A New Species and a New Record of the Ant Genus *Stigmatomma* Roger (Hymenoptera: Formicidae) from India

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**Introduction**

Based on the comparative study of mandible characters in worker caste, Yoshimura and Fisher (2012) revived *Stigmatomma* from synonymy within *Amblyopone*. It is widely distributed and currently represented by 63 living species and 2 fossil species (Bolton, 2015). Noteworthy contributions to this genus include, Brown, 1960; Taylor, 1979; Morisita et al., 1989; Terayama, 1989; Dlussky et al., 1990; Lattke, 1991; Atanasov and Dlussky, 1992; Onoyama, 1999; Xu, 2001; Lacau and Delabie, 2002; Xu, 2006; Arias-Penna, 2008; Terayama, 2009; Heterick, 2009; Bharti and Wachkoo, 2011 and Xu, 2012.

In India, *Stigmatomma* is represented by 4 species (Bharti, 2011; Bolton, 2015), *S. bellii* (Forel, 1990), *S. rothneyi* (Forel, 1990), *S. minutum* Forel, 1913 and *S. boltoni* (Bharti & Wachkoo, 2011) with recent exclusion of *S. pertinax* (Baroni Urbani, 1978) which has been transferred to *Bannapone* (Eguchi et al., 2015). Here, we describe a new species *S. xui* sp. n. and also document a new record *S. awa* (Xu & Chu, 2012) from India, which we redescribe and formally transfer from *Amblyopone* to *Stigmatomma*. An identification key to the known species of *Stigmatomma* having eleven segmented antenna is provided herewith.

**Materials and Methods**

The specimens were collected through Winkler’s extractor. These were preserved in 70% alcohol and later pinned as per standard procedure in ant taxonomy. The taxonomic analysis was conducted on a Nikon SMZ 1500 stereo zoom microscope. For digital images, Evolution MP digital camera was used on the same microscope with Auto-Montage (Syncroscopy, Division of Synoptics, Ltd.) software. Later images were cleaned with Adobe Photoshop CS5 and Helicon Filter 5. Holotype of new species has been deposited in PUAC (Punjabi University Patiala Ant Collection at Department of Zoology and Environmental Sciences, Punjabi University, Patiala, Punjab, India). Measurements were recorded in millimeters on Nikon SMZ 1500 stereo zoom microscope. Standard measurements and indices follow Xu and Chu (2012).
TL-Total Length: The total outstretched length of the individual, from the mandibular apex to the gastral apex.

HL-Head Length: The straight-line length of the head in perfect full-face view, measured from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin. In species where one or both of these margins is concave, the measurement is taken from the mid-point of a transverse line that spans the apices of the projecting portions.

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

SL-Scape Length: The straight-line length of the antennal scape, excluding the basal constriction or neck.

ML-Mandible Length: The straight-line length of the mandible measured from apex to the lateral base.

PW-Pronotal Width: The maximum width of the pronotum measured in dorsal view.

WL-Weber’s Length: The diagonal length of the mesosoma in profile view, measured from the point at which the pronotum meets the cervical shield to the posterior basal angle of the metapleuron.

PL-Petiole Length: The length of the petiole measured in profile from the anterior process to the posterior most point of the tergite, where it surrounds the gastral articulation.

PH-Petiole Height: The height of the petiole measured in profile from the apex of the ventral (subpetiolar) process vertically to a line intersecting the dorsal most point of the node.

DPW-Dorsal Petiole Width: The maximum width of the petiole in dorsal view.

GL: Gaster Length: The length of gaster in lateral view from the anterior most point of first gasteral segment to the posterior most point (excluding sting).

CI-Cephalic Index = HW×100 / HL.

SI-Scape Index = SL×100 / HW.

LPI-Lateral Petiole Index = PH×100/PL.

DPI-Dorsal Petiole Index = DPW×100/PL.

Acronym of depository

PUAC: Punjabi University Patiala, Ant Collection at Department of Zoology and Environmental Sciences, Punjabi University, Patiala, Punjab, India.

Results

Genus Diagnosis: Head without mandible rectangular or trapezoidal mesosoma and gaster more or less cylindrical in form; mandibles elongate narrow, pointed and slightly curved at apex, middle to basal part of inner margin of mandible with triangular teeth arranged in two rows, or with more or less bifid teeth arranged in a single row, eye moderate to minute to vestigial, placed at the sides on above or below the mid length of head; antennae 11-12 segmented, filiform, the apex only slightly incrassate. Mesosoma narrower than head, promesonotal suture distinct, mesosoma strongly constricted at promesonotal suture and divided in to almost two equal halaves; meso-metanotal suture effaced; metanotum obliquely truncate posteriorly, basal portion passing into the apical portion by a more or less rounded curve, apical face of metanotum broadened, sides submargined; legs short, robust, tibiae of the posterior legs with two calcaria. Petiole cubical, broadly attached to ABIII, gaster narrow, not wider than the mesosoma, constriction between the basal two segments deep, giving the basal segment a nodiform appearance; sting exserted.

Description of new species

*Stigmatomma xui* sp. n.


Holotype measurements: TL:  1.87; HL:  0.43; HW: 0.34; SL: 0.22; ML: 0.29; PW: 0.21; WL: 0.46; PL: 0.18; PH: 0.19; DPW: 0.20; GL: 0.57; CI: 79; SI: 64; LPI: 106; DPI: 112.

Paratype measurements: TL: 1.94; HL: 0.44; HW: 0.33; SL: 0.21; ML: 0.30; PW: 0.21; WL: 0.49; PL: 0.17; PH: 0.20; DPW: 0.21; GL: 0.54; CI: 75; SI: 63; LPI: 117; DPI: 123.

Head: In full face view, head rectangular (CI:79); Occipital margin weakly concave, occipital  corners rounded; mandibles narrow and slender, outer margins almost straight except at the apical part with 8 teeth (2 apical and 2 basal teeth are simple; middle 4 are paired arranged in two rows); anterior margin of clypeus convex, with 6 dentiform setae which arise from flat cuticle; median setae fused at base; posttorular flange close to each other, covering antennal insertion; antennae 11 segmented; scape short, not reaching to posterior corner of head (SI: 64); antennal segments 3-10 broader than long; segment 11 longer than broad; eyes absent (as seen under stereozoom optical microscope).

Mesosoma and Petiole: In lateral view, mesosoma weakly convex; promesonotal suture distinct; meso-metanotal suture effaced. propodeal dorsum straight, posterolateral corner of propodeum rounded; petiole broadly attached to ABIII, petiole quadrate in lateral view with anterior border almost straight, dorsal margin straight; subpetiolar process narrow, oblique with rounded anterventral corner.

In dorsal view, mesonotum constricted, propodeum slightly widened backward, propodeal declivity concave, petiole broader than long (DPI: 112), anterodorsal corner rounded.

Gaster: First gastral segment broader than long, broader than dorsal petiolar width, second gastral segment broader than the first gastral segment.


Pilosity and pubescence, Pilosity sparse few erect or suberect hairs on mandibles, apical antennal segments and apex of gaster; dorsal surfaces of head and body with dense decumbent pubescence. tibiae with dense decumbent pubescence, but without suberect hairs.

Color: reddish brown; antennae, mandibles, legs and tip of gaster yellow.

Ecology: This species was collected by Winkler’s extractor from an undisturbed dense forest. The thickness of leaf litter was about 4 inches. The floor of the forest receives limited sun light. The maximum recorded temperature of the area is 28°C with minimum -1°C and the region receives 325cm of rainfall per annum.

Etymology: The species is named in honor of Prof. Zhenghui Xu.

Remarks: This new species most resembles S. sakaii (Terayama, 1989), but can be distinguished from the latter by the presence of 6 dentiform setae which arise from flat cuticle; oblique subpetiolar process and rounded posterolateral corner of propodeum and anterodorsal corner of petiole, whilst S. sakaii is characterized by anterior clypeal margin with 8 dentiform setae which arise from tubercle-like cuticular projection; trapezoidal subpetiolar process; bluntly angled posterolateral corner of propodeum and anterodorsal corner of petiole.

New record from India

Stigmatomma awa (Xu & Chu, 2012) new combination

*Amblyopone awa* Xu & Chu, 2012: 1192, figs. 51-56 (w. q.) CHINA.

**Material Examined:** 7 workers: India: Arunachal Pradesh, Lumla, 27°32’49.68”N, 91°43’ 56.99”E, 2800 m, 8.x.2013 Winkler method (coll. Joginder Singh Rilta).

TL: 6.37-6.71; HL: 0.79 - 0.86; HW: 0.67- 0.74; SL: 0.41 - 0.46; ML: 0.55 - 0.62; PW: 0.38 - 0.41; WL: 0.98 - 1.13; PL: 0.36 - 0.38; PH: 0.40 - 0.43; DPW: 0.43 - 0.46; GL: 1.10 - 1.22; CI: 84.34 - 86.04; SI: 61.19 - 62.16; LPI: 111.12 - 113.15; DPI: 104.87 - 121.05 (workers measured).

Head: In full-face view, head roughly trapezoidal, widened forward and longer than broad (CI:86.04); Occipital margin weakly concave, occipital corners bluntly angled; lateral sides weakly convex, anterolateral corners acutely toothed; mandibles elongate, masticatory margin with a long apical tooth, a short subapical tooth; anterior clypeal margin with 8 dentiform setae, arranged in pairs; antennae short, 12-segmented, apices of scape reach to about 2/3rd of the distance from antennal socket to occipital corners (SI:62.16), funiculi incrassate toward apex; eyes small with 3 facets, located behind the midpoint of the lateral sides of head.

Mesonotum and Petiole: In lateral view, pronotum weakly convex, promesonotal suture distinctly notched, mesosoma short and convex, metanotal groove absent, propodeal dorsum straight about 2 times as long as declivity, posterodorsal corner rounded, declivity weakly convex; petiole trapezoidal, dorsal and anterior faces nearly straight, subpetiolar process roughly rectangular, with a large elliptical sub-transparent fenestra, ventral face straight, posteroventral corner rightly angled.

In dorsal view, mesonotum constricted, propodeum slightly widened backward, propodeal declivity longitudinally concave; petiole broader than long, (DPI: 121.05) anterior and lateral sides weakly convex.

Gaster: First gastral segment broader than long, broader than dorsal petiolar width, second gastral segment broader than the first gastral segment.

Sculpture: Mandible longitudinally striate, head densely punctured, interfaces appear as micro-reticulation; pronotum densely punctured, the narrow longitudinal middle strip without punctures, dorsum of mesonotum and propodeum densely punctured; lateral sides of mesonotum and metanotum finely longitudinally striate; petiole and gaster finely sparsely punctured.

Pilosity and pubescence: dorsal surface of head and body with sparse suberect short hairs, except two pairs of long hairs on anterior clypeal margin and dense decumbent pubescence; tibiae with dense decumbent pubescence, but without suberect hairs.

Colour: reddish brown, eyes black, antennae and legs yellowish brown.

Global distribution: Palearctic Region: China, Tibet and India.

Remarks: Stigmatomma awa (Xu & Chu, 2012) is reported here for the first time from India, earlier known from China and Tibet. This species is remarkably different from the other known Indian species with following combination of characters: mandibles with 7 teeth; anterior clypeal margin with 8 dentiform setae; eyes small, each with 3 facets; subpetiolar process with elliptical sub-transparent fenestra. This species was originally described in Amblyopone and we formally place it in Stigmatomma based on the diagnosis provided by Yoshimura and Fisher (2012).

Key to the known species of Stigmatomma with eleven segmented antenna

1. Anterolateral corners of head acutely toothed/Genal teeth present (Fig A), mesosoma smooth and shiny (Fig C) (Neotropical Region: Dominican Republic, Greater Antilles, Lesser Antilles, Type locality-Puerto Rico)………………................................. S. falcatum (Lattke, 1991).

– Anterolateral corners of head not toothed/Genal teeth absent (Fig B), mesosoma variously sculptured from sparsely to densely punctuate (Fig D).................................2

Figs A-D. S. falcatum (Lattke, 1991).  A. Anterolateral corners of head acutely toothed; B. Anterolateral corners of head not toothed; C. Mesosoma smooth and shiny; D. Mesosoma variously sculptured from sparsely to densely punctuate.

Figs E & G. S. sakaii (Terayama, 1989): E. Head in full-face view; G. Body in profile view. Figs F & H. S. xui sp. n.: F. Head in full-face view; H. Body in profile view.
2. In full face view, head trapezoidal in shape, masticatory margin of mandible with 5 set of paired teeth; in profile view (Fig E), posterolateral corner of propodeum angulate, and anterodorsal corner of petiolar node bluntly angled; subpetiolar process trapezoidal (Fig G) (Palearctic Region: Japan; Oriental Region: China, Type Locality-Taiwan)...................... S. sakai (Terayama, 1989).
– In full face view, head rectangular in shape, masticatory margin of mandible with 4 set of paired teeth; in profile view (Fig F), posterolateral corner of propodeum and anterodorsal corner of petiolar node rounded; subpetiolar process oblique (Fig H) (Oriental Region: India).................................................. S. xui sp. n.

Fig 7-9. Images illustrating the measurements used.
7. head in full-face view with measuring lines for HL, HW, SL and ML.
8. body in lateral view with measuring lines for WL, PH, PL and GL.
9. body in dorsal view with measuring lines for PW and DPW.

Fig 10-13. Stigmatomma sakai (worker-image from antwiki):
10. Head in full face-view;
11. Body in profile view;
12. Body in dorsal view;
13. Label.

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References


