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A new ant species of the *Leptogenys sulcinoda*-group (Hymenoptera: Formicidae) from Saudi Arabia

Mostafa R. Sharaf^{a*}, Shahid A. Akbar^b, Hathal M. Al Dhafer^a and
Abdulrahman S. Aldawood^a

^aPlant Protection Department, College of Food and Agriculture Sciences, King Saud University, Riyadh, Saudi Arabia; ^bPlant Protection Division, Department of Entomology, Central Institute of Temperate Horticulture, Srinagar, Jammu and Kashmir, India

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Leptogenys polaszeki sp. n. is described from the Asir Mountains, Saudi Arabia, based on the worker caste. The new species is a member of the *L. sulcinoda*-group and appears closest to *L. bellii* Emery, 1901, originally described from Ethiopia. The likely male caste of *L. polaszeki* sp. n. is described based on a single specimen collected by a pitfall trap in the type locality.

<http://www.zoobank.org/urn:urn:lsid:zoobank.org:pub:5D3BF3AF-5308-48E8-8416-902278909AD5>

Keywords: Ponerinae; Middle East; Asir Mountains; key; Afrotropical region

Introduction

The ant genus *Leptogenys* Roger, 1861 is one of the most speciose genera within the subfamily Ponerinae, with 302 valid species, 25 subspecies and one fossil species (Bolton, 2016). The genus is widely distributed throughout tropical and subtropical regions (Schmidt, 2013; Rakotonirina & Fisher, 2014) and is known for its ability to successfully invade regions beyond its native habitats through human commerce (Wilson & Taylor, 1967), especially some members of the *L. maxillosa*-group (Bolton, 1975; Rakotonirina & Fisher, 2014).

Leptogenys has been revised for several zoogeographical regions, including the Afrotropical (Bolton, 1975; Taylor, 1998), the Malagasy (Rakotonirina & Fisher, 2014), the Nearctic, Neotropical (Lattke, 2011), and the Oriental region (Xu & He, 2015). Additionally, this genus has been reviewed for southwestern Australia (Heterick, 2009), Fiji (Sarnat & Economo, 2012), China (Zhou et al. 2012), and India (Bharti & Wachkoo, 2013). In their study of the higher classification of the Ponerinae, Schmidt and Shattuck (2014) provided information on the taxonomy distribution, ecology, behaviour, and phylogeny of *Leptogenys*.

The nesting habits of *Leptogenys* are diverse, including rotten wood, logs, leaf litter, directly in soil, under rocks, and a few species are even subarctic (Bolton 1975, Rakotonirina & Fisher 2014). The limited data on the feeding habits indicate specialised predatory foraging of mainly Isoptera (termites) and terrestrial Isopoda (Bolton, 1975; Lattke, 2011).

Little taxonomic information is currently available for Arabian *Leptogenys*. Records for *L. maxillosa* (Smith, F., 1858) have been published from Saudi Arabia and Oman (Collingwood, 1985). This species has been introduced into both the Old and the New

*Corresponding author. Email: antsharaf@gmail.com

World tropics with a probable origin from the Afrotropical Region (Bolton, 1975). In the present paper, a new species is described from the Asir Mountains of southwestern Saudi Arabia, based on the worker and male castes.

Material and Methods

Measurements: All measurements are in millimetres and follow the standard measurements given by Rakotonirina and Fisher (2014). Eye length (EL): Maximum diameter of eye; Head length (HL): Midline length of head capsule in frontal view; Head width (HW): Width of head in frontal view; Petiolar node height (PNH): Height of node in profile; Petiolar node length (PNL): Maximum length of node in dorsal view; Petiolar node width (PNW): Maximum width of node in dorsal view; Pronotum width (PW): Maximum width of pronotum with mesosoma in dorsal view; Scape length (SL): Straight line length of first antennal segment excluding basal constriction; Total Length (TL): Total length as sum of lengths of head, mesosoma, petiole and gaster; Weber's length (WL): Length of mesosoma in profile from a point at which pronotum meets cervical shield to posterior base of propodeal lobes or teeth. – **Indices:** Cephalic index (CI): $HW/HL \times 100$; Dorsal petiolar node index (DNI): $PNW/PNL \times 100$; Eye Index (EI): $(EL/HW \times 100)$; Lateral petiolar node index (LNI): $PNH/PNL \times 100$; Scape index (SI): $SL/HW \times 100$.

Taxonomic Classification

The following characters were used to distinguish *Leptogenys* from other Ponerine genera (Bolton, 1975; 1994): workers are monomorphic, minute to large in size; mandibles either subtriangular, short linear, or strongly elongate; median clypeal portion in the form of a distinct lobe, and with a longitudinal median carina; palp formula 4, 4; antennae 12-segmented, with long scapes (SI usually >100); metanotal groove present; middle and hind tibiae each with a large pectinate spur and a smaller simple one; a well-developed constriction between first and second gastral tergites; sting long and stout.

The *L. sulcinoda*-group can be recognised by the following features: mandibles either short and closing tightly against clypeus, or curvilinear, leaving a space between themselves and clypeus when closed; eyes varying in size; second funicular segment as long as or little longer than third; head broader anteriorly than posteriorly; metanotal groove deeply impressed and cross-ribbed (Bolton, 1975).

Results

Leptogenys polaszeki Sharaf & Akbar sp. n.

Worker (Figures 1, 6A, C, E)

Material. Holotype: Asir Province: Abha, Raydah, Saudi Arabia, 18.19465°N, 42.39485°E, alt. 1851 m, 06.ix.2015 (Al Dhafer leg.), Pitfall Trap (P.T.), No. 1-3-1, King Saud University Museum of Arthropods (KSMA), Riyadh, Saudi Arabia. – Paratype. 1 worker, same data as the holotype (KSMA) (CASENT0922261).

Measurements of holotype (paratype in brackets): EL 0.25 (0.25); HL 1.25 (1.15); HW 0.90 (0.85); PNH 0.70 (0.60); PNL 0.45 (0.50); PNW 0.45 (0.45); PW 0.65 (0.60); SL 1.35 (1.35); TL 5.75 (6.00); WL 1.90 (1.85). Indices: CI 72 (74); DNI 100 (90); EI 28 (29); LNI 156 (120); SI 150 (159).

Description. Head. Slightly oval, longer than broad in frontal view, lateral margins converging posteriorly; posterior margin nearly straight in frontal view; antenna 12-segmented; scape long, extending beyond posterior margin of head by about one-third of its length; second funicular segment longer than third; in frontal view, eyes just breaking lateral sides of head in frontal view; eyes of moderate size, with a straight ventral margin and convex dorsal margin, and with 13 ommatidia in the longest row; in

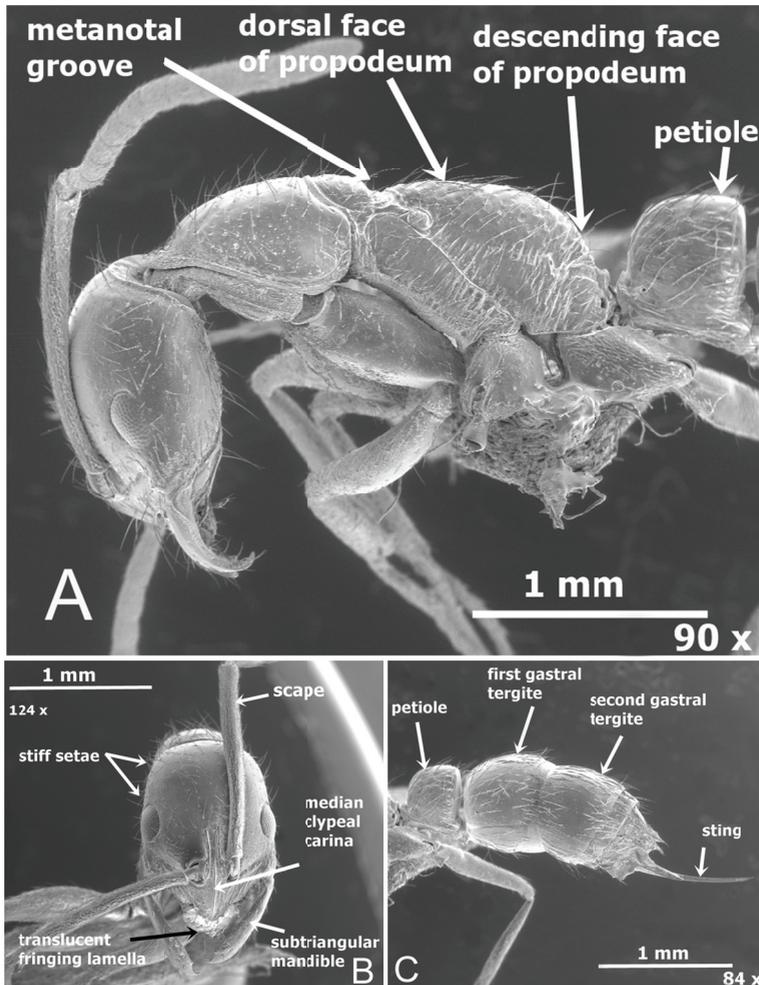


Figure 1. SEM image of worker of *Leptogenys polaszeki* sp. n. 1A. Head, mesosoma, and petiole in profile; 1B. Head in frontal view; 1C. Petiole and gaster in profile.

frontal view, mandibles subtriangular, but capable of closing tightly against the anterior margin of clypeus without a gap between them when apices overlap, and with a terminal tooth and a small basal dent; clypeus triangular with a distinct median carina and a prominent median lobe; anterior clypeal margin with a large translucent, fringing lamella. – Mesosoma. Metanotal groove deeply impressed; propodeal dorsum long, more than 2.5 x longer than descending face; metapleural gland orifice prominent. – Petiole. In profile, anterior face shorter than the posterior face and rounding to dorsum, which meets the posterior face at a right angle, posterodorsal angle not projecting posteriorly. – Sculpture. Mandible smooth and shining with scattered punctures; clypeus finely, longitudinally rugulose; cephalic surface smooth and shining with relatively pit-like punctures; promesonotum, mesonotum, and propodeal dorsum with few scattered pit-like punctures; metanotal groove cross-ribbed in dorsal view; meso-, metapleuron and descending face of propodeum transversally rugulose; petiole, and gastral tergites finely

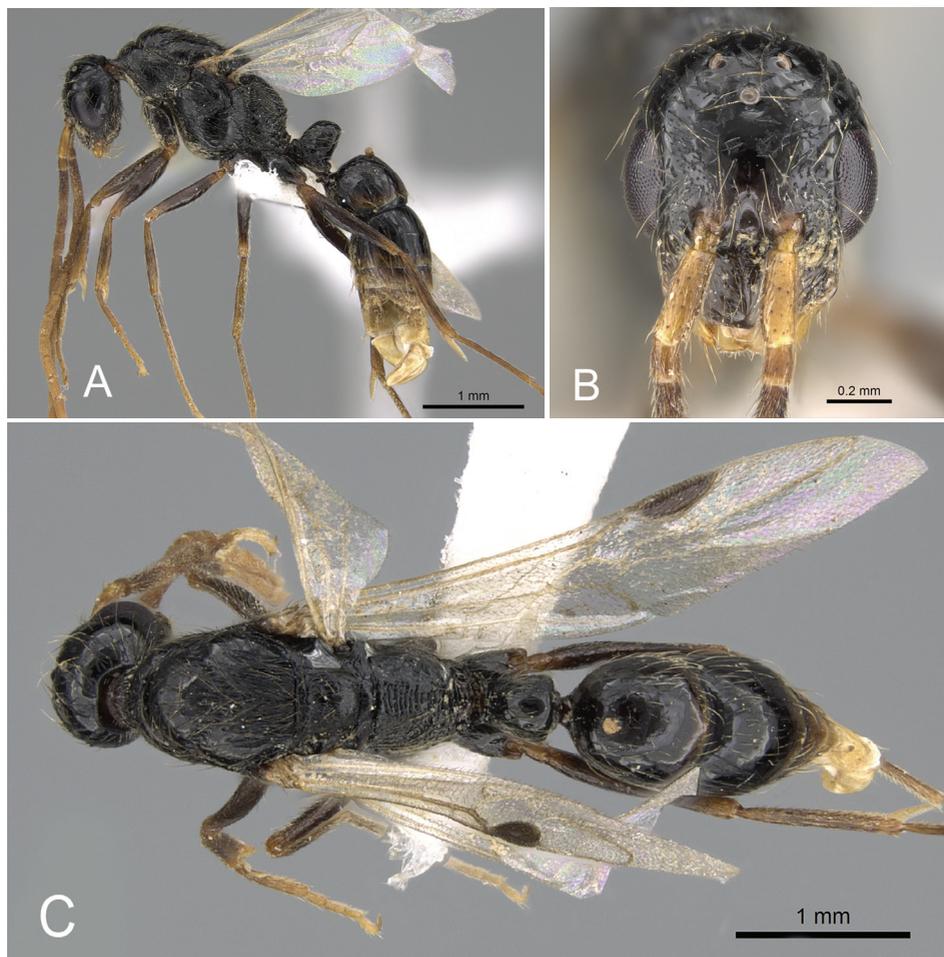


Figure 2. Automontage images of male of *Leptogenys polaszeki* sp. n. A. Body in profile; B. Head in frontal view; C. Body in dorsal view (CASENT0922262) (Photograph: Michele Esposito).

shagreened. – Pilosity. Body with long, yellow, stiff erect to suberect setae; antennae with appressed dense pubescence. – Colour. Black to brown-black; mandibles, antennae, legs, and tip of gaster brown.

Male (Figures 2)

A single male was collected by a pitfall trap in the type locality. This specimen is similar to the workers of *L. polaszeki* sp. n. in terms of body size, colour, sculpture and pilosity and appears to be the male caste of this species. However, a final confirmation is required.

Material: Asir Province: Abha, Raydah, Saudi Arabia, 18.02915° N, 42.389083° E, alt. 1614 m, 26.viii.2014 (Al Dhafer leg.), P.T. 3-3-5, KSMA (CASENT0922262).

Measurements: EL 0.36; HL 0.92; HW 0.72; PNH 0.51; PNL 0.38; PNW 0.39; SL 0.28; TL 5.52; WL 1.92. Indices: CI 78; DNI 103; EI 50; LNI 134; SI 39 (n=1).



Figure 3. Type locality: Raydah Nature Reserve.

Description. Head. Longer than broad with strongly convex posterior margin in frontal view; antenna 13-segmented; scape short (SI 39); all funicular segments distinctly longer than broad; eyes large (EL 0.5 x HW, EI 50), with a straight ventral margin and convex dorsal margin; in frontal view, mandibles reduced; clypeus broad, rectangular, with a feeble but distinct median carina. – Petiole. Like worker. – Sculpture. Mandible as worker; clypeus superficially, irregularly rugulose; cephalic surface as worker; in dorsal view, promesonotum and mesonotum finely longitudinally irregularly rugulose; propodeal dorsum transversely rugulose; petiole smooth and shining. – Pilosity. Like worker. – Colour. As worker, but mandibles, antennae, legs, and tip of gaster yellow or yellow-brown.

Etymology. The species is named in honour of Dr. Andrew Polaszek (Natural History Museum, London).

Type locality (Figure 3). The Raydah Nature Reserve is a part of the Asir Mountains and is located 10 km west of Abha City. The village of Raydah lies at 1600 m just outside the protected area. Raydah Nature Reserve has one of the last remnants of bushy juniper forests existing in Saudi Arabia, with a distinct altitudinal zonation of vegetation. The diversity of the vegetation cover of the region is exceptionally high including *Juniperus procera* (Cupressaceae), *Olea europaea africana* (Oleaceae), *Lycium shawii roem* (Solanaceae), *Aloe officinalis* (Xanthorrhoeaceae), *Panicum turgidum* (Poaceae), *Haloxylon salicornicum* (Chenopodiaceae), *Maerua crassifolia* (Capparceae), *Opuntia ficus-indica* (Cactaceae), *Ziziphus spina-christi* (Rhamnaceae), *Coffea arabica* (Rubiaceae) and *Acacia* spp. (Mimosaceae).

Differential Diagnosis. *Leptogenys polaszeki* sp. n. is a member of the *L. sulcinoda*-group as defined by Bolton (1975) and cannot be identified using his key to Afrotropical species. *L. polaszeki* sp.n. is most similar to *L. bellii* Emery, 1901 from Ethiopia. The

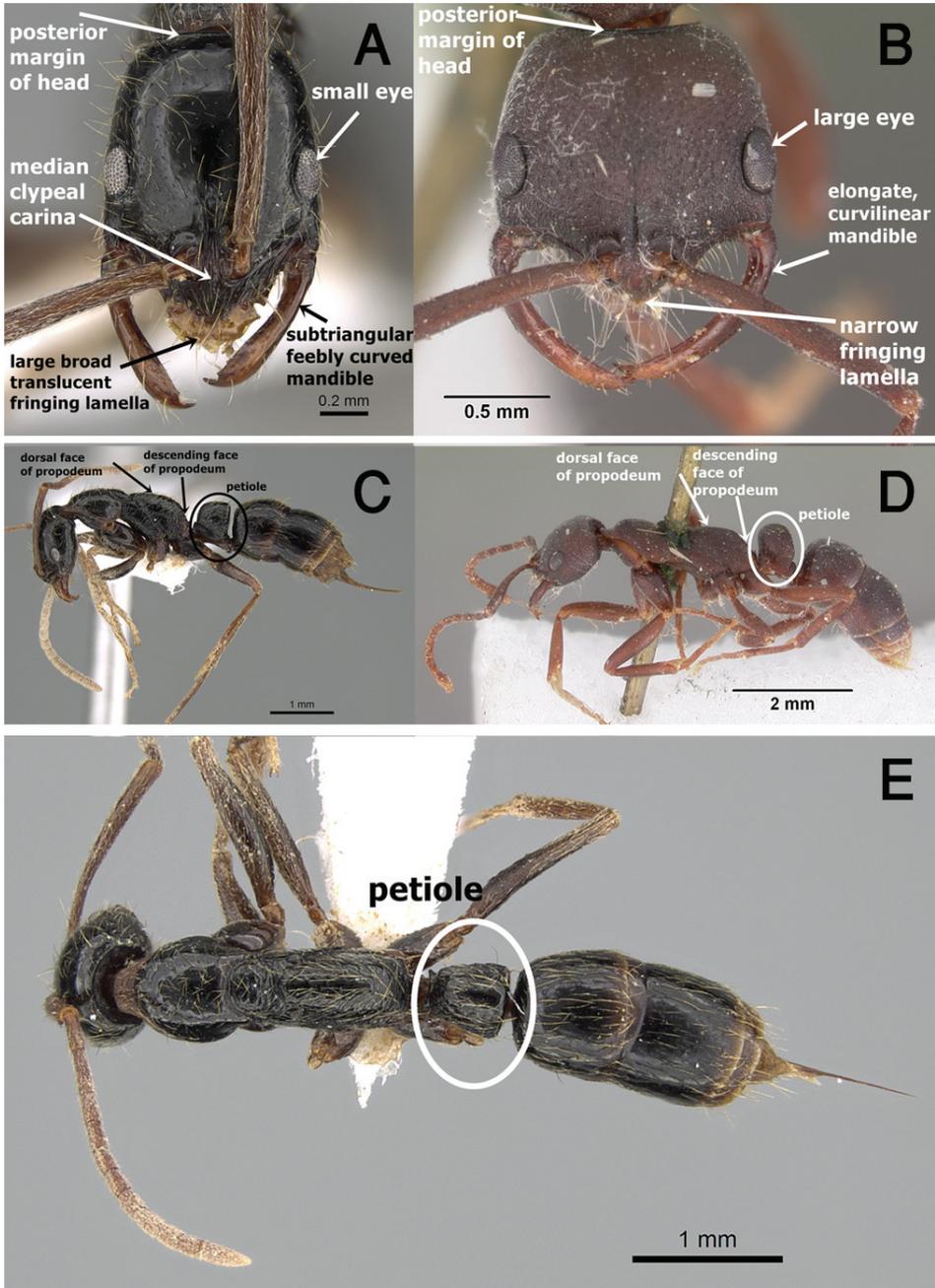


Figure 4. Automontage images of *Leptogenys polaszeki* sp. n. and *L. maxillosa*: A. holotype worker of *L. polaszeki* sp. n., head in frontal view, CASENT 0922261, B. *L. maxillosa*, Syntype worker, head in frontal view, CASENT0102266 (photographer: April Nobile), C. holotype worker of *L. polaszeki* sp. n., body in profile, CASENT 0922261, D. *L. maxillosa*, syntype worker, body in profile, CASENT0102266, E. holotype worker of *L. polaszeki* sp. n. body in dorsal view.

two species are uniformly black to brown-black with mandibles, antennae, legs, and tip of gaster brown. *L. polaszeki* has the metanotal groove deeply impressed in profile, whereas in *L. bellii* the metanotal groove is shallowly impressed. In addition, *L. polaszeki* has longer scapes (SI 150-159), lower dorsal petiolar node index (DNI 90-100), and lower lateral petiolar node index (LNI 120-156), versus (SI 122, DNI 127, LNI 171) for *L. bellii*. Moreover, *L. polaszeki* has smaller eyes, with 13 ommatidia in the longest row, while the eyes of *L. bellii* are larger, with about 21 ommatidia in the longest row. Superficially, *L. polaszeki* appears similar to *L. elegans* Bolton, 1975 from Nigeria, but it can be readily separated by the larger body size (TL 5.75-6.00; HL 1.15-1.25; HW 0.85-0.90), the longer scapes (SI 150-159), and the less abundant hair-pits on the body surface; while *L. elegans* has a smaller body (TL 4.50-4.90; HL 0.96-1.02; HW 0.60-0.72), shorter scapes (SI 125-138), and abundant hair-pits on the body surface.

Key to species of the genus *Leptogenys* from the Arabian Peninsula

- 1 In frontal view, mandibles subtriangular and feebly curved, but capable of closing tightly against the anterior margin of clypeus without a gap between them (Figure 4A); eyes smaller, with about 13 ommatidia in the longest row (Fig. 4A); in profile, petiolar node making a right angle with the straight posterior face (Fig. 4C); petiole as long as or little longer than broad in dorsal view (Fig. 4E); scapes long (SI 150 – 159) *L. polaszeki* sp. n.
- In frontal view, mandibles elongate and curvilinear, not capable of closing tightly against the clypeus (Fig. 4B), the apices leaving a large gap between themselves and the clypeus when closed (Fig. 4B); eyes larger, with about 25 ommatidia in the longest row (Fig. 4B); petiolar node making a continuous curve with the convex posterior margin (Fig. 4D); petiole at least 1.5 x broader than long in dorsal view; scapes shorter (SI 101–110) *L. maxillosa* (Smith)

Remarks. The relatively few specimens of *Leptogenys* known from this region may be due to the nocturnal activity of the species. Direct collecting methods such as hand picking are not as effective as pitfall trapping. *Leptogenys polaszeki* n. sp. seems to be a rare taxon since only two specimens were collected during extensive insect surveys near the type locality, including setting more than 200 pitfall traps bimonthly over two consecutive years.

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Disclosure Statement

No potential conflict of interest was reported by the authors.

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