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**ANTS OF THE GENUS *LEPTOGENYS* ROGER, 1861 (HYMENOPTERA:  
FORMICIDAE, PONERINAE) FROM NEPAL**

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**Summary.** Six species of the genus *Leptogenys* Roger, 1861 are reported from Nepal. *Leptogenys laeviceps* (Smith, 1857), **stat. ressur.** is raised to species status. *Leptogenys birmana* Forel, 1900, *L. chinensis* (Mayr, 1870), *L. dentilobis* Forel, 1900, *L. kitteli* Mayr, 1870, and *L. laeviceps* (Smith, 1857) are recorded from Nepal for the first time. A key based upon the worker caste is provided for all Nepalese species. A map of the distribution of *Leptogenys* species in Nepal is presented.

**Key words:** ants, fauna, new records, taxonomy, worker diagnosis, key, Himalayas.

**И. П. Субеди, П. Б. Будха, Ск. Ямане. Муравьи рода *Leptogenys* Roger, 1861 (Hymenoptera: Formicidae, Ponerinae) фауны Непала // Дальневосточный энтомолог. 2022. N 448. С. 11-20.**

**Резюме.** Из Непала приводятся шесть видов муравьев рода *Leptogenys* Roger, 1861. *Leptogenys laeviceps* (Smith, 1857), **stat. ressur.** рассматривается в качестве самостоятельного вида. *Leptogenys birmana* Forel, 1900, *L. chinensis* (Mayr, 1870), *L. dentilobis* Forel, 1900, *L. kitteli* Mayr, 1870 и *L. laeviceps* (Smith, 1857) впервые указываются для Непала. Дана определительная таблица непальских видов. Также приводится карта-схема распространения видов рода *Leptogenys* в Непале.

**INTRODUCTION**

*Leptogenys* Roger, 1861 is one of the most speciose ponerine ant genera distributed mostly in tropical and subtropical regions and comprises over 314 species and 15 subspecies (Bolton, 2021) with over a hundred of undescribed taxa (AntWeb, 2021). The type species of the genus is *Leptogenys falcigera* Roger, 1861, which was first recorded from Sri Lanka (Roger, 1861). Some of the notable contributions to the genus include Bolton (1975), Xu (2000), Lattke (2011), Zhou *et al.* (2012), Bharti & Wachkoo (2013), Rakotonirina & Fisher (2014), Xu & He (2015), Arimoto (2017), Sharaf *et al.* (2017), Wachkoo *et al.* (2018), Arimoto & Yamane (2018).

Only one valid species *Leptogenys diminuta* has been reported from Nepal. *Leptogenys sarasinorum* (or *L. diminuta sarasinorum*) previously reported from Nepal (Collingwood, 1970; Thapa, 2015; Subedi *et al.*, 2020) is currently considered to be a junior synonym of *L.*

*diminuta* (Xu & He, 2015; Bolton, 2021). Our knowledge on the genus *Leptogenys* in Nepal is incomplete and recent ant surveys identified some species new to Nepal.

The female castes (worker and queen) of *Leptogenys* can be diagnosed by the presence of pectinate claws and carinate median clypeal lobe (Bolton, 1975; Rakotonirina & Fisher, 2014). Another useful feature for distinguishing this genus from other ponerines is the absence of a basal protarsal comb which is present in most Ponerini (Lattke, 2011). This genus is remarkable for having ergatoid queens, frequent specialization on isopods as prey and showing an army ant-like lifestyle (Schmidt & Shattuck, 2014). The genus includes large-eyed epigaeic species to small-eyed cryptobiotic species nesting in diverse habitats, including leaf litter, rotten wood, logs, soil, under stones, and even in vegetation (Bolton, 1975; Rakotonirina & Fisher, 2014).

This paper provides distribution data and diagnostic features for *Leptogenys* species from Nepal based upon the examination of the materials in our collection from different parts of the country. A key to species of *Leptogenys* from Nepal based upon the worker caste is presented and the images of each species are provided.

## MATERIAL AND METHODS

The specimens used in this study were collected from 2006 to 2021 during ant surveys in different parts of Nepal using various methods including pitfall and bait trapping, or hand collection. The morphological examination of point-mounted specimens was done with a stereo zoom microscope (Coslab MSZ-115). Morphometric measurements were taken with an ocular micrometer at  $\times 45$  magnification and expressed in millimeters up to the second decimal position. Digital images were taken under the same microscope using a digital camera (Samsung SM-M625F). Specimens are deposited at the Central Department Zoology Museum of Tribhuvan University (CDZMTU). Our identifications are based on available keys (Bharti & Wachkoo, 2013; Xu & He, 2015; Arimoto & Yamane, 2018), original description (Smith, 1857) and comparison with type images available on AntWeb (<http://www.antweb.org>). A distribution map for Nepalese *Leptogenys* was created using QGIS 3.16 (QGIS Development Team, 2020).

Measurements and indices: morphological terms for measurements (in millimeters) and indices follow Arimoto & Yamane (2018): **EL** – Eye length. The vertical line length of the compound eye in full-face view. **HL** – Head Length. The maximum straight-line length of the head in full-face view, excluding the mandibles. **HW** – Head Width. The maximum width of the head in full-face view, excluding the eyes. **PeH** – Petiole Height. The height of the petiolar node in profile view, from the ventral margin of the subpetioalr process to the tip of the node. **PeL** – Petiole Length. The maximum length of the petiole in dorsal view, from its anterior margin to posterior margin. **PrW** – Pronotum Width. The maximum width of the pronotum in dorsal view. **SL** – Scape Length. The straight-line length of the first antennal segment, excluding the basal condyle and neck. **WL** – Weber’s Length. The diagonal length of the mesosoma from the posteroventral extremity of the propodeum to the anteriormost margin of the pronotum, excluding the neck. **CI** – Cephalic Index.  $HW/HL \times 100$ . **SI** – Scape Index.  $SL/HW \times 100$ .

## LIST OF SPECIES

In this paper, a total of six species of *Leptogenys* are reported from Nepal including five new records. Here we present the distribution data and diagnostic features for all species known from Nepal.

***Leptogenys diminuta* (Smith, 1857)**

Figs 1, 2

*Ponera diminuta* Smith, 1857: 69 (worker). Type locality: Sarawak, Borneo, Malaysia.

MATERIAL EXAMINED. **Nepal:** Gandaki province: Tanahun, Jamune, 27.9875° N, 84.18305° E, h=530 m, hand collection, 28.XII 2006, 4♀, leg. I.P. Subedi; Nawalpur, Madhyabindu, Sal forest, 27.6218° N, 84.05651° E, h=198 m, hand collection, 4.X 2020, 1♀, leg. P.B. Budha; Bagmati province: Shivapuri-Nagarjun National Park, Nagarjun forest, 27.74833° N, 85.27222° E, h=1900 m, hand collection and pitfall trap, 3.V 2019, 3♀, leg. I.P. Subedi & T.R. Adhikari.



Figs 1–4. Workers of *Leptogenys* spp. 1, 2 – *L. diminuta*: 1 – head in full-face view; 2 – habitus, lateral view; 3, 4 – *L. laeviceps*: 3 – head in full-face view; 4 – habitus, lateral view.

WORKER DIAGNOSIS. Head elongated, narrowed posteriorly, extensively with longitudinal striation that is curved transversely on vertex; with mesosoma in dorsal view, pronotum rounded and much broader than mesonotum and propodeum, propodeum broadened posteriorly, entire mesosoma dorsally irregularly rugose, with no regular striation; petiole nodiform, not compressed longitudinally; gaster smooth and shining, first segment rounded at base. Body entirely blackish brown, with antennae and legs paler. Our identification is based on the original description of *Ponera diminuta* in Smith (1857) and keys (Bharti & Wachkoo, 2013; Arimoto & Yamane, 2018).

MEASUREMENTS AND INDICES (n=3). HL 1.58–1.72, HW 1.17–1.24, EL 0.31–0.36, SL 1.67–2.06, PrW 0.85–0.90, PeL 0.61–0.67, PeH 0.64–0.75, WL 2.28–2.68, CI 71.77–73.72, SI 142.86–166.29.

DISTRIBUTION. Nepal, India, Sri Lanka, Myanmar, China, Vietnam, Laos, Thailand, Singapore, Malaysia, Brunei, Indonesia, Philippines, New Guinea, Solomons, Australia (Eguchi & Yamane, 2003; Xu & He, 2015; Guenard *et al.*, 2017; Subedi *et al.*, 2020).

***Leptogenys laeviceps* (Smith, 1857), stat. resurr.**

Figs 3, 4

*Ponera laeviceps* Smith, 1857: 69 (worker). Type locality: Sarawak, Borneo, Malaysia.

*Leptogenys diminuta laeviceps*: Bolton, 1995: 232.

MATERIAL EXAMINED. **Nepal:** Bagmati province: Shivapuri-Nagarjun National Park, Jamacho, 27.74555° N, 85.26722° E, h=2087 m, bait and hand collection, 3.V 2019, 3♀, leg. I.P. Subedi, A. Pandey & K. Chaudhary; Shivapuri-Nagarjun National Park, Sundarijal forest, 27.79083° N, 85.42083° E, h=1850 m, hand collection, 10.X 2020, 3♀, leg. I.P. Subedi; Kathmandu, Ranibari community forest, 27.73082° N, 85.32101° E, h=1300 m, hand collection, 15.X 2019, 5♀, leg. I.P. Subedi; same locality, 27.729444° N, 85.320555° E, h=1310 m, hand collection, 14.IV 2021, 12 ♀, leg. I.P. Subedi & I. Pandit; Tribhuvan University Campus, Kirtipur, 27.68011° N, 85.28866° E, h=1300 m, pitfall and hand collection, 11.V 2019, 7♀, leg. I.P. Subedi & S. Adhikari; Gandaki province: Kaski, Hemja, 28.28318° N, 83.93301° E, hand collection, 26.X 2007, 1♀, leg. I.P. Subedi; Kaski, Pokhara, 28.213611° N, 83.97222° E, h=840 m, hand collection, 18.VI 2006, 4♀, leg. I.P. Subedi; same locality, hand collection, 20.X 2021, 7♀, leg. N. Subedi; Tanahun, Jamune, 27.9875° N, 84.18305° E, h=530 m, hand collection, 24.X 2021, 5♀, leg. R. Pandit; Lumbini province: Rupandehi, Butwal, hand collection, 9.III 2013, 10♀, leg. I.P. Subedi.

WORKER DIAGNOSIS. The workers of this species can be distinguished by the presence of fewer striae on the gena and frons, and smooth and shiny vertex without any striation in contrast to the entirely striated head dorsum of *L. diminuta*. Pronotum is nearly smooth in this species unlike striated pronotum in *L. diminuta*. Further it is smaller in body size than typical *diminuta* specimens. Our identification is based on worker description for *Ponera laeviceps* in Smith (1857) and key in Bharti & Wachkoo (2013; treated as subspecies of *L. diminuta*).

MEASUREMENTS AND INDICES (n=5). HL 1.33–1.61, HW 1.06–1.17, EL 0.26–0.29, SL 1.39–1.67, PrW 0.79–0.83, PeL 0.56–0.61, PeH 0.58–0.64, WL 2.06–2.33, CI 72.41–79.17, SI 129.27–142.85.

DISTRIBUTION. Nepal (new record), India, Sri Lanka, Myanmar, Malaysia, Indonesia, New Guinea (Smith, 1857; Guenard *et al.*, 2017).

REMARKS. *Leptogenys laeviceps* was described by Smith (1857) as *Ponera laeviceps* from Sarawak, Borneo, East Malaysia. It was kept in *Lobopelta* by Mayr (1862) and in *Leptogenys* by Emery (1895). Mayr (1863) treated it as junior synonym of *Leptogenys diminuta* while Smith (1858) provided species status. Emery (1887) and subsequent authors treated it as a subspecies of *L. diminuta*. According to the current concept of subspecies (geographical race), the treatment of *laeviceps* as subspecies is not justified because the distribution ranges of the two forms extensively overlap. This form is clearly separable from the sympatric *L. diminuta* as mentioned above, and should be raised to species rank.

***Leptogenys chinensis* (Mayr, 1870)**

Figs 5, 6

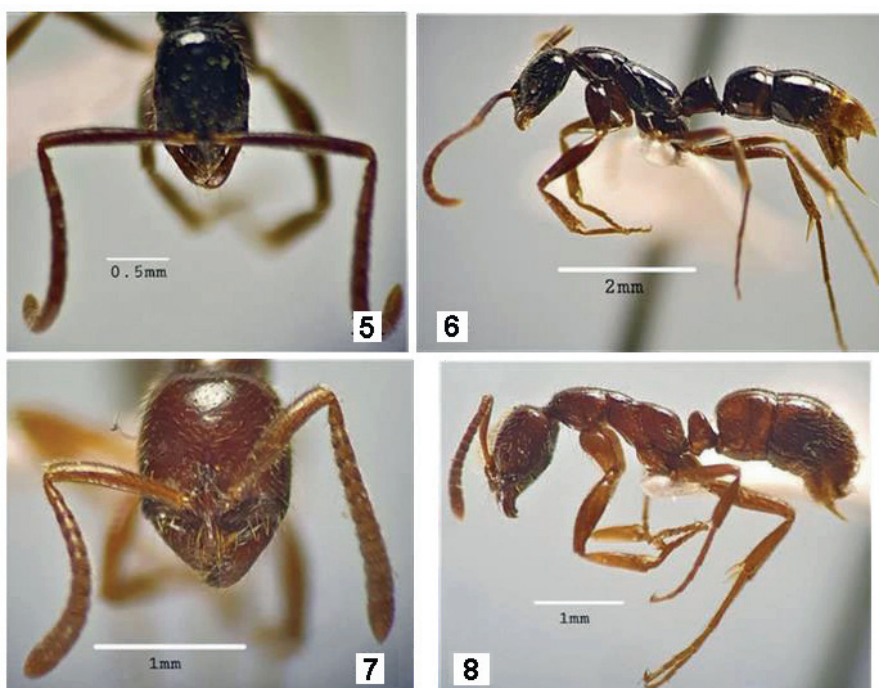
*Lobopelta chinensis* Mayr, 1870: 965 (worker). Type locality: China.

MATERIAL EXAMINED. **Nepal:** Bagmati province: Kathmandu, Ranibari community forest, 27.73082° N, 85.32101° E, h=1300 m, hand collection, 15.X 2019, 1♀, leg. I.P. Subedi.

DIAGNOSIS. The diagnostic features in the workers include relatively small size, smooth and shiny cephalic dorsum lacking punctures, propodeal declivity transversely striate, petiolar node longer than broad in dorsal view, petiolar dorsum sloping anteriorly in lateral view. Our identification is based on worker description for *Lobopelta chinensis* in Mayr (1870) and keys (Bharti & Wachkoo, 2013; Xu & He, 2015).

MEASUREMENTS AND INDICES (n=1). HL 1.13, HW 0.75, EL 0.19, SL 1.13, PrW 0.63, PeL 0.56, PeH 0.5, WL 1.69, CI 66.37, SI 150.67.

DISTRIBUTION. Nepal (new record), India, Sri Lanka, Vietnam, China, Philippines (Xu & He, 2015; Guenard *et al.*, 2017).



Figs 5–8. Workers of *Leptogenys* spp. 5, 6 – *L. chinensis*: 5 – head in full-face view; 6 – habitus, lateral view; 7, 8 – *L. birmana*: 7 – head in full-face view; 8 – habitus, lateral view.

***Leptogenys birmana* Forel, 1900**

Figs 7, 8

*Leptogenys (Lobopelta) birmana* Forel, 1900: 310 (worker). Type locality: Burma.

**MATERIAL EXAMINED.** **Nepal:** Bagmati province: Shivapuri-Nagarjun National Park, Nagarjun forest, 27.7444° N, 85.2946 E, h=1400 m, bait collection, 1.V 2019, 2♀, leg. I.P. Subedi & A. Pandey.

**WORKER DIAGNOSIS.** The characteristic features of worker: sub-quadrate head in full-face view, posterior head margin weakly concave, longitudinally striate head dorsum in anterior half (striation reaching level of posterior eye margin), shorter scape, fourth to sixth antennal segments almost as long as broad, clypeus convex and unarmed anteriorly, broad and triangular subpetiolar process, smooth and shiny first gastral segment, and reddish brown body. Our identification is based on keys in Bharti & Wachkoo (2013) and Xu & He (2015).

**MEASUREMENTS AND INDICES** (n=2). HL 1.19–1.25, HW 0.94–1, EL 0.14, SL 0.94, PrW 0.63, PeL 0.38, PeH 0.5, WL 1.69–1.81, CI 78.99–80, SI 94–100.

**DISTRIBUTION.** Nepal (new record), India, China, Myanmar, Thailand, Vietnam (Xu & He, 2015; Guenard *et al.*, 2017; Khachonpisitsak *et al.*, 2020).

### ***Leptogenys dentilobis* Forel, 1900**

Figs 9, 10

*Leptogenys (Lobopelta) dentilobis* Forel 1900: 305 (worker). Type locality: India.

**MATERIAL EXAMINED.** **Nepal:** Bagmati province: Kathmandu, Tribhuvan University Campus, Kirtipur, 27.68011° N, 85.28866° E, h=1300 m, *Salix* forest, pitfall trap, 9–11.V 2019, 1♀, leg. I.P. Subedi & S. Adhikari; Kathmandu, Ranibari community forest, 27.73082° N, 85.32101° E, h=1300 m, pitfall trap, 13–15.X 2019, 1♀, leg. I.P. Subedi & R.P. Pokhrel.

**DIAGNOSIS.** The diagnostic features in the worker include quadrate head in full-face view, posterior head margin straight in full-face view, sparsely punctate head dorsum, clypeus anteriorly armed with teeth, median carina very strong, smooth and shiny first gastral segment. Our identification is based on the keys in Bharti & Wachkoo (2013) and Xu & He (2015).

**MEASUREMENTS AND INDICES** (n=2). HL 1.19–1.31, HW 0.94, EL 0.13, SL 0.88–0.94, PrW 0.63, PeL 0.38–0.44, PeH 0.5, WL 1.69–1.81, CI 71.76–78.99, SI 93.62–100.

**DISTRIBUTION.** Nepal (new record), India (Xu & He, 2015).

### ***Leptogenys kitteli* (Mayr 1870)**

Figs 11, 12

*Lobopelta kitteli* Mayr, 1870: 966 (worker). Type locality: Sikkim, India.

**MATERIAL EXAMINED.** **Nepal:** Bagmati province: Shivapuri-Nagarjun National Park, Nagarjun forest, 27.7444° N, 85.29416° E, h=1400 m, pitfall collection, 1–3.V 2019, 2♀, leg. I.P. Subedi, A. Pandey & T.R. Adhikari leg.; Chitwan, Bhandara, 27.60620° N, 84.63145° E, hand collection, 10.III 2013, 1♀, leg. I.P. Subedi; Gandaki province: Baglung, Kalika Bhagwati temple, 28.25548° N, 83.61359° E, hand collection, 7.III 2013, 1♀, leg. I.P. Subedi; Kaski, Pokhara, 28.213611° N, 83.97222° E, h=840 m, hand collection, 8.III 2013, 3♀, leg. I.P. Subedi.

**WORKER DIAGNOSIS.** The workers have the following set of character states: elongated head that is narrowed behind and entirely with longitudinal striation, eyes located near mid-length of head, clypeus without longitudinal central carina; pronotum much broader than mesothorax and propodeum, propodeum broadened posteriorly, entire mesosoma with regular striation; petiole nodiform, not compressed longitudinally; gaster smooth and shining. Our identification is based on the worker description for *Lobopelta kitteli* in Mayr (1870) and keys (Bharti & Wachkoo, 2013; Xu & He, 2015; Arimoto & Yamane, 2018).

MEASUREMENTS AND INDICES (n=3). HL 1.81–2, HW 1.44–1.56, EL 0.31–0.37, SL 1.69–1.75, PrW 0.94–1, PeL 0.63–0.69, PeH 0.94–1, WL 2.63–2.81, CI 78–79.56, SI 112.18–117.36.

DISTRIBUTION. Nepal (new record), India, Myanmar, China, Vietnam, Thailand, Malaysia, Indonesia, New Guinea (Xu & He, 2015).



Figs 9–12. Workers of *Leptogenys* spp. 9, 10 – *L. dentilobis*: 9 – head in full-face view; 10 – habitus, lateral view; 11, 12 – *L. kittelli*: 11 – head in full-face view; 12 – habitus, lateral view.

**Key to Nepalese species of *Leptogenys* based on the worker caste**

1. Petiolar node longitudinally compressed with elongate dorsal face and in profile view triangular, or squamiform and distinctly narrowed apically ..... 2
- Petiolar node nodiform, in profile with almost parallel anterior and posterior margins ..... 4
2. Petiolar node longitudinally compressed, in profile view triangular ..... *L. chinensis*
- Petiolar node squamiform and in profile view distinctly tapered apically ..... 3
3. Head dorsum sparsely punctate, posterior head margin straight in full-face view, clypeus with strong median carina ..... *L. dentilobis*
- Head dorsum smooth and shiny, posterior head margin weakly concave in full-face view, clypeus without median carina ..... *L. birmana*
4. Head striate only anteriorly, posterior portion smooth and shiny ..... *L. laeviceps*
- Head entirely striate ..... 5



5. Entire head dorsum with regular longitudinal striation, entire mesosoma regularly striate, clypeus without longitudinal median carina, erect hairs on antennal scape very short or completely missing ..... ***L. kitteli***
- Head with longitudinal striation that is curved transversely on vertex, pronotum and mesonotum irregularly rugose with no regular striation, clypeus with longitudinal median carina, hairs on antennal scape long, dense and very conspicuous ..... ***L. diminuta***

### CONCLUSION

Nepalese ants of the genus *Leptogenys* now contain six species, of which five species *L. birmana*, *L. chinensis*, *L. dentilobis*, *L. laeviceps*, and *L. kitteli* are newly recorded for Nepal. The species rank of *L. laeviceps* has been revived. The distribution map of species is given in Fig. 13. *Leptogenys* were collected in Nepal from an altitudinal range of 198 m to 2087 m. The highest collecting location is in the Nagarjun forest, which is located in the transition zone between subtropical and temperate climates. The site is a natural forest with a variety of forest types, including oak, rhododendron, and pine. The ant diversity in Nepal appears to be under sampled. Future exploration of ants in different parts of the country should reveal more ant species from Nepal.

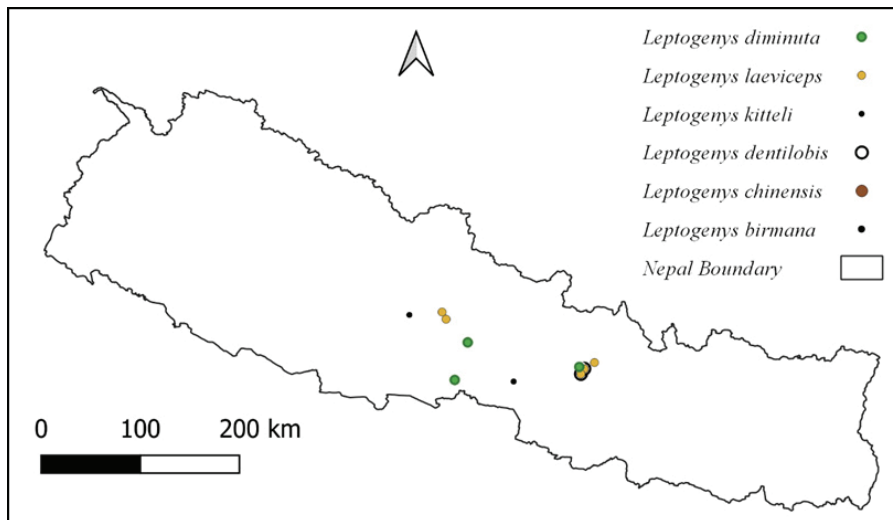


Fig. 13. Distribution map of *Leptogenys* in Nepal.

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