

## Description of nine new species of the genus *Sycophila* Walker (Chalcidoidea, Eurytomidae) from Kerala, India

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**ABSTRACT:** Nine new species viz., *Sycophila drupacea* sp. nov., *S. arnottiana* sp. nov., *S. religiosa* sp. nov., *S. virens* sp. nov., *S. infectoria* sp. nov., *S. wayanadensis* sp. nov., *S. batheri* sp. nov., *S. tinctoria* sp. nov. and *S. gibbose* sp. nov. were described and reported from five different fig species, *Ficus drupacea*, *F. arnottiana*, *F. religiosa*, *F. virens* and *F. tinctoria*, from Wayanad regions of Kerala, India.

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**KEY WORDS:** Fig wasp, Hymenoptera, taxonomy, Wayanad, non-pollinator

### INTRODUCTION

The genus *Sycophila* was described for the first time by Walker in 1871 with *S. decatomoides* Walker, 1871 reared from the fruits of *Ficus benghalensis* L. as the type species. The major publication on fig associated *Sycophila* in India was Joseph and Abdurahiman, 1968, describing six *Sycophila* species. An extensive study of this genus of oriental region was published by Narendran in 1994. There are around 119 species of *Sycophila* in the world (Noyes, 2019) out of which 31 are from oriental region (Noyes, 2019). *Sycophila* species that are associated with figs are around 20 in number, in the world; 11 in oriental region and 8 in India (Noyes, 2019). Although more than 100 different host species are reported for *Sycophila* (Noyes, 2019), including parasitoids on species of Hymenoptera, Diptera, Lepidoptera and Hemiptera, genus *Sycophila* reared from syconia of *Ficus* are actually inquiline in Epichrysomallinae galls

(Lotfalizadeh *et al.*, 2007). In this study, new species of genus *Sycophila*, associated with five different *Ficus* species namely *F. drupacea*, *F. arnottiana*, *F. religiosa*, *F. virens* and *F. tinctoria*, are described from Kerala, India.

### MATERIALS AND METHODS

Nearly mature D-phase figs (syconia) of different *Ficus* sp. were collected during 2019 – 2021 and brought them to the laboratory and divided the figs into parts and observed the fig wasp's emergence. Later the fig wasps were transferred to alcohol (70 %), labelled and then the specimens were transferred to alcohol (90 %) for storage. The specimens were card mounted on triangular cards (14×5mm) after passing through alcohol series (95 and 100 per cent) and then drying in HMDS (hexamethyldisilazane) solution. The labelled and card mounted specimens were later studied, identified and described using LEICA M205 stereo zoom microscope and imaged with an attached

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LEICA DFC 2900 digital camera. Measurements were obtained using Leica LAS software (Leica Application Suite V3.80) and images taken at varying focal depths were stacked using LAS. Final illustrations were improved for contrast and brightness using Adobe® Photoshop® CS5 (Version 12.0 x 64) software. The type species is deposited in the entomological collections of Systematic Entomology Laboratory, Malabar Christian College, Kozhikode and will be deposited also in the 'National Zoological Collection' of Zoological Survey of India, Western Ghat Regional Centre, Kozhikode (ZSIK).

The general abbreviations of the terms are as follows, POL – distance between posterior ocelli; OOL – distance between posterior ocellus and eye margin; SMV – submarginal vein; MV – marginal vein; STV – stigma vein; PMV – post marginal vein; T<sub>1</sub> – T<sub>6</sub> – gaster tergal segments. All lengths are measured medially and widths are measured at the maximum wider area, unless mentioned otherwise. The total range are taken from all specimens while the ratios mentioned are the mode values taken from multiple measurements from a single (a holotype and single paratype male) specimens.

## RESULTS AND DISCUSSION

Key to species of fig associated *Sycophila* of India, modified from Narendran, 1994

- 1 Antenna pedicel as long as F1 or shorter than F1 .....2
  - Antenna pedicel always longer than F1.....12
- 2 Pedicel as long as F1 ..... 3
  - Pedicel shorter than F1.....6
- 3 POL < OOL; MV d" 2× STV ..... 4
  - POL > OOL; MV > 2× STV .....5
- 4 Median length of pronotum distinctly shorter than half the median length of scutellum; MV 2× STV; SMV having 12 bristles in row .....***S. tinctoria* sp. nov.**
  - Median length of pronotum distinctly longer than half the median length of scutellum; MV 1.3× STV; SMV having 9 bristles in row .....***S. gibbosa* sp. nov.**
- 5 Anterior width of head 1.35× length; pterostigmal area 2× as wide as long; MV 2.75× STV; T4 longest .....***S. dharwarensis*** (Joseph & Abdurahiman)
  - Anterior width of head 3.8× length; pterostigmal area a little longer than wide; MV 3× STV; T3 longest.....***S. fici*** (Joseph)
- 6 F1 distinctly longer than pedicel (F1 > 1.5× pedicel); median length of mesoscutum and scutellum subequal; T3 or T4 longest .....7
  - F1 a little longer than pedicel; median length of mesoscutum longer or shorter than the median length of scutellum; T4 longest .....10
- 7 POL almost equal to OOL; F1 ≥ 2× pedicel; T3 longest.....8
  - POL ≥ 1.5× OOL; F1 < 2× pedicel; T3 or T4 longest .....9
- 8 Anterior width of head 1.45× length; length of F1 > 2× length of pedicel; pterostigmal area wider than long; propodeum with a median smooth fovea, sides weakly reticulate .....***S. karnatakensis*** (Joseph & Abdurahiman)
  - Anterior width of head 1.7× length; length of F1 2× length of pedicel; pterostigmal area longer than wide; median area of propodeum concave with narrow median groove interrupted by a number of transverse carinae .....***S. taprobanica*** (Westwood)
- 9 Anterior width of head 1.4× length; pterostigmal area 1.3× wide as long; T4 longest; POL 1.8× OOL; propodeum with a median fovea, sides of fovea punctate with large number of macrochaetae on either side .....***S. pilosa*** (Joseph & Abdurahiman)

- Anterior width of head  $1.18\times$  length; pterostigmal area wider than long; T3 longest; POL  $1.5\times$  OOL; propodeum with broad depressed fovea, its bounded laterally by carinae, surface of fovea smooth and shiny ..... *S. decatomoides* Walker
- 10** Median length of mesoscutum distinctly longer than the median length of scutellum; SMV having 20 bristles in a row; pterostigmal area longer than wide .....  
*S. robusta* (Joseph & Abdurahiman)
- 6 Median length of mesoscutum little shorter than the median length of scutellum; SMV with less than 15 bristles in a row; pterostigmal area wider than long .....11
- 11** Anterior width of head  $1.45\times$  length; POL  $2\times$  OOL; SMV with 14 bristles in a row; propodeum with a median smooth fovea, bounded by lateral carinae, anteriorly delimited by oblique cross carinae.....  
*S. drupacea* sp. nov.
- Anterior width of head  $1.7\times$  length; POL  $1.2\times$  OOL; SMV with 10 bristles in a row; propodeum with a median fovea, bounded by lateral carinae, surface of the fovea rugulose and imbricate medially .....*S. virens* sp. nov.
- 12** POL < OOL distance; Anterior width of head  $1.6\times$  length.....*S. infectoria* sp. nov.
- POL > OOL distance; Anterior width of head  $\geq 1.6\times$  length .....13
- 13** Eye length less than  $2\times$  malar space; POL <  $2\times$  OOL .....14
- Eye length more than or equal to  $2\times$  malar space; POL >  $2\times$  OOL .....16
- 14** POL  $1.5\times$  OOL; scape  $2.4\times$  pedicel; Anterior width of head  $1.4\times$  length .....  
*S. benghalensis* (Joseph & Abdurahiman)
- POL almost equal to OOL; Other characters also different .....15
- 15** Pronotum distinctly shorter than half the median length of scutellum; T5 longest .....*S. batheri* sp. nov.
- Median length of pronotum longer than the median length of scutellum; T3 longest .....*S. wayanadensis* sp. nov.
- 16** Median length of pronotum shorter than the median length of scutellum; T4 longest; MV  $2\times$  STV; SMV with 15 bristles in a row .....*S. arnottiana* sp. nov.
- Median length of pronotum longer than the median length of scutellum; T5 longest; MV  $1.6\times$  STV; SMV with 5 bristles in a row .....*S. religiosa* sp. nov.

**SYCOPHILA** Walker

*Sycophila* Walker, 1871. Type species *Sycophila decatomoides* Walker.

*Decatomidea* Ashmead, 1888. Type species *Decatomidea xanthochroa* Ashmead.

*Eudecatoma* Ashmead, 1888. Type species *Decatoma batatoides* Ashmead.

*Isanisa* Walker, 1875. Type species: *Sycophila decatomoides* Walker, by monotypy.

*Pseudisa* Walker, 1875. Type species: *Pseudisa smicroides* Walker, by monotypy.

*Tineomyza* Rondani, 1872. Type species: *Tineomyza pistacina* Rondani, by monotypy.

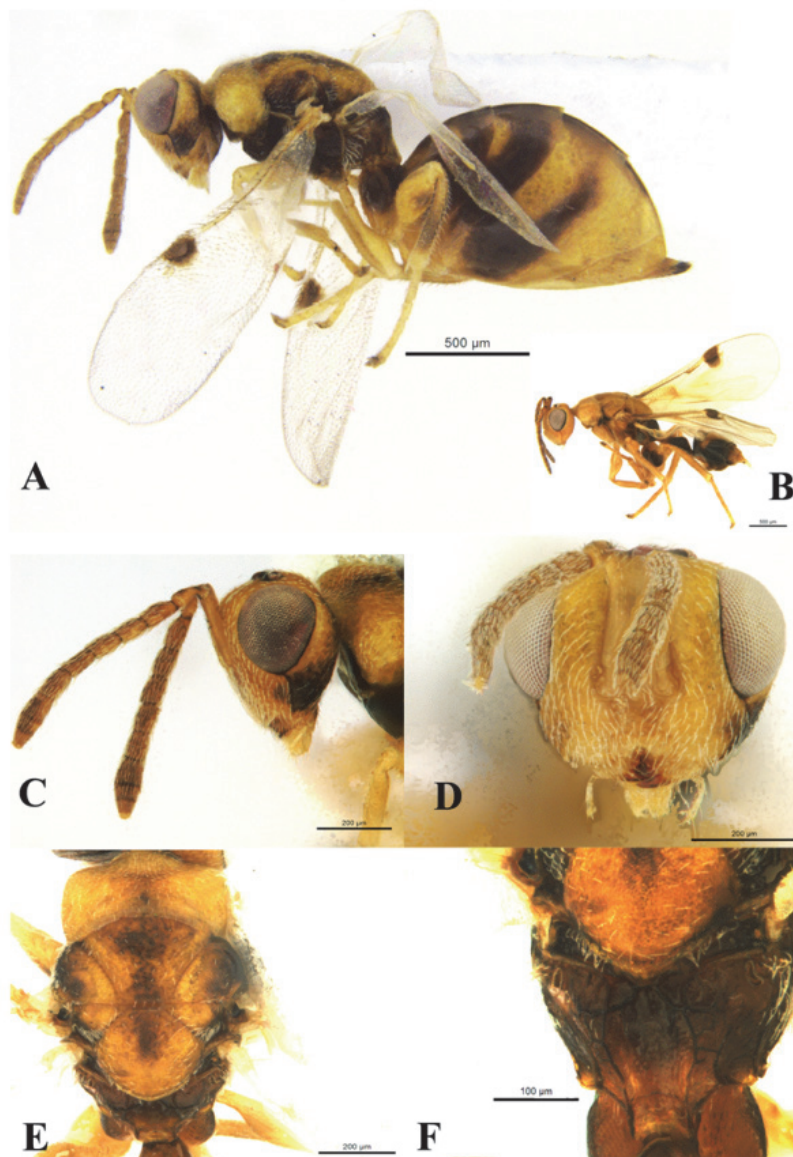
**Diagnosis.** Antennal formula 11153; MV enlarged, with big stigma, with dark brown shading below MV, PMV absent or short, hind femur with enlarged in the middle, gaster petiolate and mostly compressed laterally; propodeum with criss-cross carina medially adhering to the anterior margin.

***Sycophila drupacea* sp. nov.**

LSIDurn:lsid:zoobank.org:act:815604E9-5E9B-4551-9A96-C57648FCFF51

**(Plate 1, Figs. 1A – F)**

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.82098 N 76.09564 E, 19.iv.2019, collected by Shilpa K. Satheesan, ex *Ficus*

Plate 1. *Sycophila drupaceae* sp. nov.

Figs. 1A–1F. *Sycophila drupaceae* sp. nov. Holotype ♀ 1A. Habitus, lateral view; 1B. ♂ Habitus, lateral view; 1C. Head, lateral view; 1D. Head, frontal view; 1E. Thorax, dorsal view; 1F. Propodeum, dorsal view

*drupacea* Thunb., Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

*Paratype*: Male specimen with same collection data as holotype.

**Diagnosis**: Length 2.7mm. General colour yellow. Head width (anteriorly)  $1.45\times$  distance between front ocellus and clypeal margin; POL  $1.9\times$  OOL. Eyes as long as wide. F1 longer than pedicel. Median length of pronotum distinctly shorter than half the median length of scutellum. T4 longest.

**Description: Female. Holotype.** Length 2.7mm. General colour yellow; lateral lobe of mesoscutum and propodeum, mostly black. The posterior 3/4 of T1, T2, T3 and lateral side of T4 black. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infuscation; Antennal scape and pedicel yellow and funicle brownish yellow.

**Head** (Figs. 1C, D): Head alveolate with pubescence; Head width (anteriorly)  $1.45\times$  distance between front ocellus and clypeal margin; POL  $1.9\times$  OOL. Eyes as long as wide. Malar space 0.135mm. Scrobe deep, not reaching front ocellus; Scrobe is 0.015mm from front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape reaching front ocellus, not reaching level of vertex; length of scape  $3.45\times$  length of pedicel; F1 longer than pedicel. Flagellum plus pedicel is 0.63mm. Pedicel is 1.7 times as long as broad while F1 is 1.6 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 1A, E, F): Dorsum of thorax with irregular areolae sculpturing and pubescent; Median length of pronotum distinctly shorter than half the median length of scutellum; mesoscutum little shorter than scutellum; scutellum as wide as long. Notauli complete. Propodeum declining sharply, with a median shallow depression, which is carinate on sides, anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of depression rugulose with short carinae at lateral third; area lateral to fovea mostly rugulose with a short carinae or short costula, plica present, spiracle bean shaped having setae rising from black pits to

the lateral side. Forewing length  $2.4\times$  length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 14 bristles in row; MV broad and distinctly longer than STV. MV 1.48 times STV. Rusty infuscation extends beyond the posterior margin of MV. The infuscation is wider than long. Hind coxa with 14 bristles on ventral side; Hind tibia with a series of setae and 2 prominent spurs at apex, tarsal segments in ratio 9:5:4:3:4.

**Metasoma** (Fig. 1A): Petiole as long as broad but distinctly less than length of hind coxa; gaster strongly compressed, its surface smooth and shiny; T4 longest. Gaster little longer than thorax. Hypopygium ending shortly before middle of gaster body.

**Male**: Length 2.8mm. Similar to female in general except in having: antenna with four funicular segments and one club with four fused segments; gaster small with sooty brown to black patches; petiole longer than gaster with a characteristic hump dorsally.

**Host**: Syconia galls of *F. drupacea* Thunb.

**Etymology**: 'drupacea' derived from the name of host plant *F. drupacea*

**Discussion**: *S. drupacea* sp. nov. differs from all other *Sycophila* species' in having these combination of characters – First funicular segment (F1) a little longer than pedicel; Median length of mesoscutum little shorter than the median length of scutellum; pterostigmal area wider than long. Anterior width of head  $1.45\times$  length between front ocellus and clypeal margin; POL  $2\times$  OOL; SMV with 14 bristles in a row; propodeum with a median smooth fovea, bounded by lateral carinae, anteriorly delimited by oblique cross carinae.

*S. drupacea* sp. nov. is similar to *S. virens* sp. nov., in having similar shorter pedicel than F1; length ratios of scape and pedicel; length of scutellum larger than length of mesoscutum but differs in *S. drupacea* sp. nov. having anterior width of head  $1.45\times$  its length (*S. virens* sp. nov. having width  $1.7\times$  length); POL  $2\times$  OOL (POL  $1.2\times$  OOL in *S. virens* sp. nov.) and having propodeal

fovea smooth (fovea imbricate and rugulose in *S. virens* sp. nov.).

**Remarks:** Colour variation on the propodeum from black to dark rusty brown is seen. Dark patches on thorax are also seen in lighter shades.

***Sycophila arnottiana* sp. nov.**

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(Plate 2, Figs. 2A – F)

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, Lakkidi 11°30.7962 N, 76°01.0892 E, 23.iv.2019, collected by Shilpa K. Satheesan, ex *Ficus arnottiana* (Miq.) Miq., Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Paratype:** Male specimen with same collection data as holotype.

**Diagnosis:** Length 1.4mm. General colour yellowish brown or honey brown. Head width (anteriorly) 1.44× distance between front ocellus and clypeal margin; POL 2.8× OOL. Eyes as long as wide. Pedicel is longer than F1. Median length of pronotum shorter than half the median length of scutellum. T4 longest.

**Description: Female.** Length 1.4mm. General colour yellowish brown or honey brown. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining pterostigma; Antenna yellowish brown.

**Head** (Figs. 2A, E): Head width (anteriorly) 1.44× distance between front ocellus and clypeal margin; POL 2.8× OOL. Eyes as long as wide. Malar space 0.110mm. Scrobe deep, almost reaching front ocellus; Scrobe is 0.070mm from front ocellus; Para scrobal space smooth; Median ocellus red and lateral ocelli white; eyes glabrous. clypeal margin bilobed; Malar groove complete. Malar groove moderately carinate at the distal half Antennal formula 11153; scape not reaching front ocellus; length of scape 2.8× length of pedicel; pedicel is longer than F1. Pedicel is 2.2 times as long as broad while F1 is 1.75× as broad as long.

**Mesosoma** (Figs. 2C, D, F): Pronotum with faint or weak areola extending as a weak rugulae laterally. Mesoscutum and scutellum imbricate with scattered white setae. Median length of pronotum shorter than half the median length of scutellum; mesoscutum shorter than scutellum; scutellum as wide as long. Notauli complete, Propodeum declining sharply, with a broad depressed median fovea bounded laterally by carinae, surface of fovea smooth; area lateral to fovea rugulose with a plica present, spiracle bean shaped having five setae rising from black pits to the lateral side. Forewing length 2.3× length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 15 bristles in row; MV broad and distinctly longer than STV. STV 2× MV. Pterostigma a wider than long. Hind tibia with a series of setae and one prominent bifid spur at apex, tarsal segments in ratio 3:2:3.3:2.

**Metasoma** (Fig. 2A): Petiole distinctly less than length of hind coxa; gaster strongly compressed, its surface smooth and shiny; T4 longest. Gaster longer than thorax. Hypopygium ending before middle of gaster body.

**Male:** Similar to female in general except in having: antenna with four funicular segments and one club with four fused segments; gaster small with yellowish colour; petiole longer than gaster.

**Host:** Syconia galls of *F. arnottiana* (Miq.) Miq.

**Etymology:** ‘arnottiana’ derived from the name of host plant *F. arnottiana*

**Discussion:** *S. arnottiana* sp. nov. differs from all other *Sycophila* species’ in having these combination of characters – Antenna pedicel always longer than F1; Median length of pronotum shorter than the median length of scutellum; T4 longest; MV 2× STV; SMV with 15 bristles in a row. Eye length 2.1× malar space; POL 2.8× OOL; Anterior width of head 1.44× length between front ocellus and clypeal margin.

*S. arnottiana* sp. nov. is similar to *S. religiosa* sp. nov. in having longer pedicel than F1; similar eye length to malar space ratio, POL – OOL ratio,

head length to width ratio but differs in having length of pronotum shorter than scutellum in *S. arnottiana* **sp. nov.** where as in *S. religiosa* **sp. nov.** length of pronotum is longer than scutellum; MV 2× STV and SMV with 15 bristles in a row in *S. arnottiana* **sp. nov.** whereas MV 1.6× STV and SMV with 5 bristles in a row in *S. religiosa* **sp. nov.**; In *S. arnottiana* **sp. nov.** fourth tergite is the longest whereas in *S. religiosa* **sp. nov.** fifth tergite is longest; propodeal median fovea smooth, slightly rugulose in *S. arnottiana* **sp. nov.** whereas propodeal median fovea is imbricate with carinae in *S. religiosa* **sp. nov.**

***Sycophila religiosa* sp. nov.**

LSIDurn:lsid:zoobank.org:act:CCBEB4FC-C03C-47BF-A478-64DCD965814E

(Plate 2, Fig. 2G – L)

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.71986N 76.32443E, 14.i.2019, collected by Shilpa K. Satheesan, ex *F. religiosa* L. Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Paratype:** Male specimen with same collection data as holotype.

**Diagnosis:** Length 1.6mm. General colour yellowish brown or honey brown. Head width (anteriorly) 1.4× distance between front ocellus and clypeal margin; POL 2.8× OOL. Eyes as long as wide. Pedicel is longer than F1. Median length of pronotum longer than half the median length of scutellum; mesoscutum shorter than scutellum. T5 longest.

**Description:** Female *Holotype*. Length 1.6mm. General colour yellowish brown or honey brown. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining pterostigma; Antenna yellowish brown.

**Head** (Figs. 2G, K): Head width (anteriorly) 1.4× distance between front ocellus and clypeal margin; POL 2.8× OOL. Eyes as long as wide. Malar space 0.110mm. Scrobe not reaching front ocellus; Scrobe is 0.07mm from front ocellus; Para scrobal space smooth; Median ocellus and lateral ocelli white; eyes glabrous. clypeal margin bilobed; Malar

groove complete. Malar groove moderately carinate at the distal half Antennal formula 11153; scape not reaching front ocellus; length of scape 2.7× length of pedicel; pedicel is longer than F1. Pedicel is 2.2 times as long as broad while F1 is 1.75× as broad as long.

**Mesosoma** (Figs. 2I, J, L): Pronotum with weak areola extending as a weak rugulae laterally. Mesoscutum strigulated anteriorly posterior mesoscutum and scutellum imbricate with scattered white setae. Median length of pronotum longer than half the median length of scutellum; mesoscutum shorter than scutellum; scutellum wider than long. Notauli complete, Propodeum declining sharply, with a broad depressed median fovea bounded laterally by carinae, surface of fovea imbricate rugulose; area lateral to fovea with numerous carinae, spiracle bean shaped. Forewing length 2.23× length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 5 bristles in row; MV broad and distinctly longer than STV. MV 1.6 × STV. Pterostigma a wider than long. Hind tibia with a series of setae and one prominent bifid spur at apex, tarsal segments in ratio 13:7:5:6:4.

**Metasoma** (Fig. 2G): Petiole distinctly less than length of hind coxa; gaster strongly compressed, its surface smooth and shiny; T5 longest. Gaster longer than thorax. Hypopygium ending before middle of gaster body.

**Male:** Similar to female in general except in having: antenna with four funicular segments and one club with three fused segments; gaster small with yellowish colour; petiole longer than gaster.

**Host:** Syconia galls of *F. religiosa* L.

**Etymology:** ‘religiosa’ derived from the name of host plant *F. religiosa*.

**Discussion:** *S. religiosa* **sp. nov.** is similar to *S. arnottiana* **sp. nov.** but differs from it and all other *Sycophila* species’ in having these combination of characters – Antenna pedicel always longer than F1; Median length of pronotum longer than the median length of scutellum; T5 longest; MV 1.6× STV; SMV with 5 bristles in a row; propodeal

median fovea imbricate rugulose; Eye length  $2.1 \times$  malar space; POL  $2.8 \times$  OOL; Anterior width of head  $1.41 \times$  length between front ocellus and clypeal margin.

***Sycophila virens* sp. nov.**

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**(Plate 3, Figs. 3A – E)**

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.887N 76.0687E, 18.ii.2021, collected by Shilpa K. Satheesan, ex *F. virens* Aiton. Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Diagnosis:** Length 2mm. General colour yellow. Head width (anteriorly)  $1.7 \times$  distance between front ocellus and clypeal margin, with POL  $1.2 \times$  OOL. Eyes slightly longer than wide. F1 longer than pedicel. Median length of pronotum distinctly shorter than half the median length of scutellum. T5 slightly longer than T4.

**Description: Female. Holotype.** Length 2mm. General colour yellow; lateral lobe of mesoscutum and propodeum, mostly black. The posterior 3/4 of T1, T2, T3 and lateral side of T4 black. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infuscation; Antennal scape and pedicel yellow and funicle brownish yellow.

**Head** (Figs. 3B, C): Head alveolate with pubescence; Head width (anteriorly)  $1.7 \times$  distance between front ocellus and clypeal margin, with POL  $1.2 \times$  OOL. Eyes slightly longer than wide. Malar space 0.112mm. Scrobe deep, almost reaching front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape reaching front ocellus; length of scape  $3.3 \times$  length of pedicel. F1 longer than pedicel. Pedicel is 1.7 times as long as broad while F1 is 1.8 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 3C, D, E): Pronotum faintly coriaceous; Median length of pronotum distinctly shorter than half the median length of scutellum; mesoscutum little shorter than scutellum; scutellum slightly wider than long. Notauli complete.

Propodeum declining, with a median area carinate on sides. Surface of depression rugulose; area lateral to fovea mostly rugulose with a short carinae or short costula, plica present, spiracle bean shaped having setae rising from black pits to the lateral side. Forewing length  $2.2 \times$  length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 10 bristles in row; MV broad and distinctly longer than STV. MV 1.27 times STV. Rusty infuscation extends beyond the posterior margin of MV. The infuscation is wider than long. Hind tibia with a series of setae with prominent spurs at apex, tarsal segments in ratio 15:8:5:4:5.

**Metasoma** (Fig. 3A): Petiole as length  $1.67 \times$  times wide; gaster strongly compressed, its surface smooth and shiny; T5 slightly longer than T4. Gaster little longer than thorax. Hypopygium ending shortly before middle of gaster body.

**Male:** Unknown; not represented in collection.

**Host:** Syconia galls of *F. virens* Aiton.

**Etymology:** ‘virens’ derived from the name of host plant *F. virens*.

**Discussion:** *S. virens* sp. nov. is similar to *S. drupacea* sp. nov. but differs from it and all other *Sycophila* species’ in having these combination of characters – First funicular segment (F1) of antenna a little longer than pedicel; Median length of mesoscutum little shorter than the median length of scutellum; pterostigmal area wider than long; anterior width of head  $1.7 \times$  length between front ocellus and clypeal margin; POL  $1.2 \times$  OOL; SMV with 10 bristles in a row; propodeum with a median fovea imbricate and rugulose, bounded by lateral carinae, anteriorly not delimited by oblique cross carinae.

***Sycophila infectoria* sp. nov.**

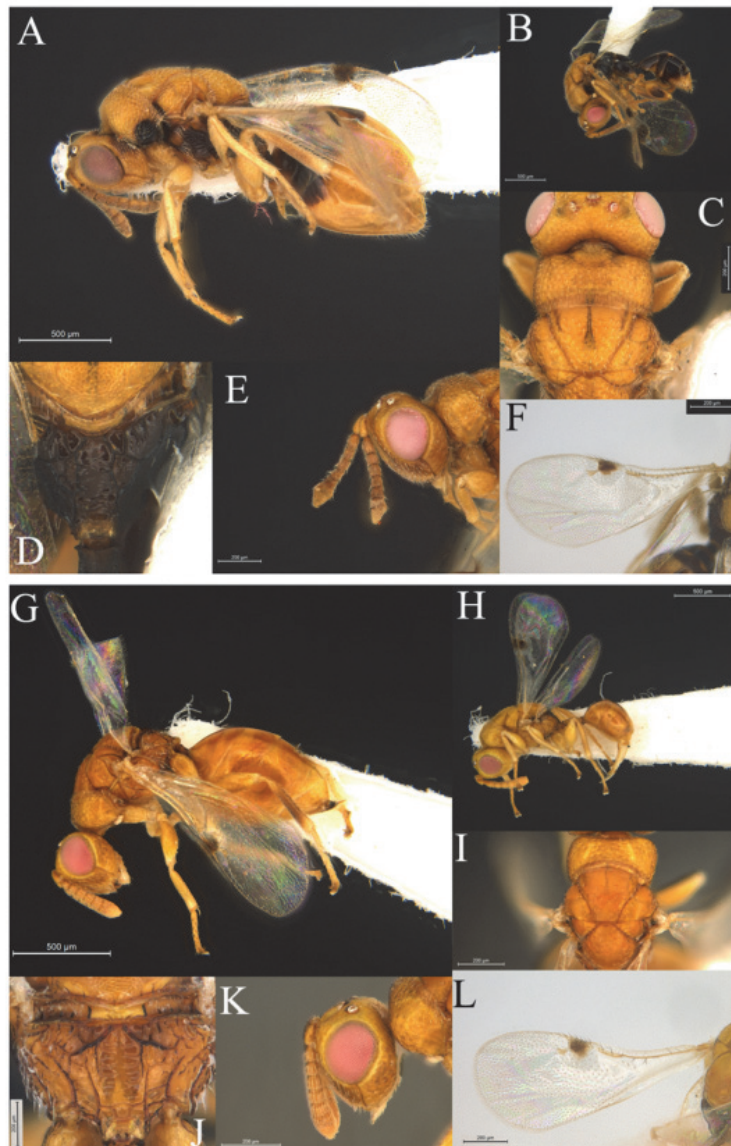
LSIDurn:lsid:zoobank.org:act:89EE55C3-8CB8-4EE7-9779-5B33A48B58A3

**(Plate 3, Figs. 3F – J)**

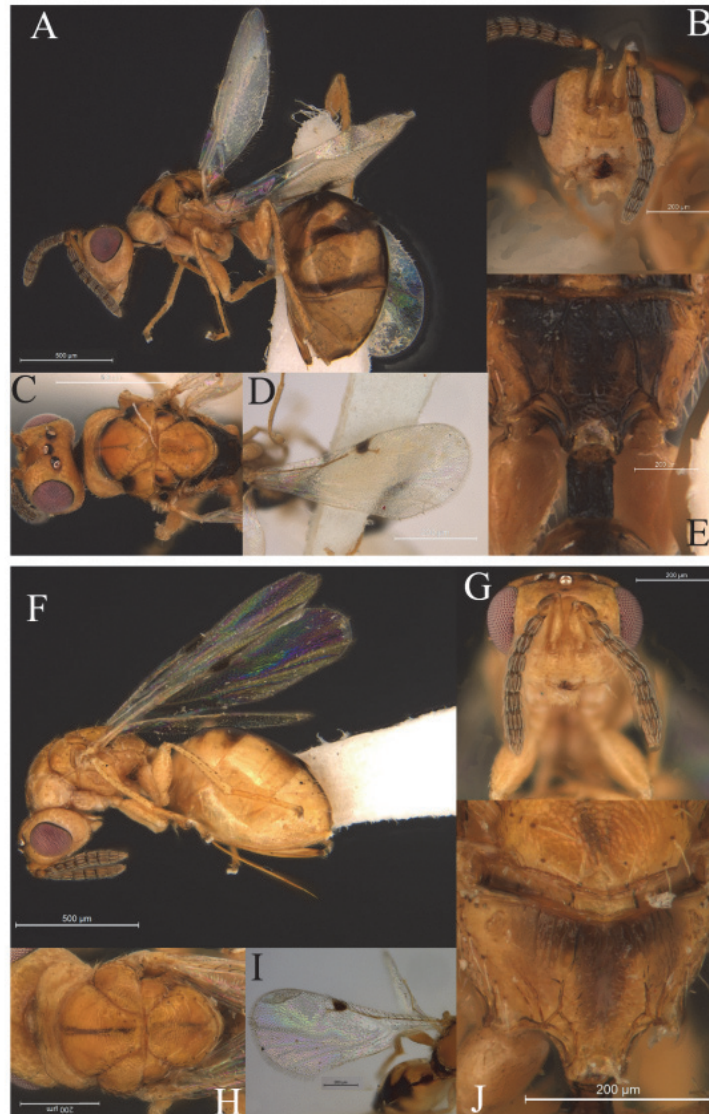
**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.887N 76.0687E, 18.ii.2021, collected by Shilpa K. Satheesan, ex *Ficus virens* Aiton.,



Plate 2. *S. arnottiana* sp. nov. and *S. religiosa* sp. nov.



Figs. 2A–2F. *Sycophila arnottiana* sp. nov. Holotype ♀ 2A. Habitus, lateral view; 2B. ♂ Habitus, lateral view; 2C. Thorax, dorsal view; 2D. Propodeum, dorsal view; 2E. Head, lateral view; 2F. Fore wing  
Figs. 2G–2L. *Sycophila religiosa* sp. nov. Holotype ♀ 2G. Habitus, lateral view; 2H. ♂ Habitus, lateral view; 2I. Thorax, dorsal view; 2J. Propodeum, dorsal view; 2K. Head, lateral view; 2L. Fore wing

Plate 3. *S. virens* sp. nov. and *S. infectoria* sp. nov.

Figs. 3A–3E. *Sycophila virens* sp. nov. Holotype ♀ 3A. Habitus, lateral view; 3B. Head, frontal view; 3C. Thorax, dorsal view; 3D. Fore wing; 3E. Propodeum, dorsal view  
 Figs. 3F–3J. *Sycophila infectoria* sp. nov. Holotype ♀ 3F. Habitus, lateral view; 3G. Head, frontal view; 3H. Thorax, dorsal view; 3I. Fore wing; 3J. Propodeum, dorsal view

Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Diagnosis:** Length 1.3mm. General colour yellow. Head width (anteriorly)  $1.6\times$  distance between front ocellus and clypeal margin, with POL  $0.73\times$  OOL. Eyes  $1.2\times$  longer than wide. Pedicel longer than F1. Median length of pronotum distinctly shorter than half the median length of scutellum. T4 longest.

**Description:** Female. *Holotype*. Length 1.3mm. General colour yellow. The median portion of T1, T2, T3 and T4 black. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infuscation; Antennal scape and pedicel yellow and funicle brownish yellow.

**Head** (Fig. 3F, G): Head weakly coriaceous with pubescence; Head width (anteriorly)  $1.6\times$  distance between front ocellus and clypeal margin, with POL  $0.73\times$  OOL. Eyes  $1.2\times$  longer than wide. Malar space 0.115mm. Scrobe deep, not reaching front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape not reaching front ocellus; scape length is  $2.2\times$  length of pedicel. Pedicel longer than F1. Pedicel is 1.8 times as long as broad while F1 is 1.32 times as long as broad. Flagellar segments stout-filiform; Inter-torular distance  $1.3\times$  each torulus width.

**Mesosoma** (Figs. 3H, I, J): Pronotum faintly coriaceous; Median length of pronotum distinctly shorter than half the median length of scutellum; mesoscutum little longer than scutellum; scutellum slightly wider than long, with four pair of setae. Notauli complete. Propodeum declining, with a median area carinate on sides on the posterior half. Surface of depression wrinkled and glabrous; area lateral to fovea mostly smooth, pale yellowish with small brown shades at the anterior part mostly in the median area; an inverted Y shaped carinae lateral side just above the neck of the propodeum, laterally; spiracle bean shaped having setae rising from black pits to the lateral side. Forewing length  $2.12\times$  length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 10 bristles in row; MV broad and distinctly longer than STV. MV 1.5 times STV.

Rusty infuscation extends beyond the posterior margin of MV. The infuscation is longer than wide. Hind tibia with a series of setae with prominent spur at apex, tarsal segments in ratio 4:3:2:1:2.

**Metasoma** (Fig. 3F): Petiole as long as wide; gaster strongly compressed, its surface smooth and shiny; T4 longest. Gaster longer than thorax.

**Male:** Unknown; not represented in collection.

**Host:** Syconia galls of *F. virens* Aiton.

**Etymology:** 'infectoria' derived from the synonymised name of host *F. arnottiana*.

**Discussion:** Antenna pedicel always longer than F1; POL  $0.73\times$  OOL distance; Anterior width of head  $1.6\times$  length; Eyes  $1.2\times$  longer than wide; scape length is  $2.2\times$  length of pedicel; median length of pronotum distinctly shorter than half the median length of scutellum; Propodeal fovea wrinkled and glabrous; an inverted Y shaped carinae just above the neck of the propodeum, laterally. MV 1.5 times STV. T4 longest.

*S. infectoria* sp. nov. is different from all the other *Sycophila* species with above mentioned combination of characters. It shares similar character with *S. benghalensis* in having antennal pedicel always longer than F1; median length of pronotum distinctly shorter than half the median length of scutellum and differs from it in having these combination of characters, like, POL  $0.73\times$  OOL distance (POL  $1.5\times$  OOL in *S. benghalensis*); Anterior width of head  $1.6\times$  length (head width is  $1.4\times$  length in *S. benghalensis*); scape length is  $2.2\times$  length of pedicel ( $2.44\times$  in *S. benghalensis*); propodeum with inverted Y shaped carinae just above the neck of the propodeum (propodeum without inverted Y shaped carinae in *S. benghalensis*).

***Sycophila wayanadensis* sp. nov.**

LSIDurn:lsid:zoobank.org:act:37F680E1-9D8B-44F2-A18A-C0EF9C2B800B

(Plate 4, Figs. 4A – E)

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.887N 76.0687E, 18.ii.2021, collected by Shilpa K. Satheesan, ex *F. virens* Aiton. Deposited

in Zoological Survey of India, Western Ghats Regional Centre, Calicut

*Paratype*: Male specimen with same collection data as holotype.

**Diagnosis**: Length 1.4mm. Brownish yellow colour thorax, head; pale yellow legs except coxa; later side of gens below the eye, lateral lobe of mesoscutum and propodeum, hind coxa black. Head width (anteriorly)  $1.4\times$  distance between front ocellus and clypeal margin, with POL  $1.02\times$  OOL. Eyes slightly longer than wide. F1 shorter than pedicel. Median length of pronotum longer than median length of scutellum. T3 longest.

**Description: Female.** *Holotype*. Length 1.4mm. Brownish yellow colour thorax, head; pale yellow legs except coxa; later side of gens below the eye, lateral lobe of mesoscutum and propodeum, hind coxa black. The dorsal side of tergites black and ventral side tergites mostly black with yellow patches. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infestation; Antennal scape and pedicel yellow and funicle honey yellow.

**Head** (Figs. 4C, D): Head faintly strigulate with pubescence; Head width (anteriorly)  $1.4\times$  distance between front ocellus and clypeal margin, with POL  $1.02\times$  OOL. Eyes slightly longer than wide. Scrobe deep, reaching front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11143; scape not reaching front ocellus; length of scape is  $2\times$  length of pedicel. F1 shorter than pedicel. Pedicel is 2.1 times as long as broad while F1 is 1.4 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 4C, E): Pronotum coriaceous and mesosoma and scutellum imbricate strigulate. Median length of pronotum longer than median length of scutellum; mesoscutum longer than pronotum and scutellum; scutellum as wide as long. Notauli complete. Propodeum declining sharply, with a median shallow depression, anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of depression rugulose with each rugae boarded by short wavy or circular

carinae; area above the fovea rugulose with a short carinae bordering each rugae, spiracle round shaped having white setae rising from pits to the lateral side. Forewing length  $1.86\times$  length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal  $1/3$  of forewing bare. SMV having 15 bristles in row; MV broad and distinctly longer than STV. MV 2.2 times STV. Rusty infuscation extends beyond the posterior margin of MV. The infuscation is wider than long. Hind tibia with a series of setae and prominent spur at apex, tarsal segments in ratio 7: 4: 3: 2: 2.

**Metasoma** (Fig. 4A): Gaster strongly compressed, its surface smooth and shiny; T3 longest. Gaster shorter than thorax.

**Male**: Length 1.5mm. Similar to female in general except in having: yellow colour; antenna with four funicular segments and one club; gaster small with sooty brown to black patches medially on T1 and T4; setaceous with setae raising from dark pits. 13 bristles on SMV and four round sensilla on stigma vein; petiole  $4.4\times$  longer than broad.

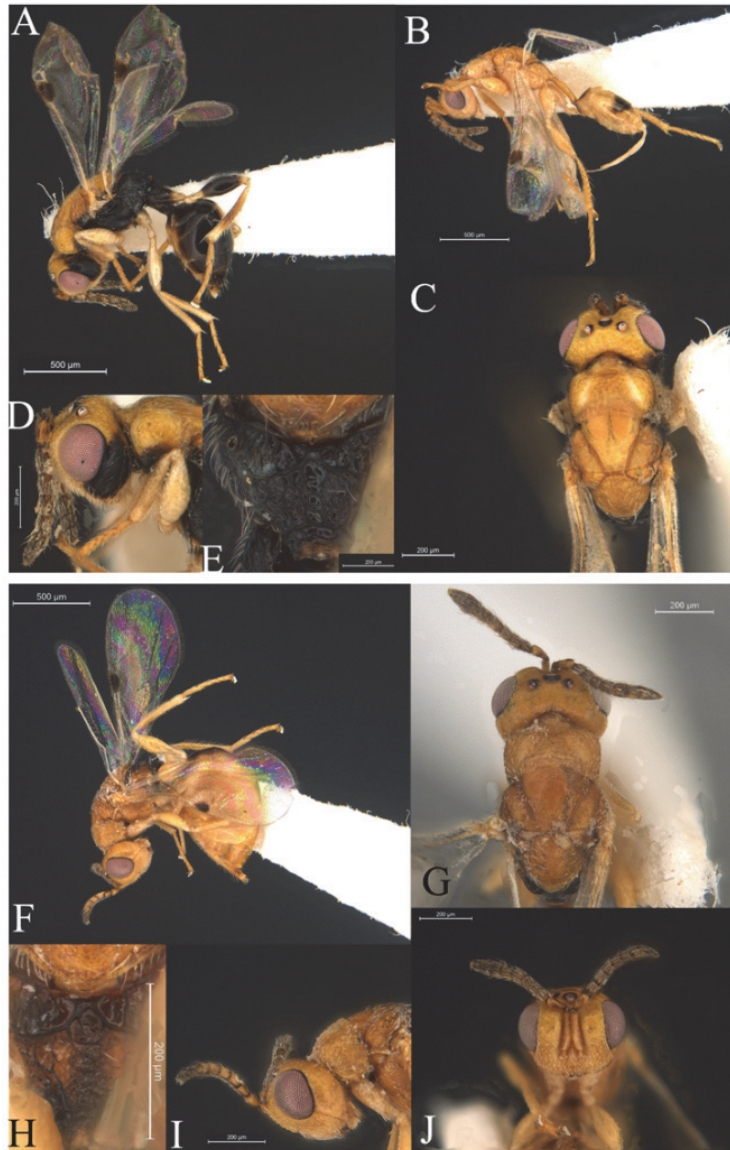
**Host**: Syconia galls of *F. virens* Aiton.

**Etymology**: 'wayanadensis' derived from the name of the place of collection of the specimen, Wayanad.

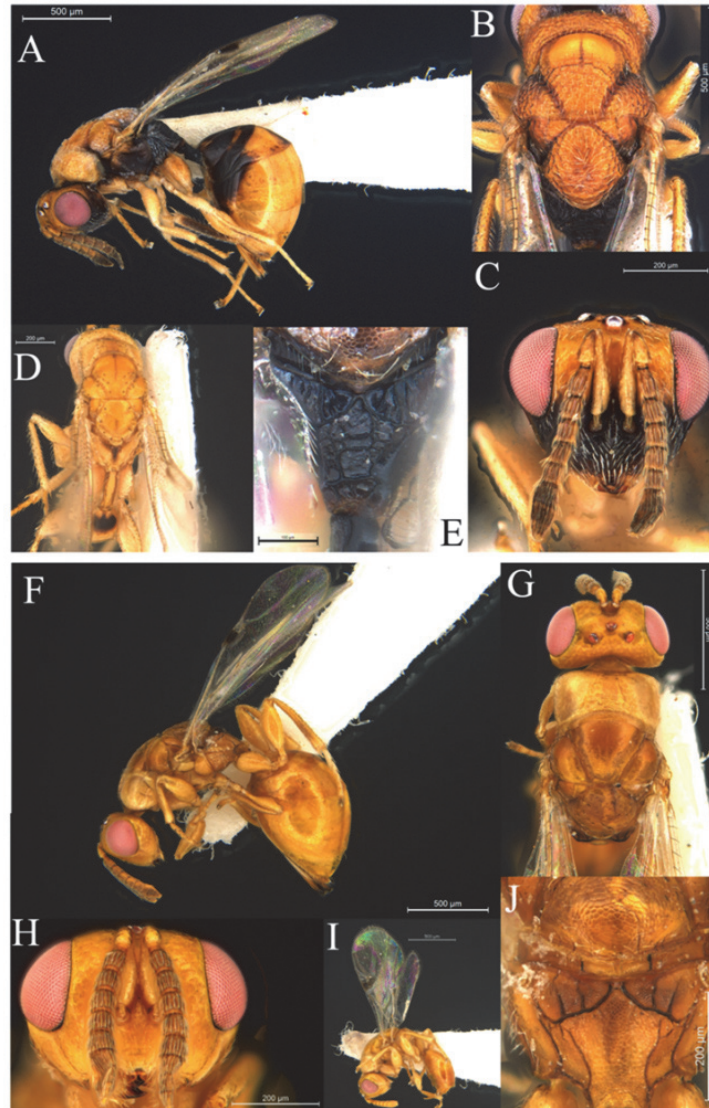
**Discussion**: Antenna pedicel always longer than F1; POL  $1.02\times$  OOL distance; Anterior width of head  $1.4\times$  length; Eyes slightly longer than wide; scape length is  $2\times$  length of pedicel; median length of pronotum longer than the median length of scutellum; Propodeum anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of propodeal fovea rugulose with each rugae boarded by short wavy or circular carinae. MV 2.2 times STV. T3 longest.

*S. wayanadensis* **sp. nov.** is different from all the other *Sycophila* species with above mentioned combination of characters. It shares similar character with *S. benghalensis* in having antennal pedicel always longer than F1; Anterior width of head  $1.4\times$  length and differs from it in having these combination of characters, like, POL  $1.02\times$  OOL distance (POL  $1.5\times$  OOL in *S. benghalensis*); scape length is  $2\times$  length of pedicel ( $2.44\times$  in *S.*

Plate 4. *S. wayanadensis* sp. nov. and *S. batheri* sp. nov.



Figs. 4A–4E. *Sycophila wayanadensis* sp. nov. Holotype ♀ 4A. Habitus, lateral view; 4B. ♂ Habitus, lateral view; 4C. Thorax, dorsal view; 4D. Head, lateral view; 4E. Propodeum, dorsal view  
Figs. 4F–4J. *Sycophila batheri* sp. nov. Holotype ♀ 4F. Habitus, lateral view; 4G. Thorax, dorsal view; 4H. Propodeum, dorsal view; 4I. Head, lateral view; 4J. Head, frontal view

Plate 5. *S. tintoria* sp. nov., *S. gibbosa* sp. nov.

Figs. 5A–5E. *Sycophila tintoria* sp. nov. Holotype ♀ 5A. Habitus, lateral view; 5B. Thorax, dorsal view; 5C. Head, frontal view; 5D. ♂ Thorax, dorsal view; 5E. Propodeum, dorsal view  
 Figs. 5F–5J. *Sycophila gibbosa* sp. nov. Holotype ♀ 5F. Habitus, lateral view; 5G. Thorax, dorsal view; 5H. Head, frontal view; 5I. ♂ Habitus, lateral view; 5J. Propodeum, dorsal view

*benghalensis*); median length of pronotum larger than the median length of scutellum (length of pronotum shorter than length of scutellum in *S. benghalensis*); Surface of propodeal fovea rugulose with each rugae boarded by short wavy or circular carinae (Surface of propodeal fovea smooth in *S. benghalensis*).

***Sycophila batheri* sp. nov.**

LSIDurn:lsid:zoobank.org:act:6815D2B1-D443-48D4-9D64-06D00FE47BE2

(Plate 4, Figs. 4F – J)

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, 11.7439N 76.2271E, 19.ii.2021, collected by Shilpa K. Satheesan, ex *F. virens* Aiton., Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Diagnosis:** Length 1.7mm. General colour brownish yellow. Head width (anteriorly) 1.43× distance between front ocellus and clypeal margin, with POL 1.01× OOL. Eyes 1.15× longer than wide. Pedicel longer than F1. Median length of pronotum distinctly shorter than half the median length of scutellum. T5 longest.

**Description:** Female. *Holotype*. Length 1.7mm. General colour brownish yellow; with propodeum and median area of gaster brown. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infuscation; Antennal scape and pedicel yellow and funicle brownish yellow.

**Head** (Figs. 4G, I, J): Head faintly imbricate strigulate with pubescence; Head width (anteriorly) 1.43× distance between front ocellus and clypeal margin, with POL 1.01× OOL. Eyes 1.15× longer than wide. Malar space 0.118mm. Scrobe deep, not reaching front ocellus; Scrobe is 0.031mm from front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape not reaching front ocellus; length of scape is 2.4× length of pedicel. Pedicel longer than F1. Pedicel is 1.8 times as long as broad while F1 is 1.2 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 4F, G, H): Dorsum of thorax with faintly imbricate strigulate and pubescent; Median

length of pronotum distinctly shorter than half the median length of scutellum; mesoscutum little shorter than scutellum; scutellum longer than wide. Notauli complete. Propodeum declining sharply, with a median shallow depression, which is carinate on sides, anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of depression slightly rugulose with several short carinae and depressions; area lateral to fovea mostly rugulose, spiracle circular having setae to the lateral side. Forewing length 2.2× length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 12 bristles in row; MV broad and distinctly longer than STV. MV 1.6 times STV. Rusty infestation extends beyond the posterior margin of MV. The infestation is wider than long; tarsal segments in ratio 6: 4: 2: 2: 3.

**Metasoma** (Fig. 4F): Gaster strongly compressed, its surface smooth and shiny; T5 longest. Gaster distinctly longer than thorax.

**Male:** Unknown

**Host:** *Syconia* galls of *F. virens* Aiton.

**Etymology:** ‘batheri’ derived from the name of the place of collection of the specimen, Sulthan Bathery.

**Discussion:** Antenna pedicel always longer than F1; POL 1.01× OOL distance; Anterior width of head 1.5× length; Eyes 1.15× longer than wide; scape length is 2.4× length of pedicel; median length of pronotum distinctly shorter than half the median length of scutellum; Propodeal fovea slightly rugulose with several short carinae and depressions. MV 1.6 times STV. T5 longest.

*S. batheri* sp. nov. is different from all the other *Sycophila* species with above mentioned combination of characters. It shares similar character with *S. benghalensis* in having antennal pedicel always longer than F1; median length of pronotum distinctly shorter than half the median length of scutellum; scape length is 2.4× length of pedicel and differs from it in having these combination of characters, like, POL 1.01× OOL distance (POL 1.5× OOL in *S. benghalensis*); Anterior width of head 1.5× length (head width is

1.4× length in *S. benghalensis*); MV 1.6 times STV (MV 3.75× STV in *S. benghalensis*); Propodeal fovea slightly rugulose with several short carinae and depressions (Surface of propodeal fovea smooth in *S. benghalensis*).

***Sycophila tinctoria* sp. nov.**

LSIDurn:lsid:zoobank.org:act:39D05281-D665-41FC-ABA1-826B9D7BD8F8

**(Plate 5, Figs. 5A – E)**

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, N 11° 38.617' E 76° 18.087', 17.ii. 2021, collected by Shilpa K. Satheesan, ex *F. tinctoria* G. Forst., Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Paratype:** Male specimen with same collection data as holotype.

**Diagnosis:** Length 1.9mm. General colour yellow; Head width (anteriorly) 1.38× distance between front ocellus and clypeal margin, with POL 0.92× OOL. Eyes 1.1× longer than wide. Pedicel almost equal to F1. Median length of pronotum distinctly shorter than half the median length of scutellum. T4 longest.

**Description:** Female. *Holotype.* Length 1.9mm. General colour yellow; anterior part of head, lateral side of thorax, propodeum, petiole, T1, T2 and lateral and median portion of T3 black. Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infestation; antennal scape and pedicel yellow and funicle brownish yellow to greyish black at the ends.

**Head** (Figs. 5A, C): Head faintly strigulate with pubescence; Head width (anteriorly) 1.38× distance between front ocellus and clypeal margin, with POL 0.92× OOL. Eyes 1.1× longer than wide. Malar space 0.103mm. Scrobe deep, not reaching front ocellus; Scrobe is 0.029mm from front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape almost reaching front ocellus; scape length is 2.64× length of pedicel. Pedicel almost equal to F1. Pedicel is 1.95 times as long as broad while F1 is 1.94 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 5B, E): Dorsum of thorax with irregular areolae sculpturing and pubescent; Median length of pronotum distinctly shorter than half the median length of scutellum; mesoscutum little longer than scutellum; scutellum longer than wide. Notauli complete. Propodeum declining sharply, with a median shallow depression, anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of depression large irregular reticulations with carinae bordering these reticulations; area above the fovea mostly imbricate with a short carinae, spiracle circular having setae rising from lateral side. Forewing length 2.06× length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having 12 bristles in row; MV broad and distinctly longer than STV. MV 2.1 times STV. STV with four sensilla. Rusty infuscation extends beyond the posterior margin of MV. The infuscation is longer than wide; tarsal segments in ratio 11: 6: 7: 5: 5.

**Metasoma** (Fig. 5A): Petiole as long as broad; gaster strongly compressed, its surface smooth and shiny; T4 longest. Petiole 1.12× wider than long; Gaster as long as thorax.

**Male:** Length 1.2mm. Colour yellow, T4 posteriorly black and T5 anteriorly black. Numerous setae coving the body. Similar to female in general except in having: antenna with four funicular segments and one club with three fused segments; petiole 3.26× longer than wide.

**Host:** Syconia galls of *F. tinctoria* G. Forst.

**Etymology:** ‘tinctoria’ derived from the name of host plant *F. tinctoria*.

**Discussion:** *S. tinctoria* sp. nov. differs from all other *Sycophila* species’ in having these combination of characters – Pedicel as long as F1; POL 0.92× OOL; Anterior width of head 1.38× length between front ocellus and clypeal margin; median length of pronotum distinctly shorter than half the median length of scutellum; MV 2× STV; SMV having 12 bristles in row; pterostigma is longer than wide; propodeal fovea with large irregular reticulations each delimited with carinae.



*S. tinctoria* sp. nov. is similar to *S. gibbosa* sp. nov. in having Pedicel as long as F1; POL < OOL; similar eye length to malar space ratio, but differs in having anterior width of head 1.38× length between front ocellus and clypeal margin (head width 1.68× length in *S. gibbosa* sp. nov.); median length of pronotum distinctly shorter than half the median length of scutellum (length of pronotum distinctly longer than half the length of scutellum in *S. gibbosa* sp. nov.); MV 2× STV (MV 1.3× STV in *S. gibbosa* sp. nov.); SMV having 12 bristles in row (SMV having nine bristles in *S. gibbosa* sp. nov.); pterostigma is longer than wide (pterostigma wider than long in *S. gibbosa* sp. nov.); propodeal fovea with large irregular reticulations each delimited with carinae (propodeal fovea imbricate-reticulate and smooth in *S. gibbosa* sp. nov.).

**Remarks:** Colour variation of fully yellow-coloured individuals with black petiole observed. Dark patches on T1, T2 and T3 are also seen in yellow colour.

***Sycophila gibbosa* sp. nov.**

LSIDurn:lsid:zoobank.org:act:CF215287-96B6-4F4C-903F-0C04627E3E65

**(Plate 5, Figs. 5F – J)**

**Type material.** Holotype ♀: INDIA, Wayanad, Kerala, N 11° 38.617' E 76° 18.087', 17.ii. 2021, collected by Shilpa K. Satheesan, ex *F. tinctoria* G. Forst Deposited in Zoological Survey of India, Western Ghats Regional Centre, Calicut.

**Paratype:** Male specimen with same collection data as holotype.

**Diagnosis:** Length 1.6mm. General colour yellow. Head faintly imbricate; Head is 1.68× as wide as length between front ocellus and clypeal margin, with POL 0.96× OOL. Eyes 1.08× longer than wide. Pedicel almost equal to F1. Median length of pronotum distinctly longer than half the median length of scutellum. T4 distinctly longest. Gaster little longer than thorax.

**Description:** Female. *Holotype.* Length 1.6mm. General colour yellow; Wings semi hyaline with area below costal cell bare, veins brown with rusty brown patch adjoining the dark infestation; antennal

scape and pedicel yellow and funicle yellow.

**Head** (Fig. 5G & 5H): Head faintly imbricate; Head is 1.68× as wide as length between front ocellus and clypeal margin, with POL 0.96× OOL. Eyes 1.08× longer than wide. Malar space 0.113mm. Scrobe not reaching front ocellus; Scrobe is 0.036mm from front ocellus; clypeal margin bilobed; Malar groove complete. Antennal formula 11153; scape not reaching front ocellus; scape length is 2.45× length of pedicel. Pedicel almost equal to F1. Pedicel is 1.52 times as long as broad while F1 is 1.13 times as long as broad. Flagellar segments stout-filiform.

**Mesosoma** (Figs. 5F, G, J): Dorsum of thorax coriaceous and imbricate; Median length of pronotum distinctly longer than half the median length of scutellum; mesoscutum longer than scutellum; scutellum wider than long. Notauli complete. Propodeum declining sharply, with a median shallow depression, which is carinate on sides, anteriorly delimited by oblique cross carinae diverging from the middle of base. Surface of depression reticulate and smooth; area lateral to fovea reticulate with a short carinae or short costula, plica present, spiracle bean shaped having setae rising from black pits to the lateral side. Forewing length 2.26× length of SMV; PMV absent; costal cell (CC) with minute pilosity; basal 1/3 of forewing bare. SMV having nine bristles in row; MV broad and distinctly longer than STV. MV 1.31 times STV. Rusty infuscation extends beyond the posterior margin of MV. The infestation is wider than long; tarsal segments in ratio 10: 9: 7: 5: 6.

**Metasoma** (Fig. 5F): Petiole as 1.77× wider than long; gaster strongly compressed, its surface smooth and shiny; T4 distinctly longest. Gaster little longer than thorax.

**Male:** Length 1.2mm. Colour yellow. Similar to female in general except in having: antenna with four funicular segments and one club with three fused segments; SMV with 10 setae and four sensilla at the end of stigma vein.

**Host:** Syconia galls of *F. tinctoria* G. Forst.

**Etymology:** 'gibbosa' derived from the name of

the variety gibbose of the host *F. tinctoria*.

**Discussion:** *S. gibbosa* **sp. nov.** is similar to *S. tinctoria* **sp. nov.** but differs from it and all other *Sycophila* species' in having these combination of characters – Pedicel as long as F1; POL 0.96× OOL; Anterior width of head 1.68× length between front ocellus and clypeal margin; median length of pronotum distinctly longer than half the median length of scutellum; MV 1.3× STV; SMV having nine bristles in row; pterostigma is wider than long; propodeal fovea with imbricate-reticulate and smooth.

### ACKNOWLEDGEMENTS

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