

GENERAL NOTES

STATUS OF THE PAPILIONID TYPES *PAPILIO STEWARTI* AVINOFF AND *P. MORRISI* EHRMANN

Additional key words: taxonomy, Neotropics.

Recently we reviewed the types and some newly acquired specimens of several papilionid taxa of uncertain taxonomic status known only from extremely small samples (Johnson, K., R. Rozycki & D. Matusik 1985, J. N.Y. Entomol. Soc. 93:99-109, 1986, 94:

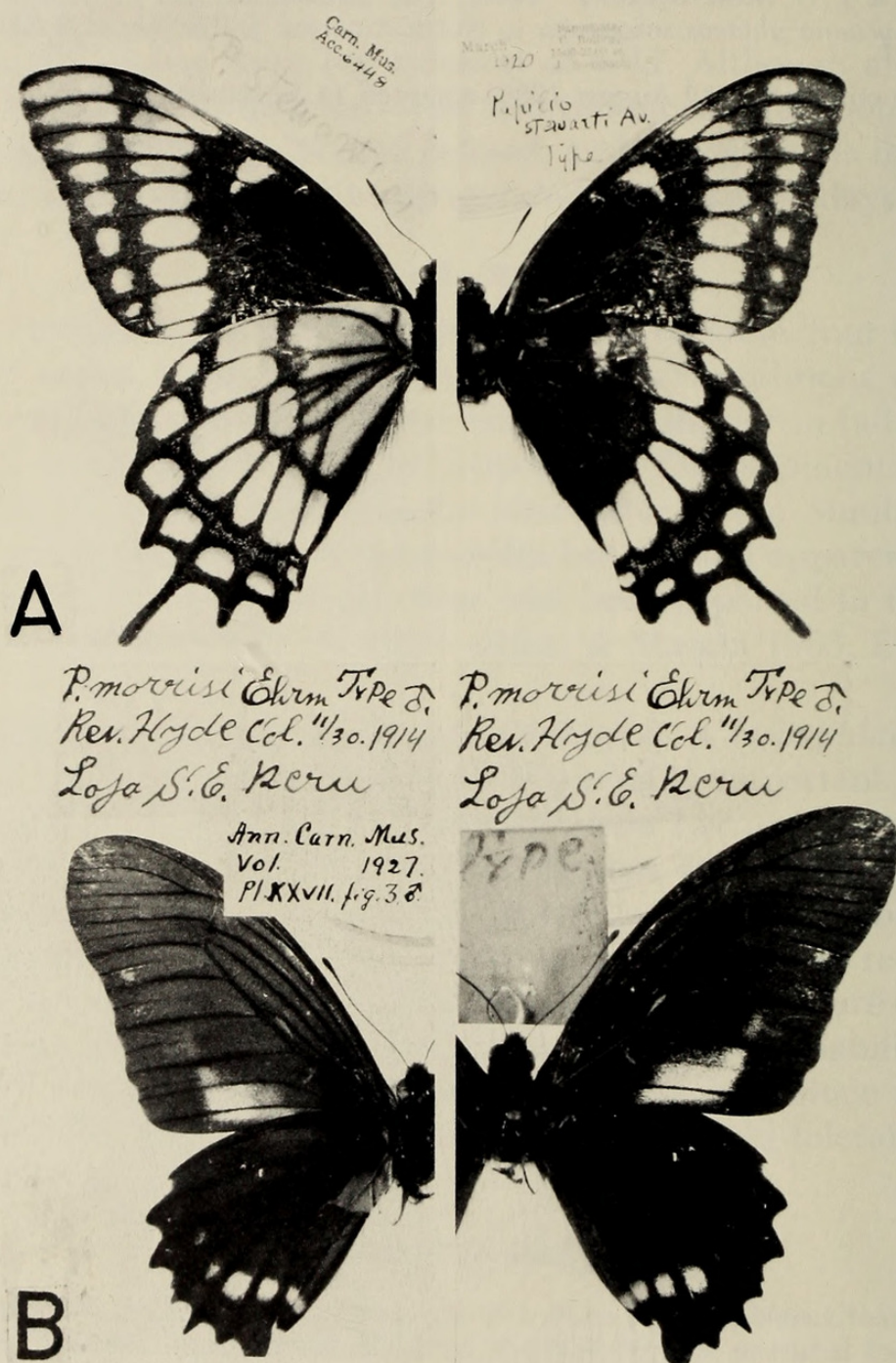


FIG. 1. *Papilio* holotype males. A, *P. stewarti*, upper surface on right, under on left; forewing expanse, base to apex, 50.0 mm; B, *P. morrиси*, as above; forewing expanse 40.0 mm.

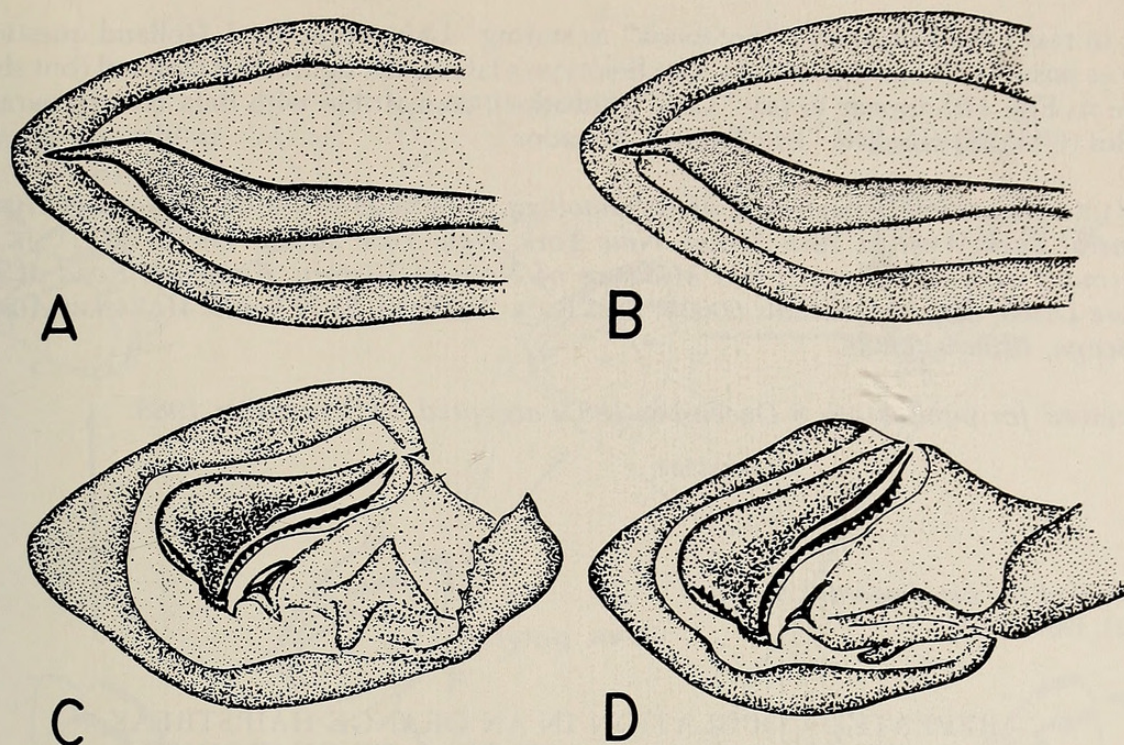


FIG. 2. Papilionid male genital valves, inner lateral view. A, *Papilio stewarti* holotype male; B, *P. scamander joergenseni*, Tucumán, Argentina (David Matusik Collection); C, *P. morrissi* holotype male; D, *Protesilaus xenaides*, Rio Pastaza, Ecuador (Am. Mus. Nat. Hist., New York).

383–393; Johnson, K. & R. Rozycki 1986, J. N.Y. Entomol. Soc. 94:516–525; Johnson, K., R. Rozycki & D. Matusik 1986, J. Lepid. Soc. 40:65–66; Johnson, K. & D. Matusik 1987, J. Lepid. Soc. 41:65–69, 108–113; Johnson, K., D. Matusik & R. Rozycki 1987, J. Res. Lepid. in press). The status of two other papilionid taxa, *P. stewarti* Avinoff and *P. morrissi* Ehrmann, are of interest to South American colleagues preparing a study of Neotropical Papilionidae (K. S. Brown Jr. pers. comm.). These taxa, originally described as species from one, or very few, specimens (types at Carnegie Museum of Natural History, Pittsburgh, CMNH), have had little subsequent report in the literature, and their genitalia have hitherto not been examined.

Papilio stewarti (Avinoff, A. 1926, Ann. Carnegie Mus. 16:355–375, type locality, TL, Samaipata, Bolivia). The holotype male (Fig. 1A) indicates *P. stewarti* belongs to the “*scamander* Group” of *Pterourus* (tribe Papilionini) (*sensu* Hancock, D. L. 1983, Smithersia 2:1–48), and is a synonym of the tailed subspecies *P. scamander joergenseni* Röber (Röber, J. K. M. 1925, Entomol. Mitteil. 14:85) which occurs commonly southward in Bolivia and northwestern Argentina (D’Almeida, R. F. 1965, Catalogo dos Papilionidae Americanos, Sociedade Brasileira de Entomologia, 366 pp.). Male genitalia of *P. stewarti* (Fig. 2A) differ negligibly from *P. s. joergenseni* (Fig. 2B) and nominate *P. scamander* (Johnson, Matusik & Rozycki 1985, above:fig. 2A).

Papilio morrissi (Ehrmann, G. A. 1921, Lepidoptera 5(2):17, TL of original description “Peru” but TL of holotype “Loja, S.E. Peru” [sic]). The holotype male (Fig. 1B) indicates *P. morrissi* belongs to the “*lysithous* Group” of *Protesilaus* (tribe Leptocircini) (*sensu* Hancock 1983, above), and, more specifically, the “*harmodius* cluster” (*sensu* Johnson, Rozycki & Matusik 1986, J. N.Y. Entomol. Soc. 94:383–393; 1987, above). Wing characters (Fig. 1B), genitalia (Fig. 2C), and locality data (other *P. morrissi* specimens labelled “Rio Bamba, Ecuador”) indicate *P. morrissi* is a synonym of *Protesilaus xenaides* (Hewitson) (Fig. 2D) (Johnson, Rozycki & Matusik 1986, J. N.Y. Entomol. Soc. above:fig. 4F).

W. J. Holland (1927, Ann. Carnegie Mus. 17:299–365) noted that Ehrmann, in describing many (often synonymic) taxa, sometimes made clerical errors. Holland, in his entry concerning *P. morrissi*, repeats Ehrmann’s citation of “Peru” as the type locality,

but in text cites Ehrmann's "notebook" as stating "Laja, Peru" [sic]. Holland questioned this as possibly "Loja" [Ecuador]. The holotype's labels, not figured by Holland (but shown here in Fig. 1B) appear to say "Loja" [Ecuador], compatible with data on two paratype males (CMNH) labelled "Rio Bamba, Ecuador".

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REPEATED COPULATION IN AN ORANGE HAIRSTREAK, *SHIROZUA JANASI*: A CASE OF MATE GUARDING?

Additional key words: Lycaenidae, mating, behavior.

In butterflies, multiple copulations are common not only in males (Svärd, L. & C. Wilkund 1986, *Behav. Ecol. Sociobiol.* 18:325-330) but also in females (Burns, J. M. 1968, *Proc. Nat. Acad. Sci. U.S.A.* 61:852-859; Ehrlich, A. H. & P. R. Ehrlich 1978, *J. Kans. Entomol. Soc.* 51:666-697; Thornhill, R. & J. Alcock 1983, *The evolution of insect mating systems*, Harvard Univ. Press, Cambridge, Massachusetts, 547 pp.; Drummond, B. A. 1984, pp. 291-370 in Smith, R. L. (ed.), *Sperm competition and the evolution of animal mating systems*, Academic Press, Orlando, Florida, 687 pp.). However, within-a-day repeated copulations are very rare in both sexes (Svärd & Wilkund, above; Fujii, H. unpubl. data).

Recently, Tanaka and Unno (*in* Fukuda, H., E. Hama, K. Kuzuya, A. Takahashi, M. Takahashi, B. Tanaka, H. Tanaka, M. Wakabayashi & Y. Watanabe 1984, *The life histories of butterflies in Japan*, Vol. 3, Hoikusha, Osaka, 373 pp., Japanese, English summary) observed that females of an orange hairstreak, *Shirozua janasi* (Janson) soon copulated with other males after preceding copulations. Such immediate remating seems to be exceptional in butterflies.

In the summer of 1986, I observed repeated within-pair copulations in *S. janasi*. This paper describes mating behavior in *S. janasi* and suggests that mate guarding is a possible consequence of remating.

Shirozua janasi is the only omnivorous species in the tribe Theclini. Like other Theclini, it has one generation per year, and imagines are on the wing from late July to September (Fukuda et al., above).

Field observations were made in secondary forest including *Quercus serrata* Murray (Fagaceae), *Pinus densiflora* Sieb. et Zucc. and *Larix Kaempferi* (Lamb.) (both Pinaceae), at Sakai village, Nagano, Japan in August 1986.

The male of *S. janasi* flies 3-10 m above the ground and alights just behind the female. This has been called a patrolling-type mate-locating strategy (Scott, J. A. 1973, *J. Res. Lepid.* 11:99-127; Fujii, H. 1982, *Yadoriga* (107/108):1-37, Japanese). Then the male's wings are held open about 30° apart and fluttered. The male moves slowly to the side of the female, bends its abdomen towards the tip of the female's abdomen, and copulates (Fig. 1). This courtship sequence usually ends in successful copulation within 5 sec.

During the survey, five courting pairs were found, and all copulated thereafter. At intervals after copulation began, I disturbed these pairs by approaching or touching them with my fingers until they separated or flew away *in copula*. As shown in Table 1, most



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