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Description of *Lasioglossum (Mediocralictus) orchidodeceptum* sp. n. from Thailand and India (Hymenoptera: Halictidae)

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Lasioglossum (Mediocralictus) orchidodeceptum sp. n. from Thailand and India is described. It is compared to the closest species, *Lasioglossum puloense* (Blüthgen, 1926), from Penang, Malaysia. Both are illustrated. The subgenus *Mediocralictus* Pauly 1984, previously known only from tropical Africa, is new for the Oriental region. *Lasioglossum orchidodeceptum* sp. n. is ecologically important as pollinator of a rare orchid, the pollination mechanism of which is based on deception.

Keywords: *Lasioglossum*, *Mediocralictus*, new species, Halictidae, Thailand.

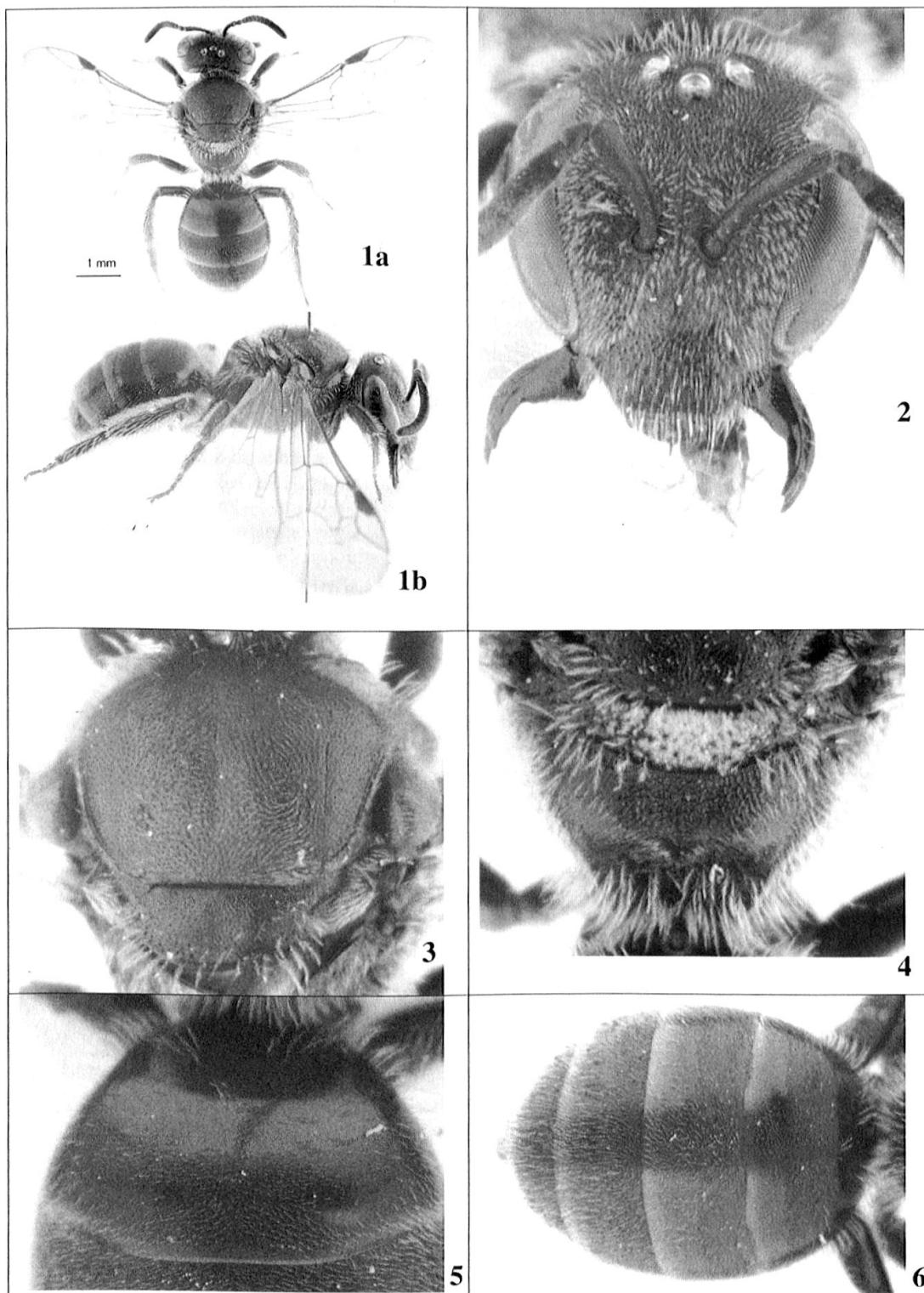
INTRODUCTION

For the correct understanding of the reproduction of valuable flowers, such as endangered orchids, and for the implementation of appropriate conservation projects, it is necessary to know exactly what species of pollinators are involved. This is particularly important when only one or a restricted number of pollinators are involved, such as found in *Ophrys* orchids (e.g. Kullenberg 1961; Schiestl *et al.* 2000) and slipper orchids (e.g. Atwood 1985; Bänziger 2002; Bänziger *et al.* 2005). For tropical regions, with their high species diversity and therefore often insufficiently known insect fauna, identification can be a serious problem. Among SE Asian bees, the Halictidae possibly represent the greatest challenge in this respect.

While studying the pollination of an endangered lady slipper orchid (*Paphiopedilum* sp.) in Thailand, the co-author found a *Lasioglossum* as pollinator which the first author could not assign to any described species. Subsequent checking of other collections revealed its presence also in India. A designation such as *Lasioglossum* sp. A, without a proper name and description, would be unsatisfactory both for ecological and conservation work. Moreover, the risk for such a *Lasioglossum* sp. A of sinking into oblivion because of its being overlooked by future taxonomic treatises, is much higher than with a fully identified species. Hence description and naming of the new species is justified since a comprehensive revision of the many Oriental halictine sweat bees may take a decade or more. Treatment of the complex pollination mechanism will be detailed elsewhere.

STUDY SITES, MATERIAL AND METHODS

Field research was carried out by H.B. and assistants in the hills 410 m above Phangnga, South Thailand, 23–25 March and 23–25 April, 2008, 5–8 April and 3–6 May 2009, and 24–26 February, 2010. A three hours trek from the nearest house



Figs 1–6. *Lasioglossum orchidodeceptum*, female. — 1, Habitus, a, holotype dorsal view; b, paratype, lateral view; 2, head; 3, scutum; 4, propodeum; 5, first tergum; 6, metasoma.

was required to reach the sites, needing porters for carrying rock climbing and bivouacking equipment to camp for up to 4 days. The vegetation was primary evergreen rain forest on craggy limestone. More details on habitat are mentioned in Bänziger *et al.* (2011). The orchids mostly grew in pockets or on ledges often near or at the edge overhanging more or less vertical limestone rock faces. Some were accessible only by mountaineering ropes, others required ropes for safety during the day-long watching of the flowers. Typically for these orchids, insect visitation was very infrequent and during 142 men-hours watching on 16 days only 17 *Lasioglossum orchidodeceptum* fell into the flowers, of which only 8 specimens could be collected while they escaped from the orchid's slipper.

The holotype will be deposited at Royal Belgian Institute of Natural Sciences, Brussels (RBINS), the paratypes at the Department of Entomology and Plant Pathology, Faculty of Agriculture, Chiang Mai University, and other official Thai Institutions.

***Lasioglossum (Mediocralictus) orchidodeceptum* n. sp.**

(Figs 1–13)

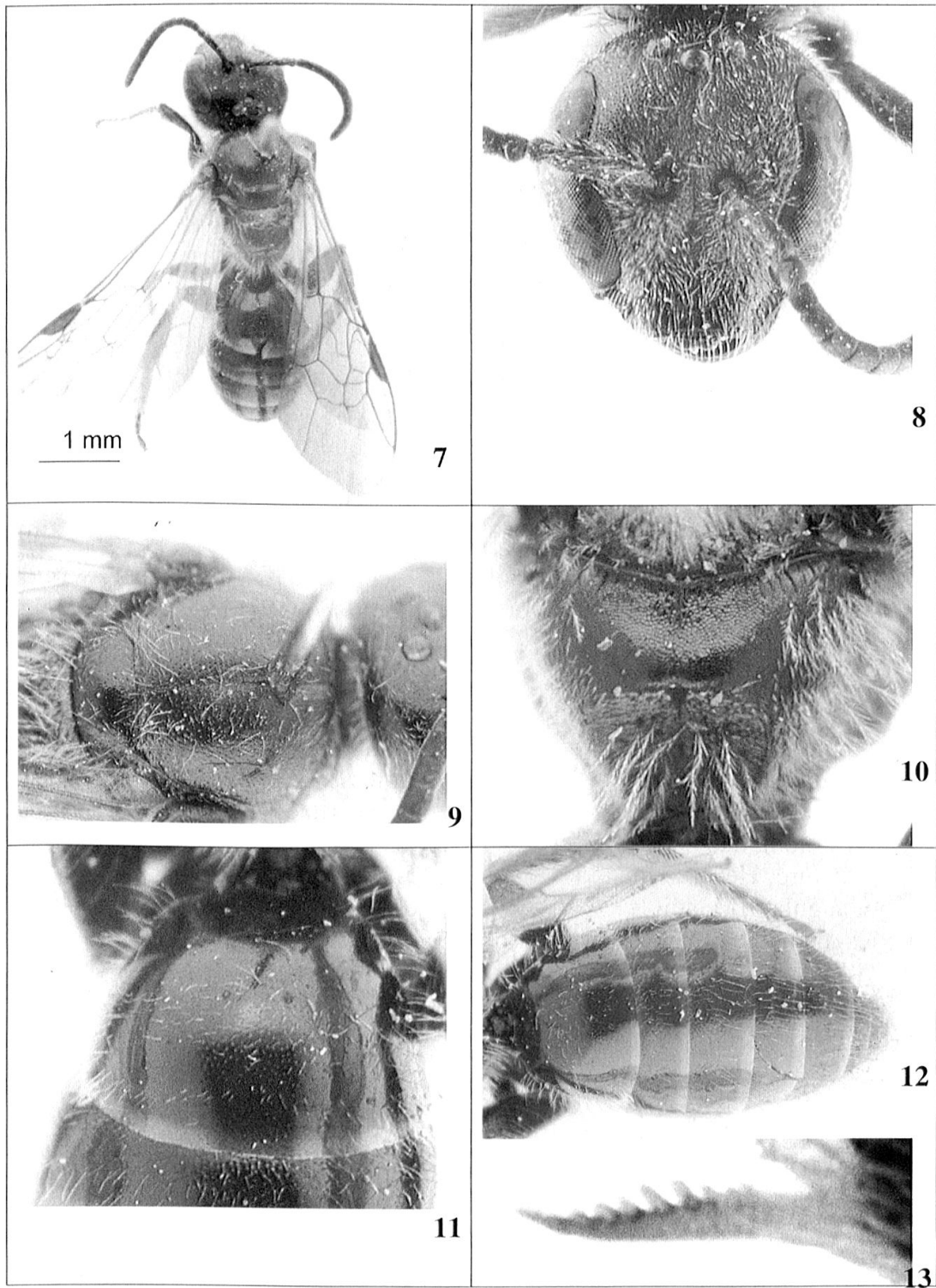
Diagnosis. Female. Head triangular and scutum densely punctate as in the *sexstrigatum* group of *Evylaeus* but propodeum not short and terga without apical hair bands. The closest species in the keys of Blüthgen (1926) is *L. puloense* Blüthgen, 1926 by the terga finely and densely striate and punctate. *L. orchidodeceptum* differs by the dull scutum (spaces between punctures shiny in *L. puloense*), the propodeum without lateral wrinkles (numerous lateral wrinkles on dorsal and lateral surfaces of propodeum in *L. puloense*), the darker legs (chestnut testaceous in *L. puloense*). Propodeum is particular: apical margin of dorsal surface open on posterior surface, forming a small triangle delimited by white short hairs on vertical surface. Male with a pectinate hind tibial spur, subrectangular head, strongly curved mandibles and black clypeus.

The pectinate inner hind tibial spur of the male is a unique structure of the subgenera *Sudila* Cameron, 1898, from the Oriental region (Sakagami *et al.* 1996; Michener 2007) and *Mediocralictus* Pauly, 1984, from the Afrotropical region and Madagascar (Pauly 1984; 1999). By its small size, this new species rather belongs to *Mediocralictus*, and then the subgenus is new for the Oriental region. Head subrectangular and strongly curved mandibles in the males, long propodeum, are similar to African species of *Mediocralictus*. Probably *Sudila* is close to *Mediocralictus* but has developed extreme characters, especially the shape of the head in males. A multi-locus DNA barcoding (Danforth *et al.* 2008) should be used to confirm the affinities of these two groups when fresh specimens in ethanol will be available.

Description. Female. Length 6 mm; forewing length: 5 mm.

Colour. Integument of head and mesosoma black (Fig. 1). Tegulae chestnut brown. Legs and metasoma dark brown. Apical margins of metasomal terga yellow-brown (Fig. 6).

Pubescence. Hairs of head rather short and white. Scutum with short, simple, laterally directed hairs. Dorsolateral angles of pronotum and metanotum covered with dense white hairs. Posterior and lateral surfaces of propodeum with white and



Figs 7– 13. *Lasioglossum orchidodeceptum*, paratype male. — 7, Habitus; 8, head; 9, scutum; 10, propodeum; 11, first tergum; 12, metasoma; 13, inner hind tibial spur.

plumose hairs. Terga without patch of tomentum, except a very small patch of white setae on basilateral part of T2. Tergum 1–4 with numerous, short, obliquely directed hairs, on disc and apical margin, not forming basal or apical bands.

Structure. Head as long as wide (Fig. 2), subtriangular, upper interorbital distance/lower interorbital distance = 1.19. Genal width and length of vertex weak. Frons and vertex finely and closely punctate, punctures separated by a puncture width or less. Frontal carina complete.

Mesosoma. Scutum finely and densely punctate (Fig. 3), interspaces similar in size to the punctures, dull or weakly shiny. Propodeum without carina (Fig. 4); propodeal area nearly trapezoidal, as long as scutellum, posterior margin open on the posterior face, forming a small vertical triangle delimited by white short hairs. Trapezoidal enclosure covered by short, weak and irregular ridges, lateral fields rounded, with fine punctures and shagreened interspaces.

Legs. Brown. Inner hind tibial spurs with 3 teeth.

Metasoma. First metasomal tergum shining and minutely striate, with very fine, superficial, rather dense, piliferous punctures (Fig. 5). Apical margin of tergum 1 not depressed, with punctures similar to those of the disc. Punctuation of terga 2–4 similar to punctuation of tergum 1.

Male: Length 6 mm; forewing length: 5 mm.

Colour. Integument of head and mesosoma black (Fig. 7). Mandibles and clypeus totally black. Tegulae chestnut brown. Legs and metasoma dark brown. Apical margins of metasomal terga yellow-brown (Fig. 12).

Pubescence. Face with some grey and short hairs (Fig. 8). Metanotum with tomentum and some long, plumose setae. Lateral and posterior parts of propodeum with long plumose setae, posterior face with adpressed grey tomentum. Metasoma without tomentum except for a small patch of white setae on basilateral part of T2. Sterna with long hairs.

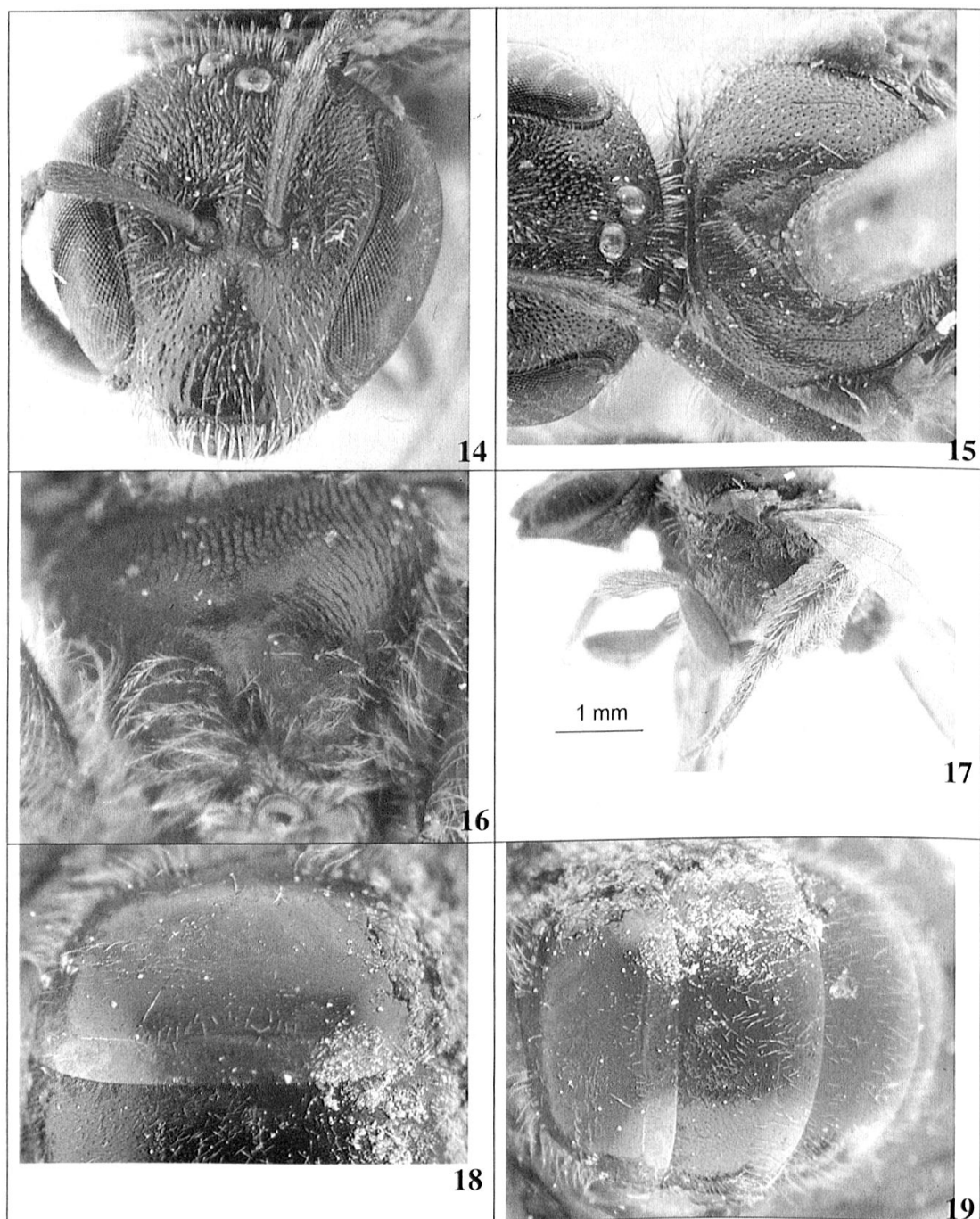
Structure. Head as long as wide (Fig. 8), subrectangular. Genae as wide as eye, not angulate. Mandible strongly curved, relatively long. Flagellomeres as long as wide. A small carina between antennal sockets.

Mesosoma. Scutum finely and densely punctate (Fig. 9), interspaces similar in size to the punctures, dull or weakly shiny. Propodeum without carina (Fig. 10), rounded on sides; dorsal propodeal area nearly trapezoidal, long (as long as scutellum), covered with small tessellations, some short plicae only on base.

Legs. Inner hind tibial spurs with five relatively long and spaced teeth (Fig. 13). Hind coxa and femora wide.

Metasoma. Terga shining (Fig. 12). Tergum 1 with some punctures (Fig. 11). Terga 2–4 with some punctures on base.

Material studied. Holotype female: Hills above Phangnga, Phangnga Province, South Thailand, 25.iv.2008, leg. H. Bänziger (RBINS). Paratypes: ditto, 24.iv., two females, 25.iv.2008, 1 female, 8.iv., 1 female, 4.v., 1 female, 6.v.2009, 1 female, 26.ii.2010, 1 female (Chiang Mai University; RBINS). South India: Madras, Anamalai Hills, Kadamparai, 3500 ft, v.1963, 3 males and 2 females, leg. P.S. Nathan (RBINS, Brussels). South India, Anamalai Hills, Cinchona, 3500ft, v.1969, 1 female, ix.1969, 1 female, leg. P.S. Nathan (RBINS, Brussels). South India, Nilgiri Hills, Naduvattam, 6000ft, v.1958, 3 males and 1 female, leg. P.S. Nathan (RMNH Leiden).



Figs 14–19. *Lasioglossum puloense*, female, holotype. — 14, head; 15, scutum; 16, propodeum; 17, lateral view of head, mesosoma, and legs; 18, first tergum; 19, metasoma (dusty on right side and glued in arabic gum).

Derivatio nominis. The epithet is a composite name alluding to the fact that the bees are cheated (*deceptum*, Latin, participle perfect of *decipere*, to deceive) by the rewardless orchid (*orchis*, *orchid*-, testicle, Neolatin word of Greek origin). For being fertilized, the lady slipper orchid entraps pollinators for a few minutes in its slipper. Female *L. orchidodeceptum* are enticed by various lures faking nectar as

reward. But the flower is nectarless and the sticky pollen clump inadvertently smeared onto their back cannot be removed by the bees except against the stigma of another orchid. They escape to liberty with no reward but a good scare.

***Lasioglossum puloense* (Blüthgen, 1926), comb. nov.**

(Figs 14–19)

Halictus puloensis Blüthgen, 1926: 667–668. Holotype female: Penang, 23.x.1913, leg. G.E. Bryant, BM Type Hym. 17a 733 (BMNH, London) (examined).

The holotype is in a very bad state: metasoma and wings are detached and glued with arabic gum on a label; leg 2 on the right side is lacking.

This species is closest to *L. orchidodeceptum* and our new species falls to it in the keys of Blüthgen (1926) (see differences above). *Halictus puloensis* has been correctly described by Blüthgen, so a redescription is not necessary but illustrations here are useful (Figs 14–19) to compare the two species. Its subgeneric placement is in the *Evylaeus/Dialictus* series. The male is needed for a more accurate subgeneric placement. Perhaps it is also a *Mediocralictus*.

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REFERENCES

- Atwood, J.T. 1985. Pollination of *Paphiopedilum rothschildianum*: brood-site deception. — National Geographic Research, Spring 1985: 247–254.
- Bänziger, H. 2002. Smart alecks and dumb flies: natural pollination of some wild lady slipper orchids (*Paphiopedilum* spp., Orchidaceae). In: Clark, J., Elliott, W.M., Tingley, G. & Biro, J. (eds), Proceedings of the 16th World Orchid Conference. — Vancouver: Vancouver Orchid Society, 165–169, 461–463 [plates 45–57].
- Bänziger, H., Sun H. & Luo, Y. 2005. Pollination of a slippery lady slipper orchid in Southwest China: *Cypripedium guttatum* (Orchidaceae). — Botanical Journal of the Linnean Society 148: 251–264.
- Bänziger, H., Pumikong, S. & Srimuang, K. 2011. The remarkable nest entrance of tear drinking *Parotrigona klossi* and other stingless bees nesting in limestone cavities (Hymenoptera: Apidae). — Journal of the Kansas Entomological Society 84: 22–25.
- Blüthgen, P. 1926. Beiträge zur Kenntnis der indo-malayischen *Halictus* und *Thrincostoma*-Arten. — Zoologische Jahrbücher Jena (Syst. Geogr. Biol. Tiere) 51: 375–698, pls 4–5.
- Danforth, B.N., Eardley, C., Packer, L., Walker, K., Pauly, A. & Randrianambinintsoa, F.J. 2008. Phylogeny of Halictidae with an emphasis on endemic African Halictinae. — Apidologie 39: 86–101.
- Kullenberg, B. 1961. Studies in *Ophrys* pollination. — Almquist and Wiksells, Uppsala.
- Michener, C.D. 2007. The Bees of the World. — Johns Hopkins University Press, Baltimore, Maryland, 992 pp.
- Pauly, A. 1984. Classification des Halictidae de Madagascar et des îles voisines. 1. Halictinae (Hymenoptera Apoidea). — Verhandlungen der Naturforschenden Gesellschaft Basel 94: 121–156.
- Pauly, A. 1999. Classification des Halictini de la Région afrotropicale (Hymenoptera Apoidea Halictidae). — Bulletin de l'Institut royal des Sciences naturelles de Belgique, Entomologie 69: 137–196.

- Sakagami, S.F., Ebmer, A.W. & Tadauchi, O. 1996. The halictine bees of Sri Lanka and the vicinity, III. *Sudila* (Hymenoptera, Halictidae) Part 1. — *Esakia* 36: 143–189.
- Schiestl, F.P., Ayasse, M., Paulus, H.F., Löfstedt, C., Hansson, B.S., Ibarra, F. & Francke, W. 2000. Sex pheromone mimicry in the early spider orchid (*Ophrys sphegodes*): patterns of hydrocarbons as the key mechanism for pollination by sexual deception. — *Journal of Comparative Physiology A* 186: 567–574.

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