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BIOLOGY OF LABORATORY-REARED *LONOMIA OBLIQUA* (LEPIDOPTERA: SATURNIIDAE)

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Larvae of *Lonomia obliqua* Walker (Lepidoptera: Saturniidae) are largely found in the Southern Region of Brazil. Contact with the toxin present in its spines can lead to simple skin reactions, dermatitis, burns, allergies, and generalized hemorrhages, with kidney failure and death in the worst cases (Duarte et al. 1990). The increasing incidence of larvae in the South of Brazil could be related to several factors, including deforestation, reduction of natural enemies, temperate climate conditions, and because the larvae may be adapting to exotic, introduced plants (Abella et al. 1999).

Laboratory rearings of any insects are often useful to gain new knowledge about the insect's behavior and biology. This is certainly true with this species of Saturniidae (Santos et al. 1996; Borges 1985; Borges et al. 1986; Zanuncio et al. 1992, 1994; Gardiner 1967). Attempts to rear *L. obliqua* larvae on an artificial diet were unsuccessful, mainly due to the various interferences shown by the species when manipulated under artificial conditions (Lorini unpublished). Hence, the aim of this work was to establish a rearing methodology in the laboratory to obtain *L. obliqua* adults with natural diet, and describe some relevant aspects of its biology as a foundation for studies on the chemical ecology of this species.

Larvae of *L. obliqua* were collected in the field in the Northern Region of the State of Rio Grande do Sul, and kept in a room at $25 \pm 1.0^\circ\text{C}$, relative humidity of $70 \pm 10\%$ and a 13L:11D photoperiod. The larvae were fed daily with *Platanus acerifolia* Ait. (Platanaceae) leaves until pupae were obtained. After emergence, the adults were separated by sex based on sexually dimorphic characters (Lorini 1999). *Platanus acerifolia* leaves provided a sufficient food source for rearing *L. obliqua*, and a good number and quality of adults were obtained in the laboratory.

Among the larvae collected in the field from 2001 to 2004, 71% had *Platanus acerifolia* as host, while 13% were found in *Pyrus communis* L., 2% in *Prunus domestica* L., and the remaining 14% in various tree species: *Morus nigra* Linn., *Lithraea malleoides* (Well) Engl., *Lagerstroemia indica* Linn., *Ficus monckii* Hassl., *Tabebuia umbellata* (Sond.) Sandwith, *Citrus sinensis* (Linn.) Osbeck, *Citrus limon* (Linn.) Burm., *Malus domestica* Borkhausen, *Pittosporum tobira* (Thumb.) Ait., and *Sesbania virgata* (Cav.) Pers. We observed

gregarious habits during all 5 instars. Generally, when resting, the larvae remain grouped with their heads pointed outward in relation to the group and, if disturbed, they become very active and start moving in line. These larval behaviors were similar to those reported for several species of *Hemileuca* found in California (Tuskes 1984). By the end of the last instar (in the pre-pupal stage), the larvae stop feeding. Body length decreases, while thickness increases; the body becomes lightly bent, assuming a darker color on its dorsal region. The transformation from larva into pupa takes approximately 60 min, from the time the larval integument is ruptured to the moment when the exuvia is shed. The pupal stage was one of the most critical stages in the laboratory-rearing of *L. obliqua*. Keeping high humidity in the room was essential to obtain adults. We obtained 730 adults from 1,022 pupae, with a viability of 71.4%. The other 292 pupae did not produce adults, as the pupae died during that stage. The average duration of the pupal period for males and females is shown in Table 1, without statistical differences by the *t*-test ($P > 0.05$). Young pupae are yellowish in color, and become darker after a few hours. By the next day, they become reddish-brown, and maintain this color until the end of the pupal stage.

The results for pupal duration herein obtained were similar to those found for the laboratory rearing of *D. avicula* (Zanuncio et al. 1994). However, with *H. nanus*, the period was shorter: 15.7 d for both sexes at 26°C (Santos et al. 1996).

The variation in the pupal period of *L. obliqua* can be explained by the potential occurrence of 2 generations per year (Lorini 1999). The first generation occurs when the adults mate and lay eggs on the leaves of host plants in Oct, while the second occurs in the end of summer (Mar), with

TABLE 1. MEAN TIME (D) OF THE PUPAL PERIOD (\pm SDM) IN THE LABORATORY. TEMP: $25 \pm 1^\circ\text{C}$; RH: $70 \pm 10\%$ AND PHOTOPHASE: 13 H.

	<i>n</i>	Mean \pm SDM ¹	Range
Males	376	31.9 \pm 5.03 a	24-56
Females	354	33.5 \pm 5.18 a	25-58

¹Means followed by the same letter are not statistically different by the *t*-test, at 5% probability.

pupae diapausing during the coldest months of the year.

When adults first emerge, their wings are folded and small in size, taking about 60 min to become completely expanded. Most adults (70.2% of males and 87.8% of females) emerged during the scotophase; no protandry was observed. Only 29.8% of males and 12.2% of females emerged during the photophase. The average time for adult emergence in the scotophase is shown in Table 2, without statistical differences by the *t*-test ($P > 0.05$). In this species, the proportion of males ($n = 376$) and females ($n = 354$) was 1.06:1, with a sex ratio of 0.48.

The adults lived for a short period of time, with longevity of 5.9 ± 1.59 d for males and 7.7 ± 2.27 d for females. This can be explained by the fact that they do not feed; adult life is limited to mating and ovipositing.

In conclusion, the procedures herein described allowed us to obtain a continuous supply of *L. obliqua* adults in the laboratory, which was essential for the successful development of studies concerning the identification and synthesis of sex pheromone for this species (Zarbin et al. 2007).

SUMMARY

Larvae of *Lonomia obliqua* collected in its natural habitat in Brazil were effectively reared in the laboratory on leaves of *Platanus acerifolia*; and some relevant aspects about the basic biology of the species are described.

TABLE 2. MEAN ADULT EMERGENCE TIME (H) (\pm SEM) DURING THE SCOTOPHASE IN THE LABORATORY. TEMP: $25 \pm 1^\circ\text{C}$; RH: $70 \pm 10\%$ AND PHOTOPHASE: 13 H.

	<i>n</i>	Mean \pm SDM ¹	Range
Males	264	3.57 ± 2.58 a	1-11
Females	311	3.72 ± 2.52 a	1-11

¹Means followed by the same letter are not statistically different by the *t*-test, at 5% probability.

REFERENCES CITED

- ABELLA, H. B., J. B. TORRES, M. G. B. MARQUES, A. C. DUARTE, AND E. BARROS. 1999. Manual de diagnóstico e tratamento de acidentes por *Lonomia*. Centro de Informações Toxicológica do Rio Grande do Sul, Porto Alegre, 1-20.
- BORGES, J. D. 1985. Biologia de *Dirphia araucariae*, em laboratório. Pesq. Agropec. Bras. 20: 155-158.
- BORGES, J. D., M. F. CARNEIRO, AND A. A. ALMEIDA. 1986. Dados sobre as pupas e comportamento dos adultos de *Dirphia araucariae*. Pesq. Agropec. Bras. 21: 467-471.
- DUARTE, A. C., J. CAOVILLA, I. LORINI, D. LORINI, G. MANTOVANI, J. SUMIDA, P. C. MANFRE, R. C. SILVEIRA, AND S. P. MOURA. 1990. Insuficiência renal aguda por acidentes com lagartas. J. Bras. Nefrol. 12: 184-187.
- GARDINER, B. O. C. 1967. Rearing the larvae of *Lonomia cynira* (Saturniidae). J. Lep. Soc. 21: 138-140.
- LORINI, L. M. 1999. A Taturana. Aspectos biológicos e morfológicos da *Lonomia obliqua*, EDIUPF, Passo Fundo, 1-67.
- LORINI, L. M. AND E. CORSEUIL. 2001. Aspectos Morfológicos de *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae) em laboratório. Neotrop. Entomol. 30: 373-378.
- LORINI, L. M., G. S. REBELATO, AND J. BONATTI. 2004. Reproductive Parameters of *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae) in Laboratory. Braz. Arch. Biol. Tech. 47: 575-577.
- SANTOS, G. P., T. V. ZANUNCIO, O. S. DIAS, AND J. C. ZANUNCIO. 1996. Biologia de *Hylesia nanus* (Walker) (Lepidoptera: Attacidae). An. Soc. Entomol. Bras. 25: 479-482.
- TUSKES, P. M. 1984. The biology and distribution of California Hemileucinae (Saturniidae). J. Lep. Soc. 38: 281-309.
- ZANUNCIO, J. C., L. G. BATISTA, T. V. ZANUNCIO, AND W. L. GASPERAZZO. 1992. Alguns aspectos de biologia *Dirphia rosacordis* (Lepidoptera: Saturniidae) em folhas de eucalipto. Rev. Árvore 16: 112-117.
- ZANUNCIO, T. V., J. C. ZANUNCIO, I. A. MEIRA, AND F. S. ARAÚJO. 1994. Caracterização das fases larval e adulta de *Dirphia avicula* (Lepidoptera: Saturniidae) em folhas de *Eucalyptus urophylla*. Rev. Árvore 18: 153-158.
- ZARBIN, P. H. G., L. M. LORINI, B. G. AMBROGI, D. M. VIDAL, AND E. R. LIMA. 2007. Sex pheromone of *Lonomia obliqua*: Daily rhythm of production, identification and synthesis. J. Chem. Ecol. 33: 555-565.