

*Jpn. J. Ent.*, 65(3): 588–592. September 25, 1997

Notes on *Lasioglossum (Evyllaesus) vulcanium* (BLÜTHGEN)  
in Sumatra showing polymorphic male gigantism  
(Hymenoptera, Halictidae)<sup>1)</sup>

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**Abstract** Male cephalic polymorphism in a Southeast Asian halictine bee, *Lasioglossum (Evyllaesus) vulcanium* (BLÜTHGEN), is recorded based on three males from Sumatra, with supplementary descriptions of coloration and morphology.

Key words: cephalic polymorphism; halictine bees; Sumatra; taxonomy; Hymenoptera.

BLÜTHGEN (1928) described a halictine bee, *Halictus vulcanium (vulcanius)* in description, p. 382 and figure, but *vulcanicus* in index, p. 406; the former name is adopted here), based on a single male collected at Volcano Papandajan, 6000 ft, West Java in April, 1923. This male holotype was stated as preserved in Museum Kuala Lumpur, but it is now in the Natural History Museum, London; another male is known from Tjibodas, West Java, 1400 m (leg. HAMANN) (EBMER & SAKAGAMI, 1985). This species belongs to the *Lasioglossum (Evyllaesus) leiosoma* group (EBMER & SAKAGAMI, op. cit.).

We could examine three males, which structurally fit well to the original description of *L. vulcanium*, all collected at Kayujao, Alahanpanjang, Solok, Province of Sumatera Barat (= West Sumatra), 1300 m, on January 30, 1988. This record of *L. vulcanium* is new to Sumatra.

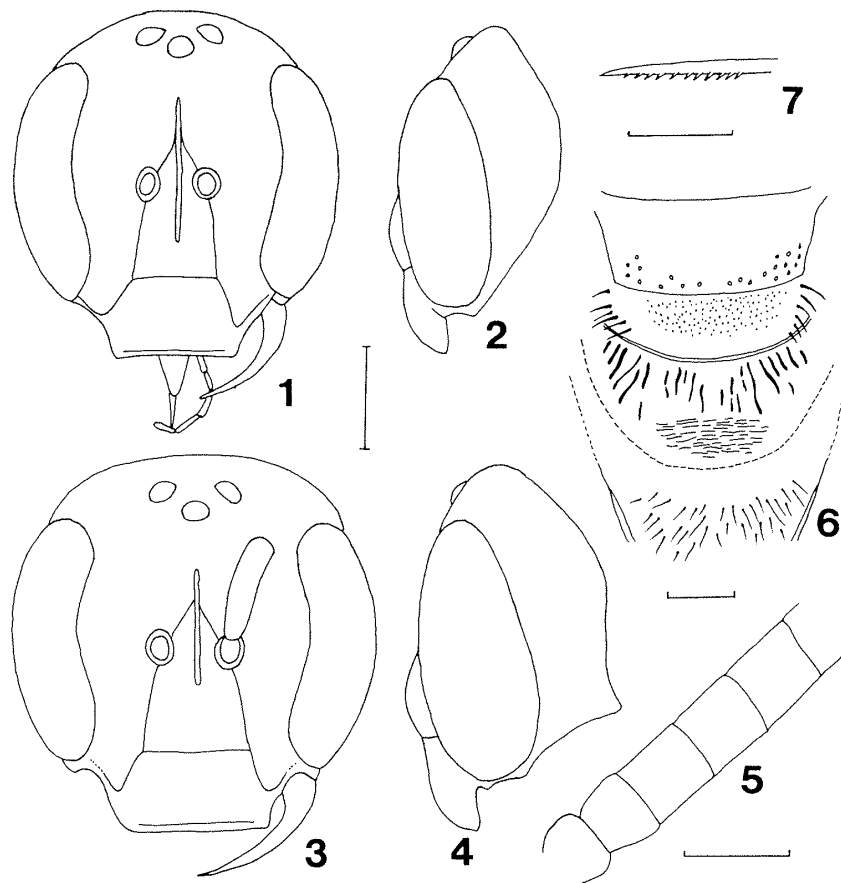
The type male has the head wider than the mesosoma, its upper part raised, the mandibles long and sickle-like, and the genae below angulate, *i.e.*, showing a mild cephalic gigantism. The two larger specimens of the three males collected in Sumatra have the head raised and flat on upper part, clypeus wide, mandibles long and genae angulate more distinctly than those illustrated by

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BLÜTHGEN (Figs. 3, 4). The other smaller male has the upper part of head lower and outcurved, mandibles shorter and genae not angulate (Figs. 1, 2). Thus, this species exhibits a male cephalic polymorphism as seen in some other halictine bees, although not so bizzare as in certain species of the *Lasioglossum* (*Evyllaesus*) *sexstrigatum* group (e.g. *L. ohei* HIRASHIMA et SAKAGAMI, 1966, in SAKAGAMI *et al.*, 1966, or *L. (Sudila) bidentatum* (CAMERON, 1898), in SAKAGAMI *et al.*, 1996).

Some additional taxonomic notes: *Coloration*: The Sumatran males (S) differ from BLÜTHGEN's description of the Javanese male (J) as follows: 1. Propodeum and terga 1–3 reddish in J but concolorously blackish brown in S. 2. Mandible pale yellow brown, apically red (the same as in *L. perakense*, BLÜTHGEN, 1928, and *L. pahanganum* BLÜTHGEN, 1928) in J (BLÜTHGEN did not mention the color except the apex), basally narrowly black and apically narrowly chestnut brown in S. 3. Tegula pale brown with inner margin darker



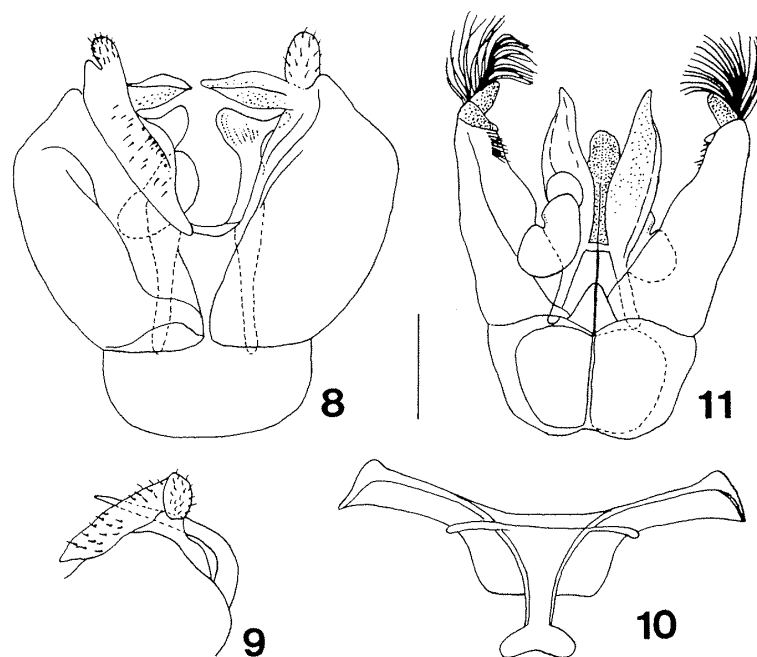
Figs. 1–7. *Lasioglossum* (*Evyllaesus*) *vulcanium* (BLÜTHGEN) male. 1, 2. Head of small male (frontal and lateral views; scale=0.5 mm). 3, 4. Head of large male (as in 1, 2). 5. right flagella (scale=0.25 mm). 6. Mesoscutellum, metanotum and propodeum (scale=0.25 mm). 7. Right inner hind tibial spur (scale=0.25 mm).

in J, generally dark brown in S. 4. Veins and stigma "very dark yellow brown" in J, while dark brown in S. Generally S seems to be darker, but mandibles paler, than J. Whether the differences are subspecific or not is still uncertain. In all S and probably also in J, the clypeus below has no yellow marks.

**Structure:** S coincides with J. Some additional features: Basal flagellomeres relatively short (Fig. 5;  $F_1$  L=5,  $F_{2,3}$  L=7,  $F_2$  W=5; L, W=length & width, 40 units=1 mm). Pronotal lateral angle obtuse, not projecting but outer margin slightly incurved. Propodeal dorsum as in Fig. 6. Basitibial plate absent. Inner hind tibial spur serrate (Fig. 7). Hamuli 2-1-2. Sternum 7 apically inverted-T shape and S8 invert trapezoid (Fig. 10). Genitalia generally as in other *Evyllaes* (Figs. 8-10): Gonobase relatively short. Gonocoxite not following gonobasal outline. Gonostylus with conspicuous mesal process pointed at apex, apically shallowly bifid, the inner lobe round with spicules and sparse, short hairs, the outer lobe roundly pointed and continuous to moderately developed ventral retrose lobe, the latter anteriorly densely spiculate, medially sparsely haired and the apex obliquely truncate. Penis valve broad medially.

**Morphometric values:** The values of three males are arranged in the order of nos. 2, 3, 1, following descending order of head width (HW). Body length 6.0, 6.3, 6.0 mm, wing length including tegula, 5.2, 5.4, 5.0 mm.

A. 25 units=1 mm. Head W 43, 41, 38; wing diagonal length 70, 65, 63; mesosomal W 39, 41, 39; metasomal W 35, 37, 34. Upper, maximum, lower



Figs. 8-11. Male terminalia (scale=0.25 mm): 8-10, *Lasioglossum (Evyllaes) vulcanium*; 11, *Lasioglossum (Evyllaes) hirashimae*. 8, 11. Genitalia seen ventrally (left) and dorsally (right). 9. Apex of genitalia seen laterally. 10. Metasomal sterna 7 and 8.

interorbital D (=distance) 25, 24, 22; 27, 26, 24; 21, 21, 18. Head L 44, 44, 41. Clypealveolar D 19, 18, 17; clypeal L all 10; L of apical part of clypeus exceeding lower orbital line 7, 7, 5. Mandible L 30, 28, 24. Mesoscutellum L 10, 10, 9; metanotal L 6, 5, 5; propodeal dorsum L 9, 9, 8.

B. 40 units=1 mm. Interorbital D all 7; ocellocular D 13, 12, 12; verticorbital D 13, 13, 12; eye W 19, 18, 18; gena W 18, 17, 16.

This group, possibly a natural group with 6–8 species (EBMER & SAKAGAMI, op. cit.), is predominant in SE. Asia, where the largest Palaearctic halictine group, subgenus *Evyllaesus*, is not represented by many species. We compared this species with *L. (E.) hirashimae* EBMER et SAKAGAMI, 1985 from Japan, the northernmost representative of the same species-group and the only species of the group of which both sexes were available for us (Figs. 8 and 11). *L. vulcanium* differs from *L. hirashimae* in having the clypeus black without yellow band, mesoscutum very smooth and shining, gonostylus with very sparse short hairs and ventral retrose lobe well developed.

Finally, we add ecological notes on *L. vulcanium*. The male bees were found visiting only yellow flowers of *Impatiens korthalsii* and *I. talangensis* (Balsaminaceae) growing along streamlets in a montane evergreen forest in Sumatra. These *Impatiens* flowers had long spurs filled with nectar, which was harvested “legally” and pollinated by long-tongued *Amegilla sumatrana* LIEFTINCK, 1956 and *Elaphropoda impatiens* (LIEFTINCK, 1944) (KATO *et al.*, 1991). *L. vulcanium* with shorter tongues could not suck the nectar from flower entrance, but it sucked nectar from holes pricked on spurs by an anthophorid bee, *Protomelissa vulpecula* and probably by larger males of *L. vulcanium*. Although evolutionary significance of the male cephalic polymorphism in halictid bees is still unknown, the functions both in mating and nectar robbing for larger males should be studied in more detail.

### Acknowledgments

We are deeply indebted to Dr. M. HOTTA, Dr. I. ABBAS, Dr. S. SALMAH, Dr. A. BAKAR and Mr. R. TAMIN for their kind arrangement during our field work; Mr. SATAR and Mr. ASRIL for their help in the field. This research was permitted by National Scientific Institute of Indonesia (LIPI) and was supported by the International Scientific Research Program of the Ministry of Education, Science and Culture, Japan (Nos. 62041048 and 63043043).

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(Received December 2, 1995; Accepted June 20, 1997)