

Key to world species of *Notanisomorphella* Girault (Hymenoptera: Eulophidae), and description of a new species parasitizing the three-striped pyralid *Dichocrocis chlorophanta* Butler (Lepidoptera: Pyralidae) on Chinese silkvine in China

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Notanisomorphella dichocrocae n. sp. (Hymenoptera: Eulophidae) is described from China and a key to the 10 described world species of *Notanisomorphella* Girault is provided. The types are deposited to the Insect Collection Museum of Chinese Academy of Forestry.

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1. Introduction

Girault (1913) established *Notanisomorphella* (Chalcidoidea: Eulophidae, Eulophinae) for *N. australiensis* from Australia. Noyes (2005) listed nine world species of *Notanisomorphella* in the Afrotropical, Australian, Oriental and Palearctic regions. Here we describe a new species from China and provide a key to the 10 described species.

Notanisomorphella appears to be closely related to *Sympiesis* Foerster, *Di cladocerus* Westwood and *Dimmockia* Ashmead (Burks 2003). It was synonymized under *Sympiesis* by Girault (1917), but later reestablished as a valid genus by Bouček (1988). It is easily distinguished from *Sympiesis* by its complete, “step-like” propodeal plicae that enclose median panels that are elevated above the sunken paraspiracular areas of

the propodeum. Although some species of *Sympiesis* have a strong median carina and plicae, in such species the enclosed median panels are not raised sharply above the areas lateral to the plicae. Individuals of *Di cladocerus* are distinguished from *Notanisomorphella* by their bilobed clypeal margin and, in most species, submedian grooves on the scutellum. Furthermore, the antennal funicle of male *Di cladocerus* has two branches whereas the funicle of *Notanisomorphella* males has three branches.

Species of *Notanisomorphella* are parasitoids of Coleophoridae and other small Lepidoptera, as well as leaf-mining beetles in the subfamily Hispininae (Coleoptera: Chrysomelidae). Species have also been reared from spider egg-sacs (Burks 2003). The newly described species is a pupal parasitoid of the three-striped pyralid, *Dichocrocis chlorophanta* Butler (Lepidoptera: Pyrali-

dae), which defoliates Chinese silkvine, *Periploca sepium* Bunge (Asclepiadaceae) in China.

2. Material and methods

Description of the new species is based on reared material. Specimens were examined with a "Motic SMZ-140" stereo microscope, and color pictures were acquired with a "UV-C photics focus image processing system". A "Hitachi S-450" was used to obtain scanning electron photographs. Morphological terms used follow Bouček (1988) and Gibson *et al.* (1997). Type material of the new species is deposited to the Insect Collection Museum of Chinese Academy of Forestry. The key below is compiled from the literature, mostly from original descriptions in English, Italian and French (Delucchi 1962, Masi 1940, Risbec 1952, Risbec 1955, Ferrière 1936, Kerrich 1969).

3. Description, biology and distribution of *Notanisomorphella dichocrocae* Yao & Yang, sp. n. (Figs 1–9)

Material examined. Holotype ♀, Fuxian, Shaanxi Province, En-kui Xie and Zhong-qi Yang Co., 2.VIII.1986, reared from pupae of *Dichocrocis chlorophanta*. Paratypes: 8♀♀, 2♂♂ with same data as holotype.

Description. Female (Figs 1–8): body (Fig. 1) 1.8–2.6 mm. in length; bluish green or reddish bronze with metallic tint. Antenna with scape yellow except apex darker, pedicel and flagellum infusate. Mandible rufous. Eye fuscous. Ocelli dark red. Legs, including coxae, entirely white. Metasoma brown with blue-green and purple metallic lusters except with yellow spot between first and second tergite, but the spot variably large and distinct. Tegula light brown. Wings hyaline with veins and hairs light brown.

Head (Figs 2–3) reticulate, with sparse, short, stout hairs, but vertex with several longer bristles along anterior and posterior edges. Head in dorsal view 2× as broad as long (Fig. 2). POL 1.5× OOL; OOL equal to ocellar diameter (POL = post-ocellus line, OOL = ocular-ocellar line). Temple 0.3× eye length. Vertex with anterior and poste-

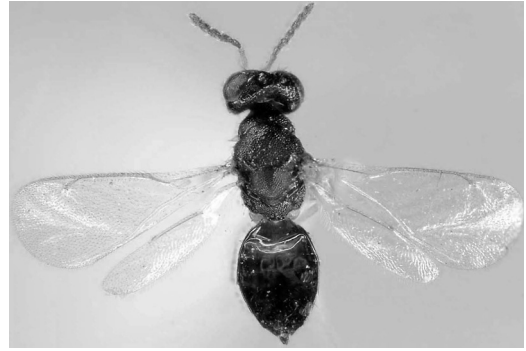


Fig. 1. Female body of *Notanisomorphella dichocrocae* Yao & Yang, sp.n., dorsal view.



Fig. 2. Female head of *N. dichocrocae*, dorsal view.

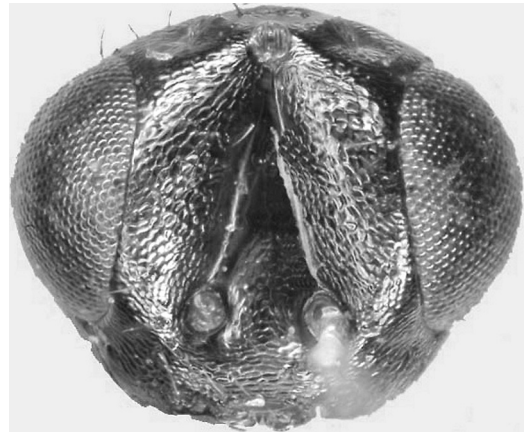


Fig. 3. Female head of *N. dichocrocae*, front view.

rior edges strongly protruding medially, (Fig. 3) and each edge with a long bristle behind inner hind corner of eye. Head in front view 0.9× as high as broad (Fig. 3). Parascrobal areas distinctly reticulate. Lower face rugulose. Scrobes smooth. Eyes with inner margins divergent ventrally, 1.8× as high as wide. Malar sulcus straight,



Fig. 4. Female antenna of *N. dichocrocae*.

and malar space $0.3\times$ as long as eye height.

Antenna (Fig. 4) with ventral margin of torulus at level of ventral margin of eyes, the toruli much closer to mouth than to vertex, with distance between ventral margin of torulus and vertex $3.5\times$ distance to apical margin of clypeus. Scape short, $4.7\times$ as long as broad, compressed, and slightly curved distally, not reaching ventral margin of median ocellus; pedicel narrower than scape and $2.2\times$ as long as broad; first funicular segment slightly longer and stouter than pedicel, $2\times$ as long as broad, remaining three funicular segments slightly shorter and distinctly stouter than funicle 1, and gradually shorter distally (11:10:9) but of same breadth; second and third funicular segments $1.2\times$ and $1.1\times$ as long as broad, respectively, and last funicular segment as long as broad; clava as long as combined length of the last two funicle segments, but slightly narrower.

Mesosoma (Fig. 5) narrower than head in dorsal view. Pronotum delicately reticulate, $0.2\times$ as long as mesoscutum medially, posterior margin with a row of long setae. Mesoscutum flat, with coarser reticulate sculpture than on pronotum, $0.6\times$ as long as broad. Mid lobe with 3 pairs of setae, without scattered setae, and notauli absent over posterior $2/3$. Lateral lobes with sparse hairs. Axillae projecting slightly forward, with weak rugosity. Scutellum with sculpture more delicate than on mesoscutum, slightly broader than long (8:7), without submedian grooves, and with two pairs of setae nearly of same length. Dorsellum with raised reticulation, $0.5\times$ as long as propodeum medially. Prepectus uniformly sculptured. Mesopleuron minutely sculptured except upper mesepisternum nearly smooth.



Fig. 5. Female mesosoma of *N. dichocrocae*, dorsal view.

Propodeum (Fig. 7) distinctly areolated, median carina and plicae strong and complete; median area $2.5\times$ as broad as long. Spiracle round, large, separated from dorsellum by less than $1/2$ of its diameter. Callus coarsely sculptured, with sparse, short hairs.

Wings hyaline (Fig. 6). Forewing (Fig. 6a) $2.4\times$ as long as broad; submarginal vein slightly shorter than marginal vein (15:16) and with 7

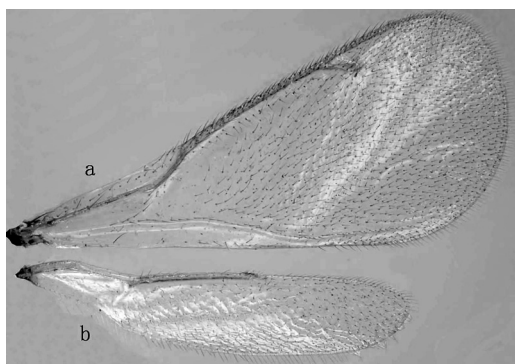


Fig. 6. Female wings of *N. dichocrocae*. – a. Forewing. – b. Hind wing.



Fig. 7. Female propodeum and metasoma of *N. dichocrocae*, dorsal view.

setae; marginal vein $2.2\times$ as long as postmarginal vein; postmarginal vein $1.5\times$ as long as stigmal vein; costal cell with several hairs on upper surface distally and complete row of hairs on lower surface along length; basal cell bare, closed apically by 4 hairs on basal fold and ventrally by a few hairs on mediocubital fold; speculum with upper margin reaching to basal $1/3$ of marginal vein, closed below by line of setae along mediocubital fold.

Hind leg with basitarsus almost as long as second tarsomere (6:5.5).

Metasoma (Fig. 7) sessile, oblong, and about $0.9\times$ combined length of head and mesosoma, but



Fig. 8. Male body of *N. dichocrocae*, profile view.



Fig. 9. Male antenna of *N. dichocrocae*.

$1.2\text{--}1.3\times$ length of mesosoma, and $1.6\times$ as long as broad. First gastral tergite smooth and bare, subsequent tergites with fine rugae and with hairs, the hairs gradually increasing in number distally. Ovipositor projecting by distance equal to length of last tergite.

Male (Figs 8, 9). Similar to female except as follows. Body (Fig. 8) length 1.5 mm. Antenna light brown; legs with coxae more or less brown, the hind coxa dark brown. Antenna (Fig. 9) with scape shorter and stouter, $2.2\times$ as long as broad; funicle with all 3 branches short, erect and curved, and with long hairs, with first branch arising basally from inner lateral edge of funicle 1, second branch subbasally from inner lateral edge of funicle 2, and third branch mesally from inner lateral edge of funicle 3; pedicel shorter than funicle 1 (2.1:3.9), $2\times$ as long as broad; funicular segments nearly of same breadth, with following length ratio: 3.9:3.0:2.8:2.5; clava shorter than combined length of the last 2 funicular segments

(4:5.3). Mesepimeron smooth. Hind coxa almost smooth.

Diagnosis. This species is easily distinguished by following combined characters: pedicel brown, concolorous with flagellum, mid lobe of mesoscutum with 3 pairs of adnotaular setae. More differences are listed in the key below.

Etymology. The species epithet is derived from the generic name of its only known host.

Biology. This new species is a pupal parasitoid of *Dichocrocis chlorophanta* Butler (Lepidoptera: Pyralidae), which is a serious pest of *Periploca sepium* Bunge (Asclepiadaceae) and *Paulownia tomentosa* (Thunb.) (Scrophulariaceae).

Distribution. China: Shaanxi Province.

4. Key to described world species of *Notanisomorphella*

1. Propodeum with median area smooth and shiny *N. proserpinensis* (Girault, 1913)
 - Propodeum with median area reticulate 2
2. Metasoma uniformly colored, without a yellow spot 3
 - Metasoma with spot 4
3. Metasoma slightly longer than mesosoma; eyes with pilosity shorter than the diameter of facets; scape dark brown
 - N. arachnevara* (Risbec, 1955)
 - Metasoma shorter than mesosoma; eyes with pilosity longer than the diameter of facets; scape yellow or light brown
 - N. somalica* (Masi, 1940)
4. Metasoma yellow except for dark spot on terga laterally; mid lobe of mesoscutum with 6 or more than pairs of setae
 - N. flaviventris* (Girault, 1913)
 - Metasoma dark or only with pale spot medially; mid lobe of mesoscutum with less than 6 pairs of setae 5
5. Body length 3.3 mm; metasoma dark without basal pale spot *N. australis* (Risbec, 1952)
 - Body length less than 3.0 mm; metasoma with pale spot basally 6
6. Hind coxa yellow in female; forewing with speculum closed below
 - N. dichocrocae* sp.nov
- Hind coxa brown to dark brown with metallic tint; forewing with speculum sometimes open below 7
7. Pronotum 0.5× as long as mesoscutum length and with dense hair; marginal vein as long as submarginal vein
 - N. bicolor* (Delucchi, 1962)
 - Pronotum 0.3× as long as mesoscutum length, and with sparse hairs; marginal vein slightly or distinctly longer than submarginal vein 8
8. Coxae dark and femora yellow or slightly darkened; propodeum with reticulation shallow
 - N. borborica* (Risbec, 1952) (female)
 - N. tsimbazae* (Risbec, 1952) (male)
 - Coxae and femora concolorous; propodeum with reticulation deep
 - N. femorata* (Girault, 1913)

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