



An updated distributional checklist of Bees of the subfamily Nomiinae (Hymenoptera: Apoidea: Halictidae) with new records from south India

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ABSTRACT: The first comprehensive distributional checklist of the species belonging to Nomiinae of south India is presented. Totally, 48 species under 13 genera are listed, of which *Curvinomia strigata* (Fabricius, 1793), *Macronomia antennata* (Smith, 1875) and *Steganomus lieftincki* Pauly, 2009 are newly recorded from south India. Sixteen of these species are reported for the first time for Karnataka, three species for Andhra Pradesh, two species for Tamil Nadu and one species each for Kerala and Telangana. Distribution of species of Nomiinae in south India is provided.

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KEYWORDS: Apiformes, distribution, fauna, Halictidae, diversity

INTRODUCTION

Bees belonging to the subfamily Nomiinae are distinctive members of the family Halictidae. The subfamily includes an incredibly diverse group of metallic and non-metallic species, which are largely solitary, except for a few communal nesting species (Batra, 1966, 1977; Michener, 2007). Though majority of these bees are generalist foragers, they are very important pollinators for many agricultural crops and wild plant species (Cane, 2002, 2008; Isaacs and Kirk 2010). The great majority of Nomiinae occurs in Afrotropical, Oriental, Australian and Palaearctic regions, but poorly distributed in Nearctic region and totally absent in Neotropical region (Astafurova, 2013). This subfamily is comprised of approximately 600 species worldwide and the Oriental fauna includes

154 valid species (Pauly, 2009; Astafurova, 2013). According to Michener (2007), the subfamily includes 11 genera worldwide, which were considered to be belonging to a single genus, *Nomia* Latreille for a long time. Generic level classification of Nomiinae of Afrotropical and Oriental species has undergone several changes owing to tremendous species diversity and heterogeneity. Taxonomy of Afrotropical and Oriental species was restructured and many changes in nomenclature have been made subsequently by the revisionary works of fauna of these regions undertaken by Pauly (1980, 1984, 1990, 1991, 2000, 2005, 2008, 2009, 2014) and Karunaratne *et al.* (2005) resulting in subdivision of Nomiinae genera into a number of separate genera including raising several subgenera to generic level. In the present study, recent classification of Oriental fauna by Pauly (2009) is followed.

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The Halictidae fauna is rich and diverse, yet it is poorly studied from India. Most species of Nomiinae were studied and described in the 19th century. Smith (1853, 1875ab, 1879), Westwood (1875), Cameron (1897, 1898, 1902, 1904, 1907ab, 1908), Nurse (1902, 1904), Cockerell (1911, 1917, 1919, 1920), Meade-Waldo (1916) and Baker (2002) have made valuable contributions to Indian Halictidae. Bingham (1897) in his Fauna of British India (Hymenoptera Vol. I.) reported 26 species under 2 genera belonging to Nomiinae from Indian subcontinent (with no information on south Indian species). Online version of the checklist published by Gupta (2010) unfortunately is a mere checklist without any updated locality data or changes in classification. However, classification of Nomiinae from Oriental region, New Guinea and Islands of the Pacific Ocean by Pauly (2009), a web based Atlas Hymenoptera (Pauly 2015/2016) and Discover Life's bee species guide and world checklist (Ascher and Pickering 2016) provide a better understanding of the diversity and distribution of these bees from India. Saini and Rathor in 2012 listed 72 species in 15 genera from India mainly based on published data, of which only 17 species are reported from south India. Considering the scattered and incomplete knowledge about south Indian fauna, the current study was attempted to provide a complete checklist of south Indian Nomiinae bees with updated distributional records. South India is the area encompassing India's states of Andhra Pradesh, Karnataka, Kerala, Telangana, Tamil Nadu, as well as the union territories of Lakshadweep and Puducherry, occupying 19.31% of the geographical area of the country. We list a total of 48 species under 13 genera from south India. Distribution ranges of 27 species are appreciably extended owing to the new specimens examined. Floral records are also provided wherever available.

MATERIALS AND METHODS

The present checklist is based on the examination of a total of 1062 specimens deposited in the Department of Entomology, University of Agricultural Sciences, Gandhi Krishi Vignan Kendra, Bengaluru, collected from various localities

in Karnataka and other south Indian states. Material from College of Horticulture (Mudigere) was also examined. External morphological examinations of specimens were made using a Nikon SMZ 1000 (Lens – WD 70 (model- C-FIR) -1007956) microscope. Specimens were identified using keys in Bingham (1897); Pauly (2009, 2014) and Atlas Hymenoptera (Pauly, 2015/2016). Both adult females and males (when available) were examined. Digital colour images of species were made using a Leica M205A stereomicroscope with DFC 420 camera attachment. All images were edited with Adobe Photoshop CS2 (Version 9.0).

The genera and species of Nomiinae are listed alphabetically together with specimens examined. The checklist also contains the general distribution of the listed species. New distribution records are marked with an asterisk (*). The distribution of species is given in this order: (1) the states of south India arranged in alphabetical order along with the localities within it, (2) the other Indian states (Elsewhere in India), (3) the other counties (outside India) in alphabetical order. Attempts have been made to incorporate the current names of the localities and present geographical distribution. The list of new names include Bengaluru (Bangalore), Chennai (Madras), Firozpur (Ferozepore), Jeypore (Tey pore), Kodagu (Coorg), Kolkata (Calcutta), Mangaluru (Mangalore), Mumbai (Bombay), Mysuru (Mysore), Puducherry (Pondicherry), Pune (Poona), Shivamogga (Shimoga), Tumakuru (Tumkur) etc. To produce the distribution map, all localities from south India from where Nomiinae bees have been collected were used (only records with detailed locality indication or complete coordinates were included). Mapinfo Professional 7.5SCP was used for generating the distribution map.

RESULTS

The subfamily Nomiinae is differentiated from other subfamilies of Halictidae by the following characters: marginal cell usually rounded at apex, third submarginal cell in forewing usually about as long as first, and distinctly longer than second

(*Steganomus* has only two submarginal cells), basal vein of the forewing varies from slightly and uniformly curved to strongly curved, prepygidial fimbria not divided medially, antenna arising near midlength of eyes, episternal groove present up to scrobe but sometimes as a weak depression below scrobal groove. Male: S7 a transverse plate with short apodemal arms and no midapical projection, highly variable in leg modifications (adapted from Michener, 2007).

Genus *Austronomia* Michener, 1965

Austronomia arcuata Pauly, 2009

No specimens examined.

Distribution:

South India	Karnataka (Bengaluru-Bannerghatta National Park), Kerala (Walayar forest), Puducherry (Karaikal)
Elsewhere in India	Madhya Pradesh (Satpura Hills, Pachmarhi), Maharashtra (Mumbai)
Outside India	-

Austronomia capitata (Smith, 1875)

(Fig. 1 & 2)

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 12°58' N 77°35' E, 1♀, 12.ix.2011, coll. Latha, C; 1♂, 28.i.2012, coll. Shrikant; 1♀, 31.vii.2013, coll. Girish, R.; 1♀, 10.i.2014, coll. Arati Pannure; 1♀, 29.x.2013, coll. Najeer; Hebbal, 900 m, 13°02' N 77° 35' E, 1♂, 19.x.2014, 1♀, 9.iii.2015, coll. Zameeroddin; Sadahalli, 906 m, 13°12' N 77°38' E, 1♀, 30.x.2014, coll. Zameeroddin. Haveri, Ranebennur, 957 m, 14°36' N 75°37' E, 1♀, 27.x.2010, coll. Sudha, M. Telangana: Medak, Narayankhed, 479 m, 18°04' N 77°50' E, 1♂, 12.ix.2012, coll. Yeshwanth, H.M.

Distribution:

South India	Karnataka (Bengaluru, *Haveri), *Telangana
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Elsewhere in India Maharashtra, Punjab (Ludhiana)

Outside India Sri Lanka

Floral records: *Phaseolus vulgaris*, *Calotropis* sp., *Tectona grandis*.

Austronomia notiomorpha (Hirashima, 1978)

No specimens examined.

Distribution:

South India	Karnataka (Bengaluru), Kerala (Wayalar Forests)
Elsewhere in India	Maharashtra
Outside India	Sri Lanka

Austronomia pseudoscutellata Pauly, 2009

No specimens examined.

Distribution:

South India	Kerala (Walayar forest), Tamil Nadu (Nilgiri Hills, Devala).
Elsewhere in India	-
Outside India	-

Austronomia ustula (Cockerell, 1911)

(Fig. 3 & 4)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♂, 1.xi.1988; 1♂, 11-20.ix.1989, coll. Ghorpade, K; GKVK, 876 m, 13°5' N 77°34' E, 1♀, 1.xii.2011, 927 m, 13°5' N 77°34' E, 2♀, 28.ii.2012, 1♀, 30.iv.2012, coll. Arun, B.C; 1♀, 12.x.2012, coll. Girish, R; 1♂, 23.x.2014, 1♀, 5.xi.2014, coll. Zameeroddin; 1♂, 8.iv.2015, coll. Sunil M.T; Hebbal, 900 m, 13°02' N 77° 35' E, 1♀, 11.xi.2014, 1♀, 1.4.xii.2014, 1♀, 30.i.2015, 1♀, 5.ii.2015, coll. Zameeroddin. Sadahalli, 906 m, 13°12' N 77°38' E, 1♀, 4.xi.2014, 1♂, 6.ii.2015, coll. Zameeroddin; Chikkamagaluru, Mudigere, 979 m, 13°06' N 75°37' E, 1♀, 10.xi.2014, coll. Prashantha, C. Kolar, Horticulture college, 830 m, 13°07' N 78°10' E, 1♂, 16.xii.2014, coll. Pradeep. Mysore, Chinnamballi, 716 m, 12°05' N 76°49' E, 1♂, 30.vii.2014, coll. Prashantha, C.

Distribution:

South India	Karnataka (*Bengaluru, Chamarajanagera - Bandipur National Park, *Chikkamagaluru, *Kolar, *Mysuru)
Elsewhere in India	Maharashtra
Outside India	Sri Lanka

*Chikkamagaluru, Kodagu-Madikeri, *Mandya, *Mangalore, *Mysuru), Tamil Nadu (Anaimalai Hills, Coimbatore, Nilgiri hills)

Elsewhere in India Maharashtra, West Bengal (Barrackpore)

Outside India It is distributed from India to Indonesia

Genus *Curvinomia* Michener, 1944***Curvinomia fulvata* (Fabricius, 1804)**

No specimens examined.

Distribution:

South India	Tamil Nadu (Nilgiri Hills, Gudalur)
Elsewhere in India	-
Outside India	Cambodia, China, Germany, Indonesia, Malaysia, Nepal

***Curvinomia iridescens* (Smith, 1857)**

(Fig. 5 & 6)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♀, 19.v.1980, 1♀, 11.viii.1980, 1♀, 14.vii.1980, coll. Veena; GKVK, 2♀, 13.v.2006, coll. Suma, S; 1♀, 30.iv.2009, 1♂, 19.v.2009, 1♂, 21.iv.2009, coll. Latha, H.C; 1♂, 7.iv.2009, coll. Geeta, R.N; 1♀, 16.iv.2009, coll. Mutthuraju, G.P; 1♀, 18.x.2011, coll. Dhanyavathi, P.N; 1♂, 1.vii.2014, coll. Sunil Rathod; Sadahalli, 906 m, 13°12' N 77°38' E, 1♂, 30.x.2014, coll. Zameeruddin. Chikkamagaluru, Mudigere, Malaymarutha, 980 m, 13°07' N 75°30' E, 1♀, 28.iv.2013, coll. Girish; Thogarihankal, 1023 m, 13°28' N 75°48' E, 1♀, 21.ix.201, coll. Prashantha, C; Sringeri, 672 m, 1♂, 20.vi.2015, coll. Sachin Hegde; 672 m, 1♀, 19.vi.2015, coll. Abhishek. Coorg, 1♂, 4.iii.2007, coll. Chengappa. Mandya, VC farm, 727 m, 12°48' N 76°74' E, 6♀ & 1♂, 10.viii.1982, coll. B. Mallik. Mangalore, 45 m, 12°92' N 74°85' E, 1♂, 9.v.1983, coll. B. Mallik. Mysore, Hunsur, 1♀, 10.iii.2009, coll. Dhanyavathi, P.N.

Distribution:

South India	Karnataka (*Bengaluru,
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Floral records: *Cajanus cajan*, *Anacardium occidentale*

***Curvinomia strigata* (Fabricius, 1793) (Fig. 7)**

Specimens examined. INDIA: Andhra Pradesh: Visakhapatnum, Araku valley, 934 m, 18° 33' N 82° 87' E, 1♀, 22.ix.2013, coll. Vinayak, T. Karnataka: Bangalore, 916 m, 1♀, 19.v.1980, 1♀, 11.viii.1980, 1♀, 14.vii.1980, coll. Veena. Chikkamagaluru, Mudigere, 1♀, 6.vi.2002, coll. Anas; Jannapura, 931 m, 29°10' N 75°46' E, 1♀, 3.iv.2012, coll. Y. Diwakar. Dakshina Kannada, Puttur (DCR), 1♀, 9.ii.2015, coll. K. Vanitha. Coorg, 1♀, 4.iii.2007, 1♂, 21.iv.2009, coll. Chengappa; Ponnampet, 858 m, 12°08' N 76°56' E, 1♀, 21.vii.2015, coll. Prashantha, C. Uttara Kannada, Badagunda, Ganeshgudi, 570 m, 15°16' N 074° 33' E, 1♀, 17.x.2015, coll. Prashantha C. Tamil Nadu: Coimbatore, 3♀, 13.x.2000, coll. C.A. Viraktamath.

Distribution:

South India	*Andhra Pradesh, *Karnataka, *Tamil Nadu
Elsewhere in India	-
Outside India	India to Indochina, Indonesia to Java and Borneo

Floral records: *Mimosa pudica*, *Oryza sativa*

Genus *Gnathonomia* Pauly, 2005***Gnathonomia aurata* (Bingham, 1897) (Fig. 8)**

Specimens examined. INDIA: Karnataka: Bidar, Ghorwadi, 628 m, 1♂, 15.x.2015, coll. Zameer. Mandya, VC farm, 727 m, 12° 48' N 76° 74' E, 1♂, 10.viii.1982, coll. B. Mallik. BM, 2♂, date and

location unknown, coll. B. Mallik. Tumkur, Yarabahalli, 861 m, 1♂, 29.vii.2014, coll. Revansidda.

Distribution:

South India	*Karnataka, Tamil Nadu (Coimbatore -Kovai)
Elsewhere in India	Punjab (Chohla Sahib), Uttarakhand
Outside India	Malaysia, Myanmar, Laos, Sri Lanka, Thailand

***Gnathonomia radiata* Pauly, 2009** (Fig. 9 & 10)

Specimens examined. INDIA: Karnataka: Chamarajanagar, BRT wildlife sanctuary, Khaggali, 2♂, 16.v.2011, coll. Suman. Chikkamagaluru, Mudigere, 981 m, 13°07' N 75°37' E, 1♀, 3.vi.2011, coll. Ashwath, P.C. Coorg, 2♀, 22.x.2008, coll. Chengappa; Ponnampet, 858 m, 12°08' N 76°56' E, 1♀, 21.vii.2015, coll. Prashantha, C. Dakshina Kannada, Puttur (DCR), 1♀, 9.ii.2015, coll. K. Vanitha. BM 123, BM 129, BM 130, BM 132, date and locality unknown, coll. B. Mallik.

Distribution:

South India	*Karnataka, Tamil Nadu (5 km S. Theppakadu Mudumalai National Park, 30 km NW Ooty)
Elsewhere in India	-
Outside India	Malaysia, Thailand

***Gnathonomia thoracica* (Smith, 1875)**

(Fig. 11 & 12)

Specimens examined. INDIA: Karnataka: Coorg, 1♀, 17.ix.2008, coll. Chengappa. Mangalore, Ullal (ARS), 6 m, 12°81' N 74° 84' E, 2♂, 18.viii.1983, ♀ & 1♂, 25.vii.1985, coll. B. Mallik.

Distribution:

South India	*Karnataka, Kerala, Tamil Nadu
Elsewhere in India	Sikkim, West Bengal (Kolkata)
Outside India	It is distributed from India to Indonesia (Java, Philippines), China

Genus *Hoplonomia* Ashmead, 1904***Hoplonomia elliotii* (Smith, 1875)** (Fig. 13 & 14)

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 13°04' N 77°34' E, 1♀, 21.iii.2015, coll. Sunil, M.T; 1♀, 18.vi.2009, coll. Kalleshwaraswamy; 1♀, 28.x.2009, coll. Suma, S. Chikkamagaluru, Mudigere, 980 m, 13°06' N 75°37' E, 3♀ & 2♂, 1.vii.2014, coll. Prashantha, C; Kodagu, Ponnampet, 858 m, 12°08' N 76°56' E, 2♀ & 3♂, 21.vii.2015, coll. Prashantha, C. Mandya (Sasalu), 841 m, 12° 47' N 76° 26' E, 2♀, 6.x.2014, coll. Pradeep. Mangalore, Ullal (ARS), 6 m, 12° 81' N 76° 26' E, 1♀, 30.ix.2011, coll. B. Mallik. Mysore, Hunsur, 1♀, 10.iii.2009, coll. Dhanyavathi, P.N. Kerala: Kannur, Madayipara, 38 m, 12°01' N 75°15' E, 1♂, 13.viii.2015, coll. Prashantha, C; 1♀, 13.viii.2015, coll. Pradeepa, S.D.

Distribution:

South India	*Karnataka, Kerala (Ponmudi Range, Trivandrum, *Kannur), Tamil Nadu
Elsewhere in India	Maharashtra, West Bengal (Barrackpore)
Outside India	It is distributed from India to Indochina and southern China

Floral records: *Cajanus cajan*, *Portulaca* sp., *Glycine max*.

***Hoplonomia westwoodi* (Gribodo, 1894)**

(Fig. 15 & 16)

Specimens examined. INDIA: Andhra Pradesh: Bapatla, 1♂, 12.xii.2006, coll. David, K.J. Karnataka: Bangalore, GKVK, 930 m, 12° 58' N 77°35' E, 1♀, 5.vi.2013, coll. Girish; 1♀, 23.iv.2012, coll. Arun B.C; 1♀, 7.i.2014, 1♀, 20.i.2014, coll. Arati Pannure; 1♂, 10.ii.2008, coll. Nayana, E.D; 4♀ & 1♂, 4,5,6,ix.2014, coll. Pradeep. GKVK, 934 m, 13° 08' N 77° 58' E, 1♀ & 3♂, 31.i.1982, coll. B. Mallik; Hebbal, 900 m, 13° 02' N 77° 35' E, 2♀, 31.x.2014, 1♀, 11.xi.2014, 1♀, 16.xi.2014, 1♀, 21.ii.2015, 1♂, 6.i.2015, 1♂, 20.xi.2015, coll.

Zameeroddin; Sadahalli, 906 m, 13°12'N 77°38' E, 1♀, 6.ii.2015, 1♀, 26.ii.2015, coll. Zameeroddin. Belgaum, Arabhavi, 582 m, 16°13' N 74°49' E, 2♀, 20.ix.2014, coll. Revansidda. Bellary, 1♀, 21.ix.2011, coll. M. Srinivasa. Chikkamagaluru, Kadur, 758 m, 13°33' N 76°49' E, 1♀, 24.xi.2014, coll. Prashantha, C; Mudigere (20 km SW), 2♂, 15.iii.2008, coll. Nayana, E. Hassan, karekere, 934 m, 13°06' N 76°10' E, 2♀, 23.vi.2014, coll. Zameeroddin. Dakshina Kannada, Kankandi, 20 m, 12°81' N 74°88' E, 1♀, 5.iii.2015, coll. Prashantha, C. Kodagu, Ponnampet, 858 m, 12°08' N 76°56' E, 1♀, 21.vii.2015, coll. Prashantha, C. Kolar, Horticulture college, 830 m, 13°07' N 78°10' E, 1♀, 16.xii.2014, coll. Zameeroddin. Koppal, Munirabad, 466 m, 15°33' N 76°33' E, 1♀, 5.xii.2012, coll. Najeer. Mandya (Sasalu), 841 m, 12° 47' N 76° 26' E, 2♀, 6.x.2014, coll. Pradeep; VC farm, 727 m, 12° 48' N 76° 74' E, 2♂, 10.viii.1982, coll. B. Mallik. Mysore, Chinnamballi, 716 m, 12°05' N 76°49' E, 2♀, 19.vii.2015, coll. Prashantha, C; COH, 824 m, 12° 22' N 76°31' E, 1♂, 20.vii.2015, coll. Prashantha, C; Hunsur, 1♀, 18.iv.2009, Dhanyavathi, P.N; Nanjangud, 1♂, 24.i.2009, coll. Dhanyavathi, P.N; Banur, 1♀, 23.iv.2009, Dhanyavathi, P.N. Udupi, Brahmavar, 1♂, 12.iv.1985, coll. A.R.V Kumar.

Distribution:

South India	*Andhra Pradesh, *Karnataka, Puducherry (Karaikal), Tamil Nadu (Coimbatore-Kovai)
Elsewhere in India	Maharashtra (Pune), Rajasthan (Udaipur), West Bengal (Barrackpore)
Outside India	Afghanistan, Pakistan, Sri Lanka

Floral records: *Leucas aspera*, *Cajanus cajan*, *Ocimum* sp., *Grewia* sp., *Gossypium hirsutum*, *Duranta erecta*, *Euphorbia pulcherrima*.

Genus *Leuconomia* Pauly, 1980

Leuconomia interstitialis (Cameron, 1898)
(Fig. 17 & 18)

Specimens examined. INDIA: Karnataka:

Bangalore, GKVK, 930 m, 12° 58' N 77°35' E, 1♂, 21.i.2013, coll. Girish; Sadahalli, 906 m, 13°12'N 77°38' E, 1♂, 30.x.2014, 4♀, 4.xi.2014, 1♀, 17.xi.2014, 1♂, 18.i.2015, 3♀, 29.i.2015, 2♀, 15.ii.2015, coll. Zameeroddin. Bidar, Markal, 584 m, 17°59' N 75°28' E, 1♀, 7.i.2011, coll. A.N.Reddy. Bijapur, 598 m, 16°46'N 75°44' E, 1♂, 16.viii.2011, coll. A.N.Reddy. Mysore, 1♀, 18.iii.2009, coll. Dhanyavathi, P.N.

Distribution:

South India	*Karnataka, Kerala (Walayar Forests)
Elsewhere in India	Punjab (Chohla Sahib), Uttar Pradesh (Allahabad), Uttarakhand (Mussoorie)
Outside India	-

Floral records: Grasses, *Cuphea hyssopifolia*, *Triticum aestivum*

Leuconomia rufitarsis (Smith, 1875)

No specimens examined.

Distribution:

South India	Kerala (Walayar Forests)
Elsewhere in India	-
Outside India	Africa

Genus *Lipotriches* Gerstaecker, 1858

Lipotriches (Rhopalomelissa) bombayensis
(Cameron, 1908)

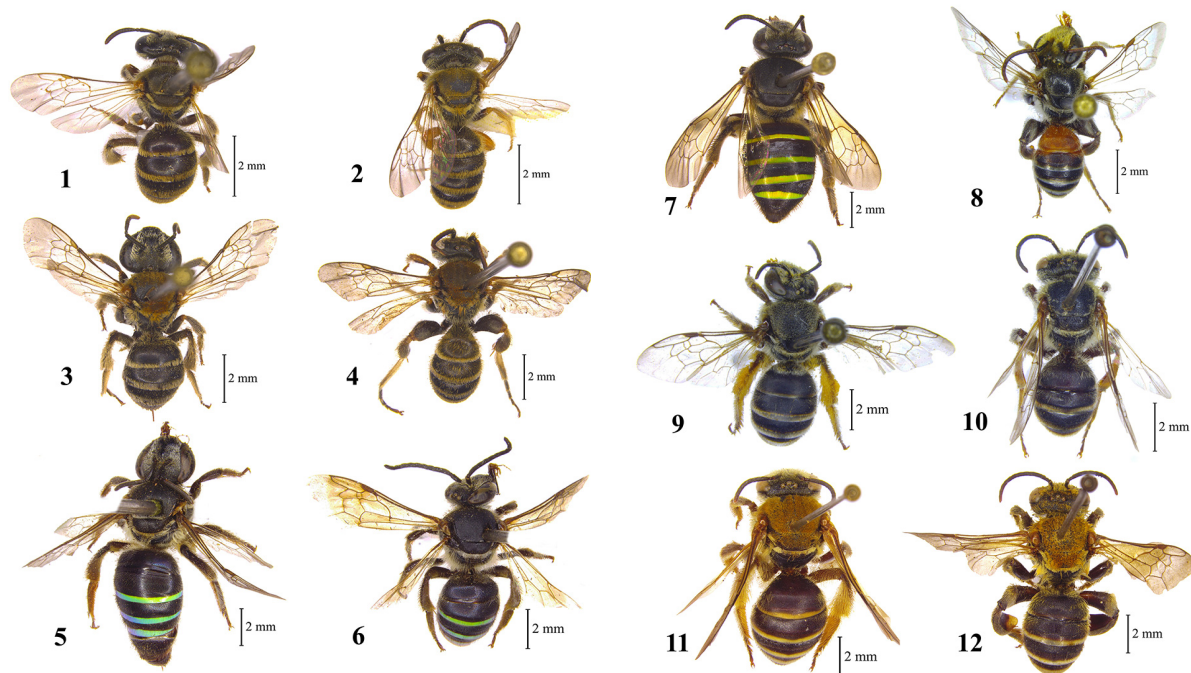
No specimens examined.

Distribution:

South India	Tamil Nadu (Coimbatore)
Elsewhere in India	Goa (Mormugao), Gujarat (Deesa), Maharashtra (Bombay)
Outside India	Sri Lanka

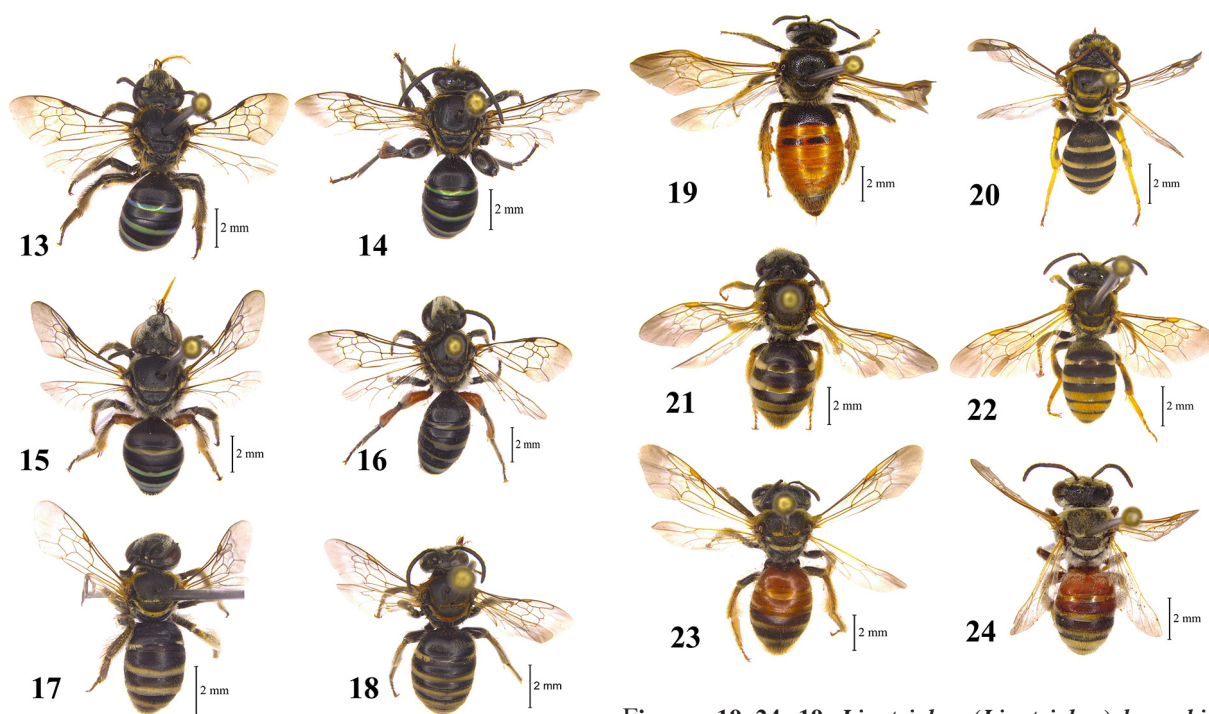
Lipotriches (Lipotriches) bouceki Pauly, 2014
(Fig. 19)

Specimens examined. INDIA: Karnataka:
Bangalore, GKVK, 939 m, 12° 58' N 77° 35' E, 1♀,
8.vi.2012, coll. G. Keshavareddy; Hebbal, 1♀,
25.x.1976, coll. Students.



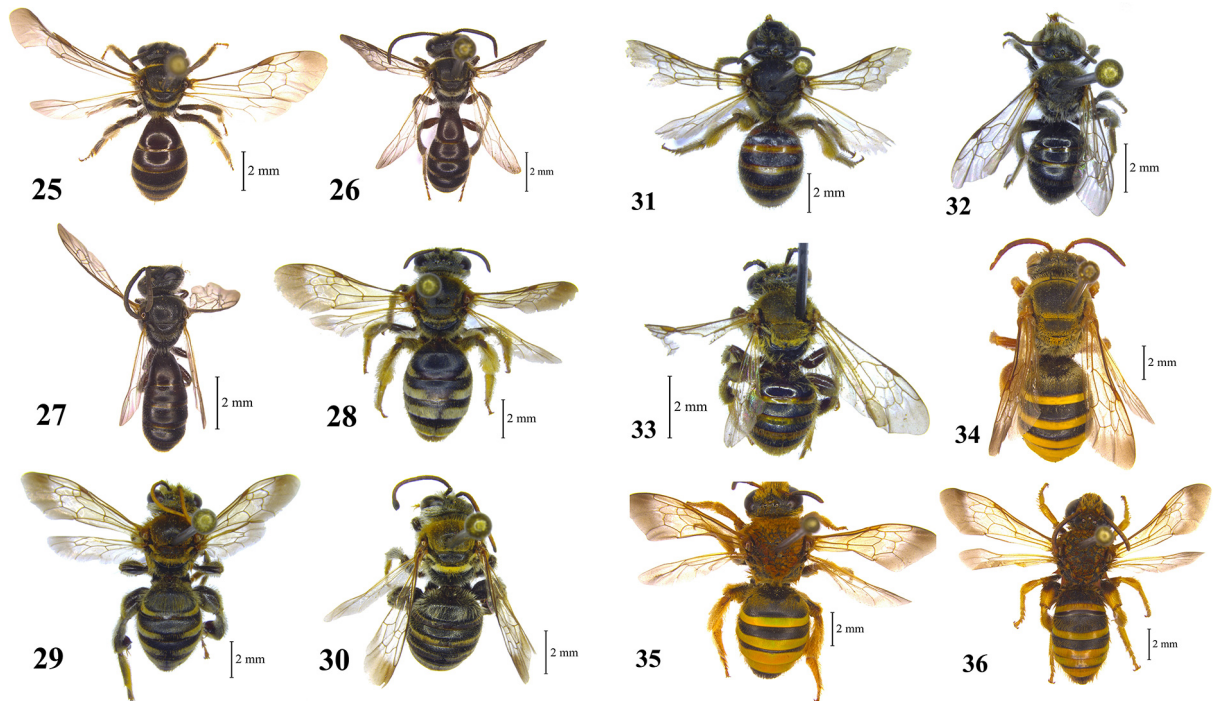
Figures 1–6. 1. *Austronomia capitata*, female; 2. *Austronomia capitata*, male; 3. *Austronomia ustula*, female; 4. *Austronomia ustula*, male; 5. *Curvinomia iridescens*, female; 6. *Curvinomia iridescens*, male.

Figures 7–12. 7. *Curvinomia strigata*, female; 8. *Gnathonomia aurata*, male; 9. *Gnathonomia radiata*, female; 10. *Gnathonomia radiata*, male; 11. *Gnathonomia thoracica*, female; 12. *Gnathonomia thoracica*, male.



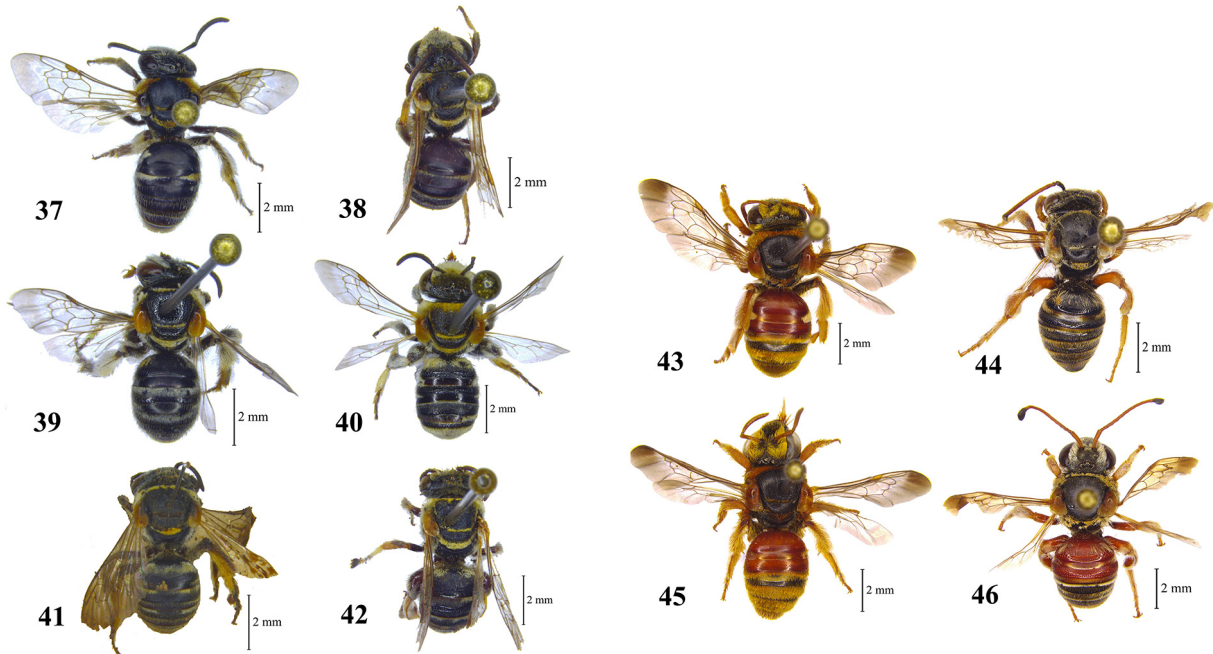
Figures 13–18. 13. *Hoplonomia elliotii*, female; 14. *Hoplonomia elliotii*, male; 15. *Hoplonomia westwoodi*, female; 16. *Hoplonomia westwoodi*, male; 17. *Leuconomia interstitialis*, female; 18. *Leuconomia interstitialis*, male.

Figures 19–24. 19. *Lipotriches (Lipotriches) bouceki*, female; 20. *Lipotriches (Armatriches) fervida*, male; 21. *Lipotriches (Lipotriches) fulvinerva*, female; 22. *Lipotriches (Lipotriches) fulvinerva*, male; 23. *Lipotriches (Lipotriches) phenacura*, female; 24. *Lipotriches (Lipotriches) phenacura* male.



Figures 25–30. 25. *Lipotriches (Rhopalomelissa) pulchriventris*, female; 26. *Lipotriches (Rhopalomelissa) pulchriventris*, male; 27. *Lipotriches (Rhopalomelissa) tubulisetae*, male; 28. *Macronomia antennata*, female; 29. *Macronomia antennata*, male; 30. *Macronomia dilatata*, male.

Figures 31–36. 31. *Macronomia karnatakaensis* female, 32. *Macronomia karnatakaensis*, male; 33. *Macronomia walayarensis*, male; 34. *Nomia curvipes*, female; 35. *Nomia crassipes*, female; 36. *Nomia crassipes*, male.



Figures 37–42. 37. *Pachynomia aliena*, female; 38. *Pachynomia aliena*, male; 39. *Pseudapis oxybeloides* female; 40. *Pseudapis oxybeloides*, male; 41. *Pseudapis patellata*, female; 42. *Pseudapis patellata*, male.

Figures 43–46. 43. *Steganomus bipunctatus*, female; 44. *Steganomus bipunctatus*, male; 45. *Steganomus lieftincki*, female; 46. *Steganomus lieftincki*, male.

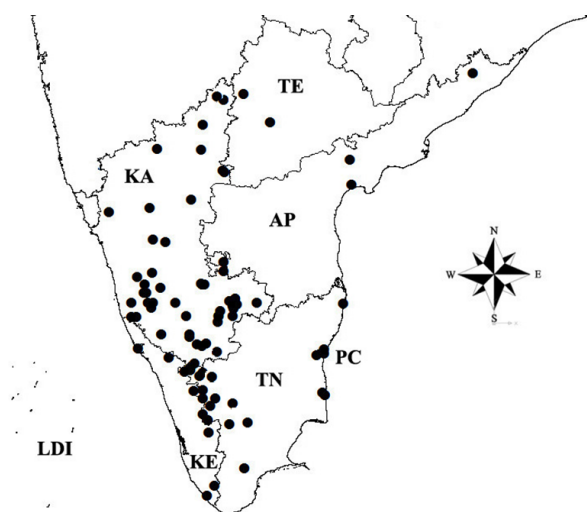


Figure 47. Summarized distributional map of bees belonging to Nomiinae recorded so far from south India. Current states and union territories of south India abbreviated as follows, AP: Andhra Pradesh, KA: Karnataka, KE: Kerala, TE: Telangana, TN: Tamil Nadu, LDI: Lakshadweep Islands and PC: Puducherry.

Distribution:

South India	Karnataka (Bengaluru)
Elsewhere in India	-
Outside India	-

***Lipotriches (Rhopalomelissa) ceratina* (Smith, 1857)**

No specimens examined.

Distribution:

South India	Puducherry (Karaikal)
Elsewhere in India	Orissa (Jeypore)
Outside India	China, Indonesia (Borneo, Sumatra, Sulawesi), Japan, Korea, Laos, Malaysia, Myanmar, Philippines, Taiwan, Thailand, Vietnam

***Lipotriches (Rhopalomelissa) exagens* (Walker, 1860)**

No specimens examined.

Distribution:

South India	Tamil Nadu (Coimbatore-Marudamalai Hills)
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Elsewhere in India Goa (Mormugao), Orissa (Jeypore), Punjab (Ludhiana), Rajasthan, Thar Desert

Outside India Sri Lanka

***Lipotriches (Armatriches) fervida* (Smith, 1875) (Fig. 20)**

Specimens examined. INDIA: Karnataka: Raichur, 939 m, 16°15' N 77°20' E, 2♂, 25.viii.2013, coll. Veereshkumar.

Distribution:

South India Andhra Pradesh, *Karnataka, Puducherry (Karaikal, Nettapakam), Tamil Nadu (Coimbatore), Telangana (Hyderabad)

Elsewhere in India Gujarat (Deesa), Haryana, New Delhi (Sakeet), Punjab (Ferozpur), Rajasthan (Mount Abu), Thar Desert, Uttar Pradesh (Agra, Allahabad)

Outside India Pakistan, Sri Lanka

Floral records: *Tribulus terrestris*.

***Lipotriches (Lipotriches) fulvinerva* (Cameron, 1907) (Fig. 21 & 22)**

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 12° 58' N 77° 35' E, 1♂, 11.ii.2014, coll. Unknown; Hebbal, 900 m, 13° 02' N 77° 35' E, 1♀, 20.xi.2014, 1♀, 4.xii.2014, 1♂, 31.x.2014, coll. Zameeroddin.

Distribution:

South India *Karnataka, Puducherry (Karaikal), Tamil Nadu (Coimbatore)

Elsewhere in India Assam (10 min N. of Tinsukia), Bihar, Gujarat (Deesa), Maharashtra, West Bengal (Barrackpore, Kanchrapara, Kolkata)

Outside India Bangladesh, Myanmar, Pakistan, Sri Lanka

Lipotriches (Rhopalomelissa) minutula
(Friese, 1909)

No specimens examined.

Distribution:

South India	Tamil Nadu (Anamalai Hills, Cinchona)
Elsewhere in India	Maharashtra
Outside India	China, Indonesia (Borneo, Sumatra, Java, Sulawesi), Laos, Malaysia, Philippines, Thailand, Vietnam

Lipotriches (Lipotriches) phenacura
(Cockerell, 1911) (Fig. 23 & 24)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♂, 3.xi.1987, coll. K. Ghorpade; GKVK, 930 m, 12°58' N 77°35' E, 1♀, 8.vi.2012, coll. Veereshkumar; Hebbal, 900 m, 13° 02' N 77° 35' E, 2♀, 4.xii.2014, coll. Zameeroddin.

Distribution:

South India	*Karnataka, Kerala (Walayar Forest), Puducherry (Karikal), Tamil Nadu (Coimbatore)
Elsewhere in India	Maharashtra (Pune-Yerandavna, Nasik)
Outside India	Sri Lanka

Lipotriches (Rhopalomelissa) pulchriventris
(Cameron, 1897) (Fig. 25 & 26)

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 12° 58' N 77° 35' E, 1♀, 21.vi.2011, 1♂, 28.vi.2011, coll. Girish; 1♂, 21.vi.2011, 1♀, 1.viii.2011, coll. E.D. nayana; 1♂, 24.xi.2011, coll. P. Nirmala; 1♂, i.vi.2014, coll. Students; Hebbal, 900 m, 13° 02' N 77° 35' E, 1♀, 20.xi.2014, 2♀, 16.xi.2014, 1♀, 5.ii.2015, coll. Zameeroddin; Lalbagh, 1♂, 9.vi.1976, coll. Students; Cubbon Park, 916 m, 1♂, 4.xi.1976, coll. A.R.V. Kumar. Hassan, karekere, 934 m, 13°06' N 76°10' E, 5♀, 23.vi.2014, coll. Prashantha, C; 3♀, 23.vi.2014, coll. Zameer.

Distribution:

South India	Karnataka (Bengaluru,
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*Hassan, Kodagu - Madikeri), Tamil Nadu (Nilgiri -Devala, Singara)

Elsewhere in India

Assam (Chabua, 6mi NW Digboi), Maharashtra (Nasik), Uttarakhand (Mussoorie, Kumaon), West Bengal (Kanchrapara)

Outside India

Australia (Queensland), China (Hainan, Hunan), Indonesia (Borneo, Sumatra, Java, Timor, Sulawesi, Moluccas), Laos, Malaysia, Nepal, New Guinea, Philippines, Solomon Islands, Sri Lanka, Thailand, Vietnam

Lipotriches (Rhopalomelissa) taprobanae
(Cameron, 1897)

No specimens examined.

Distribution:

South India	Puducherry (Auroville), Tamil Nadu
Elsewhere in India	-
Outside India	Sri Lanka (Colombo)

Lipotriches (Rhopalomelissa) tubulisetae Pauly,
2009 (Fig. 27)

Specimens examined. INDIA: Karnataka: Kodagu, Chettalli, 1001 m, 12°22' N 75°49' E, 1♂, 9.xi.2012, coll S. Ramani. Uttara Kannada, Sirsi, Unchalli falls, 510 m, 14°82' N 74°92' E, 1♂, 20.xi.2012, coll. Vinayaka, T; 1♂, 20.xi.2012, coll. R. Girish.

Distribution:

South India	Karnataka (Kodagu, *Uttara Kannada), Tamil Nadu (Coimbatore, Nilgiri Hills)
Elsewhere in India	-
Outside India	-

Genus *Macronomia* Cockerell, 1917

***Macronomia anamalaiensis* Pauly, 2009**

No specimens examined.

Distribution:

South India	Tamil Nadu (Chennai, Anamalai Hills-Kadamparai, Cinchona)
Elsewhere in India	-
Outside India	-

***Macronomia antennata* (Smith, 1875)**

(Fig. 28 & 29)

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 12°58' N 77°35' E, 1♀, 26.ii.2015, Sunitha, N.D; 930 m, 13°04' N 77°34' E, 1♂, 23.x.2014, coll. Zameeroddin; Sadahalli, 906 m, 13°12' N 77°38' E, 1♀ & 1♂, 12.x.2014, 1♀ & 3♂, 30.x.2014, 1♀ & 1♂, 29.x.2014, 2♀ & 1♂, 04.xi.2014, 2♀ & 1♂, 17.xi.2014, 1♀, 5.xii.2014, 1♀ & 1♂, 6.ii.2015, 3♂, 26.ii.2015, Zameeroddin. Raichur, 939 m, 16° 15' N 77° 20' E, 1♀, 27.ix.2014, coll. Veereshkumar. Kerala: Kannur, Madayipara, 38 m, 12°01' N 75°15' E, 1♂, 13.viii.2015, coll. Prashantha, C.

Distribution:

South India	*Karnataka, *Kerala
Elsewhere in India	Madhya Pradesh (Jabalpur), Maharashtra (Mumbai, Pune), Uttar Pradesh
Outside India	-

Floral record: *Tephrosia* sp.***Macronomia dilatata* Pauly, 2009** (Fig. 30)

Specimens examined. Tamil Nadu: Tarapura, 277 m, 10°49' N 77°27' E, 1♂, 10.xi.2010, coll. A. N. Reddy.

Distribution:

South India	Kerala (Walayar Forest, Malabar), Tamil Nadu (Nilgiri Hills- Moyar Camp, Coimbatore-Marudamalai Hills)
Elsewhere in India	-
Outside India	-

***Macronomia karnatakaensis* Pauly, 2009**

(Fig. 31 & 32)

Specimens examined. INDIA: Karnataka: Bangalore, GKVK, 930 m, 13°04' N 77°34' E, 1♂, 5.xi.2014, coll. Zameeroddin. Chikkamagaluru, Mudigere, Ettina Bhuja, 1005 m, 12°59' N 75°35' E, 1♀, 14.xii.2013, coll. Najeer. Kolar, Horticulture College, 830 m, 13°07' N 78°10' E, 2♂, 16.xii.2014, coll. Pradeep.

Distribution:

South India	Karnataka (Bengaluru-Doddagubbi, Bannerghatta National Park, *Chikkamagaluru, *Kolar), Kerala (Walayar Forest), Tamil Nadu (Coimbatore)
Elsewhere in India	-
Outside India	Sri Lanka

***Macronomia madrasensis* Pauly, 2009**

No specimens examined.

Distribution:

South India	Tamil Nadu (Chennai)
Elsewhere in India	-
Outside India	-

***Macronomia nilgiriensis* Pauly, 2009**

No specimens examined.

Distribution:

South India	Tamil Nadu (Nilgiri Hills-Moyar Camp, Singara)
Elsewhere in India	-
Outside India	-

***Macronomia savannakheti* Pauly, 2009**

No specimens examined.

Distribution:

South India	Tamil Nadu (Nilgiri Hills-Singara, Gudabu)
Elsewhere in India	-
Outside India	Laos

***Macronomia walayarensis* Pauly, 2009** (Fig. 33)
Specimen examined. INDIA: Tamil Nadu: Burliar,
860 m, 1♂, 19.xi.2000, coll. K. Ghorpade.

Distribution:

South India Kerala (Walayar Forest),
*Tamil Nadu
Elsewhere in India -
Outside India -

Genus *Maynenomia* Pauly, 1984

***Maynenomia chalcea* (Cockerell, 1920)**

No specimens examined.

Distribution:

South India Kerala (Manantoddy,
Wynad)
Elsewhere in India -
Outside India -

***Maynenomia keralaensis* Pauly, 2009**

No specimens examined.

Distribution:

South India Kerala (Walayar Forest),
Puducherry (Karaikal),
Tamil Nadu (Coimbatore,
Marudamalai hills).
Elsewhere in India -
Outside India -

***Maynenomia lonavlaensis* Pauly, 2009**

No specimens examined

Distribution:

South India Puducherry, Tamil Nadu
Elsewhere in India Maharashtra (Lonavla)
Outside India -

***Maynenomia nathani* Pauly, 2009**

No specimens examined

Distribution:

South India Kerala (Walayar Forest),
Puducherry (Indra Nagar),
Tamil Nadu (Anamalai Hills,
Cinchona)

Elsewhere in India -
Outside India Sri Lanka

Genus *Nomia* Latreille, 1804

***Nomia curvipes* (Fabricius, 1793)** (Fig. 34)

Specimen examined. INDIA: Gujarat: 19 km S.
Baroda, 1♂, 18.ix.1990, coll. K. Ghorpade.

Distribution:

South India Kerala (Walayar Forests),
Puducherry (Karaikal),
Tamil Nadu (Coimbatore,
Kovilpatti, Nagapattinam)
Elsewhere in India Gujarat (Baroda, Deesa),
Madhya Pradesh,
Maharashtra (Mumbai),
Punjab (Ludhiana), Uttar
Pradesh, West Bengal
Outside India Pakistan (Karachi),
Myanmar, Nepal

***Nomia crassipes* (Fabricius, 1798)**

(Fig. 35 & 36)

Specimens examined. INDIA: Karnataka:
Bangalore, GKVK, 930 m, 13°04' N 77°34' E, 1♂,
22.x.2014, 1♀, 5.xi.2014, coll. Zameeroddin; 2♀,
10, 25.ix.2014, coll. Pradeep; 1♀, 22.x.2013, coll.
Srinivas; 3♀, 10, 12, 19.x.2012, coll. Girish, R; 927
m, 13°5' N 77°34' E, 1♂, 7.v.2012, 1♂, 16.vi.2012,
coll. Arun, B.C; Hesaraghatta, 1♀, 1.x.2005, coll.
Suma, S; 1♀, 25.vii.2009, 1♂, 26.vii.2009, coll.
Yeshwanth, H.M. Sadahalli, 906 m, 13°12' N 77°38'
E, 1♀, 12.x.2014, 2♀ & 1♂, 30.x.2014, 1♂,
4.xi.2014, 1♀ & 1♂, 6.ii.2015, coll. Zameeroddin.
Belgaum, Arabhavi, 582 m, 16°13' N 74°49' E, 1♀,
20.ix.2014, coll. Revansidda. Chikkamagaluru,
Mudigere (Jannapura, YFC), 931 m, 29°10' N 75°46'
E, 1♀, 3.iv.2012, coll. Y. Diwakar. Dakshina
Kannada, Vittal, 1♂, 30.ix.2011, coll. Aswathy, T.V.
Gulberga, 1♂, viii.1981, coll. A.R.V Kumar. Kerala:
Kasaragod, Padannakkad, 14 m, 12°15' N 75°07'
E, 2♀, 14.viii.2015, coll. Arati Pannure.

Distribution:

South India *Karnataka, Kerala
(*Kasaragod, Walayar

Forest), Tamil Nadu (Coimbatore)
 Elsewhere in India Odisha (Jeypore), New Delhi (nr Sakeet), Maharashtra
 Outside India Bhutan, China, Pakistan, Sri Lanka, Taiwan, Thailand

Floral records: *Croton bonplandianum*, *Coffea arabica*

Genus *Nomiapis* Cockerell, 1919

Nomiapis carcharodonta (Baker, 2002)

No specimens examined.

Distribution:

South India Kerala (Walayar Forest)
 Elsewhere in India -
 Outside India -

Genus *Pachynomia* Pauly, 1980

Pachynomia aliena (Cameron, 1898)

(Fig. 37 & 38)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♂, 24.vii.1984, coll. B. Mallik; 3♀, 18.ii.1978, fields, coll. k. Ghorpade; 934 m, 13°08' N 77°58' E, 3♂, 14-16.xi.1981, coll. B. Mallik; 1♂, 4.ix.1984, coll. Prasad; 930 m, 12°58' N 77°35' E, 5♀, 17-20.i.2014, coll. Arati Pannure; 2♀, 24.xi.2011, coll. Nayana, E.D; 3♀, 15.i.2013, coll. Girish, R; 2♀ & 1♂, 18.xi.2014, 1♂, 23.x.2014, 1♂, 5.i.2015, coll. Zameeroddin. Hebbal, 900 m, 13°02' N 77° 35' E, 1♀, 14.x.2014, 2♀, 31.x.2014, 2♀, 20.xi.2014, 1♀, 11.xi.2014, 1♀, 21.ii.2015, 1♀, 30.i.2015, 1♀, 9.iii.2015, coll. Zameeroddin; Sadahalli, 906 m, 13°12' N 77°38' E, 1♀, 12.x.2014, 1♀, 5.xii.2014, 3♀, 29.i.2015, coll. Zameeroddin. Gulberga, Bheemarayan Gudi, 454 m, 1♀, 16.viii.1981, coll. A.R.V Kumar. Mysore, COH, 824 m, 12°22' N 76°31' E, 1♀, 20.vii.2015, coll. Prashantha, C. Raichur, 421 m, 16° 12' N 77°22' E, 2♂♂, 19.ix.2014, coll. Veereshkumar. Kerala: Walayar, 2♀, 25.v.1982, coll. V.V. Belavadi.

Distribution:

South India *Karnataka, Kerala (Walayar)
 Elsewhere in India Maharashtra (Nasik, Pune), Uttarakhand (Mussoorie)
 Outside India Sri Lanka

Floral records: Grasses, *Helianthus annuus*, *Solanum* sp.

Pachynomia nathani Pauly, 2009

No specimens examined.

Distribution:

South India Kerala (Walayar Forest), Tamil Nadu (Nilgiri Hills-Kallar)
 Elsewhere in India -
 Outside India Sri Lanka

Genus *Pseudapis* Kirby, 1900

Pseudapis oxybeloides (Smith, 1875)

(Fig. 39 & 40)

Specimens examined. INDIA: Andhra Pradesh: Guntur, Ananthavaram, 105 m, 16°30' N 80°26' E, coll. Girish, R. Karnataka: Bangalore, GKVK, 930 m, 12°58' N 77°35' E, 2♂, 24.xi.2011, coll. Nayana, E.D; 1♀, 21.v.2012, coll. Arun, B.C; 1♀, 20.i.2014, coll. Arati Pannure; 1♀, 5.i.2015, coll. Prashanth, C. Belgaum, Arabhavi, 595 m, 16°13' N 74°50' E 17.viii.2011, coll. H.M. Yeshawant. Chikkamagaluru, Mudigere, ARS, 930 m, 13°13' N 75°65' E, 1♀, 12.xi.1985, coll. T. Shivashankar. Dakshina Kannada, Puttur (DCR), 2♀ & 1♂, 25.ii.2015, coll. K. Vanitha; 90 m, 12°45' N 75°01' E, 3♀ & 3♂, 3.iii.2015, coll. Prashanth, C; Moodabidri, 80 m, 13°06' N 75°06' E, 2♀, 25.vii.2015, coll. Prashantha, C. Koppal, Munirabad, 466 m, 15°33' N 76°33' E, 1♀, 5.xii.2012, coll. Najeer. Mangalore, Ullal (ARS), 6 m, 12°81' N 74°84' E, 2♀, 16.xi.1983, 1♀, 28.xii.1985, coll. B. Mallik. Mysore, Hunsur, 3♂, 17.i.2009, coll. Dhanyavathi, P.N. Shimoga (40 km SW), 1♀ & 1♂, 21.v.2008, coll. Nayana, E.D; Navile, 640 m,

2♀ & 1♂, 24.xii.2014, coll. Sunil Rathod. Tumkur, Pavagada, 876 m, 14°5' N 77°21' E, 1♀, 17.i.2012, coll. Arun, B.C. Kerala: Kannur, Madayipara, 38 m, 12°01' N 75°15' E, 1♀, 13.viii.2015, coll. Prashantha, C. Pondicherry, 1♀, 19.ix.1979, coll. ARV Kumar. Tamil Nadu: Dindigul (Gandhi gram), 331 m, 10°16' N 77°56' E, 1♂, 17.x.2010, coll. A.N. Reddy.

Distribution:

South India	*Andhra Pradesh (Guntur), Karnataka, Kerala (Kannur), Puducherry (Karaikal), Tamil Nadu (Annamalai hills, Chennai, Coimbatore, *Dindigul, Thanjavur)
Elsewhere in India	Gujarat (Banaskantha, Deesa), Maharashtra (Bombay, Lonavla, Khandala, Nasik, Pune), Madhya Pradesh (Jabalpur), Punjab (Ludhiana), Rajasthan (Mount Abu, Udaipur), Uttar Pradesh (Allahabad), West Bengal (Kolkata)
Outside India	Pakistan to Bangladesh, Sri Lanka

Floral records: *Anacardium occidentale*, *Sorghum bicolor*, Grasses, *Tridax procumbens*, *Aegle marmelos*, *Callistemon citrinus*.

***Pseudapis patellata* (Magretti, 1884)**

(Fig. 41 & 42)

Specimens examined. INDIA: Karnataka: Mandya, VC farm, 727 m, 12°48' N 76°74' E, 1♀, 10.viii.1982, coll. B. Mallik. Mysore, Megalapura, 605 m, 12°39' N 77°13' E, 1♂, 8.viii.1982, coll. B. Mallik. Tamil Nadu: Kodaikanal (Bryant Park), 1♀, 15.xii.1985, coll. T. Shivashankar.

Distribution:

South India	*Karnataka, Puducherry (Karaikal), Tamil Nadu (Coimbatore, *Kodaikanal, Thanjavur- Kurumbagarm)
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Elsewhere in India -

Outside India Africa, Oman, Saudi Arabia, Sudan, UAE, Yemen

Genus *Steganomus* Ritsema, 1873

***Steganomus bipunctatus* (Fabricius, 1804)**

(Fig. 43 & 44)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♀, 25.xi.1989, coll. K. Ghorpade; GKVK, 921 m, 13°04' N 77°34' E, 1♀, 12.x.2012, 1♀, 28.xi.2012, 1♂, 4.iii.2013, coll. Girish, R; 2♀, 10.ix.2014, coll. Pradeep; 3♀, 17.ix.2013, coll. Najeer; Sadahalli, 906 m, 13°12' N 77°38' E, 1♀, 15.ii.2015, coll. Zameeruddin. Chikkamagaluru, Kadur, 758 m, 13°33' N 76°49' E, 1♀, 24.xi.2014, coll. Prashantha, C; Mudigere, Jannapura, 931 m, 29°10' N 75°46' E, 1♀, 3.iv.2012, coll. Y. Diwakar. Hassan, karekere, 934 m, 13°06' N 76°10' E, 1♂, 24.vi.2014, coll. Prashantha, C. Shimoga, Navile, 640 m, 13°93' N 75°56' E, 6♀, 24.xii.2014, coll. Prashantha, C. Ramanagara, Magadi, Savandurga, 12°55' N 77°16' E, 1♂, 15.x.2009, coll. Yeshwanth, H.M. Mysore, COH, 824 m, 12°22' N 76°31' E, 1♀ & 1♂, 21.viii.2015, coll. Prashantha, C.

Distribution:

South India	*Karnataka, Tamil Nadu
Elsewhere in India	Punjab (Ludhiana), Uttar Pradesh (near Lucknow), West Bengal (Barrackpore)
Outside India	Pakistan, Sri Lanka.

Floral records: *Phaseolus vulgaris*

***Steganomus gracilis* Cameron, 1898**

No specimens examined.

Distribution

South India	Puducherry (Karaikal)
Elsewhere in India	Uttarakhand
Outside India	Sri Lanka

***Steganomus lieftincki* Pauly, 2009** (Fig. 45 & 46)

Specimens examined. INDIA: Karnataka: Bangalore, 916 m, 1♀, 10.x.1988, coll. K. Ghorpade; GKVK, 930 m, 13°04' N 77°34' E, 1♂, 12.xi.2014,

coll. Zameeroddin; 1♀, 11.x.2012, coll. Prashantha, C; 900 m, 13°04' N 77°34' E, 1♀, 29.xi.2014, 1♀, 11.x.2012, coll. Prashantha, C; 876 m, 13°04' N 77°34' E, 1♀, 8.xi.2011, coll. Arun, B. C; Sadahalli, 906 m, 13°12' N 77°38' E, 1♂, 30.x.2014, 3♀, 4.xi.2014, coll. Zameeroddin. Belgaum, Arabhavi, 582 m, 16°13' N 74°49' E, 2♀ 20.ix.2014, coll. Revansidda. Hassan, karekere, 934 m, 13°06' N 76°10' E, 1♂, 23.vi.2014, coll. Prashantha, C.; 1♀, 23.vi.2014, coll. Zameeroddin. Kolar, Horticulture College, 830 m, 13°07' N 78°10' E, 1♂, 16.xii.2014, coll. Pradeep; 3♀ & 1♂, 16.xii.2014, coll. Arati Pannure. Tumkur, Ankasandra, 1086 m, 13°32' N 76°53' E, 1♀, 26.xii.2012, coll. Prashantha, C; Yarabahalli, 816 m, 2♀ & 2♂, 29.vii.2004, coll. Veereshkumar.

Distribution:

South India	*Karnataka
Elsewhere in India	New Delhi, Ranchi (Namkum), Eastern Rajasthan, West Bengal (Barrackpore)

Outside India -

Floral records: *Grewia hirsuta*

DISCUSSION

Bees, like most other insects in India, have been largely ignored, except for a few noteworthy literature resources, proper taxonomic and distributional studies on this economically imperative insect group are lacking. Bingham's (1897) work had almost exclusively been limited to the northern and eastern parts of India. Online checklist by Gupta (2010) and checklist of halictid bees by Saini and Rathor (2012) are without complete species list, localities or details of distribution. Since no comprehensive list of these bees from south India has been ever published, the present list has been compiled with updated information from different south Indian states keeping in mind the recent nomenclatural changes by Pauly (2009). Altogether, 48 species belonging to 13 genera of Nomiinae bees are reported, among them sixteen species are reported for the first time for Karnataka, three species for Andhra Pradesh, two species for Tamil

Nadu and one species each for Kerala and Telangana. *Curvinomia strigata* (Fabricius, 1793), *Macronomia antennata* (Smith, 1875) and *Steganomus lieftincki* Pauly, 2009 are newly recorded from south India. The current nomiinae bee diversity in south India represents around 8.2 % and 31.8 % of world and Oriental fauna respectively. Two species of *Macronomia*, one species each of *Lipotriches*, *Maynenomia* and *Nomia* remain unidentified.

The study also indicates that most areas of the south Indian states like Andhra Pradesh, Telangana, Tamil Nadu, Northern parts of Karnataka and Kerala are unexplored for bees (Fig. 47). Considering the Western Ghats and Eastern Ghats are unknown for bees, the true number of species in the region could be undeniably larger than reported here. There is further scope of discovery of many more bees from the study area, if more extensive and intensive surveys of the unexplored areas are undertaken. The updated checklist of the Nomiinae bees of south India presented here therefore can facilitate future research of this area.

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REFERENCES

- Ashmead W. H. (1904) A list of the Hymenoptera of the Philippine Islands, with descriptions of new species. *Journal of the New York entomological Society* 12: 1–22.
- Astafurova Y. V. (2013) Geographic Distribution of Halictid Bees of the Subfamilies Rophitinae and Nomiinae (Hymenoptera, Halictidae) in the

- Palaeartic. Entomological Review 93(4): 437–451.
- Ascher J. S. and Pickering J. (2016) Discover Life - bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). http://www.discoverlife.org/mp/20q?guide=Apoidea_species
- Baker D. B. (2002) On Palaeartic and Oriental species of the genera *Pseudapis* W.F. Kirby, 1900, and *Nomiapis* Cockerell, 1919. Beiträge zur Entomologie, Keltern 52(1): 1–83.
- Batra S. W. T. (1966) Social behavior and nests of some nomiine bees in India (Hymenoptera, Halictidae). Insectes Sociaux 13(3): 145–153.
- Batra S. W. T. (1977) Bees of India (Apoidea), their Behaviour, Management and a Key to the Genera. Oriental Insects 11(3): 289–324.
- Bingham C. T. (1897) The fauna of British India, including Ceylon and Burma. Hymenoptera. Vol. I. Wasps and bees. Taylor & Francis, London. XXIX + 579 pp. 4 pls.
- Cameron P. (1897) Hymenoptera Orientalia or contributions to knowledge of the Hymenoptera of the Oriental Zoological region. Part V. Memoirs of the Manchester Literary and Philosophical Society 41: 1–144.
- Cameron P. (1898) Hymenoptera Orientalia or contributions to a knowledge of the Hymenoptera of the Oriental Zoological region. Part VII. Memoirs of the Manchester Literary and Philosophical Society 42(11): 1–84.
- Cameron P. (1902) Descriptions of new genera and species of Hymenoptera from the Oriental Zoological Region (Ichneumonidae, Fossores and Anthophila). Annals of Natural History 9(7): 145–155, 204–215, 245–255.
- Cameron P. (1904) Descriptions of new species of aculeate and parasitic Hymenoptera from Northern India. Annals and Magazine of Natural History 13: 211–233.
- Cameron P. (1907a) Description of a new genus and some new species of Hymenoptera captured by Lieut.-Col. C.G. Nurse at Deesa, Matheran and Ferozepore. Journal of the Bombay natural History Society 17: 1001–1012.
- Cameron P. 1907b. Three new bees from the Oriental zoological region. The Entomologist 40: 284–286.
- Cameron P. 1908. A Contribution to the Aculeate Hymenoptera of the Bombay Presidency. Journal of the Bombay Natural History Society 18: 300–311.
- Cane J. H. (2002) Pollinating Bees (Hymenoptera: Apiformes) of U.S. Alfalfa Compared for Rates of Pod and Seed Set. Journal of Economic Entomology 95(1): 22–27.
- Cane J. H. (2008) A native ground-nesting bee (*Nomia melanderi*) sustainably managed to pollinate alfalfa across an intensively agricultural landscape. Apidologie 39: 315–323.
- Cockerell T. D. A. (1911) New and little known bees. Transactions of the American entomological Society, Philadelphia 37: 217–234.
- Cockerell T. D. A. (1917) New records of bees from Natal. Annals of the Durban Museum 1: 460–468.
- Cockerell T. D. A. (1919) Bees in the collections of the United States National Museum – 3. Proceedings of the United States National Museum 55: 167–221.
- Cockerell T. D. A. (1920) Descriptions and Records of Bees. LXXXIX. Annals and Magazine of Natural History (9) 6: 201–211.
- Fabricius J. C. (1793) Entomologia systematica emendata et aucta. Secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus. Tome 2. Christ. Gottl. Proft, Hafniae, viii + 519 pp.
- Fabricius J. C. (1798) Supplementum Entomologiae Systematicae (Apoidea: 272–278). Hafniae: Proft.
- Fabricius J. C. (1804) Systema Piezatorum secundum Ordines, Genera, Species adjectis Synonymis, Locis, Observationibus, Descriptionibus. Carolum Reichard, Brunsvigae [= Braunschweig], xiv + 15–440 + 30 pp.
- Friese H. (1909) Die Bienenfauna von Neu-Guinea. Annales Historico Naturales Musei Nationalis Hungarici 7: 179–288.
- Gerstaecker A. (1858) [Bees and wasps collected in Mozambique]. Monatsberichte, Akademie der Wissenschaften, Berlin 29 October 1857, pp. 460–464.
- Gribodo G. (1894) Note imenotterologiche, Nota II: Nuovi generi e nuove specie di Imienotteri Antofili ed osservazioni sopra alcune specie gia conosciute. Bolletino della Societa entomologica Italiana 26: 76–136, 262–314.
- Gupta R. K. (2010) An annotated catalogue of bees of the Indian Region, Web online <http://geocities.com/BeesInd2/braunsapis.htm>. Accessed on December, 2016.
- Hirashima Y. (1978) Some Asian species of *Austronomia*, a subgenus of *Nomia*, with descriptions of three new species from Sri Lanka

- (Hymenoptera, Halictidae). *Esakia* 12: 89–101.
- Isaacs R. and Kirk A. K. (2010) Pollination services provided to small and large highbush blueberry fields by wild and managed bees. *Journal of Applied Ecology* 47: 841–849.
- Karunaratne W. A. Inoka P., Edirisinghe J. P. and Pauly A. (2005) An Updated Checklist of Bees of Sri Lanka with new records. MAB (National Man and Biosphere) Checklist and Hand Book Series, 23, National Science Foundation, Sri Lanka. i-vii, 1–32.
- Kirby W. F. (1900) Descriptions of the new species of Hymenoptera, *in* The Expedition of Sokotra. *Bulletin of the Liverpool Museums* 3: 13–24.
- Latreille A. (1804) Tableau méthodique des Insectes, pp. 129–200 in *Nouveau Dictionnaire d'Histoire Naturelle*, vol. 24, Paris, Déterville.
- Magretti P. (1884) Risultati di raccolte imenoterologiche nell'Africa Orientale. *Annali del Museo Civico di Storia Naturale di Genova* 21: 523–636, pl. 1.
- Meade-Waldo G. (1916) LIII. Notes on the Apidae (Hymenoptera) in the Collection of the British Museum, with Descriptions of new Species. *Annals and Magazine of Natural History* 17(8): 448–470.
- Michener C. D. (1944) Comparative external morphology, phylogeny, and a classification of the bees. *Bulletin of the American Museum of Natural History* 82: 151–326.
- Michener C. D. (1965) A classification of the bees of the Australian and South Pacific regions. *Bulletin of the American Museum of Natural History* 130: 1–362, pls. 1–15.
- Michener C. D. (2007) *The Bees of the World*. Johns Hopkins University Press. Baltimore, Maryland, USA. 953 pp.
- Nurse C. G. (1902) New species of Indian Hymenoptera. *Journal of the Asiatic Society of Bengal* 70(2): 146–154.
- Nurse C. G. (1904) New species of Indian Hymenoptera. Apidae. *Journal of the Bombay Natural History Society* 15: 557–585.
- Pauly A. (1980) Descriptions préliminaires de quelques sous-genres afrotropicaux nouveaux dans la famille des Halictidae. *Revue de Zoologie Africaine* 94: 119–125.
- Pauly A. (1984) Contribution à l'étude des genres afrotropicaux de Nomiinae. *Revue de Zoologie Africaine* 98: 693–702.
- Pauly A. (1990) Classification des Nomiinae africains (Hymenoptera Apoidea Halictidae). *Musée Royal de l'Afrique centrale, Tervuren, Annales Sciences Zoologiques* 261: 1–206.
- Pauly A. (1991) Classification des Halictidae de Madagascar. II. Nomiinae (Hymenoptera Apoidea Halictidae). *Annales de la Société Entomologique de France (N.S.)* (3): 287–321.
- Pauly A. (2000) Classification des Nomiinae africains: le genre *Leuconomia* Pauly, 1980 (Hymenoptera, Apoidea, Halictidae). *Entomologie* 70: 165–188.
- Pauly A. (2005) Appendix, Description of new genus, p.28–29, In: Inoka, W.A., Karunaratne, P., Edirisinghe J.P. and Pauly A., An Updated Checklist of Bees of Sri Lanka with new records. MAB (National Man and Biosphere) Checklist and Hand Book Series, n°23, i-vii, 1–32. ISSN 1391–5010. National Science Foundation, Sri Lanka.
- Pauly A. (2008) Révision du genre *Nomia* sensu stricto Latreille, 1804 et désignation du lectotype de l'espèce-type *Nomia curvipes* Fabricius, 1793, non 1781 (Hymenoptera: Apoidea: Halictidae). *Entomologie* 78: 211–223.
- Pauly A. (2009) Classification des Nomiinae de la Région Orientale, de Nouvelle-Guinée et des îles de l'Océan Pacifique (Hymenoptera: Apoidea: Halictidae). *Entomologie* 79, 151–229.
- Pauly A. (2014) Les Abeilles des Graminées ou Lipotriches Gerstaecker, 1858, sensu stricto (Hymenoptera: Apoidea: Halictidae: Nomiinae) de la Région Orientale. *Belgian Journal of Entomology* 21: 1–94.
- Pauly A. (2015/2016) Atlas Hymenoptera- Halictidae. <http://www.atlashymenoptera.net/Halictidae.htm>
- Ritsemá C. (1873) Beschrijving van een nieuw Hymenopteren genus uit de onder-familie der Andrenidae Acutilingues. *Tijdschrift voor Entomologie* 16: 224–228, pl. 10 (part).
- Saini M. S. and Rathor V. S. (2012) Species checklist of family Halictidae (Hymenoptera: Apoidea) along with keys to its subfamilies, genera & subgenera from India. *International Journal of Environmental Sciences* 3(1): 134–166.
- Smith F. (1853) Catalogue of Hymenopterous Insects in the collections of the British Museum. [Vol. I] Part I. Andrenidae and Apidae. Trustees of the British Museum, London, Pp. [i-iii], [1]-197, pl. I-VI.
- Smith F. (1875a) Descriptions of new species of Indian Aculeate Hymenoptera, collected by Mr. G. R. James Rothney, Member of the Entomological Society. *Transactions of the Entomological Society of London* 4(8): 33–51.

- Smith F. (1875b) V. Descriptions of new species of Bees belonging to the genus *Nomia* of Latreille. Transactions of the Entomological Society of London 23(1): 53–70.
- Smith F. (1879) Descriptions of new Species of Hymenoptera in the Collection of the British Museum. Trustees of the British Museum, London. i-xxi, 1–240.
- Walker F. (1860) Characters of some apparently undescribed Ceylon insects. The Annals and Magazine of Natural History Series 3 (5): 304–311.
- Westwood J. O. (1875) Descriptions of some new species of short-tongued bees belonging to the genus *Nomia* of Latreille. Transactions of the Entomological Society of London 23: 207–222.

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