and total proteins during the peripartum period in sows from a Santa Fe farm. Blood samples without anticoagulants were collected from 12 sows in December 2023 via puncture. Urea and total protein levels were quantified in serum from the sows during the prepartum and postpartum periods. These variables were determined using colorimetric methods (commercial kits). Statistical analysis was performed with Minitab software. The mean values and standard deviations for prepartum and postpartum were as follows:
- Urea (mg/dL): 34.23 ± 9.82; 34.57 ± 13.4
- Total protein (mg/dL) 8.21 ± 0.34; 6.9 ± 1.13

Urea averages were observed above the reference range (8.2-24.6 mg/dL) throughout peripartum period, especially in postpartum period and if we relate it to the article by Ferraro *et al.* (2004), it is possibly due to water stress due to the temperatures of the sampling month. For total proteins, a significant difference ($p < 0.05$) was observed between both periods, being the prepartum values higher than the postpartum values.
Results obtained were complemented with the determination of some variables of the lipid profile; for a general evaluation of animals in production.

A75
ANALYSIS OF PERFORMANCE IN THEIR FEEDLOT FATTENING SYSTEM: INFLUENCE OF ENTRY DATE. ANIMAL BIOTYPE AND CYCLE LENGTH

Sleiman L[1], Torres JC[1], Dos Santo D[2], Mata A[3], Lara JE[4], Vega Parry HEB[1]*
[1]FAZ y V U.N.T, [2]CONICET, [3]Empresa Forres Beltran S.A., [4] IIACS-INTA. PIUNT A732.
**E-mail: sleimanluciana@gmail.com*

The feedlot fattening system has become an integral part of the meat production chain due to several advantages, such as its ability to transform grains into meat, freeing grazing land for crops, increasing the number of animals, and ensuring proper finishing and slaughtering. The objective of this study is to evaluate the impact of entry date (FI), animal biotype (BA) (zebu and Holando crossbreed), and the duration of the fattening cycle (DC) on daily live weight gain (GDPV) and feed conversion efficiency (EC) in a feedlot fattening system. The feedlot is located

in Forres (Robles, Santiago del Estero). A total of 950 batches of animals (165 Holando and 785 zebu crossbreeds) that entered between 2021 and 2023 were examined. A multiple linear model using R was fitted to evaluate the effect of predictors on yield response, specifically GDPV and EC. FI, BA, and DC were considered as predictors. Time was treated as a circular variable, allowing for a more accurate representation of the temporal continuity of climatic conditions. The GDPV model, which includes the cosine and sine of the adjusted date, BA, and DC, shows that cosine time has a significant positive effect ($\beta = 0.020$, $p < 0.001$), as does sine time ($\beta = 0.012$, $p = 0.027$). Additionally, BA Holando has a significant positive effect ($\beta = 0.070$, $p < 0.001$), while DC has a significant negative effect on GDPV ($\beta = -0.001$, $p < 0.001$). Despite these significant effects, the model explains only a small proportion of the variability in GDPV ($R^2 = 0.048$). In the EC model, cosine time ($\beta = 0.024$, $p = 0.583$) and sine time ($\beta = -0.017$, $p = 0.697$) show no significant effects, while BA Holando has a significant positive effect ($\beta = 2.230$, $p < 0.001$), and DC negatively affects EC ($\beta = -0.013$, $p < 0.001$). This model explains a significant proportion of the variability in EC ($R^2 = 0.264$). These results highlight the importance of considering both temporal factors and the characteristics of BA and DC in evaluating EC and GDPV.

A76
ANTIMICROBIAL ACTIVITY OF TINCTURES FROM A NATIVE PLANT AGAINST ENTEROPATHOGENS ISOLATED FROM SHEEPS

Albarracín DA[1], Ale CE[2], Cundon CC[3], Blanco Crivelli X[3], Sampietro DA[2]
[1]Facultad de Agronomía y Zootecnia. UNT. Avda. Pte. N. Kirchner 1900. Tucumán. [2]Facultad de Bioquímica, Química y Farmacia. UNT. Ayacucho 471. Tucumán. [3]Facultad de Ciencias Veterinarias, UBA. Argentina.
E-mail: agus.97albarracin@gmail.com

Gastroenteritis caused by *Escherichia coli* occurs in super-intensive breeding systems, with significant impact on sheep production. The use of antibiotics against these bacteria has led to the emergence of microbial resistance and negatively affects the environment. Extracts from the native plant *Larrea divaricata* (LD) have demonstrated potent *in vitro* control against *E. coli* strains isolated from sheep, an activity associated with its phenolic constituents. On the other hand, the extracts need to be formulated to act on those parts of the intestinal system where these bacteria reside once ingested. In this study, we determined the encapsulation efficiency of phenolic compounds (PEC) in LD tincture incorporated into alginate (1%) beads and the antimicrobial activity (AA) of the formulation against *E. coli* at pH values typically observed in the gastrointestinal tract. PEC was determined using Folin-Ciocalteu reagent, and AA was assessed by plate counting from *E. coli*. Both PEC and AA were evaluated in encapsulated tincture (M) and non-encapsulated (NE). pH was adjusted using sequential addition of HCl (0.1 M) or NaOH (0.1 M). 2 mm average size alginate beads were obtained containing ≈ (approximately) 292, 5 µg of PEC (encapsulation efficiency ≥ 93%). The AA was 4×10^7 in the control, 1×10^6 (NE), and 2×10^7 CFU/mL (M). When NE and M were subjected to different pH values, the PEC and AA profiles were maintained at 1-2 x 10^7 CFU/mL, representing a reduction of ≈2-3 log units compared to the control (pH = 7). Our results indicate that M is promising for control of *E. coli*. Further physicochemical characterization will allow to standardize an effective prototype for diarrhea control in lambs

A77
INCIDENCE OF CORN STUNT ON MAIZE CULTIVATION IN TUCUMAN AND WEST SANTIAGO DEL ESTERO PROVINCE

Rudelli MM[1], Canteros FH[1,2], Sánchez Tello EL[1], Zalazar WB[1], Logarzo JA[1], Lescano DM[1]
[1]INTA. Ruta Provincial 301, km 31. CP 4132. [2]Facultad de Agronomía, Zootecnia y Veterinaria. UNT. Av. Kirchner 1800. E-mail: canteros.francisco@inta.gob.ar

In the 2023-24 season, the maize crop suffered the attack of the corn stunt complex, caused by Corn Stunt Spiroplasma (CSS) produced by Spiroplasma kunkelii, Maize Bushy Stunt Phytoplasma (MBSP) produced by phytoplasma, both belonging to the Mollicutes group and corn fine streak virus, Maize Rayado Fino Virus (MRFV), all transmitted by the corn leafhopper (*Dalbulus maidis*). The objective of this work was to evaluate the

incidence of corn stunt on yield (YD) and ears. Samples of 10 m^2 were taken in 19 locations in the province of Tucumán (TUC) and the west of Santiago del Estero (SE), 95 samples were collected. They were weighed and brought to $kg.ha^{-1}$ with 14.5% humidity; The number of ears was counted and classified by calculating percentages of ears: loose tooth ears (%EC), a characteristic symptom of Mollicutes, ears that do fill properly (%EI) and ears without grains (%EV), which are possible virus symptoms, and normal ears (%EN). For data analysis, the sampling sites (SI) were grouped by geographical proximity, into 4 sites: Northeast of TUC and Northwest of SE (NE), central east of TUC and central west of SE (ES), Leales TUC (LE) and South of TUC (SU), and 3 sowing dates (SD), second half of December (2QD), first half of January (1QE) and second half of January (2QE). The ANOVA showed highly significant differences ($p<0.0001$) for YD, %EV and %EN, and significant differences for %EI ($p<0.05$) in the different SIs. As for SD, it showed significant differences ($p<0.05$), for YD and %EC. Fisher's LSD test for SI showed the highest YD in NE (5,454.5 $kg.ha^{-1}$) and the lowest in SU (563.7 $kg.ha^{-1}$), the latter coincides with the high %EV values (60.6%) and %EI (41.46%), and low value of %EN (2.34%). For SD, the LSD test showed the highest YD for 2QD (5,746 $kg.ha^{-1}$) and the highest %EC value for 2QE (33%). Therefore, we can conclude that the YD and %EN decreased from NE to SU, and the %EV and %EI. In late SD (2QE), YD decreased and %EC increased.

A78
PHENOLOGICAL BEHAVIOR OF TWO RAPESEED HYBRIDS (*BRASSICA NAPUS* L.) IN TUCUMÁN (ARGENTINA)

Abascal GF, Guantay FMA, Páez BM, Valverdi GR
Faculty of Agronomy, Zootecnics and Veterinary-UNT. Av. Kirchner 1900. Tucumán. 4000. Argentina.
E-mail: fabiola.abascal@faz.unt.edu.ar

Rapeseed (*Brassica napus* L.) is an annual winter-spring oilseed crop from the Cruciferae family. Its production has increased in recent years worldwide, due to its edible oil of very good nutritional quality and its use in the manufacture of biofuel. In our country, it is grown in the south-central, southeast, and southwest of Buenos Aires province, east of La Pampa, south of Santa Fe and Entre Ríos. Little information is available about the NOA where its cultivation is incipient. This work is intended to characterize the phenological behavior of two rapeseed hybrids. In June 2023, two 20 x 5 m plots were sown in the experimental field of the Faculty of Agronomy, Zootechnics, and Veterinary - UNT in Finca El Manantial (26°49'57.9"S; 65°16'33.4"W), Tucumán - Argentina. Two hybrids (H1 and H2) were sown manually in lines, at 0.21 m between furrows, considering a harvest population of 60 - 80 pl.m-2. Phenological status observations were made once a week from emergence until harvest, using the phenological scale developed by CETIOM in France. Observations were made on plants occupying one linear meter of furrow, performing 4 repetitions within the plot. Plant samples were also taken for better identification and description of the phenological stages. At 120 days after sowing, both hybrids had reached the vegetative rosette stage (C1). At 150 days after sowing, it was observed that H1 continued in the C1 state, while H2 was in the maturation stage (G5). As a conclusion, the H2 hybrid complies with what was cited by different authors for spring materials distributed in our country, but not the H1 hybrid, which did not complete its ontogenic cycle. Regarding the health aspect, both materials were affected by cabbage moth in the vegetative state, while H2 was affected by aphids in the reproductive stages.

A79
BEHAVIOR OF THREE GENOTYPES OF CORN (*ZEA MAYS* L.) IN DIFFERENT DENSITIES

Pascual GO[1], Canteros FH[1,2]
[1]Facultad de Agronomía, Zootecnia y Veterinaria. Universidad Nacional de Tucumán. Av. Kirchner 1800.
[2]Agencia de Extensión Rural, Monteros INTA. Ruta Nacional 38, km 758. CP 4142.
E-mail: gabriel.pascual@faz.unt.edu.ar

In Tucumán, in the piedmont area, there is a possibility of planting corn with different genotypes. The objective of this work was to evaluate the behavior of corn hybrids (H), a temperate DK72-10 VT3P (H1) and a temperate × tropical DK77-10 VT3P-RR2 (H2) from Bayer, and a tropical SYN 505 VIP3 (H3) from Syngenta; planted in

5 densities (D) as follows: D1 (3.5 pl.m2), D2 (4.7 pl.m2), D3 (5.8 pl.m2), D4 (9 pl.m2) and D5 (12 pl.m2). The trial was carried out in the experimental field of the FAZ and V of the UNT. It was sown on December 26, 2020, with a planting stick, 2 seeds per hole every 5 cm, thinning each plot to the final density for each treatment. The experimental design was a completely randomized block design with 4 repetitions. The experimental unit was 4 rows of 5 m at 0.70 m. Yield at 14.5% moisture (YD), prolificacy (PRO), weight of a thousand seeds (P1000), number of grains per ear (NG), and leaf area of the ear-bearing leaf (AF) were evaluated. The ANOVA showed highly significant differences for H in YD and P1000, for D in PRO, and for H and D in NG and AF ($p<0.001$). H3 was the one with the highest YD (6,995.73 kg.ha-1), NG (379.2 grains.ear-1), and also the one with the highest AF (675.62 m-2); D1, being the lowest density, had the highest PRO (1.19 ears.plant-1), NG (441.97 grains.ear-1), and AF (694.09 m-2). Regarding P1000, the highest values were found in H2 and H1. In the joint analysis, the interaction of H and D was significant ($p=0.019$) for YD. The highest YD was observed in D4 (7,593.2 kg.ha-1), D3 (7,479.6 kg.ha-1), and D2 (7,214.9 kg.ha-1) for H3, while the lowest and significantly different values were found in H1 across all densities, with intermediate results for H2. We can conclude that the tropical H3 showed the highest YD in three densities, showing the best adaptation to the site and the sowing date, with D4 being its optimal density.

A80
ANALYSIS OF OVIDUCTAL CELL INTERACTIONS IN A 3D COCULTURE SYSTEM AND THEIR IMPACT ON EARLY EMBRYO DEVELOPMENT

De Boeck M[1,2], Morado SA[3,4], Valdecantos PA[1,2], Cetica PD[3,4], Roldán-Olarte M[1,2]
[1]Instituto Superior de Investigaciones Biológicas (INSIBIO), [2]Instituto de Biología, Fac. de Bioq., Qca. y Fcia, UNT. [3]Instituto de Investigación y Tecnología en Reproducción Animal (INITRA-UBA). [4]Unidad Ejecutora de Investigaciones en Producción Animal (UBA-CONICET). E-mail: maxideboeck1@gmail.com

The mammalian oviduct is a specialized organ that plays a key role in the early stages of the reproductive process, facilitating gamete transport, sperm capacitation, fertilization, and early embryonic development. The oviduct microenvironment influences gametes and embryos; consequently, a bidirectional interaction with the cells of the oviductal epithelium occurs. The aim of this work was to evaluate the interactions between oviductal mucosa cells in a 3D *in vitro* coculture model of bovine oviductal epithelial and stromal cells (BOEC-BOSC) cultured in a type I collagen matrix, and how this culture influences the embryonic development up to the blastocyst stage. The 3D cultures were maintained in DMEM/F12 medium with 10% fetal bovine serum (FBS) for 21 days in an air-liquid interface at 38.5 °C, 5% CO_2 and 100% humidity. Using histological techniques and scanning electron microscopy (SEM), it was observed that the 3D culture mimics the morphological characteristics of the bovine oviductal mucosa *in vivo*. To assess the impact on embryonic development, bovine oocytes were matured and fertilized *in vitro*. At 18 h post insemination (hpi), the presumptive zygotes were co-incubated in the 3D culture with TCM-199 medium and 5% FBS. Presumptive zygotes cultured in standard medium (SOF) were considered as positive controls, while those cultured in TCM-199 + 5% FBS without cells were used as negative controls. At 48 hpi, cleavage rates were similar between treatments. On day 7 pi blastocyst developed in the 3D coculture. The percentage of blastocyst was lower in 3D coculture compared to SOF medium, while no development occurred in the cell-free TCM control. The results suggest that the 3D coculture model mimics the oviductal microenvironment, promoting epithelial-stromal and embryonic communication.