

# Three new species of the genus *Sycophila* (Hymenoptera, Chalcidoidea, Eurytomidae) from China

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Academic editor: T. Dörfel | Received 19 November 2020 | Accepted 22 February 2021 | Published 8 April 2021

<http://zoobank.org/3E2BFD5E-80D0-4BAD-9FB3-4414FA62A2C5>

**Citation:** Xiao H, Zhang R, Gao M (2021) Three new species of the genus *Sycophila* (Hymenoptera, Chalcidoidea, Eurytomidae) from China. ZooKeys 1029: 123–137. <https://doi.org/10.3897/zookeys.1029.60911>

## Abstract

Three new species of *Sycophila* Walker (Hymenoptera, Eurytomidae), *S. hunanensis* **sp. nov.**, *S. melanoloma* **sp. nov.** and *S. melanopoda* **sp. nov.**, are reported and described from mainland China. Meanwhile, *Plagiotrochus glaucus* Melika & Tang, 2011 (Hymenoptera, Cynipidae) is reported as a new host record of the genus *Sycophila*. A key to Chinese *Sycophila* and illustrations of external features of the species are provided.

## Keywords

Chalcid wasp, fig wasp, key, parasitoids, plant galls, taxonomy

## Introduction

*Sycophila* is one of the large genera in the family Eurytomidae. It was described for the first time by Walker in 1871 under the Agaonidae, with two species included (*S. megastigmoides* Walker, 1871 and *S. decatomoides* Walker, 1871), both reared from the fruits of *Ficus benghalensis* L.. Ashmead (1904) selected the latter as the type species of *Sycophila* and transferred the genus to the subfamily Idarninae in the Torymidae. Bouček (1974) transferred it to Eurytomidae and synonymized

several genera with *Sycophila* (Bouček 1988). Since then, the genus has been extensively studied by several researchers, including Nieves Aldrey (1984), Narendran (1994) and Zerova (1995). The genus can be distinguished from other genera in the family Eurytomidae by the following combination of characters: marginal vein broadened, maculae dark brown and limited at the marginal and stigmal vein (or expanded to the disc), petiole elongate, and gaster often laterally compressed. Most species develop in very hard parts of plant galls or in figs, some species are recorded as parasitoids on gall makers (Bouček 1988; Narendran 1994; Chen et al. 1999; Lotfalizadeh and Gharali 2007). More than 100 different host species are reported for *Sycophila* (Noyes 2020), including species of Hymenoptera, Diptera, Lepidoptera and Hemiptera. Until now, 117 valid species of the genus have been described (Noyes 2020), but specific identification is difficult because the species differences are very small. Lotfalizadeh et al. (2008) used morphometrics and sequence data to distinguish several species based on morphological studies. It provides a new idea and method for the taxonomic study of this genus. Before the present work, only one species, *S. fujianensis* Özdikmen, was recorded from mainland China (Xu and He 2003; Özdikmen 2011). In this study, three new species, *S. hunanensis* sp. nov., *S. melanoloma* sp. nov. and *S. melanopoda* sp. nov. are reported and described from mainland China, meanwhile two species, *S. curta* Chen and *S. maculafacies* Chen, are newly recorded from mainland China.

## Materials and methods

All specimens were collected in the laboratory where they were reared from *Ficus microcarpa* L. and preserved in 75% or 95% ethanol. They were subsequently air-dried, point-mounted, and examined with a Leica MZ APO stereomicroscope. Photographs were taken under the Nikon Multizoom AZ100 system, and the plates were compiled using Adobe Photoshop software. Five species were identified, and all type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS).

Morphological terminology follows that of Bouček (1988), Gibson et al. (1997) and Lotfalizadeh et al. (2007). All specimens were examined and identified based on the studies of Balduf (1932), Bouček (1988), Narendran (1994), Zerova (1995), Chen et al. (1999), Lotfalizadeh and Gharali (2007), Lotfalizadeh et al. (2008) and Zerova and Harten (2009). Body length (i.e., the length of body excluding the ovipositor sheaths) is measured in millimeters (mm), other measurements are given as ratios.

Abbreviations of morphological terms used are:

- Fu<sub>n</sub>** funicular 1, 2...
- POL** posterior ocellar distance
- OOL** ocellocular distance
- Gt<sub>n</sub>** gastral tergite 1, 2...

## Taxonomy

### Key to species

- 1 Antenna slender, each funicular longer than broad,  $Fu_1$  at least  $2.0\times$  as long as broad ..... **2**
- Antenna thick,  $Fu_1$  at most  $1.5\times$  as long as broad ..... **3**
- 2 Body yellow-brown, except collar of pronotum, median line of propodeum, and median area of  $Gt_{1-3}$  black;  $Fu_1$   $2.8\times$  as long as broad, longer than pedicel; gastral petiole  $4.0\times$  as long as broad,  $Gt_4$  dorsally  $1.3\times$  as long as  $Gt_3$  ..... ***S. fujianensis***
- Body yellow-brown except median line of gaster black;  $Fu_1$   $2.0\times$  as long as broad, as long as pedicel; gastral petiole  $3\times$  as long as broad,  $Gt_4$  dorsally  $1.8\times$  as long as  $Gt_3$  ..... ***S. melanoloma* sp. nov.**
- 3 Body black, shoulder of pronotum and lateral panel of pronotum yellow-brown; fore wing with maculae not extending backward to disc; pedicel and flagellum combined longer than head width ..... ***S. hunanensis* sp. nov.**
- Body mainly yellow-brown; fore wing with maculae expending backward to disc; pedicel and flagellum combined as long as or shorter than head width.... **4**
- 4 Pedicel and flagellum combined as long as head width; pronotum yellow-brown, thorax reddish brown, gaster dark brown ..... ***S. melanopoda* sp. nov.**
- Pedicel and flagellum combined shorter than head width; body yellow-brown ..... **5**
- 5  $Fu_1$   $1.33\times$  as long as broad, as long as pedicel; pronotum and mesosoma with sparsely umbilicate puncturation, scutellum without umbilicate puncturation ..... ***S. curta***
- $Fu_1$  as long as broad, shorter than pedicel; pronotum, mesosoma and scutellum with sparsely umbilicate puncturation ..... ***S. maculafacies***

### *Sycophila* Walker, 1871

*Sycophila* Walker, 1871: 63. Type species: *Sycophila decatomoides* Walker, designated by Ashmead 1904; Bouček 1974: 267–268; Bouček 1988: 96–97; Narendran 1994: 156–170.

*Tineomyza* Rondani, 1872: 205. Type species: *Tineomyza pistacina* Rondani. Synonymized by Bouček 1974: 267–268.

*Pseudisa* Walker, 1875: 15. Type species: *Pseudisa smicroides* Walker. Synonymized by Bouček 1988: 96.

*Isanisa* Walker, 1875: 16. Type species: *Isanisa decatomoides* Walker. Synonymized by Bouček 1988: 96.

*Decatomidea* Ashmead, 1888: 42. Type species: *Decatomidea xanthochroa* Ashmead. Synonymized by Bouček 1988: 96.

*Eudecatoma* Ashmead, 1888: 42. Type species: *Decatoma batotooides* Ashmead, designated by Ashmead 1894. Synonymized by Bouček 1974: 267–268.

**Diagnosis.** Body yellowish or brownish, occasionally black. Head wider than mesosoma, lower margin of clypeus bilobed. Antennal insertion slightly above or on lower ocular line, antennal formula 11153 in female, 11143 in male. Prothorax with pronotum rectangular, almost as long as mesoscutum; mesothorax dorsally convex, notauli deep and complete, scutellum convex; propodeum with an inverted V-shaped basal submedian carina. Fore wing with marginal vein broadened, mostly with dark brown maculae below marginal vein; postmarginal vein slightly shorter than marginal vein. Hind femur distinctly thickened. Petiole elongated, gaster compressed from side-to-side.

**Biology.** Most species develop in plant galls or in figs, some extralimital species are recorded as parasitoids. The hosts involved Hymenoptera (Pteromalidae, Eulophidae, Eurytomidae, Tanaostigmatidae, Torymidae, Tenthredinidae, Cynipidae and Cecidomyiidae), Lepidoptera (Cecidosidae, and Gelechiidae), Diptera (Prodoxidae) and Hemiptera (Psyllidae) (Noyes 2020).

**Distribution.** China (Hainan, Fujian, Hunan, Guangxi, Hongkong, Taiwan) (Luo et al. 1987; Huang et al. 1988; Beardsley 1998; Chen et al. 1999; Xu et al. 2002). The species of *Sycophila* are reported throughout the world (Narendran 1994; Noyes 2020).

### *Sycophila fujianensis* Özdikmen, 2011

*Sycophila fujianensis* Özdikmen, 2011: 838. Replacement name for *Sycophila flava* Xu & He, 2003.

*Sycophila flava* Xu & He, 2003. Junior secondary homonym of *Sycophila flava* (Ashmead, 1881).

**Diagnosis.** Body length 3.0 mm. Body yellow-brown in general except collar of pronotum, median line of propodeum, and median area of  $Gt_{1-3}$  black. Wings hyaline, marginal vein and the surrounding dark brown. Head in dorsal view  $2.3\times$  as wide as long, head in frontal view  $1.2\times$  as wide as high. Antennal insertion on lower ocular line, scrobes not reaching anterior ocellus. Antenna slender, each funicular longer than broad respectively;  $Fu_1$   $2.8\times$  as long as broad, longer than the other funiculars; the length of the other funiculars shorter towards the end, the last funicular length  $1.9\times$  width. Fore wing  $2.7\times$  as long as broad, speculum distinct and closed behind; marginal vein  $1.6\times$  as long as stigmal vein; postmarginal vein shorter than marginal vein,  $1.1\times$  as long as stigmal vein. A row of long setae on the dorsal edge of hind tibia shorter than tibia width. Gaster cylindrical,  $4.0\times$  as long as broad,  $Gt_4$  dorsally  $1.3\times$  as long as  $Gt_3$ ; Length of  $Gt_4$   $1.2\times$  length of  $Gt_3$ . Male similar to the female, body length 3.0 mm, antenna with 4 funiculars; gaster short; petiole black dorsally.

**Hosts.** Gall wasps (cynipids) in bamboo shoots.

**Distribution.** China (Fujian) (Xu and He 2003).

***Sycophila melanoloma* Zhang & Xiao, sp. nov.**

<http://zoobank.org/B2CEEAEA-EB0A-4652-B314-74AE0A69B1C8>

Figs 1–5

**Material examined. Holotype.** ♀, China: Hainan: Danzhou, 19.31°N, 109.34°E, VI.2006, reared from *Ficus microcarpa* L., leg. Haoyuan Hu. **Paratypes.** 4♀, same data as holotype.

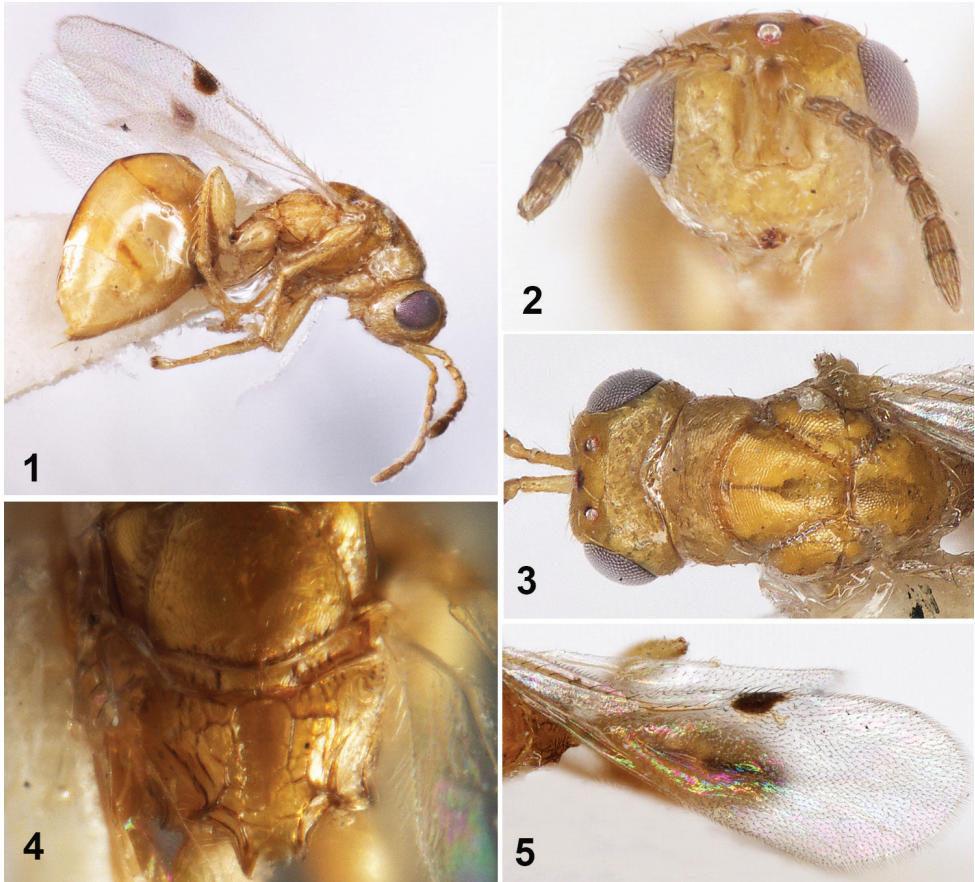
**Diagnosis.** Body slim, length 1.8–2.3 mm, mainly yellowish except eyes dark brown, median line of gaster black; antenna slender with  $Fu_1$  2.0× as long as broad; fore wing hyaline, marginal vein enlarged and with dark brown maculae; gastral petiole longer than wide, gaster compressed laterally, dorsally arched.

**Description. Female (holotype). Body** (Fig. 1) length 2.0 mm. Body brownish yellow except eyes red-brown, median line of gaster black; antennae and legs concolorous with body; wings hyaline, venation yellow-brown except marginal vein enlarged with black maculae; head and thorax smooth, umbilicate puncturation sparse and shallow.

**Head** with white pubescens sparse, head in frontal view 1.5× as wide as high (Fig. 2), eyes separated by 1.5× their height, malar space 0.7× eyes height, malar sulcus space 1.43× malar space. Antennal insertion above lower ocular line; scrobes deep and smooth, not reaching anterior ocellus, interantennal crest absent. Lower face smooth. Lower margin of clypeus with incision separating a single tooth on both sides; mandible three toothed. Head in dorsal view (Fig. 3) 1.67× as broad as long, occipital carina inconspicuous; temple length 0.2× eyes length; POL 2.5× OOL, OOL 2.0× ocellus diameter. Antennal formula 11153 (Figs 1, 2); scape reaching anterior ocellus, equal to eyes height, 5.0× as long as broad, 2.5× pedicel length; pedicel and flagellum combined 1.33× head width; pedicel in lateral view 2.0× as long as broad, equal to  $Fu_1$ ; anellus 0.5× as long as broad;  $Fu_1$  2.0× as long as broad,  $Fu_2$ – $Fu_5$  slightly shorter than  $Fu_1$  (1.85× as long as broad); clava length 3.0× width, shorter than the following three funiculars combined; each funicular with single row of sensilla; ventral surface of clava without micropilose area.

**Mesosoma** 1.45× as long as broad in dorsal view. Pronotum 0.46× as long as broad. Mesoscutum 0.62× as long as broad, notauli deep and complete. Scutellum as long as broad. Propodeum shorter than mesoscutum (0.39×), nucha distinct, median carina and plica absent; median longitudinal furrow distinct, irregular cells formed by irregular ridges on both sides (Fig. 4). Fore wing (Fig. 5) 2.86× as long as broad, with marginal fringe; maculae dark brown, confining on marginal vein and stigmal vein, not extending backward; marginal vein triangular broadened; ratio of marginal vein: postmarginal vein: stigmal vein as 8:3:3. Fore femur stout, fore tibia with a ventral spur at apex; mid femur enlarged, mid tibia thin and outer edge with a single row of setae; hind coxa stout, 2.0× as long as broad; hind femur enlarged, 1.67× as long as broad; hind tibia with 2 ventral spurs at apex.





**Figures 1–5.** *Sycophila melanoloma* sp. nov., female holotype **1** body in lateral view **2** head in frontal view **3** head and mesosoma in dorsal view **4** propodeum in dorsal view **5** fore wing in dorsal view.

**Metasoma** 1.67× as long as mesosoma. Gaster petiolate, 3.0× as long as broad, laterally compressed. Gaster bare and smooth, distinctly compressed and dorsally arched, median line of gaster black; length of  $Gt_4$  as long as  $Gt_1$ - $Gt_3$  combined, 2.0× as  $Gt_3$ . Ovipositor exposed, 0.08× as long as gaster.

**Male.** Unknown.

**Etymology.** The specific name is derived from the Latin 'melanolomus', referencing the character of the gaster with a median black line.

**Remarks.** The species is similar to *S. petiolata* Chen, 1999 from Taiwan (Chen et al. 1999) but noticeably different by the gaster compressed and dorsally arched (gaster oval in *S. petiolata*), mesonotum and metanotum yellowish (mesonotum and metanotum with dark brown patches in *S. petiolata*).

**Host.** *Ficus microcarpa* L.

**Distribution.** China (Hainan).

***Sycophila hunanensis* Xiao & Gao, sp. nov.**

<http://zoobank.org/E97CFFFB-03C1-42AD-84FE-FFE09135E9C0>

Figs 6–13

**Material examined.** *Holotype*. ♀, China: Hunan: Yanling Xian: Shidu, 1.III.2017, ex. galls of *Plagiotrochus glaucus* Melika & Tang (Cynipini), leg. Gaozhi Zhao. *Paratype*. 4♀1♂, same data as holotype; 2♂, China: Hainan: Wuzhi Shan, 708-1206M, 9.IV.2010, leg. Tianyang Jiao.

**Diagnosis.** Body length 1.8–2.0 mm, mainly black except lateral shoulder and lateral panel of pronotum yellow-brown; antenna slightly thick,  $Fu_1$  1.23× as long as broad,  $Fu_2$ – $Fu_5$  subequal to  $Fu_1$ ; pedicel and flagellum combined slightly longer than head width (1.1×); marginal vein enlarged, maculae not extending backward to disc of fore wing.

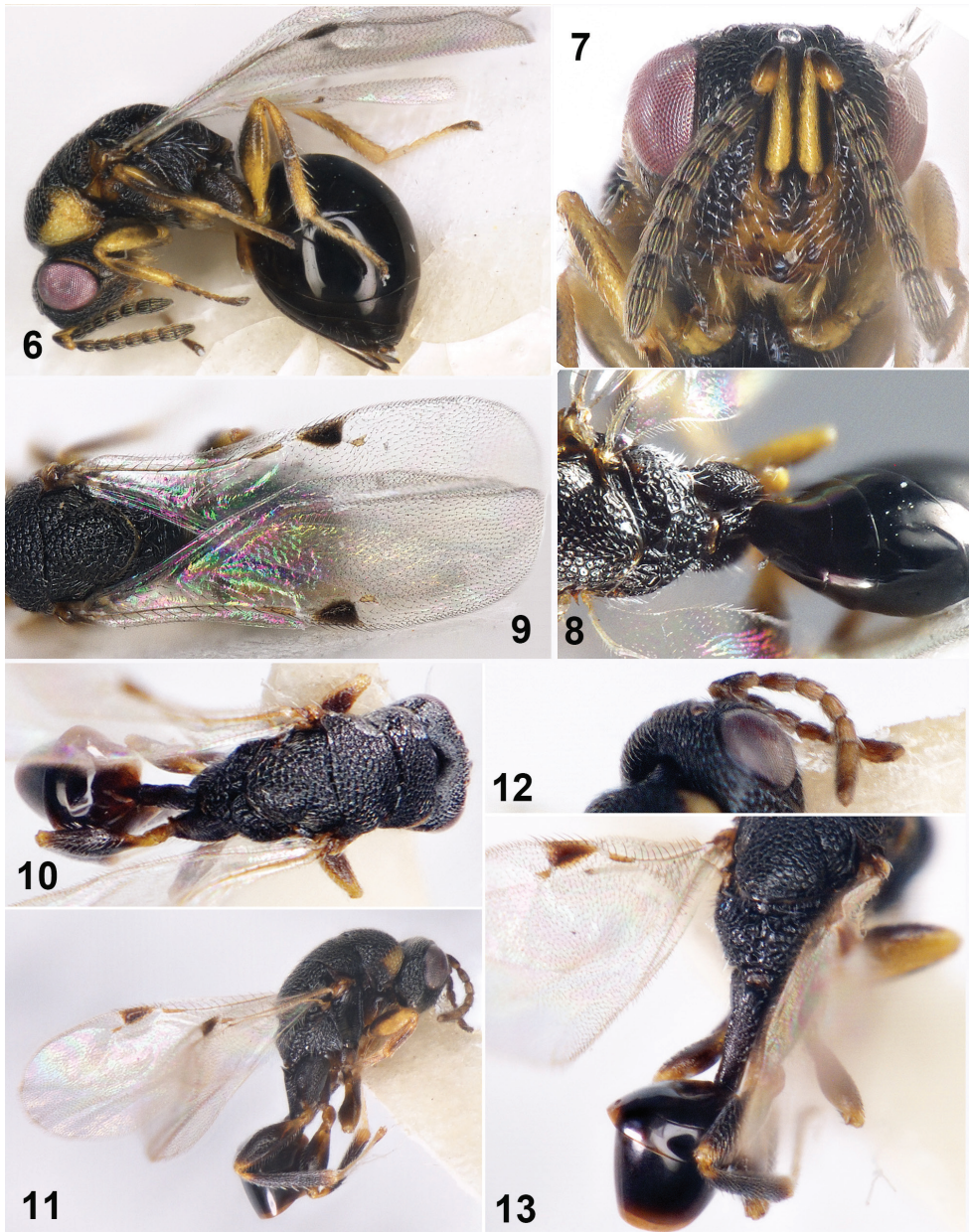
**Description. Female (holotype).** *Body* (Fig. 6) length 2.0 mm, body black except eyes red-brown, middle part of lower face yellowish, shoulder of pronotum and lateral panel of pronotum yellow-brown. Antennae brown except scape yellowish and pedicel yellow-brown. Legs yellowish except coxa dark brown, femur and tibia brown on middle part. Wings hyaline, venation yellow-brown except marginal vein enlarged with black spot. Head and thorax with densely umbilicate puncturation.

**Head** hairy, 1.25× as wide as high in frontal view (Fig. 7), eyes separated by 1.52× their height, malar space 0.81× eyes height. Antennal insertion on lower ocular line; scrobes deep and smooth, not reaching anterior ocellus, interantennal crest absent. Umbilicate puncturation shallow on lower face. Lower margin of clypeus with incision separating a single tooth on both sides; mandible three toothed. Head in dorsal view 1.67× as wide as long, occipital carina inconspicuous; temple length 0.3× eyes length; POL 2.16× OOL, OOL 2.0× ocellus diameter. Antennal formula 11153; scape reaching anterior ocellus, equal to or slightly shorter than eyes height, 6.25× as long as broad, 2.36× pedicel length; pedicel and flagellum combined 1.1× head width; pedicel in lateral view 2.0× as long as broad, longer than  $Fu_1$ ; anellus 0.5× as long as broad;  $Fu_1$  1.23× as long as broad,  $Fu_2$ – $Fu_5$  as long as  $Fu_1$ ; clava length 3.0× width, shorter than the following three funiculars combined; each funicular with a single row of sensilla; ventral surface of clava without micropilose area.

**Mesosoma** 1.58× as long as broad. Pronotum 0.51× as long as broad. Mesoscutum 0.67× as long as broad, notauli shallow and complete. Scutellum slightly longer than broad (1.11×). Propodeum rugosity (Fig. 8), shorter than mesoscutum (0.73×); basal sculpture of median furrow with one row of areoles; median carina and plica absent. Fore wing (Fig. 9) 2.3× as long as broad, with marginal fringe, speculum and basal hairline; maculae dark brown, confining on marginal vein and stigmal vein, not extending backward; marginal vein triangular broadened; ratio of marginal vein: post-marginal vein: stigmal vein as 12:2:10. Hind coxa stout, 2.0× as long as broad; hind femur enlarged in middle part, 3.33× as long as broad; hind tibia with 2 ventral spurs.

**Metasoma** 1.22× as long as mesosoma. Gaster with petiole longer than broad, reticulate; gaster 2.0× as long as broad, laterally compressed. Gaster arched in lateral view, gastral tergum smooth;  $Gt_4$  longest, 1.36× as long as  $Gt_3$ . Ovipositor not exposed.





**Figures 6–13.** *Sycophila hunanensis* sp. nov. **6–9** female holotype **6** body in lateral view **7** head in frontal view **8** propodeum in dorsal view **9** fore wing in dorsal view **10–13** male **10** body in dorsal view **11** body in lateral view **12** antenna **13** propodeum, petiole and gaster in dorsal view.

**Male.** Length 2.0 mm, body (Figs 10, 11) black except tegula, anterior corner of pronotum yellowish, apex of femur, apex of tibia and tarsus yellowish. Head and thorax with densely umbilicate puncturation. Antenna dark brown, formula 11143 (Fig. 12),



Fu<sub>1</sub> 1.83× as long as broad, Fu<sub>2</sub>-Fu<sub>4</sub> equal to Fu<sub>1</sub>. Petiole (Fig. 13) 4.0× as long as broad, shorter than gaster; gaster 1.55× as long as petioles, Gt<sub>4</sub> longer than other tergites.

**Etymology.** Named after the location of the type material.

**Remarks.** The species is similar to *S. biguttata* (Swederus, 1795) from Sweden (Lotfalizadeh and Gharali 2007), but different by the maculae on fore wing not extending backward to disc, hind tibia pale yellowish except mid part brown.

**Host.** The wasps were reared from the galls of *Plagiotrochus glaucus* Tang & Melika, 2011 (Hym., Cynipidae) (Tang and Melika 2011) in China.

**Distribution.** China (Hunan, Hainan).

***Sycophila melanopoda* Zhang & Xiao, sp. nov.**

<http://zoobank.org/7BDF6F62-524C-4103-9CBC-58B1527A5162>

Figs 14–18

**Material examined. Holotype.** ♀, China: Hainan: Danzhou, 19.31°N, 109.34°E, VI.2006, reared from *Ficus microcarpa* L., leg. Haoyuan Hu. **Paratypes.** ♀, same data as holotype.

**Diagnosis.** Body length 1.6–1.8 mm, head and mesonotum brownish black, pronotum yellow, gaster dark brown; antenna with pedicel and flagellum combined as long as head width, Fu<sub>1</sub> 1.6× as long as broad. Fore wing with maculae expending backward to disc, marginal vein 2.5× as long as postmarginal vein, postmarginal vein shorter than stigmal vein. Hind femur enlarged, 1.5× as long as broad, gaster compressed.

**Description. Female (holotype).** *Body* length 1.8 mm (Figs 14, 15). Head and mesonotum brownish black, pronotum yellow, gaster dark brown; forehead black, gena yellow, eyes red-black; antennal yellow except clava dark brown; legs yellow except hind tibia concolorous with gaster; wings hyaline, venation yellow-brown; marginal vein enlarged, maculae expanded backward. Head and thorax with sparsely shallower umbilicate puncturation.

**Head** in frontal view 1.17× as wide as high. Face with white pubescens sparse; eyes separated by 0.94× their height; malar space 0.35× eyes height; malar sulcus space 1.33× malar space. Antennal insertion slightly above lower ocular line, at 3/4 of head height. Lower margin of clypeus emarginated and with a small tooth on both sides; mandible three toothed. Head in dorsal view 2.15× as wide as high, occipital carina inconspicuous; temple length 0.33× eyes length; POL 2.25× OOL, OOL 4.0× ocellus diameter. Antennal formula 11153 (Fig. 16); scape not reaching anterior ocellus, 5.5× as long as broad, 0.65× eyes height, 3.67× pedicel length; length of pedicel and flagellum combined as long as head width; pedicel in lateral view 2.0× as long as broad, as long as Fu<sub>1</sub>; anellus 0.5× as long as broad; Fu<sub>1</sub> 1.6× as long as broad, following funiculars increase gradually on length and width; clava length 1.75× width, shorter than the following three funiculars combined; each funicular with a single row of sensilla; ventral surface of clava without micropilose area.



**Figures 14–18.** *Sycophila melanopoda* sp. nov., female holotype **14** body in dorsal view **15** body in lateral view **16** head in frontal view **17** mesosoma and metasoma in dorsal view **18** fore wing in dorsal view.

**Mesosoma** 1.62× as long as broad, with reticulation and sparsely umbilicate puncturation in dorsal view. Pronotum near rectangle, 0.42× as long as broad. Mesoscutum 0.58× as long as broad; notauli deep and complete. Scutellum as long as broad, medially protuberate. Propodeum (Fig. 17) 0.47× as long as mesoscutum, with small and dense sculpture; with an inverted V-shaped carina and a V-shaped carina, plica distinct, median carina absent. Fore wing (Fig. 18) 2.34× as long as broad, maculae expending backward to disc, marginal vein subparallel; ratio of marginal vein: postmarginal vein: stigmal vein as 5:2:3. Fore tibia with a ventral split spur at apex; mid tibia slim, with a ventral spur at apex. Hind coxa enlarged, 2.5× as long as broad; hind femur enlarged, 1.5× as long as broad; hind tibia ventrally with single apical spur.

**Metasoma** 1.19× as long as mesosoma. Gaster petiolate; gaster near rhombus, 2.33× as long as broad; gastral tergum smooth;  $Gt_4$  longest, 1.25× as long as  $Gt_3$ . Ovipositor exposed, 0.17× as long as gaster.

**Male.** Unknown.

**Etymology.** The specific name is derived from the Latin ‘*melano*’ (black) and ‘*podus*’ (foot), referencing the character of hind tibia black.

**Remarks.** The species is similar to *S. maculafacies* Chen, 1999 from Taiwan (Chen et al. 1999) but noticeably different by pedicel and flagellum combined as long as head width (shorter than head width in *S. maculafacies*), hind tibia black (yellow-brown in *S. maculafacies*), gaster dark brown (yellow-brown in *S. maculafacies*).

**Host.** *Ficus microcarpa* L.

**Distribution.** China (Hainan).

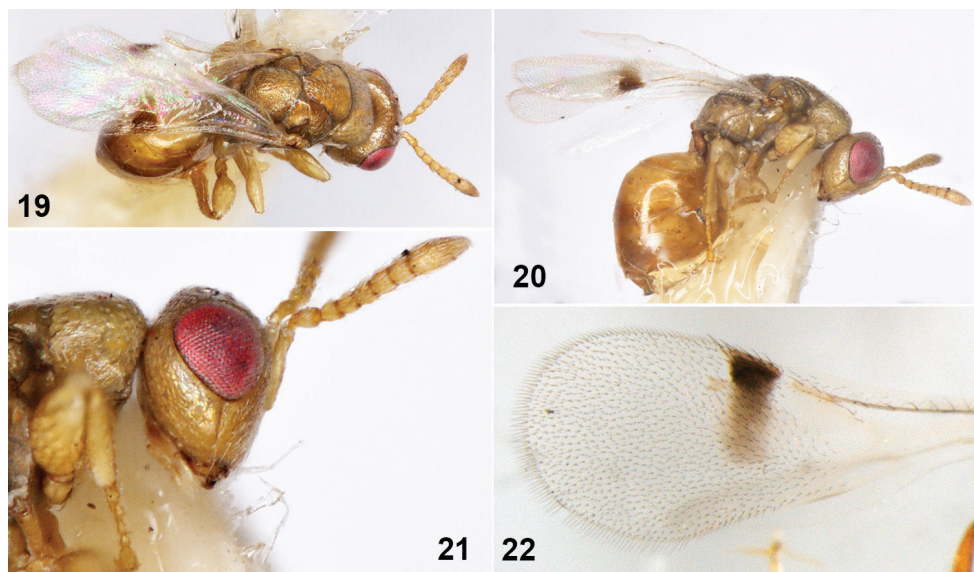
### *Sycophila curta* Chen, 1999

Figs 19–22

*Sycophila curta* Chen, 1999, in Chen et al. 1999: 45.

**Material examined.** 3♀, China: Hainan: Danzhou, VI.2006, leg. Haoyuan Hu. 5♀, China: Hainan: Danzhou, VIII.2006, leg. Haoyuan Hu. 4♀, China: Hainan: Lingshui, IV.2005, leg. Yanzhou Zhang, Tongxin Zhang. ♀, China: Guangxi: Wuzhou, X.2005, leg. Yanzhou Zhang, Wei Li.

**Diagnosis.** Body (Figs 19, 20) length 1.38–1.8 mm. Body yellow-brown, eyes reddish, antennal yellow, wings venation yellow-brown except marginal vein enlarged and with dark brown maculae. Head in frontal view 1.4× as wide as high, eyes separated by 1.5× their height; malar space 0.6× eyes height. Lower margin of clypeus emarginated



**Figures 19–22.** *Sycophila curta* Chen, female **19** body in dorsal view **20** body in lateral view **21** head in lateral view **22** fore wing in dorsal view.

and with a small tooth on both sides, mandible three toothed. Head in dorsal view  $2.14\times$  as broad as long, POL  $3.33\times$  OOL, OOL  $3\times$  ocellus diameter. Antennal insertion on lower ocular line; scape  $4.5\times$  as long as broad, not reaching anterior ocellus (Fig. 21); scape length shorter than eyes height; pedicel as long as  $Fu_1$ ; length of pedicel and flagellum combined shorter than head width ( $0.83\times$ );  $Fu_1$   $1.33\times$  as long as broad. Pronotum and mesosoma with sparsely umbilicate puncturation, scutellum sub-rectangular, without umbilicate puncturation. Fore wing (Fig. 22) with maculae around marginal, post-marginal and stigmal vein, and expending backward to disc. Marginal vein broaden, stigma elongate; marginal vein  $1.5\times$  as long as postmarginal vein,  $3.0\times$  as long as stigmal vein. Legs covered with soft small setae. Gaster blob-shape. Ovipositor unexposed.

**Male.** No male species was found in this study. According to Chen et al. (1999), body length 1.14–1.62 mm. Body yellowish, eyes dark red, 2 brown black spots at the end of gaster. Body covered with small umbilicate puncturation. Head as wide as high. Antennal formula 11143. Petiole shorter than gaster.

**Host.** *Ficus microcarpa* L.

**Distribution.** China (Guangxi, Hainan, Taiwan).

### *Sycophila maculafacies* Chen, 1999

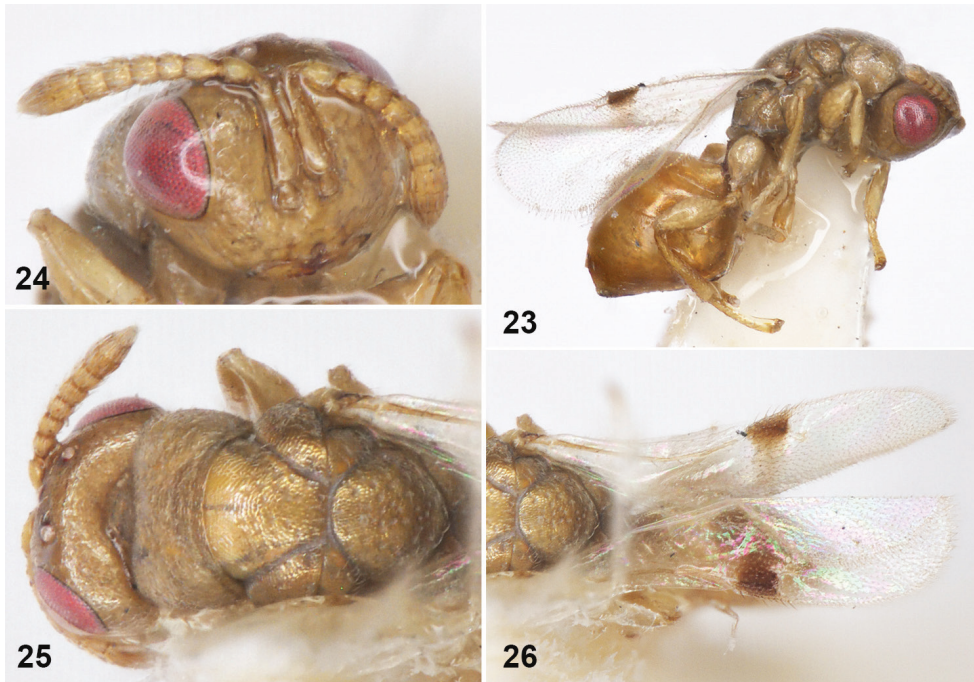
Figs 23–26

*Sycophila maculafacies* Chen, 1999, in Chen et al. 1999: 51.

**Material examined.** 5♀, China: Hainan: Zhanzhou, V. 2006, leg. Haoyuan Hu. 6♀, China: Hainan: Zhanzhou, VI. 2006, leg. Haoyuan Hu. 5♀, China: Hainan: Zhanzhou, VIII.2006, leg. Haoyuan Hu. 5♀, China: Hainan: Zhanzhou, IX.2006, leg. Haoyuan Hu. 4♀, China: Hainan: Lingshui, IV.2005, leg. Yanzhou Zhang, Tongxin Zhang. ♀, China: Guangxi: Wuzhou, X.2005, leg. Yanzhou Zhang, Wei Li.

**Diagnosis. Female.** Body (Fig. 23) length 1.5–1.62 mm. Body yellow-brown (or head, thorax, and gaster dark brown except pronotum yellowish); eyes dark red; antennal yellow or yellow-brown; wings hyaline, venation yellow-brown except marginal vein enlarged and with dark brown maculae; head and thorax with sparsely shallower umbilicate puncturation. Head in frontal view  $1.25\times$  as wide as high (Fig. 24), eyes separated by  $1.6\times$  their height; malar space  $0.8\times$  eyes height. Head in dorsal view  $2.0\times$  as broad as long, POL  $5\times$  OOL, OOL  $3.0\times$  ocellus diameter. Antennal insertion on lower ocular line. Antenna stout, formula 11153 (11143 in male) (Figs 24, 25), scape  $5.0\times$  as long as broad, not reaching anterior ocellus; scape length equal to eyes height,  $3.33\times$  as long as pedicel; pedicel slightly longer than  $Fu_1$ ; each funicular square or shorter than its broad, ( $Fu_1$  square,  $Fu_2$   $0.78\times$  as long as broad); pedicel and flagellum combined shorter than head width ( $0.88\times$ ). Mandible three toothed. Mesosoma (Fig. 25)  $1.4\times$  as long as broad, pronotum and mesosoma with sparsely umbilicate puncturation, notauli deep and complete, scutellum as long as broad. Fore wing (Fig. 26) marginal vein broaden, stigma elongate; marginal vein as long as stigmal vein,  $1.43\times$  as long as postmarginal vein. Gaster diamond-shape in dorsal view.





**Figures 23–26.** *Sycophila maculafacies* Chen, female **23** body in lateral view **24** head and antenna in frontal view **25** head and thorax in dorsal view **26** fore wing in dorsal view.

**Male.** According to Chen et al. (1999), body length 0.96–1.20 mm. Frons black, gena yellow, eyes dark red, body black except pronotum yellowish. Body covered with small umbilicate puncturation. Head as wide as high, antennal formula 11143. Petiole shorter than gaster.

**Host.** *Ficus microcarpa* L.

**Distribution.** China (Guangxi, Hainan, Taiwan).

## Acknowledgements

Thanks are due especially to Dr Danqing Xiao (Department of STEM, Regis College, USA) for the help in editing the text. This work was supported by the National Natural Science Foundation of China under grant numbers 316723288 and 31750002.

## References

- Ashmead WH (1881) On some species of Chalcididae from Florida. Canadian Entomologist 13(6): 134–136. <https://doi.org/10.4039/Ent13134-6>
- Ashmead WH (1888) A revised generic table of the Eurytominae, with descriptions of new species. Pt I. Entomologica Americana 4: 41–43.

- Ashmead WH (1894) Report on the parasitic Cynipidae, part of the Braconidae, the Ichneumonidae, the Proctotrupidae, and part of the Chalcididae. Part II. Journal of the Linnean Society (Zoology) 25: 108–188.
- Ashmead WH (1904) Classification of the chalcid flies of the superfamily Chalcidoidea, with descriptions of new species in the Carnegie Museum, collected in South America by Herbert H. Smith. Memoirs of the Carnegie Museum 1(4): 225–551. <https://doi.org/10.5962/bhl.title.10341>
- Baldur WV (1932) Revision of the chalcid flies of the tribe Decatomini (Eurytomidae) in America north of Mexico. Proceedings of the United States National Museum 79: 1–95. <https://doi.org/10.5479/si.00963801.79-2894.1>
- Beardsley WJ (1998) Chalcid wasps (Hymenoptera: Chalcidoidea) associated with fruit of *Ficus microcarpa* in Hawaii. Proceedings of the Hawaiian Entomological Society 33: 19–33.
- Bouček Z (1974) On the Chalcidoidea (Hymenoptera) described by C. Rondani. Redia 55: 241–285.
- Bouček Z (1988) Australian Chalcidoidea (Hymenoptera): A Biosystematic Revision of Genera and Fourteen Families, with a Reclassification of Species (Fig wasp section). CAB International, Wallingford, Oxon, U.K., Cambrian News Ltd., Aberystwyth, Wales, 832 pp.
- Chen YR, Chuang WC, Wu WJ (1999) Chalcid wasps on *Ficus microcarpa* L. in Taiwan (Hymenoptera: Chalcidoidea). Journal of Taiwan Museum 52(1): 39–79.
- Gibson GAP, Huber JT, Woolley JB (1997) Morphology and Terminology. In: Gibson GAP, Huber JT, Woolley JB (Eds) Annotated Keys to the Genera of Nearctic Chalcidoidea (Hymenoptera). National Research Council Research Press, Ottawa, 794 pp.
- Huang JF, Luo YQ, Liao DX (1988) Studies on the natural enemies of chestnut gall wasp in China. Scientia Silvae Sinicae (Linze Kexue) 24(2): 162–169.
- Lotfalizadeh H, Gharali B (2007) Some notes on the genus *Sycophila* Walker, 1871 (Hymenoptera: Eurytomidae) in the west of Iran. Zoology in the Middle East 40: 77–84. <https://doi.org/10.1080/09397140.2007.10638207>
- Lotfalizadeh H, Delvare G, Rasplus J-Y (2007). Phylogenetic analysis of Eurytominae based on morphological characters (Chalcidoidea: Eurytomidae). Zoological Journal of the Linnean Society 151: 441–510. <https://doi.org/10.1111/j.1096-3642.2007.00308.x>
- Lotfalizadeh H, Delvare G, Rasplus J-Y (2008) *Sycophila pistacina* (Hymenoptera: Eurytomidae): A valid species. European Journal of Entomology 105: 137–147. <https://doi.org/10.14411/eje.2008.019>
- Luo YQ, Huang JF, Liao DX (1987) Studies on the distribution and biology of *Torymus sinensis* Kamijo. Journal of Beijing Forestry University 9(1): 45–57.
- Narendran TC (1994) Torymidae and Eurytomidae of Indian subcontinent (Hymenoptera: Chalcidoidea) Zoological Monograph, Department of Zoology, University of Calicut, Kerala, 500 pp.
- Nieves Aldrey JL (1984) On the species of *Sycophila* Walker, associated with cynipid galls in the Iberian Peninsula, with description of a new species (Hym., Eurytomidae). Eos. Revista Española de Entomología. Madrid 59(1/4): 179–191.
- Noyes JS (2020) Universal Chalcidoidea Database. <http://www.nhm.ac.uk/chalcidoids> [Accessed 21 October 2020]

- Özdikmen H (2011) New names for some preoccupied specific epithets in Chalcidoidea II: families Eupelmidae, Eurytomidae, Mymaridae, Perilampidae, Pteromalidae, Torymidae (Hymenoptera: Parasitica). *Munis Entomology & Zoology* 6(2): 832–855.
- Rondani C (1872) Sopra alcuni vesparii parassiti. Note. *Bullettino della Society Entomologica Italiana* 4(2): 201–208.
- Tang CT, Melika G, Yang MM, Nichollas JA, Stone GN (2011) New species of oak gallwasps from Taiwan (Hymenoptera: Cynipidae: Cynipini). *Zootaxa* 2865: 37–52. <https://doi.org/10.11646/zootaxa.2865.1.2>
- Walker F (1871) Chalcididae, Leucospidae, Agaonidae, Perilampidae, Ormyridae, Encyrtidae. Part 4. Notes on Chalcididae 55–70.
- Walker F (1875) Descriptions of new genera and species of parasites, belonging to the families Proctotrupidae and Chalcididae, which attack insects destructive to the fig in India. *Entomologist* 8: 15–18.
- Xu ZH, He JH (2003) Eurytomidae. In: Huang BK (Ed.) *Fauna of Insects of Fujian Province of China*. Fujian Publishing House of Science and Technology, Fuzhou, Fujian, China, 7: 483–486.
- Xu ZH, Hu GL, Jiang HZ, Ye YZ (2002) Ten species of chalcidoids reared from bamboo gall with notes on one new record species. *Forest Research* 15(4): 444–449.
- Zerova MD (1995) The parasitic Hymenoptera – subfamilies Eurytominae and Eudecatominae (Chalcidoidea, Eurytomidae) of the Palaearctics. *Naukova Dumka Publishers*, Kiev, 457 pp.
- Zerova MD, Harten A van (2009) Two new species of the genus *Sycophila* (Hymenoptera, Eurytomidae) from Yemen. *Vestnik Zoologii*, Kiev 43(6): 543–544. <https://doi.org/10.2478/v10058-009-0024-8>