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1. ARGINYLATED CALRETICULINAVOIDS PROTEASOMAL DEGRADATION THROUGH SELF-DIMERIZATION

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Arginylation is a posttranslational modification that occurs at the N-terminal position of proteins and it is catalyzed by the enzyme ATE1. The addition of Arg could be involved in the N-end rule, as a primary destabilizing residue. Calreticulin (CRT) is a protein that retrotranslocates from the endoplasmic reticulum to the cytoplasm, where it is arginylated (R-CRT). We have shown that R-CRT has a greater degree of dimerization than CRT. Here we evaluate if R-CRT is degraded by the proteasome and how dimerization affects its stability. Cells incubated in the presence of the proteasome inhibitor MG132 show increased levels of R-CRT compared with control cells. Moreover, in the presence of MG132 and after stress induced by thapsigargin, R-CRT remains at high levels. While during the recovery period in the absence of MG132, R-CRT levels return to the values of control cells. In order to evaluate the effects of CRT dimerization on its degradation, we transfect CRT +/- cells with CRT-EGFP or C146A-CRT-EGFP (which is unable to dimerize). Cells expressing CRT-EGFP exhibit higher levels of R-CRT than cells transfected with C146A-CRT-EGFP. In addition, when these cells are incubated in the presence of MG132 show an accumulation of R-CRT in both cases. Our results indicate that R-CRT is susceptible to be degraded by the proteasome and that dimer formation protects the protein from proteasomal degradation. *Supported by SECYT-UNC, CONICET, ANPCyT-PICT.*

2. DETECTION OF BOVINE PARAINFLUEZA VIRUS TYPE 3 BY RT-PCR IN CELL CULTURES

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The confirmation of infection of Bovine Parainfluenza Virus type 3 (BPIV-3) in cell cultures is achieved by immunofluorescence or immunohistochemistry. However, they have low or variable sensitivity and specificity, and are not capable to discriminate different viral serotypes. Is necessary to optimize a new diagnostic tool as PCR for early detection of the virus in cell cultures. Monolayers of MDBK cells were infected with the JR-2007 strain of BPIV-3. RNA extraction was performed using TRIzol® from cell culture infected and uninfected. For the synthesis of cDNA Super ScriptIII® with random primer was used. PCR was performed using primers and conditions proposed by Vaucher *et al.* (2008) and DNA polymerase Platinum Pfx. An amplicon of 1009 bp was sequenced for greater specificity. Amplicons of 1009 bp corresponding to PIV3-B HN gene were obtained. Sequencing the 1009 bp fragment confirmed the HN gene amplification. Uninfected cultures did not show any reaction. The RT-PCR technique described provides a rapid, specific and reliable detection for BPIV-3 in cell cultures. This would permit a new approach to study the pathogenesis of viral infection, and the molecular epidemiology of circulating strains in the south-central region of Córdoba province.

3. MOLECULAR DETECTION OF RESPIRATORY PATHOGENS IN REARING CALVES

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The primary agents associated with the bovine respiratory disease complex (BRDC) more prevalent in Holstein calves, in rearing stage, are Bovine Parainfluenza type 3 Virus (BPIV-3) and Bovine Respiratory Syncytial Virus (BRSV). BRDC control should be addressed with emphasis in diagnosis and prevention. For an accurate diagnosis RT-PCR can be used, being necessary to optimize the technique to use from clinical samples. Twenty nasal swabs were collected in two farms (A and B) from calves aged 2-4 months old with clinical symptoms. RNA was extracted and the synthesis of cDNA Super ScriptIII® with random primer was used. BPIV-3 and BRSV PCR's were performed using primers and conditions as previously proposed. Non-infected and infected MDBK cells with both viruses were used as negative and positive controls, respectively. An amplicon of each gene was purified and sent to sequencing. We detected amplicons of the gene *HN* of the BPIV-3 in three calves from farm A and amplicons of gene *G* of the BRSV in a calf from farm A and in three calves from farm B. The sequencing of the amplicons of *HN* and *G* genes confirmed the specificity of the RT-PCRs. We concluded that the techniques used were rapid, specific and reliable in the detection of both viruses from clinical specimens. In addition, viral circulation was confirmed in calves in our country.

4. BIOFILM PRODUCTION AND ANTIBIOTIC RESISTANCE OF *Streptococcus uberis* ASSOCIATED TO BOVINE SUBCLINICAL MASTITIS

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Microbial biofilm (BF) formation is a potential responsible for the failure of antibiotic therapy, also contributing to the evasion of the immunological defenses and detachment of planktonic cells often resulting in persistent bacterial infections. BF mode of growth has been associated with *S. uberis*, the main environmental streptococcus responsible of subclinical mastitis infections (SCM). The aim of this study was to determine BF production and antimicrobial susceptibility to a five antibiotics of 25 *S. uberis* isolated from cows with SCM from 18 dairy herds located in the east-central region of Argentina. Susceptibility to antibiotics was determined using the disc diffusion assay on agar plates, according to the CLSI (2008). BF production was evaluated *in vitro* by quantification of BF production by optical density measurement. The results showed a high percentage of isolates resistant to each of the five antibiotics tested. Twelve resistance profiles were identified in *S. uberis*; Profile A (8/25: 32%) was the most frequent and exhibited resistance to all antibiotics. 21 (84%) isolates were BF producers. 10 (40%) and 2 (5.5%) of 25 *S. uberis* showed strong and moderate BF production capability, respectively. 9 (42.8%) of the 21 positive BF isolates exhibited resistance to 3 to 5 antibiotics. The high rate of drugs resistance and BF production suggest that these two factors play important roles in subclinical intra-mammary infections by *S. uberis*.

5. IMMUNOLocalIZATION OF CYCLOOXYGENASE 2 (COX 2) IN THE DIFFERENT PLACENTAL ZONES OF STRESSED RATS

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Chronic stress applied to pregnant rats alters the physiological mechanisms that maintain placental homeostasis, including angiogenesis, a process in which is involved the COX2 enzyme. The aim was to determine qualitatively the COX2 marked cells in different placental zones of stressed rats. Wistar rats, control (C) and experimental (E), stressed by immobilization in tube, were sacrificed at 12, 17 and 21 days of pregnancy. The placental sections were immunolabeled with anti-COX2. We observed COX 2 marked cells in both placental zones, the junctional zone (JZ) and labyrinth zone (LZ). In the day 12 of the C group, COX2 was found in the spongioblast cells (SC) in the LZ, and in 12E also in trophoblast giant cells (TGC) of JZ. At day 17 of the C and E groups in the glycogenic cells (GC) and in the TGC of the JZ. On the day 21 of the C group, COX2 was localized in the GC and SC in the JZ and at day 21 of the E group on the SC and TGC in the JZ. In both groups, the spatial distribution of COX2 marked cells changed from the LZ to the JZ as pregnancy progresses. This could be related to the prostaglandins biosynthesis, which are mediators in myometrial contractility and increased blood flow at the end of pregnancy.

6. COMPARISON OF HABITAT USE AND BEHAVIOUR (FORAGING AND VIGILANCE) OF GUANACOS (LAMA GUANICOE) REINTRODUCED THROUGH HARD RELEASE (2007) AND SOFT RELEASE (2011/12) IN QUEBRADA DEL CONDORITO NATIONAL PARK

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In 2007 began the guanaco reintroduction project in the PNQC, in order that this great wild mammal extinct in the region will help to restore the balance between large-scale herbivory and maintaining diversity without degradation soils, which is needed by this ecosystem of central Argentina. In this paper we compare habitat selection and behavior among guanacos reintroduced by hard release (without pre-adaptation period) and soft release (with pre-adaptation period). We calculated the differential relative use for each habitat unit with Ivlev index. We also made sampling behavior with focal animal type, calculated the occurrence rate and obtained the percentages for vigilance and foraging. The results show that wet and dry grasses were selected by guanacos, both released in 2007 as in 2011/12. The groups of 2011/12 allocated more time to feed than the groups of 2007 and while no significant difference in the time spent on monitoring.

For the species meets the ecological role for which it was reintroduced, it will take more reinforcements populations through soft releases.

7. RECOMBINANT LACTASE ACTIVITY IN THE PRESENCE OF LIPID INTERFACES

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Previously we demonstrated that the activity of soluble wild-type *E. coli* β -galactosidase (β -Gal_{wt}) versus soluble substrate ortho-nitrophenylgalactopyranoside (ONPG) increases in the presence of multilamellar vesicles (MLVs) composed of neutral phospholipids. The aim of this study was to compare the activity of *E. coli* β -Gal_{wt} (Sigma-Aldrich) with a recombinant β -Gal (β -Gal_{-His6}), against natural substrate (lactose). β -Gal_{-His6} was overexpressed in *E. coli*, and the six histidine residues (His-tag) fused to the carboxyl terminus facilitated purification by ion metal affinity chromatography (IMAC). The enzyme activity was measured spectrophotometry, in the absence or presence of MLVs of pure egg phosphatidylcholine (EPC interface zwitterion) or at 80:20 molar ratio with dioleoyl phosphatidyl glycerol (EPC₈₀/DOPG₂₀) negative interface. Kinetic parameters were determined by fitting the Michaelian model to the experimental data using nonlinear regression. Our results showed that, compared to β -Gal_{wt}, the β -Gal_{-His6} exhibited lower affinity for the substrate and specific activity. However, it retained the property of being activated by adsorbing to the lipid-water interface we already described for β -Gal_{wt} but with a greater enhancing effect induced by negatively charged interfaces, favored by electrostatic interactions mediated by the presence of residues His.

8. PHOSPHOLIPASE D ACTIVITY WITH NBD-PC IN RESPONSE TO HORMONAL STIMULATION IN BARLEY ALEURONE

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Phospholipids signalling in part of the plant response to stress and hormone. In addition to *de novo* synthesis in the endoplasmic reticulum, phosphatidic acid (PA) may be generated from plasma membrane glycerophospholipids (GPL) like phosphatidylcholine (PC), phosphatidylethanolamine (PE) by the hydrolytic actions of phospholipases, such as phospholipase D. PLD activity was determined by the ability of PLD to use a primary alcohol, in this case butanol, in frank preference to water as an acceptor for the phosphatidyl moiety to form phosphatidylbutanol (PBut). Previously, by surveying fatty acid composition and levels of main lipid classes in aleurone layers, we found that PLD appears to be the key enzyme that responds to ABA, the generated 18:2-PA being the lipid messenger whose action is terminated by PA-kinase activity to give 18:2-DGPP (Villasuso *et al.*, 2013). Now, we measured the PLD activity with NBD-PC and evaluated the effect of H₂O₂ stimulation as a mechanism involved in ABA response.

9. FARMERS PROFILE AND MORTALITY REPORTED IN THE 2008 DEPARTMENT OF RIO CUARTO APICULTURE CENSUS

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Apiculture is very important for the Department of Río Cuarto economy. During 2008, a census was carried on to characterize beekeepers in the region. The objective of this report was to show a preliminary summary of the data collected. The census universe corresponded to the 639 RENAPA records. Only 47.1% (301/639) of the beekeepers registered could be contacted by phone. In addition, 36.87% (111/301) beekeepers reported being currently out of business, those who were still in (n=190), were interviewed. The beekeepers reported an average of 14 years in apiculture business. Two out of three farmers stated that beekeeping was their main income source. More than a half, contract extra labor (104/190) and two third had been diversified the system. The mortality reported, showed high variation among participants (range 0-100%), with a median of 25%. One hundred sixty three participants declared to control *Varroa destructor* (57 once, 103 twice and 13 three times a year), the rest did not applied any treatment. This present findings applied only for beekeepers still in business. The great variation in mortality reported, requires of an indepth investigation of the factors associated.

10. DISPERSION AND FINE-SCALE GENETIC STRUCTURE IN POPULATIONS OF *Triatoma infestans*

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Triatoma infestans is the main vector of Chagas' disease in South America between latitudes 10°S and 46°S. A total of 314 insects from 22 domestic and peridomestic sites of 15 houses from the locality of San Martín (Capayán department, Catamarca province) were typed for 10 polymorphic microsatellite loci. Significant levels of genetic differentiation were detected among all collection sites, including the different sampled sites within the same house. The results confirm subdivision in populations of *T. infestans* with restricted dispersal among sampling sites and suggest inbreeding and/or stratification within the different domestic and peridomestic structures. Spatial autocorrelation analysis indicated that significantly positive autocorrelations were found in the first (50 m, $r = 0.081$, 95% CI 0.085, 0.078) and second distance classes (300 m, $r = 0.039$, 95% CI 0.043, 0.034), with an x-intercept at 405 m. This result suggests that dispersal typically occurs on the scale of approximately 400 m. Besides, it was detected difference in scale of structuring among sexes, with females dispersing over greater distances than males. This study suggests that in order to reach a higher vector control effectiveness, insecticide treatment and surveillance should be extended within a radius of 400 m around the infested area, which would prevent the propagation and reinfestation process after insecticide spraying.

11. EVALUATION OF CYTOTOXIC EFFECTS OF METABOLITES IDENTIFIED IN AQUEOUS EXTRACT OF *Baccharis articulata* FOR ITS POSSIBLE APPLICATION AS BIOPROTECTORS IN MYCOTOXICOSIS

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Ochratoxin A (OTA) is a dangerous mycotoxin in food and feed. Pure compounds with antioxidant properties are effective for reducing the toxic effects of mycotoxins. A previous study identified the major compounds of the aqueous extract of *B. articulata*, a medicinal plant (luteolin, acacetin and chlorogenic acid). The aim of this study was to determine the *in vitro* cytotoxic effect of these compounds. HPLC analysis of the extract revealed the presence of luteolin (L) ($1.96 \pm 0.27\%$), acacetin (A) ($1.12 \pm 0.14\%$) and chlorogenic acid (CA) ($0.29 \pm 0.05\%$). Lymphocytes were obtained from Wistar rats and exposed to L, A and AC (10, 50, 100 and 200 $\mu\text{g/mL}$) (n = 3) in independent trials and in combinations (L + A, L + AC, AC and A + L + A + AC) for 18-24 h. Cells with RPMI-1640 alone were used as control. Toxicity was evaluated by MTT reduction. Test compounds alone or in combination did not affect the cell viability (L: $96.50 \pm 1.28\%$, A: $97.70 \pm 0.98\%$, AC: $97.82 \pm 1.08\%$, L + A: $96.56 \pm 1.00\%$, L + AC: $98.02 \pm 0.76\%$, A + AC: $96.87 \pm 1.33\%$, L + A + AC: $97.78 \pm 1.37\%$) compared to control ($98.70 \pm 0.88\%$). The results encourage evaluation of these compounds to neutralize the toxic effects of OTA.

12. CELLULAR SENESCENCE IN ESTROGEN-INDUCED PITUITARY HYPERPLASIA

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The benign nature of pituitary adenomas suggests the contribution of an anti-tumoral mechanism such as cellular senescence, a proliferative arrest triggered by cellular stress signals. We evaluated *in vivo* the existence of this phenomena during the development of estrogen-induced pituitary hyperplasia in Wistar male rats implanted with benzoate estradiol capsules (30mg) for 10, 20, 40 and 60 days. Empty capsules were used as control. Statistical analysis: ANOVA-Fisher, $p < 0.05$. After 40 days of estrogen treatments we found strong evidences of cellular senescence markers as: raise in beta-Galactosidase pH6, DNA damage response activation through ATM phosphorylation, an increase in cell cycle regulator p21 nuclear expression by western blotting (WB), diminution of cellular proliferation rates by Ki67 immunodetection and an abnormal cell cycle profile analyzed by flow cytometry. We also detected the induction of protein expression related to the senescence-associated secretory phenotype such as NFkappaB e IL-6 by WB. In addition, the unbalance of mitochondrial dynamic (DRP-1 y MFN-1) and augmentation of carbonilated proteins were indicative of oxidative damage. Our results lead us to conclude the existence of pituitary predisposition to activate the senescence as a cellular mechanism to control the pituitary cell growth.

13. THE RELATIONSHIP BETWEEN APOPTOSIS AND CELL PROLIFERATION DURING PORCINE GESTACIÓN

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The increase in fetal mass with the advance of gestation requires a tissue placental adaptation, involving development and remodeling of tissues. During this process, the apoptosis and cell proliferation phenomena play a key role. Our objective was to evaluate the apoptotic and cell proliferation markers, IAp and Ki67, throughout pregnancy, to understand the existing relation between both processes. Crossbred placental samples from slaughterhouses from Río Cuarto, Argentina, were used. The estimated gestational periods of the samples were: 30, 60, 80 and 90 days of gestation. IAp index was calculated from TUNEL assay and ApopTag® commercial kit that detected *in situ* apoptosis. % Ki67 was obtained through the determination of cell proliferation by immunohistochemistry using Ki67 specific antibodies. Until day 80 of pregnancy, IAp y Ki67 showed the same expression pattern. However, by day 90 an increase of apoptosis was detected, together with a marked diminution of cell proliferation. It has been informed that an inverse relation exists between both processes. Nevertheless, in the present work that is only evidenced in the advanced gestation of day 90. During placental remodeling by apoptosis, the eliminated cells are replaced by an active cell proliferation process. Synchronization of both phenomena takes to an increase in the area of placental villi and blood vessels. In more advanced pregnancies, the apoptosis is involved in the mechanisms triggering the farrowing.

14. RELATION BETWEEN *Helicobacter spp* AND GASTRINE PRODUCING CELLS. PRELIMINARY STUDY

Mac Loughlin V, Merkis C, Sanchis G, Cristofolini A, Dauría P, Ritta L, Savino F, Sagripanti G, Grosso C, Bonino F.
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Gastric acid secretion is mainly controlled by the hormone gastrine, which is synthesized by G cells of *gastric mucosa*. *Helicobacter pylori* alters the inhibitory control of gastrin release and this results in an excessive acid secretion causing peptic ulcers. Several studies confirm the implication of *Helicobacter spp* in gastric pathologies in human and in other animal species, including pigs. That is why these bacteria could be responsible of zoonosis. The aim of this work was to study the relationship between the presence of *Helicobacter spp* and the functionality of the G cells in gastric biopsies of pigs. The presence of *Helicobacter spp* was determined in gastric biopsies of crossbred pigs of different ages and sexes, diagnosed gastritis H (+) and H (-). Porcine samples were obtained from slaughterhouses from Río Cuarto, mainly of the antral region. The detection of positive G cells was carried out by immunohistochemistry using commercial antibodies. No statistically significant differences were found between groups gastritis H (+)/H (-) (p=0.3895). In this preliminary study, the results indicate that the increase of gastrine is independent of the presence or absence of *Helicobacter*. In contrast, in humans differences are found related to gastrin concentration and to the increase in number of gastrine producing cells, regardless of sex.

15. FOLIAR SPRAY RESPONSE WITH *Pseudomonas sp.* TO THE APPLICATION OF GLYFOSATE IN CORN PLANTS

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At present, the use of pesticides is widely spread in the world. However, the continuous use of these components for extensive periods can lead to alterations in hard reversible soils. Glyfosate constitutes one of the most commonly used wide spectrum pesticides. The microorganisms' activity in soils is the main determinant of pesticides degradation. The aim of this paper was to evaluate the response of corn plants RR (resistant to Roundup®) to the foliar spray with *Pseudomonas* bacteria and the use of this pesticide as a biofertilizer and detoxificant method of the Glyfosate residues. Five repetitions were done (n=6), in 300 cc pots with soil/perlite, in growth chamber (16h light, 28°C/ 8h darkness, 20°C), for 30 days. The foliar spray with Glyfosate (2.5L/100L) and *Pseudomonas sp.* (10⁷ UFC/ml) was carried out in the V2 and V3 stages respectively. The herbicide application decreased the foliar area, root dry weight and area part, pigments content and phytohormones, rate and stomachic frequency, compared to the control. On the other hand, the foliar spray with *Pseudomonas sp.* in the presence of Glyfosate significantly decreased these herbicide effects, decreased more than 50% of the residual content of Glyfosate in leaves and increased the content of phytohormones. This capacity is advantageously interesting for the agro-industry. Besides reinforcing the role of PGPR for its characteristics already known, it would contribute to optimum results in the toxic residues degradation as a sustainable practice.

16. STUDY OF THE BIOSTIMULANT AND DETOXIFICANT CAPACITY OF INOCULATED *Azospirillum sp* IN THE EARLY GROWTH STAGE OF CORN

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Due to its capacity to improve growth, development and yield *Azospirillum* is the inoculants most widely used. The use of corn transgenic varieties selective to Glyfosate (RR) has contributed to the wide use of this component. However, its excessive use could bring potentially toxic effects. In search of alternatives for a more sustainable agriculture and given the little information about inoculation and the interaction fertilizer-herbicide, we evaluate the response to inoculation with *Azospirillum sp* in early stages of the RR corn development in the presence of Glyfosate. Experiments in Petri dishes were carried out with distilled water or Glyfosate (0,25L/100L), depending on the treatment: Control, Inoculated, Glyfosate, Glyfosate+Inoculated. They were incubated at 29°C and from 48 to 96 hrs the germinative power and coleoptile length and root were determined. The inoculated seeds showed a faster germination speed, root length and radical hair development. The inoculation in the presence of Glyfosate resulted in an increase of the germinative power, the roots growth and the radical hair development. At the same time, this inoculation counteracted the damages caused by the herbicide during growth, which could be explained by the capacity that this PGPR would have to metabolize Glyfosate residues. Therefore, the use of *Azospirillum sp* in crops will not only have beneficial effects for growth, development and potential yield, but it would also reduce the excessive use of chemical fertilizers and the xenobiotic components persistence.

17. VASCULAR DEVELOPMENT IN GOAT PLACENTAS. PRELIMINARY STUDY

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The placenta performs important nutritional, respiratory and excretory functions. These are possible by the formation of an extensive vascular network by angiogenesis. The objective was to evaluate the placental vascular development by studying blood vessels morphometric variables from the last two thirds of gestation. Placental samples were obtained from 10 crossbred goats of 50 and 100 days of pregnancy, which were fixed and processed by conventional histological technique. The sections were stained with H/E staining. Images at 200x in 10 random fields per slide were acquired. Area and perimeter of capillaries were measured with the Axiovision® software. The results show that the caruncular vascular area did not exhibit significant differences between the placentas of 50 and 100. In contrast, cotyledonary vascular area was significantly higher in placentas of 100 days. The perimeter of the vessels was significantly higher at 100 days in both tissues. These results are consistent with data in sheep, showing a slight development in caruncular tissue until 100 days, and a large increase in the vascular area and perimeter at 100 days in cotyledonary tissue. This is consistent with the increase of umbilical blood flow and exponential growth of fetal size in the last third of gestation.

18. MICROBIAL CONSORTIUM FOR AGRICULTURE SUSTAINABLE

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The process of biological fixation of atmospheric nitrogen (FBN) partially covers the demand for soybean nitrogen estimated at 80 kg per ton of grain produced. This process can only be performed by prokaryotes. *Bradyrhizobium japonicum* is the quintessential symbiont of soybeans. Furthermore, the technique can use the bacterium coinoculation combined with plant growth-promoting bacteria (PGPR) as *Azospirillum brasilense* and *Pseudomonas fluorescens*, which enables better results in performance due to the synergistic effect of these PGPR. The aim of this study was to optimize the FBN with consortium of microorganisms in the soybean crop. We conducted a study of 4 inoculated treatments, one with addition of nitrogen fertilizer and one control, in two different places. The results show that the grain yield was higher in treatments with microorganisms than the control, with increases observed from 250-650 kg ha⁻¹.

19. ARGININE DEIMINASE IS INVOLVED IN THE REGULATION OF THE ENCYSTATION PROCESS IN *Giardia lamblia*

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Giardia lamblia differentiation from the trophozoite to the cyst stage is critical for the parasite survival in the environment and for disease transmission. Despite recent discoveries in the field of *Giardia* encystation, our understanding of the molecular mechanisms initiating and regulating gene expression during this critical process remains incomplete. In a previous work, we analyzed the role of SUMO protein and the putative enzymes of the SUMOylation pathway in *Giardia*. At present, only the enzyme Arginine Deiminase (ADI) was confirmed as a SUMOylated substrate. ADI is involved in the survival of the parasite and catalyzes the modification of arginine residues to citrulline in the cytoplasmic tail of surface proteins. During encystation, however, ADI translocates from the cytoplasm to the nuclei. In this work, by site-specific mutation of the ADI SUMOylation site, we observed that these transgenic cells failed to enter the nucleus at the first steps of encystation but shuttled in the nuclei late during this process through classical nuclear localization signals. Inside the nuclei, ADI modifies histones by citrullination, and this modification is probably involved in the downregulation of CWP expression and cyst wall formation. Our results strongly indicate that ADI plays a regulatory role during encystation in which posttranslational modifications of proteins are key players.

20. GLYPHOSATE EFFECT ON GROWTH IN MODIFIED CZAPEK MEDIUM OF *Aspergillus flavus*. DETERMINATION OF RESIDUAL PESTICIDE CONCENTRATION

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Glyphosate is an important herbicide used in different crops in our region. Filamentous fungi are a powerful tool in the pesticide bioremediation from soil. The *in vitro* effect of different concentrations of glyphosate (5 to 30 mM) on growth of a non-toxicogenic *A. flavus* strain was evaluated under three water activities (a_w) (0.995, 0.98 and 0.98). The residual concentration of the herbicide on media was calculated. In general, fungi biomass was higher in each herbicide concentrations than in the control treatment at all a_w assayed. At 5 mM of glyphosate and 0.995 of a_w it was observed a pesticide reduction of 55% after 20 days of incubation. While, herbicide reductions of 91% and 88% were obtained at 0.98 and 0.95 of a_w after 10 and 15 days of incubation, respectively. These results the capacity of *A. flavus* to develop in presence of glyphosate and degrade it on *in vitro* conditions.

21. EFFECT OF AQUEOUS OZONE ON SPORES GERMINATION OF *Aspergillus SECTION flavi* AND *nigri* ON SOIL

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Recently, aqueous ozone has been proposed as a new sanitizer to eliminate the risk of pathogenic bacteria or mould in foods. The fungus is found throughout the world in soils including agricultural, forest, orchard, grassland and wetland soils. Colonization of grains by *Aspergillus species* has often resulted in mycotoxin accumulation at harvest. This work evaluate the effect of different concentrations of aqueous ozone (5, 10, 20 y 40 mg/L) on spore germination of two toxigenic *Aspergillus* strains (*A. flavus* and *A. niger* aggregate) on sterile soil; colony-forming units per gram of soil (CFU/g) were determinate to analyze the effect of ozone on each fungal strain. In general, CFU/g of both strains were significantly reduced when aqueous ozone concentration increased, this fact was more noticeable on *A. flavus*. The spore germination reduction become significant from the lowest concentration of ozone assayed (5 mg/L). Aqueous ozone application on soils could be an alternative to diminishing fungal contamination of crops and the subsequently mycotoxin production.

22. DESMIN AND VIMENTIN IMMUNOEXPRESSION IN PORCINE PLACENTAS DURING PREGNANCY

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The presence of desmin and vimentin intermediate filaments plays an important role in the implantation, development and reorganization of placental tissues in different animal species. The aim of this work was to study the distribution of intensity of desmin and vimentin immunolabelling during porcine placentation. Histological samples of $\pm 4 \mu\text{m}$ from placentas of 28, 40, 60, 70, 80 and 114 days of pregnancy were used. The placental samples were processed by immunohistochemistry using NovocastraTM primary antibodies and Santa Cruz, Inc. FITC-conjugated secondary antibodies. The High Score values of desmin and vimentin were derived by summing the percentages of intensity of labelling at each intensity value. Effect of gestational period was detected on the High Score of desmin and vimentin. At 28 and 80 days of gestation the greatest values of desmin and vimentin were observed. The presence of these intermediate filaments in the peri-implantation period would favor the maintenance of vascular and tissue integrity, coinciding with our previous studies in which we found the highest rates of proliferation and apoptosis. At the day 80 the High Score of desmin and vimentin are correlated with high rates of vascular proliferation and with high vascular areas found in previous studies. The presence and immunoreactivity of desmin and vimentin in the placental/fetal microenvironment would be closely associated to the vascularization process observed in early and advanced gestations.

23. SILDENAFIL: EFFECTS ON UTERINE CAPACITY AND OXIDATIVE STRESS IN GILTS

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The uterine capacity can be defined as the relative surface area of placental endometrial attachment required to support the nutrient requirements of each fetus throughout gestation. Transport efficiency of nutrients is conditioned by vascular development and balance between different factors, such as nitric oxide (NO). Sildenafil (SDF), a selective 5-phosphodiesterase inhibitor, elevates the vasodilatory effect of NO on vascular smooth muscle. The aim of this study was to determine the effects of SDF on uterine capacity and oxidative stress in pregnant gilts. Artificially inseminated gilts were selected and divided into two groups: control (n=3) and treatment (n=3). In the treatment group, oral SDF citrate (100 mg) was administered from day 45 to day 55 of pregnancy. The animals were euthanized on day 56 of pregnancy. Number of embryonic vesicles, fetal and placental weights and fetal measures were registered. Lipid peroxide levels in fetal placenta and uterus homogenates were determined, and placental villi length was evaluated. Animals treated with SDF show significantly reduced levels of lipid peroxidation in fetal placenta (p=0.0360) and a significant increase (p=0.0195) in length of fetal placental villi was found. In conclusion, treatment with SDF citrate in the early pregnancy may increase the relative area of fetal placental adherence and decrease lipid peroxidation in the fetal placental tissue.

24. INTESTINAL PARASITES AND ASSOCIATED FACTORS IN DOGS IN RIO CUARTO

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The presence of intestinal parasites in dogs have veterinary and human health implications. The objective of this study was to determine parasites prevalence in dogs and associated factors. A cross sectional study was undertaken between the years 2011 and 2013, fecal samples of dogs whose owner agreed to participate were recollected from 36 neighborhoods of Río Cuarto city. Samples were processed with Willis, Benbrooks and modified Telleman techniques. Age, animals' origin, housing characteristics, observation of feces in the moment of the survey and access outdoors without supervision were the variables analyzed. One hundred sixty eight samples were positive to at least one parasite structure of a total of 368 dogs, representing a prevalence of 37.78%. *Ancylostoma caninum* was the most frequent structure found (25.00%), followed by *Trichuris vulpis* (9.24%), *Giardia intestinalis* (4.89%), *Toxocara canis* (4.35%), *Isospora spp* (3.80%), *Capillaria* (1.36%) and *Sarcocystis spp.* (1.09%). Results of the logistic regression showed an association of dogs' age and lack of shadow in the house with a decreased risk of presence of parasites in dogs. The high frequency of parasites found in dogs, reinforces the need of effective prevention measures. Veterinarians should play an important role in increasing the level of awareness of canine zoonotic parasites, thus helping to prevent or minimize zoonotic transmission.

25. VOLATILE COMPOUND VALUES IN THE GRAIN-INSECT-FUNGAL INTERACTIONS

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The grains produce volatile compounds (VC) as a defense mechanism, modulating insect attack and fungal infection. The present study aimed to evaluate the insecticidal activity against *Sitophilus zeamais* Motschulsky (Coleoptera: Curculionidae) and antifungal activity on *Fusarium verticillioides*. The VC from grains and fungi were obtained from commercial preparations. The insecticidal and antifungal activities were evaluated through fumigant assays. The most bioactive VC against fungal strain were: trans-2-nonenal > trans-2, cis-6-nonadienal > trans-2-hexenal > valeraldehyde > 1-octen-3-ol > 3-octanol. However, 1-octen-3-ol and 3-octanol were the most toxic against *S. zeamais*. 1-octen-3-ol and 3-octanol are synthesized by fungal strains and low concentrations of them stimulate *F. verticillioides* growth. The aldehydes were more effective than alcohols. The present results suggest that these compounds, synthesized by grains, may play an interesting role in the control of fungi and insect infections. In addition, VC synthesized by fungal strains could have repellent effects on insect and/or attractant effects in order to disperse their reproductive structures. In conclusion, the interaction between grain-insect-fungal strain could regulate the fungal and insect infections. These findings could provide an important contribution in search for new compounds to control insect and fungal.

26. INSECTICIDE ACTIVITY OF TERPENES AGAINST *Tribolium castaneum* HERBST (COLEOPTERA: TENEBRIONIDAE) AND *Sitophilus zeamais* MOTSCHULSKY (COLEOPTERA: CURCULIONIDAE)

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The stored products are attacked by many beetle pests. Essential oils and its main compounds (terpenes) are interest alternative to synthetic insecticides and have little or no harmful effect on human health. The aims of this study are: 1) to evaluate insecticidal activity of terpenes with different functional groups against maize pests (*T. castaneum* and *S. zeamais*); 2) to evaluate insecticidal activity of essential oils whose main components contain the functional group with the highest insecticidal activity against *S. zeamais*, selected to aim 1). According to previous research, the most toxic terpenes have been tested in contact and fumigant toxicity assays. In addition, essential oil and their main components were tested in fumigant assay. The most bioactive terpenes were: ketones > phenols > ethers > hydrocarbons > alcohols. Essential oils rich in ketones from *Aphyllcladus decussatus* Hieron, *Aloysia polystachya* Griseb, *Minthostachys verticillata* Griseb Epling, *Tagetes minuta* L. and its major components: α -thujone, carvone, pulegone and ocimenone, respectively, were selected. *M. verticillata* and its main compound, pulegone, were the most bioactive ($LC_{50} = 116.6 \mu\text{L/L}$ y $11.8 \mu\text{L/L}$, respectively). In conclusion, the essential oils rich in ketones could be used as potential fumigants against stored product insects.

27. GENOTYPIC CHARACTERIZATION OF *Staphylococcus coagulase* NEGATIVE RESISTANT TO β -LACTAMS

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Antibiotic therapy is an essential component of mastitis control programs against bovine mastitis (BM). Recent research shows a predominance of coagulase negative *Staphylococcus* group (SCN) as causative agents of BM. Indiscriminate use of β -lactams has contributed to the increase of resistant strains either by the presence of the β -lactamase enzyme or by a penicillin-binding protein which has a very low affinity for all β -lactams antibiotics, coded by *blaZ* and *mecA* genes, respectively. *S. chromogenes* and *S. haemolyticus* are the most prevalent species isolated from BM to 50 dairy farms from the central basin of Argentina. At a phenotypic level, both species revealed a high percentage of strains resistant to β -lactam. The aim of this study was to analyze the genetic profiles of β -lactams resistance of SCN species with clinical significance in BM. PCR detection of *blaZ* and *mecA* correlated at 75% and 62.5%, respectively, with phenotypic resistance to β -lactams in strains of *S. chromogenes* and 75% and 31.5% in isolates of *S. haemolyticus*. These results show the wide spread of resistance mediated by β -lactamase and a different horizontal transfer, but not least, of the *mecA* gene between SCN prevalent species. *S. chromogenes* and *S. haemolyticus* could act as a reservoir of these resistance genes, and therefore it is advisable the rational use of β -lactam antibiotics against prevalent pathogens associated with BM.

28. ERYTHROMETRIC PARAMETERS AS DIAGNOSTIC CHARACTER IN CRYPTIC ANURAN SPECIES WITH DIFFERENT PLOIDY LEVEL

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In cryptic complexes including species with different ploidy levels, the character that clearly differentiates them is the number of chromosome complements. The blood cells of amphibians conserve their nucleus, and so the erythrocyte size is correlated with the DNA content. We analyzed two cryptic-polyploid complexes occurring in the center of Argentina: *Odontophrynus cordobae* (2n)/*O. americanus* (4n) and *Pleurodema kriegi* (4n)/*P. cordobae* (8n). Our aim was evaluate the efficiency in the utilization of nuclear area with respect to cellular area of the erythrocytes to define the limits values for the identification of cryptic-polyploid species. We studied 110 individuals of *Pleurodema* and 116 individuals of *Odontophrynus*. For each individual, we measured the cellular and nuclear length (L) and width (A) of 40 erythrocytes ($\text{Area} = L \cdot A \cdot \pi / 4$) and boundary values were calculated using distribution curves. In both complexes studied, the erythrometric parameters showed significant differences between related species. Moreover, in both complexes the nuclear area was more efficient for identifying the species (*Pleurodema*: $34.39 \mu\text{m}^2$ (probability=99.96%) and *Odontophrynus*: $24.02 \mu\text{m}^2$ (99.075%)) than the cell area (*Pleurodema*: $273.08 \mu\text{m}^2$ (97.55%) y *Odontophrynus*: $197.69 \mu\text{m}^2$ (97.94%)). Greater efficiency found using nuclear area is novel and significant because most studies use only the cell area to differentiate polyploid complexes.

29.

EFFICACY OF VACCINATION AGAINST *Staphylococcus aureus* BOVINE MASTITIS UNDER FIELD CONDITIONS: A PRELIMINAR REPORT

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S. aureus is the ethiological agent most commonly associated with bovine mastitis, infectious disease with a strong economic impact in dairy farming. The objective of the present study was to investigate the efficacy of a live avirulent *S. aureus* vaccine under field conditions. A sequential trial was conducted at a commercial dairy farm in Córdoba, Argentina with 156 Holstein cows in lactation. The prevalence of intramammary infections due to *S. aureus* was 21%. Cows and heifers were assigned through block randomization. Subcutaneous doses (5×10^8 cfu/ml) of the *S. aureus* RC122 strain were administered to 21 cows and 14 heifers, 90, 60 and 10d before calving. The experiment was balanced regarding control and vaccinated cows. Milk samples were collected from each quarter at 14, 21 and 60d after calving and tested for bacteriology. A logistic regression model with repeated measures was fitted. Preliminary results show that isolation of *S. aureus* in milk was significantly lower in vaccinated cows (OR=0.31; CI95% 0.14-0.66) in comparison to non-vaccinated group, while there were not significant differences between both groups (OR=0.29; CI95% 0.02-2.50) in heifers. Results showed that immunization of dairy animals with strain RC122 provides protection in cows demonstrated by a significant reduction in bacterial infections with an efficacy of 70%.

30.

***Achyrocline satureioides* (Lam) DC: CYTOTOXIC CAPACITY AGAINST LYMPHOCYTES OF EQUINES AND CHEMICAL ANALYSIS OF ITS COLD AQUEOUS EXTRACT**

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Introduction: *Achyrocline satureioides* (Lam) DC is an important species of Asteraceae family, is commonly known as “marcela del campo”. In previous studies we demonstrated the ability of cold aqueous extract (CAE) to inhibit the *Western Equine Encephalitis* virus. It is necessary to evaluate the cytotoxic effect of CAE on normal cells of equines to determine its safety and establish a selectivity index. **Objective:** To evaluate the cytotoxicity on lymphocytes of equines and analyze the chemical composition of CAE of *A. satureioides*. **Methodology:** Vegetal aerial parts were submitted to extraction with cold (4°C) water for two days. Then, the solution was filtered and lyophilized to obtain CAE. Equine lymphocyte cultures were treated with different concentrations (0-3000 µg/mL) of CAE, for 18-24 h. Then cytotoxicity was evaluated by two techniques: a) the staining by Trypan Blue Exclusion (TBE) and b) Reduction of MTT. Analysis of chemical composition was performed by HPLC-ESI-MS/MS. **Results and Discussion:** Cytotoxic studies showed low toxicity of CAE. It was demonstrated dose-response relationship on lymphocytes equine by both TBE (CC₅₀=1300 µg/mL) and MTT (CC₅₀=700 µg/mL). Chemical analysis indicated the presence of quercetin, 3-O-methylquercetin and luteolin.

31.

EVALUATION OF BOX-PCR MOLECULAR TECHNIQUE TO STUDY *Escherichia coli* ISOLATED FROM WATER

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E. coli is the most important indicator microorganism of fecal contamination in water. Typeability, reproducibility and discriminatory power of BOX-PCR were determined, to establish the genetic relation of *E. coli* strains and compared with land use. Thirty-eight isolates were analyzed from surface water and groundwater obtained from Barranquita-Knutzen and El Barreal basins. The watersheds include rural zone and land use is predominantly agricultural, followed by livestock. Drinking water is supplied by the unconfined aquifer. By BOX-PCR, 20 patterns were defined with 3 to 7 bands in a rank of 250 y 2500 pb. Typeability and reproducibility were 100%. Discriminatory power was 94% (D=0,94). By UPGMA (Unweighted Pair-Group Method with Arithmetic Averages) and Canonical Discriminant Functions analysis the molecular technique linked strains to each studied basin. In each basin was able to establish the relation between cluster and land use, finding that livestock waste would be the main source fecal contamination in water. PCR-based methods are cheaper, easier to perform and provide faster results. This study demonstrated the value of BOX-PCR as alternative molecular tool for routine examination of water quality.

32.

EFFECT OF POLYMER NANOCOMPOSITES IN CELLULAR REDOX BALANCE

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A polymeric nanocomposite material is characterized by the homogeneous dispersion of nanoscale particles within a polymer matrix. These compounds have many applications, including controlled release of drugs. However, little is known about the potential effects of these nanocomposites. The aim of this study was to evaluate the effect of exposure of porcine intestinal cells against different nanocomposites in cellular redox balance. Acrylamide-acrylic acid hydrogels were synthesized incorporating in the solution synthesis different proportions of carbon nanotubes functionalized with chitosan: hydrogel, hydrogel-nanotubes_{1%} and hydrogel-nanotubes_{5%}. Porcine enterocytes were cultured and the effect of the incubation of these cells with the nanocomposites in the main antioxidant enzymes (CAT, GPx, SOD and Grd) was evaluated. None of the compounds tested altered the expression of the enzymes compared with untreated control cells. In accordance with previous studies, carbon nanotubes were shown to be not potent inducers of oxidizing species and inflammatory mediators. These results are in concordance with previous reports that says that carbon nanotubes functionalized with chitosan become highly biocompatible.

33. USE OF URBAN ENVIRONMENTS BY AMPHIBIANS ANURANS: IMPLICATIONS FOR PLANNING AND CONSERVATION

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The urbanization is one of the causes of the amphibian population decline. In this paper, we analyzed the reproductive aspects of anuran species in the locality of Río Cuarto, Córdoba, Argentina. We selected 18 sampling sites associated with urban and suburban environments that according to the stability of the water body were classified as environments: permanent (P), semipermanent (SP), semitemporal (ST) and temporal (T). To determine the reproductive activity we recorded acoustic emissions and presence of larval stages. The indexes of alpha and beta diversity, relative importance and permanence were calculated. To compare the diversity among environments a Hutcheson's t-test was performed. We recorded eight anuran species, with three different reproductive modes. The greater dissimilarity values were recorded by comparing the permanent environment on the other three categories. The statistical test showed significant differences in the amphibian diversity in all environments except for the pair SP-ST. These environments have the highest diversity values. The lowest diversity was recorded for the environment P, in which only *Bufo arenarum* larvae were observed. Because the particular requirements of the different species, the diversity of environments with different hydroperiods, particularly with SP and ST regimes, would represent a key factor for the conservation of urban anuran communities.

34. ANTIOXIDANT AND HEPATOPROTECTOR EFFECT OF RHIZODEPOSITION AND SEEDLINGS OF PEANUT (ARACHIS HYPOGAEA)

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It is known that peanut is a source of products with pharmacological properties. The isolation and identification of organic compounds rhizodeposition could be an alternative to obtaining products with beneficial effects on human health. We evaluated the antioxidant and hepatoprotective activity of rhizodeposition and methanol extracts (ME) of peanut plant. Methanol extracts (EM) of leaves (LE), stem (SE) and root (RE) of seedlings of 7 days and lyophilized root exudates (rhizodeposition, Ri) were used. ME and Ri (1mg/ml) were administered orally to Balb/c mice and after 21 days a dose of paracetamol (Pa, 750 mg / kg, orally) was given. The animals were sacrificed, plasma GPT and alkaline phosphatase and hepatic malondialdehyde (MDA) levels were determined. Antioxidant capacity was determined *in vitro* by assay of DPPH (2,2-diphenyl-1-picrylhydrazyl). Pa administration increased liver enzymes and MDA levels. The administration of the extracts and Ri prevented drug-induced damage, with no differences between the different fractions. ER produced a 30%, EH 67%, ET 27% and Ri 15% of inhibition of DPPH. In conclusion, both Ri as extracts shown antioxidant activity. Furthermore, prevention of increased liver enzymes in response to Pa indicates plasma membrane stabilization and repair of hepatic tissue damage. The isolation of the compounds contained in the rhizodeposition for use in human health could create added value to the cultivation of this legume.

35. EFFECT OF STRESS INTENSITY ON SODIUM EXCRETION AND OXIDATIVE STATUS IN RATS WITH A PARENTAL HISTORY OF HYPERTENSION

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Urinary sodium excretion in basal conditions and in response to stress (S) is a heritable phenotype that can be used to study the etiology of hypertension (HTA). We have also demonstrated that the increase of free radicals (FR) associated with renal sodium handling, with nitric oxide bioavailability and HTA. We compared the oxidative and natriuretic response in rats with genetic predisposition to HTA and subjected to two types of chronic S. Three groups of male rats F1 crosses between Wistar and spontaneously hypertensive rats: control, movement restriction S (R) and immobilization S (IMO) 1h/día/14day. Urine samples were obtained, blood, adrenals and kidneys. Plasma was determined in glucose (GLU), corticosterone (COR), Na + and creatinine. Urine creatinine was measured, Na + and volumen. We calculated creatinine clearance (CC). Activity was measured by the superoxide dismutase (SOD) and malondialdehyde (MDA) and renal total nitrites. Increase was observed in GLU and COR in all stressed rats was higher in the IMO. The IMO antinatriuresis caused no changes in the CC. Natriuresis and caused the largest R CC. IMO only increased the MDA and SOD activity decreased in all rats S. Despite having predisposition to HTA, only strong stress caused antinatriuresis and increase in RL, although in both cases decreased renal response antioxidante. La protection seems to depend more on the intensity of the S strain.

36. EFFECT OF STRESS INTENSITY ON SODIUM EXCRETION AND OXIDATIVE STATUS IN BHR RATS

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Urinary sodium excretion in basal and stress conditions is a heritable phenotype that can be used to study the etiology of hypertension (HTA). Moreover has been shown that an increase of free radicals (FR) is associated with renal sodium handling, nitric oxide bioavailability and HTA. We compared the oxidative and natriuretic response in rats with genetic predisposition to HTA and subjected to two types of chronic stress. Three groups of male rats, F1 from Wistar x spontaneously hypertensive rats (BHR) were considered: control, restriction stress (R) and immobilization stress (IMO) 1h/day/14days. Urine, blood, adrenals and kidneys were obtained. Plasma glucose (GLU), corticosterone (COR), Na + and creatinine was determined. Urine creatinine and Na + was measured. Creatinine clearance (CC) was calculated. Renal superoxide dismutase (SOD) activity, malondialdehyde (MDA) and total nitrites were measured. Higher GLU and COR levels in all stressed rats was observed, but this values were greater in IMO than R. Antinatriuresis without changes in CC were observed in IMO, but R caused natriuresis and an increase in CC. Only IMO increased MDA and SOD activity decreased in all stressed rats. Despite HTA predisposition, only strong stress caused antinatriuresis and FR increases, although in both cases antioxidant renal capacity was lower.

37. ISOLATION AND IDENTIFICATION OF BACTERIA FROM LIVIXIATED VERMICOMPOST. INHIBITORY EFFECT ON PHYTOPATHOGENIC FUNGI

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Alternatives and agroecological production measures that allow sustainable agriculture are being investigated. The high cost and the pollution by mineral fertilization has made frequent use of organic fertilizers (biofertilizers). The aim of this work was to isolate and characterize microorganisms from a foliar biofertilizer based on vermicompost; to confront them with phytopathogenic fungi “*in vitro*”; to determine the innocuity and physical-chemistry composition. To isolate the bacteria, the biofertilizer was diluted and inoculated in Petri plates containing TSA at 25%. It was incubated at 28°C for 48 h. The isolated bacteria were submitted to metabolic testing for identification. The results were loaded and evaluated in bacterial identification software (ABIS 6). To determinate the inhibition by bacteria, TSA plates were inoculated at 25% with fungi of the genera: *Macrophomina*, *Fusarium* and *Cercospora*. The plates were incubated at 28°C for 7 days. The percentage of inhibition was calculated based on the reduction of mycelial growth compared to the control plates. The innocuity was performed by determining *E. Coli* sp. and *Salmonella* sp. Thirteen bacteria included in genera: *Paenibacillus*, *Bacillus*, *Serratia* and *Yersinia* were isolated. These microorganisms inhibited the growth of fungi in different magnitudes. The biofertilizer proved to be harmless. The results of the physical-chemical analysis indicated that the product has macroelements and microelements, which could increase plant growth.

38. HEMATOLOGICAL BIOMARKERS OF ENVIRONMENTAL IMPACT IN URBAN AND RURAL ENVIRONMENTS OF CÓRDOBA PROVINCE

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The use of hematological biomarkers allows to detect observable or measurable changes in the exposure of organisms to xenobiotics. In this work, differential count and cytomorphometry of white blood cells are proposed as biomarkers of genotoxicity in *Bufo arenarum* inhabiting in environments with different alteration degrees of Río Cuarto (Villa Dalcar and UNRC), rural areas and a control site. The blood samples were obtained by angularis vein puncture of 93 individuals and the smears were stained with May Grunwal-Giemsa and observed by using a microscope. The mean leukocyte of Villa Dalcar was higher compared to the other sites (425.48 ± 481.34). Leukocyte formula showed significant differences between Villa Dalcar and control site respect to monocytes and basophils (W=62.5, p=0.000; W=103.5, p=0.007), with higher values in the first site. Cytomorphometry also showed significant differences between Villa Dalcar and control site for both cell a nuclear area (p < 0.05), except in basophils and monocytes (p = 0.5, p = 0.949). The observed variations in hematological parameters revealed that Villa Dalcar represents the more disturbed site. These results have proven that the hematological parameters represent a reliable biomarker to evaluate contaminated environments and/or altered by human activities.

39. INTRASPECIFIC INTERACTIONS AND HOME RANGE IN RED BELLIED TOAD *Melanophryniscus stelzneri* (ANURA, BUFONIDAE)

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The space used by an individual to satisfy its daily requirements is defined as home range. In the present study, we studied the size and use of *Melanophryniscus stelzneri* home range during its reproductive period. We selected an ambient in which the species typically inhabits, called *mallín*, characterized for being a swampy area, developed in floodable sites of the landscape alongside permanent or semi permanent water courses, in which water accumulates or flows slowly. We established a grid encompassing 128m², subdivided in 1m² quadrants. We captured and photographed all active individuals for their later identification by using their dorsal spot patterns. Later, we monitored active individuals and we registered their position in the grid during each sampling day. We identified a total of 43 individuals, of which nine were recaptured on two opportunities and nine had one recapture. Sites used most frequently by the species were represented by cavities of approximately 1m³ produced from livestock stepping. Most of these sites were near or under *Cortaderia selloana*, a plant species used as refuge by the red bellied toad.

40. DETERMINATION OF REACTIVE OXYGEN SPECIES AND ITS RELATIONSHIP WITH LIPID SIGNALS IN SALINE AND/OR OSMOTIC STRESS IN PLANTS OF BARLEY (*Hordeum vulgare*)

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It is called stress to the change of any environmental factor acting on the plant affecting the biochemical and physiological response. This change may occasionally result in damage or injury. Plants, unlike animals, lack mobility exposing themselves to environmental stresses, causing limitation on their growth and productivity. According to the changes observed in our laboratory against phospholipids signals involved in the response to stress, and trying to establish a link between metabolism and reactive oxygen species (ROS), an objective was established to determine the formation of the same in seedlings germinated under control and stressed conditions. The seeds were germinated in darkness under control conditions and salt (25-100 mM NaCl) and osmotic (50-200 mM mannitol) stress for 4 days. In spectrophotometry determination of H₂O₂ and O²⁻ stressed seedlings, an increase was detected in the level of these ions, which was confirmed histologically. In roots and coleoptiles mannitol treated, H₂O₂ increased 108 and 150% respectively. Salt stress produced an increase of 107 and 125% in roots and coleoptiles, respectively. Regarding the determination of O²⁻ treated roots both NaCl or mannitol, the increase was of 31 and 51%, whereas in coleoptiles was of 91 and 83% compared to control. Data suggest that both types of stresses influence ROS production, and that the highest production level is on coleoptiles, causing damage to membranes, change in phospholipids and other cellular components which could explain the reduction in the growth of seedling when they germinate under stress.

41.

RELEASE CALLS OF *Hypsibo aspulchellus* AND *H. cordobae*
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The release call in anurans is an acoustic-mechanical response to a male-male mating attempt. Some studies show that the temporal structure of these vocalizations could be phylogenetically informative. In this study, we analyzed a total of 110 release calls from seven individuals (*Hypsibo aspulchellus*: n=2; *H. cordobae*: n=5). Release calls were induced in the laboratory by a slight pressure in the axillary region, simulating an amplexus. The acoustic signals were digitalized and analyzed by means of oscillograms, sonograms and power spectra using the software Adobe® Audition™ 1.0. Each call series was characterized by three parameters: (1) call duration [ms]; (2) intercall duration [ms]; and (3) dominant frequency [Hz]. We calculated means, standard deviations, maximum and minimum for each individual variable. Species comparisons were performed using ANOVA. The release call in both species consists of a single note. *H. pulchellus* call has an average duration of 11.6 ms, being higher than that of *H. cordobae*. The mean intercall duration (274.05 ms) and the mean dominant frequency were higher in *H. cordobae* (2388.95 Hz) than in *H. pulchellus* (1604.82 Hz). Call duration and dominant frequency showed significant differences between species (p < 0.05). This work represents the first description and characterization of the temporal and spectral release call of these two species.

42.

THE ALLUVIAL AQUIFER OF RIO CUARTO (CORDOBA, ARGENTINA) AS AN ECOSYSTEM

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Groundwater ecosystems are characterized by the absence of primary producers. Microorganisms are the basis of food webs and they are consumed by invertebrates. The aim was to analyze the food webs in groundwater and the relationships with nutrient inputs in an unconfined aquifer of alluvial origin. Ten wells were sampled (unsaturated zone between 2 and 14 m) in areas with different land uses in the alluvial aquifer of Río Cuarto during 2010 (wet and dry seasons). Groundwater chemical and bacteriological analyzes were carried out. For invertebrate assessment, three samples of 50 L each one were collected and sieved with a 63 µm mesh. Highest invertebrate abundances, with dominance of crustaceans and mites, occurred in sites where -although groundwater was characterized by low ionic contents (fresh water)- some anomalies (e.g. nitrates) and high bacteriological values were detected. These wells are characterized by their proximity to pollution sources (cattle, on-site sanitation and compost) that generate nutrients and bacteria input to groundwater. We conclude that the nutrient input in these heterotrophic environments promotes the bacterial growth and therefore the increase of invertebrate abundance.

43.

MICRONUCLEI AND NUCLEAR ANORMALITIES IN ANURAN LARVAE FROM AGROECOSYSTEMS

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The pampean region has presented an important agricultural and livestock expansion, reducing the habitat quality and negatively impacting in anuran amphibians, which by its characteristics are bio-indicators of environmental quality. Our aim was to determine the frequency of micronuclei (MN) and nuclear abnormalities (NA) in erythrocytes of anuran that inhabit in environments with different alteration degrees in suburban area of Río Cuarto, Córdoba. The sampling was conducted at three sites: two agroecosystems (C1 and C2) and a site with a lower anthropic intervention (SM). In each site, five larvae of *Bufo arenarum* (B.a) and *Leptodactylus latrans* (L.l) between stages 30-40 were collected. Blood was taken from each larvae by cardiac puncture and a smear was prepared, which was stained with May Grunwal-Giemsa and observed microscope (1000X). The frequency of Mn and NA were calculated on 1000 erythrocytes. The results were B.a: C1: MN 1,5±1,2 and NA 2,8±3,72; C2: Mn 1,19±0,48 y AN 5,38±5,08; SM: MN 0,64±0,46 y NA 0,84±0,94; whereas for L.l: C1: MN 0,60±0,60 y AN 2,5±2,26; C2: MN 0,87±0,49 y NA 5,90±4,70; SM: MN 0,10±0,22 y NA 1,35±1,49. These results allow us to infer a relation between the alteration degrees of the environment with genetic abnormalities present in anurans, and presume the existence of genotoxic compounds in agricultural and livestock sites.

44.

PARASITISM OF *Hannemania* sp (ACARI: LEEUWENHOEKIIDAE) IN *Pleurodema kriegi* AND *Pleurodema cordobae* FROM SIERRA GRANDE, CÓRDOBA, ARGENTINA

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The mites of the genus *Hannemania* Oudemans are intradermal parasites in numerous species of amphibian around the world. In the present study we compare the prevalence, mean abundance and mean intensity of infestation on the endemic species *Pleurodema kriegi* and *Pleurodema cordobae* from Sierra Grande, Córdoba. Populations of *Pleurodema* were sampled in permanent and semi-permanent ponds and streams. A total of 188 adult individuals were examined under a stereoscopic microscope to quantify the number of capsules per specimen. Then, the subcutaneous parasites were excised with needles for its taxonomic determination. Snout-vent length (SVL) and sex was measured to each individual. The parasites were identified as larval stages of *Hannemania* sp. The prevalence in *P. kriegi* (90.99%) was notably higher than in *P. cordobae* (41.56%). Similar results were found comparing mean intensity (40.71/14.38 per individual, respectively) and mean abundance (37.05/5.97 per infested host, respectively) between species. A relation between body length and mean parasite abundance was only found in *P. kriegi* (r=0.27; p=0.0004). The present study represents the first comparative analysis of the parasitic ecology of *Hannemania* sp. on cryptic and endemic anuran species from Sierra Grande, Córdoba.

45. GERMINATION WITH *Justicia squarrosa* GRISEB AT DIFFERENT LIGHT, TEMPERATURE AND WATER STRESS CONDITIONS

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Justicia squarrosa is a forage species which is present at natural communities of Argentinian Chaco Árido. It is part of an important component in the livestock's diet during drought periods. The aim of this study was to characterize factors affecting germination and seeds bank with the objective of deducing the strategies to establish its domestication and crop. Germination was evaluated at different temperature patterns (15/5°C, 25/15°C, 30/15°C and 35/20°C), light quality (light-12/12 hs- and permanent dark) and hydrological potential (0,0; -0,75; -1,5; -1,0 y -1,2MPa). The seeds bank was determined. Germination was conditioned by both temperature and wa stress. The highest germination percentage was found at 25/15°C both in light and darkness. Seed germination decreased significantly below -0.2MPa. The seeds did not respond to light treatments. After 48 months a high percent of germination of the seeds of the species was observed. Despite this fact, soil seeds bank were not formed. The obtained results allowed establishing strategies to domesticate and propagate the species.

46. CHARACTERIZATION OF THE VEGETATIVE GROWTH OF TWO PEACH TREE CULTIVARS (*Prunus persicae* B.) AT DIFFERENT LOCATIONS OF THE TREE CROWN

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The different crown sections of the fruit trees in a plantation can be exposed to several environmental conditions. This causes a differential vegetative growth, which implies adapting the monitoring of soil to be done. The aim of this study was to analyse the vegetative growth of two peach tree cultivars - Elegant Lady (EL) and Summer Pearl (SP) - through a shoot growth monitoring. The evaluation was conducted in the UNRC, 2012/13 season in a seven years plantation. The latter was arranged in a rectangle of 5x4m, N-S orientation and vase-shape pruning. Three randomly chosen plants from each vegetative cultivar (VC) were used and marks were drawn over the shoots at two different heights: above (A) the intermediate position of the crown and below (B) it, two orientations: North (N) and South (S) and two exposures: East (E) and West (W). From 09/04/2012 to 01/22/2012 the length of the shoots was weekly recorded in centimetres and compared with ANAVA ($p \leq 0.05$). The orientations and exposures did not show significant variations. Major differences were found in both length and height of the shoots of the two cultivars. The final shoot length of the vegetative cultivars SP and EL was of 45.9 and 37cm. respectively. Shoots located at the top of the crown showed a growth 35% superior to the ones located at the lowest part of the crown (A 47,7 cm y B 35,1 cm). This difference in growth could be due to a better dominance of the buds of superior brands, favoured by a better lighting.

47. MONITORING OF PRIMARY PLAGUES AND DAMAGE TO FRUITS IN A PEACH TREE IN RIO CUARTO, CORDOBA

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The aim of this study was to analyse the population dynamics of the Mediterranean fruit fly (*Ceratitis capitata*) (MFF) and Oriental fruit moth (*Cydia molesta*) (OFM) in two peach tree cultivars in Rio Cuarto - 2012/13 season - and the effect on the damage to fruits. The monitoring was conducted with two yeast pellets traps for MFF and two sex pheromone traps of OFM, being the captures registered weekly. The first MFF capture was conducted on 12/18/12 and it lasted until 3/12/13, having its highest peak on January 22nd with 40 adults. OFM captures were performed from early September 2012 to late March 2013. Population peaks (and number of individuals) were: 9/29 (1,5), 11/21 (5,5), 12/11 (10), 01/09(11,5) and 02/07(15). On 01/02/13 1736 Elegant Lady cultivar fruits were harvested, weighting approximately 81 grams, 8,8 °Brix and 23 lb under pressure. The damage registered was of 2,94% per MFF and 0,11% per OFM. This harvest was conducted after the third OFM peak in which the plague remains in shoots, it is the onset of MFF capture and the fruits remain with better strength. On 01/15/13 498 Summer Pearl cultivar fruits were harvested, weighting approximately 120 grams, 10,1°Brix and 3,9 lb. the damage recorded was of 32,93% per MFF and 1,4% per OFM. This type of harvest occurred only after the fourth OFM peak and almost at the highest peak of MFF capture. This cultivar harvested at advanced maturity and withstood the highest pressure in the plagues, inflicting substantial levels of damage.

48. EFFECT OF COPPER AND SULPHUR BASED FUNGICIDES ON SOIL ORGANISMS IN THE PEACH TREE

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The presence of disease affects fruit production, for this reason, fungicides with strong effect are used on soil organisms. Studies conducted on the impact of agrochemical on the environment greatly contribute to a sustainable agriculture. The objective of this research was to evaluate the impact in the peach tree of bordeles breeding ground (BBG) and copper oxychloride (CO) on soil organisms. This study was conducted in UNRC, 2012/13 season, in two seven year old peach cultivars - Elegant Lady and Summer Pearl. Fungicide-treated plots were compared to control plots: CO (400 g/hl) and BBG (1%) applied in autumn (leaves fall) and late winter (swollen bud) soaking the whole plant. The impact of fungicides on the floor was evaluated through the vegetable material deterioration, using two mesh bags sizes: 0.2 and 3 mm, filled with 50g of alfalfa hay. The bags, buried at 10cm, were placed on 05/09/2012. On bag from each mesh was located in surrounding soil of each plant. BCA was the design used, with 12 treatments and three repetitions. The dry weight (DW) of the undergraded material was obtained in order to measure the edaphic biological activity by weight difference. It was also analysed using ANAVA ($p < 0.05$). The breaking down of the dry material was major in the big mesh bags (1.83 g DW) than in the small mesh bags (3.50 g DW). There were no significant differences between, the cultivars, the BBG treatments (2.75 g DW), CO (2.25 g DW) and the control (3 g DW). This finding indicates that the fungicides used did not present a negative impact on the soil organisms.

49. NATIVE ARBOREAL SPECIES IN THE CHAQUEÑO FOREST: REQUIREMENTS FOR GERMINATION

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Forestation with native species demands the necessity of knowing the requirements for germination and preservation of their seeds. The aim of this study was to evaluate the germination of “Molle de beber” *Lithraea molleoides* (Vell.) Engl. (sp1), “Manzano del campo” *Ruprechtia apétala* Wedd. (sp2) y “Orco quebracho” *Schinopsis marginata* Engl. (sp3). The seeds were collected from Valle de Punilla (30°50'3.18"S 64°30'4.56"O), the date varied with the specie, sp1: 02/11 and 02/12; sp2: 06/10 y 06/11; sp3: 06/11 y 0/12. Both the purity of the plot and the humidity in the seeds were determined, weight of 1000 and number per kilo. The germination was evaluated on paper at 20 and 25°C (50 seeds x 5 repetitions). Previously, in sp1 and sp3 a mechanical scarification (ME) and soaking in warm water (SW) were conducted. In sp1 the SW improved the germination and the increase in temperature both reduced the hard seeds and increased the number of dead seeds. Abnormal seedlings were also observed in different year. In sp2 the germination was affected due to the environmental conditions during the growth of the seed, causing dormancy (fresh seeds) or deterioration. In sp3, neither ME nor SW improved the germination and the seeds stayed hard – not soaking- until the end of the experience (1 month).

50. Cryptosporidium parvum IN DAIRY CALVES IN CORDOBA

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Cryptosporidiosis is a common infection in cattle worldwide, economic losses are related to diarrhea and the extra costs that diarrheic calves demand. *C. parvum* is known to infect humans and is recognized as the major zoonotic species. The objective of this study was the molecular identification of *C. parvum* in positive calves. A cross sectional study was undertaken between March 2011 and June 2012 in dairies located in San Martín department, Córdoba. Calf rearing units that were positive in a previous study were resampled. Feces from Holstein calves less than 15 days of age were recollected from the rectum in plastic bags and refrigerated. Samples were processed with formol-ether technique, and *Cryptosporidium* oocysts was demonstrated by microscopic examination of faecal smears with the modified Ziehl-Neelsen technique. Oocysts were purified, DNA was extracted and PCR was performed to detect the gene encoding 18S rRNA. The study population comprised a total of 225 calves from 27 dairies. Overall prevalence for *Cryptosporidium* spp oocysts was 27.11% (95% C.I.: 21.30; 32.92). Amplification of a 844 bp fragment corresponding to *C. parvum* was detected in 23 of 52 samples analyzed and confirmed via a second PCR amplifying a fragment of the cowP gene. The identification of *C. parvum* in calves indicates that neonatal calves are an important source of zoonotic transmission. Calves may, therefore, represent a risk to farmers and veterinarians by means of direct contact, and to the general human population in the region through the contamination of food and water with oocysts.

51. INFECTIVITY OF *Steinernema rarum* (OLI) (NEMATODA: STEINERNEMATIDAE) IN LARVAE OF *Diatraea saccharalis* (INSECTA: LEPIDOPTERA)

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Diatraea saccharalis is the principal pest of corn in Argentina. Larvae cause physiological and mechanical damages. Entomopathogenic nematodes are lethal for their hosts and they are employed as biological control agents. The infectivity- capability to penetrate and to reproduce - of *S. rarum* (OLI) in larvae of *D. saccharalis* was evaluated. The experiences were carried out in multi-well dishes. Two dose, 50 and 500 infective juveniles (IJs) per insect were used. Controls were identical to the treatments but no IJs were added. Twenty six individuals per dose were evaluated. Mortality was recorded each 24 h during 10 days, and dead larvae were put in White traps to obtain new IJs. Mortality was determined considering the insects which observed production of new IJs at the end of parasitic cycle. The percentages of host mortality were: 80.7% and 92.3%, for 50 and 500 IJs/insect, respectively. Significant differences between dose were not detected (ANOVA, p>0.05). These results confirm that *S. rarum* (OLI) is efficient to parasite larvae of *D. saccharalis* and this insect is a favourable host for the nematode, because it offers suitable conditions for its development and reproduction, and permit the nematode to complete its parasitic cycle. It is necessary to evaluate with field assays the infectivity of *S. rarum* (OLI) against *D. saccharalis*, to estimate its potential as biological pesticide.

52. EFFECTS OF HERBICIDES ON *Cynodon dactylon* TURFGRASS OVERSEEDED WITH *LOLIUM PERENNE*

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Cynodon dactylon turfgrasses (bermuda) of south-central province of Córdoba are overseeding with *Lolium perenne* (perennial ryegrass) to maintain a green cover throughout the year and reduce bermuda wear while it is dormant. New varieties of perennial ryegrass are heat tolerant and persist during the spring, causing poor spring transition, due to bermuda regrowth problems. The transition period can be shortened with the use of herbicides to achieve a gradual decline of the overseeded. Average soil temperature (TMS) at the time of application may influence the effectiveness of herbicides and therefore the duration of the transition spring. The aim was to evaluate the effect of Foramsulfuron, Trifloxysulfuron, Propyzamide and Metsulfuron at 4 application dates during the spring. Total quality and degree of perennial ryegrass damage were assessed. The results indicate that Propyzamide caused less ryegrass damage and good total quality at TMS close to 18°C, while at higher values ryegrass damage was greater, affecting the total quality. The other three herbicides showed high ryegrass damage, TMS independent, and total quality was under acceptable values. A good spring transition would be achieved Propyzamide early applications.

53. LAND USE DETERMINATION OF RÍO TERCERO RESERVOIR WATERSHED (CÓRDOBA, ARGENTINA) BY REMOTE SENSING

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Lakes and reservoir are exposed to eutrophication as a result of anthropogenic impacts. As each reservoir is part of its watershed, activities perform in the basin will influence on it. Therefore it is difficult to manage a reservoir as an independent system of its watershed and environment. The objective was to generate a land use map of the watershed of Río Tercero reservoir, which is used for multiple purposes. Samples in the basin were taken to determined the different categories or classes. A Landsat 5 TM image of the study area (Path: 229, Row: 82) was used as satellite information. Watershed and sub-watershed were delimited by remote sensing techniques. A supervised classification was done. As final product we obtained a land use map of the watershed, from which we determined the absolute and relative surfaces of each category. In relation to the antecedents, we observed a reduction of forest, which were replaced by the advance of the agricultural frontier. Santa Rosa and La Cruz sub-basin presented high anthropic activities, dominated by larger urban settlements and the largest agriculture and animal husbandry areas. These results demonstrate the potential use of remote sensing in the integrated management of watersheds and reservoirs.

54. DORMANCY IN SUNFLOWER (*Helianthus annuus* L.) ACHENES

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The pericarp regulates seed dormancy due to physical and/or chemical factors. Our aim was to examine the pericarp contribution on achenes germination of two sunflower inbred lines (**B123: with dormancy; B91: without dormancy**) at harvest (day 0) and after storage at $-20^{\circ}\text{C}\pm 1$ during 33 days. Hormonal quantification was performed by LC-ESI/MS-MS. **At day 0**, the germination percentage in achenes of both lines was similar with and without pericarp. Storage at low temperature maintained **B123** achenes dormant. At day 0, 12-oxo-phytodienoic acid (OPDA) and salicylic acid (SA) were the major compounds in pericarps of **B123** achenes; imbibition process caused a SA, OPDA and jasmonic acid (JA) decrease. In **B91** line, SA and JA were stable during the time-course of imbibition. At 12 h, abscisic acid (ABA) peaked in both lines. **At 33 days after harvest**, SA was the most abundant compound in **B123**. At low temperature, OPDA and JA decreased; ABA increased in **B91** and SA in **B123**. Upon imbibition, SA decreased in both lines; on the contrary, ABA and OPDA increased. In **B123**, the similar germination percentage between achenes with and without pericarp suggests that dormancy wouldn't be regulated by the pericarp. In our conditions, the storage at low temperature is a major factor to maintain the **B123** achenes dormant. The similar kinetics of pericarp SA accumulation between 0 and 33 days after harvest suggest that this hormone may not act as mediator in the dormancy maintenance of **B123**.

55. PREVALENCE OF *Listeria* spp IN NON-PASTEURISED WHOLE COW MILK

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Listeria spp. strains have been isolated from a variety of living organisms and complex ecological niches such as crops, vegetation, forages, foods and soil, among others. Non-pasteurised dairy products have been identified as one of the main vehicles for listeriosis. The aim of this study was to evaluate the prevalence of *Listeria* spp. in non-pasteurised whole milk. A total of 362 milk samples from 128 different dairy cows were analyzed. A selective enrichment of *Listeria* spp. was done in triptic soy broth added with ceftazidime and trypaflavine incubating cultures for 48 h at 37°C . A second enrichment procedure was done keeping the enrichment broth at 4°C for 48 h. Finally, each culture broth was streaked on Oxford agar and incubated for 24-48 h at 37°C . Colonies showing typical morphology of *Listeria* spp. were picked and tested for biochemical characteristics. *Listeria* species were isolated from two milk samples from two different cows (1.56%) and they were confirmed as *L. welshimeri* and *L. innocua* according to biochemical characterization. These results partially agree with Jamali *et al.* (2013). This study showed a low prevalence of *Listeria* spp. in milk. However the presence of these species indicates a low hygienic level in food, since *L. welshimeri* is currently considered potentially pathogen for humans.

56. COMPARISON OF *Listeria monocytogenes* GROWTH IN WHOLE AND SKIM MILK

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Listeria monocytogenes is a foodborne pathogenic microorganism able to growth at diverse environmental conditions. Milk constitutes a rich culture media for listerial growth because of its water content, near neutral pH and the presence of several nutrients. The aim of this study was to compare *L. monocytogenes* growth in whole and skim milk. A *L. monocytogenes* inoculum from a 18 h culture was added into 200 ml of whole milk and 200 ml of skim milk (final concentration 3×10^4 CFU/ml) and incubated for 24 h at 37°C . Then, listerial counts were determined in Palcam agar supplemented with ceftazidime and trypaflavine. Results were expressed in CFU/ml. After 24 h of incubation, listerial counts in whole milk and skim milk were 1.5×10^8 CFU/ml and 4.7×10^7 CFU/ml, respectively. The difference was found to be statistically significant ($P \leq 0.05$). While skim milk is a culture media that allows the microorganism growth, *L. monocytogenes* recovery was higher in whole milk. These results may be related to the protective effect exerted by fat globules on bacterial cells. These results agree with Rodriguez Gonzalez *et al.* (2010).

57. HISTOMORPHOMETRIC CHANGES IN GUT ASSOCIATED LYMPHATIC TISSUE (GALT) IN *Escherichia coli* K88 IMMUNIZED HEN

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The gut associated lymphatic tissue (Galt) is well development into avian being the first line defensive of oral or digestive pathogens. The purpose of this work was study the Galt histomorphometry in hens, immunized with *Escherichia coli* K88. Twenty two Lohmann hens were immunized with bacterins from the most prevalent strain which produces diarrhea in piglets farms in south of the province of Cordoba (N=11, K88 group) or with the adjuvant (aluminium hidroxide) (n=11, Control group). At 44 weeks old, the avian were sacrificed and Galt samples were removed and processed for conventional technique and stained with hematoxilinosin. Into the villus, height, area and perimeter were measured by Axio Vission Release program. We registered hight height in villus gut ($p \leq 0.05$), anastomosed villus in apical border and decreased number of globelet cells and epithelial cells increased ($p \leq 0.05$) in hens of K88 group. Also, we noticed a mucosae well developed, with hight Lieberkün cript number ($p \leq 0.05$). Into cecal tonsilae of K88 hen's group, we register follicles more developed. ($p \leq 0.05$) These changes, in conclusion, being presupposing a Galt activated, specially into cecal tonsilae.

58. HEMOLYTIC ACTIVITY OF *Listeria monocytogenes* ISOLATED FROM BREWER'S GRAINS

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Listeria monocytogenes is a pathogenic bacteria of human and animal species. The most important virulence factor of these microorganisms is listeriolysin O (LLO). This toxin is responsible for the hemolytic activity of the bacteria. The aim of this study was to detect and quantify hemolytic activity of *L. monocytogenes* LM1, a strain isolated from brewer's grains an alternative feedstuff used in swine production. Well diffusion assay on horse blood agar plate was used to detect LLO and microplate method with human erythrocytes was used to quantify LLO. *L. monocytogenes* LM1 showed a hemolytic activity of 1.32 (hemolytic diameter/growth diameter) in horse blood agar. The hemolysin quantification showed 2 complete hemolysis units (the reciprocal of the highest dilution at which 100% hemolysis was observed) and 8 minimum hemolysis units (the reciprocal of the highest dilution at which hemolysis was detected). These results differ from those found by Gallego *et al.* (2007), who found *Listeria* strains with a higher hemolytic activity. In conclusion, the methods used showed the active virulence of *L. monocytogenes* LM1 isolated from brewer's grains, representing a potential risk of infection for pigs that consume these feeds.

59. BIOCONTROL OF *Listeria monocytogenes* BY LACTIC ACID BACTERIA

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Listeria monocytogenes is a foodborne pathogen and is the causative agent of listeriosis in humans and in several animal species. Lactic acid bacteria (LAB) are safe microorganisms that produce antimicrobial metabolites. The aim of this study was to study the antilisterial activity of LAB isolated from brewer's grains, an alternative swine feed. The antimicrobial activity of LAB was assayed by well diffusion test. Cell free supernatant (CFS), containing antimicrobial metabolites, was obtained by centrifugation at 8000 rpm for 20 min at 4°C. The CFS of all strains assayed (n=5) (*L. brevis* B20, *L. plantarum* B29, *L. plantarum* B54, *L. plantarum* B57, *L. brevis* B131) inhibited *L. monocytogenes* LM1, isolated from brewer's grains. The mean of inhibition halos ranged between 12.5 y 22.5 mm. The neutralized CFS of B20, B54 and B57 retained their inhibitory effect; therefore these strains produce acids and other metabolites. These results differ from those found by Botina *et al.* (2008) and Mazaini *et al.* (2009), who found that CFS of LAB did not show antimicrobial activity on *L. monocytogenes*. It is remarkable the isolation of LAB in brewer's grains with antilisterial activity. Futher studies with larger number of listeria strains could support the possible use of these LAB as biocontrol agents.

60. ENVIRONMENTAL CONDITIONS OF THE MOTHER PLANT AND THE PEANUT SEEDS QUALITY

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The crop establishment may be affected by different factors such as the genotype characteristics and the seeds physiological quality determined by environmental conditions during the mother plant growth-development. The aim of this study was to evaluate the physiological quality of peanut genotypes grown in different environments. Cultivars were Utre-UNRC and Granoleico and the environments generated by three sowing dates: 08/10/10, 10/11/10 and 12/12/10 in Río Cuarto (Córdoba, Argentina). The physiological quality of seed was evaluated in different seed sizes. In the laboratory, we quantified the germination and vigor using cold test, accelerated aging, conductivity test, seedling evaluation, and at field the seedling emergence. The cycle duration and growth habit of the cultivar used as mother plant and the environmental conditions during seed development, affected the seed physiological quality. Thus, the cultivar with the longest cycle and more indeterminate growth habit (Granoleico) required the whole growing season (early sowing date) to produce seed with good physiological quality, while the less indeterminate and shorter cycle cultivar (Utre-UNRC) produced a similar result at different times (sowing dates) of the crop season. The physiological quality of seeds was also affected by seed size.

61.

USE OF BIOSTIMULANTS IN CROPS. I SOYBEAN

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The biostimulants are natural or synthetic compounds that can be applied to plants (leaves, fruits, seeds) causing changes in physiological and structural processes in order to improve the physiological quality and the crop establishment and grain yield. The aim of this study was evaluate the effect of biostimulant Stimulate®, which formulation includes 0.005% indol butyric acid (auxin), 0.005% gibberellic acid and 0.009% kinetin (cytokinin), applied to the seed and leaf, on the soybean crop establishment and yield (Maturity Group MG V) in Río Cuarto. Treatments were 5: Stimulate® applications on seeds (300 ml/100 kg) and foliage (250 ml/ha) in R1 and R3 stages, their combinations, and a control during the 2012/13 growing season. The seed coating significantly increased main root length, secondary roots and leaves unfolded number at 15 and 32 days after sowing. At harvest the crop showed higher biomass per plant and increase the fruits and seeds number and weight (per plat and area), and grain yield when biostimulant was applied on seeds, without effect of foliage application in reproductive stages or interaction between the types of applications. The changes found in grain yield are mainly due to the number of seeds per area, without significant effects on the individual seed weight and harvest index.

62.

BROMEGRASS POTENTIAL PRODUCTION IN THE RÍO CUARTO REGION

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In order to choose a forage species it is important to know its growth dynamics and production levels. Due to the complexity of the interactions between crops and environmental factors, documented information on the behavior of certain species is not always available. The aim of this study was to characterize the growth and production of bromegrass (*Bromus catharticus*) in the region of Río Cuarto under potential conditions. The study was carried out in the experimental field of the UNRC during 2011 under conditions of irrigation and fertilization. In order to achieve physiological maturity, 2333°Cd (Tb = 0°C) were necessary. Production was 10121 kg ha⁻¹ of total dry matter during the grain filling and 9573 kg ha⁻¹ at physiological maturity. To achieve this 376mm was evapotranspirated and 647 MJ m⁻² of PAR was intercepted. Of total evapotranspiration, 215 mm (57.3%) corresponded to crop transpiration, while the remaining 161 mm (42.7%) to soil evaporation. Efficiencies in the use of water (WUE) and radiation (RUE) at the cycle end were 44.7 kg ha⁻¹ mm⁻¹ transpired and 1.47 g m⁻² MJ⁻¹ intercepted. On the other hand, upon obtaining a shoot/root ratio of 0.27, a large contribution of organic waste was made to the soil system. These results extend our knowledge about this species and make it possible to evaluate with greater certainty its inclusion and use in the production systems of the region.

63.

PHOTOERRADICATION OF MICROORGANISMS INDUCED BY GRAPHENE OXIDE DOPED WITH PORPHYRIN

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Nanomaterials as fullerenes, carbon nanotubes and graphene oxide (GO) present interesting biological and biomedical applications. Photodynamic inactivation (PDI) has been proposed as an alternative therapy for the eradication of pathogenic microorganisms. In this work was studied the spectroscopic and photodynamic properties of GO doped with 5-(4-carboxyphenyl)-10,15,20-tris(4-methylphenyl) porphyrin (H₂P-GO) for the photoinactivation of *Candida albicans* and *Staphylococcus aureus*. Absorption UV-visible studies of H₂P-GO show *Soret* (420 nm) and *Q* (515-650 nm) bands of the porphyrin. The excitation of H₂P-GO produces two bands of fluorescence at 655 and 720 nm and form singlet molecular oxygen as main photocytotoxic agent. The photodynamic effect in *C. albicans* induced by H₂P-OG produces a decrease in the cellular viability of 82.3 y 98.0% after 30 and 60 min irradiation, respectively. The photoinactivation of *C. albicans* was independent of the H₂P-GO concentration. Also, cultures of *S. aureus* in presence of H₂P-GO showed an inactivation of 89.6 and 99.9% when they were irradiated with visible light for 30 and 60 min, respectively. These studies indicate that H₂P-OG presents potential applications as photosensitizer agent for the inactivation of microorganisms using PDI.

64.

PHOTODYNAMIC ACTIVITY OF ZINC (II) 2,9,16,23-TETRAKIS [4-(N METHYLPYRIDYLOXY)] PHTHALOCYANINE IN *Candida albicans*

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The basic principle of PDI is the administration of a photosensitizer, which accumulated in the microbes. Subsequent irradiation with visible light results in the formation of reactive oxygen species (ROS) that lead to cell death. In this study we evaluated the photodynamic properties, the cellular uptake and the photodynamic action of Zn(II)2,9,16,23-tetrakis[4-(N-methylpyridyloxy)]phthalocyanine (ZnPPc⁴⁺) in *Candida albicans*. ZnPPc⁴⁺ intensely absorbs at 678 nm and emits fluorescence at 687 nm. Also, it produces singlet oxygen with a quantum yield of 0.59. The amount of cell bound phthalocyanine depends on the concentration (1-10 μM) and cell density (10⁶-10⁸ cell/ml), decreasing with the washing steps and under pretreatment with azide and 2,4-dinitrophenol. The bound phthalocyanine at 37°C and 4°C was similar to short incubation times (<5 min), however at long times, the binding agent was greater at 37°C. Cell survival after irradiation was dependent on the concentration of ZnPPc⁴⁺ (1-10 μM) and the irradiation time (15 and 30 min), resulting in a decrease of 5 log (> 99.999%) with 10 μM and 30 min irradiation. Therefore, the results indicate that ZnPPc⁴⁺ presents potential applications as a phototherapeutic agent for fungal inactivation.

65. USE OF BIOSTIMULANTS IN CROPS. II PEANUT

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Numerous factors affect the seed physiological quality and peanut crop establishment. The biostimulants can be used to intervene in physiological and morphological crop processes as the seed germination and initial vegetative growth with potential effect on the grain yield. These products favors hormone balance in the plant and produce a suitable ratio of the root system. The aim was to evaluate the effect of biostimulant Stimulate®, which formulation includes indol butyric acid (auxin) gibberellic acid and kinetin (cytokinin), applied to peanut seed, on crop establishment and pod yield. Treatments were Stimulate® application at 300 cc/100 kg seed and control. Assessments were carried out at laboratory and field -including different sites (11) in Cordoba province, and years (5), between 2007/2012. In laboratory, the biostimulant increased seed germination and vigor; while at the field significantly increased the final number of plants established, the main root length, and secondary roots and leaves unfolded number per plant. This improved crop establishment had a positive impact on the pod and grain yield. The application of biostimulant in the seed significantly increased pod yield regardless of site and year, 402 kg/ha on average ($p < 0.0001$). These results validate the technique use in peanut crop region of Cordoba, Argentina.

66. PRENATAL STRESS EFFECTS ON LIPID AND GLUCOSE METABOLISM IN MALE RATS

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There is evidence that prenatal stress (PS) generates low birth weight, which is a risk factor for developing diseases encompassed within the Metabolic Syndrome in adulthood. The aim of this study was to determine the effect of prenatal stress on lipid metabolism parameters and their relation with the activity of the Hypothalamic-Pituitary-Adrenal axis in adult male rats. 90 days old Wistar rats were used, divided into 2 groups: prenatally stressed (PS) by chronic immobilization in wooden boards during the last two weeks of pregnancy and controls (CP) from unstressed mothers. Blood plasma was collected to determine: corticosterone (COR), total cholesterol, HDL cholesterol and LDL cholesterol and triacylglycerols. Prenatal stress levels increased COR and also increased plasma levels of total cholesterol, HDL-col, LDL-col and triglycerides, compared with their controls. In conclusion, the PS alters the studied parameters of the metabolic syndrome, indicating that prenatally stressed animals are more prone to suffer diseases within the Metabolic Syndrome, in adulthood.

67. EFFECT OF POSTNATAL ACUTE STRESS BY FORCED SWIM IN RATS PRENATALLY STRESSED ON THE LYMPHOCYTE FUNCTIONALITY

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Prenatal stress (PS) produces in young adults, altered distribution of leukocytes and decreased functional response of T lymphocytes at baseline and versus postnatal stress. There are precedents that during exercise changes occur in the immune response in adults. The objective was to investigate the effect of acute physical stress, by forced swimming (FS) in adult male rats with PS, on the immune response and its relation to the activity of the Hypothalamic-Pituitary-Adrenal axis. 90 days old Wistar rats were used, stressed in uterus by chronic immobilization (IMO) and unstressed controls (CP). The FS postnatal acute stress was performed in water at $35 \pm 2^\circ\text{C}$. Corticosterone (COR), neutrophils (N), lymphocytes (L) and lymphocytes T proliferation were determined. The FS on adult male PS rats produces: increased levels of COR, % of N and N/L ratio; decrease in % of L and lymphocytes T proliferation. The results indicate that FS stress alters the number and redistribution of leukocytes, as well as the functionality of the lymphocytes T in the PS animals.

68. ANTIOXIDANT SYSTEM INDUCTION IN RESPONSE TO DROUGHT STRESS IN PEANUT

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Drought stress is an abiotic factor responsible for growth limitation. Under this condition, peanut plants accumulated reactive oxygen species (superoxide anion (O_2^-) and hydrogen peroxide (H_2O_2)), abscisic acid and revealed oxidative damage in macromolecules. The aims of this work were to evaluate the electrophoretic protein profile and antioxidant system responses in peanut leaves exposed to drought stress and rehydration. Assays were conducted with peanut seeds (cv Granoleico) inoculated with *Bradyrhizobium* sp. SEMIA6144 growing in volcanic sand during 30 days. Plants were divided into three groups: control: normal watering; drought stress: withhold irrigation; and rehydration: re-watering of stressed plants. Results revealed that electrophoretic profile changed, evidenced by two stains with different mobility in drought stressed and rehydrated leaves. Regarding antioxidant enzyme activities, superoxide dismutase (SOD) increased, but catalase (CAT) and glutathione peroxidase (GPX) involved in H_2O_2 removal remained unaltered. Besides, ascorbate-glutathione cycle enzymes, ascorbate peroxidase (APX) and glutathione reductase (GR) were induced and those responses were reversed upon rehydration. Thus, antioxidant system induction in response to drought stress condition was not sufficient to prevent oxidative damage but contributed to metabolism restoration upon a short period of rehydration.

69. MORPHOLOGICAL DAMAGES DURING THE PHOTODYNAMIC INACTIVATION OF YEAST SENSITIZED BY AMINOPORPHYRINS

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Candida albicans is the most frequency cause in hospital infections. The treatments are complicated due at their eukaryotic nature and the long use of anti-fungals has produced the emergence of resistant strains. The photodynamic inactivation (PDI) of microorganisms combines a photosensitizer, visible light and oxygen, to produce reactive oxygen species (ROS) that kill the fungal cells. In this work, the PDI of *C. albicans* was evaluated using 5,10,15,20-tetrakis [4-(3-*N,N*-dimethylaminopropoxy)phenyl] porphyrin (TAPP) and its tetracationic derivative (TAPP⁴⁺). The cells (1x10⁶ cells/ml) treated with 5 μM porphyrin and 30 min irradiation, show an inactivation of ~5 log (>99,999%). The morphologic damage was studied by scanning electron microscopy (SEM) and transmission (TEM) microscopy. The results of SEM indicated that in control cells, the cellular envelope remained smooth, but the yeast after PDI showed irregularities. Thus the treatment has an injurious effect on the cellular wall. The cells treated and examined by TEM presented external and internal alterations. TAPP can be protonated at physiological pH, proving to be as effective as TAPP⁴⁺ in the PDI of *C. albicans*.

70. VIABILITY OF SUNFLOWER NATIVE BACTERIA

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To encourage the development of plants can be used pre-selected beneficial bacteria cultures ("native strains"). In sunflower, identify bacterial strains *Achromobacter xylosoxidans* (strain SF2) and *Bacillus pumilus* (strain SF3 and SF4). With the purpose of use as sunflower seed inoculant we evaluate the viability of the strains in culture media Luria Bertani (LB), Glucose Yeast (GY) and Ommafuvbe (OM), and counts performed to different storage times. The viability of the strain SF2 was similar in all three media, reaching 8,10⁶ ufc.ml⁻¹ at 365 days (colony forming units). SF3 strain showed higher viability and stability in LB and reached 1,6.10⁷ ufc.ml⁻¹, while strain SF4 was more stable and viable in the medium OM, since the end of the storage period reached 1,9.10⁷ cfu.ml⁻¹. The differential growth of sunflower native strains is linked to the preference for sources of nutrients from culture media, a feature that would contribute to the stability of the product. Due to the commercial interests of sunflower cultivation in Argentina, as well as the need to expand their planting unfavorable areas, an inoculant formulation based on these strains will minimize the contribution of nitrogen fertilization and the consequent saving, improving seedling establishment under adverse conditions and being environmentally friendly.

71. FATTY ACIDS FROM *Pseudomonas putida* A ATCC 12633 INVOLVED IN ADAPTATIVE RESPONSE TO BROMIDE-TETRADECYLTRIMETHYLAMMONIUM

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P. putida degrade high concentrations of cationic surfactant tetradecyltrimethyl ammonium (50 mg l⁻¹) (TTAB). The aim of this work was to establish if the response to TTAB involves changes in the fatty acid (FA) composition of *P. putida*. For this, we examined the FA profile of *P. putida* grown with glucose and NH₄Cl exposed or not to TTAB. In absence of surfactant and unlike as described for other *Pseudomonas* species, *P. putida* showed predominance of the saturated FA (SFA: 86.86%), having: palmitic acid (16:0, 24%), stearic acid (18:0, 64%) and trace amounts of myristic acid (14:0:1.49%) and heptadecanoic acid (17:0, 2.62%). The remaining fraction was represented by unsaturated FA (UFA): palmitoleic acid (16:1Δ9, 6.29%), *cis*-oleic acid (18:1*cis*-Δ9, 1.98%) and *cis*-vaccenic acid (18:1*cis*-Δ11, 5.62%). Therefore, the SFA/UFA was 6.22. Respect to untreated cells, in *P. putida* exposed 15 min to TTAB, the levels the FA 18:0 and the FA 17:0 increased about 10% and 70%, respectively, while the amount of *cis*-18:1Δ11 and 16:1Δ9 decreased significantly (95%). Consequently, the SFA/UFA relationship increased 7 fold (reached value 44.32), indicating decreased the degree of fluidity of the cell membrane. Based in the AGS/AGI ratio, we conclude that the modifications of FA contents could be part of the rapid response to TTAB, contributing significantly to increase of the rigidity membrane necessary to counteract the effect and to maintain the integrity of the cell envelope.

72. SEMEN QUALITY IN PATIENTS WITH FERTILITY PROBLEMS IN THE CITY OF SAN LUIS

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According to the new Manual for the examination and processing of human semen (WHO 2010), is really important unify globally the reference values (RV) for all the laboratories and reproductive research institutions. The aim of this study was to evaluate semen quality in patients with fertility problems that attending to a laboratory in the city of San Luis. During the years 2010-2011-2012 semen samples from 80 patients (aged 20-40 years) were analyzed. The spermograms were classified in two categories: normozoospermic (n = 44) and altered (n = 36). The parameters evaluated were: volume, motility, concentration and morphology (according to Kruger criteria). Statistical analysis was performed using Kruskal-Wallis test (InfoStat). Differences were statistically significant at p < 0.05. The 55% of the samples analyzed were normozoospermics, their average values were: volume (4.13 ml); concentration (107.3 million / ml); progressive motility (51.4%) normal morphology (19.6%). The 94% of the abnormal samples showed teratozoospermia (RV < 14%, average value 7.6%). The 22.2% had astenozoospermia (progressive motility RV < 32%, average value 4.6%), the 25% showed oligozoospermia (RV < 15 sperm million / ml, average value 4.2 million / ml) The 19.4% had hipospermia (RV < 1.5 ml, average value 1.2 ml) and the 11.1% were azoospermics. Considering the evaluated parameters decreased semen quality observed in 45% of the patients analyzed.

73. ANDROGEN RECEPTOR IN PITUITARY PARS DISTALIS OF VISCACHA: QUANTITATIVE ANALYSIS DURING LONG AND SHORT PHOTOPERIODS

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The viscacha is a seasonal reproduction rodent. The environmental photoperiod synchronizes the annual reproductive cycle of male adults. They have variable androgen levels during the annual reproductive cycle. The androgen receptor (AR) is activated by high affinity binding of testosterone. The aim of this work was to study the expression of AR in different areas of pituitary pars distalis (PD) of adult male viscacha during long (summer, n = 4) and short (winter, n = 4) photoperiods. AR were immunostained with anti-AR (N-20) and the biotin-streptavidin system. Labeled nuclei were counted and expressed as percentage of the total number of cells/microscopic field. It was shown that AR localization in pituitary PD was most abundant at the caudal end during the reproductive period. There were seasonal variations between LP (reproductive period) and SP (gonadal regression period) in some PD zones. These results suggest that the pituitary expression of AR varies with testosterone levels, probably by regulating the activity of pituitary cells involved in the reproductive axis.

74. GFAP EXPRESSION IN PINEAL GLAND OF VIZCACHA DURING LONG AND SHORT PHOTOPERIODS

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The viscacha is a seasonal breeding rodent photoperiod dependent. The pineal gland of this rodent shows marked changes in the ultrastructural morphology of pinealocytes according to the length of the days. The aim of this work was to study the expression of glial fibrillary acidic protein (GFAP) in pineal gland of adult male viscacha during long (LP, summer, n = 4) and short (SP, winter, n = 4) photoperiods. This protein is part of intermediate filaments and is used as a marker of astrocytic and glial cells. Anti-GFAP and the biotin-streptavidin system (DAB chromogen) were used. The percentage of immunopositive area (%AI) was measured by image analysis. GFAP localization was only observed in the pineal interstitial cells mainly in cytoplasmic projections. The morphometric analysis revealed significant differences between LP (% AI = 5.21 ± 0.99) and SP (% AI = 20.33 ± 4.53), p < 0.001. These results demonstrate variations in the expression of GFAP in interstitial cells, with maximum values in winter (LP), according to changes previously reported in pinealocytes and in the melatonin synthesis. Therefore we suggest that the interstitial cells of the pineal gland of viscacha, in addition to being supporting and nutritional elements as was described in other species, these cells are actively involved in glandular function.

75. INVOLVEMENT OF TWO ACID HYDROLASES IN THE FOLLICULAR ATRESIA IN *Dipetalogaster maxima* (HEMIPTERA: REDUVIIDAE)

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In insects, unfavorable nutritional conditions induce changes in the ovarian tissue that in turn, promote follicular atresia. In this process, early degradation of vitellin (Vt), the main oocyte protein, and oocyte resorption take place. In the vectors of Chagas' disease, follicular atresia is poorly understood. The aim of this work was to study the biochemical and molecular events that take place during follicular atresia induced by nutritional deprivation in *Dipetalogaster maxima*, with special focus on two acid hydrolases, cathepsin D (CD) and acid phosphatase (AP). The study included enzymatic and western blot assays, RT-qPCR and *in vitro* assays of Vt proteolysis. The results showed that in the ovary, CD is expressed in all reproductive stages, being the active form more expressed during atresia, in correlation with its activity profile. AP was differentially activated throughout the reproductive cycle and most of such activity corresponded to a tyrosine phosphatase. *In vitro* assays demonstrated that AP was important in promoting Vt degradation, which in turn was mediated by CD. Our findings suggest that early activation of CD and AP during follicular atresia may be important in the homeostasis of ovarian tissue to either, increase female lifespan or maintain younger oocytes until improvement of nutritional conditions.

76. BIOCHEMICAL AND MOLECULAR ASPECTS OF VITELLOGENIN AND ITS RECEPTOR DURING THE REPRODUCTIVE CYCLE OF *Dipetalogaster maxima*

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In insect females, vitellogenesis is a central event of reproduction that elicits a massive synthesis of yolk protein precursors in the fat body, mainly vitellogenin (Vg). Vg is taken up by developing oocytes by receptor mediated endocytosis and stored as vitellin (Vt) in yolk bodies. Unfavorable nutritional conditions may impair Vg uptake by oocytes to favor follicle degeneration to an atretic stage. The aim of this work was to better understand the roles of Vg and its receptor, RVg, through the reproductive cycle of *Dipetalogaster maxima*, a vector of Chagas' disease. The experimental approaches included western blot, ELISA, RT-qPCR and *in vivo* Vg-FITC uptake assays. The expression of Vg in the fat body and the stores of Vt in the ovaries increased during vitellogenesis, in correlation with an active process of Vg uptake by developing oocytes. By contrast, Vg synthesis and uptake diminished at early follicular atresia until it was undetectable in late atretic stages. It was shown that the levels of RVg transcript were significantly high during vitellogenesis, although RVg was also expressed during follicular atresia. At present, our results strongly suggested that RVg may play an important regulatory role in the initiation and progression of follicular atresia.

77. CHANGES OF NUTRITIONAL RESOURCES IN OVARIAN TISSUE OF *Dipetalogaster maxima* DURING THE REPRODUCTIVE CYCLE

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In hematophagous insects, each gonadotrophic cycle is associated with the intake of a blood meal, which must be appropriated in quantity and quality of nutrients to promote vitellogenesis. Under unfavorable nutritional conditions, changes in ovarian tissue promote follicular atresia and the redistribution of stored nutrients. In this study, we have analyzed the changes of ovarian resources in *Dipetalogaster maxima* at pre-vitellogenesis, vitellogenesis and fasting-induced early and late atresia (post-vitellogenesis). The amounts of ovarian lipids, proteins and glycogen increased significantly from pre-vitellogenesis to vitellogenesis and then, diminished during atresia. Specific lipid staining of ovarian tissue sections evidenced remarkable changes in the shape, size and distribution of lipid droplets throughout the reproductive cycle. Cellular approaches demonstrated that lipid delivery to oocytes occurred at all reproductive stages, privileging the non-endocytic pathway of lipophorin, the main insect lipoprotein, during the degenerative stage. The results indicated that in females, nutritional deprivation during post-vitellogenesis is relevant in the progression of follicular atresia to either, facilitate insect lifespan or sustain the energetic demand of another gonotrophic cycle.

78. MORPHOLOGICAL DESCRIPTION OF EPIDIDYMAL CORPUS OF VISCACHA (*Lagostomus maximus maximus*) IN RELATION TO AGE

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The main epididymal function is to provide an microenvironment suitable for sperm maturation, transport, and storage. The objective of this study was to evaluate the possible morphological changes of corpus in animals at different ages and observed the reached sexual maturity. Epididymal tissue samples from viscachas at different ages (n = 10) captured in summer, were removed and processed by conventional optical microscopy. The age of the animals (immature, prepubertal, adult) was determined by the weight of them, the serum testosterone levels and testicular histology. Epididymal parameters were quantified: luminal diameter and epithelial height showed an increase in more mature animals, while the thickness of the lamina propria decreased. The number of principal, basal and clear cells varied with age of the animal, while halo cells remained constant. Only in prepubertal animals were observed apical cells. These results suggest that the epididymis expresses structural changes and variations in the distribution of the different cell populations, to facilitate a suitable microenvironment for the capacitation and sperm maturation.

79. OVARIAN DEVELOPMENT IN FEMALES OF *Triatoma sordida* UNDER FASTING CONDITIONS

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Triatoma sordida is a secondary vector of *Trypanosoma cruzi*, epidemiologically important to be present in intra and peridomicile environments. Evaluate aspects of the reproductive capacity of this species is relevant because the relationship they have with the colonization of a new habitat. In order to characterize through morphometric and histological studies different stages of ovarian development of *T. sordida* females in the absence of food and mating, the insects were killed between 2 and 10 days post-ecdysis. Morphological changes of ovarian tissue were estimated by morphometric analysis of basal follicle (FB) of each ovariole and oocytes number in pre-vitellogenesis (PV), vitellogenesis (V) and coriogenesis (C). *T. sordida* presents a quantitative pattern appropriate to identify the 3 phases of oogenesis. FB size increased from PV to C. At the 2nd day post-ecdysis 100% of the females showed PV oocytes and 50% showed V oocytes at the 4th day. The coriogenesis and ovulation process began at 6th and 8th day post-ecdysis respectively, it is suggested the end of the first gonadotrophic cycle. Morphological changes of the FB were consistent with the histological analyses. These results indicate that at 6 days post-ecdysis females of *T. sordida* without feeding have eggs ready to be oviposited.

80. CHARACTERIZATION OF NITRIC OXIDE SYNTHASE IN SPECIALIST AND PARASITIC SOLITARY BEES

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Nitric oxide (NO) is recognized as a signaling molecule in the insect nervous system. Several experiments in *Apis mellifera* suggest an important role of this molecule in the processing of olfactory information as well as in learning and memory formation. To localize the presence of NO synthase (NOS), we carried out immunocytochemistry, histochemistry and western blot (WB) experiments in pollen collecting (NP) and parasitic (P) bees. Using an antibody directed to the C-terminal sequence of the enzyme, WB experiments revealed a band at approximately 130 kDa in both NP and P species. NOS activity was evaluated in brain homogenates by following spectrophotometrically the oxidation of oxyhemoglobin to methemoglobin. This activity varies from 40,3 to 27,9 nmol/min/mg protein in NP bees whereas in P insects, it ranged from 7,8 to 16,9 nmol/min/mg protein. NADPH diaphorase histochemistry allowed detection of positive somata and fibers in the mushroom body calices and the antennal lobes. These results suggest that NO production is mainly present in olfactory brain areas. NP females showed higher levels of NOS activity than P females. In conclusion, NO might be related with the detection and processing of olfactory information during foraging.

81. FUNCTIONAL ANALYSIS OF β -ATP SYNTHASE AS A LIPOPHORIN-BINDING PROTEIN IN THE MIDGUT OF *Panstrongylus megistus* (HEMIPTERA: REDUVIIDAE)

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Lipophorin (Lp), the main insect lipoprotein, is a “reusable shuttle” that takes up or delivers lipids to tissues without being internalized and degraded. The process of lipid transfer involves the interaction of Lp with specific sites in the plasma membrane of the cells. Despite the relevance of this event in the physiology of the insects, the identification of non-endocytic Lp receptors is still lacking. The aim of this work was to characterize the role of the β subunit of the ATP synthase (β -ATPase) as an Lp-binding protein in the midgut as well as its involvement in the transfer of lipids. Fifth instar nymphs of *Panstrongylus megistus*, an important vector of Chagas’ disease, were used for the experiments. Ligand blotting followed by mass spectrometry allowed to identify the β -ATPase as an Lp-binding protein. After subcellular fractionation and western blot assays, β -ATPase was detected in cell membranes. The immunofluorescence analysis evidenced co-localization of β -ATPase and Lp in the membrane of midgut cells. Functional *in vivo* studies injecting anti- β -ATPase to block the Lp- β -ATPase interaction resulted in an important inhibition of the lipid transfer from Lp to the midgut. Taken together, these findings supported the role of β -ATPase as a non-endocytic Lp receptor in the midgut of *P. megistus*.

82. CHANGES IN THE FATTY ACIDS OF *Pseudomonas putida* INDUCED BY ALUMINIUM

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P. putida A ATCC 12633 grown in presence of 0.1 mM of the toxic metal aluminum (Al). The metal is adsorbed in the membrane through the formation of Al-phosphatidylcholine (PC) complexes. The isogenic mutant, *P. putida* PB01, which is devoid of PC, adsorbs less Al and is sensitive to the metal. The aim of this work was to establish if the response to Al stress involves changes in the fatty acids (FA) composition of *P. putida* A ATCC 12633. In absence of Al, the membrane of *P. putida* wild-type shown high levels of the saturated FA (SFA: 86.68%) and low amounts of the unsaturated FA (UFA: 13.02%). In *P. putida* PB01, in concordance with the absence of PC and in order to maintain stable bilayers, the UFA decreased 90% (*cis*-vaccenic acid (18:1 *cis*- Δ 11) and palmitoleic acid) while the SFA increased 10% (pentadecanoic acid (15:0)). In relation to parental strain, the SFA/UFA ratio in the mutant strain increased 11 fold, indicating increment the rigidity of membrane. In presence of Al, in *P. putida* wild-type the FA 15:0 increased 7% and the 18:1 *cis*- Δ 11 decreased 75%, leading to 4 fold increase the SFA/UFA relationship, while, in the mutant strain, the SFA/UFA ratio was similar to detected in the absence of ion. Since the changes in the SFA/UFA relationship indicate modification in membrane fluidity, these results suggest that the modifications of FA contents could be part of a defense or/and repair mechanism aimed at reducing the damage caused by Al.

83. DEGRADATION OF BENZALKONIUM BY CELLS OF *Pseudomonas putida* AATCC 12633 FREE AND IMMOBILIZED IN CALCIUM ALGINATE

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The Cl- benzalkonium is a cationic detergent widely used as industrial disinfectant and antistatic softening. In this study we evaluated the degradation of two of its components: Cl-benzyltetradecyldimethylammonium (BTDDMA) and Cl-benzylhexadecyldimethylammonium (BHDDMA) by cells of *P. putida* A ATCC 12633 free and immobilized in calcium alginate. The degradation process was evaluated with free cells in M9 medium and, for immobilized cells, in 20 mM Tris-HCl pH 7.4, 44mM and 85mM KCl NaCl, supplemented with Cl-BHDDMA and Cl-BTDDMA as sole C and N sources. To an initial concentration of 35 mg/l, free cells degrade in 48 h, 18 to 24 mg/l of both compounds added individually. Mixing the two compounds leads to cell death. Immobilized cells (0.6 g of alginate beads 4% w/v containing 200 mg of cells (wet weight)) degraded, 90% of 315 mg/l Cl-BTDDMA and Cl BTDDMA and 83% of the mixture of both compounds together. Also the immobilized cells are able to degrade 90% of 12 mg/l of detergent present in an industrial effluent. We conclude that the immobilization of *P. putida* in alginate beads provides protection to cells which allows for greater efficiency of degradation and its use for treatment of wastewater containing cationic detergents.

84. IDENTIFICATION OF GENES FOR CARDIOLIPIN SYNTHASE IN *Pseudomonas putida* A ATCC 12633

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Under stress conditions, bacteria respond modifying the content of cardiolipin (CL) of the membrane. The cardiolipin synthase (Cls) catalyzes the condensation of two phosphatidylglycerol molecules to form cardiolipin (CL) and glycerol. The aim of this work was to identify the genes of *P. putida* ATCC 12633 involved in the synthesis of CL. We have cloned and sequenced two *orfs* of *P. putida* A ATCC 12633 that encodes a homologous to cardiolipin synthase genes (*cls* and *cls2*) from *P. putida* KT 2440. Singles and double mutants were obtained. The CL content in the wild type strain and in the single mutants *P. putida* GP01 (*cls* Δ *aacCl* Gm^R) and *P. putida* RH01 (*cls2* Δ :*aph*(3')-*Ila*, Km^R) was similar. In the double mutant *P. putida* RH02 (*cls* Δ *aacCl*, *cls2* Δ :*aph*(3')-*Ila*) the CL content represented only 2.9% of total phospholipids. The trace amounts of CL detected in the double mutant could be attributed to the action of phosphatidylserine synthase. The decrease in levels of CL of *P. putida* RH02 was compensated with a 120% increase in the relative amounts of phosphatidylglycerol, which is consistent with the CL synthesis pathway. Only the cell-free extracts of *P. putida* RH02 did not contain Cls activity, when it was determined using the fluorescent substrate NBD-PG. These results highlight that in *P. putida* A ATCC 12633, at least two genes are responsible for the synthesis of CL.

85. TRIMETHYLAMINE DEGRADATION BY FREE AND ALGINATE-IMMOBILIZED *Pseudomonas putida*

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Trimethylamine chloride (TMA) degradation by immobilized *P. putida* A ATCC (12633) and free cells suspension was studied under controlled conditions. For suspended cells culture, exponentially growing cells were added to Erlenmeyer flasks containing HPI-BSM medium. For immobilized cells, 20mM HCl-Tris pH 7.4 plus KCl 44mM, NaCl 85mM, was used. In both conditions, TMA 2.5-20 mM was added. The degradation process was carried out at 30°C on a rotary shaker at 100 rpm. Samples from the culture were withdrawn under sterile conditions at different incubation period for the analysis of residual TMA. The free cells degraded 90-100% of TMA after 24 h of incubation from an initial 2.5-5 mM TMA. The alginate-immobilized cells degraded 90-100% of TMA after 24 h of incubation from an initial 2.5-5 mM of TMA and 80-100% after 72 h from 10-15 mM TMA. An inhibitory effect of TMA from degradation was observed in free cells and immobilized cells when the initial concentration was increased to 10 mM and 20 mM, respectively. The rate degradation of TMA by alginate immobilized cells showed activity between 15 and 30 °C, but, the free cells showed activity between 25 and 30 °C. The free cells showed activity in the pH range between 7 and 8, while the immobilized cells were active between 6.5 and 8.5. Overall, these results revealed that the immobilized cell systems are more efficient than suspended cells for TMA degradation, indicating that alginate is a promising method of immobilization of *P. putida* for TMA degradation.

86. TRANSFECTION OF FETAL BOVINE FIBROBLAST WITH CATIONIC POLYMERS

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The objective was to evaluate transfection efficiency and cytotoxicity of two cationic polymers: polyalilamine (PAA) and 25 KDa polyethylenimine (PEI) in bovine fetal fibroblasts (BFF). Cells were seeded on 24-well plates in DMEM/10% SFB. Different PAA and PEI/plasmidic DNA (encoding GFP) ratios were studied (2:1, 1:1 w/w). Percentage of green fluorescent cells was determined by flow cytometry 48 h after transfection. Cell viability was determined by MTT assay. A higher proportion of GFP-expressing cells was detected at PEI:DNA of 2:1 compared to 1:1 (1 µg of DNA; 38.4±1.9% vs 13.5±1.4%). Doubling the amount of DNA did not improve transfection efficiency (38.4±1.9% vs 32.4±1.9%). PEI at 2 and 4 µg/well caused significant cytotoxicity (54.7 ± 3.4% and 18.5 ± 5.7% of viable cell, respectively). Transfection efficiency of PAA at 0.5 and 1 µg/well was marginal (~3% of GFP-positive cells) and the cytotoxic effect was similar to that caused by PEI. Using 2 µg DNA/2µg polymer per well, the percentage of fluorescent cells was higher in PEI transfected cultures (32.4±1.9%) than those observed in PAA treated cells (12.7±1.3%). These results indicate that PEI 25KDa outperforms PAA's ability to deliver plasmidic DNA into BFF.

87. QTL MAPPING FOR A MULTIDIMENSIONAL INDICATOR OF THE REACTION TO MAL DE RÍO CUARTO VIRUS IN FAMILY F_{2,3} OF MAIZE

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The Mal de Río Cuarto (MRC) is one of the most destructive diseases that reduce yield, quality and economic value of maize in Argentina. The disease severity index (DSI), as a multidimensional indicator of reaction to Mal de Río Cuarto Virus (MRCV), is a weighted average of the severity and incidence of this viral disease. The objective of this study was to map quantitative trait *loci* (QTL) for reaction to MRCV. A population of 208 families F_{2,3} derived from a cross between resistant line (LP116) and susceptible line (B73) was phenotyping for DSI in three environments where the disease is endemic. Simple and composite interval mapping were applied for QTL detection using a previously constructed linkage map with SSR markers. The investigation resulted in the identification of five QTL for DSI, which were detected on chromosomes 1, 8 and 10. These QTL explained 4% to 11% of the phenotypic variance total. Most of the QTL for reaction to MRC detected in the present study were mapped to genome regions of the maize containing genes conferring resistance to various pathogens.

88. DIFFERENTIATION OF HYBRIDS CORN ACCORDING TO FORAGE POTENTIAL

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The maize germplasm available commercially show variation in the ability for making up into fodder reserves. The aim of this study was to differentiate twenty eight corn hybrids according to their forage potential. The field trial was performed in the area of Río Cuarto (64°20'W, 33°8'S, 334m asl) during growing season 2013. The experimental design was a randomized complete block design with two replications. The traits measured were days to flowering (DF), interval between male and female flowering (IMF), spike insertion height (SH), plant height (PH), number of leaves (NL), green stuff (GS), dry matter (DM), crude protein (CP), acid detergent fiber (ADF) and metabolic energy (ME). The multivariate methodologies applied for the data analysis were principal components analysis (PCA) and cluster analysis. The first two components of PCA explained 75% of the variation. The CPI allowed the differentiation of two hybrid groups according to the time of flowering, one with the medium maturity cycle and another with late maturity cycle respectively. Temperate genotypes formed three subgroups and were associated with greater values of IMF, DM and ME. Tropical hybrids were associated with higher values of DF, SH, PH, NL, GS, CP and ADF. Cluster analysis allowed us to establish three groups by four, five and seventeen hybrids, respectively. Two hybrids were none clustered. Techniques used were adequate to visualize relationships between the different corn hybrids evaluated for their potential forage.

89.
2,4-DB AND IMAZETHAPYR EFFECTS ON LEAF ANATOMY OF *Adesmia bicolor* (Poir.) DC.

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Adesmia bicolor (Poir.) DC. is a native legume. This species has good potential for the introduction and domestication in production systems, with good forage attributes and nutritional for livestock feed. In Argentina, Uruguay, Chile and Brazil is being investigated to introduce in the agroecosystem. The aim of this work was to evaluate the effect on *Adesmia bicolor* leaves of different doses of the herbicides 2,4-DB and Imazethapyr. The study was conducted on a plot of the UNRC. The experimental design was a split-plot with 3 replications. Application rates were 0,25X, 0,5X, 1X, 2X, 4X, 8X, being X for 2,4-DB 250 g.i.a.ha⁻¹ and for Imazetapir 100 g.i.a.ha⁻¹. *Adesmia bicolor* showed irreversible damage at all doses used 2,4-DB. For imazethapyr doses 0,25X, 0,5X and 1X presented temporal chlorosis in leaf and with doses 2X, 4X and 8X presented persistent leaf chlorosis, necrotic areas and detachment of leaflets.

90.
ANNUAL CORTISOL LEVELS AND WEANING EARLY IN INTENSIVE SYSTEM BREEDING PORCINE

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The extreme temperature seasonal would generate stress as an adaptive response, therefore, housing conditions are an important variable in porcine intensive breeding systems. In the shed 1 (birth to weaning) the temperature is lowered 1°C every day from 24°C to 20°C at weaning. In the shed 2 (weaning and rearing) with temperature to 26°C starting to enter the litters and lowered 1°C per day up to 22°C lower limit. We analyzed plasma levels of cortisol as an indicator of animal welfare throughout the year in early weaned piglets (14 days). Blood samples were taken in piglets (n = 50 for each season) the day before weaning (shed 1) and 7 days after weaning (shed 2) in each season. We measured the levels of cortisol by RIA (Coat-A KIT-Count Siemens). The values obtained were statistically analyzed with one-way ANOVA and Tukey test a posteriori. No significant differences before weaning in the four seasons. After weaning the values found were: 2.72 µg / dl, spring 2.12 µg / dl, summer 2.72 µg / dl and winter 3.58 µg / dl. While cortisol levels in winter was higher than in the other seasons, had significant difference only between winter and spring (p = 0.003). However, these values (3.58 g / dl) are not considered stress levels. Increased cortisol in winter probably will may due to physiological mechanisms in response to small misalignments nocturnal in temperature at the shed during the winter. This would indicate that the temperature control is suitable for young piglets as in the early weaning in 14 days, without affecting their welfare.

A		Castillo P	70	Gonzalez FD	18
Abdala G	70	Castro S	68	Gonzalez N	37
Acevedo D	32	Cavaglieri L	11	González S	13, 22
Aguilar J	2, 3	Cerioni G	60	Greco C	90
Aguilera Merlo C	72, 78	Cerioni GA	61, 65	Grenat PR	28, 39, 41, 44
Aguirre S	79	Cesari A	34	Grosso C	14, 23
Aguirre SA	76, 77	Chanique A	22	Grosso MC	32
Alemano S	54, 70	Chaves E	72	Guevara E	46, 47, 48
Alessio A	86	Chaves EM	78	Gutiérrez S	12
Alustiza F	23, 32, 86	Chiacchiera SM	20, 21	H	
Alvarez D	70	Comini L	11, 30	Hallak ME	1
Álvarez MG	63, 64, 69	Cots D	5, 17	Heredia RM	71, 82, 84
Andrade A	54	Cristofolini A	5, 13, 14, 17, 22	Herrera J	26
Andrés J	89	Crococo L	79	Herrera JM	25
Arnasio N	60	Cruceño A	72, 78	Huck G	66, 67
Ashworth G	90	Cufre ME	6	I	
Astorquiza PL	8	D		Iriarte H	37
Asurmendi P	58, 59	Dalcero A	11	K	
Autrán VA	89	Dambolena J	26	Kearney MIT	61, 65
B		Dambolena JS	25	Kleinert A	68
Babini MS	33, 43	Dardanelli M	34	L	
Baraquet M	38, 41	Dauría P	14	Larriestra A	9, 29, 50
Barberis C	20, 21	De Benedictis M	80	Lasagno M	4, 27
Barberis L	55, 56, 58, 59	De Luca N	49	Latini AS	12
Barbero C	86	De Paul AL	12	Lazaro Martinez J	86
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