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ON THE MALE OF XYLOCOPA OGASAWARENSIS MATSUMURA

(HYMENOPTERA, APIDAE)*

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Xylocopa ogasawarensis Matsumura is an interesting carpenter bee, being endemic to the Bonin Islands, of which the male has so far been unknown. Through the courtesy of Prof. Chihisa Watanabe, I have had the opportunity to examine a remarkable carpenter bee specimen taken from the Bonin Islands and preserved in the Entomological Institute, Hokkaido University, indubitably representing the male of *X. ogasawarensis* as described below. A redescription of the female is also given, being based upon the examination of type specimens in the same collection. This species belongs to the subgenus *Coptorthosoma* Gribodo, 1894 (= *Orbitella* Maa, 1938; = *Maiella* Michener, 1942; Cf. Maa, 1954, Vidensk. Medd. Dansk Naturh. Foren., 116 : 192) and exhibits a conspicuous sexual dimorphism which is characteristic of the subgenus.

Xylocopa (Coptorthosoma) ogasawarensis Matsumura

Xylocopa ogasawarensis Matsumura 1912: Thous. Ins. Jap. Suppl., 4 : 13, pl. xlii, fig. 19; 1930: Illust. Thous. Ins. Jap., 2 : 54, pl. v, fig. 19; 1932: 6000 Illust. Ins. Jap., 10, fig.; 1932: Illust. Comm. Ins. Jap., 4 : 5, 7, pl. ii, fig. 3; Esaki 1930: Bull. Biogeogr. Soc. Jap., 2 : 217.

Mesotrichia ogasawarensis Sonan 1934: Trans. Nat. Hist. Soc. Formosa, 24 : 232; Yasumatsu 1955: Bull. Biogeogr. Soc. Jap., 16/19 : 222.

Male.

Coloration: Black. Ill-outlined spot at mandibular base, short transverse band on upper margin of clypeus, a pair of spots obliquely placed behind posterior ocelli orange yellow. Antennae black with slightly brownish tint, reddish brown anteriorly, scape with yellowish streak anteriorly, flagella II-IV partly yellowish brown anteriorly. Tegulae, posterior margins of metasomal terga, metasomal sterna, coxae partly, tibiae and tarsi more or less reddish brown. Claws and dorsal surface of tibiae blackish. Wings subhyaline, pale brown, apically slightly infuscate, veins dark brown to brown.

Pilosity: In general appearance resembling *X. bryorum* (Fabricius) except for: 1) hairs on basal metasomal terga more scanty, 2) hair fringes on apical metasomal terga, tibial streak, hairs of tibiae and tarsi bright ferruginous instead of blackish.

Paraocular tufts dense and bright yellow; hairs relatively long and suberected at

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and below, while rather short and appressed above antennal sockets and on genae. Vertex, occiput, area between posterior ocelli, supraclypeus and clypeus, especially periphery of the latter, with long erected hairs, bright yellow mixed with blackish brown. Hairs on mesosoma and vertical declivity of metasomal tergum I bright yellow, erect and dense but not completely concealing the surface. Hairs on mesopleura gradually becoming less dense and reddish brown below. Hairs on metasomal terga dorsally bright yellow, sparser than in mesosomal disc, mixed with scattered blackish brown hairs on terga II-IV laterally. Lateral fringes bright yellow on terga I-III, mixed with longer reddish hairs, bright reddish to ferruginous on IV-VII together with dorsal hairs of VI and VII, making sharp contrast with yellowish general plumage. Hairs on metasomal sterna long, bright yellow, those of sternum VII reddish orange.

Sparse hairs on coxae, trochanters and femora reddish to orange brown, with ochraceous tint in long hairs on coxa III. Hairs on tibia I bright yellow, mixed with scattered blackish hairs; on tarsi I orange yellow to orange brown, longer posteriorly, with a bright yellow row above, shorter and bristle-like anteriorly. Hairs on tibia II bright yellow above, with a small ferruginous patch apically, ferruginous to reddish below; on tarsi ferruginous to reddish with a bright yellow row on basitarsus I above. Hairs on tibia III bright yellow antero-dorsally, orange postero-ventrally, with conspicuous dark red hair streak along line given by basitibial plate; on tarsi III yellow above, especially on the basal half; reddish to ferruginous postero-ventrally.

Structure: Eyes seen frontally swollen, without extending beyond genae. Relative proportion of head parts (Fig. 2): Maximum head width, 80.4; maximum width of eye (seen frontally), 19; length of eye, 48; head length (vertex to lower margin of clypeus), 59; interocular distance (upper minimum, maximum at middle, lower minimum) 39, 45, 40; diameters of anterior ocellus and posterior ocelli, 6, 5.5; distance between anterior and posterior ocellus, 2; between posterior ocelli, 6.6; ocello-ocular distance, 10.5; width of mandible at base, narrowest middle, widest subapical part, 10, 6, 10; length and width (at middle and apex) of scape, 29, 3.5, 4; length and width of pedicel, 3.5, 3.2; length and width (at narrowest subbasal part and at apex), 10, 2, 3; length and width of flagellum II, 4, 3.2; of III, 4, 3.2; of IV, 4.5, 3.5 (Fig. 3).

Maxillar galea triangular, outer surface smooth. Labrum (Figs. 10 & 11) transverse; anterior margin semicircularly concave medially; apical one-third distinctly depressed, coriaceous and dully polished; basal two-thirds tuberculate, projecting medially, coarsely and densely punctured; median longitudinal ridge sharply elevated, coriaceous and dully polished. Mandibles (Fig. 12) distinctly constricted medially, outer tooth dully pointed, inner tooth broad and dully angulate, outer and inner furrows distinct, the former minutely punctured. Clypeus slightly bending at upper one-third, with dense and coarse punctures of which diameters slightly longer than in labrum; interspaces dully polished, narrower than diameters of punctures; lateral extremities with scattered, small, ill-defined punctures mixed with some larger ones; upper margin straight; median longitudinal ridge short, coriaceous and dully polished, not reaching lower margin. Supraclypeus elevated medially, frontal ridge short and distinct, postocellar areas including paler markings coriaceous and

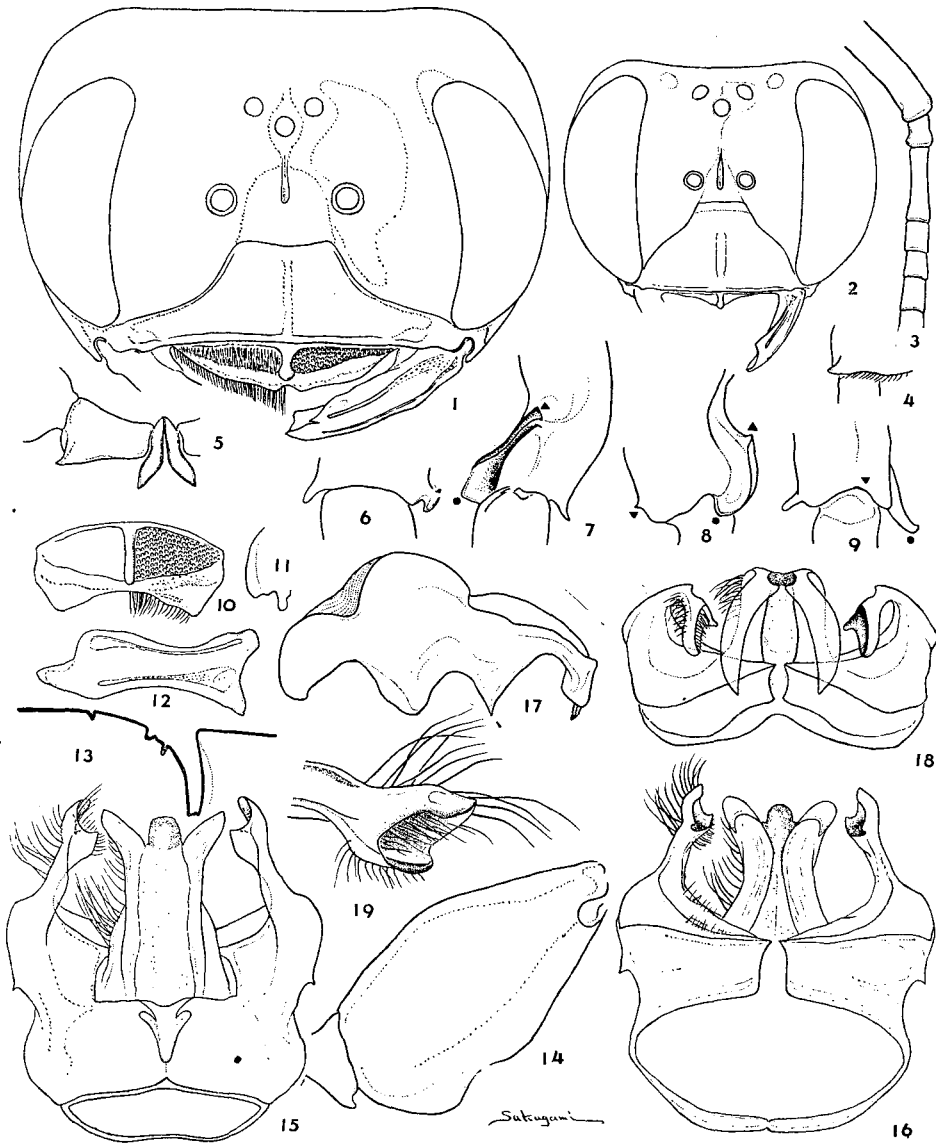


Fig. 1. (Female) and Figs. 2-19 (Male). *Xylocopa ogasawarensis* Matsumura.

Figs. 1 & 2. Head (frontal view). Fig. 3. Left antenna (frontal view). Figs. 4 & 6. Apices of left tibia I and femur I (dorsal view). Fig. 5. Left coxa and trochanter I (ventral view). Figs. 7-9. Apex of left tibia III (antero-ventral, postero-dorsal and antero-dorsal views). Figs. 10 & 11. Labrum (frontal and lateral views). Fig. 12. Left mandible (anterior view). Fig. 13. Meso-metasomal junction (lateral view). Fig. 14. Left femur III (ventral view). Figs. 15-18. Genitalia (dorsal, ventral, lateral and apical views). Fig. 19. Apex of right gonocoxite (post-ventral view).

dully polished, remaining parts of head with dense punctures, slightly smaller than those on clypeus. Malar space obsolete, interrupted at mandibular articulation.

Mesoscutal impunctate and polished disc elliptical, reaching posterior margin of mesoscutum, remaining parts of mesoscutum with even, dense and coarse punctures, of which diameters about equal to those of clypeal punctures. Mesoscutellum punctured as in mesoscutum, median impunctate area narrower than in mesoscutal disc. Metanotum about three-fifths of mesoscutellum in length, distinctly lower than, and obliquely attached to the latter (Fig. 13). Propodeum subvertical and slightly convex, rather scatteredly punctured except for distinct median longitudinal groove.

Coxa I prolonged caudally, forming conspicuous lanceolate process, slightly divergent, flattened with coarse punctures ventrally, tip blade-like, obliquely pointed (Fig. 5). Trochanter I produced posteriorly into bluntly triangular tooth (Fig. 5). Femur I finely coriaceous and dully polished below, without punctures, apical process distinct (Fig. 6). Tibia I rather slender, 9.5 : 46 in width to length, finely coriaceous and dully polished, apical denticule projecting laterally (Fig. 4). Coxae II and III unarmed. Trochanter II postero-apically only bluntly projecting. Femur II as in I, but with very scattered, ill-defined punctures below. Tibia II measuring 11 : 46 in width to length, postero-apical projection much more conspicuous than in II (Fig. 14). Femur III (Fig. 14) simple; finely coriaceous and dully polished; dorso-posteriorly with dense punctures bearing hairs; ventral (or anterior) surface with very scattered, small punctures, median longitudinal keel virtually obsolete, represented by mere rounded elevation even in apical extremity, basal tooth wanting; posterior margin approximately straight at apical half, subbasal incision shallow and large, inner-basal lobe simple. Tibia III gently curved, apical projection obliquely broad, apically round with inner denticule (Figs. 7-9).

Vein 1 r-m slightly convex outwards, just receiving M anally, 2 r-m dully angulate at slightly below mid-point of its length, both and R₂ without anal obliteration.

Metasoma flattened dorso-ventrally, maximum width at tergum II medially. Anterior declivity forming acute angle with horizontal dorsal part of tergum I; but the rim not too sharp. Dorsal part of tergum I and other terga with even and coarse punctures of which diameters distinctly shorter than interspaces. Epipygium semicircularly incised medially. Metasomal sterna scatteredly punctured. Median impunctate elevation subcarinate on sternum VI apically, sharply carinate on sternum VII. Genitalia as in Figs. 15-19.

Measurement: Total length 23 mm., width of head across eyes 5.5 mm., width of mesosoma across tegulae 9 mm., of metasoma 10 mm., length of fore-wing 18 mm.

Female.

Coloration: Black. Tegulae and marginal areas of metasomal sterna brownish, tarsal segments with brownish tint. Wings dark brown, decidedly darker than in male, with slight bluish iridescence. Veins blackish, partly dark brown.

Pilosity: Scanty hairs on face, vertex and coxae to femora partly, dense hairs on mesoscutal disc marginally, mesopleura and propodeum dark to pale chocolate brown,

with tints varying individually, often tawny ochraceous or, on some parts, especially on genae and femora, with ferruginous reflexion, nearly yellowish brown on propodeum laterally. Hairs on metasomal terga black and appressed dorsally, while denser at apical terga laterally. Hairs on median depression of vertical declivity of tergum I, lateral fringes of metasomal terga, and on femora to tarsi reddish to bright ferruginous.

Structure: Head decidedly transverse. Occiput and genae swollen (Fig. 1). Relative proportion of head parts: Maximum head width, 144; maximum width of eye seen frontally, 27; length of eye, 67; head length, 90; interocular distance (upper, middle, lower), 75, 85, 81; diameters of anterior ocellus and posterior ocelli, 6.5, 6.5; distance between anterior and posterior ocellus, 3.8; between posterior ocelli, 9; ocello-ocular distance, 25; length and apical width of scape, 45, 6; of pedicel, 5, 4; of flagellum I, 14, 4 (basal width 3.5), of II, 4.5, 4.5; of III and IV, 6, 5.

Labrum coarsely and densely punctured, basal margin and apical lamella coriaceous, median marginal notch distinct; median ridge tuberculate and strongly arcuate, basally smooth and highly polished. Clypeus flat, dully polished; with coarse and dense punctures of which diameters shorter in subapical depression, in general distinctly longer than interspaces; apical transverse ridge coriaceous and dully polished; lateral extremities highly polished with unevenly scattered large and small punctures; median longitudinal impunctate band rather obscure, often partly interrupted; lateral margins distinctly concave; upper margin gently concave. Supraclypeus below in the same level with clypeus, above roundly elevated; lateral contour of elevation rounded; coarsely punctured; frontal keel reaching middle of antennal sockets, apically slightly dilated and depressed medially. Face including paraocellar depressions densely and coarsely punctured. Vertex and ocellar stemmaticum coriaceous, with scattered, well-defined punctures of rather short diameters in a relatively regular arrangement. Genae below highly polished and scatteredly punctured. Inner and outer orbits slightly depressed, without forming deep grooves, coriaceous with scattered minute punctures, contrasting to neighbouring polished areas. Malar space highly polished, about as wide as flagellar segments.

Mesoscutum and mesoscutellum densely and coarsely punctured; interspaces longitudinally longer, transversely shorter than diameters of punctures. Mesoscutum with broadly oval, impunctate and polished disc reaching posterior margin, with small impunctate patch external to parapsidal lines. Mesoscutellum antero-medially with impunctate and polished area of invert-triangular form; posteriorly divided into horizontal and vertical areas by raised and sharply carinate ridge. Metanotum, seen dorsally, completely concealed below mesoscutum; coriaceous with scattered, ill-defined, minute punctures laterally. Propodeum vertical, with coarse and dense punctures except for narrow median impunctate band grooved medially. Apical process of tibia II dully pointed, with distinct lateral depression. Basitibial plate apically free and dully pointed. Vein R_{s2} occasionally slightly obliterated anally, 1 r-m, and 2 r-m complete.

Metasoma moderately flattened, maximum width at terga II and III. Anterior declivity of tergum I deeply concave and coarsely punctured medially; upper margin distinctly angulate. Horizontal area of tergum I dully polished; with very scattered

small punctures, slightly denser posteriorly. Punctures gradually becoming larger and denser in succeeding terga. Epipygium with apical longitudinal depression; apical process parallel-sided, depressed medially, with round tip. Punctuation in sterna denser and coarser than in terga, gradually becoming denser in apical sterna; median impunctate elevation as in male.

Measurement (Figures of one small specimen in parentheses): Total length 25-27 (22) mm., width of head across eyes 8-9.5 (7) mm., width of mesosoma across tegulae 10-11 (9) mm., of metasoma 12-13 (10) mm., length of fore-wing 22-24 (20.5) mm.

Specimens examined; 1♂: labelled "20, VIII, 1905, Ogasawara, S. Matsumura" and with another label handwritten "*Xylocopa daidonis* n. sp." by late Prof. S. Matsumura; 1♀: labelled "20, VIII, 1905, S. Matsumura, Type Matsumura"; 2♀♀ with same data, labelled "Paratype Matsumura"; 1♀ with a handwritten label, the letters almost obliterated, but indubitably the specimen used for the illustrations in Matsumura (1912-1932), labelled "Paratype Matsumura"; 1♀: labelled "Japan, Matsumura, Ogasawara, Paratype Matsumura" (The smallest specimen).

Finally I would like to express my cordial thanks to Prof. Chihisa Watanabe for the loan of the valuable material, and to Dr. T. C. Maa (Taipeh) for his kind suggestion to this work.