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COMPORTAMENTO E ECOLOGIA ANIMAL

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SUMÁRIO

Relationship between callosum agenesia, testosterone and free tyroxine: study of a possible neuroendocrine substract for the comportamental laterality in mice BALB/cCF

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ABSTRACT: Cerebral asymmetries consist of morphological, neurochemichal and functional differences between both hemispheres, which are not just each other's replica, but entities with their own morphological and functional features. They communicate through commissural fibres, the largest number of which make up the callosum. This exchanges information between the hemispheres helping them to work in harmony. Several studies describe an important role of the callosum in the origin or guiding of cerebral asymmetries. Hormonal influences are also thought to interfere with the formation of the callosum. One can thus imagine that changes in testosterone levels could be linked to defects in such formation. Conversely, animals with callosum alterations might have problems with the secretion of testicular hormones (testosterone) and/or thyroid ones (free thyroxin).This study aimed to find a possible relationship between hormonal levels (testosterone and free thyroxin) in BALB/cCF mice and callosum defects. This strain has around 20% of the animals

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with congenital defects of the callosum. Twenty-two adult, male animals were beheaded after being anesthetized. The brains were dissected and the hemispheres separated and analysed under microscopy for detection or not of the callosum. Blood from 12 normal mice and from 10 mice without the callosum was used for determination of testosterone and free thyroxin through chemoluminescence. The results underwent statistics tests in a search for significant differences in testosterone levels between mice with and without callosum. The same statistics was used to assess free thyroxin levels. In our sample, no statistically significant differences in testosterone and free thyroxin levels between normal mice and those BALB/cCF without callosum were found.

Feeding ecology of *Triportheus albus* (Cope, 1871) and *Triportheus trifurcatus* (Castelneau, 1855) (Teleostei, Characiformes, Characidae), before, during and after the impoundment of Tocantins River by the Hydroeletric Powerplant Serra da Mesa, State of Goiás, Brazil

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ABSTRACT: The upper Tocantins River, where the Hydroeletric Powerplant Serra da Mesa was developed, has a well-defined system, with rainy and dry seasons (River phase). The transition from a lotic environment to a lentic one began with the conclusion of the dam (Filling phase). In June 1998 the Operational phase of the plant started. *Triportheus albus* and *T. trifurcatus* showed up in the areas where the dam

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played an important role, and their diets were studied not only in the river basin in the year previous to the damming, but also in areas which have remained lotics, and in the recently recently formed reservoir (Dec./95 to Oct./98). The collections were made with gillnets every two months. The analysis of the stomach contents was made using the frequency of occurrence method and the score method, when then the Indices of Nutritious Importance per phase and per classification of the samplings size were calculated. The structural characteristics of the gill arches were examined, the grade of stomachs fulfillment was estimated and the intestinal quotient of both species was established. *T. trifurcatus* has presented high index of Zooplancton and Vegetal Remains. *T. albus* has fed chiefly on Insects and Vegetal Remains. Differences in the gill structures of both species related to the amount of consumption of Zooplancton have been found. *T. trifurcatus* has been able to consume these items and has done so in a higher proportion than *T. albus*. The process of installation of the dam has not influenced the diet of the species studied, for they are an opportunist species and major differences among the examined phases have not been found. It has been suggest that both species live in different places, as *T. albus* feed in the water edges and the *T. trifurcatus* in places far from them. The species do not presents any diet specialization, as it can be detected through the analysis of the diversity of the items consumed, which have been constant. In relation to the classification of size, no differences were found in the diet of both species among the phases. The value of the overlapping of the diets was high in all phases, except in the Operational phase. It has been suggested that this is due to retraction of the dam during this phase, probably reducing the offer of items and making both species consume distinct items.

Behaviour, ecology and biology of the free-living phase of *Boophilus microplus* (Canestrini, 1887) (Acari, Ixodidae) in *Pennisetum purpureum* (Schum) pasture

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ABSTRACT: The behaviour and ecology of larvae and engorged females of the tick, *Boophilus microplus*, and the biology of the free-living phase, as related to environmental changes in periodically pastured Elephant Grass, Pennisetum purpureum, is described from three experiments conducted at the Field Experimental Station of the Embrapa Gado de Leite, Coronel Pacheco, MG, Brazil. The experiment on the development of the free-living phase of the tick consisted of two trials (summer and winter), with five repetitions/trials, where 12 engorged female ticks/ repetition were weighed, placed inside sachets of nylon gauze closed with clips and placed at the base of the grass of approximately 2m height. Three observations per week were carried out in order to establish their average periods of pre-oviposition and oviposition and incubation of the eggs. These were, respectively; 5.0, 17.1, and 32.5 days, in summer, and 9.7, 35.5 and 74.4 days, in winter. The periods of pre-oviposition, oviposition and incubation were significantly related to humidity, and of pre-oviposition, with the different conditions of summer and winter. The experiment with larvae

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consisted of two trials (summer and winter), each with six, fortnightly repetitions. Larvae were reared in the laboratory in disposable plastic syringes, that were subsequently placed at the base of the grass, maintained at 1.60m in height, and permitted to escape spontaneously. Their behaviour was observed at 06:30, 12:00 and 17:00, three times weekly, along with the local conditions of temperature and humidity. Larvae took longer to climb up the vegetation in the winter. The height reached, preferred locations and number of groups of larvae in the pasture were characteristic of each season. Larvae showed periodical vertical migrations of 2cm. There was increased larval activity towards the end of the afternoon related to the temperature, in summer, and from the protection offered by the thick stalk of this grass. The experiment with engorged female ticks consisted of two trials (summer and winter), each with six, fortnightly repetitions. Thirty ticks/repetition were washed, dried, weighed, individually labelled and distributed within the pasture, that was maintained at 80cm. Each tick's location was identified with a numbered marker and its locomotion measured between the time intervals of 08:30, 10:30, 12:30, 14:30 and 16:30, along with the local temperature and humidity. Each tick was collected for re-weighing when it started to lay eggs. The ticks showed a shorter pre-oviposition period during summer and greater average daily locomotion during winter. They showed most movement immediately after their release, and when humidity was least. In summer, 11.1%, and, in winter, 1.67% of the engorged female ticks were preyed.

Drop-off behaviour of engorged females of *Boophilus microplus* (Canestrini, 1887) (Acari, Ixodidae)

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ABSTRACT: A description of the drop-off behaviour of engorged females of the tick *Boophilus microplus* was carried out as a result of an experiment at the Experimental Station, Embrapa Gado de Leite, Coronel Pacheco, MG, Brazil. Its objective was to evaluate any repercussions of changing the time of milking of cattle in terms of reduced recontamination of the pastures with the tick. Such possible changes in this daily cattle management routine have recently become a reality since the advent of refrigerated on-farm storage of the milk and non-daily collection by tanker truck. The field experiment consisted of a phase in summer, with a longer photoperiod, and in winter, with a shorter photoperiod. Twelve weekly experimental repetitions, of 24 hours duration, were carried out in each of these seasons. For each repetition, eight non-lactating, 7/8 Holstein-Friesian x Zebu cows, naturally infested with *B. microplus* and maintained on pastures, were removed to an experimental area on the day on which the observations were to be made and maintained in individual stalls. At each hour, over 24 hours, all fully engorged ticks that had dropped off naturally from the cattle were collected from the stalls. The results showed a significant difference in the rhythm of their drop-off in the summer compared to winter. In the summer the greater proportion of ticks dropped off between 07:00 and 10:00 (35.3%) with

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a maximum at 09:00. In winter, there were two daily periods of greater drop-off of ticks, the first between 06:00 and 09:00 (19.69%) with a maximum at 06:00, and the second between 14:00 and 17:00 (21.79%) with a maximum at 15:00. The percentage of ticks dropping off during the traditional milking time (05:00-08:00 and 13:00-16:00) would have been 35.15%, while those falling during an alternative sytem under consideration for Central Brazil (08:00-11:00 and 16:00-19:00) would be 45.48%, during the summer. During the winter, the proportion of ticks falling from the cattle is 40.51% and 32.71% for the two times of milking, respectively. Considering the time that the animals remain in stalls for feed supplement during the period between milkings during the dry season (May to September), the proportion of ticks falling would be 55.83% for the traditional system (05:00-16:00) and 52.36% for the milking period under consideration (08:00-19:00). The correlation between drop-off of ticks and photoperiod was significant only for the summer, but not so for mean air temperature nor relative humiditty for either of the seasons compared.

Some aspects of the reproduction and of the growth of *Bradybaena similaris* (Férussac, 1821) (Mollusca, Xanthonychidae) and *Leptinaria unilamellata* (d'Orbigny, 1835) (Mollusca, Subulinidae) in laboratory

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ABSTRACT: Biological aspects of *Bradybaena similaris* (Férussac, 1821) (Mollusca, Xanthonychidae) and *Leptinaria unilamellata* (d'Orbigny, 1835) (Mollusca, Subulinidae) were studied, such as: onset of sexual maturity, occurrence of self-fertilization, oviposition, incubation period and eclosion rate, shell length measurement at different stages of development, growth and reproduction under different densities populations. Beginning with newly hatched young individuals, 38 specimens of *B. similaris* and 37 specimens of *L. unilamellata* were kept isolated, and 35 specimens of both species were grouped for 180 days. It was noted that in isolated *B. similaris* the minimum and maximum time for reaching sexual maturity were 109 and 180 days, respectively. When kept in groups, the minimum time was 78 days. In isolated specimens of *L. unilamellata,* sexual maturity was reached at 74 days (minimum time) and 104

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days (maximum time). To the grouped specimens, the minimum time was 71 days. The occurrence of self-fertilization was observed in both species; 100% specimens of *L. unilamellata* have reproduced by self-fertilization whereas only 31.8% specimens of *B. similaris* used the same reproductive mechanism. In *B. similaris* the total number of eggs per oviposition varied from one to 38 (average: 3.5 ± 7.15), the total number of eggs per mollusk varied from one to 39 (average: 7.0 ± 10.21). In *L. unilamellata* the total number of young per birth varied from one to 22 (average: 7.35 ± 5.78), the total number of offsprings per mollusk varied from two to eight (average: 4.1 ± 1.41) and the total number of young per mollusk varied from five to 46 (average: 30.21 ± 8.08). Thirty ovipositions (894 eggs) of *B. similaris* were followed and the minimum eclosion time of the young was 14 days, the maximum eclosion time was 35 days and the average was 23.69 days. The eclosion average percent was 81.22. As to the shell length in different growth stages, it was observed that in *B. similaris* the length of the shell was similar until 30 days for age. After this period isolated specimens acquired a greater growth rhythm when compared to that of grouped specimens. The maximum shell length of isolated specimens of *B. similaris* was 17.4mm whereas grouped specimens reached 14.5mm. In *L. unilamellata,* growth rhythm was similar until 15 days for age. After this period grouped specimens showed a higher growth rhythm until 105 days after which the growth rhythm of grouped specimens became constant and the growth rhythm isolated specimens became higher. Grouped and isolated specimens reached a maximum size of 18.7mm and 20.6mm respectively. Three hundred newly hatched individuals of both species were followed and submitted to five different treatments (T): T1: ten mollusks, T2: 20 mollusks, T3: 30 mollusks, T4: 40 mollusks and T5: 50 mollusks. In *B. similaris,* the shells average length (mm) was: T1: 13.32; T2: 11.96; T3: 11.25; T4: 11.66 and T5: 10.18. For the species *L. unilamellata,* the results were: T1: 17.06; T2: 18.44; T3: 14.8; T4: 12.2 and T5: 14.22. The average number of eggs per treatment in *B. similaris* was: T1: 133.3; T2: 63.17; T3: 39.03; T4: 24.07 and T5: 25.44. The average number of offsprings per treatment in *L. unilamellata* was: T1: 24.75; T2: 23.55; T3: 16.13; T4: 10.31 and T5: 20.69. In both species, individuals That were kept grouped

became sexually mature earlier than isolated ones. Both species reproduce by self-fertilization, but with best results in *L. unilamellata.* In the moment of the sexual maturity, the length of the shell in the individuals that were kept isolated was smaller than the grouped ones for *B. similaris ,* while the opposite happens in *L. unilamellata.* In both species individuals that were kept isolated reach larger length of shell. The population density acts upon the growth in both species. Moreover, there was influence on the reproduction of *B. similaris.*

Research about hemoparasites and some ectoparasite in stray dogs form Juiz de Fora count, Minas Gerais State

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ABSTRACT: The study of the ectoparasite and hemoparasite species of dogs is very important in Veterinary Medicine and Public Health. The survey of these species is important to elaboration of control measures. From February 1999 to February 2000, 104 stray dogs were studied, being 60 proceeding from Animal Capture Sector (SAA) and 44 from Juizforense Animal Care Society (SJPA). Blood samples were collected in the ear, where two GIEMSA- coloured blood smear, were made for each host. The arthropods were collected manually and kept in ethanol 70ºGL. The only hemoparasite found was *Babesia canis* in 26.92% of the dogs studied (28.33% in SAA and 25% in SJPA). The pups were more affected than adults dogs (43.47% and 23.07% respectively). The following ectoparasites were found (with their respective prevalences) in the SAA: *Rhipicephalus sanguineus* (63.33%), *Amblyomma cajennense* (10%) *Amblyomma sp.* (1.66%), tick larva (6.66%), tick nymph (23.33%), *Ctenocephalides felis* (73.33%), *Trichodectes canis* (21.66%), *Heterodoxus spiniger* (8.33%), while SJPA, were found: *Rhipicephalus sanguineus* (56.81%), *Amblyomma cajennense* (4.54%) *Amblyomma aureolatum* (2.27%), tick larva

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(11.36%), tick nymph (38.63%), *Ctenocephalides felis* (81.81%), *Trichodectes canis* (4.54%), *Linognathus setosus* (2.27%). *Rhipicephalus sanguineus* showed larger infestation intensity in the hot and rainy months. The sexual ratios (female: male) were: *C. felis* (~4:1); *T canis* (~7:1) and *R sanguineus* (~1:2). The most preferred places of tick fixation on the host body were also observed.

Molting and survival of the larvae and nymphs of *Haemaphysalis leporispalustris* (Packard, 1869) (Acari, Ixodidae) submitted to imersion in distilled water.

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ABSTRACT: The present work was carried out at the Tick Biology and Ecology Laboratory of the Biological Sciences Post-Graduate Course - Animal Behaviour and Ecology, Institute of Biological Sciences, Federal University of Juiz de Fora with the purpose of evaluate the effect of immersion in distilled water on immature instars of *Haemaphysalis leporispalustris* (Packard, 1869). Experimental groups were formed with unengorged larvae and nymphs. They were placed in test tubes according to their life cycle phase and submitted to immersion for 24, 48, 72, 96, 120 and 144 hours. For each phase studied a control group was formed with the same number of samples and repetitions of the experimental groups. The experiments were perfomed in on incubator chamber regulated at 27º ± 1º C relative humidity above 80% and under darkness. It was observed that unengorged larvae as well as and engorged larvae were few affected by immersion as the habilith survival. However, a deleterious effect was observed in engorged nymph as moulting occurred only untill 24 hours of immersion in a much lower level than that of the control group (70% in the control group and 10% in the 24 hour immersed group).

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Maternal behaviour and offspring development of female rats (*Rattus norvegicus* Berkenhout, 1769) treated with lobeira *(Solanum lycocarpum* St.Hil.) during lactation

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ABSTRACT: The mother behavior is indispensable to the survival and the physical and neurobehavioral development of the suckling. Among typical behavior patterns are protection, stimulus, cleaning of the suckling and their feeding as well. Several factors can modify the behavior – stress, environmental pollution, external changing in the mother's body, endocrinopathies, and external administration of medicines, drugs chemicals and others. Such factors can also change the quality and/or the amount of milk produced, and other mother's kinds of cares . This paper tested the effect of the aqueous solution of "lobeira" (*Solanum lycocarpum*) powder given during the period of full lactation of the female rat, upon the mother's behavior. The evaluation was done considering the typical mother's behavior and the survival and physical and neuromotors reflex development of the pups. Nursing female Wistar rats were treated from day two to day sixteen with 5ml of solution of "lobeira" powder/kg of body weight (20mg of powder/ml of destilled water), by oral gavage, twice a daily, at 10am. and 3pm. Mother and suckling were observed at least twice in the

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morning and in the afternoon, in order to evaluate the following patterns: (a) Mother: body weight, food uptake, changing in the locomotion activity, pyloerection, diarrhea, mother death and behavior in constructing and maintaining the nest, gathering and licking the pups and the attitude during nursing. (b) Pups: body weight, signs of physical development – ears detachment, fur and hair appearing, incisors eruption, eye opening, testicle migration and vaginal opening – and the appearing of the neuromotors reflexes: holding, postural reflex and clift avoidance. The parametric data were evaluated by variance analysis-one way followed by Dunnet test and the non-parametrical data, with the Chi square test. Significance level of the tests was a= 0.05. None of the experimental groups presented mother's death, changing in the locomotion activity, pyloerection, diarrhea, changing in the body weight or food uptake. The mother behavior during nursing, constructing and maintaining the nest, gathering and licking the pups were the same in all groups. The pup's weight gain was similar for both male and female in the three experimental groups. The appearing of physical development signs and neuromotors reflexes date was similar in all groups, for both male and female. The conclusion was that the administration of the solution of "lobeira" powder to nursing female rat had no toxic effect upon the mother; did not change the mother behavior; did not modify the quality and the amount of milk; did not change the suckling physical development; did not modify the date of the beginning of puberty and did not change the beginning of the neuromotor reflexes observed.

Behaviour of *Boophilus microplus* larvae (Canestrini, 1887) (Acari, Ixodidae) in *Brachiaria decumbens* (Stapf) pasture

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ABSTRACT: The experiment was conduced at The Coronel Pacheco Experimental Station of Embrapa Dairy Cattle, in Coronel Pacheco city, MG, Brazil, to study the larval behaviour of the cattle tick, *Boophilus microplus*, in *Brachiaria decumbens* pasture naturally infested. The infestation power of the larvae was evaluated at 0, 15, 30, 45 and 60 days of life, during the period of January 17th to April 7th of 2000, using groups of five calves 7/8 Holstein x Zebu, grazing each paddock of 100 x 20m during 72h. After the grazing period, the animals were confined in groups, and at the 15th day of confinement allocated to individual pens, where all the total detached engorged females were collected and counted. The results showed that it was necessary 60 days on average to reduce the larvae population in the pasture to low levels. The data were submitted to regression analysis and it was estimated that would be necessary 82,6 days to control completely the larvae infestation potential.

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Populacional structure and reproductive biology of *Serrasalmus rhombeus* (L., 1758) (Teleostei, Characiformes) pre and post the impoundment of the Tocantins river by the hydroeletric plant of Serra da Mesa, GO

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ABSTRACT: The construction of hydroelectric dams provokes alterations in the physical and biological conditions of the environment. The modifications affect the fish community, that, in several occasions, is used as indicative of the environmental conditions. As part of the project "Studies on the Ichthyofauna of the Serra da Mesa Hydroelectric Plant in the Upper Tocantins River, Goiás, Brazil" this study analyzed the modifications happened in the reproductive process of the females of *Serrasalmus rhombeus* (Teleostei, Characiformes) and in the population parameters. The captures were bimonthly with gill nets, in the previous period, dec/95 to oct/96 (flowing environment), and posterior to the dammed, dec/96 to apr/98 (remaining flowing environment

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and lake environment), of the river Tocantins. It was analyzed the size composition, sexual ratio, weight/ length relationship and medium size of 1st maturation. The description of the maturity stages were based on macro and microscopic characteristics of the ovaries. For determination of spawning season the it was used the relation between the weight of the ovaries and the total weight (GSI), the relation between the weight of the ovaries and the weight of the body (GSI *), condition factor (K and K') and temporary frequency of maturity stages. The temporary and spatial distribution of the females in different stages were analyzed for the three environments. The type spawn was determined by the oocyte development and temporary frequency of stages. The fecundity was estimated and related to total weight, length and weight of the ovaries. The population structure showed representatives in several stages of the life cycle, and the largest sizes were found in the fast-flowing environment. The growth was considered the isometric and, at first sight, it was not affected by the dammed. The sex-ratio, considering the total of individuals, was different from 1:1 only in the remaining water flowing environment and in the three environments there were months and localities that males prevailed. *Serrasalmus rhombeus* enrolled a delay into 1st maturation in the lake and in the environments water flowing remaining ambient. By the histology analysis, eight maturity stages were recognized. For the three environments, reproductive individuals were found in the whole period and the spatial distribution showed individuals in all the places. The values of GSI medium and frequency of reproductive individuals decreased in dammed environments. In the three environments, the entrance of the juvenile happened, practically, during the whole period. The juvenile were found at all the places of the lake ambient. This species has a parceled spawn and RAI (Reproductive activity index) showed low values for lake environments. The relative fecundity presented better relationship with the weight of the ovaries. We can conclude that the dammed of the river affected the negatively reproduction, as well as propitiated better conditions for survival of the juvenile, probably, for the amplification of the shelter places and food.

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Study of the age and the morphophysiological conditions influencing on the body weight of adult females of *Polistes versicolor* Olivier, (Hymenoptera, Vespidae)

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ABSTRACT: The present research has analyzed among reproduction and behaviour conditions, colonies cycle aspects, winter assemblage and morphometry of adult females from *Polistes versicolor* (Olivier, 1791) (Hymenoptera, Vespidae). The field research were done in three different areas in the region of Juiz de Fora – Minas Gerais, from where 100 adult wasps were collected proceeding from five winter assemblages and twenty-seven colonies. The colonies were denominated according to their development cycles and productivity, separated by their foundation form. The animals were marked on their thorax and pedicels with a special ink used on model aircrafts, which permitted the observation of each adult wasp daily activities. Following the collection the wasp were transported inside material bags to the laboratory where they were anesthetized, and killed with sulphuric acid, weighed and

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dissected in order to measure their internal characters (ovary development, spermatec contents and body fat), which was done under a magnifying lens. All the data were analyzed using the SAS statistics package. The observations indicate that the settlement occurs specially on human buildings and the foundations may occur in different periods of the year. The colonies foundation can be done by a single mated female which later on accepts joiners, or they can be done by a group of mated females. The highest percentage mortality of the colonies occurs in the foundation stage, founded by a single mated female. It was observed the occurrence of female-producer and male-producer. In the winter, the females can aggregate in various shelters, constituting winter assemblages. The new colonies are founded by gynes from the winter assemblages, in which sister females or relatives join to and this fact brings various benefits to the group. It was possible to observe, through weighing, that gynes were heavier than dominants and subordinated females, perhaps because they were collected at the beginning of the winter assemblages. The dominant mated females presented a low significant difference in their body weight against their subordinates. The foundresses (gynes) are old than dominants. The laboratory observations on morphometric studies, analysis of ovarium development, spermatec conditions, color and body fat quantity, finalized this research. The ovarium development and the frequency of mated and un-mated females varied during the colonies cycles. The gynes presented large quantity of body fat followed by the dominants. The role of each one of these phenomena is initially discussed and later analyzed within a global context of interdependence between individuals and colonies cycle.

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Referências Bibliográficas (modelos)

◆ Artigos em periódicos

BATEMAN, G.C. & T.A. VAUGHAN. 1974. Nightly activities of mormoopiad bats. **Jour. Mammal. 55**(1): 45-65.

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OGIMOTO, K. & S. IMAI. 1981. **Atlas of rumen microbiology.** Tokyo, Japan Scientific Societies Press, VII + 231p.

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