

No. 3.— *The Ants of Borneo.*

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CONTRIBUTIONS FROM THE ENTOMOLOGICAL LABORATORY OF THE
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DURING the past decade several collections of Bornean ants have been sent me for study and identification. Mr. John Hewitt sent an interesting lot of specimens accumulated during his residence in Kuching and Prof. Harrison W. Smith, of the Massachusetts Institute of Technology, made a collection in the same locality for the Museum of Comparative Zoölogy. He also contributed a number of specimens collected in British North Borneo by Mr. E. B. Kershaw, a clever young naturalist who lost his life in that country in a forest fire. Prof. Roland Thaxter of Harvard University gave me a number of small species from Sarawak, and Mr. Horace Donisthorpe kindly sent several that had been taken by Mr. G. E. Bryant on Mt. Matang, near Kuching. Recently a few additional specimens were received from Mr. William Beebe, of the New York Zoölogical Park.

While working up this material I found it necessary to prepare a complete list of the known Bornean Formicidæ with their more important synonymy and distribution. During recent years less attention has been bestowed on the ants of Borneo than on those of Java, Sumatra, the Malay Peninsula, Burmah, and India. The Bornean fauna has, however, considerable historical interest to the taxonomist, because it has been studied by all the leading myrmecologists, Smith, Mayr, Ernest André, Emery, and Forel, and because the researches of several of these investigators were based on material secured by such well-known collectors and explorers as Alfred Russel Wallace, Doria, Beccari, Bedot, Pictet, and Chaper. Thus Borneo has come to be the type-locality for many interesting species later found to have a wide distribution in Indonesia. The material sent me by Hewitt and Harrison W. Smith is valuable because it was taken in the very localities in which Wallace collected. Professor Smith has given me the following notes in regard to some of these:

"*Serambu* is the little mountain a few miles up country from Kuching, on the Sarawak River, where the first Rajah had his bunga-

low and where Wallace made the celebrated collection of moths to which he refers in "The Malayan Archipelago."

"*Rambungan River* is a small stream entering the sea about ten miles south of the Sarawak River. The specimens were taken about twelve miles from the coast.

"*Sadong* is the town on the Sadong River where the first coal mine was started.

"*Matang Mountain* is the beautiful mountain which one sees from Kuching."

The total number of species of which I have been able to make a record from Borneo is 256. I may have overlooked a few, owing to the widely scattered publication of the original descriptions and citations of localities. On the whole, the fauna has many forms in common with Sumatra, Java, and the Malay Peninsula, and additional exploration will no doubt greatly increase the number of such species. Quite a number of forms, however, seem to be peculiarly Bornean. The total number of genera is 59, distributed among the five subfamilies as follows: Ponerinae 18, Dorylinae 2, Myrmicinae 23, Dolichoderinae 4, Camponotinae 12. The following pages add some 58 species (indicated by an asterisk) to the known fauna, including 23 new to science.

The series of Bornean ant genera comprises several of ancient aspect, *e.g.*, Cerapachys, Phyracaces, Metapone, Acanthomyrmex, Calypatomyrmex, Rhopalothrix, Cataulacus, Myrmoteras, Aphomomyrmex, Oecophylla, Gesomyrmex, Dimorphomyrmex, and Echinopla. Some of these seem to be confined to the mountains of Borneo and to be represented also in the mountains of Burmah and the Philippines. One species, *Gesomyrmex chaperi*, is unusually interesting, as it is peculiar to Borneo. The genus was first described by Mayr in 1868 from the Baltic Amber, and many years elapsed before the living Bornean species was discovered by Ernest André (1892). In the same paper André described a species of *Dimorphomyrmex* from Borneo and three years later Emery recorded a fossil species from the Baltic Amber. Recently I described a second living species from the mountains of Luzon. It is probable, therefore, that careful exploration of the mountains of Borneo and the neighboring islands will bring to light other interesting relicts of the once very widely distributed Eocene ant-fauna.

Some of the Bornean ant-genera are very rich in species, *e.g.*, *Crematogaster*, which is remarkable also in comprising more numerous forms with 10-jointed antennae (subgen. *Decacrema*) and swollen

epinotum (subgen. Physocrema) than occur in other regions. Leptogenys is represented by several large and handsome species of the subgenus Lobopelta, and Cataulacus, Dolichoderus (subgen. Hypoclinea), Polyrhachis, and Echinopla are also rich in species. All but three of the subgenera of Polyrhachis (Hagiomyrma, Hedomyrma, and Myrmatopa) are known to occur in the island. Of Camponotus the subgenera Myrmotarsus and Colobopsis are represented by numerous species, while most of the other subgenera are rather poorly represented, though often by peculiar forms (Myrmoturba, Myrmosphincta). Compared with the Philippines and the adjacent mainland, and especially with Papua and Australia, Borneo seems to possess few species of Pheidole and Monomorium, and many primitive ponerine genera have not been recorded from the island, *e.g.* Mystrium, Stigmatomma, Trapeziopelta, Prodiscothyrea, Cryptopone, and Centromyrmex. I believe, however, that some or all of these will be found in Borneo. Only recently I received species of Mystrium, Stigmatomma, Trapeziopelta, and Centromyrmex from the Philippines, where they were previously unknown. Of course, Borneo has been invaded by the usual tropicopolitan tramp species, *Monomorium pharaonis* and *floricola*, *Tetramorium guineense* and *simillimum*, *Pheidole megacephala*, *Triglyphothrix striatidens*, *Plagiolepis longipes*, and *Prenolepis longicornis*, and *obscura*.

FORMICIDAE: PONERINAE.

1. CERAPACHYS ANTENNATUS Smith.

Cerapachys antennatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 74, ♀; Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 5, p. 445, ♀, pl. 1, fig. 8, 9; Emery, Gen. Ins. Ponerinae, 1911, p. 9, ♀ ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Worker. Length 5.5 mm.

Head distinctly longer than broad, narrower in front than behind, with straight sides, broadly concave occipital border, acute occipital angles and convex dorsal surface, subtruncate behind. Eyes rather large, flattened, their anterior orbits at the middle of the head. There is a small shallow impression on the middle of the vertex. Occipital border marginate, the margination surrounding the corners and continued some distance along the ventral surface of the head. Gula with a pair of small, prominent teeth at

its anterior margin. Mandibles rather large, triangular, strongly bent at the base, flattened, with straight lateral and broad, dentate apical borders. Clypeus extremely short and transverse. Frontal carinae prominent, vertical, approximated and rounded, confluent but not truncated behind in a depression continuous with the antennal foveae. In front between the carinae there is a small, acute, median tooth. Frontal groove absent. Cheeks with a strong carina, terminating anteriorly in a sharp, rectangular tooth or projection. Antennae short; scapes rapidly enlarging towards their apices, which reach back to a line connecting the anterior orbits; funiculi thick, all the joints except the last decidedly broader than long, joints 1-6 much broader than long, joints 7-10 subequal, somewhat longer, terminal joint very large, glandiform, as long as the four preceding joints together. Thorax narrower than the head, about $2\frac{1}{2}$ times as long as broad, as broad through the epinotum as through the pronotum, narrowed in the mesoëpinotal region; with indistinct, slightly impressed mesoëpinotal suture. Pronotum subrectangular in front, its anterior and inferior borders strongly marginate. In profile the dorsal outline of the thorax is horizontal and very feebly convex. Epinotum from above a little longer than broad, rather rounded on the sides, its declivity sloping, slightly concave and strongly marginate above and on the sides. Petiole narrower than the epinotum, distinctly longer than broad, as broad in front as behind, with feebly rounded sides and dorsal surface, the former slightly carinate below; its ventral surface anteriorly with a prominent, compressed, triangular tooth. The anterior surface is strongly truncated and with a sharp carina above. Postpetiole a little longer than the petiole but distinctly broader, longer than broad and broader behind than in front, with evenly convex dorsal, ventral, and lateral surfaces, its anterior border strongly marginate, with sharply angular corners. Gaster elongate, first segment shaped like the postpetiole but larger; pygidium truncated and slightly concave above, bordered with numerous prominent spinules. Sting large. Legs with short tibiae, those of the middle and hind legs not longer than the metatarsi; hind coxae without a lamelliform expansion at the tip on the inner side.

Shining; mandibles opaque, striatopunctate; cheeks very coarsely rugose. Surface of the body with very sparse, coarse, piligerous punctures, longitudinally confluent on the dorsolateral surfaces of the petiole.

Hairs moderately long, bristly, erect, pale yellowish, sparse on the body, sparser on the scapes and legs. Pubescence absent, except on the funiculi tibiae, and tarsi.

Black; mandibles, funiculi, tarsi, tips and bases of scapes, femora, and tibiae, pygidium and sting deep red.

A single specimen from Kuching (John Hewitt).

I have redescribed this insect which is the type of the genus, as the worker has not been seen within recent years and because Smith's description is antiquated and incomplete. Emery described and

figured a dealated female from Sumatra. Compared with his figures, the worker has the petiole distinctly longer and more narrowed in front, and the head is also narrower anteriorly.

2. CERAPACHYS DOHERTYI Emery.

Cerapachys dohertyi Emery, Rend. R. accad. sci. Bologna, 1901, p. 25, ♀ ;
Emery, Gen. Ins. Ponerinae, 1911, p. 9, ♀ .

Type-locality: Pulo Laut, Borneo (W. Doherty).

3. CERAPACHYS PARVULUS Emery.

Cerapachys dohertyi var. *parvula* Emery, Rend. R. accad. sci. Bologna, 1901,
p. 25, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 9.

Type-locality: Pulo Laut, Borneo (W. Doherty).

As Emery surmised, this is, in all probability, a distinct species and not a variety of *dohertyi*.

*4. CERAPACHYS BRYANTI, sp. nov.

Worker. Length 2 mm.

Head about $\frac{1}{4}$ longer than broad, a little broader behind than in front, with very feebly convex sides, broadly excised and marginate posterior border and sharp posterior angles. Eyes distinctly smaller than the greatest diameter of the scapes, their posterior orbits at the middle of the head. Cheeks with a prominently angled carina in front. Mandibles small, not flexed at the base, with feebly rounded lateral and very indistinctly denticulate apical borders. Frontal carinae prominent, erect, approximated, rounded, subtruncate, but not fusing behind. Frontal groove absent. Antennal scapes thick, about half as long as the head, joints 1-10 of the funiculus very short and transverse, terminal joint large, glandiform, as long as the six preceding joints together. Thorax narrower than the head, elongate, subrectangular, flattened above and on the sides, twice as long as broad, not broader behind than in front, slightly narrowed in the middle, without promesonotal or mesoepinotal sutures. Anterior border of pronotum very straight and transverse, its superior and inferior borders as well as the superior and lateral borders of the abrupt epinotal declivity marginate. Petiole nearly square, very slightly broader behind than in front, narrower than the epinotum, truncated and sharply marginate in front, but not on the sides. Postpetiole shaped exactly like the petiole, but larger. Gaster formed very largely of the first segment, which

has the same shape as the postpetiole but is somewhat larger. Terminal gastric segments small. Pygidium minutely and rather bluntly spinulate on the sides. Sting well-developed. Legs short and robust, hind coxae without a lamelliform enlargement at the tip on the inner side.

Shining; head, thorax, petiole, and postpetiole evenly covered with sparse, coarse umbilicate, piligerous punctures or foveolae, excepting the middorsal portion of the thorax, which is smooth and very shining. Gaster sparsely punctate, more finely than the more anterior regions, legs and scapes with sparser, finer punctures.

Hairs pale yellow, sparse, erect, bristly, of uneven length, less numerous on the appendages than on the body. Pubescence absent, except on the funiculi.

Castaneous; mandibles, antennae, pygidium, sting, and legs, excluding the coxae, red.

Described from a single specimen sent me by Mr. Horace Donisthorpe. It was taken by Mr. G. E. Bryant on Mt. Matang in West Sarawak.

This species has the appearance of a *Syscia* on account of its small size and the structure of the thorax and abdomen, but the antennae are 12-jointed as in *Cerapachys sens. str.* It is allied to *C. dohertyi* Emery and *parvula* Emery, but both of these forms are decidedly larger and have the petiole and postpetiole broader than long.

5. *PHYRACACES PUBESCENS* Emery.

Phyracaces pubescens Emery, Rend. R. accad. sci. Bologna, 1901, p. 26, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 11, ♀.

Type-locality: Pulo Laut, Borneo (W. Doherty).

*6. *PHYRACACES HEWITTI*, sp. nov.

Worker. Length 3.5 mm.

Head a little longer than broad, scarcely broader behind than in front, with feebly rounded sides, broadly excavated posterior border and sharp posterior corners, both strongly marginate. In profile the dorsal surface is moderately convex, subtruncate behind, the gular surface feebly convex. Eyes rather large, feebly convex, distinctly in front of the middle of the head. Mandibles triangular, strongly bent at the base, with nearly straight external and indistinctly denticulate apical borders. Frontal carinae approximated, erect, rounded, united but not truncated behind. Cheeks with a short, strong carina, terminating in front in an acute, rectangular tooth. Antennal scapes

thickened towards their tips, which extend a little beyond the posterior orbits; funiculi rather long, joints 1-9 broader than long, joint 10 as long as broad, terminal joint as long as the two preceding joints together, somewhat tapering and not broader than the penultimate joint. Thorax slightly narrower than the head, distinctly broader through the epinotum than through the pronotum, less than twice as long as broad, without promesonotal and mesoepinotal sutures. Pro- and mesonotum together rectangular, as long as broad; epinotum with rounded, rather swollen sides. In profile the whole thorax is feebly and evenly rounded above. Epinotal declivity abrupt, very strongly carinate above and on the sides, as is also the pronotum. Pleurae concave. Petiole as broad as the epinotum, rectangular, nearly $1\frac{1}{2}$ times as broad as long, as broad in front as behind, feebly convex above, truncated anteriorly and posteriorly, with its anterior and lateral borders marginate and its posterior angles produced as a pair of triangular, rather acute teeth. Postpetiole rectangular, a little broader than long, as broad in front as behind and as broad as the petiole, feebly convex above, marginate in front, with sharp anterior corners, submarginate on the sides. First gastric segment a little larger than the postpetiole, as long as broad, with more convex sides and dorsum, ventrally, in front, with a conspicuous rounded tubercle. Pygidium truncate, with finely spinulate border. Legs rather short, hind coxae with a rounded expansion at the tip on the inner side.

Moderately shining; mandibles very sparsely and coarsely punctate; body finely punctate, dorsal surfaces of head and thorax also with irregular scattered foveolae; region between the eyes and frontal carinae smooth and shining. Sides of head and thorax also more shining and less punctate.

Hairs and pubescence grayish, the hairs rather short, sparse, erect, both on the body and appendages, longest and most abundant at the tip of the gaster, the pubescence rather long and abundant, especially on the petiole, postpetiole, gaster, legs, and antennae, but also well-developed on the thoracic dorsum and head.

Black; mandibles, antennae, legs, pygidium, and sting dark red, the middle portions of the scapes, femora, and tibiae somewhat darker.

Female. Length 4 mm.

Very similar to the worker. Thorax through the wing-insertions as broad as the head; mesonotum small, flat, a little broader than long, shaped like an isosceles triangle, with the apex directed anteriorly. Sculpture, pilosity, and color as in the worker. Wings yellowish hyaline, with pale yellow veins and conspicuous brown pterostigma.

Described from four workers and three females taken by Mr. John Hewitt at Kuching. *Type*.—M. C. Z. 8,945.

This species seems to be closely related to *Ph. pubescens* Emery, described from a dealated female, but *hewitti* is much smaller (*pubes-*

cens measures about 6 mm.); the epinotal declivity is very distinctly separated from the base by a pronounced margination or carina, the petiole, and postpetiole are much broader and the former has distinctly dentate posterior angles.

*7a. MYOPOPONE CASTANEA Smith subsp. MACULATA Roger.

Myopopone maculata Roger, Berl. ent. zeitschr., 1861, **5**, p. 50, ♀ ♀.

Myopopone castanea Forel, Journ. Bombay nat. hist. soc., 1900, **13**, p. 54, ♀ ♀;
Bingham, Fauna Brit. India. Hymenop., 1903, **2**, p. 54.

Myopopone castanea subsp. *maculata* Emery, Gen. Ins. Ponerinae, 1911, p. 26.

Type-locality: Ceylon (♀) and Bintang Island (♀).

A single female from Kuching (John Hewitt), though measuring only 12.5 mm., agrees in all other respects with females from the Philippines. The tibiae are not spotted. The species has not been recorded from Borneo, though well known from other parts of the Malayan and Papuan regions.

*8. PLATYTHYREA PUSILLA Emery.

Platythyrea pusilla Emery, Rev. Suisse zool., 1893, **1**, p. 188, ♀; Emery,
Gen. Ins. Ponerinae, 1911, p. 29, ♀.

Type-locality: Amboina.

A single dealated female from Kuching (John Hewitt) agrees well with Emery's description of the worker. It measures only 5 mm.

9. PLATYTHYREA SUBTILIS Emery.

Platythyrea subtilis Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 666,
nota ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 29, ♀.

Type-locality: Pulo Laut, Borneo (Doherty).

10. STICTOPONERA BORNEËNSIS Emery.

Ectatomma coxale Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 150, ♀ (*nec* Roger).
Stictoponera borneënsis Emery, *ibid.*, 1900, ser. 2, **20**, p. 662 *nota*, ♀; Emery,
Gen. Ins. Ponerinae, 1911, p. 47, ♀.

Type-locality: Sarawak, Borneo.

Two workers from Kuching (John Hewitt).

11a. STICTOPONERA COSTATA Emery var. UNICOLOR Forel.

Stictoponera costata var. *unicolor* Forel, Rev. Suisse zool., 1901, **9**, p. 335, ♀ ;
Emery, Gen. Ins. Ponerinae, 1911, p. 48, ♀ .

Type-locality: Sarawak, Borneo (Haviland).

12. STICTOPONERA COXALIS (Roger).

Ponera coxalis Roger, Berl. ent. zeitschr., 1860, **4**, p. 308, ♀ .

Ectatomma coxale Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 444.

Stictoponera coxalis Emery, ibid., 1900, ser. 2, **20**, p. 662; Emery, Gen. Ins. Ponerinae, 1911, p. 48.

Ectatomma (Stictoponera) coxale Bingham, Fauna Brit. India. Hymenop., 1903, **2**, p. 84, ♀ , fig. 44.

Type-locality: Ceylon (H. Nietner).
Sarawak (Doria and Beccari).

13. STICTOPONERA MENADENSIS Mayr.

Ectatomma (Stictoponera) menadensis Mayr. Verh. Zool. bot. gesellsch. Wien, 1887, **37**, p. 539 nota ♀ .

Stictoponera menadensis Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 663; Emery, Gen. Ins. Ponerinae, 1911, p. 48, ♀ .

Type-locality: Menado, Celebes (Radoszkowski).
Borneo.

A worker, which agrees very closely with Mayr's description, and three males from Kuching (John Hewitt). I refrain from describing the latter, as I am not certain that they belong with the worker.

14. STICTOPONERA RUGOSA (Smith).

Ponera rugosa Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 66, ♀ .

Stictoponera rugosa Emery, Gen. Ins. Ponerinae, 1911, p. 48, ♀ .

Type-locality: Sarawak, Borneo (A. R. Wallace).

15. RHOPALOPONE DIEHLI (Forel).

Ectatomma (*Mictoponera*) *diehli* Forel, Ann. Soc. ent. Belgique, 1901, **45**, p. 372, ♀.

Rhopalopone diehli Emery, Gen. Ins. Ponerinae, 1911, p. 35, ♀.

Type-locality: Sarawak, Borneo (Haviland).

16. ODONTOPONERA TRANSVERSA (Smith).

Ponera transversa Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 68, ♀; Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 86, ♀.

Ponera denticulata Smith, *ibid.*, p. 90, ♀, pl. 6, fig. 13, 14.

Odontoponera denticulata Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 717.

Odontoponera transversa Dalla Torre, Cat. Hymenop., 1893, **7**, p. 30; Emery, Gen. Ins. Ponerinae, 1911, p. 60.

Type-locality: Singapore (A. R. Wallace).

Sarawak (Doria and Beccari).

Several specimens from Kuching (John Hewitt), Rambungan River, Sarawak (H. W. Smith) and British North Borneo (E. B. Kershaw). These and a series of specimens taken at Surubaya, Java, by H. W. Smith and by F. X. Williams in the Philippines vary considerably in size. Rather pronounced differences in color have also been noted by other authors, but no attempt has been made to name varieties.

17. DIACAMMA HOLOSERICEUM (Roger).

Ponera holoserica Roger, Berl. ent. zeitschr., 1860, **4**, p. 302, ♀.

Diacamma holosericeum Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 149, ♀; Emery, *ibid.*, 1887, ser. 2, **5**, p. 435, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 65.

Type-locality: Java.

Sarawak (Doria and Beccari).

18. DIACAMMA INTRICATUM (Smith).

Ponera intricata Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 67, ♀.

Diacamma intricatum Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 149; Emery, Gen. Ins. Ponerinae, 1911, p. 65.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (J. Doria and O. Beccari); Kapouas Basin (Chaper); Central Borneo (Munich Museum).

Several workers taken at Kuching by John Hewitt and H. W. Smith and by the latter at Sadong, Serambu Mt., and Rambungan River, Sarawak.

*18a. *DIACAMMA INTRICATUM* subsp. *KERSHAWI*, subsp. nov.

Worker. Length about 11 mm.

Smaller than the typical *intricatum*, with smaller eyes, less pronounced clypeal carina, the petiole narrower anteriorly, and the striae on the upper surface of the petiole and first gastric segment almost obliterated. The second gastric segment is faintly, but distinctly, longitudinally striated in the middle above, and the whole gaster is more opaque and more densely punctate. The pilosity on the body and legs is slightly more abundant than in the typical form.

A single specimen taken by Mr. E. B. Kershaw in British North Borneo. *Type*.—M. C. Z. 9,073.

19. *DIACAMMA RUGOSUM* (Le Guillou).

Ponera rugosa Le Guillou, Ann. Soc. ent. France, 1840, **10**, p. 318, ♀.

Ponera versicolor Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 65, ♀.

Diacamma rugosum Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 149, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 66.

Diacamma geometricum subsp. *versicolor* Emery, Rev. Suisse zool., 1893, **1**, p. 189; Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 438.

Type-locality: Borneo. (Voyage of the "Astrolabe" and "Zelée"). Sarawak (Doria and Beccari; Bedot and Pictet; A. R. Wallace).

Eleven workers from Sadong, Sarawak (H. W. Smith) and two from Kuching (John Hewitt) agree with Emery's redescription of this species. They lack metallic reflections, however.

19a. *DIACAMMA RUGOSUM* subsp. *TORTUOLOSUM* (Smith).

Ponera tortuolosa Smith, Journ. Proc. Linn. soc. London. Zool., 1863, **7**, p. 18, ♀.

Diacamma tortuosum Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 46, ♀.

Diacamma rugosum subsp. *tortuosum* Emery, Rend. R. accad. sci. Bologna, 1897, 1896-97, n. s., **1**, p. 160; Emery, Gen. Ins. Ponerinae, 1911, p. 67.

Type-locality: Ceram (A. R. Wallace).

Tandjong, S. E. Borneo (Fritz Suck).

19b. *DIACAMMA RUGOSUM* subsp. *GEOMETRICUM* (Smith).

Ponera geometrica Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 67, ♀.

Diacamma geometricum Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 718, ♀.

Diacamma javanum Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 439, ♀.

Diacamma rugosum subsp. *geometricum* Emery, Rend. R. accad. sci. Bologna, 1897, 1896-97, n. s., **1**, p. 154, fig. 3, 8, 14, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 66, ♀.

Type-locality: Singapore (A. R. Wallace).

Banguay I., N. Borneo (Emery).

A worker and two males taken in British North Borneo (E. B. Kershaw). The male measures 8 mm., and is ferruginous red, with the posterior part of the head and some indistinct spots on the mesonotum dark brown. Wings slightly infuscated, with dark brown veins and pterostigma. Antennae very long (7 mm.), mandibles small, narrow, edentate, with acuminate, pointed tips. Petiole $1\frac{1}{4}$ times as long as broad, narrowed in front, but with very prominent stigmatic tubercles; in profile about as long as high, triangular, with sloping, slightly concave anterior and abrupt posterior surface and blunt apex. Pygidium small, bluntly rounded, cerci well-developed; genitalia partially exerted. Body shining, sparsely and finely punctate. Hairs brown, short, rather abundant, pubescence pale, more abundant, and like the hairs, on all parts of the body.

19c. *DIACAMMA RUGOSUM* subsp. *VAGANS* Smith var. *BIRMANUM* Emery.

Diacamma rugosum subsp. *vagans* var. *birmana* Emery. Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 441, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 67; Forel, Rev. Suisse zool., 1911, **19**, p. 23.

Diacamma rugosum subsp. *sculptum* var. *birmana* Emery, Rend. R. accad. sci. Bologna, 1897, 1896-97, n. s. **1**, p. 157, ♀.

Type-locality: Minhla, Burmah (Comotto).

Sarawak (Haviland).

20a. BOTHROPONERA INSULARIS Emery var. BREVIOR Forel.

Pachycondyla (*Bothroponera*) *insularis* v. *brevior* Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 45, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 76.

Type-locality: Borneo.

21. BOTHROPONERA RUFIPES (Jerdon).

Ponera rufipes Jerdon, Ann. mag. nat. hist., 1854, ser. 2, **13**, p. 102, ♀ .

Pachycondyla rufipes Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 106, ♀ .

Bothroponera rufipes Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 359; Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 53, ♀ .

Ponera (*Bothroponera*) *rufipes* Forel, Journ. Bombay nat. hist. soc., 1900, **13**, p. 323.

Pachycondyla (*Bothroponera*) *rufipes* Emery, Gen. Ins. Ponerinae, 1911, p. 76.

Type-locality: Malabar, Southern India (Jerdon).

Kapouas Basin, Borneo (Chaper).

22. BOTHROPONERA TRIDENTATA (Smith).

Pachycondyla tridentata Smith, Cat. Hymenop. Brit. mus. 1858, **6**, p. 106, ♀ .

Bothroponera tridentata Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 149; Emery, ibid., 1887, ser. 2, **5**, p. 442, ♀ .

Pachycondyla (*Bothroponera*) *tridentata* Emery, Gen. Ins. Ponerinae, 1911, p. 77.

Type-locality: Sarawak, Borneo.

Sarawak (Doria and Beccari).

23a. BOTHROPONERA TRIDENTATA subsp. DEBILIOR Forel.

Pachycondyla (*Bothroponera*) *tridentata* subsp. *debilior* Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 46, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 77, ♀ .

Type-locality: Tandjong, S. E. Borneo (Fritz Suck).

24. ECTOMOMYRMEX OBTUSUS (Emery).

Pachycondyla (*Bothroponera*) *obtusa* Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 667 nota ♀ .

Pachycondyla (*Ectomomyrmex*) *obtusa* Emery, Gen. Ins. Ponerinae, 1911, p. 79, ♀.

Type-locality: Pulo Laut, Borneo (W. Doherty).

25. EUPONERA (BRACHYPONERA) LUTEIPES (Mayr).

Ponera luteipes Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 722, ♀ ♀ ;

Forel, Journ. Bombay, nat. hist. soc., 1900, **13**, p. 326, ♀ ♀ ♂.

Euponera (*Brachyponera*) *luteipes* Emery, Ann. Soc. ent. Belgique, 1901, **45**, p. 47; Emery, Gen. Ins. Ponerinae, 1911, p. 84.

Brachyponera luteipes Bingham, Fauna Brit. India. Hymenop., 1903, **2**, p. 101, ♀ ♀ ♂.

Type-locality: Milu, Nicobar Islands (Novara Expedition).
Sarawak (Haviland).

26a. EUPONERA (TRACHYMESOPUS) DARWINI Forel var. INDICA
Emery.

Euponera (*Pseudoponera*) *darwinii* var. *indica* Emery, Bull. Soc. ent. Ital., 1900, **31**, p. 268 *nota*, ♀.

Pseudoponera darwini Bingham, Fauna Brit. India. Hymenop., 1903, **2**, p. 93.

Euponera (*Trachymesopus*) *darwinii* var. *indica* Emery, Gen. Ins. Ponerinae, 1911, p. 86.

Type-locality: Upper Burmah (Doherty).
Sarawak (Haviland, Will).

27. PONERA TRUNCATA Smith.

Ponera truncata Smith, Journ. Proc. Linn. soc. London. Zool. Suppl., 1860, **4**, p. 72, ♀; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 150, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 92, ♀.

Type-locality: Celebes.
Sarawak (Doria and Beccari).

Two dealated females from Sarawak (H. W. Smith) seem to be referable to this species, but are only 3–3.5 mm. long, whereas the dimensions of the female cotypes are given by Mayr as 4–4.2 mm. My specimens may represent a distinct variety or subspecies, but it seems inadvisable to introduce another name on the basis of such meager material.

*28. *PONERA GLEADOWI* Forel.

Poneragleadowi Forel, in Emery, Mem. R. accad. sci. Bologna, 1896, 1895-1896, ser. 5, 5, p. 292 *nota* ♀; Emery, *ibid.*, p. 297, fig. 17a, b, c; Bingham, Fauna Brit. India. Hymenop., 1903, 2, p. 91; Emery, Gen. Ins. Ponerinae, 1911, p. 91.

Type-locality: Poona, India (Wroughton).

Two workers from Sarawak (H. W. Smith) agree very closely with a typical specimen from Orissa received from Professor Forel. The species has a wide distribution, occurring as far north and west as Algeria.

*29a. *PONERA CONFINIS* Roger var. *JAVANA* Forel.

Ponera confinis var. *javana* Forel, Mitth. Naturh. mus. Hamburg, 1905, 22, p. 6, ♀ ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 90, ♀ ♀.

Type-locality: Buitenzorg, Java (K. Kraepelin).

Seven workers and two females from Kuching (John Hewitt) agree well with a specimen from Singapore given me by Forel, with the description of specimens from Buitenzorg and with a worker taken by H. W. Smith at Surubaya, Java.

30. *LEPTOGENYS (LOBOPELTA) CHALYBEA* Emery.

Lobopelta iridescens Mayr, Ann. Mus. civ. Genova, 1872, 2, p. 150, ♀; Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, 28, p. 665, ♀ (*nec* Smith).

Lobopelta chalybea Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 5, p. 432, ♀.

Leptogenys (Lobopelta) chalybea Emery, Gen. Ins. Ponerinae, 1911, p. 102, ♀.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Four workers from Kuching (John Hewitt).

31. *LEPTOGENYS (LOBOPELTA) IRIDESCENS* (Smith).

Ponera iridescens Smith, Journ. Proc. Linn. Soc. London. Zool., 1857, 2, p. 66, ♀.

Lobopelta iridescens Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 5, p. 431, ♀.

Leptogenys (Lobopelta) iridescens Emery, Gen. Ins. Ponerinae, 1911, p. 104, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari, Haviland).

A dozen workers from Kuching (H. W. Smith).

31a. LEPTOGENYS (LOBOPELTA) IRIDESCENS subsp. CURRENS Forel.

Leptogenys (Lobopelta) iridescens subsp. *currens* Forel, Rev. Suisse zool., 1901, **9**, p. 329, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 104, ♀ .

Type-locality: Sarawak, Borneo (Haviland).

32. LEPTOGENYS (LOBOPELTA) MUTABILIS (Smith).

Ponera mutabilis Smith, Journ. Proc. Linn. Soc. London. Zool., 1861, **6**, p. 45, ♀ .

Lobopelta mutabilis Mayr, Tijdschr. ent. 1867, **10**, p. 89; Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 30, ♀ .

Leptogenys (Lobopelta) mutabilis Emery, Gen. Ins. Ponerinae, 1911, p. 104.

Type-locality: Tondano, Celebes (A. R. Wallace).

Sarawak, Borneo (Doria and Beccari; Bedot and Pictet).

Eleven workers from British North Borneo (E. B. Kershaw) and two from Kuching (H. W. Smith).

33a. LEPTOGENYS (LOBOPELTA) PROCESSIONALIS Jerdon var. DISTINGUENDA Emery.

Lobopelta distinguenda Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 430, ♀ .

Lobopelta mutabilis (part) Mayr, *ibid.*, 1872, **2**, p. 151, ♀ .

Leptogenys (Lobopelta) ocellifera subsp. *distinguenda* Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 46, ♀ .

Leptogenys (Lobopelta) processionalis var. *distinguenda* Emery, Gen. Ins. Ponerinae, 1911, p. 104.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Tandjong, S. E. Borneo (Fritz Suck).

Two dozen workers from Kuching (H. W. Smith).

34. LEPTOGENYS (LOBOPELTA) DIMINUTA (Smith).

Ponera diminuta Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 69, ♀ .

Lobopelta diminuta Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 734, ♀ .

Leptogenys diminuta Forel, Journ. Bombay nat. hist. soc., 1900, **13**, p. 312.

Leptogenys (Lobopelta) diminuta Emery, Gen. Ins. Ponerinae, 1911, p. 103.

Type-locality: Sarawak, Borneo (A. R. Wallace).

S. E. Borneo (Fritz Suck).

34a. LEPTOGENYS (LOBOPELTA) DIMINUTA var. LAEVICEPS (Smith).

Ponera laeviceps Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 69, ♀.

Ponera simillima Smith, ibid., 1861, 5, p. 105, ♀.

Lobopelta diminuta var. *laeviceps* Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 5, p. 433, ♀.

Leptogenys (*Lobopelta*) *diminuta* var. *laeviceps* Emery, Gen. Ins. Ponerinae, 1911, p. 103.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Two workers from Kuching (John Hewitt).

*35. LEPTOGENYS (LOBOPELTA) BORNEËNSIS, sp. nov.

Worker. Length: 9 mm.

Long and slender. Head about $\frac{1}{5}$ longer than broad, a little broader in front than behind, with nearly straight sides in front, rounded behind, with rather deeply excavated occipital border. Eyes rather small, situated a distance equal to their length from the anterior corners of the head. Mandibles rather large, triangular, with deflected tips, distinctly concave lateral, dentate apical and denticulate basal borders. Clypeus strongly carinate, its anterior border entire, projecting as a membranous, rather narrowly rounded lobe. Antennae long and slender; scapes extending about $\frac{1}{4}$ their length beyond the posterior corners of the head; all the funicular joints much longer than broad; first joint a little more than half as long as the second, second slightly longer than the third. Thorax long and slender. Pronotum slightly flattened above, longer than broad, mesonotum shorter and much narrower and lower than the pronotum, its dorsal outline very feebly concave; epinotum scarcely broader than the mesonotum, but very distinctly higher and longer, the base straight and horizontal, twice as long as the vertical declivity into which it passes through a curve without any trace of an angle. The sides of the declivity are feebly marginate. Each epinotal stigma is situated in a sharply defined elliptical depression. Petiole from above fully twice as long as broad, narrowed in front, laterally compressed. In profile the node is longer than high, its anterior border long and convex, the posterior border straight, the apex blunt, the ventral surface of the petiole sinuous in the middle. Gaster small. Legs long and slender.

Shining, very sparsely and very finely punctate; mandibles very finely and densely striate.

Hairs whitish, short, sparse, and erect on the body, more abundant and more oblique on the appendages. Pubescence pale, present only on the funiculi and tarsi.

Castaneous; mandibles, clypeus, legs including coxae, neck, prosterna

petiole and tip of gaster, red; posterior margins of gastric segments yellowish.

Described from a single specimen taken at Kuching by Mr. John Hewitt.

This species has much the same color as *iridescens* apart from the blue reflections, but the shape of the node and thorax serve to distinguish it at once.

36a. *LEPTOGENYS (LOBOPELTA) KITTELI* Mayr subsp. *LAEVIS* Mayr.

Lobopelta kitteli var. *laevis* Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, **28**, p. 665, ♀.

Leptogenys (Lobopelta) kitteli subsp. *laevis* Forel, Rev. Suisse zool., 1901, **9**, p. 329, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 104.

Type-locality: Java.

Sarawak (Haviland).

37. *ODONTOMACHUS HAEMATODA* (Linné).

Formica haematoda Linné, Syst. nat., ed. 10, 1758, p. 582, ♀.

Myrmecia unispinosa Fabricius, Syst. Piez., 1804, p. 423, ♀.

Myrmecia haematoda Fabricius, Syst. Piez., 1804, p. 423, ♀.

Odontomachus haematodes Latreille, Hist. nat. Crust. Ins., 1805, **13**, p. 257.

Ponera (Odontomachus) haematoda Latreille, ibid., 1809, **4**, p. 128, ♀.

Odontomachus haematoda Dalla Torre, Cat. Hymenop., 1893, **7**, p. 50; Emery, Gen. Ins. Ponerinae, 1911, p. 114, pl. 3, fig. 18, ♀ ♀ ♂.

Formica maxillosa DeGeer, Mem. hist. ins., 1773, **3**, p. 601, ♀, pl. 31, fig. 3-5.

Formica unispinosa Fabricius, Ent. syst., 1793, **2**, p. 359, ♀.

Odontomachus simillimus Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 80, pl. 5, fig. 8, 9.

Type-locality: South America (Rolander).

Sarawak (Doria and Beccari), Kapouas Basin (Chaper).

Two workers from Kuching (John Hewitt).

38. *ODONTOMACHUS RIXOSUS* Smith.

Odontomachus rixosus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 67, ♀; Emery, Gen. Ins. Ponerinae, 1911, p. 114.

Type-locality: Singapore (A. R. Wallace).

Sarawak (J. Doria and O. Beccari); Kapouas Basin (Chaper).
A dozen workers from Kuching (H. W. Smith).

39. ODONTOMACHUS MALIGNUS Smith.

Odontomachus malignus Smith, Journ. Proc. Linn. soc. London. Zool., 1859, **3**, p. 144, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 113.
Odontomachus tuberculatus Roger, Berl. ent. zeitschr., 1861, **5**, p. 28, ♀ ; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 149, ♀ .

Type-locality: Aru (A. R. Wallace).
Sarawak, Borneo (Doria and Beccari).

40. ANOCHETUS AGILIS Emery.

Anochetus agilis Emery, Ann. Soc. ent. Belgique, 1901, **45**, p. 53, ♀ ; Emery, Gen. Ins. Ponerinae, 1911, p. 108.

Type-locality: Banguay, Borneo (Staudinger and Bang-Haas).

DORYLINAE.

41. DORYLUS (DICHTHADIA) LAEVIGATUS (Smith).

Typhlopone laevigatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 70, ♀ .
Dichthadia glaberrima Gerstäcker, Stettin. ent. zeit., 1863, **24**, p. 93, ♀ .
Dorylus klugi Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 448, pl. 1, fig. 10, ♂ .
Dorylus laevigatus Emery, Zool. jahrb. Syst., 1895, **8**, p. 729, ♀ .
Dorylus (Dichthadia) laevigatus Emery, Gen. Ins. Dorylinae, 1910, p. 8, ♀ ♀ ♂ .

Type-locality: Sarawak, Borneo (A. R. Wallace).
Sarawak (Doria and Beccari).
Two large workers from Kuching (John Hewitt).

42. AENICTUS LAEVICEPS (Smith).

Typhlatta laeviceps Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 79, ♀ .
Aenictus laeviceps Forel, Ann. Soc. ent. Belgique, 1890, **34**, C. R., p. CII, ♀ ;
Emery, Gen. Ins. Dorylinae, 1910, p. 30, ♀ .

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari).

Five workers from Bongo Mt., Borneo (Hewitt and Brooks).

43. AENICTUS GRACILIS Emery.

Aenictus gracilis Emery, Rev. Suisse zool., 1893, **1**, p. 187, ♀ ; Emery, Gen. Ins. Dorylinae, 1910, p. 30, ♀ .

Type-locality: Sarawak (Bedot and Pictet).

44. AENICTUS CORNUTUS Forel.

Aenictus cornutus Forel, Ann. Soc. ent. Belgique, 1900, **44**, p. 75, ♀ ; Emery, Gen. Ins. Dorylinae, 1910, p. 29, ♀ .

Type-locality: Sarawak (Haviland).

A single worker from Kuching (John Hewitt).

45. AENICTUS PUNCTIVENTRIS Emery.

Aenictus punctiventris Emery, Bull. Soc. ent. Ital., 1901, **33**, p. 47, ♂ ; Emery, Gen. Ins. Dorylinae, 1910, p. 31, ♂ .

Type-locality: Borneo.

A single worker from Kuching (John Hewitt).

46. AENICTUS AITKENI Forel.

Aenictus aitkeni Forel, Journ. Bombay nat. hist. soc. 1901, **13**, p. 465, 475, ♀ ; Bingham, Fauna Brit. India. Hymenop., 1903, **2**, p. 19, fig. 18, ♀ ; Emery, Gen. Ins. Dorylinae, 1910, p. 29, ♀ .

Type-locality: Kanara, India (Aitken).

Sixteen workers from Kuching (H. W. Smith).

MYRMICINAE.

*47. METAPONE HEWITTI, sp. nov.

Male. Length 6-7 mm.

Body long and slender. Head as broad as long, evenly convex and rounded behind, without posterior corners; cheeks very short; eyes moderately large,

but not very convex; ocelli rather small. Mandibles small, but well-developed, their external borders slightly sinuate towards the base, convex at the tips; apical and basal borders distinct, subequal, the former with four subequal teeth. Clypeus large, convex, somewhat broader than long, slightly depressed or flattened posteriorly. Front truncated anteriorly, with a transverse crest or carina separating it from the preocellar space and connecting the frontal carinae, which are prominent, nearly straight, subparallel and as far apart as they are from the lateral borders of the head. Posteriorly each carina curves forward medially to the eye as a distinct ridge and terminates opposite its anterior end, thus enclosing a small, shallow, elliptical scrobe about the base of the antenna. Antennae 12-jointed, scape very small, about twice as long as broad, first funicular joint also very small, broader than long, subglobular; second joint longer but also broader than long, the remaining nine joints cylindrical, of equal breadth, distinctly longer than broad and gradually increasing in length distally; terminal joint nearly as long as the two preceding joints together, with tapering and somewhat pointed tip. Thorax long, narrower than the head through the eyes. Pronotum well-developed, truncated in front; mesonotum and scutellum somewhat flattened above, the former with distinct Mayrian furrows, the latter with a peculiar blunt, spatulate spine on each side, slightly curved inward at its tip. Epinotum longer than broad, subrectangular from above, its base horizontal and twice as long as the vertical declivity into which it passes through an abrupt curve, the sides of the declivity above and of the base coarsely and rather irregularly margined. Petiole with a short, stout peduncle anteriorly and a thick, cuboidal node, which is a little longer than broad and slightly higher in front than behind, with truncated anterior and posterior and feebly rounded dorsal and lateral surfaces. Seen in profile its ventral margin is slightly bisinuate, with a small, triangular tooth at the anterior end of the peduncle. Postpetiole distinctly broader than the petiole and broader than long, from above transversely elliptical, in profile slightly truncated anteriorly, convex and rounded above, its ventral border unarmed, nearly straight. Gaster elongate elliptical, with straight anterior border and tapering tip. Genitalia completely retracted, cerci apparently absent; pygidium and hypopygium short and pointed. Legs short, of the usual simple form, without the tibial spines of the worker and female; spurs of the middle and hind tibiae simple, blunt at the tip. Tarsal claws very small, strongly curved, nonpectinated. Wings very short (4.5 mm.), with a well-developed discoidal cell, a single cubital cell and the radial cell slightly open at the tip. The radial cell is large. Pterostigma well-developed and conspicuous.

Subopaque; mandibles opaque, longitudinally rugose and very finely punctate. Head reticulate-rugose, the clypeus more coarsely and transversely. Front behind its anterior truncation with regular longitudinal rugae converging to the anterior ocellus. Antennal scrobes less distinctly longitudinally rugose. Upper surface of mesonotum and scutellum and sides of thorax sharply and regularly longitudinally rugose, with elongate, shallow

foveolae in the narrow interrugal spaces on the mesonotum. Dorsal surface of epinotum, including the upper portion of the declivity, with extremely coarse reticulate rugae, some of which are clearly transverse. Petiole above less coarsely and even more irregularly rugose. Postpetiole and gaster very finely and densely punctate, with superimposed small, sparse, and very regular piligerous punctures.

Hairs grayish brown, short, rather abundant, erect on the head, thorax, and petiole, mostly subappressed or oblique on the postpetiole, gaster, and legs. Antennal funiculi with very short, fine hairs, or pubescence. Wings minutely hairy.

Black; mandibles, antennae, legs, and tip of gaster reddish brown, the tarsi slightly paler. Wings grayish hyaline, with slightly infuscated tips and anterior margin; veins sharply defined, brown; pterostigma dark brown.

Described from four specimens taken by Mr. John Hewitt at Kuching in 1908. *Type*.—M. C. Z. 8,946.

I have described this male in detail and given it a name, although it closely resembles the male of *M. greeni* Forel from Ceylon, described from a mature pupa, because no adult winged male of the genus has been described. The Bornean specimens may belong to a different species, possibly *M. sauteri* Forel of Formosa or *M. bakeri* Wheeler of the Philippines, both known only from females. It can hardly be the male of the only other known species of *Metapone*, *M. mjöbergi* Forel of Queensland. The four specimens of *M. hewitti* have been in my collection for many years and were placed provisionally with *Cataulacus*. Forel's very careful description and figures (Rev. Suisse zool., 1911, **19**, pl. 14) finally enabled me to recognize them as *Metapone* males. Forel is, I believe, in error in stating that the antennae of the male *M. greeni* are 11-jointed. He has apparently overlooked the second funicular joint. As Green has shown, the species of this extraordinary genus nest in decayed branches. He found the types of *M. greeni* and their larvae in company with termites.

48. TETRAPONERA NIGRA (Jerdon).

Eciton nigrum Jerdon, Madras journ. lit. sci., 1851, **17**, p. 112, ♀.

Tetraponera atrata Smith, Ann. mag. nat. hist., 1852, ser. 2, **9**, p. 44, ♀;

Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 70, ♀.

Pseudomyrma nigra Smith, Cat. Hymenop., Brit. mus., 1858, **6**, p. 159, ♀.

Pseudomyrma atrata Smith, ibid. p. 159.

Pseudomyrma carbonaria Smith, Journ. Proc. Linn. soc. London Zool., 1863,

7, p. 20, ♀ ♀.

Sima nigra Emery in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 54.

Type-locality: Malabar, Southern India (Jerdon).
Sarawak (A. R. Wallace).

49. TETRAPONERA ATTENUATA Smith.

Tetraponera attenuata Smith, Trans. Ent. soc. London, 1877, p. 71, ♀.
Sima attenuata Ern. André, Mém. Soc. zool. France, 1892, 5, p. 53, ♀.
Sima (Tetraponera) attenuata var. *tenuissima* Emery, Ann. Mus. civ. Genova, 1900, ser. 2, 20, p. 675, ♀ ♀, fig. 5b.

Type-locality: Sarawak.
Kapouas Basin (Chaper); Tandjong, S. E. Borneo (Fritz Suck).
A single worker from Kuching (John Hewitt).

*50. TETRAPONERA DIFFICILIS Emery.

Sima (Tetraponera) difficilis Emery, Ann. Mus. civ. Genova, 1900, ser. 2, 20, p. 676, ♀.

Type-locality: Benculen, Sumatra (E. Modigliani).
Six workers from Kuching (John Hewitt).

51. TETRAPONERA PILOSA (Smith).

Pseudoponera pilosa Smith, Cat. Hymenop. Brit. mus., 1858, 6, p. 160, ♀.
Sima pilosa Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 5, p. 449 *nota*; Emery, *ibid.*, 1900, ser. 2, 20, p. 675.

Type-locality: Borneo.
Two workers and a dealated female from Kuching (John Hewitt).

52. MYRMICA RITAE Emery.

Myrmica ritae Emery, Ann. Mus. civ. Genova, 1889, ser. 2, 7, p. 501, ♀, pl. 11, fig. 27; *ibid.*, 1894, ser. 2, 14, p. 451, ♀.

Type-locality: Mt. Mooleyit (1,000–1,900 m.), Tenasserim (L. Fea).
Pulo Laut, Borneo (W. Doherty).

*53. PHEIDOLE MEGACEPHALA (Fabricius).

Formica megacephala Fabricius, Ent. syst., 1793, 2, p. 361, 2.
Formica (Myrmica) trinodis Losana, Mem. Accad. sci. Turino, 1834, 37, p. 327, pl. 36, fig. 6.

Oecophthora pusilla Heer, Hausameise Madeiras, 1852, p. 15, 2 ♀ ♀ ♂, pl. 1, fig. 1-4.

Myrmica? laevigata Smith, Trans. Ent. soc. London, 1855, ser. 2, 3, p. 130, ♀, pl. 9, fig. 7, 8.

Myrmica trinodis Mayr. Verh. Zool. bot. gesellsch. Wien, 1855, 5, p. 414, nota, ♀.

Myrmica (Pheidole) laevigata Smith, Cat. Brit. fossor. Hymenop., 1858, p. 35, 225, ♀.

Pheidole pusilla Smith, Cat. Hymenop. Brit. mus., 1858, 6, p. 173, pl. 9, fig. 18-20.

Pheidole janus Smith, ibid., p. 175, ♀, pl. 9, fig. 13-17.

Pheidole megacephala Roger, Verzeich. formicid., 1863, p. 30; Dalla Torre, Cat. Hymenop., 1893, 7, p. 92.

Type-locality: Mauritius (Coll. Bosc).

Numerous soldiers and workers from Kuching (John Hewitt and H. W. Smith).

54. PHEIDOLE JAVANA Mayr.

Pheidole javana Mayr, Tijdschr. ent., 1867, 10, p. 98, 2 ♀.

Type-locality: Java.

Sarawak (Doria and Beccari; Bedot and Pictet); Kapouas Basin (Chaper).

Two soldiers and several workers from Kuching (John Hewitt) and Sarawak (H. W. Smith).

*55. PHEIDOLE BUGI, sp. nov.

Soldier. Length 2 mm.

Head large, subrectangular, longer than broad, with nearly straight subparallel sides, slightly narrowed at the posterior corners, with deeply and angularly excised occipital border, distinctly depressed in the occipital region and with distinct occipital groove. Eyes small, with angular inferior orbits, situated at the anterior fourth of the head. Mandibles large, convex, with broad apical margins, furnished at their tips with a pair of large, blunt teeth. Clypeus flattened, or slightly concave in the middle, ecarinate, its anterior border deeply notched. Frontal area distinct, semicircular, impressed. Frontal carinae rather short, diverging behind and bordering flattened, indistinct scrobe-like areas. Antennae short and slender, the scapes reaching the lateral borders of the head a little behind the eyes and in front of the middle;

joints 2-7 of the funiculi distinctly broader than long; club somewhat longer than the remainder of the funiculus. Thorax robust, the pronotum broad and convex, its humeri protruding as bluntly rounded angles; mesonotum sloping, with a transverse torus in the middle. Epinotum low, its base in profile straight and longer than the declivity; the spines short, rather erect, much shorter than the base of the epinotum and shorter than their distance apart at their insertions. Petiole short, the anterior slope of the node very concave, its summit blunt, transverse, and rather deeply emarginate, its posterior slope abrupt. Postpetiole slightly broader than the petiole, transverse, very convex above, broader in front than behind, the sides rounded. Gaster broadly elliptical, flattened, smaller than the head, with straight anterior border. Legs with stout, slightly swollen femora.

Somewhat shining; mandibles smooth, minutely and sparsely punctate. Clypeus smooth and shining in the middle, rugose on the sides; remainder of head sculptured, the anterior $\frac{2}{3}$ longitudinally rugose, with feebly reticulate interrugal areas, especially on the sides, the posterior third reticulately rugose, the scrobe-like areas densely punctate. Neck, pronotum, and mesonotum more finely reticulate-rugose; epinotum smooth and shining; petiole and postpetiole subopaque, indistinctly and very finely punctate or alutaceous. Gaster and legs smooth and shining, sparsely and finely punctate.

Hairs yellow, erect or suberect, coarse, rather long, of uneven length, more abundant on the body than on the appendages.

Ferruginous; gaster darker, brown; legs and antennae paler, more yellowish; borders of mandibles and clypeus blackish.

Worker. Length 1.4 mm.

Head $\frac{1}{5}$ longer than broad, subrectangular, with very feebly convex sides and feebly sinuate posterior border, as broad in front as behind. Eyes very small, at the middle of the sides of the head. Mandibles with oblique apical margins furnished with four acute, subequal teeth. Clypeus short, convex, its anterior border broadly rounded, entire. Antennal scapes reaching the posterior border of the head. Thorax rather slender; pro- and mesonotum fused, feebly rounded above and on the sides; mesoëpinotal constriction short and deep. Epinotum with subequal base and declivity, the spines reduced to small, rather blunt teeth, not longer than broad at their bases. Superior border of petiolar node transverse and entire. Postpetiole much as in the soldier.

Smooth and shining; mesopleurae and sides of epinotum densely punctate; petiolar and postpetiolar nodes subopaque.

Hairs whitish, erect, more uniform and somewhat more abundant than in the soldier, especially on the legs and scapes.

Yellowish brown; head and gaster a little darker; thorax and appendages paler and more yellowish.

Described from a single soldier and four workers from Sarawak, (Roland Thaxter). *Type*.— M. C. Z. 8,947.

This species is evidently related to *Ph. nodgii* Forel of Java, but the soldier is smaller, with more deeply notched clypeus, much less distinct antennal scrobes, shorter epinotal spines, more deeply notched petiolar node, laterally less angular postpetiole, and very different thoracic sculpture. The worker *bugi* is also smaller than that of *nodgii*, has a more elongate head, very feebly armed epinotum, a more rounded postpetiole, and very different sculpture.

56. PHEIDOLE ARISTOTELIS Forel.

Pheidole aristotelis Forel, Rev. Suisse zool., 1911, **19**, p. 43, 2 ♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

57. PHEIDOLE COMATA Smith.

Pheidole comata Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 176, ♀ ; Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 360.

Type-locality: Sarawak, Borneo.

58. PHEIDOLE HAVILANDI Forel.

Pheidole havilandi Forel, Rev. Suisse zool., 1911, **19**, p. 38, 2 ♀ ♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

59a. PHEIDOLE SAUBERI Forel subsp. SARAWAKANA Forel.

Pheidole sauberi subsp. *sarawakana* Forel, Rev. Suisse zool., 1911, **19**, p. 45, 2 ♀.

Type-locality: Sarawak, Borneo (Haviland).

60. ISCHNOMYRMEX LONGIPES (Smith).

Myrmica longipes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 70, ♀, pl. 1, fig. 6.

Myrmica (*Monomorium*) *longipes* Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 126, ♀.

- Ischnomyrmex longipes* Mayr, Tijdschr. ent., 1867, **10**, p. 60, ♀ ; Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 53, ♀ .
- Aphaenogaster longipes* Emery, Ann. Mus. civ. Genova, 1888, ser. 2, **5**, p. 531, ♀ , pl. 9, fig. 2.
- Aphaenogaster* (*Ischnomyrmex*) *longipes* Forel, Rev. Suisse zool., 1911, **19**, p. 24, ♀ .
- Pheidole* (*Isopheidole*) *longipes* Forel, Rev. Suisse zool., 1912, **20**, p. 765, 2 ♀ .
- Pheidole* (*Ischnomyrmex*) *longipes* Forel, Zool. jahrb. Syst., 1913, **36**, p. 49, 2 ♀ , fig. N.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Haviland); Kapouas Basin (Chaper).

Nine workers from the Rambungan River, Sarawak (H. W. Smith) and one from Kuching (John Hewitt).

61. MYRMICARIA CARINATA (Smith).

- Heptacondylus carinatus* Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 73, ♀ .
- ?*Physatta dromedarius* Smith, ibid., p. 78, ♀ .
- Myrmicaria carinata* Dalla Torre, Cat. Hymenop., 1893, **7**, p. 155.
- Myrmicaria fodiens* race *carinata* Emery, Rev. Suisse zool., 1893, **1**, p. 219.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Tandjong, S. E. Borneo (Fritz Suck).

Two workers and two males from Kina Balu, N. Borneo, obtained from Staudinger. The worker has the gaster distinctly striated at the base. This character, not mentioned by Smith, nevertheless exists in the type (*teste* W. F. Kirby) and is regarded by Emery as distinctive of the species.

*61a. MYRMICARIA CARINATA subsp. GAGATINA, subsp. nov.

Worker. Length 5.7 mm.

The series of small angles formed by the lateral carinae of the meso- and epinotum are somewhat more acute than in the typical form and the body is much smoother and more shining. There are only a few delicate longitudinal rugae on the head, some confined to the sides and just below and above the eyes and some abbreviated and widely separated on the posterior portion of the head. On the thorax the rugae are also finer, more regular and further apart. The extreme base of the gaster is finely striated as in typical *carinata*.

The color, however, is very different, the body being jet black, with the mandibles, antennae, legs, neck, and articulations of the pedicel dark reddish brown. The hairs covering the body and appendages are very dark brown, almost black.

Described from a single worker taken by Mr. G. E. Bryant on Matang Mt., West Sarawak and sent me by Mr. Horace Donisthorpe.

62. MYRMICARIA SUBCARINATA (Smith).

Heptacondylus subcarinatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 73, ♀.

Physatta gibbosa Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 172, ♀.

Heptacondylus dromedarius Mayr, Verh. Zool. bot. gesellsch. Wien., 1862, **12**, p. 757, ♀ (*nec* Smith).

Myrmicaria subcarinata Mayr, Tijdschr. ent., 1867, **10**, p. 112, ♀ ♀.

Myrmicaria fodiens race *subcarinata* Emery, Rev. Suisse zool., 1893, **1**, p. 219.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari; Haviland); Kapouas Basin (Chaper); Tandjong (Fritz Suck).

Two workers from British North Borneo (E. B. Kershaw).

63. MYRMICARIA RUGOSA (Smith).

Heptacondylus rugosus Smith, Journ. Proc. Linn. soc. London. Zool. Suppl., 1860, **4**, 110, ♀.

Myrmicaria (Heptacondylus) rugosus Smith, *ibid.*, 1864, **8**, p. 73, ♀ ♀ ♂.

Myrmicaria rugosa Mayr, Tijdschr. ent. 1867, **10**, p. 113, ♀.

Type-locality: Batjan (A. R. Wallace).

Tandjong, S. E. Borneo (Fritz Suck).

64. MYRMICARIA ARACHNOIDES (Smith).

Heptacondylus arachnoides Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 72, ♀ ♀.

Heptacondylus longipes Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 142, ♀.

Myrmicaria longipes Mayr, Tijdschr. ent., 1867, **10**, p. 113, ♀ ♀ ♂.

Myrmicaria arachnoides Emery, in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 155.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Tandjong, S. E. Borneo (Fritz Suck); Kapouas Basin (Chaper); Sarawak (Doria and Beccari).

A male, female, and worker from Kuching (John Hewitt) and a male and a dozen workers from the same locality (H. W. Smith). Hewitt's specimens are accompanied by two of the peculiar nests of this ant, which consist of coarse, fibrous carton, built in the form of a series of contiguous and rather irregular chambers on the under surfaces of large leaves. One of the nests is 9 cm. long, 5 cm. broad and 2-3 cm. high, the other 8 cm. long, 4 cm. broad and 2 cm. high. These nests have been observed by Jacobson and von Buttel Reepen in Java and are briefly described by Forel (Notes of the Leyden mus., 1909, **31**, p. 252 and Zool. jahrb. Syst., 1913, **36**, p. 73).

*64a. MYRMICARIA ARACHNOIDES subsp. MELANOGASTER Emery.

Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 692 *nota*, ♀.

Forel, Rev. Suisse zool., 1911, **19**, p. 23, ♀ ♀ ♂.

Type-locality: Sarawak, Borneo.

Sarawak (Haviland); Hayvep (Zimmer).

*65. CARDIOCONDYLA NUDA (Mayr).

Leptothorax nudus Mayr, Sitzb. Akad. wiss. Wien, 1866, **53**, p. 508, ♀.

Cardiocondyla nuda Forel, Mitth. Münch. ent. ver. 1881, **5**, p. 3, ♀.

Type-locality: Ovalau, Fiji (Mus. Godeffroy).

A single worker from Sarawak (H. W. Smith).

66. CREMATOGASTER BRUNNEA Smith.

Crematogaster brunneus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 75, ♀.

Cremastogaster brunnea Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 360, ♀.

Cremastogaster brunea Dalla Torre, Cat. Hymenop., 1893, **7**, p. 80.

Type-locality: Sarawak, Borneo (A. R. Wallace).

A single worker from Sarawak (H. W. Smith) agrees well with Smith's description of the worker minor of this species although the

color is somewhat darker. Unfortunately the thorax is somewhat crushed so that its precise form cannot be determined.

67. CREMATOGASTER CEPHALOTES Smith.

Crematogaster cephalotes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 75, ♀ (*nec* Gerstaecker).

Cremastogaster cephalotes Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 53, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).
Kapouas Basin (Chaper).

68. CREMATOGASTER CORIARIA Mayr.

Cremastogaster coriaria Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 154, ♀ ;
Emery, *ibid.*, 1887, ser. 2, **5**, p. 467, ♀.

Type-locality: Sarawak, Borneo (Doria and Beccari).

69a. CREMATOGASTER EGIDYI Forel subsp. SPINOZAE Forel.

Cremastogaster egidyi subsp. *spinozai* Forel, Rev. Suisse zool., 1911, **19**, p. 25,
♀ ♀.

Type-locality: Sarawak, Borneo (Haviland).

69b. CREMATOGASTER EGIDYI subsp. SPINOZAE var. HAYVEPANA Forel.

Cremastogaster egidyi subsp. *spinozai* var. *hayvepana* Forel, Rev. Suisse zool.,
1911, **19**, p. 26, ♀ ♀.

Type-locality: Hayvep, Borneo (Winkler).

70. CREMATOGASTER FERRARII Emery.

Cremastogaster ferrarii Emery, Ann. Mus. civ. Genova, 1888, ser. 2, **5**, p. 533,
♀ ; Emery, Rev. Suisse zool., 1893, **1**, p. 193.

Type-locality: Siboga, Sumatra (E. Modigliani).
Sarawak, Borneo (Bedot and Pictet).

71. CREMATOGASTER FRAXATRIX Forel.

Cremastogaster fraxatrix Forel, Rev. Suisse zool., 1911, **19**, p. 28, ♀.

Type-locality: Sarawak, Borneo (Haviland).

72. CREMATOGASTER INNOCENS Forel.

Crematogaster innocens Forel, Rev. Suisse zool., 1911, **19**, p. 30, ♂ ♀.

Type-locality: Hayvep, Borneo (Winkler).

73. CREMATOGASTER LONGIPILOSA Forel.

Crematogaster longipilosa Forel, Ann. Mus. nat. Hungar., 1907, **5**, p. 24, ♂ ;
Forel, Rev. Suisse zool., 1911, **19**, p. 24, ♂ .

Type-locality: Kwala Lampur, Malacca (Biro).

Sarawak, Borneo (Haviland).

Eleven workers from Sarawak (H. W. Smith; Roland Thaxter).

74. CREMATOGASTER MODIGLIANII Emery.

Crematogaster modiglianii Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**,
p. 688, ♂ .

Type-locality: Sipora, Mentawai (E. Modigliani).

Banguay, Borneo (Coll. Emery).

74a. CREMATOGASTER MODIGLIANII var. SARAWAKANA Forel.

Crematogaster modiglianii v. *sarawakana* Forel, Rev. Suisse zool., 1911, **19**,
p. 25, ♂ .

Type-locality: Sarawak, Borneo (Haviland).

Ten workers from the Rambungan River, Sarawak (H. W. Smith).

75. CREMATOGASTER MYOPS Forel.

Crematogaster myops Forel, Rev. Suisse zool., 1911, **19**, p. 31, ♂ ♀.

Type-locality: Sarawak, Borneo (Haviland).

76. CREMATOGASTER OBSCURA Smith.

Crematogaster obscura Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**,
p. 76, ♂ ; Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 137, ♂ .

Type-locality: Sarawak, Borneo (A. R. Wallace).

77a. CREMATOGASTER ROGENHOFERI Mayr var. FICTRIX Forel.

Cremastogaster rogenhoferi var. *fictrix* Forel, Rev. Suisse zool., 1911, **19**, p. 27, ♀.

Type-locality: Sarawak, Borneo (Haviland).

78. CREMATOGASTER SUBCIRCULARIS Mayr.

Cremastogaster anthracina Mayr, Tijdschr. ent., 1867, **10**, p. 75, ♀; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 154 (*nec* Smith).

Cremastogaster subcircularis Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, **28**, p. 681, 685, ♀; Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 467, ♀.

Type-locality: Borneo (Doria and Beccari).

79. CREMATOGASTER SUBNUDA Mayr.

Cremastogaster subnuda Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, **28**, p. 680, 682, ♀; Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 53, ♀.

Type-locality: Calcutta, India.

Kapouas Basin, Borneo (Chaper).

80. CREMATOGASTER (PHYSOCREMA) DIFORMIS Smith.

Cremastogaster difformis Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 76, ♀.

Cremastogaster ampullaris Smith, *ibid.*, 1861, **6**, p. 47, ♀.

Cremastogaster difformis Mayr, Tijdschr. ent., 1867, **10**, p. 75, ♀.

Cremastogaster edentata Mayr, *ibid.*, p. 104, ♀, pl. 2, fig. 10.

Cremastogaster deformis Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **5**, p. 467, ♀.

Cremastogaster deformis Emery, Rev. Suisse zool., 1893, **1**, p. 193.

Type-locality: Singapore (A. R. Wallace).

Sarawak (Doria and Beccari; Bedot and Pictet); Kapouas Basin (Chaper).

A single worker from Kuching (John Hewitt).

*80a. CREMATOGASTER (PHYSOCREMA) DIFORMIS subsp. PHYSO-
THORAX Emery.

Crematogaster difformis st. *physothorax* Emery, Ann. Mus. civ. Genova, 1889,
ser. 2, 7, p. 506, ♀.

Crematogaster physothorax Dalla Torre, Cat. Hymenop., 1893, 7, p. 84.

Type-locality: Thagatá, Tenasserim (L. Fea).

Four workers from Kuching (John Hewitt).

80b. CREMATOGASTER (PHYSOCREMA) DIFORMIS subsp. SEWARDI
Forel.

Crematogaster deformis subsp. *sewardi* Forel, Mitth. Naturh. mus. Hamburg,
1901, 18, p. 64, ♀ ♀.

Type-locality: Borneo (Seward).

81. CREMATOGASTER (PHYSOCREMA) INFLATA Smith.

Crematogaster inflatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2,
p. 76, ♀, pl. 2, fig. 2.

Crematogaster inflata Mayr, Tijdschr. ent., 1867, 10, p. 74, ♀; Mayr, Ann.
Mus. civ. Genova, 1872, 2, p. 153; Emery, *ibid.*, 1887, ser. 2, 5, p. 466, ♀.

Type-locality: Singapore (A. R. Wallace).

Sarawak (Doria and Beccari).

Several workers from Kuching (John Hewitt; H. W. Smith) and
one from the Rambungan River, Sarawak (H. W. Smith).

*82. CREMATOGASTER (PHYSOCREMA) STETHOGOMPHA, sp. nov.

Worker. Length 3–6 mm.

Head slightly broader than long, slightly broader behind than in front, with
rounded, convex sides and broadly concave posterior border. Mandibles
stout, rather convex, with oblique, coarsely 5-toothed apical borders. Clypeus
moderately convex, ecarinate, with strongly depressed, straight, anterior
border. Eyes small, flattened, just behind the middle of the head. Frontal
carinae short, subparallel; frontal area small, triangular; frontal groove short
and indistinct. Antennae 11-jointed; scapes reaching the posterior corners of

the head; funiculi with 4-jointed club, all the joints longer than broad. Thorax resembling that of *C. deformis*, but the epinotum is less swollen above and is armed with two sharp, backwardly directed spines, which are longer than broad at their distinctly swollen bases. Promesonotal suture absent, pro- and mesonotum together, excluding the neck, as long as broad, robust, only slightly narrowed behind to the mesoëpinotal suture, which is distinct and transverse, but not impressed. The epinotum is broader than long, broader than the pro- and mesonotum, bulging on the sides and dorsally in front so that the base is very convex in profile. The declivity falls off vertically between the spines; it is as long as the base and longitudinally grooved in the middle. A more or less distinct carina or prominent ruga runs along the middorsal line of the thorax from the neck to the epinotal declivity, with an interruption at the mesoëpinotal suture. Petiole longer than broad, as broad in front as behind, octagonal, the anterior and posterior borders longer than the six other sides, which are subequal. In some specimens, especially in the small workers, the angles become rounded so that the petiole may be described as elongate elliptical. Its upper surface is flat; in profile it is slightly thicker at the posterior than at the anterior end. Postpetiole as broad as the petiole, contracted posteriorly, its anterodorsal surface flat, bilobed behind, but without a median longitudinal furrow in large specimens, feebly sulcate in small specimens. Gaster thick and broad, triangular, with straight anterior border, rounded anterior corners and pointed tip. Legs moderately long and stout.

Opaque; gaster and mandibles distinctly shining; the latter coarsely longitudinally striate and punctate. Clypeus and head densely punctate and reticulate-rugose, with more prominent longitudinal rugae anteriorly, growing finer and merging with the punctate surface on the occiput, sides, and posterior corners. Thorax densely punctate, the upper surface of the pro- and mesonotum and base of the epinotum also vermiculately rugose. Petiole, postpetiole, and first gastric segment much more finely and densely punctate than the thorax, the first segment also with sparser and somewhat larger, piligerous punctures; remaining gastric segments, legs, and scapes smoother, more shining, transversely alutaceous; the legs with sparse, coarse piligerous punctures.

Hairs short, whitish, delicate, sparse, and erect, of uneven length on the body, more numerous on the head and thorax than on the pedicel and gaster; shorter and more appressed on the legs and antennae. Pubescence pale, rather long, sparse, very distinct on the gaster and sides and posterior corners of the head.

Dark brown; mandibles, except the teeth, gula, and sometimes the lateral and posterior corners of the head, sides of epinotum, upper surface of petiole and articulations of legs, ferruginous red, second to fourth tarsal joints reddish yellow.

Numerous workers taken by Harrison W. Smith near Kuching (type-locality) and three workers from the Rambungan River, Sarawak. *Type*.—M. C. Z. 8,948.

This species is quite distinct from the other East Indian Physocremas, especially *deformis*, *inflata*, and *tumidula* Emery, and easily recognized by its large size, coarse sculpture, and well-developed epinotal spines. It is much more closely related to a form described by Forel from Malacca as *C. deformis* subsp. *vacca* (Bull. Soc. Vaud. sci. nat., 1911, ser. 5, 47, p. 384) but which, I believe, should be regarded as an independent species. This Malaccan form, however, is black, measures only 3.3–3.5 mm., and has the epinotum much less swollen, and apparently even less distinctly constricted off from the mesonotum than in *stethogompha*, and the postpetiole is sulcate dorsally. It is, perhaps, admissible to regard *stethogompha* as a subspecies of *vacca*.

*82a. CREMATOGASTER (PHYSOCREMA) STETHOGOMPHA var. DETRITINODIS, var. nov.

Worker. Length 3.5 mm.

Differing from the typical form in having the head less distinctly concave behind and in sculpture, the rugae of the head and thorax being finer, so that the dense puncturation is more apparent and the vermiculate rugosity of the thorax is laxer and finer, especially in the middorsal region. The petiole and postpetiole are shining, the former elongate elliptical, the latter with a distinct median furrow. Mandibles more yellowish than in the typical form.

A single worker from the Sarawak River, Kuching (H. W. Smith).

83. CREMATOGASTER (OXYGYNE) DAISYI Forel.

Cremastogaster (Oxygyne) daisyi Forel, Ann. Soc. ent. Belgique, 1901, 45, p. 376, ♀ ♀.

Type-locality: Sarawak (Haviland).

84. CREMATOGASTER (DECACREMA) DECAMERA Forel.

Cremastogaster (Decacrema) decamera Forel, Ann. Soc. ent. Belgique, 1910, 54, p. 18 nota, ♀ ♀ ♂.

Type-locality: Sarawak (Haviland).

Five workers and a dealated female from Kuching (John Hewitt), "from Macaranga with slightly trifid leaves," and a winged female from British North Borneo (E. B. Kershaw).

85. CREMATOGASTER (DECACREMA) BORNEËNSIS Ern. André.

Cremastogaster borneënsis Ern. André, Rev. ent., 1896, p. 263, ♀.

Type-locality: Borneo.

85a. CREMATOGASTER (DECACREMA) BORNEËNSIS var. INSULSA Forel.

Cremastogaster (Decacrema) borneënsis var. *insulsa* Forel, Rev. Suisse zool., 1911, **19**, p. 33, ♀ ♀ ♂.

Type-locality: Borneo (Hose).

85b. CREMATOGASTER (DECACREMA) BORNEËNSIS var. HARPYIA Forel.

Cremastogaster (Decacrema) borneënsis var. *harpyia* Forel, Rev. Suisse zool., 1911, **19**, p. 33, ♀ ♀.

Type-locality: Sarawak, Borneo (Haviland).

85c. CREMATOGASTER (DECACREMA) BORNEËNSIS subsp. SYMBIA Forel.

Cremastogaster (Decacrema) borneënsis subsp. *symbia* Forel, Rev. Suisse zool., 1911, **19**, p. 34, ♀ ♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

85d. CREMATOGASTER (DECACREMA) BORNEËNSIS subsp. NOVEN Forel.

Cremastogaster (Decacrema) borneënsis subsp. *novem* Forel, Rev. Suisse zool., 1911, **19**, p. 35, ♀ ♀.

Type-locality: Sarawak, Borneo (Haviland).

I refer a single female from British North Borneo (E. B. Kershaw), to this subspecies.

85e. CREMATOGASTER (DECACREMA) BORNEËNSIS subsp. HOSEI Forel.

Cremastogaster (Decacrema) borneënsis subsp. *hosei* Forel, Rev. Suisse zool., 1911, **19**, p. 35, ♀.

Type-locality: Sarawak, Borneo (Haviland).

85f. CREMATOGASTER (DECACREMA) BORNEËNSIS subsp. CAPAX Forel.

Cremastogaster (Decacrema) borneënsis subsp. *capax* Forel, Rev. Suisse zool., 1911, **19**, p. 37, ♂, ♀.

Type-locality: Sarawak, Borneo (Haviland).

86. CREMATOGASTER (DECACREMA) CAPTIOSA Forel.

Cremastogaster (Decacrema) captiosa Forel, Rev. Suisse zool., 1911, **19**, p. 37, ♂.

Type-locality: Sarawak, Borneo (Haviland).

87. CREMATOGASTER (DECACREMA) ANGULOSA Ern. André.

Cremastogaster angulosa Ern. André, Rev. ent., 1896, p. 264, ♂.

Type-locality: Borneo.

88. CREMATOGASTER (DECACREMA) BIFORMIS Ern. André.

Cremastogaster biformis Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 53, ♂.

Type-locality: Kapouas Basin, Borneo (Chaper).

89. VOLLENHOVIA PUNCTATOSTRIATA Mayr.

Vollenhovia punctatostriata Mayr, Reise Novara. Zool., **2**. Formicid., 1865, p. 21, *nota*, ♀; Mayr, Tijdschr. ent., 1867, **10**, p. 94, ♀; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 152, ♀; Emery, *ibid.*, 1887, ser. 2, **5**, p. 453, ♀.

Type-locality: Java (Leyden Museum).

Sarawak (Doria and Beccari).

90. VOLLENHOVIA RUFIVENTRIS Forel.

Vollenhovia rufiventris Forel, Ann. Soc. ent. Belgique, 1901, **45**, p. 374, ♂.
Monomorium rufiventre Emery, in Sarasin and Roux, Nova Caledonia. Zool., 1914, **1**, p. 407 *nota*, ♂.

Type-locality: Sarawak, Borneo (Haviland).

Female. Length 11.5 mm.

Head rectangular, slightly longer than broad, nearly as broad in front as behind with feebly excised posterior border and a large shallow impression on each side of the vertex. Eyes small, near the middle of the sides, ocelli very small, the anterior distinctly larger than the posterior. Mandibles large, with nearly straight external borders, the apical borders broad, deeply and arcuately excised in the middle, with three large, subequal teeth at the apical and three smaller, blunt teeth at the basal end of the excision. Clypeus very short on the sides, rather flat in the middle, with a narrow elongation backward between the frontal carinae, the anterior border straight and entire. Frontal area obsolete; frontal carinae well-developed, nearly half as long as the antennal scapes, slightly diverging behind, nearly as far apart as their distance from the lateral border of the head. Antennae short, 12-jointed, the scapes strongly curved at the base, their tips reaching only to the posterior orbits; the funiculi with a 3-jointed club; joints 2-5 broader than long, joint 6 as long as broad, the remaining joints longer than broad. Thorax rather small, as broad as the head, the pronotum with submarginate sides and bluntly rectangular humeri, the mesonotum flattened above, as long as broad, prolonged in the middle anteriorly; the epinotum short, in profile evenly rounded and moderately convex, without distinct base and declivity, concave in the middle behind between a pair of slight swellings representing the denticles of other species. Petiole from above regularly rectangular, $1\frac{1}{2}$ times as long as broad, as broad in front as behind, with sharp anterior and posterior angles; in profile, with a node as high as the segment, its anterior surface concave, its posterior convex, the summit blunt and rounded; the lower surface anteriorly produced as a large protuberance translucent in the middle, and tipped with a small, blunt tooth. Postpetiole subrectangular, with convex sides and dorsum, slightly broader than long and broader than the petiole, its ventral surface with a large, thick, pointed, downwardly directed tooth at the anterior end. Gaster elongate elliptical, narrowed anteriorly and posteriorly. Legs with much thickened femora and clavate tibiae. Wings nearly 8 mm. long, narrow, with a single cubital and a small, narrow discoidal cell; radial cell open; pterostigma small but distinct.

Very shining; mandibles sparsely punctate, sharply longitudinally striate along the external borders and at the tip. Clypeus uneven but not rugose. Cheeks and anterior $\frac{3}{4}$ of head above, longitudinally and rather densely rugose, with interspersed punctures; occipital region and sides of gula with coarse, piligerous punctures. Pronotum coarsely and sparsely punctate, indistinctly striate on the sides. Mesonotum finely, longitudinally rugose behind, anteriorly smooth in the middle and coarsely and sparsely punctate on the sides. Scutellum and sides of epinotum sharply, longitudinally rugose, the former smooth and more or less coarsely punctate in the middle. Slope of epinotum, petiole, postpetiole, gaster, scapes, and legs very smooth and shining, with sparse piligerous punctures; lateral and ventral portions of petiole and postpetiole densely and finely punctate.

Hairs slender, pointed, whitish, sparse, of very unequal length, suberect

or erect, shorter and more reclinate on the appendages, partly short and appressed on the gaster.

Black; terminal antennal joint, articulations of legs and tarsi, beyond the basal joint, reddish brown; cheeks and tips of mandibles obscurely tinged with red. Wings distinctly infuscated, more deeply along the anterior margin; veins and pterostigma dark brown.

Described from a single specimen taken on Mt. Matang, West Sarawak by G. E. Bryant and sent me by Mr. Horace Donisthorpe. There is also a worker from Kuching (John Hewitt) in my collection.

I have described the female in detail on account of its interest in connection with Emery's contention (in Sarasin and Roux, Nova Caledonia. Zool., 1914, 1, p. 407 *nota*) that *rufiventris* is really a Monomorium, mainly because the worker is smooth and shining and has a slightly pedunculate petiole. Although my specimen is not accompanied by workers, Forel's recent discovery (Tijdschr. ent., 1915, 58, p. 23) of all three phases of a new variety of this ant, var. *simalurana* from Simalur, a small island off the west coast of Sumatra, shows that the Bornean female must belong to the typical *rufiventris* or one of its varieties. The worker *simalurana* varies from 3–7.9 mm. in length, the female measures 12–12.5 mm. and the male only 4.4 mm. These extraordinary differences in stature are comparable to those previously noted by Forel (Philippine journ. sci., 1910, 5, p. 125) in *V. oblonga* subsp. *dispar*, the worker of which measures 3.2 mm., the female 8 mm., the male 3.8 mm. Certainly the female of what I take to be the typical *rufiventris* described above and that of the var. *simalurana*, which is merely somewhat larger and very slightly different in other respects, must be regarded as belonging to *Vollenhovia*. It is, moreover, closely related to *V. striatopunctata* Mayr, known only from the female (9–10 mm. long), and considered by Emery as probably the female of *V. oblonga* subsp. *laevithorax* Emery (*loc. cit.*, p. 406). In some species and subspecies of *Vollenhovia*, however, the female is only slightly larger than the worker, e.g., in *V. emeryi* Wheeler of Japan and in a Bornean subspecies of *V. banksi* Forel described below.

91a. *VOLLENHOVIA OBLONGA* Smith var. *RUFESCENS* Emery.

Vollenhovia rufescens Emery, Bull. Soc. ent. France, 1894, p. 69, ♀.

Vollenhovia oblonga var. *rufescens* Emery, in Sarasin and Roux, Nova Caledonia. Zool., 1914, 1, p. 406, ♀.

Type-locality: Pulo Laut, Borneo.

Borneo (Coll. Emery).

91b. VOLLENHOVIA OBLONGA subsp. ALLUAUDI Emery.

Vollenhovia alluaudi Emery, Bull. Soc. ent. France, 1894, p. 68, ♀.

Vollenhovia oblonga var. *alluaudi* Emery, Ann. Mus. civ. Genova, 1897, ser. 2, 18, p. 560, ♀.

Vollenhovia oblonga subsp. *alluaudi* Emery, in Sarasin and Roux, Nova Caledonia. Zool., 1914, 1, p. 406; Forel, Trans. Linn. soc. London. Zool., 1912, ser. 2, 15, p. 162, ♀ ♀.

Type-locality: Seychelles.

Borneo (Coll. Emery).

91c. VOLLENHOVIA OBLONGA subsp. LAEVITHORAX Emery.

Vollenhovia laevithorax Emery, Ann. Mus. civ. Genova, 1889, ser. 2, 7, p. 501, ♀.

Vollenhovia oblonga subsp. *laevithorax* Emery, in Sarasin and Roux, Nova Caledonia. Zool., 1914, 1, p. 406.

Type-locality: Tenasserim (L. Fea).

Borneo (Coll. Emery).

*92. VOLLENHOVIA HEWITTI, sp. nov.

Worker. Length 2.4–2.6 mm.

Head rectangular, about $\frac{1}{5}$ longer than broad, with parallel sides and nearly straight posterior border. Eyes flattened, a little in front of the middle of the sides. Mandibles rather broad, their apical and basal borders meeting at a sharp right angle, the former with three large apical and a few minute and indistinct basal teeth. Clypeus rather convex in the middle, strongly bicarinate, its anterior border straight and entire. Frontal area small, semicircular, frontal carinae short. Antennal scapes reaching nearly to the posterior third of the head; funiculi with a 4-jointed club, joints 2–7 decidedly broader than long. Thorax rather long, narrower than the head, the pro- and mesonotum together longer than broad, with prominent humeri, somewhat flattened dorsally and laterally; mesoëpinotal constriction narrow but distinct. Epinotum from above a little longer than broad, distinctly narrower than the mesonotum, laterally compressed above in profile, with the base feebly rounded, and longer than the abrupt, concave declivity, which is slightly angulate but not dentate on each side above. Petiole narrow, twice as long as broad, as broad in front as behind, through the node nearly as high as long, the latter blunt and rounded, with subequal, slightly concave anterior and feebly convex posterior slope, the ventral surface anteriorly with a compressed, translucent

tooth. Postpetiole broader than the petiole, longer than broad, scarcely broader behind than in front, elliptical, with convex lateral and dorsal surfaces.

Shining; mandibles with a few minute, scattered punctures; head with the cheeks and anterior $\frac{4}{5}$ above subopaque, longitudinally rugulose and sparsely serially punctate; occiput and lower surface coarsely and sparsely punctate and shining. Thorax above smooth, with small, scattered, piligerous punctures; sides of thorax subopaque and densely punctate; extreme base of first gastric segment sharply striate; remainder of body smooth and shining, with indistinct, scattered, piligerous punctures.

Hairs pale, sparse, of unequal length, erect or reclinate; on the appendages shorter and more appressed.

Dark castaneous brown; mandibles, tips of scapes, funiculi, trochanters, knees, tibiae and tarsi red.

Described from four specimens taken at Kuching (John Hewitt).

This species resembles *V. oblonga* subsp. *laevithorax* Emery in sculpture, but is much smaller, with narrower head, broader mandibles and longer petiole and postpetiole, and is quite different from any of the numerous other species of *Vollenhovia* recently described by Emery, Forel, and Viehmeyer. The genus is difficult, so that the limits of the subspecies and varieties are still to be established on the basis of much more material than has been collected heretofore.

*93a. *VOLLENHOVIA BANKSI* Forel subsp. *KUCHINGENSIS*, subsp. nov.

Worker. Length 1.8–2 mm.

Differing from the typical form from the Philippines in its darker color, the body, femora, and tibiae being dark brown. The meso-epinotal impression is visible, though very feeble; the epinotum has a minute denticle on each side, the antennal scapes are a little shorter and the eyes a little further forward on the head.

Female (deälated). Length nearly 3 mm.

Resembling the worker, but the rugae on the head are coarser, more undulating, with finely punctate interrugal spaces. The thorax above is coarsely and rather densely punctate, the pronotum somewhat reticulately rugose, the mesonotum smooth in the middle in front, longitudinally rugulose behind, the mesopleurae rather smooth and shining in the middle. The epinotum is coarsely reticulately rugose, the concavity of the declivity transversely rugose; the petiole and postpetiole above coarsely foveolate. The tips of the antennal scapes reach only a little beyond the median transverse diameter of the head.

Described from twelve workers and a single female from Kuching (John Hewitt) taken "from an old fungus." I have compared the workers with a couple of cotypes of *banksi* received from the Manila Bureau of Science. *Type*.—M. C. Z. 8,949.

94. *MONOMORIUM FLORICOLA* (Jerdon).

Atta floricola Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 107; Jerdon, Ann. mag. nat. hist., 1854, ser. 2, **13**, p. 49, ♀.

Monomorium speculare Mayr, Sitzb. Akad. wiss. Wien, 1866, **53**, p. 509, ♀.

Monomorium floricola Emery, in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 66.

Type-locality: Tellicherry, Southern India (Jerdon).

Sarawak (Doria and Beccari).

Several workers from Kuching (John Hewitt).

95. *MONOMORIUM LATINODE* Mayr.

Monomorium latinode Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 152, ♀;
Emery, ibid., 1887, ser. 2, **5**, p. 459, ♀.

Type-locality: Sarawak (Doria and Beccari).

96. *MONOMORIUM PHARAONIS* (Linné).

For the long synonymy of this cosmopolitan ant see Dalla Torre, Cat. Hymenop., 1893, **7**, p. 68.

Type-locality: Egypt.

Sarawak (Doria and Beccari).

Numerous workers and dealated females from Kuching, Matang, and Poi (John Hewitt).

*97. *SOLENOPSIS GEMINATA* (Fabricius) subsp. *RUFA* (Jerdon).

Atta rufa Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 106; Jerdon, Ann. mag. nat. hist., 1854, ser. 2, **13**, p. 48, 2 ♀ ♀.

Solenopsis geminata Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, **20**, p. 996 (part); Mayr, ibid., 1886, **36**, p. 460 (part); Rothney, Trans. Ent. soc. London, 1889, p. 365.

Solenopsis geminata var. *rufa* Forel, Deutsch. ent. zeitschr., 1909, p. 268.

Solenopsis geminata race *rufa* Forel, Biol. Centr. Amer. Hymenop., 1899-1900, **3**, p. 80.

Type-locality: Malabar, Southern India (Jerdon).

Two workers and a male from Kuching (John Hewitt).

98. LOPHOMYRMEX BEDOTI Emery.

Lophomyrmex bedoti Emery, Rev. Suisse zool., 1893, **1**, p. 192, ♀ ♀.

Type-locality: Deli, Sumatra (Bedot and Pictet).

Pulo Laut, Borneo (Coll. Emery).

A single worker from Kuching (John Hewitt).

99. PHEIDOLOGETON AFFINIS (Jerdon).

Oecodoma affinis Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 110, 2 ♀ ;

Jerdon, Ann. mag. nat. hist., 1854, ser. 2, **13**, p. 51, 2 ♀ .

Pheidole affinis Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 174, ♀ .

Atta bellicosa Smith, ibid., p. 164, ♀ .

Solenopsis laboriosa Smith, Journ. Proc. Linn. soc. London. Zool., 1861, **6**, p. 48, ♀ .

Pheidologeton laboriosus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 750, ♀ .

Pheidologeton affinis Roger, Verzeich. formicid., 1863, p. 30.

Solenopsis calida Smith, Journ. Proc. Linn. soc. London. Zool., 1863, **7**, p. 22, ♀ .

Pheidologeton bellicosum Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 360.

Type-locality: Malabar, Southern India (Jerdon).

Kapouas Basin, Borneo (Chaper).

A single worker media from Sarawak (Roland Thaxter).

100. PHEIDOLOGETON DIVERSUS (Jerdon).

Oecodoma diversus Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 109, ♀ ; Jerdon, Ann. mag. nat. hist., 1854, ser. 2, **13**, p. 51, ♀ .

Pheidole diversa Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 174, ♀ .

Pheidole ocellifera Smith, ibid., p. 174, 2 ♀ .

Pheidole pabulator Smith, Journ. Proc. Linn. soc. London. Zool. 1861, **5**, p. 112, ♀ .

Pheidologeton ocelliferus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 750 24, pl. 19, fig. 13.

Pheidologeton megacephalus Roger, Verzeich. formicid., 1863, p. 30 24.

Pheidologeton diversus Roger, ibid., p. 30.

Pheidologeton ocellifer Mayr, Reise Novara. Zool., **2**. Formicid., 1865, p. 103.

Pheidologeton pabulator Mayr, Verh. Zool. bot. gesellsch. Wien., 1886, **36**, p. 362.

Pheidole megacephalotes Dalla Torre, Wien. ent. zeit., 1892, **11**, p. 90.

Type-locality: Wynaad, Southern India (Jerdon).

Kapouas Basin, Borneo (Chaper).

101. DILOBOCONDYLA BORNEËNSIS Wheeler.

Dilobocondyla borneënsis Wheeler, Proc. New Engl. zool. club, 1916, **6**, p. 12, ♀, fig. 2.

Type-locality: Bongo Mt., Sarawak, Borneo (John Hewitt).

102. PRISTOMYRMEX TRACHYLISUS (Smith).

Myrmica (Monomorium) *trachylissa* Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 126, ♀.

Pristomyrmex trachylissa Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 359.

Pristomyrmex trachylissus Dalla Torre, Cat. Hymenop., 1893, **7**, p. 62.

Type-locality: Borneo (A. R. Wallace).

103. MYRMECINA UNDULATA Emery.

Myrmecina undulata Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 678, ♀ ♀.

Type-locality: Si Rambé, Sumatra (E. Modigliani).

Pulo Laut, Borneo (Coll. Emery).

*104. ACANTHOMYRMEX DYAK, sp. nov.

Soldier. Length 5 mm.

Head very large, convex above, overlapping the thorax nearly to the meso-epinotal constriction, subrectangular, a little longer than broad, with rather

straight, subparallel sides, bilobed behind, owing to the deep, angular occipital incision, which is continued into a deep occipital and frontal groove all the way to the frontal area. Eyes small, moderately convex, elongate elliptical at the anterior third of the head. Mandibles very large and convex, with very broad, straight, edentate apical and very concave basal borders. Clypeus depressed on the sides and behind, convex and roof-like, but not carinate in the middle in front, where it projects over the proximal ends of the apical mandibular borders as a short lobe, with straight margin and indistinctly dentate corners. Frontal area rather distinct, triangular. Frontal carinae strongly diverging behind, each bordering a deep narrow scrobe for the antennal scape, running down obliquely to the side of the head a little behind and above the eye. At this point it turns sharply at an angle to form a short scrobe for the base of the funiculus, running forward just above the eye and merging anteriorly into an interrugal space. Antennae slender, the scapes curved and flattened but not dilated at the base. Funiculi with a 3-jointed club, shorter than the remainder of the funiculus; joints 2-8 as long as broad. Thorax short, less than half as broad as the head; pro- and mesonotum rather depressed dorsally where they are covered by the posterior portion of the head; pronotum without spines. Mesoëpinotal constriction not very pronounced. Epinotum very short, its base much shorter than the vertical declivity; the spines very long, slightly curved downward, thick at the base, strongly tapering at the tips, diverging outward, backward and upward, much longer than their distance apart at the base. Metasternal angles small, acute, directed upward. Petiole from above nearly twice as long as broad, a little broader behind than in front, with concave sides and narrow node, armed with two upwardly directed acute spines, the space between which is semicircular; anterior surface of the node long and concave, the posterior straight and abrupt. Postpetiole a little broader than the petiole and a little broader than long, very convex dorsally and rounded on the sides. Gaster only about $\frac{1}{4}$ as large as the head, subcircular, flattened, with straight anterior border. Femora thickened in the middle, tibiae somewhat clavate.

Rather shining; mandibles smooth, with very fine, widely scattered punctures. Clypeus smooth and shining. Head covered with umbilicate piligerous foveolae, elongate on the gular surface, on the space between the frontal carinae interspersed with strong, diverging longitudinal rugae; cheeks coarsely, longitudinally rugose, space enclosed by the two limbs of the scrobes coarsely reticulate-rugose; the scrobes smooth and shining, not transversely rugose. Thorax coarsely and reticulately rugose; epinotal declivity between the spines and the whole petiole smooth and shining; postpetiole coarsely and indistinctly rugose above, subopaque. Gaster smooth and shining.

Hairs pale grayish, short, erect, blunt, but not thick, sparse, covering the scapes and legs including the funiculi and tarsi as well as the body, more abundant on the gaster; on the antennal scapes, most numerous on the anterior surface; on the legs, most numerous on the extensor surfaces.

Deep ferruginous brown; mandibles, antennae, legs, epinotal spines, and peduncle of petiole deep red; gaster and borders of mandibles blackish.

Worker. Length 3.5 mm.

Head much smaller than in the soldier, as broad as long, rather rectangular, with straight posterior border and feebly convex sides. Eyes small, but very convex, hemispherical, distinctly behind the middle of the head. Mandibles large, shaped somewhat as in the soldier, but with much less convex external borders, with 2 or 3 apical and several minute, widely spaced basal teeth. Clypeus moderately convex, with nearly straight anterior border. Frontal area large, flat, triangular. Antennal scrobes short, limited to a groove for the base of the scapes between the prominent rugae. Antennal scapes straight, not flattened at the base, extending about $\frac{1}{3}$ their length beyond the posterior corners of the head. Funiculi also longer than in the soldier, with all the joints longer than broad. Thorax shaped much as in the soldier, but the pronotum with a pair of very long, straight, pointed spines, directed upward and outward, distinctly longer than the similarly directed spines on the epinotum. The latter, however, are bent slightly backwards at a feeble angle just beyond the middle. Shape of petiole, postpetiole, and gaster much as in the soldier, but the spines on the petiole are less spreading and more erect, more slender, and acute.

Sculpture of thorax like that of the soldier; mandibles and clypeus smooth, the anterior border of the latter with short, coarse rugae, the head very coarsely longitudinally rugose, the rugae connected by transverse rugules. Antennal scrobes shining, feebly punctate, transversely rugulose anteriorly. Petiole postpetiole and gaster smooth and shining.

Pilosity and color much like those of the soldier, except that the mandibles are more yellowish and without dark borders.

Described from a single soldier and two workers taken by Mr. John Hewitt at Kuching.

This species seems to be very close to *A. ferox* Emery, based on a worker specimen from Perak. I am, however, unable to make Emery's description of the sculpture of the head and thorax accord with that of the Bornean form. At any rate his words "foveolis piligeris confertis sculptum" do not seem to me to describe the conditions in my specimens. Moreover, he gives the length of his specimen as about 4.5 mm. and describes the two pairs of thoracic spines as equal ("thorax spinis quatuor subrectis, aequalibus armatus"), and the postpetiole as "sublaevis," whereas it is very smooth and shining in *dyak*. The ants of the genus *Acanthomyrmex* seem to be very rare. No one has taken *A. notabilis* since it was described by Smith, and Bingham in the Fauna of British India merely translates Emery's description of *A. lucirolae* of Ceylon. Emery has recently based another species, *A. kochi*, from New Guinea (Nova Guinea, 9, Zool., 1911, 2, p. 252) on a

single worker specimen. It is very small (2.2 mm.), ferruginous yellow, with the spines more curved and more nearly horizontal than in the other species.

*105. *ACANTHOMYRMEX DUSUN*, sp. nov.

Soldier. Length 3.6 mm.

Head very large, extending back over the thorax to the mesoëpinotal constriction, subrectangular, a little longer than broad, with straight, parallel sides in front and rounded posterior corners, or lobes, separated by an angular occipital incision continuous with a deep occipital and frontal groove, running forward to the clypeus. In profile the dorsal surface of the head is convex and rounded, but distinctly depressed in the middle just in front of the occipital border. Eyes small, elongate elliptical, rather convex, at the anterior fourth of the sides. Clypeus, mandibles, and antennal scrobes shaped much as in *dyak*, but the frontal carinae which border them much more diverging behind and the frontal area obsolete. Antennae also very similar, but joints 2 and 3 more transverse and joints 4-8 as long as broad. Thorax short, the epinotal spines very long, stout at the base, tapering and pointed at the tips, strongly curved backward and downward and somewhat outward. Petiole fully twice as long as broad, its anteroposteriorly compressed node narrowed above, without spines, but with its rather sharp, transverse margin angularly excised. Postpetiole regularly rectangular, broader than long, broader than the petiole, rather flat above. Gaster about $\frac{1}{4}$ as large as the head, excluding the mandibles, nearly circular, with rather straight anterior border. Femora thickened in the middle, tibiae clavate.

Shining; mandibles and clypeus smooth, the former sparsely and finely punctate, the latter without rugosities along its anterior border. Head covered rather uniformly with sparse, punctate foveolae, the triangular space between the two limbs of each scrobe very coarsely reticulate-rugose, the space between the frontal carinae finely, but not uniformly, longitudinally striate, the scrobes transversely striolate. Thorax and postpetiole very coarsely reticulate-rugose, epinotal declivity between the spines, the petiole and gaster very smooth and shining.

Pilosity much as in *dyak*, but the hairs longer and more delicate, though blunt, and somewhat more numerous on the head, forming an even row along the anterior border of the antennal scapes and more numerous on the extensor than on the flexor surfaces of the legs.

Brownish ferruginous; mandibles, antennae, and legs deep red; petiolar node, postpetiole, and gaster black.

Described from a single specimen taken on Mt. Matang, West Sarawak by Mr. G. E. Bryant and sent me by Mr. Horace Donisthorpe.

This species is certainly very different from *dyak* and *luciolae*, but seems to be closely related to Smith's *notabilis* described from the island of Batjan. Judging from Smith's figure and description, however, *dusun* has a smaller and longer head and more curved epinotal spines. My specimen seems to be too small to be the soldier of Emery's *ferox*.

106. CALYPTOMYRMEX EMERYI Forel.

Calyptomyrmex emeryi Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 51,
♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

Female. Length 4.5 mm.

Very similar to the worker. Thorax narrower than the head only slightly longer than broad; mesonotum somewhat flattened above, subtriangular, fully as broad as long; scutellum longitudinally impressed in the middle, overhanging the extremely short, vertical epinotum. Both the mesonotum and scutellum coarsely reticulate-rugose. Wings with well-developed discoidal cell, large pterostigma and single cubital cell, the membranes uniformly brownish hyaline, the veins and pterostigma darker brown.

A single specimen from Kuching (John Hewitt), which has been compared with a worker cotype in my collection.

107. MERANOPLUS CASTANEUS Smith.

Meranoplus castaneus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 81, ♀, pl. 2, fig. 7; Forel, Zool. jahrb. Suppl., 1912, **15**, p. 61.

Meranoplus cordatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 82, ♀, pl. 2, fig. 5; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 155, ♀; Emery, *ibid.*, 1887, ser. 2, **5**, p. 470, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari).

108. MERANOPLUS MUCRONATUS Smith.

Meranoplus mucronatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 82, ♀, pl. 2, fig. 6; Mayr, Tijdschr. ent., 1867, **10**, p. 84, ♀.

Type-locality: Mt. Ophir, Malacca (A. R. Wallace).

Borneo.

*109. TETRAMORIUM CURTULUM Emery.

Tetramorium curtulum Emery, Ann. Mus. civ. Genova, 1894, ser. 2, **14**, p. 22, ♀.

Type-locality: Palon, Burmah (L. Fea).

A single worker from Mt. Matang, West Sarawak (G. E. Bryant), received from Mr. Donisthorpe.

*110. TETRAMORIUM SIMILLIMUM (Smith).

Myrmica simillima (Nylander) Smith, List. Brit. anim. Brit. mus., 1851, **6**, Acul. p. 118, ♀.

Tetrogmus caldarius Roger, Berl. ent. zeitschr., 1857, **1**, p. 12, ♀ ♀.

Myrmica (Leptothorax) simillima Smith, Cat. Brit. foss. Hymenop., 1858, p. 31, ♀.

Myrmica caldaria Meinert, Naturv. afh. Dansk. vid. selsk., 1860, ser. 5, **5**, p. 334, ♀ ♀ ♂.

Tetramorium simillimum Mayr, Europ. Formicid., 1861, p. 61, ♀.

Type-locality: Dorsetshire, England, in a hot-house (Dale).

Four workers from Sarawak (Roland Thaxter).

111. TETRAMORIUM PACIFICUM Mayr.

Tetramorium pacificum Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, **20**, p. 972, 976, ♀ ♀.

Type-locality: Tongatabu, Friendly Islands (Museum Godeffroy).

Kapouas Basin, Borneo (Chaper); Tandjong (Fritz Suck).

112. TETRAMORIUM SCABRUM Mayr.

Tetramorium scabrum Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, **28**, p. 672, ♀.

Type-locality: Borneo (Museum of Pest).

A single worker from Bongo Mt., Sarawak (Hewitt and Brooks).

113. TETRAMORIUM GUINEENSE (Fabricius).

For the synonymy of this common tropicopolitan ant see Dalla Torre, Cat. Hymenop. 1893, **7**, p. 133.

Type-locality: Guinea (Dr. Isert).

Sarawak (Doria and Beccari; Bedot and Pictet); Kapouas Basin (Chaper).

Several workers and a female from Kuching (John Hewitt).

114. TRIGLYPHOTHRIX PARVISPINA Emery.

Triglyphothrix parvispina Emery, Rev. Suisse zool., 1893, **1**, p. 214, ♀.

Type-locality: Pulo Laut, Borneo.

*115. TRIGLYPHOTHRIX STRIATIDENS (Emery).

Tetramorium obesum st. striatidens Emery, Ann. Mus. civ. Genova, 1889, ser. **2**, **7**, p. 501, ♀.

Triglyphothrix obesum st. striatidens Emery, Explor. sci. Tunisie. Fourmis, 1891, p. 4.

Triglyphothrix striatidens Dalla Torre, Cat. Hymenop., 1893, **7**, p. 136.

Type-locality: Bhamô, Burmah (L. Fea).

A worker and female from Kuching (John Hewitt) and a worker from Sarawak (Roland Thaxter).

116. CATAULACUS BROOKEI Forel.

Cataulacus brookei Forel, Ann. Soc. ent. Belgique, 1901, **45**, p. 378, ♀ ♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

117. CATAULACUS GRANULATUS (Latreille).

Formica granulata Latreille, Hist. nat. fourmis, 1802, p. 275, ♀, pl. 12, fig. 75.

Cryptocerus granulatus Lepeletier, Hist. nat. ins. hyménop. 1836, **1**, p. 171.

Cataulacus granulatus Smith, Trans. Ent. soc. London, 1854, ser. **2**, **2**, p. 226.

Cataulacus reticulatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 81, ♀, pl. 2, fig. 8.

Type-locality: "Grandes-Indes."

Sarawak, Borneo (A. R. Wallace).

117a. CATAULACUS GRANULATUS subsp. HISPIDUS Smith.

Cataulacus hispidus Smith, Trans. Ent. soc. London, 1876, p. 611, ♀, pl. 11, fig. 11.

Cataulacus granulatus subsp. *hispidus* Forel, Rev. Suisse zool., 1911, **19**, p. 24, ♀.

Type-locality: Singapore.

Sarawak, Borneo (Haviland).

A single worker from Kuching (John Hewitt).

118. CATAULACUS HISPIDULUS Smith.

Cataulacus hispidulus Smith, Journ. Proc. Linn. soc. London. Zool., 1864, **8**, p. 76, ♀, pl. 4, fig. 7; Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 155; Emery, *ibid.*, 1887, ser. 2, **5**, p. 470, ♀; Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 55, ♀.

Cataulacus granulatus var. *hispidulus* Dalla Torre, Cat. Hymenop., 1893, **7**, p. 138.

Type-locality: Sumatra (A. R. Wallace).

Sarawak (Doria and Beccari), Kapouas Basin (Chaper).

Four workers from Kuching (John Hewitt) and one from Bongo Mt. (Hewitt and Brooks).

119. CATAULACUS HORRIDUS Smith.

Cataulacus horridus Smith, Journ. Proc. Linn. Soc. London. Zool., 1857, **2**, p. 81, ♀, pl. 2, fig. 3; Emery, Rev. Suisse zool., 1893, **1**, p. 216.

Cataulacus insularis Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 80, ♂, pl. 2, fig. 4.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Three workers and six males from Kuching (John Hewitt). The males agree very closely with Smith's description of his *C. insularis*, except in having the gaster entirely black, so that I regard *insularis* as a synonym of *horridus*. He describes the gaster of his specimen as reddish at the base, a condition probably due to immaturity.

120. CATAULACUS PRAETEXTUS Smith.

Cataulacus praetextus Smith, Trans. Ent. soc. London, 1867, ser. 3, **5**, p. 528, ♀, pl. 26, fig. 5.

Type-locality: Borneo.

I refer a female specimen from Kuching (John Hewitt) to this species.

*121. *CATAULACUS LATISSIMUS* Emery.

Cataulacus latissimus Emery, Rev. Suisse zool., 1893, **1**, p. 215, ♀, pl. 8, fig. 10.

Type-locality: Perak (Bedot and Pictet).

Two workers from Kuching (John Hewitt).

*122. *STRUMIGENYS INDAGATRIX*, sp. nov.

Worker. Length 1.7 mm.

Slender; head flattened, $1\frac{3}{4}$ times as long as broad, with semicircularly excised posterior border, narrowed at the eyes, the portion anterior to the antennal insertions as long as broad; eyes moderately large and convex. Mandibles about half as long as the head, straight, slender, slightly narrowed at their insertions, with straight, parallel borders, a pair of long, acute, subequal apical teeth and a spiniform preapical tooth of the same shape but somewhat shorter. Clypeus as long as broad, flat, with entire anterior border. Antennae slender; the scapes reaching nearly to the posterior fifth of the head; last funicular joint longer than the remainder of the funiculus; joints 2 and 3 subequal, small, not longer than broad, fourth joint a little longer than the first, about twice as long as the second and third together. Thorax narrow, the profile outline of the pronotum feebly convex, rising to the mesonotum, which is the highest part of the thorax, and descending gradually to the long epinotum, the base of which is nearly straight in profile and fully $1\frac{2}{3}$ times as long as the declivity. The spines are rather long and slender, but indistinct, as each is embedded in a spongiform plate continued down the side of the declivity. Petiole and postpetiole with large spongiform masses on the sides and ventrally, so that only the dorsal surfaces are exposed. Gaster but little broader than its straight, transverse, anterior border. Legs slender.

Mandibles, gaster, and dorsal surface of postpetiole smooth and shining; head, thorax, petiole, legs, and antennae opaque, densely and regularly punctate, the head a little more coarsely than the thoracic dorsum, the appendages very finely. Extreme base of gaster longitudinally rugose.

Hairs yellowish, sparse, rather long, especially at the tip of the gaster, erect or suberect, shorter and blunter on the head, on the clypeus and anterior border of the scape curved but pointed, nonclavate. Legs with very short, subappressed hairs.

Yellowish ferruginous; mandibles and legs paler.

Described from two specimens taken by Mr. John Hewitt at Kuching.

In the shape of the head, mandibles, and antennae this species approaches *S. mocsaryi* Emery of Papuasia, but the mandibles are decidedly shorter and the pilosity and arrangement of the spongiform appendages of the petiole are very different. The Bornean species is also related to four Javanese species recently described by Forel (*S. kraepelini*, *koningsbergi*, *signeae*, and *ebbae*), but is smaller than any of them. It can be readily distinguished from *kraepelini* and *koningsbergi* by the well-developed, spiniform, preapical tooth of the mandibles. *S. signeae* possesses a translucent inner border to the mandibles and an emarginate clypeus and in *ebbae* the preapical tooth is only slightly longer than broad, the antennal scapes are shorter, the first funicular joint not longer than broad, the hairs are club-shaped and the color is deep ferruginous.

*123. *STRUMIGENYS BRYANTI*, sp. nov.

Female. Length, 4.8 mm.

Slender; head fully $1\frac{3}{4}$ times as long as broad, its posterior border deeply and semicircularly excised, the sides gradually converging to the rather large, convex eyes, the preocular portion $1\frac{1}{2}$ times as long as broad, with subparallel sides; vertex very feebly convex, the posterior lobes depressed and flattened. Mandibles fully $\frac{1}{2}$ as long as the head, straight, flattened, with parallel borders, very slightly narrowed at their insertions, sinuately excised at the inner border just back of the two strong, subequal, spiniform, apical teeth. Preapical tooth absent. Clypeus flattened, as long as broad, its anterior border entire. Antennae very slender; scapes reaching to the posterior fourth of the head; last funicular joint much shorter than the remainder of the funiculus and somewhat longer than the preceding joint, joints 2 and 3 subequal, as long as broad, together a little more than half as long as the first joint. Thorax distinctly narrower than the head, a little more than twice as long as broad, very high and convex in the region of the mesonotum and scutellum, the epinotum low with short horizontal base and long vertical declivity, meeting it at a right angle; spines reduced to rectangular flat teeth, each continued as a translucent, spongiform plate down the side of the declivity. Petiole three times as long as broad, broader behind than in front, with straight sides, the node low and rounded, in profile gradually passing into the peduncle, its posterior border with spongiform appendages and its ventral surface behind with a median spongiform lamella. Postpetiole subcircular, as long as broad, broader than the petiolar node, only its dorsal surface exposed, the remainder embedded in spongiform material, with a long, flat plate of the same substance

depending from its midventral line. Gaster small, narrow and straight in front, its anteroventral surface with a broad mass of spongiform material. Legs long and slender. Wings with small pterostigma and almost no veins.

Opaque; mandibles and gaster shining; the gaster longitudinally rugose and reticulate at the base. Remainder of body densely and finely punctate, rugulose, the posterior lobes of the head regularly and more coarsely, the appendages more finely punctate.

Hairs pale yellow; very long, sparse, erect, slender, and pointed, quite as long and conspicuous on the legs as on the body; antennal scapes with short curved, subappressed, pointed hairs, not arranged in a regular row. Head, clypeus, and thorax also with numerous short, appressed, simple hairs, representing a long, dilute pubescence.

Ferruginous brown; mandibles, antennae, legs, and base and tip of gaster paler and more yellowish. Wings yellowish hyaline with dark brown pterostigma.

Described from a single specimen taken by Mr. G. E. Bryant on Mt. Matang, West Sarawak and sent me by Mr. Horace Donisthorpe.

In size, in the general shape of the body and its extraordinary pilosity, this species is most closely related to *S. doriae* Emery, described from a worker specimen taken in Amboina. This form, however, has more slender and cylindrical mandibles, so that the Bornean specimen can hardly be the cospecific female.

*124. RHOPALOTHRIX BORNEËNSIS, sp. nov.

Female (deälated). Length, 3.5 mm.

Resembling *Rh. procera* Emery, but smaller and the emarginations of the sides of the head at the eyes and antennal insertions deeper and more sinuous and the border just behind the eyes forming a rounded, rather flattened lobe. The clypeus is distinctly longer, its median portion being prolonged further posteriorly. Thorax decidedly narrower than the head, the pronotum laterally compressed, deeply and angularly excised behind. Mesonotum flattened above, grooved in the middle, but not carinate anteriorly. Scutellum and epinotum very small, the former gibbous, overhanging the latter, which has a pair of acute, flattened teeth as long as broad at their bases. Petiolar node subrectangular when seen from above, as long as broad; feebly longitudinally impressed in the middle. Postpetiole $2\frac{1}{2}$ times as broad as the petiole, much broader than long, with broadly concave anterior and broadly convex posterior border, the dorsal surface with a feeble median sulcus in front and a large round impression behind. Gaster with a faint median sulcus.

Opaque; densely and finely punctate-rugulose; gaster and postpetiole evenly punctate; antennal scrobes and mesopleurae shining.

Head, legs, and dorsal surface of body covered with dirty white, flattened, appressed, scale-like hairs, fine and numerous on the clypeus and mandibles, long and conspicuous on the external borders of the antennal scapes, tibiae, and tarsi, absent on the pleurae and lateral surfaces of the coxae.

Ferruginous brown; appendages scarcely paler.

Described from a single specimen taken by Mr. John Hewitt at Kuching in 1908 "in an old fungus."

Additional material may show that this is merely a small subspecies of *Rh. procera* Emery of New Guinea. The female of this form measures 5 mm. and has the petiolar node broader than long. *Rh. borneënsis* seems also to be more opaque than *procera*, but Emery's description of the female is very brief.

DOLICHODERINAE.

125. DOLICHODERUS (HYPOCLINEA) BITUBERCULATUS (Mayr).

Hypoclinea bituberculata Mayr, Verh. Zool. bot. gesellsch. Wien., 1862, **12**, p. 705, ♀.

Dolichoderus bituberculatus Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **4**, p. 254, ♀ ♀.

Hypoclinea sellaris Roger, Berl. ent. zeitschr., 1863, **7**, p. 168, 213, ♀.

Dolichoderus (Hypoclinea) bituberculatus Emery, Gen. Ins. Dolichod., 1912, p. 10.

Type-locality: Luzon Island, Philippines.

Sarawak (Doria and Beccari; Bedot and Pictet); Kapouas Basin (Chaper); Bandjermassin (Fritz Suck).

Numerous workers from British North Borneo (E. B. Kershaw) and from Serambu Mt., Sarawak (H. W. Smith). A dealated female and five workers from Kuching (John Hewitt) are of a more reddish color.

125a. DOLICHODERUS (HYPOCLINEA) BITUBERCULATUS var. BORNEONENSIS (Roger).

Hypoclinea sellaris var. *borneonensis* Roger, Berl. ent. zeitschr., 1863, **7**, p. 214, ♀.

Type-locality: Borneo.

126. DOLICHODERUS (HYPOCLINEA) CONIGER Mayr.

Hypoclinea conigera Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, **20**, p. 956, ♀.

Dolichoderus (Hypoclinea) coniger Emery, Gen. Ins. Dolichod., 1912, p. 13.

Type-locality: Sarawak, Borneo (Doria and Beccari).

A single worker from Mt. Matang, West Sarawak (John Hewitt).

127. DOLICHODERUS (HYPOCLINEA) CUSPIDATUS (Smith).

Polyrhachis cuspidatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 63, ♀.

Hypoclinea cuspidata Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, 20, p. 955, ♀.

Dolichoderus cuspidatus Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 256, ♀.

Dolichoderus (Hypoclinea) cuspidatus Emery, Gen. Ins. Dolichod., 1912, p. 13.

Type locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari).

Several workers from Mt. Matang and the Rambungan River, Sarawak (H. W. Smith).

128. DOLICHODERUS (HYPOCLINEA) PATENS (Mayr).

Hypoclinea patens Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, 20, p. 957, ♀.

Dolichoderus patens Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 254.

Dolichoderus (Hypoclinea) patens Emery, Gen. Ins. Dolichod., 1912, p. 14.

Type-locality: Sarawak, Borneo (Doria and Beccari).

129. DOLICHODERUS (HYPOCLINEA) SEMIRUGOSUS (Mayr).

Hypoclinea semirugosa Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, 20, p. 956, ♀.

Dolichoderus semirugosus Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 254, ♀.

Dolichoderus (Hypoclinea) semirugosus Emery, Gen. Ins. Dolichod., 1912, p. 14.

Type-locality: Sarawak, Borneo (Doria and Beccari).

130. DOLICHODERUS (HYPOCLINEA) SULCATICEPS (Mayr).

Hypoclinea sulcaticeps Mayr, Verh. Zool. bot. gesellsch. Wien, 1870, 20, p. 957, ♀.

Dolichoderus sulcaticeps Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 254, ♀.

Dolichoderus (Hypoclinea) sulcaticeps Emery, Gen. Ins. Dolichod., 1912, p. 14.

Type-locality: Sarawak, Borneo (Doria and Beccari).
Several workers from Sadong, Sarawak (H. W. Smith).

*131. DOLICHODERUS (HYPOCLINEA) TAPROBANAЕ (Smith).

Formica taprobane Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 13, ♀.
Dolichoderus taprobanae Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 353.
Hypoclinea gracilis Motschulsky, Bull. Soc. nat. Moscou, 1863, **36**, p. 14, ♀.
Dolichoderus (Hypoclinea) taprobanae Emery, Gen. Ins. Dolichod., 1912, p. 14.

Type-locality: Ceylon.
Two workers from Kuching (John Hewitt).

131a. DOLICHODERUS (HYPOCLINEA) TAPROBANAЕ (Smith) var.
BORNEËNSIS Forel.

Dolichoderus taprobanae var. *borneënsis* Forel, Rev. Suisse zool., 1911, **19**,
p. 46, ♀.
Dolichoderus (Hypoclinea) taprobanae var. *borneënsis* Emery, Gen. Ins. Dolichod., 1912, p. 14.

Type-locality: Hayvep, Borneo (Winkler).

132. IRIDOMYRMEX ANCEPS (Roger).

Formica anceps Roger, Berl. ent. zeitschr., 1863, **7**, p. 164, ♀.
Iridomyrmex excisus Mayr, Tijdschr. ent., 1867, **10**, p. 77, ♀ ♀, pl. 2, fig. 8.
Hypoclinea (Iridomyrmex) excisa Mayr, Verh. Zool. bot. gesellsch. Wien, 1870,
20, p. 959, ♀.
Iridomyrmex anceps Emery in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 169;
Emery, Gen. Ins. Dolichod., 1912, p. 23.

Type-locality: Malacca.
Sarawak (Doria and Beccari).
Several workers and three females from Kuching (John Hewitt).

133a. IRIDOMYRMEX CORDATUS (Smith) subsp. PROTENSUS Forel.

Iridomyrmex cordatus subsp. *protensus* Forel, Rev. Suisse zool., 1911, **19**,
p. 47, ♀ ♀ ♂; Emery, Gen. Ins. Dolichod., 1912, p. 24.

Type-locality: Sarawak, Borneo (Haviland).

*134a. IRIDOMYRMEX MYRMECODIAE Emery.

Iridomyrmex cordatus var. *myrmecodiae* Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 249, ♀.

Iridomyrmex myrmecodiae Emery, ibid., 1900, ser. 2, 20, p. 694; Emery, Gen. Ins. Dolichod., 1912, p. 25.

Type-locality: Java.

Numerous workers from British North Borneo (E. B. Kershaw) and a dealated female and two workers from Kuching (John Hewitt), found nesting in the rootstocks of a fern (*Polypodium sinuosus sinuosus*).

135. TAPINOMA FLAVIDUM Ern. André.

Tapinoma flavidum Ern. André, Mém. Soc. zool. France, 1892, 5, p. 51, ♀; Emery, Gen. Ins. Dolichod., 1912, p. 41.

Type-locality: Kapouas Basin, Borneo (Chaper).

136. TAPINOMA MELANOCEPHALUM (Fabricius).

Formica melanocephala Fabricius, Ent. syst., 1793, 2, p. 353, ♀.

Lasius melanocephalus Fabricius, Syst. Piez., 1804, p. 417.

Myrmica melanocephala Lepeletier, Hist. nat. ins. hyménop., 1836, 1, p. 185.

Formica nana Jerdon, Madras Journ. lit. sci., 1851, 17, p. 125, ♀.

Micromyrma melanocephala Roger, Berl. ent. zeitschr., 1862, 6, p. 258, ♀ ♀.

Myrmica pellucida Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 71, ♀.

Formica familiaris Smith, ibid., Suppl., 1860, 4, p. 96 (*nec. ibid.*, p. 68, ♀).

Tapinoma melanocephalum Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, 12, p. 651; Emery, Gen. Ins. Dolichod., 1912, p. 41.

Type-locality: Cayenne (Coll. Bosc.).

Kapouas Basin (Chaper).

*137. TAPINOMA INDICUM Forel.

Tapinoma melanocephalum var. Mayr, Termesz. füzetek., 1897, 20, p. 432, ♀.

Tapinoma indicum Forel, Journ. Bombay nat. hist. soc., 1895, 9, p. 472, ♀; Bingham, Fauna Brit. India. Hymenop., 1903, 2, p. 304, ♀; Emery, Gen. Ins. Dolichod., 1912, p. 41.

Tapinoma melanocephalum subsp. *indicum* Forel, Notes Leyden mus., 1911, **33**, p. 206.

Type-locality: Poona, India (Wroughton).

Several workers from Sarawak (Roland Thaxter).

138. TECHNOMYRMEX ALBIPES (Smith).

Formica (*Tapinoma*) *albipes* Smith, Journ. Proc. Linn. soc. London. Zool., 1861, **6**, p. 38, ♀.

Tapinoma albipes Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 147; Emery, *ibid.*, 1887, ser. 2, **4**, p. 249.

Technomyrmex albipes Emery, Zeitschr. wiss. zool., 1888, **46**, p. 392; Emery, Gen. Ins. Dolichod., 1912, p. 43.

Type-locality: Tondano, Celebes (A. R. Wallace).

Sarawak (Doria and Beccari); Kapouas Basin (Chaper).

Several workers from Sarawak (H. W. Smith) and one from Kuching (John Hewitt).

139. TECHNOMYRMEX STRENUUS Mayr.

Technomyrmex strenua Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 147, ♀ ♀.

Technomyrmex strenuus Emery, *ibid.*, 1887, ser. 2, **4**, p. 248, ♀; Emery, Gen. Ins. Dolichod., 1912, p. 44, ♀ ♀, pl. 1, fig. 20, 20b.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Sarawak (Haviland).

Four workers from Kuching (John Hewitt).

CAMPONOTINAE.

140. MYRMOTERAS DONISTHORPEI Wheeler.

Myrmoteras donisthorpei Wheeler, Proc. New Eng. zool. club, 1916, **6**, p. 14, ♀, fig. 3.

Type-locality: Mt. Matang, West Sarawak (G. E. Bryant).

141. PLAGIOLEPIS (ANOPOLEPIS) LONGIPES (Jerdon).

Formica longipes Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 122, ♀.

Formica gracilipes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 55, ♀.

- Formica trifasciata* Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 27, ♀.
Prenolepis gracilipes Mayr, Verh. Zool. bot. gesellsch., Wien, 1862, **12**, p. 698.
Plagiolepis gracilipes Mayr, Tijdschr. ent., 1867, **10**, p. 73, ♂ ♀.
Plagiolepis longipes Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **4**, p. 247.
Plagiolepis (Anoplolepis) longipes Forel, Tijdschr. ent., 1915, **58**, p. 34.

Type-locality: India (Jerdon).

Sarawak (Doria and Beccari; Bedot and Pictet); Kapouas Basin (Chaper).

Numerous workers from Sandakan, Sadong and Mt. Matang, Sarawak (H. W. Smith), British North Borneo (E. B. Kershaw) and Kuching (John Hewitt).

142. APHOMOMYRMEX ANDREI (Emery).

- Dimorphomyrmex andrei* Emery, Ann. Soc. ent. France, 1894, p. 73, ♀.
Aphomomyrmex andrei Emery, Ann. Soc. ent. Belgique, 1899, **43**, p. 894, ♀;
 Wheeler, Psyche, 1910, **17**, p. 132, ♀.

Type-locality: Pulo Laut, Borneo.

143. APHOMOMYRMEX HEWITTI Wheeler.

- Aphomomyrmex hewitti* Wheeler, Psyche, 1910, **17**, p. 132, ♂ ♀, fig. 1.

Type-locality: Bidi, Borneo (John Hewitt).

144. GESOMYRMEX CHAPERI Ern. André.

- Gesomyrmex chaperi* Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 47, ♂.
 fig. 1-3.

Type-locality: Kapouas Basin, Borneo (Chaper).

145. DIMORPHOMYRMEX JANETI Ern. André.

- Dimorphomyrmex janeti* Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 51, ♂,
 fig. 4, 5; Wheeler, Psyche, 1910, **17**, p. 132, ♂.

Type-locality: Kapouas Basin, Borneo (Chaper).

*146. PRENOLEPIS JERDONI Emery.

Prenolepis jerdoni Emery, Rev. Suisse zool., 1893, **1**, p. 223, ♀, pl. 8, fig. 20.

Type-locality: Perak.

Three workers from Kuching (John Hewitt).

*147. PRENOLEPIS (NYLANDERIA) LONGICORNIS (Latreille).

Formica longicornis Latreille, Hist. nat. fourmis, 1802, p. 113, ♀.

Formica vagans Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 124, ♀ ♀.

Formica (Tapinoma) gracilescens Nylander, Ann. sci. nat. Zool., 1856, ser. 4, **5**, p. 73, ♀, pl. 3, fig. 20.

Formica gracilescens Nylander, Ann. Soc. ent. France, 1856, ser. 3, **4**, Bull., p. XXVIII, ♀.

Tapinoma gracilescens Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 56.

Prenolepis gracilescens Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 698.

Paratrechia currens Motschulsky, Bull. Soc. nat. Moscou, 1863, **36**, p. 14.

Prenolepis longicornis Roger, Verzeichn. formicid., 1863, p. 10.

Prenolepis (Nylanderia) longicornis Santschi, Voy. Allmand et Jeamel Afr. Orient. Formicid., 1914, p. 127, ♀.

Type-locality: Senegal (Bosc.).

Seven workers from Sarawak (Roland Thaxter).

148. PRENOLEPIS (NYLANDERIA) OBSCURA Mayr.

Prenolepis obscura Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 698, ♀ ♀.

Type-locality: Sydney, New South Wales (Novara Expedition).

Kapouas Basin, Borneo (Chaper).

*149. PRENOLEPIS (NYLANDERIA) KRAEPELINI Forel.

Prenolepis kraepelini Forel, Mitth. Naturh. mus. Hamburg, 1905, **22**, p. 24, ♀ ♀ ♂.

Type-locality: Buitenzorg, Java (Kraepelin).

Two workers from Kuching (John Hewitt), "nesting in fungus," and one from Sarawak (Roland Thaxter). Another worker from Mt. Matang (G. E. Bryant) appears to belong to the same species but is considerably larger (2.6 mm.).

150a. PRENOLEPIS (NYLANDERIA) BUTTELI Forel subsp. BRYANTI^I
Forel.

Prenolepis (Nylanderia) butteli Forel subsp. *bryanti* Forel, Rev. Suisse zool. 1916, **24**, p. 439, ♀.

Type-locality: Mt. Matang, West Sarawak (G. E. Bryant).

Worker. Length 1.5 mm.

Head subrectangular, as broad as long, nearly as broad in front as behind with rounded sides and posterior corners and feebly convex posterior border. Eyes moderately large, flat, just behind the middle of the sides. Mandibles narrow, with straight external and short, minutely 5-toothed apical borders. Clypeus very convex, but not carinate, its anterior border entire and rounded. Frontal carinae short, as far apart as their distance from the sides of the head. Antennae slender, scapes extending about $\frac{1}{6}$ their length beyond the occipital border of the head; second funicular joint small, broader than long, joints 3-6 a little longer than broad. Thorax short, with distinct promesonotal and mesoëpinotal sutures, very feeble and short mesoëpinotal constriction, the pro- and mesonotum rather flat; the epinotum with very short and transverse, feebly convex base, passing rapidly into the long sloping declivity. Petiole with very short, low node, a mere anteriorly directed projection at the anterior end of the segment, much as in some species of *Tapinoma*. Gaster with the first segment concave in front and lying over the petiole.

Head and thorax subopaque; mandibles, legs, antennae, and gaster more shining; mandibles sparsely and finely punctate; the head, thorax, and gaster distinctly shagreened, the gaster transversely.

Hairs dark brown, coarse, sparse, erect, blunt, except on the anterior portion of the head; body without, antennae and legs with extremely short, appressed, whitish pubescence.

Castaneous brown; head, thorax, and gaster with pronounced metallic reflections, the head and pronotum more blue, the gaster and remainder of the thorax more violet. Mandibles, antennae, tarsi, middle and hind tibiae, knees, and ends of tibiae of fore legs, and tips of hind femora whitish yellow.

A single specimen from Sarawak, received from Prof. Roland Thaxter.

Forel's description is very brief and is hidden away in the midst of a paper devoted to Congolese ants!

151. PSEUDOLASIUS MAYRI Emery.

Lasius familiaris Mayr, Reise Novara. Zool., **2**. Formicid., 1865, p. 55, ♀
(nec Smith).

Pseudolasius familiaris Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **4**, p. 245, nota, ♀ (nec Smith nec ♀).

Pseudolasius mayri Emery, Ann. Soc. ent. Belgique, 1911, **55**, p. 215, ♀ ♀ ♂.

Type-locality: Buitenzorg, Java.

Sarawak (Coll. Emery).

151a. *PSEUDOLASIUS MAYRI* var. *SARAWAKANUS* Forel.

Pseudolasius mayri var. *sarawakana* Forel, Zool. jahrb. Syst., 1913, **36**, p. 107 nota, ♀ ♂.

Type-locality: Sarawak, Borneo (Haviland).

152. *OECOPHYLLA SMARAGDINA* (Fabricius).

Formica smaragdina Fabricius, Syst. ent., 1775, p. 828, ♀.

Formica macra Guérin, Duperry Voy. Coquille. Zool., 1830, **2**, p. 202, ♀, pl. 8, fig. 1.

Formica zonata Guérin, ibid., p. 205, ♀.

Oecophylla smaragdina Smith, Journ. Proc. Linn. soc. London. Zool. Suppl., 1860, **4**, p. 102, ♀.

Type-locality: India (Edler).

Sarawak (Doria and Beccari; Bedot and Pictet; A. R. Wallace).

Numerous workers from British North Borneo (E. B. Kershaw); and a dealated female and workers from Kuching and Sadong (H. W. Smith).

153. *CALOMYRMEX LAEVISSIMUS* (Smith).

Formica laevisissima Smith, Journ. Proc. Linn. soc. London. Zool., 1859, **3**, p. 138, ♀.

Camponotus laevisissimus Mayr, Tijdschr. ent., 1867, **10**, p. 39, ♀, pl. 2, fig. 1.

Colobopsis levissima Roger, Verzeich. formicid., 1863, p. 10.

Calomyrmex laevisissimus Emery, Mem. R. accad. sci. Bologna, 1896, 1895-1896, ser. 5, **5**, p. 776.

Type-locality: Aru (A. R. Wallace).

Borneo (teste Roger).

154. *CAMPONOTUS (DINOMYRMEX) GIGAS* (Latreille).

Formica gigas Latreille, Hist. nat. fourmis, 1802, p. 105, ♀, pl. 2, fig. 6.

Camponotus gigas Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 669, ♀.

Camponotus (Dinomyrmex) gigas Forel, Rev. Suisse zool., 1914, **22**, p. 268.

Type-locality: "Grandes-Indes" (Riche).

Several workers from British North Borneo (E. B. Kershaw) and from the Silimpopon River (Hugh M. Smith).

154a. CAMPONOTUS (DINOMYRMEX) GIGAS subsp. BORNEËNSIS
Emery.

Camponotus gigas subsp. *borneënsis* Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 214, ♀ ♀ ♂.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Kapouas Basin (Chaper); Poeloe Island, E. Borneo (P. Jachan).

Numerous workers from Kuching, Sadong, and the Rambungan River, Sarawak (H. W. Smith) and a single worker from Kuching (John Hewitt).

155. CAMPONOTUS (DINOMYRMEX) ANGUSTICOLLIS (Jerdon).

Formica angusticollis Jerdon, Madras Journ. lit. sci., 1851, 17, p. 120, 2 ♀ ♀.

Formica ardens Smith, Cat. Hymenop. Brit. mus., 1858, 6, p. 17, ♀.

Formica impetuousa Smith, ibid., p. 18, ♀.

Formica callida Smith, ibid., p. 18, ♀.

Camponotus prismaticus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, 12, p. 669, ♀.

Camponotus angusticollis Roger, Verzeichn. formicid., 1863, p. 3; Dalla Torre, Cat. Hymenop., 1893, 7, p. 221.

Camponotus ardens Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, 36, p. 353.

Camponotus (Dinomyrmex) angusticollis Forel, Rev. Suisse zool., 1914, 22, p. 268.

Type-locality: Malabar, Southern India (Jerdon).

Borneo (Mus. Caes.).

156. CAMPONOTUS (MYRMOTURBA) FESTINUS (Smith).

Formica festina Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 53, ♀.

Camponotus festinus Roger, Verzeich. formicid., 1863, p. 3; Dalla Torre, Cat. Hymenop., 1893, 7, p. 231.

Camponotus (Myrmoturba) festinus Forel, Rev. Suisse zool., 1914, 22, p. 267.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari; Bedot and Pictet).

Two major workers and one minor from Kuching (John Hewitt), one major from British North Borneo (E. B. Kershaw) and a minor from Sadong, Sarawak (H. W. Smith) agree in measurements with the type of this species as defined by Emery. Smith unfortunately based the species on a female, so that, as Emery says, examination of the type would probably give no clue as to whether it belonged to this form or to the subspecies described by the Italian myrmecologist as subsp. *eximius* from Sumatra.

*156a. CAMPONOTUS (MYRMOTURBA) FESTINUS subsp. EXIMIUS
Emery.

Camponotus festinus subsp. *eximius* Emery, Ann. Mus. civ. Genova, 1900, ser. 2, 20, p. 701, ♀.

Type-locality: Si Rambe, Sumatra (E. Modigliani).

A single worker major from Kuching (John Hewitt).

*157. CAMPONOTUS (MYRMOTURBA) AUTRANI Forel.

Camponotus autrani Forel, Ann. Soc. ent. Belgique, 1886, 30, p. 165, ♀.

Camponotus festinus subsp. *autrani* Emery, Ann. Mus. civ. Genova, 1888, ser. 2, 5, p. 528, ♀.

Camponotus (Myrmoturba) autrani Forel, Rev. Suisse zool., 1914, 22, p. 266.

Type-locality: Sumatra (Conrad Klaesi).

Two major workers from Sadong, Sarawak (H. W. Smith).

158. CAMPONOTUS (MYRMOTURBA) SUCKI Forel.

Camponotus sucki Forel, Mitth. Naturh. mus. Hamburg, 1901, 18, p. 71, ♀.

Camponotus (Myrmoturba) sucki Forel, Rev. Suisse zool., 1914, 22, p. 267.

Type-locality: Tandjong, S. E. Borneo (Fritz Suck).

159a. CAMPONOTUS (MYRMOTURBA) MACULATUS Fabricius subsp.
SETITIBIA Forel.

Camponotus maculatus race *setitibia* Forel, Mitth. Naturh. mus. Hamburg, 1901, 18, p. 68, ♀.

Type-locality: Tandjong, S. E. Borneo (Fritz Suck).

159b. CAMPONOTUS (MYRMOTURBA) MACULATUS subsp. IRRITANS
(Smith).

Formica irritans Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 55, ♀.

Camponotus irritans Roger, Verzeichn. formicid., 1863, p. 3.

Camponotus inconspicuus Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 135, ♀.

Camponotus (*Myrmoturba*) *maculatus* subsp. *irritans* Forel, Rev. Suisse zool., 1914, **22**, p. 267.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari; Bedot and Pictet).

Numerous workers and a female from Kuching (H. W. Smith).

159c. CAMPONOTUS (MYRMOTURBA) MACULATUS subsp. IRRITANS var.
INFERIOR Forel.

Camponotus maculatus subsp. *irritans* var. *inferior* Forel, Rev. Suisse zool., 1911, **19**, p. 48, ♀ ♀.

Type-locality: Sarawak, Borneo (Haviland).

Several workers from Kuching (John Hewitt).

159d. CAMPONOTUS (MYRMOTURBA) MACULATUS subsp. COMPRESSUS
(Fabricius).

Formica compressa Fabricius, Mant. Ins., 1787, **1**, p. 307, ♀.

Formica indefessa Sykes, Trans. Ent. soc. London, 1835, **1**, p. 104, ♀, pl. 13, fig. 3.

Camponotus compressus Roger, Verzeichn. formicid., 1863, p. 2.

Camponotus quadrilaterus Roger, Berl. ent. zeitschr., 1863, **7**, p. 136, ♀.

Camponotus maculatus subsp. *compressus* Emery, in Dalla Torre, Cat. Hy-menop., 1893, **7**, p. 226.

Type-locality: Tranquebar (Hybner).

Sarawak (A. R. Wallace).

160. CAMPONOTUS (MYRMOTURBA) PALLIDUS (Smith).

Formica pallida Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 57, ♀.

Camponotus pallidus Mayr, Verh. Zool. bot. gesellsch. Wien, 1863, **13**, p. 400; Forel, Journ. Bombay nat. hist. soc., 1892, **7**, p. 21, ♀; Emery, Mem. R. accad. sci. Bologna, 1896, 1895-1896, ser. 5, **5**, p. 769.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari); Kapouas Basin (Chaper).

A single worker from Kuching (John Hewitt) from a colony "nesting in a bunch of ratan fruits."

161. CAMPONOTUS (MYRMOTURBA?) FERVENS (Smith).

Formica fervens Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 55, ♀.

Camponotus fervens Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 354.

Camponotus (Myrmoturba?) fervens Forel, Rev. Suisse zool., 1914, **22**, p. 267.

Type-locality: Sarawak, Borneo (A. R. Wallace).

162. CAMPONOTUS (MYRMOTARSUS) MISTURA (Smith).

Formica mistura Smith, Journ. Proc. Linn. soc. London, Zool., 1857, **2**, p. 53, ♀.

Formica exasperata Smith, *ibid.*, p. 56, ♀.

Camponotus exasperatus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 659, ♀.

Camponotus mistura Mayr, *ibid.*, 1886, **36**, p. 354.

Camponotus (Myrmotarsus) mistura Forel, Rev. Suisse zool., 1914, **22**, p. 269.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari; Haviland).

A female from British North Borneo (E. B. Kershaw) and one from Kuching (H. W. Smith).

163. CAMPONOTUS (MYRMOTARSUS) RUFIFEMUR Emery.

Camponotus rufifemur Emery, Ann. Mus. civ. Genova, 1900, ser. 2, **20**, p. 705, ♀.

Camponotus (Myrmotarsus) rufifemur Forel, Rev. Suisse zool., 1914, **22**, p. 269.

Type-locality: Mentawai (E. Modigliani).

Sarawak, Borneo.

A major worker from Kuching (John Hewitt) and a major and minor worker from the Rambungan River (H. W. Smith).

164. CAMPONOTUS (MYRMOTARSUS) PRESSIPES Emery.

Camponotus pressipes Emery, Ann. Soc. ent. France, 1893, p. 268 *nota*, ♀.

Camponotus (Myrmotarsus) pressipes Forel, Rev. Suisse zool., 1914, **22**, p. 269.

Type-locality: Borneo.

Tandjong, S. E. Borneo (Fritz Suck).

Three females from Kuching (H. W. Smith).

165. CAMPONOTUS (MYRMOTARSUS) IRRITABILIS (Smith).

Formica irritabilis Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 56, ♀.

Camponotus irritabilis Roger, Verzeichn. formicid., 1863, p. 3.

Camponotus (Myrmotarsus) irritabilis Forel, Rev. Suisse zool., 1914, **22**, p. 269.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Doria and Beccari).

Several workers from Kuching (John Hewitt) and the Rambungan River, Sarawak (H. W. Smith) and a single worker transitional to the var. *sedulus* from British North Borneo (E. B. Kershaw).

165a. CAMPONOTUS (MYRMOTARSUS) IRRITABILIS var. SEDULUS (Smith).

Formica sedula Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 56, ♀.

Camponotus sedulus Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 136, ♀ ♀.

Camponotus irritabilis var. *sedulus* Forel, Rev. Suisse zool., 1911, **19**, p. 51.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Four major workers from the Rambungan River, Sarawak (H. W. Smith).

165b. CAMPONOTUS (MYRMOTARSUS) IRRITABILIS var. WINKLERI Forel.

Camponotus irritabilis var. *winkleri* Forel, Rev. Suisse zool., 1911, **19**, p. 51, ♀.

Type-locality: Hayvep, Borneo (Winkler).

166. CAMPONOTUS (MYRMOPHYMA) QUADRISECTUS (Smith).

Formica quadrisecta Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 28, ♀.

Camponotus gilviceps Mayr, Tijdschr. ent. 1867, **10**, p. 5, ♀.

Camponotus quadrisectus Forel, Ann. Soc. ent. Belgique, 1909, **53**, p. 57 *nota*.

Camponotus (Myrmophyma) quadrisectus Forel, Rev. Suisse zool., 1914, **22**, p. 269.

Type-locality: Philippine Islands.

Borneo (Leyden Mus.).

A soldier and two minor workers from Baram, Borneo (John Hewitt) taken from the "distorted pseudobulb of a *Myrmecodia*."

Forel assigns this species to his subgenus *Myrmophyma*, of which he has designated it as the type, but it seems to me to belong more naturally in *Myrmotarsus*, owing to the peculiar compression of the hind metatarsi and the shape of the head. Emery had previously (Mem. R. accad. sci. Bologna, 1896, ser. 5, 5, p. 773) placed the species in his manipulus 11 of *Camponotus* with *mistura* Roger, *platypus* Roger, etc.

167. *CAMPONOTUS (MYRMOPHYMA) EXSECTUS* Emery.

Camponotus exsectus Emery, Ann. Mus. civ. Genova, 1900, ser. 2, 20, p. 709, fig. 15, ♂ ♀.

Type-locality: Sipora, Mentawai (E. Modigliani).

Pulo Laut, Borneo (Coll. Emery).

168. *CAMPONOTUS (MYRMOMALIS) CONTRACTUS* Mayr.

Camponotus contractus Mayr, Ann. Mus. civ. Genova, 1872, 2, p. 137, ♂.

Camponotus (Myrmomalis) contractus Forel, Rev. Suisse zool., 1914, 22, p. 271.

Type-locality: Sarawak, Borneo (Doria and Beccari).

169a. *CAMPONOTUS (MYRMAMBLYS) RETICULATUS* Roger subsp.
BEDOTI Emery.

Camponotus bedoti Emery, Rev. Suisse zool., 1893, 1, p. 196, ♂, pl. 8, fig. 2.

Camponotus reticulatus subsp. *yerburyi* var. *bedoti* Emery, Mem. R. accad. sci. Bologna, 1896, 1895-1896, ser. 5, 5, p. 772.

Camponotus (Myrmamblys) reticulatus subsp. *bedoti* Forel, Rev. Suisse zool., 1914, 22, p. 271.

Type-locality: Batjan.

Sarawak (Bedot and Pictet).

170. *CAMPONOTUS (MYRMOSPINCTA) CAMELINUS* (Smith).

Formica camelina Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 57 ♂.

Camponotus senilis Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 675, ♀, pl. 19, fig. 3.

Camponotus camelinus Roger, Verzeichn. formicid., 1863, p. 3.

Camponotus singularis var. *camelinus* Emery, Ann. Mus. civ. Genova, ser. 2, **4**, 1887, p. 210.

Camponotus cinerascens var. *camelinus* Dalla Torre, Cat. Hymenop., 1893, **7**, p. 224.

Camponotus (*Myrmosphincta*) *camelinus* Forel, Mem. Soc. ent. Belgique, 1912, **20**, p. 92.

Camponotus (*Myrmocamelus*) *camelinus* Forel, Rev. Suisse Zool., 1914, **22**, p. 270.

Type-locality: Singapore (A. R. Wallace).

Kapouas Basin, Borneo (Chaper).

Numerous workers from British North Borneo (E. B. Kershaw) and Serambu Mt., Sarawak (H. W. Smith).

170a. *CAMPONOTUS* (*MYRMOSPHINCTA*) *CAMELINUS* var. *SINGULARIS* (Smith).

Formica singularis Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 27, ♀.

Camponotus cinerascens Roger, Verzeich. formicid., 1863, p. 3; Dalla Torre, Cat. Hymenop. 1893, **7**, p. 224; Emery, Mem. R. accad. sci. Bologna, 1896, 1895-1896, ser. 5, **5**, p. 771.

Camponotus singularis Mayr, Tijdschr. ent., 1867, **10**, p. 39, ♀.

Type-locality: Java.

Sarawak (Doria and Beccari).

A worker from Matang Mt., W. Sarawak (H. W. Smith) and one from Kuching (John Hewitt).

171. *CAMPONOTUS* (*MYRMOSPHINCTA*) *DOLICHODEROIDES* Forel.

Camponotus dolichoderoides Forel, Rev. Suisse zool., 1911, **19**, p. 51, ♀.

Camponotus (*Myrmosphincta*) *dolichoderoides* Forel, Rev. Suisse zool., 1914, **22**, p. 273.

Type-locality: Hayvep, Borneo (Winkler).

172. *CAMPONOTUS* (*MYRMOSPHINCTA*) *HYPOCLINEOIDES*, sp. nov.

Worker minor. Length 5.3 mm.

Slender; head nearly $1\frac{1}{2}$ times as long as broad, with the sides in front of the moderately large and convex eyes, which are just anterior to the posterior third of the head, rather straight and parallel, behind the eyes gradually contracted to a narrow, marginate, but not colliform posterior border; in profile very convex above and flat below. Mandibles narrow, feebly convex, with straight external borders, their apical borders apparently 6-toothed. Both the maxillary and labial palpi very long. Clypeus subcarinate behind, its median portion trapezoidal, a little broader than long, its lateral portions very narrow and reaching to the anterior corners of the head, its anterior border straight and entire. Clypeal foveae small and deep. Frontal area large, semicircular, rather indistinct. Frontal carinae sigmoidal, at their greatest curvature fully as far apart as their distance from the lateral borders of the head. Antennae long and slender, inserted well behind the clypeal border, the nearly straight scapes extending about half their length beyond the occipital border of the head. Thorax shaped like that of *Hypoclinea*, broadest through the pronotum which, including the neck, is as long as broad, evenly rounded and convex above; mesonotum broadly and deeply constricted behind, the anterior dorsal outline in profile falling rather steeply with an even curve from the pronotum to the depression in which lie the two very prominent metathoracic stigmata. Epinotum about as broad as the mesonotum, only a little lower than the pronotum, with subequal base and declivity, the former longitudinally and transversely rounded, rising rather steeply in front and meeting the latter at a right angle which is neither sharp nor marginate. Petiole narrow, as long as high, the node at its anterior end, erect and very blunt and rounded, lower than the epinotum. Gaster elliptical. Legs long and slender, distinctly compressed, tibiae without bristles on their flexor surfaces.

Shining; mandibles subopaque, very finely and sparsely punctate; gaster transversely alutaceous, with sparse, piligerous punctures.

Hairs long, erect, rather abundant, in part very long and flexuous on the dorsal surface of the head, thorax, and petiole, whitish, with brown bases in some lights, shorter on the front and sides of the head; long, abundant, and oblique on the scapes and legs. Pubescence yellowish, confined to the antennal funiculi.

Brown; fore tibiae and bases of middle and hind tibiae paler; neck, mandibles, except the teeth, cheeks, anterior border of clypeus, antennal funiculus except the basal half of the first joint, whitish yellow; posterior portion of clypeus and antennal insertions somewhat darker; palpi dark brown, with pale articulations.

Described from a single specimen taken on Mt. Matang, W. Sarawak by Prof. Harrison W. Smith.

This species is related to *C. dolichoderoides* Forel but is smaller, shining and with very different pilosity and very differently shaped

head and petiole. It is also very different from *C. horrens* Forel of the Philippines and *moeschi* Forel of Sumatra.

173. CAMPONOTUS (MYRMOSPINCTA) MEGALONYX, sp. nov.

Worker major. Length about 7 mm.

Robust; head large, trapezoidal, broad behind and narrow in front, with straight, anteriorly converging sides and deeply excised posterior border, high and convex in the region of the vertex, with the posterior corners and lateral borders feebly depressed. Eyes on the dorsal surface behind the median transverse diameter of the head, rather small, moderately convex. Mandibles stout and convex, their apical borders long, 6-toothed. Clypeus rather flat, subcarinate behind, the median portion subhexagonal, as long as broad, the lateral portions short, triangular, far from reaching the anterior corners of the head; the anterior border sinuately excised on each side, with a short, narrow, rounded lobe in the middle. Clypeal foveae pronounced. Frontal area large, subtriangular; frontal groove very distinct. Frontal carinae sinuous, diverging behind. Antennae short and stout; scapes feebly curved, narrow, and terete at the base, gradually thickened towards their tips, not reaching the posterior border of the head. Thorax very short; pronotum broad, narrower than the head, convexly rounded, excluding the neck twice as broad as long; mesonotum very short, broader than long, bordered anteriorly by a strong semicircular, promesonotal suture, rapidly sloping in profile to a deep, narrow constriction only as broad as the prominent metanotal stigmata on each side of it. Epinotum subcuboidal, only half as broad as the pronotum, higher than long, with flat sides; in profile with the base abruptly truncated in front, straight and horizontal above and forming a right angle with the flattened, truncated declivity which is narrowed below. Petiole higher than long, subcuboidal, much lower than the epinotum, the node thick, higher than long, the anterior surface slightly concave and higher than the posterior surface, the dorsal surface rounded and sloping backward and downward. Gaster broadly elliptical, smaller than the head, somewhat flattened. Legs stout, the terminal tarsal joint, claws, and empodia noticeably enlarged; tibiae slightly flattened but not channelled, without a row of bristles on their flexor surfaces.

Opaque; head and gaster slightly lustrous; very finely, densely, and evenly punctate, with sparser piligerous punctures, abundant and transverse on the gaster. Mandibles and legs shining, very finely and superficially shagreened, the mandibles also coarsely and sparsely punctate and near their apical margins coarsely striate; legs with sparse piligerous punctures.

Hairs reddish, rather abundant, erect; long and flexuous on the thoracic dorsum and first gastric segment, shorter elsewhere; absent on the cheeks and almost absent on the antennal scapes, present on the gula and legs. Pubescence long and abundant but nowhere concealing the sculpture, conspicuous on the posterior portion of the head, the thorax and gaster.

Black; thorax and petiole dark brown; upper surface of epinotum and some spots on the pleurae ferruginous; coxae and femora brownish yellow; tibiae, tarsi, and funiculi dark brown; terminal tarsal joints, claws, and empodia reddish.

Worker minor. Length nearly 5 mm.

Very similar to the major worker, except that the head is much smaller, proportionally longer, with straight posterior border, more prominent eyes and the antennal scapes extending about $\frac{1}{6}$ their length beyond the occipital border. The epinotal declivity is slightly concave and a little more sloping, the petiolar node is decidedly thinner. The thorax and legs are dark brown, except the articulations of the latter and the tarsi beyond the basal joint, which are reddish. The erect hairs on the legs are somewhat less numerous.

Described from two major and two minor workers taken by Mr. William Beebe on the Mujong River, Sarawak, "running on bushes."

Like the preceding, this is a very peculiar species, which I have placed in Forel's subgenus *Myrmosphincta* on account of its thoracic structure. In my opinion this subgenus is an unnatural assemblage of forms, but in the present stage of myrmecology it is useful as a catch-all for the species with markedly sellate thorax. The tarsi and claws of *C. megalonyx* show that it is a true arboreal ant. It exhibits certain peculiarities in the structure of the clypeus and thorax that recall the conditions in *Colobopsis*.

174. CAMPONOTUS (COLOBOPSIS) PILOSUS (Smith).

Formica pilosa Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 54, ♂.

Colobopsis pubescens Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 691,

♂ ♀ (nec Fabricius).

Camponotus pubescens Emery, Ann. Mus. civ. Genova, 1889, ser. 2, **7**, p. 517.

Camponotus (Colobopsis) leonardi Emery, ibid., p. 515, ♀.

Camponotus (Colobopsis) pilosus Forel, Rev. Suisse zool., 1914, **22**, p. 272.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Kapouas Basin (Chaper).

Soldiers, workers, and females from British North Borneo (E. B. Kershaw), Kuching and Rambungan River (H. W. Smith).

175. CAMPONOTUS (COLOBOPSIS) BADIUS (Smith).

Formica badia Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 54, ♂.

Camponotus badius Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 354.

Camponotus (Colobopsis) badius Forel, Rev. Suisse zool., 1914, **22**, p. 272.

Type-locality: Singapore (A. R. Wallace).

Sarawak (A. R. Wallace).

A worker from Kuching and one from the Rambungan River (H. W. Smith).

176. CAMPONOTUS (COLOBOPSIS) CLERODENDRI Emery.

Colobopsis clerodendri Emery, Ann. Mus. civ. Genova, 1887, ser. 2, 4, p. 241, 2 ♀, fig.

Camponotus (Colobopsis) clerodendri Emery, ibid, 1889, ser. 2, 7, p. 517; Forel, Rev. Suisse zool., 1914, 22, p. 272.

Camponotus clerodendri Dalla Torre, Cat. Hymenop., 1893, 7, p. 225.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Two soldiers and two workers from Kuching (John Hewitt). A note accompanying the specimens states that "this ant vomits a yellow, sticky juice."

177. CAMPONOTUS (COLOBOPSIS) DORIAE Mayr.

Camponotus doriae Mayr, Ann. Mus. civ. Genova, 1872, 2, p. 137, ♀.

Camponotus (Colobopsis) doriae Forel, Rev. Suisse zool., 1914, 22, p. 272.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Two workers from Kuching (John Hewitt).

178. CAMPONOTUS (COLOBOPSIS) FASCIATUS Mayr.

Colobopsis fasciata Mayr, Tijdschr. ent., 1867, 10, p. 57, ♀.

Camponotus (Colobopsis) fasciatus Emery, Ann. Mus. civ. Genova, 1889, ser. 2, 7, p. 517.

Type-locality: Java (Leyden Museum).

Kapouas Basin, Borneo (Chaper).

*179. CAMPONOTUS (COLOBOPSIS) SAUNDERSI Emery.

Camponotus (Colobopsis) saundersi Emery, Ann. Mus. civ. Genova, 1889, ser. 2, 7, p. 516, ♀.

Type-locality: Thagatà, Tenasserim (L. Fea).

Six minor workers from the Sarawak River, near Kuching (H. W. Smith).

*180. CAMPONOTUS (COLOBOPSIS) VITREUS (Smith).

Formica vitrea Smith, Journ. Proc. Linn. soc. London. Zool., 1861, **5**, p. 94, ♀.

Camponotus vitreus Emery, in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 257.

Camponotus (Colobopsis) vitreus Forel, Rev. Suisse zool., 1914, **22**.

Type-locality: Batjan (A. R. Wallace).

A single worker from British North Borneo (E. B. Kershaw).

181. CAMPONOTUS (COLOBOPSIS) STRICTUS (Jerdon).

Formica stricta Jerdon, Madras Journ. lit. sci., 1851, **17**, p. 123, ♀.

Colobopsis stricta Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 353.

Camponotus strictus Dalla Torre, Cat. Hymenop. 1893, **7**, p. 253.

Camponotus (Colobopsis) strictus Emery, Ann. Mus. civ. Genova, 1889, ser. 2, **7**, p. 517.

Type-locality: Malabar, Southern India (Jerdon).

Sarawak (A. R. Wallace).

182. CAMPONOTUS (COLOBOPSIS) VIGILANS (Smith).

Formica vigilans Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 26, ♀.

Colobopsis vigilans Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 354.

Camponotus (Colobopsis) vigilans Emery, Ann. Mus. civ. Genova, 1889, ser. 2, **7**, p. 517.

Camponotus vigilans Dalla Torre, Cat. Hymenop., 1893, **7**, p. 257.

Type-locality: Sarawak, Borneo.

*183. CAMPONOTUS (COLOBOPSIS) LEUCODISCUS, sp. nov.

Female (deälated). Length 5 mm.

Head subrectangular, longer than broad, broader behind than in front, with straight posterior and lateral borders, indistinctly truncate in front and convex dorsally. Eyes large, behind the middle of the head, separated by a distance equal to their length from the anterior corners of the head. Mandibles convex, with 5 subequal teeth. Clypeus flat, ecarinate, subrectangular, a little longer than broad, as broad behind as in front, its lateral borders notched just in front of the middle at the deep, pit-like clypeal foveae, the anterior border rounded and entire. Frontal area lozenge-shaped; frontal groove distinct

but not reaching the anterior ocellus. Frontal carinae sinuous, diverging behind. Antennae inserted some distance behind the clypeus; the scapes terete, slightly thickened at their tips, reaching a little beyond the posterior corners of the head; funicular joints all very distinctly longer than broad. Thorax very regularly elongate-elliptical, nearly $2\frac{1}{2}$ times as long as broad, as broad as the head. Mesonotum convex and rounded in front, flattened behind, as long as broad. Epinotum with distinct base and declivity, the former about half as long as the latter, meeting it at a rounded right angle. Petiole low and small, the node very blunt and rounded, about twice as broad as long. Gaster regularly elliptical, a little shorter and broader than the thorax. Legs rather short.

Subopaque; head in front and especially the mandibles more shining; mandibles and clypeus very finely and sparsely punctate; remainder of the body very finely and densely punctate, with coarser, sparse, piligerous punctures, most distinct on the front and posterior portion of the head.

Head, thorax, and gaster with very sparse, delicate, erect, blunt, blackish hairs; antennae and legs with short, sparse, appressed, rather indistinct, pale pubescence.

Black or very dark brown; mandibles, except their teeth, clypeus, cheeks, sides of front, antennae and their insertions, reddish yellow. Gaster milk-white, dorsal surface black, with a large, median, irregularly elliptical white spot, extending from the anterior third of the first to the posterior border of the fourth segment; the posterolateral margins of the second to fourth segments also white; anal segment black, with yellowish tip. Wing-insertions, coxae, and trochanters white; tarsi, anterior surface of the fore legs and ventral portions of the fore femora brownish yellow.

Described from a single specimen taken by Mr. E. B. Kershaw in British North Borneo.

This species is readily distinguished by its unusual coloration from any of the *Colobopsis* of which I have seen specimens or descriptions. Its small size indicates that the workers must be diminutive, like those of the European and North American species.¹

184. CAMPONOTUS (COLOBOPSIS) GILVICEPS Roger.

Formica ruficeps Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 54, ♀ (*nec* Fabricius).

Camponotus gilviceps Roger, Verzeichn. formicid., 1863, p. 3; Forel, Ann. Soc. ent. Belgique, 1909, 53, p. 57 *nota*.

¹ Since the foregoing description was written I have received from Dr. J. W. Chapman a fine series of the soldiers and workers of this ant taken at Dumaguete, Negros Oriental, in The Philippines. The soldiers are colored like the female, but in the worker the white gastric spot is shorter, extending only to or slightly beyond the posterior margin of the second segment.

Camponotus (Colobopsis) gilviceps Forel, Rev. Suisse zool., 1914, **22**, p. 272.

Type-locality: Sarawak, Borneo (A. R. Wallace).

185. CAMPONOTUS (COLOBOPSIS) HOSEI Forel.

Camponotus hosei Forel, Rev. Suisse zool., 1911, **19**, p. 55, ♀.

Camponotus (Colobopsis) hosei Forel, *ibid.*, 1914, **22**, p. 272.

Type-locality: Borneo (Hose).

186. CAMPONOTUS (COLOBOPSIS) HOSEI var. MIMUS Forel.

Camponotus hosei var. *mimus* Forel, Rev. Suisse zool., 1911, **19**, p. 56, ♀.

Type-locality: Borneo (Hose).

187. CAMPONOTUS (COLOBOPSIS) SEVERINI Forel.

Camponotus (Colobopsis) severini Forel, Ann. Soc. ent. Belgique, 1909, **53**, p. 55, 2 ♀ ♀ ♂.

Type-locality: Labuan Island, Borneo.

188. CAMPONOTUS (COLOBOPSIS) SMITHIANUS, sp. nov.

Worker major. Length 5-5.6 mm.

Head large, regularly oblong, $1\frac{1}{2}$ times as long as broad, equally flattened above and below, obliquely truncated in the clypeal region, with the cheeks swollen and rounded and their borders projecting anteriorly around the insertions of the mandibles as curved plates; the region in front of the eyes and near the frontal carinae distinctly impressed on each side; the eyes rather small and flat, their anterior orbits just in front of the posterior third of the head. Mandibles very stout and convex, with five obtuse teeth. Palpi very short. Clypeus with distinct median and lateral portions, the former ecarinate, consisting of two planes, a posterior continuing the dorsal surface of the head, rectangular and nearly twice as broad as long, and an anterior, obliquely sloping and semicircular, its median curved edge forming the anterior border of the clypeus. The triangular, scale-like lateral portions of the clypeus are marked off by grooves that terminate behind in the small but distinct clypeal foveae. Frontal area indistinct; frontal groove delicate; frontal carinae long, lyriform, continued nearly as far back as the posterior orbits, diverging behind

where they are twice as far apart as their distance from the lateral corners of the head. Antennae short and slender, the scapes uniformly bent, slightly flattened though narrow at the base, gradually enlarging towards their tips, which reach the posterior corners of the head; funiculi of very uniform thickness throughout, the joints subequal, a little longer than broad, the first and last longer. Thorax much narrower and a little shorter than the head, the pro- and mesonotum together forming a hemispherical mass, with strong mesoëpinotal suture, the mesonotum broader than long. Mesoëpinotal constriction rather deep and very short; metanotal sclerite distinct, short, and convex; epinotum very small, its base long, flattened, nearly perpendicular, the declivity extremely short and strongly concave. Petiole thick, and very low; from above twice as broad as long and a little narrower in front than behind, in profile truncated anteriorly, posteriorly, and dorsally, the posterior surface higher than the anterior and distinctly impressed in the middle above. Gaster elongate-elliptical, smaller than the head. Legs rather stout, slightly flattened, the fore femora enlarged, the claws well developed.

Mandibles shining, finely and evenly but not densely punctate; anterior half of head subopaque, densely and finely punctate and minutely and indistinctly rugulose; remainder of body shining, distinctly shagreened, the gaster transversely, covered with sparse, piligerous punctures.

Hairs grayish, coarse, erect, of uneven length, longest and moderately abundant on the dorsal surface of the head, thorax, petiole, and gaster; absent on the gula; short, even, and oblique on the legs and distal portions of the antennal scapes. Pubescence pale, long, coarse, and sparse, conspicuous on the sides of the head, between the frontal carinae and on the gaster.

Black; mandibles, cheeks, and clypeus cherry-red; antennal funiculi yellow, except the first and last joint, which are black or piceous like the scapes; tarsi and articulations of the thorax, petiole, and legs brown or reddish.

Worker minor. Length 3.5 mm.

Head subtrapezoidal, as broad as long, a little narrower in front than behind, with feebly convex sides and posterior border, only moderately and evenly convex above, with the eyes at the posterior third. Mandibles narrow, with oblique, apparently 4-toothed apical and straight lateral borders. Maxillary palpi much longer than in the major worker. Clypeus broader than long, subtrapezoidal, feebly carinate, with nearly straight, entire anterior border. Frontal area obsolete; frontal groove feeble; frontal carinae short, rather straight, strongly diverging behind. Antennae long, the scapes extending about $\frac{1}{3}$ their length beyond the posterior corners of the head; first funicular joint nearly as long as the second and third together, the second distinctly shorter than the third, which like the fourth and fifth is nearly twice as long as broad. Thorax in profile composed of two subequal hemispherical masses, one formed by the pro- and mesonotum, the other by the meta- and epinotum, meeting at a short, acute, mesoëpinotal incision; the epinotum really without

distinct base and declivity, though the lower metasternal border is reflected at the articulation with the petiole. Petiole resembling that of the major worker, but even lower, with its dorsal surface more truncated and flattened.

Sculpture and pilosity much as in the worker major, but the anterior portion of the head not subopaque and punctate, the pubescence on the sides and front of the head replaced by oblique or subappressed, rather abundant hairs and the scapes as abundantly provided with oblique hairs as the legs.

Black; mandibles, anterior border of cheeks and clypeus, the mesopleurae, sides and posteroinferior border of the epinotum, and the tarsi beyond the first joint, red. Funicular joints 3-9 brownish yellow.

Described from three major workers and one minor worker taken on the Rambungan River, Sarawak by Prof. Harrison W. Smith, to whom the species is dedicated. It is very distinct from all the Indomalayan *Colobopsis* of which I have seen specimens or descriptions. *Type*. M. C. Z. 9,074.

189. CAMPONOTUS (INCERTAE SEDIS) TENUIPES (Smith).

Formica tenuipes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 57, ♀.

Camponotus tenuipes Mayr, Verh. Zool. bot. gesellsch. Wien, 1886, **36**, p. 354.

Type-locality: Sarawak, Borneo (A. R. Wallace).

190. POLYRHACHIS (POLYRHACHIS) BIHAMATA (Drury).

Formica bihamata Drury, Illustr. nat. hist., 1773, **2**, pl. 38, fig. 7, 8, ♀.

Formica affinis Le Guillou, Ann. Soc. ent. France, 1841, **10**, p. 314, ♀.

Polyrhachis bihamata Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 58, pl. 1, fig. 9.

Polyrhachis affinis Mayr, Verh. Zool. bot. gesellsch. Wien, 1863, **13**, p. 443.

Type-locality: Johanna Island, Comoro Islands.

Sarawak, (Doria and Beccari; A. R. Wallace); Kapouas Basin (Chaper).

Numerous workers from Sarawak River, Kuching, Serambu, Sarawak (H. W. Smith) and Kuching (John Hewitt).

191. POLYRHACHIS (POLYRHACHIS) BELLICOSA Smith.

Polyrhachis bellicosus Smith, Journ. Proc. Linn. soc. London. Zool., 1859, **3**, p. 142, ♀.

Polyrhachis bihamata var. *bellicosa* Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 677.

Polyrhachis bellicosa Mayr, Tijdschr. ent. 1867, **10**, p. 50, ♀.

Type-locality: Aru (A. R. Wallace).

Sarawak (Doria and Beccari; Bedot and Pictet).

Numerous workers from Sadong, Serambu, and Sarawak River, Kuching (H. W. Smith), British North Borneo (E. B. Kershaw), and Kuching (John Hewitt).

192. POLYRHACHIS (POLYRHACHIS) YPSILON Emery.

Polyrhachis bihamata Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 58, ♀.

Polyrhachis ypsilon Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **4**, p. 239, ♀.

Type-locality: Borneo.

Fourteen workers from Sadong and Kuching (H. W. Smith).

193. POLYRHACHIS (CAMPOMYRMA) EQUINA Smith.

Polyrhachis equinus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 63, ♀.

Polyrhachis equina Dalla Torre, Cat. Hymenop., 1893, **7**, p. 261.

Polyrhachis biloba Forel, Rev. Suisse zool., 1911, **19**, p. 58, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

Sarawak (Haviland).

Examination of a single specimen taken by John Hewitt at Kuching shows that Forel has redescribed Smith's *Polyrhachis equina* as *biloba*.

194. POLYRHACHIS (CAMPOMYRMA) GRIBODOI Emery.

Polyrhachis gribodoi Emery, Ann. Mus. civ. Genova, 1887, ser. 2, **4**, p. 22, ♀ ♀.

Type-locality: Java.

Sarawak (Doria and Beccari).

195. POLYRHACHIS (MYRMA) RELUCENS (Latreille).

Formica relucens Latreille, Hist. nat. fourmis., 1802, p. 131, ♀, pl. 4, fig. 24.

Polyrhachis relucens Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 59.

Type-locality: East Indies (Riche and La Billardière).
Sarawak (A. R. Wallace).

196. POLYRHACHIS (MYRMA) PRUINOSA Mayr.

Polyrhachis pruinosa Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 142, ♀.

Type-locality: Sarawak, Borneo (Doria and Beccari).

197. POLYRHACHIS (MYRMA) MURINA Emery.

Polyrhachis murina Emery, Rev. Suisse zool., 1893, **1**, p. 198, ♀.

Type-locality: Sarawak, Borneo (Bedot and Pictet).

198. POLYRHACHIS (MYRMA) MAYRI Roger.

Polyrhachis relucens Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 685,
♀ (*nec* Latreille).

Polyrhachis mayri Roger, Verzeich. formicid., 1863, p. 7; Mayr, Tijdschr.
ent. 1867, **10**, p. 56, ♀.

Type-locality: Java (Kirsch).

Sarawak (Doria and Beccari); Kapouas Basin (Chaper).

Two workers from Serambu Mt., Sarawak (H. W. Smith).

199. POLYRHACHIS (MYRMA) LYCIDAS Smith.

Polyrhachis lycidas Smith, Journ. Proc. Linn. soc. London. Zool., 1861, **6**,
p. 43, ♀, pl. 1, fig. 23; Mayr, Tijdschr. ent., 1867, **10**, p. 31, ♀ ♀.

Type-locality: Celebes.

Borneo (Leyden Mus.).

Two workers from Kuching (John Hewitt).

200. POLYRHACHIS (MYRMA) BECCARII Mayr.

Polyrhachis beccarii Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 141, ♀; Emery,
ibid., 1887, ser. 2, **4**, p. 232, ♀.

Type-locality: Sarawak, Borneo (Doria and Beccari).

Two workers from Kuching (John Hewitt).

201. POLYRHACHIS (MYRMA) NIGROPILOSA Mayr.

Polyrhachis nigropilosa Mayr, Ann. Mus. civ. Genova, 1872, **2**, p. 141, ♀ ;
Emery, ibid, 1887, ser. 2, **4**, p. 232, ♀ .

Type-locality: Sarawak, Borneo (Doria and Beccari).

Three workers from Serambu Mt., Sarawak and Kuching (H. W. Smith) and British North Borneo (E. B. Kershaw).

201a. POLYRHACHIS (MYRMA) NIGROPILOSA var. CONOPHTHALMA
Emery.

Polyrhachis nigropilosa var. *conophtalma* Emery, Ann. Mus. civ. Genova,
1900, ser. 2, **20**, p. 713, ♀ .

Type-locality: Sumatra (E. Modigliani).

A single worker from Serambu Mt., Sarawak (H. W. Smith).

202. POLYRHACHIS (MYRMA) SCULPTURATA Smith.

Polyrhachis sculpturatus Smith, Journ. Proc. Linn. soc. London. Zool., 1861,
5, p. 70, ♀ ♀ .

Polyrhachis sculpturata Mayr, Tijdschr. ent., 1867, **10**, p. 59, ♀ .

Type-locality: Makassar, Celebes (A. R. Wallace).

Kapouas Basin, Borneo (Chaper).

203. POLYRHACHIS (MYRMA) STRIATA Mayr.

Polyrhachis striatus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 686, ♀ ,
pl. 19, fig. 8.

Polyrhachis striata Mayr, Reise Novara. Zool., **2**, Formicid., 1865, p. 44, ♀ ,
pl. 2, fig. 11.

Type-locality: Java (Novara Expedition).

Sarawak (Doria and Beccari).

A single worker from Kuching (John Hewitt).

204. POLYRHACHIS (MYRMA) SUMATRENSIS Smith.

Polyrhachis sumatrensis Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 65, ♀ ,
pl. 4, fig. 43; Forel, Sitzb. K. bayr. akad. wiss. Math. phys. klasse, 1911,
p. 296.

Type-locality: Sumatra.
Sarawak (Munich Mus.).

205. POLYRHACHIS (MYRMA) VILLIPES Smith.

Polyrhachis villipes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 61, ♀; Mayr, Tijdschr. ent., 1867, 10, p. 58, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).
Sarawak (Doria and Beccari; Haviland).

Two workers and a female from Kuching (John Hewitt) and a worker from the same locality (H. W. Smith).

206. POLYRHACHIS (MYRMA) VINDEK Smith.

Polyrhachis vindex Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 64, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).
Worker. Length: 5-6 mm.

Head broadly oval, a little longer than broad, and a little broader behind than in front, nearly as high in the region of the frontal carinae as long. Eyes distinctly behind the middle of the sides, moderately large and convex. Mandibles with feebly convex external and oblique, coarsely 4-toothed apical border. Clypeus subcarinate, its anterior border feebly and sinuately emarginate in the middle and on each side. Frontal area distinct, triangular; frontal carinae closely approximated, erect, very close together anteriorly. Antennae long; scapes slender, reaching about $\frac{2}{5}$ their length beyond the occiput. Thorax short, only a little longer than its greatest height, the sides flat, the dorsum evenly convex and rounded, its sides acutely marginate, the margin incised at the distinct promesonotal and at the nearly obsolete mesoepinotal suture. Pronotum, excluding the neck, nearly twice as broad as long, its anterior corners produced as flattened, acute spines which are nearly twice as long as broad at their bases, and directed forward and very slightly outward. Mesonotum transversely oblong, nearly as broad as the pronotum and nearly four times as broad as long. Base of epinotum trapezoidal, somewhat less than twice as broad as long, with straight sides and posterior border, the latter strongly marginate, with a small, acute, upturned tooth at each corner, the declivity abrupt, concave and narrowed below, as long as the base and marginate on the sides. Petiole lenticular, as broad as the anterior border of the epinotum, in profile convex anteriorly and posteriorly, with a sharp superior border, which seen from behind is evenly arcuate and entire, with a small,

rather acute, triangular tooth on each side. Below the teeth the sides are straight and rapidly converge. Gaster subglobose, with very large first segment, strongly and concavely truncated in front. Legs long and stout, tibiae cylindrical, constricted at the base, without bristles on their flexor surfaces.

Subopaque; mandibles finely and evenly striated, with minute, scattered punctures; clypeus finely and densely punctate; upper surface of head, dorsum and sides of thorax evenly and rather finely longitudinally rugose with indistinctly punctate interrugal spaces; sides of head finely and somewhat irregularly rugulose-punctate; gula smooth and shining; declivity of epinotum finely, transversely rugulose; petiole and gaster lustrous, very finely and indistinctly punctate.

Hairs very sparse, whitish, erect, confined to the head and tips of the gaster. Pubescence whitish, indistinct on the head; longer and more abundant on the pleurae; very fine and dense, producing a pruinose appearance on the thoracic dorsum, petiole, and gaster, less apparent on the legs.

Black; palpi reddish; legs variable in color; in some specimens black throughout, in others with the femora and tibiae red or reddish yellow and the knees, coxae, and tarsi black.

Eight workers; three from Kuching (John Hewitt "nesting at base of an epiphyte between intertwining roots"), one from Kuching and one from Serambu Mt. (H. W. Smith), two from Bongo Mt. (Hewitt and Brooks) and one from Mt. Matang, West Sarawak (G. E. Bryant).

I have redescribed this form in detail because it seems certain that it is Smith's *P. vindex*, which has not been recognized up to the present time. The species is evidently very close to Smith's *inermis* and *orsyllus*, especially to the latter, but both of these forms were described later and would therefore be only subspecies or synonyms of *vindex*.

*207a. POLYRHACHIS (HEMIOPTICA) ACULEATA Mayr subsp. CYBELE, subsp. nov.

Worker. Length 6–6.5 mm.

Differing from the typical form in its somewhat larger size, broader head, and decidedly larger and higher petiole, with its two spines a little shorter and the transverse margin between them more arcuate and sharper. The eyes are a little larger and distinctly less truncated laterally and less conical and more hemispherical when seen from the front. The erect, pale hairs on the body are distinctly less abundant than in the typical *aculeata* and the legs are entirely black.

Described from four specimens from Kuching (John Hewitt).
Type.—M. C. Z. 9,076.

*208a. POLYRHACHIS (MYRMOTHRINAX) THRINAX Roger var.
JAVANICA Mayr.

Polyrhachis thrinax var. *javanica* Mayr, Tijdschr. ent., 1867, **10**, p. 20, ♀.

Type-locality: Java (Mus. Holm.).

Three workers from Kuching (John Hewitt).

209. POLYRHACHIS (MYRMOTHRINAX) AEQUICUSPIS, nom. nov.

Polyrhachis constructor Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 68, ♀, pl. 4, fig. 23 (*nec P. constructor* Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 60).

Type-locality: Sarawak, Borneo (Saunders Coll.).

It seems not to have been noticed that Smith gave the name *constructor* to two very different species of *Polyrhachis*. In 1857 he described a *P. constructor* from a female specimen taken by A. R. Wallace at Sarawak. This specimen measured $3\frac{1}{2}$ lines and had the petiole "quadrate, with two very stout, short, curved spines above" and the body covered with "short, silky, ashy pile, most apparent on the abdomen." In 1858 he gave the same name to a female from the same locality but from the W. W. Saunders Collection, measuring $4\frac{1}{2}$ lines, with the "node of the petiole incrassate and with three stout, short, acute spines." The figure accompanying this description shows that he had before him a species of *Myrmothrinax*, with subequal petiolar spines, possibly the form afterwards called *thrinax* var. *javanica* by Mayr. It therefore becomes necessary to change the name of the second *constructor*. The first will have to be consigned to the species of *Polyrhachis incertae sedis* for the present (*vide infra* p. 137).

*210. POLYRHACHIS (MYRMOTHRINAX) TRIAENA, sp. nov.

Worker. Length 6.5–7 mm.

Head a little longer than broad, a little broader behind than in front, with evenly rounded and convex occipital border and straight sides; very convex dorsally in the frontal region. Eyes large and convex, broadly elliptical, their anterior orbits at the median transverse diameter of the head. Mandibles very convex, with five large, subequal teeth. Clypeus carinate, broader

than long, its anterior border entire, evenly rounded and slightly projecting. Frontal area distinct, triangular; frontal groove narrow but distinct; frontal carinae rather approximated, prominent, sinuous, as near together behind as in front. Antennae long; scapes extending more than half their length beyond the occipital border, the basal funicular joints about $2\frac{1}{4}$ times as long as broad. Thorax slender, its dorsal and lateral surfaces flattened, the former strongly marginate on all sides, except at the neck. Promesonotal and meso-epinotal sutures distinct, but not incised where they meet the lateral marginations. Dorsum of pronotum as broad as long, with two flat, blunt teeth anteriorly, as long as broad at their bases, directed outwards; dorsum of mesonotum trapezoidal, about $1\frac{1}{4}$ times as long as broad, with straight sides, converging posteriorly. Base of epinotum regularly oblong, twice as long as broad, its posterior angles forming two small erect teeth, as large as those on the pronotum but more acute; epinotal declivity shorter than the base, sloping and concave. Petiole from above $1\frac{1}{4}$ times as long as broad, broader in front than behind, bearing above in the middle a long, straight, backwardly directed spine, nearly as long as the greatest height of the remainder of the petiole, and on each side a triangular tooth, only a little longer than broad at the base and somewhat blunter than the median spine. Gaster a little larger than the head, oval, broad in front. Legs long; tibiae cylindrical, distinctly constricted at the base, without a row of bristles on their flexor surfaces.

Mandibles slightly shining, very finely striated and finely and sparsely punctate; clypeus, head, thorax, and petiole densely and evenly punctate. Gaster and legs very finely and superficially shagreened, the former shining, the latter lustrous.

Hairs very few, short, obtuse, yellowish, confined to the clypeus, mandibles, and tip of the gaster; pubescence extremely fine and dilute, visible only on the antennae and tibiae.

Brownish ferruginous; scapes, legs, and gaster a little paler than the head, thorax, and petiole.

Female (deälated). Length nearly 10 mm.

Resembling the worker in the shape of the head and petiole. Thorax elongate-elliptical, nearly $2\frac{1}{2}$ times as long as broad, narrower than the head; meso- and epinotum not marginate on the sides, the former as broad as long, convex in front, flattened behind; the latter with subequal base and declivity, the base slightly convex and not separated from the sloping, concave declivity by a transverse ridge as in the worker; epinotal teeth stout, short, and blunt, directed upward. Pronotum with the blunt, triangular teeth at the anterior corners not connected by a distinct transverse carina. Median spine of the petiole of rather uniform thickness, with blunt tip.

Sculpture resembling that of the worker, but the head, thorax, and petiole delicately reticulate-rugose as well as finely punctate.

Black; tip of last funicular joint yellowish; gaster with a slightly reddish tint.

Described from two workers and a female taken by Mr. John Hewitt at Kuching.

Of the various species of *Myrmothrinax*, namely *thrinax* Roger, *textor* Smith, *aequicuspis* Wheeler, *dahli* Forel and *frauenfeldi* Mayr, this species seems to be most closely related to the last. The worker *triaena*, however, is smaller, not black and has the sides of the thorax sharply marginate, whereas Mayr says of *frauenfeldi* that it has the "thorax sine marginibus acutis." The Bornean form is not unlike *dahli* in the general shape of the thorax, but the pronotal teeth of the former are longer, the epinotal teeth much shorter, the sculpture, color, and size are different and the basal funicular joints are shorter. *P. triaena* occurs also in Java as I possess a dealated female from that island received from Staudinger under the name *frauenfeldi*.

211. POLYRHACHIS (CHARIOMYRMA) ARCUATA (Le Guillou).

Formica arcuata Le Guillou, Ann. Soc. ent. France, 1841, **10**, p. 315, ♀ ♀.

Polyrhachis latifrons Roger, Berlin ent. zeitschr. 1863, **7**, p. 155, ♀.

Polyrhachis modiglianii Emery, Ann. Mus. civ. Genova, 1888, ser. 2, **5**, p. 529, ♀ ♀, pl. 9, fig. 1.

Polyrhachis arcuata Forel, Mitth. Zool. mus. Berlin, 1901, **2**, p. 32.

Type-locality: Borneo (Voyage of the "Astrolabe" and "Zelée").

A single dealated female from Bongo Mt., Sarawak (Hewitt and Brooks).

212. POLYRHACHIS (MYRMHOPLA) ARMATA (Le Guillou).

Formica armata Le Guillou, Ann. Soc. ent. France, 1841, **10**, p. 313, ♂.

Polyrhachis armata Mayr, Tijdschr. ent., 1867, **10**, p. 46, ♀.

Polyrhachis defensus Smith, Journ. Próc. Linn. soc. London. Zool., 1857, **2**, p. 59, ♀.

Polyrhachis pandarus Smith, *ibid*, p. 62, ♀.

Type-locality: Samboangan, Philippines (Voyage of the "Astrolabe" and "Zelée").

Sarawak (Doria and Beccari; A. R. Wallace); Hayvep (Winkler).

Numerous workers and females from Kuching (John Hewitt) and Kuching, Matang, and Serambu Mts. (H. W. Smith) and British North Borneo (E. B. Kershaw). Nearly all of these specimens have the gaster ferruginous instead of black.

213. POLYRHACHIS (MYRMHOPLA) LUGENS Mayr.

Polyrhachis lugens Mayr, Tijdschr. ent., 1867, **10**, p. 31, ♀.

Type-locality: Borneo (Leyden Museum).

*214. POLYRHACHIS (MYRMHOPLA) PRESSA Mayr.

Polyrhachis pressus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 681, ♀ ♀.

Polyrhachis pressa Mayr, Reise Novara. Zool., **2**. Formicid., 1865, p. 39, ♀ ♀, pl. 1, fig. 5.

Type-locality: Batavia, Java (Novara Expedition).

A single worker from Kuching (John Hewitt).

215. POLYRHACHIS (MYRMHOPLA) ABDOMINALIS Smith.

Polyrhachis abdominalis Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 63, ♀.

Polyrhachis phyllophilus Smith, Journ. Proc. Linn. soc. London. Zool. Suppl., 1860, **4**, p. 69, ♀.

Polyrhachis phyllophila Mayr, Tijdschr. ent., 1867, **10**, p. 47, ♀.

Type-locality: Burmah.

Sarawak (Doria and Beccari); Kapouas Basin (Chaper).

Two workers from British North Borneo (E. B. Kershaw) and one from Serambu Mt., Sarawak (H. W. Smith).

216. POLYRHACHIS (MYRMHOPLA) RUBIGINOSA (Le Guillou).

Formica rubiginosa Le Guillou, Ann. Soc. ent. France, 1841, **10**, p. 316, ♀.

Polyrhachis rubiginosa Emery in Dalla Torre, Cat. Hymenop., 1893, **7**, p. 268.

Type-locality: Borneo (Voyage of the "Astrolabe" and "Zelée").

*217. POLYRHACHIS (MYRMHOPLA) RUGIFRONS Smith.

Polyrhachis rugifrons Smith, Journ. Proc. Linn. soc. London. Zool., 1861, **5**, p. 70, ♀; Mayr, Tijdschr. ent., 1867, **10**, p. 43, ♀.

Type-locality: Makassar, Celebes (A. R. Wallace).

A single worker from Serambu Mt., Sarawak (H. W. Smith).

*218. POLYRHACHIS (MYRMHOPLA) FURCATA Smith.

Polyrhachis furcatus Smith, Cat. Hymenop. Brit. mus. 1858, **6**, p. 64, ♀, pl. 4, fig. 20.

Polyrhachis furcata Forel, Journ. Asiat. soc. Bengal, 1886, **55**, p. 241, ♀; Emery, Ann. Mus. civ. Genova, 1889, ser. **2**, **7**, p. 518, ♀ ♀.

Type-locality: Burmah.

A single dealated female from the Rambungan River, Sarawak (H. W. Smith). As Emery has observed, the petiolar spines of the female are not hooked as in the worker, but merely curved.

219. POLYRHACHIS (MYRMHOPLA) CHALYBEA Smith.

Polyrhachis chalybea Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 61, ♀.

Type-locality: Singapore (A. R. Wallace).

Sarawak (Doria and Beccari); Kapouas Basin (Chaper).

A single worker from Kuching (John Hewitt).

220. POLYRHACHIS (MYRMHOPLA) ARGENTEA Mayr.

Polyrhachis argenteus Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 682, ♀.

Polyrhachis argentea Mayr, Reise Novara. Zool., **2**. Formicid., 1865, p. 40, ♀, pl. 2, fig. 7.

Polyrhachis acasta Forel, Journ. Asiat. soc. Bengal, 1886, **55**, p. 241, ♀; Dalla Torre, Cat. Hymenop., 1893, **7**, p. 257.

Type-locality: Manila, Philippine Islands (Novara Expedition).

Sarawak (Bedot and Pictet).

221. POLYRHACHIS (MYRMHOPLA) BICOLOR Smith.

Polyrhachis bicolor Smith, Cat. Hymenop. Brit. mus. 1858, **6**, p. 65, ♀; Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 681, ♀, pl. 19, fig. 5.

Type-locality: Burmah.

Sarawak (Doria and Beccari; Bedot and Pictet). Tandjong, S. E. Borneo (Fritz Suck).

A few workers, females, and males from Kuching (John Hewitt).

221a. POLYRHACHIS (MYRMHOPLA) BICOLOR Smith var. AURINASIS Forel.

Polyrhachis bicolor var. *aurinasis* Forel, Mitth. Naturh. mus. Hamburg, 1901, 18, p. 77, ♀.

Type-locality: Sarawak, Borneo (Haviland).

222. POLYRHACHIS (MYRMHOPLA) CEPHALOTES Emery.

Polyrhachis cephalotes Emery, Rev. Suisse zool., 1893, 1, p. 199, ♀, pl. 8, fig. 6; Forel, Rev. Suisse zool., 1913, 21, p. 665, ♀ ♀ ♂.

Type-locality: Deli, Sumatra (Bedot and Pictet).
Balik Papan, Borneo (Kampmeiner).

223. POLYRHACHIS (MYRMHOPLA) DIVES Smith.

Polyrhachis dives Smith, Journ. Proc. Linn. soc. London. Zool., 1857, 2, p. 64, ♀.

Polyrhachis acantha Smith, ibid, Suppl., 1860, 4, p. 98, ♀, pl. 1, fig. 16.

Type-locality: Singapore (A. R. Wallace).
Borneo (Leyden Museum).

*224. POLYRHACHIS (MYRMHOPLA) TIBIALIS Smith.

Polyrhachis tibialis Smith, Cat. Hymenop. Brit. mus., 1858, 6, p. 63, ♀.

Type-locality: Burmah.
A single worker from Kuching (John Hewitt).

225. POLYRHACHIS (MYRMHOPLA) DIOTIMA Forel.

Polyrhachis diotima Forel, Rev. Suisse zool., 1911, 19, p. 60, ♀.

Type-locality: Hayvep, Borneo (Winkler).

226. POLYRHACHIS (MYRMHOPLA) ASPASIA Forel.

Polyrhachis aspasia Forel, Rev. Suisse zool., 1911, 19, p. 59, ♀.

Type-locality: Sarawak, Borneo (Haviland).

*227. POLYRHACHIS (MYRMHOPLA) DAPHNE, sp. nov.

Worker. Length: 5.5–6 mm.

Head a little longer than broad, a little broader at the eyes than at the anterior corners, semicircularly rounded behind, with rather straight sides and cheeks; in profile very convex in the region of the frontal carinae, with feebly convex gular surface. Eyes large and convex, their anterior orbits at the median transverse diameter of the head. Palpi long and slender. Mandibles moderately convex, with four stout, subequal teeth. Clypeus semicircular, convex, ecarinate; its anterior border very feebly sinuate on each side of the middle which does not project as a lobe. Clypeal fossa very pronounced. Frontal area indistinct, triangular. Frontal carinae approximated, sinuate, erect, not further apart behind than in front. Antennae long, their scapes extending fully half their length beyond the occipital border of the head. Thorax subcylindrical, narrower than the head, a little broader through the posterior part of the pronotum than through the meso- and epinotum which are of equal width; pro- and mesoëpinotal sutures very distinct and strongly impressed. Pronotum, excluding the neck, a little broader than long, rounded on the sides, with two stout, straight, acute spines which are twice as long as the width of their bases and directed forward and outward. Mesonotum as long as broad, its anterior outline semicircular, its lateral and posterior borders straight, the sides not marginate. Epinotum compressed above, the base horizontal and slightly concave, oblong, strongly marginate on the sides, the marginations continued into the spines which are stout, straight, acute, twice as long as those on the pronotum and as long as the base of the epinotum, laterally compressed, and directed backward and very slightly upward. The epinotal declivity is abrupt, slightly concave in profile, not marginate on the sides, with large, prominent stigmata. Petiole subcuboidal with a denticle on each side below near the anterior border and above with two stout, compressed, curved spines, a little longer than those on the epinotum and directed outward and backward. The distance between their tips is less than half the diameter of the first gastric segment. Gaster large, broadly elliptical, less than half of it formed by the first segment, slightly flattened dorsoventrally, convex but not truncated in front. Legs long; tibiae cylindrical, slightly constricted at the base, without bristles on their flexor surfaces.

Mandibles and clypeus smooth and shining, the former minutely and sparsely punctate; head shining above, subopaque on the sides; shagreened, the vertex and sides of the front sparsely punctate. Thorax and petiole opaque; sides of the former densely and evenly punctate, the dorsum very finely punctate-rugulose, the rugules on the mesonotum obscurely concentric, the base of the epinotum, especially behind, smooth and shining. Petiole indistinctly punctate, slightly shining between the insertions of the spines. Gaster shining, very finely and superficially shagreened or aciculate, with small, sparse punctures; legs more opaque and more coarsely shagreened.

Hairs yellow, erect; present only on the venter, tip of gaster, mandibles, and anterior border of the clypeus. Pubescence yellow, very short, sparse, and appressed, distinct on the sides of the head, on the legs and gaster.

Brownish yellow; mandibles reddish, with dark brown teeth; scapes, except their tips, a median line on the clypeus, the upper surface of the head and sides of the front, a large spot on the pronotum, the mesonotum, epinotum, petiole, and basal half of first gastric segment, brown; epinotal and petiolar spines, tarsi, and constricted bases of the tibiae somewhat darker.

Described from two specimens taken by Prof. Harrison W. Smith on Matang Mt., near Kuching. *Type*.—M. C. Z. 9,075.

I can find no description of this beautiful and striking species.

*228. POLYRHACHIS (MYRMHOPLA) PERSONATA, sp. nov.

Worker. Length nearly 5 mm.

Head oval, a little longer than broad, slightly narrowed in front and behind, with rounded sides, convex above in the region of the frontal carinae, the lower surface in profile convex in the middle, owing to a peculiar condition of the occipital margin, which descends on each side of the narrowed gula as a prominent ridge or fold and extends all the way to the anterior corner of the head, with a blunt angle about half way between the neck and the mandible. The ant therefore has the appearance of wearing a mask, the border of which stands off on the sides and below from the neck. Eyes moderately large and convex, broadly elliptical, with impressed orbits, at the middle of the sides of the head. Mandibles feebly convex, 5-toothed. Clypeus moderately convex, subcarinate behind, its border forming a short lobe, straight in the middle and rounded on each side. Frontal area obsolete. Frontal carinae approximated, strongly sinuate and bluntly angular in the middle, a little further apart behind than in front. Antennae long, the scapes extending about $\frac{1}{5}$ their length beyond the occipital border. Thorax subcylindrical, narrower than the head, about twice as long as broad, slightly broader through the pronotum than elsewhere; pronotum, excluding the neck, as long as broad, rounded and rather convex above, anteriorly with a pair of straight, slender, acute spines, directed outward, upward, and slightly forward. Promesonotal suture distinct and slightly impressed; mesoëpinotal suture obsolete. Mesonotum broader than long, transversely rounded, its dorsal outline straight in profile. Epinotum short, the base much shorter than the straight, abrupt declivity, armed with two slender, acute spines about half again as long as those of the pronotum, directed outward, backward, and upward, their tips very feebly recurved. Petiole stout, with convex anterior and posterior surfaces, bearing above a pair of long, stout, curved, acute spines. These are much longer and stouter than those on the epinotum and form a semicircle, clasping the base of the gaster. The median dorsal border of the petiole between their bases bears two small acute teeth. Gaster subglobose, as broad as long, slightly flattened,

the first segment forming about $\frac{2}{3}$ of its surface, truncated in front. Legs moderately long; tibiae cylindrical, constricted at the base, without bristles on their flexor surfaces.

Gaster and gula smooth and shining; remainder of body and the appendages subopaque. Mandibles very finely striated and sparsely punctate; head, thorax, and petiole densely punctate-rugulose, the rugules coarser and reticulate on the dorsal surface of the head; the spines of the epinotum and petiole very finely shagreened, like the antennal scapes and legs.

Hairs whitish, erect; present only on the venter, tip of gaster, clypeal border, and mandibles. Pubescence pale, very fine and dilute, visible only on the tibiae, antennal funiculi, and sides of the gaster.

Black; palpi and spurs of the tibiae red.

Described from a single specimen taken by Mr. G. E. Bryant on Mt. Matang, West Sarawak and sent me by Mr. Horace Donisthorpe.

This species belongs to the *dives* group but is very distinct in the shape of the head, thorax, and petiole.

*229. POLYRHACHIS (MYRMHOPLA) ATROVIRENS Emery.

Polyrhachis atrovirens Emery, Ann. Mus. civ. Genova, 1900, ser. 2, 20, p. 718, ♀, fig. 16a.

Type-locality: Bua Bua, Engana (E. Modigliani).

A single worker from Sadong, Sarawak (H. W. Smith).

*230. POLYRHACHIS (MYRMHOPLA) OEDACANTHA, sp. nov.

Worker. Length 4 mm.

Related to *P. hippomanes* Smith and *atrovirens* Emery. Head elliptical, longer than broad, semicircularly rounded behind with feebly convex sides and equally convex dorsal and gular surfaces. Eyes moderately convex, their anterior orbits at the median transverse diameter of the head. Mandibles with rather rounded external borders, the apical borders with 5 subequal teeth. Clypeus carinate at the base, its anterior border broadly rounded and somewhat crenulate. Frontal area distinct, triangular. Frontal carinae approximated, sinuous, a little further apart behind than in front; frontal groove absent. Antennae long and slender, their scapes extending fully $\frac{2}{5}$ their length beyond the posterior border of the head. Thorax from above elongate trapezoidal, broadest through the humeri, evenly, longitudinally, and transversely rounded and convex above, with distinct promesonotal and mesoepinotal sutures. Pronotum about $1\frac{1}{2}$ times as broad as long, its anterior corners produced as flattened, triangular and slightly upturned teeth. Mesonotum of the same length as the pronotum; epinotum very short, without distinct base, but sloping abruptly from the mesoepinotal suture which lies just in front of the spines. These are long, stout, and acute, as long as the declivity, widely separated and curved at their bases, with slightly sinuous

tips, directed backward, upward, and outward. Petiole in profile with straight, not angulate, anterior and slightly convex posterior surface, armed above with a pair of stout spines, longer and stouter than those of the epinotum, constricted at the base and distinctly swollen in the middle, curved and tapering, directed outward and backward around the base of the gaster. The distance between their tips is a little less than the greatest diameter of the gaster, which is subglobose, distinctly broader than long, with $\frac{2}{3}$ of its surface formed by the first segment. Legs moderately long, tibiae cylindrical, strongly constricted at their bases, without bristles on their flexor surfaces.

Head, thorax, petiole, and legs subopaque; mandibles very finely striated and sparsely punctate; head, thorax, and petiole densely and uniformly punctate, thoracic dorsum also with scattered, shallower punctures; epinotal and petiolar spines longitudinally rugulose. Gaster shining, more finely and more superficially punctate than the head and thorax. Legs finely and sharply shagreened.

Hairs and pubescence whitish, the former only on the venter, tip of gaster, clypeus, and mandibles, the latter very fine, distinct only on the gaster, which has a slightly pruinose appearance.

Black; head, thorax, and petiole with indistinct purplish metallic reflections, more greenish on the occiput. Palpi, tibiae, femora, and middle and hind coxae red, tips of femora and constricted bases of the tibiae more or less infuscated.

Described from a single specimen taken by Mr. John Hewitt at Kuching.

This species, though closely related to *P. hippomanes*, *paromalus*, *mucronata*, and *atrovirens*, is easily distinguished by the robust, somewhat fusiform epinotal spines. It is perhaps merely a subspecies of *hippomanes*, although the petiole does not agree with Smith's figure of the type from Celebes. It is certainly very different from the subsp. *ceylonensis* Emery, represented in my collection by a couple of specimens received from Professor Forel.

231. POLYRHACHIS (CYRTOMYRMA) RASTELLATA (Latreille).

Formica rastellata Latreille, Hist. nat. fourmis, 1802, p. 130, ♀.

Polyrhachis rastellata Smith, Cat. Hymenop. Brit. mus., 1858, 6, p. 59.

Type-locality: East Indies (Riche).

Sarawak (Doria and Beccari).

232. POLYRHACHIS (CYRTOMYRMA) LAEVISSIMA Smith.

Polyrhachis laevisimus Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 64, ♀, pl. 4, fig. 42.

Polyrhachis globularia Mayr, Tijdschr. ent., 1867, **10**, p. 41, ♀.

Polyrhachis laevisima Mayr, Verh. Zool. bot. gesellsch. Wien, 1878, **28**, p. 651, ♀.

Polyrhachis levissima Dalla Torre, Cat. Hymenop., 1893, **7**, p. 264.

Type-locality: Burmah.

Kapouas Basin, Borneo (Chaper).

233. POLYRHACHIS (INCERTAE SEDIS) CASTANEIVENTRIS Smith.

Polyrhachis castaneiventris Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 67, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

234. POLYRHACHIS (INCERTAE SEDIS) NITIDA Smith.

Polyrhachis nitidus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 61, ♀.

Polyrhachis nitida Dalla Torre, Cat. Hymenop. 1893, **7**, p. 266.

Type-locality: Sarawak, Borneo (A. R. Wallace).

235. POLYRHACHIS (INCERTAE SEDIS) RUFICORNIS Smith.

Polyrhachis ruficornis Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 60, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

This is probably the female of *P. bicolor* Smith.

236. POLYRHACHIS (INCERTAE SEDIS) CONSTRUCTOR Smith.

Polyrhachis constructor Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 60, ♀ (*nec P. constructor* Smith, Cat. Hymenop. Brit. mus., 1858, **6**, p. 68).

Type-locality: Sarawak, Borneo (A. R. Wallace).

237. ECHINOPLA LINEATA Mayr.

Echinopla lineata Mayr, Verh. Zool. bot. gesellsch. Wien, 1862, **12**, p. 689, ♀.

Type-locality: Singapore.
Sarawak (Doria and Beccari).

238. ECHINOPLA MELANARCTOS Smith.

Echinopla melanarctos Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 79, ♀, pl. 25, fig. 29.

Type-locality: Singapore (A. R. Wallace).
Sarawak (Doria and Beccari; Haviland).

239. ECHINOPLA PALLIPES Smith.

Echinopla pallipes Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 80, ♀.

Echinopla pallidipes Dalla Torre, Cat. Hymenop., 1893, **7**, p. 272.

Type-locality: Sarawak, Borneo (A. R. Wallace).
A single worker from Kuching (John Hewitt).

240. ECHINOPLA RUGOSA Ern. André.

Echinopla rugosa Ern. André, Mém. Soc. zool. France, 1892, **5**, p. 47, ♀.

Type-locality: Kapouas Basin, Borneo (Chaper).

241. ECHINOPLA STRIATA Smith.

Echinopla striata Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 80, ♀.

Type-locality: Malacca (A. R. Wallace).
Sarawak (Doria and Beccari).
Three workers from Serambu Mt., Sarawak (H. W. Smith).

242. ECHINOPLA SUCKI Forel.

Echinopla sucki Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 75, ♀.

Type-locality: Tandjong, N. E. Borneo (Fritz Suck).

Three workers from Kuching (John Hewitt).

243. ECHINOPLA TRITSCHLERI Forel.

Echinopla tritschleri Forel, Mitth. Naturh. mus. Hamburg, 1901, **18**, p. 74, ♀ ♀.

Type-locality: Indrapura, Sumatra (Tritschler).

Tandjong, S. E. Borneo (Fritz Suck).

BORNEAN SPECIES INCERTAE SEDIS.

244. CERAPACHYS OCVLATUS Smith.

Cerapachys oculatus Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 74, ♂.

Type-locality: Sarawak, Borneo (A. R. Wallace).

245. PONERA APICALIS Smith.

Ponera apicalis Smith, Journ. Proc. Linn. soc. London. Zool. 1857, **2**, p. 66, ♀.

Type-locality: Sarawak, Borneo (A. R. Wallace).

246. PONERA POMPILOIDES Smith.

Ponera pompiloides Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 69, ♂.

Type-locality: Sarawak, Borneo (A. R. Wallace).

247. PONERA VIDUA Smith.

Ponera vidua Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 68, ♂.

Type-locality: Sarawak, Borneo (A. R. Wallace).

248. ATTA PENETRANS Smith.

Atta penetrans Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 77, ♀.
Aphaenogaster penetrans Dalla Torre, Cat. Hymenop., 1893, **7**, p. 104.

Type-locality: Sarawak, Borneo (A. R. Wallace).

249. ATTA CINGULATA Smith.

Atta cingulata Smith, Journ. Proc. Linn. soc. London. Zool., 1857, **2**, p. 77, ♂.
Aphaenogaster cingulata Dalla Torre, Cat. Hymenop., 1893, **7**, p. 102.

Type-locality: Sarawak, Borneo (A. R. Wallace).

POSTSCRIPT.

A series of specimens, which Prof. C. F. Baker of Manila, P. I. collected at Sandakan, Borneo and sent me too late to be included in the foregoing revision, comprises several interesting and four new species.

1. CERAPACHYS ANTENNATUS Smith. (*Ante* p. 45).

Male. Length about 7 mm.

Long and slender. Head, including the eyes, as broad as long, the eyes large, fully $\frac{1}{3}$ as long as the sides of the head and situated a little in front of its middle. Mandibles shaped as in the worker, their apical borders well-developed and finely denticulate. Clypeus indistinctly carinate behind, its anterior border broadly rounded and entire. Antennae long and stout, scapes somewhat longer than the three basal funicular joints together; first funicular joint as long as broad, the second broader than long, the remaining joints longer than broad, gradually increasing in length to the tip. Thorax through the wing-insertions as broad as the head through the eyes, mesonotum feebly convex, with pronounced Mayrian furrows. Epinotum in profile angular, with subequal base and declivity, the latter flat, seen from behind subcircular, strongly marginate both above and on the sides. Petiole subcylindrical, $1\frac{2}{3}$ times as long as broad, sharply truncated and marginate in front. Post-petiole broader than the petiole, broader behind than in front, also $1\frac{2}{3}$ times as long as broad, with evenly convex dorsal, lateral, and ventral surfaces.

Gaster very long and narrow, broadest in the middle, the basal half formed by the first segment. Genital appendages small and retracted. Legs rather long and slender.

Shining; mandibles very sparsely, coarsely, and irregularly punctate. Clypeus feebly striolate. Head finely and rather regularly longitudinally rugose on the front, irregularly punctate-rugulose behind. Thorax coarsely and transversely foveolate along the sutures and Mayrian furrows and coarsely and sparsely foveolate on the surfaces of the sclerites. Pronotum longitudinally rugose. Base of epinotum coarsely and vermiculately rugose, the declivity finely and densely punctate-rugulose. Petiole above with a few strong, undulating longitudinal rugae, becoming more reticulate on the sides. Postpetiole, gaster, and legs smooth, with minute, sparse, piligerous punctures.

Hairs as in the worker, and most abundant on the apical portion of the gaster.

Black; mandibles, genitalia, and tips of tarsi reddish. Wings grayish hyaline, with large black pterostigma and dark brown veins.

Described from a single specimen, which must, I believe, represent the hitherto unknown male of *C. antennatus* though the sculpture of the head, thorax, and petiole is very different from that of the worker.

*2. MYOPOPONE CASTANEA Smith ♀.

3. PLATYTHYREA PUSILLA Emery ♀ (*Ante*, p. 50).

*4. BOTHROPONERA SANDAKANA, sp. nov.

Female. Length about 14 mm.; wings 11 mm.

Allied to *rufipes* Jerdon and *insularis* Emery. Head, excluding the mandibles, broader than long and considerably broader behind than in front, with broadly excavated posterior border and nearly straight sides. Posterior orbits of the moderately large and convex eyes at the median transverse diameter of the head. Mandibles large and rather convex above, not flattened as in *rufipes*, their apical borders finely and rather evenly serrate. Clypeus short, strongly carinate, truncated anteriorly in the middle; the anterior border entire, straight, and transverse. Antennae short and stout, scapes reaching nearly to the middle of the occipital border, all the funicular joints, except the first and last, distinctly broader than long. Thorax through the wing-insertions a little narrower than the head. Epinotum sharply angular in profile, the base feebly convex and distinctly shorter than the concave, sloping declivity, which has a marked, crenulate border, both above and on the sides. Petiole higher than thick, as thick above as below, truncated in front and behind, convex above and on the sides, the posterior surface slightly concave but with its superior border merely sub marginate and not denticulate. Gaster and legs of the usual form.

Mandibles shining, very coarsely and sparsely punctate, with a few coarse rugae near the base. Remainder of body subopaque, densely punctate; head, thorax, and petiole also covered with sparse but rather regular foveolae, which are more pronounced on the posterior portion of the head, sides of thorax, and on the petiole. Epinotal declivity rather shining, very minutely punctate. Postpetiole and first gastric segment longitudinally but much less sharply costate than in *rufipes*, the spaces between the costae with shallow foveae having sharper anterior margins. These foveae become much more distinct on the sides of the segments. Legs with sparse piligerous punctures.

Hairs and pubescence golden, abundant and rather long, the pubescence appressed on the head, gaster, and appendages, more oblique on the thoracic dorsum, nearly absent on the pleurae. Hairs longest on the abdomen, especially on the apical segments.

Dark brown; mandibles blackish; legs, including the coxae, posterior borders of gastric segments, wing-insertions, epinotum and petiole reddish. Wings rather heavily infuscated, with blackish stigma and brown veins.

A single specimen. I describe this large ant with some reluctance. It is certainly not a form of *rufipes* or of *insularis*, judging from Emery's very brief description of the worker of the latter species. Professor Baker sent me from Singapore a female specimen which evidently represents a variety of *insularis*, and I possess a worker from Ceylon labeled "*insularis*" by Forel. Though these specimens have the mandibles much like those of *sandakana* in being shining, convex, and without the fine, longitudinal striae of *rufipes*, the petiole has a sharp denticulate postero-superior border. According to Emery, the petiole is also costate in the typical *insularis* and this is the case in my Ceylonese specimen.

5. BOTHROPONERA TRIDENTATA (Smith) ♀ ♂ (*Ante*, p. 55).

Male. Length nearly 10 mm.

Head through the very large, convex, and reniform eyes broader than long, flat above, with evenly rounded posterior border and very short cheeks, the eyes occupying nearly the whole of the sides of the head. Ocelli large and prominent. Mandibles small, flat, edentate. Palpi very long, the labial pair 3-, the maxillary pair 5-jointed, the three terminal joints of the latter long and attenuated. Clypeus feebly convex, ecarinate, with straight, entire anterior border. Antennae very long and slender, filiform; scape short, only twice as long as broad, the first funicular joint as broad as long, the remaining joints cylindrical, gradually diminishing in length towards the tip. Thorax somewhat broader through the wing-insertions than the head. Pronotum transverse, truncated in front; mesonotum as long as broad, feebly convex above, without

Mayrian furrows; scutellum very convex; epinotum in profile strongly angular, both the base and declivity concave, the former shorter than the latter, the two surfaces separated by a pronounced, subcircular margination or carina. Petiole like that of the worker but with the three blunt teeth on the postero-superior border much less prominent, the ventral surface with two strong teeth, the anterior directed downward and forward, the posterior somewhat longer and more slender, directed downward and backward. Postpetiole broader than long, evenly and convexly rounded in front, strongly marked off from the broader and very short gaster, the last segment of which terminates in a long, stout, downwardly curved spine. Genitalia deeply retracted. Legs slender.

Subopaque; postpetiole, gaster, and legs shining. Head very finely punctate; thorax densely punctate, the pro- and mesonotum and mesopleurae also with indistinct, scattered foveolae. Scutellum and epinotum irregularly rugose, the declivity of the latter more finely, so that its surface is somewhat shining. Petiole coarsely reticulate-rugose, its truncated posterior surface finely rugulose. Postpetiole, gaster, and legs smooth, with fine piligerous punctures.

Hairs and pubescence as in the worker, but shorter.

Head, postpetiole, and gaster castaneous; thorax and petiole black, neck and discal portion of mesonotum red; antennae, palpi, and legs, including the coxae, yellow, the tibiae streaked with fuscous or black. Wings clear yellowish hyaline; pterostigma brown, veins yellow.

A single specimen, which I have described in detail, because very few *Bothroponera* males have been seen.

*6. *PSEUDOPONERA AMBLYOPS* (Emery) ♀.

*7. *TRAPEZIOPELTA BREVILOBA*, sp. nov.

Female. Length 5.8 mm.

Head, excluding the mandibles, a little broader than long, slightly broader behind than in front, with feebly rounded sides and feebly and broadly excised occipital border. Eyes rather convex, longer than their distance from the anterior corners of the head. Ocelli small and close together. Mandibles distinctly shorter than the head, slender and terete at the base, dilated and flattened apically, their inner borders with three separated teeth; the most basal merely a low, rounded convexity, the others stronger and decidedly acute. Lobe of clypeus very short, rectangular, more than twice as broad as long, its anterior border slightly concave. Oral border of clypeus with a median, slender, truncated tooth. Frontal groove strongly impressed. Antennal scapes not reaching to the posterior border of the head; funiculi with distinctly 4-jointed club; joints 2-7 slightly broader than long; joints 8-10 longer than broad; terminal joint nearly as long as the three remaining joints

of the club together. Thorax $2\frac{1}{2}$ times as long as broad, parallel-sided, distinctly narrower than the head, flattened above; pronotum, excluding the neck, about as long as the mesonotum; base and declivity of epinotum forming nearly a right angle in profile, the declivity slightly concave. Petiole, postpetiole, and gaster together but little longer than the thorax, the petiole truncated anteriorly and posteriorly, higher than long, from above broader than long and broader behind than in front, with rounded dorsal and lateral surfaces, its ventral surface in front with a blunt, compressed tooth. Postpetiole rather strongly constricted behind, its anteroventral surface with an acute, downwardly directed tooth. Sting long and compressed.

Smooth and shining; head, thorax, and abdomen with small, sparse, inconspicuous, piligerous punctures.

Hairs yellow, bristly, pointed, of uneven length; sparser on the body and legs, suberect on the former, oblique on the latter; more abundant but short on the antennae.

Deep red; antennae, legs, and mandibles slightly yellowish red. Wings uniformly brown, with dark brown veins and conspicuous black pterostigma.

Described from a single specimen.

This does not seem to be the female of any of the described species, nearly all of which are known only from worker specimens. It is evidently most closely related to the Papuan *T. laevigata* Emery, the female of which is still to be discovered.

8. *DORYLUS LAEVIGATUS* (Smith) ♂. (*Ante*, p. 61).
9. *TETRAPONERA ATTENUATA* Smith ♀ ♀ ♂. (*Ante*, p. 65).
10. *TETRAPONERA DIFFICILIS* Emery (?) ♀. (*Ante*, p. 65).
11. *TETRAPONERA PILOSA* (Smith) ♀ ♀. (*Ante*, p. 65).
12. *MYRMICARIA ARACHNOIDES* (Smith) subsp. *MELANOGASTER* Emery ♀. (*Ante*, p. 71).
13. *VOLLENHOVIA RUFIVENTRIS* Forel ♀. (*Ante*, p. 79).
- *14. *VOLLENHOVIA OBLONGA* Smith var. (?) ♀.
15. *PRISTOMYRMEX TRACHYLISUS* (Smith) ♀. (*Ante*, p. 86).
- *16a. *PARATOPULA*, gen. nov. *CEYLONICA* (Emery) var. *SUMATRENSIS* (Forel) ♀.

I have received all three phases of this ant from the Philippines (F. X. Williams). The typical form of the species, originally described

as *Atopomyrmex ceylonicus*, has recently been placed by Forel in the genus *Leptothorax*. As I cannot agree with this allocation and as the species cannot be left in *Atopula*, I have coined a new generic name, *PARATOPULA*.

17. *MERANOPLUS MUCRONATUS* Smith ♀. (*Ante*, p. 90).

18. *CATAULACUS GRANULATUS* (Latreille) ♀. (*Ante*, p. 92).

19. *CATAULACUS HISPIDULUS* Smith ♀. (*Ante*, p. 93).

20. *CATAULACUS LATISSIMUS* Emery ♀. (*Ante*, p. 94).

*21. *MYRMOTERAS BAKERI*, sp. nov.

Female. Length nearly 4 mm.

Very similar to *M. donisthorpei* Wheeler, but differing in the following characters: the five large teeth along the apical half of the mandibles are distinctly longer and stouter, though alternating with shorter teeth as in *donisthorpei*, whereas the denticles on the basal half are very small and almost obsolete; the frontal carinae are somewhat further apart; the lateral lobes of the head just behind the eyes are more acutely angular; the petiolar node is much more compressed anteroposteriorly so that its upper border is transverse and rather sharp; the middle and hind tibiae are less strongly swollen in the middle and the sculpture and color are different. The head is very smooth and shining like the remainder of the body, and the insect is honey-yellow, with the mandibles, except their brownish teeth, the femora and tarsi paler, whitish yellow. The middle portion of the first gastric segment and the bases of the succeeding segments are brownish. The pilosity and wing-venation are as in *donisthorpei*, but the erect hairs on the scapes, body and legs are somewhat coarser and more bristly.

Male. Length 3 mm.

Head through the eyes broader than long, gradually contracted and rounded behind, without the peculiar lobular eminences of the female, to the concave and marginate occipital border. Eyes large, but placed far forward, so that the cheeks are very short. Ocelli small. Mandibles very small, vestigial, bluntly pointed, edentate. Clypeus, frontal carinae, and antennae much as in the female, except that the antennae are 13-jointed. Thorax, gaster, and legs as in the female; middle and hind tibiae less incrassated, petiolar node thicker and much blunter above. Genital appendages small, exserted, superficially like those of *Prenolepis*. Wings as in the female, with the same peculiar venation.

Smooth and shining; thorax subopaque, finely punctate-rugulose.

Pilosity as in the female but somewhat sparser and finer.

Castaneous brown; pronotum and head paler and more reddish; palpi and tarsi beyond the first joint, whitish.

Described from a single female and three males. More material may show that this form is merely a pale race, or subspecies of *donisthorpei*. The color of the female before me is certainly not due to immaturity. Dr. F. X. Williams has recently sent me a male and female of another species, *M. williamsi*, sp. nov., from the Philippines, the fourth species of this remarkable genus to come to light in the Malayan subregion. The female is larger and more robust than *donisthorpei* and *bakeri*, with the head and thorax rich reddish brown, opaque, and very finely and densely punctate and the basal half of the swollen middle and hind tibiae black, the apical half yellow. The male is black, with pale terminal tarsal joints and the head and thorax are densely punctate-rugose. The worker is known only of the type-species, *M. binghami* Forel of Burma.

22. CAMPONOTUS (MYRMOTARSUS) MISTURA (Smith) ♀.
(*Ante*, p. 109).

*23. CAMPONOTUS (MYRMOTARSUS) SATAN, sp. nov.

Female. Length: 18 mm.; wings 19 mm.

Head subtrapezoidal, broader than long without the mandibles, much broader behind than in front, with straight sides and broadly excised posterior border. Eyes moderately large and convex. Mandibles large, convex, with 6 large, subequal teeth. Clypeus broader than long, rather flat, ecarinate; its anterior margin straight and transverse in the middle, with a small tooth in each side and feebly concave lateral to each tooth. Frontal carinae slightly diverging behind and not strongly curved. Antennal scapes decidedly flattened, reaching to the posterior corners of the head. Thorax and legs as in the other species of the subgenus. Petiole broad, cuneate in profile, its anterior and posterior surfaces flat, its superior margin moderately sharp, feebly and sinuately emarginate. Gaster considerably shorter than the thorax. Tibiae and middle and hind metatarsi flattened as in other species of the subgenus. Wings long.

Very smooth and shining except the sides of the thorax and the top of the head, which are opaque. Mandibles, clypeus, and cheeks sparsely punctate, the punctures becoming finer and denser on the sides of the head; the opaque dorsal portion sharply and finely coriaceous.

Hairs black, rather short, coarse, moderately abundant, erect, absent on the cheeks but covering the body and appendages, short on the scapes; venter and borders of gastric segments above, and lower surfaces of tarsal joints with short, appressed fulvous hairs. Pubescence absent.

Deep black; terminal tarsal joints reddish. Wings brown with resin colored veins and apterostigma bordered with darker brown.

A single specimen. This species is quite distinct in the shape of the head, sculpture and color of the pilosity.

24. CAMPONOTUS (MYRMOSPINCTA) CAMELINUS (Smith) ♂.
(*Ante*, p. 111).

- 24a. CAMPONOTUS (MYRMOSPINCTA) CAMELINUS var. SINGULARIS
(Smith) ♂. (*Ante*, p. 112).

25. POLYRHACHIS BIHAMATA (Drury) ♂ ♀. (*Ante*, p. 121).

26. POLYRHACHIS (MYRMA) VINDEIX Smith ♂. (*Ante*, p. 125).

A single specimen, differing from the typical form described on p. 125 in having the legs entirely black.

27. POLYRHACHIS (MYRMHOPLA) ARMATA (Le Guillou) ♂. (*Ante*, p. 129).

28. POLYRHACHIS (MYRMHOPLA) FURCATA Smith ♀. (*Ante*, p. 131).

29. POLYRHACHIS (MYRMHOPLA) CHALYBEA Smith ♂. (*Ante*, p. 131).

30. POLYRHACHIS (MYRMHOPLA) CEPHALOTES Emery ♂. (*Ante*, p. 132).

31. POLYRHACHIS (CYRTOMYRMA) RASTELLATA (Latreille) ♂.
(*Ante*, p. 136).

A specimen with the legs entirely black.

32. ECHINOPLA PALLIPES Smith ♂. (*Ante*, p. 138).



Wheeler, William Morton. 1919. "The ants of Borneo." *Bulletin of the Museum of Comparative Zoology at Harvard College* 63, 43–147.

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