

First record of the ant genus *Overbeckia* Viehmeyer, 1916 (Hymenoptera: Formicidae) in Thailand

Nawee Noon-anant¹ and Weeyawat Jaitrong²

¹Division of Biological Science, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand.

²Office of Natural Science Research, National Science Museum, Technopolis, Khlong 5, Khlong Luang, Pathum Thani, 12120 Thailand.

Article History

Received: 25 October 2024

Accepted: 23 December 2024

Corresponding author

Nawee Noon-anant

E-mail: nawee.n@psu.ac.th

Editor

Dr. Weeyawat Jaitrong

E-mail: polyrhachis@yahoo.com/

weeyawat@nsm.or.th

ABSTRACT

Overbeckia Viehmeyer, 1916 is a rare ant genus of the subfamily Formicinae. Currently, three valid species are known in the genus, but none have previously been recorded for Thailand. Here we record two named species: *Overbeckia subclavata* Viehmeyer, 1916 and *Overbeckia jambiensis* Klimeš, 2022 and an unknown species for the first time from Thailand. Alate queens of unknown species were also collected and described in detail. A key to the species of the genus based on worker caste is provided.

Keywords: ants, Formicinae, new species, Southeast Asia, taxonomy

INTRODUCTION

The ant genus *Overbeckia* Viehmeyer, 1916 belongs to the subfamily Formicinae with *Overbeckia subclavata* Viehmeyer, 1916 as the type species (Viehmeyer, 1916; Bolton, 2003; Klimes *et al.*, 2022; Bolton, 2024). The genus has been recorded in Singapore, Indonesia (Sumatra), Philippines, Papua New Guinea, and Australia, and three named species are currently recognized in the genus: *Overbeckia jambiensis* Klimeš, 2022 and *O. subclavata* Viehmeyer, 1916 from Southeast Asia; and *O. papuana* Klimeš, 2022 from New Guinea and Australia (Heterick, 2019; Klimeš *et al.*, 2022; Wang *et al.*, 2022; Bolton, 2024). So far, no species of the genus have been known from Thailand (Khachonpisitsak *et al.*, 2020; Jaitrong *et al.*, 2024). Members of the genus are rare ants which are found in hollow dead bamboo or hollow dead twig hanging on shrubs (Klimeš *et al.*, 2022).

In the course of intensive surveys on ant fauna in Southern Thailand, we found two species of the genus *Overbeckia*, representing the first record of the genus from the country. In the present paper brief accounts on these species and a key to them based on the worker caste are provided. Furthermore, winged queens of unknown species are described in detail.

MATERIALS AND METHODS

The pin-mounted dry specimens of *Overbeckia* were compared with high-resolution images of the syntypes of *O. subclavata* (see “Types” of species below) and those of the holotypes and paratypes of *O. jambiensis* and *O. papuana* in Klimeš *et al.* (2022). Most morphological observations were made with a ZEISS Stemi 305 stereo microscope. Multi-focused montage images were produced using NIS-Elements-D-[Sequence6*-Focused] from a series of source images taken by a Nikon Digital Sight-Ri1 camera attached to a Nikon AZ100M stereoscope. The specimens were measured for the following parts using a micrometer (accurate to 0.01 mm).

The abbreviations used for the measurements and indices are as follows:

- TL** Total length (the necessarily composite measurement of the entire ant) in profile.
HL Head length: maximum distance measured in full-face view between midpoint of anterior clypeus margin to vertex, with both in the same horizontal plane.
HW Maximum head width including eyes in full-face view.
EL Eye length measured along maximum longitudinal diameter with head in lateral view.
ML Mesosomal length: length of mesosoma in profile, from angle at which pronotum meets cervix to posterior basal angle of metapleuron.
SL Scape length from anterior to posterior margin of scape and excluding condylar bulb.
PW Maximum width of pronotum in dorsal view.
PetW Maximum petiolar width measured in dorsal view.
PetL Maximum petiolar length excluding posterior joint to abdomen in profile.
CI Cephalic index = $(HW/HL) \times 100$.
SI Scape index = $(SL/HW) \times 100$.

The general terminology of the worker ants follows Hölldobler and Wilson (1990) and Bolton (1994). Most of the important characters of the genus *Overbeckia* used in this paper are cited from Klimeš *et al.* (2022).

RESULTS

Overbeckia Viehmeyer, 1916

Overbeckia Viehmeyer, 1916: 151. Type-species: *Overbeckia subclavata*, by monotypy.

Worker diagnosis. Monomorphic with body size 4–5 mm. Mandible subtriangular, its masticatory margin with 5 teeth (4 teeth in queen); area between frontal carinae without thin, median, longitudinal depression (this character can be used separating *Overbeckia* from *Camponotus* and most species in *Colobopsis*); antenna with 12 segments; palp formula 6:4, with apical segment of maxillary palp shorter than subapical segment; head without ocelli; mesosoma and petiole without spines; metapleural gland vestigial and indicated by a fine

transverse ridge terminating in a very small thin, vertical slit overhung by three or four guard hairs, and probably not functional; petiole squamiform and triangular, with sharp apex in profile and of relatively broad lentil-shape in dorsal view; body cuticle entirely smooth and glossy, with only fine punctation or soft striation (Heterick, 2019; Klimeš *et al.*, 2022).

This genus belongs to the tribe Camponotini and is most closely related to the genera *Calomyrmex* Emery, 1895; *Camponotus* Mayr, 1861; and *Echinopla* Smith, 1857 (Klimeš *et al.*, 2022). However, *Overbeckia* has a few short erect hairs (hair length \leq EL) on body surface, antenna and legs, while the other three genera usually have dense and long erect hairs on these portions (but with exceptions). The area between frontal carinae lacks the thin, median, longitudinal depression in *Overbeckia* (with depression in *Camponotus*). The petiole lacks spines on its dorsum (with spines or denticles in *Echinopla*).

Distribution. South Thailand (present study), Singapore, Indonesia (Sumatra), Philippines, Papua New Guinea, and Australia (Heterick, 2019; Klimeš *et al.*, 2022; Wang *et al.*, 2022; Bolton, 2024).

Overbeckia jambiensis Klimeš, 2022

(Figure 1)

Overbeckia jambiensis Klimes, in Klimeš *et al.*, 2022: 569, fig. 4. Type locality: Indonesia, Sumatra.

Types. Holotype (MZB) and paratype workers (ZMHB), BF2.2, 7.X.2013, wet season, canopy fogging, lowland forest, Bukit Duabelas National Park, 01°58'54.2"S, 102°45'02.3"E, J. Drescher leg., det. R. Nazarreta, P. Klimeš.

Non-type material examined. Six workers (THNHM-I-00029974, THNHM), S Thailand, Surat Thani Province, Ban Takhun District., Ratchaprapa Dam, 21.IV.1994, L. Lebel leg., LM39ED1, canopy fogging.

Measurements and indices. Worker (n = 6). TL 4.94–5.25, HL 1.23–1.30, HW 1.37–1.40, EL 0.35–0.39, SL 1.33, ML 1.72–1.82, PW 0.91–0.98, PetW 0.42, PetL 0.25–0.32, CI 108–111, SI 95–97.

Diagnosis of worker. Head in full-face view round, almost as long as broad; antennal scape extending beyond posterior margin of head by about one-third of its length; with mesosoma in dorsal view, propodeum laterally constricted compared to relatively broad pronotum. Head integument without punctation and with fine lineation. Head and mesosoma black; petiole and remaining abdominal segments (gaster) dark reddish brown; mandible, antenna, and legs reddish brown.

Remarks. *Overbeckia jambiensis* is most similar to *O. papuana* in having dense erect hairs on body. However, *O. jambiensis* can be distinguished from *O. papuana* by 1) erect hairs on body relatively denser and longer; 2) area between frontal carinae superficially reticulate with smooth and shiny interspaces (finely punctate in *O. papuana*); 3) frontal carina evenly convex laterally (almost straight in *O. papuana*). This species is also similar to *O. subclavata*. See “Remarks” under *O. subclavata* and the key to the known species of the genus based on the worker caste below.

Distribution. Thailand (new record) and Indonesia (Sumatra) (Klimeš *et al.*, 2022; Bolton, 2024).



Figure 1. *Overbeckia jambiensis*, worker (THNHM-I-00029974). A, Body in profile; B, head in full-face view; D, body in dorsal view. The red triangle indicated dense erect hair on head.

***Overbeckia subclavata* Viehmeyer, 1916**
(Figure 2)

Overbeckia subclavata Viehmeyer, 1916: 152, figs. 11, 12. Type locality: Singapore.

Types. The type series was collected by Overbeck from a home garden, 7 miles from the main city of Singapore. All syntype images (workers, CASENT0178502, FOCOL0130, FOCOL2567, FOCOL2568; dealate queen, FOCOL2566; males, CASENT0905180, FOCOL2564, and FOCOL2565) available on Antweb (2024) were examined.

Non-type material examined. Two workers (THNHM-I-00029782, THNHM), S Thailand, Trang Province, Yan Takhao District, Thung Khai Subdistrict, near Thung Khai Botanical Garden, 7.4682°N, 99.6342°E, 30.VII.2024, W. Jaitrong leg., WJT300624-04; 1 worker (PSU-01), S Thailand, Songkhla Province, Hat Yai District., 23.VII.2002, S. Tongjerm leg., canopy fogging.

Measurements and indices. Worker (n = 3). TL 4.55–4.69, HL 1.19–1.26, HW 1.12–1.25, EL 0.32–0.35, SL 1.02–1.05, ML 1.47–1.68, PW 0.88–0.91, PetW 0.46–0.49, PetL 0.28, CI 94–97, SI 86–91.

Diagnosis of worker. Head in full-face view round, almost as long as broad; antennal scape just slightly extending beyond posterior margin of head; in dorsal view propodeum laterally constricted compared to relatively broad pronotum. Body cuticle entirely smooth and glossy, with only fine punctation or soft striation. Body dorsum with a few short erect hairs present at least at scape apex, on ventral head, clypeus, mandible, and abdominal segments III-VII; a pair of erect hairs on vertex shorter than hairs on clypeus. Head and mesosoma black; petiole and remaining abdominal segments (gaster) dark reddish brown; mandible and antenna reddish brown; legs yellowish brown.

Remarks. *Overbeckia subclavata* can be distinguished from the other two *Overbeckia* species, *O. jambiensis* and *O. papuana*, in the worker caste by; 1) dorsum of mesosoma and petiole without erect hairs (with sparsely erect hairs in the latter two); 2) dorsum of head with fine dense punctation (with finely reticulate in the latter two); 3) vertex with a pair of erect hairs (dense hairs in the latter two). A specimen collected from Songkhla province (PSU-01) is slightly larger than the two workers from Trang province (THNHM-I-00029782).

Distribution. Thailand (**new record**), Singapore, Indonesia (Sumatra), Philippines (Viehmeyer, 1916; Klimeš *et al.*, 2022; Wang *et al.*, 2022; Bolton, 2024).

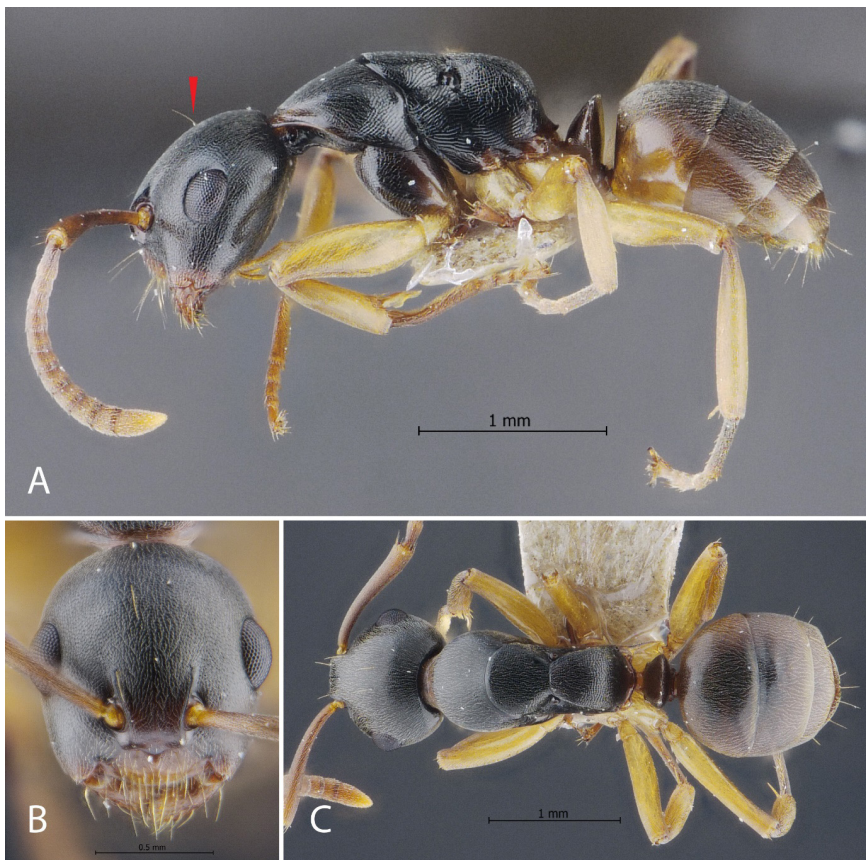


Figure 2. *Overbeckia subclavata*, worker (THNHM-I-00029782). A, Body in profile; B, head in full-face view; D, body in dorsal view. The red triangle indicated a pair of erect hair on head.

***Overbeckia* sp.**

(Figure 3)

Material examined. Four alate queens (THNHM-I-00029783, THNHM), S Thailand, Trang Province, Palian District, Kuan Mai Dam Subdistrict, Khao Ban Tad Wildlife Sanctuary, Ton Tok Waterfall, light trap, 18.II.2022, W. Jaitrong leg.

Measurements and indices. Queen (4 non-types). TL 7.70–7.88, HL 2.03–2.07, HW 1.96–2.00, EL 0.60–0.63, SL 1.44–1.47, ML 3.22–3.33, PW 1.72–1.45, PetW 0.63–0.67, PetL 0.49, CI 97, SI 72–75.

Diagnosis of queen. Head subtriangular, slightly broader posteriorly; body entirely black, covered with dense gray tiny appressed hairs mixed with dense erect hairs over body surface, except for petiole with sparse erect hairs but without appressed hairs. Body entirely black.

Description of queen. Head in full-face view subrectangular, slightly broader posteriorly, with almost parallel lateral margins, and weakly convex posterior margin. Mandible subtriangular, its masticatory margin with four distinct teeth. Clypeus almost as long as broad, its anterior margin weakly convex. Frontal carina reaching level of med-length of eye. Antennal scape clavate, reaching posterolateral corner of head; antennal segment II slightly longer than III and IV; segments V–XII each longer than broad. Eye large, maximum diameter almost as long as antennal segments II+III+IV, its outer margin slightly extending beyond lateral margin of head. Three ocelli well-developed, median ocellus located at level of posterior margin of eye; distances between median ocellus and lateral ocelli slightly longer than distance between lateral ocelli. Mesosoma as broad as head but distinctly longer than head length; in profile stout, with weakly convex dorsal outline. Pronotum in dorsal view short, subquadrate, in profile lower than mesoscutum; parapsidal lines distinct and long; in dorsal view mesoscutellum almost as long as broad, anterior margin straight, while posterior margin convex. Mesopleuron in profile large, subrectangular, clearly demarcated from lateral face of pronotum, mesoscutum, and metapleuron by distinct sutures; anepisternum clearly demarcated from katepisternum by deep oblique mesopleural sulcus; metapleuron not clearly demarcated from lateral face of propodeum; metanotum short (just a ‘narrow’ band). Propodeum in profile view slightly lower than promesonotum, slightly longer than mesoscutellum, and propodeal junction convex without spines. Petiole slightly shorter than high and with blunter apex. Remaining abdominal segments combined (gaster) as large as mesosoma.

Entire body covered with dense gray tiny appressed hairs; entire body also covered with dense erect hairs, except for petiole with sparse erect hairs but without appressed hairs; erect hairs on clypeus, ventral face of head, and tip of gaster distinctly longer than in other parts; scape with short erect hairs.

Head and mesosoma finely punctate; petiole and remaining abdominal segments slightly smoother than head; scape and legs micropunctate; mandible striate. Body entirely black.

Remarks. The queen specimens have dense-appreciated hairs mixed with erect hairs on

the body as in *O. papuana* queens. However, this species can be separated from *O. papuana* by petiole in profile elevate posteriorly (elevate anteriorly in *O. papuana*); head in full-face view broadened posteriorly (broadened medially in *O. papuana*); entire scape with dense erect hairs (a few erect hairs present on apical one-third in *O. papuana*). The queens examined are clearly different from the *O. subclavata* queen by the presence of dense appressed hairs mixed with erect hairs on the body dorsum (*O. subclavata* with less pilosity over body dorsum, without erect hairs on mesosoma and petiole).

Habitat. The specimens were collected from a light trap set up near an evergreen forest.

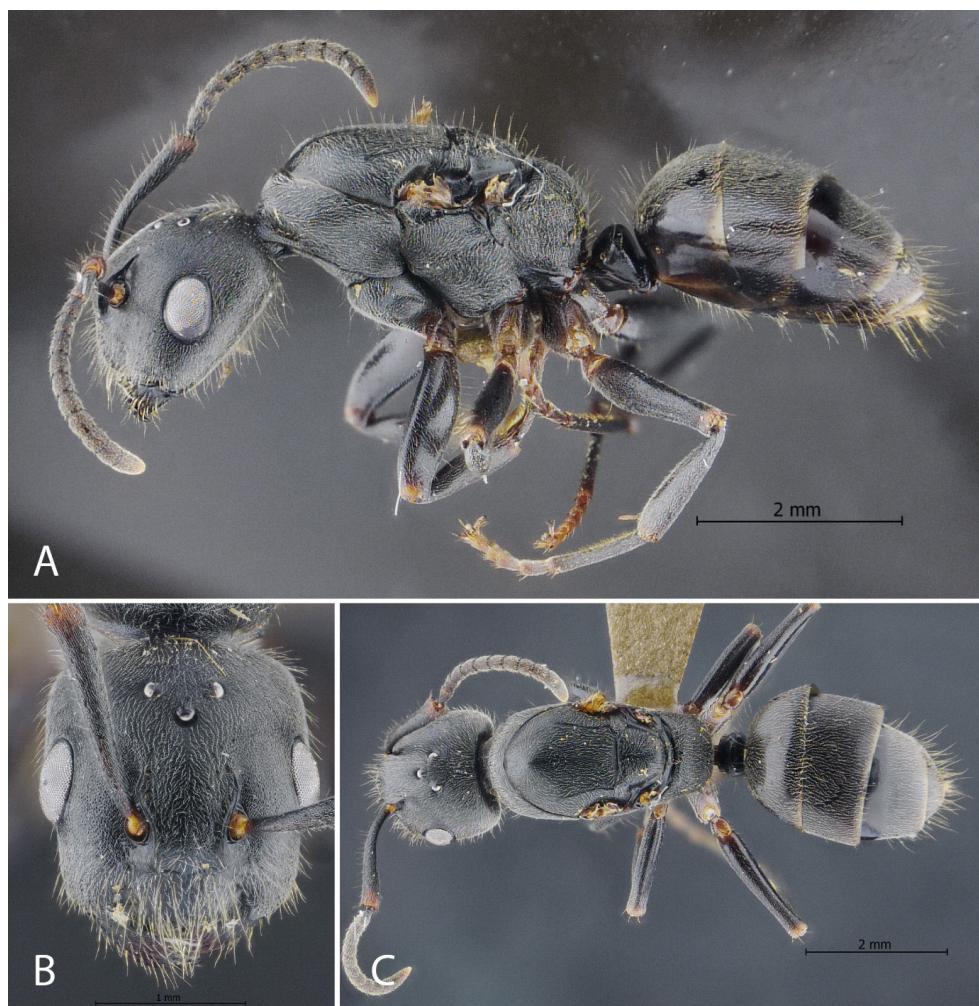


Figure 3. *Overbeckia* sp., alate queen (THNHM-I-00029782, wing removed). A, Body in profile; B, head in full-face view; D, body in dorsal view.

Key to known species of the genus *Overbeckia* based on the worker caste

- 1. Dorsum of mesosoma and petiole without erect hairs; vertex with 2 erect hairs (Figure 2A); dorsum of head finely punctate..... *O. subclavata*
- Dorsum of mesosoma and petiole with sparse or dense erect hairs; vertex with more than 2 erect hairs (Figure 1A); dorsum of head partly reticulate with smooth interspaces. 2
- 2. Dorsum of head with sparse appressed hairs (Figure 4A); frontal carina curvature evenly convex (Figure 4C); erect hairs on scape usually longer than maximum width of scape. *O. jambiensis*
- Dorsum of head with dense appressed hairs (Figure 4B); frontal carina weakly convex or almost straight (Figure 4D); erect hairs on scape short usually shorter than maximum width of scape. *O. papuana*

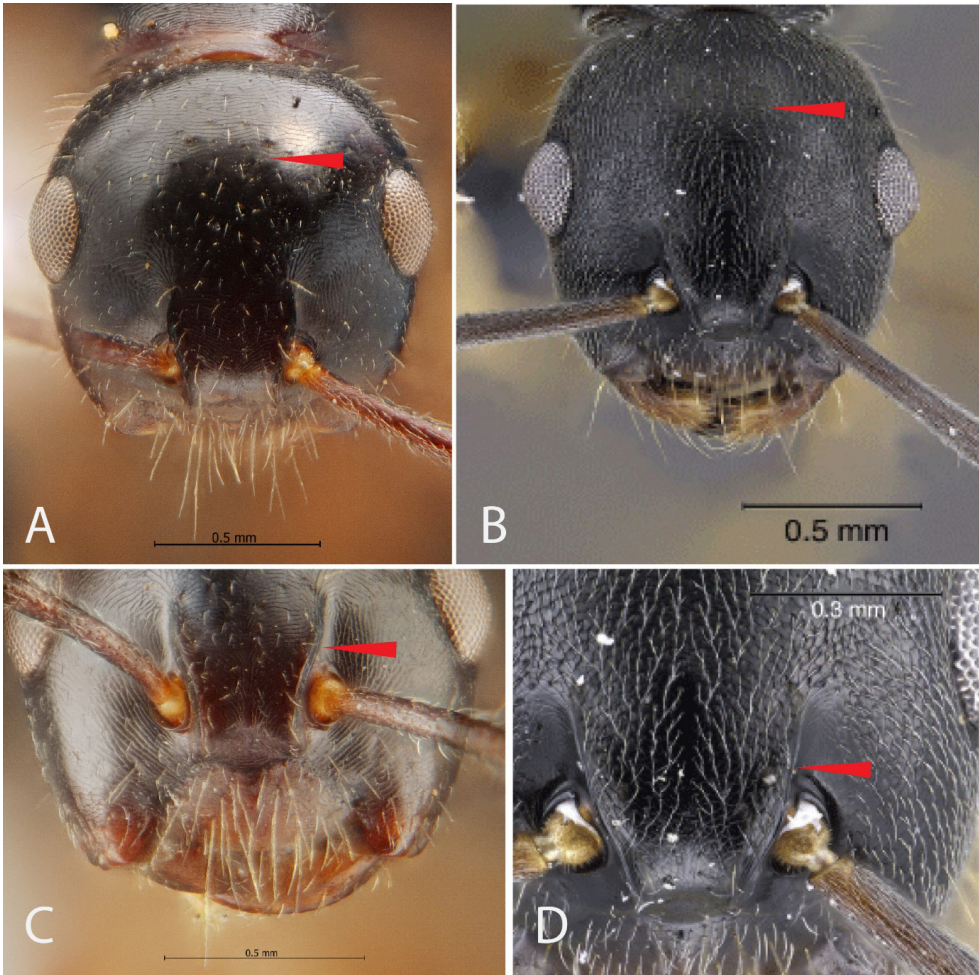


Figure 4. *Overbeckia* spp., workers, head in full-face view. A, C, *Overbeckia jambiensis* (THNHM-I-00029974); B, D, *O. papuana* (Figure 5 in Klimeš *et al.*, 2022).

DISCUSSION

Using an integrative approach of morphological and molecular data, Klimeš *et al.* (2022) reported that *Overbeckia* is a valid genus in Formicinae (Camponotini). The genus is not closely related to *Camponotus* or *Colobopsis* as previously hypothesized (Bolton, 2003; Ward *et al.*, 2016) but rather to the genera *Echinopla* and *Calomyrmex*. The lack of worker dimorphism in *Overbeckia* may represent an evolutionary constraint, as the two sister genera, *Echinopla* and *Calomyrmex*, also lack polymorphism or dimorphism in workers (Ward *et al.*, 2016; Laciny *et al.*, 2017).

Overbeckia was previously recorded from Singapore, Indonesia (Sumatra), Philippines, Papua New Guinea, and Australia (Heterick, 2019; Klimeš *et al.*, 2022; Wang *et al.*, 2022; Bolton, 2024). Khachonpisitsak *et al.* (2020) and Jaitrong *et al.* (2024) recorded 110 genera in Formicidae from Thailand, but *Overbeckia* was not included. In this paper we record *Overbeckia* for the first time from Thailand (Southern), which is the northernmost limit of the distribution range of the genus (ca. 280 km south of the Isthmus of Kra). *Overbeckia subclavata* is a widespread species that can be found in Southern Thailand, Singapore, Indonesia (Sumatra), and the Philippines. At present *Overbeckia jambiensis* is only known from Indonesia (Sumatra) and Southern Thailand.

Klimeš *et al.* (2022) reported that all *Overbeckia* species were collected from vegetation. Colonies appear to be rather small and difficult to detect, like species with similar nesting ecological patterns in the closely related arboreal genus *Echinopla*. *Overbeckia* is one of the rarest genera in arboreal ant communities. The previous reports in Singapore, Papua New Guinea, and Australia, members of the genus were recorded from disturbed sites such as, secondary forests and shrub lands near urban areas, including the data from Sumatra sampled by canopy fogging in the lowland rainforest (Viehmeyer, 1916; Heterick, 2019; Klimeš *et al.*, 2022; Wang *et al.*, 2022). Previous information and the present study indicate that this genus occurs across different vertical layering, from the lower vegetation to canopy, and different forest types, from the lowland rainforests, rubber plantations to oil palm plantations.

The two specimens of *O. subclavata* from Southern Thailand were collected from a small dead branch of bamboo at an edge of swamp forest. Specimens of *O. jambiensis* from Thailand and the type series were collected by canopy fogging in the primary lowland rainforest. *Overbeckia papuana* from Australia were collected from dead twigs hanging on shrubs (Klimeš *et al.*, 2022). The alate queens from Southern Thailand were collected with a light trap set up near an evergreen forest. According to the information, members of the genus should be arboreal ants nesting in dead bamboo or dead twigs hanging on shrubs or canopy of high trees in a variety of habitats.

We could not compare the alate queens examined in this study with *O. jambiensis* queens because *O. jambiensis* was described solely based on worker caste. We need to collect *O. jambiensis* colonies containing queens or conduct DNA analysis of the material to establish the correct worker-queen combination in these forms.

ACKNOWLEDGMENTS

This study was partly supported by the Office of Thailand Science Research and Innovation. We would like to thank the Department of National Parks, Wildlife and Plant Conservation (Thailand), who allowed us to study ant species diversity in Khao Ban Tad Wildlife Sanctuary (permission No. นผ.0907/ 21403). We thank Yudthana Samung (Faculty of Tropical Medicine, Mahidol University, Thailand) for imaging assistance in this paper.

REFERENCES

- Antweb. 2024. *Overbeckia subclavata* Viehmeyer, 1916. Accessed online from <https://www.antweb.org/images.do?subfamily=formicinae&genus=overbeckia&species=subclavata&rank=species&project=allantwebants> on 16 August 2024.
- Bolton, B. 1994. *Identification Guide to the Ant Genera of the World*. Harvard University Press, Cambridge, Massachusetts. 222 pp.
- Bolton, B. 2003. Synopsis and classification of Formicidae. *Memoirs of the American Entomological Institute* 71: 1–370.
- Bolton, B. 2024. *An Online Catalog of the Ants of the World by Barry Bolton*. Accessed online from <https://www.antcat.org/catalog/442708> on 16 August 2024.
- Jaitrong, W., K. Suwannaphak, Y. Samung and T. Jeenthong. 2024. *Ants of Thailand* (second edition). The National Science Museum, Pathum Thani. 528 pp. [in Thai]
- Heterick, B.E. 2019. First record of the formicine genus *Overbeckia* (Hymenoptera: Formicidae) from Australia. *Myrmecological News* 29: 163–166.
- Hölldobler, B. and E.O. Wilson. 1990. *The ants*. Harvard University Press, Cambridge, Massachusetts. xii + 732 pp.
- Khachonpisitsak, S., Sk.Yamane, P. Sriwichai and W. Jaitrong. 2020. An updated checklist of the ants of Thailand (Hymenoptera, Formicidae) *ZooKeys* 998: 1–182.
- Klimeš, P., J. Drescher, D. Buchori, P. Hidayat, R. Nazarreta, P. Potocky, M. Rimandai, S. Scheu and P. Matos-Maraví. 2022. Uncovering cryptic diversity in the enigmatic ant genus *Overbeckia* and insights into the phylogeny of Camponotini (Hymenoptera: Formicidae: Formicinae). *Invertebrate Systematics* 36(6): 557–579. 10.1071/IS21067.
- Laciny, A., H. Zettel, B. Metscher, A.S. Kamariah, A. Kopchinskiy, C. Pretzer and I.S. Druzhinina. 2017. Morphological variation and mermithism in the female castes of *Colobopsis* sp NrSA, a Bornean ‘exploding ant’ of the *Colobopsis cylindrica* group (Hymenoptera: Formicidae). *Myrmecological News* 24: 91–106.
- Viehmeyer, H. 1916 (“1915”). Ameisen von Singapore. Beobachtet und gesammelt von H. Overbeck. *Archiv für Naturgeschichte* (A) 81(8):108–168.
- Wang, W.Y., E.J.Y. Soh, G.W.J. Yong, M.K.L. Wong, B. Guénard, E.P. Economo and Sk.Yamane. 2022. Remarkable diversity in a little red dot: a comprehensive checklist of known ant species in Singapore (Hymenoptera: Formicidae) with notes on ecology and taxonomy. *Asian Myrmecology* 15: e015006:1–152. 10.20362/am.015006.
- Ward P.S., B.B. Blaimer and B. Fisher. 2016. A revised phylogenetic classification of the ant subfamily Formicinae (Hymenoptera: Formicidae), with resurrection of the ant genera *Colobopsis* and *Dinomyrmex*. *Zootaxa* 4072(3): 343–357. Doi:10.11646/zootaxa.4072.3.4