

# Redescription of *Leptogenys aspera* (André, 1889) (Hymenoptera, Formicidae, Ponerinae) from Southeast Asia

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**Abstract** *Leptogenys aspera* (André, 1889) is redescribed on the basis of the worker caste from Vietnam, Laos, and Thailand. This species is newly recorded from Laos and Thailand. It is recognized by the remarkable mandible with seven teeth, i.e., three short teeth on the basal margin, basal angle, two distinct teeth on the masticatory margin and an acute apical tooth.

## Introduction

The genus *Leptogenys* Roger, 1861 is one of the largest ant genera and contains 302 species and 25 subspecies throughout the tropical and subtropical regions (Bolton, 2016). In the Oriental region, 60 species and 22 subspecies have been recorded, but for many of them information on structural characters and behavior as well as distribution is quite restricted. *Leptogenys aspera* (André, 1889) was originally described from Vietnam based on the worker caste. Although records of this species are available for the worker from Myanmar (Bingham, 1903) and for the larva from Sulawesi (Wheeler & Wheeler, 1976), its precise range has been almost unknown. It subsequently appeared only in certain ant catalogs and keys (Emery, 1911; Chapman & Capco, 1951; Bolton, 1995; Xu & He, 2015). In this paper, it is redescribed and newly recorded from Laos and Thailand.

## Material and Methods

Depositories of the type specimens and non-type specimens examined are as follows:

SKYC – Seiki Yamane Collection, Kagoshima, Japan

MNHN – Muséum National d’Histoire Naturelle, Paris, France

Colony codes and depositories are shown in round and square brackets, respectively.

Photographs of specimens were taken with a Canon EOS 7D digital camera with a Canon macro photo lens MP-E 65mm (Canon Inc., Tokyo, Japan) and then combined using the CombineZM software. General structure of specimens was observed with an Olympus-SZX9 stereomicroscope (Olympus Corporation, Tokyo, Japan). Maps were generated using DIVA-GIS 7.5.0. Digital images of photographs and maps were edited with Adobe Photoshop 7.0 (Adobe, San Jose, CA, USA).

## Measurements & Indices

Measurements are shown in millimeters and were taken with a micro ruler (MR-2, minimum scale value: 0.05 mm). The ratios were calculated from measurements as denominated indices.

HL – Head length: the maximum length of the head in full-face view, excluding the mandible, measured from the

anterior margin of the clypeus to the nuchal carina.

HLL – Head lateral margin length: in full-face view, the head length measured from the mandible base to the nuchal carina.

HLA – Anterior head length: in full-face view, the head length measured from the mandible base to the anterior edge of the eye.

HW – Head width: the maximum wide of the head in full-face view, excluding the eyes.

CML – Clypeal median lobe length: in full-face view, the straight-line length measured from the anterior margin of the clypeus to the anterior margin of the torulus.

CI – Cephalic index:  $HW/HL \times 100$ .

CLI – Clypeus index:  $CML/HL \times 100$ .

SL – Scape length: the straight-line length of the first antennal segment, excluding the neck and basal condyle.

SI – Scape index:  $SL/HW \times 100$ .

EL – Eye length: the vertical-line length of the compound eye in full-face view.

OI – Ocular index:  $EL/HLL \times 100$ .

PrL – Pronotum length: the diagonal length of the pronotum in profile, measured from the anterior margin of the pronotum excluding the collar to the posterior extremity of the pronotum.

PrH – Pronotum height: the maximum height of the pronotum

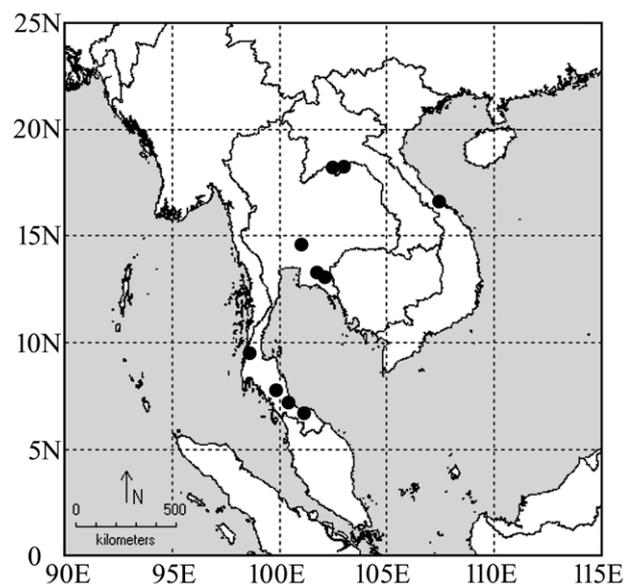


Fig. 1. Collection sites of *Leptogenys aspera* in this study.

in profile, measured from the posterior base of the lateral margin of the pronotum to the highest point of the pronotum.

PrW – Pronotum width: the maximum width of the pronotum in dorsal view.

WL – Weber's length: the diagonal length of the mesosoma in profile from the anterior margin of the pronotum excluding the collar to the posterior extremity of the propodeal lobe.

PeL – Petiole length: the maximum length of the petiole in profile, measured from the anteriormost margin to posteriormost margin of the petiole, including the peduncle.

PeH – Petiole height: the height of the node in profile, measured from the ventral margin of the subpetiolar process to the highest point of the node.

PeW – Petiole width: the maximum width of the node in dorsal view.

LPI – Lateral petiole index:  $PeH/PeL \times 100$ .

DPI – Dorsal petiole index:  $PeW/PeL \times 100$ .

## Taxonomy

### *Leptogenys aspera* (André, 1889) (Figs. 1–4)

*Loboptelta aspera* André, 1889: 222 (original description: type locality: Hue, Vietnam); Dalla Torre, 1893: 43 (catalog); Bingham, 1903: 55 (in key), 60 (record from Myanmar; description).

*Leptogenys (Lobopelta) aspera* (André, 1889); Forel, 1900: 305 (in key), 310 (comment); Emery, 1911: 102 (catalog); Chapman & Capco, 1951: 32 (checklist); Wheeler & Wheeler, 1976: 52 (record from Sulawesi; description of larva).

*Leptogenys aspera* (André, 1889); Bolton, 1995: 230 (catalog); Xu & He, 2015: 138 (checklist), 150 (in key).

*Type material.* Holotype. Worker, Hue, Vietnam, specimen code: ANTWEB CASENT 0915462 [MNHN: EY9255] (Fig. 2D). Detailed collecting locality of the types is unknown. For convenience, the location of this specimen is marked



Fig. 2. *Leptogenys aspera*, holotype, worker from Vietnam, specimen code: ANTWEB CASENT 0915462. A: head, full-face view, B: lateral view, C: dorsal view, D: labels.



Fig. 3. *Leptogenys aspera*, worker from Laos. A: head, full-face view, B: lateral view, C: dorsal view.

at the center of Thua Thien-Hue Province, Vietnam, on the distribution map (Fig. 1).

*Non-type materials.* CENTRAL LAOS. 1 worker, Sivilay Village, Naxaithong District, Vientiane Capital, Laos, 18°15' N, 102°27' E, ca. 200 m, 7 V 2010, Weeyawat Jaitrong leg. [SKYC]; 5 workers (WJT10-LAO127), Dry evergreen forest, Phang Dang Village, Mayparkngum District, Vientiane Capital, Laos, 18°14' N, 103°01' E, up to 500 m, 13 VI 2010, Weeyawat Jaitrong leg. [SKYC]; 1 worker, same loc., 14 VI 2010, Weeyawat Jaitrong leg. [SKYC]; 2 workers (LA10-SKY-097), from rotting wood, same loc., 12 VI 2010, Seiki Yamane leg. [SKYC]; 3 workers (LA10-SKY-111), same loc., 13 VI 2010, Seiki Yamane leg. [SKYC]. EAST THAILAND. 5 workers (TH02-SKY-24), Phu Khae Botanical Garden, Saraburi Province, Thailand, 1 VII 2002, Seiki Yamane leg. [SKYC]; 7 workers (TH03-SKY-16), Dry evergreen forest, Lumchangwat Station, Khao Ang Rue Nai Wildlife Sanctuary, Chachoengsao Province, Thailand, 21 VIII 2003, Seiki Yamane leg. [SKYC]; 5 workers (TH01-SKY-46), Rainforest, Khao Soi Dao Wildlife Sanctuary, Chanthaburi Province, Thailand, 4 VI 2001, Seiki Yamane leg. [SKYC]. SOUTH THAILAND. 2 workers (WJT09-TH20-72), Evergreen forest, Khlong Nakha Wildlife Sanctuary, Ranong Province, Thailand, 12 VIII 2009, Weeyawat Jaitrong leg. [SKYC]; 1 worker, River side, Khao Chong, Na Yong District, Trang Province, Thailand, 24 VIII 1998, Hirofumi Ôkido leg. [SKYC]; 3

workers, Kho Hong Hill, Hat Yai District, Songkhla Province, Thailand, 21 X 2011, Seiki Yamane leg. [SKYC]; 2 workers (TH11-SKY-152), same data as the former [SKYC]; 1 worker, Sai Khao, Khok Pho District, Pattani Province, Thailand, 25 VIII 1998, Hirofumi Ôkido leg. [SKYC].

*WORKER. Diagnosis.* In full-face view, head longer than wide (CI: 72–77). In full-face view, eye situated anterior to mid-length of head, breaking lateral outline of head. Mandible with basal angle; basal margin with three teeth; masticatory margin with three teeth including apical tooth. Anterior edge of torulus anterior to transverse line extending across mandible bases. Clypeus projecting apically into trapezoidal lobe, with longitudinal median carina; apex truncate; median lobe short (CLI: 15–17). Hypostomal tooth absent. Petiole in profile higher than long, in dorsal view longer than wide; in profile, petiolar node rectangular, highest posteriorly; anterior and posterior margins inclined anteriorly. Subpetiolar process consisting of fan-shaped anterior lobe and thin posterior extension.

*Measurements.* VIETNAM (n = 1, holotype). HL: 1.49, HLL: 1.15, HLA: 0.16, HW: 1.14, CML: 0.24, CI: 76, CLI: 16, SL: 1.36, SI: 119, EL: 0.32, OI: 28, PrL: 0.81, PrH: 0.65, PrW: 0.95, WL: 2.08, PeL: 0.71, PeH: 0.87, PeW: 0.71, LPI: 123, DPI: 101.

CENTRAL LAOS (n = 5). HL: 1.45–1.57, HLL: 1.11–1.23, HLA: 0.14–0.20, HW: 1.08–1.17, CML: 0.19–0.28, CI: 73–77,

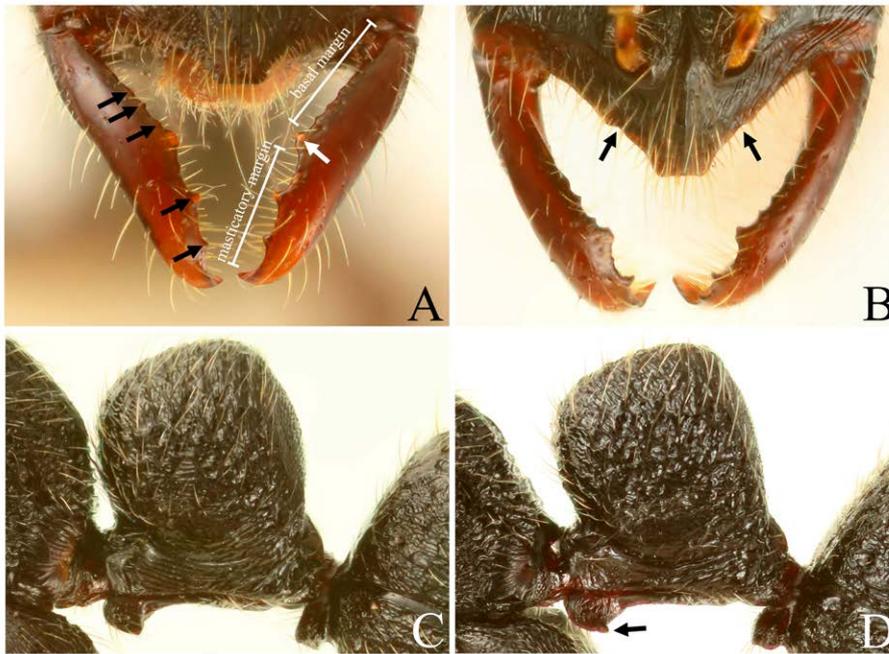


Fig. 4. *Leptogenys aspera*, workers. A, B: from Thailand; C, D: from Laos. A: mandible, frontal view (black arrows: teeth; white arrow: basal angle); B: ventral half of head, full-face view (arrow: notch on anterolateral margin of clypeus); C: petiole, lateral view; D: ditto (arrow: acute posteroventral angle of anterior lobe).

CLI: 12–18, SL: 1.32–1.41, SI: 119–128, EL: 0.28–0.34, OI: 25–27, PrL: 0.87–0.91, PrH: 0.57–0.65, PrW: 0.88–0.97, WL: 2.20–2.28, PeL: 0.72–0.79, PeH: 0.91–0.98, PeW: 0.63–0.69, LPI: 120–132, DPI: 85–94.

EAST THAILAND (n = 5). HL: 1.34–1.57, HLL: 1.04–1.21, HLA: 0.15–0.17, HW: 1.03–1.19, CML: 0.22–0.24, CI: 76–77, CLI: 15–17, SL: 1.29–1.51, SI: 125–128, EL: 0.29–0.33, OI: 26–28, PrL: 0.82–0.91, PrH: 0.53–0.59, PrW: 0.84–0.95, WL: 2.09–2.25, PeL: 0.67–0.79, PeH: 0.81–0.95, PeW: 0.61–0.72, LPI: 119–124, DPI: 89–92.

SOUTH THAILAND (n = 5). HL: 1.37–1.49, HLL: 1.05–1.15, HLA: 0.15–0.18, HW: 1.06–1.13, CML: 0.21–0.26, CI: 72–77, CLI: 15–17, SL: 1.27–1.45, SI: 120–135, EL: 0.27–0.34, OI: 25–30, PrL: 0.86–0.94, PrH: 0.55–0.64, PrW: 0.87–0.92, WL: 2.12–2.26, PeL: 0.70–0.73, PeH: 0.86–0.95, PeW: 0.64–0.71, LPI: 120–129, DPI: 93–97.

**Redescription** (holotype and non-type specimens) Head more than 0.7 times as wide as long in full-face view, widest just posterior to eyes; lateral margin broadly convex; posterior margin broadly convex. Mandible long, moderately narrow, not capable of closing tightly against anterior margin of clypeus; basal angle present (Fig. 4B: white arrow); three short teeth on basal margin (Fig. 4B: black arrows), often reduced; masticatory margin with two distinct teeth (Fig. 4B: black arrows) and acute apical tooth. With head in full-face view, eye longer than one-fourth of lateral margin of head, situated anterior to mid-length of head, breaking lateral outline of head, weakly prominent. Antennal scape surpassing posterior margin of head by one-fifth to one-fourth of its length; antennomere III longer than II; III–VII becoming progressively shorter apically; VII–XI almost same in length; XII slightly longer than III. Anterior edge of torulus lying anterior to transverse line that extends across mandible bases. Clypeus projecting apically into trapezoidal lobe, with longitudinal median carina; apex truncate, with a peg-like seta; median lobe less than one-fifth of head length; anterolateral

margin slightly concave to almost straight, with notch at mid-length (Fig. 4A: arrow). Hypostomal tooth absent. Pronotum in profile longer than high, in dorsal view longer than wide. Mesonotum in dorsal view shorter than wide. Metanotal groove weakly impressed. Mesopleuron demarcated from metapleuron by sulcus. Metapleural-propodeal sulcus present. In profile, propodeal dorsum broadly convex, longer than length of propodeal declivity; propodeal declivity almost straight to weakly concave, forming continuous curve with dorsum or separated from dorsum by blunt angle. Petiole in profile higher than long, in dorsal view longer than wide; in profile, petiolar node rectangular, highest posteriorly; anterior and posterior margins inclined anteriorly, convex; dorsal margin weakly convex; in dorsal view, lateral margin convex. Subpetiolar process consisting of anterior lobe and posterior extension; anterior lobe occupying one-fourth to one-third of ventral margin of petiole, fan-shaped, with continuous curve formed by anterior and ventral margins, with posteroventral angle rounded or acute (Fig. 4C, D: arrow), posteriorly incurving into posterior extension; posterior extension thin. Anterior face of gastral tergite I flat; gastral sternite I with indentation between prora and anteroventral angle; in profile, prora shorter than high, subrectangular (Fig. 4C, D); gaster with distinct constriction between segments I and II.

Head longitudinally rugulose-striate, but vertex transversely rugulose-striate, gena longitudinally striate. Mandible smooth. Clypeus obliquely striate. Mesosoma rugulose. Ventral face of head, and prosternum transversely to longitudinally striate. Mesosternum smooth, with few striae. Propodeal declivity ventrally with transverse crests. Petiole rugulose, but ventral half of petiole usually longitudinally striate, sometimes smooth. Gastral segment I alveolate, with scalloped depressions; constriction between gastral segments I and II scrobiculate; gastral segment II finely and longitudinally striate, with scalloped depressions; gastral segments III–V smooth. Body with small, scattered piligerous

punctures.

Body black, shiny; antenna, mandible, femora, tibiae, tarsi, and gastral segments III–V orangish. Clypeus black, except for lateral lobe and anterior margin of median lobe orangish. Ventral half of petiole, and coxae black to black-red. Body with yellow-brown long standing hairs; antennal scape, tibiae and tarsi densely with short recumbent pubescence, mixed with long scattered hairs; antennomeres II–XII densely with short standing pubescence.

Queen and Male. Unknown.

*Distribution.* Myanmar (Southern Shan). Laos (Vientiane). Vietnam (Thua Thien-Hue). Thailand (Saraburi, Chachoengsao, Chanthaburi, Ranong, Trang, Songkhla, Pattani). New records from Laos and Thailand.

In this study, I did not obtain conclusive evidence for the occurrence of this species in Sulawesi, Indonesia. The record from Sulawesi based on the larva (Wheeler & Wheeler, 1976) is tentatively removed from the distribution of this species.

*Discussion.* This species is easily recognized by the remarkable structure of the mandible with seven teeth (three short teeth on basal margin, basal angle, two distinct teeth on masticatory margin and an acute apical tooth) (Fig. 4A).

I examined specimens from the four areas: central Vietnam, central Laos, east Thailand, and south Thailand. Measurements of body parts in these specimens showed no noticeable variation between the populations. However, variation was found in the shape of the propodeum. In the specimens from central Laos the propodeal dorsum and declivity form a continuous curve, while in those from Vietnam and Thailand the dorsum is separated from the declivity by a blunt angle. The two ‘forms’, here considered to represent geographical variation, are allopatric in range. Morphological variation among sympatric individuals was observed in the proportion of the anterior lobe of the subpetiolar process (Fig. 4C, D), body surface sculpture, and coloration.

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