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Research Note

ASSOCIATION BETWEEN *HEMERODROMIA* SP. (DIPTERA, EMPIDIDAE) AND *SIMULIUM PERFLAVUM* (DIPTERA, SIMULIIDAE) IN CENTRAL AMAZÔNIA, BRAZIL

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This note reports for the first time an association between empidids and simulids in the Neotropical region. Although empidids were not observed predating *Simulium perflavum* Roubaud, 1906, studies of this relationship are important because empidids, both as larvae and as adults, are known to prey on immature and adult simulids.

J. G. Needham & C. Betten (1901, *Bull. New York State Museum, 47:* 383-612) observed an association between empidids and blackfly larvae in the Adirondack Mountains, New York (USA); F. Vaillant (1951, *Bull. Soc. Zool. Fr., 76:* 371-379; 1953, *Hydrobiologia,* 5: 180-188) recorded larvae of Empididae eating larvae and pupae of Simuliidae in Algeria; W. W. Wirth & A. Stone, p. 372-482 In R. L. Usinger, *Aquatic Insects of California* found adults of *Wiedemannia* spp. (Empididae) predating blackfly larvae in California (USA); B. V. Peterson (1960, *Can. Ent., 92:* 266-274) observed empidid adults preying upon blackfly adults in Utah (USA); B. V. Peterson & D. M. Davies (1960, *Can. J. Zool., 38:* 9-18) made a similar observation in Ontario (Canada); K. M. Sommerman (1962, *Proc. Ent. Soc. Wash., 64:* 123-129), in Alaska (USA), recorded that larvae *Oreogeton* spp. (Empididae) can be effective in controling populations of blackfly larvae because this empidid kills more larvae than it can consume.

Hemerodromia sp. and *S. perflavum* were observed during a study of the reproductive ecology of *S. perflavum* in the Aruanã Farm, located at km 215 on the AM 010 Highway, which connects the cities of Manaus and Itacoatiara. Observations in two artificial wooden troughs were made; one (2.10 m in width by 11 m in length) is a spillway for a small dam; the other (25 cm in width by 16.5 m in length) is a flume for a waterwheel. Both insects were observed laying eggs in the same place, sometimes one on top of the other (Fig. 1). Pupae of *Hemerodromia* sp. were using empty cocoons of *S. perflavum* (Fig. 2). The females of these two species display a synchronism in the time of oviposition.

Fig. 1: eggs of *Simulium perflavum* (S) and *Hemerodromia* sp. (H). Scale bar 0.5 mm

Preliminary data indicate that females of *S. perflavum* normally begin their oviposition activities in the midafternoon, continuing until dusk. Females of *Hemerodromia* sp. begin their activities just before dusk, when the light level is reduced.

The family Simuliidae has various medically important species in different parts of the world. It is, therefore, important that studies be carried out on all possibilities that could lead controling the populations of these insects.

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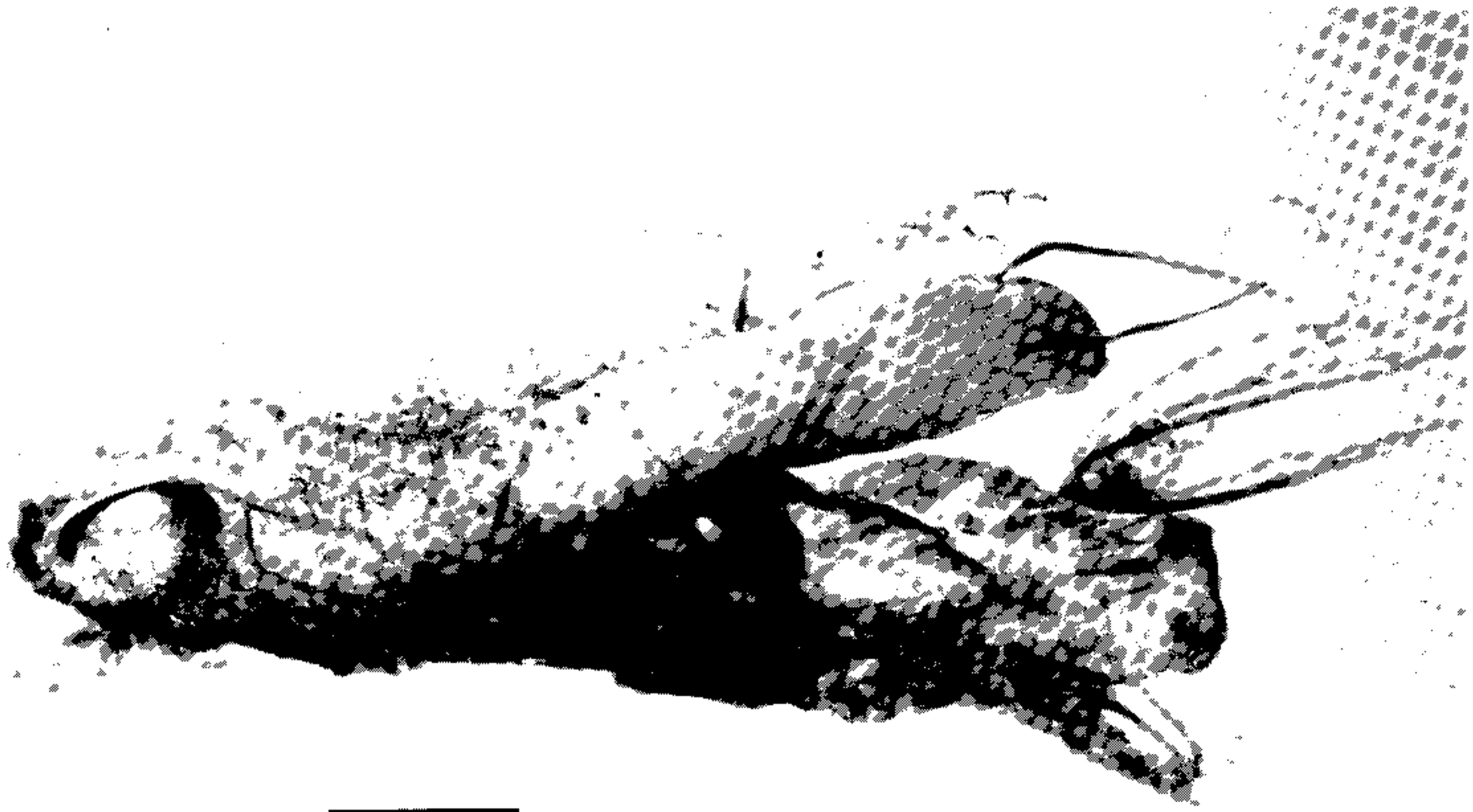

Fig. 2: pupa of *Hemerodromia* sp. inside empty cocoon of *Simulium perflavum*. Scale bar = 0.5 mm.