

DESCRIPTION OF THE FEMALE OF *SATURNIA CAMERONENSIS* FROM WEST MALAYSIA (LEPIDOPTERA: SATURNIIDAE)

STEFAN NAUMANN

Potsdamer Strasse 71, D-10785 Berlin, Germany

ABSTRACT.— The hitherto unknown female of *Saturnia cameronensis* Lemaire, 1979 is described and figured in color. It is compared with females of the closely related *S. pyretorum* Westwood, and *S. pinratanai* Lampe. The female of *S. cameronensis* differs clearly from those two species by its larger size, larger ocelli, the red inner portion of the antemedian line of the forewing, and the weakly shaded postmedian band of the hindwing; these features are shared with the male. The tip of the female abdomen is covered by a mass of grayish brown scales, typical for this species complex.

ZUSAMMENFASSUNG.— Das noch immer unbekanntes Weibchen von *Saturnia cameronensis* wird beschrieben und abgebildet. Es wird verglichen mit Weibchen der nahe verwandten *S. pyretorum* und *S. pinratanai*; diese drei Arten werden von Nässig (1994) innerhalb der Gattung *Saturnia* allesamt im Subgenus *Saturnia* und nicht mehr im Subgenus *Eriogyna* Jordan, 1913 geführt. Eine Revision dieses Komplexes ist von Naumann in Vorbereitung. Das Weibchen von *S. cameronensis* unterscheidet sich von den genannten anderen Arten deutlich durch die grössere Spannweite, die grösseren Ocellen, den breiten Rotanteil des Antemedianbandes im Vorderflügel sowie den nur sehr dezent verdunkelten Postmedianbereich des Hinterflügels. Diese Merkmale stimmen mit dem Männchen sehr gut überein. Wie bei beiden anderen Arten ist das Ende des Abdomens stark mit dunkelgraubrauner Afterwolle besetzt.

KEY WORDS: Asia, *Eriogyna*, Oriental, taxonomy, West Malaysia.

The eastern Asiatic species of *Saturnia* Schrank, 1802, formerly classified in the genus or subgenus *Eriogyna* Jordan, 1913, comprise a closely related complex of species (Fig. 1-4) with females having loose, dark scales on the ends of their abdomens, which they scrape off to form a protective covering over their egg masses. The name *Eriogyna* means "hairy female." Because of similarities of adults, genitalia, larvae, and cocoons, Nässig (1994) treated these species as congeneric with the type-species of *Saturnia*, namely the European *Saturnia pyri* [Denis & Schiffermüller], so the name *Eriogyna* should be considered a synonym of *Saturnia*. Other current authors concur with this arrangement (e.g., Peigler and Wang, 1996). A taxonomic revision of this species complex is in preparation by the author.

This paper describes and illustrates the hitherto unknown female (Fig. 1, 5) of *Saturnia cameronensis* Lemaire (1979), originally described from three males from Cameron Highlands, Pahang Province, in West Malaysia. I recently received a female of this species from Jean-Marie Cadiou, who in turn obtained it several years earlier from Hisatoshi Kezuka, a Japanese specialist of Carabidae (Coleoptera). It is also from the type locality, where it was collected in July 1975. This specimen is in the author's collection in Berlin. Because the Cameron Highlands and other areas of peninsular Malaysia have been intensively collected in recent years, it is surprising that this is the first known female, but there may be others awaiting discovery in other collections.

Saturnia cameronensis Lemaire

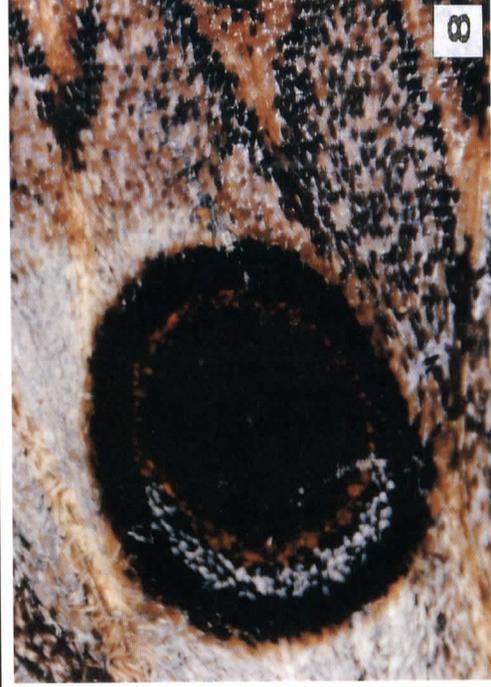
Description of Female.— Antennae (mostly missing) yellowish beige, quadripectinate. Length of forewing 59mm. **Dorsum.**— Forewing: costa grayish brown; forewing antemedian area with brown scales, then whitish; antemedian line with 1.5mm wide reddish and 1.5mm wide dark brown components; median area whitish with gray scales apically; large oval eyespot (ocellus) 10.0mm in maximum diameter, broadly bordered with black, centrally with blue, then yellow, black, and white scales, with unscaled crescent in center; medially a narrow, brown zigzag line; then beginning in postmedian area a parallel zigzag border composed of grayish brown scales, apically terminating with two black spots; submarginal line with proximal two mm broadly whitish, apically red, outer portion 2-3mm of beige.

Hindwing: with similar markings as in forewing, but generally paler; ocellus 6.3mm in maximum diameter, with same colors as in forewing; postmedian area only weakly scaled; white portion of submarginal band 2.4mm wide, near upper margin ending with red scales. **Venter.**— Generally with lighter and less distinct markings, generally with numerous whitish and beige scales; red portions of the hindwing more intensively marked than on upperside. Thorax with grayish brown scales. Legs dark brown. Abdomen as far as recognizable, dorsally with shorter white scales and intersegmental grayish brown scales, ventrally totally whitish; posterior end with copious mass of darker scales ("anal wool").

DISCUSSION AND COMPARISON WITH ALLIED TAXA

The above described female shares all characters with the male of *S. cameronensis* (Lemaire, 1979; Lampe 1984, 1985), except for the typically sex-related features like size, wing shape, and abdominal tip. The characters defining *S. cameronensis* include largest size in the complex of Asiatic species, the large, broadly yellow ringed ocelli of forewing and hindwing, red basal portion of the antemedian line of the forewing, and the weakly shaded postmedian area of the hindwing.

Typical and consistent characters of the species-group are in the pattern of the ocelli (Fig. 6-9). While *S. cameronensis* shows broad yellow and black rings with a bluish central crescent between, a black center with white scales in the forewing and hindwing ocelli, the forewing ocellus in *S. pinratanai* Lampe shows only a weak yellow portion and a black center, whereas the hindwing ocellus shows less ring components with only a yellow and blue patch on the black surface. In *S. pyretorum* Westwood, there is a narrower yellow ring and a dark grayish central portion with a hyaline area on the ocelli of all four wings of most specimens. Although nothing can be stated about the variability of these patterns in females of *S. cameronensis*, males show less variability in size of the ocelli (of both forewing and hindwing) as compared to those of *S. pinratanai*, which sometimes have different sizes of their right and left hindwing ocelli (Paukstadt and Paukstadt, 1990) and generally show a tendency toward reduction of these markings (Lampe and Nässig, 1994). While specimens of *S. pinratanai* show no lighter inner component of the



submarginal line, those of *S. cameronensis* and *S. pyretorum* have this character, which is narrower in *S. cameronensis*.

Nothing is known of the early stages of *S. cameronensis*. The female of this species was apparently collected in the month of July, a period that superficially appears doubtful because males have only been taken in December, January, and March, as far as I know. However, Paukstadt and Paukstadt (1990) and Lampe and Nässig (1994) reported single specimens of *S. pinratanae* collected in August in Thailand, whereas most specimens of that species have been collected later in the year (Lampe, 1989; Pinratana and Lampe, 1990). So, although the European and Mediterranean species of *Saturnia* are strictly univoltine, it appears that these tropical Asian species may be at least partially bivoltine. During rearing of *S. pinratanae*, it was observed that males were active by day (Lampe and Nässig, 1994), but this is not known for males of the other two Asiatic species. During a visit to Tanah Rata, West Malaysia, in 1994, I was told that males of *S. cameronensis* are generally collected in light traps during the night (W. T. Fatt, pers. comm.).

ACKNOWLEDGMENTS

I thank Jean-Marie Cadiou of Brussels for giving me the specimen which forms the basis of this paper. Richard S. Peigler delivered a copy of the original description by C. Lemaire and gave critical comments on the manuscript.

LITERATURE CITED

Lampe, R. E. J.

1984. Die Saturniiden der Cameron- und Genting-Highlands in West-Malaysia (Lepidoptera: Saturniidae). *Neue Ent. Nachr.* (Keltern), 11:2-16, 8 pls.
1985. Malayan Saturniidae from the Cameron- and Genting Highlands: a guide for collectors. Faringdon: E. W. Classey. 16pp, 8 pls.
1989. *Saturnia (Eriogyna) pinratanae* n. sp., eine neue Saturniide aus dem thailändischen Hochland (Lep.). *Ent. Zeit.* (Essen), 99:179-180.

Lampe, R. E. J., and W. A. Nässig

1994. Zuchtbericht der thailändischen *Saturnia (Saturnia) pinratanae* (Lepidoptera: Saturniidae). *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.), 15:305-314.

Lemaire, C.

1979. Description de trois Attacidae Indo-Australiens. *Lambill.* (Tervuren), 78:89-96.

Nässig, W. A.

1994. Vorschlag für ein neues Konzept der Gattung *Saturnia* Schrank 1802 (Lepidoptera: Saturniidae). *Nachr. Ent. Ver. Apollo* (Frankfurt), (n.s.) 15:253-266.

Paukstadt, U., and L. H. Paukstadt

1990. Beschreibung des bisher unbekanntes Männchens von *Saturnia (Eriogyna) pinratanae* Lampe 1989 aus Thailand (Lepidoptera: Saturniidae). *Ent. Zeit.* (Essen), 100:250-252.

Peigler, R. S., and H. Y. Wang

1996. *Saturniid Moths of Southeastern Asia*. Taipei: Taiwan Museum. 265pp.

Pinratana, A., and R. E. J. Lampe

1990. *Moths of Thailand. Vol. 1: Saturniidae*. Bangkok: Broth. St. Gabriel. 47pp., 44 pls.

Fig. 1-9. *Saturnia* from southeastern Asia. 1. *S. cameronensis*, female, West Malaysia. 2. *S. pinratanae*, female, Thailand. 3. *S. pyretorum*, female, Taiwan. 4. *S. cameronensis*, male, West Malaysia. 5. *S. cameronensis*, female, underside. 6-7. *S. cameronensis*. 6. forewing ocellus. 7. hindwing ocellus. 8-9. *S. pinratanae*. 8. forewing ocellus. 9. hindwing ocellus. All specimens in the collection of S. Naumann (Berlin). Photos by S. Naumann.