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INFLUENCE OF LIGHT CONDITIONS ON ADULT MORTALITY AND EGG-LAYING OF *TRIATOMA BRASILIENSIS* NEIVA, 1911 (HEMIPTERA: REDUVIIDAE: TRIATOMINAE)

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We compared, for Triatoma brasiliensis, *the egg-laying process and the mortality of adults under conditions of almost permanent darkness and with normal laboratory luminosity. Mortality did not differ between groups. The egg-laying per vial and per female was significantly greater in the group of normal luminosity. We consider that it is not recommendable to keep the adults of this species under complete darkness. Other biological aspects should be analysed in relation to luminosity.*

Key-words: Light-dark cycle. Triatoma brasiliensis. *Triatominae.*

Due to the predominance of feeding and ambulatory activity of triatomine bugs during the nocturnal period, under experimental condition[2,5] and in nature[8], these bugs have generally been bred, in the laboratory, with little or no luminosity.

Based on reports of better performance in almost total darkness[7] and better yield with light[6], we decided to observe the effect of total darkness on egg-laying and mortality of adults of *T. brasiliensis*, to look for ways to improve the productiveness of breeding of these insects and to obtain data on the effect of light deprivation on their biology.

MATERIAL AND METHODS

We divided the adults of a colony of *T. brasiliensis*, started four years before the experiment, with insects of the municipalities of Aguiar and Boqueirão dos Cochos, in Paraíba, into two groups. Each group initially had 98 males and 73 females and was maintained in a transparent plastic cylinder. The cylinders had a volume of 4.7l, contained a perforated light cardboard cylinder, absorbent paper in the bottom and were covered with white shirting. Both were kept in a bookcase, three meters from a window, and near fluorescent lamps frequently used during the day, with a light-dark periodicity of ca. 13:11h. One of them was covered by a black cardboard cylinder, a little larger then the cylinder itself. The room temperature was held at 27 +/- 1°C and the relative humidity was 70-80%.

RESULTS

Mortality for the period of 15 weeks was about 50%. The differences between groups, analysed by Chi-square, were not significant. The egg-laying per vial and per female per week (Table 1) was higher in the vial exposed to luminosity, analysed by Wilcoxon at 5%. The general means of egg/female week were 4.6+/-0.9 for the group in total darkness and 5.9+/-1.2 for the light/dark group. The eclosion percentage, for some weeks, also is shown in Table 1.

DISCUSSION

Wood[13] emphasized the negative phototaxic responses, indicating preference for darkness, Dias[4] did not refer to this factor, while Gomez-Nuñez[6] affirmed that light increased the production of *Rhodnius prolixus*. It was known that triatomine bugs perceive light stimuli with the eyes, the ocelli and tegument[12], the proportion of darkness: light hours influences the rythm of oviposition[1], and bugs prefer to lay eggs between 6 and 8 p.m., under laboratory conditions in Belo Horizonte, Minas Gerais, Brazil[5]. However, there was no conclusive data on the influence of light on mortality and egg-

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Table 1 - Oviposition of T. brasiliensis *maintaned in different light conditions.*

Weeks	Darkness				Light/darkness			
	mean of females/ period	eggs/ vial	eggs/ female*	% of eclosion	mean of females/ period	eggs/ vial	eggs/ female*	% of eclosion
1	72.0	482	6.7	-	73.0	613	8.4	-
2	69.5	342	4.9	-	71.0	221	3.1	-
3	66.5	365	5.5	55.1	68.5	403	6.0	69.5
4	62.5	215	3.4	-	65.5	380	5.8	-
5	58.5	298	5.1	55.4	61.5	458	7.5	83.8
6	56.0	221	4.0	48.9	57.2	313	5.5	68.7
7	54.0	221	4.1	48.9	55.8	312	5.5	68.6
8	50.6	214	4.2	50.0	52.5	252	4.8	62.3
9	46.0	177	3.8	-	50.0	242	4.8	62.0
10	43.5	242	5.6	53.7	48.5	254	5.2	-
11	40.0	175	4.9	-	45.0	295	6.6	-
12	36.5	117	3.2	-	42.5	263	6.2	-
13	34.0	182	5.4	-	38.5	264	6.9	-
14	32.0	160	5.0	-	33.5	220	6.6	-
15	30.0	137	4.6	-	30.0	190	6.3	-

* The ratio eggs/female was calculated taking into account the eggs layed during the week and the mean of females at the beginning and at the end of the same period.

laying.

Direct sunlight, with or without glass, can be harmful to some species of triatomine bugs[10 11]. In our study, this factor probably had no effect, due to distance from the window and the moderate temperature.

The insects exposed to light could hide temselves in the cylinder, therefore they were not forced to be exposed to strong light, implying that it was the availability of light which influenced egg-laying. Probably, a little light must have passed through the shirting, which was not covered. The significant differences in the egg-laying indicates that this light leakage was not enough to equate the results, but it could have influenced mortality.

We can conclude that it is advantageous to maintain adults of *T. brasiliensis* in normal luminosity conditions. The higher proportion of eclosion of eggs from females in this condition is an additional factor indicating this condition as better for breeding.

Egg production per day per female and the proportion of eclosion in light/dark and darkness conditions was much lower than observed previously[7 9]. This could be an influence of blood source[3] and of age of females and of time colonies are maintained in the laboratory[9]. The colony used in this study, eight years after it started, had such a production decrease that it could not be used for xenodiagnosis.

RESUMO

Comparamos, para T. brasiliensis. *a postura e a mortalidade de adultos em condições de escuridão quase permanente e de luminosidade normal de laboratório. Os grupos não diferiram significativamente quanto à mortalidade. A postura por frasco e por fêmea foi significativamente maior no grupo de luminosidade normal. Não consideramos recomendável manter os adultos desta espécie em escuridão completa. Outros aspectos biológicos devem ser analisados com relação à luminosidade.*

Palavras-chaves: Ciclo claro-escuro. Triatoma brasiliensis. *Triatominae.*

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