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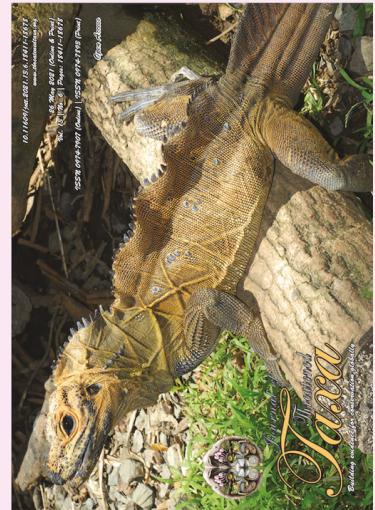
## COMMUNICATION

### CHECKLISTS OF SUBFAMILIES DRYPTINAE AND PANAGAEINAE (INSECTA: COLEOPTERA: CARABIDAE) FROM THE INDIAN SUBCONTINENT

V.A. Jithmon & Thomas K. Sabu

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## Checklists of subfamilies Dryptinae and Panagaeinae (Insecta: Coleoptera: Carabidae) from the Indian subcontinent

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**Abstract:** Distribution patterns and literature details of 45 Dryptinae and 33 Panagaeinae species reported from the Indian subcontinent are provided. Out of the 45 Dryptinae species, six species are endemic to the Western Ghats & Sri Lanka hotspot of biodiversity, two species are endemic to the Indo-Burma hotspot of biodiversity and two species are endemic to the Himalaya hotspot of biodiversity. Distribution patterns revealed that 24 Dryptinae species are endemic to the Indian subcontinent with 22 species recorded from the Oriental (ORR) region and two from the Palearctic (PAR) region. Out of the 33 Panagaeinae species, 20 species are endemic to the Indian subcontinent with 17 of these species distributed in the Oriental region; two in the Palearctic region and one species in both Oriental and Palearctic regions. Seven species are endemic to the Western Ghats & Sri Lanka hotspot of biodiversity and two endemic to the Himalaya hotspot of biodiversity. Six Panagaeinae species and seven Dryptinae species recorded only from the Western Ghats and Sri Lanka hotspot of biodiversity are likely to be representatives of the Gondwana remnants. Genus *Ardistomopsis* with five species is endemic to the Indian subcontinent.

**Keywords:** Dryptini, Galeritini, ground beetle, Panagaeini, Peliciini, Zuphini.

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**Author details:** V.A. JITHMON completed PhD in Zoology (Entomology) under the guidance of Dr. Sabu K. Thomas from St. Joseph's College, affiliated to the University of Calicut. Area of specialisation is taxonomy of Carabidae. Worked as a project fellow in DST-SERB major Project titled "Taxonomy and Barcoding of south Indian Carabidae". Discovered two new Carabidae species. SABU K THOMAS, Principal, St. Joseph's College (Autonomous) and is Professor of Zoology. Ecology and taxonomy of Dung beetles and Carabidae, home invading nuisance pest, *Luprops tristis* are areas of interest. Currently engaged with updating the taxonomy of Indian Carabidae by preparation of revised checklists and taxonomic keys. Discovered 18 new Carabidae species and 11 dung beetle species.

**Author contribution:** SKT and Jithmon VAJ reviewed the earlier works and discussed the distribution patterns. VAJ conducted the field studies, preparations of the plates and specimens.

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## INTRODUCTION

Globally, 560 species from 30 genera have been described from the subfamily Dryptinae (Lorenz 2005) and 387 species in 29 genera are described from the subfamily Panagaeinae (Hackel & Farkac 2012). Dryptinae (Dryptini Bonelli, 1810, Zuphiini Bonelli, 1810 & Galeritiini Leconte, 1853) and Panagaeinae (Peliciini Chaudoir, 1880 & Panagaeini Bonelli, 1810) are two lesser known Carabidae subfamilies from the Indian subcontinent with 45 species and 33 species, respectively. Andrewes (1930) recorded 15 Dryptinae species and 11 Pangaeinae species from Indian subcontinent. Taxonomic studies on these groups from Indian subcontinent have been infrequent since 1930 (Jedlicka 1935; Andrewes 1936; Landin 1955; Jedlicka 1956; Darlington 1968; Mateu 1981; Straneo & Ball 1989; Baehr 1990; Xie & Yu 1991; Mateu 1992; Baehr 1998; Kirschenhofer 2000; Liang & Kavanaugh 2007; Kirschenhofer 2011; Hackel & Kirschenhofer 2014; Jithmon & Sabu 2018).

World Catalogue of Carabidae (Lorenz 2005) provided up to date nomenclatural information on Dryptinae and Panagaeinae and the Catalogue of Palearctic Coleoptera (Lobl & Lobl 2017) provided countrywise details and related bibliographic references of Palearctic region. World Checklist of Panagaeinae (Hackel & Farkac 2012) provided country wise data including India for the subfamily Panagaeinae but no species specific regional distribution data. In general, lack of species specific regional distribution data and reference details hinders taxonomic analysis of the Dryptinae and Panagaeinae fauna of the Indian subcontinent. In this paper, we provide an up to date checklist of both subfamilies, with distribution and reference details of all species recorded in the Indian subcontinent (Indian mainland, Sri Lanka, and Bangladesh).

## MATERIALS AND METHODS

Distribution data for each species was collected by verifying records and descriptions of listed species between the years of 1781 and 2020. Listed references were collected by analysing the primary literature, websites (e.g., Carabidae of the World, Catalogue of Life), and contacting various carabidologists. Data for 12 Panagaeinae species was collected by examination of the insect collections of host institutions from various forest insect diversity projects. Indian locality details of 65 species from the descriptions and records are provided,

13 species with no locality details in the descriptions are marked as from 'India', species from Oriental (ORR) and Palaearctic (PAR) localities of Indian subcontinent have been categorised as ORR - India/ PAR - India.

Specimens were collected from forests and agricultural lands in the south Indian states, Kerala and Tamil Nadu using light traps and by active collecting. Specimens were identified with the aid of keys available in Liang and Kavanaugh (2004, 2007), Hackel & Kirschenhofer (2014a,b), Fedorenko (2016), Jithmon & Sabu (2018) and with aid of species descriptions available in various publications. Verifications were done by comparing with the types in: MNHN—Muséum National d'Histoire Naturelle, Paris, France; ZMUC—University of Copenhagen Zoological Museum, Denmark; ZMHB—Museum für Naturkunde, Humboldt Universität, Berlin, Germany; MPC—National Museum of Natural History, Prague, Czech Republic; and NHMW—Naturhistorisches Museum, Wien, Austria. Images were taken using Leica M205C Stereo zoom microscope fitted with Leica MC 170 HD digital camera. Measurements are taken with Leica LAS V4.5 software and provided in millimetres. Verified specimens were added to the insect collections of Zoological Survey of India, Kozhikode station.

Separation of the Indian species from the World catalogue of Carabidae (Lorenz 2005) was done with the aid of Andrewes (1930), Hackel & Farkac (2012), and Löbl & Löbl (2017) and by verifying the distribution pattern of each species in the cited literature. One species, *Dischissus alaticollis* Bates 1892 (Panagaeinae), known only from the Andamans is excluded from the list of species in Indian subcontinent.

## Abbreviations and markings Used

- id. "Idem" (the same; as just mentioned)
- ORR Oriental Region
- PAR Palaearctic Region
- IAR Indo-Australian Region
- \* Species assessed by the authors.
- # Species with Indian regional distribution data not available.

## Checklist of the Indian Dryptinae with distribution records

### I. Tribe Dryptini Bonelli, 1810

#### Genus 1. *Drypta* Latreille, 1796

Latreille, 1796: 75; Fabricius, 1801: 230; Latreille, 1806: 117; Dejean, 1825: 182; Schmidt-Goebel, 1846: 22; Lacordaire, 1854: 79; Andrewes, 1924: 51; id. 1930: 157; Lorenz, 2005: 503.



Figure 1. Distribution pattern of the tribes Dryptini, Zuphini and Galeritini of subfamily Dryptinae and Peliciini and Panagaenae of subfamily Panagaenae from Indian subcontinent.

### 1. *Drypta aenipes* Wiedemann, 1823 \*

Wiedemann, 1823: 60; Andrewes, 1921: 173; Heller, 1923: 304; Andrewes, 1930: 157; id. 1936: 135; Lorenz,

2005: 503.

Geographical Distribution: ORR - India, Bangladesh (Dhaka), Myanmar.

**2. *Drypta aetheria* Andrewes, 1936**

Andrewes, 1936: 135; Lorenz, 2005: 503.  
Geographical Distribution: ORR - India (Assam).

**3. *Drypta argillacea* Andrewes, 1924**

Andrewes, 1924: 106; id. 1930: 157; id. 1936: 135;  
Lorenz, 2005: 503.  
Geographic Distribution: ORR - India (Uttar Pradesh;  
Bijnor; Maharashtra: Nagpur; Odisha: Ganjam, Surada),  
Bangladesh (Dhaka), PAR - India (Uttarakhand: Chakrata,  
Dehra Dun, Nainital).

**4. *Drypta cyanopus* Andrewes, 1936**

Andrewes, 1936: 136; Lorenz, 2005: 503.  
Geographic Distribution: ORR - Bangladesh (Sardah).

**5. *Drypta crassiuscula* Chaudoir, 1861**

Chaudoir, 1861: 550; Andrewes, 1923: 6; id. 1930:  
157; id. 1936: 135; Lorenz, 2005: 503.  
Geographic Distribution: PAR - India (Uttarakhand:  
Dehra Dun).

**6. *Drypta flavipes* Wiedemann, 1823**

Wiedemann, 1823: 60; Dejean, 1826: 442; Schmidt-  
Goebel, 1846: 24; Andrewes, 1921: 173; id. 1930: 158;  
id. 1936: 135; Lorenz, 2005: 503; Lobl & Lobl, 2017: 500.  
= *pallipes* Chaudoir, 1850: 33; id. 1861: 518.

Geographic Distribution: PAR - India (Himachal  
Pradesh: Shimla; Sikkim), Nepal, Bhutan, ORR - India  
(Assam).

**7. *Drypta lineola* Macleay, 1825 (Image 1a) \***

Macleay, 1825: 27; Dejean, 1825: 184; Redtenbacher,  
1867: 4; Chaudoir, 1877: 262; Bates, 1883: 279; id. 1891:  
336; id. 1892: 383; Heyne-Tasch, 1898: 13; Bouchard,  
1903: 173; Andrewes, 1919: 167; id. 1923 (1924): 460;  
id. 1924: 469; id. 1930: 158; id. 1936: 135; Lorenz, 2005:  
503.

Specimens examined (n= 5): SJC-ZO-CAR001,  
15.x.2015, 2 ex. Rajapalayam, 9.450°N, 77.566°E, 275m,  
light trap, coll. Jithmon V.A. & Akhil S.V.; 18.x.2015, 2  
ex. Kadayam, 8.832°N, 77.357°E, 367m, light trap, coll.  
Jithmon V.A. & Akhil S.V.; 03.iii.2015, 1 ex. Padinjarathara,  
11.672°N, 75.939°E, 734m, light trap, coll. Jithmon V.A. &  
Akhil S.V.

Geographical Distribution: ORR - Throughout  
India (Tamil Nadu: Rajapalayam, Kadayam; Kerala:  
Padinjarathara), Sri Lanka, Myanmar, Malaysia, Thailand,  
Cambodia, Vietnam, and Indonesia (Java, Sumatra,  
Borneo).

**8. *Drypta longicollis* Macleay, 1825 #**

Macleay, 1825: 28; Liang et al. 2004: 380.  
= *Drypta longicollis* Dejean, 1825: 185.  
= *Dendrocellus longicollis* Dejean; Bates, 1892: 385.  
= *Desera longicollis* Macleay; Andrewes, 1919: 168;  
id. 1930: 142; Heller, 1923: 303; Jedlicka, 1963: 486;  
Lorenz, 2005: 504.

Geographic distribution: ORR - India, Myanmar  
(Karen hills, Thagata, Tenasserim).

**9. *Drypta siderea* Bates, 1892**

Bates, 1892: 382; Andrewes, 1923: 6; id. 1930: 159;  
id. 1936: 135; Lorenz, 2005: 503.  
Geographic Distribution: ORR - India (Meghalaya:  
Garo hills), Myanmar (Karen Hills), Laos. PAR - India  
(Uttarakhand: Dehra Dun), China.

**Genus 2. *Dendrocellus* Schmidt Geobel, 1846**

Schmidt-Goebel, 1846: 24; Lacordaire, 1854: 80;  
Chaudoir, 1861: 545; id. 1872: 101; Bates, 1892: 385;  
Andrewes, 1930: 141; id. 1939: 133; Jeannel, 1949:  
1064; Liang et al. 2004: 379.  
= *Desera* Hope, 1838: 105; Lacordaire, 1854: 80;  
Dupuis, 1912: 319; Heller, 1923: 303; Csiki, 1932: 1553;  
Basilewsky, 1960: 177; Jedlicka, 1963: 486; Hansen,  
1967: 400; Habu, 1967: 277; Lorenz, 2005: 503.

**1. *Dendrocellus coelestinus* (Klug, 1834) #**

Chaudoir 1861: 545; Liang & Kavanaugh, 2007: 15;  
Lobl & Lobl, 2017: 499.  
= *Drypta coelestina* Klug 1834: 53.  
= *Desera coelestina* (Klug), Andrewes 1927: 100; id.  
1930: 141; Lorenz, 2005: 503.  
= *Dendrocellus parallelus* Chaudoir 1872: 101.  
Geographic distribution: ORR - North India,  
Myanmar (Carin Cheba), Thailand, Indonesia (Sumatra,  
Java, Sulawesi), Malaysia, Laos (Pakneun), PAR - Pakistan  
(Chiringa), Bhutan, China (Yunnan, Hainan).

**2. *Dendrocellus confusus* (Hansen, 1968) #**

Liang & Kavanaugh, 2007: 16; Lobl & Lobl, 2017: 499.  
= *Desera confusa* Hansen, 1968: 164; Lorenz, 2005:  
503.  
Geographic Distribution: ORR - India, Indonesia  
(Sumatra, Java, Kalimantan), Laos, Thailand. PAR  
- Pakistan (Ichamati), China (Fujian; Guangdong;  
Guangxi), Japan.

**3. *Dendrocellus geniculatus* (Klug, 1834)**

Schmidt-Geobel, 1846: 25; Liang & Kavanaugh, 2007:  
19.

= *Drypta geniculata* Klug, 1834: 52; Chaudoir, 1872: 192; Bates, 1883: 279; id. 1889: 280; id. 1891: 336; Bouchard, 1903: 173; Andrewes, 1921: 173; Heller, 1921: 530; Andrewes, 1923: 8; Heller, 1923: 303; Andrewes, 1924: 469; id. 1930: 142; Lorenz, 2005: 503.

= *Desera (Dendrocellus) gilsoni* Dupuis 1912: 319.

= *Desera gilsoni continentalis* Hansen 1967: 405.

Var. *Dendrocellus rugicollis* Chaudoir, 1861: 546; id. 1872: 102; Andrewes, 1919: 170.

Geographic Distribution: ORR - India (Tamil Nadu: Pondicherry: Karaikal), Bangladesh, Cambodia, Malaysia (Malacca), Indonesia (Batoe Doelang; Sumatra), Laos, Thailand (Chiang Mai; Chonburi; Nakhon Nayok), Vietnam (Annam; Tonkin Hoabinh; Quang Nam). PAR - India (Sikkim), Bhutan, Pakistan (Ichamati), China (Formosa; Hainan; Fujian; Shanghai; Guangxi; Guizhou; Guangdong; Yunnan; Sichuan; Tibet), Japan. IAR - Philippines (Ile Basilan; Laguna; Mindoro).

#### **4. *Dendrocellus inexpectus* Liang & Kavanaugh, 2007**

Liang & Kavanaugh, 2007: 23.

Geographic Distribution: ORR - India (Jharkhand: Chota Nagpur: Barway, Konbir; Maharashtra: Mumbai; Karnataka: Belgaum; Uttar Pradesh: Barnai).

#### **5. *Dendrocellus nepalensis* (Hope, 1831)**

Chaudoir, 1872: 102; Liang & Kavanaugh, 2007: 27.

= *Desera nepalensis* Hope, 1831: 21; Dohrn, 1879: 457; Andrewes, 1919: 170; Heller, 1923: 303; Andrewes, 1930: 142; Lorenz, 2005: 504.

= *Dendrocellus discolor* Schmidt-Goebel, 1846: 24; Bates, 1891: 336; Andrewes, 1923: 7; Heller, 1923: 304.

Geographic Distribution: ORR - India (Assam: Assam valley, Khasi hills, Cachar; Sikkim; West Bengal: Darjiling, Gopaldhara, Pedong; Jharkhand: Chota Nagpur, Konbir; Rajasthan: Tetara; Tamil Nadu: Shembaganur; Manipur), Bangladesh, Myanmar (Martaban), Vietnam (Tongking). PAR - Nepal, China (Tibet; Yunnan), Bhutan.

#### **6. *Dendrocellus rugicollis* Chaudoir, 1861**

Chaudoir, 1861: 546; Lorenz, 2005: 504.

= *Dendrocellus flavipes*, Schmidt-Goebel, 1846: 24.

Geographic Distribution: ORR - North India (West Bengal: Kolkata). PAR - China (Guangxi), Nepal.

#### **7. *Dendrocellus unidentatus* (Macleay, 1825)**

Chaudoir, 1861: 545, Liang and Kavanaugh, 2007: 35; Lobl & Lobl, 2017: 499.

= *Drypta unidentata* Macleay, 1825: 28; Andrewes, 1919: 167; Heller, 1923: 303. Andrewes, 1930: 143.

= *Desera unidentata* Andrewes, 1919: 167; Lorenz,

2005: 504.

Geographic Distribution: ORR - India (Assam: Khasi hills; Andaman Islands), Indonesia (Java; Sumatra), Vietnam, Thailand, Myanmar (Matupi; Tenasserim; Carin Cheba), PAR - Pakistan (Ichamati), China (Yunnan).

### **II. Tribe Zuphini Bonelli, 1810**

#### **Genus 1. *Paralelepidia* BASILEWSKY, 1951**

Basilewsky, 1951: 176; id. 1953: 271 ; Baehr, 1990: 10; Mateu, 1981: 717 ; Lorenz, 2005: 504.

#### **1. *Paralelepidia linearis* Baehr, 1990**

Baehr, 1990: 10; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (Tamil Nadu: Ootacamund).

#### **2. *Paralelepidia loebli* Mateu, 1981**

Mateu, 1981: 719; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (Tamil Nadu: Nilgiri Hills).

#### **3. *Paralelepidia besucheti* Mateu, 1981**

Mateu, 1981: 717; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (Kerala: Cardamon hills, Pambanar, Peermedu).

#### **Genus 2. *Gunvorita* Landin, 1955**

Landin, 1955: 467; Darlington, 1968: 208; Mateu, 1981: 721; Perrault, 1982: 76; Casale 1985: 41; Baehr, 1988: 115; id. 1990: 16; id. 1991: 194; Lorenz, 2005: 504; Lobl & Lobl, 2017: 835.

#### **1. *Gunvorita besucheti* Baehr, 1998**

Baehr, 1998: 288; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (West Bengal: Darjeeling: Algarah).

#### **2. *Gunvorita depressipennis* Baehr, 1998**

Baehr, 1998: 295; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (Meghalaya: Khasi hills- Nongpoh).

#### **3. *Gunvorita elegans* Landin, 1955**

Landin, 1955: 467; Darlington, 1968: 210; Mateu, 1981: 721; Casale, 1985: 41; Baehr, 1998: 269; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (West Bengal: Darjeeling). PAR - India (Sikkim), Nepal.

#### **4. *Gunvorita indica* Darlington, 1968**

Darlington, 1968: 208; Mateu, 1981: 722; Baehr,

1998: 274; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (West Bengal: Darjeeling, Ghoom).

##### **5. *Gunvorita inermis* Baehr, 1998**

Baehr, 1998: 272; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (West Bengal: Darjeeling: Mahanadi).

##### **6. *Gunvorita laeviceps* Baehr, 1998**

Baehr, 1998: 270; Lorenz, 2005: 504.

Geographic Distribution: ORR - India (West Bengal: Darjeeling).

##### **7. *Gunvorita minor* Baehr, 1998**

Baehr, 1998: 291; Lorenz, 2005: 505.

Geographic Distribution: ORR - India (Meghalaya: Khasi Hills: Mawsynram - Balat).

##### **8. *Gunvorita ovaliceps* Baehr, 1998**

Baehr, 1998: 275; Lorenz, 2005: 505.

Geographic Distribution: ORR - India (West Bengal: Darjeeling: Ghoom).

#### **Genus 3. *Agastus* Schmidt-Goebel, 1846**

Schmidt-Goebel, 1846: 30; Lacordaire, 1854: 87; Andrewes, 1930: 12; Lorenz, 2005: 505.

##### **1. *Agastus lineatus* Schmidt-Goebel, 1846**

Schmidt-Goebel, 1846: 31; Gestro, 1875: 867; Bates, 1889: 280; id. 1892: 388; Andrewes, 1923: 10; id. 1930: 13; Lorenz, 2005: 505.

Geographic Distribution: ORR - India (West Bengal: Kolkata), Myanmar, Vietnam (Cochinchina), Cambodia, PAR - Hong Kong, IAR - Philippines.

#### **Genus 4. *Zuphiump Latreille, 1806***

Latreille, 1806: 198; Latreille et Dejean, 1824: 121; Dejean, 1825: 192; Schmidt-Goebel, 1846: 27; Lacordaire, 1854: 85; Chaudoir, 1862: 310; K & J Daniel, 1898: 24; Bedel, 1913: 295; Andrewes, 1930: 358; Lorenz, 2005: 506.

##### **1. *Zuphiump dabreui* Andrewes, 1922 (Image 1b) \***

Andrewes, 1922: 168; id. 1930: 359; Lorenz, 2005: 506.

Specimens examined (n=1): SJC-ZO-CAR002, 18.x.2015, India: Kadayam, 8.832°N, 77.357°E, 367m, light trap, coll. Jithmon V.A. & Akhil S.V.

Geographic Distribution: ORR - India (Maharashtra: Nagpur, Karnataka: Belgaum, Tamil Nadu: Chennai,

Kadayam), Sri Lanka (Vauniya, Horawupotana).

##### **2. *Zuphiump erebeum* Andrewes, 1923 \***

Andrewes, 1923: 243; id. 1930: 359; Lorenz, 2005: 506.

Geographic Distribution: ORR - Sri Lanka.

##### **3. *Zuphiump erythrocephalum* Chaudoir, 1862 (Image 1c) \***

Chaudoir, 1862: 311 Andrewes, 1930: 359; Lorenz, 2005: 506.

Specimens examined (n= 1): SJC-ZO-CAR003, India: Rajapalayam, 9.450°N, 77.566°E, Pitfall, 275 m, 14.II.2015, coll. Jithmon V.A. & Akhil S.V.

Geographic Distribution: ORR - India (Madhya Pradesh: Neemuch; Maharashtra: Nagpur; Kerala: Malabar; Tamil Nadu: Rajapalayam, Ooty, Chennai, Pondicherry).

##### **4. *Zuphiump indicum* Andrewes, 1922**

Andrewes, 1922: 167; id. 1930: 359; Lorenz, 2005: 506.

Geographic Distribution: ORR - India (Maharashtra: Nagpur).

##### **5. *Zuphiump modestum* Schmidt-Goebel, 1846**

Schmidt-Goebel, 1846: 29; Chaudoir, 1862: 312; Bates, 1892: 387; Andrewes, 1923: 10; id. 1930: 359; Lorenz, 2005: 506.

Geographic Distribution: ORR - India (West Bengal: Kolkata; Maharashtra: Nagpur, Venna Valley, satara), Myanmar (Tharrawaddy, Palon), Malaysia (Penang), Thailand, Cambodia, Vietnam (Cochinchina).

##### **6. *Zuphiump olens* (Rossi, 1790)**

Rossi, 1790: 217; Chaudoir, 1862: 311; Bates, 1889: 280; id. 1892: 386; Andrewes, 1921: 155; id. 1923: 9; id. 1927: 99; id. 1930: 359; Lorenz, 2005: 506; Lobl & Lobl, 2017: 837.

= *clermonti* Jeannel, 1949a: 49

= *kochi* Schatzmayr, 1936a: 106

= *longiusculum* Chaudoir, 1842a: 804

= *pubescens* Nietner, 1858: 182

= *rufifrons* Chaudoir, 1863d: 312

Geographic Distribution: ORR - India (West Bengal: Kolkata; Delhi: Pusa; Bihar: Chapra; Odisha: Balugaon), Sri Lanka, Myanmar (Tharrawaddy, Moulmein, Palon, Tikekee (Pegu), Tenasserim), Malaysia (Langkawi I), Thailand, Vietnam (Cochinchina, Annam), Indonesia (Java), PAR-China, Albania, Austria, Bulgaria, Cyprus, Corsica, Italy, France, Spain, Ukraine, Malta, Israel,

southern European Russia, Africa (Egypt).

#### **Genus 5. *Metazuphium* Mateu, 1992**

Mateu, 1992: 196; Lorenz, 2005: 506.

##### **1. *Metazuphium spinangulus* Mateu, 1992 #**

Mateu, 1992: 196; Lorenz, 2005: 506.

Geographic Distribution: ORR - Sri Lanka

#### **Genus 6. *Parazuphium* Jeannel, 1942**

Jeannel, 1942: 1094; Lorenz, 2005: 507; Lobl & Lobl, 2017: 836.

##### **1. *Parazuphium inconspicuum* (Schmidt-Goebel, 1846)**

Schmidt-Goebel, 1846: 30; Bates, 1892: 387; Andrewes, 1923: 10; id. 1930: 359; Jeannel, 1942: 1094; Lorenz, 2005: 507.

Geographical Distribution: ORR - India (Karnataka: Belgaum), Myanmar (Palon), Thailand, Indonesia, IAR - Philippines.

#### **Genus 7. *Planetes* Macleay, 1825**

Macleay, 1825: 28; Lacordaire, 94; Bates, 1873: 304; Andrewes, 1924: 52; id. 1930: 278; Lorenz, 2005: 507; Lobl & Lobl, 2017: 501.

= *Heteroglossa* Nietner, 1857: 141; id. 1857: 279.

##### **1. *Planetes bimaculatus* Macleay, 1825**

Macleay, 1825: 29; Chaudoir, 1872: 139; Bates, 1892: 388; Andrewes, 1919: 169; id. 1930: 278; Lorenz, 2005: 507.

Geographic Distribution: ORR - India (Assam), Sri Lanka, Myanmar (Karen Hills), Malaysia (Kuala Lumpur), Thailand, Indonesia (Java, Sumatra), PAR - Japan (Nagasaki, Hiogo), China.

##### **2. *Planetes indicus* Andrewes, 1922**

Andrewes, 1922: 166; id. 1930: 278; Lorenz, 2005: 507.

Geographic Distribution: ORR - India (Maharashtra: Nagpur).

##### **3. *Planetes ruficeps* Schaum, 1863 (Image 1e) \***

Schaum, 1863: 81; Chaudoir, 1872: 139; Andrewes, 1924: 53; id. 1930: 279; Lorenz, 2005: 507.

= *bimaculatus* (*Heteroglossa*) Nietner, 1857: 144; id. 1857: 282; Andrewes; 197: 106.

Specimens examined (n= 2): SJC-ZO-CAR004, 1 ex, India: Tholpetty, 11.960°N, 76.064°E, 882m, light trap, 05.v.2015, coll. Jithmon V.A. & Akhil. S.V.; 1 ex, Koorachundu, 11.538°N, 75.845°E, 95m, hand picking,

12.xi.2016, coll. Jithmon V.A.

Geographic Distribution: ORR - India (Kerala: Tholpetty, Koorachundu; Odisha: Surada; Tamil Nadu: Chennai, Nilgiri Hills), Bangladesh (Dhaka), Sri Lanka (Colombo, Hambegamuwa, Kotte), Myanmar (Tharrawaddy). PAR - India (Uttarakhand: Dehra Dun).

##### **4. *Planetes ruficollis* (Nietner, 1857)**

Nietner, 1857: 144; id. 1857: 282; Chaudoir, 1872: 140; Vuillet, 1912: 17; Andrewes, 1927: 106; id. 1930: 279; Lorenz, 2005: 507.

Geographic Distribution: ORR - India (Delhi: Pusa), Bangladesh (Dhaka), Sri Lanka (Colombo), Vietnam (CochinChina), Indonesia, Thailand, Malaysia, Cambodia.

##### **5. *Planetes simplex* Bates, 1886**

Bates, 1886: 199; Andrewes, 1930: 279; Lorenz, 2005: 507.

Geographic Distribution: ORR - Sri Lanka (Peradeniya).

#### **III. Tribe- Galeritini Leconte, 1853**

##### **Genus 1. *Galerita* Fabricius, 1801**

Fabricius, 1801: 214; Latreille, 1806: 117; Dejean, 1825: 186; Schmidt-Goebel, 1848: 26; Lacordaire, 1854: 82; Andrewes, 1924: 52; id. 1930: 167; Lorenz, 2005: 508.

= *Galeritula* Strand, 1936: 168

= *Galeritina* Jeannel, 1949c: 1058

= *Galeritella* Jeannel, 1949c: 1058

= *Galeritiola* Jeannel, 1949c: 1059

##### **1. *Galerita batesi* Andrewes, 1923 #**

Andrewes, 1923: 9; id. 1930: 168; Lorenz, 2005: 508.

= *orientallis* (not Schmidt-Goebel) Bates, 1889: 109; id. 1892: 385.

Geographic Distribution: ORR - India, Bangladesh (Sylhet), Myanmar (Karen hills, Teinzo, Palon, Thagata, Tenasserim, Annam), Vietnam.

##### **2. *Galerita indica* Chaudoir, 1861 #**

Chaudoir, 1861: 557; id. 1877: 255; Andrewes, 1930: 168; Lorenz, 2005: 508; Lobl & Lobl, 2017: 500.

Geographic Distribution: ORR - northern India.

##### **3. *Galerita orientalis* Schmidt-Goebel, 1846 (Image 1d)**

\*

Schmidt-Goebel, 1846: 26; Bates, 1889: 109; Andrewes, 1923: 8; id. 1930: 168; Lorenz, 2005: 509; Kushwaha et al. 2015: 22; Lobl & Lobl, 2017: 500.

= *Galerita nigripennis* Chaudoir, 1861: 557; id. 1877: 255; Andrewes, 1924: 52; id. 1930: 168; Lorenz, 2005:

509.

Specimens examined (n= 2): SJC-ZO-CAR005, 15.iii.2015, 1ex, India: Chelari, 11.100°N, 75.883°E, 55m, hand picking, coll. Akhil S.V.; 26.xi.2017, 1ex, Kakkayam, 11.551°N, 75.925°E, 755m, hand pickinging, coll. Jithmon V.A.

Geographic Distribution: ORR - India (Kerala: Chelari, Kakkayam; Assam: Khasi Hills; Madhya Pradesh: Mhow; Maharashtra: Nagpur; Odisha: Surada), Bangladesh (Dhaka), Myanmar (Patkai hills), Indonesia, PAR - Taiwan, Japan, China, North Korea, South Korea.

#### 4. *Galerita ruficeps* Chaudoir, 1861

Chaudoir, 1861: 556; Andrewes, 1930: 168; Lorenz, 2005: 509.

Geographic Distribution: PAR - India (Uttarakhand: Harki Dun, Nainital, Almora).

### Checklist of the Indian Panagaeinae with distribution records

#### I. Tribe Peliciini Chaudoir, 1880

##### Genus 1. *Ardistomopsis* Straneo & Ball, 1989

Straneo & Ball, 1989: 123; Lorenz, 2005: 318.

= *Disphaericus* (in part) Schaum, 1864: 122; Bates, 1886: 73; Andrewes, 1923: 228; id. 1927: 109; id. 1930: 153; Csiki, 1929: 400.

##### 1. *Ardistomopsis andrewesi* Straneo & Ball, 1989

Straneo & Ball, 1989: 126; Lorenz, 2005: 318.

Geographic Distribution: ORR - India (Tamil Nadu: Shenbaganur, Palani Hills).

##### 2. *Ardistomopsis batesi* Straneo & Ball, 1989

Straneo & Ball, 1989: 126; Lorenz, 2005: 318.

Geographic Distribution: ORR - India (Madhya Pradesh: Jabalpur).

##### 3. *Ardistomopsis marginicollis* (Schaum, 1864)

Straneo & Ball, 1989: 124; Lorenz, 2005: 318.

= *Disphaericus marginicollis* Schaum, 1864: 122; Andrewes, 1923: 228; id. 1927: 109; id. 1930: 153; Csiki, 1929: 400.

Geographic Distribution: ORR - India (Tamil Nadu: Chennai, Tharangambadi; Karnataka: Bengaluru; Andhra Pradesh: Horseley Konda).

##### 4. *Ardistomopsis myrmex* (Andrewes, 1923)

Straneo & Ball, 1989: 125; Lorenz, 2005: 318.

= *Disphaericus myrmex* Andrewes, 1923: 228; id. 1930: 153; Csiki, 1929: 400.

Geographic Distribution: ORR - India (Tamil Nadu:

Anamalai Hills), Sri Lanka (Koggala, Velverry).

##### 5. *Ardistomopsis ovinollis* (Bates, 1886)

Straneo & Ball, 1989: 125; Lorenz, 2005: 318.

= *Disphaericus ovinollis* Bates, 1886: 73; Andrewes, 1923: 229; id., 1930: 153; Csiki, 1929: 400.

Geographic Distribution: ORR - Sri Lanka (Dikoya).

### II. Tribe- Panagaeini Bonelli, 1810

#### Genus 1. *Craspedophorus* Hope, 1838

Hope, 1838: 165; Lacordaire, 1854: 210; Chaudoir, 1878: 90; Andrewes, 1919: 126; id. 1924: 22; id. 1930: 133; Kirschenhofer, 2000: 328; Lorenz, 2005: 320; Hackel & Kirschenhofer, 2014: 276; Fedorenko, 2016: 2.

= *Camptoderus* Hope, 1838: 66.

= *Eudema* Castelnau, 1840: 137; Lacordaire, 1854: 210; Chaudoir, 1878: 133.

= *Isotarsus* Laferte-Senectere, 1851: 217.

= *Epicosmus* Chaudoir, 1846: 512; id. 1854: 338; id. 1861: 335; id. 1878: 104.

= *Brachycosmus* Jeannel, 1949: 857 (subgenus)

= *Acanthocosmus* Jeannel, 1949: 855 (subgenus)

##### 1. *Craspedophorus angulatus* (Fabricius, 1781) (Image 1f) \*

Andrewes, 1919: 125; id. 1921: 154; id. 1924: 115; id. 1924b: 462; id. 1930: 133; Jedlicka 1965: 3; Kirschenhofer, 2000: 323; Baehr, 2003: 446; Lorenz, 2005: 320; Pang & Tian, 2012: 265; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 357; Fedorenko, 2016: 4; Manthen & Hegde, 2018: 206.

= *Carabus angulatus* Fabricius, 1781: 302; id. 1787: 197; id. 1792: 148; Oliver, 35.38.

= *Carabus reflexus* Fabricius, 1801: 166 (not 1781).

= *Cyhrus reflexus* Fabricius 1801: 166.

= *Panagaeus angulatus* Hope, 1838: 92; Chaudoir, 1861: 336; Heyne-Tasch, 1898: 21.

= *Pimelia fasciatus* Fabricius, 1781: 318; id. 1787: 209; id. 1792: 104; Schaum, 1847: 42; Motschulsky, 1855: 69.

= *Panagaeus tomentosus* Vigors, 1825: 537; Dejean, 1826: 284; Dejean, 1831: 598; Schaum, 1847: 42.

= *Panagaeus fabricii* Hope, 1838: 66.

= *Pimelia bifasciata* Chaudoir, 1861: 336.

= *Eudema bifasciatum* Chaudoir, 1878: 133. Alluaud, 1895: 130

= *Eudema michardi* Fairmaire 1880: 307; Alluaud, 1895: 130.

Specimens examined (n= 1): SJC-ZO-CAR006, 26.v.2017, India: Bonacaud, 8.756°N, 77.188°E, 933m, hand picking, coll. Jithmon V.A. & Akhil S.V.



Geographic Distribution: ORR - India (Andra Pradesh; Tamil Nadu: Coimbatore, Pondicheri; Karnataka: Shivamogga, Mysuru; Kerala: Bonacaud; Maharashtra: Pune), Sri Lanka, Bangladesh, Myanmar.

### **2. *Craspedophorus bifasciatus* (Castelnau, 1835) (Image 2a) \***

Andrewes, 1919: 126; id. 1921: 341; Andrewes, 1930: 134; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 346; Fedorenko, 2016: 4.

= *Panagaeus bifasciatus* Castelnau, 1835: 155.

= *Isotarsus bifasciatus* Laferte-Senectere, 1851: 220; Schaum, 1853: 431; Motschulsky, 1855: 69.

= *Epicosmus bifasciatus* Chaudoir, 1861: 336;

= *Epicosmus castelnau* Chaudoir, 1878: 112; Bates, 1886: 73; Andrewes 1919: 126.

= *Eudema bifasciatum* Heyne-Tasch, 1898: 21;

Specimens examined (n= 3): SJC-ZO-CAR007, 10.ix.2015, 1 ex, India: Bharathiyar, 11.047°N, 76.880°E, 514m, hand picking, coll. Akhil. S.V.; 06.xii.2017, 1 ex, Chinnar, 10.3°N, 77.175°E, 627m, hand picking, coll. Divya M.; 18.x.2015, 1 ex, Kadayan, 8.832°N, 77.357°E, Hand picking, coll. Jithmon V.A. & Akhil S.V.

Geographic Distribution: ORR - India (Kerala: Chinnar; Tamil Nadu: Kadayan, Coimbatore, Bharathiyar, Chennai, Mahabalipuram, Nilgiri Hills, Thiruchirapally, Pondicherry; Andhra Pradesh: Udayagiri, Horsely Konda; Madhya Pradesh; Odisha: Barunikuda I. - Lake Chilika, Sri Lanka (Colombo, Trincomalee, Suriya Ara, Tissa, Maha, Illupalama).

### **3. *Craspedophorus geniculatus* (Wiedemann, 1823)**

Andrewes, 1921: 170, 187; id. 1930: 135; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 301.

= *Panagaeus geniculatus* Wiedemann, 1823: 56; Schaum, 1853: 28.

= *Isotarsus rufipalpis* Laferte-Senectere, 1851: 221 (*nomen nudum* Andrewes 1924b: 588); Chaudoir, 1878: 110; Andrewes, 1930: 135; Kirschenhofer, 2000: 323; Hackel & Farkac, 2012: 77, 79.

= *Epicosmus geniculatus* Chaudoir, 1861: 351; id. 1869: 351; id. 1878: 112. Andrewes, 1924: 588.

= *Epicosmus hilaris* Chaudoir, 1878: 110; Csiki, 1929: 357.

Geographic Distribution: ORR - India (West Bengal; Delhi: Pusa; Bihar).

### **4. *Craspedophorus gracilipes* (Bates, 1892)**

Andrewes, 1930: 135. Saha & Biswas, 1985: 123; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 370; Lobl & Lobl, 2017: 638.

= *Epicosmus gracilipes* Bates, 1892: 302.

Geographic Distribution: ORR - India (Assam: Sadiya; Arunachal Pradesh: Noa Dihing), Myanmar (Kachin), PAR - China (Yunnan).

### **5. *Craspedophorus hexagonus* (Chaudoir, 1861)**

Andrewes, 1930: 135. Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 329; Lobl & Lobl, 2017: 638.

= *Epicosmus hexagonus* Chaudoir, 1861: 338; id. 1878: 114.

Geographic Distribution: ORR - India (Indes orientales), PAR - India (Uttarakhand: Dehra Dun).

### **6. *Craspedophorus hilaris* (Laferte-Senectere, 1851)**

Andrewes, 1921: 170; id. 1924: 588; id. 1930: 135; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Kirschenhofer, 2011: 47; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 276 & 303; Manthen & Hegde, 2018: 206.

= *Isotarsus hilaris* Laferte-Senectere, 1851: 221.

= *Epicosmus hilaris* Chaudoir, 1861: 345; id. 1878: 110.

Geographic Distribution: ORR - India (West Bengal; Maharashtra: Pune).

### **7. *Craspedophorus incostatus* Kirschenhofer, 2000**

Kirschenhofer, 2000: 349; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 276 & 349.

Geographic Distribution: PAR - India (Uttarakhand: Ramgarh).

### **8. *Craspedophorus mandarinellus* (Bates, 1892) (Image 2b) \***

Andrewes, 1921: 187; Andrewes, 1930: 135; Baehr, 2003: 447; Xie & Yu, 1991: 170; Kirschenhofer, 2000: 324; Lorenz, 2005: 321; Kirschenhofer, 2011: 40, 47; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 309 ; Fedorenko, 2016: 30; Lobl & Lobl, 2017: 638.

= *Epicosmus mandarinellus* Bates, 1892: 299.

= *Craspedophorus vietnamensis* Kirschenhofer, 2000: 339; Hackel & Farkac, 2012: 77; Fedorenko, 2016: 30.

= *Craspedophorus freudeellus* Hackel & Kirschenhofer, 2014: 299; Fedorenko, 2016: 30.

Specimens examined (n= 2): SJC-ZO-CAR008,

16.x.2016, 1 ex, India: Koorachundu, 11.538°N, 75.845°E, 95m, light trap, coll. Jithmon V.A.; 10.ii.2017, 1 ex, Peruvannamoozhi, 11.596°N, 75.823°E, 128m, light trap, coll. Jithmon V.A.

Geographic Distribution: ORR - India (Karnataka: Shivamogga; Kerala: Koorachundu, Peruvannamoozhi), Myanmar (Kachin, Nam Tamai, Tenasserim), Vietnam (Dongnai), PAR - China (Guangxi, Guangdong, Yunnan).

### 9. *Craspedophorus pubiger* (Chaudoir, 1861) #

Andrewes, 1930: 136; Kirschenhofer, 2000: 324; Lorenz, 2005: 321; Hackel & Farkac, 2012: 79; Hackel & Kirschenhofer, 2014: 354; Fedorenko, 2016: 4.  
= *Epicosmus pubiger* Chaudoir, 1861: 337; id. 1878: 122.

Geographic Distribution: ORR - 'Indes orientales'

### 10. *Craspedophorus assamensis* Hackel & Kirschenhofer, 2014

Hackel & Kirschenhofer, 2014: 341.

Geographic Distribution: ORR - India (Assam).

### 11. *Craspedophorus sikkimensis* Hackel & Kirschenhofer, 2014

Hackel & Kirschenhofer, 2014: 337; Lobl & Lobl, 2017: 638.  
Geographic Distribution: PAR - India (Sikkim: Rabong).

### 12. *Craspedophorus maharashtraensis* Kirschenhofer, 2011

Kirschenhofer, 2011: 43; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 308 Manthen & Hegde, 2018: 207.

Geographic Distribution: ORR - India (Maharashtra: Panchgani).

### 13. *Craspedophorus cereus* (Macleay, 1825)

Andrewes, 1919: 135; id. 1930: 134; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 80; Hackel & Kirschenhofer, 2014: 73; Hackel, 2015: 238; Fedorenko, 2016: 31; Manthen & Hegde, 2018: 206.

= *Panagaeus cereus* Macleay, 1825: 12.

= *Craspedophorus buruensis* Hackel & Kirschenhofer, 2014: 295.

= *Craspedophorus formosanus* Jedlicka, 1939: 1; id. 1965: 5; Habu, 1978: 71; Kirschenhofer, 2000: 330; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 298.

= *Craspedophorus chinensis* Jedlicka, 1965: 5; Kirschenhofer, 2000: 331; Hackel & Kirschenhofer, 2014: 297.

= *Craspedophorus saddlepeakensis* Kirschenhofer, 2011: 45; Hackel & Kirschenhofer, 2014: 319.

= *Craspedophorus laosensis* Kirschenhofer, 2012: 231; Hackel & Kirschenhofer, 2014: 305.

= *Craspedophorus punensis* Hackel & Kirschenhofer, 2014: 318.

= *Craspedophorus batesi* Hackel, 2014: 3.

= *Craspedophorus maculatus*: Hackel & Kirschenhofer, 2014: 307.

= *Craspedophorus philippinus* Jedlicka, 1939: 1.

Geographic Distribution: ORR - India (Maharashtra: Mumbai, Pune; Andaman Is.), Laos, Vietnam, Indonesia (Java, Buru), PAR - southern China, southern Japan, IAR - Philippines.

### 14. *Craspedophorus bisemilunatis* (Xie & Yu, 1991).

Xie & Yu, 1991: 161; Lobl & Lobl, 2017: 638.

= *Craspedophorus dehradunensis* Hackel & Kirschenhofer, 2014: 281.

= *Dischissus dehradunensis* Kirschenhofer, 2000: 355; Lorenz, 2005: 320; Hackel & Farkac, 2012: 84.

= *Dischissus guangdongensis* Hackel & Kirschenhofer, 2014b: 282.

= *Dischissus sapaensis* Kirschenhofer, 1994: 1044.

Geographic Distribution: PAR - India (Uttarakhand: Dehra Dun), China (Guangdong, Guizhou, Guangxi, Yunnan).

### 15. *Craspedophorus microspilotus* Andrewes, 1924

Andrewes, 1924: 131; id. 1930: 136; id. 1933: 1; Kirschenhofer, 2000: 324, 330; Lorenz, 2005: 321; Kirschenhofer, 2011: 47; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 314.

Geographic Distribution: ORR - Sri Lanka (Nuwara Eliya).

### 16. *Craspedophorus halyi* Andrewes, 1923

Andrewes, 1923: 230; id. 1930: 135; Kirschenhofer, 2000: 323; Lorenz, 2005: 320; Hackel & Farkac, 2012: 78; Hackel & Kirschenhofer, 2014: 302.

Geographic Distribution: ORR - Sri Lanka (Niroddumunai).

### 17. *Craspedophorus lankaensis* Hackel & Kirschenhofer, 2014 #

Hackel & Kirschenhofer, 2014: 351.

Geographic Distribution: ORR - Sri Lanka

### Genus 2. *Adischissus* Fedorenko, 2015

Fedorenko, 2015: 273; Lobl & Lobl, 2017: 637.



### **1. *Adischissus notulatus* (Fabricius, 1801) (Image 2c) \***

Fedorenko, 2015: 277; Lobl & Lobl, 2017: 637.  
 = *Carabus notulatus* Fabricius, 1801: 201; Hope, 1838: 90; Schaum, 1847: 48; id. 1853: 432; Motschulsky, 1855: 70;  
 = *Dischissus notulatus* Andrewes, 1921: 162; id. 1930: 153; Lorenz, 2005: 322.  
 = *Dischissus longicornis* (*Craspedophorus*) Schaum, 1863: 84; Chaudoir, 153; Bates, 1892: 303; Heller, 1916: 276; Andrewes, 1927: 108.  
 = *Dischissus sumatranaus* (*Panagaeus*) Dohrn, 1891: 253 and 254; Andrewes, 1922: 246.  
 = *Dischissus tibialis* Andrewes, 1933:  
 Specimens examined (n=2): SJC-ZO-CAR009, 15.vi.2015, 1 ex, India: Koorachundu, 11.538°N, 75.845°E, 95m, hand picking, coll. Jithmon V.A.; 10.ii.2017, 1 ex, Peruvannamoozhi, 11.596°N, 75.823°E, 128m, Light trap, coll. Jithmon V.A.

Geographic Distribution: ORR - India (West Bengal; Kolkata; Goa: Margo, Calangut; Tamil Nadu: Nilgiri hills; Kerala: Koorachundu, Peruvannamoozhi), Myanmar (Insein, Toungoo, Rangoon, Kawkareik), Vietnam (Annam, Dongnai, Lam Dong, Binh Duong, Tay Ninh, Phuoc Vinh), Malaysia (Kuala Lumpur), Singapore, PAR – India (Sikkim: Namsoo; Uttarakhand: Almora), China (Anhui, Foochow, Guangdong, Guizhou, Guangxi, Hunan, Shanghai), Hongkong.

### **2. *Adischissus quadrinotatus* (Motschulsky, 1865)**

Fedorenko, 2015: 277; Lobl & Lobl, 2017: 637.  
 = *Peranomus quadrinotatus* Motschulsky, 1864: 333;  
 = *Dischissus quadrinotatus* Bates, 1873: 244; Chaudoir, 1878: 152; Andrewes, 1928: 22; id. 1930: 153; Lorenz, 2005: 322.

Geographic Distribution: ORR - India (Karnataka: Shivamogga: Sringeri), Vietnam (Annam), PAR - Japan.

### **Genus 3. *Microcosmodes* Strand, 1936**

Strand, 1936: 169; Lorenz, 2005: 322; Fedorenko, 2015: 278; Lobl & Lobl, 2017: 639.  
 = *Microshemus* Andewes, 1940: 536.  
 = *Microcosmus* Chaudoir, 1878: 139.

#### **1. *Microcosmodes flavopilosus* (Laferte-Senectere, 1851)**

Lorenz, 2005: 322; Lobl & Lobl, 2017: 639.  
 = *Isotarsus flavopilosus* Laferte-Senectere, 1851: 222; Chaudoir, 1861: 348; id. 1878: 142; Bates, 1873: 243.  
 = *Epicosmus transversus* Motschulsky, 1864: 332; Andrewes, 1928: 11.

Geographic Distribution: ORR - India (Delhi: Pusa;

West Bengal: Kolkata; Maharashtra: Nagpur, Mumbai, Bandra; Tamil Nadu: Chennai, Coimbatore; Lakshadweep: Minikoi; Gopkuda), Bangladesh (Dhaka, Sardah), Indonesia (Sumatra), Vietnam (Tongking), PAR – India (Uttarakhand: Dehra Dun), Nepal, Japan, China, Taiwan (Formosa).

### **2. *Microcosmodes elegans* (Dejean, 1826) \***

Fedorenko, 2015: 278; Lobl & Lobl, 2017: 639.  
 = *Panagaeus elegans* Dejean, 1826: 290.  
 = *Isotarsus elegans* Laferte-Senectere, 1851: 221; Schaum, 1853: 432.  
 = *Craspedophorus elegans* Andrewes, 1921: 162; id. 1924: 23; id. 1930: 134; Kirschenhofer, 2000: 323, 347; Lorenz, 2005: 320; Kirschenhofer, 2011: 47; Hackel & Farkac, 2012: 77; Hackel & Kirschenhofer, 2014: 276 & 284.

Geographic Distribution: ORR - Throughout India, Sri Lanka. PAR – Nepal, Pakistan.

### **Genus 4. *Euschizomerus* Chaudoir, 1850**

Chaudoir, 1850: 413; Lacordaire, 1854: 212; Chaudoir, 1878: 157; Andrewes, 1930: 165; Kirschenhofer, 2000: 359; Lorenz, 2005: 322; Hackel & Farkac, 2012: 86; Lobl & Lobl, 2017: 639.

= *Euschiromerus* Chaudoir, 1869: (in error)  
 = *Praeschizomerus* Kirschenhofer, 2000: 359. (Subgenus).

#### **1. *Euschizomerus aeneus* Chaudoir, 1869**

Chaudoir, 1869: 118; id. 1878: 160; Bates, 1892: 303; Andrewes, 1930: 165; Lorenz, 2005: 322; Hackel & Farkac, 2012: 86.

Geographic Distribution: ORR - Bangladesh (Dhaka), Myanmar (Taik Kyi, Pegu).

#### **2. *Euschizomerus denticollis* (Kollar, 1836) (Image 2e) \***

Andrewes, 1930: 165; Lorenz, 2005: 322; Hackel & Farkac, 2012: 86.  
 = *Panagaeus denticollis* Kollar, 1835: 334; Chaudoir, 1878: 161.

Specimens examined (n= 1): SJC-ZO-CAR010, 10.v.2017, India: Ernakulam, Kalady, 17m, 10.166°N, 76.438°E, hand picking, coll. Divya M.

Geographic Distribution: ORR - India (West Bengal: Kolkata, Kerala: Ernakulam: Kalady), Sri Lanka.

#### **3. *Euschizomerus devagiriensis* Jithmon & Sabu, 2018 (Image 2d) \***

Jithmon & Sabu, 2018: 362.  
 Specimens examined (n= 1): SJC-ZO-CAR011,

**Table 1.** Geographic distribution pattern of the Dryptinae and Panagaeinae species recorded from India.

	Species	Region
<b>Subfamily Dryptinae</b>		
I.	<b>Tribe Dryptini Bonelli, 1810</b>	
	<i>Drypta</i> Latreille, 1796	
1.	<i>Drypta aenipes</i> Wiedemann, 1823	Oriental
2.	<i>Drypta aetheria</i> Andrewes, 1936	Oriental
3.	<i>Drypta argillacea</i> Andrewes, 1924	Oriental, Palearctic
4.	<i>Drypta cyanopus</i> Andrewes, 1936	Oriental
5.	<i>Drypta crassiuscula</i> Chaudoir, 1861	Palearctic
6.	<i>Drypta flavipes</i> Wiedemann, 1823	Oriental, Palearctic
7.	<i>Drypta lineola</i> Macleay, 1825	Oriental
8.	<i>Drypta longicollis</i> Macleay, 1825	Oriental
9.	<i>Drypta siderea</i> Bates, 1892	Oriental, Palearctic
	<i>Dendrocellus</i> Schmidt Geobel, 1846	
10.	<i>Dendrocellus coelestinus</i> (Klug, 1834)	Oriental, Palearctic
11.	<i>Dendrocellus confusus</i> (Hansen, 1968)	Oriental, Palearctic
12.	<i>Dendrocellus geniculatus</i> (Klug, 1834)	Oriental, Palearctic, Indo-Australian
13.	<i>Dendrocellus inexpectus</i> Liang & Kavanaugh, 2007	Oriental
14.	<i>Dendrocellus nepalensis</i> (Hope, 1831)	Oriental, Palearctic
15.	<i>Dendrocellus rugicollis</i> Chaudoir, 1861	Oriental, Palearctic
16.	<i>Dendrocellus unidentatus</i> (Macleay, 1825)	Oriental, Palearctic
II.	<b>Tribe Zuphini Bonelli, 1810</b>	
	<i>Paralelepida</i> Basilewsky, 1951	
17.	<i>Paralelepida linearis</i> Baehr, 1990	Oriental
18.	<i>Paralelepida loebli</i> Mateu, 1981	Oriental
19.	<i>Paralelepida besucheti</i> Mateu, 1981	Oriental
	<i>Gunvorita</i> Landin, 1955	
20.	<i>Gunvorita besucheti</i> Baehr, 1998	Oriental
21.	<i>Gunvorita depressipennis</i> Baehr, 1998	Oriental
22.	<i>Gunvorita elegans</i> Landin, 1955	Oriental, Palearctic
23.	<i>Gunvorita indica</i> Darlington, 1968	Oriental
24.	<i>Gunvorita inermis</i> Baehr, 1998	Oriental
25.	<i>Gunvorita laeviceps</i> Baehr, 1998	Oriental
26.	<i>Gunvorita minor</i> Baehr, 1998	Oriental
27.	<i>Gunvorita ovaliceps</i> Baehr, 1998	Oriental
	<i>Agastus</i> Schmidt-Goebel, 1846	
28.	<i>Agastus lineatus</i> Schmidt-Goebel, 1846	Oriental, Palearctic, Indo-Australian
	<i>Zuphium</i> Latreille, 1806	
29.	<i>Zuphium dabreui</i> Andrewes, 1922	Oriental
30.	<i>Zuphium erebeum</i> Andrewes, 1923	Oriental
31.	<i>Zuphium erythrocephalum</i> Chaudoir, 1862	Oriental
32.	<i>Zuphium indicum</i> Andrewes, 1922	Oriental
33.	<i>Zuphium modestum</i> Schmidt-Goebel, 1846	Oriental
34.	<i>Zuphium olens</i> (Rossi, 1790)	Oriental, Palearctic
	<i>Metazuphium</i> Mateu, 1992	
35.	<i>Metazuphium spinangulus</i> Mateu, 1992	Oriental
	<i>Parazuphium</i> Jeannel, 1942	
36.	<i>Parazuphium inconspicuum</i> (Schmidt-Goebel, 1846)	Oriental, Indo-Australian
<b>Subfamily Panagaeinae</b>		
	<i>Planetes</i> Macleay, 1825	
37.	<i>Planetes bimaculatus</i> Macleay, 1825	Oriental, Palearctic
38.	<i>Planetes indicus</i> Andrewes, 1922	Oriental
39.	<i>Planetes ruficeps</i> Schaum, 1863	Oriental, Palearctic
40.	<i>Planetes ruficollis</i> (Nietner, 1857)	Oriental
41.	<i>Planetes simplex</i> Bates, 1886	Oriental
III.	<b>Tribe Galeritini Leconte, 1853</b>	
	<i>Galerita</i> Fabricius, 1801	
42.	<i>Galerita batesi</i> Andrewes, 1923	Oriental
43.	<i>Galerita indica</i> Chaudoir, 1861	Oriental
44.	<i>Galerita orientalis</i> Schmidt-Goebel, 1846	Oriental, Palearctic
45.	<i>Galerita ruficeps</i> Chaudoir, 1861	Palearctic



	Species	Region
	<i>Microcosmodes</i> Strand, 1936	
25.	<i>Microcosmodes flavopilosus</i> (Laferte-Senectere, 1851)	Oriental, Palearctic
26.	<i>Microcosmodes elegans</i> (Dejean, 1826)	Oriental, Palearctic
	<i>Euschizomerus</i> Chaudoir, 1850	
27.	<i>Euschizomerus aeneus</i> Chaudoir, 1869	Oriental
28.	<i>Euschizomerus denticollis</i> (Kollar, 1836)	Oriental
29.	<i>Euschizomerus devagiriensis</i> Jithmon & Sabu, 2018	Oriental
30.	<i>Euschizomerus indicus</i> Jedlicka, 1956	Oriental
31.	<i>Euschizomerus metallicus</i> Harold, 1879	Oriental
	<i>Trichisia</i> Motschulsky, 1864	
32.	<i>Trichisia morio</i> (Laferte-Senectere, 1851)	Oriental, Palearctic
33.	<i>Trichisia violacea</i> Jedlicka, 1935	Oriental, Palearctic, Indo-Australian

25.v.2017, India: Kozhikode, Devagiri, 11.265°N, 75.835°E, 45m, hand picking, coll. Divya M.

Geographic Distribution: ORR - India (Kerala: Kozhikode: Devagiri).

#### 4. *Euschizomerus indicus* Jedlicka, 1956 (Image 2f) \*

Jedlicka, 1955: 207; Lorenz, 2005: 322; Hackel & Farkac, 2012: 86.

= *Euschizomerus schuhi* Kirschenhofer, 2000: 360; Hackel & Farkac, 2012: 87.

Specimens examined (n= 6): SJC-ZO-CAR012, 18.iv.2017, 4 ex, India: Kozhikode (East Devagiri), 11.265°N, 75.835°E, 45m, light, coll. Divya M.; 05.x.2016, 2 ex, Govindapuram, 11.233°N, 75.8°E, 11m, UV light, coll. Anju.

Geographic Distribution: ORR - India (Maharashtra: Mumbai: Lonvala; Goa: Benaulin beach; Kerala: Kozhikode: East Devagiri, Govindapuram).

#### 5. *Euschizomerus metallicus* Harold, 1879 \*

Harold, 1879: 331; Vuillet, 1912: 19; Andrewes, 1927: 109; Andrewes, 1930: 165; Lorenz, 2005: 322; Hackel & Farkac, 2012: 86.

Geographic Distribution: ORR - "Indes orientales", Myanmar (Karen Hills, Rangoon, Tenasserim); Cambodia.

#### Genus 5. *Trichisia* Motschulsky, 1864

Motschulsky, 1864: 331; Chaudoir, 1878: 164; Lorenz, 2005: 322; Hackel & Farkac, 2012: 98; Lobl & Lobl, 2017: 640.

#### 1. *Trichisia morio* (Laferte-Senectere, 1851)

Andrewes, 1930: 350; Lorenz, 2005: 323; Hackel & Farkac, 2012: 98.

= *Isotarsus morio* Laferte-Senectere, 1851: 221;

Chaudoir, 1861: 348; Id. 1878: 165; Gardner, 1927: 66.  
= *cyanescens* Motschulsky, 1864: 332; Andrewes, 1928: 24.

Geographic Distribution: ORR - India (Assam: Jorhat; Delhi: Pusa), Bangladesh (Dhaka), Indonesia (Sumatra), PAR - India (Uttarakhand: Dehra Dun), Pakistan (Rawalpindi).

#### 2. *Trichisia violacea* Jedlicka, 1935 \*

Jedlicka, 1935: 2; Lorenz, 2005: 323; Hackel & Farkac, 2012: 98.

Geographic Distribution: ORR - India, IAR - Philippines; PAR - China.

## DISCUSSION

Out of the 45 Dryptinae species recorded from India, 24 species (53.3%) are endemic to the Indian subcontinent, with two species endemic to the Indian palaearctic region (PAR) and 22 species endemic to the Indian Oriental region (ORR). Among the 21 species endemic to the Indian ORR region, six species (*Paralelepidia linearis*, *P. loebli*, *P. besucheti*, *Zuphium erebeum*, *Metazuphium spinangulus*, and *Planetes simplex*) are endemic to the Western Ghats & Sri Lanka hotspot of biodiversity, two species (*Gunvorita depressipennis* and *G. minor*) are endemic to the Indo Burma hotspot of biodiversity and two species (*Drypta crassiuscula* and *Galerita ruficeps*) are endemic to the Himalaya hotspot of biodiversity. Six species endemic to the Western Ghats & Sri Lanka hotspot of biodiversity (*Paralelepidia linearis*, *P. loebli*, *P. besucheti*, *Zuphium erebeum*, *Metazuphium spinangulus*, and *Planetes simplex*) could be remnants of the ancient Indian fauna existed on Indian part of Gondwanaland which broke away from Gondwana land along with Madagascar in the early Cretaceous (about 160 million years ago) leading to the formation of Indian subcontinent (Mani 1974; Courtillot et al. 1988; Sabu et al. 2008).

Out of the 33 Panagaeinae species recorded from Indian subcontinent, 20 species (60.6%) are endemic to the Indian subcontinent with genus *Ardistomopsis* with five species. Two species (*Craspedophorus sikkimensis*, *Craspedophorus incostatus*) reported only from Indian PAR region, 17 Panagaeinae species reported only from Indian ORR region and *Craspedophorus hexagonus* reported from both Indian ORR and PAR regions. Among the 20 Indian subcontinent endemic species, seven species (*Ardistomopsis andrewesi*, *A. myrmex*, *A. ovicollis*, *Craspedophorus maharashtraensis*, *C. microspilotus*, *C.*

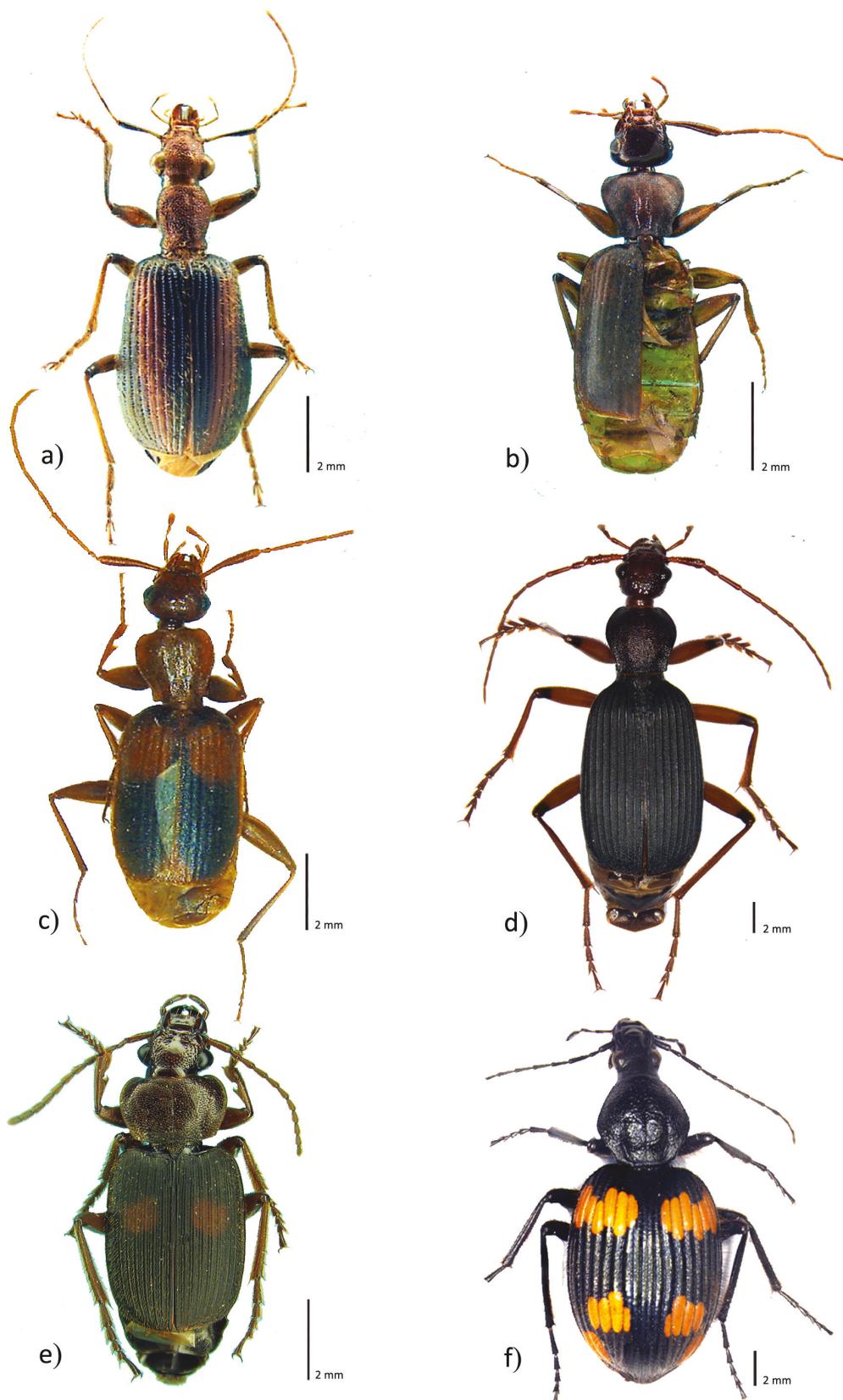


Image 1. Habitus of Dryptinae and Panagaeinae species collected: a—*Drypta lineola* Macleay, 1825 | b—*Zuphium dabreui* Andrewes, 1922 | c—*Z. erythrocephalum* Chaudoir, 1862 | d—*Galerita orientalis* Schmidt-Geobel, 1848 | e—*Planetes ruficeps* Schaum, 1863 | f—*Craspedophorus angulatus* (Fabricius, 1781). © Jithmon V.A. & Akhil S.V.

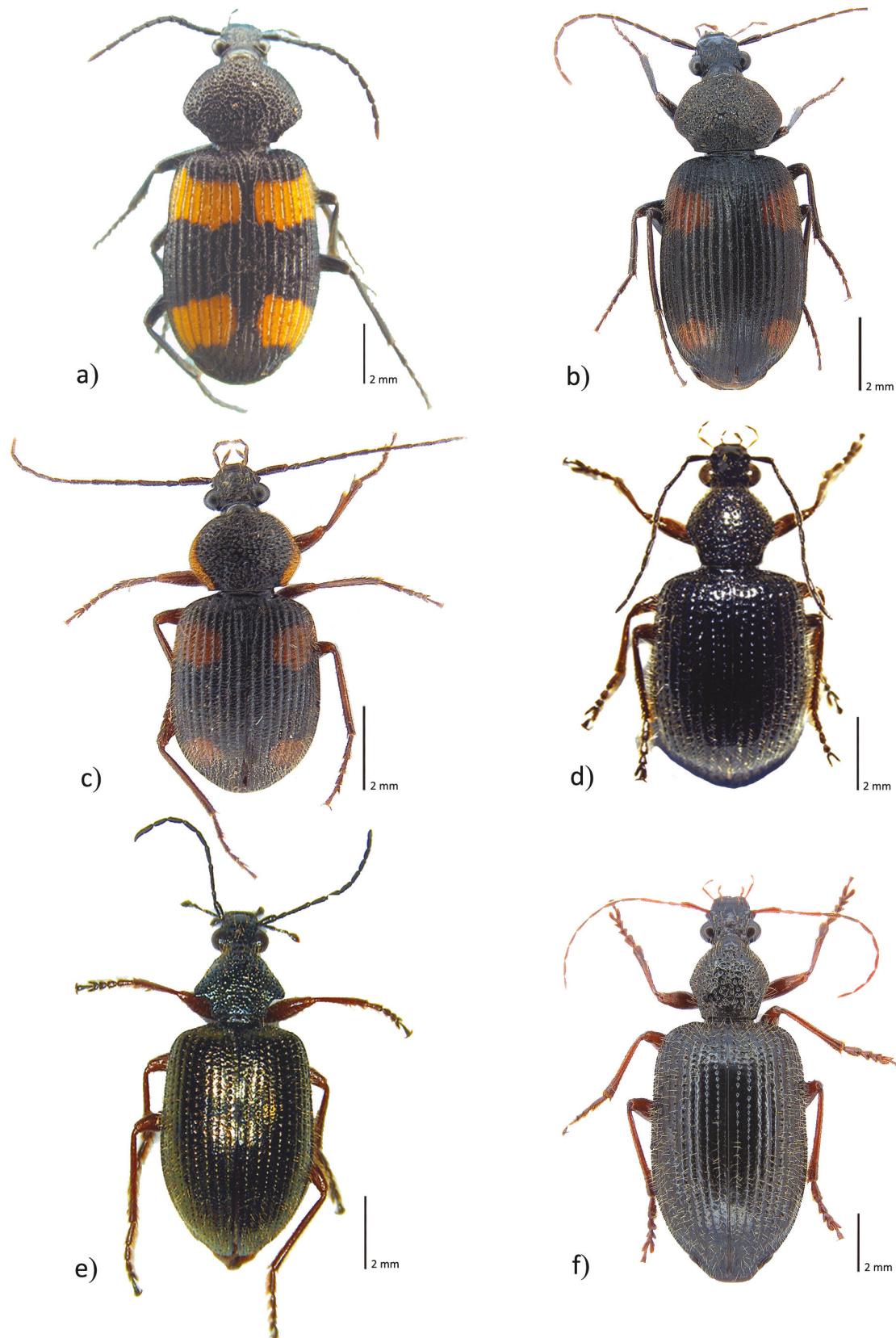


Image 2. Habitus of Panagaeinae species collected: a—*Craspedophorus bifasciatus* (Castelnau, 1835) | b—*C. mandarinellus* Bates, 1892 | c—*Adischissus notulatus* (Fabricius, 1801) | d—*Euschizomerus devagiriensis* Jithmon & Sabu, 2018 | e—*E. denticollis* Kollar, 1836 | f—*E. indicus* Jedlicka, 1955. © Jithmon V.A. & Akhil S.V.

*halyi* and *C. lankaensis*) are endemics to the Western Ghats and Sri Lanka Hotspot of biodiversity and two species, (*Craspedophorus sikkimensis*, *Craspedophorus incostatus*) endemics to Himalaya hotspot of biodiversity. Remaining 11 Indian subcontinent endemic species of subfamily Panagaeinae have a wide range distribution across India. Seven species (*Ardistomopsis andrewesi*, *A. myrmex*, *A. ovicollis*, *Craspedophorus maharashtraensis*, *C. microspilotus*, *C. halyi* and *C. lankaensis*) recorded only from the Western Ghats and Sri Lanka are likely to be representative of the Gondwana remnants that got isolated in Indian subcontinent following the separation of the subcontinent.

Present study provides the distribution patterns and literature details of 45 Dryptinae and 33 Panagaeinae species reported from the Indian subcontinent. Primary aim of the present effort was to prepare a checklist with regional distribution patterns and reference details which will make it easier for taxonomists and will lead to more taxonomic works across the Indian subcontinent. Distribution records show poor representation of both the groups from Central and north western regions of the Indian subcontinent indicating the need for further taxonomic explorations. Additionally, our analysis revealed the presence of a large number of species endemic to the Indian mainland, local endemics (endemic to the hotspots of biodiversity in India: the Western Ghats & Sri Lanka hotspot of biodiversity, the Indo Burma hotspot of biodiversity and the Himalaya hotspot of biodiversity), species confined to the PAR or ORR regions of Indian mainland and a few ancient species with possible Gondwana linkages which will attract the attention of evolutionary and conservation biologists also to these two lesser known subfamilies.

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#### Conservation Application

##### First attempt at rehabilitation of Asiatic Black Bear cubs to the wild in Thailand

- Robert Steinmetz, Worrapan Phumanee, Rungnapa Phoonjampa & Suthon Weingdow, Pp. 18411–18418

#### Communications

##### Status of Sumatran Tiger in the Berbak-Sembilang landscape (2020)

- Tomi Ariyanto, Yoan Dinata, Dwiyanto, Erwan Turyanto, Waluyo Sugito, Sophie Kirklin & Rajan Amin, Pp. 18419–18426

##### The diversity of small mammals in Pulau Perhentian Kecil, Terengganu, Malaysia

- Aminuddin Baqi, Isham Azhar, Ean Wee Chen, Faisal Ali Anwarali Khan, Chong Ju Lian, Bryan Raveen Nelson & Jayaraj Vijaya Kumaran, Pp. 18427–18440

##### Patterns, perceptions, and spatial distribution of human-elephant (*Elephas maximus*) incidents in Nepal

- Raj Kumar Koirala, Weihong Ji, Yajna Prasad Timilsina & David Raubenheimer, Pp. 18441–18452

##### Assessing spatio-temporal patterns of human-leopard interactions based on media reports in northwestern India

- Kaushal Chauhan, Arjun Srivaths & Vidya Athreya, Pp. 18453–18478

##### Bat diversity in the Banpale forest, Pokhara, Nepal during spring season

- Prabhat Kiran Bhattacharai, Basant Sharma, Anisha Neupane, Sunita Kunwar & Pratyush Dhungana, Pp. 18479–18489

##### A patho-microbiological study of tissue samples of the Greater Adjutant *Leptoptilos dubius* (Aves: Ciconiiformes: Ciconiidae) that died in Deeporbeel Wildlife Sanctuary, Assam, India

- Derhasar Brahma, Parikshit Kakati, Sophia M. Gogoi, Sharmita Doley, Arpita Bharali, Biswajit Dutta, Taibor Rahman, Saidul Islam, Arfan Ali, Siraj A. Khan, Sailendra Kumar Das & Nagendra Nath Barman, Pp. 18490–18496

##### Vaduvur and Sitheri lakes, Tamil Nadu, India: conservation and management perspective

- V. Gokula & P. Ananth Raj, Pp. 18497–18507

##### A new species of shieldtail snake (Squamata: Uropeltidae: Uropeltis) from the Bengaluru uplands, India

- S.R. Ganesh, K.G. Punith, Omkar D. Adhikari & N.S. Achyuthan, Pp. 18508–18517

##### A looming exotic reptile pet trade in India: patterns and knowledge gaps

- A. Pragatheesh, V. Deepak, H.V. Girisha & Monesh Singh Tomar, Pp. 18518–18531

##### Legal or unenforceable? Violations of trade regulations and the case of the Philippine Sailfin Lizard *Hydrosaurus pustulatus* (Reptilia: Squamata: Agamidae)

- Sarah Heinrich, Adam Toomes & Jordi Janssen, Pp. 18532–18543

##### Conservation breeding of Northern River Terrapin *Batagur baska* (Gray, 1830) in Sundarban Tiger Reserve, India

- Nilanjan Mallick, Shailendra Singh, Dibyadeep Chatterjee & Souritra Sharma, Pp. 18544–18550

##### Discovery of two new populations of the rare endemic freshwater crab *Louisea yabassi* Mvogo Ndongo, von Rintelen & Cumberlidge, 2019 (Brachyura: Potamonautidae) from the Ebo Forest near Yabassi in Cameroon, Central Africa, with recommendations for conservation action

- Pierre A. Mvogo Ndongo, Thomas von Rintelen, Christoph D. Schubart, Paul F. Clark, Kristina von Rintelen, Alain Didier Missoup, Christian Albrecht, Muriel Rabone, Efole Ewoukem, Joseph L. Tamesse, Minette Tomedi-Tabi Eyang & Neil Cumberlidge, Pp. 18551–18558

##### Checklists of subfamilies Dryptinae and Panagaeinae (Insecta: Coleoptera: Carabidae) from the Indian subcontinent

- V.A. Jithmon & Thomas K. Sabu, Pp. 18559–18577

##### Mantids (Insecta: Mantodea) of Uttar Pradesh, India

- Ramesh Singh Yadav & G.P. Painkra, Pp. 18578–18587

##### An assessment of genetic variation in vulnerable Borneo Ironwood *Eusideroxylon zwageri* Teijsm. & Binn. in Sarawak using SSR markers

- Siti Fatimah Md.-Isa, Christina Seok Yien Yong, Mohd Nazre Saleh & Rusea Go, Pp. 18588–18597

#### Review

##### Termites (Blattodea: Isoptera) of southern India: current knowledge on distribution and systematic checklist

- M. Ranjith & C.M. Kalleshwaraswamy, Pp. 18598–18613

#### Short Communications

##### Population status and distribution of Ibisbill *Ibidorhyncha struthersii* (Vigors, 1832) (Aves: Charadriiformes: Ibidorhynchidae) in Kashmir Valley, India

- Iqram Ul Haq, Bilal A. Bhat, Khursheed Ahmad & Asad R. Rahmani, Pp. 18614–18617

##### A new fish species of genus *Garra* (Teleostei: Cyprinidae) from Nagaland, India

- Sophiya Ezung, Bungdon Shangningam & Pranay Punj Pankaj, Pp. 18618–18623

##### Occurrence of Tamdil Leaf-litter Frog *Leptobrachella tamdil* (Sengupta et al., 2010) (Amphibia: Megophryidae) from Manipur, India and its phylogenetic position

- Ht. Decemson, Vanlalsiammawii, Lal Biakzuala, Mathipi Vabeiryureilai, Fanai Malsawmdawngiana & H.T. Lalremtsanga, Pp. 18624–18630

##### Further additions to the Odonata (Insecta) fauna of Asansol-Durgapur Industrial Area, Paschim Bardhaman, India

- Amar Kumar Nayak & Subhajit Roy, Pp. 18631–18641

##### A note on the ecology and distribution of Little Bloodtail *Lyriothemis acigastra* Brauer, 1868 (Insecta: Odonata: Libellulidae) in Kerala, India

- Jeevan Jose, Muhammed Sherif & A. Vivek Chandran, Pp. 18642–18646

#### Viewpoint

##### A unique archetype of conservation in Himachal Pradesh, western Himalaya, India

- Rupali Sharma, Monika Sharma, Manisha Mathela, Himanshu Bargali & Amit Kumar, Pp. 18647–18650

#### Notes

##### A camera trap record of Asiatic Golden Cat *Catopuma temminckii* (Vigors & Horsfield, 1827) (Mammalia: Carnivora: Felidae) in State Land Forest, Merapoh, Pahang, Malaysia

- Muhamad Hamirul Shah Ab Razak, Kamarul Hambali, Aainaa Amir, Norashikin Fauzi, Nor Hizam Hassin, Muhamad Azahar Abas, Muhammad Firdaus Abdul Karim, Ai Yin Sow, Lukman Ismail, Nur Azmin Huda Mahamad Shubli, Nurul Izzati Adanan, Ainur Izzati Bakar, Nabihah Mohamad, Nur Izyan Fathiah Saimeh, Muhammad Syafiq Mohamad Nor, Muhammad Izzat Hakimi Mat Nafi & Syafiq Sulaiman, Pp. 18651–18654

##### Reappearance of Dhole *Cuon alpinus* (Mammalia: Carnivora: Canidae) in Gujarat after 70 years

- A.A. Kazi, D.N. Rabari, M.I. Dahya & S. Lyngdhoh, Pp. 18655–18659

##### Mating behavior of Eastern Spotted Skunk *Spilogale putorius* Linnaeus, 1758 (Mammalia: Carnivora: Mephitidae) revealed by camera trap in Texas, USA

- Alexandra C. Avrin, Charles E. Pekins & Maximillian L. Allen, Pp. 18660–18662

##### Record of Indian Roofed Turtle *Pangshura tecta* (Reptilia: Testudines: Geoemydidae) from Koshi Tappu Wildlife Reserve, Nepal

- Ashmita Shrestha, Ramesh Prasad Sapkota & Kumar Paudel, Pp. 18663–18666

##### Additional distribution records of *Zimiris doriae* Simon, 1882 (Araneae: Gnaphosidae) from India

- Dhruv A. Prajapati, Pp. 18667–18670

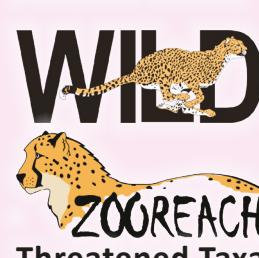
##### Notes on new distribution records of *Euaspa motokii* Koiwaya, 2002 (Lepidoptera: Lycaenidae: Theclinae) from Bhutan

- Jigme Wangchuk, Dhan Bahadur Subba & Karma Wangdi, Pp. 18671–18674

##### New distribution records of two little known plant species, *Hedychium longipedunculatum* A.R.K. Sastry & D.M. Verma (Zingiberaceae) and *Mazus dentatus* Wall. ex Benth. (Scrophulariaceae), from Meghalaya, India

- M. Murugesan, Pp. 18675–18678

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