

**TUCUMAN BIOLOGY SOCIETY**  
(Asociación de Biología de Tucumán)

Abstracts from the  
**XVIII JORNADAS CIENTIFICAS**

October 4 - 6, 2001

Tafí del Valle, Tucumán  
**ARGENTINA**



## MIGUEL LILLO LECTURE 2001

### L. 1.

#### DOMESTICATION AND THE ORIGIN OF AGRICULTURE

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Agriculture did not appear suddenly, but it has been the result of several activities done by human beings during a period of thousands of years. In America, the first cultivated plants were found in archaeological deposits dating around 10000 years ago. Most of the economic important cultigens were created between 8000 and 4000 years B.C., and around 2000 years B.C. almost all the crops were completed, before the beginning of the Formative stage, which is characterized by the establishment of sedentary village life as a consequence of agriculture.

It is evident that the domestication process was done by the primitive people when lived grouped in small itinerant bands of hunting-gatherers, that initiated the culture of useful plants, either for food, medicinal or other uses.

The genetic variation arises by random mutation and recombination, while gene frequencies can change by random genetic drift, genetic flow or migration and by selection. People from the Archaic stage have, because of the itinerant character, a sound knowledge of food resources that nature offered. With their digging stick used for planting and sowing they began to create a new ecosystem, the agroecosystem, which made them independent from the environment. The extension of their plots were very small, adequate to the band size, which induces the genetic drift. The movement of these bands with their crops, led to a continuous cycle of isolation and migration which allow the action of inbreeding and outbreeding, both basic tools of modern plant breeding.

Most of the economic important crops are consumed cooked, and the fact that the bottle gourd (*Lagenaria siceraria*) and the chilies (*Capsicum spp.*) are found among the oldest plant remains, the former as containers and the later as condiments, indicates that the cooking art was one of the promoters of domestication. With a progressive increase of food production, the invention of tools and the use of new techniques, village agriculture was developed and allowed the sedentary way of life.

## OPENING LECTURE

### L. 2.

#### MATE CHOICE EVOLUTION IN HUMANS

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More than a century ago, Darwin (1871) postulated a revolutionary interpretation concerning the mysteries of mate choice. His original concern was the justification of the emergence of certain traits that apparently put at risk the individual survival. Long horns, appealing colors, powerful vocalizations were uneconomic and threatened survival. These features emerged and developed, according to Darwin, as a result of a process he termed Sexual Selection. Such traits evolved since their beholders acquired differential reproductive advantages.

More than 60 years after Darwin's seminal proposal, the first theoretical foundations and explanations of Sexual Selection appeared. On the one hand, the male/female asymmetry of parental investment (Bateman 1948, Trivers 1972); on the other, the equilibrated sex ratio in natural populations (Fisher 1930). The role of each sex during reproduction was defined in the frame of these two concepts. Therefore, the sex investing less in the offspring competes for a mate, while the sex investing more becomes highly selective. Today, Sexual Selection is based on a central idea: there is a conflict of interests between the two sexes during reproduction, where each one tries to maximize its own reproductive success.

Human beings belong to an animal species and, even if we are an unusual one, we are no more special than bats or elephants. Accordingly, if the evolutionary principles mentioned above can be applied to these two species, reconsider the reasons why we can not do so to humans.

If we propose that Natural Selection was the process underlying the evolution of humans, our genes must have contributed to the development of adaptations. Thus, if our body is a product of Natural Selection, why not our psyche?

Our complex psychological mechanisms, designed after a long evolutionary history, gave us a very large and plastic behavioural repertoire to solve the adaptive problem of mating.

In order to understand the mating strategies of humans, we must first answer the adaptive problems of the species history, the psychological mechanisms arising from this pressure, and the actual context that activate some answers upon others.

**PLENARY LECTURE I****L. 3.****THE USE OF CHRYSOPIDS FOR AGRICULTURAL PESTS BIOLOGICAL CONTROL PROGRAMS**

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The chrysopids, ordinarily called green lacewings, are a special kind of predator because the adult and larva have different food sources. The larva is predator but only in a few species this feeding habit is found in adult. Generally, the adults are honey-dew or pollen feeders. The green lacewings can be found in 23 different crops and they feed on many kinds of prey such as: aphid, scale (Monophlebidae, Pseudococcidae, Eriococcidae, Coccidae, Diaspididae); leafhoppers (Cercopidae, Cicadellidae, Membracidae, Fulgoridae); whitefly (Aleyrodidae); psyllids (Psyllidae); thrips (Thripidae); eggs and young larvae of Lepidoptera. The feeding performance depends on the quality and assessability of the prey, but the voracity is a distinctive attribute of the larvae. Additionally, their world wide distribution and large plant interaction make these insects a good option as biological agents for pest control. Many insects pests have been controlled by green lacewings mass release which were produced by biological industries. The laboratory breeding is guaranteed under modern technology or under simple and easy techniques using *Sitotroga cerealella* as alternative prey.

**PLENARY LECTURE II****L. 4.****DEVELOPMENT OF BIOMATERIALS BY USING NATURAL SOURCES**

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A biomaterial is a substance pharmacological and chemically designed to be used as partial or total replacement, substitution or repair an organ or tissue, its origin can be natural or synthetic. Actually there are many materials considered as biomaterials, involving from those used as medical supplies (i.e. gauges, sutures, etc.) until such with specialized application (i.e. dental implants, bone cements, etc.). In this conference a state of the art was presented, focusing the attention to materials used when a surgical procedure is necessary to repair a bone loss by use of biocompatible materials with similar composition to that tissue. The hydroxylapatite (HA) is the main inorganic component of bone, its chemical composition  $[Ca_5 PO_4 (OH)_2]$  determines its properties (hardness, dimensional stability, solubility), for this reason a wide variety of materials are made in laboratory pretending to have that composition. Technical and laboratory methodology to produce HA, usually involve chemical reagents such as  $CaCO_3$ ,  $PO_4$ ,  $NOH$ , etc., however, even HA is obtained, in many cases a non porous structure is seen, decreasing its biological performance. In order to solve this problem, investigations searching alternatives were done, and found that the skeleton of certain corals had porous structure and its chemical composition ( $CaCO_3$ ) could be transformed in  $[Ca_5 PO_4 (OH)_2]$ , perhaps the feasibility in this matter, the ecological consideration are strongly questioned. In other hand certain specie of algae and echinoderms were studied with similar results, without the ecological impact caused by harvesting of corals. Skeleton of both species are composed by calcium carbonate, but different crystalline phase, aragonite and calcite respectively. The studies on echinoderm skeleton's showed that this organism has potential to be considered as a biomaterials, due its porosity and interconnected structure; pore diameter is between  $20\mu m$  to  $50\mu m$ , and the biological behavior was considered as tolerated when the in vivo studies were done. The scope of alternatives of biomaterials is still open, and new sources are studied keeping in mind considerations such as feasibility, non ecological impact, and low cost material with high clinical use.

**LECTURE I****L. 5.****TOPOLOGY OF THE GLYCOLIPID SYNTHESIS IN THE GOLGI COMPLEX**

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The synthesis of complex glycolipids in higher eukaryotes is carried out in the Golgi complex, the site of residence of a machinery for synthesis constituted by different glycosyltransferases, glycolipid acceptors and sugar nucleotide transporters. Transferases are type II membrane proteins that act in succession in the stepwise addition of sugars to acceptor glycolipids. These glycolipids increase in complexity as they move along the organelle as part of the exocytotic flow to the plasma membrane. Recent studies on the topological organization of the machinery for synthesis, indicate that although they overlap along the cisternae, they concentrate selectively in different subcompartments. The N-terminal domains, harbor information for their selective subcompartment concentration, and for their association in multienzyme complexes able of channeling the intermediates along the different transferases. Experiments of fluorescence resonance energy transfer showed that these complexes exist in vivo. These results shed light on the topological organization of Golgi complex enzymes and their intimate relationships in the Golgi membrane.

Supported by CONICET y FONCYT (Argentina), HHMI (USA) y Mizutani Foundation (Japón)

**LECTURE II****L. 6.****PHAGOCYTOSIS Y INTRACELLULAR PARASITES.**

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Several microorganisms, after being phagocytosed by host cells, becomes sequestered in a membrane-bound organelle called phagosome. This compartment undergoes a maturation process that involves acidification, several fission events and fusion with endosomes and lysosomes. Most of the internalized particles are finally degraded in lysosomes.

Several phagocytosis steps has been reconstituted in cell-free systems. We have shown that phagosomes fuse with endosomes, and this interaction is regulated by GTPases. Using permeabilized macrophages, we have reconstituted fusion between phagosomes and lysosomes. This fusion event was microtubule-dependent and regulated by GTP proteins and NSF. Recently, we have shown that COPI protein complexes bind to purified phagosomes in an ARF-dependent manner. Our results suggest that COP proteins may play a role in the phagosome recycling process.

Several intracellular pathogens have developed different strategies to escape from the phagosomal maturation route. Some pathogens inhabit vacuoles that fail to fuse with lysosomes. In contrast, *Coxiella burnetii* (CB) is a parasite that lives and replicates in a vacuole with phagolysosomal characteristics (CBV). The molecular basis of the mechanism that CB has developed to control the replicative vacuole biogenesis is essentially unknown. We have observed that in HeLa cells infected with CB acidic vacuoles with autophagosome characteristics are generated. We have evidences that CBV formation is dependent on cytoskeleton elements. Also, we found that Rab 7 (a late endocytic marker) label CBV suggesting that CB reside in vacuoles interconnected with the late endocytic/autophagic route.

**LECTURE III****L. 7.****EFFECT OF HUMAN GAMMA INTERFERON ON CULTURED MURINE EMBRYOS**

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In 1993 Wegmann *et al.* postulated that the embryo would protect itself from maternal immune rejection by secreting TH2 cytokines. When TH1 cytokines predominates intrauterine growth retardation may occur, and in severe cases, pregnancy loss. Several studies have shown evidence supporting this hypothesis; nevertheless recent publications have questioned it. Svensson *et al.* concluded that IL-4 and IL-10, both TH2 cytokines, are not crucial for a successful pregnancy. In 1999 and 2000 Ashkar *et al.* reported that, during normal implantation in mice, INF- $\gamma$ , a TH1 cytokine, seems to play a role in facilitating the modifications that take place in the arteries of the decidua.

Previously we demonstrated that both, sera from infertile patients and hINF- $\gamma$ , added to the culture medium, impair mouse embryo development. As at the time of morula-blastocyst transition embryo differentiate into two cell types: trophoblast (TB) and inner cell mass (ICM) we considered important to study whether the inhibitory effect of hINF- $\gamma$  is expressed on ICM and/or TB cells.

After culture, embryos were fixed, stained, and classified according to the ICM and TB morphology as Type A or Type B. The surface area of the outgrowth was calculated by the formula  $A = \pi \cdot d_1 \cdot d_2$  where  $d_1$  and  $d_2$  are the major and minor diameters of the expansion areas. A "normal outgrowth" value was established according to the surfaces of the control group. Our results showed that exogenous hINF- $\gamma$  alters the development of both ICM and TB cells. A significant difference was found between the proportion of embryos classified as ICM/Type A ( $P < 0.0001$ ) and TB/Type A ( $P = 0.0013$ ) in Control (C) and hINF- $\gamma$  group. Differences between C and hINF- $\gamma$  group were also significant for surface area:  $204941 \pm 9727 \text{ um}^2$  C vs  $150281 \pm 9363 \text{ um}^2$  IFN- $\gamma$  group ( $p < 0.01$ ).

To ensure successful implantation, it is necessary to establish a molecular and cellular interaction between the embryo and the mother. Among the molecules involved in such interaction, some growth factors and their receptors are of crucial importance. We are currently analyzing the effect of hINF- $\gamma$  on the expression of members of the family of EGF receptors in the embryo. Since these receptors seem to be involved in the interaction of the blastocyst with the uterine luminal epithelium, inhibition of their expression could cause defective implantation, and in extreme cases, pregnancy loss.

**1. EFFECT OF HORMONES IN THE VEGETATIVE GROWTH AND PRODUCTION OF BIOMASS OF A NATIVE STRAIN OF *PLEUROTUS***

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In Argentina commercial strain of gírgolas are cultivated whose production cost is high; but native species can be taken to the commercial cultivation, we tested the vegetative growth and production of biomass of this strain with hormones in liquid and solid means. We used Alpha-Naphthaleneacetic acid, 6-Benzylaminopurine, Indole-3-butyric acid and 6-furfurylaminopurine. Mycelium of 6 days was used, Petri dish that contained the mean PDA like witness, that was supplemented with the hormones to different concentrations. The production of biomass was evaluated with identical mean but without agar, the biomass was dry until constant weight. For NAA, the growth is bigger than the witness and inside the treatment, the difference showed to bigger concentration, bigger growth. For the IBA, as much to 2 ppm as to 20 ppm the growth was smaller than the witness. With BA, the growth was smaller than the witness, while Kinetin was the one that bigger influence, since to the day 8 of cultivation and 20 ppm it had covered the Petri dish totally, for 1 and 2 ppm it also overcame the witness. The hormone that better manifested their effects in the vegetative growth and production of biomass, it was Kinetin since the development micelial had a marked difference against the witness to all the used concentrations.

**3. THE CLASSROOM – WORKSHOP: AN ALTERNATIVE METHODOLOGICAL STRATEGY TO TEACH AND LEARN BIOLOGY AT COLLEGE LEVEL**

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A dramatic change in the conceptual frame and in the strategies applied to the traditional teaching-learning model is imperative in order to acquire the scientific knowledge in Biology. The role of scientific education in this area is to make students construct concepts, attitudes and procedures during class time. The acquired knowledge should be transferable to new contexts and situations. In other words, linking everyday experience with scientific knowledge requires the adoption of specific didactic strategies. The objective of this paper is to propose the Classroom – Workshop as a methodological strategy. This methodology motivates participation. Participation is organized as a learning process in order to prompt creativity, diminishing mental dispersion, but keeping spontaneity, becoming this way the classroom in a space where everybody is the 'artisan of knowledge'. Students will be able to 'learn actively', i.e. to accomplish all necessary intellectual operations in order to elaborate information but integrating the thinking process with the effect and the action. Planning of the teaching – learning process will require three steps: a) Initial task: to focus students on the subject, b) Development of theoretical frame c) Conclusion and integration–extension tasks. Any of these steps need constant evaluation and supervision.

**2. THE SELF-EVALUATION OF THE CAREERS OF BIOLOGY AT THE UNIVERSIDAD NACIONAL DE SALTA**

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In the process of the institutional evaluation actions of self-evaluation of the careers Profesorado and Licenciatura en Ciencias Biológicas, were carried out since April 1998 to July 2000. The aims were: analysing the efficiency and effectiveness of the academic performance and identifying strengths, weaknesses, threats and opportunities (FODA), considering the teaching-learning process, scientific production and academic-administrative organization. Commissions working according the indicators and variables provided by the CONEAU\*, agreed upon procedures, stages and objectives. Information from different sources of the University, interviews and/or inquiries was collected. The data allowed the determination of FODA. Based on this identification, a tentative and specific plan of improvement was agreed upon. This process of self-evaluation and the advice from the external evaluators allowed us to carry out a critical, prospective, analytical and global reflection, in order to define a better profile of the Biology graduate, of the institution and also contribute to accede to a University of higher standards. (\*Comisión Nacional de Evaluación y Acreditación Universitaria)

**4. A COMPARATIVE STUDY OF TWO ORDINATION TECHNIQUES BASED ON SIMULATED MULTIVARIATE NORMAL DATA**

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Principal components (PCA) and Principal Coordinates (PCDA) are two statistical techniques widely used in numerical taxonomy. The results obtained may differ dramatically according to the way these techniques are used. A set of multivariate normal data under different scales of measurement was simulated, representing 50 samples drawn from 5 biological populations. Two conditions of standardization were studied: unstandardized and standardized by variables. Variance-covariance, correlation and Manhattan, Euclidean and Taxonomic distances were applied to data matrices. PCA (Q and R modes) and PCDA (Q mode) were run. Runs were made on the package NTSYS-pc 2.02. PCA did not performed well on Q mode; only variance-covariance and correlation in PCA R mode gave accurate scatter diagrams; standardization performs very well when working with variables measured in different scales; PCDA from distance matrices gave identical output as R mode PCA when working with covariances or correlations (duality of PCA and PCDA); even when using correlations in R mode PCA is better to start with a matrix of standardized data.

**5. EVALUATION OF ARGENTINEAN NORTHWEST WEEDS: TITHONIA TUBAEFORMIS (ASTERACEAE)**

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*Tithonia tubaeformis* (Jacq.), *Fam. Asteraceae*, commonly called "pasto cubano" it's an annual grass that growth spontaneously in Mexico and Central America. It was introduced in our country from Panama mixed with foreign seeds. This plant is considered a plague for the cultivations causing serious problems for the agriculture. However, the pollen of its flowers is very appreciated by the natural medicine. The aim of this present work was to carry out a study the chemical composition and biological activity in this species. Flowers was dried and extracted by maceration with methanol and fractionating into different constituents according to polarity. Phytochemical screening revealed tannins, steroids, triterpenoids, antrone and alkaloids. Analysis of the toxicity of hexane, chloroform and methanol extracts were carried out by means of the Brine Shrimp Lethality Test. It's conclude that "pasto cubano" may be evaluated from the double antagonistic conception of weed and medicinal plant.

**7. EVALUATION OF CLASSROOM PRACTICES: A forgotten task at University?**

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The present paper aims at enhancing a few of the premises to be considered when the time comes to design a process of evaluation of the pedagogic in a university classroom. Its purpose is to incorporate some aspects complementary to a mere measurement of the contents learned. The evaluation of our pedagogic practices should be a way of ensuring a constant and effective improvement of the personal and cultural formation of our students. Any educational evaluation should meet certain conditions in order to be relevant. It should take into account efforts and strategies and not only results in the learning process; focus on the acquisition of values and attitudes together with pure knowledge; value both explicit and not explicit formative data of the curriculum; be contextualized within the community the students belong to; be both quantitative and qualitative for an understanding of complex realities; designed to be compatible with the processes of teaching and learning to improve them in all ways; include the ethical dimension, admitting critical judgement, discrepancy and diversity of concepts; accompany the whole educational process synchronically and diachronically to provide a "temporal perspective" of the processes and results. To sum up, quality evaluation should lead to a better education.

**6. VALIDATION OF USED VEGETABLE SPECIES IN POPULAR MEDICINE: RETAMILLA**

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Retamilla is a medicinal herb that is expended in the pharmacy, used for the blood circulation, for varix and for cramps. The action pharmacological knowledge of this drug comes from the popular medicine, however, there aren't bibliographical references that justify their scientifically use in therapy.

The aim of this work to study the chemical composition and biological activity in this specie. The sample is identified as *Bulnesia retama* Griseb (*Zygophyllaceae*).

The preliminary study indicates the presence of tannins, triterpenoids, antrones and flavonoids.

For the bioassays of *Artemia salina* was used plants extracts of different polarity: hexanic, chloroformic and methanolic.

The results was statistically analyzed with the Finney Program to determine the values of LD<sub>50</sub>. The most polar retamilla extract present high cytotoxicity.

You will continue with the investigation of this species to contribute to the validation of their use.

**8. ATTENDING THE FIRST YEAR UNIVERSITY STUDENTS LEARNING**

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To begin a university carrier is a complex reality very different from the high school experience. This cause no few difficulties to the students and to the teachers. As Botánica General is a first year subject in Agronomía and Zootecnia career, the students have all these adaptative problems. Analyzing the students difficulties, first as Cathedra and then with related Cathedras from the northwest of Argentina, the Botánica General teachers review the teaching and learning methods actually in use. The objective of the present paper is to show a new pedagogic method and the parcial results which we obtained in the present year 2001. The students concepts, the methodological deficiency, plus the low adaptation to a superior level requeriment, were the main problems. In this new method we propose to see the teaching and learning methodology as a whole, which includes the students laboratory practices, their attitudes and habilities. So we propose that the student is the teaching center, the teacher function is only a guide, incentiving the group work, the independent study, the reasoning work and critical positions. All of them are subjects to be taken in consideration.

**9. EXPRESSION OF PROGESTERONE MEMBRANE RECEPTOR GENE IN PIG'S OVIDUCT**

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The steroid hormones act modulating the nuclear transcription and the synthesis of proteins through nuclear receptors. But also they act through specific membrane receptors that trigger fast effects. It is known that in pig's oviduct the steroid hormones provide an apt milieu for the transport of gametes, the qualification of the spermatozoa, the fertilization and the embryogenesis early stages. Since great part of these processes are regulated by the progesterone, is important to investigate the molecular mechanisms involved in this regulation. The objective of these work was to determine the genetic expression of the progesterone membrane receptor in pig's oviduct. The oviducts were classified in different stages according to the estrous cycle. After extraction and purification of the RNA, RT-PCR assays showed a specific amplified band. The results indicated that the gene of the progesterone receptor is expressed in all the stages of the sexual cycle. In comparison with the expression of b-actin taking as a control of constitutive expression, semi quantitative differences were not early observed. Since the actin is also involved in phenomena of cellular response, we thought that it is necessary to use another constitutive gene to study the progesterone membrane receptors regulation during the sexual cycle in further assays for confirming the differential expression of this gene.

**11. POLINIC MORPHOLOGY IN THREE SPECIES OF THE GENUS *COMMELINA* L. IN THE PROVINCE OF TUCUMÁN (ARGENTINA)**

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As a part of multidisciplinary investigation, the results of this study about the polinic morphology of the species *Commelina erecta* L., *Commelina tuberosa* L. and *Commelina diffusa* B. are presented, in order to contribute to clear the complexity of the phenotypic variability of this genus. Results obtained have shown the following: monocolped (anacolped) heteropolar oblate pollen grains; a thin apertural membrane with scattered spines; a tected-perforated exine thicker than the apertural membrane with small supracteal spines which were more tightly disposed than in the rest of the grain. Differences referring to the size of the grains, the height, and the distance between the spines and the area occupied by the colp were observed by using OM. The biggest grains were corresponded to *Commelina erecta* and *Commelina tuberosa* but the smallest ones were in *Commelina diffusa*. About the height of the spines, it was observed that it decreased in a similar way. In the first two species, the area, which was occupied by the colp, corresponded to the  $\frac{1}{3}$  part of the total grain surface, while in *Commelina diffusa* it corresponds to half total surface. Differences in the sculptura of the exina were observed by using SEM.

**10. TWO RT-PCR APPROACHES FOR RAPID IDENTIFICATION OF SENSE STRAND OF UNCHARACTERIZED EXPRESSED SEQUENCE TAGS (ESTs)**

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In our effort to search for differentially expressed genes in the mammalian oviduct using RAP-PCR, we have identified the Pr14 clone (Accession #: AF202268), an EST expressed in rat oviducts during the early pregnant stage. Pr14 sequence is similar to several non-related uncharacterized ESTs. In order to know the template strand of Pr14, we designed two different RT-PCR approaches. In the first approach, two cDNA reactions with specific primers were performed; one with primer Pr14A and the other with primer Pr14B. The resulting reverse transcribed reactions were PCR amplified with both specific primers. Only one of the two PCR reactions gave the specific RT-PCR product of the expected size, indicating that the sequence of primer Pr14A is the antisense. In the second experimental approach, a cDNA reaction using oligo dT was performed; the reverse transcribed sample was PCR amplified in two reactions using a single specific primer. PCR amplification of the products from linear amplification with both specific primers gave the specific product only in one of the two reactions. The result obtained was according with the first approach. These rapid RT-PCR approaches allowed us the identification of the polarity of the natural RNA of the Pr14 clone, as a first step towards the further characterization of this EST.

**12. PRESENCE AND QUANTIFICATION OF FREE FIXATIVE ATMOSPHERIC NITROGEN MICRO ORGANISMS IN *Hydrangea macrophylla* (Thunb.)**

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*Hydrangea macrophylla* (Thunb) is a shrub belonging to the Saxifrage family originating in Japan. The objective of this work was the determination of the presence and quantification of free fixative atmospheric nitrogen micro organisms in *Hydrangea macrophylla*. Roots samples were taken and they were washed and soaked. Samples of rhizosferic (R) zone and not rhizosferic (S) in soils were taken, too. It was made dilutions, suspensions. The samples were sown in specific culture mediums for *Azotobacter sp.*, *Azospirillum sp.* and *Derrxia sp.*, according to Döbereiner (1980) and for *Beijerinckia sp.* according to Girard and Rougieux (1964), and the bacteria quantification according Fischer and Yates Table (1963) and the identification we used the techniques of the Manual of Bergey's (1961). The analysis of the evaluated samples permitted the bacteria identification of the genders *Azospirillum sp.*, *Azotobacter sp.*, *Beijerinckia sp.* and *Derrxia sp.*, in root R and S. The values found indicates an association between bacteria and plant, being *Beijerinckia sp.* the one which presents an important population rate, it will be consider in the stock selection of free fixative atmospheric nitrogen micro organisms in order to inoculation with them. This method will give a good increase in the productivity.

**13. ATMOSPHERIC NITROGEN FREE FIXING BACTERIAS IN *Eleusine indica* (L) Gaertner, IN THE SUBHUMID-HUMID PLAINS OF TUCUMAN**

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The aim of this paper is to determine the existence, kind and quantity/gram of root, of Atmospheric Nitrogen free fixing bacterias in *Eleusine indica* (L) Gaertner. This is a native cespitous gramineous plant. The sampling of material to be evaluated was done in May in three areas of El Manantial Experimental Station, Tucuman Province. From 1 gr. of macerated root, dilutions-suspensions 1/10 were made, which were sown in cultures specific for *Azotobacter sp.*, *Beijerinckia sp.* and *Azospirillum sp.*. To determine the kind and quantity of free fixing bacterias associated to the root system and the rhizospheric area of *Eleusine*, Bergey's (1991) and Fisher & Yates (1963) methodologies were used. The results show that in the root, *Eleusine* evidences a population of free fixing bacterias much higher than that found in the rhizospheric area, mostly in the case of *Beijerinckia sp.* ( $8,5 \times 10^5$ ) y *Azotobacter sp.* ( $2,9 \times 10^5$ ). In the rhizospheric area, the population of micro-organisms is 10 times lower than in the root for the kind *Beijerinckia sp.* ( $8,5 \times 10^4$ ), while *Azotobacter sp.* presents a population density similar to the latter ( $8,5 \times 10^4$ ). In both areas under study, *Azospirillum sp.* was found in lower quantities regarding the other kinds ( $8,5 \times 10^4$  in root and  $2,9 \times 10^4$  in rhizospheric zone).

**15. CONDITIONS NEEDED TO STUDY ALLELOPATHIC EFFECT OF PLANT EXTRACTS**

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Inadequate control of growth factors could lead to wrong results in bioassays of the allelopathic effect of plant extracts. The aim of this work was the evaluation of pH, light and osmotic potential on germination and seedling growth. In each Petri dish 25 seeds of *Lactuca sativa* var Grand Rapids were placed on Whatman N°1 paper and 3 ml of solution (NaCl, pH or distilled water controls) was added. After 96 hs, shoot length, rooth elongation and germination were measured. The highest germination and root elongation was measured at 12hs light/dark. Shoot length was maximum in dark. Root elongation increased with higher pH levels. The highest shoot length was measured at pH 6,5 and the lowest at pH 5. Germination was similar for all treatment. Petri dishes without parafilm seal were affected considerably by osmotic pressure. The interpretation of shoot response was not clear.

Conclusions: Root elongation is the most suitable parameter for quantification of allelopathic effect of plant extracts on lettuce growth. pH and Osmotic pressure should be adjusted at 5-6,5 and 40 mOsm, respectively.

**14. DIMENSIONAL STUDY OF NATIVE SHRUBS AND TREES FROM SEMIARID OCCIDENTAL CHACO OF TUCUMAN, ARGENTINA**

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The objective of this work is to realize a dimensional study of the Mean Total Height (MTH) and Mean Treetop Diameter (MTD) parameters of a native shrub community from Semiarid Occidental Chaco Tucuman Province, Argentine, as data base for a posterior evaluation of its potential forage contribution in a woodedpastoral statement of extensive cattle raising. The work methodology consisted in the determination of Total Height and two Treetop Diameters (N-S and E-W) in 30 specimens of each species, selected at random for each sampled place, into plots of 250 has of representative forest of the evaluated region. The results of the MTH and MTD, respectively, were: *A. aroma*: 2,57 and 3,23 m; *A. praecox*: 2,15 and 2,16 m; *A. queb. blanco*: 4,32 and 3,60 m; *B. foliosa*: 1,59 and 1,56 m; *C. paraguariensis*: 4,79 and 6,08 m; *C. pallida*: 2,20 and 2,49 m; *C. australe*: 2,71 and 3,32 m; *M. carinatus*: 2,87 and 3,51 m; *P. microphylla*: 1,51 and 1,83 m; *P. nigra*: 3,94 and 4,70 m; *P. torquata*: 1,34 and 2,60 m; *S. queb. colorado*: 9,50 and 9,75 m; *Schinus sp.*: 2,16 and 2,97 m; *Z. mistol*: 3,40 and 2,85 m. From these results it is observed that Semiarid Occidental Chaco xerophytic forest is, in general, a low size formation.

**16. CARBOHYDRATE ANALYSIS DURING TREE TOMATO FRUIT DEVELOPMENT**

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Sugars are important components of fruit quality. Sugars constitute approximately 55 to 65% of fruits soluble solids fractions and significantly contribute to the tomato fruit flavor. The purposes of this work was to investigate the levels of sugar accumulation and carbohydrate metabolizing enzyme activities through fruit development in *Cyphomandra betacea* Sendt. This specie popularly used as raw or cooked fruit, is widely cultivated in Andean South America. This plant is of increasing economic importance and may have considerable potential for future exploitation. Analysis of fruit sugars level demonstrated that reducing sugar content increasing during tomato fruit ripening. Little sucrose concentration was detected. The high levels of invertase activity during the end of the ripening stages would be enzymic determinants that facilitate accumulation of high reducing/nonreducing sugar level. Similar results were reported for *Lycopersicon esculentum*. Other important feature was the low pH (3.7) found in fruit. The acidity determined in the fruit juice can be mainly attributed to a high malic acid concentration

**17. VIDEO DISCUSSION: AN ALTERNATIVE STRATEGY FOR THE METAEVALUATION IN SCIENCES**

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This work has as objective to describe an experience of metaevaluation of the process of learning of sciences, like an alternative strategy, by means of a video debates. Its use in the educative investigation, provides abundant and trustworthy information on pedagogical situations that appear daily in our classrooms. An interdisciplinary encounter with educational was implemented of first course of agronomic engineering and zootechnist. By means of the projection of the video "exams", it's been analyzed the situations created from a final evaluation to measure the learned thing in order to decide on the promotion of the students. The paradigms were analyzed on the evaluation in order to reassign the rolls of the different actors: students, educational, institution and family. The dialogue that was generated between the professors allowed to observe the different tendencies that the educational ones are seen implicitly and explicitly involved. The critical analysis of a situation of final examination through a video, has allowed to generate a space of reflection to the educational ones and to carry out a metaevaluation. This one will help to support the strengths and to surpass the weaknesses of the evaluation processes in use in our classrooms.

**19. CITOTOXICITY AND GENOTOXICITY OF *Acacia aroma* GILL. H. Et. ARN PHARMACEUTICAL FORMULATIONS**

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*Acacia aroma* GILL. H. ET, ARN., Known as tusca is used in popular medicine as antiseptic, antiinflammatory and cicatrizant. Antimicrobial activity of extracts obtained from different parts of the vegetal was demonstrated in previous works. Fluid extracts from leaves and flowers demonstrated to be the most active against *Staphylococcus* (CIM < 150 µg/ml) y *Enterococcus* (CIM < 400µg/ml). The aim of this work was to evaluate citotoxicity and genotoxicity activity of both, flowers and leaves fluid extracts.

Brine shrimp assay was selected to test citotoxicity of the extracts. Fluid extracts from leaves and flowers showed to be citotoxic (LD<sub>50</sub> < 1000 ppm).

*Allium cepa* L test was used to evaluate genotoxicity of extracts. The results indicated dose-dependant effects on root length growth. Both extracts increased the mitotic index compared to controls, the cellular cycle is made active by decreasing the number of cells in interfase and so increasing the numbers of cellular division in the next stages. Extracts of 1000 and 10000 ppm produced macroscopic and microscopic anomalies.

These observations permit us to conclude that tissue regeneration and cicatrization can be convalidated with popular attribution to this vegetal, as well as its potential antitumoral activity.

**18. STRATEGIES OF TEACHING. COMPARISON OF DIFFERENT EXPERIENCES OF LEARNING**

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The aim of this work was to apply pedagogic strategies to a subject in the fifth course of the career of pharmacy in the National University of Tucumán, based on the fact that practice is the main tool to get knowledge. Groupal dynamic was the methodology chosen to work with some groups of students whereas the classic methodology was used comparatively. The pedagogical techniques used were: mosaic and symposium. These permitted the integration of originally heterogeneous groups and a wide participation of alumni respectively. Long lasting and enriching discussions among students of different plans of study in the career were the result of this methodology compared to that where written answers on the same topic were made as a control

**20. THE CONTROL OF PROCESS AS A NEW TOOL IN THE METHODOLOGY OF TEACHING IN PHARMACEUTICAL TECHNOLOGY**

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In the production of pharmaceutical dosage it is necessary to know the general process and every stage in particular. Every step should be conducted to make sure that no mistakes or unnecessary risks will involved.

The objective of the present work was to plan and to explain to the students on what the elaboration of a pharmaceutical dosage form means following normatives as pharmaceutical industry does. According to them it was designed a sampling system and control during the production process (CDP) of paracetamol tablets. The CDP is physicochemical andl pharmacotechnical. Tets.

As a result of this novel focusing methodology in our laboratory alumni adquired plenty of consciousness of all requirements demanded for a medicine.

### 21. EVALUATION OF TEACHING DEVELOPMENT

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To procure the students get knowledges, skills, aptitudes and attitudes is the main objective in all levels of teaching. The evaluation of teaching performance may be done either by measuring the level of succeed in these purposes or by requiring to be evaluated by the students throw a well designed formulary.

This sell evaluation method could help to identify the possible causes of a low students-yield. The aim of this work was to evaluate teaching performance, specially during lab works.

This would leade to increase professor.student relationship.

The investigation was conducted with students of the last year of the career of pharmacy, by means of a well designed filling-form to be anonymously and voluntarily filled and houded over.

We can concluded that this sort of evaluating methodology is a very usefull tool and allows teachers to better the development of a subjet to contribute to the teaching-learning process.

### 23. HEMATOLOGICAL VALUES IN BROWN BROCKET DEER

S. Chamut<sup>1</sup>, J. Yapur<sup>2</sup> and P. Black-Décima<sup>3</sup>

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The objective of this investigation was to obtain reference values for 5 hematological parameters in brown brocket deer (*Mazama gouazoubira*). Data were obtained from 16 deer, 10 males and 6 females, between 4 months and 7 years of age; all were maintained in captivity in 2 reserves. From each animal 3-5 ml of blood was obtained; 3 smears were made and the rest treated with EDTA as anticoagulant. Determinations were made in duplicate with automatic, semi-automatic and manual methods, using particle counters Sysmex CC130 and CellDyn 1600 and a Neubauer chamber. Hematocrit (Hto) values were 32-48%, Hemoglobin (Hb) from 10.8-16.5 g/dl, erythrocytes between 10 and 25 million/ $\mu$ l, leucocytes (WBC) between 3,800 and 11,900/ $\mu$ l and Mean Corpuscular Volume (MCV) was 21-35 fl. In general the values for Hto, Hb, WBC and MCV are similar to those reported for other deer species; MCV is at the smaller end. We found higher values for red blood cells than those reported by other authors; this is due to the different methods used for the determination and to the reduced MCV.

### 22. SICKLING IN HYPOXIC ERYTHROCYTES OF BROWN BROCKET DEER

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A mutant hemoglobin (HbS) in human red blood cells produces the often fatal disease Sickle Cell Anemia, characterized by elongated, sickle shaped erythrocytes with altered function and half life. The genetic and molecular bases of this disease have been studied extensively. Similar sickle cells have been described in deer and other animal species. The present objective was to investigate the phenomenon in brown brocket deer (*Mazama gouazoubira*). Blood smears from 15 deer were colored with May Grunwald Giemsa and analyzed microscopically under normal and hypoxic conditions. In one specimen blood was prepared for transmission and scanning electron microscopy; one part was also hemolyzed for hemoglobin electrophoresis. All samples showed the characteristic formation of sickle cells and also of polymers in both light and electron microscopy. Electrophoresis revealed dense bands of deer hemoglobin at the level of human HbH and HbBart's. Although in deer this phenomenon apparently occurs in vitro but not in vivo and does not produce deleterious effects, the origin and explanation of these findings are still not clear.

### 24. VESICULAR - ARBUSCULAR MYCORRHIZAE AND PHOSPHATE NUTRITION IN NATIVE, PERENNIAL GRASS SPECIES

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Concentration of available nutrients in the soil (mainly phosphorus) is an important determinant of the degree of association of plant root systems with mycorrhizal fungi. The relationships between percentage vesicular-arbuscular mycorrhizae (VAM) colonization and concentration of phosphorus (P) in the soil or in the shoot tissue were studied in *Stipa clarazii*, *S. tenuis* and *S. ambigua* within an enclosure to domestic herbivory in the Chacra Experimental de Patagones (40° 39'S, 62° 54'W). Within each species, half of the plants was defoliated on 17/9/98 and 12/10/98, while the other half remained undefoliated. During 1998, four plants were harvested per treatment on 26/9, 23/10 and 4/12 to determine %VAM, and %P in the soil and shoot tissues. Significant correlations were only obtained in the first sampling date, where defoliated plants of *S. tenuis* showed a positive correlation ( $r=0.99$ ;  $n=4$ ) between %VAM and % tissue P. At the same time, a negative correlation ( $r=0.84$ ;  $n=8$ ) between %VAM and % soil P was obtained on defoliated and undefoliated plants of *S. clarazii*. These results emphasize the importance of VAM to phosphate nutrition in these species under conditions of soil available P deficiency.

25.

**ATMOSPHERIC NITROGEN-FIXING RHIZOBACTERIAS IN *Chloris gayana* IN THE EAST OF TUCUMAN, ARGENTINA***Cisneros Nuñez, J.C.; Jaime, M.; Mascaro, P.; Chueca, C.; Nasca, J. and Ricci, H.**Faculty Agronomy and Zootechnia, U. N. T., Argentina.*

*Chloris gayana* common name Grama Rhodes was introduced in Tucumán in 1916, is a tropical graminea perennial, in before works of this pastures for times different of year (June and December of 2000) have shown there is a good association microorganisms – plant. The object of this work were identification and count atmospheric nitrogen – fixing rhizobacterias in *Chloris gayana*. Different root and soil rhizospheric (R) samples were taken in Tucumán, in march 2001, cultures prepared for *Azotobacter sp.*, *Azospirillum sp.* and *Derxia sp.*: Döbereiner, J. (1980) and for *Beijerinckia sp.*: Girard and Rougieux (1964). The identification of this fixing bacteria: Bergey's (1991), the count Fisher and Yate (1963). The results were statistics with ANOVA for completely aleatorizado sketch was determine significant different by means of Test of Tukey (p. 0,05). The results obtiene prove there is a community important of nitrogen – fixing rhizobacterias free in the root of *Chloris gayana* and the soil R. *Beijerinckia sp.* the population increased in the two situations. *Derxia sp.* evidenced decrease in population. *Azotobacter sp.* and *Azospirillum sp.* have shown different distribution in root and R. were identified and count atmospheric nitrogen – fixing rhizobacterias in *Chloris gayana*.

27.

**CARTICAINE, CANPHORATED MONOCHLORO PHENOL (CMCP) AND CMCP+PROPILEN GLYCOL: VEHICLES OF  $Ca(OH)_2$** *M. Pacios<sup>1\*</sup>, M. de la Casa<sup>2</sup>, M. Bulacio<sup>3</sup>, J. Mena<sup>3</sup>, M. López<sup>1</sup>**<sup>1</sup>Cát. Quím. Biol., <sup>2</sup>Cát. Endod, Fac. Odontol, <sup>3</sup>INIE. UNT. Av. Benj. Aráoz 800, 4000 Tucumán, Argentina.*

$Ca(OH)_2$  has been used in Endodontics in the disinfections of the root canal, to stop reabsorptions, to diminish inflammations and to promote formation of hard tissue. The aim of this work is to compare the *in vitro* effect with the time on chemical composition of root dentin of different vehicles of  $Ca(OH)_2$ . Incisive and canine were selected, disinfected with 1%NaClO and rinsed. The coronary portion and the remain pulp and cement were eliminated. Two final cuts were made. Pieces were placed into tubes with  $Ca(OH)_2$  solutions added of: carticaine, CMCP and CMCP+propilenglycol. PH, proteins, hydroxyproline and phosphor were determined at 0,1,7,14,21 and 35 days. All solutions maintain pH. In total proteins values with carticaine are significantly higher that the control, while in the other two solutions values are lower than the control, without being significant different. With hydroxyproline, values with carticaine are lower than the control without being significant different, while in the other two solutions values are higher than the control. In phosphor, values of the three solutions are significantly lower that the control, without being significant different among them. Pieces of dentin lacking of root cement showed calcium ion attraction which would be influenced by the addition of the different vehicles.

26.

**COMPARATIVE STUDY OF BONE VOLUME IN PERIODONTITIS WITH EXPERIMENTAL THERAPIES. MORPHOMÉTRIC ANALYSIS***Martín A, Garat J, Lopez Miranda L, Ruiz Holgado N, Pani M, Meheris H, Gordillo M.**Dept. of Histology School of Dentistry. University of Tucuman. Argentina.*

The use of chemiotherapical agents in periodontitis treatment are effective for the illnesses produced by bacterial badge. The objective of the present study is to compare the morphometrics results of experimental periodontitis treated with Iodopovidona and Metronidazol. Sprague Dawley rats were used. Periodontitis was induced by cervical wire thread (WT) in lower first molars. Then the animals were distributed as follows: design experimental

Grupos	Dia 0	Dia 21	Dia 22 to 35	Dia 36
I				Sacrifice
II	WT	Sacrifice		
III	WT	Rem. WT	Destilled W	Sacrifice
IV	WT	Rem. WT	Metronidaz.	Sacrifice
V	WT	Rem. WT	Iodopovido.	Sacrifice

The samples were routine processed by light microscopy observation. The histomorphometric analysis assessed bone volume in terms of trabeculae volume and Total Bone Volume. Results: G I=58,37±8,41; GII=69,38±9,84; G III= 63,75 ±12,05; G IV = 78,71± 8,5; G V = 79,8± 1,9. The bone loss was smaller in the group IV. Conclusions: of the obtained results it is inferred that the metronidazol is since the election quimioterapico control the inflammation and it favors the increment of the bone volume and the bone decrease of the lost one in rats with experimental periodontitis. Sponsored by CIUNT.

28.

**DISORDERS OF GLYCOLYTIC PATHWAY IN MICE EXPOSED TO LOW LEVEL LEAD***Sant Yacumo R, Martínez Riera N, Soria N, Guzzi L, Riera de Martínez Villa N.**Dpto. Salud Pública (Or. Toxicología). Facultad de Medicina, UNT. Lamadrid 875, CP 4000. Tucumán.**E-mail: santyac1402@ciudad.com.ar CIUNT*

Several studies suggest that  $Pb^{2+}$  induces changes in the activity of many enzymes in glucose metabolism. In the present work we examined the effects of low level lead on glycolytic pathway. Male and female (40-50g body wt) C3H adults mice were used. They were kept at constant temperature (24°C), humidity (50%), and in a 12 hs light/dark cycle. They were feeded with a free- $Pb^{2+}$  standard diet and water ad-libitum. One group (n=18) received lead acetate in drinking water in a dose of 0,5 ppm. After six months, blood samples were collected to measure plasma glucose (PG), glycosylated hemoglobin (HbA1c), tryglicerides (Tg), glutathione reductase (GSH) and pyruvate kinase (PK). ALA-D was measure as lead exposure marker. Statistically significant difference of blood variables levels between lead exposure group and control group (n=18) was observed: PG g/l (1.95 ± 0.22 v.s. 1.16 ± 0.1) (P<0,0001), Tg g/l (1.75 ± 0.1 v.s. 1.17 ± 0.1) (P<0,0001), ALA-D U/I (10.22 ± 2.8 v.s. 17.07 ± 1.1) (P<0,0001), GSH fluorescence time in minutes (FT) (23.6 ± 2.3 v.s. 15.9 ± 1.7) (P<0,0001), PK(FT)(22.7 ± 2.6 v.s.15.6 ± 1.5) (P<0,0001) No significant difference in HbA1c levels (5.1 ± 0.4 v.s. 4.9 ± 0.5) were observed. The data suggest that  $Pb^{2+}$  in low level causes disorders in glycolytic pathway and deficiency in both enzymes, GSH and PK.

**29. DISTRIBUTION OF *Phyllocoptruta oleivora* ASHM (ACARI-ERIOPHYIDAE) IN LEMON TREE PLANT**

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The citrus rust mite, *Phyllocoptruta oleivora* Ashm is a lemon tree occasional plague in Tucumán (Argentina). The objective of this work is to know the distribution of *P. oleivora* in the plant, in order to adjust the monitoring technique. The study was realized in a field of Lules locality. For the sampling 10 plants at random were taken and leaves of four quadrants and of three different heights: low (0.50 to 0.70m), mean (1.30 to 1.50) and high (2 or more m) were collected. The recounts were made on the right and back side of the leaves; two circles were marked in every one face in order to know the revised surface. The measurements were made in periodical form during 1997 to 1999. The obtained results gave the following average values of mite distribution: a) by quadrant: East 17.4%, South 19.3%, North 29.1% and West 34.3%; B) as sampling height: low 16.4%, mean 36% and high 47.6% and c) by leaf location: right side 8.3% and back side 91.7%. For the monitoring of *Phyllocoptruta oleivora* must be sampled preferably the leaves located on the West. At 1.50 to 2.00 m of height and to determine the population density (mites/cm<sup>2</sup>) only on the back side of leaves.

**31. RECOGNITION OF FREQUENT ERECT WEEDS IN CULTIVATED FIELDS IN NW ARGENTINA. FAMILIES: EUFORBIACEAE, FABACEAE, LABIATAE, MALVACEAE, PAPAVERACEAE, PORTULACACEAE, RUBIACEAE, SOLANACEAE AND VIOLACEAE**

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The presence of weeds plays an important role in diminishing yields of crops. A correct identification is important in order to manage and/or control weeds populations. The objective of this study is to recognize and describe erect habit weeds, belonging to several botanical families, present in productive systems in NW Argentina. Farms were surveyed during the last 12 years. Easily observable vegetative and reproductive characters were chosen. The following species were recognized: **Euforbiaceae:** *Acalypha poiretti*; *Croton lobatus*; *Euphorbia acerensis*; *E. heterophylla*; *Ricinus communis*. **Fabaceae:** *Senna occidentalis*; *S. tora*. **Labiatae:** *Leonurus sibiricus*; *Stachys petiolosa*. **Malvaceae:** *Malvastrum coromandelianum*; *Sida rhombifolia*; *Sphaeralcea bonariensis*. **Papaveraceae:** *Argemone mexicana*. **Portulacaceae:** *Talinum fruticosum*; *T. paniculatum*. **Rubiaceae:** *Borreria eryngioides*. **Solanaceae:** *Nicandra physalodes*; *Physalis angulata*; *P. pubescens*; *P. viscosa*; *Solanum atriplicifolium*; *S. conditum*; *S. hieronymi*; *S. lorentzii*; *S. physalidicalyx*; *S. sysimbriifolium*. **Violaceae:** *Hybanthus parviflorus*

**30. RECOGNITION AND DESCRIPTION OF ERECT WEEDS IN PRODUCTIVE SYSTEMS IN NW ARGENTINA. FAMILIES: AMARANTACEAE, ASTERACEAE, CHENOPODIACEAE AND VERBENACEAE**

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A correct identification is necessary in order to manage or control weeds populations. The objective of this study is to recognize and describe erect habit weeds, belonging to several botanical families, present in productive systems in NW Argentina. Species were chosen by means of surveys in farms during the last 12 years. Botanical identification was accomplished by means of taxonomic keys. Easily observable vegetative and reproductive characters are included. The following species are recognized and described: **Amarantaceae:** *Amaranthus spinosus*; *A. standleyanus*; *A. quitensis*; *A. viridis*; *Gomphrena perennis*; *Pfaffia glomerata*. **Asteraceae:** *Acanthospermum hispidum*; *Ageratum conyzoides*; *Bidens pilosa*; *B. subalternans*; *Carduus thoermeri*; *Coniza bonariensis*; *C. floribunda*; *Erechtites hieracifolia*; *Galinsoga parviflora*; *Gamochaeta pensylvanica*; *Tagetes minuta*; *Tithonia tubaeformis*; *Verbesina encelioides*; *Wedelia glauca*. **Chenopodiaceae:** *Chenopodium album*. **Verbenaceae:** *Verbena bonariensis*; *V. gracilescens*.

**32. RELATION BETWEEN PRESENCE - DAMAGES OF *Eriophyes sheldoni* EWING (ACARI-ERIOPHYIDAE) IN LEMON TREE**

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*Eriophyes sheldoni* (Ewing) known as "bud mite", is key plague of the lemon tree crop. It is important to point out that, owing to its very small size (not visible at first sight), the producers realize their control treatments based on the damage symptom. This produces frequent mistakes because of the mites could or not be presents there. The objective of this work was to statistically demonstrate the relation between the presence or not of bud mites and the state of them. For that, little branch were collected from lemon tree plants located in two different agroecological regions: Burruyacú and La Cocha, of the Tucumán province. The sampling dates were fixed each three months, at the four seasons (autumn, winter, spring and summer). A study of sane and damaged buds, with and without mites, was realized. For the statistical analysis a Chi Square Test was used. It is demonstrated that it exists independence between the mite presence and the state of the buds. Because of this, the decisions about control measures have to be necessarily based on the recount of mites per bud and not on the damage symptom.

33.

**RELATIONSHIP BETWEEN THE GOLD NUMBER AND THE DISPOSITION AND MORPHOLOGY OF NITROGEN FIXER NODULES IN THE RADICAL SYSTEM**

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The terms of the succession of Fibonacci, of great importance in Botany, are related with the gold number  $\Phi = 1,6180339$ . The relationship between the disposition of the radical system of *Daucus carota* L. and the distribution and form of nitrogen fixer nodules of alfalfa (*Medicago sativa*) with the gold number was analyzed in this work. Samples of *Medicago sativa* and of *Daucus carota* L. roots were collected, carrying out observations and measurements of transversal cuts of nodules and of the disposition of the radicals vegetative points.

The nodules lengths ratio that falls in the  $[\sqrt{\Phi}, \Phi]$  interval was of 28%. Both the radical points of *Daucus carota* L. and the *Medicago sativa* nodules define a helicoidal growth pattern, which can be constructed starting from golden rectangles.

The distribution and form of roots and nodules, in the nature is not at random but rather respond to a definite, which is related with the gold number.

35.

**IDENTIFICATION AND DETERMINATION OF POPULATION VARIATION SUMMER VS. WINTER OF NITROGEN-FIXING BACTERIA IN *CENCHRUS CILIARE*, VAR. TEXAS 604**

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*Cenchrus Ciliare* is a forage significance for the cattle. Previous researches on tropical graminea have shown there is a good association with nitrogen-fixing microorganisms. These paper encouraged to continue with nitrogen fixing microorganisms *Azotobacter* sp., *Azospirillum* sp., *Beijerinckia* sp. and *Derrxia* sp., at the beginning of summer in order to determine the behaviour in summer vs. winter. Soil samples were taken: rhizospheric (R) and non-rhizospheric area (S). The roots were washed, macerated and sown Döbereiner, J.(1980), Girard and Rougieux (1964). The identification Bergey's (1991) the count Fisher and Yates. Values summer vs. winter. In S, *Beijerinckia* sp. and *Derrxia* sp. Increased ( $29 \times 10^5$  vs.  $85 \times 10^3$ ). *Azospirillum* sp. remained constant ( $29 \times 10^4$ ) and *Azotobacter* sp. evidenced decrease ( $85 \times 10^3$  vs.  $29 \times 10^5$ ). In the root *Azotobacter* sp. and *Derrxia* sp. kept constant *Beijerinckia* sp. and *Azospirillum* sp. increase ( $85 \times 10^4$  vs.  $29 \times 10^4$ ). In R there was an increase ( $29 \times 10^5$  vs.  $29 \times 10^4$ ). As a conclusion, nitrogen-fixing bacteria were identified and variations in the populations of these microorganisms were observed compared to those in winter. A good association microorganism-plant due to an increase in the root exudates in summer was noticed.

34.

**THE SEMINAR AS AN INTEGRATIVE PEDAGOGICAL PROPOSAL IN SPECIAL BOTANY. AGRONOMY AND ZOOTECNIC FACULTY OF THE NATIONAL UNIVERSITY OF TUCUMÁN**

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From the analysis of the teaching and learning process, we have concluded that there are some faults regarding the integration of theoretical and practical knowledge, as well as in different skills and abilities to handle real situations closely linked with the students' professional duty. The current work's objective is proposing the Seminar as pedagogical innovation, integrative of theoretical and practical knowledge in the Special Botany subject, relating them to the problem of the current Production Systems. The Seminar is led by a Professor and performed in groups of students. The activities are: Selection of work issues; Bibliographical search; Consultations with other Departments or Institutions. Collection of the chosen vegetal species; Herborization of the plants Species Identification through Taxonomical Keys; Botanic description; Analysis of the agronomic importance; Oral exposition. With this activity we, the teachers, have proved that the teaching-learning process in the subject of Special Botany improves in a notorious way since students achieve an acceptable relation and integration of all subjects; it encourages and develops the team work spirit.

36.

**THE CHAOTIC PROCESS AND THE APPLICATION OF THE SERIE DE FOURIER IN THE BIOLOGICAL ANSWER OF CULTIVATED FLOORS WITH CANE OF SUGAR TO NITROGEN'S FERTILIZER**

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In its moment the cultivation of the cane of sugar in Tucumán is fertilized with nitrogen. It has been proven that the fertilization with nitrogen alters the answer of the microbial flora that fixes nitrogen in the floor.

The objective of the work is to show that the system presents chaotic conditions after the mathematical formulation with the use of Series of Fourier. The result of the alteration caused in the microbial flora that fixes nitrogen by the action of the fertilization, it was used to express a periodic function, the one that also admits a representation in series of trigonometrical terms. The number of microorganisms was adjusted obtained when using the recount carried out amid special cultivations, and its approached a function to the terms of the Series of Fourier. You concludes that the system is chaotic, what expresses that the answer is in many cases unpredict, characteristic of most of the biological systems, those that are usually amid the chaos and the order, for that as much its structure as its behavior, they turn out to be so complicated and variables that cross from a frontier to another unbeforehand.

**37. EFFECT OF HEXOSES AND OXYGEN AVAILABILITY ON GLYCEROL DEGRADATION BY *Lactobacillus hilgardii* X<sub>1</sub>B FROM WINE**

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In wine, glycerol is available after alcoholic fermentation by yeast and is important for body and softness. Therefore, its degradation is an undesirable property. We studied the effect of glycerol and other carbon sources (glucose and fructose) on growth and fermentation balances of *Lb. hilgardii* X<sub>1</sub>B. This strain grows better on fructose than glucose and it poorly grows on glycerol. Growth is lower and diauxic when glycerol is added to the media containing sugars and the consumption of them decreases. Glycerol utilization is higher in anaerobic conditions than in microaerophilic ones. In both cases, independently of the carbon source, the products of sugar fermentation are lactate, acetate and ethanol. The fermentation balances from glycerol and sugar cultures show differences related to the presence of O<sub>2</sub>. Under anaerobic conditions, lactate, acetate and ethanol concentrations increase, suggesting the presence of the oxidative or kinase pathway. Under microaerophilic conditions, in spite of the higher consumption of glycerol, these products do not increase but a significant quantity of glycerol leads to the formation of 1,3-propanediol indicating the presence of reductive pathway. We can conclude that *Lb. hilgardii* X<sub>1</sub>B degrades glycerol via two different pathways whose expression depends on the availability of O<sub>2</sub>.

**39. A COMPARATIVE STUDY OF TWO ORDINATION TECHNIQUES BASED ON A MATRIX OF BINARY DATA**

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Presence/absence data are frequently used in numerical taxonomy or ecology studies. Different combinations of technique, standardization and di/similarity coefficients may produce different outputs by means of which different conclusions may be drawn. The objective of this study is to comparatively study Principal Components (PCA) and Principal Coordinates (PCDA) under different condition of application in order to judge the similarity of the conclusions to be drawn. Data were standardized by variables and non standardized. The following coefficients were applied to data: Variance-covariance (VARCOV), Correlation (CORR); Taxonomic (TAX) and Euclidean (EUC) distances; Simple Matching (SM), Dice (DC) Jaccard (J) and Rogers and Tanimoto (RT) association coefficients. PCA (R mode) and PCDA (Q mode) were applied to matrices. Ordinations from PCA on VARCOV and correlation R matrices are dual to SM, TAX and EUC ones. Standardization is not necessary on binary data. SM, TAC and EUC showed identical outputs. SM, CORR, RT and DC produced very similar results.

**38. SPIDERS OVER LEMON TREE BUDS ATTACKED BY *Phyllocnistis citrella* STANTON (LEPIDOPTERA - GRACILLARIIDAE)**

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Among the principal plagues that affect the lemon trees it is the "citric leaf miner" *Phyllocnistis citrella* Stainton which population is regulated by different arthropods as spiders, among them. These function as regulators that limit the initial exponential growth of a specific population of preys. The objective of this work was to determine the present spiders in buds of lemon tree attacked by *Phyllocnistis citrella*. The study was realized in a three years lemon tree plantation from Finca El manantial, F.A.Z. (UNT) from December of 1999 to March of 2000. The spider collect was realized at diurnal journeys over buds affected by the miner. The collected spiders were phenotypically differentiated and grouped in morphospecies. They were grouped in 7 families and 18 morphospecies. The most diverse family was Salticidae with 5 morphospecies; Thomisidae, 3; Araneidae, 3; Anyphaenidae, 3; Miturgidae, 1; Theridiidae, 2 and Clubionidae, 1, resulting a total of 26 collected individuals. The obtained results indicate a numerous community of spiders related to the miner that could be acting as regulators of their populations.

**40. EFFECT OF SOLARIZATION IN THE CONTROL OF WEEDS**

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Different authors demonstrated herbicidal effect of solarization but in the province of Tucumán no signs of previous studies about it are registered. The objective of this paper is to determine the effect of solarization in the control of weeds. The experiment was carried out in two greenhouses in Chicligasta department. The period went from 24/11/00 to 30/12/00. The soil was prepared and was watered until field capacity. One of them was covered with a crystal plastic of 40 u, the other one was left as a witness. Temperature with a soil thermometer at a depth of 10 cm was measured daily at 7,9,11,1,3,5 and 7 pm. To measure the effect of solarization on weeds the same were catalogued and the degree of abundance was determined: 1- very scarce, 2- scarce, 3- not numerous, 4- numerous and abundant and 5- very numerous. It was determined, during the experimental period, that the greater temperatures were registered at 5 and 7 pm, being of 41°C in unsolarised soil and of 46,7°C in solarised soil. In the greenhouse without solarising the degree of abundance in annual weeds was of 3, 4 and 5 and in the perennial of 3 and 5. In the solarised of 1 and 2 for the annual ones and of 1 and 3 for the perennial ones. The solarization of the soil produces an important reduction of annual and perennial weeds.

**41. BIOCHEMISTRY IN MEDICAL TRAINING. A PEDAGOGY-COMPUTING ALTERNATIVE**

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Computing changes and deep transformation in educational technology occurring in our society demand the search for alternatives in the process of information transfer. The aim of this paper is to combine Problem-solving Based Learning with the new tendencies our society is going through. An interactive program was designed where 'simulated' patients and contexts were used in the teaching-learning process, making it possible, from the symptoms found out, to make suitable lab tests according to every case. This new teaching-learning approach was used with a group of university students (subject: Biochemistry). After the experience, they were surveyed to find out their opinion. Seventy percent (70%) considered the new approach 'excellent'. A hundred percent (100%) said that the knowledge they had on the subject was enough to handle and solve the problems included in the test. From the ones that had performed wrongly, 84% knew why they were mistaken. This independent learning approach leads to knowledge building, increasing students' skills for having an active role in acquiring, analyzing and applying information.

**43. NATIVE MYCORRHIZAS IN AVOCADO (*Persea americana*) AS A SUBSTITUTE CROP OF THE WOODED FLORA IN EL TAFICILLO, TUCUMÁN**

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In the province of Tucumán it has been eliminated wide areas of the wooded flora along the Parque Sierra de San Javier, being replaced by different crops. The aim of this work is to determine the presence of native mycorrhizas in avocado. The experience was carried out in a 4 hectares plot in Los Nogales at 1000 m.a.s.l., with 15% of pending and pH 7.0 collecting selectively the vegetal material. The avocado plants were 18 months old, Mexican foot grafted with Torres and Hass varieties; they came from nursery under organic management with dripping irrigation and fertilized with equine manure. The soil was covered with different native shrubs and trees species. A Basidiomycete associated to horco cebil roots was collected. Avocado roots and soil samples were taken, as well as from covering plants associated to avocado and from the neighbor area. Roots were treated according to Phillips and Hayman method. Sections of carpophores were placed on culture medium of Hagem, incubating at 28°C. Results show a low colonization of endomycorrhizas in avocado (20%); Arrayán, nogal and Fagara sp showed 50% of colonization whilst in the other species no mycorrhizic structures were observed. In the medium of Hagem a fungus was observed after 12 days of incubation, showing a central cream-white to rose colored colony surrounded by a dry-dusty greenish colony. Basidiospores and conidiophores with conidia of *Penicillium* in the perimeter were observed. The low colonization of endomycorrhizas in avocado could be due to the joined action of the host plant change, neutral pH of the soil and to the contribution of nutrients by the organic fertilizer.

**42. ESTIMATION BIAS OF THE POPULATION DENSITY THROUGH THE STRIP TRANSECT METHOD WHEN THE ASSUMPTION THAT ALL THE INDIVIDUALS ARE SEEN IS VIOLATED**

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One of the assumptions of the method of strip transect is that all the individuals in the strip are seen. However, if the probability of detecting an individual depends on the distance from it to the transect, it is adequate to propose a model for the detectability in order to avoid the introduction of an important bias in the estimation.

Our objective is to deduce the bias in the estimation of the population density if it is supposed that all the individuals are seen, that is, detectability is given by  $g(y)=1$ ,  $0 < y < w$  (1), when in fact it is given by  $g(y)=1-(y/w)^a$ ,  $a > 0$ ,  $0 < y < w$  (2).

When detectability is given by (2), we can estimate the population density by  $D_p = n(a+1)/(2Lw)$ , but when detectability is given by (1) the estimator is  $D_u = n/(2Lw)$ , where  $L$  is the length of the transect,  $n$  the number of individuals observed, and  $w$  is the maximum distance in which individuals can be observed.

If the right detectability is (2) and  $w$  is known, the estimator  $D_p$  is unbiased so we deduce that the percentage bias of the estimator  $D_u$  is  $-100(1+a)^{-1}\%$ . Thus, in the case of  $a=1$ , in which detectability decreases in a proportional way in relation to the distance from the individual to the transect, the expected value of  $D_u$  is half the value of the real density.

**44. PHENOLICS COMPOUND IN HONEYS OF THE CALCHAQUI VALLEY**

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These phenolics compound, coming from natural products, has got importance by the reevaluation of the green medicine and the well known therapeutic properties. This work has the object of the study of the total content of phenolics compound in the honeys of the Calchaquí Valley. The calibration curve was carried out with a phenolic compound like the Gallic Acid and a reagent, the Ferricianuro of Potassium, measuring absorbance in espectrofotometers to 765 nm. Other methods exist to determine the phenolic compound, as cromatography in column of aluminum oxide, gassy cromatography, blue of Prussia, etc. We lean for the method of the Gallic acid because this compound is very soluble in water, easy handling and easy to get. Sixteen Samples of honeys of the Valley were collected and stored according to well-known techniques. Each sample was analyzed in our Laboratory of Quality Control of the products of the beehive. Five grams of each sample were dissolved in water taking to final volume to 100 ml in volumetric flask. The aliquot of 1 ml of mother solution was added a mixture of 400  $\mu$ l of  $K_4 Fe(CN)_6$  and 400  $\mu$ l of  $Fe Cl_3$ , taking to final volume of 10 ml. The total concentration of phenols was expressed as Gallic Acid, according to the calibration of the curve before mentioned. The obtained values are in the order of  $10^{-3}\%$ , concluding that the phenolic contained in honeys of the Calchaquí Valley is but very low.

**45. INVITRO INHIBITION OF PHYTO-PATHOGENIC FUNGUS GROWTH**

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In spite of the lack of plant protection mechanisms such as animal immune system, plant cells are capable of synthesise various secondary metabolites as defence against predators.

The aim of this work was to continue chemical and biological studies on the biocompounds with antifungal ability isolated of ethanolic extract of *Larrea divaricata* Cav. These substances were fractionated by Kieselgel (230-400 mesh) chromatographic column. The elution was performed with toluene, ethyl acetate, chloroform and methanol succesively. MeOH eluate showed the antifungal activity against various phytopathogenic fungi assayed: *Trichoderma* spp, *Penicillium notatum*, *Aspergillus niger* and *Lenzites elegans*.

By ascendent and bidimensional TLC of this eluate we separate a fraction with  $R_f=0,36$  responsible of the bioactivity (Solvent: toluene-acetic acid 2:1).

Our results suggest that antifungal compounds may be isolated from Argentine native plants such as *Larrea divaricata* Cav.

**47. EFFECT OF DEXAMETASONE ON NO RELEASE IN RENAL TISSUE**

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Nitric oxide (NO) is a vasodilator that regulates arterial pressure in an antagonistic form to angiotensin II (Ang II). Its release would be controlled by local tissue levels of Ang II. It has been demonstrated that one of the enzymes that produce NO, inducible-NO-synthase (iNOS) would be constitutively expressed in the kidney. Our objective was to study the role of iNOS in basal and stimulated NO in renal cortex (C) and medulla (M). Fractions (158 30 mg, n=14) of total renal tissue (T), of M and C of rats were obtained. NO contents were measured by Griess reaction in presence and absence of Ang II ( $10^{-8}$ - $10^{-6}$ M) and/or L-NAME (NO synthesis inhibitor) and dexamethasone: DEXA ( $10^{-4}$ M). Basal NO content after equilibration period was 15.3 ± 1.8 (nmoles/mg, n=20). In M and C significant differences were found between NO contents (16.8 ± 3.7 vs 3.4 ± 1.1 nmoles/mg, p<0.05, M and C respectively). After washing a diminution (p<0.01) was observed of NO in all cases. In M DEXA inhibited a 20% NO levels and did not modify NO levels in C. In T the response to Ang II was variable (all doses). L-NAME did not modify basal or Ang II levels of NO. CONCLUSIONS: NO contents are very high in comparison with vascular tissues. Lack of action of DEXA in C and the low effect of M suggest that iNOS induced by inflammatory reaction is not involved in renal NO content regulation. However, an iNOS constitutively expressed can not be discarded.

**46. GONADAL CYCLE AND REPRODUCTION OF *Trichomycterus spegazzinii* Berg 1870 (PISCES TRICHOMYCTERIDAE) IN THE ARIAS RIVER SALTA**

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The fish present a wide range of reproductive patterns that they respond to the environmental conditions that it allowed them to colonize a great variety of environment. Their reproductive adaptations define tactical and reproductive strategies of the species, such as: modality of it spawns, grade of maturity, reproductive period, fecundity and migration in the period of freza. The study area is located in the Arias river (63° 30' LO, 64° 45' LS) that presents seasonal fluctuations of flow. Our objective is to study the cycle feminine gonadal and reproduction of *Trichomycterus spegazzinii*, considering the modality of it spawns, variations during the maturity gonadal, standard length of the first sexual maturation and the fecundity. One worked with 60 females captured among October of 1999 and August of 2001. The specimens grouped in size intervals. The ovaries were fixed in 10% formalin for later oocytes recounts and histological analysis. The IGS index was applied (IGS) to quantify the state of maturity gonadal and was realized the analysis of the frequency of the different sizes oocytes. The fecundity was determined following the gravimetric method of Bagenal (1978). A scale of maturation of VII stades settled down. The development was of asynchronous type, indicates it spawns partially. The reproductive period extended between October and December. The fecundity average was of 1192 eggs. Starting from the 2,093 mm of standard length sexually mature individuals were registered.

**48. DISTRIBUTION OF "ATACOS" SPECIES IN THE AGRICULTURAL AREA OF TUCUMAN PROVINCE**

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The "atacos" are wide-foliated weeds, that produce considerable decreases on the yield of the crops in which they are present.

In the province of Tucuman, three species of "atacos" were identified: *Amaranthus quitensis* H.B.K., *Amaranthus spinosus* L. and *Amaranthus viridis* L. in sugar cane, soybean, bean, horticultural and fruit crops.

The objective of this work is to know the distribution of "atacos" species in the agricultural area of Tucuman.

The presence of *A. quitensis* was constant in every crop and in every agroecological region. Populations of *A. spinosus* increase towards the south of the province and it was found especially in sugar cane, soybean and fruit, while populations of *A. viridis* increase towards the center and north in sugar cane, bean, and soybean crops. Due to its bioecologic characteristics, *A. quitensis* is one of the most harmful wide-foliated weeds, while *A. spinosus* and *A. viridis* are not, which would make necessary to perform further studies to determine its potential ability to colonize other areas.

**49. NUMBER OF WEEDS-CONTROL INTERRELATION FOR *Sicyos polyacanthus* Cogn. IN SUGARCANE CROPS OF FRONTERITA (TUCUMÁN, ARGENTINA)**

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This work was made during 1998-1999 in Fronterita (27°02' S-65°26' W) in CvCP65-357 sugarcane plots infested by *Sicyos polyacanthus* Cogn. (Cucurbitaceae). The objective is to find the relation between the number of weeds in competence and the necessity of making control. Four blocks or areas of 4800 m<sup>2</sup> each were determined. In each area, three replications in plots of 64 m<sup>2</sup> each and a control without competence were established. The areas were: 1) until 900 pl.ha<sup>-1</sup>; 2) until 3000 pl.ha<sup>-1</sup>; 3) until 7200 pl.ha<sup>-1</sup>; 4) until 12600 pl.ha<sup>-1</sup>. The results were: Area 1 had slight dangerousness. Area 2 had intermediate dangerousness. At this zone the weed control is necessary. Area 3 had serious dangerousness. The control is urgent, herbicides must be put at several replications and the sugarcane burning must be included in harvest. Area 4 had very serious dangerousness and one weed produced cane losses of 2,23 kg.ha<sup>-1</sup> and 0,279 kg.ha<sup>-1</sup> of sugar. The weed control is very urgent. It is concluded that at inferior levels to 900 pl.ha<sup>-1</sup>, the control is not necessary in spite of the moderate losses caused by that density. From this level the employment of special control techniques is indispensable, in front of the diverse gravity and damage gradients.

**51. CADMIUM BIOSORPTION BY SOIL MICROORGANISMS CULTIVATED IN A LIQUID MEDIUM**

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Soil cleaning-up, is a process not technical and economically suited for an agricultural soil contaminated by cadmium. The control by microorganisms may be a convenient method. Bacteria ZAN-044, actinomycete R27 and *Fomitopsis pinicola* were tested. It was compared the cadmium biosorption by viable or immobilized cells in alginate beads and incubated in a soil extract medium at pH 5, 6 and 7 and 1 and 10 mg/l cadmium concentrations. The Cd concentration had the most important effect on the average of Cd biosorbed in free and immobilized cells. *Fomitopsis pinicola* and R27, biosorbed Cd by free cells (6-42% at 1mg/l Cd to 11-48% at 10 mg Cd/l). At low Cd concentration, bacterium ZAN-044 only absorbed 69% at pH 7. Relatively low specific biosorption of Cd was observed. The choice of the microorganism for the inoculation of contaminated soils depends on the cadmium level in the medium and on the distribution of the metal between the biomass and the medium.

**50. FLORAL ANATOMY AND POLLEN MORPHOLOGY OF THREE SPECIES OF ROSACEAE**

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*Duchesnea indica* (Andr) Focke, *Fragaria vesca* L., and *Potentilla Tucumanensis* Castagnaro & Arias belong to the Rosaceae family, considered from the northern hemisphere, but grown wild in the southern hemisphere. The three genus found in Tucuman assemble wild species related with the cultured strawberry, *Fragaria ananassa*. The anatomical features of reproductive structures has been studied from different points of view in *F. ananassa* varieties, not even so its pollen. Floral anatomy and pollen morphology are not well known in wild species and since they are of diagnostic value, they can be used to characterize natural and artificial hybrids. Specimens were collected from different places in Tucuman, except *F. ananassa* that came from Mendoza. They were fixed in FAA and after dehydration they were included in paraffin for cuts. The pollen was observed by LM and SEM. Results show that the three species have nectaries but, stamens, ovules, and adult tissues are different among them. The pollen presents structural differences in the species. Results indicate that these caracteres may be used as diagnostic characters for the identification of species and interespecific hybrids.

**52. FLORA OF THE *PODOCARPUS* FOREST IN THE MEDINA RANGES (TUCUMÁN, NW ARGENTINA)**

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We studied the vascular plant flora associated to the forests dominated by *Podocarpus parlatorei* Pilg. in the Medina Range between 1000 and 1700 m. Two main forest types can be distinguished *P. parlatorei* mixed with *Alnus acuminata* in the upper part of the range (1500-1700m asl) and *P. parlatorei* mixed with xerophytic Chaco tree species in the lower and dryer slopes (1000-1500 m asl). Collections at different altitudes were performed to analyze the variability along the gradient. We collected 135 species belonging to 58 families, with Asteraceae (24 spp.), Fabaceae (8 sp.), Solanaceae (8 spp.), Lamiaceae (6 spp.) and Poaceae (5 spp.) as the most common.

**53. MORPHOANATOMY OF LEPIDIUM PERUVIANUM Chacón (sp. nov.) BRASSICACEAE**

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*Lepidium peruvianum* Chacón, maca, Peruvian ginseng, is the only species of the genus tamed in the Peruvian Andes, between 3400 and 4800 m.s.m. as a source of food and medicine. Cultivated since 1600 BC.

The objective of this paper, is the morphoanatomic characterization of the leaf, root and hypocotyl.

The Peruvian material studied was fresh and fixed in FAA, for optic microscopy and for SEM.

Leaf: lamina pinnatifid to bipinnatifid. Anatomy: epidermis with lobulated cells, large size idioblasts. Striated cuticle. Homogenous, anfiestomatic. Anisocytic stomata. Trichomes: simple unicellular and glandular. Cells with miosine. Roots and hypocotyl: Morphology: they constitute the succulent part of the plant. The color ranges from ivory white to red. Anatomy: presents root epidermis, cortical parenchyma with air chambers. The hypocotyl presents secondary and tertiary growth with abundant xylematic parenchyma and secondary cambium with anficribal, cortical vascular bundles.

Etnobotanical uses: anemia, menstrual disorders, menopause and tuberculosis, and as aphrodisiac and energizing, It is consumed fresh or dry, raw or cooked in candies, pills, powder and liqueur. It is rich in sugar, protein, starch and essential minerals specially iodine.

**55. ACTINOMYCETES CHROMIUM VI RESISTANT**

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Cr VI is a toxic heavy metal producing nasal ulcer, dermatitis and a high risk of lung cancer. High Cr<sup>6+</sup> concentrations are toxic for microorganisms, but some of them can grow in presence of this metal, accumulating it as reduced form. There is almost no information about Gram positive resistant bacteria, specially actinomycetes. The aim of this work is to determine qualitative and quantitatively the Cr<sup>6+</sup> resistance in actinomycete strains isolated from different Tucumán areas. The qualitative screening were made in Minimal Medium (MM) with 5 mM Cr<sup>6+</sup>. 48 strains were assayed (24 from a basin sediment, 3 from a sugar cane plant, 9 from a sediment of a discharge channel of a miner plant, 6 from an old nickel miner and 6 from the sediment of Salí River). For semiquantitative screening the previous selected strains were inoculated in MM with different Cr<sup>6+</sup> concentrations (0 to 20 mM). 100% strains from the miner nickel plant and the sugar cane plant, 90% of the discharge channel, 83% from Salí River and 62% from the basin could tolerate 5 mM Cr<sup>6+</sup>. Only actinomycete strains from the sugar cane plant could grow until 17 mM Cr<sup>6+</sup>. Strains from the discharge channel grew until 13 mM. The other strains could grow until 3 mM. These results indicate the potential capacity of actinomycetes for using in Cr VI bioremediation.

**54. EFFECT OF ANTIBODIES ON MILK LACTOPEROXIDASE OF MAMMALS SPECIES**

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Lactoperoxidase (LPO) is an enzyme present in many exocrine secretions of mammals. Its forms part, with the hydrogen peroxide and thiocyanate anion, of named "LPO system", which has been proved to has bactericidal activity, due to short-lived oxidation products from the LPO-catalyzed oxidation of thiocyanate. LPO is the most abundant enzyme in bovine milk, where many studies were done. The aim of this work was to evaluate the effect of antibodies anti-bovine LPO on the enzyme of milk of seven different species. LPO assays were carried out according to Marshall et al (1986), modified by Saad de Schoos (1996). The samples were measured before and after incubation for 30 minutes at 37°C with mentioned antibodies. Results showed that LPO of all tested species was inhibited at higher antibody concentration. The lower inhibition was showed in mammals belonging to different Order than cow. The immunogenic similarity of LPO could be related to the filogenic of species.

**56. THE CONCEPTION OF INTRASPECIFIC VARIABILITY. RENEWED IMPORTANCE IN GENETIC TEACHING**

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The notion of variability is fundamental for genetic. Thanks to intraspecific variability genetic was born, reproduced, and multiplied. It is basal to evolutionary theory, to phytotecnic achievement, and to biotechnology. In academics context, variability is sometime shaded by other concepts like genetic material nature, its replication, transcription, and translation. The concept of "change" had a central role through the term "mutation" which ever gravitated, may be too much. In this context, we have the impression that is possible to improve the students profit of genetic programs. We think is necessary to revalue and rearrange the variability concepts. We suggest enlarging variation examples, the molecular variability causes, structure and functions of transposons, retrotransposons, integrons, horizontal transfer, polymerases specificity variation, role of repetitive segments, and genomes strategies to produce programmed changes. Mentioned concepts are included in textbooks, but subsidiary to other points. We suggest a quantitative change about relative importance of variability concept, including way extant between genome structure and phenotype expression, omitted during decades, like pleiotropy and epistasis cases, now well known and constituting interesting examples.

**57. INFLUENCE OF SCROTUM ANATOMY ON SEMEN QUALITY**

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Anatomically, the scrotum of the Creole breed male caprines can present as entire or divided. When this happens the division can be total, appearing that each testicle has one scrotum or partially divided, presenting at least a division at the epididymis tail region. This characteristic could be an animal adaptation to high temperatures that would improve spermatogenic production.

The objective of this paper was to determine the effect of the scrotum anatomy over seminal parameter values.

The experience took place in the experimental field of the Agronomy and Zootechnic Faculty of the UNT with 12 Creole animals aged 1 year. Seminal extractions were done each 14 days using an artificial vagina. Measured parameters were volume (n=196), massal motility (n=175), progressive motility, counting and concentration (n=200). Data were analyzed by ANOVA.

Animals with divided scrotum showed significant differences in 2 parameters: volume (p<.01) and total spermatozoons (p<.05). The results for entire scrotum and divided scrotum respectively were: volume (ml): 0.50±0.30 and 0.69±0.42; mass motility: 4±1 and 4±1 too; progressive motility (%): 80±18 and 76±21; concentration (x10<sup>3</sup>esp/ml): 7096±3276 and 6338±3536; spermatozoons (x10<sup>3</sup>): 3373±2380 and 4271±3103.

The obtained results could imply the possibility of a better seminal quality in animals with divided scrotum.

**59. EFFECT OF THERMOTHERAPY FOLLOWED BY HYPOCHLORITE OF SODIUM IN THE DESINFECTION OF APEXES FOR THE MICROPROPAGATION OF *Gardenia jasminoides* Ellis**

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The micropropagation constitutes an alternative for the massive production of commercial interest plants. One of the drawbacks is the pollution with fungi, yeasts and bacteria, causative of large economic losses. The objective of this work is to evaluate the action of thermotherapy and of the hypochlorite sodium in the control of the fungus pollution of apexes for the micropropagation of *Gardenia jasminoides* Ellis. They were used apical stakes of 10 cm. of length that they were exposed to six treatments: hot water to 51°C during 0,15 and 30 minutes, submerged thereafter in hypochlorite of sodium to the 1% and 2% during 15 minutes, respectively. They were cut apexes of 1 to 1,5 cm, and were put on pipes with water and 20 gr/l of saccharose, for their visual evaluation. The statistic analysis indicated meaningful differences between the treatments. It is concluded that to greater dip time in hot water is achieved a decrease in the fungus pollution that is stressed when it is followed by hypochlorite to the 2%. The best treatment was that of thermotherapy during 30 minutes followed by hypochlorite of sodium to the 2% during 15 minutes.

**58. THE EVALUATION OF TEMPERATURE INCREASES ON EDAPHIC ENVIRONMENTAL IN SOLARIZATIONS SOIL EXPERIENCCE**

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The increments of temperature in soil to produce changed in mineral and biological components. These exchanged modify the level of activity and also level different of evolutions in relation their productivity. Whereas the soil as live elements where interactions microflora and fraction mineral. The action in some components to produce changed in relation ship. The solarization in soil used how technique propitious in obtencion of soil with low level pathogens wit how use material biocide witch be toxic promissory how ecology methods for obtain sustrated acceptable in vegetal health. This experience be useful for measure the influence of temperature increments on biological components of soil in order obtain the transformations function to permit and evaluation of the quality soil habitat. The experience to realize in field of Faulted of Agronomy y Zootecnia UNT where maked three plot of land one test (T0) uncovered treatment (T1) plastic easy cover and (T2) double plastic cover. The temperature registered in January in three different depths 5, 10, 20 cm to realize analysis in laboratory of contains organic matter, pH, electric conductivity and microbiological analysis (dilution with plaque on selective cultivate middle). The results show an abrupt fall by up to 10°C increments in microorganism poblacion (bacteria) consequent a lower of biological activity. The intensity in process to show specifies confinement conditions to evaluate only the temperature variations of one-dimensional model to take a poblacions indicators parameters of microorganisms (bacteria).

**60. FREQUENT ASYNCHRONOUS IN NORMAL MALE GAMETOGENESIS CELL CYCLES OF *AMYNTHAS HAWAYANUS* (ROSA, 1891), *AMYNTHAS MORRISI* (BEDDARD, 1892) AND *METAPHIRE CALIFORNICA* (KINBERG, 1867) (OLIGOCHAETA, MEGASCOLECIDAE)**

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Frequent asynchronism in normal male gametogenesis cell cycles of *A. hawayanus*, *A. morrisi* and *M. californica* were studied. Specimens, without gregarinas, which influences in normal development of male gametogenesis, were collected in Yerba Buena and Tafi Viejo, Tucumán, Argentina. The study was carried out using air-drying and tritium autoradiography techniques, modified for terrestrial oligochaeta. In spite of spermatogonial and spermatocytes grouped cells are usually synchronized in their mitotic and meiotic stages and in their DNA synthesis, they frequently perform these processes asynchronously, which was detected at cytological and cytomolecular levels. In fact, conglomerates identification with interphase nuclei and divisional ones, as well as labelled nuclei by the side of unlabelled ones, clearly indicates that cellular divisions are absolutely not synchronous, as other investigators up to present time reported it. Results are in concordance with ultrastructural studies of *Pheodrillus* abnormal morula, in which occasionally an undivided spermatogonium lies next to a spermatogonium which has undergone multiplication.

**61. EFFECT OF CARRAGEENAN AND INDOMETHACIN IN THE DEVELOPMENT AND POPULATION OF MAST CELLS IN A MURINE FIBROSARCOMA**

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**Problem:** To analyze the antitumoral activity of Carrageenan (C) and Indomethacin (I) in an experimental fibrosarcoma, in relation to modulation of tumoral growth and population of Mast Cells (MC).

**Methods:** Balb/c mice with induced fibrosarcoma were treated separately with (C), (I) and (C-I) in order to evaluate the tumoral volume and the number of MC.

**Results:** Mice treated with (C) and (CI) developed the tumor with a significantly smaller volume than the ones treated with (I) in a period of 3 to 9 days of development. The number of MC in the treated mice group was significantly smaller than in the witness group, at the same time of development.

**Conclusions:** Carrageenan as well as Indomethacin inhibited the development of experimental fibrosarcoma, while carrageenan (alone or with indomethacin) diminished the population of Mast Cells.

**63. PATTERNS OF SUGAR CONSUMPTION IN 12 TO 14 YEAR OLD STUDENTS FROM SAN MIGUEL DE TUCUMÁN**

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**Aim:** Identifying sugar consumption patterns in 12 to 14 year old students in urban and marginal urban schools in San Miguel de Tucumán.

**Methodology:** The design of this research was cross-section, analitic-observational. A several stages, stratified sampling was carried out, according to urban (U.S) and marginal urban (M.U.S.) schools in order to control the size of the sample. The interviews were done with the approval of parents and school authorities. For the statistical processing of the data Fisher exact test,  $\chi^2$  lineal tendency test and logistic regression model were used.

**Results:** The sample was 141 students. From the total amount of U.S students, 78% have "no compatible health sugar moments" (S.M.), a percentage that lowers to 57% in those of U.M.S. Fisher exact test  $p=0,01$ . There is no enough evidence to state that sex is related to daily sugar consumption moments. Fisher exact test  $p=0,598$ . Among the U.S., 6% have 3 or more S.M. "snacks", value which increases significantly to 24% in M.U.S. Relating candies consumption with sex, female consume more cookies than male  $OR=0,4$   $IC_{95\%}=(0,2;0,9)$ .

**Conclusions:** Most of the students showed no compatible health S.M. Chewing gums, sweets and sodas were consumed more frequently.

**62. ANATOMY OF ROOT THE DUCHESNEA INDICA, FRAGARIA VESCA AND POTENTILLA TUCUMANENSIS**

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*Duchesnea*, *Fragaria* and *Potentilla* belong to the Rosaceae, family of the Northern Hemisphere with adventitious species in Argentina. *D. indica* (Andr.) Focke and *F. vesca* L. are perennial herbs, creeper, with stolons, trifoliolate and grow in the low forest at open spaces and in pasture grounds. *P. tucumanensis* Castagnaro & Arias is an annual herb, erect, trifoliolate and grows in disturbed environments. Several authors have studied the growth and distribution of the roots in different varieties of *F. ananassa*. We have carried out a comparative anatomical study of the root system in the *D. indica*, *F. vesca* and *P. tucumanensis*. The studied material was collected from different environments in the province of Tucumán. The material was fixed in FAA for cross and longitudinal sections. Results show that the three species present axonometric roots with emerging thick and thin lateral roots and primary, secondary and early secondary growth. These root features differ with the species and the environment. We conclude that these anatomic characters are of diagnostic value in the determination of species analyzed in relation with different environment.

**64. AUTOEVALUACIÓN FOR HALF DE THOSE LISTS OF I COMPARE**

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**Objectives:** to Evaluate the acting of the students in the Practical Works in the Class Clinical Surgical II course of the FOUNT, by means of a List of I Compare and to confront the obtained results of an autoevaluación.

**Materials and métodos:** La show it was at random constituída for 16 students of to commission that studied 5° year, divididos in two grupos. Se it used to design "cross over" during two Practical Works. You proceeded así: Group TO: in the Practical one 1, before beginning the Practical Work, he/she surrendered the List of I Compare and in the Practical one 2 were evaluated by the educational responsible for the commission. In the Grupo B you proceeded to the inverse one. The results of the evaluation of each Group were compared (Practical 1 vs. Practical 2) and of the Groups to each other in each practical one. It was used like instrument of nsuration of the acting the scale of Likert. The obtained data were analyzed by means of an ANOVA for designs "cross over".

**Results:** he/she was a significant effect of the use of the List of I Compare in the siguientes "items": Clinical History, Clinical Diagnosis, Preparation of the Patient, Extraction, Handling of the Material descartable, with ( $P < 0.005$ ).

**The Lists of I Compare they are an important resource to achieve the student to be capable of autoevaluar his achievements and deficiencies.**

65.

**CENTAUREA DIFFUSA LAM INFLUENCE OVER CHE-NOPODIUM QUINOA WILLD (QUINOA) GERMINATION**

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This paper aims at evaluating the CS effect over the Quinoa germination. A chloroform subextract was prepared with *C. diffusa* dried aerial parts. Five hundred and 1000 ppm concentrations were used for the germination trials according to Kato's method. Concentrations of 1000 ppm were used for calorimetric studies. The number of germinated seeds, plantlet length, cell efflux conductivity, and the mitosis index were evaluated in the first trial. Germination enthalpies, the corresponding times, and the time-specific (p-t) thermal potential curve were obtained by microcalorimetric techniques. The findings showed the following: wNumber of germinated seeds yielded no significant differences between treatments and controls. wPlantlet length decreases were noted by increasing concentrations and the most significant decrease was noted at 1000 ppm concentrations. wMitosis index yielded no significant differences between treatments and controls. wCell efflux conductivity decreases when compared to controls but no significant differences were seen between 500 and 1000 ppm concentrations. The calorimetric curves were analysed by using Microcal Origin version 4.0. yielding the following results: Time-specific (p-t) thermal potential curves yielded no differences among trials during the measurement periods (1200min). •A delay was noted in the root shooting initiation time. Control seeds began germination at  $412 \pm 69$  min. whereas the seeds treated with the *Centaurea diffusa* extract began germination at  $507 \pm 64$  min. •Germination energies were  $\Delta_{\text{g}}h = -375 \pm 41 \text{ J.g}^{-1}$  y  $455 \pm 42 \text{ J.g}^{-1}$ . The results suggest that *C. diffusa* exerts an inhibitory effect in a post-germinal stage.

67.

**BOLIVIACRIS NOROESTENSIS R. & C. 1990 (ACRIDIDAE: MELANOPLINAE). BIOECOLOGY AND DESCRIPTION OF THE FEMALE**

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The genus *Boliviocris* Ronderos & Cigliano (1990) includes 5 species. Their bioecology is unknown.

This papers deals with several biological aspects of *Boliviocris noroestensis*, describes its still unknown female and registers its presence in Tucumán. The specie was reared under insectary conditions, at  $30^{\circ}\text{C}$ ; nymphs cycle, mortality, oviposition and diapause were established. **Female:** chromatic characters similar to male: general color brown, with dark brown postocular stripe and costal area of tegmina. Body length: 25,4 mm. Eyes prominent; length / wide ratio: 1,35. Inner part of hind femora red and posterior tibiae violet.

**Bio-ecological data:** population univoltine, egg-pods cylindricals, within the ground, 16 eggs with diapause. First hatch occurs in September. Nymphal cycle with 6 stages (51 to 63 days). Mortality: eggs (37%), nymph I (20%), nymph II-VI (23%). Ovipositing adults from November to April. *B. noroestensis* was found in mixed herbs in disturbed areas of dry western Chaco of N.W. Argentina at 160 to 500 msnm.

66.

**DETERMINATION OF THE *Sicyos polyacanthus* Cogn. INVASION CAPACITY BY MEANS OF A INFESTATION POTENTIAL MODEL**

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The capacity of invading that a weed species as *Sicyos polyacanthus* Cogn. (Cucurbitaceae) has, it is intimately related to its reproductive strategies; to the ability for occupying new areas; to the species genetic characteristics; to the possibilities of overcoming critical ecological conditions; to inherent factors to the actual population of that species and to the associated species. The objective of this work is to determine a infestation potential model (PI) of the species based on the weed reproductive characteristics; seed quantity produced and entered to the soil bank; viability; germinative power and weed actual density of the area. The model is employed in four localities where *Sicyos polyacanthus* Cogn. infests the sugarcane crops: Manantial ( $26^{\circ}50'S-65^{\circ}15'W$ ); Villa Quinteros ( $27^{\circ}13'S-65^{\circ}31'W$ ); Fronterita ( $27^{\circ}02'S-65^{\circ}26'W$ ) and Soldado Maldonado ( $27^{\circ}10'S-65^{\circ}30'W$ ). The found potential values oscillate from  $2434,66 \text{ m}^{-2}$  at Soldado Maldonado (major density area) to  $9737,28 \text{ m}^{-2}$  at Manantial (minor density area). It is concluded that infestation potential is inversely related with the present weed density in an area. In low density areas the PI is high and in high density areas the PI is low. At high PI the territorial occupation of the invading species will be important because it will be established in a big area owing to the species actual low density.

68.

 **$\beta$ -LACTOGLOBULIN IS MAJOR PROTEIN OF *Dama-dama* Medina, Analía; Medina, Mirta; Van Nieuwenhove, Carina; Saad, Silvia.**

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$\beta$ -Lactoglobulin ( $\beta$ -Lg) is a milk protein present in great concentration in most Artiodactyla and Perissodactyla species. Its biological role is still unknown. An interesting property of this protein is its ability to bind some substances such as fatty acids and retinol. The aim of this work was to study the lactoserum of *Dama-dama*; an European deer which is related to Argentinean deer. The samples were analysed through PAGE-SDS, scanning and densitometry. The results showed 12 protein bands which can be detected in lactoserum of *Dama dama*. Six of them were recognised, corresponding to  $\alpha$ -Lactalbumin( $\alpha$ -la),  $\beta$ -Lg, heavy and light chain of immunoglobulins, serumalbumin and lactoferrin. The most abundant protein of lactoserum (45%) was  $\beta$ -Lg, 14% correspond to  $\alpha$ -la and 5% to serumalbumin. The results of this work place *Dama-dama* in a particular situation, were  $\beta$ -Lg concentration in milk is one of the highest found to the present.

**69. HEAVY-CHAIN IGG IN WHEY OF SOUTH AMERICANS CAMELIDS**

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Immunoglobulins (Igs) are a family of proteins exhibiting antibody functions. They exhibit a wide range of antigen specificity. The Igs of milk belong to three classes: IgA, IgG, IgM, and its relative abundance is species depending. Transference of Igs from mother to offspring differs among the mammalian species. In llama the transport of maternal IgG is through the colostrum. In blood of old-world camelids has been founded recently a heavy-chain IgG. The aim of this work was to investigate the types of IgG in the whey of South Americans camelids. Milk samples were taken from animals belonged to INTA-Abra Pampa (Jujuy); Reserva Fitozoológica Dr. Carlos Pellegrini, Reserva de Flora y Fauna Horco Molle-UNT. They were analyzed through PAGE- SDS and immunoblotting. Results showed that antibodies anti-IgG recognized two classes of IgG, the conventional IgG (Mr 150 Kda) and the IgG with Mr 92 Kda. This finding is in agreement with those founded by Hammers *et al.*, 1993 in old-world camelids. PAGE-SDS in presence of reducers agents showed two heavy chains types: 55Kda. one, and an additional M<sub>r</sub> 46 Kda chain. Otherwise light chains a 25 Kda weight, which both are homology to goat. Present results showed that chain H IgG is a characteristic belonging to all known camelids species.

**71. LACTOSERUM  $\gamma$ -GLUTAMYLTRANSFERASE ACTIVITY. COMPARATIVE ASPECTS**

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The enzyme  $\gamma$ -glutamyltransferase (GGT) catalyzes transference of glutamic acid to different acceptors, and can be found in milk of domestic species. GGT function was related with protein secretion due to its known role in aminoacids transport and uptake across cellular membrane. It was suggested that milk GGT activity might have relationship with protein amounts exported by mammary gland. Present work was carried out in several mammalian species to verify GGT milk activity association with other biological parameters. Fourteen species lactoserum samples belonging to eleven Families were analyzed through kinetics  $\gamma$ -glutamyl-p-nitroanilide method. Results show a large interspecific variability, and a lower intraspecific one. Total species mean value was  $173 \pm 223$  U/L, being highest those from cow samples, and lowest ones those from marine mammals and *Myrmecophaga* sp. which were almost near zero. Frequency distribution shows a bimodal pattern, and no ecological, neither taxonomic relationship was found. No significant correlation was found with total or particular protein concentrations. GGT activity in milk seems to be species specific, without clear dependency to physiological most common variables.

**70. ANALYSIS OF PROBLEMS FOR THE TRANSFER OF KNOWLEDGE IN THE MEANINGFUL LEARNING OF HEMODYNAMICS**

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The transfer of knowledge to new contexts is one of the main features of meaningful learning. Such transfer, however, does not occur spontaneously whenever learning takes place. A dramatic number of students of Biological Sciences are not able to transfer their knowledge to new fields to produce new learning. We, as teachers of Human Anatomy and Physiology and Physics, intended to investigate the causes of these problems. We worked on hemodynamics as a contextualized design. We started from a classroom experience during the course of Human Anatomy and Physiology. In order to carry out this study, we used teaching devices such as: - Pre- and post-instruction semistructured questionnaires. - Interviews by planning prediction, observation, and explanation activities. - Systematic observation of classes by recording the teacher's and the students' intervention during the carrying out of didactic activities. The analysis of the results of this experience allowed us to detect that the students: -do not distinguish relevant and differential features between the different types of flow: ideal, laminar and turbulent. -Do not differentiate key concepts such as force, pressure and difference of pressure, or velocity and flow. Conclusions: we inferred that is need a more effective transfer of the knowledge acquired in Physics to optimize the learning of the hemodynamics.

**72. BIOLOGICAL ACTIVITY of CYCLOLEPIS GENITOIDES D. DON and MUTISIA ACUMINATA RUIZ & PAV. VAR. PAUCIJUGA**

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The present paper aims at evaluating the effect of chloroform subextracts (CS), hexane subextracts (HS) and methanol extracts (ME) of *C. genitoides* and *M. acuminata* on quinoa seed germination (*Chenopodium quinoa* Wild). The subextracts and extracts mentioned were pre-pared with the aerial parts of both species. Kato's method was used for the germination assays. The number of germinated seeds, plantlet length, and mitosis index was determined after 24 hours. Data was obtained and analysed with the ANOVA variance analysis and Tukey's test (p 0,05) was used for means comparison with controls. The results are as follows. *C. genitoides* • **Number of germinated seeds:** a decrease and significant differences were noted for CS at all concentrations; HS showed a decrease and significant differences only at 600 ppm concentrations; and ME remained unchanged. • **Plantlet Length:** a decrease with significant differences was noted for CS, HS and ME at all concentrations (30%, 12% and 16% at 1000 ppm, respectively). • **Mitosis index:** a significant decrease was noted for CS (45%), HS (34%) and ME (53%) at 1000 ppm concentrations. *M. acuminata* • **Number of germinated seeds:** HS at 600 and 1000 ppm, and EM at 1000 ppm showed a decrease with significant differences. CS remained unchanged. • **Plantlet Length:** CS, HS and ME showed a decrease with significant differences at all concentrations (36%, 32% and 51% at 1000 ppm, respectively). • **Mitosis Index:** HS and ME showed a decrease with significant differences (23% and 25%, respectively). CS showed scarce influence on the mitosis index.

**73. INTRAVAGINAL ADMINISTRATION OF PROBIOTIC LACTOBACILLI TO MICE. MICROBIOLOGICAL AND HISTOLOGICAL STUDIES**

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Lactobacilli maintain the ecological equilibrium in the human urogenital tract and protect from pathogenic bacteria. Even though the lactic acid bacteria are included into the GRAS (Generally regarded as Safe) group, our objective is to know if they can colonize the vaginal tract of mice, and if they produce some type of adverse effect. Two months female BALB/c mice were synchronized with 0,5 mg of estradiol valerate (0,05 ml Progynon Depot, Schering, Germany). 48 hours later they were i.v. inoculated with 4 doses of  $1 \times 10^7$  CFU/dose every 12 h of *L. crispatus* CRL 1266 ( $H_2O_2$  producer) or *L. salivarius* CRL 1328 (bacteriocin producer). Mice were killed at 2, 5, 7, 10 and 15 days. There were performed: a) microbiological studies to know the lactobacilli numbers in vaginal washes and organs homogenates, b) histological technique to study the adverse effects. Both microorganisms are able to colonize the vaginal tract of mice up to the 15th day post-inoculation, with higher number in vaginal washes in values between  $10^1$  and  $10^4$  CFU/ml. There is a proliferation of the queratin layer similar to the control mice (estradiol-treated), and a higher infiltration of nucleus in the queratin surface layers at different days. There are not any type of structural modification. Human lactobacilli administered i.v. to mice produce a transitory colonization up to day 10 or 15, without producing adverse effects.

**75. GROWTH AND PROTEIN MODIFICATION IN MIXED CULTURE OF LACTIC ACID BACTERIA ISOLATED OF WINE**

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Mixed cultures are used in the industry of foods to carry out fermentative processes. Proteins are important source of essential amino acids. This work compares growth and protein modification in pure and mixed cultures of *Pediococcus pentosaceus* 12p and *Lactobacillus hilgardii* 5w. Microorganisms were grown at 30°C in basal medium containing per liter: 10 g yeast extract, 1 ml Tween 80 and 170 ml grape juice at pH 5,5. Growth was measured by changes in OD at 560 nm and by viable cells count. Enumeration in mixed cultures was made for cellular and colonies morphology. *L. hilgardii* develops white and round colonies with irregular edges. *P. pentosaceus* develop white colonies, round or lenticular with smooth edges. Proteins were assayed by Bradford method. In pure culture,  $\mu_{max}$  of *P. pentosaceus* and *L. hilgardii* was 0,15 and 0,21 h<sup>-1</sup>, reaching a final biomass of  $3.02 \times 10^9$  and  $4.17 \times 10^9$  respectively. In mixed culture, *P. pentosaceus* diminishes growth rate and final biomass, and not modification of growth parameters were observed for *L. hilgardii*. In pure culture *P. pentosaceus* consumes 14 mg/ml of proteins in 84 h incubation and 72% was used in 24 h (log phase). *L. hilgardii* consumes 31 mg/ml in 84 h incubation and 87% was used in 36 h (beginning of lag phase). Amensalistic growth response is in relation to the greater adaptive capacity of *Lactobacillus* to grape juice broth.

**74. WINE PHENOLIC COMPOUNDS UTILIZATION BY *Lactobacillus hilgardii* 5w**

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Grapes and wine contain a large array of phenolic compounds: nonflavonoids, flavonoids and tannins. The concentrations of total phenol varied from 1,800 to 4,059 expressed as mg/l gallic acid equivalents (GAE), for red wines. Bacteria may use phenolic compounds and they can affect their growth and metabolism. We study the ability of *Lactobacillus hilgardii* to utilize phenolic compounds normally present in wine under different storage conditions. *L. hilgardii* 5w, isolated from argentinean wine, was incubated at 4 and 20°C in control, 3 x and 6 x concentrated (rotary evaporator) red wines. Anthocyanins, catechins, proanthocyanidins and total phenols were determined in the cell free supernatants. The decrease in total anthocyanins concentration at ten days of storage at 4 and 20°C were: 11 and 50 mg/l malvidin 3-glucoside for control wine, 12 and 110 for 3 x and 18 and 138 for 6 x concentrated wine. The values of catechin consumption were 8 and 532 mg/l for control wine, 106 and 934 for 3 x and 172 and 1,435 for 6 x concentrated wine. The diminution of proanthocyanidins, 441 and 782 mg/l cyanidin chloride for control wine, 585 and 800 for 3 x and 607 and 1,095 for 6 x concentrated wine. The decrease in total phenolic compounds, correspond to: 857 and 2,002 for control wine, 550 and 1,500 for 3 x and 1,300 and 3,500 for 6 x concentrated wine. From these results we can conclude that *Lactobacillus hilgardii* 5w is able to use the phenolic compounds normally present in wine.

**76. COMPARATIVE STUDY OF ARGININE UTILIZATION BETWEEN HOMO AND HETEROFERMENTATIVE LACTOBACILLUS**

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Heterofermentative *Lactobacillus* gain a mol of ATP per mol of glucose consumed, and homofermentative *Lactobacillus* gain two mol of ATP per mol of glucose consumed. Arginine utilization via Arginine Deiminase System (ADI) provides a mol of ATP per mol of consumed amino acid. In this work we carry out a comparative study of the effect of arginine utilization on the growth of *Lactobacillus plantarum* N4 and N8 strains (homofermentative) and *Lactobacillus hilgardii* X<sub>1</sub>B strain (heterofermentative), in a complex medium. A consumption of 5.53; 1.60 and 0.30-mmol/l arginine were determined after 48 h incubation of *Lb. hilgardii* X<sub>1</sub>B and *Lb. plantarum* N4 and N8 strains respectively. The growth of *Lb. hilgardii* increased 25% by arginine addition. Only the strain N4 of *Lb. plantarum* increased the growth 9% in presence of arginine. These results point out that arginine utilization is strain dependent in *Lb. plantarum*. 81.7% of consumed arginine by *Lb. hilgardii* X<sub>1</sub>B, was degraded via ADI System producing ATP. Only 12.8% of degraded arginine by *Lactobacillus plantarum* N4 arrives to produce ATP. From these results we can concluded that the efficiency of arginine utilization is higher in *Lb. hilgardii* X<sub>1</sub>B.

**77. SEQUENTIAL GROWTH OF *Hanseniaspora uvarum* and *Lactobacillus hilgardii* ISOLATED FROM WINE. PROTEOLYTIC ACTIVITY**

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Non-*Saccharomyces* species of yeast can survive during vinification and to contribute in the analytic composition of the wine. The malolactic fermentation conducted by lactic acid bacteria; depend of the yeast growth that provides amino acids, peptides and vitamins for bacteria growth.

In this work, we determined the influence of *Hanseniaspora uvarum* growth on the proteolytic activity of *L. hilgardii* sequentially inoculated. The supernatants from different incubation times of *H. uvarum* were inoculated with *L. hilgardii* and incubated at 30°C. Proteolytic activity was determined by Doi method using grape juice as substrate. It was detected from 3h of *H. uvarum* growth, being maximal at 12h (9.9 mM). An increase of amino acids was detected until 8h growth and then began its consumption. In the supernatants from the early yeast growth (A), *L. hilgardii* showed proteolytic activity from 24 h (0.5 mM), being lower than that obtained from stationary yeast growth phase (0.9 mM) (B). In supernatants A, *L. hilgardii* showed higher proteins consumption rate (0.01g/l h) than that obtained from supernatants B (0.04 g/ l h). We can conclude that the modifications of the nitrogenous compounds by the yeast growth affect the *L. hilgardii* proteolytic system expression.

**79. EFFECT OF DIFFERENT THERMIC TREATMENTS OVER UNINODAL STAKE BUDDING OF FOUR SUGARCANE CULTIVARS (*Saccharum* sp.)**

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The hot water is employed for eliminating the *Clavibacter xyli* subsp. *Xyli*. bacterium of the sugarcane ratoon rachitis disease. According to the temperature and the exposition time these treatments affect in different form the sugarcane budding, and cultivars also respond in different form. In this work it was evaluated the budding percentage in four sugarcane cultivars: CP 48-103, LCP 85-384, LCP 85-376 and RA 87-2. In all cases uninodal stakes were used. The treatments were: CP 48-103, T1=50°C, 2hs.; T2=52°C, 30'; T3= a pretreatment at 50°C, 10'; after, stakes are maintained at ambient temperature, 8 to 12 hs. and treated at 51°C, 1h.; T4= control; LCP 85-384, LCP 85-376 and RA 87-2, T3 without pretreatment (T3a=51°C, 1h.) and T4=control. Budding percentages were: CP 48-103 T1=60%, T2=100%, T3=85% and T4=95%; LCP 85-384, T3a=0% and T4=100%; LCP 85-376, T3a=20% and T4=100%; RA 87-2, T3a=15% and T4=100%; CP 48-103 the best treatment was T2, the budding percentage surpassed the control with a stimulant effect over budding. In the others treatments the heat produced the bud death that was manifested in the minor budding percentages.

**78. EFFECT OF *Leuconostoc mesenteroides* FROM TOMATO ON BACTERIA AND YEAST GROWTH**

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Natural microflora of tomatoes includes bacteria, yeasts and molds representing many genera. We investigated the lactic acid bacteria (LAB) present on the surface of a north Argentinean tomatoes variety. Among the isolates we selected the strain *Leuconostoc mesenteroides* subsp. *mesenteroides* TSC, to study its growth and metabolism in the natural habitat and its effect on the autochthonous bacteria and yeasts growth. The LAB were identified as *Leuconostoc* (60%), *Lactobacillus* (27%) and *Pediococcus* (13%), being *Lc. mesenteroides* subsp. *mesenteroides* the dominant specie. In the tomato pulp at 48 h incubation at 30°C, the bacterial microflora increased by 6 log cycles and  $3 \times 10^4$  cfu/g yeasts were determined. At this time, in the inoculated tomato pulp the bacterial biomass only increased by 2 log cycles and yeasts were isolated in smaller concentration than in the control medium ( $9 \times 10^2$  cfu/ml). Maximum bacterial concentration was reached in 8 and 4 days incubation in control and inoculated media respectively. Yeasts concentration was maximal after 22 days incubation. The dominant microorganism on tomato surface was *Lc. mesenteroides* subsp. *mesenteroides*. TSC strain of *Lc. mesenteroides* subsp. *mesenteroides* inhibited the natural microflora tomatoes growth, especially on lactic acid bacteria.

**80. DIAGNOSIS OF STUDENTS ENTERING TO BIOLOGICAL CHEMISTRY**

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Frequently, students of Chemistry as subject of the first years of careers that are not Chemistry evidence a negative attitude toward its study. The objectives of this work are: to analyze the knowledge of entering students, to establish associations with the institution type and city of which they proceed and to determine their attitude toward the subject. 158 students were interrogated on: place of graduation, school type to which attended, time that had Chemistry and laboratory. Theoretical or practical topics of General Chemistry, Inorganic and Organic simple compounds and Biological Chemistry were questioned. Students were most from Tucumán (53%) and Salta (15,5%), mainly of the capital cities. Most had from 1 to 3 years of Chemistry and of 0 to 2 years of laboratory. For the questions of General Chemistry 77% do not answer or do incorrectly, 50% does not inorganic formulas and 67% organic ones. 30% recognized nucleic acids, and 90% of elements of Biological Chemistry were not answered. No differences were observed among students from private or public education, but better level among those of capital cities. Few students answered more than 70%. 86% of the students answered they consider necessary to include Chemistry in the career of Dentistry, although 35% only recognizes the relationship between the subject and the career.

**81. ANTIMICROBIAL ACTIVITY OF *ZYMONONAS* GROWN IN DIFFERENT CULTURE MEDIA**

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Due to its broad antagonistic spectrum and harmlessness toward man, *Zymomonas* is a potential source for the obtainment of atoxic antimicrobial compounds and for food and fodder preservation. The previous studies on the antimicrobial capacity of *Zymomonas* were performed using complex media. The aim of the present work was to find out if the antagonism was also expressed in much cheaper broth, in order to improve the cost-effectiveness of the process. In addition, the stability of the antimicrobial activity under different environmental conditions was also tested. The strain of *Zymomonas* (isolated from sugarcane juice) was batch cultivated in three different media: *standard*; synthetic and sugarcane juice. It was found that the antagonism produced by fermentation of sugarcane juice (900 UA/ml) determined using *Escherichia coli* AB1133 as the test organism, was 3 and 2,3 fold higher than that corresponding to synthetic and standard medium, respectively. This means that sugarcane juice by itself, replaced advantageously the salts and yeast extract contained in the standard medium. Concerning the stability, it was found that it was not affected by heating 30 min at 120°C, nor by keeping the samples for 24 h in a pH range from 1 to 9 or after treatment with several proteolytic enzymes. This outstanding stability, the broad antagonistic effect and the ability to grow actively in sugarcane juice, may confer to this bacterium a relevant role concerning the ecological characteristics of areas cultivated with sugarcane.

**83. INOCULATION OF *Azospirillum brasilense* TO PLANTS OBTAINED FROM ONE BUD STALK OF SUGARCANE FROM MICROPROPAGATION ORIGIN**

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The objective of the trial was to determine the influence of rizobacteria on plant's total fresh weight (TFW) obtained from stalk with one bud of sugarcane harvested at cultivar Tuc 77-42 from micropropagation. This essay was carried out in the year 2001 with one bud stalk which was germinated at 34°C up to initiation of stalk and roots. The roots were put into liquid solution of *Azospirillum brasilense* with 10<sup>8</sup> cel/ml, during 2 min. The plants were placed in pots which were filled up with substrate of perlita and vermiculita at 1:1, pH 6,4 and soil humidity at f.c. under greenhouse conditions of 32-35°C and 17.000 lux. Hoagland solution was applied twice a week (3ml per pot). A randomized experimental design with two treatments and 28 replications ANOVA and Tukey Test ( $p=0.05$ ) were applied. TFW, was evaluated at the beginning and 30 days later stalk length and root developed. With *Azospirillum* treatment significant differences were found in the TFW and also roots from shoots were observed. Increase of root development would be due to the nitrogen fixation and also to plants hormones production from *Azospirillum*. Plant-bacteria relationship produces shoot development that improve the vitro-plants multiplication.

**82. FORMATION OF EMBRYOGENIC CALLUSES OF THE LCP 85-384 SUGARCANE (*Saccharum sp.*) Cv.**

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The objective is to establish a protocol for obtaining sugarcane embryogenic calluses. It was worked with LCP 85-384 sugarcane (*Saccharum sp.*) cv. Pod disks from stem top, in dark conditions and 25-27°C, were used. For establishment, Payan et al. (P), medium with 2,4 D (1,0; 3,0 and 5,0 ppm); agar-agar (6ppp); pH 5,6, was used. Explant percentage that formed calluses was evaluated. There were no differences for the 3 concentrations. In multiplication, Heinz and Mee (HM), medium with coconut water (0, 5 and 10 ppm), agar-agar (6ppm) was used. Material was maintained separated according to its original medium (P<sub>1</sub>; P<sub>3</sub> and P<sub>5</sub>). Modified Santana Scale was used. At first evaluation, the material from P<sub>1</sub>, that was incubated in HM<sub>0</sub>, HM<sub>5</sub> and HM<sub>10</sub> reached 5 value between 46 and 43%. Calluses from P<sub>3</sub> and incubated at the same media reached the 5 value of the scale between 100 and 67%. Calluses from P<sub>5</sub> reached 5 value between 77 and 67%. At first evaluation, a better calluses from P<sub>3</sub> behavior is noted. Differences are not noted in calluses behavior in HM<sub>0</sub>; HM<sub>5</sub> and HM<sub>10</sub> media. At second evaluation, differences in the effects of HM<sub>0</sub>; HM<sub>5</sub> and HM<sub>10</sub> media, favorable to HM<sub>5</sub> between 58 and 46% in P<sub>1</sub>, P<sub>3</sub> and P<sub>5</sub>, are noted. The major percentages of the growth scale descend to 3, for HM<sub>0</sub>; HM<sub>5</sub> and HM<sub>10</sub> according to they are originated from P<sub>1</sub>; P<sub>3</sub> and P<sub>5</sub>.

**84. SUGARCANE (*Saccharum sp. L.*) PLANTS PRODUCTION FROM ONE BUD**

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The trial was designed to study the plants' production from one bud pieces of stalks of sugarcane obtained from first multiplication of *in vitro* c.v.: Tuc.77-42 and C.P.65-357. Pieces of one bud were planted. Treatments were T1: substrate (sand) without sterilization (SWE) and stalk without disinfection (SWD) of Tuc 77-42; T2: (SWE) and (SWD) of CP 65-357. T3: substrate sterilized (SE) and stalks with disinfection (SD) of Tuc 77-42. T4: (SE) and (SD) of CP 65-357. The stalks were disinfected with 3% sodium hypochloride and Tween 20. The (SE) were disinfected under autoclave for 1 h. at 1,5 atm. and germinated at 28-30°C and 98% of the air humidity during 8 days. The experimental design were randomized blocks. ANOVA and Tukey Test were applied. Number of bud germinated (NBG), volume of roots (VR) and disease infection (D) were evaluated. Significant differences were found at T3 and T4 with high % of (NBG) and (VR); stalk buds were obtained with very fast growth. At a root place *Phytophthora* sp. infection at (SWE) and at (SWD) in the two cultivars was observed. CP 65-357 had a very low growth rate. This system could be a multiplication new method which is proposed for experimental new design.

**85. SALIVARY MANIFESTATIONS OF PATIENTS WITH GINGIVITIS AND LEEVEE PERIODONTITIS**

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The Periodontal Disease and the Dental Caries are frequent affections in the oral cavity. The high prevalence, of the gingivo-periodontal disease, near 100% for the Gingivitis and among 5 - 29% for the Periodontitis denotes a problem in the population's health. The objective of this work was to chemically analyze the saliva of patient with gingivitis, levee Periodontitis according to clinical diagnosis, regarding a control group. The sample was constituted of 50 patients with ages between 22 and 46 years. Depth probing, level, insert bleeding, gingival index and index plaque, CPOD and CPOS were determined. Chemical determinations: Hidroxiprolina (Jamall *et al.*), Proteins (Lowry *et al.*), Calcium and phosphor (Winner Lab, Arg), Peroxidase (Ingman *et al.*), Colagenasae for Zymography in SDS-PAGE (Sorsa *et al.*), were determined. CPOD and CPOS were analyzed with descriptive statistic. Results in the patients with Gingivitis show values of proteins and calcium increased in saliva regarding the group control. In the patients with Levee Periodontitis, proteins, hidroxiprolina, phosphor and peroxidase were increased in comparison to the group with Gingivitis. Through zymografy they show colagenase results increased regarding the group control.

This work was partially subsidized by CIUNT.

**87. NEW EVALUATION SYSTEM IN THE "ELEMENTS OF MECHANIC AND AGRICULTURAL MACHINERY" CATHEDRA OF FAZ (UNT)**

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The evaluation processes "evaluate" not only the pupil but learning, teacher and study plan, too. Today, the evaluation is not only the act of verify the yield or pupil qualities but it is interpreted as a more phase, the final of a complete cycle of didactic activity reasonably planned, developed and analyzed. The objective of this work is to implement a new evaluation system in the "Elements of Mechanic and Agricultural Machinery" Cathedra of the FAZ (UNT). It was realized in the 2000 year, over 147 pupils. It consisted in three Evaluation moments: A) Diagnostic; B) Formative; C) Additive. Diagnostic evaluation was made in the first theoretical class. Formative evaluation had three steps: 1) an informal one of the learning and comprehension; 2) for groups, in the partial tests and 3) personal one during the pupil consultations for the final examinations. The Additive evaluation was made at the final examination and the final mark was averaged with the ones from the anterior evaluations.

The obtained results were: the yield of the final examination was superior, passing from 60% of approved pupils with the anterior system to 80% with the new one and the final marks were superior.

**86. EVALUATION OF SYMPATHETIC INNERVATION ON VENOUS SYSTEM OF LIMBS IN SUBJECTS WITH CHAGAS´DISEASE BY A HYDRAULIC PLETHYSMOGRAPHY MODEL**

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Since Chagas´ disease was discovered, there is an increasing interest in autonomic nervous system (ANS). Several studies demonstrated disorders on ANS in acute period of Chagas´ disease as well as chronic period. This work was undertaken to evaluate sympathetic innervation of venous limbs in chronic Chagas´ disease. Fourty four patients were evaluated: 24 (both sex, aged  $22.7 \pm 0.8$  years) patients in functional class (FC) I of chagasic cardiomyopathy (Ch-Cm) defined by 2 blood test, immunofluorescence (IF) / hemagglutination (HA), with titles  $\geq 1:32$ , without symptoms, normal ECG and chest x-ray. b) 20 (both sex, aged  $25.7 \pm 2.5$ ) patients in FC II of ChCm, IF and HAI ( $\geq 1:32$ ), symptoms, abnormal ECG and chest x-ray. As control, 20 (both sex, aged  $22.9 \pm 1.2$  years) patients healthy subjects participated. Exclusion criteria: deep venous thrombosis, venous incompetence, Ch-Cm III, drugs and illness causing of neuropathies. Compliance measurements have been calculated using a hydraulic plethysmography model, in 2 phases (with pressure and without it). No significant differences between groups a, b and control were observed. So ANS disorders don't produce changes of venous compliance in subjects with Chagas´ disease.

**88. ULTRAESTRUCTURAL AND METABOLIC CHANGES INDUCED BY UV-B RADIATION IN COTYLEDONS OF QUINOA (*CHENOPODIUM QUINOA* WILLD.)**

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Ultraviolet-B radiation (290-320 nm) on plants can comprise alterations of grow and development. The photosynthetic machine, by your light request is vulnerable to this radiation. Changes produced by UV-B radiation are not uniform, they are doses dependent and specie specific. The aim of this study is to describe UV-B effects on chloroplast structure and on sucrose and proline content. Quinoa seedlings 7-d-old were grown at 25°C with 12 h light/dark. At the middle of the light treatment, seedlings were daily exposed to 5 h of UV-B radiation during three days. Anatomical and chemical studies were performed by TEM microscopy and colorimetric methods, respectively. UV-B radiation induced changes in the thylakoids organization after 2 d treatment. Sucrose content showed a significant decrease from the second dose. Proline content showed an initial strong increase and then a decrease until the end of the experiment was observed. Results revealed that quinoa plant responses to UV-B radiation with specific modifications in biochemical and anatomical parameters.

**89. EFFECT OF SALINE STRESS ON SOLUBLE CARBOHYDRATES DISTRIBUTION DURING QUINOA (*CHENOPODIUM QUINOA* WILLD.) COTYLEDONS ONTOGENY**

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High salt concentrations in the soil and drought are the stress conditions more frequently observed in the world. Plant metabolism and crop productivity result affected by stress. Salinity has been recognized as major agricultural problem because it affects over 40% crop areas. Several studies on saline stress have been performed, although the most of them were focused in a determined development stage. Thus, the aim of the present study was to analyze the variations in soluble carbohydrates content in quinoa cotyledons, during ontogenetic cycle under saline stress. Seedlings were grown at 25°C under 12 h light/dark with or without NaCl 230 mM. Cotyledons were harvested at 6, 12 and 21 days and sugar contents were determined by colorimetric methods. Results showed that soluble sugar levels were differentially affected by saline stress during ontogenetic cycle. The highest glucose content was observed under stress condition. However, the fructose content showed an inverse pattern. Sucrose did not show significant changes. These changes may be necessary to maintain an adequate sucrose level, which may acts as an osmotic component under saline stress.

**91. ORAL ADMINISTRATION OF *Lactobacillus casei* AND YOGURT IN A *Streptococcus pneumoniae* RESPIRATORY INFECTION**

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In a previous work we demonstrated that *Lactobacillus casei* (*Lc*) and yogurt administration were able to induce an activation of alveolar macrophages and an increase of IgA levels in the respiratory tract. The aim of this work was to study the effect of the oral administration of *Lc* and yogurt in prevention of respiratory infection with *Streptococcus pneumoniae* (*Sp*). Swiss-alpine adult mice were treated with *Lc* (10<sup>9</sup> UFC/day) for 2, 5 and 7 days (d) or yogurt for 5 and 7 d. At the end of each treatment the animals were infected intranasally with *Sp* (10<sup>6</sup> UFC per mouse) and during 15 d post-infection we performed: **a)** Hematocrit, number of leucocytes and differential cell counts; **b)** Counting of UFC of pneumococci in lung and blood samples **c)** IgA pathogen specific in bronchoalveolar lavages (BAL) by ELISA test. In lung and blood samples of the control infected animals the pathogen was detected in all of the assayed period (15 d). The group treated with *Lc* for 2 d showed presence of pathogens in lung for 7 d and for 2 d in blood with an increase of the number of leucocytes and neutrophils; in this group it was a significant enhance of the IgA levels in BAL (p<0.05). The animals treated with yogurt for 5 d showed lung infection up to the 10<sup>th</sup> d. **Conclusion:** The oral administration of *Lc* and yogurt, at the appropriate dose, improve the defence capacity of the host against a respiratory infection with *Sp*.

**90. DEGRADATION OF GLYCEROL BY THE REDUCTIVE PATHWAY IN *Pediococcus pentosaceus* CAg FROM BEER**

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Lactic acid bacteria (LAB) may produce flaws with the formation of metabolites. During alcohol fermentation, yeast produces glycerol in high amounts. If LAB are capable of using it as a C source, they may produce changes in the quality of beer. We isolated *P. pentosaceus* CAg during the malting stage. The cultures were grown in modified MRS-broth with glucose and/or glycerol in microaerophilic conditions. We have followed the dynamics of growth and formation of fermentation products. The activities of the enzymes involved in the possible metabolic pathways were measured. This strain is able to grow on glycerol as the only C source but with a lower  $\mu$  (h<sup>-1</sup>) than on glucose. With both substrates, growth is diauxic; after glucose consumption glycerol is consumed in the same percentage as without glucose. The main products detected were D- and L-lactate, acetate, 1,3-propanediol, diacetyl and 2,3-butanediol. We did not find the oxidative pathway in any of the cases. In all cell-free extracts we found 1,3-PDDH activity whereas GK activity was only detected in extracts from glycerol medium. These results supported the fermentation balance we found. This is the 1<sup>st</sup> time that the gliceroldehidratase pathway, leading to the undesirable production of acrolein, is described in a homofermentative LAB.

**92. DEGRADATION OF ALKYLAMMONIUM AND ORGANOPHOSPHONATES BY BACTERIA OF THE GENUS *Pseudomonas***

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Organophosphonates, are utilized as pesticides or herbicides. Glyphosate and glyphosine are plant growth regulators that can act, for instance, either, as gramineous growth inhibitor or to increase the sucrose content in sugarcane cultivars. In bacteria, these compounds may be breakdown through the participation of phosphonatease or C-P lyase activities, to use them as the Pi source. These work was focused to know if these pathways are present in different species of *Pseudomonas* (RNA group 1), when they utilize glyphosate or glyphosine as sole carbon, nitrogen, or Pi source. These organophosphonates were not carbon source at 20 mM but at 0.5 mM they were utilized as carbon or nitrogen source. As phosphorous source a better growth was observed at 0.5 mM. Most of bacteria from the fluorescent group, saprophytic or opportunistic, produce acid phosphatase (AP) and cholinesterase, but not fosfolipase C. Most bacteria fluorescent, pathogenenic for plants or mushrooms, and nonfluorescent species contained only AP activity, not involved in the choline metabolism. Some of the strain tested brokedown glyphosate and glyphosine to sarcosine and dimethylglycine, respectively.

**93. CHARACTERIZATION OF *Pseudomonas aeruginosa* MUTANT STRAIN DEFICIENT IN ACID PHOSPHATASE ACTIVITY**

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In order to identify the gene responsible of acid phosphatase (AcPase) activity, enzyme related with choline metabolism in *P. aeruginosa*, a transpositional mutant was selected. This mutant strain was capable to grow with choline or its derivatives as sole carbon and nitrogen source but it was deficient in AcPase activity. The physical presence and single insertion of Tn5-751 in the chromosome was demonstrated by Southern hybridization. A physical map was constructed by restriction analysis of the mutant DNA. For digestions with *SalI* alone, or in combination with *XhoI* or *HindIII*, hybridizing fragments of approximately 2.5-kb, 1.9-kb and 1.3-kb respectively, were found. A 9-kb signal appeared when DNA was digested with *Clal*.

The DNA fragments flanking the Tn5-751 insertion, between 2-5-kb, was cloned using a "marker rescue", approach that involved digestion with *SalI*, which cut once the Tn5-751 beyond the Km resistance marker, ligated into pBlueScript II SK. The cloned DNA will be sequenced and analyzed in database of *P. aeruginosa* PAO1 genome.

[<http://www.pseudomonas.com>]

Supported by SECyT-UNRC and Agencia Córdoba Ciencia.

**95. CHOLINE METABOLISM IN BACTERIA FROM THE *Pseudomonas* GENUS**

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*Pseudomonas* genus sensu stricto are only this included in RNA group I which contain: non-fluorescent; fluorescent, saprophytic or opportunistic pathogens; fluorescent, pathogenic for plants or mushrooms. Choline, and their metabolites are among the factors promoting the pathogenicity of *P. aeruginosa* because, when they are utilized as nutrients, the bacteria produce phospholipase C (PLC), phosphorylcholine phosphatase (PCpase), and cholinesterase (ChE). Experiments with different *Pseudomonas* species indicated that: all the *Pseudomonas* strains metabolized choline, betaine, and dimethylglycine. Excepting *P. chicorii* and *P. pseudoalcaligenes*, the rest of *Pseudomonas* grew also on sarcosine or carnitine. Positive ChE activity was found in *P. fluorescens*, *P. chlororaphis*, *P. tolaasi* and *P. pseudoalcaligenes*. The presence of PLC, PCpase and ChE was an exclusive property of *P. aeruginosa*. Lecithinase and PCpase activities detected in *P. fluorescens* and *P. chlororaphis* as well as lecithinase and AcPase, but not PCpase activity found in *P. agarici* and *P. tolaasi*, indicated that these bacteria utilize a different mechanism to breakdown phospholipids than the described for *P. aeruginosa*.

**94. MELANIN-CONCENTRATING HORMONE SYSTEM IN THE CICHLID FISH *Cichlasoma dimerus*: DISTRIBUTION AND ONTOGENY**

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Melanin-concentrating hormone (MCH) is a 17-aminoacid peptide involved in melanin aggregation in melanophores. It acts as an antagonistic of  $\alpha$ melanocyte-stimulating hormone ( $\alpha$ MSH). In teleosts, MCH system consists on hypothalamic neurones which project fibers to the pars intermedia (PI) of the adenohypophysis (ADH). The distribution and ontogeny of immunoreactive (ir) MCH cells was studied by immunocytochemistry. Two hypothalamic nucleus were identified from day 4 after hatching (ah): nucleus lateralis tuberis (NLT) and nucleus periventricularis posterioris (NPP). Ir-fibers penetrate through the 3 zones of the ADH and they also reach several brain regions. In the epidermis ir-MCH neuromasts-like structures were seen associated with melanophores from day 4 ah. Ir-MSH cells surround neurohypophysis (NH) interdigitations in the PI and appear in early developmental stages. They were also found in hypothalamic regions. The expression of hormones that regulate pigmentation in *C. dimerus* occurs in early developmental stages. This is the first time that the presence of ir-MCH cells in the PI and in neuromasts were identified in teleosts.

**96. "THE TELEOST GERMINAL EPITHELIUM: ¿WHO IS WHO DURING SEX REVERSAL IN THE HERMAPRODITIC, DIANDRIC FISH, *Synbranchus marmoratus* BLOCH, 1795 (TELEOSTEI, SYNBRANCHIDAE)?"**

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The swamp eel, *Synbranchus marmoratus*, is a protogynous, diandric species widely distributed in South America. Primary males develop directly as males, but secondary males arise from the sex reversal of females (Lo Nostro & Guerrero, 1996). In both males, testes are unrestricted, lobular types. Histologically, testes have germinal and interstitial compartments. The first one, supported by a basement membrane, is composed of Sertoli and germ cells which enter in meiosis to produce sperm (Grier & Lo Nostro, 2000). The ovarian germinal epithelium (OGE) is composed of epithelial and germ cells; borders the ovarian lumen and produces follicles (oocyte and follicle cells). During sex reversal, the gonial and epithelial cells form acinar ingrowths into the stroma and demonstrate bipotentiality by producing, not follicles, but Sertoli cells and spermatogonia (SG), respectively. As cellular divisions occur, the acinus becomes elongated, forming a lobule. The ovary lateral supports form the testicular ducts (neoformation). The OGE in *S. marmoratus* has the potential to produce oocytes and follicle cells, or SG and Sertoli cells at the beginning of sex reversal.

**97. RECORDING OF SOME GASTEROMYCETES AND PODAXACEAS OF THE PROVINCE OF CATAMARCA, REPUBLICA ARGENTINA**

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The current work is parte of systematized study of the fungi flora of Catamarca, whose aim is to get a first approximation to its diversity and location in the province, making in this way a contribution to the knowledge of the region diversity. Some interesting recordings of Gasteromycetes and Podaxaceas (Basidiomycota) from different phytogeographic regions of the province are presented. Several of these recordings, *Podaxis argentinus* Speg., *Anales Mus.Nac.Buenos Aires* 6:186. 1898 (como *Podaxon*); *Geastrum fornicatum* (Huds.) Hook., *Flora Londinensis* 4: 575, 1821.; *Geastrum hieronymii* Henn., *Hedwigia* 36: 211. 1897; *Geastrum schmidellii* Vittad. var. *parvisporum* G. Moreno, Altés & Dios var. nov. ; *Myriostoma coliforme* (With.: Pers.) Corda, *Anleitum Stud. Mycol.*: 204; emend. J.T. Palmer, *Nova Hedwigia* 15: 119-120. 1968; constitute the first reference of the species for Catamarca; meanwhile the others confirm their own presence in the study zone.

**99. INFLUENCE OF THE DRYING SYSTEM IN THE QUALITY OF THE OLEORESIN PAPRIKA**

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Spice oleoresins are relatively recent and have reached great importance in the food industry as natural colorants and antioxidants. Oleoresin Paprika (ORP) is a liquid extract which contains all the components of paprika and is presented as an oil of average viscosity and a deep red colour. It has the typical smell of the capsicum and it is very rich in carotenoid pigments. The quality of the oleoresin depends on the technological process of extraction, as well as on the raw material. The aim of this work was to determine the influence of the drying system in the quality of the oleoresin obtained from dehydrated raw material using three drying systems solar drying, macro tunnel, shadow-drying and liofilization. Samples of *Capsicum annum* Trompa de elefante of INTA Catamarca were used. The dehydrated fruit were crushed and ORP was obtained through extraction of hexane with a rotavapor. The evaluation parameter of the ORP quality taken into account was the colour in ASTA degrees, determined through the method recommended by the American Spice Trade Association. Results obtained through experiments show the efficiency of the solar drying system in a macro tunnel because the ORP that has been obtained possesses a higher degree of coloration in ASTA units, and therefore more quality compared to ORP taken from shadow or liofilization drying systems. Oleoresin colour values of 12.114 ASTA and a shorter drying time justify its efficiency.

**98. LOCALIZATION OF BETAINE HOMOCYSTEINE METHYLTRANSFERASE (BHMT) GENE IN *Pseudomonas aeruginosa* GENOME**

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*P. aeruginosa* is able to utilize betaine as sole carbon and nitrogen sources, and under hyperosmotic condition it is used as an osmoprotector agent. In view of the dual role of betaine in this bacterium we focussed the study of genetic organization of the BHMT, the enzyme responsible to convert betaine to dimethylglycine.

A Tn5-751 mutant deficient in BHMT activity was obtained. The physical presence of the transposon in the chromosome was determined and the genomic fragment was cloned into a pBlueScript. The nucleotide sequence of the DNA insert shows an homology of 98% with the gene PA3081, of the genome sequence of *P. aeruginosa* PAO1, published in 2000 (www.pseudomonas.com). The determinations of *Sall* sites in the physical map of the cloned fragment allow us to localize the real Tn5-751 insertion site in the mutant chromosome. Then, it had occurred in PA3082, described as the gene that codes a hypothetical protein. By Blastp search of Gene Bank revealed that this protein shared homology to transferases. The most striking finding of this work is the different localization of genes involved in osmoprotection and in the DMG synthesis. Supported by SECyT - UNRC and Agencia Córdoba Ciencia.

**100. MATHEMATICAL EXPRESSION OF THE PATTERN OF HELICAL GROWTH OF THE RADICAL SYSTEM DE *Daucus carota* L.**

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In the biological processes of growth and development of the plants, as much the leaves as the roots are ordered responding to a certain pattern. The rizotaxia of *Daucus carota* L. allowed to describe the regularities that present the ramifications of the radical systems through a geometric model, without having defined the equation that explains this relationship.

The objective of this work is to define the mathematical expression that models the helical growth in the radical system.

For such an end, samples of *Daucus carota* L. was gathered and the dispositions of the vegetative points were analyzed. The equation that explains the helical pattern of growth and the radical disposition of *Daucus carota* L. is expressed for

$$\begin{cases} x = (d/2) \cos \alpha \\ y = (d/2) \sen \alpha \\ z = k \alpha \end{cases}$$

Where "d" is the diameter average of the root and "k" a constant. z increases with the angle. When varying "k" the spires crowd together more or less. Analyzing the parameters of the equation one will be able to describe helical pattern's radical systems that characterize the dynamics of the growth.

**101. EFFECT OF KALLIKREIN-KININ SYSTEM IN THE NON CONTRACTED RABBIT SMOOTH MUSCLE**

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We found a vasorelaxant effect of  $Ca^{2+}$ -free media and atrial peptide in rabbit aorta basal tone (BT) sensitized with angiotensin II (Ang II). The objective of this work was to determine if Ang II conditions the vessel to a vasorelaxant action of kallikreins (K) or bradikinin (BK) on BT and the role of endothelium in this action. Rabbit aortic rings with (E) and without (WE) endothelium were placed in an isometric tension recording system. After an equilibration period different protocols were performed: 1- administration of K  $1 \mu\text{M}$  or BK  $10^{-11}\text{M}$  on the BT of unstimulated arteries 2- K ( $1 \mu\text{M}$ ) and a cumulative dose response curve (CDRC) of BK  $10^{-11}$ - $10^{-7}\text{M}$  after a CDRC of Ang II  $10^{-10}$ - $10^{-6}\text{M}$ . 3- Protocol 2 was repeated on a noradrenaline (NA)  $10^{-5}\text{M}$  precontracted muscle. In some experiments preincubation with HOE 150, B2-receptors inhibitor, was performed. K and BK did not modify BT of unstimulated arteries E and WE. In Ang II sensitized arteries, K did not modify BT whereas only a vasocontractil dose-dependent action ( $p < 0.01$ ) was observed with BK ( $10 \pm 14$  to  $508 \pm 127 \text{ mg}$ ,  $n=9$ ,  $10^{-11}$ - $10^{-7}\text{M}$ , respectively) in E. In WE arteries NA-precontracted, BK significantly reduced this action. However a relaxant effect of BK could be obtained with  $10^{-7}\text{M}$  higher doses in E arteries. HOE 150 ( $10^{-7}\text{M}$ ) did not modify BK action in any case. Results suggest that endogenous kallikreins are not involved in Ang II dependent BT regulation. Vasoconstrictor effects of BK and lack HOE-inhibition would indicate an action of BK on B1 receptors.

**103. EVOLUTION OF THE KNOWLEDGE IN CHEMISTRY OF STUDENTS OF DENTISTRY**

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The selection of contents of a subject and its methodological design should be based on the characteristics of each environment. The aim of this work is to know the application of knowledge in Chemistry acquired in first year that students of Dentistry make along the career. 271 students were surrendered on General, Inorganic, Organic, Biological Chemistry and Odontology. Among the students of first year 99% answered correctly about the structure of the atom but 49,5% did not answer on the preparation of a solution. 13,5% did not respond inorganic nomenclature and 26% organic one. Questions of Biological Chemistry were correctly answered in 90%. Collagen and calcemia are identified by 80%, while the constituents of bacterial plaque or acquired pellicle were not answered by 64% and 71,5%. In the third year, 90% recognized the atom but 66% answers incorrectly the preparation of a solution. 32,5% did not write inorganic formulas and around 55% Organic Chemistry. Questions of Biological Chemistry were responded by 70-90%. Collagen and calcium were correct for 76% and 81%. Answers about bacterial plaque are partially correct in 49%. Acquired pellicle is correct in 36% but not answered in 46%. In students closed to graduate answers conserved percentages of the previous groups. However bacterial plaque and acquired pellicle grew to 56% and 72,5%.

**102. KARIOTYPE OF *Eryngium elegans* Cham. et Schlecht.**

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*Eryngium* genus (Apiaceae) has a high species number that are characterized by a great reproduction and adaptation capacity. One of them, *Eryngium elegans* Cham. et Schlecht, has ruderal characteristics and affects crops like sugarcane and also pasture areas. Cytogenetic studies are an important tool for contributing to the systematic identification of them. The objective of this work is to make the karyotype and to determine the chromosomal asymmetry index. The material came from La Rinconada (Tucumán, Argentina). For the mitosis microscopic preparations tip roots were pretreated in p-dichlorobenzene, fixed in 3:1 (ethylic alcohol: acetic acid), and colored with 2% hematoxylin. For making the karyotype, amplified photographs at 3000x and Levan *et al* technique were used. The asymmetry calculus (intra and inter chromosomal) was realized according to Romero Zarco. *Eryngium elegans* Cham. et Schlecht has  $2n=16$ , it is a diploid species with  $x=8$ . The karyotype is represented by 4 pairs of metacentric chromosomes and 4 pairs of submetacentric ones with a size of 1,8 and 4  $\mu$ . The intrachromosomal asymmetry index ( $A_1$ ) gave a value of 0,93 and the interchromosomal ( $A_2$ ) of 0,21. It is associated specialization with increasing asymmetry, so the  $A_1$  value would be according to the great diffusion and adaptation species capacity.

**104. TEACHING OF THE STRUCTURE AND FUNCTION OF THE HEMOGLOBIN USING A MOLECULAR ANIMATION PROGRAM**

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It is very important for students to visualize the 3-dimensional structure of biomolecules in order to understand biochemistry because there is a very close relationship between the structure of a biomolecule and its function.

The purpose of this work is to analyze the application of an innovative methodology of teaching in the Biochemistry course of the medical school at the National University of Tucumán. These innovative strategy involves the use of 3-dimensional models of the hemoglobin molecule generated by the computer to facilitate the comprehension of its structure. The educational tool is a RasMol Script of hemoglobin. RasMol is a visualization program written by R. Sayle and the hemoglobin script was written by E.Martz using this program.

To evaluate the experience, two surveys, one before and the other after the students have visualized the animation, were used. The surveys included questions about hemoglobin structure. The results showed that after the molecular animation the percent of correct responses increased 13%. Furthermore this methodology of teaching contributed to students motivation.

**105. SUGARCANE MICROPROPAGATION: AN EEAOC NEW PROJECT TO RENOVATE THE TUCUMAN CROPS**

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The EEAOC purpose was to use a complementary method to renew in a five-year-period the sugarcane crops of Tucuman as a way to improving the productivity of the province's main industry activity. The multiplication average rate was 6 in MS medium plus 0.4 ug of belzilaminopurine (BAP). An alternative method of the conventional micropropagation was the temporal immersion system (TIS). It was based on the alternative and automatic immersion of the vitroplants in the culture medium. This reduce costs and accelerate the vitroplants production. For the rooting stage MS/2 culture medium plus 40 gr/ sucrose without hormone was employed. After 30 days the rooted vitroplants were isolated and treated with fungicide product during 48 hours. After that they were put in a greenhouse with high humidity and warm temperature. Both varieties had a very good behavior, however LCP 85-384 was a little better than CP 65-357 during the establishment and the rooting stages. The 80.000 healthy plants obtained in a 6 month period are the basic seed land that will generate registrated and certified seeds. The last one will be employed as commercial crops.

**107. FIRST RESULTS OF THE ENVIRONMENTAL STUDY OF THE NORTHERN SECTOR OF "LA AGUADA" GARBAGE DUMP, IN THE CAPITAL OF THE PROVINCE OF CATAMARCA**

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The periurban garbage dump constitutes one of the most important causes of environmental impact and of diminution in the environmental quality of the urban ecosystems. The current environmental study concerns: the northern sector of 'La Aguada' garbage dump (located in the north of the city San Fernando del Valle de Catamarca). Aim: to present the preliminar results of an environmental study of the northern sector of the garbage dump. Methodology: the environmental study has to verify the condition of the environmental qualities of two components of the ecosystems (flora and fauna) affected by the anthropic action (generation of wastes). Results: Presence of wastes mainly formed by scrap iron, glass, wood, plastic and bony remains. Conclusion: The environmental impact is fundamentally corroborated in the biotic adaptations to the environmental effects of the urban wastes. The anthropic action is characterized by the cultural habit of recognizing the peripheral urban zone as a receptive area of waste material.

**106. ARCHAEOLOGICAL METHODOLOGY AND ENVIRONMENTAL IMPACT**

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This work is including in a transdisciplinary project of environmental impact study of urban garbage dump at city external limits (near nature areas). This environmental study is a post-impact analysis of a garbage accumulation named "La Aguada" in North sector of the city of San Fernando del Valle de Catamarca (NW of Argentina). The archaeological methodology has to determine the cultural behavior linking with the garbage accumulation and generation. Objectives: 1-To determines the deterioration level of the environmental quality and 2-relationship between culture behavior and garbage accumulation. Methodology: Analysis of superficial and subsuperficial remains to determine the residue composition and its time accumulation. Results: superficial remains include bones, glass, plastic, papers and vehicles metal parts. The deposition of garbage is removed and cleaned periodically. Conclusion: exists a high level of landscape environmental deterioration but the ecosystem structure and function is not seen seriously altered.

**108. DESCRIPTION OF THE PELVIC WAIST OF SOME SILURID PIMELODIDAE FISH**

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The silurid neo-tropical fish form a very widespread taxon in the sweet waters of part of Central America and in South America. Of this group, which is characterized by its high diversity of specimens, there have been studied those belonging to the *Heptapterus*, *Rhamdia* and *Pimelodus* genera. These fish, which are important for sports and nutrition in depressed communities, have outstanding characteristics such as a generally depressed body with bent dorsal region and flat ventral region, the first spiny radius with fins except for the *Heptapterus mustelinus*, adipose second fin and the compact scapular waist linked to the skull. The aims of this work are to contribute with some information about the pelvic waist morphology of the *Heptapterus mustelinus*, *Rhamdia sapo* and *Pimelodus argenteus* specimens, which is a subject little considered in the concerning bibliography. The Hollister technique (1934) is used for transparentizing and staining with alizarine some samples of standard length. The achieved results refer that the paired symmetric hemiwaists of the three species studied look like a trapezoid which is thickened in the middle part. The radius of the ventral fins are connected with the lateral side of the pelvic bone. The rear process is more developed in *Rh. sapo* while the lateral processes are more evident in *P. argenteus*. The family of the *Pimelodidae* has a general organizational plan shown in the structure of the pelvic waist.

**109. CIDER BIOTECHNOLOGY: ISOLATION AND CHARACTERIZATION OF YEASTS FROM FERMENTING APPLE MUSTS**

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The aim of this work is isolate, characterize and compare yeast strains from fermenting apple musts in two industrial cider making establishments. Initial musts from both cidery, were also processed in the laboratory. In each cidery, samples were taken from the surface of continuous presses and from must fermentation in the tanks along initial, middle and final stages of the process. Musts processed in the laboratory underwent the same sampling. In the presses of both cideries isolation was very similar, identifying yeast of the strains *Cándida* and *Kloeckera*, which also dominated the initial stages of the process with yeast of the *Pichia* genus. Strains of *Sacharomyces cerevisiae*, however, turned out the most among those isolated at middle and final stage. Fermentation made in the laboratory showed a different frequency from the same strains. This characteristic was reflected in the quality of the final product obtained, were the resulting parameters were very similar, with the exception of the volatile acidity, which was higher in the broth obtained in the laboratory. From the results obtained we can conclude that there exists a significant influence of the native yeast present in the cideries during the fermentation process. Meanwhile, this doesn't happen under laboratory conditions.

**111. APOPTOSIS IN TESTIS AND OVARIES OF CICHLASOMA DIMERUS (CICHLIDAE, PERCIFORMES)**

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Apoptosis is a form of programmed cell death that is essential for development of the embryo and adult tissue plasticity. In adults, it is observed mainly in those tissues undergoing active differentiation such as the hematopoietic system, testis, ovary and intestinal epithelium. While the intracellular signaling mechanism may vary in different cells, they all display similar morphological and biochemical features at the later stages of the apoptotic process. In mammals, most the oocytes present in the ovary will not be ovulated and will die in their follicles (follicular atresia), however the role of this process in teleost ovarian function is currently unknown. Apoptosis has been demonstrated in the goldfish and trout ovary *in vivo* and *in vitro*. In rainbow trout follicles, apoptosis was shown to be restricted to the thecal cell layer. Using the shark testis model, cytological features of apoptosis were seen in germ cells, but not Sertoli cells. *Cichlasoma dimerus*, is an asynchronous-spawning species. Fishes were kept at 12:12 hs photoperiod and  $26^{\circ} \pm 1^{\circ}\text{C}$ . The preliminar assay of testis and ovaries, using TUNEL labelling, demonstrated that the thecal, follicular and Sertoli cells and sperm show apoptosis in postspawning and resting fishes.

**110. YEAST MICROBIOTA ASSOCIATED TO WINERY EQUIPAMENT**

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The transformation of grape juice into wine by spontaneous alcoholic fermentation, i.e. without inoculating any selected yeast strain, is the result of the sequential development and metabolic activity of various species of yeasts originated from grape and winery equipment surfaces. It is now evident that each yeast species may be represented by several strains, and that successive strain evolution and death is characteristic of the ecological profile. The presence of different strains influence wine quality. The aim of this work was to study the yeast microbiota in winery equipment. All samples were taken aseptically from different winery surfaces of five wineries. Yeast characterization at genus level was performed according to Kurtzmann & Fell (1998), using differential killer sensitivity as a tool for fingerprinting at the strain level. *Saccharomyces cerevisiae* was the major yeast species identified in fermentation tank and press. Other generous common were *Candida*, *Kloeckera* y *Cryptococcus*, but their proportion were different. *Rhodotorula* was only associated to slipper. From an ecological point of view, our results showed a great diversity of enological indigenous strains. These results show a significant difference on yeasts microbiota of each winery, being perhaps these yeasts responsible for the differential characteristics of each cellar.

**112. MORPHOLOGY AND HISTOLOGY OF THE FOREGUT OF PALAEMONETES ARGENTINUS (CRUSTACEA, DECAPODA)**

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The digestive tract of decapod crustaceans is, depending on the species, a simple tube or a complex chambered structure. Foregut comprises mouth, esophagus and stomach, in this region takes place ingestion, storage, trituration and first digestion of food. The aim of this work was to describe the morphology and histology of the foregut of the freshwater prawn *P. argentinus*. Morphology was observed by dissecting adult individuals. Other prawns were processed by using histological techniques. The mouth is a ventral opening lined by a simple columnar epithelium, dense connective tissue and tegumental glands. The esophagus is a short tube that connects the mouth with the stomach; its wall is similar to that of the oral region. The stomach comprises a cardiac and a pyloric chamber. The cardiac is dorsal and is lined by a simple epithelium with many infoldings. The connective is dense and is surrounded by circular and longitudinal muscle. The pyloric chamber is also divided into a dorsal and a ventral chamber. The wall of the dorsal pyloric chamber is similar to that of the cardiac stomach. The ventral one (filter press) is formed by setae from cuticular origin. The main features of the foregut of *P. argentinus* are similar to those of the rest of decapods. The distinctive feature is the lack of a well-developed gastric mill like in other Caridea.

113.

**MOLT CYCLE AND REPRODUCTION OF MAR DEL PLATA POPULATION OF SHRIMP *PLEOTICUS MUELLERI* (CRUSTACEA, PENAEOIDEA)**Díaz, A.C.<sup>1,3</sup>; Petriella, A.M.<sup>2,3</sup> and Fenucci, J.L.<sup>2,3</sup>.<sup>1</sup>CIC. <sup>2</sup>CONICET, <sup>3</sup>Dpto. Ciencias Marinas, UNMP. Funes 3350. B7602AYL, Mar del Plata, Argentina. E-mail: acdiaz@mdp.edu.ar

Field sampling was conducted to examine patterns of molt and reproductive activity of *Pleoticus muelleri* from Mar del Plata coastal waters. Four samples of about 100 individuals were obtained on a seasonal basis by fishing with a commercial trawl. Animals were sexed and their morphometric characters measured. Hepatopancreas and gonads were weighed to calculate the somatic indices. Molt stage was determined by examining setogenesis on the uropods. Ovarian maturity stages were recognised based on the external appearance of the ovaries. The results revealed patterns of molt activity, which vary dramatically with changes in reproductive status and with the season. Females and males exhibited a synchronous molt cycle, which was reflected in the highest percentage of soft animals after spawning season was over (autumn). The present study indicated that this species has a long spawning season ranging from spring to autumn. The large amount of reserves for oocyte development is evident from the increase in gonadosomatic index during maturation and the higher hepatosomatic index of females compared with the males. Results show that growth is continuous throughout the year.

115.

**KILLER SENSITIVITY OF WINE YEASTS IN MERLOT TYPE MUSTS FERMENTATION**Zajonskovsky L.<sup>1</sup>, Lavalle L.<sup>1</sup>, Sangorrín M.<sup>1</sup>, Caballero A.<sup>1</sup> and van Broock M.<sup>2</sup><sup>1</sup>Depto. de Química. Fac. Ingeniería. <sup>2</sup>CRUB. U.N. Comahue- Buenos Aires 1400. (8300) Neuquen. Argentina. E-mail: izajonsk@uncoma.edu.ar

In Comahue region (Northwestern Patagonia, Argentina) industrial winemaking is mostly based on spontaneous grape juice fermentation or inoculated with yeast starters. Yeasts of the genus *Saccharomyces* predominate in the early stages of fermentation, followed by *S. cerevisiae* in the late stages of natural wine fermentation. The killer phenomenon was observed in winemaking yeasts and its biotechnological significance led to killer trait study in spontaneous fermenting musts.

In this work we studied the diversity of yeast strains isolated from Merlot grape musts in three spontaneous wine fermentation processes carried out in the same wineries (two vintages) and in a different winery (one vintage). The 110 isolates were identified according to Kurtzmann & Fell (1998), using differential killer sensitivity as a tool for fingerprinting at the strain level.

*Saccharomyces* wild strains were sensitive to K1 and K2 toxins but non-*Saccharomyces* were never sensitive to them. This sensitivity test could be used to make a difference between *Saccharomyces* and non-*Saccharomyces* yeasts.

114.

**DIFFERENTIAL EFFECT OF THE BALANCE AUXIN/CYTOKININ ON IN VITRO GROWTH OF *Encyclia oncidioides* (Lindl.) Schltr. (ORCHIDACEAE)**

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The purpose of this work was to determine the ratios auxin/cytokinin on the MS medium to induce better *in vitro* responses in the growth of *Encyclia oncidioides* (Lindl.) Schltr. Starting from asymbiotic *in vitro* germination of seed, plantlets of 5 mm were obtained, and transferred to the complete MS medium with several ratios auxin/cytokinin. The action of two levels of AIA, with three levels of KIN, BAP and 2iP were evaluated, resulting in 36 different combinations besides the control. The growth variables evaluated were: number of roots, length of roots, number of leaves and length of foliar systems. The development of plantlets was significantly affected by the presence of phytohormones, comparing the control with the treatments ( $p < 0.01$ ). 2,85  $\mu$ M AIA combined with 4,44  $\mu$ M BAP (ratio auxin/cytokinin of 0,64) or with 4,92  $\mu$ M 2iP (ratio 0,58) induce a better growth in the roots number and length, and foliar system length. A similar response, was observed in the treatment with 5,71  $\mu$ M ANA with 9,84  $\mu$ M 2iP. Ratios up or down these combinations of phytohormones were ineffective in the improvement of values in the variables studied. The combination of the AIA with BAP or 2iP and ANA with 2iP in the ratio about 0,5 induced the best *in vitro* growth of this orchid.

116.

**EFFECT OF SCARIFICATION TREATMENTS ON *Macroptilium bracteatum* AND *Macroptilium erythroloma* SEED GERMINATION**Pomiro, S.<sup>1</sup>; Vacca Molina, M.<sup>1</sup>; Pérez de Bianchi, S.<sup>2</sup> and E. Gilardón<sup>3</sup><sup>1</sup>Fisiología Vegetal, <sup>2</sup>Botánica General y <sup>3</sup>Genética Fac. Cs. Nat. UNSa. Salta. E-mail: vaccam@unsa.edu.ar

*M. bracteatum* y *M. erythroloma* were evaluated for their forage potentiality. Seeds dormancy imposed by hard seed coat resulted in pastures regeneration problems. The purpose of this research was to evaluate different scarification treatments to overcome seedcoat dormancy and improve seed germination.

The treatments were: A. Mechanic scarification. A1: Rubbing with sandpaper B. Soaking in concentrated sulfuric acid. B1: H<sub>2</sub>SO<sub>4</sub>-10 min; B2: H<sub>2</sub>SO<sub>4</sub>-20 min. C. Immersion in hot water. C1: 70°C-5 min; C2: 70°C-10 min; C3: 80°C-5 min; C4: 80°C-10 min D. Dry warmth. D1: 140°C-3 min; D2: 140°C-5 min. Germination energy (GE) was registered at the first count (4 days) and Percentage germination (PG) at the final count (10 days). All the treatments improved the *M. bracteatum* seeds GE and PG, being hot water and concentrated sulfuric acid the most effective ones. Dry warmth treatments had little effect on the germination of *M. erythroloma* over the range of temperatures and times tested. The other treatments improved GE, a very important fact in the achievement of quick uniform stands.

**117.**  
**A METHODOLOGICAL INSTANCE TO REINFORCE THE STUDENTS' SENSE OF AUTONOMY**

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Every year our subject offers a six weeks long duration workshop (TPDL) with the objectives of increasing expertise in the management of material and laboratory techniques, through students personal experience of carrying out a complete research study, as a contribution to their preparation as future researchers. During the year 2000, the theme was the determination of subclinical mastitis in goats comparing two diagnostic methods: the field one (CMT) and the laboratory method (CCS), using the light microscope. Groups of five students carried out both methods with 20 milk samples. The registered data from each group were interchanged among groups to have the total results. The experience ended with the exposition of a final report, including antecedents, data analysis and conclusions. Analyzing the interviews done at the end of the TPLD, it is noticed that the 66% of the students consider they increase their ability in instrumental management and laboratory techniques, and an 80% thought this experience gave them a concrete sight of the researcher work. This proposition achieved students' specific and general abilities that contributed to their academic formation and increased their aptitude in the research field.

**119.**  
**LIPIDIC CHARACTERIZATION OF *B. arenarum* STAGE III OOCYTES**

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Stage III oocytes, late vitellogenesis, have been described by Valdéz Toledo and Pisanó (1980) but they have not been biochemically characterized yet.

Lipid level and their fatty acid composition were analyzed. Oocytes were manually isolated. Lipids were extracted according to Folch (1957), were separated by thin-layer chromatography and were methanolized for fatty acid composition studies. Fatty acid methyl esters were quantified in a gas-liquid chromatograph. Phosphorus phospholipidic was measured following Rouser (1970) and proteins according to Lowry (1951).

Phosphoglycerides represent about 5% of total lipids. Phosphatidylcholine and phosphatidylethanolamine (PC and PE) are the main components followed by diphosphatidylglycerol (DPG), phosphatidylinositol (PI), phosphatidylserine (PS) and phosphatidic acid (PA). A high content of DPG, a mitochondrial lipid, was observed in comparison with stage V oocytes suggesting a major mitochondrial population.

Palmitic and linoleic acids are important components in PC and PE. PI and PA are also enriched in arachidonic acid. Stearic and oleic acids are the main fatty acids in DPG.

With respect to neutral lipids, triacylglycerides (TAG) are the major group followed by free fatty acids (FFA) and diacylglycerides (DAG). Unsaturation index indicate that TAG are more unsaturated (153) than DAG (129) and FFA (116).

**118.**  
**IDENTIFICATION OF GLYCOCONJUGATES IN THE CLITELLAR CELLS OF *Eisenia foetida* BY MEANS OF LECTINHISTOCHEMISTRY**

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The clitellum is the glandular portion of the epidermis. Its cellular secretion may be associate with cocoon formation and albumina secretion. Histological sections show three cellular types: 1) mucous cells; 2) cells containing large granules, and 3) cells containing thin granules. The aim of this work was the characterization of the glycoconjugates present in the clitellar cells, during the different seasons of the year by means of conventional histochemistry and lectinhistochemistry. All sections were stained with PAS, AB pH 2,5 and AB pH 1,0 and treated with eleven biotinated lectins (PNA, Con A, WGA, DBA, SBA, UEA-I, RCA-I, VVA, GSA, LCA, STA-Vector BK-1000 Kit-). After formation of avidin-biotin peroxidase complex (ABC) they were revealed with DAB. The results showed: thin granule cells react strongly with PAS, mucous cells react with AB pH 2,5 and large granule cells stained weakly with PAS. The majority of lectins bind predominantly and with high intensity to the large granule cells, while PNA and UEA-I lectins bind to mucous cells and thin granule cells were negative. No differences were observed in the reactivity of clitellar cells to these techniques on the different seasons. These results allowed to determine a remarkable variability of glycoconjugate residues in the different cell types, which would confirm the hypothesis that each cell type contributes differently to cocoon formation.

**120.**  
**CONTENT AND COMPOSITION OF LIPIDS IN YOLK PLATELETS FROM *Bufo Arenarum* OVARIAN OOCYTES**

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Yolk platelets are structures situated in the oocyte cytoplasm that may be involved in membrane biogenesis. The lipid characterization of these organelles in stage V oocytes was carried out.

Oocytes were manually obtained. Yolk platelet fraction was isolated according to Bonini *et al* (1981). Lipids were extracted by Folch (1957), separated by thin-layer chromatography and derivatized by methanolysis for compositional studies. Methyl esters were identified in a gas-liquid chromatograph. Phosphorus phospholipids and proteins were measured by Rouser (1970) and Lowry (1951), respectively.

Phosphatidylcholine and phosphatidylethanolamine (PC and PE) are the main phosphoglycerides followed by phosphatidylinositol (PI), sphingomyeline (SM), phosphatidylserine (PS) and phosphatidic acid (PA). Phosphoglycerides profile is similar to that in whole oocytes except for diphosphatidylglycerol which is a mitochondrial lipid. Yolk platelet fraction is free of mitochondrial contamination. Oleic, palmitic and linoleic acids are the principal fatty acids in PC and PE. PI and PS are enriched in arachidonic acid. In triacylglycerides, palmitic and oleic acids are the majors followed by linoleic acid. In diacylglycerides, palmitic acid is the main component as in free fatty acid fraction. The three neutral lipid classes show a similar unsaturation index.

121.

**BIOCHEMICAL CHARACTERIZATION OF *Tupinambis meriana* FAT BODIES***H. Vega Parry\**, *M. Manes\** and *T. Alonso\*\**\**Cát. Hist.Emb., Fac. Agron. Zoot., UNT*; \*\**INIBIBB (UNSCONICET), C.C.857, B. Blanca.*E-mail: [hevepa@manant.unt.edu.ar](mailto:hevepa@manant.unt.edu.ar)

Abdominal fat bodies of *Tupinambis* lizards are important organs of adipose tissue involved in nutritional, reproductive and pharmacological tasks. The theoretical and practical interest of these bodies justifies a lipid detailed analysis. Lipids were extracted by Folch (1957), isolated by thin-layer chromatography and derivatized by methanolysis for compositional studies. Methyl esters were quantified in a gas-liquid chromatograph. Phosphorus phospholipidic and proteins were measured by Rouser (1970) and Lowry (1951), respectively.

Triacylglycerides (TAG) are the most abundant lipids and within the neutral ones they show the greatest insaturation index (190) whereas the free fatty acids (AGL) and the diacylglycerides (DAG) register 122 and 120, respectively. Among TAG, oleic acid is the most important component followed by palmitic and linoleic acids which exhibit similar levels. Significant amounts of palmitoleic acid were also found. Among DAG, oleic acid is the main acyl compound followed by palmitic, palmitoleic and linoleic acids. AGL profile is similar to that of DAG showing an important level of stearic acid. Total phosphoglycerides are minor fat bodies components, only represented by phosphatidyl-choline, phosphatidylethanolamine and sphingomyelin.

123.

**EFFECTS OF CHRONIC STRESS ON SOME MORPHOMETRIC VARIABLES DURING THE DEVELOPMENT OF RAT C.N.S.***María T. Mugnaini*; *A.N. Rolando*; *M.C. Romanini*; *C.A. Soñez*; *R. Dezi*; *H.F. Gauna*.*Dpto. Anatomía Animal. FAV, Univ. Nacional Río Cuarto. (5800) Río Cuarto, Argentina. E-mail: mmugnaini@ayv.unrc.edu.ar*

The objective of this work was to determine the morphometric variables that can be used to characterize the development of the olfactory pit and the prosencephalon at 12<sup>th</sup> days of embryonic age, and the effects on them of chronic stress (CS) by immobilization. In controlled laboratory conditions, the embryos of stressed mother rats (SE) and of control mothers (CE) were studied at 12<sup>th</sup> days of development age. Intermittent, homotypic intense CS was administered, avoiding habituation. Stereological analysis (VIDAS-K-System) were applied on images from serial sections. Stereological variables were: 1. olfactory pit area; 2. prosencephalon area; 3. prosencephalon perimeter; 4. prosencephalon thickness and 5. prosencephalon surface density (perimeter/area). Two types of analysis were made: 1. to compare between each variable value in CE and SE; 2. to test the relation between olfactory area value and each of the other variables value in CE vs. SE (Student's "t" test employing the ratios 2/1, 3/1, 4/1 and 5/1). The comparison of variable values between CE and SE revealed significant differences ( $p < 0.05$ ) in variables 2 and 4 (in favor of SE), whereas the study of the different variable ratios described, showed significant differences ( $p < 0.05$ ) in favor of CE in all ratios except 5/1 that was greater in SE. The greater growth of the prosencephalic vesicle in the embryos of stressed mothers could be due to: - the activation of multiple trophic factors with proved ability to generate and accelerate inductions, with size increase of the vesicle without shape variations nor cell number increase. The regulation of the process of programmed cell death, a factor widely accepted as a determinant in the development of CNS, which could be influenced by CS.

122.

**PHYSIOLOGIC AND MOLECULAR STUDY OF A *Pseudomonas aeruginosa* MUTANT SENSITIVE TO HIGH OSMOLARITY CONDITIONS***López, Fernando*; *Massimelli, Julia*; *Lisa, Teresita*.*Dpto de Biología Molecular. Universidad Nacional de Río Cuarto. 5800 Río Cuarto. Córdoba. E-mail: tlisa@exa.unrc.edu.ar*

It was carried out the physiologic and molecular study of the mutant strain C18, obtained by transpositional mutation of the *P. aeruginosa* Fildes III wild type (wt). This mutant strain was grown in high osmolarity with the presence of preferential and not preferential carbon and nitrogen sources and with different compounds as osmoprotectors. The C18 strain was at least 50% more sensible to the high osmolarity with regard to the wt strain. This sensibility is associated with the use of different osmoprotectors related to the choline metabolism like betaine or carnitine. The uptake of choline and accumulation of betaine under osmotic stress was also studied in both strains. It was found that the wt strain accumulated betaine and the C18 strain secreted this metabolite to the culture supernatant. Results suggest that the transposon insertion would have happened at level of some genetic sequence responsible of the synthesis of a protein involved in the accumulation or in the retention of betaine.

124.

**BIOASSAYS OF TOXICITY OF FLUIDS EXTRACTS OF LEAVES OF *Secchium edule* Swartz***Jaime Gloria. S.<sup>1</sup>*, *Ordoñez A.A.L.<sup>3</sup>*, *Gómez J.D.<sup>3</sup>*, *Vattuone Marta A.<sup>2</sup>*, *Isla M. Inés<sup>2</sup>*<sup>1</sup>*Cat. de Botánica.* <sup>2</sup>*Cat de Fitoquímica. Inst. Estudios Vegetales.*<sup>3</sup>*Cat. de Farmacotecnia II. Fac. de Bqca., Qca. y Farm. U.N.T Ayacucho 471. (4000). E-mail: fitoqui@unt.edu.ar*

The leaves fluid extracts of *Secchium edule* Swartz have antibacterial action, they are able to inhibit the growth of bacteria mainly *Staphylococcus aureus* meticolino resistant and *Enterococcus faecalis*. The aim of this work was to evaluate the potential toxicity of *S. edule* extracts. The activity was assayed using the *Allium cepa* test. The results of the genotoxicity test indicated that the mitotic index was 99% at concentrations of 1 to 100 ppm, decreased 5% in 1000 ppm and 66% ppm at 10.000 ppm. The mitotic divisions were active at 10 ppm, percentage of interphases decreasing respect to controls, while following phases increased. Higher concentrations had an inhibitory effect of length growth of the roots. Tissue damages nor microscopics alterations were observed in the concentrations from 1 to 100 ppm, while in 10.000 ppm they inhibited the cellular cycle in profase stadium. Our results show that this extracts doesn't have toxic effect on the onion roots in the concentrations of 10 to 20 µg/ml. Otherwise, bioassays of the plant extract on *Artemia Salina* revealed that they had no toxicity.

**125. MORPHO-ANATOMY AND POPULAR USE OF TETRAPANAX PAPHYRIFERUM (Benth. & Hook. f.) Koch. (ARALIACEAE)**

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The objective of our work was the determination of the anatomical-morphological characters of *Tetrapanax papyrifera*, native specie of south China and Taiwan, commonly named "Plant of the paper of rice", to which therapeutic properties in respiratory affections are attributed. The samples obtained from the interviewed users were confronted with fresh material recolected in different localities of the Province of Tucumán.

Anatomical and morphological studies of the leaves (split traditionally used) by microscopic techniques with coloring Safranina-Fast Green were carried out. The leaf presents a thin cuticle, an striated epidermis (Istratus); the mesophyle is constituted by a parenchyma in palisade (2 stratus) and spongy parenchyma with secretory canals; the abaxial face presents anomocytic stomas and shattered trichomas; an angular colenchyma is observed at main nervure level and a homogeneous parenchyma with specialized cells containing drusas and secretory canals. Vascular bundles are concentric. From a series of interviews it is concluded that such species would be of pharmacology action for the respiratory apparatus. Because of this, it is indispensable to determine the characters of identification, the scientific verification of their bioactivities.

**127. CHARACTERIZATION OF A LOWER VASCULAR PLANT ?-FRUCTOFURANOSIDASE**

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Invertases are key enzymes with a rol in carbohydrate movilization and partitioning. They were extensively studied in higher plants, specially in monocot. and dicot. species. However, lower plant invertases were rather less studied. The aim of this work was the characterization of an invertase from a fern sporophyte, so that a comparative study with higher plant invertases could be done. Different tissues from *Pteris deflexa* Link sporophytes were analysed to investigate invertase activity. An acid soluble invertase was found in a grater extent in fronds than in rhizome, while in fronds the higher invertase activity was localized in pinna. Every assayed tissue exhibited two invertase isoforms. One of them was purified and characterized. An optimum pH at 5,0 was determined. The enzyme was a ?-fructofuranosidase able to hidrolize sucrose and the related oligosaccharides raffinose and stachyiose with  $K_m$  of 3,22 mM, 10,80 mM and 38,50 mM, respectively. The invertase protein resulted an hetrodimer (Mr: 90.000, with subunits of 63.000 and 27.000). Reaction products were enzyme inhibitors but proteins anuladed this effect. The effect of several compounds (proteins, lectins and inorganic) on the enzyme was analyzed. Although this fern invertase shares many higher plant invertase properties, some differences were noticed.

**126. THEORY ORIENTS PRACTICE IN THE SYSTEMIC PLANNING OF BIOLOGY AT COLLEGE LEVEL**

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The objective of the present proposal is to try to overcome the dichotomy theory-practice by means of the Systemic Planning of Biology at College level. The relationship theory-practice in the systemic planning implies reflection and explication of theoretical framework, the latter being one of the requisites of a rational planning so that any class activity will have a theoretical background avoiding this way to be based on repetitive or intuitive tasks. This concept of planning differs from the one during previous decades when it was conceived as a mere technical activity. Theory is a starting point, a background to be taken into account in order to elaborate different ways of acting. Once practical work has been carried out, theory will be re-elaborated accordingly. The Professor in Biology must use the theoretical background not only as a set of abstract and general principles but also as a conceptual framework in order to face problems and make decisions. Knowing and making are not independent levels. The relationship between theory and practice is not lineal, i.e a theoretical scheme cannot be derived deductively into a practical scheme. It is necessary to consider practice as a derivation of a theoretical framework. Re-elaborating the theory and the theoretical scheme of action after the practical work is a must.

**128. SOME NUTRITIONAL PROPERTIES OF GOAT MILK**

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Goat milk has high availability and is easily to digest. Then it could be used in malnutrition problems. **Objective:** it was to study the effect of goat milk (GM) administration to malnourished mice in a comparative way with cow milk (CM). **Materials and methods:** different groups of malnourished mice were fed with pasteurised GM and CM for 7 and 14 days. We determined: a) total proteins, albumin and transferrin in serum. b) IgA in the intestinal fluid (IF) and bronchoalveolar lavages (BAL) samples, using ELISA test c) Cytomorphological and cytochemical studies ( $\beta$ -Glucuronidase and  $\alpha$ -naphthyl butyrate esterase positive cells) in bone marrow. **Results:** the malnutrition induce a significant decrease in the serum proteins. Feedings with both, GM and CM increase these parameters achieving the control values with 14 days of renutrition. The IgA levels are also increased. Both milks revert the erythroid hypoplasia induced by the malnutrition. Not any experimental groups showed significant differences in the cytochemical maturation markers. **Conclusion:** The GM administration is as efficient as the CM to improve important parameters affected by the malnutrition. It is a good alternative for development countries.

**129.**  
**IMMUNE MODULATORY EFFECT OF THE PROPOLIS FROM AMAICHA DEL VALLE, TUCUMAN, ON MURINE MODEL**

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We have demonstrated by *in vitro* assays that propolis from Amaicha del Valle, have immune modulatory properties. **Aim:** to investigate these effects by *in vivo* assays. In order to study the phagocytosis rate (PR) of peritoneal macrophages, each group of mice (M) received 0 (control) 200 and 400 ug of propolis extracts (p.e.). The PR was assayed 24 and 48 hour later. Both doses increased PR. With 400 ug the effect was longer ( $C=17,8\pm 2,14$ ;  $M_{200-24h}=37\pm 3,2$ ;  $M_{400-24h}=32,7\pm 2,6$ ;  $M_{400-48h}=29,2\pm 1,5$ ). In order to assay protection against infection each group of mice received 0, 400, 800, 1600 and 2400 ug of p.e. Then the animals were challenged with a  $10^6$  cells of *Salmonella typhimurium*. All doses protected partially against the infection, but 2400 ug increased the number of pathogens compared with control. Adverse effects at the liver level was determined by alanine amino transferase. Only 1600 and 2400 ug increased transitorily this parameter. **Conclusions:** The immune modulatory effects of Propolis from Amaicha del Valle are dose-dependent. It is necessary to determine the best dose to obtain positive effects without adverse side-effects.

**131.**  
**MOLECULAR PROPERTIES OF A LECTIN FROM SAMBUCUS PERUVIANA KUNT CORTEX**

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*Sambucus* species have an heterogeneous set of inhibitory proteins of protein synthesis. We have recently isolated a lectin from *S. peruviana* cortex with protein synthesis inhibitory activity. An affinity chromatography in Sepharose 6B, with previous HCl treatment, yielded to fractions with hemoagglutinating activity, one of them having matrix affinity. Eluted fraction (0.3 M lactose) agglutinated red cells without group specificity and the agglutination was inhibited by fetuine>lactose-galactose. Lectin Mr. resulted 120.000. SDS-PAGE showed two bands of 36.000 and 26.000, respectively. We concluded that the lectins had two 36.000 and two 26.000 subunits. The N-terminal sequence of 26.000 subunit (IDYPSVSFNLGANSAT) reveled homology with *Sambucus nigra* and *Sambucus ebulus* RIPs type 2 chain (Nigrin f; Ebulin f; Ebulin Y; Nigrin b). Gel filtration of the extract yielded two peaks with hemoagglutinating activity. Accordingly to the elution volumes, one of them would be a protein of Mr. about 250.000 (titrated 32) and the other a protein of about 120.000 (titrated 16). The latter protein would correspond to the lectin obtained from an AT-Sepharose column. Our results would indicate the presence of at least two lectins in *S. peruviana* cortex.

**130.**  
**TOXICITY OF EVALUATION A HEMIPARASITE PLANT OF NORTHWEST ARGENTINE**

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*Phoradendron pruinosum* Urb. (Loranthaceae, common name:corpo), a native specie of the northwest Argentina, is an hemiparasite plant that grows on *Prosopis* genre species among others.

The ethanolic extracts showed antimicrobial activity against human pathogenic Gram(+) and Gram (-) microorganisms.

Genotoxic activity assay of *P. pruinosum*, were made by chromosomal aberration test of *Allium cepa* L.

Our results revealed that alcoholic extracts have not genotoxic action from 60 to 160 µg of phenolic compounds /ml. No modification of mitotic index (cellular division frequency) was observed nor macroscopic or microscopic anomalies were observed.

The genotoxic analysis of aqueous extracts showed 53% inhibition of mitosis at concentrations from 300 to 1000 µg/ml. These extracts produced inhibition of the length and growth of roots. Microscopic and macroscopic anomalies were also observed.

In accordance with ours results we can conclude that aqueous extracts have genotoxicity at phenolic compounds concentration higher than the minimal inhibitory concentration of the assayed microorganisms.

**132.**  
**FOOD DIET OF THREE SPECIES OF AKODON IN THE SIERRA OF SAN JAVIER PARK**

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The Sierra of San Javier Park have an area of 14.000 Ha, with environments of sylvia, forest and grasslands. There are three species of *Akodon* cited and there are no known data about micromammalia diet in the province of Tucumán. The aim of this work was to evaluate the food diet of *A. simulator*, *A. boliviensis* y *A. illuteus* in the Sierra of San Javier Park for winter and summer seasons. The sampling was carried each fifteen days in a mature forest from Horco Molle. The captured species of *Akodon* were incorporated in the collection of Miguel Lillo Foundation. At present *A. boliviensis* is in systematic conflict, and it is included in *boliviensis* group. Histological preparations of heces were treated using microanalysis technics. For quantitative analysis the relative abundance of vegetal and animal fragments were estimated. The results over the food diet of *A. illuteus* and *A. boliviensis* are a first contribution within this protected area. In summer there are 36% of vegetal fragments while in July (42%) y August (63%). It was also observed that diet in rodentia included vegetal and animal, condicionated for availability of resources.

**133. SOCIAL INTERACTION AND AGGRESSION IN MICE WITH LOW LEAD CONCENTRATION**

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Neurobehavioral disorders than child as experimental animals produced by lead suggest an unbalanced of different neurotransmitters. Previous result evidence that animal treatment with low doses of lead, showed alterations in different behavioural tests in correlation with dopamine endogenous levels decrease. The aim of the present work was investigate the possible alterations of aggressive and social behaviour in male and female mice treated with low lead concentrations.

We work with C3Hs adult's mice, of both sexes. The animals were divided in two groups: an experimental treated with lead acetate (0.5 ppm) in the drinking water, the control group with tap water. Two observers, unaware of treatments, recorded behavioural activity during 15 min. The following variables were measured: Latency time Contact frequency and contact time with the other animal. The number of aggressive attacks was considered. Kruskal – Wallis test was used for all multiple comparisons. Test showed higher scores of number and time contact and latency time. Only the animals treated with lead exhibited aggressive interaction. These behaviour alterations could be caused by changes in the serotonergic system.

**135. IDENTIFICATION AND QUANTIFICATION OF BEIJERINCKIA SP. AND DEXISIP. IN EARTHWORM COMPOST**

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Earthworm humus is obtained from the earthworm dejections. It is an important physical and chemical improver of the soil, high organic matter content, and nitrogen fixing bacteria. The objective of this work was to identify and quantify nitrogen fixing bacteria *Beijerinckia sp.* and *Dexisia sp.* in the earthworm compost. This research was carried November 1999; August 2000 at the earthworm farm El Manantial, Tucumán. The earthworm was *Eisenia foetida* (californian red) feeded with cow manure which was previously converted into compost during three months, three samples were taken depths: 0-17 cm, 17- 34 cm, and 34-50 cm. It should be noticed that the uppermost sample had remained four months in the bed, the intermediate seven months, and the deepest sample ten months. The samples were sawn *Beijerinckia sp.* (Girard and Rougieux, 1964), *Dexisia sp.* (Döbereiner, 1980) and the count (Fisher and Yate, 1963). The identifications (Bergey's, 1991). The results obtained in the three sample show that *Beijerinckia sp.* increases in the earthworm compost with aging. In the superficial sample  $29 \times 10^3$  intermediate sample  $85 \times 10^3$  and deepest sample  $29 \times 10^4$ . *Dexisia sp.* shows a different trend. The following results were  $85 \times 10^2$  the upper, and  $29 \times 10^3$  in the other two samples. The results show that *Beijerinckia sp.* grows better in this type of earthworm compost, probably due to the nutritional nature of the feed used for the earthworm.

**134. PRELIMINARY QUALITATIVE ANALYSIS OF THE PLANKTON OF "LAS PIRQUITAS" DIKE, PROVINCE OF CATAMARCA**

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The aim of this work is to achieve a preliminary qualitative characterization of the plankton of Las Pirquitas dike. The study was performed during 4 season campaigns of sampling. The samples were taken with a sounding bottle at three depth levels, in the dike's tail, pond and wall. They were stored in plastic bottles and preserved in formal at 4%. Phytoplankton: it is represented in the taxonomic groups Cyanophyta, Heterokontophyta, Euglenophyta, Dinophyta, Chlorophyta, many of which have been reported as pollution indicators. Organisms belonging to the Cyanophyta division are present in the four seasons, and they are dominant in early spring and autumn. This fact corresponds to the observed blooms of these algae, which belong to the species *Anabaena spiroides*. Zooplankton: Rotifera of the *Keratella*, *Brachionus* and *Polyarthra* genus were registered, which have been reported as pollution indicators. Besides, an important abundance of ciliated, The relationship N/P (nitrogen/phosphorus) indicates a deterioration in the environmental quality of the water surface, confirmed by the proliferation of organisms indicating eutrophication and organic pollution.

**136. CONCEPTUAL MAPS FOR AN INTEGRATED EVALUATION**

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Conceptual maps constitute a strategy to promote significant learning in medical education. They are an active, creative, visual, and spatial methodology: The student organizes concepts relating and integrating them according to their hierarchical relationship, and lineal unidirectional thought is replaced by multiple direction advancing thought. They allow the student to preserve useful information, to reduce memorization of irrelevant data, and to promote knowledge transfer to the solution of future problems.

The objective was to design a learning evaluation instrument. Evaluation was performed in small groups, which should build a conceptual map representing the integration of all the subjects taught up to the first midterm in Biophysics -with concepts presented as mathematical formulas- finding their articulation. Sixty formulas representing fundamental concepts were selected and written in cards. Each group selected at random twenty cards to build the conceptual map. Students should write the nexuses, and could consult bibliography. Where previous concepts were lacking, up to three jokers could be used. The task was highly motivating and creative. Students analyzed and solved card location and the most important nexuses to build the conceptual map. Use of conceptual maps is adequate for an integrated evaluation and useful for group formative evaluation, prior to individual additive evaluation. Conceptual Maps revitalize the quality of University teaching and learning processes.

137.

**ENDOTHELIAL DYSFUNCTION AND CARDIOVASCULAR DISEASE RISK FACTORS IN TYPE 2 DIABETES MELLITUS**

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Endothelial dysfunction, an atherosclerosis early marker, is associated with Diabetes mellitus and can be evaluated through circulating adhesion molecule levels, such as E-selectin (sE-S). Since classical risk factors are not sufficient to explain the grate incidence of atherosclerosis in diabetes, the aim of our work was to establish how these factors modify sE-S plasmatic levels.

We studied 62 patients with type 2 diabetes mellitus, of both sex, between 40 and 65 years old, and they were compared with 20 healthy subjects. The values of sE-S in diabetic patients and controls were:  $90.58 \pm 36.24$  ng/ml and  $49.55 \pm 9.25$  ng/ml respectively ( $p < 0.001$ ). There were no significant differences in sE-S levels between normotensive and hypertensive, smokers and non smokers, normal and increase LDL-cholesterol levels diabetic patients. Although, when we related plasma sE-S levels with body mass index (BMI), there were significant differences between diabetics with normal and increase BMI. These findings evidence that endothelial dysfunction in diabetic patients would be increase with obesity. Which would relate with the insulin-resistant present in the 70% of overweight diabetic type 2 patients.

139.

**ANTIMICROBIAL SUSCEPTIBILITY OF ENTEROCOCCI ISOLATES OF CLINICAL SAMPLES**

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*Enterococcus* were considered as a principal cause of nosocomial infections. This role and the emergency of glycopeptides resistance became enterococci in a primary pathogen. In order to differentiate *Enterococcus* genus from other microorganisms, a total of sixty clinical isolates obtained from Dr Nicolas Avellaneda Hospital during 1999 were identified by biochemical test. The 96.7% was *E. faecalis* and 3.3% *E. faecium*. Susceptibility tests were performed in all of strains. Ampicilin, streptomycin and gentamicin (high level) resistance was detected on 1.6%, 46.6% and 40% of the strain respectively. None of the isolates showed  $\beta$ -lactamase production. Vancomycin resistance was not detected in our isolates. High level of resistance to aminoglycoside was found. Our results showed that: susceptibility test to gentamicin and streptomycin must be realized in isolate of severe infections to confirm synergy between the  $\beta$ -lactamic and the aminoglycoside.

138.

**VITAMIN A DEFICIENCY AND HEPATIC EXTRACELLULAR MATRIX PROTEINS**

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The vitamin A and its metabolites have an established physiological role in differentiation, development and cell growth. Its deficiency has been implicated in the development of hepatic fibrosis, where the disorganization of the parenchyma and the excessive accumulation of extracellular matrix are patterns present in all types of liver fibrosis, even though the mechanism has not been fully elucidated. In the present work Western immunoblotting of the liver extracts revealed that experimental deficiency of vitamin A in female Wistar rats resulted in a marked increase in the intensity of the bands corresponding to Fibronectin and a weak increase in the intensity of the bands corresponding to Laminin-1. Immunohistochemical studies demonstrated a strong labeling of Fibronectin in perisinusoidal space together with a weak labeling of Laminin-1, compared with control animals. Others structural alterations found were a partial disorganization in the hepatic histoarchitecture, the presence of fat droplets in the hepatocytes and fibroblast like-cells in Portal space. We propose that vitamin A deficiency might triggered the accumulation of fibroblast like cell, these could play an important role in the increase of the expression of extracellular matrix proteins. The alteration in these proteins are probably related with fibrogenetic process.

140.

**ANTIMICROBIAL ACTIVITY OF MEDICINAL HERBS OF ARGENTINIAN NORTH**

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Medicinal herbs are used in popular medicine in Argentina. The aim of our work is evidence the presence of antibiotic substances in folkloric medicinal herbs of our country. We studied 5 different species of plants: *Parthenium hysterophorus L.*, *Marrubium vulgare L.*, *Polylepis australis*, *Prygilanthus acutifolius* and *Thevetia peruviana*. These species are recollected in Santiago del Estero and Amaicha del Valle (Tucumán), between April and June. Folia, stems and/or flowers were utilized to make alcoholic and aqueous extracts. Microbiological assays were carried out using Gram (+) Bacteria (*Staphylococcus aureus*, *Streptococcus  $\beta$ hemolitic A*, *Enterococcus faecalis* and *Streptococcus saprofitis*) and Gram (-) Bacteria (*Klebsiella pneumoniae*, *Serratia marcescens*, *Escherichia coli*, *Acinetobacter sp.*, and *Pseudomonas aeruginosa*). Alcoholic extracts of folia of *Polylepis australis*, *Marrubium vulgare* and *Prygilanthus acutifolius* showed a bacteriostatic activity against almost all assayed bacteria. Our results are the first step in the study which tends to validate the use of these plants in popular medicine.

**141.****FSH MECHANISM IN GAP JUNCTION FUNCTIONALITY**  
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The oogenesis processes in amphibian ovarian follicles are coordinated by gap junctions. Our previous studies demonstrated that FSH gonadotrophin induces the ensemble of these unions both *in vivo* and *in vitro*. In the present work, we studied connexin Cx43 expression during oogenesis by immunohistochemical techniques, using a monoclonal antibody anti Cx43. We found that this protein is present in all oogenetic stages. Western immunoblotting analysis showed increased Cx43 synthesis mediated by FSH in full growth oocyte. FSH mechanism was determined using activators and inhibitors of protein kinase A and a protein kinase C activator. Our results showed that protein kinase A activation is involved in FSH mechanism.

**143.****STUDY OF HEPATIC PLASMA MEMBRANES OF DIABETIC RATS USING A GANGLIOSIDE GM1 ANALOGUE***Abregú, Adela; Arroyo, Jesús; Aybar, Manuel; Sánchez Riera, Alicia; Sánchez, Sara.**Depto de Biología del Desarrollo, INSIBIO, (CONICET-UNT). Chacabuco 461, S. M. de Tucumán. Argentina.**E-mail: ssanch@unt.edu.ar*

Diabetes mellitus is associated to structural and functional abnormalities of various organs, among them, the liver. In previous studies, we demonstrated that diabetic hepatic plasma membranes showed an increase in cholesterol and gangliosides concentrations, mainly GM1. Insulin treatment leads to a significant decrease of cholesterol but not gangliosides. Membrane fluidity, measured by fluorescence polarization, was low in liver plasma membranes of diabetic rats. In the present work, we determined the fluorescence intensity and membranes fluidity, using an GM1 analogue (BODIPY FL C5 ganglioside GM1), to analyze the participation of gangliosides in properties modulation of diabetic hepatic membranes. These results showed that diabetic membranes present less fluidity than controls, and it is even minor in insulin treated animals. Our results suggest that either gangliosides and cholesterol, contribute to increase the rigidity of hepatic plasma membranes. These findings confirm the hypothesis that membrane pathologic processes play an important role in the pathogenesis of diabetes mellitus.

**142.****MOLECULAR ANALYSIS OF THE EXPRESSION AND PARTICIPATION OF GANGLIOSIDE-ENZYME SYNTHESIS IN XENOPUS LAEVIS EMBRYOS***Mónaco, M. Eugenia; Aybar, Manuel; Fuentes, Analía; Tribulo, Celeste; Sánchez, Sara.**Depto de Biología del Desarrollo, INSIBIO, (CONICET-UNT). Chacabuco 461, S. M. de Tucumán. Argentina.**E-mail: ssanch@unt.edu.ar*

Gangliosides are present in the outer leaflet of the plasma membrane of the all eucariotic cells, so they are optimal situated to participate in cell-cell and cell-extracellular matrix interactions. In previous studies, we determined expression and biosynthesis of different gangliosides in *Bufo arenarum* embryos. In the present work, we analyzed by RT-PCR and in situ hybridization the expression of mRNA of glucosyl ceramide transferase in different stages of *Xenopus laevis* embryos. We showed that the major expression of this enzyme is in stage 12. To establish the participation of gangliosides in cellular interactions during development, overexpression of GD3 synthase, GM1 synthase and GM2 synthase was carried out microinjecting the respective mRNA in two cells stage embryos. These results showed an expansion of mesodermic layer and a decrease in neural crest cells, which suggest an important role of gangliosides during amphibian embryo development.

**144.****INFLUENZA CASES DURING THE PERIOD 1998-2001 IN TUCUMAN***Zamora de Raya, A.M.; Suárez, A.M.; Castagnaro, N.R. de Fac. de Bqca. Qca. y Fcia. UNT.*

Influenza (Flu) is an infection of the respiratory tract caused by the influenza virus. The reason for the recurrent outbreaks is that the virus undergoes periodic antigenic shifts in its two outer membrane glycoproteins – hemagglutinin and neuraminidase, thus introducing a new virus into a population that has no protective-serum antibody. Objectives a- The detection of viral-antigen of influenza A or B virus. b- To determine theseasonality. Between August 1998 and August 2001 were processed 401 samples (nasopharyngeal aspirates and throat and nasal swabs) from hospitalized and ambulatory children under five years of age and ambulatory teen-agers and adults. Indirect fluorescent monoclonal antibody (IFI) test was used for viral-antigen detection of respiratory virus. The obtained results were: Influenza A Positive / Total: 1/22 (1998), 5/92 (1999), 27/112 (2000), 30/175 (2001). Influenza B was detected in one case (1999) and two cases (2001). The highest number of Influenza cases were observed during winter with a clear peak in June, July and August. Our findings show the importance of surveillance of Influenza virus in our region and country. An National network for Influenza surveillance was created in our country. The network helps to monitor Influenza activity in all regions of our country and ensures that virus isolates and information are sent to the collaborating Centers for Virus Reference and Research (INEI-ANLIS). Results from Influenza network are reviewed each year and relate to the composition of vaccine that will be used for the winter in the southern hemisphere.

145.

**BIOLOGY STUDENT'S PROFILE**

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Biology is a 2<sup>nd</sup> year subject in the careers of Biochemistry, Chemistry, Pharmacy and Biotechnology at the UNT. In 1997/98 and 2001, a preparatory course was adopted for these careers. 65-80% of the students fulfilled the requirements to take their final exams on Biology. The aim of this work was to investigate factors influencing learning: a) personal situation (parental financial dependence, marital status, age, living environment); b) previous learning (high school orientation and basic knowledge); c) academic factors (teachers to students proportion (T/S)). The methods used were surveys and tests to determine levels of academic learning. Our team sorted out the data from 2 years of Biology courses (1999 and 2001) based on: a) maximum difference in the % of students able to take final exams on Biology (1999, 80%; 2001, 65%); b) inclusion or not of Biology in the entrance prep course; c) addition in 1999 of the career of Biotechnology, which includes the largest % of students taking Biology in 2001. The results of students' personal situation showed no difference between the years analyzed. Financial dependence centers on parents in 95% of the cases studied. As to marital status and age group, most students were single and between 18 and 23. 70-75% lived with their family. As to previous learning, in 1999, 15% and in 2001, 19% of the students held a high school Biology-oriented degree and 20% of them passed the diagnosis exam. Moreover, in 1999, the T/S proportion was 0.23 while in 2001 it was 0.19.

147.

**HISTOLOGY OF THE HEPATOPANCREAS OF CHASMAGNATHUS GRANULATA (DECAPODA, BRACHYURA) DURING THE DIGESTIVE CYCLE**

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The hepatopancreas of decapod crustaceans is a composed tubular gland. In *C. granulata*, blind tubules are suspended in the hemocelic space and organized in an open net forming three lobes. Each tubule is differentiated longitudinally in three zones: distal, lined by embryonic E-cells; medial with F (fibrillar), R (resorptive) and B (secretory) cells and proximal, where R-cells are dominant. The aim of this work was to describe the histological changes during the digestive cycle. Adult males from Mar Chiquita lagoon (37°40'S, 57°20' W) were acclimatized in aquaria (20±2°C) and starved for 24hs. The hepatopancreas of crabs at 3, 6, 9, 12, 18, 24, 30, 36, 48 and 72 hrs after feeding were processed by using histological techniques. After 12hs, hypertrophied B-cells form metacromatic clusters. After 24hs, a peritrophic membrane surrounds the clusters and mature B-cells are extruded into the lumen. At 72hs most of the tubules lack of content and the peritrophic membrane is thin. In conclusion, two phases were observed in the digestive cycle: the first, between 24 and 48hs, tubules present an increment in size and number of B-cells. In the second one, after 72hs, tubules show an empty lumen in which starts the new peritrophic membrane synthesis.

146.

**COMPETENCE OF YIELD AND NODULATION BETWEEN VARIOUS STRAINS OF IDENTIFIED RIZOBIOS AND A NATURALIZED POPULATION, IN A DOYBEAN CULTIVATION (*Glycine max* L. Merr) IN THE PROVINCE OF TUCUCMAN**

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To obtain new strains from rizobios with good competitive and efficient characteristics in the fixing from atmospheric N for the soybean zone of Tucuman, is that was installed a trial in Cruz Alta. It was observed nodulation and yield in grains as response to the inoculation. The same was accomplished in blocks at random, with 10 treatments and 5 repetitions. The results were analyzed by Tuckey ( $p=0.05$ ) and non-parametric Kruskal-Wallis test. They were observed meaningful differences with respect to the witnesses for the T4 in number of nodules, not thus in the grains yield, being registered meaningful variations between treatments. It is concluded that the strains of the T4 shows a positive trend upon having a better adjustment to the habitat by originating of a nearby zone to the trial. These results are not definitive, they must be continued the studies on % of strains recovery in plant and % of N<sub>2</sub> in plant and soil and to obtain thus a rigorous selection that show clearest results that encourage practice of the inoculation in the zone.

148.

**PRELIMINARY STUDIES OF FLAVONOIDS OF HYALOSERIS ANDRADE-LIMAE CRISTOBAL ET CABRERA (ASTERACEAE)**

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The present work comprises of the study of flavonoids in genera of the Mutisieae tribe of the northwest of Argentina. *Hyaloseris* belongs to this tribe and consists of six species distributed in Argentina and Bolivia. In our country they inhabit four species. *Hyaloseris andrade-limae* is endemic of the center of Argentina, in the chaqueña province. One appears like shrubs of 1.5 ms. of height. Lanceolated leaves mucronated in the apex. Ligulated red flowers and pubescent aqueous.

Our objective is to isolate, to purify and to identify the content of the flavonoids in leaves of *Hyaloseris andrade-limae*, following, in general, the procedures and techniques described by Mabry *et al.* (1970), Harborne (1975), Markham (1982). In the chromatographic profiles were detected a) visualized dark spots with ultraviolet light that in the presence of ammoniac fumes turn to the greenish yellow, dealt soon with the Na reagent (Naturstoffereagenz) some were observed that give yellow color or orange according to the substitution of ring B and of C<sub>7</sub> b) yellow spot that does not change of color with ammoniac fumes and with the Na it gives yellow color. By acid hydrolysis glucose was obtained. According to the values of R<sub>f</sub> in PC and TLC and spectrophotometric behavior VIS/UV it can be inferred a priori that the flavonoids are present as mono and diglucosides of flavones and flavonols C-4-OH, C-3' 4'-diOH and C-7-OH. It is to emphasize that in literature available data of flavonoids for the genera were not registered.

149.

**HAEMOPHILUS INFLUENZAE (H.i.): STUDY OF THE ANTIMICROBIAL BEHAVIOUR**

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H.i. is one of the agents able to produce invasive diseases such as bacterial meningitis, pneumonia, bacteriemia, etc. To detect resistant strains in our environment is essential in order to select adequate antimicrobial and to establish a guide for the empirical treatment. Our objective was to study the behavior of H.i. against antimicrobials of clinical usage by qualitative and quantitative methods. We studied 22 strains of H. i type b., isolated from clinical samples. The study of the antimicrobial susceptibility was performed by disk diffusion following the guidelines of the National Committee for Clinical Laboratory Standards (NCCLS) and by agar dilution method. There were assayed the following antimicrobial agents: ampicilin (AMP), ceftriaxone (CRO), ampicilin+sulbactam (AMS), cephotaxim (CTX), ceftazidim (CAZ), cefaclor (CEF), aztreonam (AZT) Imipenem (IMP), claritromicin (CLA), tetracyclin (TET), ciprofloxacin (CIP), cloranphenicol (CMP), trimetoprim+sulphametoxazol (TMS) and rifampicin (RIF). 100% of the strains tested showed sensibility to: AMS, CRO, CTX, CAZ, CEF, IMP, TET, TMS, CMP, RIF and CIP. 72% to AMP and 85% were sensitive to AZT. AMP resistant strains, produced  $\beta$ -lactamase TEM-1, which was confirmed by the chromogenic nitrocephin method. The strains behaviour against the antimicrobial agents by agar dilution method showed correlation with the agar diffusion method. AMP was considered the best antibiotic for empiric therapy by Hi infections, but the high percentage of resistance (27,28%) in our environment showed that it is very important to know the antimicrobial sensibility to implement effective therapies.

151.

**INFECTIONS RELATED TO ENDOVASCULAR CATHETERS IN DIALYZED PATIENTS**

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Infections related to endovascular catheters represent an important cause of nosocomial morbid-mortality in dialysis patients. Our objective was to determine the etiological agents and the sensibility to antimicrobials. 186 catheters and 333 hemocultures (2 per patient) were analyzed. The tests were performed following the guidelines of the NCCLS: 1-Gram positive cocci: oxacylin (OXA), vancomycin (VAN), teicoplanin (TEI), gentamicin (GEN), ciprofloxacin (CIP), phosphomycin (FOS), chloramphenicol (CMP) and minocyclin (MIN), 2- Gram negative bacilli: ampicillin (AMP), clavulanic-amoxicilin (AMC), cefalotin (CTN), cefuroxim (CFX), cefotaxim (CTX), ceftazidim (CAZ), ceftoxitin (CXT), piperacilin (PIP), ciprofloxacin (CIP), trimetoprim-sulphametoxazol (TMS), (GEN) and amikacin (AKN). Culture of 82,3% of catheters and 18,3% of blood were positive. The isolates in catheters and hemocultures were: *S. epidermidis* 37.2 and 32.2%, *S. haemolyticus* 13 and 8.5%, *S. hominis* 9.7 and 5.1%, *S. cohnii* 6.4 and 0%, *Enterobacter aerogenes* 5.1 and 8.5%, *Klebsiella pneumoniae* 2.5 and 1.7%, *Serratia* spp 0.5 and 1.7%, *Ps aeruginosa* 4.5 and 3.4%, *Acinetobacter* spp 0.5 and 3.4% and *Candida* spp 1.2 and 3.4% respectively. The percentage of resistance of SCN and *S. aureus* was 15% against OXA and no strains resistant to vancomycin were detected. The enterobacteria showed 53.8% resistance to CTX and CAZ due to the presence of extended- spectrum  $\beta$ -lactamases and chromosomally mediated  $\beta$ -lactamases. These results will define control policies and effective treatments

150.

**STAPHYLOCOCCUS COAGULASE NEGATIVE (SCN) IN HEMODIALYSIS PATIENTS URINE**

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SCN, which cause infections in patients submitted to prolonged dialysis, represent a serious therapeutic problem due to the increase of resistance to  $\beta$ -lactamics and other antibiotics. Our objective was characterize strains of SCN implicated in urinary tract infections, evaluate the antimicrobial profile and detect phenotypically the mechanisms of resistance. 80 strains of SCN isolated in the period 1999-2000 were studied. The antimicrobial sensitivity profiles were determined following the guidelines of NCCLS: ciprofloxacin (CIP), gentamicin (GEN), trimetoprim+sulphametoxazol (TMS), oxacilin (OXA), clindamicin (CLIN), eritromicin (ERI), tetracyclin (TET), vancomicin (VAN), rifamicin (RIF), chloramphenicol (CMP), ofloxacin (OFLO), minocyclin (MINO) and teicoplanin (TEICO). *S. haemolytic* (35%), *S. cohnii* (27.5%), *S. epidermis* (15%), *S. hominis* (15%), *S. saprophyticus* (5%) and *S. simulans* (2.5%) were isolated. The resistance profile of *S. haemolyticus* was:  $\beta$ -lactamics (42.8%), CIP (50%), TET (42.8%), TMS (28.5%), CMP (35.7%) and MINO (7.6%). The macrolides resistance was 53.5% and the metilase inducible phenomenon (MLS) 40.2%. MLS phenomenon was detected in *S. cohnii* (18.2%), *S. epidermis* (16.6%) and *S. hominis* (16.6%), *S. saprophyticus* (50%) and *S. simulans* (100%). The resistance of *S. cohnii*, *S. epidermis* and *S. simulans* against TET was 36.4%, 50% and 100% respectively. All the SCN strains were sensitive to VAN. These results will allow us to prevent the progressive invalidation of some drugs.

152.

**PHENOTYPICAL CHARACTERIZATION OF  $\beta$ -LACTAMASES, IN ENTEROBACTERIA ISOLATED IN A HEMODIALYSIS CENTRE**

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Third generation cephalosporins became widely used in infections due to gram negative bacteria. The responsible enzymes of the resistance mechanism were extended-spectrum  $\beta$ -lactamases (ESBLs) and cromosomally mediated  $\beta$ -lactamase (AmpC). Our objective was the phenotypical characterization of these enzymes in Gram-negative bacilli isolated from clinical sources. The microorganisms were: *E. coli*, *Enterobacter* spp, *K. pneumoniae* y *Proteus* spp. The phenotypical characterization of  $\beta$ -lactamases was performed using the following antimicrobial disks: ampicilin (AMP), clavulanic-amoxicilin (AMC), cephalotin (CTN), piperacilin-tazobactam (PTAZ), cefuroxima (CFX), cephotaxim (CTX), cephtazidim (CAZ), cephoxitin (CXT), aztreonam (AZT), cefpodoxima (CPO), cephtibuten (CTB), cephepime (FEP). *E. coli* showed 11% resistance to third generation cephalosporins and the phenotypical profile indicated the presence of ESBLs. *Enterobacter* sp showed a resistance of 43.75%; the phenotypical detected enzymes were: ESBLs (12.5%), deprived chromosomal  $\beta$ -lactamases (25%) and ESBLs+deprived chromosomal  $\beta$ -lactamases (6,25%). *Proteus* spp and *K. pneumoniae* did not possess any of the studied enzymes. It is important the detection of Amp-C in *Enterobacter* spp, to prevent prolonged treatment with CAZ and CTX, because to the selection of mutants that confere high resistance levels. Phenotypical characterization of ESBLs is important to prevent resistance genes diffusion and to adopt adequate empiric therapies.

153.

**STUDY OF THE FACTORS THAT INFLUENCE THE LIOPHYLIZATION OF *H. INFLUENZAE* (H.i.)***O. Aulet de Saab, M.C. de Castillo and O.M. de Nader.**Fac. de Bqca, Qca y Fcia. Cátedra de Bacteriología. UNT.*

It is very difficult to maintain viable in the laboratory microorganisms such as *N. gonorrhoeae*, H.i., etc. Different methodologies have been developed for their conservation. Liophylization is an effective method, however many microorganisms suffer cellular damage or die during this process. Our objective was to evaluate the influence of the following factors on the survival liophylized strains: support medium, rehydration medium, rehydration times and initial inoculum concentration. The following media were studied: Brain Heart Infusión (B), B+lactose 6% (B+L), B+sacharose 10% (B+S), milk 10%+ glutamate 5% (M+G). The H.i. strains were resuspended in different support media. The cellular counts were realized at 7, 30 days and at 6 months. The results were: M+G (52%), B+L (50%) and B+S (41%). The liophylized vials were rehydrated after 10 days with 0,3ml of: B, H<sub>2</sub>O, SF, B+L, B+S and have left at room temperature. The best recuperation was obtained by rehydrating with H<sub>2</sub>O (61%). Different rehydration times were studied. The cells counts were performed after each times. The best survival cells was obtained after 15 minutes of rehydration (59.9%). The harvested strains were resuspended at final concentrations of 10<sup>16</sup> to 10<sup>2</sup> c.f.u./ml. Cellular counts were performed until 6 months after lyophilization. At concentration  $\geq 10^8$  there was no bacterial survival. The best viability was obtained at concentration  $\geq 10^{16}$  (56,9% after 10 days and 51,3% after 6 months). We conclude that we have to start from an initial inoculum of  $\geq 10^{16}$  c.f.u./ml and rehydrate with water to obtain an elevated survival rate.

155.

**ANTIMICROBIAL ACTIVITY OF FLAVONOID EXTRACT FROM *S. ODORA* CORRELATED WITH ANTIBIOTIC OF CLINICAL USE***N.E. Hernández, M.C. de Castillo\* and L.R. Abdala.**Fac. de Cs. Naturales e I.M.Lillo. Cátedra de Qca Org. y Biológica. \*Cát. de Bacteriología. Fac. de Bqca., Qca. y Fcia.*

*S. odora*, native from NEA is an arbustic plant known as "Salvia muña" used for the treatment of several bacterial diseases. Ethanolic extracts of *Satureja* species showed good inhibitory activity against Gram (+) and Gram (-) bacteria. Our objective was to compare the antimicrobial activity of flavonoid extract isolated from *S. Odora* and other antimicrobials against different microorganisms. Aerial parts of *S. odora* were extracted with EtOH 80% and 50% and then solid residue was taken to a final concentration of 100 µg/ml. The antimicrobials assayed were: ampicilin (AMP), cefalotin (CTN), chloramfenicol (CMP), gentamicin (GEN) and carbenicilin (CARB). The biological assay was performed against *E. faecalis* (ATCC 29212), *S. aureus* (ATCC 29213), *E. coli* (ATCC 25922) and *P. aeruginosa* (ATCC 27853). Minimum Inhibitory Concentration (MIC) of antimicrobials tested followed NCCLS guideline. *S. odora* extract showed good antibacterial activity against gram (+) coccus and gram (-) bacilli. The correlation between CIM of *S. odorans* extract (5 mg/ml) and the other antimicrobial agents in ATCC strains was: *E. faecalis*: AMP (1ug/ml), CPM (8ug/ml), GEN (8ug/ml), CARB (32 ug ml). *S. aureus*: AMP (0,5ug/ml), CTN (0,25ug/ml), CPM (4ug/ml), GEN (0,8ug/ml), CARB (8 ug/ml). *E. coli*: AMP (4ug/ml), CPM (8ug/ml), GEN (0,5ug/ml), CARB (8 ug ml). *P. aeruginosa*: GEN (1ug/ml), CARB (32 ug/ml). It is important to find new antimicrobial sources in plant kingdom. The new fitomedicine, avoid the colateral effects such as antibiotic toxin reactions, offering new alternatives as antimicrobial agents.

154.

**RESISTANCE PROFILE AND IDENTIFICATION OF GRAM NEGATIVE BACILLI ISOLATED FROM URINE CULTURES OF DIALYZED PATIENTS***C. Silva, L. Fernández Solá, N. Porcel and M.C. de Castillo.**Fac. Bqca, Qca y Fcia. Cátedra de Bacteriología.*

Peritoneal dialysis is a therapeutic option for patients with chronic renal insufficiency. Bacterial infections of the urinary tract is a serious problem in them. The high consumption of antibiotics combined with the multiple pathologies contribute to aid the acquisition of high levels of microbial resistance. Our objective was to determine the incidence of Gram-negative bacilli in urine cultures of dialyzed patients and determine their sensibility to antimicrobial agents. 475 patients were studied. The identification was performed by bioquimical test. The sensibility assays were performed following the guidelines of NCCLS: ampicilin (AMP), clavulanic-ampicilin (AMC), piperacilin-tazobactam (PTZA), cephalotin (CTN), cephoxitin (CXT), cephtazidim (CAZ), cephotaxim (CTX), amikacin (AKN), imipenem (IMP), meropenem (MER), ciprofloxacin (CIP), trimethoprim-sulfametoxazol (TMS) and aztreonam (AZT). 19% of urine culture were positive to *E. coli* (73.33%), *Enterobacter* spp (16%), *E. cloacae* 10% *E. aerogenes* 6.67% and *K pneumoniae* (10%). The percentage of resistance of *E. coli* was: AMP (68%), TMS (54%), AMC (27.27%) and (22.73%). A significant resistance was observed (9%) against CIP. *Enterobacter* spp showed a natural resistance to AMP, AMC, CTN and CXT and also acquired resistance to CAZ and CTX (50%) and fluroquinolone. *K. pneumoniae*: showed natural resistance to AMP (100%) and acquired resistance to CTN and AMC (33%). The elevated rate of resistance of these microorganisms could be due to the indiscriminate empiric use of fluorquinolone and third generation cephalosporins in dialysis centers.

156.

**STUDENT PERFORMANCE IN THE ANIMAL HISTOLOGY DISCIPLINE: 1996-2000 PERIOD***Catalán NMY, Cruz López ME and Esper L.**Cát. Histología Animal. Fac. Cs. Naturales e IML. UNT.*

Animal Histology is a significant discipline in the formation of biologists since it promotes the development of critical-reflexive attitudes and the acquisition of judgement elements and methodologies to generate scientific knowledge. In this paper we analysed the pedagogical design used in relation to the results in order to evaluate the efficiency of the teaching-learning process. This discipline has been taught on the basis of theoretical- practical classes with activities of observation and interpretation of biological structures, structure-function relation, organization of brain maps, identification of classification viewpoints and formulation of conclusions, evaluations, workshops, partial and final examinations. We employed slides, transparencies, photographs, histological preparations and videos. We obtained the following results: From the registered students in the subject, 75% became regular. 76% of the regular students took the final examination. 88% of the regular students who took the final examination approved. We concluded that 48% of the regular students who took the final examination passed with a mark equal or higher than very good. These marks reveal students good performance obtained due to the academic work. The knowledge, viewpoints and methodologies acquired throughout the learning of this discipline provide the structural bases of biological processes and a motivation for research.

**157.**  
**cdc2/CYCLIN B1 AND MICROTUBULES IN *Bufo arenarum* OOCYTES**

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The cyclin B, which is the regulatory subunit of M-phase promoting factor (MPF), is located in different sub-cellular areas during the meiosis reinitiation. Its association to the microtubules and centrosomes could explain the importance of its compartmentalization in controlling this process. In this paper we intend to: a) verify the presence and localization of the cyclin B1 in fully grown *Bufo arenarum* oocytes during the first stages of the meiosis resumption *in vitro* induced by progesterone, b) analyze the cyclin B1 distribution and the microtubule dynamics during the same stages. In order to do that, fully grown *Bufo arenarum* oocytes were induced to mature by progesterone treatment (1mg/ml). The cyclin B1 and tubulin were investigated by indirect immunofluorescence with specific monoclonal antibodies.

The results indicate that in prophase-blocked oocytes, the cyclin B1 appear evenly distributed in the cytoplasm. The oocytes that had started meiosis (3 to 5 hours of cultivation), show a halo of fluorescence around the germinal vesicle that remains in the same position until its breakdown. This distribution pattern is similar to which was observed in the microtubules. In brief, during *in vitro* the maturation process, the *Bufo arenarum* oocytes show changes in the localization of the cyclin B1 which are temporarily associated to the events of the meiotic maturation and the microtubules distribution.

**159.**  
**EFFECT OF PROTEASES ON THE ECM OF AMPHIBIAN OOCYTES AND THEIR ROLE ON FERTILIZATION**

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It is known that amphibian oviducal proteases produces changes in the oocyte's ECM glycoproteins and that these changes would be responsible of the fertilizability acquired by eggs after crossing the oviduct. In previous studies, using isolated vitelline envelopes (VE) subjected to biotin conjugation, it was observed that union of labeled molecules to the sperm plasma membrane occurred. In this work, the ultrastructural changes in *B. arenarum* coelomic VE (CE) after trypsin or oviducal pars recta fluid treatment was analyzed. It was also made an electrophoretic study of the isolated VEs, solubilized and then treated with trypsin. The trypsin treatment of CE affects the 84kD protein, which disappears after 3 min treatment. We observed that the trypsin activity modified the proteins ranging 30 to 41 kD, giving a similar pattern to that of the uterine oocytes VE. At the ultrastructural level, after 60 seconds treatment with 0.001% trypsin, the VEs showed dispersion of the horizontal fibrils fascicles and disappearance of the characteristic spaces. The perpendicular fascicles to the surface are more diffuse, losing their interaction with the horizontal fascicles. The internal face of the EV shows marked modifications, disappearing the reticular pattern and acquiring a diffuse aspect. The biological essays indicate that these transformations are related with the acquisition of the capacity of the VE to interact with the sperms.

**158.**  
**EFFECT OF THIMEROSAL ON MEIOSIS REINITIATION IN *Bufo arenarum* OOCYTES**

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In *Bufo arenarum*, oocyte maturation is induced by progesterone which interacts with the plasma membrane of the oocyte and starts a cascade of transduction events of signs that lead to the transformation from the pre-MPF to active MPF. The phosphatase cdc25 is the main responsible for this transformation. In amphibians, the resumption of meiosis can be induced *in vitro* by other substances like thimerosal. The purpose of this work is to study the participation of the purines and phospholipids in the maturation process induced by thimerosal in denude oocytes of *Bufo arenarum*. The results of our experiments indicate that high intracellular levels of purines as cAMP, Guanosine, or Theophylline, inhibit reversibly the maturation induced by thimerosal. On the other hand, the action of thimerosal seems to be independent of the phospholipids of the membrane, since the inhibition of the hydrolysis of the phosphatidylinositol 1-4,5-diphosphate by Neomycin, does not affect the maturation induced by this agent. The inhibition of the turn over of phospholipids of the membrane by CLi has not influence on the effect of thimerosal. However, it is important to highlight that the p34cdc2 dephosphorylation by Protein tyrosine phosphatase (ptpsa) that leads to the activation of the MPF is a necessary step for the maturation induced by thimerosal, as it has been demonstrated by the effect of the sodium vanadate in the resumption of meiosis.

**160.**  
**CYTOMORPHOLOGICAL ASPECTS OF OVARY IN THE GASTROPOD AMPULLARID *Pomacea canaliculata*: FOLLICULAR CELLS**

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In *Pomacea canaliculata* the singular and branched ovary is located in the visceral corkcrew near the digestive gland. The ovarian tubules have a germinal epithelium with oogenic and follicular cells surrounded by a fibroconnective stratum. The aim of this work is to study the cytomorphological characteristics of the follicular cells in relation to its functions. Ovarian samples were processed according to the histological routine technique for light microscopy. Results indicate that follicular cells surround the basal and lateral regions of the oogenic cells, changing their form (plane at cilindric) according to the stage of the oogenesis. The follicular cells associated with previtellogenic oocytes have a singular, large and heterochromatic nucleus. In vitellogenic oocytes, some follicular cells have an heterochromatic nucleus while the others present euechromatic ones with non-condensed chromatin and prominent nucleolus. The cytoplasm of the follicular cells presents a diffuse basophilia. In the lax connective stroma it can be observed many bloody sinus adjacent to growing oocytes, relation probably necessary for the provision of substances for the oocyte in development. While the oogenesis continues, gradually the oocyte give out of the ovarian tubules wall with forming cytoplasmic prolongations separated by wide intercellular spaces. These results suggest that the follicular cells would play a mechanic function giving support necessary for the oogenic cells in development.

161.

**HISTOCHEMICAL ANALYSIS OF *Bufo arenarum* OVIDUCTAL SECRETION DURING THE OVULATORY PERIOD***Crespo CA, Gerez V, Medina MF, Ramos I and Fernández SN.**Dpto Biol del Desarrollo INSIBIO (CONICET-UNT). Chacabuco 461. 4000 Tucuman, Argentina.*

The electrophoretic analysis of the products secreted by the secretory cells of *Bufo arenarum* oviduct shows the presence of proteins of high molecular weight (MW) that forms the stable structure of jelly, and medium and low MW proteins, that diffuse in high proportion to insemination medium. The purpose of this work was identify different mucins by histochemical techniques on polyacrilamide gels. *Bufo arenarum* females were collected during the ovulatory period. As biological material we used full jelly (FJ) obtained by solubilization with B mercaptoethanol, diffusible factor (DF) obtained by incubation of oocytes strings in deionized water and the remanent washed jelly (WJ) solubilized with B mercaptoethanol. The samples were analyzed by SDS-PAGE with gels of 4% and 9% under reducing and denaturing conditions. The mucins were identified by PAS, Alcian Blue (AB) and Toluidine Blue (TB). The results shows that the stain with PAS and AB is positive (+) for the lane of 100 KDa in FJ, DF and WJ, while the lane of 300 KDa only are determined in FJ and WJ. The stain with AT is + for the lanes of 95, 78, 60 and 55 KDa only in the DF. These results demonstrate that the proteins of high MW, although shows acidic groups (AB+), in larger proportion are constituted by neutral sugars (PAS+) that no diffuse to the insemination medium. In relation to the proteins of medium MW, we can observe a larger diffusion of the molecules that present acidic and strongly acidic groups (AB+ - TB+).

163.

**EXTRAPARENCHYMAL SEGMENT OF THE PALLIAL OVIDUCT IN THE GASTROPOD *Pomacea canaliculata*. ULTRASTRUCTURAL ASPECTS***Catalán NMY\*, Winik BC\*\*, Fernández SN\*\***\*Fac.Cs. Naturales e IML, \*\*Fac. Bioq., Qca. y Farmacia. UNT. Tucumán. E-mail: catalan@csnat.unt.edu.ar*

The pallial oviduct of *Pomacea canaliculata* exhibits a high degree of development and structural complexity probably associated with its involvement in various aspects of the reproductive process. The extraparenchymal segment is a tubular structure that extends along the mantle until the genital female opening. Their wall is made up of an internal epithelial layer folded in crests, a muscular-connective layer and a partial external epithelial covering. The inner epithelium presents ciliated, secretory and neurosecretory-like cells. The former are cylindrical with basal nuclei, numerous mitochondria and long apical cilia. The voluminous secretory cells exhibit a peripheral nucleus, dilated profiles of the rough endoplasmic reticulum, numerous Golgi complexes and a cytoplasm filled with secretory granules, the size, shape and electron density of which vary markedly. An uncommon cell type shows a process of fusion of its secretory granules which exhibits a parallel striated pattern of microtubular appearance. Electron-dense calcium deposits infiltrate the cytoplasmic matrix and the granules of some secretory cells, the extracellular spaces and the ductal lumen. The small neurosecretory-like cells are basally located and show few organelles and vesicles with an electron-dense core. The secretions released by this segment would facilitate mating and would contribute to the egg capsule formation.

162.

**HORMONAL REGULATION OF CALCIUM AND Ca-ATPase ACTIVE IN *Bufo arenarum* OVIDUCTS***Medina MF, Winik BC\*, Crespo CA, Ramos I and Fernández SN.**Dpto. Biol. Des. \*Dpto. Serv. Microsc. Electrónica. INSIBIO (CONICET-UNT). Chacabuco 461. 4000 Tucumán. Argentina.*

The calcium secreted by epithelial and glandular secretory cells of the pars convoluta (PC) oviductal of *Bufo arenarum*, is an important factor in the fertilization process. Ultracytochemical studies indicate that  $Ca^{2+}$  contents as well as Ca-ATPase activity exhibit marked changes during the sexual cycle. The aims of this work is to study the hormonal regulation of both parameters in the PC. Castrated females were treated with: estradiol ( $E_2$ ), progesterone (P),  $E_2+P$ , and dihydrotestosterone (DHT). After treatment oviducts were sectorized in intermediate proximal zone (ZIP), pars preconvoluta (PPC) and pars convoluta (pc). For  $Ca^{2+}$  analysis we used the  $K^+$  piroantimoniate technique, and the presence of Ca-ATPase functional was determined by activation with  $CaCl_2$ . Results demonstrate that ovariectomy determine a marked reduction of  $Ca^{2+}$  and Ca-ATPase in all the zones analyzed. Although the administration of  $E_2$ , P or  $E_2+P$  induce an increment in these deposits, the reactivity to these hormones varies according to the zone. With  $E_2$  the increase is observed in the epithelium of ZIP and glands of ZIP and pc. With P, the reactivity is evident in epithelium and glands of PPC. The treatment with  $E_2+P$  not induce potentiation and the reaction is limited to epithelium and glands of ZIP and pc. DHT determine a scarce increment on the  $Ca^{2+}$  deposits and Ca-ATPase activity only in secretory cells located at the bottom of the folds in all the segments analyzed.

164.

**CONTENTS OF NITROGEN AND PLANT HARVEST INDEX IN NURSERY OF STRAWBERRY (*Fragaria x ananassa* Duch.) IN TUCUMAN, ARGENTINA***Villagra, E.L.; Brandán, E.Z.**Cát. Hortic. Fac. de Agron. y Zoot. U.N.T. Avda. Roca 1900. 4000 Tucumán. E-mail: evillagra@manant.unt.edu.ar*

The objective of the work was to relate the contents from N to level to foliate with the Plant Harvest Index (PHI) of strawberry in nursery in valleys of height of Tucumán. The experience was carried out in Tafi del Valle, -2200 m.s.n.m. - in 1999/2000 and 2000/2001, with cv. Milsei. The treatments were: T1 = control, T2 = 18, T3 = 60, T4 = 100, T5 = 200 and T6 = 300 kgN/ha. The experimental design was with parcels completely randomized with 6 treatments and 6 replications. It was carried out ANOVA and test of Tukey. The N was applied: at the start of the cultivation; 1<sup>st</sup> and 2<sup>nd</sup> stolons series. Edaphic analysis were made and of N in foliate tissue at the beginning and in 3<sup>rd</sup> stolons series. Total N was determined in foliate and N-NO<sub>3</sub> in petiole, and PHI in crop. Significant differences were presented among years in production of plants, (48,25 and 31,99 respectively). In PHI the behavior was homogeneous for treatments in every year. The values means differ significantly (68,56 and 75,78) for 1<sup>st</sup> and 2<sup>nd</sup> year, respectively. Treatments with 60 and 100 kg N/ha gave the best results. The contents of N in plant, -N-NO<sub>3</sub> in petiole - and PHI can be indicative of physiologic maturity of plants of strawberry of nurseries of height.

**An experimental design was used with parcels completely randomized with 6 treatments and 6 replications**

165.

**PROJECT OF ACADEMIC INTERLINKS BETWEEN THE FACULTAD DE BIOQUÍMICA, QUÍMICA Y FARMACIA AND THE INSTITUTO DR. CARLOS PELLEGRINI (F-53)**

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In order to overcome the high percentage of failures in the entrance exams as well as of dropouts at the University, an agreement was signed between the Facultad de Bioquímica, Química y Farmacia and the Instituto Dr. Carlos Pellegrini. Its aims were: a- to design new pedagogic strategies for the area of natural sciences; b- to exchange scientific and technical data; c- to interconnect syllabuses, bibliography and facilities. Through the joint efforts of teachers from both educational levels, complex theme areas for high school students' comprehension were selected and their theoretical and practical lab expertise was enhanced. Furthermore, using group dynamics, students analyzed subjects dealing with scientific investigation and the stages of experimental methods. Results were: a- a significant interest from students in the novel approach; b- the use of various pedagogical strategies and environments; c- an outstanding student performance to academic requirements; d- a response to the demand for interlinks between the two educational levels in the specific area of natural sciences. On the basis of the results obtained we plan to tackle further activities: updating courses, conferences, lectures, internships and the integration of research groups for the development of scientific and academic projects.

167.

**INFLUENCE OF THYROXINE IN AMPHIBIAN OOCYTE MATURATION**

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In the sexual cycle of *Bufo arenarum* females three stages are clearly identifiable: a postovulatory period followed by a quiescent period characterized by the growing and development of the oocytes. Then, and during the breeding period the oocytes adquire the capacity to mature, undergoing cytoplasm and nuclear changes, that allow the subsequent fertilization and normal embrionic development. Previous works demonstrated that this process is under neuroendocrine control. The aims of the present study was to analyze the influence of thyroxine ( $T_4$ ) in the regulation of *Bufo arenarum* oocyte maturation. The metabolic changes in the oxidation of carbohydrates and the meiotic resumption evinced by the germinal vesicle breakdown were used as indicators of cytoplasm and nuclear maturation respectively. The results, using ovarian oocytes obtained from females captured during the quiescent and the breeding period, suggest that  $T_4$  would be one of the factors responsible for the metabolic behaviour that characterizes cytoplasmically immature oocytes. The effect of the hormone, both "in vivo" and "in vitro" conditions, was dose and time dependent. Although  $T_4$  acts modulating the cytoplasmic maturation, it do not affect nuclear maturation by themself at least at doses assayed. Data shows that the association of  $T_4$  and progesterone induce an important increase in nuclear maturation.

166.

**OVIPOSITION IN ANURA: IDENTIFICATION OF "ALBUMIN GLANDS"**

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Anuran amphibians have diverse specie-specific modes of oviposition, being a distinctive process in all of them, the passage of the oocytes throughout the oviduct. During the transit they becoming in contact with the products released by secretory cells, necessary for a succesfull fertilization. The present paper analyze the histochemical characteristics of glandular cells in species that form foam nests: *Leptodactylus chaquensis*, *Pleurodema borelli*, *Pleurodema tucumana* and *Physalaemus bilogonigerus*. Trophic oviducts were sectorized and processed with the following techniques: H-E, PA-Schiff, Alcian Blue (pH 2,5 and 0,5) and Toluidin Blue (pH 3.0 and 5,6).

Results show that, in the transition segment between Convolute Zone and ovisac there are glands that elaborated proteins, we call them "Albumin Glands". The products are released as granules by exocytosis and them organize as flocules by combination with neutral and acidic glucids and lipids. Two types of secretory cells were identified: one of them involved in the synthesis and secretion of the components that form the egg coats, and the others related to the secretion of the biomolecules that form, during the amplexus, the foam which surround the eggs and embryos. The presence of this Gland of Albumin, is reported for the first time in anurans.

168.

**MORPHOLOGICAL CHANGES IN DUCTAL EPITHELIUM OF CHRONIC SCLEROSING SIALOADENITIS OF SUBMANDIBULLARY GLAND (CSSSG OR KÜTTNER TUMOR)**

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CSSSG is an infrequent, unspecific and special form of salivary gland inflammation. It has been described the first time by Küttner in 1896. The clinical course is similar to the true tumors. The cellular changes like mucous, squamous and ciliated transformation of ductal epithelium were described in normal and pathological human glands. The present study aims to analyze the morphological transformation of intercalar and striated duct cells and to determine the association degree with macro and microlithiasis. Submaxillary gland biopsies with Küttner tumor diagnosis from 119 patients were studied. The following histological parameters were evaluated: ciliated epithelial cells, mucinous and squamous metaplasia in ductal epithelium of intercalate and striated ducts of submandibullary glands. The severity of inflamation was classified in four stages according to Seifert et al., 1977. Metaplasia was found in 68 of the 119 cases (57.14%). In 46.21% of total cases metaplasia showed comбинated forms. The association between mucous and squamous metaplasia were the most frequent forms. 36 out of the 68 metaplasia cases showed association with lithiasis. In 25 of these cases the association was with macrolithiasis. The findings show an adaptative tendence of ductal epithelium of submandibullary gland in cases of chronic inflammatory changes and the association of this changes with the presence of lithiasis.

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