

FIG WASPS FROM *FICUS DZUMACENSIS*, WITH NOTES ON THE GENUS *SYCOBIELLA* WESTWOOD

by

J. T. WIEBES

Rijksmuseum van Natuurlijke Historie, Leiden

A sample of fig wasps from New Caledonia, sent to me by Mr. E. J. H. Corner, contained a species of *Blastophaga* Gravenhorst (Agaonidae) and a species of *Sycobiella* Westwood (Torymidae). The insects were reared from the receptacles of *Ficus dzumacensis* Guillaum. The *Blastophaga* is of interest because it is the first record of a fig wasp from any *Ficus* of the section *Oreosycea*. The species of *Sycobiella* is the first to become known in both sexes.

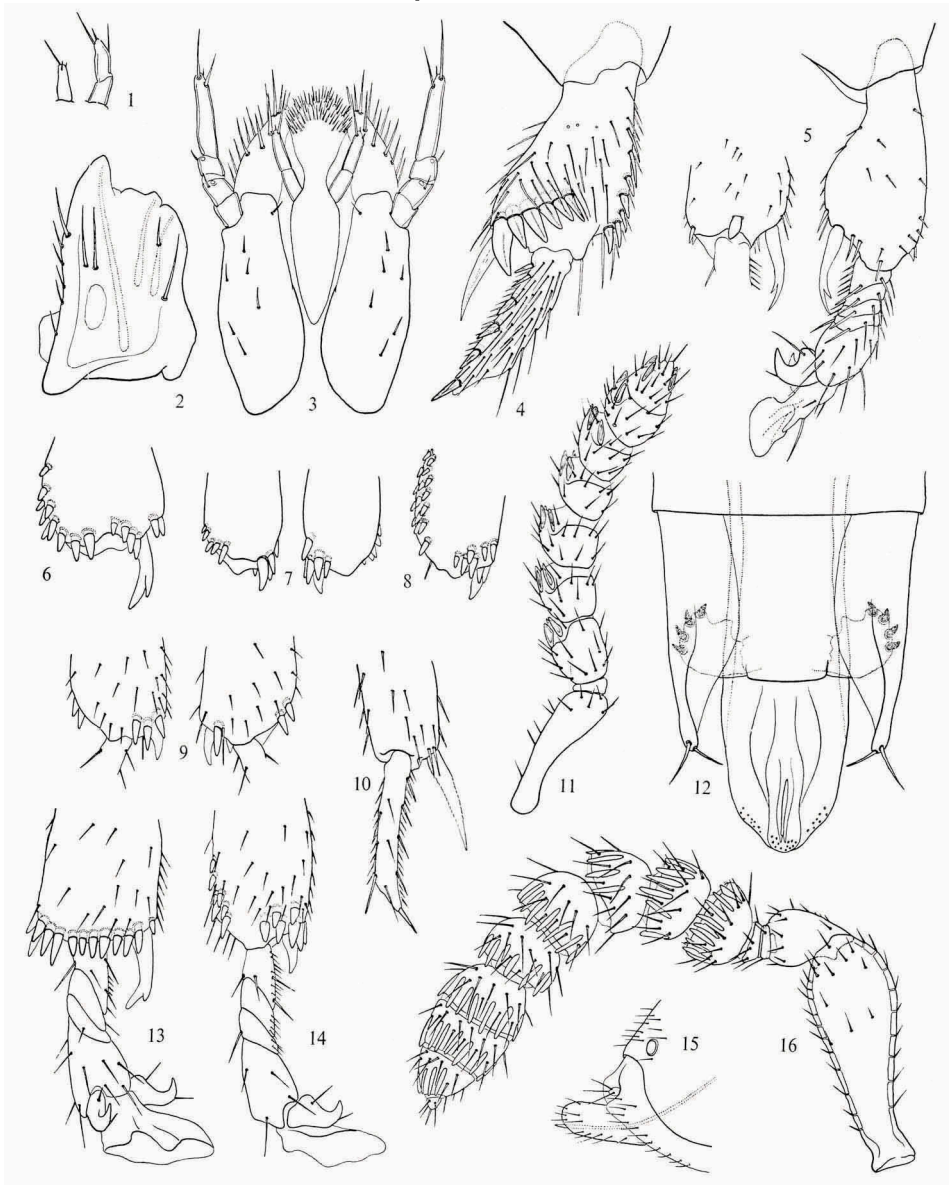
***Sycobiella boschmai* sp. n.**

Series ♀, ♂, ex *Ficus dzumacensis* Guillaum. (det. E. J. H. Corner), Mt. Kogi, New Caledonia, leg. H. S. McKee, 26 December 1960, no. 7797; coll. Museum Leiden, no. 574; holotype (♂), slide no. 574b, allotype (♀), no. 574a, paratypes (♂, ♀), no. 574c, d, e.

Male. — Head (fig. 20) not quite as long as wide. Eyes large. Antennal toruli situated on the dorsal surface, wide apart, with large lateral ridges. Ocelli absent. Epistomal margin very faintly trilobate, with six stout hairs. Mandible large, nearly as long as the head, with a subapical tooth (without glands), and a bidentate axial process (with two glands) near the base. Maxilla with many long, stout hairs. Maxillary palpus (fig. 1) consisting of two segments, the apical segment nearly twice as long as the basal segment; labial palpus consisting of only one segment.

Antenna (fig. 11). Scape very large, expanded anteriorly, very shortly stalked; pedicel one fifth the length of the scape; third antennal segment annuliform; the fourth to tenth segments larger, the apical two shaped so as to form a club. Funicular segments with two or three triangular sensilla at the antaxial distal edges, the tenth segment moreover with one sensillum at the axial margin. The segments, except the annulus, bear rather stout hairs. Fourth segment not quite half as long as the pedicel, but one and a half times as long as the fifth, sixth, and ninth segments, and approximately twice as long as the seventh, eighth, and tenth segments.

Thorax (fig. 20). Pronotum as wide as the head or slightly wider, the



Figs. 1-5, 9-16. *Sycobiella boschmai* sp. n. 1, labial and maxillary palpi of male; 2, female mandible; 3, female labium and maxillae; 4, female hind tibia and metatarsus, antaxial aspect; 5, female fore tibia and metatarsus in antaxial aspect, and detail in axial aspect; 9, apex of male mid tibia, axial and antaxial aspect; 10, apex of female mid tibia and metatarsus, antaxial aspect; 11, male antenna (scape omitted), dorsal aspect; 12, male genitalia, ventral aspect; 13, apex of male fore tibia and tarsus, antaxial aspect; 14, apex of male hind tibia and tarsus, antaxial aspect; 15, apex of female abdomen, lateral aspect; 16, female antenna, lateral aspect.

Figs. 6-8. *Sycobiella saundersii* Westwood, male. 6, apex of fore tibia, antaxial aspect; 7, apex of mid tibia, axial and antaxial aspect; 8, apex of hind tibia, antaxial aspect.

Figs. 1-3, $\times 215$; 4-14, 16, $\times 135$; 15, $\times 55$.

length three-fifths of the width; lateral margins hyalinous. Mesonotum short, as wide as the pronotum; metanotum slightly wider, for the greater part concealed by the trapezoid propodeum. Length of the propodeum one third of its posterior width; small tufts of hairs occur laterally, next to the circular spiracles.

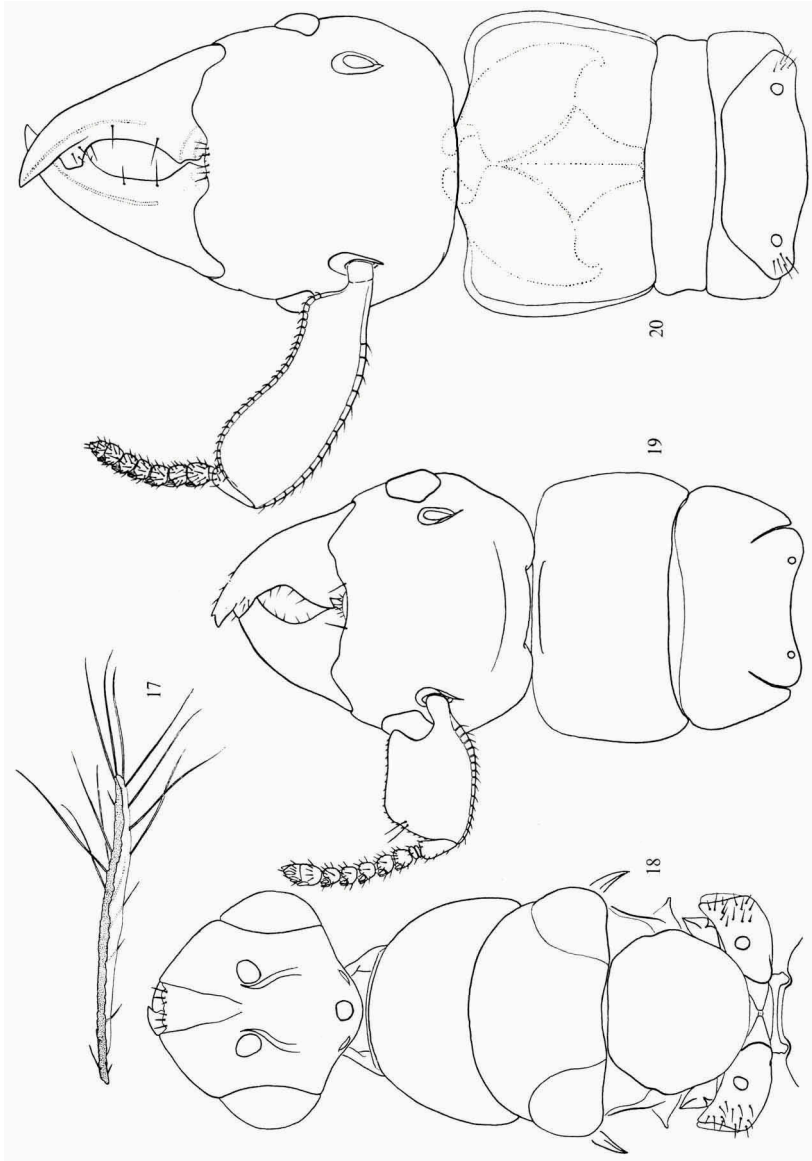
Fore wing (fig. 17) reduced, hind wing absent. Fore leg (fig. 13) with coxa large, not much smaller than the femur, with some black hairs at the antaxial ventral corner; trochanter small; femur robust, with short pubescence; tibia as long as the femur, widening distally, heavily armed with thirteen peg-like spines along the apical edge and one large ventral spur, which is bifid at apex; tarsus tetramerous, with stout hairs, the segments approximately in ratio 3:2:2:10 (measured dorsally). Mid leg of the same facies as the fore leg, but the segments more slender; the tibial armature (fig. 9) consisting of a few peg-like spines, two of which are situated along the dorso-apical edge, and four at the ventral edge: three axially of the robust spur, and one antaxially; tarsus tetramerous, the segments approximately in ratio 3:1:2:9 (measured dorsally). Coxa of the hind leg as long as the femur; the femur expanded dorsally, rather angular proximally, with small spines along the dorsal edge; tibia slender, subclavate, its apical armature (fig. 14) consisting of one ventral spur and two sets of peg-like spines: seven at the antaxial side of the spur, and seven along the dorsal margin; tarsus with spines and hairs, the four segments approximately in ratio 6:5:5:14 (measured dorsally).

Gaster short, subovoid. Genitalia (fig. 12). The cerci bear four robust claws, the parameres bear two apical hairs.

Length (head without mandibles, and thorax): 1.5 mm; very small specimens measure 1.2 mm. Colour yellow-brown, the mandibles red-brown.

Female. — Maximum length of the head (fig. 18) slightly shorter than the width across the compound eyes. Eyes protruding, the longitudinal diameter as long as the cheek. A narrow groove runs from the epistomal margin up to the height of the antennal toruli, which are well spaced. Ocelli rather close together, situated on a distinct dorsal elevation. Epistomal margin indistinctly trilobate, with six hairs. Mouthparts (figs. 2, 3). Mandible tridentate, with three glands, stout hairs occur along the outer margin and on the ventral disk. Maxillary palpus four-segmented, the segments in ratio 4:4:3:13. Labial palpus consisting of two subequal segments.

Antenna (fig. 16) twelve-segmented (not including the very small apex); scape more than twice as long as the pedicel; third and fourth segments annuliform; funicular segments subequal; the apical three segments shaped



Figs. 17, 18, 20. *Sycobiella boschmai* sp. n. 17, male fore wing; 18, female head and thorax; 20, male head and thorax.

Fig. 19. *Sycobiella saundersii* Westwood, male head and thorax.
Figs. 17-20, X 55.

so as to form a club, the first segment of which (the tenth antennal segment) is as long as the funicular segments, the apical segments are distinctly shorter. The fifth to eleventh segments bear one row of about twelve long sensilla each, the apical segment bears eight sensilla.

Thorax (fig. 18). Pronotum not very long, rounded anteriorly, with very small spines on the lateral surfaces. Scutum one and a half times as long as the pronotum; the scapulae large, with small spines similar to those of the pronotum. Scutellum almost circular in outline, partly concealing the metanotum from dorsal view. Propodeum consisting of two very narrowly fused sclerites, with circular stigmata; the lateral parts with about fifteen hairs.

Fore wing (2:1), 1.8 mm long. Submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 12:8:3:6; the stigmal vein with four pustules, the submarginal vein broken, with two pustules next to the interruption. Hind wing (11:3), 1.2 mm long. Fore leg short and robust; the coxa nearly as long as the femur, but narrower; trochanter small, one third the length of the coxa; femur robust, one and a half times as long as the tibia, and much wider; the tibia (fig. 5) widening distally, with sparse spiniform hairs; tarsus five-segmented, the segments short and wide, with stout dorsal and lateral spines, the ventral edges fimbriated, the segments in ratio 4:1:1:1:4 (measured dorsally). Tibial spur of the fore leg bifid at apex, several spines occur along the dorsal and ventral margins: one spine above and two or three spines beneath the spur, and two short spines at the dorsal edge, one very short but stout spine is situated at the axial distal margin. Mid leg slender; the coxa semiglobular; trochanter small and narrow; femur four times as long as the trochanter, widening distally but narrowing again at apex; tibia subclavate, slightly longer than the femur, with one ventral spur (fig. 10); the tarsus as long as the tibia, with ventral spines, the segments approximately in ratio 13:10:4:3:10 (measured dorsally). Hind leg short and robust; the coxa wide, expanded dorsally; trochanter small; femur widely expanded dorsally, larger than the coxa; tibia (fig. 4) less than two-thirds the length of the femur, its armature consisting of a series of spines along the dorsal margin, and an antaxial ventral comb of peg-like spines, two ventral spurs, and many long stout hairs; tarsus five-segmented, the metatarsus with six ventral spines, the other segments with apical spines only, the segments in ratio 16:7:6:4:6.

Gaster. Ovipositing organs (fig. 15) very short, the valves robust and pubescent. Stigma of the eighth urotergite circular. Cercus of the ninth urotergite small, with three long hairs.

Length, 2.5 mm. Colour black-brown, the scape of the antenna and the distal segments of the legs lighter.

NOTES ON THE GENUS SYCOBIELLA

The generic identification of *Sycobiella boschmai* remains open to some doubt. On account of the morphology of the male it could be classified in two different genera (viz., *Sycobiella* Westwood, and *Terastiozoon* Grandi, Idarninae), whereas the structure of the female give support to its inclusion in *Lipothymus* Grandi (Sycophaginae). Similar problems were found in the genera *Eukoebelea* Ashmead and *Sycophaga* Westwood, and in *Otitesella* Westwood and *Lipothymus* Grandi. In an earlier paper (Wiebes, 1961) I have pointed out this confusion in the classification of the Sycophaginae and the Idarninae, and suggested that they should be classified into one subfamily of the Torymidae. This change of the original concept of the Idarninae warrants an alteration of its name, as the name SYCOPHAGINAE (Sycophagides Saunders, 1883, p. 20) is older than Idarninae Ashmead, 1899, p. 246.

Westwood (1883, pp. 33, 34) erected the genus *Sycobiella* for the reception of the new species *S. saundersii* Westwood. Forty years later, Grandi (1922) treated the genus in his revision of *Otitesella* Westwood and related genera, although the only species known to him from his own studies was *S. monstruosa* Grandi. In the same paper the type species of *Terastiozoon* was redescribed and figured. The males of *Terastiozoon* and *Sycobiella* were differentiated by the following characters (Grandi, 1922, p. 57): (1) the shape of the antennal toruli (the large lateral margins produced posteriorly in *Sycobiella*, not produced in *Terastiozoon*), (2) the number of annuli in the antenna (two in *Sycobiella*, one in *Terastiozoon*), and (3) the number of free thoracic terga (all free in *Sycobiella*, mesonotum, metanotum, and propodeum fused in *Terastiozoon*).

Last year I had the opportunity to examine some specimens of what I believe to be the original series of *Sycobiella saundersii* Westwood in the British Museum (Natural History) and in the Hope Department of Entomology. Recently I could dissect one male specimen of a small series reared from *Ficus benghalensis* in Allahabad, India (leg. M. H. Ansari). The illustrations (figs. 6-8, 19) accompanying the present notes on *S. saundersii* were made from this dissected specimen (coll. Museum Leiden, slide no. 686a). They may serve to amend the rather crude drawings by Westwood (1883, pl. 5 figs. 13-19).

In *S. saundersii*, the lateral margins of the antennal toruli are produced posteriorly, and there are two annuli in the antenna. The mesonotum, metanotum, and propodeum are fused into one dorsal sclerite, as in *Terastiozoon*. Some years ago, Joseph (1957, pp. 127, 128, fig. 16: 1-6) described a similar fusion of the thoracic terga in *S. claviscapa* Joseph.

Sycobiella boschmai appears to be intermediate between the genera *Sycobiella*, *Terastiozoon*, and *Otitesella*. The antennal toruli are not or scarcely produced posteriorly and the antenna bears only one annulus, as in *Terastiozoon*. The maxillary palpus consists of two segments, as in *Otitesella*. A common character of *S. saundersii*, *S. monstrosa*, and *S. boschmai*, is the abrupt dilatation of the scape, which gives this segment a nearly rectangular shape. This character, however, is not shown by *S. clavisca*.

In the present state of our knowledge of the fig insects, it seems wisest not to take any nomenclatorial decisions on the generic level unless a group is monographically treated. This is why I refrain from synonymizing the genera treated above. The new species is described in the genus with the oldest name, i.e., *Sycobiella* Westwood. It may be distinguished from the other species described in this genus by the following key.

Key to the species of *Sycobiella* (♂ ♂)

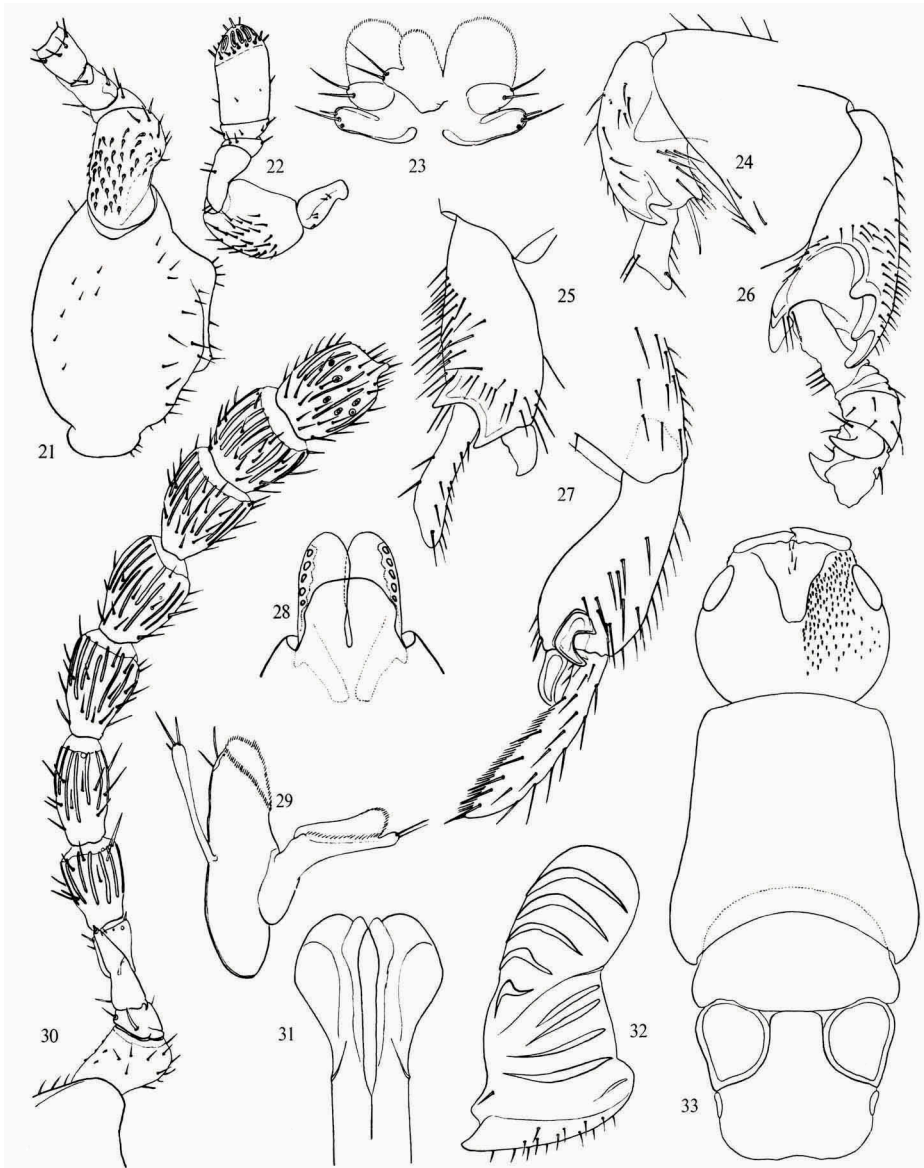
- | | |
|---------------------------------------------------------------------------------------------|-------------------------------|
| 1. Mesonotum, metanotum, and propodeum fused | 2 |
| — Thoracic terga free | 3 |
| 2. Scape dilated angularly at base. Fore tibia with about fifteen peg-like spines | |
| | <i>S. saundersii</i> Westwood |
| — Scape gradually widening at base. Fore tibia with about thirty peg-like spines | |
| | <i>S. clavisca</i> Joseph |
| 3. Antenna with two annuli | <i>S. monstrosa</i> Grandi |
| — Antenna with one annulus | <i>S. boschmai</i> sp. n. |

***Blastophaga boschmai* sp. n.**

Eleven ♀, 16 ♂, ex *Ficus dzumacensis* Guillaum. (det. E. J. H. Corner), Mt. Kogi, New Caledonia, leg. H. S. McKee, 26 December 1960, no. 7797; coll. Museum Leiden, no. 573; holotype (♂), slide no. 573a, allotype (♀), no. 573c, paratypes (♂, ♀), no. 573b, d, e.

Male. — Head (fig. 33) nearly circular in outline, slightly produced anteriorly. Eyes large. Antennal groove deep, wide anteriorly and narrowing posteriorly. Epistomal margin faintly bilobate. Dorsal surface with many small spines (omitted from the figure in the left side). Mandible tridentate, with two glands. The labium (fig. 23) with two apical hairs on the ventral lobe, the dorsal lobe setose; maxillae (fig. 23) with two lateral lobes, which bear long spiniform hairs.

Antenna (fig. 22) robust; the scape nearly twice as long as its maximum width, twice as long as the radicola, with stout spines on the dorsal surface; pedicel more slender, more than half as long as the scape, with two basal spines and two spines at mid length; third and fourth segments annuliform, approximately three times as wide as long; apical segment large, nearly as



Figs. 21-33. *Blastophaga boschmai* sp. n. 21, basal segment of female antenna, axial aspect; 22, male antenna, dorsal aspect; 23, male labium and maxillae; 24, tibia and metatarsus of female fore leg, antaxial aspect; 25, tibia and metatarsus of male hind leg, antaxial aspect; 26, tibia and metatarsus of male fore leg, antaxial aspect; 27, tibia and metatarsus of female hind leg, antaxial aspect; 28, cerci of tenth urite of male, dorsal aspect; 29, female labium (lateral aspect) and maxilla (ventral aspect); 30, female antenna, antaxial aspect; 31, male, apex of aedeagus, dorsal aspect; 32, female mandible; 33, male head and thorax.

Figs. 21, 22, 24-27, 29, 30, $\times 135$; 23, $\times 215$; 28, 31, $\times 225$; 33, $\times 55$.

long as the scape, twice as long as wide, with one subapical sensillum on the ventral antaxial surface, and a row of eight oblong sensilla and many blunt spiniform processes in the apical part.

Thorax (fig. 33). Pronotum large, the length not quite equal to the posterior width, and nearly one and a half times the anterior width. Mesonotum half as long, and nearly as wide as the pronotum. Metanotum visible in dorsal view as two ear-like plates next to the anterior part of the propodeum, which is as long as wide posteriorly. Dorsal surfaces of the thoracic terga with sparse short pubescence; some longer hairs occur behind the propodeal spiracles. Propleurae large, the meso- and metasternal sclerites very small.

Femur of the fore leg large, more than twice as long as the tibia, with the small trochanter closely fitted to the large quadrangular coxa; tibia (fig. 26) with three dorso- and three ventro-apical teeth, deeply excavated on the antaxial surface, with heavy pubescence along the dorsal margin and on the antaxial disk; tarsus nearly as long as the tibia, the first segment twice as long as the fifth, with a few ventral spines, the intermediate segments much shorter, subequal, incompletely separate. Mid leg slender; the coxa semiglobular; trochanter small; femur a little shorter but much wider than the arcuate tibia; tarsus slightly longer, the five segments in ratio 5:4:3:3:6. Hind leg robust; coxa nearly as long as the femur, and as wide; tibia (fig. 25) three-fifths the length of the femur, heavily pubescent along the dorsal margin, with three apical teeth, one of which is motile; the five tarsal segments approximately in ratio 9:4:4:3:7.

Gaster. Cerci of the tenth urite (fig. 28) large, with five blunt claws; the aedeagus (fig. 31) dilated apically.

Length (head and thorax), 1.5 mm. Colour uniformly brown.

Female. — Head nearly as long as wide across the compound eyes. Longitudinal diameter of the eye one and a half times as long as the cheek. Three ocelli. Mandible with four ridges, its appendage with five ridges (fig. 32). Labium and maxilla (fig. 29): labium with two apical hairs on the ventral lobe; maxilla with two subapical lateral hairs and a subclavate bacilliform process, which is approximately half as long as the maxilla, and which bears three short apical hairs.

Antenna (figs. 21, 30). Scape twice as long as the pedicel; pedicel with approximately forty spines on the axial surface; the appendage of the third segment rather long, reaching beyond the base of the fifth segment; fourth segment large, without sensilla, but with an apical row of spines; fifth segment one and a half times as long as the fourth, with one row of approx-

imately fifteen long sensilla; sixth to eighth segments subequal in length, but differing in width, longer than the fifth, the sixth segment with about fifteen sensilla, the seventh and eighth with nearly twenty sensilla, some of which are shorter than the others; ninth segment but slightly longer than the sixth, the tenth as long as the fifth, both with about twenty long sensilla; eleventh segment distinctly longer than the other flagellar segments, with a dozen long, and as many circular sensilla.

Thorax. Pronotum short, with very few small hairs. Scutum glabrous, not quite as long as its maximum width; the scapulae with small lateral hairs. Scutellum subquadrate, slightly widening anteriorly and posteriorly, with a few small hairs. Metanotum short, with a lateral row of five hairs. Propodeum thrice as long as the metanotum, with one long hair above, and about fifteen hairs beneath the spiracular peritremata.

Fore wing (2: 1), 1.9 mm long. Submarginal, marginal, stigmal, and post-marginal veins approximately in ratio 16: 5: 6: 12; the stigmal vein with five pustules, the submarginal vein with three. Hind wing (5: 1), 1.0 mm long. Coxa of the fore leg large, with long ventral hairs; trochanter small; femur two and a half times as long as the tibia, with a few dorsal hairs; tibia (fig. 24) with long dorsal and ventral hairs and a ventral spur, the dorsal armature consisting of two teeth; tarsus pentamerous, its segments approximately in ratio 9: 3: 3: 4: 6. Mid leg slender; the tibia slightly longer than the femur, with long hairs and one apical spur; the five tarsal segments approximately in ratio 6: 4: 4: 3: 5. Hind leg: coxa but little smaller than the femur; trochanter small; femur excavated ventrally; tibia (fig. 27) two-thirds the length of the femur, the tibial armature consisting of two teeth, the antaxial one of which is deeply bidentate, the axial one is curved; tarsus fimbriated along the plantar edge, the five segments approximately in ratio 14: 6: 5: 4: 5.

Gaster. Ovipositor one third longer than the gaster.

Length, 2.2 mm. Colour brown, the extremities lighter.

Although distinctly different in the relative proportions of the male and female, in the shape and the number of sensilla of the antenna, and in the armature of the male genitalia, the new species appears to be related to *Blastophaga javana* Mayr and its relatives (from figs of section *Ficus*), and it does not show any connections with the American wasps living in figs of the subgenus *Pharmacosycea* (section *Pharmacosycea*). This is the more surprising, as the section *Oreosycea*, to which *Ficus dzumacensis* belongs, is only with difficulty distinguished from the section *Pharmacosycea*.

REFERENCES

- ASHMEAD, W. H., 1899. Classification of the old family Chalcididae. Proc. ent. Soc. Wash., vol. 4, pp. 242-249.
- GRANDI, G., 1922. Ricostruzione e morfologia comparata dei generi *Otitesella* Westw., *Sycobiella* Westw. ed affini (Hymenoptera-Chalcididae). Boll. Lab. zool. Portici, vol. 16, pp. 3-58, figs. 1-21.
- JOSEPH, K. J., 1957. Contributions to our knowledge of fig insects (Chalcidoidea; parasitic Hymenoptera) of India. VII. Descriptions of fifteen new and revision of some old species. Ann. Soc. ent. France, vol. 125, pp. 97-133, figs. 1-19.
- SAUNDERS, S. S., 1883. Descriptions of three new genera and species of fig insects allied to *Blastophaga* from Calcutta, Australia and Madagascar; with notes on their parasites and on the affinities of the respective races. Trans. ent. Soc. Lond., 1883, pp. 1-27, pls. 1-3.
- WESTWOOD, J. O., 1883. Further descriptions of insects infesting figs. Trans. ent. Soc. Lond., 1883, pp. 29-47, pls. 4-10.
- WIEBES, J. T., 1961. Indomalayan and Papuan fig wasps (Hymenoptera, Chalcidoidea) I. *Grandiana wassae* nov. gen., nov. spec. (Idarninae), with remarks on the classification of the Sycophaginae. Nova Guinea, new ser. no. 14, pp. 245-252, figs. 1-19.