Journal of the American Mosquito Control Association, 20(3):328–330, 2004

SCIENTIFIC NOTE

INFLUENCE OF THE BLOOD MEAL SOURCE ON THE BIOLOGY OF *MECCUS LONGIPENNIS* (HEMIPTERA: REDUVIIDAE) UNDER LABORATORY CONDITIONS

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ABSTRACT. Influence of the blood meal source on life cycle, mortality, and fecundity of 2 cohorts of recently colonized Mexican *Meccus longipennis*, fed on hens (H-cohort) or rats (R-cohort) were evaluated in laboratory conditions. One hundred twelve nymphs (56%) (H-cohort) and 102 nymphs (51%) (R-cohort), completed the cycle. The average time from Nymph I to adult was 209 ± 41 days (H-cohort) and 239 ± 28 days (R-cohort), taking an average of 1.8 (H-cohort) and 1.9 (R-cohort) blood meals per nymphal stage (range 1–6). The average span in days for each stage from the H-cohort was 20.8 for Nymph I, 24.5 for Nymph II, 38.8 for Nymph III, 56.1 for Nymph IV, and 72.5 for Nymph V, and it was 20.2 for Nymph I, 23.1 for Nymph II, 43.2 for Nymph III, 68.8 for Nymph IV, and 75.4 for Nymph V from the R-cohort. The mortality percentage was 44% (H-cohort) and 49% (R-cohort). The average number of eggs laid per female in a 9-month period was 484.1 (range 351.1–847.8) in the H-cohort, whereas the average number of eggs was 442.3 (range 288.5–720.5) in the R-cohort. No significant differences ($P > 0.05$) were recorded among cohorts fed on the studied blood meal sources, different from most previously studied Triatominae species, perhaps due to a high degree of association of *M. longipennis* with chickens and hens as much as with mammals under natural conditions on human dwellings.

KEY WORDS *Meccus longipennis*, blood meal source, life cycle, mortality, fecundity

The influence of the blood meal source on the life cycle and biological and ethological parameters of different species of Triatominae has been studied recently. The life cycle of at least 6 Triatominae species (5 *Triatoma* spp.) was shorter on cohorts reared on mammals (mice) than on cohorts reared on birds (chicken, pigeons, or hens) and fecundity of females was higher (Lima-Gomes et al. 1990, Braga et al. 1998, Guarneri et al. 2000). In contrast, Emmanuelle-Machado et al. (2002) reported no significant differences in the life cycle of *T. klugi* Carcavallo, Jurberg, Lent, and Galvao fed on hens or on mice. Similar results were recorded for *Meccus picturata* Usinger, where no differences were found on the life cycle of cohorts fed on hens or on rabbits (Martínez-Ibarra et al. 2003b). *Meccus longipennis* Usinger is considered one of the most important vectors for Chagas disease in Mexico, with domiciliated populations endemic to 8 states (25%) of central and western Mexico, and its frequent collection from household chicken roosts (Zárate and Zárate 1985; Magallón-Gastélum et al. 1998; Martínez-Ibarra et al. 2001a, 2003a). This study was undertaken to estimate the influence of the blood meal source on some biological parameters of *M. longipennis*.

A laboratory colony established in 2001 from bugs captured in Teocuitatlán de Corona (20°03′N, 103°32′W) Jalisco was used. The colony was maintained at 27 ± 1°C, 75 ± 5% relative humidity (RH) and fed every 7 days on immobilized rabbits. Eggs were grouped by date of oviposition to initiate a cohort of 200 eggs. Three days after eclosion, the nymphs were individually offered a meal on immobilized Windstar rats (R-cohort) or leghorn hens (H-cohort) for a 1-h period, followed by a blood meal offering every 7th day. The bugs were maintained in a dark room at 25 ± 3°C and 55 ± 10% RH and were checked daily for ecdysis or death. From the insects that reached the adult stage, 15 adult couples were placed in individual containers (10.5 cm diameter × 20.5 cm height) and maintained as previously described to determine oviposition pattern.

The variables that showed a normal distribution were compared by Student's *t*-test or analysis of variance (ANOVA). In the case of ANOVA tests, post hoc comparisons were made using the Scheffé test. The Wilcoxon nonparametric test was used for variables with a nonnormal distribution. The chi-square test was used for comparison of frequencies. The differences were considered to be significant when $P < 0.05$.

One hundred twelve nymphs (56%) (H-cohort) and 102 nymphs (51%) (R-cohort) completed the cycle (Table 1). The average time from NI to adult was 209 ± 41 days (H-cohort) and 239 ± 28 (R-cohort) (Table 1), taking an average of 1.8 (H-cohort) and 1.9 (R-cohort) blood meals per nymphal stage (range 1–6) (Table 1), with no significant differences ($P > 0.05$) among both cohorts.

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Table 1. Egg-to-adult developmental cycle, mean number of blood meals to molt, and percentage of accumulative mortality in 2 cohorts of *Meccus longipennis* under laboratory conditions.

	Hens				Rats			
Stage[1]	*n*	Duration in days $\bar{X} \pm$ SD	Blood meals to molt $\bar{X} \pm$ SD	Accumulative mortality	*n*	Duration in days $\bar{X} \pm$ SD	Blood meals to molt $\bar{X} \pm$ SD	Accumulative mortality
Egg to N-I	152	20.4 ± 3.3	—	24.0	156	21.0 ± 2.4	—	22.0
N-I to N-II	145	20.8 ± 5.7	1.0 ± 0.1	3.5	139	20.2 ± 3.5	1.1 ± 0.1	8.5
N-II to N-III	135	24.5 ± 8.9	1.0 ± 0.2	5.0	128	23.1 ± 5.6	1.0 ± 0.2	5.5
N-III to N-IV	131	38.8 ± 9.8	1.4 ± 1.3	2.0	122	43.2 ± 11.1	1.1 ± 0.3	3.0
N-IV to N-V	126	56.1 ± 12.0	2.7 ± 0.9	2.5	119	68.8 ± 16.6	2.9 ± 1.1	1.5
N-V to adult	112	72.5 ± 41.2	2.8 ± 1.4	7.0	102	75.4 ± 28.7	3.8 ± 1.5	8.5
Total	112	229.7 ± 41.8	—	44.0	102	259.8 ± 28.7	—	49.0

[1] N-I, Nymph I; N-II, Nymph II; N-III, Nymph III; N-IV, Nymph IV; N-V, Nymph V.

No significant differences ($P > 0.05$) were recorded among the average development times of the 2 cohorts of *M. longipennis* in this study (H-cohort = 229.7 ± 41.8; R-cohort = 259.8 ± 28.7 days). The development times of both cohorts in this study were similar to the development time of 235.77 days for *Meccus mazzottii* Usinger feeding weekly on rabbits (Malo et al. 1993). In contrast, the average development time of *M. longipennis* was longer than for other Mexican *Triatoma* and *Meccus* species. Martínez-Ibarra and Katthain-Duchateau (1999) reported an average development time of 168 days for *Meccus pallidipennis* (Stal) fed weekly on hens. Martínez-Ibarra et al. (2001b) reported an average development time of 161.7 days for *Triatoma dimidiata* (Latreille) fed weekly on rabbits.

No significant differences ($P > 0.05$) were recorded on the mortality percentages in the both cohorts of this study (H-cohort = 44%, R-cohort = 49%) (Table 1). These similarities of mortality rates among 2 cohorts of the same *Triatoma* or *Meccus* species fed on different blood meal sources was also observed on *Triatoma pseudomaculata* Correa and Espínola and *Triatoma sordida* (Stal) fed on pigeons and mice (Guarneri et al. 2000). Mortality rates in both cohorts of this study were significantly higher ($P < 0.05$) than that for *M. mazzottii* (Malo et al. 1993) and similar to *M. pallidipennis* (Martínez-Ibarra and Katthain-Duchateau 1999) and *T. dimidiata* (Martínez-Ibarra et al. 2001b). No significant differences ($P > 0.05$) were recorded among the average number of eggs laid per female in a 9-month period by the H-cohort (484.1; range 351.1–847.8) or in the average number of eggs laid by the R-cohort (442.3; range 288.5–720.5).

In summary, differences could be recorded between the 2 cohorts of *M. longipennis* fed on different hosts. This could be the result of the proximity of *M. longipennis* and mammals or birds normally present on human dwellings. For this reason, studies on the relationship of *M. longipennis* and different hosts in the wild would be necessary before concluding whether these laboratory findings reflect the real feeding behavior of *M. longipennis*. Results of this research may also contribute to maintenance of colonies under laboratory conditions.

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