



# New Geographical Distribution of Dung Beetles (Coleoptera: Scarabaeidae: Scarabaeinae) from Indian States

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

Dung beetles, belonging to the subfamily Scarabaeinae, represent a globally distributed group of insects known for their scavenging behaviour, feeding primarily on animal excrement. Their ecological importance lies in their central role in recycling organic matter, with a particular focus on manure. A total of 6,886 species of this subfamily have been discovered, of which over 450 species are reported from India. In the present work, a total of 27 dung beetle species belonging to 8 genera from different Indian states are examined. These results are based on recent collections carried out

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as part of faunal surveys at various sites. The state distribution of the dung beetle is revised based on the material and literature records. This study documented the current status of some of the dung beetles in peninsular India and is intended to help properly discuss the scarab beetle diversity in the future. Through intensive investigations into unexplored areas, more Scarabaeinae species are expected in the future.

**Keywords:** *Dung beetles; Scarabaeinae; distribution; Coleoptera; India.*

## 1. INTRODUCTION

Dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) are a globally distributed group of insects with great diversity in tropical forests and savannas [1]. The subfamily includes over 6,886 species worldwide [2], of which over 450 species are reported from India [2]. These beetles feed primarily on the microorganism-rich liquid component of mammalian dung and use the more fibrous material to reproduce their larvae [4,5]. They play critical roles in nutrient cycling, bioturbation, secondary seed dispersal, soil aeration, and parasite suppression, and contribute to the maintenance of detritus food webs [6,7,8,9,10]. These beetles are ecological indicators in diversity studies because they can be easily sampled and analysed using inexpensive and standardized protocols to compare community structure at different sites [11,12,13,14].

The study of dung beetles in peninsular India is characterized by fragmented contributions from various researchers, including Arrow [15], Balthasar [16,17], Paulian [18,19], Biswas and Chatterjee [20], Biswas and Mulay [21], Mathew [22], Chandra and Gupta [23,24,25,26,27,28],

Gupta et al. [29,30], Sathiandran et al. [31], Mittal [3], Chandra et al. [32,33], Kalawate et al. [34], Kharel and Sarkar [35] and Ghosh et al. [36]. In this work, we examined the collection of dung beetles of the subfamily Scarabaeinae (Coleoptera: Scarabaeidae) from different sites in India, which were identified in 27 species from 8 genera. The new distribution records of these species are presented, revising their distribution in Indian states based on collected materials and literature records.

## 2. MATERIALS AND METHODS

Materials for the present study were collected in 7 states and 24 different locations. The list of localities along with their coordinates are mentioned in Table 1. Samples were collected from cattle dung and using a light trap. The collected samples were killed in jars with benzene vapours and preserved dry pinned. The samples were cleaned with detergent to remove dirt and grime from the body surface and to any morphological features for identification. The species were deposited and identified from the literature and compared with the reference collection available at the Zoological Survey of India, Kolkata.

**Table 1. List of sampled localities**

| S.N. | State     | District       | Locality                                           | Latitude (N) | Longitude (E) |
|------|-----------|----------------|----------------------------------------------------|--------------|---------------|
| 1    | Andhra    | Eluru          | Kittukura, Base Camp                               | 17.347487    | 81.469930     |
| 2    | Pradesh   | Vishakhapatnam | Vishakhapatnam                                     | 17.680090    | 83.201610     |
| 3    |           | Guntur         | Guntur                                             | 16.314209    | 80.435028     |
| 4    |           | Guntur         | Chowdavaram                                        | 16.255600    | 80.323800     |
| 5    |           | Nandyal        | Rollapadu Wildlife Sanctuary                       | 15.745001    | 78.373052     |
| 6    |           | Kakinda        | East Godavari, Annavaram                           | 17.279295    | 82.396713     |
| 7    | Jharkhand | Jamshedpur     | Dalma Wildlife Sanctuary, Makula Kocha Guest House | 22.896660    | 86.206180     |
| 8    |           | Garhwa         | Garhwa                                             | 24.074940    | 83.712300     |
| 9    |           | Garhwa         | Bisrampur                                          | 24.262600    | 83.924100     |
| 10   |           | Dhanbad        | Topchanchi                                         | 23.908576    | 86.188054     |
| 11   |           | Hazaribagh     | Hazaribagh Wildlife Sanctuary, Rajdarwa Lake       | 24.756111    | 5.503611      |

| S.N. | State       | District    | Locality                  | Latitude (N) | Longitude (E) |
|------|-------------|-------------|---------------------------|--------------|---------------|
| 12   | Karnataka   | Latehar     | Garu                      | 23.615569    | 84.208794     |
| 13   |             | Chitradurga | Hiriyur                   | 13.944550    | 76.617230     |
| 14   |             | Haveri      | Gotagodi                  | 15.031686    | 75.186301 E   |
| 15   | Odisha      | Kendujhar   | Ghatgaon                  | 21.399998    | 85.883329     |
| 16   |             | Kendujhar   | Bolani                    | 22.111859    | 85.340894     |
| 17   | Tamil Nadu  | Jajpur      | Padmapur Road             | 20.789848    | 86.142669     |
| 18   |             | Krishnagiri | Krishnagiri               | 12.518611    | 78.213737     |
| 19   |             | Krishnagiri | Balagon,<br>Barayandugram | 12.669304    | 78.085338     |
| 20   | Maharashtra | Kanchipuram | Ponniyamman               | 12.818271    | 79.694364     |
| 21   |             | Vellore     | Arapakkam                 | 12.945320    | 79.225320     |
| 22   |             | Kolhapur    | Ujalawadi                 | 16.667462    | 74.267381     |
| 23   | Rajasthan   | Kolhapur    | Kolhapur                  | 16.716661    | 74.262135     |
| 24   |             | Ajmer       | Jharwasa                  | 26.201422    | 74.720249     |

## Taxonomic Account

Family **Scarabaeidae** Latreille, 1802  
 Subfamily **Scarabaeinae** Latreille, 1802  
 Tribe **Gymnopleurini** Lacordaire, 1856  
 Genus **Paragymnopleurus** Shipp, 1897

**Paragymnopleurus sinuatus assamensis**  
 (Waterhouse, 1890)

**Material examined:** Andhra Pradesh, Papikonda National Park, Kittukura, Base Camp, 07.xii.2021, 1 ex., leg. Deepa J. [30320/H4A].

**Distribution in India:** Andhra Pradesh (new record), Arunachal Pradesh, Assam, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Tamil Nadu, Sikkim, Uttarakhand, and West Bengal; China, Myanmar, Myanmar, Nepal, and Pakistan [15,16,28,29,3,32,36,30,2].

Tribe **Coprini** Leach, 1815  
 Genus **Copris** Geoffroy, 1762  
 Subgenus **Paracopris** Balthasar, 1939

**Copris (Paracopris) surdus** Arrow, [15]

**Material examined:** Jharkhand, Makula Kocha Guest House, Dalma Wildlife Sanctuary, 11.vii.2021, 2 exs., leg. Chitra J. [30213/H4A].

**Distribution in India:** Chhattisgarh, Jharkhand (new record), Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, and Uttarakhand [15,16,26,27,29,3,33,36,2].

Tribe **Oniticellini** Kolbe, 1905  
 Subtribe **Oniticellina** Kolbe, 1905  
 Genus **Tiniocellus** Peringuey, 1900

**Tiniocellus imbellis** (Bates, 1891)

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 10 exs. [30275/H4A], Guntur, 27.xi.2021, 2 exs. [30276/H4A], Guntur, Chowdavaram, 29.xi.2021, 1 ex. [30301/H4A]; leg. D. Gupta.

**Distribution in India:** Andhra Pradesh (new record), Bihar, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal; Nepal and Pakistan [37,33,35,30,2].

Subtribe **Drepanocerina** Lansberge, 1875  
 Genus **Tibiodrepanus** Krikken, 2009

**Tibiodrepanus setosus** (Wiedemann, 1823)

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 4 exs., leg. D. Gupta [30267/H4A].

**Distribution in India:** Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, and Sikkim; Bhutan, China, Nepal, Pakistan, Sri Lanka, Sri Lanka, Indonesia, Laos, Philippines, Thailand, Vietnam [15,17,26,27,3,25,31,33,36,30,2].

Tribe **Onthophagini** Burmeister, 1846  
 Genus **Caccobius** Thomson, 1859  
 Subgenus **Caccophilus** Jekel, 1872

**Caccobius (Caccophilus) aterrimus** (Fabricius, 1798)

**Material examined:** Jharkhand, Makula Kocha Guest House, Dalma Wildlife Sanctuary, 20.vii.2021, 1 ex., leg. Chitra J. [30215-H4A].

**Distribution in India:** Andhra Pradesh, Haryana, Himachal Pradesh, Jharkhand (new record), Karnataka, Kerala, Madhya Pradesh, Maharashtra, Puducherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and Uttarakhand; Sri Lanka [15,17,24,3,32,33,30,2].

***Caccobius (Caccophilus) diminutivus*** (Walker, 1858)

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, leg. 2 exs., leg. D. Gupta [30215-H4A].

**Distribution in India:** Andhra Pradesh (new record), Haryana, Himachal Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Uttarakhand, and West Bengal; Sri Lanka [15,17,3,33,30,2].

***Caccobius (Caccophilus) indicus*** Harold, 1867

**Material examined:** Andhra Pradesh, Guntur, 27.xi.2021, 1 ex. [30258/H4A], Guntur, Chowdavaram, 29.xi.2021, 4 exs. [30298/H 4A], leg. D. Gupta.

**Distribution in India:** Andhra Pradesh (new record), Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttarakhand; Sri Lanka and Nepal [15,17,3,33,30,2].

***Caccobius (Caccophilus) meridionalis*** Boucomont, 1914

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 5exs., [30257/H4A], Guntur, Chowdavaram, 29.xi.2021, 4 exs., [30300/H4A], leg. D. Gupta

**Distribution in India:** Andhra Pradesh (new record), Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Puducherry, Rajasthan, and Tamil Nadu; Sri Lanka [15,17,3,33,2].

***Caccobius (Caccophilus) unicornis*** (Fabricius, 1798)

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 2 exs., leg. D. Gupta [30259/H4A].

**Distribution in India:** Andhra Pradesh (new record), Andaman Islands, Assam, Chhattisgarh,

Haryana, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Odisha, Rajasthan, Tripura, Uttar Pradesh, West Bengal, and Uttarakhand; China, Japan, Korea, Nepal, Taiwan, Cambodia, Indonesia, Kalimantan, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, and Vietnam [15,17,23,24,3,25, 33,30,36, 2].

***Caccobius (Caccophilus) vulcanus*** (Fabricius, 1801)

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 17 exs., [30253/H4A], Guntur, Chowdavaram, 29.xi.2021, 5 exs. [30299/H4A], leg. D. Gupta. Karnataka, Chitradurga, Hiriya, 03.xii.2021, 2 exs. [30254/H4A], leg. D. Gupta. Tamil Nadu, Krishnagiri, 02.xii.2021, 2 exs. [30255/H4A], leg. D. Gupta.

**Distribution in India:** Andhra Pradesh, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Rajasthan, Tamil Nadu (new record), Uttar Pradesh, and Uttarakhand; Sri Lanka and Nepal [15,17,3,30, 30,2].

Genus ***Onthophagus*** Latreille, 1802

Subgenus ***Colobonthophagus*** Balthasar, 1963

***Onthophagus (Colobonthophagus) dama*** (Fabricius, 1798)

**Material examined:** Jharkhand, MakulaKocha Guest House, Dalma Wildlife Sanctuary, 22.vii.2021, 1 ex., leg. Chitra J. [30222/H4A]; Garhwa, 26.x.2021, 1 ex. [30230, 30232/H4A], leg. R.K. Kushwaha. Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 1 ex., Guntur, 27.xi.2021, 1 ex., [30273/H4A]; leg. D. Gupta [30272/H4A]. Karnataka, Haveri, Cotagodi, 04.xii.2021, 1 ex., leg. D. Gupta [30274/H4A].

**Distribution in India:** Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Chhattisgarh, Himachal Pradesh, Jharkhand (new record), Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Tamil Nadu, Uttar Pradesh, Uttarakhand, Sikkim, and West Bengal; Bhutan, China, Nepal, and Sri Lanka [15,17,23,24,29,3,25,32,33,30, 36,2].

***Onthophagus (Colobonthophagus) agnus*** Gillet, 1925

**Material examined:** Odisha, Ghatgaon, 08.vii.2021, 6 exs., leg. A. Ramesh Kumar

[30279/H4A]. Jharkhand, Makula Kocha Guest House, Dalma Wildlife Sanctuary, 09.vii.2021, 3 exs. [30280/H4A], 11.07.2021, 1 ex. [30303/H4A], leg. Chitra J. & Party

**Distribution in India:** Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu and West Bengal [15,17,29,3,32,24,33,2].

**Onthophagus (Colobonthophagus) hindu** Arrow, 1931

**Material examined:** Andhra Pradesh, Rollapadu Wildlife Sanctuary, 15.viii.2021, 1 ex. [30305/H4A], 16.viii.2021, 2 exs., [30304/H4A]; 18.viii.2021, 2 exs. [30306/H4A]; leg. Deepa J.

**Distribution in India:** Andhra Pradesh, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Jammu & Kashmir, Madhya Pradesh, Maharashtra, and West Bengal; Afghanistan and Pakistan [15,17,23,26,27,29,3,25,32,33,30,2].

**Onthophagus (Colobonthophagus) quadridentatus** (Fabricius, 1798)

**Material examined:** Andhra Pradesh, East Godavari, Annavaram, 27.xii.2021, 4 exs., [30245/H4A]; Guntur, Chowdavaram, 24.xi.2021, 1 ex. [30251/H4A], leg. D. Gupta; Rollapadu WLS, 18.ii.2021, 9 exs. [30316/H4A], 15.viii.2021, 4 exs. [30317/H4A], 16.viii.2021, 1 ex. [30318/H4A], leg. Deepa J. Odisha, Ghargaon, 08.vii.2021, 2 exs. [30223/H4A], Bolani, 18.vii.2021, 1 ex. [30225/H4A] leg. A. Ramesh Kumar; Jaipur, Padmapur Road, 24.xi.2021, 1 ex., leg. D. Gupta [30252/H4A]. Karnataka, Haveri, Gotagodi, 04.xii.2021, 27 exs. [30246/H4A], Chitradurga, Hiriyur, 03.xii.2021, 19 exs. [30247/H4A], 03.xii.2021, 1 ex. [30261/H4A], 03.xii.2021, 4 exs. [30296/H4A], leg. D. Gupta. Tamil Nadu, Vellore, Arapakkam, 01.xii.2021, 4 exs. [30248/H4A], Haveri, Gotagodi, 04.xii.2021, 4 exs. [30260/H4A], Krishnagiri, 02.xii.2021, 1 ex. [30250/H4A], Vellore, Arapakkam, 01.xii.2021, 9 exs. [30264/H4A], Vellore, Arapakkam, 01.xii.2021, 3 exs., [30297/H4A], leg. D. Gupta. Maharashtra, Kolapur, Ujalawadi, 05.xii.2021, 3 exs. [30249/H4A]; Kolapur, 05.xi.2021, 1 ex. [30263/H4A], leg. D. Gupta.

**Distribution in India:** Andhra Pradesh (new record), Arunachal Pradesh, Assam, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh,

Maharashtra, Puducherry, Punjab, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal; Sri Lanka, Pakistan, and Taiwan [15,17,26,27,29,3,25,32,33,36,2].

**Onthophagus (Colobonthophagus) ramosellus** Bates, 1891

**Material examined:** Jharkhand, Latehar, Garu, 26.x.2021, 7 exs., leg. K.G. Emiliyamma [30309/H4A], MakulaKocha Guest House, Dalma Wildlife Sanctuary, 08.vii.2021, 1 ex. [30238/H4A]; 09.vii.2021, 1 ex. [30239/H4A], 22.vii.2021, 1 ex., [30240/H4A]; leg. Chitra J.

**Distribution in India:** Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand (new record), Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, and West Bengal; Afghanistan, Myanmar, Nepal and Pakistan [15,17,23,24,29,3,33,36,2].

**Onthophagus (Colobonthophagus) ramosus** (Wiedemann, 1823)

**Material examined:** Jharkhand, Ghatgaon, 08.vii.2021, 7 exs., leg. A. Ramesh Kumar [30241/H4A]; Latehar, Garu, 26.x.2021, 1 ex., leg. K.G. Emiliyamma [30315/H4A]; MakulaKocha Guest House, 11.vii.2021, 3 exs. [30242/H4A], 22.07.2021, 1 ex. [30243/H4A], leg. Chitra J.; Dhanbad, 22.vii.2021, 1 ex., leg. D. Gupta [30244/H4A]. Andhra Pradesh, Rollapadu Wildlife Sanctuary, 15.viii.2021, 52 exs. [30312/H4A], 16.viii.2021, 6 exs. [30313/H4A], 18.viii.2021, 10 exs. [30314/H4A], leg. Deepa J.

**Distribution in India:** Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand (new record), Jammu & Kashmir, Karnataka, Manipur, Madhya Pradesh, Maharashtra, Odisha, Punjab, Puducherry, Rajasthan, Tamil Nadu, and Uttarakhand; Pakistan [15,17,26,27,29,3,32,33,36,2].

Subgenus **Gibbonthophagus** Balthasar, 1935

**Onthophagus (Gibbonthophagus) rectecornutus** Lansberge, 1883

**Material examined:** Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 1 ex., leg. D. Gupta [30269/H4A]. Jharkhand, Hazaribagh Wildlife Sanctuary, Rajdarwa Lake, 30.x.2021, 1 ex., leg. K.G. Emiliyamma [30227/H4A].

**Distribution in India:** Andhra Pradesh (new record), Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Jharkhand (new record), Karnataka, Kerala, Meghalaya, Nagaland, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal; Bangladesh, Bhutan, Cambodia, China, Myanmar, Nepal, Indonesia, Sunda Islands, Malaysia, Myanmar, Sri Lanka, and Thailand [15,17,3,33,2].

Subgenus **Serrophorus** Balthasar, 1935

**Onthophagus (Serrophorus) sagittarius** (Fabricius, 1775)

**Material examined:** Jharkhand, Latehar, Garu, 26.x.2021, 6 exs., leg. K.G. Emiliyamma [30308/H4A]. Andhra Pradesh, Vishakhapatnam, 27.xi.2021, 4 exs., leg. D. Gupta [30268/H4A].

**Distribution in India:** Andhra Pradesh (new record), Arunachal Pradesh, Assam, Chhattisgarh, Jharkhand (new record), Madhya Pradesh, Meghalaya, Nagaland, Odisha, Rajasthan, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal; Cambodia, China, Indonesia, Timor, Kalimantan, Malaysia, Myanmar, Nepal, Thailand, Taiwan, Vietnam, and Australia [15,17,26,27,3,32,33,36,2].

Subgenus **Onthophagus** Latreille, 1802

**Onthophagus (Onthophagus) cervus** (Fabricius, 1798)

**Material examined:** Jharkhand, Makula Kocha Guest House, Dalma Wildlife Sanctuary, 20.vii.2021, 1 ex., leg. Chitra J. [30216/H4A]. Karnataka, Haveri, Gotagodi, 04.xii.2021, 18 exs., leg. D. Gupta [30349/H4A]. Karnataka, Chitradurga, Hiriyur, 03.xii.2021, 6 exs., leg. D. Gupta [30350/H4A]. Tamil Nadu, Krishnagiri, Balagon, Darayandugram, 02.xii.2021, 2 exs., leg. D. Gupta [30351/H4A]. Tamil Nadu, Vellore, Arapakkam, 01.xii.2021, 3 exs., leg. D. Gupta [30352/H4A]. Maharashtra, Kolhapur, Ujalawadi, 05.xii.2021, 4 exs., leg. D. Gupta [30353/H4A]. Tamil Nadu, Kanchipuram, Ponniyamman, 12.xii.2020, 1 ex., leg. Kaushik Deuti [30354/H4A].

**Distribution in India:** Andaman & Nicobar Islands, Arunachal Pradesh, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Puducherry, Tamil Nadu, Uttar Pradesh, Uttarakhand, and West Bengal;

Sri Lanka, Thailand, Vietnam, Nepal, Pakistan, La Réunion, and Mauritius [15,17,26,27,3,25,32,33,2].

**Onthophagus (Onthophagus) fuscopunctatus** (Fabricius, 1798)

**Material examined:** Tamil Nadu, Kanchipuram, 21.xii.2021, 1 ex., leg. D. Gupta [30270/H4A].

**Distribution in India:** Gujarat, Rajasthan, and Tamil Nadu; Sri Lanka [15,17,3,33,2].

**Onthophagus (Onthophagus) orientalis** Harold, 1868

**Material examined:** Jharkhand, Hazaribagh Wildlife Sanctuary, Rajdarwa Lake, 30.x.2021, 1 ex., leg. K.G. Emiliyamma [30220/H4A].

**Distribution in India:** Arunachal Pradesh, Andaman & Nicobar Islands, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand (new record), Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Rajasthan, Sikkim, Uttarakhand, Uttar Pradesh, and West Bengal; Borneo, Cambodia, China, Indonesia, Malaysia, Myanmar, Nepal, Thailand, Taiwan and Vietnam [15,17,3,33,30,36,2].

**Onthophagus (Onthophagus) sternalis** Arrow, 1931

**Material examined:** Jharkhand, Makula Kocha Guest House, Dalma Wildlife Sanctuary, 22.vii.2021, 3 exs., leg. Chitra J. [30277/H4A]. Andhra Pradesh, Rollopadu Wildlife Sanctuary, 18.viii.2021, 1 ex., leg. Deepa J. [30307/H4A].

**Distribution in India:** Bihar, Gujarat, Haryana, Jharkhand (new record), Madhya Pradesh, Uttar Pradesh, Uttarakhand, and West Bengal; Bangladesh and Nepal [15,17,3,30,2].

**Proagoderus pactolus** (Fabricius, 1787)

**Material examined:** Jharkhand, Garhwa, 26.x.2021, 1 ex., Rakesh Kumar [30218/H4A].

**Distribution in India:** Chandigarh, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand (new record), Karnataka, Madhya Pradesh, Maharashtra, Punjab, Odisha, Tamil Nadu, Uttarakhand, and Uttar Pradesh; Nepal and Sri Lanka [15,17,23,24,29,30,3,32,33,2].

Tribe **Onitini** Laporte, 1840

Genus **Cheironitis** Lansberge, 1875

**Cheironitis arrowi** Janssens, 1937

**Material examined:** Jharkhand, Garhwa, 26.x.2021, 3 exs., leg. Rakesh Kumar [30228/H4A].

**Distribution in India:** Gujarat, Haryana, Himachal Pradesh, Jharkhand (new record), Madhya Pradesh, Maharashtra, Karnataka, Punjab, Rajasthan and Tamil Nadu; Afghanistan, Pakistan, Nepal and Saudi Arabia [15,17,3,32,30,32,33,2].

Genus **Onitis** Fabricius, 1798

**Onitis falcatus** (Wuffen, 1786)

**Material examined:** Jharkhand, Dhanbad, Topchanchi, 27.ii.2023, 2 exs., leg. D. Suresh Chand [30290/H4A].

**Distribution in India:** Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jharkhand (new record), Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Puducherry, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal; China, Bangladesh, Taiwan, Vietnam, Cochin China, Myanmar, Philippines, Pakistan, Malay Peninsula and Nepal [15,17,3,32,30,38,36,33,2].

**Onitis philemon** Fabricius, 1801

**Material examined:** Jharkhand, Garhwa, Bistrampur, 23.x.2021, 1 ex., leg. Rakesh Kumar [30214/H4A]. Rajasthan, Ajmer, Jharwasa, 12.xii.2021, 2 exs., leg. D. Gupta [30265/H4A].

**Distribution in India:** Andhra Pradesh, Arunachal Pradesh, Bihar, Chandigarh, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand (new record), Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal; Sri Lanka [15,17,26,27; 29,32,30,3,33,32,2].

**Onitis subopacus** Arrow, 1931

**Material examined:** Karnataka, Haveri, 04.xii.2021, 1 ex., leg. D. Gupta [30266/H4A].

Jharkhand, Hazaribagh Wildlife Sanctuary, Rajdarwa Lake, 30.x.2021, 1 ex., leg. K.G. Emiliyamma [30278/H4A].

**Distribution in India:** Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand (new record), Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal; Afghanistan, Nepal, Pakistan, Sri Lanka, Thailand, China, Myanmar, Malay Peninsula and Sunda Island [15,17,26,27,28,32,33,3,25,32,33,38,36,2].

### 3. RESULTS AND DISCUSSION

The current study presents new records of 27 species of dung beetles belonging to 8 genera and 5 tribes of subfamily Scarabaeinae (Coleoptera: Scarabaeidae) from peninsular India. Out of these 14 species, *Copris* (P.) *surdus* Arrow [15], *Caccobius* (C.) *aterrimus* (Fabricius, 1798), *Onthophagus* (Co.) *dama* (Fabricius, 1798), *O.* (Co.) *ramosellus* Bates, 1891, *O.* (Co.) *ramosus* (Wiedemann, 1823), *O.* (G.) *recticornutus* Lansberge, 1883, *O.* (S.) *sagittarius* (Fabricius, 1775), *O.* (O.) *orientalis* Harold, 1868, *O.* (O.) *sternalis* Arrow, 1931, *Proagoderus* *pactolus* (Fabricius, 1787), *Cheironitis arrowi* Janssens, 1937, *Onitis falcatus* (Wuffen, 1786), *On.* *philemon* Fabricius, 1801, and *On.* *subopacus* Arrow, 1931 are new records to the state of Jharkhand; 9 species from Andhra Pradesh *Paragymnopleurus sinuatus* assamensis (Waterhouse, 1890), *Tiniocellus imbellis* (Bates, 1891), *Caccobius* (C.) *diminutives* (Walker, 1858), *C.* (C.) *indicus* Harold, 1867, *C.* (C.) *meridionalis* Boucomont, 1914, *C.* (C.) *unicornis* (Fabricius, 1798), *O.* (Co.) *quadridentatus* (Fabricius, 1798), *O.* (G.) *recticornutus* Lansberge, 1883, *O.* (S.) *sagittarius* (Fabricius, 1775). Among the studied species, the majority of them belong to the genus, *Onthophagus* (12 species), followed by *Caccobius* (6 species), *Onitis* (3 species), and *Paragymnopleurus* (1 species), *Tiniocellus* (1 species), *Tibiodrepanus* (1 species), *Proagoderus* (1 species), and *Cheironitis* (1 species). It has been observed that none of the 27 species have been reported from the Trans Himalayas and Coastal areas whereas, 23 species share their distribution with the Himalayas, 22 with Semi-Arid, 21 each from Gangetic Plains, Desert and Western Ghats, 14 from North East, and 3 from the Islands (Table 2).

Table 2. Distribution of studied species in different biogeographic zones of India

| S.N. | Species                        | Biogeographic Zones of India |          |        |           |               |                  |                 |       |            |         |
|------|--------------------------------|------------------------------|----------|--------|-----------|---------------|------------------|-----------------|-------|------------|---------|
|      |                                | Trans Himalaya               | Himalaya | Desert | Semi-Arid | Western Ghats | Deccan Peninsula | Gangetic Plains | Coast | North East | Islands |
| 1.   | <i>P. sinuatus assamensis</i>  | -                            | +        | -      | +         | +             | +                | +               | -     | +          | -       |
| 2.   | <i>C. (P.) surdus</i>          | -                            | +        | +      | +         | +             | +                | -               | -     | -          | -       |
| 3.   | <i>T. imbellis</i>             | -                            | +        | -      | +         | -             | +                | +               | -     | -          | -       |
| 4.   | <i>Ti. setosus</i>             | -                            | +        | -      | +         | +             | +                | +               | -     | +          | -       |
| 5.   | <i>C. (C.) aterrimus</i>       | -                            | +        | +      | +         | +             | +                | +               | -     | -          | -       |
| 6.   | <i>C. (C.) diminutivus</i>     | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 7.   | <i>C. (C.) indicus</i>         | -                            | +        | +      | +         | +             | +                | -               | -     | -          | -       |
| 8.   | <i>C. (C.) meridionalis</i>    | -                            | +        | +      | -         | +             | +                | -               | -     | -          | -       |
| 9.   | <i>C. (C.) unicornis</i>       | -                            | +        | +      | +         | +             | +                | +               | -     | +          | +       |
| 10.  | <i>C. (C.) vulcanus</i>        | -                            | +        | +      | +         | +             | +                | +               | -     | -          | -       |
| 11.  | <i>O. (Co.) dama</i>           | -                            | +        | -      | +         | +             | +                | +               | -     | +          | -       |
| 12.  | <i>O. (Co.) agnus</i>          | -                            | -        | +      | -         | +             | +                | +               | -     | -          | -       |
| 13.  | <i>O. (Co.) hindu</i>          | -                            | +        | -      | +         | +             | +                | +               | -     | -          | -       |
| 14.  | <i>O. (Co.) quadridentatus</i> | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 15.  | <i>O. (Co.) ramosellus</i>     | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 16.  | <i>O. (Co.) ramosus</i>        | -                            | +        | +      | +         | +             | +                | +               | -     | -          | -       |
| 17.  | <i>O. (G.) rectecornutus</i>   | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 18.  | <i>O. (S.) sagittarius</i>     | -                            | +        | +      | -         | -             | +                | +               | -     | +          | -       |
| 19.  | <i>O. (O.) cervus</i>          | -                            | +        | +      | -         | +             | +                | +               | -     | +          | +       |
| 20.  | <i>O. (O.) fuscopunctatus</i>  | -                            | -        | +      | -         | -             | +                | -               | -     | -          | -       |
| 21.  | <i>O. (O.) orientalis</i>      | -                            | -        | +      | +         | -             | +                | +               | -     | +          | +       |
| 22.  | <i>O. (O.) sternalis</i>       | -                            | -        | +      | +         | -             | +                | +               | -     | -          | -       |
| 23.  | <i>Pr.pactolus</i>             | -                            | +        | -      | +         | +             | +                | -               | -     | -          | -       |
| 24.  | <i>C. arrowi</i>               | -                            | +        | +      | +         | +             | +                | -               | -     | -          | -       |
| 25.  | <i>On. falcatus</i>            | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 26.  | <i>On. philemon</i>            | -                            | +        | +      | +         | +             | +                | +               | -     | +          | -       |
| 27.  | <i>On. subopacus</i>           | -                            | +        | +      | +         | -             | +                | +               | -     | +          | -       |

## 4. CONCLUSION

The present study on dung beetles in peninsular India has provided valuable insights into the diversity and distribution of these species in the study area. A total of 27 species belonging to 8 genera of the subfamily Scarabaeinae provide a comprehensive overview of the dung beetle community in the region, with 14 new records from Jharkhand and 9 from Andhra Pradesh. The absence of these species in the trans-Himalayan and coastal areas is notable. Instead, there was significant overlap in distribution with the Himalayas, Semi-Arid regions, Gangetic Plains, Desert, Western Ghats, Northeast and Islands. The study not only outlines the current diversity and distribution of dung beetles in peninsular India, but also highlights the urgency of conservation efforts to ensure the continued existence of these species. The present work resulted in a database of dung beetles that will assist in future work to conserve, maintain and expand the local biodiversity of these beetles.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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