REDESCRIPTION OF
SPILOCONIS PICTICORNIS BANKS
(NEUROPTERA: CONIOPTERYGIDAE)¹

BY F. M. CARPENTER
Harvard University

Within the past two years several lots of specimens of *Spiloconis picticornis* Banks have been sent to me from the Department of Biological Control at the Citrus Experiment Station, California. Some of these were secured on Hong Kong, China, by Dr. S. Flanders; but most of them were reared at the Citrus Experiment Station from stock obtained on Hong Kong. This extensive series of specimens has made possible the preparation of a more detailed description of the species than could be achieved from the unique female type on which the species was originally based.

I am indebted to M. E. Badgley, C. A. Fleschner, and J. C. Hall, all of the Citrus Experiment Station, for providing me with specimens used in this study. An account of the biology of *picticornis* by these investigators follows in the present issue of *Psyche*; it is a significant account, since little is known about the biology of the coniopterygids in general and nothing at all has previously been known about the life history of any species of *Spiloconis*.

The genus *Spiloconis* was erected by Enderlein in 1907, within the subfamily Aleuropteryginae, to include two species. One of these, *sexguttata* Enderlein (genotype), was known only from Japan, though Enderlein later (1908) recorded it from Formosa as well; the other was *maculata* Enderlein, from New South Wales, originally described (1906) in *Helicoconis*. A third species, *interrupta*, was described from Mindanao (Philippines) by Banks, in 1937. A fourth species, *picticornis*, was described from Hainan, by the same author, in 1939. Finally, Banks (1939) trans-

¹Published with a grant from the Museum of Comparative Zoology at Harvard College.

ferred to *Spiloconis* Hagen's *cerata* from Ceylon, originally assigned to *Coniopteryx*.² Up to the present time, therefore, the genus has been known from Australia and five islands in the Asiatic region. The specimens of *picticornis* from Hong Kong are the first of the genus recorded from the Asiatic continent.

The outstanding characteristic assigned to *Spiloconis* by Enderlein is the unusual length of the first two antennal segments, both of which are several times as long as wide; in other genera of the family these segments are about as broad as long. Knowing only *sexguttata* and *maculata* at the time of the description of *Spiloconis*, Enderlein was led to believe that the genus might also be characterized by maculations on the fore wings, but *picticornis*, *interrupta* and apparently *cerata* have unmarked wings. In all probability the most significant generic features will be found in the terminal abdominal segments of both sexes. An account of these terminal structures in *picticornis* is given in detail below, but until equivalent structures are known in other species, we cannot propose their generic application.

The redescription of *picticornis* included below is based in part on the type, which is in the Museum of Comparative Zoology, but largely on eighty-five additional specimens, as follows: 3 ♂, 3 ♀, Taipo, Hong Kong, China, Jan. 1, 1954, ex citrus (Flanders); 2 ♂, 1 ♀, Fanling, Hong Kong, Nov. 16 and 25, 1953 (Flanders); 23 ♂, 19 ♀, bred from Hong Kong stock at Riverside, California, Dec. 20, 1954; 20 ♂, 10 ♀, same, May 7, 1954; 4 ♂, 3 ♀, same, April 17, 1955. All of this material is preserved in alcohol and is deposited in the Museum of Comparative Zoology.

The fore wing of the type is 2.3 mm. long and 1 m. wide (maximum); in other specimens which I have examined it ranges from 2.5 to 1.9 mm. long, and from 1.1 to .8 mm. wide. The general body color of living or alcoholic specimens is pale yellow; that of dried specimens is much darker. The frons is light yellow, occipital and genal areas brown. The antennae in all specimens which I have seen,

²*Spiloconis rufa* Nakahara, originally described from Japan in 1913, is now considered by its author to be a synonym of *sexguttata* (*in litt.*).

including the type³, consist of 18 segments; the scape is about six times as long as any segment of the flagellum, and the pedicel is about four times as long. The proximal eight segments are light yellow, though the 8th is sometimes partially gray; the next two (9th and 10th) are either black or dark gray; the next two (11th and 12th) light yellow; and the distal six (13th through 18th) black or nearly so. This pattern of coloration is uniform in all specimens which I have seen, though the intensity of pigmentation in segments 9 and 10 varies somewhat. The maxillary and labial palps are black or nearly so on the outer surfaces, but lighter on the inner. The thorax and abdomen are pale yellow, except for the dark brown lines which mark the apodemes; the legs are pale yellow, but with some light tint of gray on the femora. The wings are smoky brown and lack maculations; certain cross-veins and parts of some main veins are obsolescent, their positions being indicated by white streaks in the wings. The venation, shown in figure 6, is typical of that of the Aleuropteryginae; I have seen no obvious variations in the venational pattern of either wing. The pattern is like that of *sexguttata*, except that the bases of the macrotrichia are more conspicuous and are proximal to the middle of the wing.

The terminal abdominal segments of *picticornis* differ greatly from those of the species of the Coniopteryginae and Aleuropteryx. Since I have had no opportunity to make a comparative study of the terminalia of other species of *Spiloconis*, I am unable to indicate which characteristics are generic and which are specific. The most striking peculiarity of the male abdomen is the reduction of the ninth tergite and sternite. Although the sclerotization of the abdomen is weak, the first eight segments are readily distinguished, each bearing a pair of spiracles; segments 3-6 also have the evaginable sacs peculiar to the Aleuropteryginae. The tenth tergite is distinct but the ninth appears to be fused with the eighth, presumably bearing

³Banks' statement that there are 20 antennal segments in the type was apparently an error. His description of the color pattern was also incorrect, probably as a result of his mistake in counting the segments.

the distal row of macrotrichia. The anus is clearly seen just above the strap-shaped tenth sternite, which forms the roof of the genital opening; at the base of the tenth sternite is a complicated supporting structure into which the parameeres and aedeagus extend; this supporting structure is apparently the gonarcus, described in the Coniopteryginae by Tjeder⁴. The parameeres are fused together to form a cylindrical body, with a terminal and a subterminal hook distally (possibly the aedeagus) and a pair of divergent arm-like processes dorsally. The gonarcus and parameeres showed no obvious variations in the fifteen specimens of *picticornis* which I dissected. The parameeres are apparently not attached to the gonarcus, but the distal end of the fused parameeres extend into the gonarcus a short distance; in figure 2 the parameeres are shown slightly removed from their normal position in the gonarcus. The triangular and curved tips of the gonarcus project slightly from the genital opening and can readily be seen when the abdomen is observed from the side (figure 1). There is no indication of a ninth sternite or of the hypandrium, which is well developed in the Coniopteryginae. The floor of the genital opening consists of the eighth sternite; this is directly ventral to the corresponding tergite.

In the female, the ninth abdominal tergite is apparently fused with the eighth; between the eighth tergite, which bears spiracles, and the anus, there is only a single

⁴It is probably a derivative of the tenth sternite (Killington, 1936).

EXPLANATION OF PLATE 7

Spiloconis picticornis Banks. Fig. 1. Terminal abdominal segments of male, drawn from reared specimens (lateral view); 7t, 8t, 9t, 10t, tergites; 8s, 10s, sternites; a, anus; gen, genital opening; gon, gonarcus; ev, evaginable sac. The parameeres and internal portions of the gonarcus are shown by dotted lines. Fig. 2. Gonarcus (top) and parameeres (bottom), dorsal view. Fig. 3. Terminal abdominal segments of female, drawn from type (lateral view); gph, gonapophysis; other lettering as in figure 1. Fig. 4. Gonapophysis of ninth segment of female, drawn from reared specimens (ventral view). Fig. 5. Venation of fore and hind wings; the dotted lines indicate obsolescent parts of veins.

CARPENTER — *SPILOCONIS PICTICORNIS*

tergite, which I interpret as the tenth; beneath the tenth sternite, which forms the roof of the genital chamber, is a flat plate, presumably a derivative of the ninth sternite; this gonapophysis appears as a hairy, oval disc, when observed from a ventral-posterior direction; internally, it narrows and recurves ventrally. Below this plate is one distinct sclerite, which appears to be the ninth sternite, although it resembles the eighth sternite of the Coniopteryginae in form and could be a derivative of that sclerite.

S. picticornis is most readily recognized by the antennae, the color pattern of which is unlike that of any other species of the genus.

LITERATURE CITED

BANKS, N.

1937. Philippine Neuropteroid Insects. Phil. Journ. Sci., **63**(2): 153-154.

1939. New Genera and Species of Neuropteroid Insects. Bull. Mus. Comp. Zool., **85**(7): 473-474.

ENDERLEIN, G.

1906. Monographie der Coniopterygiden. Zool. Jahrb., **23**(2): 232.

1906. Die Coniopterygidenfauna Japans. Stett. Ent. Zeit., **68**(1): 6-8.

1908. Neuroptera, family Coniopterygidae. Genera Insectorum, **67**: 16.

KILLINGTON, F. J.

1936. Monograph of the British Neuroptera, I. Ray Society, **122**: 48-51.

NAKAHARA, W.

1936. On the Study of Japanese Coniopterygidae. Dobuts. Zool., **25**: 200.

TJEDER, B.

1954. Genital structures and terminology in the order Neuroptera. Ent. Medd., **27**: 23-40.