

**Research article**

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## First record of *Lipotriches (Rhopalomelissa) burmica* from India along with a checklist of species from India (Hymenoptera: Halictidae, Nomiinae)

Jyoti FALSWAL<sup>1,2</sup>, Debjani DEY<sup>1,\*</sup>, Sarita KUMAR<sup>2</sup>

<sup>1</sup>National Pusa Collection, Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi-1,0012 – jyotifalswal057@gmail.com; ddeyiari@hotmail.com

<sup>2</sup>Department of Zoology, Acharya Narendra Dev College, University of Delhi, New Delhi-110019 – saritakumar@andc.du.ac.in

\* Corresponding author

**Abstract**

*Lipotriches (Rhopalomelissa) burmica* (Cockerell, 1920) is recorded for the first time from India. Both male and female of the species have been redescribed with color illustrations. An annotated checklist of the species of this genus from India is also provided.

**Key words:** Checklist, *Lipotriches*, New record, Halictidae, India.

**Introduction**

Genus *Lipotriches* was erected by Gerstaecker in 1858 with the type species *Lipotriches abdominalis*. It is one of the largest genera under the subfamily Nomiinae in the Family Halictidae. This genus has great diversity worldwide and is known to be an important pollinator of some plants, specifically grasses (Pauly 2014a). The status of this genus has been subjected to changes several times (Pauly 1984a, 2009, 2014a; Astafurova & Pesenko 2005; Michener 2007; Huang 2008; Niu et al. 2018). A compilation of all available literature indicated that *Lipotriches* was represented by 47 species from the Oriental region, but Pauly 2009; 2014b, elevated many of the subgenera to genus rank due to which currently only 28 species are represented from the Oriental Region, among which only 17 are reported from India. Genus *Lipotriches* is represented by 8 subgenera (*Armatriches*, *Betsileotriches*, *Cubitriches*, *Lipotriches*, *Patellotriches*, *Rhopalomelissa*, *Stellotriches* and *Tegumelissa*). The Asian *Lipotriches* are represented by three subgenera: *Armatriches* Pauly, 2014, *Lipotriches sensu stricto* and *Rhopalomelissa* Alfken, 1926 (Pauly 2014a, b), all reported from the Asian region as well as from India. This genus has not been investigated much by Indian scientists while Pauly (2009, 2014b) presented a key to the Oriental species of the genus *Lipotriches*. The aim of this article is to record *Lipotriches (Rhopalomelissa) burmica* for the first time from India. Both male and

female of the species have been redescribed with illustrations. An updated checklist of the genus *Lipotriches* from India is also provided, including new regional records for other known species.

**Materials and Methods**

Explorations were conducted during 2019–2020 from various locations of North India. The specimens were collected using yellow pan traps and sweep net. The collected specimens were brought to the laboratory and suitably processed for further studies. Identification was done with the help of keys provided by Michener (2007) and Pauly (2009, 2014). Photography was done with a Leica DFC 425C digital camera attached to a Leica M205 FA stereo zoom automontage microscope. Photographic plates were finalized using Adobe Photoshop® 7.0. The terminology used follows that of Pauly (2009, 2014) and Michener (2007). The studied specimens have been deposited in the National Pusa Collection (NPC), Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi-110 012, India.

Abbreviations used in the Text: Body Length (BL), (from Clypeus margin to metasomal tip), Head length (HL), Head Width (HW), Eye Length (EL), Fore wing Length (FWL) (Exclude tegula), Inter – Ocellar Distance (IOD), Clypeus Length (CL).



Figs 1-6 – *Lipotriches burmica*, Female. 1, habitus dorsally; 2, habitus laterally; 3, head, front view; 4, thorax dorsally; 5, tergum-1; 6, abdomen dorsally.

## Results

### Annotated checklist of the Indian species of Genus *Lipotriches* (Table 1)

*Lipotriches* Gerstaecker, 1858: 460

*Rhopalomelissa* Alfken, 1926: 267

*Nomia* (*Epinomia*) Alfken, 1939: 113

*Alfkenomia* Hirashima, 1956: 33

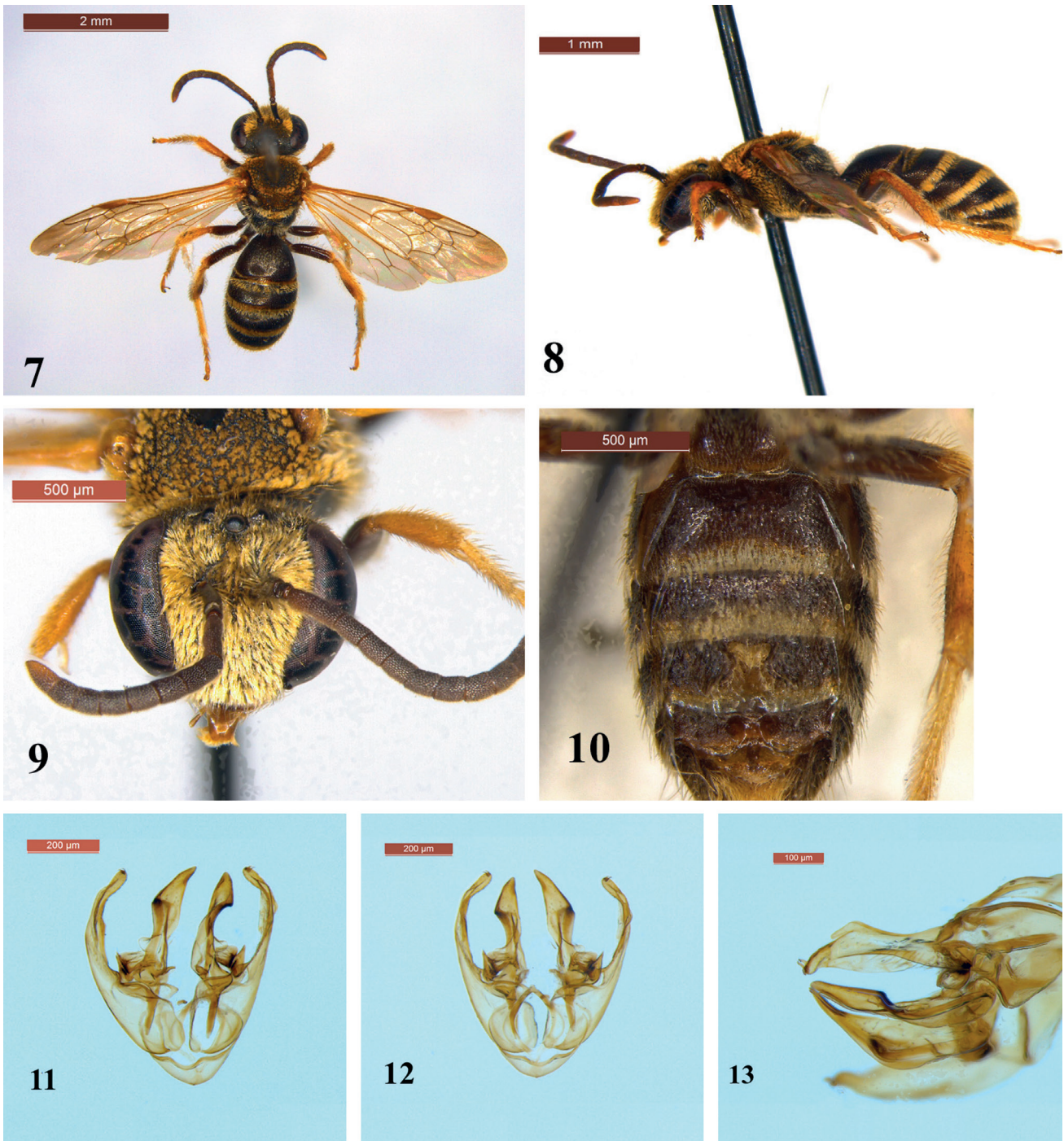
*Rhopalomelissa* (*Lepidorhopalomelissa*) Wu, 1985: 58

*Rhopalomelissa* (*Trichorhopalomelissa*) Wu, 1985: 58

*Rhopalomelissa* (*Tropirhopalomelissa*) Wu, 1985: 58

Type species: *Lipotriches abdominalis* Gerstaecker, 1857 (= *Sphecodes cribrosa* Spinola, 1843), by original designation.

**Genus *Lipotriches*** Gerstaecker, 1858



**Figs 7-13** – *Lipotriches burmica*, Male. **7**, habitus dorsally; **8**, habitus laterally; **9**, head, front view; **10**, abdomen ventrally; **11**, gonostylus, dorsally; **12**, gonostylus, ventrally; **13**, gonostylus, side view.

**Diagnosis.** Both males and females have pronotum with a carina at the edge. In females, the basitibial plate of the posterior tibiae is not carinated completely and the hind tibial spur is without subapical tooth or is unmodified.

**Redescription.**

*Lipotriches (Rhopalomelissa) burmica* (Cockerell, 1920)  
**Female:** (Figs 1-6).

**Head.** Shiny dorsally, slightly broader than long; paracocular area partially covered with setae; antenna 12- segmented; frons bare, densely punctate; clypeus moderately punctate, covered with pubescence (Fig. 3); eyes shiny without hairs.

**Mesosoma:** Scutum, scutellum and metanotum with shiny surface reflections; pronotal carina at edge; scutum and scutellum shiny with strong punctuations (Fig. 4), margin covered with yellow colour felting; metanotum simple,



Fig. 14 – Male of *Lipotriches fulvinerva*.



Fig. 15 – Female of *Lipotriches pulchriventris*.

without modifications; fore wing with three sub-marginal cells, 3rd sub-marginal cell longer than 1<sup>st</sup> sub-marginal cell, nearly 2.0x as long as 2nd sub-marginal cell; tegula normal, finely punctate anteriorly; mesoscutum closely punctate; propodeal area triangle-shaped, smooth; lateral sides of propodeum punctate; hind femur and hind tibia simple or without modifications; basitibial plate incomplete and partially carinated; scopa well developed; hamuli 10 in number.

**Metasoma.** Dense hair patch on the lateral side of T1 apically; apical margin of T2-T4 opaque; metasoma elongate, oval-shaped (Fig. 6); T1 almost smooth, sparsely punctate, apical margin not depressed; T2 densely punctate, T3 & T4 strongly punctate compared to T2, tergum II-V with apical sparse bristles, T2 with laterally sparse setae, T3-T5 covered with sparse, elongate pubescence. The dorsal surface of T2 to T5 is rough compared to T1.

**Pubescence and Coloration.** Dark brown to black, mesosoma black, metasomal terga dark brown distinctly; golden setae on clypeus, paraocular area, frons and supra-clypeal area (Fig. 3); mandible, pterostigma dark brown; flagellum ventrally dark brown, F10 apricot coloured; wing veins, basitarsus brown; tegula light brown; wing transparent; body hairs golden or dull white; eyes dark brown in colour. Pronotum, scutum margins, metanotum with yellow colour felting; propodeum with sparse golden hair; apical margins of tergites opaque; T1 with golden hair laterally, T2-T5 with sparse dull golden hair setae on apical margin (Fig. 6); legs brown; basitarsus light brown or yellowish orange in color.

**Measurement.** BL= 4.9 mm, HL= 0.86 mm, HW= 1.16 mm, EL= 0.67 mm, IOD= 0.15 mm, WL= 3.29 mm.

**Material Examined:** ♀. **INDIA:** Haryana: Panchkula, 30 Sep 2021, 30.6942° N, 76.8606° E.

**Floral association:** Flannel weed.

**Male:** (Figs 7-13)

**Head.** Shiny dorsally, little broader than long; paraocular area partially covered with setae; antenna 13 segmented;

frons, clypeus moderately punctate and completely covered with pubescence (Fig. 9); eyes shiny without hairs.

**Mesosoma.** Scutum, scutellum and metanotum covered with felting; pronotum carinated at edge; scutum and scutellum moderately punctate; metanotum simple, without modifications; three sub-marginal cells present in the fore wing, 3rd sub-marginal cell longer than 1<sup>st</sup> sub-marginal cell, nearly 2x as long as 2nd sub-marginal cell; tegulae normal, finely punctate anteriorly; mesoscutum closely punctate (Fig. 7); propodeal area triangle-shaped, smooth; lateral sides of propodeum punctate; hind femur and tibia unmodified; Hamuli 10 in number.

**Metasoma.** Apical lateral sides of T1 with a very light hair patch; apical margin T2-T4 opaque; metasoma elongate; T1 moderately punctate, apical margin not depressed; T2 densely punctate, T3 & T4 strongly punctate compared to T2, T2 to T5 with apical sparse bristles, T3- T5 covered with pubescence; cup-shaped structure at sternite 4 (Fig. 10); sternite 5 has two pointed structures.

**Genitalia.** Gonostyles narrow and rounded apically with a pair of short hooked like structure (Fig. 11- 12), inner margin with elongate setae (Fig. 13); penis valve acuminate apically, indented inner side.

**Pubescence.** Same as female. Femur dark brown; tibia yellow in colour with a dark brown coloured patch on ventral side; basitarsus light brown or yellowish orange in colour.

**Measurement.** BL= 4.3 mm, HL= 0.86 mm, HW= 1.09 mm, EL= 0.70 mm, IOD= 0.15 mm, WL= 2.95 mm.

**Material Examined:** ♂. **INDIA:** Haryana: Panchkula, 30 Sep 2021, 30.6942° N, 76.8606° E.

**Floral association:** Flannel weed.

**Note:** Male with a characteristic cup-shaped structure at the center of Sternite 4 (Fig. 10). Sternite 5 has two pointed structures. The female is closely related to *L. pulchriventris* but differs from it by the following: T1 sparsely punctuated (Fig. 5) and vertex shorter as compared to *L. pulchriventris*.

**Species distribution:** India: Haryana, Burma, China, Malaysia, Laos, Thailand.

Table 1 –

Subgenus I – <i>Lipotriches</i> Gerstaecker, 1858		
	<b><i>bouceki</i></b> Pauly, 2014 <i>Lipotriches (Lipotriches) bouceki</i> Pauly, 2014: 17	Karnataka: Bengaluru
	<b><i>fulvinerva</i></b> (Cameron, 1907) <i>Nomia silhetica</i> (Westwood) (nomen nudum): Smith, 1853: 90; Pauly, 2009: 176 <i>Nomia aurifrons</i> Smith, 1875 (invalid secondary homonym of <i>Halictus aurifrons</i> Smith, 1853); Pauly, 2009: 176 <i>Nomia fulvinerva</i> Cameron, 1907a: 1004; Baker, 1993: 258 <i>Nomia andrenina</i> Cockerell, 1911c: 230; Pauly, 2009: 177 <i>Nomia ceylonica</i> Friese, 1913: 84; Pauly, 2009: 177 <i>Lipotriches (Lipotriches) fulvinerva</i> ; Pauly, 2009: 176-177 <i>Lipotriches (Lipotriches) andrenina</i> ; Pauly, 2009: 177 <i>Lipotriches (Lipotriches) ceylonica</i> ; Pauly, 2009: 177 <i>Lipotriches (Lipotriches) fulvinerva</i> ; Pauly, 2009: 177	Gujarat: Deesa, West Bengal: Barrackpore, *Tripura, *Punjab: Ludhiana, *Uttarakhand: Haridwar, *Delhi, Assam
	<b><i>phenacopsis</i></b> (Cockerell, 1911) <i>Nomia phenacopsis</i> Cockerell, 1911c: 224 <i>Lipotriches (Lipotriches) phenacopsis</i> ; Pauly, 2009: 178	Maharashtra: Nasik
	<b><i>phenacura</i></b> (Cockerell, 1911) <i>Nomia phenacura</i> Cockerell, 1911: 224 <i>Lipotriches (Lipotriches) phenacura</i> ; Pauly, 2009: 178	Maharashtra: Nasik
	<b><i>torrida</i></b> (Smith, 1879) <i>Andrena torrida</i> Smith, 1879a: 50 <i>Nomia comperta</i> Cockerell, 1912b: 493; Pauly, 2009: 179 <i>Lipotriches (Lipotriches) comperta</i> ; Pauly, 2009: 179 <i>Lipotriches (Lipotriches) torrida</i> ; Pauly, 2009: 179	Maharashtra: Mumbai, Nasik
Subgenus II – <i>Armatriches</i> Pauly, 2014		
	<b><i>fervida</i></b> (Smith, 1875) <i>Nomia fervida</i> Smith, 1875b: 55 <i>Nomia chrysopa</i> Cameron, 1898: 69; Pauly, 2009: 176 <i>Nomia carinicolis</i> Cameron, 1902b: 251; Pauly, 2009: 176 <i>Nomia shiva</i> Nurse, 1902: 148; Pauly, 2009: 176 <i>Nomia nursei</i> Cameron, 1907b: 284; Pauly, 2009: 176 <i>Nomia abuensis</i> Cameron, 1908b: 658; Pauly, 2009: 176 <i>Nomia virgata</i> Cockerell, 1911c: 229; Pauly, 2009: 176 <i>Nomia nursei semifortis</i> Cockerell, 1911c: 229; Pauly, 2009: 176 <i>Lipotriches (Lipotriches) abuensis</i> ; Pauly, 2009: 176 <i>Lipotriches (Armatriches) fervida</i> ; Pauly, 2009: 176	Bihar, Gujarat, Haryana: Rohtak, Punjab: Ferozepur, Rajasthan: Mount Abu, Uttar Pradesh: Allahabad Gujarat: Deesa
Subgenus III – <i>Rhopalomelissa</i> Alfken, 1926		
	<b><i>aurodigitata</i></b> Pauly, 2009 <i>Lipotriches (Rhopalomelissa) aurodigitata</i> Pauly, 2009: 179	Goa: Mormugao
	<b><i>bombayensis</i></b> (Cameron, 1908) <i>Andrena bombayensis</i> Cameron, 1908a: 308 <i>Lipotriches (Rhopalomelissa) bombayensis</i> ; Pauly, 2009: 175	Maharashtra: Mumbai
	<b><i>burmica</i>*</b> (Cockerell, 1920) <i>Nomia burmica</i> Cockerell, 1920: 209 <i>Lipotriches (Rhopalomelissa) burmica</i> ; Pauly, 2009: 175	*Haryana: Panchkula
	<b><i>gracilis</i></b> Pauly, 2009 <i>Lipotriches (Rhopalomelissa) gracilis</i> Pauly, 2009: 179	Meghalaya
	<b><i>minutula</i></b> (Friese, 1909) <i>Nomia minutula</i> Friese, 1909b: 203 <i>Nomia elongatula</i> Cockerell, 1915: 178; Pauly, 2009: 177 <i>Lipotriches (Lipotriches) elongatula</i> ; Pauly, 2009: 177 <i>Lipotriches (Rhopalomelissa) minutula</i> ; Pauly, 2009: 177	India
	<b><i>mollis</i></b> (Smith, 1879) <i>Andrena mollis</i> Smith, 1879: 50 <i>Lipotriches (Rhopalomelissa) mollis</i> ; Pauly, 2009: 177	Assam Maharashtra: Mumbai

	<i>parciformis</i> (Cockerell, 1913) <i>Nomia parciformis</i> Cockerell, 1913a: 35 <i>Lipotriches (Rhopalomelissa) parciformis</i> ; Pauly, 2009: 178	Maharashtra: Nasik
	<i>pulchriventris</i> (Cameron, 1897) <i>Nomia clavata</i> Smith, 1862: 59 (invalid secondary homonym of <i>Halictus clavatus</i> Smith, 1853); Pauly, 2009: 178 <i>Halictus pulchriventris</i> Cameron, 1897: 110; 1902b: 250 <i>Nomia dimidiata</i> Vachal, 1897: 92; Pauly, 2009: 178 <i>?Nomia aureobalteata</i> Cameron, 1902: 250; Pauly, 2009: 178 <i>Nomia halictella</i> var. <i>triangularis</i> Cockerell, 1905: 307; Pauly, 2009: 178 <i>Nomia pseudoceratina</i> Cockerell, 1910b: 222; Pauly, 2009: 178 <i>Nomia halictura</i> Cockerell, 1911c: 228; Pauly, 2009: 178 <i>Nomia levicauda</i> Cockerell, 1919a: 5; Pauly, 2009: 178 <i>Rhopalomelissa xanthogaster</i> Alfken, 1926: 267; Pauly, 2009: 178 <i>Nomia wallacei</i> Cockerell, 1939: 123 [replacement name for <i>Nomia clavata</i> Smith, 1862, nec (Smith, 1853)]; Pauly, 2009: 178 <i>Rhopalomelissa (Trichorhopalomelissa) hainanensis</i> Wu, 1985: 58; Pauly, 2009: 178 <i>Rhopalomelissa (Trichorhopalomelissa) zae</i> Wu, 1985: 59; Pauly, 2009: 178 <i>Lipotriches (Rhopalomelissa) pulchriventris</i> ; Pauly, 2009: 178	Uttarakhand: Mussourie, Dehradun*, Maharashtra: Nasik West Bengal, *Haryana: Panchkula
	<i>taprobanae</i> (Cameron 1897) <i>Halictus taprobanae</i> Cameron, 1897: 111 <i>Lipotriches edirisinghei</i> Pauly, 2005: 32; Pauly, 2009: 178	Pondicherry: Auroville
	<i>tubulisetae</i> Pauly, 2009 <i>Lipotriches (Rhopalomelissa) tubulisetae</i> Pauly, 2009: 181	Karnataka: Coorg Tamil Nadu: Nilgiris Devala, Cherangod, Coimbatore, Siruvani
	<i>yasumatsui</i> (Hirashima, 1961) <i>Rhopalomelissa yasumatsui</i> Hirashima, 1961: 263 <i>Rhopalomelissa yasumatsui koreana</i> Hirashima, 1961: 269 <i>Lipotriches (Rhopalomelissa) yasumatsui</i> ; Pauly, 2009: 179	Meghalaya: Shillong
* New geographical data recorded (Figs 14-15).		

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#### Conflict of interest

No potential conflict of interest was reported by authors.

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