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AMPULICIDAE OF THE JAPANESE EMPIRE
(HYMENOPTERA)

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WITH THIRTEEN PLATES

The present revision of the Ampulicidae, a group of the natural enemies of cockroaches, of the Japanese Empire is based upon material preserved in the collections of the Entomological Laboratory of the Kyûshû Imperial University, Fukuoka, the Entomological Museum of the Hokkaidô Imperial University, Sapporo, the Entomological Museum of the Government Research Institute of Formosa, Taihoku, the Takeuchi Entomological Laboratory, Yamashina, Kyoto, as well as in the private collections of Dr. A. von Schulthess of Zurich, Mr. Munemoto Yano of Tokyo, Mr. Kaku Satô of Yokohama, Mr. Shûzô Takano of Tainan and Mr. Kôyô Okabe of Fukuoka. I was enabled to study the material in the above-mentioned collections through the kindness of Professor Teiso Esaki of the Kyûshû Imperial University, Assistant Professor Toichi Uchida of the Hokkaidô Imperial University, Professor Tokuichi Shiraki and Mr. Jinhaku Sonan of the Government Research Institute of Formosa, Mr. Kichizo Takeuchi of the Takeuchi Entomological Laboratory, Dr. A. v. Schulthess, Messrs. M. Yano, K. Satô, S. Takano and K. Okabe respectively, and I express hereby my hearty thanks to these entomologists. I am also indebted very much to Professor Teiso Esaki, Dr. Lucien Berland of the Muséum National d'Histoire Naturelle, Paris, Professor Embrik Strand of the University of Riga, Dr. Vladimir B. Popov of the Zoological Institute of the Academy of Sciences, Leningrad, Assistant Professor Masaaki Tokunaga of the Kyôto Imperial University, Dr. Yushirô Miwa of the Government Research Institute of Formosa, Taihoku, Mr. Kunio Iwata of Takebu, Mr. Michio Chûjô of the Taihoku Imperial University and Mr. Octave Piel of the Musée Heude of the Université l'Aurore, Shanghai, in looking for the literature. Further I express

my sincere gratitude to Professor Teiso Esaki for his very kind guidance and encouragement rendered in the course of the present study.

In 1873 F. Smith recorded *Ampulex novarae* Saussure from Hakodate. This is the first record of the Ampulicidae from the Japanese Empire.

About twenty years later Fr. Fr. Kohl published a Monograph of the Genus *Ampulex* and the allied genera in which *Ampulex japonica* was described.

In 1905 P. Cameron described a new species of the genus under the name of *Ampulex micado*, designating the type locality as "Japan."

In 1913 E. Strand examined the H. Sauter's famous collection and reported the following species of the family from Formosa.

1. *Ampulex amoena* Stål (=*Ampulex novarae* Saussure)
2. *Ampulex difficilis* Strand, sp. nov.
3. *Dolichurus abbreviatus* Strand, sp. nov.
4. *Dolichurus leiocops* Strand, sp. nov.
5. *Trirhogma caerulea* Westwood

In 1926 S. Matsumura and T. Uchida published the description of a new species, *Ampulex dentatus*, from the island of Okinawa, Ryûkyû Group, and in 1933 I reported the same species from Ishigaki Island of the same group.

Such are the present status of the knowledge concerning the Ampulicidae of the Japanese Empire. Of the seven known species of the family from our territories, *Ampulex japonica* Kohl is synonymous with *Ampulex amoena* Stål (=*Ampulex novarae* Saussure) and the occurrence of *Ampulex micado* Cameron in the Japanese Empire is quite doubtful. So far as my investigation goes, the type specimen of *Ampulex micado* described by P. Cameron must have been originated from some other tropical region, such as Java, or Malay Peninsula.

After examining the material derived from several sources mentioned above, I found six more species of the genus *Ampulex*, of which five may be new to science and one new to the fauna,

as well as some new localities of known species. These facts are tabulated as follows.

Species	Japan proper	Tsushima	Korea	Ryûkyû Group	Formosa	China
Ampulex amoena Stål	●	●	●		●	●
Ampulex difficilis Strand					●	
Ampulex esakii sp. nov.					●	
Ampulex sonani sp. nov.					●	
Ampulex dentata Matsumura et Uchida				●		
Ampulex takeuchii sp. nov.					●	
Ampulex kurarensis sp. nov.					●	
Ampulex seitzii Kohl					●	●
Ampulex satoi sp. nov.			●			
Trirhogma caerulea Westwood					●	●
Dolichurus abbreviatus Strand					●	
Dolichurus leioceps Strand					●	

Ampulex difficilis Strand is a splendid species, completely separated from any other forms by the short and stout antennae, an inverse Y-shaped longitudinal carina on the clypeus as well as by the peculiar combination of brilliant metallic blue and black in coloration. It must be noted that the colour combination of brilliant metallic blue and red occurs only in a single species, *Ampulex amoena* Stål in our territories and China. Both *Ampulex esakii* sp. nov. and *sonani* sp. nov. are allied to *Ampulex approximata* Turner and *fasciata* Jurine very much in coloration and structure, especially in the relative length of the two apical segments of fore tarsi. These four species may comprise a distinct group. In general appearance the structure of the pronotum in *Ampulex dentata* Matsumura et Uchida and *takeuchii* sp. nov. is quite different from that of the ordinary *Ampulex*-species and somewhat allied to that of *Trirhogma*

and *Dolichurus*. Thus the *Ampulex*-species of the Japanese Empire may be divided into the following five groups.

1. *Amoena*-group . . . . . *amoena* Stål
2. *Difficilis*-group . . . . . *difficilis* Strand
3. *Esakii*-group . . . . . *esakii* sp. nov., *sonani* sp. nov.
4. *Dentata*-group . . . . . *dentata* Matsumura et Uchida, *takeuchii* sp. nov.
5. *Seitzii*-group . . . . . *seitzii* Kohl, *kurarensis* sp. nov., *satoi* sp. nov.

The relative lengths of various portions of the body may afford many useful criteria for the separation of not only the sexes but also the species. These relations are shown in the following table.

Species		$\frac{MDE}{L_2}$	$\frac{L_1}{L_2}$	$\frac{L_2}{L_2}$	$\frac{L_3}{L_2}$	$\frac{L_4}{L_2}$	$\frac{L_3}{W_3}$	$\frac{L_4}{W_4}$	$\frac{MDE}{L_3}$
Ampulex amoena	♀	6.0	3.5	1	7.5	4.5	6	>4	<1
Ampulex amoena	♂	5.0	2.8	1	7.5	3.8	>7	<4	<1
Ampulex difficilis	♀	7.0	3.6	1	3.1	2.9	>4	2	>1
Ampulex esakii	♀	5.0	3.8	1	6.5	3.8	>8	>3	<1
Ampulex sonani	♀	5.0	2.8	1	5.5	2.5	7	3	<1
Ampulex sonani	♂	5.3	3.3	1	6.7	3.3	7	3	<1
Ampulex dentata	♀	4.3	4.2	1	6.7	4.7	<6	4	>1
Ampulex dentata	♂	8.0	5.0	1	8.7	8.0	5	<5	<1
Ampulex takeuchii	♀	3.0	3.8	1	7.3	5.0	4	3	<1
Ampulex takeuchii	♂	3.8	3.0	1	5.3	5.0	4	>2	<1
Ampulex kurarensis	♀	3.4	2.9	1	6.8	4.0	<8	4	<1
Ampulex kurarensis	♂	5.0	3.0	1	9.0	6.2	>7	6	<1
Ampulex seitzii	♀	5.0	2.6	1	5.6	4.0	<6	4	<1
Ampulex satoi	♀	6.3	3.3	1	6.0	3.5	6	>3	>1
Ampulex satoi	♂	6.3	3.0	1	6.8	3.8	>5	4	<1
Trirhogma caerulea	♀	6.6	4.4	1	7.6	6.6	5	<5	<1
Trirhogma caerulea	♂	7.0	4.0	1	5.0	5.6	5	5	>1
Dolichurus abbreviatus	♂	6.7	5.0	1	4.0	4.3	3	3	>1
Dolichurus leioceps	♀	5.7	4.3	1	4.7	3.7	>4	>3	<1

Abbreviations: MDE: minimum distance between eyes. L_1: length of first antennal segment. L_2: length of second antennal segment. W_3: width of third antennal segment.

Concerning the biology of the Japanese Ampulicidae almost nothing has so far been known, except for the observations made by J. Sonan (1924 and 1927). So our knowledge in this connection must depend much upon future investigations.

It seems unnecessary to reproduce full descriptions of the genera of the family Ampulicidae, since these are well brought together in Kohl's paper (1893 and 1898). For convenience' sake, therefore, I give only a key to distinguish the genera occurring in the Japanese Empire.

KEY TO THE GENERA

1. Radial cell of fore wing appendiculate. Front without a lamellar tubercle above the insertions of antennae . . . . . *Ampulex* Jurine
   Radial cell of fore wing not appendiculate. Front with a lamellar tubercle above the insertions of antennae 2
2. Humeral tubercle large and reaching the base of tegula. Propodeum broadened outwardly. Apex of third cubital cell situated near the outer margin of fore wing. Deep caerulean blue . . . . . *Trirhogma* Westwood
   Humeral tubercle not reaching the base of tegula. Propodeum not broadened laterally. Apex of third cubital cell remote from the outer margin of fore wing. Black . . . . . *Dolichurus* Latreille

Genus *Ampulex* Jurine, 1807

KEY TO THE SPECIES (♀♀)

1. Body entirely black 2
   Body entirely brilliant metallic blue or green 3
   Body brilliant metallic blue. Hind femora deep red . . . . *Ampulex amoena* Stål
   Body brilliant metallic blue. Trochanters and femora of mid- and hind legs black. Median carina of clypeus λ-shaped . . . . . *Ampulx difficilis* Strand
2. Third antennal segment more than eight-times as long as wide at the apex, shorter than twice the length of fourth . . . . . *Ampulex esakii* sp. nov.
   Third antennal segment seven-times as long as wide at the apex, longer than twice the length of fourth . . . . . *Ampulex sonani* sp. nov.
3. Dorsal area of pronotum flattened or somewhat depressed and without a distinct median tubercle 4
   Dorsal area of pronotum convex and with a distinct median tubercle 5
   Dorsal area of pronotum slightly convex, without a tubercle or depression and with many transverse striae . . . . . *Ampulex satoi* sp. nov.
4. Dorsal area of pronotum as long as wide . . . . . *Ampulex dentata* Matsumura et Uchida
   Dorsal area of pronotum wider than long . . . . . *Ampulex takeuchii* sp. nov.
5. Dorsal area of pronotum without any striation . . . . *Ampulex kurarensis* sp. nov.
   Dorsal area of pronotum very distinctly transversely striate . . *Ampulex seitzii* Kohl

Ampulex amoena Stål

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Ampulex Novarae Smith, Trans. Ent. Soc. London, 1873, p. 191, ♀, 1873.
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Ampulex (*Rhinopsis*) *amoena* Strand, Arch. f. Naturg., 1923, A. Heft 7, p. 152, 1913.
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Ampulex (*Rhinopsis*) *amoena* Sonan, Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 17, no. 89, p. 136, 1927.
Ampulex japonica Yano, Icon. Ins. Jap., Tokyo, p. 287, ♀♂, fig. 556, 1932.
Ampulex amoena Tosawa, List Ins. Minoo Park, Osaka, Japan, p. 99, 1932.
Ampulex japonica Kato, Three Colour Illustrated Ins. Jap., fasc. 10, pl. 32, fig. 5, 1934.

♀. Head, seen from above, slightly narrower than thorax. Head, seen in front, about as long as wide. Inner margins of eyes almost parallel and very slightly convergent above. Front well developed and slightly convex. Vertex normal and without a median impression. Distance between anterior and posterior ocelli longer than postocellar line, very slightly shorter than ocello-ocular line. Antennal tubercles moderate and each with a very short carina. Median carina on front almost obsolete and only a small tubercle is seen between the antennal tubercles. Eyes large, length : width = 35 : 22. Temples well developed, about as broad as eye seen in profile. Clypeus triangular, well produced, slightly wider than long, its anterior margin with three teeth and two notches, one tooth at the middle and the apex strongly truncate, two on the sides and notches are situated just posterior to the teeth. Median carina very

distinct; seen in profile, it is gently curved. Mandibles long, stout and curved inwardly. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 14 : 4 : 30 : 18 : 16 : 11 : 10 : 9 : 9 : 9 : 8 : 8. First segment the stoutest, about twice as long as wide; second about as long as wide; third very slightly curved outwardly, slightly widened apically, about six-times as long as wide. Fourth segment more than four-times as long as wide; fifth about four-times as long as wide; sixth and seventh more than twice as long as wide. Eighth to ninth slightly longer than twice the length of it; tenth and eleventh about thrice as long as wide. Twelfth segment about four-times as long as wide at the base. Pronotum long, about as long as mesonotum, with a median, longitudinal furrow, gently sloping anteriorly. Propleura moderately convex. Two longitudinal deep furrows on mesonotum distinctly divergent anteriorly. Mesopleura each with a very distinct, longitudinal furrow. Scutellum almost flat. Anterior margin of scutellum with a transverse groove which is costate longitudinally. Scutellum slightly wider than long, about thrice as long as postscutellum, about three-eighths the length of propodeum. Propodeum about as long as wide, with a horizontal area much longer than a caudal, vertical area. Caudo-lateral tubercles not very distinct. All the longitudinal carinae distinct and entire. First and second carinae convergent posteriorly and becoming almost parallel to each other at the posterior portion. Second and third carinae almost parallel to each other and slightly convergent at the posterior portion. Third and fourth carinae very slightly divergent posteriorly. Fourth and fifth carinae almost parallel to each other. Third and fourth area almost equal in size. All the area with many distinct, transverse striae. Sides of propodeum reticulate. Caudal area very largely reticulate. Fore femur widest just before the middle, narrowed both basally and apically, basal portion more slender and the narrowest, maximum width : length = 7 : 40. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 31 : 10 : 6 : 4 : 7. Fore tibia—width at the apex : length = 7 : 40. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur very slightly shorter than second tarsal segment. Mid-femur widest at the middle, comparatively stout,

almost equally narrowed both basally and apically, maximum width : length = 15 : 45. Mid-tibia—width at the apex : length = 7 : 50. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 34 : 12 : 7 : 4 : 10. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 5 : 4 : 12. Hind femur widest at the basal one-third, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 18 : 60. Hind tibia—width at the apex : length = 9 : 70. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 45 : 19 : 10 : 6 : 12. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 6 : 10 : 19. Claws of all legs each with a tooth at the middle. Fore wing with two cubital cells. Radial cell narrowed both basally and apically, apical portion more slender, receiving first transverse cubital nervure before the middle. First cubital cell much longer than second cubital cell, receiving first recurrent nervure almost at the middle. Second cubital cell much longer than high, widened apically, receiving second recurrent nervure at the basal one-third. First recurrent nervure as long as second recurrent one which is almost straight. Discoidal nervure slightly undulate. Nervulus interstitial. Petiole of abdomen slightly shorter than anterior slope of first tergite proper. First tergite, seen from above, distinctly wider than long. Second segment almost as long as wide, as long as high, seen in profile with the base of sternite rounded. Apical segments compressed laterally.

Clypeus impunctate, its apex only with several small punctures. Areas between antennal tubercles and eyes impunctate. Front with minute punctures, denser on the median portion and somewhat coaser around the ocelli. Vertex, occiput and temples almost impunctate. Dorsal portion of pronotum with some transverse striae. Caudo-lateral portion of pronotum with several punctures. Anterior portion and sides of pronotum impunctate. Propleura with several small punctures. Mesonotum with very sparse, irregular, comparatively large punctures, with its posterior half almost impunctate. Margins of scutellum and postscutellum with some small punctures. Sides of mesothorax with comparatively dense and large punctures.

Underside of mesothorax much coarsely and minutely punctured. Metapleura and lower half of the sides of propodeum impunctate. Abdomen impunctate.

Pubescence and hairs greyish.

Brilliant metallic blue or green. Antennae and mandibles black, apex of the latter brownish-black. Tegulae somewhat piceous. Hind femora dark red except the apex. Wings transparent, very slightly clouded, violaceously reflecting in certain aspect, nervures and stigmas brownish-black.

Measurements

(1 ♀, 15. vii. 1932, Formosa, T. Esaki leg.)

Length : Head seen from above 2.0 mm. Thorax 6.2 mm. Abdomen 7.0 mm. Fore wing 7.5 mm. Hind wing 5.8 mm.

Width : Head 3.0 mm. Thorax 3.3 mm. First abdominal segment at the apex 2.3 mm. Second abdominal segment at the middle 2.5 mm.

♂. Inner margins of eyes very slightly divergent towards clypeus. Distance between anterior and posterior ocelli very slightly longer than postocellar line, distinctly shorter than ocello-ocular line. Median carina of front almost obsolete. Temples not swollen as in the female. Anterior margin of clypeus with only one apical, median tooth, clypeus not so produced anteriorly as in the female. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 11 : 4 : 30 : 15 : 13 : 9 : 7 : 7 : 7 : 7 : 6 : 6 : 6. First segment slightly more than twice as long as broad at the middle. Second segment about as long as wide. Third segment more than seven-times as long as broad at the apex ; fourth slightly less than four-times as long as broad ; fifth about thrice as long as broad. Following segments about twice as long as broad. First abdominal tergite, seen from above, more than twice as broad as long, about one half the length of second tergite. Second tergite broader than long, about as long as high. Fore femur—maximum width : length = 9 : 40. Fore tibia—width at the apex : length = 5 : 34. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 24 : 9 : 6 : 4 : 7. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur about as long as second

tarsal segment. Mid-femur—maximum width : length=10 : 42. Mid tibia—width at the apex : length=6 : 43. Relative length of th tarsal segments of mid-leg—I : II : III : IV : V=30 : 10 : 6 : 4 : 7. Apex of fourth segment not reaching the middle portion of fifth one Outer tibial spur : inner one : second tarsal segment=5 : 5 : 10. Hin femur—maximum width : length=14 : 52. Hind tibia—width at th apex : length=7 : 55. Relative length of the tarsal segments of hin leg—I : II : III : IV : V=34 : 14 : 8 : 4 : 8. Apex of fourth segment n reaching the middle portion of fifth one. Outer tibial spur : inn one : second tarsal segment=7 : 8 : 14.

Front with very fine, longitudinal striae and somewhat reticulat seen in certain aspect. Vertex with very large somewhat confluer punctures. Occiput and temples almost impunctate and with sever minute punctures. Sides of pronotum impunctate. Dorsal portio of pronotum with many transverse striae. Mesonotum with ver large, strong, sometimes confluent, dense punctures. Mesopleu with large, strong, confluent punctures. Second abdominal sterni with very dense and minute punctures.

Measurements

(1 ♂, 15. vii. 1932, Formosa, T. Esaki leg.)

Length : Head seen from above 1.8 mm. Thorax 5.5 mm. Abdom 3.5 mm. Fore wing 6.3 mm. Hind wing 5.0 mm.

Width : Head 2.5 mm. Thorax 2.7 mm. First abdominal tergi at the apex 1.9 mm. Second abdominal tergite at t middle 2.1 mm.

Specimens examined : 2 ♂♂, Osaka, Honshû, viii. 1915, T. Esa leg., 1 ♀, Shimonoseki, Nagato, Honshû, viii. 1932, S. Ohara le 1 ♀ 1 ♂, Ushibuka-Kutama-Kamenoura, Amakusa Islands, 23. 1931, Esaki et H. Hori leg., 1 ♂, Tomioka, Amakusa Islands, ix. 1931, Hori et H. Cho leg., 2 ♀♀, Tomioka, 25. vi. 1931, Esa et Hori leg., 1 ♀ 9 ♂♂, Tomioka-Tororo, 18. vi. 1931, Esaki et H leg., 3 ♂♂, Izuhara-Uchiyama, Tsushima, 25. vii. 1930, Hori et C leg., 1 ♂, Taihorin, Formosa, 11. vi, H. Sauter leg., 1 ♂, Tak 1908, Formosa, Sauter leg., 1 ♀, Sozan, Formosa, 25. ix. 1921, Es leg., 1 ♀, Musha, Formosa, 28. iv. 1928, J. Sonan leg., 1 ♂, K panzan, Formosa, 16. v. 1930, Sonan leg., 2 ♂♂, Sozan, 3. vii. 19

Esaki leg., 3 ♂♂, Taikokei (Kahodai-Meiji-Urai), Taichushû, Formosa, 15. vii. 1932, Esaki leg.

Habitat: Japan, Tsushima, Korea (after Mr. H. Doi), Formosa, China and North India.

Ampulex difficilis Strand

Ampulex difficilis Strand, Arch. f. Naturg., 1913, A. 7. Heft, p. 152, ♀, 1913.

♀. Head, seen from above, slightly narrower than thorax. Head, seen in front, slightly longer than wide. Inner margins of eyes distinctly divergent towards clypeus. Front very strikingly developed, moderately convex and very wide. Base of antennae very distinctly tuberculate, the tubercle very stout and round seen in front. Vertex very much developed. Ocelli situated just at the central portion of front and vertex put together. Distance between anterior and posterior ocelli slightly longer than postocellar line. Postocellar line : oculo-ocellar line = 5 : 9 (20 units = 1 mm.). Distance between the apices of the two antennal tubercles about as long as oculo-ocellar line. Minimum distance between eyes : distance of eyes at the anterior margin of front = 48 : 60. Length of eye : width of eye = 40 : 28. Areas between eyes and antennal tubercles distinctly excavated. Vertex with a short, median, longitudinal furrow which is costate seen in certain aspect. At the postero-lateral portion (or along the outer margin) of each posterior ocellus there is recognizable a short, curved, comparatively deep furrow. Clypeus comparatively short, twice as broad as long, the sides conspicuously converging towards the apex, the apex narrowly, but deeply and triangularly incised. The surface of clypeus consists of three areas which are distinctly separated from one another by a median, longitudinal, Λ-shaped ridge, the central small area is deeply concave. Front with a short, moderate carina between the insertions of antennae. Head with temples, seen in profile, slightly longer than eyes. Eyes comparatively small. Mandibles long and stout, strongly curved inwardly. Antennae short and very stout. Relative length of the segments of antenna is as follows—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 25 : 7 : 22 : 20 : 19 : 18 : 17 : 14 : 13 : 13 : 13 : 15. First segment the largest and about twice as long as broad; second about

as long as broad; third slightly narrowed basally, more than four-times as long as broad at the base; fourth to eleventh about twice as long as broad; twelfth about thrice as long as broad. Pronotum somewhat cubic in shape, with horizontal, anterior, caudal and lateral areas, each of which is almost flat. A median, longitudinal, deep furrow is present from the central portion of anterior area to posterior one-third of horizontal area. Pronotum with the sides, seen from above, slightly convergent towards head. Propleura very convex. Mesonotum with two very distinct and deep longitudinal furrows which are slightly diverging anteriorly. Antero-lateral portion of mesonotum very convex. Scutellum almost flat, broader than long, slightly shorter than the horizontal area of pronotum, more than twice as long as postscutellum. Propodeum wider than long, with the horizontal area slightly longer than a vertical, caudal area. Caudo-lateral tubercles or spines distinct, but not sharply produced. Median carina occupies two-thirds the length of horizontal area, stouter basally and more feeble apically. Median and second carinae very strongly convergent posteriorly. Second and third carinae almost parallel to each other and united together making a round area at the posterior portion. The area with an appendiculate short carina which runs as far as the posterior, transverse carina of horizontal area. Third and fourth carinae very slightly divergent posteriorly. Fourth and fifth carinae almost parallel to each other. Second area almost as wide as fourth area. Third area the narrowest. First area with about seven oblique striae. Each area with many transverse striae, of which those on second area most dense. Sides of propodeum just outside the fifth carinae and posterior half of it very largely and strongly reticulate. Caudal area with its median portion somewhat transversely and narrowly striate, other portion irregularly, comparatively, weakly striate or reticulate. Fore femur widest past the middle, narrowed both basally and apically, basal portion the narrowest, maximum width : length = 20 : 65. Fore tibia—width at the apex : length = 11 : 55. Relative length of the tarsal segments of fore legs—I : II : III : IV : V = 37 : 15 : 13 : 12 : 22. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur as long as second tarsal segment. Mid-femur

widest at the middle, narrowed both basally and apically, basal half compressed, maximum width : length = 25 : 63. Mid-tibia—width at the apex : length = 15 : 65. Relative length of the tarsal segments of mid-legs—I : II : III : IV : V = 38 : 15 : 13 : 12 : 22. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 17 : 18 : 15. Hind femur widest at the basal one-third, narrowed both basally and apically, much more narrowed basally, maximum width : length = 28 : 85, compressed laterally, seen from above distinctly curved inwardly. Hind tibia—width at the apex : length = 16 : 100. Relative length of the tarsal segments of hind legs—I : II : III : IV : V = 55 : 22 : 16 : 12 : 26. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 20 : 22 : 22. Claws of all legs with a stout dens at the middle. Wings : radial cell slender, narrowed both apically and basally, receiving second transverse cubital nervure at the middle. First transverse cubital nervure obsolete, fore wings with only two cubital cells. First cubital cell (including second one) very long and slender, receiving first recurrent nervure at the middle. Third cubital cell (truly the second) much shorter than first one, but much wider than first one, receiving second recurrent nervure just before the middle, slightly widened apically. First discoidal cell very small, almost parallel-sided. Second discoidal cell widest just before the middle, gently narrowed apically. Second recurrent nervure slightly undulate. Discoidal nervure very slightly undulate or almost straight. Abdomen very compressed laterally. First tergite, seen from above, slightly wider than long ; seen in profile about as long as high, with a petiole slightly shorter than anterior slope of first tergite. First tergite about as wide as second tergite at the base seen from above. Second tergite, seen from above, gently narrowed posteriorly and the length is less than twice the width of second tergite at the base. Second segment, seen in profile, almost parallel both dorsally and ventrally, about as high as long, with ventral surface almost straight seen in profile. Second sternite with a very deep, transverse groove, and the sternite abruptly produced just posterior to the groove, thus making a vertical area which makes a right angle at

the horizontal surface. Third to seventh tergites very much compressed laterally.

Front with very sparse, strong and large punctures. Outer sides and anterior portion of ocellar triangle impunctate. Areas between eyes and antennal tubercles, occiput and temples impunctate, the latter with very sparse, small punctures near the base of mandibles. Three basal segments of antennae coarsely and comparatively minutely punctured. Clypeus impunctate. Pronotum densely and largely punctured, the diameter of each puncture almost as long as the distance between two punctures. Anterior slope and the sides (lower half) except the posterior margin impunctate. Neck with very dense, small, but strong punctures. Propleura with comparatively large, but sparse punctures. Median portion of mesonotum almost impunctate, with only several small punctures. Lateral portions of mesonotum with several very large strong punctures and mixed with several small ones. Antero-lateral portions of mesonotum with small, very coarse punctures. Scutellum and postscutellum with very coarse, small punctures and the latter microscopically punctate. Mesopleura with very strong, large, sparse punctures, the diameter of which is much shorter than the distance of two punctures and with very dense, minute punctures except the upper portion. Metapleura and basal portion of propodeum at the base impunctate. Posterior half of the sides of propodeum with very large, strong, sparse punctures. Hind coxae distinctly bipunctate: small, sparse punctures and very dense, minute ones. Abdomen with very minute and sparse punctures. Anterior slope of first tergite impunctate. Punctures on third tergite comparatively large and dense.

Almost hairless. Head and thorax with very coarse hairs. Sides of clypeus with comparatively long, brownish-golden hairs. Hairs on inner side of hind coxae somewhat long. Clypeus, neck of pronotum, propleura, margin of pronotal tubercles, coxae beneath trochanters and femora beneath with greyish dense pubescence.

Brilliant metallic green, somewhat bluish. Ocellar triangle, antennae, mandibles, apical margin of clypeus, trochanters, fore femora at the base, fore tibiae and tarsi, mid- and hind legs except

the coxae black. Tibiae of all legs somewhat metallic green seen in certain aspect. Tarsi of all legs somewhat brownish-black. Tegulae also brownish-black. Posterior margin of second and third segments brownish, following segments almost brownish. Wings brownish, violaceously reflecting seen in certain aspect. Nervures brownish-black, stigmas dark brown.

Measurements

Length : Head seen from above 2.0 mm. Thorax 8.0 mm. Abdomen 11.0 mm. Fore wing about 13.0 mm. Hind wing 10.5 mm.

Width : Head 4.2 mm. Thorax 4.6 mm. Second abdominal tergite at the base 3.0 mm.

Specimen examined : 1 ♀, Taihorin, Formosa, 1924, J. Sonan leg., in the collection of the Entomological Museum of the Government Research Institute of Formosa, Taihoku.

Habitat : Formosa.

Ampulex esakii sp. nov.

♀. Head, seen from above, about as wide as thorax. Head, seen in front, slightly longer than broad. Inner margins of eyes almost parallel below and slightly convergent above. Base of antennae tuberculate. Front well developed. Vertex normal, without a median impressed line, with a very slight impressed area which is seen only in certain aspect. Distance between anterior and posterior ocelli very much longer than postocellar line, very much shorter than ocello-ocular line. Distance between the apices of antennal tubercles slightly longer than ocello-ocular line. Eyes large, length : width = 29 : 20. Areas between antennal tubercles and eyes normal, not excavated. Front without a median, longitudinal carina, but with a feeble tubercle between the insertions of antennae. Carinae originating from antennal tubercles and running upward are almost parallel to each other, but very short. Clypeus very much produced, about as long as wide, triangular, with five teeth on the anterior margin, one at the median apex and two on the sides near the apex. Clypeus with two areas which are separated by a median, longitudinal, distinct carina or ridge. Clypeus with the carina, seen in profile, almost straight and obliquely truncate at its apical one-

fourth. Mandibles very long and stout, strongly curved inwardly. Head with eyes, seen in profile, much wider than temples. Antennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 15 : 4 : 26 : 15 : 14 : 12 : 12 : 10 : 10 : 9 : 8 : 8. First segment the stoutest, about thrice as long as broad. Second segment slightly longer than wide; third more than eight-times as long as broad at the apex, gradually narrowed towards the base. Fourth and fifth segments slightly longer than thrice the width of them. Sixth and seventh about thrice as long as broad: eighth and ninth slightly more than thrice as long as broad; tenth thrice as long as broad; eleventh and twelfth slightly more than thrice as long as broad at the base. Pronotum long, its dorsal area about as long as mesonotum, seen in profile, in a low triangle, not equilateral both anteriorly and posteriorly, with the sides almost flat, with dorsal area somewhat flat and with a median longitudinal, feeble impressed line. Propleurae moderately convex. Mesonotum with a median, longitudinal impressed line, with two longitudinal deep furrows which are almost parallel to each other and slightly divergent anteriorly. Mesopleura each with a longitudinal, very distinct furrow. Scutellum slightly convex, about twice as broad as long, more than twice as long as postscutellum, about one-third the length of propodeum. Propodeum longer than broad with two caudo-lateral tubercles on each side. Upper tubercles much stout and the lower one slender. Median carina very feeble. Second carinae very distinct. First and second carinae distinctly convergent posteriorly. Second carinae short, only reaching the middle portion of horizontal surface. Third and fourth carinae almost parallel to each other. Third carinae slightly undulate. Fourth and fifth carinae united both basally and apically. Fifth and sixth carinae almost parallel to each other. Each area with transverse oblique striae. Apical one-third of horizontal surface of propodeum between third carinae somewhat reticulate, propodeum just outside fifth carinae strongly and largely reticulate. Caudal area reticulate. Fore femur widest slightly before the middle, narrowed both basally and apically, basal portion slender, maximum width : length = 9 : 38. Fore tibia—width at the apex : length = 5 : 32. Rel

tive length of the tarsal segments of fore leg—I : II : III : IV : V = 25 : 8 : 4 : 3 : 6. Apex of fourth segment reaching the middle portion of fifth one. Tibial spur slightly shorter than second tarsal segment. Mid-femur widest before the middle, narrowed both basally and apically, apical portion slender and the narrowest, maximum width : length = 10 : 37. Mid-tibia—width of the apex : length = 5 : 40. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 27 : 10 : 7 : 5 : 9. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 5 : 6 : 10. Hind femur widest at the basal one-third, narrowed both basally and apically, apical portion slender, maximum width : length = 14 : 52. Hind tibia—width at the apex : length = 8 : 58. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 38 : 14 : 7 : 5 : 10. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 7 : 8 : 14. Claws of all legs with a tooth at the middle. Fore wings with two cubital cells. Stigma very large. Radial cell slightly narrowed both basally and apically, receiving first transverse cubital nervure (truly the second) before the middle. First cubital cell very long, much longer than second, receiving first recurrent nervure at the middle. Second cubital cell slightly longer than high, receiving second recurrent nervure at the basal one-third. First recurrent nervure slightly shorter than second one. Second recurrent nervure and discoidal nervures almost straight or very slightly curved. Nervulus almost interstitial. Petiole of abdomen comparatively long, about as long as the frontal area of first tergite proper. First tergite, seen from above, slightly narrower than twice the length of it and somewhat cup-shaped. Second segment, seen from above, about as long as the width of first tergite, slightly wider than long, narrowed both anteriorly and posteriorly. Second segment slightly wider than high, seen in profile with dorsal surface very gently curved and ventral one very roundly curved.

Almost impunctate. Dorso-lateral portion of propodeum with sparse, weak and small punctures. Propleura with sparse, minute punctures. Sides of mesothorax with some small but distinct punctures.

Body almost hairless, minute pubescence on the sides or ventra portion of thorax greyish.

Black. Wings transparent, with nervures and stigmas blackish brown. Radial, apical half of first cubital, second cubital, apical two thirds of second discoidal, apical portion of submedial cells pal brownish-black.

Measurements

Length : Head seen from above 1.2 mm. Thorax 4.8 mm. Abdome about 5.0 mm. Fore wing 6.5 mm. Hind wing 5.2 mm

Width : Head, thorax 2.3 mm. First abdominal tergite 1.7 mm Second abdominal tergite 2.0 mm.

Holotype : 1 ♀, Urai-Pistan-Saramao, Taikôkei, Taichû-shû, For mosa, 16. vii. 1932, Teiso Esaki leg., in the collection of the Ento mological Laboratory of the Kyûshû Imperial University, Fukuoka

Habitat : Formosa.

The present new species is closely allied to the European *A fasciata* Jurine, 1807, but may be easily distinguished from th latter in the following points.

1. In *esakii* the third antennal segment is more than eight times as long as broad at the apex, while in *fasciata* it is thrice a long as broad at the apex.

2. In *esakii* there is only recognizable a median tubercle o front, but in *fasciata* there is a distinct, median, longitudinal carina

The species is also allied to the Indian *A. approximata* Turner 1912, but may be separable from it by the following characters.

1. In *approximata* the fuscous pattern on the fore wings i almost completely absent, while in *esakii* it is quite distinct.

2. In *approximata* eyes are separated from each other on th vertex by a distance equal to the length of the fourth antenna segment, while in *esakii* the minimum distance of eyes is muc longer than the length of the fourth antennal segment.

3. In *approximata* the fourth antennal segment is nearly twic as long as the fifth, while in *esakii* the fourth is about as long a the fifth.

4. In *approximata* the propodeum has no spines at the caudo lateral angles, while they are very distinct in *esakii*.

Ampulex sonani sp. nov.

♀. Head, seen from above, almost as wide as thorax. Head, seen in front, slightly wider than long. Inner margins of eyes very slightly convergent below and very slightly diverging above. Front moderately developed, slightly convex. Vertex convex and without a depression or an impression. Distance between anterior and posterior ocelli much longer than postocellar line, slightly shorter than ocello-ocular line. Antennal tubercles moderately developed, distance between them very remote and twice as wide as the distance between eyes and antennal tubercles. Front with a median, longitudinal, feeble carina. Eyes very large and ovate, length : width = 35 : 22. Clypeus very sharply, triangularly, narrowly produced, with a median carina very distinct. Median carina, seen in profile, very slightly curved. Anterior margin of clypeus with five teeth, one at the middle, and with a notch near the base. Head with eyes, seen in profile, much wider than temples which are slightly swollen. Mandibles stout, large, long, and slightly curved inwardly. Antennae comparatively short. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 11 : 4 : 22 : 10 : 9 : 6 : 6 : 5 : 5 : 5 : 5 : 7. First segment the stoutest, more than twice as long as wide at the apex. Second segment very slightly longer than wide. Third segment very slightly curved, gradually widened apically, about seven-times as long as wide at the apex. Fourth and fifth segments about thrice as long as wide. Sixth and seventh about twice as long as wide; eight to eleventh much longer than wide; twelfth more than twice as long as wide. Pronotum longer than mesonotum, very much convexly swollen dorsally, anterior slope of pronotum with a median, longitudinal impressed line. Propleura slightly convex. Mesonotum short, about twice as broad as long, with a median longitudinal impression, with two longitudinal deep furrows divergent towards pronotum. Sides of mesonotum with a deep furrow along the margins. Mesopleura each with a longitudinal distinct furrow. Scutellum shorter than mesonotum, about twice as broad as long, about thrice as long as postscutellum. Propodeum as long as wide, with caudo-lateral tubercles small. Caudal area much shorter than horizontal area. All the carinae

distinct. First and second convergent posteriorly, second and thir almost parallel to each other, third and fourth very slightly divergen posteriorly, fourth and fifth carinae almost parallel to each othe Area between third and fourth carinae comparatively large. Eac area with transverse oblique striae. Sides of propodeum just outsid fifth carinae largely reticulate. Caudal area almost flat, with feebl transverse oblique striae. Fore femur widest at the middle, narrowe both basally and apically, basal portion more slender and the na rowest, maximum width : length=9 : 38. Fore tibia comparativel stout, width at the apex : length=5 : 28. Relative length of th tarsal segments of fore leg—I : II : III : IV : V=23 : 7 : 4 : 3 : 5. Apc of fourth segment reaching the middle portion of fifth one. Tibi spur about as long as second tarsal segment. Mid-femur widest a the middle, almost equally narrowed both basally and apicall maximum width : length=10 : 36. Mid-tibia—width at the apex length=5 : 35. Relative length of the tarsal segments of mid-leg- I : II : III : IV : V=25 : 10 : 5 : 5 : 8. Apex of fourth segment almo reaching the middle portion of fifth one. Outer tibial spur : inn one : second tarsal segment=4 : 4 : 10. Hind femur widest at th basal one-third, narrowed both basally and apically, more slend apically, maximum width : length=15 : 50. Hind tibia—width at th apex : length=8 : 55. Relative length of the tarsal segments of hin leg—I : II : III : IV : V=35 : 13 : 7 : 5 : 10. Apex of fourth segme not reaching the middle portion of fifth one. Outer tibial spu inner one : second tarsal segment=6 : 8 : 13. Claws of all legs eac with a tooth at the middle. Fore wing with two cubital cell Radial cell slender, receiving first transverse cubital nervure befo the middle. First cubital cell very long, much longer than secon cubital cell, receiving first recurrent nervure at the middle, secon cubital cell widened apically, receiving second recurrent nervure the basal one-third. Second transverse cubital cell curved outwardl Nervulus slightly postfurcal. First recurrent nervure much short than second recurrent nervure, discoidal nervure slightly undulat Petiole of abdomen comparatively long, about as long as the anteri slope of first tergite proper. First tergite, seen from above, distinct wider than long, cup-shaped. Second segment about as long

wide, slightly longer than high, narrowed both basally and posteriorly, much narrowed posteriorly, seen in profile, with dorsal surface slightly curved, with ventral surface much more curved. Apical segments compressed laterally.

Body almost impunctate. Front with very sparse minute punctures. Pronotum with somewhat sparse, small, but distinct punctures except the lower anterior portion. Medio-anterior portion of mesonotum with several strong, comparatively larger punctures. Other characters are the same as in *esakii*. Petiole of abdomen without any striae.

Black. Mandibles brownish-black. Fore wings with pattern as in *esakii*, but the patterns are paler than in *esakii*.

Hairs or pubescence almost the same as in *esakii*.

Measurements

Length : Head seen from above 2.0 mm. Thorax 5.2 mm. Abdomen about 5.5 mm. Fore wing 6.0 mm. Hind wing 4.2 mm.

Width : Head 2.9 mm. Thorax 2.9 mm. Apex of first tergite 1.7 mm. Second tergite 2.0 mm.

♂. Inner margins of eyes almost parallel to each other below and slightly convergent above. Front without a median, longitudinal carina and only with a feeble tubercle just above the insertions of antennae. Lateral teeth on anterior margin of clypeus almost invisible. Median longitudinal carina of clypeus obscure. Temples not so swollen as in the female. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 10 : 3 : 20 : 10 : 8 : 7 : 6 : 5 : 5 : 5 : 5 : 4 : 5. First segment the stoutest, more than twice as long as wide. Second segment slightly longer than wide. Third segment about seven-times as long as wide at the apex, slightly widened apically. Fourth about thrice as long as wide ; seventh and sixth about twice as long as wide ; eighth to twelfth much longer than wide. Petiole of abdomen very long, much longer than first tergite proper seen from above. First tergite about twice as broad as long. Second segment about twice as long as first tergite, slightly wider than long, much wider than high. Fore femur—maximum width : length = 6 : 28. Fore tibia—width at the apex : length = 4 : 22. Relative length of the tarsal segments of

fore leg—I : II : III : IV : V = 18 : 6 : 3 : 3 : 4. Apex of fourth segment reaching the middle portion of fifth one. Tibial spur about as long as second tarsal segment. Mid-femur—maximum width : length = 7 : 28. Mid-tibia—width at the apex : length = 4 : 29. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 20 : 8 : 4 : 3 : 5. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 4 : 3 : 8. Hind femur—maximum width : length = 10 : 36. Hind tibia—width at the apex : length = 6 : 37. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 25 : 10 : 5 : 3 : 6. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 5 : 6 : 10.

Punctures on front much stronger than in the female. Antero-lateral portion of mesonotum with very sparse minute punctures. Sides of mesonotum much more largely and strongly produced than in the female.

Measurements

Length : Head seen from above 1.0 mm. Thorax 3.6 mm. Abdomen 1.9 mm. Fore wing 4.0 mm. Hind wing 3.0 mm.

Width : Head 1.7 mm. Second abdominal tergite 1.0 mm.

Holotype : 1 ♂, Yoyorin, Formosa, 17. ix. 1933, Jinhaku Sonan leg.

Allotype : 1 ♀, the same as above.

Paratype : 1 ♂, the same as above, all the types are preserved in the Entomological Museum of the Government Research Institute of Formosa, Taihoku.

Habitat : Formosa.

The present species is very closely allied to the Indian *A. approximata* Turner, 1912, but may be distinguished from it in the following points.

1. In *sonani* each postero-lateral angle of the propodeum has a spine, while in *approximata* it is entirely absent.

2. In *sonani* the propodeum is as long as broad, while in *approximata* it is longer than wide.

3. In *sonani* the second abdominal segment is about as long as broad, while it is distinctly longer than broad in *approximata*.

4. In *sonani* fuscous patterns on fore wings are distinct, while they are almost absent in *approximata*.

This new species is also allied to *A. esakii* sp. nov., but may be distinctly separable from it as follows.

1. In *esakii* the third antennal segment is shorter than twice the length of the fourth, while in *sonani* it is longer than twice the length of the fourth.

2. In *esakii* the third antennal segment is longer than eight-times the width of it at the apex, while in *sonani* it is seven-times as long as broad at the apex.

3. In *esakii* the propodeum has the dorsal surface gently sloping anteriorly seen in profile, while in *sonani* the dorsal surface is more steeply sloping anteriorly.

Ampulex dentata Matsumura et Uchida

Ampulex dentatus Matsumura et Uchida, Insecta Mats., Sapporo, vol. 1, no. 1, p. 38, ♀, pl. 3, fig. 6, 1926.
Trirhogma sp. Esaki, Bot. and Zool., Tokyo, vol. 2, no. 1, p. 93, 1934.
Ampulex dentata Yasumatsu, Annot. Zool. Jap., vol. 15, no. 1, p. 34, 1935.

♀. Head, seen from above, slightly narrower than thorax. Head, seen in front, slightly longer than wide. Inner margins of eyes distinctly divergent towards clypeus. Front not strikingly developed, comparatively narrow, moderately convex. Antennal tubercles very distinct. Vertex normal. Distance between anterior and posterior ocelli slightly longer than postocellar line. Postocellar line very slightly shorter than oculo-ocellar line. Distance between anterior and posterior ocelli as long as ocello-ocular line. Distance between the apices of the two antennal tubercles distinctly longer than oculo-ocellar line. Minimum distance between eyes : distance of eyes at the anterior margin of front = 26 : 46. Eyes large, length : width = 54 : 33. Areas between eyes and antennal tubercles not excavated and normal. Small area just posterior to posterior ocelli distinctly depressed. Vertex with a distinct, deep, longitudinal, median furrow. Front with a distinct, median, longitudinal carina which is obsolete just before anterior ocellus. Front with a feeble, somewhat obsolete carina originating from each antennal tubercle and extending upwardly. Clypeus twice as broad as long, some-

what triangularly produced anteriorly, apex with three small teeth. Clypeus with two areas which are separated by a median longitudinal carina. Head with eyes, seen in profile, much longer than temples. Mandibles long and stout, strongly curved inwardly. Antennae long and slender. Relative length of the segments of antenna is as follows—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 25 : 6 : 40 : 28 : 27 : 26 : 24 : 22 : 20 : 20 : 19 : 20. First segment the stoutest, more than twice as long as broad. Second segment as long as wide. Third segment slightly less than sixth-times as long as broad at the apex: fourth segment about four-times as long as broad at the apex; fifth and sixth slightly less than four-times as long as broad at the base; seventh almost five-times as long as broad; eighth slightly longer than four-times the width of it at the apex; ninth to eleventh almost five-times as long as broad. Pronotum with a dorsal surface somewhat square in outline and the anterior half somewhat depressed except the sides, sides of pronotum very slightly convergent towards head and almost flat. Propleura slightly convex. Mesonotum with two very distinct and deep, longitudinal furrows which are almost parallel or slightly divergent towards head. Antero-lateral portions of mesonotum slightly convex. Scutellum almost flat, wider than long, slightly less than one half the length of horizontal area of propodeum, more than twice as long as postscutellum. Propodeum slightly wider than long, with horizontal area slightly longer than vertical, caudal area. Caudo-lateral tubercles distinct and the apex pointed. Median carina occupies the basal three-fourths the length of horizontal area and uniformly distinct both basally and apically. Median and second carinae very strongly convergent apically. Second and third carinae almost parallel to each other and very slightly contiguous at the extremities. Basal half of third and fourth carinae entirely or completely united with each other and apical half of third and fourth are very nearer to each other but slightly divergent towards the apex. Fourth and fifth carinae parallel to each other. Fourth carina met with a transverse oblique carina at two-thirds the length of horizontal area of propodeum. Apical portion of horizontal area with three special areas; one medio-apical small area which has two transverse striae,

two latero-apical areas which have only a few incomplete striae. Third area the narrowest and triangular in outline. Each area with many transverse oblique striae, of which those on second are most dense. Third area with two or three striae. First area with about ten striae. Sides of propodeum just outside fifth carina there are recognizable a short but distinct carina which joins the fifth one past the middle portion of fifth carina. Sides of propodeum just outside such carinae with many transverse oblique striae. Fore femur widest at the middle, narrowed both basally and apically, apical portion the narrowest, maximum width : length = 18 : 75. Fore tibia—width at the apex : length = 11 : 57. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 45 : 17 : 10 : 9 : 16. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur shorter than the second tarsal segment. Mid-femur widest just before the middle, narrowed both basally and apically, basal portion somewhat compressed laterally, maximum width : length = 23 : 77. Mid-tibia—width at the apex : length = 11 : 57. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 57 : 20 : 12 : 10 : 22. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 20 : 21 : 20. Hind femur widest at the basal one-fourth, narrowed both basally and apically, apical two-thirds very slender, maximum width : length = 28 : 104, seen from above slightly curved inwardly and apical four-fifths compressed laterally. Hind tibia—width at the apex : length = 10 : 114. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 78 : 30 : 15 : 13 : 26. Apex of fourth segment not reaching the middle portion of fifth one; fourth segment slightly longer than one-third the length of fifth one. Outer tibial spur : inner one : second tarsal segment = 21 : 24 : 30. Claws of all legs each with a distinct, somewhat erect dens at the middle. Fore wings with three cubital cells. Radial cell slender, both narrowed apically and basally, receiving three transverse cubital nervures, receiving second one far before the middle. First cubital cell twice as long as second one, slightly shorter than third one which is the highest. Second cubital cell quadrate, slightly longer than high. First transverse cubital nervure interstitial with

first recurrent nervure. Third cubital cell receiving second recurrent nervure far before the middle, second recurrent nervure strongly curved at the middle. Nervulus interstitial. First recurrent nervure very much longer than second recurrent nervure. Discoidal nervure slightly curved. Apical two segments of abdomen compressed laterally. First tergite, seen from above, almost twice as wide as long. Petiole distinctly shorter than the anterior slope of first tergite. Second tergite with the sides, seen from above, slightly narrowed both basally and apically, almost as long as wide, seen in profile, distinctly longer than high, basal anterior portion roundly sloped. The sides of second sternite with a distinct longitudinal furrow as far as the middle portion of the sternite.

Almost impunctate. Front somewhat microscopically punctured. Sides of front with some small and very sparse punctures. Scutellum and postscutellum with very small punctures. Abdomen almost impunctate. First tergite with microscopically dense punctures which are seen in certain aspect. Second tergite with sparse and very small punctures.

Hairs on vertex, anterior margin of clypeus, pronotum, mesonotum, scutellum, underside of coxae, trochanters and femora (in hind femora the base only) comparatively long and brown or brownish-black. Hairs on temples, underside of thorax long and greyish. Underside of thorax, coxae, trochanters and femora richly with greyish minute pubescence. Apical margin of each sternite with several short brownish-black hairs.

Brilliant metallic blue. Mandibles and antennae black. Tarsi of all legs somewhat blackish. Claws somewhat brownish or brownish-black. Wings pale blackish, hind ones and outer margin of fore wings much paler, violaceously reflecting seen in certain aspect. Nervulus almost black, costal cells and stigmas almost brownish-black.

Measurements

Length : Head seen from above 2.0 mm. Thorax 9.2 mm. Abdomen 11.0 mm. Fore wing 12.0 mm. Hind wing 9.2 mm.

Width : Head 4.4 mm. Thorax 4.6 mm. First abdominal tergite 3.5 mm. Second abdominal tergite 4.2 mm.

♂. Head, seen from above, very slightly narrower than thorax. Head, seen in front, very slightly longer than wide. Inner margins of eyes distinctly divergent below. Front moderately developed, slightly convex. Antennal tubercles distinct. Vertex normal, but an area just posterior to the posterior ocelli slightly depressed. Vertex with a median, longitudinal, short furrow. Distance between anterior and posterior ocelli very slightly longer than postocellar line. Postocellar line very distinctly shorter than ocello-ocular line. Distance between the apices of two antennal tubercles slightly longer than ocello-ocular line. Minimum distance between eyes : distance of eyes at the anterior margin of front = 24 : 30. Eyes large, length : width = 36 : 20. Areas between antennal tubercles and eyes not excavated but normal. Front with a median longitudinal carina obsolete, only a small tubercle is recognizable far below anterior ocellus, other carinae almost entirely obsolete. Clypeus about twice as broad as long, with the apex narrowly truncate and with a tooth. Clypeus with two areas which are separated by a median feeble carina. Head with eyes, seen in profile, much longer than temples. Mandibles long and stout, strongly curved inwardly and with a sharp, large tooth. Antennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 15 : 3 : 26 : 24 : 21 : 19 : 18 : 16 : 15 : 14 : 13 : 13 : 13. First segment about twice as long as wide ; second wider than long ; third very slightly curved seen from above ; fourth to ninth moderately undulate. Third segment about five-times as long as broad ; fourth slightly shorter than five-times the width of it ; fifth about four-times as long as broad ; sixth and seventh shorter than five-times the width of them ; eighth and ninth about four-times as long as broad ; thirteenth about four-times as long as wide at the base. Pronotum as in the female, with posterior portion of horizontal, dorsal area somewhat convex, latero-dorsal ridges much more rounded. Mesonotum as in the female, with a median line very slightly depressed. Scutellum moderately convex, slightly wider than long, less than one half the length of propodeum, more than twice as long as postscutellum. Propodeum about as long as wide, with a horizontal area distinctly longer than a vertical, caudal area.

Caudo-lateral tubercles as in the female. Median carina very feeble or low. Second carinae strong basally and lowered apically, reaching apical one-fourth the length of horizontal area. Median and second carinae very strongly convergent posteriorly, second and third carinae almost parallel to each other, third and fourth very near and very slightly divergent posteriorly and almost united at the base. Fourth and fifth carinae almost parallel to each other or very slightly divergent posteriorly. Short sixth carinae are present outside the fifth carinae. Apical portion of horizontal area with two, small, special areas at the caudo-lateral apices. Each area with many transverse oblique striae, of which those on apical four-fifths of median area almost straight and transverse. Sides of propodeum just outside the carinae with many transverse oblique striae. Caudal surface of propodeum somewhat reticulate. Fore femur widest at the middle, equally narrowed both basally and apically, maximum width : length = 9 : 50. Fore tibia—width at the apex : length = 6 : 40. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 28 : 10 : 5 : 5 : 10. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur almost as long as second segment. Mid-femur widest just before the middle, narrowed both basally and apically, basal portion slightly compressed laterally, maximum width : length = 10 : 50. Mid-tibia—width at the apex : length = 5 : 50. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 32 : 12 : 5 : 5 : 11. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 10 : 12 : 12. Hind femur widest at the basal one-third, narrowed both basally and apically, apical one-third very slender, maximum width : length = 14 : 65, seen from above, slightly curved inwardly and apical half slightly compressed. Hind tibia—width at the apex : length = 8 : 76. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 45 : 17 : 7 : 5 : 13. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 11 : 13 : 17. Claws as in the female. Fore wing with three cubital cells. Second transverse cubital nervure almost obsolete and remains only rudimantarily. Radial cell slender, narrowed both basally and

apically, apical portion much slender, receiving second transverse cubital nervure at the basal one-third. Second cubital cell almost rectangular, as high as long. First cubital cell slightly shorter than third cubital one, third cubital cell very high and prominently widened apically. First transverse cubital and first recurrent nervure not interstitial. First recurrent nervure slightly longer than second recurrent one. First cubital cell receiving first recurrent nervure before the apex. First abdominal tergite, seen from above, slightly broader than long, the sides steeply narrowed basally, with petiole short, much shorter than vertical frontal surface of the tergite. First tergite very distinctly constricted at the apex. Second tergite very slightly wider than long. Second segment, seen in profile, much more longer than high, with dorsal surface almost straight, ventral surface roundly curved basally. First tergite entirely and second tergite at the basal one half each with a median, obscure, impunctate carina which is distinctly recognizable seen in certain aspect.

Punctures on head and thorax comparatively dense. Sides of front almost impunctate at the lower margin. Lower portion of the sides of pronotum almost impunctate. Metapleura and anterior portion of the sides of propodeum impunctate. Punctures on occiput very coarse, on scutellum much coarser, on postscutellum very dense except the sides where punctures are almost absent. Punctures on abdominal tergites very strong and dense, on second tergite much larger, on the following tergites very much dense and somewhat reticulate. Punctures on second abdominal sternite the largest and very irregularly scattered. Basal portion of first sternite with very distinct transverse carinae. Entire surface minutely, densely and microscopically punctured seen in certain aspect. Hairs on dorsum of head, thorax, third and the following tergites black, comparatively long erect and coarse. Hairs or pubescence on clypeus, temples, pleura, underside of thorax, sides and the caudal area of propodeum, coxae, trochanters, underside of femora, anterior slope of first abdominal tergite and sternites dense and greyish or whitish.

Brilliant metallic green or blue. Mandibles bright brown with apex and apex of tooth black. Second and the following segments of antennae black. Tarsi of all legs brownish-black. Tibial spurs

and claws brown or brownish-black. Tegulae also brownish-black. Wings as in the female, costal cell much paler.

Measurements

Length : Head seen from above 1.7 mm. Thorax 5.8 mm. Abdomen 4.1 mm. Fore wing 9.0 mm. Hind wing 7.0 mm.

Width : Head 3.0 mm. Thorax 3.1 mm. First abdominal tergite 2.1 mm. Second abdominal tergite 2.7 mm.

Specimens examined : 2 ♀♀, Bannadake, Ishigakijima, 24. vi. 1934, T. Esaki leg., 1 ♂ (Allotype), Yakkachi, Sumiyo-mura, Amami-Oshima Islands, 18. vii. 1933, Esaki leg., 1 ♂, Ishigakijima (in the collection of Mr. Munemoto Yano).

Habitat : Ryukyu Group (Amami-Oshima, Okinawa-honto, Ishigakijima).

The male of the present species is very closely allied to *A. metallica* Kohl, 1893, from Malacca, but both the species are completely separable from each other by the proportionate length of the third antennal segment : in *dentata* it is much longer, while in *metallica* it is much shorter about 2.5-times as long as broad at the apex.

Structurally the present species is very closely allied to *A. erythropus* Kohl, 1893, from Java, but may be easily distinguished from the latter by the following characters.

1. In *dentata* the head has temples slightly swollen seen from above, while in *erythropus* temples are not swollen as in *dentata*.

2. In *dentata* the vertex just posterior to the posterior ocelli is narrowly depressed, while in *erythropus* it is much more widely depressed.

3. In *dentata* antennae are slender, while in *erythropus* they are much stouter.

4. In *dentata* the pronotum has not a median carina, while in *erythropus* it has a faint, but distinct, median longitudinal carina at its anterior portion.

5. In *dentata* the propodeum is comparatively short and the third carinae on the propodeum are roundly curved, while in *erythropus* propodeum is comparatively long and the third carinae are almost straight.

6. In *dentata* only one spine or tubercle is present on each side of the propodeum, while in *erythropus* two spines are present.

7. In *dentata* the radial cell of the fore wing is widest before the middle, while in *erythropus* it is widest at the middle.

8. In *dentata* the fore wing has three cubital cells, while in *erythropus* only two cubital cells are recognizable owing to the absence of the first transverse cubital nervure.

9. In *dentata* the first recurrent nervure is distinctly longer than the second, while in *erythropus* the first is distinctly shorter than the second.

10. In *dentata* the apex of the fourth tarsal segment is not reaching the middle portion of the fifth, while in *erythropus* it is reaching the middle portion.

11. In *dentata* first tarsal segments of all legs are more slender and much longer, while in *erythropus* they are much stouter and shorter.

12. In *dentata* the first abdominal tergite is not constricted at the apex, while in *erythropus* it is slightly but distinctly constricted at the apex seen from above.

13. In *dentata* the second abdominal sternite is very gently curved seen in profile, while in *erythropus* it is much more roundly curved.

Ampulex takeuchii sp. nov.

♀. Head, seen from above, narrower than thorax. Head, seen in front, about as broad as long. Inner margins of eyes distinctly divergent below. Front moderately developed, slightly convex. Vertex just posterior to posterior ocelli almost flat, with a median longitudinal impressed line at its posterior two-thirds. Distance between anterior and posterior ocelli longer than postocellar line, slightly shorter than ocello-ocular line. Areas between antennal tubercles and eyes normal. Antennal tubercles distinct. Distance between antennal tubercles distinctly longer than oculo-ocellar line. Front with a median longitudinal carina which is almost obsolete at the middle. Two carinae between antennal tubercles and anterior ocellus obsolete at the middle, lower portion almost parallel to each

other and the upper portions are only recognizable seen in certain aspect. Minimum distance between eyes : distance of eyes at the anterior margin of front = 12 : 30. Eyes large, length : width = 40 : 25. Head with eyes, seen in profile, much longer than temples. Clypeus produced triangularly, about twice as wide as long, its apex with three teeth. Clypeal carina, seen in profile, slightly curved anteriorly. Mandibles large and stout, curved inwardly. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 15 : 4 : 29 : 20 : 20 : 19 : 19 : 17 : 17 : 15 : 15 : 15. First segment the stoutest, about twice as long as broad. Second segment slightly wider than long. Third segment about four-times as long as broad at the apex, almost straight and very slightly widened apically ; fourth to ninth about three-times as long as broad ; tenth to twelfth about four-times as long as broad. Pronotum comparatively short, with a dorsal area oblique, almost flat and anterior portion very slightly depressed, the sides slightly convex. Dorsal area, seen from above, distinctly wider than long. Dorsal area of pronotum : length of mesonotum = 2 : 3. Propleura slightly convex. Two longitudinal deep furrows on mesonotum parallel to each other. Anterior margin of mesonotum with two short but distinct carinae at the middle. Scutellum about as wide as the dorsal area of pronotum, about twice as broad as long, about three-times as long as postscutellum, the surface slightly convex. Mesopleura each with a longitudinal, short carina on the ventral surface. Propodeum about as long as wide, horizontal surface slightly longer than vertical, caudal area. Median carina very feeble, only recognizable seen in certain aspect. Second carinae short, reaching slightly past the middle portion of the horizontal area. First and second carinae convergent posteriorly. Second and third carinae almost parallel to each other. Fourth carinae almost obsolete, only seen in the middle portion of the horizontal area along the third carinae. Fifth and third carinae almost parallel to each other. Sixth carinae distinct and joins at the middle portion of fifth one. First, second only at the base and inner sides and third areas as well as the sides of propodeum transversely obliquely striate. Caudal area with many transverse striae. Caudo-lateral tubercles of propodeum not very

distinct. Fore femur widest at the middle, almost equally narrowed both basally and apically, maximum width : length = 11 : 50. Fore tibia—width at the apex : length = 8 : 42. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 33 : 13 : 7 : 6 : 12. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur slightly shorter than second tarsal segment, slightly longer than the third. Mid-femur widest just before the middle, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 12 : 54. Mid-tibia—width at the apex : length = 9 : 54. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 43 : 16 : 8 : 7 : 15. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 12 : 15 : 16. Hind femur widest at the basal one-fourth, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 19 : 72. Hind tibia—width at the apex : length = 10 : 80. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 54 : 21 : 10 : 7 : 20. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 13 : 15 : 21. Claws of all legs each with a tooth at the middle. Fore wings with three cubital cells. First transverse cubital nervure almost obsolete except the lower base. Radial cell narrowed both basally and apically, receiving second transverse cubital nervure before the middle. First cubital cell about as long as third one, receiving first recurrent nervure near the apex. Second cubital cell slightly longer than high. Third cubital cell widened apically, receiving second recurrent nervure before the middle. Second recurrent and discoidal nervures slightly curved, first recurrent nervure about as long as second recurrent one. Petiole of abdomen shorter than frontal area of first tergite proper. First tergite seen from above, about twice as broad as long, about two-fifths the length of second tergite. Second segment about as long as wide, narrowed both anteriorly and posteriorly, about as long as high, seen in profile with dorsal surface almost straight and ventral surface very gently curved. Third and the following segments compressed laterally. Almost impunctate. Anterior margin of clypeus with very sparse,

irregular punctures. Front with sparse small punctures. Punctures on vertex, occiput and on temples much coarser. Dorsal area of pronotum and mesonotum with several small punctures. The sides of pronotum with fine, short striae at the central posterior portion. Mesopleura with several very small punctures.

Hairs on dorsum of head and thorax very sparse and feeble, somewhat brownish-black. Hairs on anterior margin of clypeus brownish. Pubescence on the sides and ventral side of thorax greyish.

Brilliant metallic blue. Antennal flagellum black. Mandibles black, with the base somewhat metallic blue and with the apex brownish-black. Claws black with the apex brownish. Wings uniformly pale brownish, with nervures brownish-black and with stigmas somewhat paler.

Measurements

Length : Head seen from above 2.0 mm. Thorax 6.1 mm. Abdomen 8.0 mm. Fore wing 9.6 mm. Hind wing 7.5 mm.

Width : Head 3.2 mm. Thorax 3.5 mm. First abdominal tergite 2.3 mm. Second abdominal tergite 2.9 mm.

♂. Head with front comparatively well developed, slightly convex. Antennal tubercles very large. Vertex just posterior to posterior ocelli slightly triangularly depressed. Inner margins of eyes very slightly convergent below. Minimum distance between eyes : distance between eyes at the anterior margin of front = 15 : 19. Clypeus with only one apical tooth. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII = 12 : 4 : 21 : 20 : 18 : 16 : 15 : 15. First segment twice as long as broad; second slightly wider than long. Third segment about four-times as long as wide; fourth and fifth more than twice as long as broad; sixth and eighth about thrice as long as broad. Median carina of propodeum almost completely obsolete except the base. Fore femur widest at the middle, maximum width : length = 8 : 39. Fore tibia—width at the apex : length = 5 : 32. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 25 : 10 : 5 : 4 : 9. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur almost as long as second tarsal segment. Mid-femur widest at the middle, maximum width :

igth=10 : 40. Mid-tibia—width at the apex : length=6 : 40. Rela- e length of the tarsal segments of mid-leg—I : II : III : IV : V=28 : : 5 : 4 : 9. Apex of fourth segment not reaching the middle por- n of fifth one. Outer tibial spur : inner one : second tarsal seg- ent=9 : 10 : 10. Hind femur widest at the basal one-third, maximum dth : length=13 : 50. Hind tibia—width at the apex : length=7 : . Relative length of the tarsal segments of hind leg—I : II : III : : V=37 : 15 : 6 : 5 : 10. Apex of fourth segment not reaching the ddle portion of fifth one. Outer tibial spur : inner one : second sal segment=11 : 12 : 15. Fore wings with second cubital cell eiving second recurrent nervure at the basal one-third. Petiole abdomen short, frontal area of first tergite longer than horizontal ea. First tergite, seen from above, wider than long, slightly con- icted at the posterior apex. Length of first tergite : length of cond one=16 : 40. Second segment slightly wider than long, rrowed both anteriorly and posteriorly, slightly longer than high. cond segment, seen in profile, with dorsal surface almost straight d ventral surface slightly curved.

Clypeus minutely punctured. Areas between antennal tubercles d eyes very minutely, longitudinally striate or almost impunctate. ead, thorax and abdomen very densely largely punctured. Lower argin of pronotum impunctate. Metapleura as well as anterior rtion of the sides of propodeum impunctate. Punctures on abdomen ry deep and strong, on second sternite somewhat irregularly, arsely scattered.

Hairs or pubescence much denser than in the female.

Brilliant metallic blue or somewhat green. Antennal segments cept scape black.

Measurements

ength : Head seen from above 2.0 mm. Thorax 5.2 mm. Abdomen 4.0 mm. Fore wing 8.0 mm. Hind wing 6.0 mm.

Width : Head 2.5 mm. Thorax 2.9 mm. First abdominal tergite 2.0 mm. Second abdominal tergite 2.5 mm.

Holotype : 1 ♂, Horisha, Formosa, 5. v. 1922, Kichizo Takeuchi g.

Allotype : 1 ♀, the same as above, in the collection of the akeuchi Entomological Laboratory, Yamashina.

Habitat: Formosa.

This new species is very closely allied to *Ampulex aborensis* Nurse, 1914, from Kobo, India, but in the latter the pronotum is nearly half as long as mesonotum.

The species is also very closely allied to *A. dentata* Matsumura, but may be separable from the latter in the following characters besides the differences in the sculpture of the propodeum.

1. In the male punctures on the body are large and slightly coarser in *takeuchii*, while they are comparatively small and less dense in *dentata*.

2. In the female the dorsal area of the pronotum is distinctly wider than long in *takeuchii*, while it is as long as wide in *dentata*.

Ampulex seitzii Kohl

Ampulex seitzii Kohl, Ann. des k. k. naturh. Hofmus., Wien, vol. 8, p. 464, ♀, pl. 12, fig. 31, 1893.

♀. Head, seen from above, almost as wide as thorax. Head, seen in front, almost as long as wide. Inner margin of eyes almost parallel to each other. Front well developed and slightly convex. Antennal tubercles distinct. Vertex normal, without a depression or a longitudinal furrow. Distance between anterior and posterior ocelli slightly longer than postocellar line, much shorter than ocello-ocular line. Distance between the apices of antennal tubercles distinctly longer than ocello-ocular line. Eyes large, ovate, length: width = 33 : 20. Areas between antennal tubercles and eyes not excavated and almost normal. Front without a median longitudinal carina. Carinae originating from antennal tubercles to the middle portion of front very distinct and stout, slightly diverging below and above, not reaching anterior ocellus. Clypeus very produced, slightly more than twice as wide as long, somewhat triangular, each side with a distinct tooth and a distinct notch just before the tooth. Clypeus with two areas which are separated by a median distinct carina or ridge. Clypeus with carina, seen in profile, straight at its basal two-thirds and somewhat obliquely truncate at its apical one-third. Mandibles very long and stout, strongly curved inwardly. Head with eyes, seen in profile, much longer than temples. An-

tennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 13 : 5 : 28 : 20 : 18 : 15 : 12 : 12 : 11 : 10 : 10 : 12. First segment the stoutest, more than twice as long as wide. Second segment about as long as wide. Third segment slightly less than six-times as long as wide at the apex, becoming slender towards the base. Fourth segment about four-times as long as broad; fifth slightly less than four-times as long as wide; sixth about four-times as long as broad; seventh and eighth about three-times as long as broad; ninth very slightly less than four-times as long as broad; tenth slightly more than three-times as long as broad; eleventh about four-times as long as broad; twelfth about six-times as long as broad at the base. Pronotum, seen in profile, almost triangular, not equilateral both anteriorly and posteriorly, with the sides almost flat, with anterior half of dorsal surface slightly depressed except the antero-lateral angles. Tubercle just anterior to the posterior margin of pronotum distinct, with a median, very feeble, longitudinal impressed line which is recognizable seen in certain aspect. Propleura very slightly convex. Dorsal area of pronotum with the sides, seen from above, slightly convergent anteriorly. Two longitudinal furrows on mesonotum parallel to each other. Mesopleura without a longitudinal carina or an impression. Scutellum very convex, about twice as broad as long, about twice as long as postscutellum, about one-third the length of the horizontal area of propodeum. Propodeum very slightly wider than long, with caudo-lateral tubercles very strong, long and pointed. Median carina almost entirely distinct except the apical portion of propodeum. Second carinae short, only reaching the central portion of the dorsal area. First and second carinae distinctly convergent posteriorly. Third carinae almost straight, reaching the caudo-median apex of the dorsal area. Second and third carinae almost parallel to each other. Third and fourth carinae remotely situated to each other. Comparatively united at the base and slightly convergent posteriorly and almost parallel to each other at the apical one half. Fourth and fifth carinae almost parallel to each other. Sixth carinae are present just outside the fifth one, sixth and fifth carinae divergent posteriorly. Each area with transverse

oblique striae. Area between fifth and fourth carinae very coarsely and largely reticulate. Caudal surface reticulate above and somewhat transversely striate below. Fore femur widest at the middle, narrowed both apically and basally, basal portion slender and the narrowest, maximum width : length = 10 : 43. Fore tibia—width at the apex : length = 5 : 35. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 33 : 14 : 8 : 5 : 8. Apex of fourth segment reaching the middle portion of fifth one. Tibial spur shorter than second tarsal segment and about as long as third segment. Mid-femur widest at the basal two-fifths, narrowed both apically and basally, apical portion more slender and the narrowest; maximum width : length = 11 : 43. Mid-tibia—width at the apex : length = 5 : 48. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 35 : 15 : 8 : 5 : 8. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 8 : 9 : 15. Hind femur widest at the basal one-fourth, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 15 : 65. Hind tibia—width at the apex : length = 9 : 10. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 45 : 17 : 13 : 5 : 13. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 8 : 12 : 17. Claws of all legs somewhat bifid. Fore wings with two cubital cells. First transverse cubital nervure obsolete, only shortly remains rudimentarily. Radial cell narrowed both basally and apically, becoming more slender apically, receiving first transverse cubital nervure (truly the second) before the middle. First cubital cell very much longer than the second (truly the third), receiving first recurrent nervure at the middle. Second cubital cell widened apically, receiving second recurrent at the basal one-third, distinctly longer than high. Nervulus interstitial. First recurrent nervure about as long as second one. Discoidal nervure moderately undulate. Petiole of abdomen very long about as long as first tergite proper seen from above. First tergite, seen from above, about twice as broad as long, cup-shaped. Second segment more than twice as long as first tergite, about as long as broad, slightly longer than high, narrowed both basally and

apically, more richly narrowed apically. Third to sixth segment compressed laterally, especially so in fifth and sixth segments. Second segment with dorsal surface, seen in profile, very gently curved, with ventral surface very roundly curved.

Anterior margin of clypeus with several small punctures. Areas between antennal tubercles and eyes impunctate. Front very densely, somewhat reticulately, largely punctured. Small area between posterior ocelli and eyes almost impunctate. Punctures on vertex slightly coarser. Temples and occiput sparsely with comparatively small punctures. Pronotum almost impunctate, its dorsal area with several very distinct transverse carinae. Pro- and mesopleura comparatively densely punctured. Metapleura and anterior portion of the sides of propodeum impunctate. Mesonotum with very strong, large punctures which are very irregularly scattered. Tegulae impunctate. Scutellum and postscutellum comparatively sparsely and deeply punctured. Abdomen almost impunctate. Underside of petiole finely transversely striate.

Hairs and pubescence pale greyish.

Brilliant metallic green. Apical half of the third segment of antennae and the following ones black. Mandibles brownish-black. Tegulae somewhat bronze green. Trochanters of all legs brown or brownish-black. Claws brownish-black with the apex pale brown. Wings transparent, very slightly smoky, nervures and stigmas brownish-black, very slightly violaceously reflecting seen in certain aspect.

Measurements

Length : Head seen from above 1.5 mm. Thorax 5.5 mm. Abdomen 4.6 mm. Fore wing 6.8 mm. Hind wing 5.4 mm.

Width : Head, thorax 2.6 mm. First abdominal tergite 2.0 mm. Second abdominal tergite 2.4 mm.

Specimens examined : 1 ♀, Hokuto, Formosa, 15. vi. 1929, Kaku Sato leg., 1 ♀, Hokuto, 23. ix. 1927, Sato leg., 1 ♀, Hokuto, 5. viii. 1929, Sato leg., in the collection of Mr. K. Sato.

Habitat : Formosa and China (Hongkong).

Ampulex satoi sp. nov.

♀. Head, seen from above, slightly narrower than thorax, with temples well developed and rounded. Head, seen in front, about as long as wide. Inner margins of eyes almost parallel below and very slightly convergent above. Antennal tubercles distinct. Front well developed and convex. Vertex normal, without a median impression or depression. Distance between anterior and posterior ocelli longer than postocellar line, very much shorter than ocello-ocular line. Eyes large, length : width = 31 : 20. Areas between antennal tubercles and eyes slightly excavated. Front without a median, longitudinal carina, and only with a low tubercle between the two carinae originating from antennal tubercles and running shortly upwardly, the carinae very short and diverging below. Clypeus very much produced, slightly wider than long, triangular, with three distinct teeth at the apex, one at the middle and two on the sides just posterior to the former. Clypeus with two areas which are separated by a median longitudinal distinct carina, seen in front with the carina very slightly curved. Mandibles very long and stout, strongly curved inwardly and with the apex sharply pointed. Head with temples, seen in profile, very much swollen and as broad as eyes. Antennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 13 : 4 : 24 : 14 : 13 : 10 : 8 : 7 : 7 : 7 : 7 : 8. First segment the stoutest, slightly more than twice as long as wide at the middle. Second segment about as long as wide. Third segment slightly curved outwardly at the basal portion and slightly widened apically, about six-times as long as wide at the apex. Fourth and fifth segments slightly longer than thrice as long as wide; sixth slightly longer than twice as long as wide; seventh to eleventh about twice as long as wide; twelfth slightly shorter than twice as long as wide at the base. Pronotum long, its dorsal area about as long as mesonotum, somewhat cubic in shape, with dorsal area oblique and somewhat convex. Dorsal area of pronotum with a median, longitudinal distinct furrow, the sides of the same flat. Propleura slightly convex. Mesonotum with a median, longitudinal impressed line, with two longitudinal deep furrows which are slightly divergent

towards pronotum. Mesopleura with a longitudinal, very distinct furrow. Scutellum almost flat, wider than long, more than twice as long as postscutellum, about one-third the length of propodeum. Propodeum almost as long as wide, caudo-lateral tubercles very feeble, with caudal, vertical area slightly convex and shorter than the horizontal area. Median carina distinct. Second carina somewhat undulate, distinctly and strongly convergent posteriorly at the basal one half and very slightly so at the apical portion. Second and third carinae almost parallel to each other. Third and fourth carinae almost parallel to each other and united at basally and apically. Fourth and fifth carinae almost parallel to each other. Each area with transverse oblique striae, the sides of propodeum just outside the fifth carinae and caudal area reticulate. Legs comparatively stout. Fore femur widest at the middle, narrowed both basally and apically, maximum width : length = 12 : 40. Fore tibia—width at the apex : length = 7 : 34. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 27 : 10 : 6 : 4 : 8. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur slightly shorter than second tarsal segment and slightly longer than third one. Mid-femur widest at the middle, narrowed both basally and apically, apical portion much slender and the narrowest, maximum width : length = 13 : 39. Mid-tibia—width at the apex : length = 6 : 42. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 30 : 10 : 7 : 4 : 9. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 5 : 6 : 10. Hind femur widest at the basal one-third, seen in profile much swollen above, narrowed both basally and apically, apical portion much slender and the narrowest, maximum width : length = 16 : 50. Hind tibia—width at the apex : length = 9 : 58. Relative length of the tarsal segments of hind leg I : II : III : IV : V = 40 : 16 : 9 : 5 : 10. Apex of fourth segment not reaching the middle portion of fifth one. Claws of all legs somewhat bifid. Fore wing with two cubital cells. Radial cell narrowed both basally and apically, apical portion much slender, receiving first transverse cubital nervure before the middle. First cubital cell very much longer than second one, receiving first recurrent nervure

at the middle. Second cubital cell widened apically, longer than high, receiving second recurrent nervure at the basal one-third. Nervulus interstitial. First recurrent nervure about as long as second one which is almost straight, discoidal nervure slightly undulate. Petiole of abdomen very long, about as long as first tergite proper seen from above. First tergite, seen from above, wider than long, somewhat cup-shaped. Second segment twice as long as first tergite, about as long as wide, narrowed both basally and apically, slightly longer or wider than high. Second segment, seen in profile, with its dorsal surface almost straight or very slightly curved, with ventral surface roundly curved basally. Fourth and the following segments compressed laterally.

Clypeus minutely and densely punctured. Areas between antennal tubercles and eyes impunctate. Front with comparatively dense small punctures. Vertex, occiput and temples almost impunctate and with several small punctures. Dorsal area of pronotum distinctly transversely striate. Dorso-lateral portions somewhat coarsely punctured. Sides of pronotum impunctate. Propleurae with sparse and small punctures. Mesonotum, scutellum as well as postscutellum very coarsely irregularly punctured. Sides and ventral side of mesothorax comparatively densely punctured. Metapleura and lower half of the sides of propodeum impunctate. Abdomen almost entirely impunctate.

Hairs sparse. Hairs and pubescence greyish or whitish.

Brilliant metallic blue or violet. Antennae and mandibles black. Tibiae and claws of all legs somewhat blackish. Wings slightly clouded, with nervures and stigmas brownish-black.

Measurements

Length : Head seen from above 2.0 mm. Thorax 5.2 mm. Abdomen 4.7 mm. Fore wing 7.0 mm. Hind wing 5.0 mm.

Width : Head 2.7 mm. Thorax 2.9 mm. Apex of first abdominal tergite 2.0 mm. Second abdominal tergite 2.2 mm.

♂. Temples not swollen as in the female. Clypeus without a tooth, seen in profile, with carina slightly swollen. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 12 : 4 : 27 : 15 : 13 : 10 : 10 : 9 : 8 : 7 : 7 : 6 : 7.

First segment about twice as long as wide; second as long as wide; third more than five-times as long as wide at the apex; fourth about four-times as long as broad; fifth slightly shorter than four-times as long as wide; sixth and the following segments each slightly longer than twice the width of it at the base. Fore femur—maximum width : length = 13 : 40. Fore tibia—width at the apex : length = 7 : 30. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 25 : 10 : 5 : 5 : 8. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur very slightly shorter than second segment. Mid-femur—maximum width : length = 13 : 38. Mid-tibia—width at the apex : length = 7 : 40. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 28 : 12 : 7 : 5 : 9. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 6 : 6 : 12. Hind femur—maximum width : length = 16 : 52. Hind tibia—width at the apex : length = 8 : 55. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 35 : 16 : 10 : 6 : 10. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 7 : 10 : 16.

Front very densely, minutely, finely, longitudinally striate. Vertex with comparatively dense and small punctures. Dorsum of pronotum much strongly and densely punctured. Mesonotum with very large strong and close punctures. Posterior margin of scutellum densely and largely punctured. Sides and ventral side of mesothorax much more densely and punctured than in the female.

Measurements

No. 1 Length : Head seen from above 1.6 mm. Thorax 5.4 mm. Abdomen 4.2 mm. Fore wing 8.0 mm. Hind wing 5.5 mm.

Width : Head 2.8 mm. Thorax 3.0 mm. Second abdominal segment 2.2 mm.

No. 2 Length : Head seen from above 1.1 mm. Thorax 3.9 mm. Abdomen 3.2 mm. Fore wing 5.0 mm. Hind wing 4.0 mm.

Width : Head 1.9 mm. Thorax 2.0 mm. Second abdominal tergite 1.6 mm.

Holotype: 1 ♂, Suigen, Korea, K. Sato leg.

Allotype: 1 ♀, the same as above.

Paratypes: 3 ♂♂, the same as above, in the collection of Mr. K. Sato.

Habitat: Korea.

This new species is somewhat allied to *A. seitzii* Kohl, 1893 from Hongkong, South China, but may be completely separable from it in the following points.

1. Coloration of the body is brilliant metallic blue or violet in *satoi*, while it is brilliant metallic green in *seitzii*.

2. In *satoi* the propodeum is not tuberculate and gently sloping anteriorly while in *seitzii* it is tuberculate, steeply sloping anteriorly and somewhat triangular seen in profile.

3. In *satoi* the punctuation on the head is very small and sparse, but in *seitzii* punctures are very large, strong and dense.

Ampulex kurarensis sp. nov.

♀. Head, seen from above, slightly narrower than thorax. Head, seen in front, as long as wide. Inner margins of eyes distinctly divergent below. Front moderately developed, slightly convex. Base of antennae distinctly tuberculate. Vertex normal, but an area just posterior to posterior ocelli slightly depressed. Vertex with a median, longitudinal furrow. Distance between anterior and posterior ocelli distinctly longer than postocellar line or almost as long as oculo-ocellar line. Distance between the apices of antennal tubercles distinctly longer than ocello-ocular line. Minimum distance between eyes: distance of eyes at the anterior margin of front = 27 : 40. Eyes large, length : width = 59 : 35. Areas between antennal tubercles and eyes somewhat longitudinally excavated. Front with a median, longitudinal, very distinct carina. Carinae originating from antennal tubercles and running upward parallel to each other and reaching the middle portion of front. Clypeus about twice as broad as long, somewhat triangularly produced, each side with a distinct tooth near the apex and a distinct notch just posterior to the tooth.

Clypeus with two areas which are separated by a median

distinct carina, seen in profile with the carina almost straight and with the apex somewhat rounded. Mandibles very long and sout, strongly curved inwardly. Head with eyes, seen in profile, much longer than temples. Antennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 23 : 8 : 54 : 32 : 30 : 25 : 22 : 20 : 17 : 15 : 15 : 16. First segment the largest, more than twice as long as broad at the apex. Second segment about as long as wide. Third segment slightly curved outwardly at the basal one-fifth, slightly less than eight-times as long as wide at the apex, slightly narrowed basally. Fourth segment four-times as long as broad; fifth shorter than four-times the width of it; sixth about thrice as long as broad; seventh shorter than four-times the width of it; eighth about four-times as long as broad; ninth shorter than four-times the width of it; tenth and eleventh about four-times as long as broad; twelfth about five-times as long as broad at the base.

Pronotum with a horizontal area long, slightly shorter than mesonotum, seen from above with the sides gently convergent anteriorly, antero-lateral portions rounded; seen in profile, with a dorsal surface somewhat obliquely sloping and roundly curved at the anterior portion. Sides of pronotum almost flat, dorsal surface slightly flattened, with a median, longitudinal furrow which reachs the median tubercle just anterior to the posterior margin of pronotum. Propleura slightly convex. Mesonotum gently curved anteriorly, with two longitudinal furrows almost parallel to each other and slightly divergent anteriorly. Mesopleurae with a longitudinal punctate or costate furrow. Scutellum much wider than long, more than twice as long as postscutellum. Propodeum almost as long as broad, with a horizontal area slightly longer than the vertical caudal area. Caudo-lateral tubercles very distinct and pointed. Median carina distinct. Second carinae very distinct and their apical two-fifths entirely obsolete. First and second carinae distinctly convergent posteriorly. Third and fourth carinae very consecutive and both extremities completely united with each other. Second and third carinae parallel to each other. Fourth and fifth carinae parallel to each other. Each area with oblique transverse striae, striation on

second area most dense. Propodeum just outside the fifth carinae with some oblique striae, apical portion somewhat reticulate. Caudal area with transverse comparatively dense striae. Fore femur widest at the middle, both narrowed basally and apically, basal portion the narrowest, maximum width : length = 20 : 80. Fore tibia—width at the apex : length = 12 : 66. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 60 : 22 : 10 : 10 : 15. Apex of fourth segment almost reaching the middle portion of fifth one. Tibial spur very much shorter than second tarsal segment, and slightly longer than third segment. Mid-femur widest at the basal one-third, narrowed both basally and apically, apical portion much more slender and the narrowest, maximum width : length = 24 : 83. Mid-tibia—width at the apex : length = 11 : 90. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 70 : 25 : 11 : 10 : 18. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 14 : 17 : 25. Hind femur widest at the basal one-fourth, narrowed both basally and apically, becoming much more slender apically, apical portion the narrowest, maximum width : length = 28 : 120. Slightly curved inwardly. Hind tibia—width at the apex : length = 11 : 124. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 85 : 30 : 15 : 11 : 23. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment = 15 : 19 : 30. Claws of all legs each with a stout tooth at the middle. Fore wing with three cubital cells. Radial cell narrowed both apically and basally, becoming much more slender apically, receiving second transverse cubital nervure far before the middle. Cubital cells comparatively slenderly built. First cubital cell the longest, slightly longer than third one, receiving first recurrent nervure at its apical one-fifth. Second cubital cell the smallest, slightly widened toward the base, slightly longer than high. Third cubital cell much more widened apically, receiving second recurrent nervure at the basal one-third. Nervulus slightly postfurcal. First recurrent nervure distinctly longer than second one which is slightly curved outwardly. Discoidal nervure undulate. Petiole of abdomen long, as long as first tergite proper, seen from above petiole

with the sides slightly divergent posteriorly. First tergite, seen from above, twice as broad as long, with antero-lateral angles rounded. Second segment, seen from above, slightly longer than wide, slightly shorter than thrice the length of first tergite, about as wide as high. Second segment, seen in profile, with a dorsal surface almost straight and gently curved both basally and apically, with a ventral surface very much swollen and its basal half rounded, fourth to sixth segments compressed laterally.

Head and thorax minutely, densely and microscopically punctured. Clypeus with very sparse and small punctures. Front with irregular, comparatively larger punctures. Occiput and upper larger portion of temples impunctate. Vertex with several small punctures. Outer side of mandibles with irregular small punctures. Sides of pronotum impunctate, dorsal area with very sparse and small punctures. Mesonotum almost impunctate with its anterior half (except the sides) only very coarsely punctured. Scutellum almost impunctate, with several comparatively large, coarse punctures at the sides and posterior margin. Postscutellum with several small punctures. Tegulae impunctate. Metapleura and the sides of propodeum almost impunctate, posterior portion of the latter with several small punctures. Propleura with coarse and sparse punctures. Mesopleura distinctly and somewhat densely punctured. Abdominal segments almost impunctate, only the apical margin of each segment with very minute and coarse punctures.

Hairs on dorsum of head and thorax long, erect, sparse and black. Hairs on anterior margin of clypeus and inner side of mandibles sparse and brownish, other hairs and pubescence greyish or whitish.

Brilliant metallic blue or violet. Mandibles black with the apex brownish. Antennae black. Tarsi of all legs somewhat blackish. Tibial spurs brown to brownish-black. Tegulae also brownish-black. Wings slightly clouded with brown, violaceously reflecting seen in certain aspect, paler portions are recognizable as shown in the figure. Nervures and stigmas brownish-black.

Measurements

Length : Head seen from above 3.0 mm. Thorax 9.5 mm. Abdomen 10.0 mm. Fore wing 12.5 mm. Hind wing 9.8 mm.

Width : Head 4.5 mm. Thorax 5.0 mm. First abdominal segment 3.0 mm. Second abdominal segment 4.0 mm.

♂. Head, seen from above, slightly narrower than thorax. Head, seen in front, longer than wide. Inner margins of eyes divergent below. Front moderately developed, slightly convex. Base of antennae distinctly tuberculate. Vertex normal, an area just posterior to posterior ocelli very slightly depressed, vertex with a median, longitudinal furrow. Distance between anterior and posterior ocelli distinctly longer than postocellar line, or slightly shorter than oculo-ocellar line. Minimum distance between eyes : distance between eyes at the anterior margin of front = 25 : 35. Eyes large, length : width = 45 : 26. Areas between antennal tubercles and eyes very distinctly longitudinally excavated and well separated from the upper portion of front. Front with a median longitudinal carina almost obsolete only leaving a small tubercle just above the insertions of antennae. Front with two very prominent carinae from antennal tubercles to anterior ocellus. They are diverging above, curved and reaching the postero-lateral portion of anterior ocellus. Clypeus almost twice as broad as long, with the margins slightly but distinctly depressed, triangularly produced, without teeth or notches. Clypeus with two areas which are separated by a median distinct carina, seen in profile with the carina very slightly curved. Mandibles long and stout, strikingly curved inwardly. Head with eyes, seen in profile, slightly longer than temples. Antennae long and slender. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 15 : 5 : 45 : 31 : 28 : 25 : 20 : 19 : 16 : 15 : 13 : 12 : 13. First segment almost twice as long as broad. Second segment as long as wide; eighth to eleventh slightly curved; third slightly longer than seven-times the width of it; fourth about six-times as long as broad; fifth slightly longer than five-times as long as broad; sixth about five-times as long as broad; seventh to ninth about four-times as long as broad; tenth slightly shorter than four-times the width of it; eleventh much shorter than four-times the width of it; twelfth about four-times as long as broad; thirteenth slightly longer than four-times the width of it at the base. Anterior one-third of the dorsal surface of pronotum

slightly depressed and with a distinct median longitudinal impression. Posterior one-third of the same also with a distinct impression. Pronotum very distinctly and transversely striate at the middle. Mesonotum with two longitudinal furrows which are parallel to each other. Mesopleura with a longitudinal short keel and without a furrow. Scutellum slightly broader than long, more than twice as long as postscutellum, about two-fifths as long as propodeum, with a median distinct impression. Propodeum slightly wider than long. Sculpture and structure of propodeum almost similar to those of the female. Fore femur widest before the middle, narrowed both basally and apically, basal portion the narrowest, maximum width : length=16 : 64. Fore tibia—width at the apex : length=9 : 52. Relative length of the tarsal segments of fore leg—I : II : III : IV : V=45 : 17 : 10 : 9 : 12. Apex of fourth segment not reaching the middle portion of fifth one. Tibial spur very much shorter than second tarsal segment and slightly longer than third one. Mid-femur widest at the basal one-third, narrowed both basally and apically, apical portion much slender and the narrowest, maximum width : length=16 : 68. Mid-tibia—width at the apex : length=9 : 70. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V=54 : 18 : 8 : 8 : 15. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment=11 : 12 : 18. Hind femur widest at the basal one-fifth, narrowed both basally and apically, apical portion becoming more slender and the narrowest, maximum width : length=20 : 88, very slightly curved inwardly. Hind tibia—width at the apex : length=12 : 93. Relative length of the tarsal segments of hind leg—I : II : III : IV : V=65 : 24 : 12 : 10 : 17. Apex of fourth segment not reaching the middle portion of fifth one. Outer tibial spur : inner one : second tarsal segment=11 : 13 : 24. Claws of all legs as in the female. Venation almost the same as in the female. Petiole of abdomen comparatively short, about as long as frontal area of first tergite proper. First tergite, seen from above, about twice as broad as long, gently and roundly narrowed anteriorly, dorso-frontal portion of the tergite with a median impression which is well recognizable seen in certain aspect. Second segment more than

twice as long as first tergite, as long as wide, narrowed both anteriorly and posteriorly, much longer than high seen in profile. Other structures are almost the same as in the female.

Front densely, largely and striato-punctate. Vertex with sparse small punctures. Occiput almost impunctate. Temples below with dense comparatively large punctures. Areas between antennal tubercles and eyes impunctate. Clypeus with some small punctures. Propleura with comparatively densely and moderately small punctures. Sides of pronotum almost impunctate. Neck of pronotum strongly, largely and densely punctured. Dorsal area of propodeum with some punctures. Mesonotum irregularly, very sparsely punctured. Postscutellum with dense punctures at the middle. Mesopleura with comparatively large dense punctures, the diameter of each puncture almost shorter than the distance between the two punctures. Punctures on abdominal tergites as large as those on thorax and irregularly, somewhat sparsely scattered. Punctures on second abdominal sternite becoming larger posteriorly and the largest at the posterior margin.

Measurements

Length : Head seen from above 2.9 mm. Thorax 8.0 mm. Abdomen 5.9 mm. Fore wing 10.8 mm. Hind wing 8.0 mm.

Width : Head 3.5 mm. Thorax 4.2 mm. First abdominal tergite 3.0 mm. Second abdominal tergite 3.4 mm.

Holotype : 1 ♂, Kuraru, Takao-shû, Formosa, 1932, Yoshio Yano leg., in the collection of the Entomological Laboratory of the Kyûshû Imperial University, Fukuoka.

Allotype : 1 ♀, Kuraru, 24. viii. 1932, T. Esaki leg.

Habitat : Formosa.

I am not aware of the nearest relatives of this new species.

Ampulex micado Cameron

Ampulex micado Cameron, Tijdschr. v. Entom., vol. 48, p. 61, ♀, 1905.

" Length 24 mm. ♀.

" Japan.

" Very similar—almost identical—in colouration with *A. javana* here described, having also the same alar neuration, but is a larger insect, and may be known by the narrowed base of abdominal

petiole being smaller; the metanotum is more strongly and regularly striated all over, the space between keels 2 and 3, instead of being smooth, is closely striated all over. (p. 62) Front and vertex sparsely, but strongly punctured, the former more strongly and closely than the latter; there is a short longitudinal furrow in the centre of the vertex. Depressed base of the pronotum coarsely, closely irregularly reticulated; the raised apical part wider than long, sparsely, weakly punctured. Metanotum closely, strongly transversely striated; keel 1 irregular, indistinct, broken in the middle; 2 and 3 widely separated, united at the apex; the space between closely, but not finely transversely striated; 3 and 4 are united at the base, 5 is distinct and hardly converges towards the apex; the apex of the segment is transverse, with the sides bluntly rounded. Pleurae distinctly, but not closely punctured, the base of the metapleurae more weakly and sparsely than the rest. The second abdominal segment is short, in length less than one half longer than the dilated part of the 1st; its sides are straight, not curved outwardly, below, its base is vertical, rounded, above not closely separated from the apex of the 1st by a furrow as in *latifrons*, *javana* as in Kohl's figure of *A. assimilis*, l. c., pl. XII, f. 38, not roundly dilated as in *latifrons*."

Genus *Trirhogma* Westwood, 1840

Trirhogma caerulea Westwood

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Trirhogma caerulea Sonan, Trans. Nat. Hist. Soc. Formosa, Taihoku, vol. 14, no. 74, p. 81, 1924.
Trirhogma caerulea Dover, China Jour. of Sci. & Arts, vol. 4, p. 234, 1926.
Trirhogma caerulea Yano, Icon. Ins. Jap., Tokyo, p. 287, fig. 557, ♀, 1932.

" ♂. Lebhaft blau gefärbt, metallisch glänzend, stellenweise mit grünlichem oder violettlichem Schimmer; Mandibeln mittem grauweisslich; die Fühlergeissel (abgesehen vom Basalglied), die Palpen und Tarsen sind matt schwarz, die Metatarsen jedoch aussen schwach metallisch schimmernd. Die Flügel gleichmässig schwach angeraucht, braungelblich schimmernd, mit schwarzem Geäder und Vorderrand. Der ganze Körper lang weiss abstehend behaart und zwar auf dem Untergesicht am dichtesten und besonders hier silbrig schimmernd; auch der Fühlerschaft so behaart, die Geissel aber mit äusserst feiner und kürzer Pubescenz, die erst unter einer starken Lupe deutlich erkennbar ist. Drei Cubitalzellen. Die dritte Cubitalquerader trifft in einer Entfernung von der Spitze der Radialzelle auf die Radialader, die ein wenig kleiner als die Länge der ersten oder zweiten Cubitalquerader ist. Die dritte Cubitalzelle erscheint auf der Radialader nur ganz wenig verschmälert. Die dritte Cubitalquerader schräg und gerade, die zweite schräg und leicht saumwärts konvex gebogen, die erste in umgekehrter Richtung schräg und noch schwächer und zwar wurzelwärts konvex gebogen. Die zweite Cubitalzelle ist hinten (auf der Cubitalader) etwa dreimal so breit auf der Radialader. Die erste rekurrente Ader mündet in die erste Cubitalzelle ein in einer Entfernung von der zweiten Cubitalzelle, die gleich der halben Breite der zweiten Cubitalzelle auf der Radialader ist, und sie erscheint nur nahe der Cubitalader leicht gebogen, sonst aber gerade. Die zweite rekurrente Ader mündet in die zweite Cubitalzelle ein in einer Entfernung von der zweiten Cubitalquerader, die ein klein wenig kürzer als die Breite dieser Zelle auf der Radialader ist. Nervulus interstitial. Übrigens variiert das Geäder etwas, so dass genannte Merkmale nicht auf allen Exemplaren genau passen. Collare ist nicht so lang wie im hinteren Drittel breit, hinten erhöht mit einer breiten und tiefen Mittellängseinsenkung, so dass zwei ziemlich deutlich abgesetzte, breit kegelförmige, leicht divergierende Höcker gebildet werden. Das Mittelsegment

erscheint oben mitten breiter als lang; die Seitenzähne höckerartig, in je zwei kleinen Warzen endend und daher fast zweispitzig erscheinend; die beiden mittleren Längsrippen sind unter sich weiter als von den benachbarten entfernt, bisweilen durch eine Querrippe unter sich verbunden und ihr Zwischenraum ist ziemlich glatt und glänzend. Scutellum erscheint als eine kräftige kegelförmige Erhöhung. Dorsulum glatt und glänzend, mit nur wenigen und seichten Punktgrübchen. Seiten des Prothorax mit kräftigen, parallelen, etwas schrägen Längsrippen. Die inneren Augenränder fast parallel, nach unten nur ganz schwach konvergierend. Clypeusvorderrand mitten gerade, seitwärts jederseits mit zwei kleinen Ausbuchtung, von denen diejenige am Augenrande die grösste ist und als ein deutlicher Höcker erscheint; sonst ist Clypeus nur ganz schwach gewölbt, fast flach, ohne Andeutung eines Mittellängskieles. Die Fühler entspringen von einem gemeinsamen kräftigen Stirnhöcker, der an der Spitze schüsselförmig ausgehöhlt ist, welche Aushöhlung oben und aussen von dieser Basis zeigt die Stirn eine glatte, stark glänzende Einsenkung. Sonst ist die Stirn kräftig und ziemlich dicht punktiert und etwas gerunzelt und ziemlich matt; das Ocellenfeld hinten tangierend verlauft eine seichte Querfurche und daher ist der Koph stark gewölbt, glatt, glänzend und fast unpunktiert. Die Geisselglieder 2, 3 und 4 sind an Länge kaum verschieden. Bauch metallglänzend und glatt, wenn auch nicht unpunktiert. Hinterleib mit nur drei Segmenten. Das letzte Tarsenglied der Hinterbeine ist am Ende des vorhergehenden eingefügt und dieses ist etwa 2/3 so lang wie das letzte Glied.

"Körperlänge 11, Flügellänge 9 mm.

"Die Art variiert beim ♂ in Grösse zwischen 13.5 und 9.5 mm Körperlänge und die Skulptur ist auch nicht ganz konstant; die beiden mittleren der Rippen des Mittelsegmentes können mitten durch eine Querrippe verbunden sein, ihr Zwischenraum ist nicht immer gleich breit und bisweilen, ebenso wie die benachbarten Zwischenräume, leicht gerunzelt.

"Auch die Grösse der ♀♀ ist ziemlich variabel. Ich habe es nicht fur überflüssig gehalten eine neue Beschreibung des ♂ dieser interessanten Art zu geben, da mir nun ein so reichhaltiges Material

davon vorliegt. Die Originalbeschreibung der Art ist nämlich höchst dürftig, die der Gattung aber ganz gut." (Strand, 1913)

♂. Ocelli almost equilateral. Ocello-ocular line about twice as long as postocellar line. Head with eyes, seen in front, much wider than temples. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 20 : 5 : 25 : 28 : 28 : 25 : 25 : 20 : 20 : 17 : 15 : 12 : 12. First segment about twice as long as broad at the middle. Second segment as long as wide; third to seventh five-times as long as or more than five-times as long as broad; the following four- to five-times as long as broad at the base. Apical segment distinctly undulate. Fore femur widest at the middle, slightly narrowed basally and much more narrowed apically, maximum width : length = 12 : 48. Fore tibia—width at the apex : length = 7 : 35. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 30 : 15 : 9 : 7 : 12. Tibial spur slightly longer than second tarsal segment. Mid-femur widest at the basal one-third, much narrowed apically, maximum width : length = 13 : 50. Mid-tibia—width at the apex : length = 9 : 45. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 34 : 15 : 10 : 7 : 13. Outer tibial spur : inner one : second tarsal segment = 11 : 16 : 15. Hind femur widest at the basal one-fourth, much swollen dorsally, much narrowed apically, maximum width : length = 17 : 65. Hind tibia—width at the apex : length = 10 : 66. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 43 : 20 : 10 : 8 : 14. Outer tibial spur : inner one : second tarsal segment = 14 : 25 : 20. Posterior margin of first and second abdominal segments constricted. First tergite about twice as broad as long. Second tergite distinctly wider than long. Posterior margin of third tergite rounded, tongue-shaped. Second sternite with transverse furrows at the base (on the sides).

Measurements

Length : Head seen from above 2.0 mm. Thorax 6.0 mm. Abdomen 6.4 mm. Fore wing 10.8 mm. Hind wing 8.0 mm.

Width : Head 3.6 mm. Thorax 3.6 mm. First abdominal tergite at the middle 2.7 mm. Second abdominal tergite at the middle 3.6 mm.

♀. Head seen from above, slightly narrower than thorax. Head, seen in front, slightly wider than long. Inner margins of eyes almost parallel below, and very slightly convergent above. Front more convex than in the male. Ocello-ocular line very slightly but distinctly longer than postocellar line. Lamella of front wider than long, widest at the middle, with the sides roundly curved and antero-lateral angles rounded. Temples not so developed as in the male. Head with temples, seen in profile, very much narrowed towards the base of mandibles. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII =22 : 5 : 38 : 33 : 32 : 30 : 28 : 25 : 23 : 20 : 18 : 18. First segment very much swollen at the middle, slightly less than twice as long as broad at the middle, basal portion the narrowest; second distinctly wider than long; third about five-times as long as broad; fourth and fifth less than five-times as long as wide; sixth about five-times as long as wide; seventh slightly less than five-times as long as wide; eighth about five-times as long as wide; ninth more than four-times as long as wide; eleventh and twelfth slightly less than five-times as long as wide. Fore femur widest at the basal one-third, much narrowed apically, maximum width : length=17 : 65. Fore tibia—width at the apex : length=10 : 50. Relative length of the tarsal segments of fore leg—I : II : III : IV : V=40 : 18 : 12 : 9 : 15. Tibial spur about as long as second tarsal segment. Mid-femur widest at the basal one-fourth, very much narrowed apically, maximum width : length=20 : 65. Mid tibia—width at the apex : length= 12 : 60. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V=40 : 21 : 15 : 10 : 20. Outer tibial spur : inner one : second tarsal segment=15 : 18 : 21. Hind femur widest at the basal one-sixth, much narrowed apically, maximum width : length=90 : 25. Hind tibia—width at the apex : length=13 : 95. Relative length of the tarsal segments of hind leg—I : II : III : IV : V=60 : 30 : 20 : 11 : 22. Outer tibial spur : inner one : second tarsal segment=17 : 25 : 30. Claws of all legs each with a tooth before the middle.

Punctures slightly weak more than in the male. Mesonotum and scutellum bipunctate.

Measurements

No. 1 Length: Head seen from above 2.3 mm. Thorax 7.8 mm. Abdomen 9.0 mm. Fore wing 12.5 mm. Hind wing 9.5 mm.

Width: Head 3.6 mm. Thorax 4.4 mm. First abdominal tergite at the middle 3.5 mm. Second abdominal tergite at the middle 4.3 mm.

No. 2 Length: Head seen from above 2.0 mm. Thorax 5.8 mm. Abdomen 6.5 mm. Fore wing 9.0 mm. Hind wing 7.5 mm.

Width: Head 3.0 mm. Thorax 3.4 mm. First abdominal tergite at the middle 2.8 mm. Second abdominal tergite at the middle 3.2 mm.

Specimens examined: 1 ♂, Taito, Formosa, 25. ii—27. iii. 1919, S. Inamura, J. Sonan et M. Yoshino leg., 1 ♂, Urai, Formosa, 18. x. 1925, J. Sonan leg., both in the collection of the Entomological Museum of the Government Research Institute of Formosa, Taihoku, 1 ♀, Taihorin, Formosa, 1911, H. Sauter leg., in the collection of Dr. A. v. Schulthess, 1 ♀, Tainan, Formosa, S. Takano leg., in the collection of the Entomological Laboratory of the Kyûshû Imperial University, Fukuoka.

Habitat: India, Burma, Celebes, South China and Formosa.

The presence of a white marking one each on the base of mandibles and of a tubercle on the scutellum is not sufficient to separate *Trirhogma prismatica* Smith, 1858, from *Tr. caerulea* Westwood. For the present I regard all the Formosan specimens of *Trirhogma* before me as belonging to *caerulea* Westwood. Here I quote the notes of R. E. Turner, 1912, on *Tr. caerulea* Westwood. "It is remarkable that all males which I have seen from India are of the form *prismatica*, Sm., which has a large tubercle on the scutellum and the base of the mandibles white; Westwood's description does not make any reference to these points, though taken from a North-Indian specimen. All females from India seem to be without the tubercle. Males in the British Museum collection from Celebes answer well to Westwood's description, and Colonel Binghams account of *caerulea* ♂ (Faun. Brit. Ind., Hym. i. p. 262) seems

be taken from these rather than from Indian specimens. I have t seen the types, but if the type ♂ is similar to the Celebes rm, I do not consider that it can be the ♂ of the usual Indian rm, for which the name *prismatica*, Sm., would have to stand. male from Hongkong in the British Museum collection has the bercle on the scutellum less strongly developed than Indian ecimens. I consider that only one species of the genus occurs India."

Genus *Dolichurus* Latreille, 1809

Dolichurus abbreviatus Strand

olichurus abbreviatus Strand, Arch. f. Naturg., 1913, A, p. 154, ♂, 1913.

♂. Head, seen from above, about as broad as thorax. Head, en in profile, subcircular in outline. Inner margins of eyes very ightly incised, convergent below and above. Front well developed, oderately convex, with a lamella between the insertions of an- nnae. Surface of the lamella concave above and the sides almost arallel to each other. The width of the lamella about as wide as the istance between anterior ocellus and inner margin of eyes. Front ithout a median impression. Distance between anterior and posterior celli very much shorter than postocellar line. Postocellar line very lightly shorter than ocello-ocular line. Eyes large, length : width = 5 : 11. Head with temples, seen in profile, slightly narrower than yes. Clypeus convex, without a median carina, much broader than ng. Antennae slender and very long. Relative length of the egments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII : XIII = 15 : 3 : 12 : 13 : 13 : 12 : 11 : 11 : 10 : 10 : 9 : 9 : 10. Each ntennal flagellum slightly curved. First segment the stoutest, about our-times as long as broad at the middle. Second segment as road as long; third to sixth about thrice as long as broad; the ollowing segments very slender and more than thrice as long as road. Pronotum, seen from above, much broader than long, with he sides slightly narrowed anteriorly. Anterior area distinct, but without a transverse carina separating it from the horizontal area. Caudo-lateral tubercles distinct. Horizontal area with a median longitudinal faint impressed line at the posterior portion. Two deep,

distinct, longitudinal furrows on mesonotum parallel to each other. Scutellum much longer than wide, much shorter than mesonotum, the surface slightly convex. Postscutellum very short. Propodeum slightly longer than wide, with three areas: large horizontal area, small obliquely striated area, and a caudal, vertical area. Horizontal area about as long as caudal area. Posterior margin of horizontal area without a lamella. Horizontal area: median carina obsolete, second carina distinct and convergent posteriorly, but obsolete at the posterior portion, third carinae entire and their extremities reach the sides of a transverse carina which separates the oblique area from the caudal area. Fore femur slender, widest at the middle, slightly narrowed both basally and apically, apical portion the narrowest, maximum width : length = 6 : 26. Fore tibia—width at the apex : length = 4 : 18. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 18 : 7 : 6 : 4 : 6. Tibial spurs about as long as second tarsal segment. Mid-femur widest at the middle, much narrowed apically, maximum width : length = 7 : 28. Mid-tibia—width at the apex : length = 4 : 25. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 20 : 8 : 6 : 4 : 6. Outer tibial spur : inner one : second tarsal segment = 7 : 10 : 8. Hind femur widest before the middle, dorsal portion much swollen, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 10 : 40. Hind tibia—width at the apex : length = 5 : 37. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 26 : 10 : 7 : 4.5 : 6.5. Outer tibial spur : inner one : second tarsal segment = 7 : 11 : 10. Fore wing with radial cell long. Radial cell widest at the basal one-fourth, narrowed both basally and apically, apical portion becoming narrower, receiving second transverse cubital nervure at the basal one-fourth and third transverse cubital nervure at the middle. First cubital cell the largest, second cubital cell slightly larger than the third. First transverse cubital nervure curved inwardly and somewhat angulate. Second and third transverse cubital nervure almost straight and parallel to each other. Third cubital cell higher than long, receiving second recurrent nervure at the basal one-third. Second cubital cell receiving first recurrent nervure at the middle. First and second recurrent nervure almost

straight, the former much longer than the latter. Discoidal nervure very slightly curved. Nervulus antefurcal. First and second abdominal tergites each constricted at the posterior margin. First tergite about twice as broad as long, roundly narrowed basally, with an anterior slope slightly longer than posterior one. Second tergite as long as first tergite or third tergite, twice as broad as long, wider than high. Medio-basal portion of second sternite produced and separating the basal, vertical portion from the horizontal, larger portion. Third tergite about twice as broad as long, the sides narrowed posteriorly with the posterior margin largely rounded.

Punctures uniformly small, very dense and deep. Punctures on occiput almost absent, on temples very sparse and minute. Head somewhat closely reticulate. Surface of lamella impunctate.

Black and shining. Tegulae, tibiae and tarsi brownish-black. Claws black. Wings slightly clouded, much darker apically, violaceously reflecting seen in certain aspect. Stigmas and nervures brownish-black.

Pubescence dense and greyish.

Measurements

Length : Head seen from above 1.1 mm. Thorax 3.5 mm. Abdomen 2.6 mm. Fore wing 6.0 mm. Hind wing 4.4 mm.

Width : Head 2.0 mm. Second abdominal tergite at the middle 1.8 mm.

Specimens examined : 1 ♂, Sikikun, Formosa, xi. 1928, J. Sonan leg., in the collection of the Entomological Museum of the Government Research Institute of Formosa, Taihoku, 1 ♂, Kanzangoe-Pass (Taito-cho), Formosa, 11. viii. 1932, T. Esaki leg., in the collection of the Entomological Laboratory of the Kyûshû Imperial University, Fukuoka.

Habitat : Formosa.

Dolichurus leioceps Strand

Dolichurus leioceps Strand, Arch. f. Naturg., 1913, A, p. 156, ♀, 1913.

" Ein ♀ von Taihorinsho IX.

" Ähnelt sehr *D. abbreviatus* m. ♀, ist aber kleiner; Körperlänge bei gekrümmtem Abdomen 7.5 mm, die senkrecht nach unten gerichtete Abdominal-spitze ist etwa 1 mm lang, der Kopf ist noch

stärker glänzend und fast unpunktiert, was besonders an der Stirn auffallend ist, indem diese bei *D. abbreviatus* grob und dicht punktiert, sowie matt oder fast matt ist, der Stirnfortsatz bezw. seine Aushöhlung von vorn und oben gesehen erscheint etwa gleich lang und breit, während sie bei *abbreviatus* erheblich breiter als lang ist, das Ende dieses Fortsatzes ist hier halbkreisförmig gerundet, während es bei *abbreviatus* mitten quergeschnitten ist; ein Mittelkiel am Clypeus ist noch undeutlicher als bei *abbreviatus* und Clypeus zeigt eine seichte Quereinsenkung in der apicalen Hälfte; die Netzaugen sind grösser, die Stirnbreite erscheint aber ein wenig geringer als bei *abbreviatus*; Pronotum ist stark und gleichmässig der Länge nach gewölbt ohne scharf hervortretende Höcker und nur mit schwacher Andeutung einer Mittellängseinsenkung, hinten ist es stark glänzend, vorn dicht und fein quergestrichelt (feiner als bei *abbreviatus*) ohne eine kleine Mediangrube daselbst (eine solche ist bei *abbreviatus*); Mesonotum und Scutellum sind fast ganz unpunktiert, die erste rekurrente Ader mündet in die zweite Cubitalzelle zwar kurz, aber doch unverkennbar vor der Mitte; die Skulptur des Mediansegments ist feiner und dasselbe ist ziemlich stark glänzend, die schräge Querstrichelung an seinen Seiten ist sehr fein; die Fühler scheinen bloss absolut, sondern auch relativ kürzer zu sein." (Strand, 1913)

♀. Head, seen from above, distinctly wider than thorax. Head, seen in front, about subcircular in outline. Inner margins of eyes slightly emarginate and convergent below and above. Front well developed, moderately convex. Distance between anterior and posterior ocelli slightly shorter than postocellar line. Postocellar line slightly shorter than oculo-ocellar line. Vertex wide and normal. Front with a distinct lamella between the insertions of antennae. The surface of the lamella concave above and the sides convergent basally, width of lamella about as wide as the distance between anterior ocellus and inner margin of eyes. Front with a median, longitudinal impressed line. Head with temples, seen in profile, very narrow, about one-third the width of an eye. Eyes large, length : width = 28 : 15. Clypeus exceedingly wider than long, without a median carina, its anterior margin with the median one-third

produced anteriorly and the margin straightly truncate. Antennae slender and long. Relative length of the segments of antenna—I : II : III : IV : V : VI : VII : VIII : IX : X : XI : XII = 13 : 3 : 14 : 11 : 11 : 11 : 10 : 9 : 8 : 7 : 7 : 7. First segment the stoutest, about thrice as long as broad at the middle. Second segment about as long as broad. Third segment more than four-times as long as broad. Fourth to sixth more than thrice as long as broad; seventh and the following thrice as long as broad. Pronotum, seen from above, somewhat quadrate, with caudo-lateral tubercles faintly distinct with a median longitudinal impressed line, with a distinct anterior surface which is separated from the rest of the area by a sharp transverse carina (lateral portion of the carina tuberculate). Two longitudinal deep furrows on mesonotum distinctly divergent towards head. Propodeum with horizontal area about as long as caudal, oblique area. Apical margin of the horizontal area distinctly lamellate, which is only interrupted in the middle. Three, median, longitudinal carinae distinct, they are almost parallel to one another. Third and second carinae convergent posteriorly. Third and fourth carinae divergent posteriorly. Fourth and fifth carinae almost parallel to each other. Areas between the carinae with several striae. Fore femur widest at the basal one-third, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 8 : 26. Fore tibia—width at the apex : length = 5 : 20. Relative length of the tarsal segments of fore leg—I : II : III : IV : V = 17 : 7 : 5 : 4 : 5. Tibial spur about as long as second tarsal segment. Mid-femur widest before the middle, narrowed both basally and apically, apical portion more slender and the narrowest, maximum width : length = 9 : 26. Mid-tibia—width at the apex : length = 5 : 25. Relative length of the tarsal segments of mid-leg—I : II : III : IV : V = 20 : 9 : 7 : 5 : 6. Outer tibial spur : inner one : second tarsal segment = 6 : 8 : 9. Hind femur widest at the basal one-fourth, its dorsal portion very much swollen, narrowed both basally and apically, apical portion slender and the narrowest, maximum width : length = 11 : 36. Hind tibia—width at the apex : length = 7 : 36. Relative length of the tarsal segments of hind leg—I : II : III : IV : V = 26 : 13 : 9 : 6 : 7. Outer tibial spur : inner one : second tarsal segment = 7 : 10 : 13.

Claws of all legs each with a tooth at the middle. Radial cell almost equally narrowed both basally and apically, receiving second transverse cubital nervure before the middle and third transverse cubital nervure past the middle. Second cubital cell the largest, first cubital cell slightly smaller than the second. Third cubital cell the smallest. First transverse cubital nervure very much curved basally, second transverse cubital nervure almost straight and perpendicular to radial cell, third transverse cubital nervure strongly undulate. Second cubital cell receiving first recurrent nervure at the middle, third cubital cell receiving second recurrent nervure at the basal one-fourth. First and second recurrent nervures almost straight, the former much longer than the latter. Nervulus strongly antefurcal. Discoidal nervure gently curved. First abdominal segment large, about twice as broad as long, with the sides slightly narrowing basally. Anterior slope about as long as posterior one. Second tergite very slightly shorter than the first and about as long as the third, more than twice as wide as long. Third tergite about twice as broad as long. Second segment slightly wider than high. Second sternite with two areas, a narrow, basal, anterior area separated by a strong, transverse carina from the other horizontal area.

Clypeus impunctate. Head very much sparsely, minutely punctured. Front just above the lamella somewhat densely striato-punctate. Pro- and mesonotum almost impunctate. Sides of pronotum longitudinally striate at the middle. Mesopleura minutely granular. Metapleura impunctate. Sides of propodeum obliquely striate. Caudal area of propodeum somewhat largely striate. Abdomen impunctate. Second, third and fourth sternites with very sparse, minute punctures at the middle.

Black. Apex of mandibles brown. Wings violaceously reflecting seen in certain aspect, slightly clouded. Costa, subcosta and stigmas brownish-black, other nervures almost paler in coloration.

Head and thorax above with several, erect, long, black hairs. Pubescence greyish.

Measurements

Length : Head seen from above 1.0 mm. Thorax 3.4 mm. Abdomen 3.6 mm. Fore wing 4.8 mm. Hing wing 3.6 mm.

Width : Head 2.0 mm. Thorax 1.7 mm. First abdominal tergite at the apex 1.5 mm. Second abdominal tergite at the middle 1.6 mm.

Specimen examined : 1 ♀, 20. v. 1928, Rantaizan, Formosa, J. Sonan leg., in the collection of the Entomological Museum of the Government Research Institute of Formosa, Taihoku.

Habitat : Formosa.

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ILLUSTRATION

Plate XI

Ampulex amoena Stål, ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen in profile.
C. Head in dorsal aspect.
D. Dorsal portion of pronotum in antero-lateral aspect.
E. Fore wing.
F. Fore femur.
G. Mid-femur.
H. Hind femur.
I. Claw.
J. Propodeum in dorsal aspect (vertical area slantly hatche, showing only the main longitudinal carinae).
K. First and second abdominal segments seen in profile.
L. First and second tergites seen from above.

Plate XII

Ampulex difficilis Strand, ♀.

Fig. A. Body seen in profile.
B. Head in facial aspect.
C. Dorsal portion of pronotum in antero-lateral aspect.
D. Fore wing.
E. Fore femur.
F. Mid-femur.
G. Hind femur.
H. Three apical segments of fore tarsus.
I. Three apical segments of hind tarsus.
J. Claw.
K. Propodeum in dorsal aspect.
L. Outline of caudal area of propodeum.

Plate XIII

Ampulex dentata Matsumura et Uchida, ♀♂.

Fig. A. Head of the female in facial aspect.
B. Head and pronotum of the female seen in profile.
C. Head of the male in facial aspect.
D. Dorsal portion of pronotum of the female in antero-lateral aspect.
E. Fore wing of the female.
F. Fore femur of the female.
G. Mid-femur of the female.
H. Hind femur of the female.
I. Three apical segments of fore tarsus of the female.
J. Three apical segments of hind tarsus of the female.
K. Claw of the female.
L. Propodeum of female seen from above.
M. Outline of caudal area of the same.

N. Propodeum of the male seen from above.
O. Abdomen seen in profile.

Plate XIV

Ampulex seitzii Kohl, ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen in profile.
C. Head seen from above.
D. Dorsal portion of pronotum in antero-lateral aspect.
E. Fore wing.
F. Fore femur.
G. Mid-femur.
H. Hind femur.
I. Claw.
J. Propodeum seen from above.
K. Abdomen in dorsal aspect.
L. First and second abdominal segments seen in profile.

Plate XV

Ampulex satoi sp. nov., ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen in profile.
C. Head and pronotum in dorsal aspect.
D. Dorsal portion of pronotum in antero-lateral aspect.
E. Fore wing.
F. Fore femur.
G. Mid-femur.
H. Hind-femur.
I. Claw.
J. Propodeum seen from above.
K. First and second abdominal segments seen from above.
L. The same seen in profile.

Plate XVI

Ampulex kurarensis sp. nov., ♀ ♂.

Fig. A. Body of the female seen in profile.
B. Head of the female in facial aspect.
C. Head of the male seen in profile.
D. Head of the male in facial aspect.
E. Dorsal portion of pronotum of the female in antero-lateral aspect.
F. The same of the male.
G. Fore wing of the femlae.
H. Fore femur of the female.
I. Mid-femur of the female.
J. Hind femur of the female.
K. Three apical segments of fore tarsus of the female.
L. Three apical segments of hind tarsus of the male.
M. Claw of the female.
N. Outline of caudal area of propodeum of the female.
O. Propodeum of the female seen from above.

Plate XVII

Fig. A. Head and pronotum of the female *Ampulex takeuchii* sp. nov. seen from above.
B. Claw of the same.
C. Propodeum of the same seen from above.
D. First and second abdominal tergites of the same seen from above.
E. First and second tergites of the male of the same species.
F. Head and pronotum of female *Ampulex difficilis* Strand seen from above.
G. First and second abdominal segments of the same seen from above.
H. Head of female *Ampulex dentata* Matsumura et Uchida seen from above.
I. First and second abdominal tergites of the same seen from above.
J. Head of male *Ampulex kurarensis* sp. nov. seen from above.
K. Head of the female of the same species.
L. Abdomen of the female of the same seen from above.
M. First and second abdominal tergites of the male of the same seen from above.

Plate XVIII

Ampulex esakii sp. nov., ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen from above.
C. Head and pronotum seen in profile.
D. Fore wing.
E. Fore femur.
F. Mid-femur.
G. Hind femur.
H. Claw.
I. Propodeum seen from above.
J. First and second abdominal segments seen in profile.
K. The same seen from above.

Plate XIX

Ampulex sonani sp. nov., ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen from above.
C. Head seen from above.
D. Fore wing.
E. Fore femur.
F. Mid-femur.
G. Hind femur.
H. Claw.
I. Propodeum seen from above.
J. First and second abdominal segments seen from above.
K. The same seen in profile.

Plate XX

Trirhogma caelurea Westwood, ♀ ♂.

Fig. A. Head of the female in facial aspect.
B. Head of the same seen from above.
C. Head of the male in facial aspect.
D. Head and pronotum of the same seen in profile.

E. Dorsal portion of pronotum of the same in antero-lateral aspect.
F. Fore wing of the female.
G. Fore femur of the same.
H. Mid-femur of the same.
I. Hind femur of the same.
J. Three apical segments of hind tarsus of the same.
K. Claw of the same.
L. Fore femur of the male.
M. Mid-femur of the same.
N. Hind femur of the same.
O. Claw of the same.
P. Propodeum of the same.
Q. Abdomen of the same seen in profile.

Plate XXI

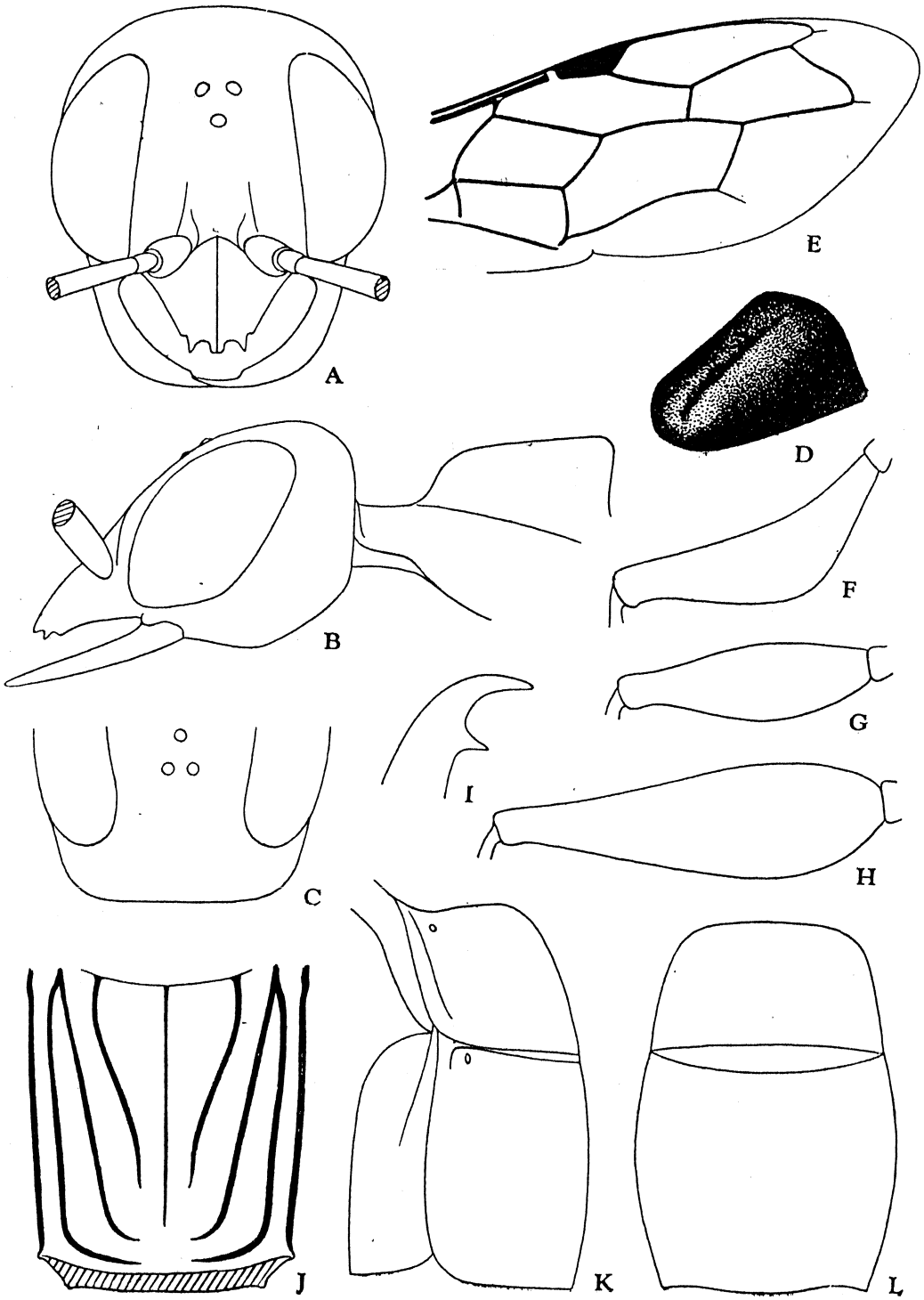
Dolichurus abbreviatus Strand, ♂.

Fig. A. Head in facial aspect.
B. Head and pronotum seen in profile.
C. Head seen from above.
D. Fore wing.
E. Fore femur.
F. Mid-femur.
G. Hind femur.
H. Three apical segments of hind tarsus.
I. Claw.
J. Propodeum seen from above.
K. Abdomen seen from above.

Plate XXII

Dolichurus leioceps Strand, ♀.

Fig. A. Head in facial aspect.
B. Head and pronotum seen from above.
C. Head and pronotum seen in profile.
D. Fore wing.
E. Fore femur.
F. Mid-femur.
G. Hind femur.
H. Claw.
I. Propodeum seen from above.
J. First and second abdominal segments seen in profile.
K. Three basal tergites seen from above.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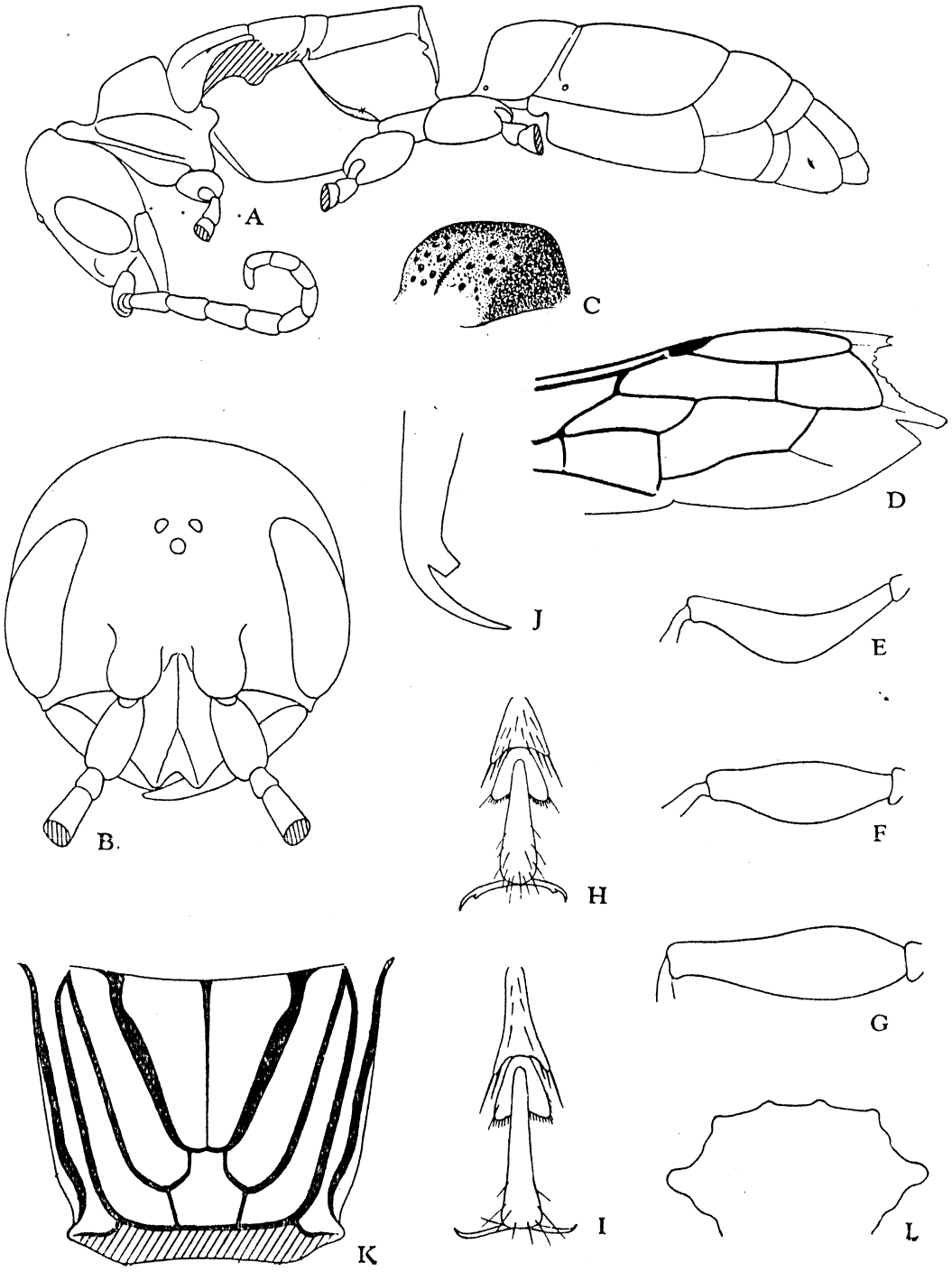
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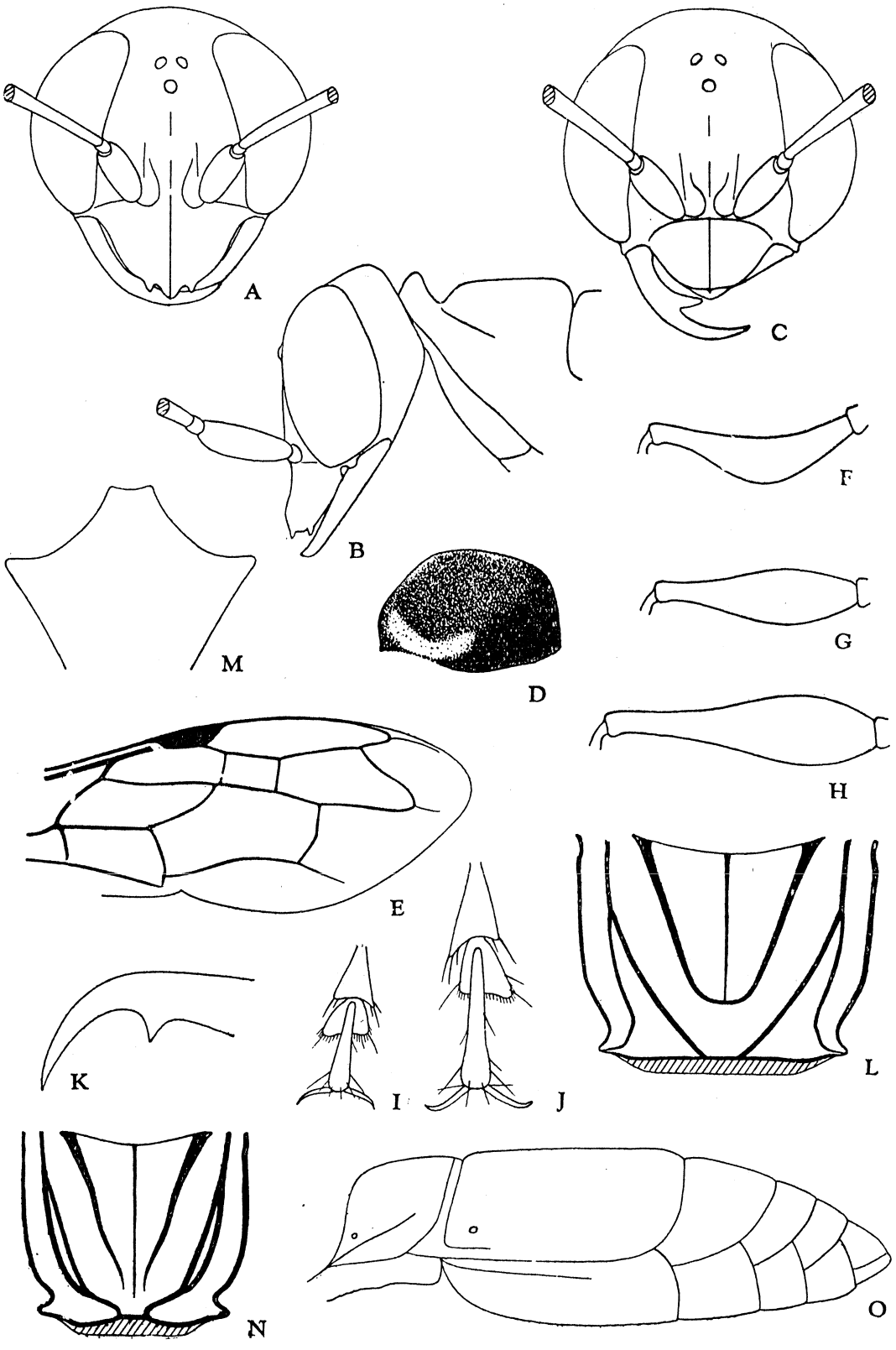
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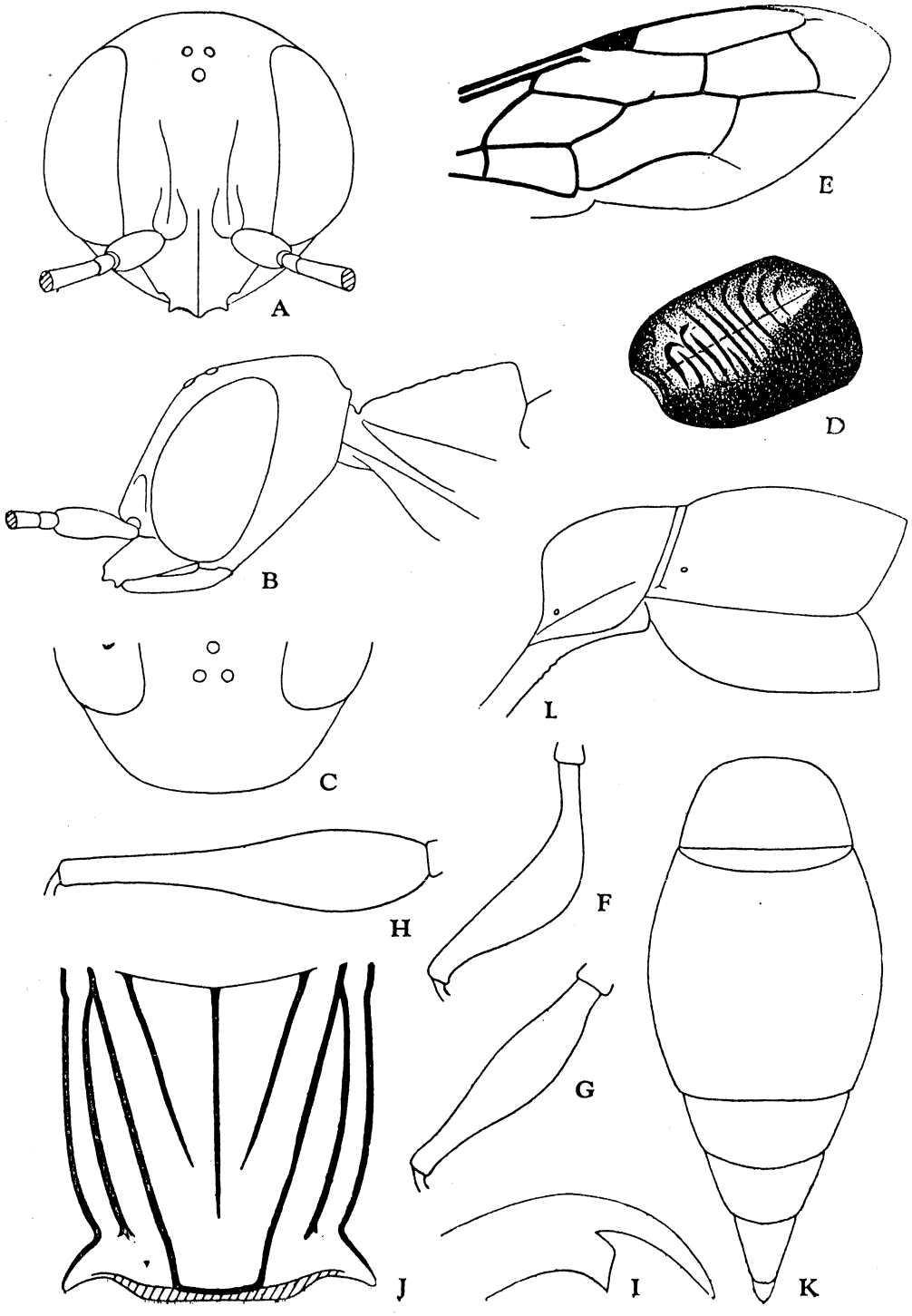
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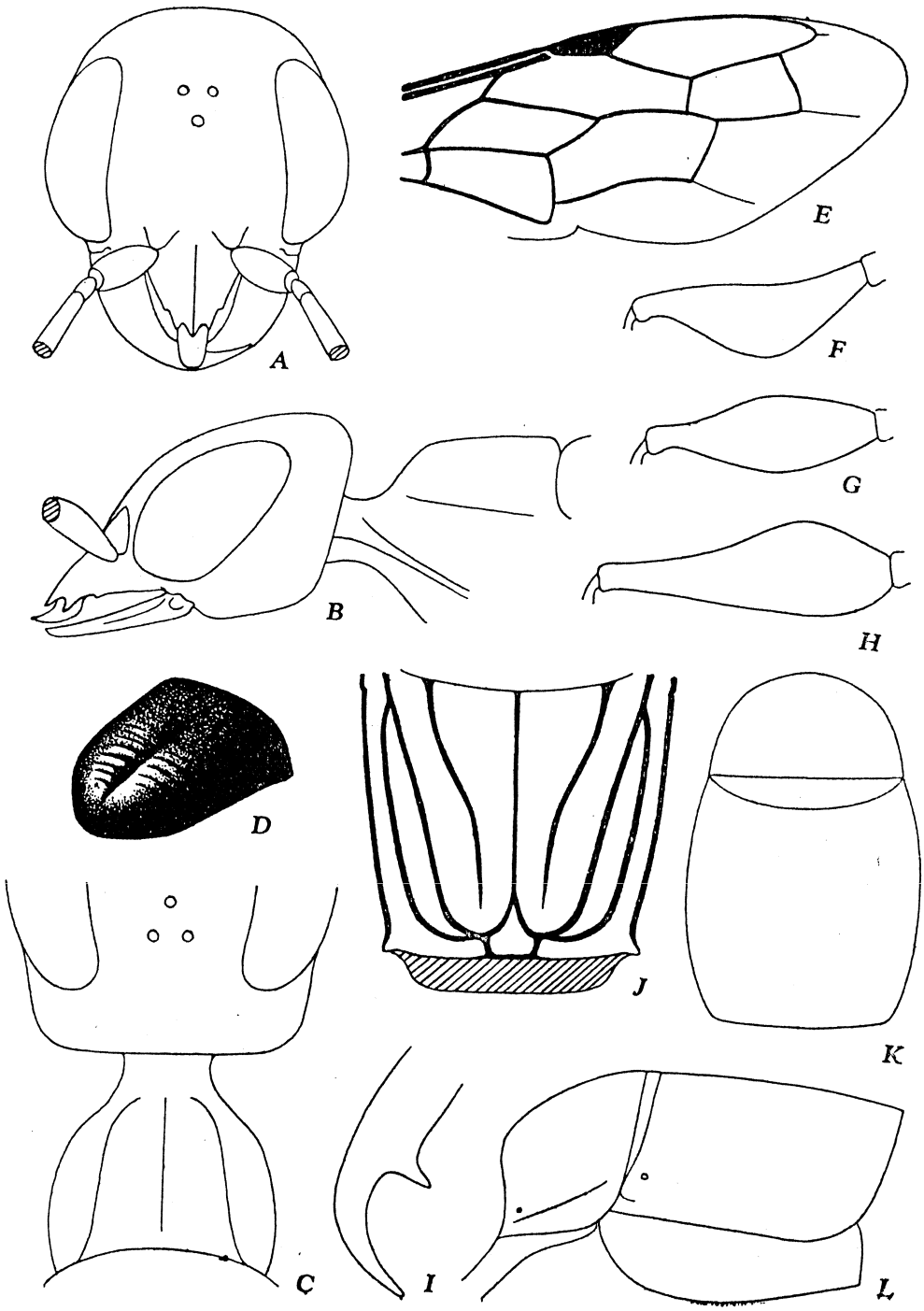
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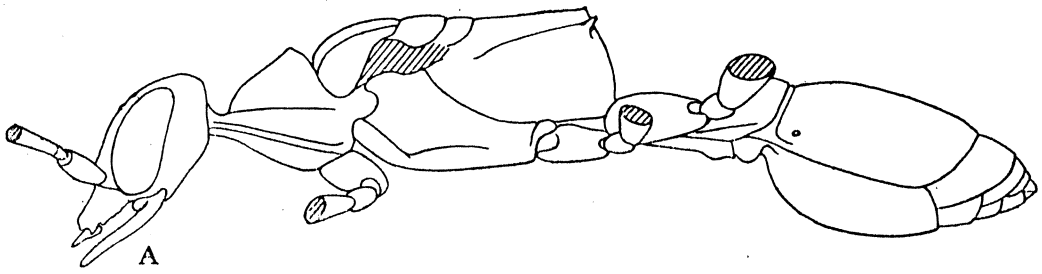

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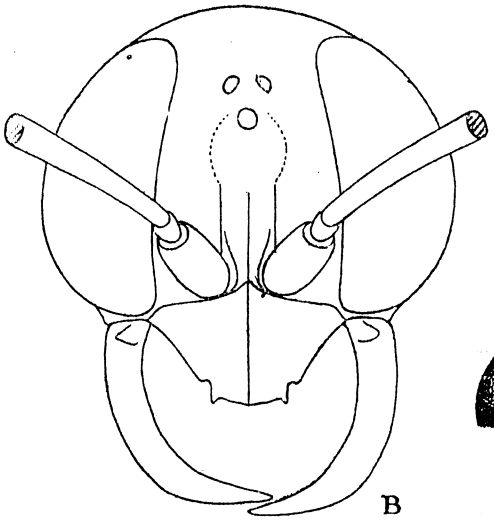

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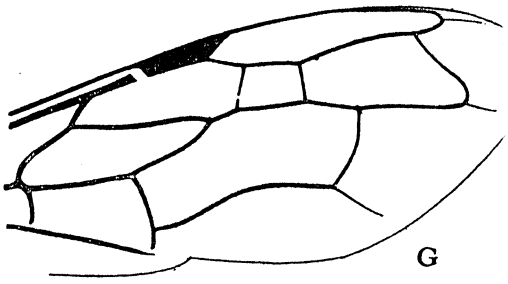

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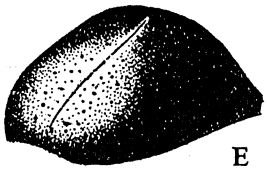

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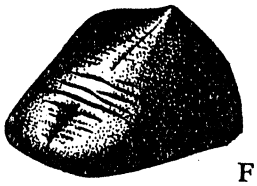

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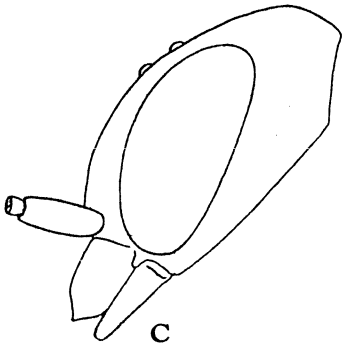

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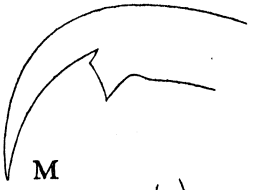

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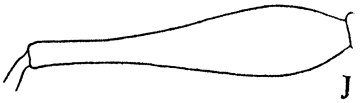

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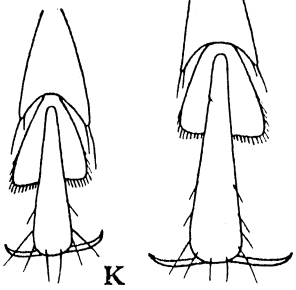

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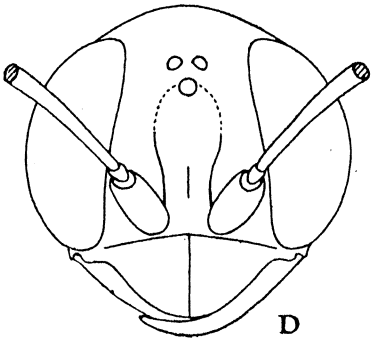

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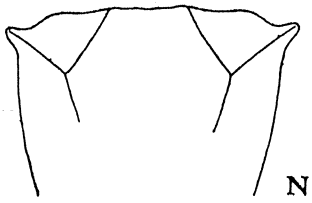

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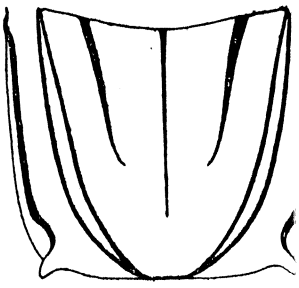

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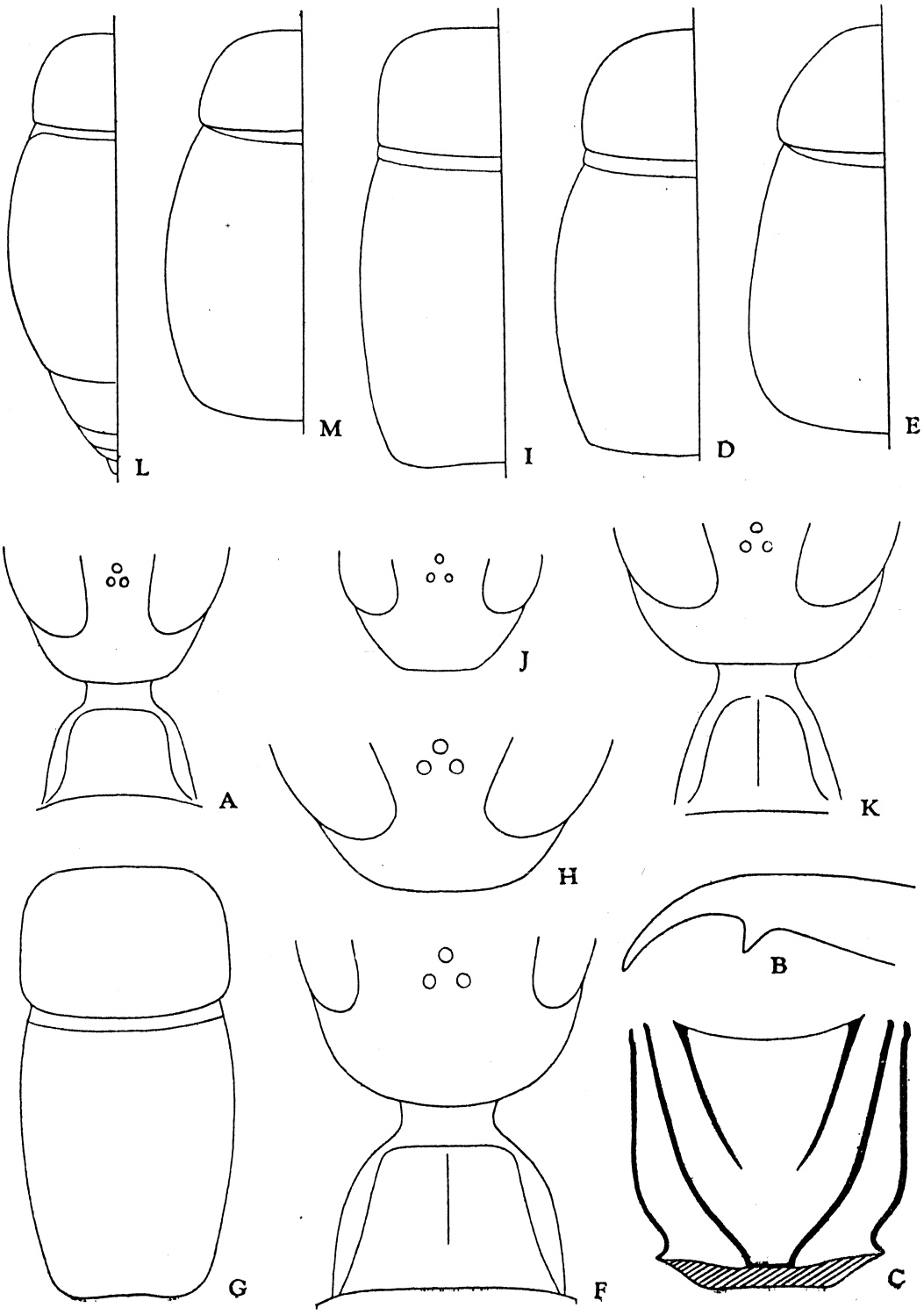
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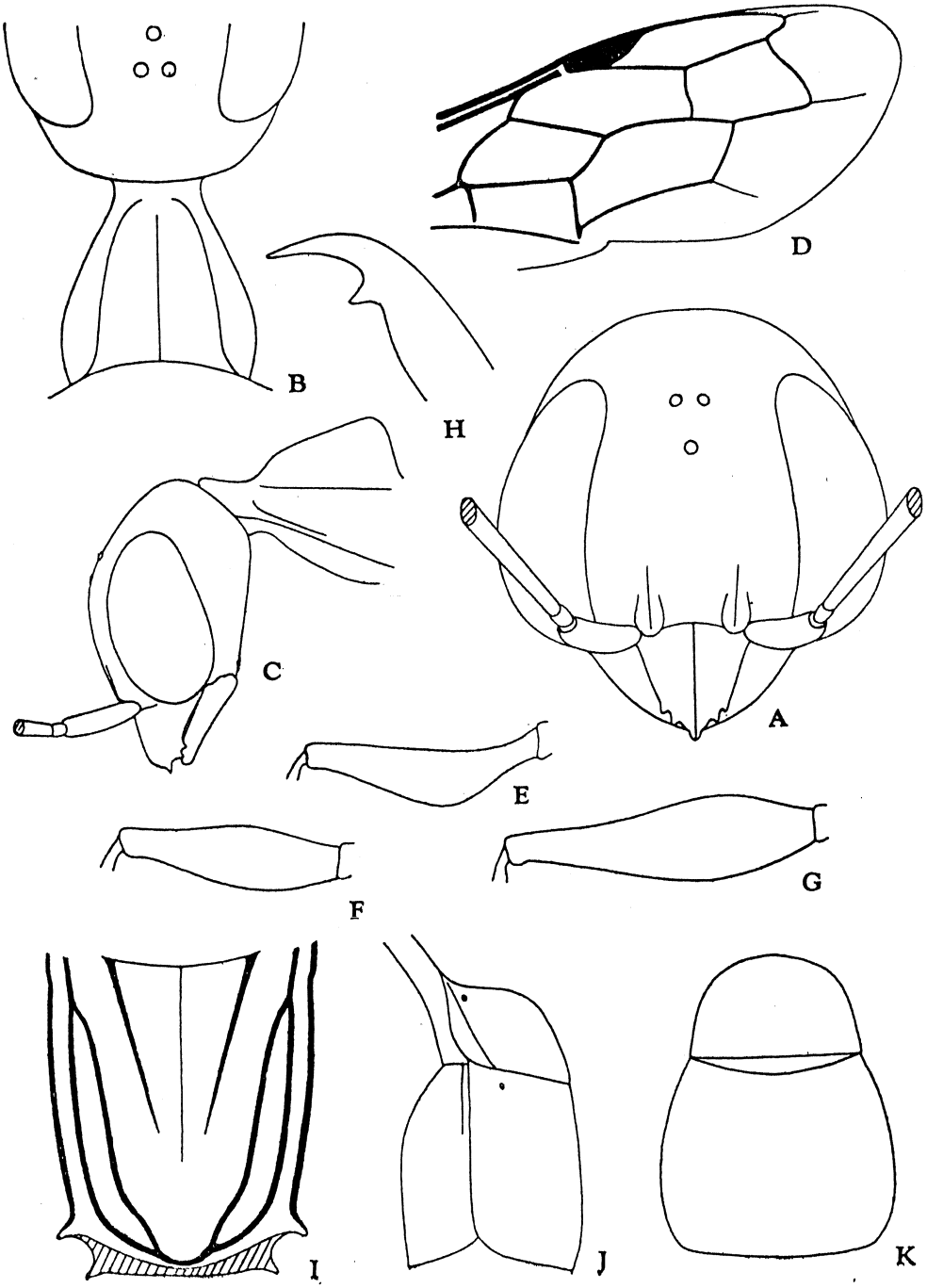
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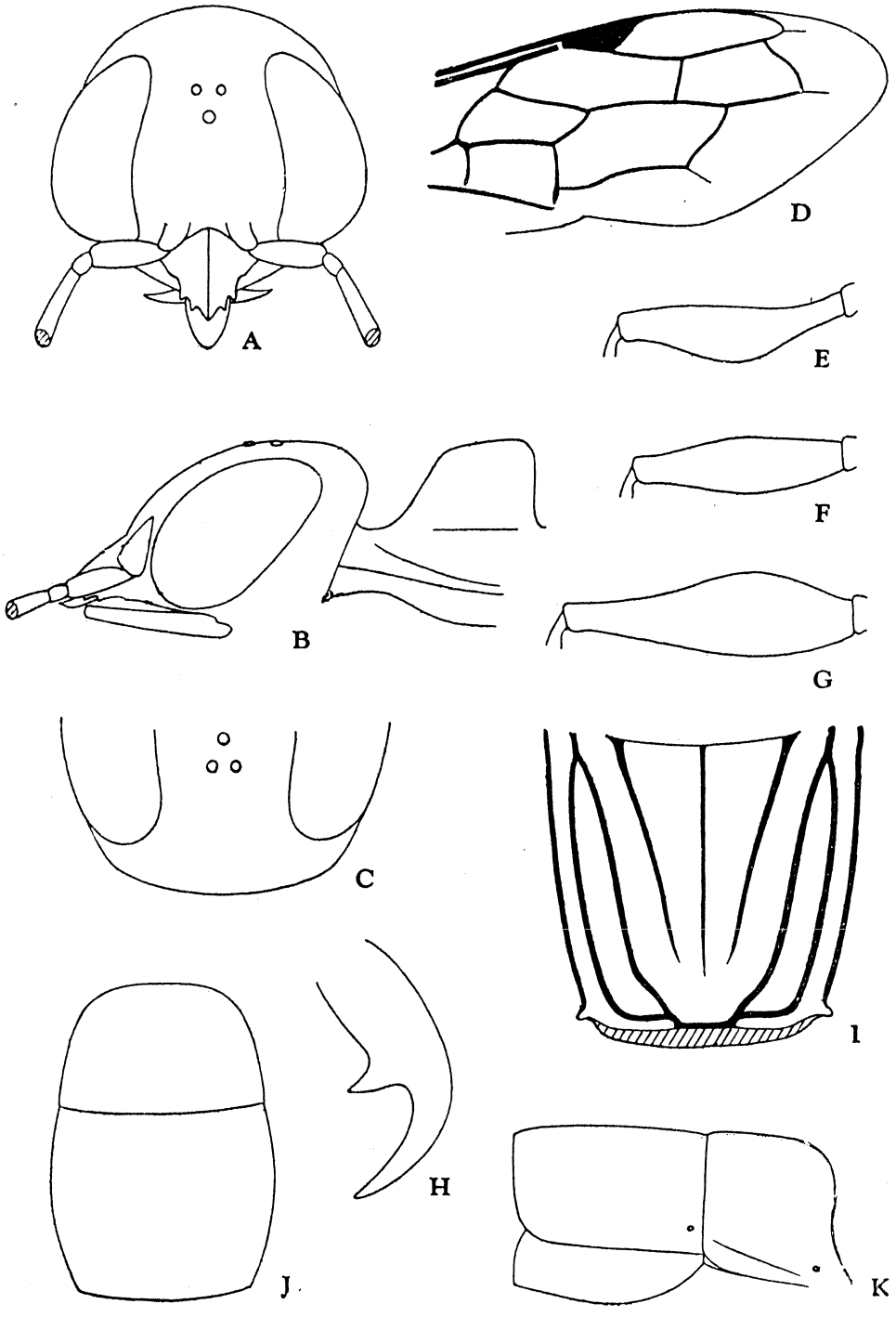
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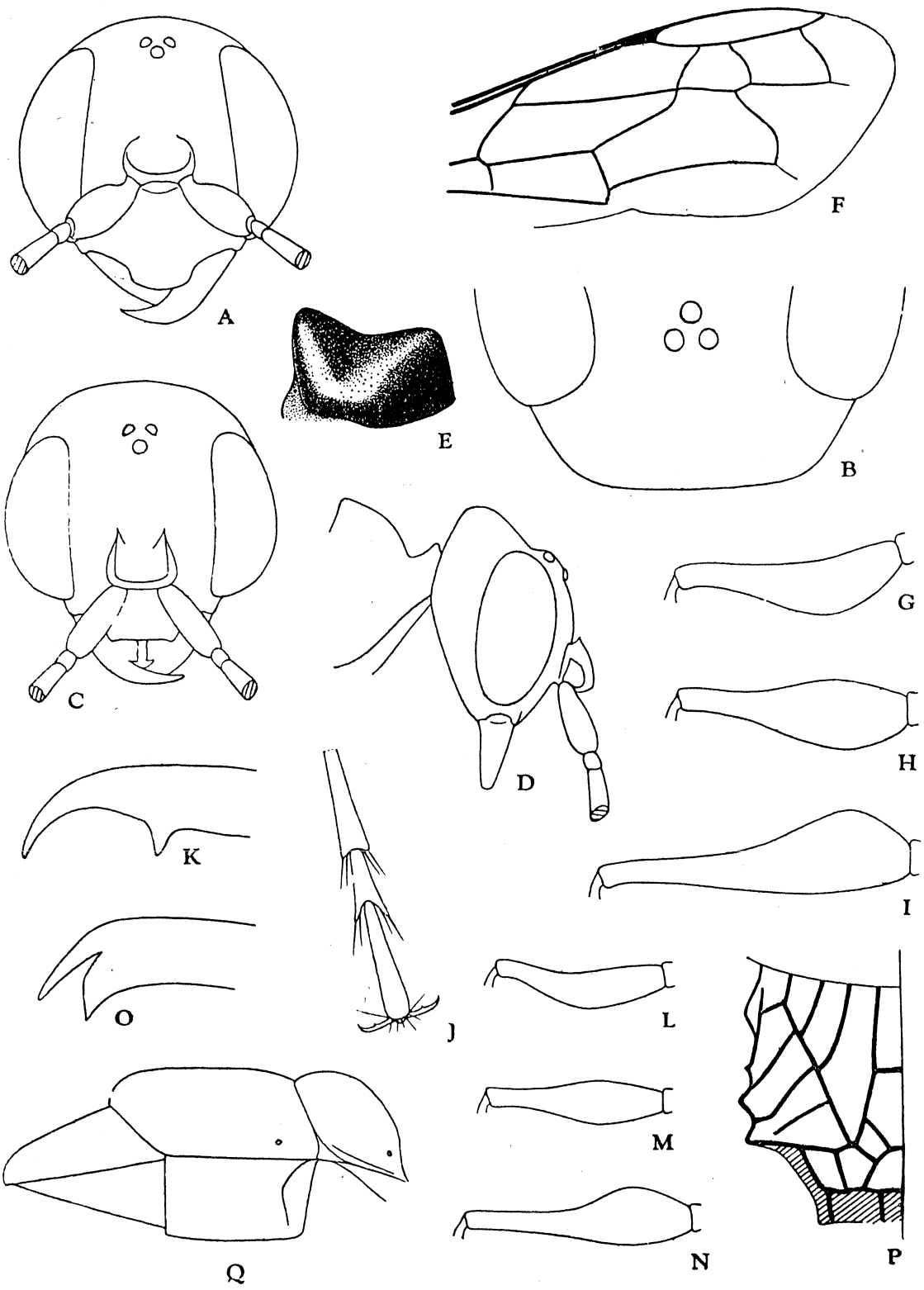
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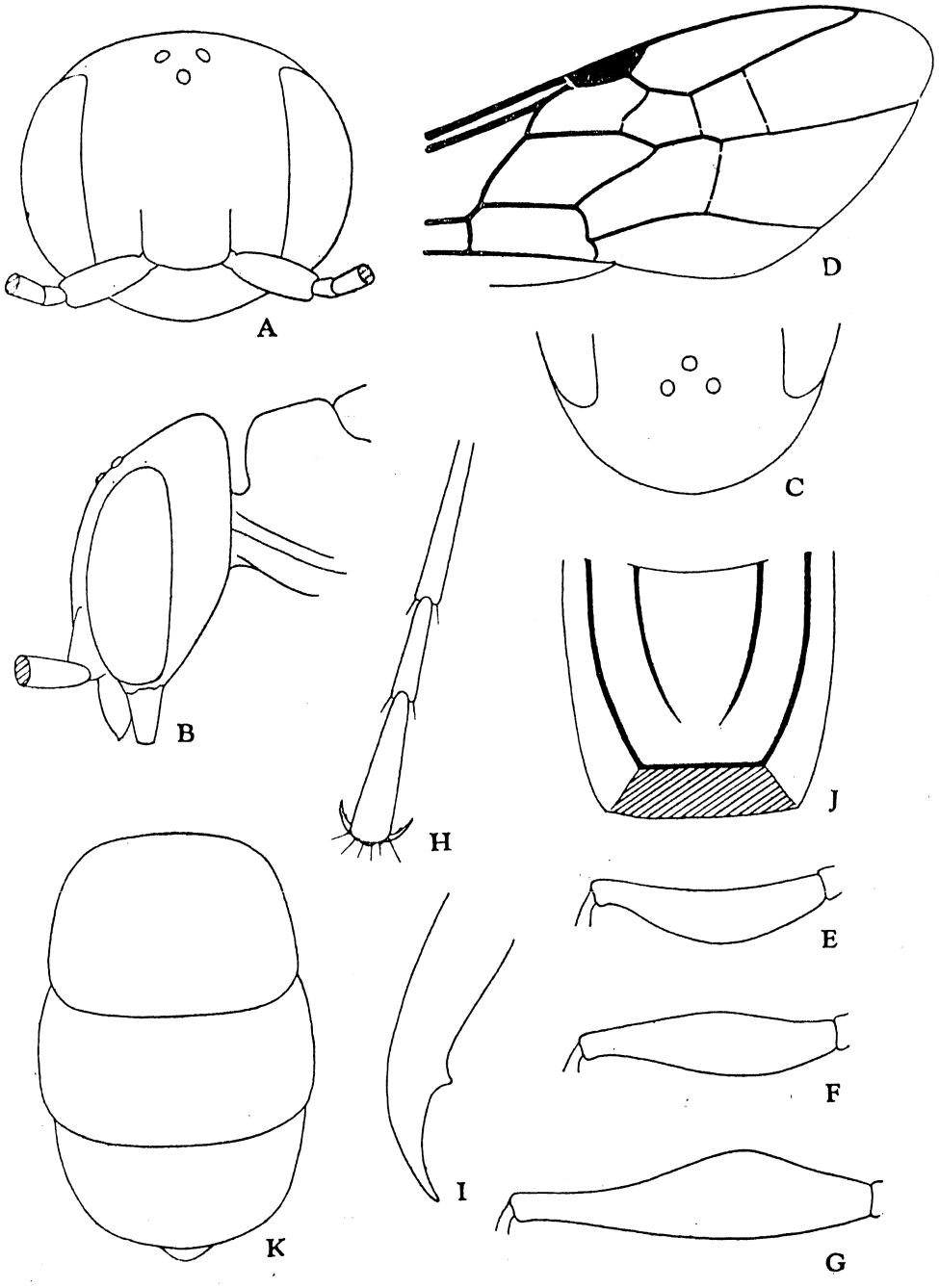
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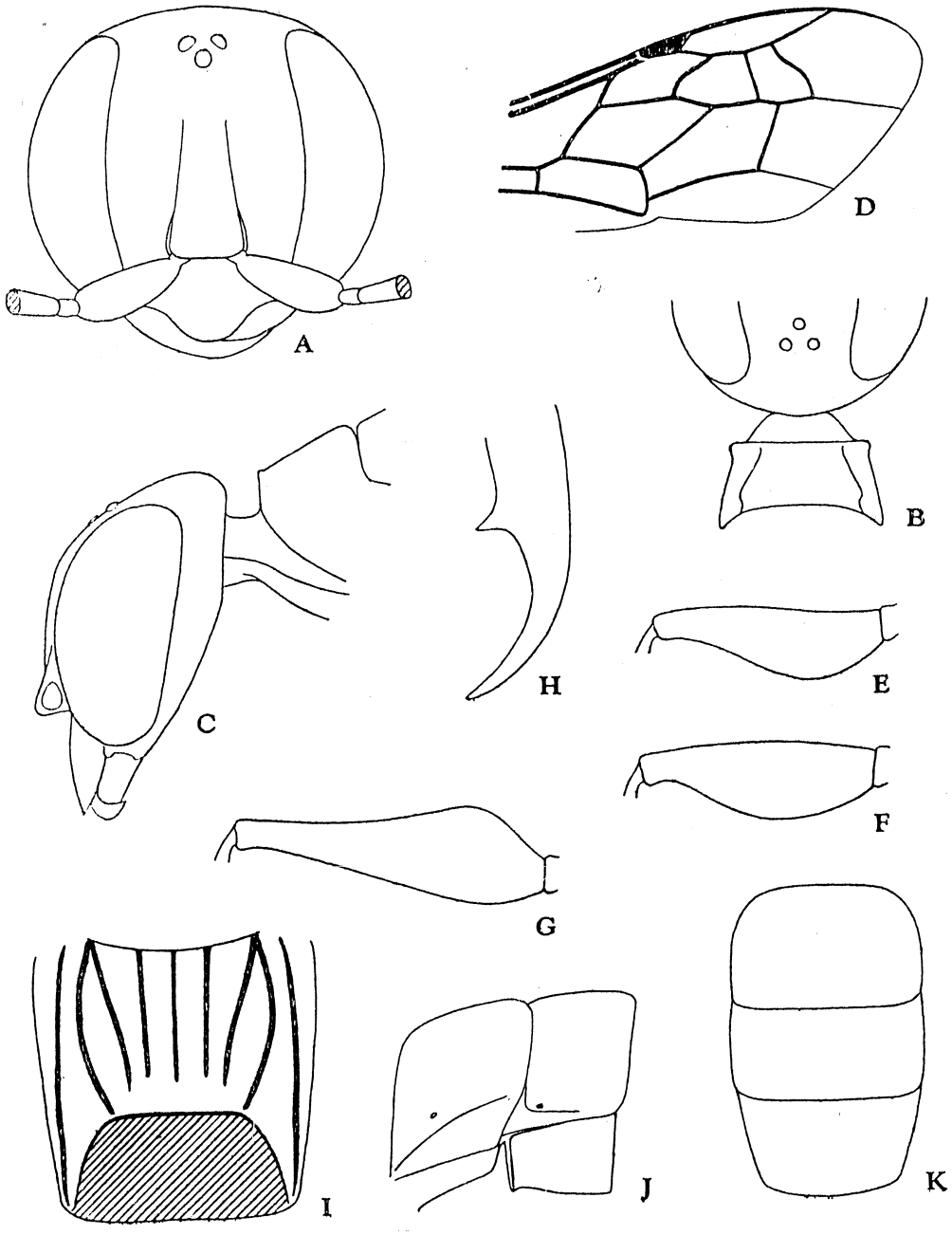
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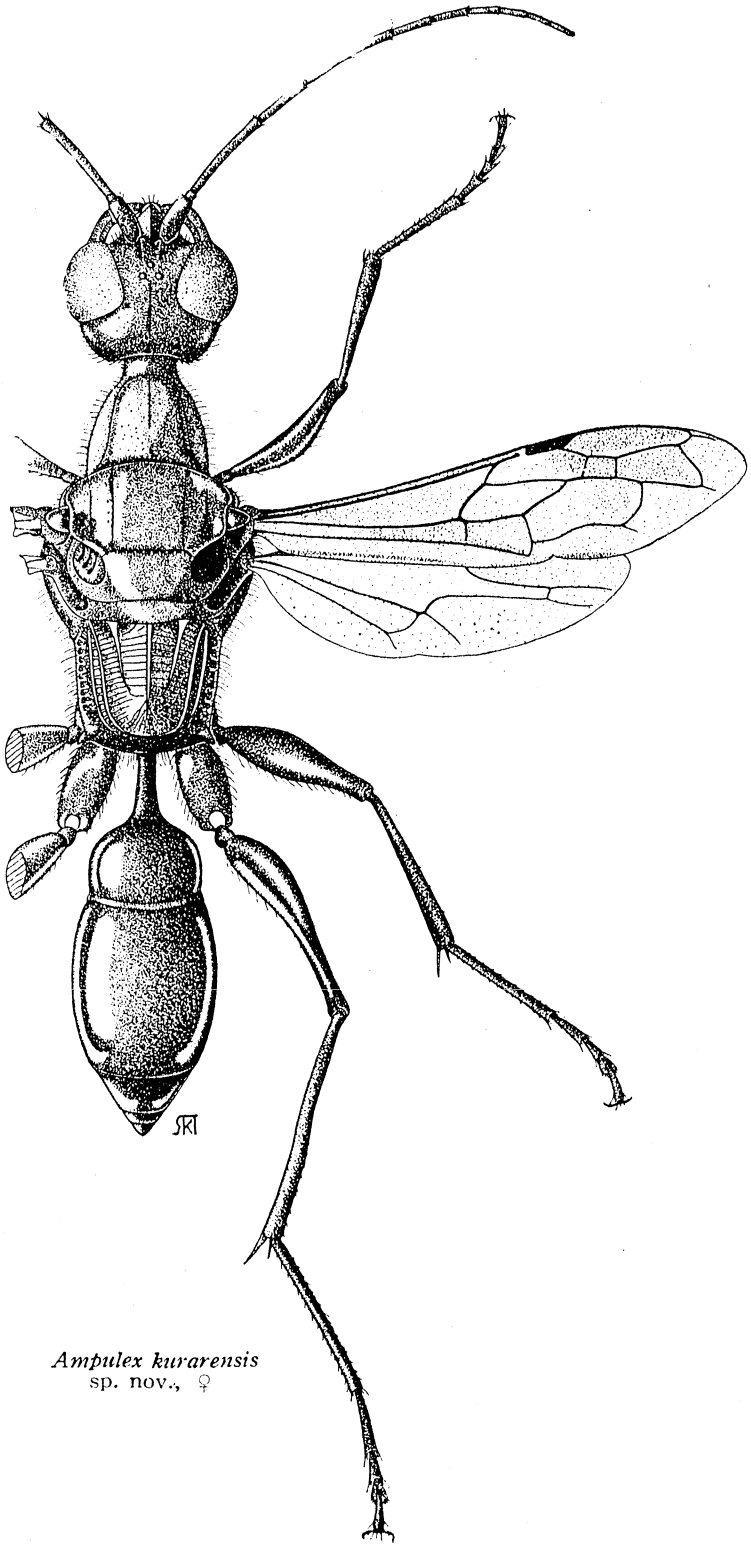

Ampulex kurarensis
sp. nov., ♀