

Indoxiphia prima (Hymenoptera, Xiphydriidae): Discovery of a Taiwanese Woodwasp in Southern Japan

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Abstract A xiphydriid woodwasp, *Indoxiphia prima* Smith, 2019, previously known only from Taiwan, is newly recorded from Ashizuri-misaki (Shikoku), Nakanoshima Island (Tokara Islands) and Amami-oshima Island, southern Japan. Its taxonomic characters are summarized, and the species is compared with some other Japanese xiphydriids. This is one of a few xiphydriid species showing a peculiar distribution pattern confined to southeastern coastal areas in Japan. This distribution pattern may have been formed at least partly as a result of dispersal by marine drift.

Key words: New distribution record, dispersal by marine drift, Shikoku, Tokara Islands, Amami-oshima Island.

Introduction

Indoxiphia prima Smith, 2019, is a small xiphydriid woodwasp recently described from Taiwan (Smith, 2019). The genus *Indoxiphia* comprises 13 species mainly distributed in the Oriental and Oceanian realms (Smith, 2008, 2019; Taeger *et al.*, 2010) and *I. prima* is the northernmost species. Recently we examined three specimens of this species collected in Ashizuri-misaki (Shikoku), Nakanoshima Island (Tokara Islands) and Amami-oshima Island, southern Japan. This is the first record of *I. prima* from Japan. Here we give a summary of taxonomic characters mainly based on the new material from Japan and we also comment on the peculiar distribution pattern of this species.

Materials and Methods

Specimens used in this work are kept in Ehime

University, Matsuyama (EU) and National Museum of Nature and Science, Tsukuba (NSMT). Observations of morphology were made with Olympus SZX7 stereo binocular microscope. For morphological terminology, we generally follow Viitasaari (2002). Photographs (Fig. 1) were taken with a digital camera, Olympus Stylus TG-4 Tough with Olympus SZX7 stereo binocular microscope. The distribution map (Fig. 2) was made using a blank map personally provided by G. Kokubugata (NSMT). The digital images were processed and arranged with Adobe Photoshop Elements[®] 9 and 15 software.

Results and Discussion

Indoxiphia prima Smith, 2019

(Figs. 1–2)

Indoxiphia prima Smith, 2019: 267.

Summary of taxonomic characters. Female: Length without ovipositor 6.5–10.5 mm. *Color.* Black, with following creamy white (Fig. 1):

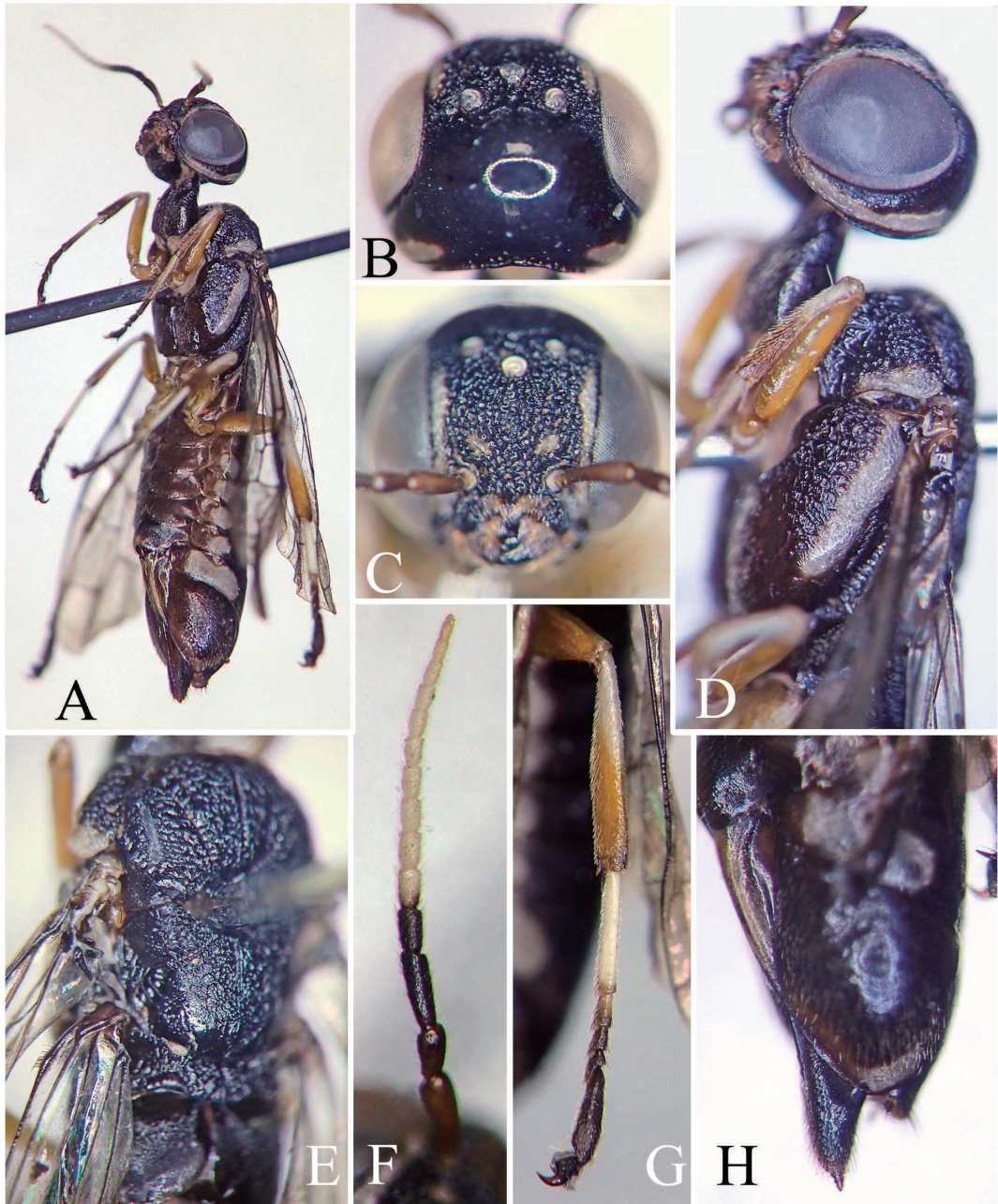


Fig. 1. *Indoxiphia prima*, female, Ashizuri-misaki (A–G) and Chinese-rindo (H).—A, Habitus, ventrolateral view; B, head dorsal view; C, head, frontal view; D, head and thorax, lateral view; E, thorax, dorsal view; F, antenna, dorsal view; G, hind leg, lateral view; H, apex of abdomen, lateral view.

base of mandible, elongate spot along inner orbit, small spot above each torulus, paired spots on clypeus, large elongate spot along posterior margin of gena, posterior margin of lateral pronotum,

large elongate spot on mesepisternum, lateral spot on each of abdominal terga 3–8 and at posterior margin of tergum 9. Valvifer 2 (basal sheath) mostly brownish. Antennal scape and



Fig. 2. Distribution of *Indoxiphia prima*, black dots showing collection records taken from Smith (2019) and present work.

pedicel dark brown, flagellomeres 1 to base of 3 black, rest of flagellum creamy white (flagellomeres 1 to base of 5 and terminal flagellomere black in one specimen). Legs pale brown; coxae black basally; anterior tibia and tarsus blackish, with basal half of tibia and most of tarsomere 1 creamy white; mid tibia and tarsus black, with basal 2/3 of tibia and most of tarsomeres 1 and 2 creamy white; hind tibia creamy white basally and pale brown apically; hind tarsus black, with tarsomeres 1 and 2 largely creamy white. *Structure*. Vertex and dorsal part of gena very smooth, impunctate (Fig. 1B); vertex without median furrow or row of punctures. Eyes very large, gena

narrow, distinctly narrowed ventrally in lateral view; malar space very narrow, about $0.1 \times$ distance between toruli, with ventral pit (antennal groove) small and shallow; space between eye and dorsal margin of ventral pit linear; occipital carina (crassa) sharp and entire around posterior margin of head, only ventral end obsolete; genal carina developed only on ventral part of gena. Maxillary palp much shorter than labial palp, with four palpomeres, palpomere 2 large and palpomeres 3 and 4 very short; labial palp with four palpomeres, palpomere 4 large. Antenna (Fig. 1F) filiform, with 13 or 14 antennomeres; ratio of lengths of scape (incl. radicula): pedicel: flagel-

lomere 1: flagellomere 2 about 26:11:17:9. Mesoscutellum with distinct microsculpture, mat, posterior 1/3, except anteromedian part, largely smooth (Fig. 1E). Anterior tarsal claws with sharp inner tooth; mid and hind tarsal claws simple without subapical tooth but with large basal lobe. Mid and hind tarsomere 5 and claws enlarged (Fig. 1G). Hind tarsomere 1 about $1.4 \times$ length of tarsomeres 2–4 combined and tarsomere 5 longer than tarsomeres 2–4 combined (Fig. 1G). Wings hyaline, veins and stigma black; fore wing with cell C narrow, cell 3R1 closed, crossvein 2r-m basal to crossvein 2m-cu on vein M and vein 1A shortly fused with or narrowly separated from vein 2A + 3A; hind wing with cell R1 closed and with one or two middle cells. Valvula 3 (apical sheath) about $0.7\text{--}0.8 \times$ length of valvifer 2 (basal sheath) (Fig. 1H). Male: unknown.

Distribution. Taiwan. Japan (Shikoku, Tokara Islands, Amami-oshima Island). New to Japan.

Specimens examined. SHIKOKU: Kochi Pref.: 1 ♀, Ashizuri-misaki, 13. VII. 2015, R. Okano (EU). KYUSHU: Kagoshima Pref.: 1 ♀, Tokara Islands, Nakanoshima Island, Otake, 7. V. 2005, T. Mita (NSMT); 1 ♀, Amami-oshima Island, Chinase-rindo, Amami-shi, Naze, Asato, 28.3494°N, 129.4499°E, 6–8. VII. 2019, YPT, Junta Abe (NSMT).

Host plant. Unknown.

Remarks. *Indoxiphia prima* was described from two specimens from Taiwan (Smith, 2019). The three Japanese specimens examined agree with the original description, except for the coloration of the antennae and abdomen. In the original description, the antenna is “mostly black with basal 4 or 5 antennomeres brownish” (in “Diagnosis”, p. 267) or “scape brown, pedicel dark brown, flagellomeres 1–5 brownish, flagellomeres 6 to apex black” (in “Description”, p. 267) and the abdomen is “black with lateral white marks on segments 3–7” (p. 272). In the Japanese specimens, the antennal flagellum is largely creamy white as described above (Fig. 1A, F) and the abdomen has a lateral spot on each of the abdominal terga 3–8 and at the poste-

rior margin of the tergum 9 (Fig. 1A, H). The Japanese specimens agree with the figures of the holotype (figs. 1–5, Smith, 2019), where a part of the whitish right flagellum is visible in figs. 1–3 and the abdomen has the almost identical color pattern with the Japanese specimen (compare Fig. 1A with fig. 1 in Smith, 2019).

Indoxiphia prima is a small black xiphydriid with creamy-white areas on the antennae, head, thorax and abdomen and pale brown and creamy-white areas on the legs, further characterized by the very large eyes, the smooth vertex, which has no longitudinal median furrow, the short maxillary palp with four palpomeres, the labial palp with four palpomeres, the enlarged hind tarsomere 5, and the simple tarsal claws on mid and hind legs. By a combination of these characters, *I. prima* is easily separated from the known Japanese species of Xiphydriidae (Shinohara, 2019c, 2020; Shinohara and Smith, 2020; Shinohara and Yamasako, 2020; Shinohara *et al.*, 2020; Shinohara and Hara, 2021). A southern species, *Lissoxiphyda mitai* Shinohara, 2020, is also a small black xiphydriid, but the antennal flagellum, head capsule and thorax are entirely black, the vertex has a longitudinal median furrow, the maxillary palp is long and with six palpomeres, and the tarsal claws of all legs are simple (Shinohara, 2020). With largely whitish antennae, *I. prima* may resemble the species of *Xiphydria palaeoarctica* group (Shinohara, 2019a), but the latter xiphydriids are larger northern species with smaller eyes, the labial palp with three palpomeres, and the tarsal claws of all legs with large inner tooth. Another northern species, *Monoxiphia harai* (Shinohara, 2019b), also has largely whitish antennae and simple tarsal claws of all legs. However, *M. harai* has the head capsule and thorax entirely black, the eyes are of normal size, the maxillary palp has five palpomeres, the labial palp has three palpomeres, and the hind tarsomere 5 is not particularly enlarged (Shinohara, 2019b; Shinohara and Hara, 2021).

The genus *Indoxiphia* Maa, 1949, is represented by 13 species distributed in vast areas

from Sri Lanka, Malay Peninsula, Borneo, Sumatra, Java, Buru, Ambon, New Guinea, New Ireland to Fiji and Taiwan and Japan (Smith, 2008, 2019; Taeger *et al.*, 2010; present work). *Indoxiphia prima*, occurring in Taiwan and Japan, has a rather isolated northernmost distribution among the congeners and shows a peculiar pattern of distribution including the southeastern coasts of Japanese archipelago (Fig. 2) similar to those of *Hyperxiphia hirashimai* (Okutani, 1965) (fig. 5, Shinohara and Yamasako, 2020) and *Lissoxiphyda mitai* (fig. 4, Shinohara, 2020). Though we need much more supporting data and information, the distribution pattern of these three southern Japanese Xiphydriidae may have been formed at least partly as a result of dispersal by marine drift (Shinohara, 2020; Shinohara and Yamasako, 2020).

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