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Four new black fly species (Diptera: Simuliidae) from Sumatra, Indonesia

HIROYUKI TAKAOKA 

Higher Institution Centre of Excellence (HICoE), Tropical Infectious Diseases Research and Education Centre (TIDREC), Universiti Malaya, 50603, Kuala Lumpur, Malaysia;
email: takaoka@oita-u.ac.jp

Abstract. *Simulium (Gomphostilbia) kandisense* Takaoka **sp. nov.**, *S. (Simulium) kotsuboyui* Takaoka **sp. nov.**, *S. (S.) solokense* Takaoka **sp. nov.**, and *S. (S.) bengkuruese* Takaoka **sp. nov.** are described.

INTRODUCTION

Four new species of black flies, *Simulium (Gomphostilbia) kandisense* Takaoka, *S. (Simulium) kotsuboyui* Takaoka, *S. (S.) solokense* Takaoka, and *S. (S.) bengkuruese* Takaoka were described from Sumatra, Indonesia, in Takaoka in 2025, which appeared in an electronic-only journal. Due to an oversight, the article was not registered in the Official Register of Zoological Nomenclature (ZooBank) and the registration not displayed in the article, and thus was not published for purposes of zoological nomenclature. In order to make the names available, a succinct, Code-compliant extract from that article is published here. For further details of the morphology and biology of the new species, see Takaoka (2025). Type specimens are preserved in vials with 80% ethanol and are deposited at Department of Entomology, Queen Sirikit Botanic Garden, Chiang Mai, Thailand.

Simulium (Gomphostilbia) kandisense Takaoka, new species

lsid:zoobank.org:act:B793EA77-A8D8-48E4-9FA5-A0AAE31727C7

Diagnosis: This species is distinguished from all other related species in the *S. asakoae* species-group in the male by the upper-eye (large) facets in 13 vertical columns and 15 horizontal rows, the scutum with yellow hairs, and the base of the radial vein with a tuft of dark brown hairs.

Type material: HOLOTYPE: 1♂ (with its associated pupal exuviae and cocoon) reared from a pupa, collected from a brook, at Tigosakato, Tanjung Kandis, Padang, West Sumatra, Indonesia, 10.viii.1994, by H. Takaoka.

Etymology: The species name *kandisense* is after Kandis, a kingdom based in the western-central region of Sumatra in the 14th century.

Simulium (Simulium) kotsuboyui Takaoka, new species

lsid:zoobank.org:act:273445E2-3226-414D-8D2A-A2729B20E2FF

Diagnosis: This species is distinguished from two other related species in the *S. iridescens* species-group by both sexes having the mid and hind femora entirely darkened; in the male by the upper-eye (large) facets in 17 or 18 vertical columns and hind basitarsus

slightly narrower than the hind tibia and femur; and in the pupa by the frons nearly bare, and gill filaments each with the interridge distances relatively longer.

Type material: HOLOTYPE: 1♂ (with its associated pupal exuviae and cocoon), reared from a pupa, collected from a river, at Airmancur, along the road from Kayutanam to Padangpanjang, Bukittinggi, West Sumatra, Indonesia, 14.viii.1994, by H. Takaoka. PARATYPES: 5♀♀, 4♂♂ (with their associated pupal exuviae and cocoons), same place and date as those for the holotype; 1♀ with its associated pupal exuviae and cocoon) reared from a pupa collected from a stream along the road from Lubukbargalung to Lubuksulasih, West Sumatra, 8.viii.1994, by H. Takaoka; 2♂♂ (with their associated pupal exuviae and cocoons) reared from pupae collected from a river in Pasaman, halfway between Bonjol and Lubuksikaping, along the road from Bukittinggi to Lubuksikaping, West Sumatra, 18.viii.1994, by H. Takaoka.

Etymology: The species name *kotsuboyui* is in honor of Mr. Yu Kotsubo, M. Ag., Deputy Editor, Department of Science and Technology News Section, The Asahi Shimbun (Newspaper), Tokyo, Japan, for his great contribution to enlightening of the importance of biodiversity, conservation of natural environment and One Health.

Simulium (Simulium) solokense Takaoka, new species

lsid:zoobank.org:act:27B08626-5A0A-45A5-AFF2-47CE96E58CDB

Diagnosis: This species is distinguished from three other related species in the *S. iridescens* species-group in the pupa by the frons and face entirely bare, thorax bare narrowly near the anterior margin and gill filaments thread-like, 0.90–1.25 times as thick as the interspiracular trunk and irregularly with annular ridges faintly forming reticulate patterns.

Type material: HOLOTYPE: 1♂ (with its associated pupal exuviae and cocoon) reared from a pupa collected from a stream along the road from Lubukbargalung to Lubuksulasih, Solok, West Sumatra, Indonesia, 8.viii.1994, by H. Takaoka. PARATYPES: 5♀♀ and 4♂♂ (with their associated pupal exuviae and cocoons), same data and date as those for the holotype; 2♀♀ and 3♂♂ (with their associated pupal exuviae and cocoons), reared from pupae collected from a river flowing in a paddy field, near Talang, along the road from Lubuksulasih to Talang, West Sumatra, Indonesia, 8.viii.1994, by H. Takaoka; one pupa collected from a stream between Alahanpanjang and Surian, West Sumatra, Indonesia, 11.viii.1994, by H. Takaoka; 1♀ and 3♂♂ (with their associated pupal exuviae and cocoons), reared from pupae collected from a river at Bandar Baru, Sibolangit, North Sumatra, Indonesia, 25.viii.1994, by H. Takaoka.

Etymology: The species name *solokense* is after the locality, Solok, where this new species was collected.

Simulium (Simulium) bengkuense Takaoka, new species

lsid:zoobank.org:act:5136E979-B4F1-4860-8E4F-044A09B577D2

Diagnosis: This species is distinguished from all the other species in the *S. striatum* species-group in the female by the higher frons ratio of length against narrowest width (1.5–1.6) and the radial vein with its basal portion haired; in the male by the upper-eye (large) facets in 16 or 17 vertical columns and 16 or 17 horizontal rows, and the scutum with yellow hairs; and in the pupa by the gill with 10 filaments arranged mainly as two pairs plus two triplets, and the overlapping of the two middle triplets of the gill filaments when viewed laterally.

Type material: HOLOTYPE: 1♂ (with its associated pupal exuviae and cocoon), reared from a pupa, collected from a river, at Airmancur, along the road from Kayutanam to Padangpanjang, Bukittinggi, West Sumatra, Indonesia, 14.viii.1994, by H. Takaoka. PARATYPES: 5♀♀, 4♂♂ (with their associated pupal exuviae and cocoons), and five pupal exuviae and cocoons, same place and date as those for the holotype; 2♂♂ (with their associated pupal exuviae and cocoons), collected from a creek (called Air Mujin), at Tanjung jati, along the road between Simpangsender and Liwa, Bengkulu, West Sumatra, Indonesia, 29.vii.1992, by H. Takaoka.

Etymology: The species name *bengkuruense* is after the locality name, Bengkulu, one of two localities where this new species was collected.

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REFERENCES

- Takaoka, H.** 2025. Four new species of black flies (Diptera: Simuliidae) from Sumatra, Indonesia. *Tropical Biomedicine* **42**(4): 391–407.