

Cladomyrma scopulosa New Species (Hymenoptera: Formicidae:
Formicinae) from Vietnam

by

Katsuyuki Eguchi¹ & Tuan Viet Bui²

ABSTRACT

Cladomyrma scopulosa new species is described from Vietnam. The present species is readily distinguished from known members of the genus in having a characteristic shape of the clypeus in the major. Colonies examined here nested inside shoots/branches of *Saraca dives* (Leguminosae).

Keywords: Indo-China, Vietnam, *Cladomyrma*, new species, *Saraca dives*.

INTRODUCTION

The ant genus *Cladomyrma* was established by Agosti (1991) under the tribe Lasini of the subfamily Formicinae. Agosti *et al.* (1999) recognized eleven species of which the range have strictly been confined to the western part of the Malesian floristic region, comprising the S. Malay Peninsula, Borneo and Sumatra. However, very recently, an unidentified species was recorded from N. Vietnam (Yamane *et al.* 2003) and E. Thailand (Fujiwara *et al.* 2004), respectively. A salient ecological feature of the genus is the myrmecophytic association with various taxa of plants, i.e. the utilization of living pithy stems of trees and vines as nest sites. In the course of our ant survey in Cuc Phuong National Park, Ninh Binh Province, N. Vietnam in June 2005, we found that *Cladomyrma* sp. frequently colonized young shoots and branches of *Saraca dives* (Leguminosae), one of the common tree species in riverside forest patches there. In the present article, we describe this species as new to science. Information on the myrmecophytic association will be given by Bui *et al.* (in prep.).

¹The Kagoshima University Museum, Kagoshima University, Kagoshima 890-0065, JAPAN, E-mail: Katsuyuki.Eguchi@mc6.seikyoku.ne.jp

²Institute of Ecology and Biological Resources, Nghia Do, Cau Giay, Hanoi, VIETNAM, E-mail: btviet@iebr.vast.ac.vn

METHODS

The following measurements and indices are used in the present article: head length (HL, maximal length of head capsule); head width (HW, maximal width of head capsule excluding eyes); scape length (SL, length of scape shaft); eye length (EL, maximal diameter of eye); mesosoma length (ML, diagonal length of mesosoma in profile from the anterior most point of the pronotum to the posteriormost point of the metapleuron); length of hind femur (FL); cephalic index ($CI=HW/HL \times 100$); scape index ($SI=SL/HW \times 100$); eye index ($EI=EL/HW \times 100$); hind femur index ($FI=FL/HW \times 100$).

All images were produced using a digital imaging system (microscope: Nikon Eclipse E600; camera: Nikon Coolpix 8400; software: Auto-Montage).

Abbreviations of the specimen depositories are: IEBR, Entomological collection of the Institute of Ecology and Biological Resources, Vietnam; FSKU, Entomological collection of Faculty of Science, Kagoshima University, Japan; ACEG, Ant Collection of Katsuyuki Eguchi (ant collection managed by Katsuyuki Eguchi, temporarily housed in FSKU); BMNH, Natural History Museum, London, UK; MCZC, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA; MHNG, Muséum d'Histoire Naturelle, Geneva, Switzerland.

DESCRIPTION

Cladomyrma scopulosa new species

Figs. 1–9

Type Material. Holotype: major from colony Eg15vi05-15 (nesting in young shoots of *Saraca dives*); type locality: Cuc Phuong N. P., Ninh Binh Province, **N. Vietnam** (K. Eguchi leg., 15/vi/2005); depository: IEBR. Paratypes: 21 majors, 22 minors and 5 dealate queens from the same colony to which the holotype belongs; depository: IEBR, MHNG, MCZC, BMNH, FSKU, ACEG.

Non-type Material Examined. **N. Vietnam**: Ninh Binh: Cuc Phuong N. P. [Colony: Eg16vi05-02 (K. Eguchi leg., 16/vi/2005); BTV16vi05-07, -08, -09, -14, -15, -19, -20, -21, -22, -23, -24, -25 (K. Eguchi & T. V. Bui leg.,



Fig. 1–2. *Cladomyrma scopulosa* n. sp., paratype, major worker. 1, Body in profile; 2, Body in dorsal view, black arrow indicates a transverse subbasal ridge on the lateral part of the clypeus.

16/vi/2005)]. **N. Vietnam**: Nghe An: Na Xan, 500 m, Que Phong [V. T. Bui leg., 14/iv/1999].

Diagnosis. Median part of clypeus strongly raised, steeply declining anteriorly; each lateral part of clypeus with a transverse subbasal ridge (major); mandible with 5 teeth (including basal angle) (queen); anepisternum covered with pubescence entirely (queen); metapleural gland orifice narrowed (major, minor and queen).

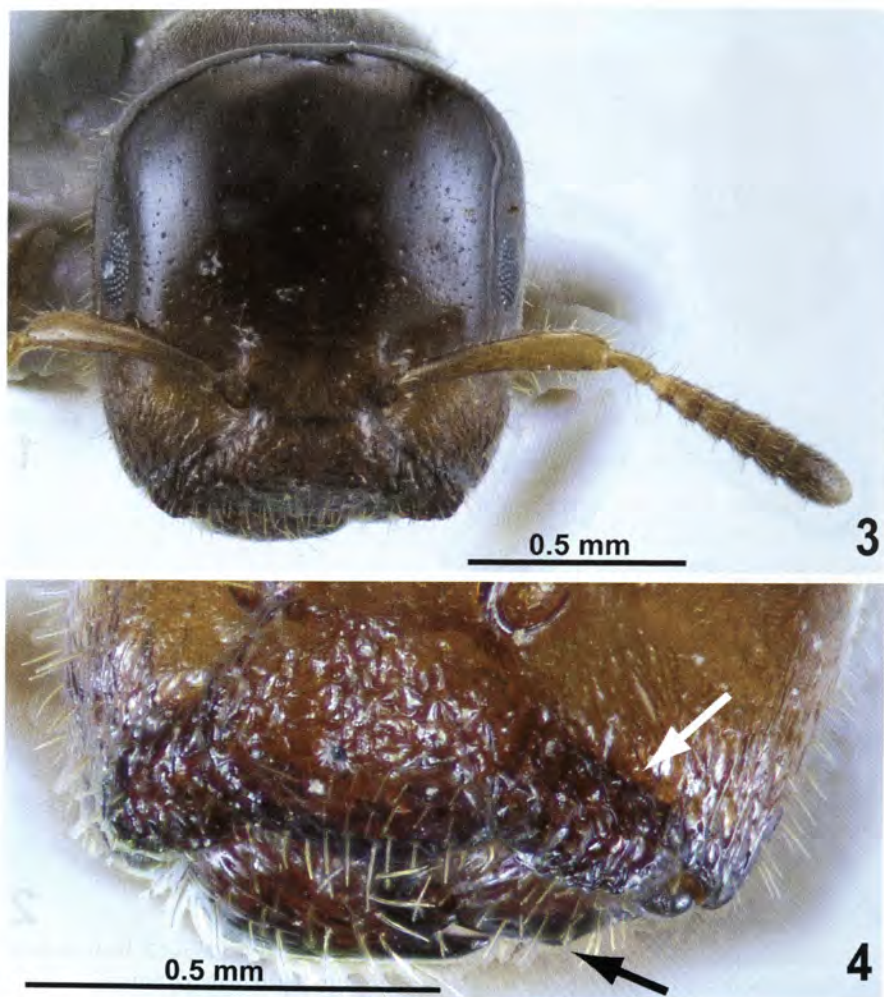


Fig. 3–4. *Cladomyrma scopulosa* n. sp., paratype, major worker. 3, Head in full-face view; 4, Clypeus in anterolateral view, black arrow indicates an obtuse outer angle of the mandible, white arrow indicates a transverse subbasal ridge on the lateral part of the clypeus.

Major (Figs. 1–4). HL 0.96–1.20 mm, HW 0.88–1.06 mm, SL 0.43–0.54 mm, EL 0.17–0.23 mm, ML 0.96–1.20 mm, FL 0.55–0.68 mm, CI 86–96, SI 45–54, EI 17–24, FI 60–67 (n=15). Body brown to dark brown, usually with paler anterior part of head and darker gaster; head in full-face view subrectangular with round posterolateral corners, sparsely bearing standing hairs posteriorly and laterally; frons and vertex sparsely bearing short stand-

ing hairs and very short appressed/decumbent hairs, largely smooth and shining (but with pits of hairs); gena weakly rugoso-punctate at least in its anterior part, bearing short standing hairs; ventral face of head covered with appressed/decumbent pubescence and bearing standing hairs; median part of clypeus strongly raised, reticulate or rugoso-reticulate, bearing relatively thick standing hairs, steeply declining anteriorly; each lateral part of clypeus with a transverse subbasal ridge (black arrow in Fig. 2; white arrow in Fig. 4); frontal lobe obsolete, only partially concealing antennal insertion; antenna 8-segmented, without distinctly differentiated club; scapes in full-face view a little beyond the line across posterior end of eyes; eye situated around or a little behind midlength of head; gena (as measured from anterior margin of eye to mandibular insertion) 1.7–2.3 times as long as maximal diameter of eye; mandible with 4 teeth (including basal angle), in full-face view forming an obtuse outer angle (black arrow in Fig. 4); outer surface of mandible coarsely rugose, bearing relatively thick standing hairs; mesosoma densely covered with pubescence (pubescent hairs longer than their interspaces) over the surface, scattering standing hairs dorsally; mesopleuron often (but not always) with an obsolete to very weak transverse impression which barely or very weakly separates anepisternum and katepisternum; matanotal groove obsolete dorsally and laterally or invisible; metapleural gland orifice narrowly opening; propodeal spiracle in profile located near the posterior margin of propodeum; petiole in profile scale-like; the dorsal top in rear view barely to conspicuously emarginate, or rarely bicuspidate; gaster covered with appressed pubescence over the surface; 1st tergite with several standing hairs other than those arranged along posterior margin of each tergite.

Minor (Figs. 5–6). HL 0.65–0.78 mm, HW 0.57–0.75 mm, SL 0.33–0.41 mm, EL 0.14–0.18 mm, ML 0.63–0.85 mm, FL 0.46–0.58 mm, CI 88–96, SI 54–60, EI 23–27, FI 75–82 (n=14). Coloration of body as the major; head in full face view subtrapezoidal with round posterolateral corners, sparsely bearing standing hairs posteriorly and laterally; frons and vertex covered by very short appressed pubescence (pubescent hairs shorter than their interspaces), sparsely bearing standing hairs, smooth and shining (but with pits



Fig. 5–7. *Cladomyrma scopulosa* n. sp., paratype. 5, Minor worker, body in profile; 6, Minor worker, head in full-face view; 7, Queen, head in full-face view.

of pilosity); gena and ventral face of head densely covered by appressed/decumbent pubescence (pubescent hairs longer than their interspaces), sparsely bearing standing hairs; median part of clypeus weakly convex anterodorsad, without conspicuous sculpture, sparsely bearing subdecumbent/suberect pubescent hairs and relatively long standing hairs; frontal lobe obsolete, only partially concealing antennal insertion; antenna 8-segmented, without distinctly differentiated club; scapes in full-face view a little beyond the line across posterior end of eyes; eye situated behind midlength of head; gena (as measured from anterior margin of eye to mandibular insertion) 1.6–2.0 times



Fig. 8–9. *Cladomyrma scopulosa* n. sp., paratype, queen. 8, Body in profile; 9, Propodeum and metapleuron in profile, arrow indicates the metapleural gland orifice. Fig. 8–9. *Cladomyrma scopulosa* n. sp., paratype, queen. 8, Body in profile; 9, Propodeum and metapleuron in profile, arrow indicates the metapleural gland orifice.

as long as maximal diameter of eye; mesosoma as in the major; mesopleuron rarely with an obsolete transverse impression; metapleural gland orifice relatively narrowly opening; petiole in profile scale-like (higher and thinner than that of the major); its dorsal top in rear view very weakly to conspicuously emarginate; gaster as major.

Queen (dealate queens; Figs. 7–9). HL 1.28–1.42 mm, HW 1.13–1.26 mm, SL 0.61–0.67 mm, EL 0.38–0.43 mm, ML 2.10–2.21 mm, FL 0.87–0.97 mm, CI 86–89, SI 52–56, EI 34–35, FI 75–80 (n=4). Coloration of body as the major; head in full-face view subrectangular with round posterior margin, bearing standing hairs posteriorly and laterally; frons and vertex sparsely bearing short standing hairs and very short appressed/decumbent hairs, smooth and shining (but

with pit of hairs); gena longitudinally rugose, bearing standing hairs; ventral face of head covered with decumbent pubescence, bearing standing hairs; median part of clypeus strongly raised, weakly reticulate, bearing relatively thick standing hairs, relatively steeply declining anteriorly; each lateral part of clypeus with a transverse subbasal ridge (but the ridge less developed than that of the major); frontal lobe obsolete, only partially concealing antennal insertion; antenna 8-segmented; scapes in full-face view a little beyond the line across posterior end of eyes; eye situated around midlength of head; gena (as measured from anterior margin of eye to mandibular insertion) almost as long as or a little shorter than maximal diameter of eye; median and lateral ocelli present; mandible with 5 teeth (including basal angle), in full-face view forming an obtuse outer angle; outer surface of mandible coarsely rugose longitudinally, bearing relatively thick standing hairs; mesosoma densely covered with pubescence over the surface (but dorsal part of katepisternum and large part of metapleuron often without pubescence), sparsely bearing standing hairs on pronotum, mesoscutum (marginal area), mesoscutellum, mesopleuron (ventral area) and propodeum (dorsum); standing hair on propodeum relatively long and thick; mesoscutum with parapsidal furrows; mesopleuron with a weak and narrow transverse groove which separates anepisternum and katepisternum; metapleural gland orifice narrowly opening (arrow in Fig. 9); petiole in profile low, flattened dorsally; gaster covered with appressed pubescence over the surface; 1st tergite sparsely bearing standing hairs other than those arranged along posterior border of each tergite.

Remarks. The present species is relatively similar to *C. hobbyi* Donisthorpe and very similar to *C. petalae* Agosti. In *C. hobbyi* (paratype queen and non-type major, minors and queens (det. Agosti & Moog, 1999, MCZC) were examined) the metapleural gland orifice broadly opens in the major, minor and queen, and mandible has 4 teeth (including basal angle) in the queen. On the other hand, in the

present species, the orifice narrowly opens especially in the major and queen (Fig. 9), and mandible has 5 teeth (including basal angle) in the queen. Subbasal ridge in each lateral part of clypeus is less developed in the major of *C. petalae* (paratype major, minors and males, and non-type major, minor and queens (det. Agosti & Moog, 1999, MCZC) were examined) than in that of the present species. The major of known members of *Cladomyrma* have a somewhat "truncated clypeus" (Agosti 1991). The present species shows an extreme case.

Distribution. Northern and Northern Middle Vietnam.

Bionomics. Colonies examined here were collected from the inside of shoots/branches of *Saraca dives* (Leguminosae). Further ecological information on this species will be given in Bui *et al.* (in prep.).

ACKNOWLEDGMENTS

We wish to thank Dr. Le Xuan Canh (Director, Institute of Ecology and Biological Resources, Hanoi), and the director and staff in Cuc Phuong N. P. (Ninh Binh Province) for their kind arranging of official permissions. Special thanks are due to Mr. Luong Van Hao (Cuc Phuong N. P.) for his kind assistance in our field work, Dr. Gary D. Alpert (Harvard University) and Stefan Cover (MCZC) for their reading through an earlier draft of this paper, and Prof. Seiki Yamane for his kind comments/suggestions. K. Eguchi's research activities are supported by the Research Fellowships of the Japan Society for the Promotion of Science for Young Scientists.

REFERENCES

- Agosti, D. 1991. Revision of the oriental ant genus *Cladomyrma*, with an outline of the higher classification of the Formicinae (Hymenoptera: Formicidae). *Systematic Entomology*, 16, 293–310.
- Agosti, D., J. Moog & U. Maschwitz 1999. Revision of the Oriental plant-ant genus *Cladomyrma*. *American Museum Novitates*, 3283, 1–24.

- Fujiwara, N., K. Murase, R. Yamaoka, D. Wiwatwitaya, W. Jaitrong & Sk. Yamane 2004. A comparison of composition and profile of surface chemicals between *Cladomyrma* ants and their host plant *Sphenodesme* sp. ANeT Newsletter, No. 7, 9–13.
- Yamane, Sk., T. V. Bui, K. Ogata, H. Ôkido & K. Eguchi 2003. Ant fauna of Cuc Phuong National Park, North Vietnam (Hymenoptera: Formicidae). Bulletin of the Institute of Tropical Agriculture, Kyushu University, 25 (2002), 51–62.

