

**RECORDED  
IN ANTBIB**

Gen. *CÆLIOXYS*, Latr.

1. *CÆLIOXYS INTRUDENS*. *C. atra*; scutello utrinque dentato, margine postico rotundato; abdomine conico segmentis fascia marginatis flavo-albida.

*Female*. Length  $4\frac{1}{4}$  lines. Black; the head and thorax covered with coarse confluent punctures; the face densely clothed with short yellowish-white pubescence; the posterior margin of the prothorax and the base of the scutellum with a narrow line of short yellowish-white pubescence; a similar line over the tegulæ; the thorax and femora beneath clothed with similar pubescence. Abdomen: the apical margin of all the segments, with a fascia of short white pubescence which is continued beneath; above, the fasciæ are narrowest in the middle, the basal segment has the fascia continued up the sides.

*Hab.* Makassar.

Gen. *CERATINA*, Latr.

1. *CERATINA PICTIFRONS*. *C. atra*; capite thoraceque flavo-pictis; abdomine fasciisque flavo-testaceis; pedibus rufo-pallidis.

*Female*. Length 5 lines. Head: the inner orbit of the eyes with a broad stripe, the clypeus, scape, labrum, mandibles and the head behind the eyes, yellow; the face punctured and with a broad deep sulcation in front of the ocelli; the base of the flagellum fulvous. The thorax yellow, with the mesothorax above and the base of the metathorax black; the mesothorax with a yellow stripe over the tegulæ, and two narrower ones in the middle of the disk; a fuscous patch on each side of the pectus; wings hyaline, the nervures ferruginous. Abdomen: the basal segment entirely of a reddish yellow, and the apical margins of the four following segments rufo-testaceous; above delicately punctured, beneath more strongly so.

*Hab.* Makassar.

Gen. *ANTHOPHORA*, Latr.

1. *ANTHOPHORA VIGILANS*. *A. nigra*, pube fulva vestita, pedibus ferrugineis.

*Female*. Length  $6\frac{1}{2}$  lines. Black; the clypeus, face on each side, labrum and mandibles, pale rufo-testaceous; the clypeus with two oblong black maculæ not extending to its apex; the tips of the mandibles, rufo-piceous; the flagellum fulvous beneath; the cheeks clothed with white pubescence. Thorax clothed above with fulvous pubescence, which on the sides and beneath is paler; the legs ferruginous and clothed with short fulvous pubescence; wings subhyaline, their apical margins faintly clouded, the nervures fusco-ferruginous, the tegulæ rufo-testaceous. Abdomen thinly clothed with short fulvous pubescence, the pubescence paler and denser on the apical margins of the segments, which are pale rufo-testaceous; the apical

segment with ferruginous pubescence; beneath naked, finely punctured and shining, with the apical margins of the segments pale testaceous.

*Hab.* Makassar.

Gen. *APIS*, *Linn.*

1. *APIS NIGRO-CINCTA*. *A. capite thoraceque nigris; abdomine pallide ferrugineo, segmentis fasciis nigris; scutello pedibusque pallidis.*

*Worker.* Length 5 lines. Head and thorax black; the scape of the antennæ, the clypeus, labrum, and mandibles pale ferruginous. Thorax: the scutellum and legs pale ferruginous, with the tibiæ and tarsi fuscous, the intermediate and posterior tibiæ pale in the middle; wings hyaline, the nervures ferruginous. Abdomen pale ferruginous, with the apical margins of the segments dark fuscous; beneath entirely pale.

*Hab.* Makassar.

This species most closely resembles the *A. socialis* of Latreille, but it is quite distinct, as I have ascertained by a comparison with and an examination of the typical specimen in Mr. Westwood's possession.

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Catalogue of Hymenopterous Insects collected by Mr. A. R. WALLACE in the Islands of Bachian, Kaisaa, Amboyna, Gilolo, and at Dory in New Guinea. By FREDERICK SMITH, Esq., Assistant in the Zoological Department, British Museum. Communicated by W. W. SAUNDERS, Esq., V.P.L.S.

[Read May 3, 1860.]

OF the various collections of *Hymenoptera* which Mr. Wallace has formed in the Indian Archipelago, none has exceeded that whose contents are described in the present paper, in the beauty and variety of the species, as well as in the interest attached to their geographical distribution. Amongst the *Formicidæ* many new and remarkable forms are both described and figured. I would particularly call attention to the two forms of the *worker* of *Pheidole notabilis*. Though convinced that nothing is created in vain, and that every modification of form has its design, adapting it to the fulfilment of conditions necessary in the economy of the particular species, I feel quite unable even to conjecture the purpose of the enormously enlarged head of the *worker major* of that species.

Another very interesting Ant is a new species of Erichson's genus *Amblyopone*; the previously described species are either from Tasmania or Australia; that here described is from Bachian.

Two remarkable species are added to the *Cryptoceridæ*, and a new genus described, which has partly the characters of *Cryptocerus*, and partly those of *Ponera*.

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D. Baker (vide Baker 1867)  
2nd. Kappeler (1867-1868).

The most interesting insect, in a geographical point of view, is undoubtedly a species of *Thynnus* from Bachian; this is the most northern range of the genus from its metropolis, Australia, with which I am acquainted. Amongst the *Apidæ*, however, will be found the gem of the collections; this is a species of *Megachile*. Not only is it equal in size to the largest known species of *Xylocopa*, but it is twice the size of the largest previously known species of the genus to which it belongs, and ten times the size of the smallest. This is certainly the finest addition which Mr. Wallace has made to our knowledge of the family *Apidæ*.

In this paper 191 species are enumerated, of which 132 are new to science, and 59 have been previously described. This fine collection of *Hymenoptera* is the property of William Wilson Saunders, Esq.

### Fam. FORMICIDÆ, Leach.

#### Gen. FORMICA, Linn.

1. *Formica lævissima*, Smith, *Proc. Linn. Soc.* 1859, ii. 138.

*Hab.* Bachian; Aru.

2. *Formica pallida*, Smith, *Proc. Linn. Soc.* 1857, ii. 57.

*Hab.* Bachian, Borneo, Sumatra.

3. FORMICA SUBTILIS. Capite, thorace, pedibusque rufo-testaceis; abdomine nigro. (*Worker major*) pallide testacea lævis nitida; pedibus elongatis (*Worker minor*).

*Worker major.* Length  $3\frac{1}{2}$  lines. Head rather darker than the thorax and legs; wider than the abdomen, elongate-ovate and shining; the mandibles stout, their inner edge with short acute blackish teeth. The thorax much compressed and narrowed behind. Abdomen ovate, black with an æneous tinge, and sprinkled with pale glittering hairs; the scale of the peduncle narrow, with its upper margin rounded.

*Worker minor.* Length 2 lines. Of a paler colour than the preceding; the antennæ very slender, and longer than the body; the legs very long, the posterior pair nearly twice the length of the body; the scale of the peduncle conical.

*Hab.* Bachian.

4. FORMICA VITREA. *F. nigra*, nitida; mandibulis tarsisque rufo-pallidis; squama quadrata.

*Worker.* Length 2 lines. Jet black, smooth and shining; head a little wider than the thorax; eyes ovate, placed rather high on the sides of the head; the antennæ longer than the thorax, the flagellum slightly thickened towards the apex; the mandibles pale rufo-testaceous. Thorax narrow, compressed behind and strangulated at the base of the metathorax; the scale of the abdomen compressed, quadrate, and

slightly notched above. Abdomen wider than the head, subglobose; the apical margins of the segments narrowly pale testaceous.

*Hab.* Bachian.

This species is found on trees, running in numbers up and down the trunks, probably in search of Aphides.

5. *FORMICA CRUDA*. *F. pallide testacea, lævis, nitida, sparse pilosa; abdomine fusco.*

*Worker.* Length 2 lines. The head, thorax, scale of the peduncle, and the legs palè testaceous yellow; the mandibles and head anteriorly sometimes of a slight ferruginous colour; the abdomen fuscous or fusco-testaceous, and covered with a fine thin short silky pubescence; the head heart-shaped; the eyes black, round, and placed forwards and inwards; the mandibles stout and triangular, their inner margin with a row of acute ferruginous teeth. Thorax much narrower than the head, strangulated at the base of the metathorax, which is oblique behind. Abdomen wider than the thorax, but not so wide as the head.

*Hab.* Bachian.

This insect varies in size, but the form and colouring is the same in all the workers, the smallest of which is about one line long. "Found beneath bark and about fern-roots."

6. *FORMICA LACTARIA*. *F. nigra; antennis pedibusque pallide ferrugineis.*

*Worker.* Length  $1\frac{1}{2}$  line. Black; the head and abdomen smooth and shining, the thorax rugose; the antennæ and legs rufo-testaceous, the apical joints of the tarsi palest; the mandibles pale ferruginous; the head ovate. The thorax narrow, compressed behind, deeply strangulated between the meso- and metathorax, the latter abruptly truncate behind; the abdomen ovate, the scale of the peduncle ovate.

*Hab.* Bachian.

This species varies in colour; some specimens are obscurely ferruginous, having the appearance of immaturity. Mr. Wallace says of this insect, "Found in numbers, milking Aphides on blades of grass."

7. *FORMICA INCURSOR*. *F. nigra; capite antice obscure ferrugineo; squama ovata.*

*Worker.* Length 2 lines. Black, smooth and shining; the head sub-ovate, narrowed anteriorly, the margin of the vertex rounded; the eyes rather large, ovate, and placed high on the sides of the head; before the insertion of the antennæ obscurely ferruginous; the mandibles and apical joints of the tarsi rufo-testaceous. The thorax narrowed behind, with a deep strangulation between the meso- and metathorax. Abdomen ovate and thinly sprinkled with pale glittering hairs; the scale of the peduncle ovate, rounded above.

*Hab.* Bachian.

8. *FORMICA RUFIFRONS*. *F. nigra; capite oblongo, antice ferrugineo; antennis tarsisque rufo-ferrugineis.*

*Female.* Length  $3\frac{1}{4}$  lines. Black, smooth and shining; the head obliquely truncate before the insertion of the antennæ; the truncate portion, the mandibles and head beneath, obscurely ferruginous; the eyes ovate, placed high on the sides of the head; the ocelli in a triangle wide apart on the vertex; the flagellum fusco-ferruginous. The thorax oblong-ovate, the metathorax truncate, the margins of the truncation rounded; the legs obscure rufo-fuscous, with the tips of the tarsi paler; the wings fuscous. Abdomen ovate; the scale of the peduncle narrow, thickened and obtusely rounded above.

*Worker.* Length  $2\frac{3}{4}$  lines. Closely resembling the female, but the head not shining; ferruginous before the eyes and rugose; the antennæ ferruginous, with the apex of the scape and first joint of the flagellum blackish. Thorax and abdomen smooth and shining, the former compressed behind; the anterior tibiæ in front and the apical joints of all the tarsi rufo-testaceous. Abdomen ovate; the scale of the peduncle narrow, its superior margin rounded.

*Hab.* Bachian.

This species, although bearing a close resemblance to *F. mutilata* from Aru, and also to the *F. truncata* of Europe, is quite distinct from both those species.

9. *FORMICA PAVIDA.* *F. nigerrima*, mandibulis tarsorumque articulo apicali ferrugineis; alis fulvo-hyalinis.

*Female.* Length 4 lines. Jet black, smooth and shining; the head oblong-quadrate; the antennæ fusco-ferruginous, the base of the scape and of the flagellum paler; the mandibles and anterior margin of the clypeus ferruginous; the inner edge of the mandibles with four or five acute teeth. The thorax oblong-ovate; the metathorax with a central smooth longitudinal channel; the wings fulvo-hyaline, the nervures ferruginous; the apical joints of the tarsi ferruginous. Abdomen oblong-ovate; the scale of the peduncle incrassate and obtuse above.

*Hab.* Bachian.

10. *FORMICA FAMILIARIS.* *F. pallide testacea*; capite thoraceque postice fusco-nigris.

*Worker.* Length  $\frac{3}{4}$  line. Pale testaceous, semi-transparent; the thorax at the sides, and behind, more or less dusky; the head dark fuscous, with the mandibles white.

*Hab.* Bachian.

This minute Ant is found in houses. Mr. Wallace says that, when living, its body, legs, and antennæ are transparent.

11. *FORMICA DORYCUS.* *F. nigra*, elongata et gracilis; capite postice in collum angustato; pedibus elongatis; abdominis nodo supra acuto.

*Worker.* Length 6 lines. Black, smooth and shining; head elongate, widest in front, slightly narrowed towards the eyes, and abruptly so behind them, forming a sort of neck; the scape of the antennæ fus-

cous, the flagellum pale rufo-testaceous; the tips of the mandibles ferruginous, their inner margin with three or four short acute teeth, their apex forming a long stout acute tooth. Thorax elongate, narrowest behind and slightly compressed; the legs elongate, slender, ferruginous and slightly pubescent. Abdomen ovate, the apical margins of the segments rufo-piceous; the node of the peduncle wedge-shaped and pointed above.

*Hab.* Dory.

This species resembles the *worker* of *F. gigas*, which is found in India, Malacca, Singapor, Borneo, &c., but the head is different in form, the colour is different, and the form of the scale of the peduncle differs too much, I think, for the insect to be considered as a form of *F. gigas*; it must, however, be one of the largest known species of the *Formicidæ*.

12. FORMICA DESECTA. *F. nigra nitida*; capite antice truncato.

*Female.* Length  $4\frac{1}{4}$  lines. Jet black, shining; the head wider than the thorax, truncate anteriorly; the truncation and sides of the head rugose; the mandibles rugose; the ocelli placed wide apart in a triangle, the posterior pair situated on the hinder margin of the vertex; the eyes ovate, placed very high on the sides of the head; the antennæ reaching to the insertion of the wings, the flagellum rufo-testaceous. Thorax, oblong-ovate, very smooth and shining; the wings hyaline and iridescent, the nervures pale rufo-testaceous. Abdomen oblong-ovate; the node of the peduncle incrassate, truncate above.

*Hab.* Dory.

#### Gen. TAPINOMA, *Foerst.*

1. TAPINOMA PRATENSIS. *T. capite, thorace, pedibusque pallide ferrugineis*; abdomine fusco-nigro.

*Worker.* Length  $1\frac{1}{4}$  line. Head and thorax pale ferruginous, smooth and shining; the antennæ and legs pale testaceous. Abdomen dark fuscous and sub-opaque; the scale of the peduncle ovate, hidden beneath the base of the abdomen.

*Hab.* Bachian.

#### Gen. POLYRHACHIS, *Smith.*

1. *Polyrhachis bihamatus*, *Drury, Ins. ii. pl. 38. f. 8. ♀.*

*Hab.* India; Borneo; Sumatra; Bachian.

The curved spines or hooks with which this remarkable species is armed vary greatly in different individuals, not only in being more or less curved or elongate, but the two spines which rise from the peduncle of the abdomen, on a short base, are sometimes widely divergent; in other individuals, they are continued nearly parallel, only curving apart, outwardly, at their summit; in the specimens from Bachian the spines are shorter and stouter than in any I have previously examined, — but I can only regard this as a local variety of the Indian species.

2. *Polyrhachis marginatus*, *Smith, Proc. Linn. Soc.* 1859, iii. 139.

*Hab.* Aru; India; Philippine Islands; Bachian.

3. *Polyrhachis dives*, *Smith, Proc. Linn. Soc.* 1857, ii. 64.

*Hab.* Malacca; Bachian.

4. *Polyrhachis sericatus*, *Smith, Append. Cat. Form.* p. 200; *Proc. Linn. Soc.* iii. 139.

*Formica sericata*, *Guér. Voy. Coq. Zool.* ii. 203; *Atlas, Ins.* pl. 8. f. 2.

*Hab.* Dory; New Hebrides; Aru.

5. *Polyrhachis sexspinosus*, *Latr. Hist. Nat. Fourm.* p. 126. pl. 4. f. 21. ♂

*Hab.* Dory; Aru; Philippine Islands; Java.

6. **POLYRHACHIS CHARAXUS.** *P. capite thoraceque nigris; antennis pedibusque ferrugineis; abdomine castaneo-rufo; squama spinis duabus acutis armatis.*

*Worker.* Length  $2\frac{1}{4}$  lines. Head and thorax black, the head shining, very finely and closely punctured; the clypeus anteriorly, the mandibles and antennæ ferruginous, the latter palest towards the apex. The thorax flattened and finely rugose above, the lateral margins raised; the metathorax obliquely truncate, with two minute acute spines at the verge of the truncation; the legs ferruginous, the apical joints of the tarsi palest. Abdomen globose, chestnut red; the scale of the peduncle armed with two acute spines. (Plate I. fig. 14.)

*Hab.* Bachian.

Taken in a small ovate papery nest on the underside of a leaf.

7. **POLYRHACHIS BUSIRIS.** *P. niger, lævis, nitidusque; thorace infermi; petioli squamula quadrispinosa.*

*Worker.* Length 3 lines. Jet-black, smooth and shining. Thorax rounded above, obliquely truncate behind. Abdomen globose; the node of the peduncle armed with four short acute teeth. (Plate I. fig. 15.)

*Hab.* Dory; Bachian.

8. **POLYRHACHIS ACANTHA.** *P. niger, pube cinereo-sericea vestitus; thorace spinis acutis antice et postice armato; squama spinis duabus longis curvatis.*

*Worker.* Length  $2\frac{3}{4}$  lines. Black: clothed with a thin silky cinereous pile; the disk of the thorax rounded; the spines in front short, stout, and acute; those on the metathorax long, divergent, and slightly curved inwards; the spines on the peduncle are stout, acute, and curved to the shape of the base of the abdomen. The abdomen globose. (Plate I. fig. 16.)

*Hab.* Bachian.

9. **POLYRHACHIS MEROPS.** *P. niger, lævis, nitidus; thorace antice spinis duabus longis acutis armato; femoribus et pedunculo ferrugineis.*

*Worker.* Length  $3\frac{1}{2}$  lines. Black, smooth, shining and very thinly covered with a changeable pile; the mandibles shining black, longi-

itudinally striated and denticulate on their inner margin; the face covered with silvery white pubescence. Thorax flattened above and at the sides, armed anteriorly on each side with an acute spine; the metathorax truncate; the thorax, viewed laterally, is quadrate; the femora and scale of the peduncle ferruginous; the latter is emarginate above with the angles oblique, the angles of the emargination produced into short acute spines. Abdomen globose, the red colour of the femora reflecting on its changeable pile. (Plate I. fig. 17.)

*Hab.* Bachian.

10. *POLYRHACHIS ITHONUS*. *P. niger*, pube argentea vestitus, prothorace bispinoso; petioli squamula quadrispinosa, pedibus ferrugineis. *Female*. Length 4 lines. Black, and covered with a glittering silvery pile; the mandibles shining black, longitudinally finely striated, and armed on their inner edge with a row of short acute teeth. The prothorax rounded and with a sharp spine at the lateral angles; the sides slightly rounded; the metathorax truncate; the legs ferruginous, with the tarsi black. Abdomen globose; the node of the peduncle slightly emarginate above, the lateral angles acute with a sharp spine outside. The *Worker* has the spines on the thorax longer and acute, the sides and disk of the thorax flattened, the divisions between the pro-, meso- and metathorax notched at the sides. The peduncular scale has the lateral angles of the emargination above produced into acute spines, the outer spines not being longer than in the female. (Plate I. fig. 18.)

*Hab.* Bachian.

11. *POLYRHACHIS EUDORA*. *P. niger* et vestitus pube pallide aurea; prothorace bispinoso; petioli squamula trispinosa.

*Female*. Length 4 lines. Black, and densely clothed with fine silky pale golden pile; the mandibles shining black, with four or five acute teeth on their inner edge. The thorax rounded anteriorly, with an acute spine at the lateral angles; the sides slightly rounded; the metathorax truncate behind, the lateral margins above, carinate; the legs and antennæ naked. The abdomen globose; the node of the peduncle has its superior margin rounded, with an acute spine at the lateral angles, and one in the centre. The *Worker* resembles the female, but has the sides of the thorax flat, the anterior spines longer, and has no ocelli, which are prominent in the female; the spines on the peduncular node are also longer. (Plate I. fig. 19.)

*Hab.* Bachian.

This species closely resembles *P. vigilans* from China, but differs in the form of the head and scale of the peduncle.

12. *POLYRHACHIS METELLA*. *P. niger* et vestitus pube pallide aurea; metathorax petiolique squamula bispinosis pedibus obscure ferrugineis.

*Worker*. Length 4 lines. Black, and thinly covered with a changeable golden pile; head nearly oblong-quadrate; the palpi elongate and



pale ferruginous; thorax flattened above, the margins acute and slightly elevated; the metathorax oblique and armed with two long acute spines, directed backwards; the femora ferruginous, the tibiæ and tarsi very obscurely so, not pubescent. Abdomen: ovate, the node of the peduncle with two acute spines, shorter than those on the metathorax; antennæ as long as the body. (Plate I. fig. 20-21.)

*Hab.* Dory.

Most of the species belonging to this genus are, when in fine condition, covered with glossy pile, but it is easily abraded. This is the case, I suspect, in the majority of specimens.

13. *POLYRHACHIS ATROPOS*. *P. niger*, capite thoraceque striatis; thorace spinis duabus acutis antice et duabus postice armato; abdominis squama bispinosa.

*Worker*. Length 2 lines. Black: the head longitudinally striated, very prominent in the middle before the eyes; the sides of the face depressed and flattened. The thorax flattened above, longitudinally striated, the lateral margins raised, the anterior angles short, stout and acute; the division between the pro- and mesothorax deeply impressed; the metathorax obliquely truncate, armed with two acute spines which are directed backwards. Abdomen: globose and thinly clothed with short pale glittering pile; the peduncle has the node armed with two curved spines directed horizontally backwards round the base of the abdomen. (Plate I. fig. 22.)

*Hab.* Dory.

14. *POLYRHACHIS ACASTA*. *P. niger*, pube cinereo-sericea vestitus; thorace antice posticeque abdominisque squama spinis duabus longis acutis armatis; pedibus ferrugineis, femoribus apicis tarsisque nigris.

*Worker*. Length  $3\frac{1}{4}$  lines. Black, and thinly clothed with silky cinereous pile. Thorax rounded above: the anterior spines are short, stout, and acute; those on the metathorax are twice as long, stout and slightly divergent; those on the peduncle are long, acute, and curved backward, corresponding to the form of the base of the abdomen; the tibiæ and femora ferruginous, the tips of the latter black. (Plate I. fig. 23.)

*Hab.* Bachian.

This insect, Mr. Wallace says, "constructs a coarse papery nest in a rolled leaf;" all the species of this genus, as far as I have ascertained, form small nests of some papyraceous material, affixing them to leaves: I have received such from Calcutta.

15. *POLYRHACHIS ALPHENUS*. *P. niger* pube cinereo-sericea vestitus; thorace spinis duabus minutis antice et postice armato; squama quadrata spinis duabus crassis acutis armata, flagello apice ferrugineo.

*Female*. Length 4 lines. Black, and thinly covered with cinereous pile. The mandibles, palpi, and six apical joints of the antennæ, ferruginous. Thorax subovate, with two minute spines in front and two rather

longer and stouter on the metathorax; the scale of the peduncle quadrate, armed above with two short spines; the abdomen globose. (Plate I. fig. 24.)

*Hab.* Bachian.

16. *POLYRHACHIS LABELLA*. *P. niger*; thorace spinis duabus acutis antice armato; abdominis squamula spinis duabus longis acutis armata; tibiis pallide ferrugineis.

*Worker*. Length 3 lines. Black: the head and thorax covered with fine silky cinereous pubescence; the thorax flattened above and longitudinally striated; the lateral margins raised and produced anteriorly into flat acute spines; the divisions between the pro-, meso-, and metathorax strongly impressed; the metathorax truncate behind; the tibiae, except their extreme base, ferruginous; the claws of the tarsi ferruginous. The abdomen smooth and shining; the node of the peduncle with two long, stout, erect, slightly curved spines, with an acute angle outside their base. (Plate I. fig. 25.)

*Hab.* Bachian.

17. *POLYRHACHIS FERVENS*. *P. capite abdomineque nigris*, thorace femoribusque obscure ferrugineis; thorace quadrispinoso; petioli squamula bispinosa.

*Worker*. Length 3 lines. Head and antennae black, the face thinly covered with short, glittering, pale pubescence; the thorax, peduncle, and femora obscure ferruginous, the tips of the latter black; the thorax flattened above, the margins acute and raised; the division between the pro- and mesothorax strongly impressed; the prothorax with two acute, stout, flattened spines; the metathorax has also two acute, bent spines, which are slightly divergent, their tips black; the spines on the node of the peduncle long, acute, and curved to the form of the base of the abdomen; the latter black, and covered with a thin silky changeable pile. (Plate I. fig. 26.)

*Hab.* Amboyna.

#### Gen. *ŒCOPHYLLA*, *Smith*.

*Head* small; *eyes* ovate, of moderate size, placed laterally about the middle of the head; *ocelli* three in a triangle in the males and females, obsolete in the workers; *antennae* geniculated, filiform, as long as the head and thorax in the males and females, as long as the body in the workers: 12-jointed in the females and workers, 13-jointed in the males: mandibles porrect, acute, and crossing at their apex, their inner margin denticulate; *labial palpi*, 4-jointed, very minute, the basal joint a little longer than the two following, the apical one much shorter; *maxillary palpi* 5-jointed, stout, short, and having joints of nearly equal length, except the apical, which is minute. Thorax ovate in the males and females, elongate and very slender in the workers, which sex has the legs elongate and very slender; *wings* ample, having

one marginal and one submarginal cell; the discoidal cells obsolete. *Abdomen* ovate, the node of the peduncle incrassate and subquadrate in the females, in the workers forming a longish petiole clavate at the apex; females and workers furnished with a sting. (Details, Pl. figs. 11, 12, 13.)

The characters here given will show the propriety of separating this insect from the genus *Formica*, in which it has been hitherto included; in a general catalogue on the *Formicidæ* I suggested the probability of this being found necessary. There are apparently two species belonging to the genus,—one *F. smaragdina* of Fabricius, the second *F. virescens* of the author; the differences between them are slight, but permanent; the first species inhabits India, most of the islands in the Archipelago, and thence southward into the Moluccas; the second apparently distinct species found in Australia and South Africa; these are the green Ants which build in trees. Their nest is formed by drawing together a number of green leaves, which they unite with a fine web. Some nests are a foot in diameter; they swarm, says Mr. Wallace, in billy forests in New Guinea; their sting is not very severe. This genus forms a link between the genera *Formica* and *Myrmica*; it agrees with the former in having a single node to the peduncle, and with the latter in having the ocelli obsolete in the workers, and in being furnished with a sting.

1. *Cecophylla smaragdina*, *Smith* (gen.).

*Formica smaragdina*, *Fabr. Syst. Prez.* p. 397.

*Hab.* Dory; Borneo; Aru; Celebes; Sumatra; Philippine Islands; India; Java.

Subfam. PONERIDÆ, *Smith*.

Gen. ODONTOMACHUS, *Latr.*

1. ODONTOMACHUS SÆVISSIMUS, *Smith*. *O. ferrugineus*, lævis nitidus; capite antice longitudinaliter striato; thorace oblongo transversim striato.

*Female.* Length 8 lines. Ferruginous: the head foveolate anteriorly and delicately striated longitudinally; the mandibles with two long stout, acute teeth at their apex, and with their inner margin serrated. Thorax elongate; the pro- and metathorax delicately striated transversely; legs elongate and slender. Abdomen ovate, very smooth and shining; of a rather deeper colour than the head and thorax. The *worker* differs in having the thorax transversely striated throughout its entire length, and narrowest in the middle; in the female it is widest. (Plate I. fig. 9.)

*Hab.* Bachian; Ceram.

This species was first captured by Madame Ida Pfeiffer at Ceram; the female is here first described.

2. ODONTOMACHUS ANIMOSUS. *O. ferrugineus*; margine internodi mandibulorum serrato; thorace transversim striato.

*Worker.* Length 5 lines. Ferruginous; the head very slightly narrowed posteriorly; the hinder portion of the sulcation of the head in front with divergent striæ opposite, and before the eyes it is smooth and shining; from the sulcation to the posterior margin of the head runs a deeply-impressed channel; the head is faintly striated obliquely behind the sulcation, there is also an oblique depression on each side; the mandibles with a row of short teeth on their inner margin, and terminating in two incurved long, stout, blunt teeth. Thorax very delicately and closely striated transversely. Abdomen smooth and shining; the node of the petiole with a long, acute, upright spine.

*Hab.* Dory.

3. *ODONTOMACHUS NIGRICEPS.* *O. ferrugineus*; capite nigro, supra longitudinaliter striato; lateribus lævibus nitidis, thorace transversim striato.

*Worker.* Length  $6\frac{1}{2}$  lines. Ferruginous; the head black, smooth and shining; the anterior portion longitudinally striated, the striation terminating at the oblique smooth ridges behind the eyes, which meet in the middle of the head, whence a deep longitudinal channel runs to the hinder margin; the antennæ and mandibles ferruginous, the latter denticulate on their inner margin, and terminating in two long incurved blunt teeth, which have a minute tooth in the middle of their fork. The prothorax smooth and shining, with a slight transverse striation on its neck in front; the meso- and metathorax finely striated transversely. The node of the peduncle unispinose, and, as well as the abdomen, smooth and shining. (Pl. I. fig. 9.)

*Hab.* Dory.

#### Gen. *PONERA*, Latr.

1. *PONERA læviceps*, Smith, *Proc. Linn. Soc.* ii. 69.

*Hab.* Bachian; Borneo.

2. *PONERA SOLITARIA.* *P. pallide testacea*; antennis elongatis; alis hyalinis; capite postice angustato; abdominis nodo conico.

*Male.* Length  $4\frac{3}{4}$  lines. Pale rufo-testaceous, smooth and shining; antennæ longer than the body; the legs elongate; the posterior tarsi longer than the tibiæ and femora; the wings hyaline, and brilliantly iridescent, the nervures ferruginous; the node of the peduncle conical; the abdomen constricted between the first and second segments.

*Hab.* Bachian.

3. *PONERA VAGANS.* *P. nigra*; capite, thorace, abdominisque basi striatis; antennis, capite antice, mandibulis pedibusque ferrugineis.

*Worker.* Length 4 lines. Black: the clypeus, mandibles, antennæ, and legs, ferruginous; the head finely striated longitudinally; eyes prominent and ovate. The prothorax with a rugose circular striation; the metathorax with an even oblique striation. The node of the peduncle has an even curved striation, and two acute spines behind; the basal segment of the abdomen with an irregular fine curved striation; the

apical margins of the third and fourth segments and the fifth entirely obscure ferruginous; the insect thinly covered with a silvery glittering pubescent pile, which is very bright on the femora and sides of the thorax.

*Hab.* Bachian.

4. *PONERA STRIATA*. *P. æneo-nigra*; capite, thorace, abdominisque basi profunde striatis; nodo spinis duabus acutis armato.

*Worker.* Length 6 lines. Black, with a bluish-green tinge; the head closely, deeply, and evenly, striated longitudinally; the mandibles shining black, their apex rufo-piceous, with their inner margins furnished with a row of short acute teeth. The prothorax with a circular striation, that on the metathorax being oblique; the tarsi and articulations of the legs rufo-piceous. The abdomen densely covered with a fine silky glittering white pubescence; the basal segment with an even curved transverse striation; the apical margins of the third and fourth segments, and the fifth entirely, ferruginous; the node of the peduncle with transverse grooved striæ, and armed behind with two acute spines; the insect has a scattered erect thin pale pubescence.

*Hab.* Bachian.

This species has a strong general resemblance to *P. geometrica* from Singapore, but is very distinct; in the latter species the grooving on the prothorax is transverse and straight; that on the metathorax is circular, and has its centre in the middle of its disk, and the head is much narrower behind the eyes, which is not the case in the present species.

5. *PONERA SIMILLIMA*. *P. nigra*; capite elongato aciculato; abdomine lævi nitido.

*Worker.* Length 3 lines. Black; head and thorax subopaque, the abdomen smooth and shining; the head oblong and longitudinally aciculate; the anterior margin of the clypeus, the mandibles, flagellum, tarsi, and articulations of the legs, rufo-testaceous. The thorax subrugose, with the oblique truncation of the metathorax transversely striated. The abdomen very smooth and shining with the apex obscurely rufo-piceous; the node of the peduncle quadrate.

*Hab.* Bachian.

This species very closely resembles *P. læviceps*, from Borneo.

6. *PONERA CUPREA*. *P. nigra*, cupreo variegata; capite, thorace, abdominisque basi profunde striatis, nodo spinis duabus acutis armato.

*Worker.* Length 5 lines. Black, with an obscure coppery tinge; the mandibles and legs obscurely ferruginous; the extreme apex of the flagellum pale rufo-testaceous. The head deeply striated, longitudinally, the clypeus and mandibles very finely so; the head narrowed behind the eyes. The thorax transversely striated, above the sides obliquely so; the legs slightly pubescent. Abdomen: the basal segment transversely striated, the striæ curved forwards; the node of

the peduncle incrassate, rounded anteriorly and truncate behind, with two acute upright spines; the striation curves round the node in front and is transverse behind; the apical margins of the second and following segments narrowly pale testaceous.

*Hab.* Dory.

This species resembles *P. geometrica*, but is very distinct. We are now acquainted with more than a dozen of these striated species of *Ponera*, all differing in the direction and depth of the striation, which is in each extremely beautiful.

7. *PONERA SIMILLIMA*. *P. fusco-brunnea*; capite postice fusco-nigro; oculis ovalibus, hirtulis; ocellis distinctis; alis hyalinis; abdomine elongato, apice pallide testaceo.

*Worker.* Length  $1\frac{1}{3}$  line. Darkish brown, some individuals reddish-brown; the head dark fuscous and semi-opaque above the insertion of the antennæ; the head anteriorly, the mandibles, antennæ, and legs ferruginous; the eyes ovate, placed in the middle at the sides of the head. Thorax oblong-ovate, the metathorax obliquely truncate. Abdomen: the scale of the peduncle incrassate, vertical; its superior margin slightly emarginate; a constriction between the first and second segments; the apex pale testaceous.

*Hab.* Dory.

This minute species very closely resembles the *P. contracta* of Europe; it differs principally in having the eyes situated in the middle of the sides of the head, in the European insect they are smaller and placed forward at the base of the mandibles; the form of the scale is different, and the body is finely pubescent; there is a species from Brazil, *P. ruficornis*, very like it.

#### Gen. AMBLYOPONE, *Ericks.*

1. *AMBLYOPONE CASTANEUS*. *A. ferrugineus*, nitidus punctatus; capite antice longitudinaliter striato; margine interno mandibularum confertim dentato.

*Worker.* Length  $4\frac{1}{2}$  lines. Ferruginous; head wider than the thorax, slightly rounded at the sides, and emarginate behind, finely and distinctly punctured above, anteriorly it is longitudinally striated; the anterior margin fuscous; the antennæ short and stout; the flagellum clavate; the mandibles with a row of short, stout, acute teeth on their inner margin; the head has a few scattered erect hairs. Thorax: the prothorax subglobose, strongly punctured in front; the mesothorax short and transverse; the metathorax oblong, parallel, and punctured; the apex transversely striated; the legs short, stout, and pubescent. Abdomen: the basal segment strongly punctured, the second and following segments delicately and very sparingly so; the first and second segments deeply constricted at their margins; the apex pointed and pubescent, the pubescence ferruginous. (Plate I. fig. 6.)

*Hab.* Bachian.

This insect, which I place in Erichson's genus *Amblyopone*, differs from the type in the antennæ being short and stout, with the flagellum club shaped; in *A. australis* they are rather slender, and the flagellum very slightly thickened at the apex; in every other particular they agree.

Gen. PSEUDOMYRMA, Guér.

1. PSEUDOMYRMA LÆVICEPS, Smith, *Proc. Linn. Soc.* iii. 145. ♂.  
*Hab.* Dory; Aru.

2. PSEUDOMYRMA MODESTA. *P. rufo-pallida*, lævis, nitida; abdomen nigro.

*Worker.* Length  $1\frac{1}{4}$  line. Pale rufo-testaceous; the head oblong; the eyes large and ovate; the flagellum clavate; the club three-jointed. Thorax oblong, narrowed posteriorly, with the metathorax compressed above; the legs short and stout. Abdomen black and ovate; the first node of the peduncle petiolated, the second pear-shaped, both of a pale rufo-testaceous colour.

*Hab.* Bachian.

3. PSEUDOMYRMA NITIDA. *P. nigra*, nitidiuscula; antennis, tibia tarsisque pallide testaceis.

*Worker.* Length  $1\frac{3}{4}$  line. Jet-black, smooth and shining; eyes very large, ovate, and about half the length of the head; the antennæ and mandibles pale testaceous; a faintly-impressed line extends from the insertion of the antennæ to the vertex. The thorax narrowed posteriorly, and deeply strangulated between the pro-, meso-, and metathorax; the tibiae and tarsi pale testaceous. Abdomen ovate: the first node of the peduncle petiolated, the second subglobose.

*Hab.* Bachian.

Gen. MESOXENA, Smith.

*Head* suborbiculate, a little wider than the thorax; eyes prominent, situated in the middle at the sides of the head; ocelli obsolete in the worker; antennæ geniculated, the scape one-third shorter than the flagellum; the flagellum 11-jointed, gradually increasing in thickness from the basal to the apical joint, the latter pointed at its apex; the maxillary palpi 6-jointed, the first joint minute, the rest elongate. Thorax oblong, the sides nearly parallel, the anterior and posterior margins slightly rounded; the divisions between the pro-, meso-, and metathorax not perceptible, or monomerous; legs of moderate length; the calcaria at the apex of the intermediate and posterior tibiae very short. Abdomen subovate; the basal segment very large, nearly concealing the following ones; the peduncle with a single node, the node incrassate, nearly as wide as the thorax, truncate anteriorly and rounded behind.

The characters laid down for this remarkable genus are drawn

from a worker or neuter insect. I have been unable to trace the labial palpi, and had only a single individual for examination. It will be seen that *Mesoxena* partakes of the characters of two very distinct families, the *Poneridæ* and the *Cryptoceridæ*; of the former, in the character, or form of the head, thorax, and peduncular node; and of the latter, in the enlargement of the basal segment of the abdomen.

1. *MESOXENA MISTURA*. *M. nigra*; antennis apice, femoribus basi, et tarsis pallide ferrugineis.

*Worker*. Length 2 lines. Black, subopaque, smooth and impunctate; the antennæ nearly as long as the thorax; the apical half of the flagellum rufo-testaceous; the eyes very prominent. Thorax oblong, the sides very slightly contracted in the middle, slightly rounded in front and behind; the tip of the coxæ, the trochanters, the extreme base of the femora and tarsi, rufo-testaceous. Abdomen subovate; the node of the peduncle subglobose, truncate in front, and rounded behind. (Plate I. fig. 10.)

*Hab.* Bachian.

## Fam. MYRMICIDÆ, *Smith*.

### Gen. MYRMICA, *Latr*.

1. *MYRMICA OBLONGA*. *M. rufo-fusca*; abdomine fuscescente, apice pallido; metathorace declivi, mutico.

*Worker*. Length  $1\frac{1}{2}$  line. Obscure ferruginous, with the antennæ, head anteriorly, mandibles, legs, and the apex of the abdomen, pale ferruginous. The head oblong and delicately striated; the eyes small and placed forward at the sides of the head. Thorax smooth and shining, with a few delicate scattered punctures anteriorly. Abdomen oblong-ovate, the apex pointed; thinly sprinkled with pale glittering hairs.

*Hab.* Bachian.

2. *MYRMICA PONEROIDES*. *M. fusco-nigra*, sparse pallide pilosula; mandibulis, antennis pedibusque ferrugineis; capite et thorace longitudinaliter striatim rugulosis.

*Female*. Length 2 lines. Dark fuscous, approaching blackness; the head and thorax subopaque, the nodes of the peduncle and the abdomen smooth and shining; the antennæ, clypeus, mandibles, and legs, ferruginous; the club of the flagellum three-jointed. The head and thorax covered with an irregular longitudinal rugose striation; a smooth shining line runs from the anterior stemma to the base of the clypeus, and a similar line divides the thorax down the middle. Abdomen oblong-ovate, the apex with glittering pale pubescence.

*Hab.* Bachian.

This species has the general appearance of a *Ponera*, and, were it not



that it has two nodes in the peduncle, would be mistaken for a species of that genus. I strongly suspect this to be the female of *M. oblonga*; they have a close specific resemblance.

3. *MYRMICA PUNCTATA*. *M.* rufo-ferruginea; capite thoraceque profunde punctatis; antennis pedibusque pallide ferrugineis.

*Worker*. Length  $1\frac{1}{4}$  line. Reddish-brown, with the antennæ and legs pale rufo-testaceous; the antennæ nearly as long as the body; the head and thorax covered with large deep punctures; the metathorax with two slender acute spines; the abdomen globose, and very smooth and shining.

*Hab.* Bachian.

4. *MYRMICA MODESTA*. *M.* rufo-pallida; capite, thorace, et petiolo longitudinaliter punctato-striatis; metathorace spinis duabus acutis; abdomine fusciscente, basi pallido.

*Worker*. Length 2 lines. Pale rufous; the head, thorax, and nodes of the petiole, coarsely striated longitudinally, the striæ with regular, large shallow punctures; the mandibles, antennæ, and legs, rather paler than the thorax and head; the metathorax with two short acute spines. Abdomen ovate and fuscous, with the extreme base pale; slightly pubescent, and very smooth and shining.

*Hab.* Bachian.

5. *MYRMICA LÆVISSIMA*. *M.* pallide flavescens, lævis, nitida; antennarum clava flagelli biarticulata; metathorace mutico; abdomine nitido, apice fusciscente.

*Worker*. Length  $1\frac{3}{4}$  line. Pale yellow, very smooth and shining; thinly sprinkled with erect pale hairs; the first node of the peduncle distinctly petiolated. Abdomen pale ferruginous, with the apical half fuscous.

*Hab.* Bachian.

Found in houses.

6. *MYRMICA POLITA*. *M.* obscure ferruginea, lævis, tota nitidissima, nuda; mandibulis, flagellis, pedibusque pallide ferrugineis.

*Worker*. Length  $1\frac{1}{2}$  line. Obscurely ferruginous, entirely smooth, shining, and impunctate; the mandibles, flagellum, and legs rufo-testaceous; the scape of the antennæ fusco-ferruginous. The metathorax armed with two acute spines. Abdomen ovate, truncate at the base; the first node of the peduncle petiolated; both the nodes and the apex of the abdomen pale rufo-testaceous.

*Hab.* Bachian.

7. *MYRMICA CÆCA*. *M.* pallide flavescens, lævis, nitida, clava flagelli triarticulata; metathorace declivi, mutico.

*Worker*. Length  $1\frac{3}{4}$  line. Pale yellow, entirely smooth and shining; the mandibles ferruginous; the antennæ a little longer than the head;

the eyes and ocelli obsolete; the thorax strangulated in the middle; the nodes of the peduncle transverse, rounded above; abdomen subovate, pointed at the apex.

*Hab.* Dory.

This small species, probably, is not a true *Myrmica*. I endeavoured to extract the palpi, but did not succeed; I must therefore retain it in the genus *Myrmica* until other specimens can be obtained for examination.

### Gen. CREMATOGASTER, *Lund.*

1. CREMATOGASTER LABORIOSUS. *C.* pallide ferrugineus, lævis et nitidus; alis hyalinis iridescentibus; abdominis segmentorum marginibus fuscis.

*Female.* Length  $3\frac{1}{2}$  lines. Pale ferruginous, smooth and shining; thorax oblong-ovate; the wings hyaline and iridescent, the nervures colourless. Abdomen oblong-ovate, with the apical margins of the segments fuscous; the nodes of the peduncle compressed and subovate.

*Hab.* Bachian.

2. CREMATOGASTER BICOLOR. *C.* pallide flavescens, lævis, nitidus; abdomine nigro.

*Worker.* Length  $1\frac{1}{4}$  line. Honey-yellow; the abdomen black, the nodes of the peduncle yellow; very smooth and shining, the eyes black; the thorax flattened above; the metathorax with two acute spines. The abdomen heart-shaped, the peduncle attached to the basal segment above.

*Hab.* Bachian.

3. CREMATOGASTER OBSCURUS. *C.* pallide testaceus, lævis et nitidus; abdomine fusco.

*Worker.* Length  $1\frac{1}{4}$  line. Pale testaceous, smooth and shining; the eyes black; the abdomen fuscous, slightly testaceous at the base; the thorax flattened above; the metathorax oblique, the lateral angles of the verge of the truncation subdentate. The abdomen heart-shaped, the apex pointed and recurved upwards.

*Hab.* Bachian.

4. CREMATOGASTER IRRITABILIS. *C.* castaneo-rufus, lævis nitidusque; abdomine nigerrimo, nitido; spinis metathoracis longis acutis.

*Worker.* Length 2 lines. Head, thorax, and legs chestnut-red; the metathorax, in some specimens blackish, very smooth and shining, with two stout, acute spines. Abdomen black, heart-shaped, pointed, recurved upwards at the apex; the first node of the peduncle petiolated, rather widest at the base and grooved in the middle, the second node subglobose.

*Hab.* Dory.

Gen. HEPTACONDYLUS, *Smith.*

1. HEPTACONDYLUS RUGOSUS. *H.* obscure fusco-ferrugineus; capite thoraceque longitudinaliter striatim rugulosus.

*Worker.* Length  $2\frac{1}{4}$  lines. Dark fusco-ferruginous; the mandibles, flagellum, and apical joints of the tarsi paler. The head and thorax longitudinally striated, the former much more finely so than the latter; the flagellum six-jointed. The metathorax armed with two long aciculate spines; the legs pubescent. Abdomen ovate, smooth and shining, truncate at the base; the first node of the peduncle petiolated; the other nodes ovate and striated.

*Hab.* Bachian.

This species closely resembles *H. carinatus*, but the latter has the antennae thicker and more pubescent, the head is smooth and shining, with a few irregular longitudinal carinae; in the present species the head is closely striated.

Gen. PODOMYRMA, *Smith.*

1. Podomyrma basalis, *Smith, Proc. Linn. Soc.* iii. 147.

*Hab.* Amboyna; Aru; Dory.

2. PODOMYRMA NITIDA. *P.* obscure ferruginea, thorace abdomineque laevissimis lucidisque; capite longitudinaliter striato; femoribus medio incrassatis, basi tenuibus.

*Worker.* Length  $2\frac{1}{2}$  lines. Obscurely ferruginous; the antennae, mandibles, legs, and nodes of the peduncle clear ferruginous; the head longitudinally and delicately striated; the femora compressed and broadly dilated in the middle, very much attenuated at their bases; the metathorax obliquely truncate, its sides longitudinally striated. Abdomen oblong-ovate, attenuated at the base and tapering to a point at the apex; the petiole elongate, the nodes oblong.

*Hab.* Dory.

3. PODOMYRMA SILVICOLA. *P.* ferruginea; capite thoraceque longitudinaliter striatim rugulosus; femoribus valde incrassatis, basi tenuissimis; abdomine nitido.

*Worker.* Length 4 lines. Rufo-ferruginous; the head and thorax with longitudinal grooves or striae, those at the sides of the head punctured; the antennae, mandibles, articulations of the legs and the tarsi pale ferruginous; the anterior margin of the thorax rounded, with the lateral angles produced into short spines; the femora incrassated in the middle, very much attenuated at the base. Abdomen with a beautiful silky gloss, caused by an extremely delicate aciculation visible under a high magnifying power; the apical segments smooth and shining; the first node of the peduncle distinctly petiolated, with a small acute tooth above, the second node globose. (Plate I. fig. 3.)

*Hab.* Bachian.

Found by Mr. Wallace running on trunks of trees in a dry forest.

4. *PODOMYRMA SIMILLIMA*. *P. fusco-ferruginea*; abdominis basi pallide testacea; femoribus medio valde incrassatis, basi tenuissimis.

*Worker*. Length  $3\frac{1}{2}$  lines. Ferruginous; the head and thorax with coarse longitudinal grooves or striæ, those at the sides of the head punctured; the scape in front, the anterior tibiæ in front, and the intermediate and posterior tibiæ at their base in front pale ferruginous; the articulations of the legs and the apical joints of the tarsi bright ferruginous. The lateral margins of the thorax above raised; the anterior margin rounded, with the angles produced into short acute spines. Abdomen shining, the basal half pale testaceous, and very delicately longitudinally aciculate; the first node of the peduncle oblong, with a minute tooth at its base above, the second subovate.

*Hab.* Bachian.

This species very closely resembles *P. basalis* from Aru; it differs only in being larger, in having the legs dark, and the abdomen of a much more oblong form: it is probably a mere climatal variety.

### Gen. PHEIDOLE, *Westw.*

1. *PHEIDOLE NOTABILIS*. *P. rufo-ferruginea*; capite maximo, in medio sulcato et punctato; metathorace spinis duabus acutis armato.

*Worker major*. Length 2 lines. Dark ferruginous; the head at least six times the size of the abdomen, subquadrate, with the angles rounded, strongly but not closely punctured, divided in the middle by a deeply-impressed longitudinal line; the mandibles very stout, curved, and edentate. The thorax hidden beneath the head; the metathorax with two acute long spines. Abdomen ovate, of a darker colour than the head.

*Worker minor*. Of the same colour as the worker major; the head of the ordinary size, and covered, as well as the thorax, with large semi-confluent punctures. The thorax armed with two long straight spines in front, and two curved ones on the metathorax. Abdomen rather narrower than the head, and very smooth and shining.

*Hab.* Bachian.

This is a most remarkable species: several are known to have workers with largely developed heads, but this surpasses every species, in that particular, with which I am acquainted; neither the large nor small workers have toothed mandibles; we have given a figure of each kind of worker. (Plate I. figs. 3, 4.)

2. *PHEIDOLE RUBRA*. *P. rufo-ferruginea*; capite maximo, longitudinaliter aciculato; antennis pedibusque pallide testaceis.

*Worker major*. Length 2 lines. Rufo-ferruginous, with the legs and antennæ pale testaceous; the head wider than the abdomen, longitudinally aciculate, the vertex transversely so; the eyes small and placed forward at the sides; the mandibles stout, with acute teeth on their inner margin; the club of the antennæ three-jointed. Thorax

short, narrowed behind, and deeply constricted in the middle. Abdomen much wider than the thorax.

*Worker minor.* Scarcely 1 line in length; of the same colour as the larger worker, entirely smooth and shining; the head much smaller in proportion than in the large worker, but still wider than the abdomen.

*Hab.* Bachian.

This species was found under rotten bark.

3. *PHEIDOLE PLAGIARIA.* *P. ferruginea*; capite maximo, in medio sulcato; abdomine apice fusco.

*Worker major.* Length 2 lines. Ferruginous, with the apical joints of the flagellum and the tarsi pale testaceous. Head very large, at least four times the size of the abdomen, longitudinally striated and deeply notched behind; the clypeus and mandibles smooth and shining. Thorax narrowest behind; the prothorax produced at the sides and subdentate; the femora incrassate in the middle, much narrowed at their base and apex; the metathorax armed with two short, acute spines. Abdomen fusco-ferruginous; with the extreme base pale.

*Worker minor.* One line in length, of the same colour as the large worker, but entirely smooth and shining; the antennæ and legs much more slender and elongate; the head much smaller in proportion; the eyes larger, and placed in the middle of the sides.

*Hab.* Bachian.

Found on a dead tree, pulling White Ants out of their holes, and carrying them away alive.

4. *PHEIDOLE PABULATOR.* *P. rufo-brunnea*; capite maximo, lævi et nitido; metathoracis spinis minutissimis; abdomine apice fusco.

*Worker major.* Length 3 lines. Reddish brown; the head very large, smooth, and shining, emarginate behind, with an impressed line in the centre running to the base of the clypeus; the face anteriorly and the mandibles pale ferruginous; the hinder portion of the head transversely striated, the anterior portion longitudinally so; the legs and antennæ paler than the body. The thorax narrowed behind, with two short, acute spines on the metathorax. Abdomen globose, in some specimens nearly black, smooth, and shining.

*Worker minor.* Length 1-1½ line. Of the same colour as the *worker major*, but entirely smooth and shining; the head a little wider than the abdomen; the flagellum and legs pale ferruginous, and more elongate than in the large worker.

*Hab.* Bachian.

Taken crossing a pathway in the forest, the giant specimens surrounded by small ones, and often dragged along by them: the small ones sting.

5. *PHEIDOLE MEGACEPHALA.* *P. obscure ferruginea*; capite maximo in medio sulcato; metathorace bispinoso, abdomine ovato.

*Worker.* Length 6½ lines. Dark ferruginous; head very large, sub-

quadrate, with the posterior angles rounded, deeply emarginate behind: a longitudinal channel runs from the emargination to the base of the clypeus, and in it, exactly opposite the eyes, is a single ocellus; the head longitudinally striated anteriorly, not extending beyond the ocellus; the hinder portion of the vertex is transversely striated, in front of which the head is delicately aciculate; mandibles very stout, black at their margins, and armed with two stout teeth at their apex. Thorax transversely irregularly striated and rugose; the scutellum prominent; the metathorax with two acute spines. Abdomen ovate; the apical half of the segments dark fusco-ferruginous.

*Hab.* Bachian.

Workers 4 lines long, apparently of this species, differ from the larger ones in wanting the ocellus.

### Gen. SOLENOPSIS, *Westw.*

1. *Solenopsis cephalotes*, *Smith, Proc. Linn. Soc.* iii. 149 (workers, major and minor).

All the sexes of this species were taken by Mr. Wallace from an underground nest. The large workers have the head enormously developed, and subquadrate; their mandibles short, very stout, and curved, and their inner edge is perfectly smooth, without teeth; the small workers have the head much smaller in proportion, being only a little wider than the abdomen; their mandibles have a row of acute teeth. The female is of a pale ferruginous colour, with the head of the ordinary size, the mandibles toothed, the wings colourless. Thorax oblong-ovate; the abdomen oblong-ovate, with the apical half fuscous. The club of the flagellum in this genus is composed of two joints; the flagellum of the male tapering to a point.

*Hab.* Bachian.

This species, Mr. Wallace remarks, has a fiery sting.

### Subfam. CRYPTO CERIDÆ, *Smith.*

#### Gen. ECHINOPLA, *Smith.*

1. *ECHINOPLA PRÆTEXTA*. *E. nigra*; capite, thorace, et abdomine punctatis; thorace oblongo, subquadrato; pedunculo transverso; mandibulis, antennis, pedibusque ferrugineis.

*Worker.* Length  $2\frac{1}{2}$  lines. Black; the head and abdomen shining, not so strongly punctured as the thorax, which is subopaque, and has a short, pale downy pubescence; the head is also slightly pubescent on the vertex. The legs, antennæ, and mandibles ferruginous, the latter stout, and armed on their inner edge with acute teeth; the antennæ longer than the thorax; the scape two-thirds of the length of the flagellum, which is very slightly thickened towards the apex, the tip acute. The thorax oblong-quadrate, and as wide as the head; the divisions between the pro-, meso-, and metathorax not discernible

above; the anterior angles acute, the posterior ones rounded. Abdomen ovate; the scale of the peduncle transverse, each extremity armed with four short teeth.

*Hab.* — ?

I place this very curious Ant in the genus *Echinopla* with some hesitation; it possesses, however, all the external characters of that genus, the form of the antennæ, mandibles, abdomen, and the scale of its peduncle resembling those of *Echinopla*. I have given a figure of this very interesting addition to the Cryptoceridæ. (Plate I. fig. 5.)

#### Gen. CATAULACUS, *Smith*.

1. CATAULACUS SETOSUS. *C. niger*; capite postice recto marginibus crenulatis; thorace aspere sculpto, spinis duabus acutis postice armato; abdomine ovato, basi emarginato.

*Worker.* Length 2 lines. Black; the head, thorax, and nodes of the peduncle rugose, the latter very coarsely so; the head with irregular longitudinal coarse striæ; the anterior margin of the clypeus widely but slightly emarginate, the lateral angles acute; the scape of the antennæ and tip of the flagellum rufo-testaceous. Thorax: the sides slightly narrowed to the base of the metathorax, and with a number of short acute denticulations; the two spines which arm the metathorax are stout, acute, and curved slightly inwards. Abdomen delicately shagreened, opaque, and sprinkled with short, erect, white setæ. The anterior tibiæ and tarsi, the intermediate tarsi, and apical joints of the posterior pair, rufo-testaceous; the femora rugose, and with a number of erect, short, rigid setæ. (Plate I. fig. 7.)

*Hab.* Bachian.

#### Gen. THYNNUS, *Fabr.*

1. THYNNUS ERRATICUS. *T. niger*, orbitis oculorum mandibulisque flavis; pedibus ferrugineis; alis fusco-hyalinis.

*Male.* Length 10 lines. Black; the head and thorax closely punctured; the scutellum and abdomen shining, and much more finely and distantly punctured; a line on the inner orbit of the eyes, a spot in the middle of the clypeus, and a V-shaped mark above it, yellow; the labrum and mandibles reddish-yellow; the clypeus truncate in front. Thorax: a widely interrupted yellow line on the collar; the mesothorax with four deeply-impressed longitudinal lines; the wings fusco-hyaline, darkest at their anterior margin and along the course of the nervures; the tibiæ, femora, and base of the anterior tarsi ferruginous. Abdomen conical, shining, and finely punctured.

*Hab.* Bachian.

#### Fam. MUTILLIDÆ, *Leach*.

1. *Mutilla suspiciosa*, *Smith*, *Linn. Proc. Soc.* ii. 84 ♂.

*Hab.* Borneo; Makassar; Amboyna; Bachian.

2. *MUTILLA MEROPS*. *M.* capite abdomineque nigris; thorace rubro; abdominis segmento tertio fascia argenteo-pubescente ornato; maris alis cæruleo violaceoque splendide micantibus.

*Female*. Length  $6\frac{1}{2}$  lines. Black; the head rugose. Thorax oblong-quadrate, coarsely rugose; legs black, spinose, and thinly covered with pale glittering hairs, the tarsi most densely so. Abdomen intense velvety-black; the third segment covered above with short silvery-white hairs; the sides of the apical segment with a mixture of white and pale brownish hairs.

The *male* closely resembles the female, but has the eyes more deeply notched, the thorax shorter, and the wings dark fuscous with a violet lustre.

*Hab.* Bachian.

3. *MUTILLA LANTHEA*. *Fæmina*.<sup>1</sup> *M.* nigra; thorace rufo; abdominis segmentis argenteo pubescentibus, secundo maculis duabus albis signato, tertio fasciato.

*Mas*. Thorace supra et abdomine rubris; alis fuscis, basi hyalinis.

*Female*. Length 4 lines. Black; the thorax blood-red, oblong-quadrate, closely and strongly punctured; the metathorax obliquely truncate; the mandibles ferruginous in the middle; the cheeks, legs, and sides with a glittering silvery-white pubescence. Abdomen covered with short black pubescence, the second segment with two minute snow-white spots, and the third with a basal band of the same colour.

*Male*. Length  $7\frac{1}{4}$  lines. Black; the thorax above and the abdomen ferruginous; the wings brown, with their base hyaline; the three apical segments of the abdomen and the metathorax black.

*Hab.* Bachian.

4. *MUTILLA ANTHYLLA*. *M.* nigra, pubescens; alis fuscis; abdomine ferrugineo, apice nigro.

*Male*. Length 6 lines. Head, thorax, and legs black, coarsely punctured; the metathorax covered with large shallow punctures, with a groove in the centre of its base; the face covered with long cinereous pubescence; the tips of the mandibles ferruginous. The thorax and legs with a scattered cinereous pubescence; wings dark fuscous; the base of the posterior pair pale. Abdomen ferruginous and shining, with the apical margin of the fifth segment, and the sixth and seventh entirely, black.

*Hab.* Bachian.

5. *MUTILLA ZEBINA*. *M.* capite abdomineque nigris; thorace sanguineo-rubro; abdominis segmenti secundi baseos maculis tribus ovatis fasciæque segmenti tertii albo pubescentibus.

*Female*. Length  $3\frac{1}{2}$  lines. Black; thorax and legs blood-red; the coxæ also red; the base of the mandibles and the tubercles at the insertion of the antennæ red. The head and thorax coarsely punctured, the latter oblong-quadrate; the antennæ, cheeks, and legs with



head quadrate, with the angles rounded; the antennæ black; the wings very dark brown, shining and iridescent; the posterior tibiæ outside and the tarsi black; the basal segment of the abdomen with an abbreviated impressed line in the middle, and another on each side extending to its apical margin; the ovipositor twice the length of the insect.

*Hab.* Bachian.

Gen. AGATHIS, *Latr.*

1. AGATHIS ATROCEPHALUS. *A. rufescenti-flavus*; capite antennisque nigris; alis nigro-fuscis, basi flavo-hyalinis.

*Male.* Length 6 lines. Reddish-yellow; the head and antennæ black; the head strongly punctured; a deep fossulet on each side of the clypeus; the mandibles and palpi pale. Thorax shining above; the metathorax with fine longitudinal carinæ, the central one expanding in the middle, and enclosing a minute diamond-shaped space; between the striæ are a number of transverse carinæ; the legs densely clothed with short pale pubescence, the posterior pair incrassate; the wings dark fuscous, with not quite the basal half flavo-hyaline. Abdomen smooth and shining.

*Hab.* Bachian.

Gen. XYLONOMUS, *Grav.*

1. XYLONOMUS FRACTICORNIS. *X. nigro-chalybeus*; capite albo notato; thorace supra maculis tribus albidis, metathorace dorso quadricarinato; abdominis segmento basali pallido, secundo apice binotato, sequentibus apice pallido fasciatis; pedibus ochraceis; tarsis postice pallidis.

*Female.* Length  $7\frac{1}{2}$  lines. Steel-blue, inclining to deep purple on the abdomen; the head, below the insertion of the antennæ, a semicircular spot above, on each side of the face, touching the inner orbit of the eyes, and a broad stripe behind them, white; the eleven basal joints of the antennæ black, the third and fourth with a white line at the outside; the four following joints white, the rest of the apical joints black; the apex of the eighteenth joint with two blunt spines at the apex outside; the apex hollowed out obliquely for the reception of the nineteenth joint, which is attenuated at its base and geniculated; this and the following joints forming, as it were, a second antenna. Thorax: the scutellum, postscutellum, tegulæ, and a spot beneath the wings, white; wings hyaline and iridescent; the legs pale ferruginous; the posterior tibiæ dusky, and the tarsi white; the claw-joint of all the tarsi black. Abdomen: the basal segment, or petiole, pale testaceous, with a blunt spine on each side of its insertion; the second segment with two white spots at its apex; the third and penultimate segment with an emarginate apical white marginal

fascia; the other segments with interrupted fasciæ; the ovipositor as long as the body.

*Hab.* Bachian.

This is the most remarkable species of *Ichneumon* with which I am acquainted: the extraordinary geniculation of the antennæ near its apex is the only instance of the kind that I have seen. By some, this might be regarded as being of generic value. The difference of form in antennæ in the same genus has, however, several parallels; I may instance the genus *Prosopis* amongst the *Apidæ*. In the form of the head, the tarsi, wings, and general contour of the body, this is a true *Xylonomus*.

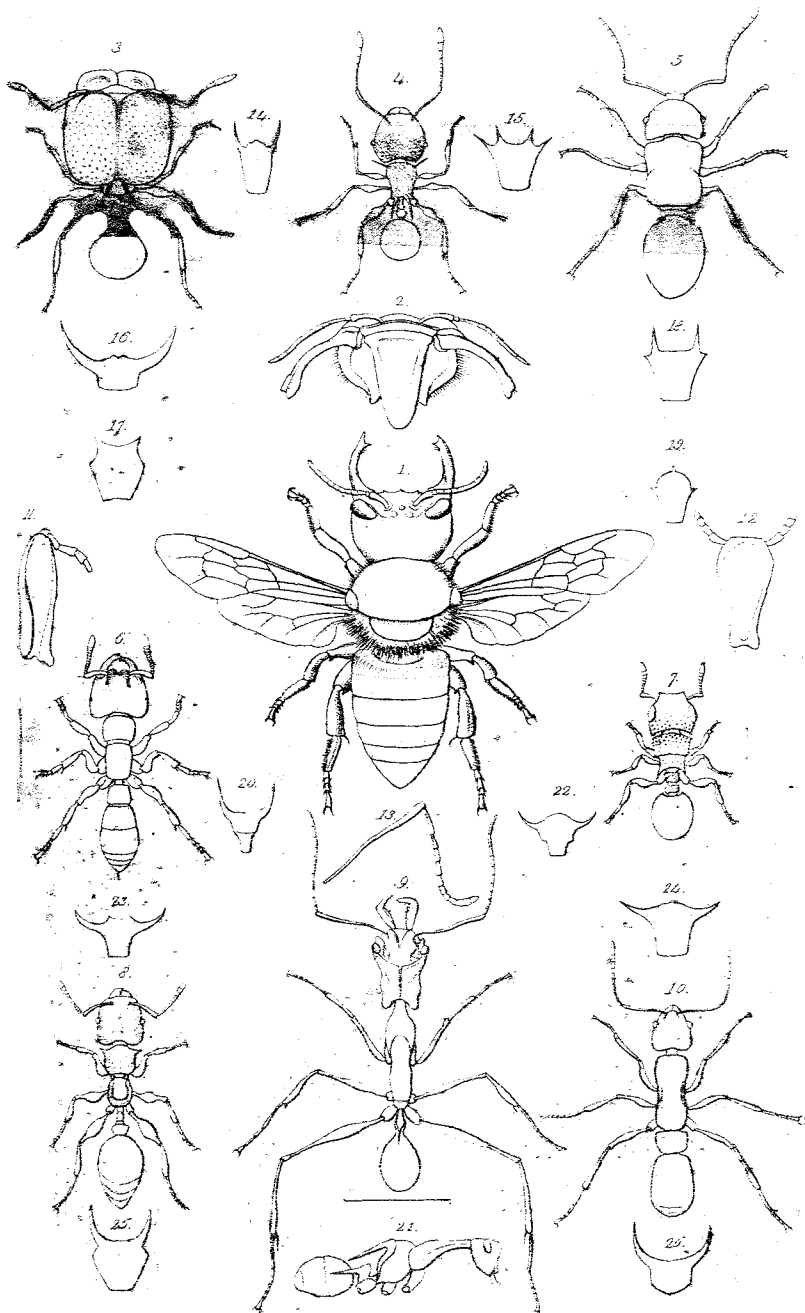
### EXPLANATION OF PLATE I.

*Fig. 1. Megachile Pluto.*

2. Front view of the head of ditto, with mandibles opened to show the labrum.
3. *Pheidole notabilis*, worker major.
4. Ditto, worker minor.
5. *Echinopla prætexta*.
6. *Amblyopone castanea*.
7. *Cataulacus setosus*.
8. *Podomyrma silvicola*.
9. *Odontomachus sævissimus*.
10. *Mesoxena mistura*.
11. Maxilla and maxillary palpi of *Æcophylla smaragdina*.
12. Labium and labial palpi of ditto.
13. Antenna of ditto.
14. Scale of the petiole of *Polyrhachis Charaxis*.
15. Ditto of *P. Busiris*.
16. Ditto of *P. Acantha*.
17. Ditto of *P. Merops*.
18. Ditto of *P. Ithonus*.
19. Ditto of *P. Eudora*.
20. Ditto of *P. Metella*.
21. Side view of *P. Metella*.
22. Scale of the petiole of *P. Atropos*.
23. Ditto of *P. Acasta*.
24. Ditto of *P. Alphenus*.
25. Ditto of *P. Sabella*.
26. Ditto of *P. fervens*.

All the figures are considerably magnified representations of the insects, except that of *Megachile Pluto*, which is of the natural size.

- Fam. MUSCIDÆ, *Latr.*  
 Gen. ECHINOMYIA, *Dum.*  
 63. monticola.  
 Gen. EURYGASTER, *Macq.*  
 64. setosa.  
 65. strigosa.  
 Gen. SENOMETOPIA, *Macq.*  
 66. sphingum.  
 Gen. MASICERA, *Macq.*  
 67. aurifrons.  
 Gen. ZAMBESA, *Walk.*  
 68. Walkeri.  
 Gen. CLYTIA, *Desv.*  
 69. modesta.  
 70. nigroanalis.  
 Gen. LYDELLA, *Macq.*  
 71. unguiculata.  
 Gen. GONIA, *Meig.*  
 72. exigua.  
 Gen. SPIROGLOSSA, *Dol.*  
 73. ipus.  
 Gen. PROSENA, *St. Farg.*  
 74. moluccana.  
 Gen. RUTILIA, *Desv.*  
 75. nigrocostalis.  
 Gen. OMALOGASTER, *Macq.*  
 76. rufescens.  
 Gen. SARCOPHAGA, *Meig.*  
 77. { aurifrons  
       { aurata? *Walk.*  
 78. aliena, *Walk.*  
 79. frontalis.  
 Gen. LUCILIA, *Desv.*  
 80. nosocomiorum.  
 81. azurea.  
 Gen. POLLENIA, *Desv.*  
 82. flavicans.
- Gen. ARICIA, *Macq.*  
 83. quadripunctata.  
 84. graminicola.  
 Gen. SPILOGASTER, *Desv.*  
 85. pusilla.  
 Gen. HYDROTÆA, *Desv.*  
 86. bicolor.  
 Gen. PACHYCEPHALA, *Dol.*  
 87. Mohnikei.  
 88. albifacies.  
 Gen. TETANOCERA, *Dum.*  
 89. tripunctata.  
 Gen. SAPROMYZA, *Fall.*  
 90. punctigera.  
 Gen. ORTALIS, *Fall.*  
 91. regularis.  
 92. flaviscutellata.  
 93. trifasciata.  
 Gen. BACTROCERA, *Guér.*  
 STRUMETA, *Walk.*  
 94. conformis.  
 95. maculigera.  
 96. vespoides.  
 Gen. THEMARA, *Walk.*  
 97. ampla, *Walk.*  
 98. alboguttata.  
 99. nigropunctulata.  
 Gen. HERINA, *Desv.*  
 100. chalybea.  
 101. limpipedipinnis.  
 102. grandis.  
 103. nigrocostata.  
 Gen. DIOPSIS, *Linn.*  
 104. graminicola.  
 Gen. NERIUS, *Fabr.*  
 105. annulipes.  
 Gen. DEOSOPHILA, *Fall.*  
 106. ananassæ.



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The Binder is requested to observe that the extra Number of the *Journal*, published in July last, and which was described by mistake on the cover as "supplemental to Vol. 4," should be bound up with Vol. 5, between the *Zoological* portions of Numbers 17 and 18, with which it will be found to be continuously paged.