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**New species of *Waterstoniella* Grandi from the Indo-Malayan region  
(Hymenoptera Chalcidoidea, Agaonidae)**

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**SUMMARY**

Five new species of *Waterstoniella* Grandi are described viz., *W. borneana* (Malaysia, Sarawak; host *Ficus binnendijki* Miq. var. *binnendijki*), *W. javana* (Indonesia, Java; *F. retusa* L.), *W. malayana* (Malaysia, Selangor; *F. consociata* Bl. var. *murtoni* King), *W. sumatrana* (Philippines, Luzon; *F. sumatrana* Miq.), *W. williamsi* (Philippines, Luzon; *F. glaberrima* Bl. var. *bracteata* Corner).

**INTRODUCTION**

For a revision of the Indo-Malayan Agaonidae, a great number of samples from all over the archipelago have to be analyzed. Many appear to contain species new to science, which require technical description. In the present paper several species of *Waterstoniella* Grandi are treated. Characters differentiating the new taxa are especially noted. The associations of the species of *Waterstoniella* with their host *Ficus* were discussed by Wiebes (1979: 8, table 3). It appeared that most pollinate figs of subsections *Conosycea* (Miq.) Corner (series *Drupaceae* Corner) and *Dictyoneuron* Corner, which belong to the subgenus *Urostigma* (Gasp.) Miq. Some of these figs (i.e., those of subseries *Drupaceae*, *Indicae* Corner and *Ficus forstenii* Miq. of subseries *Crassirameae* Corner), however, have species of *Eupristina* Saunders as pollinators, which are characteristic for subsection *Benjamina* (Miq.) Corner (see table I). This discrepancy in the phylogenetic specificity of the Agaonid genera and the (sub)sections of *Ficus* is expected to disappear once the classifications of the two have been re-evaluated.

Most samples of *Ficus* were identified by Prof. E.J.H. Corner (Cambridge). The wasp material is being preserved in the Rijksmuseum van Natuurlijke Historie, Leiden (RMNH numbers in the text) and, for one species, also in the Bernice P. Bishop Museum, Honolulu (BMH).

DESCRIPTIONS

**Waterstoniella malayana spec. nov.**

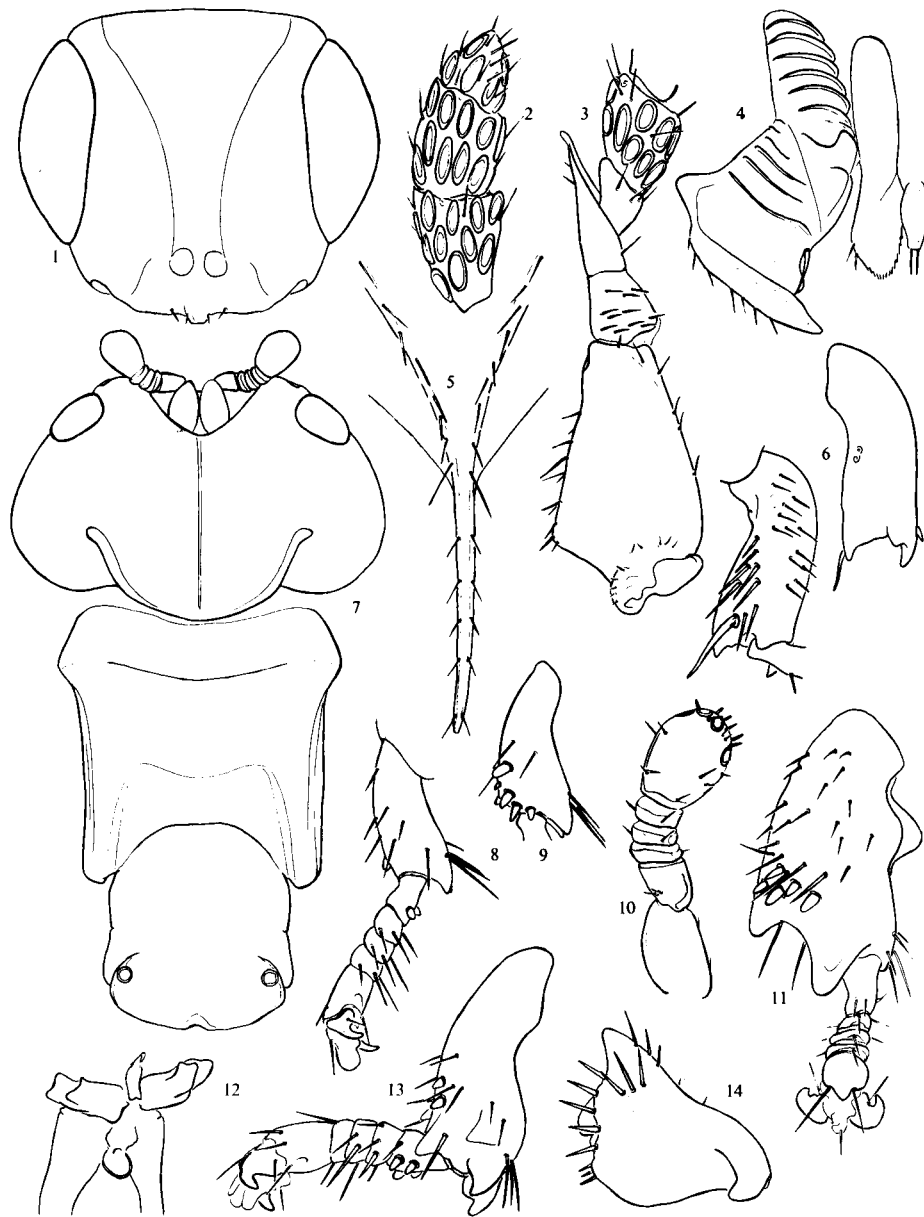
(figs. 1–14)

Type-material. – Series ♂, 6 ♀, Malaysia, Selangor, Telok reserve, Klang, leg. E.J.H. Corner (S.F. no. 34059), ex *Ficus consociata* Bl. var. *murtoni* King (det. Corner) (RMNH no. 404, holotype ♀ and paratype ♂ slide-mounted).

Female. – The specimens are not well preserved. Head (fig. 1) shorter than wide across the compound eyes (6 : 7); the longitudinal diameter of the eye four times the length of the cheek. No ocelli. Antennal toruli close to the epistomal margin, situated below an imaginary line connecting the lower margins of the

Table I. The Agaonidae of *Ficus* section *Conosycea*.

subsection <i>Conosycea</i>	Agaonidae
[series <i>Validae</i>	<i>Deilagaon</i> Wiebes]
series <i>Drupaceae</i>	
subseries <i>Drupaceae</i>	<i>Eupristina</i> Saunders
<i>F. drupacea</i> Thunb.	<i>E. belgaumensis</i> Joseph
subseries <i>Indicae</i>	
<i>F. benghalensis</i> L.	<i>E. masoni</i> Saunders
<i>F. altissima</i> Bl.	<i>E. altissima</i> Bal. & Abd.
subseries <i>Zygotricheae</i>	<i>Waterstoniella</i> Grandi
<i>F. consociata</i> Bl.	<i>W. malayana</i> spec. nov.
subseries <i>Crassirameae</i>	
<i>F. stupenda</i> Miq.	<i>W. masii</i> (Grandi)
<i>F. crassiramea</i> Miq.	<i>W. jacobsoni</i> (Grandi)
<i>F. crassiramea</i> var. <i>patellifera</i>	<i>W. solomonensis</i> Wiebes
<i>F. forstenii</i> Miq.	<i>Eupristina bakeri</i> (Grandi)
subsection <i>Dictyoneuron</i>	
series <i>Glaberrimae</i>	<i>Waterstoniella</i> Grandi
<i>F. glaberrima</i> Bl.	<i>W. williamsi</i> spec. nov.
series <i>Subvalidae</i>	
<i>F. sundaica</i> Bl.	<i>W. sundaica</i> Wiebes
<i>F. sumatrana</i> Miq.	<i>W. sumatrana</i> spec. nov.
<i>F. retusa</i> L.	<i>W. javana</i> spec. nov.
series <i>Perforatae</i>	
<i>F. binnendijki</i> Miq.	<i>W. borneana</i> spec. nov.
subsection <i>Benjamina</i>	
series <i>Benjamineae</i>	<i>Eupristina</i> Saunders
<i>F. benjamina</i> L.	<i>E. adempta</i> Wiebes
series <i>Callophylleae</i>	<i>Parapristina</i> Hill
<i>F. microcarpa</i> Linn.f.	<i>P. verticillata</i> (Waterston)



Figs. 1–14. *Waterstoniella malayana* spec. nov. 1–6, female holotype; 7–14, male. 1, head; 2, antennal club, anti-axial aspect; 3, proximal half of antenna, anti-axial aspect; 4, trophi; 5, hypopygium; 6, fore tibia, axial aspect (left) and outline of anti-axial aspect (right); 7, male; 8, mid tibia and tarsus, axial aspect; 9, do., anti-axial aspect; 10, right antenna, dorsal aspect; 11, fore tibia and tarsus, dorsal aspect; 12, remnant of maxillo-labial complex, dorsal aspect; 13, hind tibia and tarsus, anti-axial aspect; 14, mandible, ventral aspect. Figs. 1, 7,  $\times 105$ ; 2–6, 8–11, 13, 14,  $\times 210$ ; 12,  $\times 415$ .

eyes; the antenna (fig. 3) with the scape triangular in outline, the other segments resembling those of *W. sumatrana* (fig. 58), but the sensilla in two complete (or even three incomplete) rows, the club (fig. 2) of three segments. Trophi (fig. 4): the mandible with five ventral lamellae, the apical tooth not particularly prominent, the subapical slight; the appendage with nine lamellae, the proximal two of which are drawn out into a tooth; the maxilla with two subapical setae, labium with two apicals.

Thorax. Pollen pockets little developed. Submarginal, marginal, stigmal, and postmarginal veins of the fore wing approximately in length ratio 4 : 2 : 1 : 2. Fore tibia (fig. 6) with a dorso-apical tooth and one subapical spine, as well as an antiaxial crest, a ventro-apical tooth, and long axial spines including a long spur; the tarsal segments approximately in ratio 8 : 3 : 3 : 3 : 6. Mid tarsal segments in length ratio 15 : 6 : 5 : 4 : 5. Hind femur with a row of seven spines, the tibial armature consisting of a simple axial spur and a bicuspidate antiaxial; the tarsal segments in ratio 18 : 9 : 9 : 8 : 10, with the usual spines and a plantar fringe.

Gaster. The hypopygium (fig. 5) with an acute spine, which is even longer than that in *W. borneana*. Spiracular peritremata of the eighth urotergite subcircular in outline; the pygostyle long and slender, with one long subapical seta. Ovipositor 2.2 mm.

Length (head, thorax, gaster) 1.8 mm. Colour yellowish brown.

Male. – Head (fig. 7) wider than long (5 : 3), almost glabrous. Eyes longer than the cheek (5 : 4). Antenna (fig. 10) consisting of six segments: the scape as long as the pedicel and the funicle combined, the pedicel as long as the funicle, the club as long as the scape, with a trace of a subdivision in the proximal quarter. Mandible (fig. 14) with stout setae, one gland; the mouthparts atrophied, but far behind the epistomal edge some remnants of labium and maxillae are present (fig. 12).

Thorax (fig. 7) in the anterior part almost 1½ times as wide as long, with a wide expansion; the fused meso- and metanotum, too, 1½ times as wide as long, slightly constricted at half length; the propodeum incompletely separate, twice as wide as long, with subcircular spiracular peritremata. Fore tibia (fig. 11) with large apical teeth, and with five dorsal cones; the tarsal segments approximately in ratio 4 : 1 : 1 : 1 : 4, the basitarsus with two ventral cones. Mid leg small, the tibia (figs. 8, 9) with a varying number of antiaxial cones, and with two dorso-apical teeth; the tarsal segments approximately in ratio 2 : 1 : 1 : 1 : 2, the basitarsus with two ventral cones, the other segments with long spines. Hind tibia (fig. 13) with an antiaxial tooth next to the apical crest (which is not bidental as in *W. jacobsoni* Grandi and *sundaica* Wiebes), otherwise armed as usual; the tarsal segments approximately in ratio 8 : 4 : 4 : 3 : 4, with ventral cones on the basitarsus.

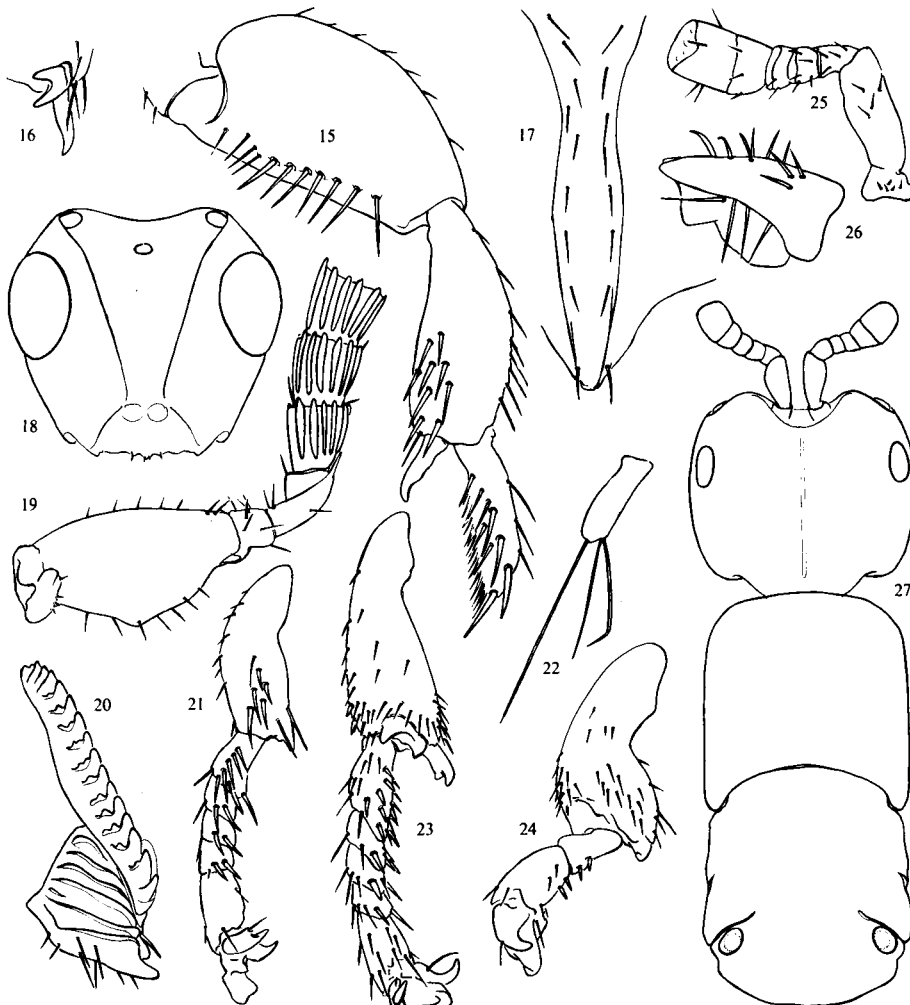
Gaster. Genitalia simple.

Length (head and thorax) ca. 1 mm. Colour light yellow-brown.

Note. — The female of the new species has rather large eyes, as also found in *W. javana*, but it has no ocelli and the spine of the hypopygium is very long (in *W. javana* the spine is short and there are two ocelli). The males are very much alike, but the shape of the head is characteristic.

***Waterstoniella williamsi* spec. nov.**  
(figs. 15–27)

Type-material. — 20 ♀ 3 ♂, Philippines, Luzon, Mt. Makiling, 18.iii.1922, leg. F.X. Williams, ex *Ficus adamii* [= *F. glaberrima* Bl. var. *bracteata* Corner] (BMH, ♀ holotype and ♀ ♂ paratypes slide-mounted; 5 ♀ 1 ♂, RMNH no. 2659).



Figs. 15–27. *Waterstoniella williamsi* spec. nov. 15–22, female holotype; 23–27, male. 15, hind femur, tibia and basitarsus, axial aspect; 16, tibial teeth of hind tibia, antiaxial aspect; 17, hypopygium; 18, head; 19, proximal half of antenna, antiaxial aspect; 20, mandible; 21, fore tibia and tarsus, axial aspect; 22, pygostyle; 23, hind tibia and tarsus, antiaxial aspect; 24, fore tibia and tarsus, antiaxial aspect; 25, left antenna, dorsal aspect (the club evidently collapsed at the apex); 26, mandible, ventral aspect; 27, male. Figs. 15–17, 19–21, 23–26,  $\times 210$ ; 18, 27,  $\times 105$ ; 22,  $\times 415$ .

Additional material, from the Philippines, Luzon, Mt. Makiling, leg. F.X. Williams, ex *Ficus longipedunculata* [see Note]: 12 ♀, 1.v.1921 (BMH); 3 ♀ 7 ♂, above swimming pool, 17.v.1921 (BMH; 3 ♂, RMNH no. 2662); 40 ♀ 6 ♂, at 1.2 km, 2.vi.1921 (BMH; 5 ♀, RMNH no. 2661).

Female. – Head (fig. 18) slightly longer than wide across the compound eyes (9 : 10); the longitudinal diameter of the eye slightly shorter than the cheek. Three ocelli. Antenna (fig. 19): the scape twice as long as wide across the ventral projection, the pedicel small, the third segment produced into a sharp apex reaching beyond the basis of the fifth segment, the fourth small; the fifth to tenth subequal, with one row of up to ten longitudinal sensilla on the antiaxial surface and ca. three to five on the axial (where part of the disc is bare); the eleventh segment smaller, forming a club with the tenth and ninth. Mandible (fig. 20) with six ventral lamellae, the apical and subapical teeth not very acute, nor very prominent; the appendage with about fifteen ventral lamellae, which are shaped so as to form small teeth (as in the Agaoninae). Labium with two apical setae, the maxillae with two subapicals.

Thorax: no pollen pockets visible. Submarginal, marginal, stigmal, and postmarginal veins of the fore wing (11 : 5, 1.2 mm long) approximately in ratio 25 : 9 : 5 : 3, the disc has many microtrichiae in the distal two-thirds. Hind wing (4 : 1) 0.7 mm long. Fore tibia (fig. 21) with two dorsal and one ventral, large teeth, the axial surface of the tibia and tarsus with robust spines, the tarsal segments approximately in ratio 6 : 2 : 2 : 2 : 5. Mid tarsus, length ratio 8 : 5 : 4 : 3 : 5. Hind leg (figs. 15, 16): the femur with a row of spines, the tibia with axial spines, a hyaline dorso-apical edge, and with two spurs viz., one simple axial and a bidentate antiaxial; the tarsal segments with axial spines and a plantar fringe, length ratio 12 : 6 : 5 : 5 : 6.

Gaster. The hypopygium (fig. 17) rather blunt at the apex; the pygostyle (fig. 22) long and slender, with three apical setae. Ovipositor 0.9 mm.

Length (head, thorax, gaster) 1.3 mm. Colour brownish.

Male. – Head (fig. 27) almost as long as wide (8 : 9); the eyes rather small, as long as the cheek. Antenna (fig. 25) consisting of six free segments: the scape three times as long as the pedicel, the funicle consisting of two subequal segments, the club divided. Mandible (fig. 26) with three apical teeth.

Thorax (fig. 27) without anterior expansion, the pronotum as wide as long, the posterior part of the thorax longer than wide; the mesonotum, as seen laterally, longer than the metanotum, the propodeum incompletely separate, with large spiracular peritremata. Fore leg (fig. 24): the tibia with a number of apical teeth, not all of which are very prominent; the tarsus bimerous (5 : 6), with ventral spines. Mid tarsus, length ratio of segments 4 : 2 : 2 : 2 : 5. Hind tibia (fig. 23) with two apical teeth, the antiaxial one widely bidentate, the axial more slender, bidentate at the apex; the tarsus with many spines, the segments in ratio 3 : 1 : 1 : 1 : 3.

Gaster. Genitalia simple.

Length (head and thorax) 0.9 mm. Colour yellowish.

Note. — *Ficus adamii* Elmer is a synonym of *F. glaberrima* Bl. var. *bracteata* Corner. *Waterstoniella williamsi* is the Agaonid different from *Deilagaon*, alluded to by Wiebes (1974: 298): Williams evidently mistook some samples of *F. adamii* for *F. longipedunculata* (= *F. chrysolepis* Miq.).

In some aspects, the new species resembles *W. sumatrana*, but in the female the eye is shorter (about as long as the cheek, versus twice as long in *W. sumatrana*), the apical tooth of the mandible is shorter, and the mandibular appendage bears fifteen lamellae (versus six). The male is at once distinguished by the fore tarsus, consisting of only two segments, versus five in the other species.

I name this species to Dr. F.X. Williams, who in the twenties published on figs and fig wasps in the Philippines (Williams, 1928) and whose collection still contains many novelties.

***Waterstoniella javana* spec. nov.**

(figs. 28–38)

Type-material. — Series ♀ ♂, Indonesia, Java, Kebun Raja, II.iv.1972, leg. E.J.H. Corner, ex *Ficus retusa* L. (det. Corner) (RMNH no. 2628, ♀ holotype and ♀ ♂ paratypes slide-mounted).

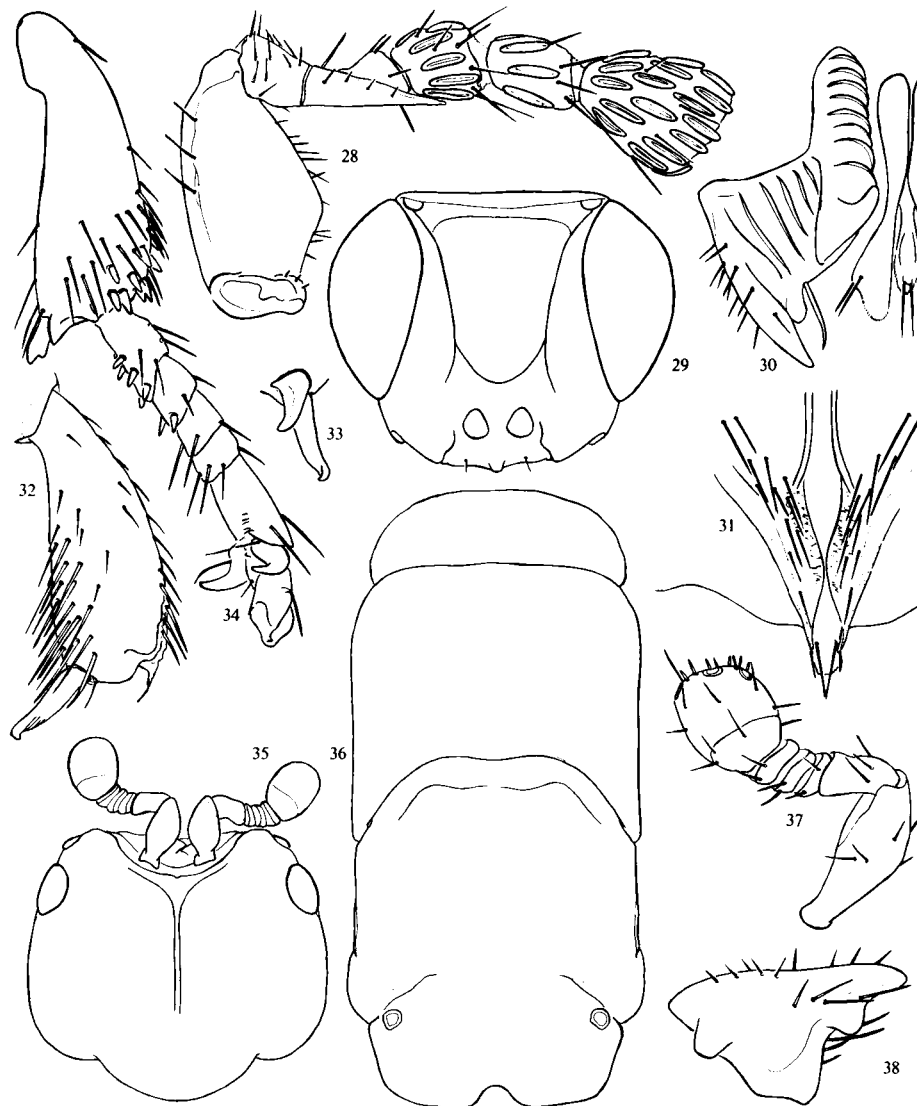
Female. — Head (fig. 29) not quite as long as wide across the compound eyes (22 : 27); the longitudinal diameter of the eye four times as long as the cheek. Two lateral ocelli present. Antennal toruli situated below an imaginary line connecting the lower margins of the eyes, but not as far distal as in *W. borneana*; the antenna (fig. 28) much like that of *W. borneana*, but the scape more robust, the appendage of the third segment reaching half way the fifth segment; the number of sensilla is low on the fifth and sixth segments (about ten, approximately in one row), much higher on the seventh and following segments (up to thirty, in two to three rows), the club consisting of three segments. Trophi (fig. 30): the mandible with six ventral lamellae, the appendage with nine (the first drawn out into a tooth), both the apical and the subapical teeth prominent; the maxilla and labium both with two subapical setae.

Thorax with mesosternal pollen pockets. Fore wing (5 : 2) 1.7 mm long; the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 5 : 2 : 1 : 2; the membrane with dense microtrichiae and faint venae spuriae. Hind wing (5 : 1) 0.8 mm long. Legs much as in *W. borneana*. Tarsal ratio of fore leg, 8 : 3 : 3 : 3 : 6; mid leg, 10 : 6 : 5 : 5 : 6; hind leg, 9 : 4 : 3 : 2 : 4; the hind tibia (figs. 32, 33) with a long and slender axial spur, hooked at the tip, and a distinctly bicuspidate antiaxial.

Gaster. The hypopygium (fig. 31) with a very short spine; heavy chitinized ridges form a central chiasma. The spiracular peritremata of the eighth urotergite almost invisible between the long setae of the distal gastral segments; the pygostyle short, almost triangular in outline, with a long apical seta and a short subapical. Ovipositor 2.8 mm i.e., distinctly longer than the body.

Length (head, thorax, gaster) ca. 1.6 mm. Colour yellow-brown, the head capsule a little darker.

Male. — Head (fig. 35) wider than long (4 : 3); the eye twice as long as the cheek. Antenna (fig. 37) seven-segmented: the scape clavate, more than twice as long as the pedicel; the three funicular segments of equal size; the large club divided. Mandible (fig. 38) with one gland; other mouthparts atrophied.



Figs. 28–38. *Waterstoniella javana* spec. nov. 28–33, female holotype; 34–38, male. 28, proximal half of antenna, anti-axial aspect; 29, head; 30, trophi; 31, hypopygium; 32, hind tibia, axial aspect; 33, spurs of hind tibia, anti-axial aspect; 34, hind tibia and tarsus, anti-axial aspect; 35, head; 36, thorax; 37, left antenna, dorsal aspect; 38, mandible, ventral aspect. Figs. 28, 30–34, 37, 38,  $\times 210$ ; 29, 35, 36,  $\times 105$ .



Thorax (fig. 36): the pronotum wider than long (11 : 8), with a large anterior expansion; the mesonotum about equal in size to the propodeum; the metanotum faintly demarcated disto-laterally; the propodeum incompletely separate, posterior margin deeply emarginate, the spiracular peritremata as in the other species. Legs much as in *W. sumatrana*; the hind tibia (fig. 34) with more antiaxial setae and robust spines, the tarsus with ventral spines, length ratio of the segments approximately as 14 : 8 : 6 : 5 : 14.

Genitalia simple.

Length (head and thorax) ca. 1 mm. Colour yellow.

Note. – Differential characters with *W. malayana* were mentioned under that species; from the other species here treated, both *W. javana* and *W. malayana* differ in the large size of the female compound eye and in the number (three) of funicular segments in the male antenna.

**Waterstoniella borneana spec. nov.**

(figs. 39–51)

Type-material. – Series ♀♂, Malaysia, Sarawak, Kuching, Matang Road, 26.ix.1961, leg. E.J.H. Corner, ex *Ficus binnendijki* Miq. var. *binnendijki* (det. Corner) (RMNH no. 670, ♀ holotype and ♀♂ paratypes slide-mounted).

Female. – Head (fig. 43) about as long as wide across the compound eyes; the longitudinal diameter of the eye more than three times the length of the cheek. No ocelli. Antennal toruli very close to the epistomal margin; the antenna (fig. 42) much like that of *W. sundaica* Wiebes, but the appendage of the third segment very short; the scape with long setae along the margin, the fourth segment half as long as the fifth to eighth segments, which bear large sensilla in two incomplete rows, the club consisting of three segments. Trophi (fig. 45): the mandible with six ventral lamellae, the apical tooth not particularly prominent, the subapical slight; the appendage with nine lamellae, the proximal three of which are drawn out into a tooth; the maxilla with three subapical setae, the labium with one.

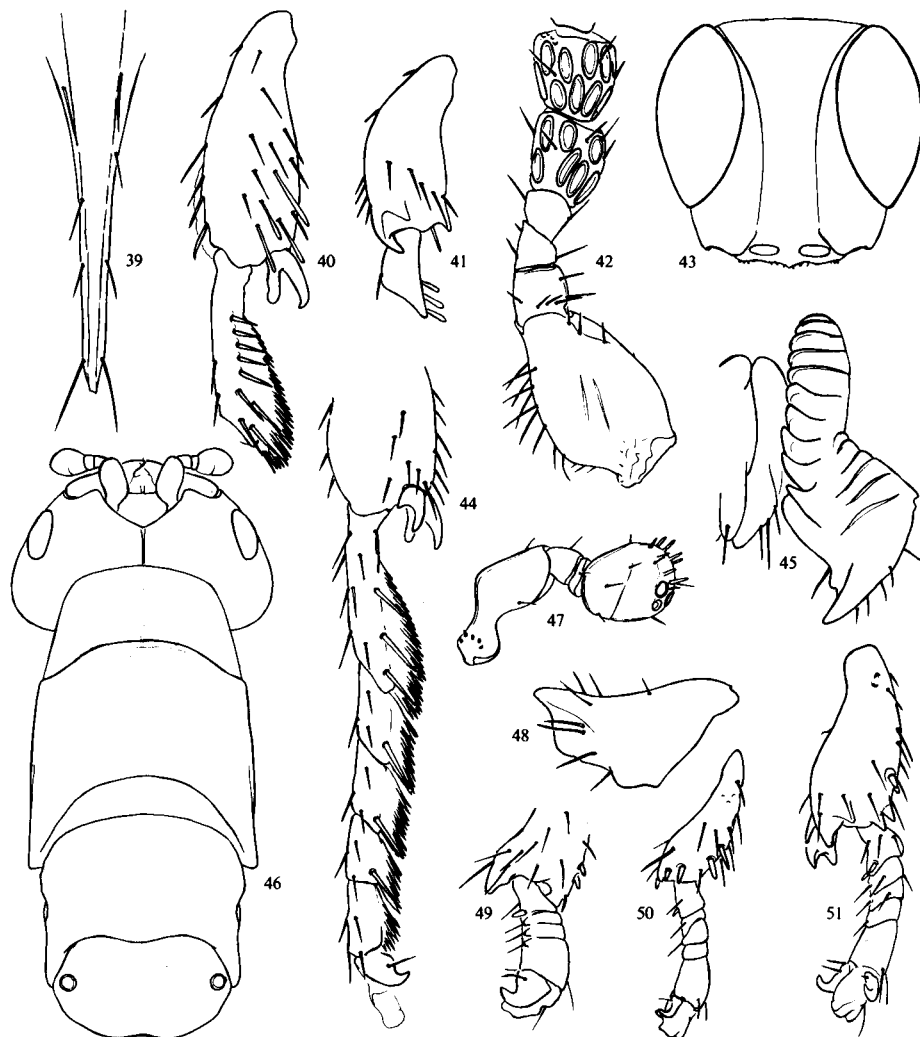
Thorax with a small, shallow pollen pocket. Fore wing (5 : 2) 1.4 mm long; the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 7 : 3 : 2 : 1, i.e., the postmarginal rather short; the membrane bears dense microtrichiae. Hind wing (5 : 1) 0.6 mm long. Fore leg (fig. 41): the tibia with two dorsal teeth and one ventral; the tarsal segments approximately in ratio 10 : 3 : 4 : 5 : 8. Tarsal ratio of mid leg, 8 : 5 : 4 : 4 : 6. Hind leg (figs. 40, 44): the femoral row of spines as depicted for *W. sumatrana* (fig. 55), the tibia armed with two ventral spurs, viz., one deeply bilamellate axial and one more bicuspidate antiaxial; the dorsal margin hyaline in the distal third; the tarsal segments approximately in ratio 14 : 6 : 5 : 4 : 6, with apical and axial spines, and with an ample plantar fringe.

Gaster. The hypopygium (fig. 39) with a long and acute spine. Spiracular

peritremata of the eighth urotergite small, subcircular; the pygostyle with three apical setae. Ovipositor as long as the body.

Length (head, thorax, gaster) ca. 1.2 mm. Colour yellow-brown.

Male. – Head (fig. 46) wider than long (5 : 3), with scattered small setae. Eyes twice as long as the cheek. Antenna (fig. 47) four-segmented, the scape clavate, almost five times as long as the pedicel, the single funicular segment one-third of the pedicel; the club large, indistinctly divided, with sensilla and sensillar



Figs. 36–51. *Waterstoniella borneana* spec. nov. 39–45, female holotype; 46–51, male. 39, hypopygium; 40, hind tibia and basitarsus, axial aspect; 41, fore tibia and tarsus, anti-axial aspect; 42, proximal half of antenna, anti-axial aspect; 43, head; 44, apex of hind tibia, and tarsus, anti-axial aspect; 45, trophi; 46, male; 47, right antenna, dorsal aspect; 48, mandible, ventral aspect; 49, apex of fore tibia, and tarsus, axial aspect; 50, mid tibia and tarsus, anti-axial aspect; 51, hind tibia and tarsus, anti-axial aspect. Figs. 39–42, 44, 45, 47–51,  $\times 210$ ; 43, 46,  $\times 105$ .

rods in the distal part. Mandible (fig. 48) with one gland; other mouthparts atrophied.

Thorax (fig. 46): pronotum wider than long (18 : 13), with a large hyaline anterior expansion; the fused meso- and metanotum almost twice as wide as long, only at half length of the lateral margin some remnant of the original division may be seen; the propodeum completely separate, twice as wide as long, with subcircular spiracular peritremata. Fore leg: the tibia with four large teeth and some smaller along the antiaxial, distal edge, and a pair of dorsal cones; the tarsus oligomeric when seen from the antiaxial side, while in axial view the pentamerous condition is apparent (fig. 49), the basitarsus with a conical spine. Mid leg slender, more distinctly so than in *W. sundaiica*, with tibial spines (fig. 50) and a (sometimes indistinctly) pentamerous tarsus (6 : 2 : 3 : 2 : 7). Hind leg: the tibia (fig. 51) heavily armed along the antiaxial edge with two ventral teeth and two dorsal, and with a robust, bicuspidate ventral spur; two conical spines are situated along the dorsal edge; the tarsus consists of five segments, approximately in ratio 4 : 2 : 1 : 2 : 5, the basitarsus with two ventral cones, all segments with ventral spines.

Gaster. Genitalia simple.

Length (head and thorax) ca. 0.7 mm. Colour light yellow brown.

Note. – The female head is almost as long as wide across the compound eyes, as in *W. javana*, but the eye is larger and the spine of the hypopygium is much longer. The male propodeum is completely separate, which differentiates *W. borneana* from all other species here treated.

#### **Waterstoniella sumatrana spec. nov.**

(figs. 52–63)

Type-material. – Series ♀ ♂, Philippines, Luzon, Laguna, Mt. Makiling, 300 M, 15.i.1965, leg. J.T. Wiebes, ex *Ficus sumatrana* Miq. (J.V. Pancho no. 4271, det. Corner) (RMNH no. 792, holotype ♀ and paratypes ♀ ♂ slide-mounted).

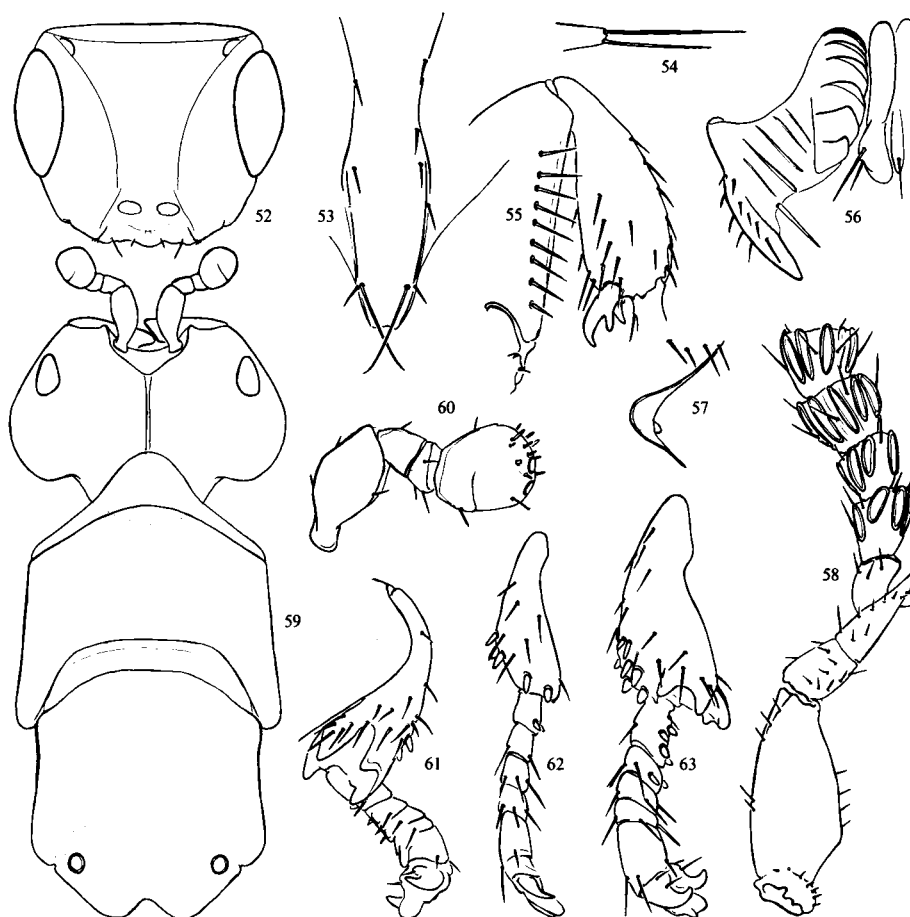
Female. – Head (fig. 52) shorter than wide across the compound eyes (6 : 7); the longitudinal diameter of the eye twice as long as the cheek. Remnants of lateral ocelli. Antennal toruli more distant from the epistomal edge than in *W. borneana*; the antenna (fig. 58) with a longer scape, the appendage of the third segment almost as long as the fifth, all funicular segments with long sensilla in one row per segment, the club three-segmented. Trophi (fig. 56): the mandibular tooth acute and rather long, the mandible with five ventral lamellae, the appendage with six; the maxilla with two subapical setae, the labium with one.

Thorax with pollen pockets (fig. 57). Fore wing (2 : 1) 1.1 mm long; the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 22 : 9 : 6 : ca. 4 (the distal portion obsolete); the membrane with dense microtrichiae. Hind wing (5 : 1) 0.5 mm long. Legs as in *W. borneana*; the axial spur of the hind tibia bidentate.

Gaster. The hypopygium (fig. 53) rather short and wide. Spiracular peritremata of the eighth urotergite subcircular; the pygostyle with two long setae (fig. 54). Ovipositor as long as the body.

Length (head, thorax, gaster) ca. 1.2 mm. Colour uniform yellow-brown.

Male. – Head (fig. 59) wider than long (11 : 7), with scattered small setae. Eyes as long as the cheek i.e., distinctly smaller than in *W. borneana*. Antenna (fig. 60) consisting of four segments: the scape not quite as long as the combined lengths of the other segments, the pedicel one-third of this length, the funicular segment approximately half as long as the pedicel; the club large, indistinctly divided, with various sensilla. Mandible as in *W. borneana*.



Figs. 52–63. *Waterstoniella sumatrana* spec. nov. 52–58, female holotype; 59–63, male. 52, head; 53, hypopygium; 54, pygostyle; 55, apex of hind femur, and tibia, axial aspect; 56, trophi; 57, right thoracic pollen pocket; 58, proximal half of antenna, antiaxial aspect; 59, male; 60, right antenna, dorsal aspect; 61, fore tibia and tarsus, antiaxial aspect; 62, mid tibia and tarsus, antiaxial aspect; 63, hind tibia and tarsus, antiaxial aspect. Figs. 52, 59,  $\times 105$ ; 53–58, 60–63,  $\times 210$ .

Thorax (fig. 59): pronotum twice as wide as long, with a relatively short, attenuated expansion in front; the fused meso- and metanotum  $1\frac{1}{2}$  times as wide as long, incompletely separate from the propodeum; posterior margin of the propodeum distinctly emarginate; the spiracular peritremata subcircular, large. Fore tibia with the usual four antiaxial teeth and two dorsal cones; not all tarsal segments separate in antiaxial view (fig. 61), the tarsus more distinctly pentamerous axially, with ventral cones (basitarsus) and spines. Mid leg slender, the tibia (fig. 62) with conical spines; the tarsal segments approximately in ratio 5 : 5 : 5 : 4 : 6, the basitarsus (and in some legs also the second segment) with ventral cones. Hind leg (fig. 63): tibial armature consisting of a ventral, bidentate, antiaxial crest next to the robust bicuspidate spur, and about seven conical spines along the distal, dorsal edge; the tarsus pentamerous (8 : 4 : 4 : 3 : 9), the basitarsus with four ventral cones, the second segment with two.

Gaster. Genitalia simple.

Length (head and thorax) ca. 0.8 mm. Colour light yellow-brown.

Note. – The sensilla of the female antenna are arranged in one row per segment (as in *W. williamsi*; see under that species); the apical tooth of the mandible is long and acute. The male eye is rather short.

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