

## Pamphiliid Sawflies (Hymenoptera) from Taiwan\*

By

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**Abstract** Three species of two conifer-feeding genera of pamphiliid sawflies, viz., *Acantholyda flavomarginata* MAA, *A. taiwana* n. sp. and *Cephalcia chui* n. sp., are recorded from Taiwan. An account for *A. flavomarginata*, descriptions and figures for the latter two new species and a key to the three species are given.

The Taiwanese fauna of the sawfly family Pamphiliidae is little known. The only reference to this subject is a paper by SHINOHARA (1983), in which I recorded an unidentified species of the conifer-feeding genus *Acantholyda* from Taiwan based on a single specimen collected in 1979 at Nan-shan-chi near P'u-li in the central part of the island. This specimen was later identified with *A. flavomarginata* MAA, 1944, a species known as a pest on pines in China (HSIAO, 1963).

Although the pamphiliids are rarely found in the southern part of East Asia, several records have been published from southern China (MAA, 1944, 1949; SHINOHARA, 1983; XIAO, 1984, 1987, 1990), northern Myanmar (BENEŠ, 1972) and even from northern Thailand (SHINOHARA, 1986). Of special significance here is the fact that half a dozen species of four cephalciine and pamphiliine genera are known to occur in Fujian Province (MAA, 1944, 1949), which faces Taiwan at a distance of only 150 kilometers across the Formosa Straits. Therefore, it would be reasonable to expect the occurrence of more pamphiliid species in Taiwan, especially on high mountains. In particular, additional species of *Acantholyda* and species of the pamphiliine genera *Neurotoma* and *Onycholyda*, both mainly associated with the Rosaceae and distributed in Fujian Province, are likely to be found in Taiwan; occurrence of the eastern Chinese endemic genus and species, *Chinolyda flagellicornis* (SMITH, 1874), a cephalciine known from Fujian and Zhejiang Provinces, is also quite possible.

With this expectation, I took part in the zoological expedition to the high mountains of Taiwan made by the National Science Museum, Tokyo, in February to March, 1991, and devoted myself to obtaining any material of the Pamphiliidae. After sweeping conifers and other plants innumerable times for nearly a month by a net with a 6.4-meter-long rod on the mountains about 800 to 3,250 meters high, I got only one female specimen of *Acantholyda* from a haploxylon pine and one female

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specimen of *Cephalcia* from a spruce at an altitude of 2,200–2,300 meters. No species of the pamphiliine genera were found. Subsequent study of the two cephalciine specimens obtained has revealed that each of them represents a new species.

In this paper, I will give a summary of the present knowledge on the Taiwanese Pamphiliidae, including descriptions of the two new species and a key to the three species known from the island.

I wish to thank Prof. Y.-I. CHU and Mr. C.-C. KO, National Taiwan University, Taipei, Dr. H. ONO, National Science Museum, Tokyo, and Mr. C.-W. LO, P'u-li, for their excellent cooperation during the 1991 expedition, Dr. G.-R. XIAO, Chinese Academy of Forestry, Beijing, for providing me with the specimens of *A. flavomarginata*, and Dr. S.-I. UÉNO, National Science Museum, Tokyo, for his critical reading of the manuscript.

*Acantholyda flavomarginata* MAA, 1944

(Fig. 1 A–B)

*Acantholyda flavomarginata* MAA, 1944, p. 50; MAA, 1949, p. 34; HSIAO, 1963, p. 16; SHINOHARA, 1983, p. 312; XIAO, 1983, p. 865; SHINOHARA *et al.*, 1988, p. 96; XIAO, 1990, p. 549.  
*Acantholyda* sp. SHINOHARA, 1983, p. 312.

*Distribution.* Taiwan. Mainland China: Fujian, Jiangxi, Hunan, Guangxi (XIAO, 1983).

*Specimens examined.* Taiwan: 1 ♀, Nan-shan-chi, 800 m, nr. P'u-li, Nan-t'ou Hsien, 15. III. 1979, A. SHINOHARA. Mainland China: 1 ♀, 1 ♂, "Jiangxi, Guixi, 1964. 3. 23." All determined by G.-R. XIAO.

*Host-plant.* *Pinus massoniana* LAMB., a diploxylon pine, has been recorded in Mainland China (HSIAO, 1963). The Taiwanese specimen was swept from the foliage of an unidentified pine (*Pinus* sp.).

*Remarks.* SHINOHARA (1983) recorded this species from Taiwan under the name of "*Acantholyda* sp.," stating that "This species is similar to *A. flavomarginata* MAA from Fukien but has a darker [actually a paler] color pattern. It may represent a subspecies of *flavomarginata*." At that time, I had no specimen of *A. flavomarginata* for comparison, descriptions and keys by MAA (1944, 1949) and HSIAO (1963) being the only source of information. After that, Dr. G.-R. XIAO [HSIAO] of the Forest Research Institute, Beijing, examined the Taiwanese specimen and identified it with *A. flavomarginata*. He also sent me a pair of specimens of *A. flavomarginata* from Jiangxi.

The Taiwanese specimen differs from the Jiangxi female as follows (character states of the Jiangxi specimen in parentheses): Antenna 29-segmented (28-segmented), with 3rd segment about 2.4 times (2.1 times) as long as 4th; pronotum mostly pale brownish yellow to brown, with only anterior half of dorsal surface black (greenish or bluish black, with ventral half of lateral pronotum and posterolateral corner of dorsal pronotum pale brownish yellow); posterior half of mesonotal middle lobe

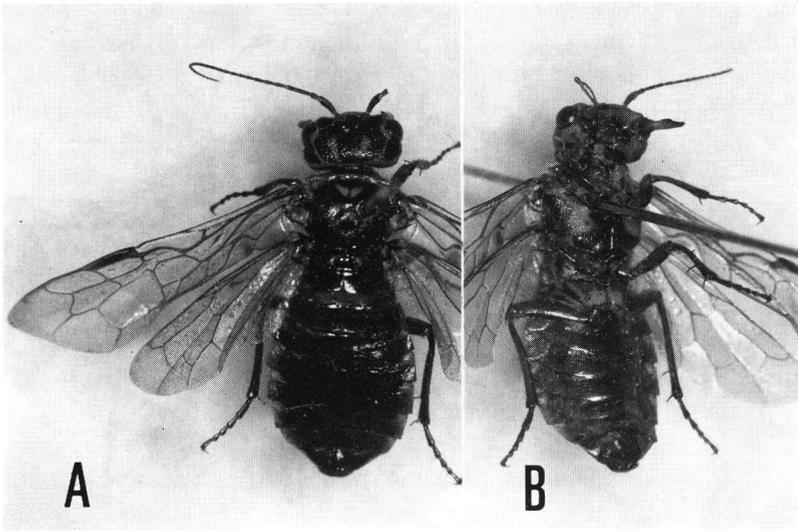


Fig. 1. *Acantholyda flavomarginata* MAA, ♀, Nan-shan-chi. — A, Dorsal view; B, ventral view.

pale yellow (pale mark small); mesonotal lateral lobe, metanotum and propodeum each with large brownish marking (without such marking); mesepisternum mostly pale brownish yellow and brown (greenish or bluish black, with three large pale brownish yellow spots); wings with veins and stigma brown to pale brown, the latter basally darkened (entirely blackish brown).

MAA (1944) and XIAO (1983) commented on the variation in color pattern of the head, antenna, pronotum, tegula, mesonotum and mesepisternum of the species, and the differences in these characters observed between the Taiwan and Jiangxi females may be within the range of the intraspecific variation. Very interesting is the difference in the color of stigma, a character usually stable and often used as a good landmark for separating species within the Pamphiliidae. It should be noted that MAA (1944), in studying the Fujian material only, said “veins and stigmata *brown to sooty brown*” (italics added), while XIAO (1983), supposedly having much material from Jiangxi, stated “veins and stigma *blackish brown*” (original in Chinese; italics added). The difference between their descriptions as well as that between the Taiwan and Jiangxi specimens seems to suggest that the color of stigma varies widely within the species and the variation may be geographic; the eastern populations (Fujian and Taiwan) have paler stigma than the western (Jiangxi).

*Acantholyda taiwana* n. sp.

(Fig. 2 A–B)

*Female (holotype)*. Head and thorax metallic greenish black, with coppery

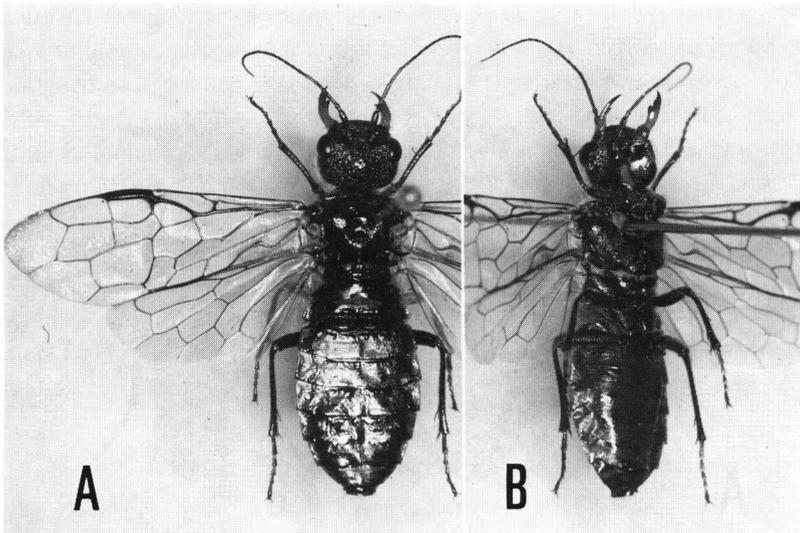


Fig. 2. *Acantholyda taiwana* n. sp., ♀, holotype. — A, Dorsal view; B, ventral view.

reflection in places, notably on clypeus, frons and venter of thorax; small whitish spot at posterior angle of eye; mandible orange, becoming rufous toward apex; antenna black, with faint metallic luster; legs black, with metallic luster, except for brown anterior surface of fore tibia and blackish brown fore tarsus; wings almost clear hyaline, with apical margin of forewing somewhat blackish; veins and stigma blackish brown to black, with subcosta and anal veins pale brown. Abdomen metallic bluish black dorsally with narrow lateral margins dark orange, and dark orange ventrally, with slight metallic reflection; caudal part, including sawsheath, and round spot in each lateral part of each sternum black.

Head with crassa distinct, very bluntly carinate; vertex (postocellar area) nearly quadrate, about 0.92 times as long as anterior width; transverse and lateral transverse sutures indistinct; coronal suture absent; upper part of frons flat; ocellar basin indicated only by shallow depression in front of median ocellus, continuing anteriorly to punctiform median fovea as a furrow; rather strongly convex, non-carinate swelling (frontal tubercle) between antennal sockets; facial crest weakly raised, bluntly carinate; clypeus raised at middle, giving a faint triangular appearance. Head covered with dense, distinct, irregular punctures; clypeus and area behind transverse and lateral transverse sutures with large, sometimes confluent punctures, with interspaces smooth, polished; area between these sutures and epistomal sutures with very dense, generally medium-sized to small, often confluent punctures, dull; gena coarsely rugose; punctures on head bearing long, curved, pale brownish hairs. Mandibles normal for genus. Both antennae 25-segmented, with 3rd segment about 2.2 times as long as 4th.

Forewing with cell C glabrous and stub of Cul very short; hindwing with long apical stub of 2A.

Abdominal segments coriaceous (more strongly so ventrally), giving oily luster.

Measurements (in mm): Length 15.0, forewing length 12.5, head width 3.48, thorax width 3.96, scape length 0.98, pedicel length 0.33, 3rd antennal segment length 0.88, 4th antennal segment length 0.40, 5th antennal segment length 0.43, malar space 0.15, distance between proximal margins of antennal sockets 0.70, distance between antennal socket and inner orbit 0.55, eye (shortest diameter  $\times$  longest diameter)  $0.89 \times 1.13$ , hind tibia length 3.96, hind basitarsus length 0.65, length of 2nd–4th hind tarsal segments together 1.10, 5th tarsal segment length 0.60.

*Male.* Unknown.

*Distribution.* Taiwan.

*Holotype.* ♀, Mt. An-ma Shan, 2,200 m, Ta-hsüeh-shan Mts., T'ai-chung Hsien, 28. II. 1991, A. SHINOHARA. In National Science Museum (Natural History), Tokyo.

*Host-plant.* Unknown. The holotype was swept from the foliage of a haploxyton pine (probably *Pinus morrisonicola* HAYATA), a likely host-plant.

*Remarks.* This new species closely resembles *A. sasakii* (YANO, 1916) from Japan, but differs from it in having fairly strong metallic reflection, which is greenish or coppery on the head and thorax and bluish on the abdomen (metallic reflection is very faint in *sasakii*), pale brownish hairs on the head and thorax (hairs are blackish brown, at least basally, in *sasakii*), polished surface of the impunctate area and spaces between punctures on the head and thorax (the surface is more or less coriaceous in *sasakii*), rather strongly convex, non-carinate swelling between the antennal sockets (the swelling is inconspicuous and often carinate in *sasakii*), and almost clear hyaline wings (distinctly dark brownish all over in *sasakii*).

In MAA's (1949) and HSIAO's (1963) keys to Chinese *Acantholyda*, this new species runs to the couplets containing *A. intermedia* MAA, 1949, and *A. flavomarginata* MAA (the 2nd couplet in MAA and the 4th one in HSIAO). Characters distinguishing between the new species and *A. flavomarginata* are given in the key below. From *A. intermedia* and *A. guizhouica* XIAO, 1987, a recently described Chinese species closely similar to *A. intermedia*, the new species is separated by the mostly bluish black abdominal dorsum and almost clear hyaline wings.

### *Cephalcia chui* n. sp.

(Fig. 3 A–C)

*Female (holotype).* Head brown, with pale yellow marks as in Fig. 3C; gena mostly pale yellow; mandible yellow, becoming rufous toward apex; antenna pale yellow, with basal 3 segments and 8th to 11th segments more or less brownish and apex of 11th and segments apical to it blackish brown to black. Thorax brown, with the following pale yellow: large spot at ventral margin of lateral pronotum, posterolateral corner of dorsal pronotum, spot in ventral part of cervical sclerite, tegula, posterior half of mesonotal median lobe, mesoscutellum, two large spots on mesepistern-

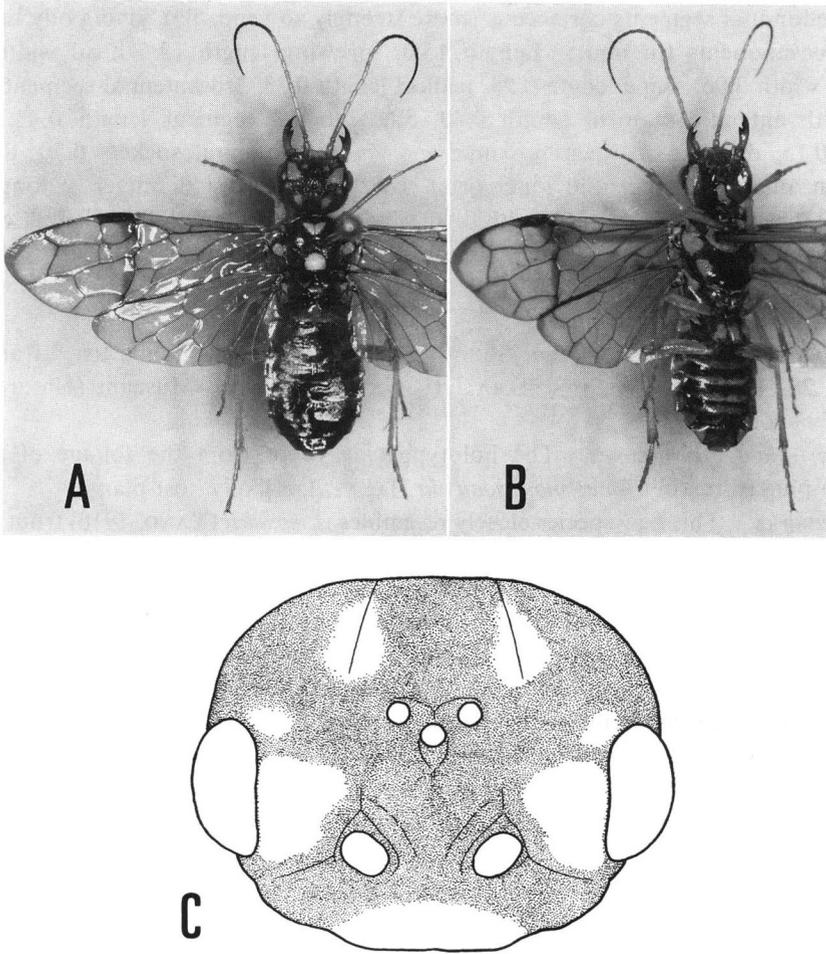


Fig. 3. *Cephalcia chui* n. sp., ♀, holotype. — A, Dorsal view; B, ventral view; C, head, dorsofrontal view.

num, metascutellum, and small elongate spot at anterior margin and large spot in posterior part of metepisternum; narrow anterior corner of cervical sclerite, narrow posterior margin of mesonotal lateral lobe, posteromedian part of mesopostnotum, narrow border between mesepimeron and mesepisternum, anteromedian part of metanotum, most of metapostnotum, and ventral part of metepisternum black. Legs pale yellow; basal half of each coxa and trochanters brownish; very narrow basal ring of each coxa and trochanter black. Wings hyaline, distinctly stained with brown; forewing with narrow, sharply defined blackish band below stigma and similarly blackish infuscation along apical and posterior margins; stigma blackish brown, with pale brown apex; veins pale brown in basal 2/3 of forewing (except for somewhat

blackish veins R and R1) and blackish brown in apical 1/3. Abdomen brown; broad anterior margin of propodeum and very narrow anterior margin of 2nd sternum black; sawsheath blackish; narrow lateral margins of dorsal side, very narrow posterior margin of each tergum, laterotergites (except for anterior part), broad posterior margin of each sternum, and caudal part pale yellow.

Head with blunt postgenal carina; vertex about 0.84 times as long as anterior width; transverse and lateral transverse sutures indistinct; coronal suture shallow but distinct, posteriorly obsolete; upper part of frons slightly convex; ocellar basin represented by a rather deep pit in front of median ocellus about the same size as the latter; median fovea indistinct; rather strongly convex, non-carinate swelling (frontal tubercle) between antennal sockets; facial crest weakly raised, rounded; clypeus raised at middle, giving a faint triangular appearance. Clypeus and area behind transverse and lateral transverse sutures with not dense, generally small or medium-sized, irregular punctures, with interspaces smooth; area between these sutures and epistomal sutures with very dense, often confluent punctures (upper part of frons rugose), except for impunctate and smooth ventral (inner) triangular area of paraantennal field; gena with only sparse punctures, rather uneven, but with smooth surface; punctures bearing rather short (those on vertex slightly shorter than ocellar diameter) blackish brown lanate hairs. Mandibles normal for genus. Right antenna with 29 segments and left one 28; 3rd segment about 1.9 times as long as 4th; hairs on scape and pedicel short, pale brown.

Forewing with cell C glabrous and stub of Cul very short, nearly absent; hindwing with apical stub of 2A absent.

Abdominal terga coriaceous, giving oily luster; sterna rather smooth, very weakly strigate.

Measurements (in mm): Length 12.0, forewing length 11.0, head width 3.18, thorax width 3.42, scape length 0.95, pedicel length 0.31, 3rd antennal segment length 1.01, 4th antennal segment length 0.53, 5th antennal segment length 0.55, malar space 0.15, distance between proximal margins of antennal sockets 0.60, distance between antennal socket and inner orbit 0.55, eye (shortest diameter  $\times$  longest diameter)  $0.80 \times 0.98$ , hind tibia length 3.88, hind basitarsus length 0.93, length of 2nd–4th hind tarsal segments together 1.10, 5th tarsal segment length 0.59.

*Male.* Unknown.

*Distribution.* Taiwan.

*Holotype.* ♀, Kuan-hsing-ch'iao, 2,270 m, near Kuan-yuan, Hua-lien Hsien, 13. III. 1991, A. SHINOHARA. In National Science Museum (Natural History), Tokyo.

*Host-plant.* Unknown. The holotype was captured from the foliage of *Picea morrisonicola* HAYATA, which may prove to be the host-plant.

*Remarks.* This new species is distinguished from the other species of *Cephalcia* by the following combination of characters: a small (length 12 mm) brown species with pale yellow marking; antenna pale yellow, somewhat brownish basally and blackish

in apical 1/3, with the 3rd segment about 1.9 times as long as the 4th (or about as long as or shorter than the 4th and 5th segments together); legs mostly pale yellow, with black area restricted to narrow basal ring of each coxa and trochanter; forewing with entirely glabrous cell C and with distinct blackish band below stigma; stigma blackish brown with only apex pale brown.

So far as I know, this is the only species of *Cephalcia* with glabrous cell C in the forewing. In all the European (BENEŠ, 1976) and Japanese species of the genus, the cell is pilose all over; for five Chinese endemic species, viz., *C. tienmua* MAA, 1949, *C. chuxiongica* XIAO, 1984, *C. danbaica* XIAO, 1987, *C. yanqingensis* XIAO, 1987, and *C. kunyushanica* XIAO, 1987, no information on this character is available

Species of the genus *Cephalcia* inhabit chiefly northern coniferous forests and only one species, *C. chuxiongica* from Chuxiong, Kunming and Nanhua Counties of Yunnan Province (XIAO, 1984), about 25.03–25.15°N in latitude, has been recorded from the area south of 30°N in latitude in Eurasia. The type locality of *C. chui*, Kuan-hsing-ch'iao (24.11°N), is thus the southernmost locality for the genus ever recorded.

#### Key to the Pamphiliidae of Taiwan

1. Fore tibia with a preapical spine in addition to a pair of apical spurs. . . . . Genus *Acantholyda*  
 . . . . . 2
- Fore tibia without a preapical spine. . . . . Genus *Cephalcia*  
 . . . . . *Cephalcia chui* n. sp.
2. Head and thorax greenish black, with extensive pale brownish yellow marks; legs brown to pale brownish yellow ventrally (anteriorly); abdomen with lateral margins of dorsum and most of venter pale brownish yellow. . . . .  
 . . . . . *Acantholyda flavomarginata* MAA
- Head and thorax almost entirely greenish black, with only a small supraocular spot whitish; legs almost entirely blackish; abdomen with lateral margins of dorsum and most of venter dark orange. . . . . *Acantholyda taiwana* n. sp.

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