# Abstracts das dissertações defendidas no Programa de Pós-Graduação em Ciências Biológicas (Zoologia)

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# SUMÁRIO

# Biology and behaviour of *Bradybaena similaris* (Férussac, 1821) (Mollusca, Xanthonychidae) kept in different substrata, under laboratorial conditions

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**ABSTRACT**: The substrate provides humidity, food and sites to laid eggs for the terrestrial molluscs. These animals select the adequate substrate for its growth, reproduction and survival. The present work reports a study on the influence of three substrata - land, sand and clay - on the biology and behavior of *Bradybaena similaris* (Férussac, 1821) (Mollusca, Xanthonychidae). The following parameters for each type of substrate had been analyzed: growth, mortality rate, daily food consumption, time required to reach sexual maturity, total number of ovipositions and eggs, incubation period and hatching, behavioral acts and activities schedules. From 60 newly hatched individuals grown in each one of the different substrata, the ones kept in sand had presented a greater growth, low mortality, greater food consumption, had reached sexual maturity early and had produced more eggs than the others. Until the 180th day of life, the molluscs kept in clay had had a lower growth and had consumed less food, and the ones kept in land had had a higher mortality, a lower egg production and had had the first oviposition later compared with the other animals. The chemical and physical characteristics of the substrata can have been responsible for these biological differences. The evolution of 30 ovipositions laid by individuals kept in different substrata were followed. The minimum hatching time for the sand molluscs was 17 days and for the clay molluscs, 18 days; the maximum time was 51 and 35 days for the sand individuals and the clay ones, respectively; the mean time was 22,91 and 23,82 days for the ones kept in sand and in clay, respectively. The hatching for the offsprings grown in sand was 81,13% for the ones grown in clay was 83,33%. However, there were no hatching for the yongs grown in land. The molluscs created in frequently moist substrata had presented a greater growth, independently of the type of substract used. Exception the clay animals, it had occurred little difference in the growth of the individuals kept in a substrate that had been moistened in each five days and the ones that had been moistened in each 10 days. The molluscs created in substrata without water for some time had had high mortality, low food consumption and they did not laid eggs until the 120 days. The specimes grown with some periods of starvation in different substrata had grown less, died more, consumed less food and did not laid eggs until the 120 days. The water loss through the tegument without a later hydrating and the interruption of feeding had affected the animals biology. The study had prooved the night behavior of B. similaris. All molluscs had shown the same behavioral acts: rest, horizontal movement, vertical movement, exploration, embedding, emerge, feeding and interaction between individuals. The clay molluscs had presented greater activity followed by the land and the sand ones. These results demonstrate the importance of the substrata on the behavior of *B. similaris*.

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# Biology and behavioral ecology of *Polistes* (*Aphanilopterus*) *ferreri* Saussure, 1853 (Hymenoptera, Vespidae)

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**ABSTRACT**: The social wasp *Polistes ferreri* Saussure, 1853 spreads in Brazil from Bahia to Rio Grande do Sul and also in Argentina, Uruguay and Bolivia. The aim of this study was the biological cycle of the colonies, the architecture and productivity of the nests, the forage activity and the captured preys by this wasp. The works took place in the municipality of Juiz de Fora, MG, from October, 1999, to November, 2003 there wasn't a synchronism according with the months of the years and the biological cycle of this species, although the tendency to nests foundation from august to January had been recorded, the analysis of the nests showed a relation between the number of cells and the width of the peduncle ($r_s$= 0.667, p< 0.001), that wasn't observed in the height of the peduncle ($r_s$= 0.118, p= 0.583). The average number of cells per nest was 100.52 ?69.13 (8 – 256) and the average number of adults produced per nest was 62.40 ?59.66 (1 – 195), reflecting the rate of 0.51 ?0.23 (0.06 – 1.03) adult produced per cell. Cells with until three layers of meconium were recorded, but 64% of the nests produced two generations in the some cell, and only 28% produced three beings. The nectar was the most collected material in the post emergency phase, while in the pre-emergency phase it was the woo pulp. The colony founded by haplometrosis was kept unprotected during 60.45% of the observation period, while the colony founded by pleometrosis was kept 5% the average time of forage was 11'59" ? 10'48" for the wood pulp, 20'54" ? 31'16" for the nectar and 63'35" ? 40'55" for the preys. Among the captured preys by P. ferreri the following orders were identified: Lepidoptera (90.48%), Hymenoptera (4.76%) and Diptera (2.38%).

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# Embryonic morphogenesis in rats (*Rattus norvegicus* Berkenhout, 1769) after administration of lapachol to the maternal environment

*Juliana Corrêa do Carmo[1] ; Vera Maria Peters[2] ; Martha de Oliveira Guerra[3]*

**ABSTRACT**: Mammal development in the uterus protects the fetus from predators but on the other hand makes it completely dependent on the maternal environment. Nutrients as well as toxic substances and microorganisms can be transfered from the maternal blood to the fetus. As far as medicines are concerned, if they are toxic to the embryo/fetus and able to pass through the placental membrana, they can produce various degree of lesions ranging from mild injuries to teratogenicity or death. Lapachol, a phytopharmacal showing a broad pharmacological activity, was reported to have severe embryotoxicit effect, but this is still doubt about its teratogenic effect. Researchers using the same dose level and experimental animal have found conflicting resuts in which some of them evidenced teratogenic activity of lapachol while others did not. To elucidat this matter, the present work was aimed at testing the lapachol effect after its administration on 9th day of pregnancy, a critical day for the rat´s embryonic development, at the same dose level used by the authors who disagreed with its teratogenic effect. Female wistar rats (Rattus norvegicus Berkenhout 1769) obtained from the colony of Centro de Biologia da Reprodução - Universidade Federal de Juiz de Fora - were mated with males of proven fertility and randomly distributed int the following experimental groups of 10 to 12 animals each: control (treated with 1ml of distilled water); vehicle (1ml of 50% hydroalcoholic solution); lapachol - 100 (100mg of lapachol/kg of body weight diluted in 1ml of hydroalcoholic solution) and lapachol - 200 (200mg of lapachol/kg of body weight diluted like the lapachol - 100). The animals were treated at 10 am, by oral gavage, on 9h day of pregnancy. All animals were anesthetized and killed by exsanguination on 21st day of pregnancy. To verify the maternal toxicity the following variables were analized: body weight, food consumption, clinical signs of toxicity weight and anatomical and pathological examination of urea and piruvic glutamic transaminase (PGT). The ovaries were weighed and the corpora lutea counted. The number of implants, live and dead fetuses, resorptions and malformed fetuses were recorded in the uterine cornua. The fetuses and placentae were weighed. After death by freezing the following fetal organs were dissected out and weighed: brain, kidneys, liver and lungs. The data were analized using the one way variance analyzis, the Bonferroni, Chi-square or Kruskal-Wallis test (level of significance ? = 0.05). The results indicated that none

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of the experimental groups showed maternal clinical signs of toxicity. However, liver weight and PGT and urea levels were higher in the lapachol - 200 group. The resorption index was higher in the lapachol - treated groups. The higher dose (200 mg/kg) produced a greater resorption index when compared to the lower dose (100mg/kg). No dead fetuses nor external malformation were observed. Body weight of lapachol treated groups was lower than that of control and vehicle. In conclusion, lapachol under the doses and experimental model used was embryotoxic but did not have any teratogenic effect.

# Thermal Requirements of *Galleria mellonella* Linnaeus (Lepidoptera, Pyralidae)

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**ABSTRACT:** With the purpose to evaluate the effect of different temperatures on immature stages of *Galleria mellonella*, allowing synchronization of cycle production, eggs, larvae and pupae were maintained in laboratory under 22, 27 and 32°C. The results for all bioassays showed that the time necessary for development of immature stages decreased under higher temperatures. Incubation, larval and pupal development periods were, respectively, 13.4, 40.4 and 18.2 days at 22°C, 8.3, 27.2 and 15.0 days at 27ºC and 6.8, 23.4 and 12.2 days at 32ºC. Higher viabilities of eggs, larvae and pupae happened under 27, 32 and 22°C, respectively. Threshold temperature and thermal constant were, respectively, 11.209167ºC and 138.380533 DD (degree day) for eggs, 7.695869ºC and 554.968830 DD for larvae, and 1.943050ºC and 369.054080 DD for pupae. These results facilitate the management of this insect in laboratory to the multiplication of entomopathogenic nematodes, which have been evaluated as biological controllers of ticks.

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# Association between the behavior and the ecology of serpents with the snake bites in the outside area of Juiz de Fora, Minas Gerais State

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**ABSTRACT:** The epidemiological data in this study were obtained from hospital records answered by patients bitten by snakes and taken to the City Hospital in Juiz de Fora, southeastern Minas Gerais, Brazil, from January 1996 to December 2001. The snakebites reported in the urban and rural areas of the city, as well as those in the counties and villages in the surroundings were considered in this study. The altitude of the region under study varies from 467 to 1,104 meters, average temperature 18,9º C, mean annual rainfall 1,538mm, and a mesothermic altitude tropical climate. In order to register the animals, the presence of poisonous snakes specimens in hospitals, health care centers, in the 4th Police District, at Colégio de Aplicação João XXIII and in the Zoology Department of the UFJF was checked. The following variables were analyzed: data concerning the snakebite cases (locations, geographic coordinates, weather variations); the number and percentage of bites by different snake species; data concerning the locations (rural or urban area); activity undertaken (work, recreation); sex; age and occupation; site of bite; outcome grading. The snake species involved in snake bite cases and the correlation between climate and the incidence of cases were also determined. The present study also presents quantitative and qualitative data on snake bite cases. Two hundred and twenty snake bite accidents of medical interest were reported in the period covered by this study, the majority occurring from December to April (63%), the season of higher temperature and rainfall that coincides with the reproductive cycle of the snakes from the *Bothrops* e *Crotalus* . Most accidents took place during the day (73%), the large majority in the afternoon (57%). Male victims accounted for 204 cases and the lower limbs were the most frequent site of bite (68%). People aged 30 to 40 accounted for 21% of the cases and for the majority bitten during labor (56%). The lack of adequate medical care or snake age led to increased severity of the symptoms in 52% of the patients. The clinical manifestations are not related to the distance of the location where the case took place or to the snake species. Among the poisonous snakes of medical importance,: 94% belongs to the *Bothrops* gender, 5% to *Crotalus* and 1% to *Micrurus*. The majority of the cases happened in times not compatible with the activity of the snakes from the *Bothrops* and *Crotalus*. The cases related to changes in the feeding behavior of the animals or more closely to defensive behavior of the snakes.

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# Effects of ghrelin on the feeding behavior and anxiety related behavior of *Mus musculus* Linnaeus, 1758 treated to fluoxetine

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**ABSTRACT**: The alimentary behavior is under control of several modulatory or driving mechanisms, such as, respectively, the serotonergic systems and the gastric peptide ghrelin. These systems are also related with behavioral phenomenons related to the anxiety, measurable to the elevated plus-maze test. In this work, we looked for to study the feeding and anxiety-related behavior related to the immediate effect of the ghrelin associated to short- or long-term fluoxetine treatment. The intraperitoneal (IP) ghrelin (3 nmol/dose) was applied in four groups swiss mice: A (fluoxetine 30 mg/kg for 20 days, subcutaneous "SC"), B (saline for 20 days, SC), C (saline for 20 days, SC + single dose of Fluoxetine 10mg/kg IP), D (saline for 20 days, SC, + single dose of fluoxetine 30mg/kg, IP). To longitudinal comparisons, we observed the behavior of the groups in the elevated plus-maze and the respective feeding along 10 hours, in three sessions: in the first day, all groups received saline IP, in the second day, they received fluoxetine (C and D) or saline (A and B) IP and, in the third day, they received fluoxetine or saline IP + ghrelin IP. We observed that the fluoxetine modestly reduced the feeding in C and it suppressed in 50% the feeding in the group D; the group A didn't have the feeding affected. The ghrelin reverted the fluoxetine effect in the group C. In the Elevated plus-maze, the B spent more time in closed arms under effect of the ghrelin; in the A, the ghrelin didn't modify the behavior; in the group C, the fluoxetine didn't modify the preceding behavior; however, when ghrelin was associated, the animals stayed less time under the closed arms. In the group D, there were not significant differences. We can conclude that (1) the ghrelin did not interfere on the feeding or anxiety behaviors by animal that received FLX 30mg/kg (acutelly or cronically); (2) the ghrelin partially reverted the fluoxetine effects upon feeding and anxiety behaviors.

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# Reproductive behaviour: Photoperiod effects in the length and frequency of the foreigner and nactive mares oestrus on the Zona da Mata ( MG)

*José Carlos Pontello Neto, Vera Maria Peters, Martha de Oliveira Guerra*

**ABSTRACT:** The human species being tried the relation with the equine in varied ways transport, work, sport, in the production of hyperimmune serum, and equoterapy.The work of selection of units consolidated the standard of current creation, with breeders using specialized technology,looking for to keep animals of high quality and productivity. To keep the pureness of the races frequently new reproducers of the same ancestry but been born and adapted to the destination place, and the breeders to develop reproduction programs, allowing the attainment of products with the same quality of the origin ascendants. The problem of the creation of equines of sport in Brazil inhabits in the fact of that the animals are created from matrices brought of the Europe and the criations constantly are enriched by animals proceeding from the origin places, being the climatic conditions related to the cycle light / darkness, determined per the stations of the year, deeply distinct in the two regions: of origin of the animal and of the destination. The mare is a seasonally polyestrous animal, or either, its reproductive activity depends on favorable climatic conditions, as light, temperature and feeding. Research leads to a reasoning that the melatonin, blocks the action of the light on the release of GnRH, inhibiting release of FHS and the responsible LH, gonadotropins for stimulating the ovaries. Some works suggest that animal submitted the deficient diet, suffer from the privation in the leptin production, a polymer synthecized in the lipocyts, and that it would be an inhibitor of the melatonin production. In Brazil some comments suggest that the great variation of the diet in the periods of rain (summer), and dries (winter), is more important in the alteration of the reproductive activity of the female of national origin, that photoperiod, that it suffers little variation that in the north hemisphere. With the hypothesis of that photoperiod would be the greater responsible for the reproductive alterations of the equine female, in this experiment, was looked to observe a criation of animals of the Brazilian Jump Horses, where they are kept first mattered and national and feeding conditions all do not suffer to significant alterations during the year national Mares and mattered they had been observed in conditions of natural light in the summer (14L/10D), natural light of winter (10L/14D), and artificial light in the winter (15L/ 9D), simulating photoperiod of summer. In a breeding formed for 30 matrices, with age between 4 and 16 years .17 mares imported of the Europe and 10 national mares had been selected descents of European blood. The election of the animals to compose the group in study, was made after analysis of the individual spread sheets of register of all the breeding, having selected those that exactly possessed origin, existence of all the data of study in the raised period and the permanence of the animal to the long one of the period of 5 years. Corporal weight, aspects of the hair, tax of estrus for mare/month average of estrus for mare for observed period, average duration of the estrus, number of ovulations, had been the observed 0 variable. The data of the 0 variable had been submitted ' the analysis statistics through the tests of the medium one, of Mann Whinthney, accurate Fisher Qui Quadrado and KrusKal-Wallis, as the distribution of the data. Level of significance of the alfa=0,05 tests. The two observed groups had all kept the steady average weight during the period. The hair was affected by the variation of photoperiod. The percentage of estrus for mare/month also was affected by the luminosity in the two groups. The average length of the estrus suffered significant variation, being longer in the period of winter with complementation of light. The results suggest that the luminosity is basic activity to follicular it of the equine female, but bigger duration of the estrus in the periods of winter with artificial illumination suggests that the temperature can be involved in the speed of maturation of follicule.

# Long-term use of food additive tartrazine: biological effects on gastric mucosae, body–weight gain and ingest of water and ration in Wistar rats

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**ABSTRACT**: Tartrazine (FD & C Yellow Nº 5) is one of the artificial colorings that are most commonly used all over the world to color foods such as candies, jellies, puddings, chewing gums, cookies, medicines and cosmetics. It has been detected that it suffers reduction through gastric system and intestinal microflora, forming aromatic amines, which are substances with a high cancer genesis power due to being a azo derivate (nitrogen in its chemical structure). Since then, it is well known for its allergic reactions and has been an object of study concerning mutation and cancer genesis. The results are still a conflict as far as the safety of this or other food additives are concerned, when used for a long time. Despite being allowed for use, they must still be an object of study. The objective of this work was to study the physyological behavior of Wistar mice under a 46-week tartrazine use, cosidering the body weight, food and water consumption, and the biological behavior of the gastric mucosal. The experiment used 45 male Wistar mice divided into two groups. One control group of 22 animals and one treated group of 23. The control group had water and ration and the treated one, ration and water with 7.5mg/kg/day of tartrazine ad libitum. The mice were observed daily, and food and water consumption and body weight were measured every week. At the end of the experiment, animals were submitted to euthanasia and their stomachs opened to macroscopic observation. Hystological cuts were made for microscopic study. Results were submitted to statistic analysis in which the groups were compared concerning body weight, ration and water consumption and the macroscopic and microscopic changes in the studied areas. We have concluded that there was no statistically significant difference concerning body weight, water and ration consumption and macroscopic changes between the groups. The number of eosinophils and lymphocytes was statistically significant in the gastric antrun, in the group wich used the coloring.

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# Histological immunohistoquímical and mophological aspects of mammary glands of suiss mice *Mus muscullus* (Linnaeus) during lactation

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**ABSTRACT:** The lactation is a maternal behavior essential for the growth and development of newborns, and the different steps of development require amount and quality of milk. It is presume that morphological, histological and physiological glandular aspects exhibit modifications during development the pups. Many drugs are release in the milk and may be ingested by the fetus inducing direct lesions. On the other hand, it is possible we suggest two others situations: reduction of the quality and amount of milk may cause direct lesion of the mammary gland. To investigate direct gland alterations is important evaluate its morphophysiology during the lactation period with is the main proposal of the present study. Mammary glands from female mice were obtained in the 19th day of pregnancy and in the follow days: first and fourth day of lactation, detachment of the ears, eruption of the incisive teeth, open of the eyes and weaning. Histological slides were examined to determine: the number of acinus by microscopic field, diameter of acinus and number of cells by each acinus. In addition, it was also evaluate by using avidin-biotin-peroxidase immunohistochemistry method the expression of prolactin receptors in the secretory cells and the number of cells in process of apoptosis using the TUNEL method. In the first day of lactation, the cells presented a intense staining to prolactin receptors which remained marked until the weaning. The major diameter of the alveoli is observed in the period of the open of the eyes, this period coincide with the end of the full lactation. In the weaning period is observed the reduction of the diameter compatible with the gland involution. Between the events of eruption of the incisive teeth and open of the eyes the gland involution is beginning since than the number of apoptotic cells increase twofold when compared the first and second events. Other studies in the intermediary days are necessary to determinate with precision the date in which the cells in apoptotic process are more numerous.

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# *Boophilus microplus* biology (Acari, Ixodidae) starting from artificial infestation in rabbits

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**ABSTRACT:** The losses caused by the tick *Boophilus microplus* to cattle raising around the world had promoted several researches, that use artificial infestation in their development, aiming more efficient control. In order to became viable the rabbit utilization as alternative hosts to this Ixodid, infestations in four rabbits prepared rightly with contention devices fixed to ears and dorsum were performed. Daily, naturally loose engorged females were collected, weighted and maintained in incubator to BOD (27 ± 1ºC and RH over 80%), to oviposition and larval hatching accompaniment. In parasitic phase, varying from 21 to 29 days (dorsum) and from 23 to 30 days (auricle of the ear), were estimated the nymph swelling up and molt (10,80 2,65 days and 11,00 ± 2,52 days, in dorsum area and auricle of the ear, respectively). Adults swelling up and copulation happened in 7,00 ± 2,50 days in dorsum area and in 8,60 ± 1,80 days in ears area. Average weight from engorged females from both dorsum and ear were 34,43 ± 18,73 and 36,30 ± 18,10 mg, respectively. Both pre-oviposition and oviposition periods were, respectively, 3,85 ± 1,80 and 5,55 ± 1,88 days to females from dorsum and 3,39 ± 1,14 and 5,17 ± 2,05 days to females from auricle of the ear. Both, indexes of reproductive and nutritional efficiency were 17,38 ± 14,27 and 26,85 ± 17,13% and were 17,42 ± 12,22% and 30,70 ± 19,80%, in the same order. Hatching percentage averages were 35,75 ± 25,59% (dorsum) and 34,34 ± 22,40% (ears). Hatching period was the only parameter that showed significant differences by corporal area (22,70 ± 1,74 days to eggs from dorsum engorged females, significant smaller than the 23,40 ± 1,53 days corresponding to auricle of the ear engorged females). Although rabbits are not adequate to maintan successive generations of B. microplus in laboratory, they can be employed to engorged different stages of this ixodid allowing experimental studies of development.

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# Wistar rats gastric mucosa biology and feeding behavior, under etoricoxib oral administration

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**ABSTRACT:** Non steroidal anti-inflammatory are drugs used to treat and control many diseases, on all mammary species. Many studies have been developed on animals and humans to observe the effects of this group of drugs on gastrointestinal tract mucosa. Gastric and duodenal lesions are among the side effects caused by non selective cyclooxygenase suppression. Etoricoxib is a new non steroidal anti-inflammatory drug, highly selective cyclooxygenase 2 inhibitor, that preserves gastric and duodenal mucosa protective function. The objective of this work was to study the biological effect of Etoricoxib oral administration, on rats gastric and duodenal mucosa, food and water ingestion and body weight changes. Forty five Wistar rats were divided on 3 groups. The first one (control group) received 0.9% Sodium chloride solution, The second and third one received 0.5 and 5.0 mg/day Etoricoxib, respectively. During 10 days period, food, water and body weight were measured. All animals were anesthetized and killed on the 11$^{th}$ day. Stomach and duodenum were macro and microscopically evaluated. We concluded that there was no significant difference on body weight changes, nor water or food ingestion on any studied groups. Enantema, erosions or ulcers were not observed macro or microscopically. Soft and diffuse eosinophilic infiltrate was observed on both treated groups. Soft submucosa linphoplasmocitary infiltrate was observed on the higher dose Etoricoxib group (5.0 mg/day).