Efeito da temperatura ambiente e da umidade relativa do ar sobre a freqüência de ingestão de alimentos e de água e de ruminação em vacas da raça holandesa

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Maria De Fátima Ávila Pires
Marcus Cordeiro Durães

EFFECT OF ROOM TEMPERATURE AND THE AIR RELATIVE HUMIDITY ON THE FREQUENCY OF WATER AND FOOD INGESTION AND THE RUMINATION OF HOLSTEIN FRIESIAN CATTLE

ABSTRACT: The feeding behaviour, rumination and water consumption of primiparous and multiparous Holsteins cows, housed in a free-stall system were studied, in response to differents combinations of temperature and relative air humidity. Data was collected during three days (24 hours) in the Summer and Winter months. Feeding behaviour and rumination were monitored in each fifteen minutes intervals, and the water ingestion, continuously all day long. Environmental temperature and relative humidity were also monitored in each hour intervals. During Summer time, the environmental temperature and relative humidity significantly affected ($P<0,05$) feeding behaviour of the cows with an increasing time of feeding intervals, from 6 a.m - 6 p.m to 6 p.m - 12 p.m. Daily pattern of rumination was defined by the daily pattern of feeding. The water ingestion varied significantly ($p < 0,05$) as a function of the feeding behavior due to environmental temperature and air humidity, mainly in the cow group.

Canibalismo em fêmeas de *Macrobrachium rosenbergii* (De Man, 1879) (CRUSTACEA, PALAEMONIDAE) em condições de laboratório: efeito da amputação das quelas

Sônia Sin Singer Brugiolo
Francisco Javier Hernandez Blazquez
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José Milton Barbosa

CANNIBALISM IN *Macrobrachium rosenbergii* (De Man, 1879) FEMALES (CRUSTACEA, PALAEMONIDAE) UNDER LABORATORY CONDITIONS: EFFECT OF CHELAE AMPUTATION

ABSTRACT: The present experiment was carried out in the Zoology Laboratory of the Federal University of Juiz de Fora, Minas Gerais, Brasil. The effect of the chelae's removal from the females of *Macrobrachium rosenbergii* (De Man, 1879), was tested in order to verify cannibalistic behavior. Newly-molted females were kept in individuals shelter-less tanks and exposed to intermolt conspecific: 1- intact females and 2- females with chelae's ablation of the cheliped. The animals were fed daily, ad libitum, with commercial ration FSH 30. The tanks were cleaned by siphon. The results showed evidences that females of *M. rosenbergii* with amputed chelae, do not exhibited cannibalistic behavior as demonstrated in intact females. The rate of survivorship was higher among newly-molted females exposed to females with amputated chelae. Other experiments have demonstrated the importance of conspecific necrophagy in this species. We hope to provide bases for the desing of an experimental model for the species which uses groups of females with the second pair chelae of amputated cheliped where the influence of heterogenous growth and cannibalism are reduced.

Estudo comparativo das glândulas do V e VI esternitos gastrais de *Polistes versicolor* Olivier, 1791 (HYMENOPTERA, VESPIDAE) em relação à repelência de *Crematogaster* sp. (Hymenoptera, Formicidae)

Maria das Graças Sarmento[1]
José Roque Raposo Filho

COMPARATIVE STUDY OF GLAND SECRETIONS OF THE V AND VI GASTRIC STERNITE OF *Polistes versicolor* Olivier, 1791 (HYMENOPTERA, VESPIDAE) IN RELATION TO THE *Crematogaster* sp. (HYMENOPTERA, FORMICIDAE) REPELLENCE

ABSTRACT: This paper was conducted in Juiz de Fora, Minas Gerais, Brazil and consisted on observations of pre and postemergent colony stages of *Polistes versicolor* Olivier, 1791, *in situ*, aiming to recognize the life cycle, social order, enemies and labor division tasks in the specie. The registers lead to data about the colonies development and the winter assemblage formation, we noticed that *P. versicolor* colonies show an asynchronic cycle, with a social organization that is highly dinamic which promotes changes on the individuals hierarchic position. Laboratorial tests were conducted to verify the efficacy or non-efficacy of the secretions produced by the 5th, the 6th and the 5th the 6th gastral sternite of femeles and males of this specie against ants *Crematogaster* sp., in such way that it would be possible to compare its efficiency in relation to the hierarchic

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position of femeles wasps (dominants and subordinates) as well as males, concerning development stage and/or sub-stage of the colonies cycles, besides the overwinter femeles assemblages. The ants taken from four colonies kept in laboratory reacted to the secretions smeared on a **Y** shaped glass capilar, which only one end of the **Y** bridge received the treatment as follow: (1) choose and come back with antenning, (2) choose and come back with antenning and jawing, (3) straight to the control end with antenning, (4) choose the control end with antenning, (5) choose the control end with antenning and jawing, (6) straigh to the test end with antenning, (7) choose the test end with antenning and (8) choose the test end with antenning and jawing. Using the X^2 (chi-square) test we concluded that the secretions are more efficient in repelling ants during the pre-emergent stage than on postemergent stage. The substance secreted by the dominants shows a most repulsive action than the substance secreted by the subordinates of the pre-emergent stage. The secretion produced by dominants and subordinates postemergent do not differ in repellence action; dominats and subordinates from different colony cycle sub-stages show secretions that have different repellence levels and the secretions produced by male is efficient as ants repellent, as well as the one produced by femeles from overwinter assemblages. We noticed, however, that the substance lost, in part, its efficacy during the period of the test. Abiotic factors as temperature and light interfered on the repellente efficacy of the substance secreted. We can state, based on the results that *P. versicolor* developed an evolutive strategy highly specialized to repel ants: a chemical barrier that is smeared on the petiole and on top of the cells.

Colonização de bolos fecais de bovinos tratados com Ivermectin durante a época seca em condições simuladas de campo

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Terezinha Padilha
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COLONIZATION OF IVERMECTIN TREATED BOVINE FAECES DURING THE DROUGHT SEASON UNDER SIMULATED FIELD CONDITIONS

ABSTRACT: Ivermectin is na antihelmintic compound commoly used in the treatment of ruminants raised in permanent pastures in tropical regions. Na experiment was carried out to evaluate the colonization of cattle dung treated subcutaneously with a standard dose of 0,2mg/kg^{-1} body weight of ivermectin in the middle of the dry season (July/95) in the Mata Region of Minas Gerais State (Coronel Pacheco). Fresh feces were collected on day 0 (previous to treatment) and on days 3, 7, 14 and 28 post-treatment from two groups on tem grazing calves, one of which had been treated with ivermectin. Subsequently, 21 experimental pats of 1 Kg from each group were placed on plots of *Brachiaria decumbens*. On days 10, 30 and 60 after deposition, seven pats from each group were removed at random for organism collection (Tullgren funnel). Insects and mites were less numerous in the treated group. The number of Cyclorrhapha dipterous larvae was affected significantly on day 3 post-treatment at 10 and 30 days after deposition ($p = 0,002$ and $p = 0,046$ respectively). Fewer Polyphaga coleopterans adults were found on day 28 post-treatment at 10 days after deposition ($p = 0,03$) and on days 3 ($p = 0,003$), 7 ($p = 0,004$) and 28 ($p = 0,004$) post-treatment at 30 days

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after deposition. Polyphaga larvae were significantly reduced on days 7 and 28 after treatment ($p = 0,02$ and $p = 0,006$ respectively), at 30 days after deposition. Miles of the Gamasida sub-order were reduced on day 14 post-treatment, at 10 days after deposition ($p = 0,03$) and on days 3 and 28 after treatment at 30 days after deposition ($p = 0,03$ and $p = 0,006$ respectively). These results that residues of invermectin in the feces of bovines affected the colonization of the dung pats deposited on *Brachiaria decumbens* plots.

Comportamento sexual de fêmeas da raça holandesa

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Marcos Cordeiro Durães
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Vanderlei Ferreira de Sá

SEXUAL BEHAVIOUR OF CONFINED HOLSTEIN FRIESIAN COWS

ABSTRACT: It was carried out at EMBRAPA/CNPGL, in Cel. Pacheco, MG, Brazil, a study about the sexual behavior of the Holstein cows, during Summer and Winter, comparig natural and induced estrous, with the objective to improve the reproduction efficiency and heat detection.

The experimental trial consisted of continuous observations of fourteen females kept under feed lot, with water, feeding and mineral salt, "ad libitum". After ovarian examination as well as the identification of luteo body presence, the heat was induced through intramuscular injection of prostaglandin F2a (PGF2a). The observations were carried since the first cows accepted mouting, and they lasted 72 hours in Summer time, and 96 hours during the Winter. Eighteen days after the first induced estrous, the cows sexual behavior was observed during 176h in Summer and 181h in Winter for natural estrous. The animals were identified and registered as instigator or as target, and sexual behavior of each cow was registered, suchas: to lick (L), to sniff (S), flehmen (F), press chin (PC), sexual butting (BS) and agressive butting (BA), following (FO), mounting attempt (MA) and mounting (M). The cow's most frequent behaviors were BS, PC and L, and they occured during the day (from 6 AM to 6 PM) in the Summer, When the natural heat was detected, However, in the induced heat, both BS, and M behaviors were the most frequent ones, During the Winter from 6 PM to 6 AM, M was the only sexual behavior observed in the induced heat.

Sexual activities reduced during Summer, due to high level of temperature. It was noticed that females in heat, tend to act

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more than accept others cow's sexual demonstration. Therefore. Among the different types of sexual activities, the front mounting (MF) was the most practiced one.

The heat activities lasted 66,43h (Summer) and 62,08h (Winter), respectively, after PGF2a aplication, however, this difference was not significant (p>0,05). The average of induced estrous activities lasted 12,28h (Summer), 13h (Winter), and natural estrous were 15,8h (Summer) and 16,14h (Winter), respectively. The average number of mounting per hour for cows in estrous were 3,07 and 4,13 (induced estrous, in the Summer and in the Winter, respectively) and 2,42 and 2,21 (natural estrous, in the Summer and in the Winter, respectively). The average number of all mounting received by a cow was 43,71 (Summer) and 55,7 (Winter) for induced estrous and 31,0 (Summer) and 39,43 (Winter) for natural estrous.

During the Summer season, it was observed that the first signal, of heat behavior started more frequently at daylight. However, the sexual activities were more intense during the night. On the other hand, during the Winter, sexual activities were more evenly distributed during the day, with a slight tendenxy to increase at night. So, it extremely important to concentrate the observations on heat detection during the night time to avoid missing na early identification of a cow's heat.

Based upon in the individual description of the cow's sexual behavior, it is recommended that Holstein cows would be kept together, in small group, in order to improve the heat detection, and consequently, reproduction efficiency.

Comportamento canibalístico de *Macrobrachium rosenbergii* (De Man, 1879) (CRUSTACEA, PALAEMONIDAE) em condições de laboratório: efeito da retirada das quelas

Marcos Cesar de Souza[1]
Marta D'Agosto
Sônia Sin Singer Brugiolo

EFFECT OF CHELAE REMOVAL ON THE CANNIBALISTIC BEHAVIOUR OF *Macrobrachium rosenbergii* (De Man, 1879) (CRUSTACEA, PALAEMONIDAE) UNDER LABORATORY CONDITIONS

ABSTRACT: The present experiment was carried out in the Zoology Laboratory of the Federal University of Juiz de Fora, Minas Gerais, Brasil. The affect of the chelae's removal from the males of *Macrobrachium rosenbergii* (De Man, 1879), was tested in order to verify cannibalistic behavior. Newly-molted individuals were kept in individuals shelter-less tanks and exposed to intermolt conspecific with chelae's ablation of the cheliped and with chelaes's intacts of the cheliped. The animals were fed daily, ad libitum, with commercial ration FSH 30. The tanks were cleaned by siphon. The results showed evidences that individuals of *M. rosenbergii* with amputed chelae, do not exhibited cannibalistic behavior do not exhibited cannibalistic, nor caused physical damage to theirs coespecifics. However, individuals with entire chelaes were able of cannibalism or even to cause cannibalistic mutilations.

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Estratégias sociais e implicações ecológicas no processo de fundação de *Polistes versicolor* (Olivier, 1791) (HYMENOPTERA: VESPIDAE)

Lenira Eloina Coelho de Souza[1]
José Roque Rapôso Filho

SOCIAL STRATEGIES AND ECOLOGICAL IMPLICATIONS IN THE FOUNDING PROCESS OF P*olistes versicolor* (Olivier, 1791)

ABSTRACT: In this study the process of foundation in *P. versicolor* (Olivier, 1791) colonies was analyzed, and its objective was to evaluate the behavioral strategies demonstrated by the foundress and the selective advantages associated with the pleometrotic foundation. The colonies were observed in the field since the beginning of the appearance of workers, in 1996 and 1997, in Juiz de Fora, MG. Sucess was evaluated among colonies and the founder's behavior was analysed, to characterize the dynamic of the foundation process and to discuss the formation of the groups. Colonies that completed the foundation process was considered well succeeded. The number of construted cells, the growth rate, the number of produced workers and the duration of the process were used as success measurements of the colonies. The flow between individuals was evaluated, as well as the parasitism and usurpation. Behavioral observations were conducted at three different periods in the egg, larval, and pupa sub-phases, and the estimated tolerance, to evaluate the conflict between the dominant founder and co-founders during the foundation. Group size affected significantly the success of the colonies; however, ecological and social variables acted together selectively. Although the acceptability standard between founders was high, behavioral interactions were altered during the foundation process and conflict occurred. Therefore, the foundation in *P. versicolor* colonies is characterized as na ecological process, in which conflict and cooperation are maintained, and where ecological and social variables act interdependently to establish the costs and benefits of this association.

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Estudo da idade e das condições morfofisiológicas influenciando o peso corporal de fêmeas adultas de *Polistes versicolor* Olivier, 1791 (HYMENOPTERA, VESPIDAE)

Glória Maria Cosme de Souza[1]
Maria Nei da Silva

STUDY OF THE AGE AND THE MORPHOPHYSIOLOGICAL CONDITIONS INFLUENCING ON THE BODY WEIGHT OF ADULT FEMALES OF P*olistes versicolor* Olivier, 1791 (HYMENOPTERA, VESPIDAE)

ABSTRACT: This paper was conducted in Juiz de Fora, Minas Gerais, Brazil and consisted on observations of pre and postemergent colony stages of *Polistes versicolor* Olivier, 1791, *in situ*, aiming to recognize the life cycle, social order, enemies and labor division tasks in the specie. The registers lead to data about the colonies development and the winter assemblage formation, we noticed that *P. versicolor* colonies show an asynchronic cycle, with a social organization that is highly dinamic which promotes changes on the individuals hierarchic position. Laboratorial tests were conducted to verify the efficacy or non-efficacy of the secretions produced by the 5th, the 6th and the 5th the 6th gastral sternite of femeles and males of this specie against ants *Crematogaster* sp, in such way that it would be possible to compare its efficiency in relation to the hierarchic position of femeles wasps (dominants and subordinates) as well as males, concerning development stage and/or sub-stage of the colonies cycles, besides the overwinter femeles assemblages. The ants taken from four colonies kept in laboratory reacted to the secretions smeared on a **Y** shaped glass capilar, which only one end of the **Y** bridge received the treatment as follow: (1) choose and come back with antenning, (2) choose and come back with antenning and jawing, (3)

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straight to the control end with antenning, (4) choose the control end with antenning, (5) choose the control end with antenning and jawing, (6) straigh to the test end with antenning, (7) choose the test end with antenning and (8) choose the test end with antenning and jawing. Using the X^2 (chi-square) test we concluded that the secretions are more efficient in repelling ants during the pre-emergent stage than on postemergent stage. The substance secreted by the dominants shows a most repulsive action than the substance secreted by the subordinates of the pre-emergent stage. The secretion produced by dominants and subordinates postemergent do not differ in repellence action; dominats and subordinates from different colony cycle sub-stages show secretions that have different repellence levels and the secretions produced by male is efficient as ants repellent, as well as the one produced by femeles from overwinter assemblages. We noticed, however, that the substance lost, in part, its efficacy during the period of the test. Abiotic factors as temperature and light interfered on the repellente efficacy of the substance secreted. We can state, based on the results that *P. versicolor* developed an evolutive strategy highly specialized to repel ants: a chemical barrier that is smeared on the petiole and on top of the cells.

Variação populacional de oligoquetos terrestres em diferentes ambientes fitofisionômicos do Parque Estadual do Ibitipoca- MG

Gilson Alexandre de Castro
Marta D'Agosto

LAND OLIGOCHAETE POPULATION VARIATION IN DIFFERENT PHYTOPHYSIOGNOMIC ENVIRONMENTS OF THE IBITIPOCA STATE PARK – MG

ABSTRACT: Aspects of the composition, habitat distribution and population variation of earthworms collected in the Parque Estadual do Ibitipoca (MG) were studied. Material sampling and fortnightly and monthly observations were carried out from April 1993 until May 1994 and from October 1995 until January 1997, respectively. Five species of the genus *Rhinodrilus* Perrier, 1872 were found: *R. curtus* Stephenson, 1931, *R. senckenbergi* Michaelsen, 1931, *R. hoeflingae* Righi, 1980, *R. garbei* Michaelsen, 1926 and *R. fafner* Michaelsen, 1918, being unlikely a substantial increase in the number of these species. Out of the 64 specimens collected, 50 were of *R. garbei*. The species showed preferences regarding the vegetation, where some species were found only in the gallery forest (*R. curtus*, *R. senckenbergi* and *R. fafner*) while others (*R. garbei* and *R. hoeflingae*), apart from the gallery forest, were also found in fields dominated by grasses and shrubs (*R. hoeflingae*) and in the campo rupestre "*stricto sensu*" and in the seasonal montane semi-deciduous forest (*R. garbei*). The vertical distribution varied. It was a broad distribution for *R. garbei* (0-25 cm), showing intermediate variations for *R. curtus* (0-15 cm) and *R. senckenbergi* (2-15 cm) and restricted to *R. hoeflingae* (0-2 cm) and *R. fafner* (25 cm). Observations about the way of life of each species at different phytophysionomic environments have been presented. The density of *Rhinodrilus* during the raining season (January till March) was greater than that of the dry season (April till June).

Pomacea lineata (Spix, 1827) (MOLLUSCA, GASTROPODA, AMPULLARIDAE): efeito do agrupamento sobre o peso

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Marta D'Agosto
José Milton Barbosa

Pomacea lineata (Spix, 1827) (MOLLUSCA, GASTROPODA, AMPULARIIDAE): THE GROUPING EFFECT ON THE WEIGHT

ABSTRACT: In this work, accomplished in laboratory, in the Federal University of Juiz de Fora - MG - Brazil, about the growth of *Pomacea lineata* (Spix, 1827) isolated animals were studied in groups of four animals, isolation was visual and physical. They were appraised for the weight and growth rates. The treatments were analyzed (ANOVA) independently of the sex and in each sex. The isolated animals grow more quickly and show larger growth rates than those created contained. The reduction of the growth for males and females appears in different moments and the growth rates have decreased along the time of the experiment.

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Comportamento e dinâmica de população da vespa noturna de fundação por enxameamento *Apoica flavissima* Van Der Vecht, 1973 (VESPIDAE, POLISTINAE, EPIPONINI)

Fabio Santos do Nascimento[1]
José Roque Rapôso Filho

POPULATION BEHAVIOUR AND DYNAMICS OF THE NOCTURNAL WASP *Apoica flavissima* Van Der Vecht, 1973 (VESPIDAE, POLISTINAE, EPIPONINI)

ABSTRACT: In this work were analysed colonies and nests of the nocturnal Neotropical social wasp *Apoica flavissima* in several stage of the development cycle. The nests were located in sheltered places and in trees that offered support to the colonies. During the day, the adults cluster on the comb's. The wasps fan their wings to cool the colony and suck water of the nest after a heavy rain. At night, the wasps accomplish fast leaving and they come back soon after. The foraging wasps continue to fly bringing prey, water and nectar it is distributed to other workers. The foraging behavior increases during the nights of full moon and growing moon. In a given colony we found three types of females: queens that possessed mature ovocites and were inseminated, workers with undeveloped ovaries and were not inseminated and intermediates that possessed ovaries with ovocites at earlier development and were not inseminated. The measurements of four body parts through the Canonical Discriminant Analysis and Mahalanobis distances discriminated between castes. Queens and workers presented clear-cut dimorphism, while the intermediates presented characteristics of both castes. The number of queens decreased along the development of the cycle of the colony supporting the ciclical oligogyny hypothesis for the maintenance of the sociality in the Neotropical swarm-foundation polistines wasps.

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Comportamento e ecologia de larvas e fêmeas ingurgitadas do carrapato *Boophilus microplus* (CANESTRINI, 1887) (ACARI: IXODIDAE) em pastagem de *Brachiaria decumbens*

Ana Carolina de Souza[1]
John Furlong

BEHAVIOUR AND ECOLOGY OF LARVAE AND *Boophilus microplus* (Canestrini, 1887) INGURGITATED FEMALES (ACARI, IXODIDAE) IN THE PASTURE OF *Brachiaria decumbens*

ABSTRACT: The *Boophilus microplus* tick parasite mainly cattle, it's situated between 40°N e 30°S parallels, having great economic importance, where it causes annual prejudice of 1 billion dollars. Just few researches were done with an ecological and behavioral vision of the larvae and engorged female in pasture and this is the main aim of this work. Six experimental repetitions were completed in the winter months, June-August, 1998 and in the summer months, November-January, 1998/ 1999. Larvae were accommodated in 20 plastic syringe, it were put in *Brachiaria decumbens* pasture in the Embrapa Gado de Leite in Juiz de Fora – MG, allowing their spontaneous exiting. They were observed 3 times for week in 3 times for day, with climatical factors recorded. Three hundred engorged females were weighted, identificated with appropriated dye and distributed in *B. decumbens*. In determinated hourly they had their dislocate measured and they were collected and weighted before the oviposition beginning. The time taken for the larvae to reach the extremities of the grass was related to the air temperature and relative humidity, taking two days in the winter and two to three in the summer. In the winter, the larvae formed

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larger and more active aggregations at the grass tips. In summer, the aggregations were smaller as the larvae were practically inactive. This was considered as a mechanism to avoid overheating and increase ventilation to save energy, and their lateral and vertical migrations a behavioral strategy to avoid the direct rays of the sun. The engorged female can walk since the moment in what they fall of the host until the oviposition moment, what is affected by luminosity, temperature and vegetal cover. In cloudy and humid days, engorged female walks just a little and in temperature under 15°C, with 95% of humidity, they practically don't move. They don't walk at night or with rain and they walk more in winter (59,22 cm average and in summer 21,3 cm) when climatical factors are more bland. When engorged female walk more, it loses more corporal weight in this season (7,9% average and in summer 2,9%), but it doesn't interfere in the average weight eggs mass (winter: 0,12 g and summer: 0,11 g). The ant, *Pachycondyla striata*, was confirmed as the tick's principal predator that fed on the engorged females *in situ* or taken to its colony. Predation was greater during the summer (50.5% of ticks released) than the winter (33.33%). It was concluded that this ant should be investigated further for possible future employment in the biological control of *B. microplus* in Brazil.

Função dos nectários extraflorais em *Heteropterys campestris* (HBK), uma Mapighiaceae do Cerrado

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Kléber Del-Claro

THE FUNCTION OF EXTRAFLORAL NECTARIES IN *Heteropterys campestris* (HBK), A MALPIGHIACEAE FROM CERRADO

ABSTRACT: The diversity of insect species in the tropics, plants bearing extrafloral nectaries and their associations with ants have been object of studies by naturalists for a long time. Extrafloral nectaries (EFNs) are nectar-secreting organs not directly involved with pollination functions. Plants bearing EFNs may account for up to 31% of the woody individuals and 25% of the woody individuals and 25% of the woody species in the Brazilian cerrado. *Heteropterys campestris* (Malpighiaceae) is a common shrub species in the cerrado vegetation *sensu stricto*, of Uberlândia, Minas Gerais, Brazil. To evaluate whether ants attracted to the EFNs of *H. campestris* reduce the action of herbivorous insects on the plants, we plotted two branches in each plant (N=62). Each branch was assigned randomly as treatment or control by the fly of a coin. Ants had free access to control plants. Treated trees had their trunks banded with a sticky resin which avoided the acces of ants. Folivory of young and adult leaves was evaluated prior to ant exclusion (January) and six months later (July). In January 1998, the number of flower buds was counted and in July, the number of fruits set. We studied the life cycle of *Chlamisus sp*. (Coleoptera), the main herbivorous species on the flower buds, as well as its biology, behavior and interactions with ants. Six instars of development were found for this beetle. Its life cycle spans one years. The ants protected the control branches against herbivory in adult leaves, but not in young ones. Branches with ants had a higher fruit-set than branches where ants were

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excluded. This occured to all groups of ants, except the genus *Ectatomma*. *Camponotus* was the most abundant genus in the control branches, being the dominant one in 23 of the 62 branches. The assumption that ants are important agents against herbivory is true for this species. However, the efficiency in herbivory deterrence varies among ant species. Many studies demonstrate that ants protect plants with EFNs against herbivory, increasing their reproductive success. Although recent in cerrado savannas, studies such as this, with *H. campestris*, seem to reinforce the hypothesis that biological and behavioral characteristics of the organisms involved in multitrophic interactions interfere positively in the reproductive fitness of plants bearing extrafloral nectaries.

Resistência do carrapato *Boophilus microplus* (CANESTRINI, 1887) (ACARI: IXODIDAE) à carrapaticidas em bovinos de leite da região da Zona da Mata de Minas Gerais

Rogério de Oliveira[1]
John Furlong

THE TICK *Boophilus microplus* (Canestrini, 1887) (ACARI, IXODIDAE) RESISTANCE TO TICKCIDE IN DAIRY CATTLE FROM ZONA DA MATA REGION, MINAS GERAIS

ABSTRACT: The tick *Boophilus microplus* is the species with the greatest geographical distribution and economic importance for major cattle farmers ranging from parallels 32 North to parallel 32 South. Chemical control is still commonly used for this parasite wideworld. Nevertheless, the inadequate handling of acaricides has greatly contributed for the appearance of tick resistance to most products available, being a matter of concern to farmers and technicians involved in the process of controlling this parasite. The problem is very serious and, in some places, there are not any product capable to effectively control the resistant tick population. Since the search for new chemicals is costly, preserving the efficiency at the available groups of acaricides in the market is of fundamental importance. Based on these facts, this research was outlined to evaluate acaricides frequently used in the Zona da Mata region in the state of Minas Gerais, Brazil. At the laboratory of Acarology of Embrapa Gado de Leite in Juiz de Fora, MG, imersion tests were performed between May 1997 and August 1998, with engorged females of *B. microplus* collected from 60 private farms randomly chosen in the Zona da Mata Region.

Five groups of acaricides, representative of the products available in the market, were chosen for the the test. For each

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sample, engorged females morphologically normal were selected. After being weighed, in groups of 10, they were immersed in each of the five products tested using the commercially recommended dosage, during 5 minutes: Coumaphos (Assuntol); Amidina (Triatox); Decamethrin (Butox), Cypermethrin + chlorfenvinphos (Supocade); Alfamethrin (Ultimate). Two control groups were immersed in water. Subsequently, the weight of the eggs and the percentage of eclosion of the larvae were evaluated. Calculations were made using the data obtained in order to achieve the efficiency of the tested products using DRUMMOND's Method. Deltamethrin and Alfamethrin presented a very low performance (27,3% and 26,36%, respectively) and were not significantly different (P>0,05). The results show that there are low susceptibility of the populations of *B. microplus* to the contact acaricides tested in the Zona da Mata Region in the state of Minas Gerais, Brazil. The conclusions drawn in relation to the generalized resistance corroborate the data in the examined literature showing the necessity to have specially delineated tests to be carried out and executed (larvae tests and tests with ingurged females) in order to monitor the dissemination of the tick resistance to the acaricides and to recommend efficiency and economic control alternatives.

Interação entre formigas e *Qualea multiflora* Mart. (VOCHYSIACEAE), uma planta com nectários extraflorais no Cerrado de Uberlândia, MG

Paula Cristina Diniz de Queiroz[1]
Kléber Del-Claro

INTERACTION BETWEEN ANTS AND *Qualea multiflora* Mart.. (VOCHYSIACEAE), A PLANT WITH EXTRAFLORAL NECTARIES FROM UBERLÂNDIA'S CERRADO, MG

ABSTRACT: In this study we worked with *Qualea multiflora.* Mart (Vochysiaceae), a common cerrado tree bearing paired Extrafloral Nectaries (EFNs) on the stem next to the insertion of the leaves, and on the bud pedicels. The ENFs attracts many ant taxa, many authors have demonstrated that the associations between ants and EFNs are beneficial to the plant, ants attracted to the ENFs of plants should reduce the actions of herbivorous insects on the plants.

Field work was done between September 1997 and June 1998 in cerrado vegetation (*sensu stricto)* in Uberlândia, Minas Gerais state, south-eastern Brazil (18º 57' S, 48º 12'W) in Reserve Ecological of CCPIU. This study provides which variation in herbivore faunas and ants faunas association in *Q. multiflora* should affect the rate net benefits between the mutualists. To evaluate whether being temporal variation in net benefits between the mutualists, we compared the results of field work 1997 with the results of field work 1994 of Del-Claro *et al* (1996). In field work two experiments were performed. In the first experiment (September, 1997) 30 trees were selects. The one branch pairs of each tree had same height and number of stems and were in the same phenlogical state

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were marked. Branch of each pair were assigned randomly as treatment or control by the flip of a coin. Ants had free access to control branches. Treated branches had their stems banded with a sticky resin (Tanglefoot ® rapids Michigan) which impeded the access of ants. Folivory was evaluated three times, fifteen days latter ant exclusion, three months latter and exclusion and six months latter ant exclusion. Folivory notwere significantly more in branch without ants than on branch with ants. The Homoptera and Ortoptera was main herbivore on leafs of *Q. multiflora*. The ants didn't reduce the Homoptera and Ortoptera great abundance.

In second experiment we investigated the effect of ant visitation to of *Q multiflora* on the reprodutive output of the plant. Using the same 30 experimental branch pairs, we selection two inflorescence on each branch of the 20 experimental pairs that flowered during October. Inflorescence the same number of buds were marked in each branch of a pair. In March we registered the number of fruits formed per buds produced in each experimental group. Branch with free ant access as many fruits per buds than did treatment branch. The beetles was the main herbivore on buds and flowers of *Q multiflora*. The ants reduce significantly the abundance of beetles in branches. The herbivore faunas and ant faunas was different between years. In 1997 the beetle *Macrodactylus pumilio* wasn't present in branches but other beetle was present. In 1994 Homoptera wasn't much present in branches. The most abundant ants observed in 1997 belong to the genus *Crematogaster* and *Camponotus*. The most abundant ants observed in 1994 belong to the genus *Camponotus* and *Zacryptocerus*. In field work 1994 the folivory were significantly more in plants without ants than on plants with ants. In field work 1994 as many ant protect EFNs of *Q. multiflora* against herbivorous insects than did field work 1997.

Influência da pineal e do nervo óptico na lactação de ratas

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INFLUENCE OF THE PINEAL GLAND AND THE OPTIC NERVE IN FEMALE RATS LACTATION

ABSTRACT: The circadian rhythm comprises cyclic functions important for the animal temporal orientation regarding the reproductive strategies to be adopted along of the year. The principal rhythm used for the synchronization with the environment is the light-dark rhythm or photoperiod. One of major components of this rhythm is the pineal gland, wich is responsible for the transduction of the photic stimulus into the hormonal secretion of melatonin. Melatonin stimulates larget organs such as the suprachiasmatic nucleus and the pituitary gland to send behaviour-synchronizing-neural and hormonal signals, wich synchronize the photoreriod-dependent-reproductive behavior and the post-natal development of Wistar rats (*Rattus norvegicus* Berkenhout, 1769), offsprings was carried out, using mothers that had been submitted procedures wich interferred with then perception to light. 20-day-pregnant Wistar rats, obtained from the CBR vivarium of UFJF, underwent pinealectomy, section of optic nerve, pinealectomy and optic nerve section and constant exposure to ligth. The control animals underwent simulated operations and another group of female rats from the colony were kept under normal conditions of case. The clinic maternal conditions, the maternal mortality indices and food consumption were analysed. The offsprings were weight on the birth, 5, 14 and 25th days, and the deaths observed in these days were noted. Milk consumption on the 14th day was also analysed by comparison of body weight 30 min before and after feeding. The results indicate that the alteration of the maternal photoperiodicity affects the development of offsprings, increases the mortality rate among them and causes puberty delay.

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Avaliação quantitativa e do comportamento de escape e migração de ciliados no sistema rúmem-retículo de bovinos

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EVALUATION OF THE ESCAPE BEHAVIOUR AND MIGRATION OF CILIATES IN THE RUMEN-RETICULUM SYSTEM OF BOVINES

ABSTRACT: The ruminants are characterized by intense presence of microorganisms in the rumen and in the bowel, responsibile they are for the majority of nutrients digestion. The protozoas were the first identified microorganisms in rumen, but, their importance to the animals is not well cleared yet. Some authors consider them as protein source for the host, once, they would be digested at the stomach cavity. Such observation is, however, contested by other authors who asseverate the existence of a retention of entodinomorphes ciliates at the rumen and a isotrichidae ciliates sequestion comportament to the walls of the reticulum moments after the digestion. The present work had as objective collecting and quantifying the genus of ciliates which occur in the rumen, omasum, abomasum and the reticulum in bovines, rises evidences about the sequestion comportament of isotrichidae in the rumen-reticulum system, to evaluate the relation between this genus and the populations types found. There have been colleted 45 ml of rumen, reticulum, omasum and abomasum content from 30 animals abated in Além Paraíba MG, at moment of the the collecting, temperature and pH were measured and later samples were analysed in laboratory. The results show that the rumen and reticulum ambients are rather stable with an average temperature between 36 e 37º C and pH 6.5. The genus most found in the rumen were *Entodinium* (64.99%), *Isotricha* (6,95%), *Diplodinium* (5.74%), *Ostracodinium* (5.14%),

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Eremoplastron (4,53%) *Dasytrica* (3.84%) and some other seven genus which make the total of 8.72% remaing. In the reticulum the results were *Entodinium* (35.24%), *Isotricha* (23.41%), *Dasytricha* (15.35%), *Eodinium* (7.2%) *Eremoplastron* (5.03%), *Diplodinium* (4.33%), *Ostracodinium* (3.77%) and some other five genus making the total of 5.62% remaining. In omasum they were found the same genus, even so in smaller amount that in the rumen and reticulum. In abomasum, it was just found *Entondinium* in small amount. The results demonstrate a predominancy of Entodinomorphids not only in the rumen but also in the reticulum, although with minor difference respecting to Isotrichidae when considered the reticulum since in both cavities they prevail. In respect to the migration of Isotrichidae the data strngthen this idea, since there was a remarkable increase of Isotrichidae in the reticulum compared to the rumen.

Comportamento de vacas Gir leiteiras submetidas a aplicação de hormônio de crescimento

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BEHAVIOUR OF THE INDIAN DAIRY CATTLE (GIR BREED) TREATED WITH GROWTH HORMONE

ABSTRACT: In order to evaluate the effect of the use of bST on the behavior of the Gir cattle, 23 cows were distributed into 3 groups of treatment. Seven animals from the control treatment received 1 ml of physiological solution every 14 days. Another group received 250 mg bST every 14 days, and the third the dosage of 500 mg bST every 14 days. Five applications subcutaneous were done and data were collected weekly. In the week following the applications, observations have been done during the day in order to get data about the time of ingestion of food, rumination and rest. In that same date the production of milk was verified. At the moment of the application of bST, the thoracic perimeter, the number of heartbeats per minute, the number of respiratory movements per minute, the enteric temperature were measured and the CMT and dark fund cup tests were done in order to rise the index of mastitis of each one of the treatments. During the first application of bST and the last data collecting, samples of blood were collected for the verification of the animals hematological profile. After 14 days of the last application of bST, samples of milk were collected for the verification of the somatic cell counting as well for the raising of the milk composition. Meaningful differences were not detected in terms of production or related to the milk composition, among the three treatments. For the animals that received 500 mg bST every 14 days, it was verified the increase of the number of respiratory movements and enteric temperature, indicating the interference

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of bST in the response to the caloric stress. It was verified the decrease of the percentage and the counting of lymphocytes and the increase of the percentage of segmented leucocytes. About the behavior, it was found out the decrease of the cows time of rest. However for the treatment of 250 mg of bST, it was verified the increase of the number of heartbeats per minute, of the index of CMT and the counting of the somatic cells showing the interference of the bST in the incidence of mastitis of the cattle. The bST interfered in the behavior of the cows once it can be evaluated an increase of the time of rumination.

Avaliação do potencial embriotóxico da oxcarbazepina administrada em ratas Wistar

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EVALUATION OF THE EMBRYOTOXIC POTENTIAL OF OXCARBAZEPINE ADMINISTERED TO FEMALE WISTAR RATS

ABSTRACT: The precocious development of the embryo occurs in specifc microenvironments present in the oviduct and in the uterus. Factors capable of changing such environments can cause lesions which, depending on their severity, lead to the conceptus death or to the appearance of future organic alterations. The present work was evaluating if the administration of 20 or 200 mg/kg of body weight of oxcarbazepine to female Wistar rats during the pre-embryo development and in the periimplantation period caused the death of the pre-embryos, prevented implantation or caused alterations in the embryo development. To carry out this work, female Wistar rats, supplied by the Centro de Biologia da Reprodução Vivarium – UFJF – were mated with fertile males and after insemination were randomly distributed in groups of 15 animals in the following experiments: I (treatment on the first day of gestation); II (treatment on the second day of gestation); III (treatment on the third day of gestation); IV (treatment on the forth day of gestation); V (treatment from the first to the forth day of gestation); VI (treatment from the fifth to the seventh day of gestation). Female rats of experiments I to V were killed on the fifth day of gestation. On this day, the pre-embryos were counted and their morphologic development was analysed. In the experiment VI, female rats were killed on the fifteenth day of gestation, and the live and dead fetuses and the resorptions were counted. Furthermore, the fetuses and their respective placentae were weighed and the fetuses' morphologic development was evaluated. Maternal body

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weight of all groups was measured at the beginning and at the end of treatment and on sacrifice day. Ovary weight was also measured and the number of corpora lutea counted. The results indicate that the treatment with oxcarbazepine (20 or 200 mg/kg of body weight) does not have any toxic effect on the mothers and does not affect the pre-embryo or embryo development.

Ictiofauna do Ribeirão Santana, Município de Rio Preto - MG: inventário, distribuição e hábitos alimentares

Gláucia Gonzaga Galvão[1]
José Carlos de Oliveira

ICHTHYOFAUNA FROM RIBEIRÃO SANTANA, RIO PRETO COUNTY – MG: INVENTORY, DISTRIBUTION AND FEEDING HABITS

ABSTRACT: The purpose of this research was to accomplish the inventory of a community of fish in the ribeirão Santana, Rio Preto county (22º02'S, 43º47'W), Minas Gerais, Brazil, and to study the spatial and temporary distribution and feeding habits of the constant or nourishment important species. The field activities were developed monthly in the period of July, 1996 to July, 1997 during the construction of Aproveitamento Hidrelétrico de Mello. Three collect points were selected which embraced a stretch of approximately 3 km, corresponding to the area directly affected by the enterprise. The collect points were subdivided in slow and rapid flow segments. The analysis of the spatial distribution shows the preference mainly for characteristic habitats among the slow and rapid flow segments influenced by the speed of the water, the most important abiotic factor in the distribution of the fishes. In the 21 registered species *Hoplias* gr. *H. malabaricus*, *Rhamdia quelen* and *Geophagus brasiliensis* has been considered constant in the segments of slow flow, against *Characidium* cf. C. *alipioi* and *Neoplecostomus microps* in the rapids. The occurrence of greater number of species in the point 1 is due to the bigger volume of water of the stream, the proximity of the Preto river and physical barriers that disable the passage, mainly of larger fishes to upper stream. It were analyzed the stomach contents of representatives of six fish species of the ribeirão Santana.

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Astyanax taeniatus demonstrated to be a omnivorous and opportunist species; *Geophagus brasiliensis*, omnivorous; *Hoplias* gr. *H. malabaricus* and *Oligosarcus hepsetus*, carnivorous tending to piscivory; *Rhamdia quelen*, generalized carnivorous, and *Leporinus mormyrops*, herbivorous. The analysis of the diet shows a food overlap that can be minimized due to small differences in the space distribution, periods of activities and alimentary preferences.