



ISSN 2320-7078

JEZS 2014; 2 (5): 225-240

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Received: 20-08-2014

Accepted: 13-09-2014

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An updated checklist of scarabaeoid beetles (Coleoptera: Scarabaeoidea) of Pench Tiger Reserve, Madhya Pradesh, India

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Abstract

An updated checklist of 61 species of Scarabaeoid beetles (Coleoptera: Scarabaeoidea) belonging to 30 genera, 19 tribes and 7 subfamilies under 3 families (Geotrupidae, Hybosoridae and Scarabaeidae) from Pench Tiger Reserve (Madhya Pradesh, India) is provided for the first time. The details of specimens examined and distribution of the recorded species in India and abroad are provided which is further supplemented with the illustrations of 54 species. The study reports 22 species as new records for the tiger reserve. Out of the total species, *Delopleurus parvus* and *Onthophagus coeruleicollis* (Scarabaeinae) have been recorded for the first time from the state of Madhya Pradesh. The present study is not only a faunistic report but also an illustrated field guide for the identification of the Scarabaeoid beetles occurring in the tiger reserve which will help in conservation planning, protected area justification and design and development of management plans.

Keywords: Beetles, Distribution, India, Madhya Pradesh, New state records, Scarabaeoidea.

1. Introduction

The superfamily Scarabaeoidea comprises a large, diverse and cosmopolitan group of beetles which are fungivores, herbivores, necrophages, coprophages, saprophages, and sometimes carnivores in feeding habit^[1]. The superfamily is divided into 12 families, 43 subfamilies, 118 tribes, and 94 subtribes^[2] and includes approximately 37,268 species under 2498 genera worldwide^[3]. Based on the position of the abdominal spiracles, the Scarabaeoidea is divided in two groups; the laparosticti and pleurosticti. The laparosticti group is characterized by having most of the abdominal spiracles located on the pleural membrane between the tergites and sternites and the pleurosticti group by having most of the abdominal spiracles situated on the upper portion of the sternites^[4, 5]. The pleurosticti group is strictly phytophagous with various feeding habits, while the laparostict group includes coprophagous beetles or lamellicorn scavengers which have also earned popular name dung beetles^[4].

The first taxonomic and faunal studies on the scarabaeoid beetles of the state, Madhya Pradesh (MP) were carried out by Arrow^[6, 7, 8] in the Fauna of British India wherein 58 species were reported. Later Balthasar^[9, 10, 11] wrote monographs on the Oriental and Palaearctic Coprinae (Scarabaeinae) and Aphodiinae, but did not concentrate much on the fauna of Central India. Later after years, Newton and Coe^[12] published information on the distribution of 15 species of the dung beetles (Scarabaeinae) from Kanha Tiger Reserve. Further faunal studies on the Scarabaeoid diversity of MP include Chandra^[13, 14, 15, 16, 17], Chandra and Gupta^[18], Chandra and Singh^[19], and Chandra and Ahirwar^[20, 21, 22]. Chandra^[13] published an inventory of 94 species belonging to 30 genera under 9 subfamilies. Subsequently Chandra and Ahirwar^[22] presented a comprehensive account of the scarab beetles of MP and Chhattisgarh and recorded 124 species/subspecies belonging to 45 genera under 11 subfamilies. So far as the faunal diversity in different protected areas of the state is concerned, 53 species have been recorded from Bandhavgarh Tiger Reserve^[17, 20], 61 species from Kanha Tiger Reserve^[21], 64 species from Pachmarhi Biosphere Reserve^[16, 18, 19, 23], 28 species from Veerangana Durgawati Wildlife Sanctuary^[24] and 26 species from Singhori Wildlife Sanctuary^[25]. Chandra^[14] listed 34 species of the scarabaeoid beetles from Pench Tiger Reserve. Recent publications made by Chandra and Gupta^[25, 26, 27, 28, 29, 30, 31] added 8 species from the tiger reserve and reported the occurrence of *Onthophagus spinifex*, *O. orissanus*, *O. abacus*, *Garreta smaragdifer* [Scarabaeinae], *Oryctes rhinoceros*, *Dipellicus bidens* [Dynastinae], *Bolbohamatum calanus*

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and *B. phallosum* [Bolboceratinae] making the list of the recorded species to 42. Still the information on the collection of data, distribution of each species in the tiger reserve and illustrations of the beetle species for identification is lacking. Thus, the aim of our study was to document, inventorise and illustrate the scarabaeoid beetle fauna of the tiger reserve providing the details of specimens examined and distribution of recorded species in the tiger reserve, in India and abroad, supplemented with the illustrations.

During the study, 61 species of the scarabaeoid beetles belonging to 30 genera, 19 tribes and 7 subfamilies under 3 families (Geotrupidae, Hybosoridae and Scarabaeidae) of superfamily Scarabaeoidea were examined and their morphotaxonomy was done. *Trox* sp. and *Apogonia* sp. have not been included in the updated inventory. The classification adopted for superfamily Scarabaeoidea is after Smith [2] and the scientific names for the recorded species are being used as given by Lobl and Smetana [32].

2. Materials and Methods

2.1 Study Area (Figure 1)

Pench Tiger Reserve is located in the Seoni and Chhindwara districts of the state, Madhya Pradesh between 21° 37' to 21°

50.30' N latitudes and 79°07.45' to 79°22.30' E longitudes with a total area of 757.907 sq. km. It consists of southern tropical slightly moist teak forests, southern tropical dry teak forest and southern dry mixed dry deciduous forests. It includes Pench National Park (PNP) and Pench Wildlife Sanctuary (PWLS) along with a buffer zone area of Seoni and Chhindwara districts. The PNP is located in the Seoni and Chhindwara districts whereas PWLS is confined to the Kurai block of Seoni district only. The total area of PNP is 292.86 sq. km. out of which 145.24 sq. km. is in Seoni and the remaining in Chhindwara. The total area of PWLS is 118.307 sq. km. The tiger reserve is quite rich in faunal diversity with 342 species of invertebrates and 350 species of vertebrates [33].

2.2 Collection, identification and illustrations

The specimens includes the collections of the scarabaeoid beetles present in the Zoological Survey of India (ZSI), Jabalpur collected by the scientific teams of ZSI from PTR during 2001-2002 in different seasonal periods using light trap and handpicking methods. They were collected from 26 localities in the Seoni district and 14 localities in the Chhindwara district.

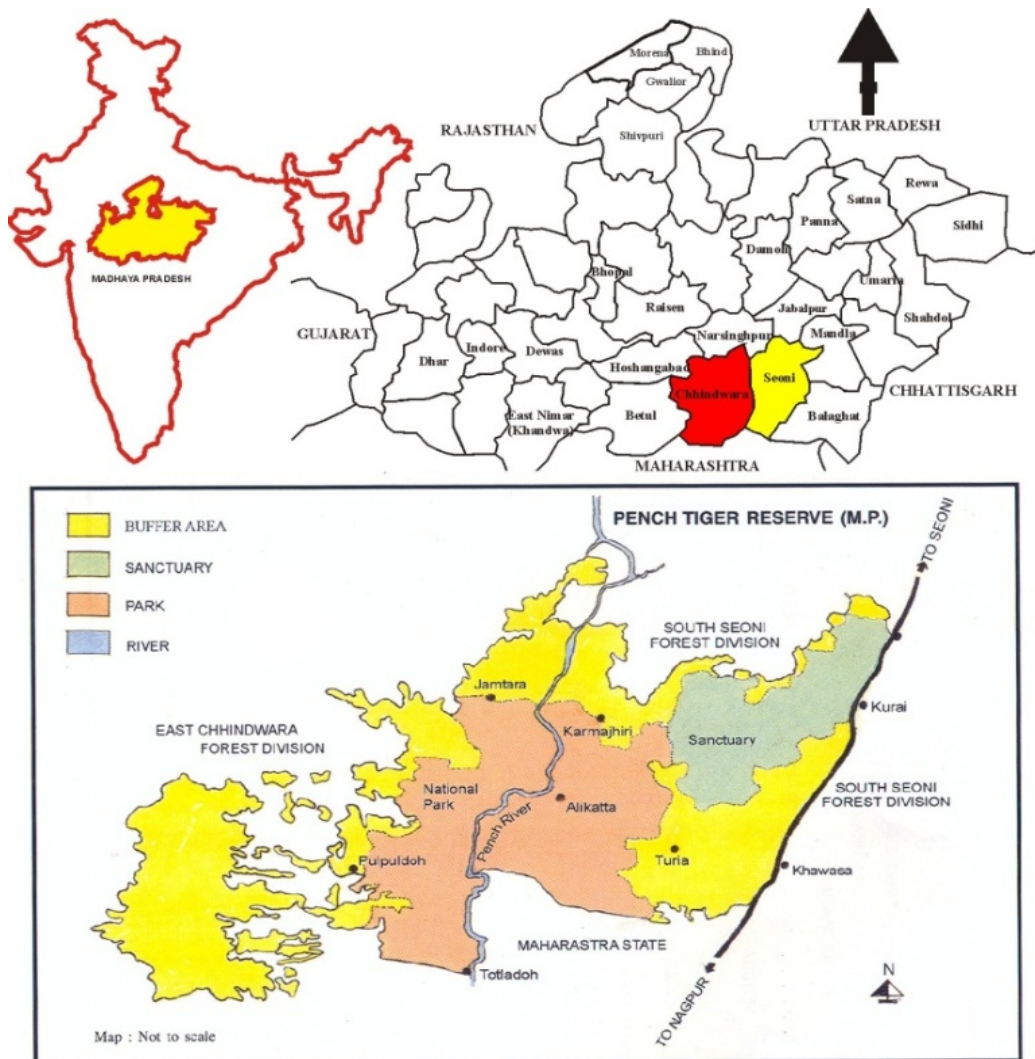


Fig 1: Map showing Pench Tiger Reserve (Study area).

After collection, they were killed in Benzene vapours and preserved dry pinned. They were later identified using the literature [6-10; 34-42]. The illustrations were made with the use of digital camera attached to Leica M205A stereomicroscope and

Nikon DSLR D-7000. The species listed with single asterisk are newly recorded from tiger reserve and with double asterisks for the first time from the state of MP.

3. Results

3.1 Taxonomic Account

Superfamily SCARABAEOIDEA Latreille, 1802

Family GEOTRUPIDAE Latreille, 1802

Subfamily BOLBOCERATINAE Mulsant, 1842

Tribe Eubolbitini Nikolajev, 1970

Genus *Bolbohamatum* Krikken, 1980

1. *Bolbohamatum calanus* (Westwood, 1848) (Figure 2A)

Specimens examined

Seoni: Karmajhiri, 13.vi.2001 (1♂) (A/16603), K Chandra.

Distribution

India (Assam, Bihar, Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu, West Bengal and Uttarakhand), Bangladesh and Java.

2. *Bolbohamatum phallosum* Krikken, 1980 (Figure 2B)

Specimens examined

Seoni: Turiya, 23.vi.2001 (1♂) (A/16604), K Chandra.

Distribution

Endemic to India
India (Madhya Pradesh, Maharashtra and East India).

Tribe Australobolbini Nikolajev, 1996

Genus *Bolboceras* Kirby, 1819

3. *Bolboceras quadridens* (Fabricius, 1781)

Specimens examined

Seoni: Turiya, 23.vi.2001 (1ex.) (A-7204), K Chandra.

Distribution

India (Chhattisgarh, Haryana, Madhya Pradesh and Uttarakhand), Asia, Europe, North America and South America.

Family HYBOSORIDAE Erichson, 1847

Subfamily HYBOSORINAE Erichson, 1847

Genus *Hybosorus* MacLeay, 1819

4. *Hybosorus orientalis* Westwood, 1846 (Figure 2C)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (1ex.) (A-6088), K Chandra.

Distribution

India (Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal), China, Afghanistan, Nepal and Pakistan.

Family SCARABAEIDAE Latreille, 1802

Subfamily SCARABAEINAE Latreille, 1802

Tribe Gymnopleurini Lacordaire, 1856

Genus *Gymnopleurus* Illiger, 1803

5. *Gymnopleurus cyaneus* (Fabricius, 1798) (Figure 2D)

Specimens examined

Seoni: Alikatta, 29.vii.2001 (1♀) (A-6094); Chhindimata, 31.vii.2001 (7♂3♀) (A-13631)/31.vii.2001 (1♀) (A-6136)/

31.vii.2001 (1♂) (A-7208), ML Koshta - Khamreet, 24.vi.2001 (1ex.) (A-7107); Chhindimata, 25.vi.2001 (1♂3♀) (A-6092); Karmajhiri, 01.vii.2001 (1♂) (A-13634)/ 04.vii.2001 (1ex.) (A-6135); Kohka, 10.vi.2001 (1ex.) (A-6670), K Chandra.

Distribution

India (Chhattisgarh, Gujarat, Haryana, Karnataka, Kerala, Rajasthan, Maharashtra, Madhya Pradesh, Odisha, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal), Bangladesh, Nepal and Sri Lanka.

Genus *Paragymnopleurus* Shipp, 1897

6. *Paragymnopleurus sinuatus* ssp. *assamensis* (Waterhouse, 1890)* (Figure 2E)

Specimens examined

Seoni: Rukhar, 12.vii.2001 (1♀); Alikatta, 07.vii.2001 (1♂NC); Karmajhiri, 14.vii.2001 (1♀), RK Singh - Kalapahar, 11.vii.2001 (1♀NC); Karmajhiri, 05.vi.2001 (3♀)/ 06.vi.2001 (2♀1♂)/ 08.vi.2001 (2♂1♀); Turiya, 23.vi.2001 (1♂), K Chandra - Badanala, 23.vii.2001 (1♀1♂NC) (A-7194); Khamareet, 29.vii.2001 (1♂); Chandrapur, 10.xi.2001 (1♂), ML Koshta.

Distribution

India (Assam, Arunachal Pradesh, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Sikkim, Tamil Nadu, Uttarakhand and West Bengal), Myanmar, Nepal, North Korea and China.

Genus *Garreta* Janssens, 1940

7. *Garreta smaragdifer* (Walker, 1858) (Figure 2F)

Specimens examined

Seoni: Turiya, 07.vi.2001 (3♂DC) (A-13835); Khamreet, 24.vi.2001 (1♂) (A-13836), K Chandra - Alikatta, 07.vii.2001 (1♀) (A-13837), RK Singh. Chhindwara: Ghat Pindrai, 29.viii.2001 (1♀) (A-13834); Gumtra, 27.viii.2001 (1♀) (A-13832), YN Gupta - Kokiwada, 28.ix.2001 (1♂) (A-13833), SK Mishra.

Distribution

India (Chhattisgarh, Madhya Pradesh and South India) and Sri Lanka.

8. *Garreta mundus* (Wiedemann, 1819)* (Figure 2G)

Specimens examined

Seoni: Karmajhiri, 13.vi.2001 (1♂NC), K Chandra.

Distribution

India (Bihar, Chhattisgarh and Madhya Pradesh) and South-West China.

Tribe Coprini Leach, 1815

Genus *Heliocopriss* Hope, 1837

9. *Heliocopriss bucephalus* (Fabricius, 1775) (Figure 2H)

Specimens examined

Seoni: Karmajhiri, 04.vi.2001 (1ex.) (A-6664)/ 09.vi.2001 (1♀) (A-272)/ 10.vi.2001 (1ex.) (A-6661)/ 11.vi.2001 (1♀) (A-277)/ 11.vi.2001 (2exs.) (A-6662)/ 12.vi.2001 (1ex.) (A-

6671)/ 12.vi.2001 (1♀) (A-289)/ 14.vi.2001 (1♀) (A-276)/ 14.vi.2001 (2exs.) (A-6663), K Chandra - Karmajhiri, 27.vii.2001 (1♂) (A-5734), ML Koshta - Karmajhiri, 13.vii.2001 (1ex.) (A-6667) 21.vii.2001 (1♀) (A-7309)/ 21.vii.2001 (1♂) (A-278)/ 21.vii.2001 (1ex.) (A-6666); Kalapahar, 11.vii.2001 (1ex.) (A-7211), RK Singh - Totladoh, 24.viii.2001 (1ex.) (A-6749), YN Gupta. Chhindwara: Dam no. 7, 22.viii.2001 (1♀) (A-6746); Totladoh, 10.ix.2001 (1♀) (A-8439)/24.viii.2001 (1♀) (A-385); Camp No. 7, 26.viii.2001 (1♂) (A-279)/ 26.viii.2001 (1ex.) (A-6667), YN Gupta.

Distribution

India (Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Rajasthan, Tripura, Uttar Pradesh and West Bengal), Myanmar, Malay Peninsula, Nepal, Thailand, Vietnam, Laos, Cochin China, Cambodia and Java.

Genus *Catharsius* Hope 1837

10. *Catharsius pithecius* (Fabricius, 1775) (Figure 2I)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (1♂NC) (A-298); Ghat Kohka, 22.vi.2001 (1♀) (A-6124); Muner Panch, 11.vi.2001 (1ex.) (A-6675), K Chandra - Ghat Pindarai, 19.ix.2001 (1♂), SK Mishra. Chhindwara: Jamun Nala, 14.ix.2001 (1♀) (A-17048); Kokiwada, 28.ix.2001 (1♀) (A-17049), SK Mishra - Swami Village, 17.viii.2001 (1♀) (A-17050); Totladoh, 20.viii.2001 (1♀) (A-17051), YN Gupta.

Distribution

India (Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh), China, Nepal, Pakistan and Sri Lanka.

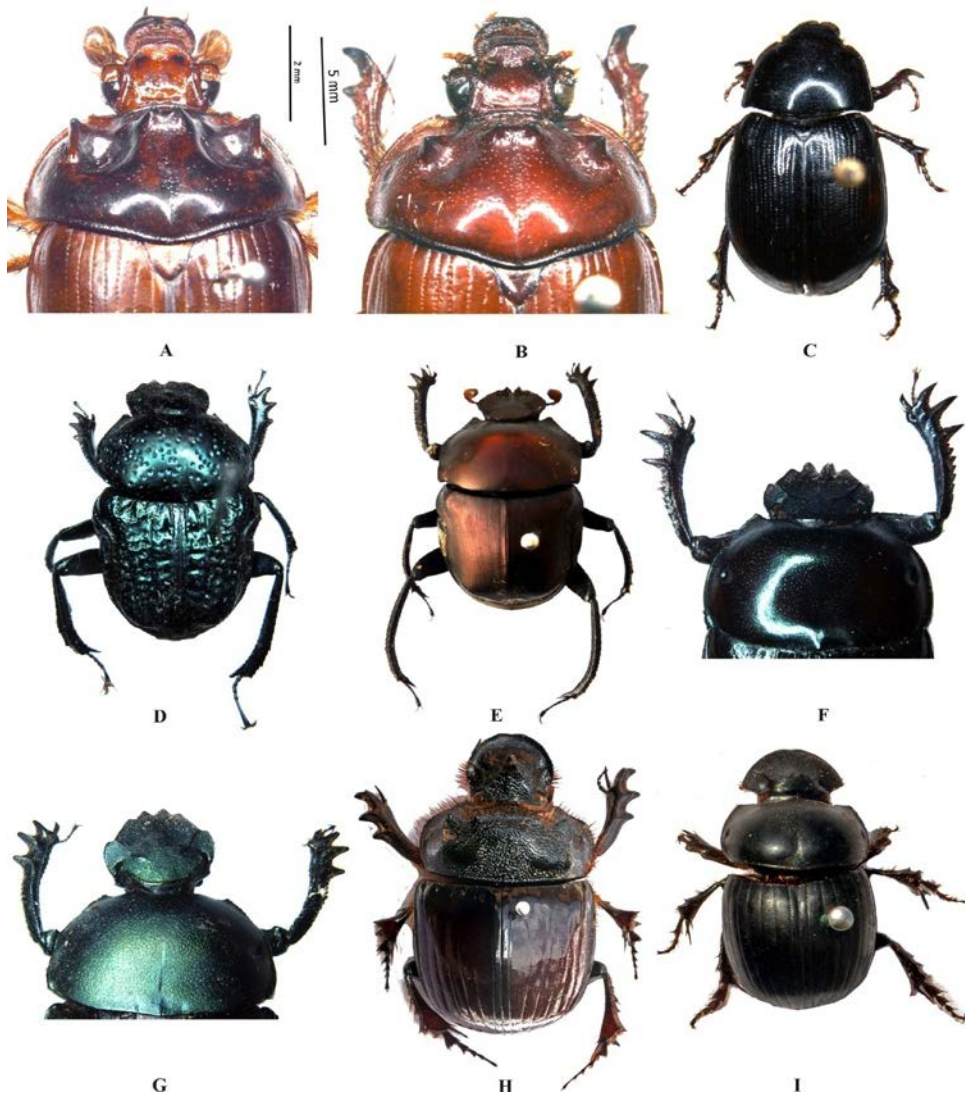


Fig 2: A. *Bolbohamatum calanus* (Westwood) (head and pronotum), B. *Bolbohamatum phallosum* Krikken (head and pronotum), C. *Hybosorus orientalis* Westwood, D. *Gymnopleurus cyaneus* (Fabricius) (♀), E. *Paragymnopleurus sinuatus* ssp. *assamensis* (Waterhouse) (♂), F. *Garreta smaragdifer* (Walker) (head and pronotum, ♂), G. *Garreta mundus* (Wiedemann) (head and pronotum, ♂), H. *Heliocopris bucephalus* (Fabricius) (♂), I. *Catharsius pithecius* (Fabricius) (♀).

11. *Catharsius molossus* (Linnaeus, 1758)* (Figure 3A)

Specimens examined

Seoni: Turiya Gate, 12.vii.2001 (1♀) (A-5455), RK Singh. Chhindwara: Totladoh, 16.ix.2001 (1♂) (A-7307NC)/ 20.ix.2001 (1♀) (A-7308)/ 20.ix.2001 (1♀) (A-17041), SK

Mishra - Totladoh, 02.ix.2001 (1♀) (A-5456); Badi Anthoni, 29.x.2002 (1♂) (A-5710), YN Gupta.

Distribution

India (Andaman and Nicobar Island, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh,

Karnataka, Kerala, Madhya Pradesh, Meghalaya, Odisha, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Uttarakhand and West Bengal), Afghanistan, Cambodia, China, Cochin China, Nepal, Pakistan, Vietnam, Laos, Sri Lanka, Thailand and Malaysia.

12. *Catharsius sagax* (Quensel, 1806) (Figure 3B)

Specimens examined

Seoni: Muner Panch, 11.vi.2001 (1♂) (A-337); Karmajhiri, 06.vi.2001 NC (1♀) (A-329)/ 08.vi.2001 (1♂1♀) (A-6707)/ 09.vi.2001 (1♂) (A-333)/ 10.vi.2001 (1♀) (A-6704)/ 11.vii.2001 (1♀) (A-17060)/ 14.vii.2001 (1♀) (A-6706), K Chandra - Karmajhiri, 09.vi.2001 (1ex.) (A-6703), YN Gupta. Chhindwara: Dam No. 7, 22.viii.2001 (1♂) (A-6746), YN Gupta - Totladoh, 10.viii.2001 (1♀) (A-6747)/ 24.viii.2001 (1♂) (A-383)/ 02.ix.2001 (2♀) (A-17058), RK Singh - Totladoh, 17.viii.2001 (1ex.) (A-6705)/ 23.viii.2001 (1ex.) (A-6701)/ 13.viii.2001 (1ex.) (A-6702)/ 31.viii.2001 (1♀) (A-17059), YN Gupta - Totladoh, 20.ix.2001 (1♀NC) (A-17072), SK Mishra.

Distribution

India (Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal), Bangladesh, Bhutan and Nepal.

Genus *Paracopris* Balthasar, 1939

13. *Paracopris surdus* (Arrow, 1931)* (Figure 3C)

Specimens examined

Seoni: Rukhar, 07.viii.2001 (2♀) (A-17738), RK Singh. Chhindwara: Totladoh, 20.ix.2001 (1♂NC) (A-17736)/ 26.ix.2000 (1♀) (A-17737), SK Mishra.

Distribution Endemic to India

India (Madhya Pradesh, Rajasthan and Uttarakhand).

14. *Paracopris imitans* (Felsche, 1910) (Figure 3D)

Specimens examined

Seoni: Barelipar, 11.vii.2001 (1ex.) (A-7196), K Chandra - Taikari Camp, 24.vii.2001 (1♀) (A-17766), ML Koshta.

Distribution

India (Chhattisgarh, Goa, Madhya Pradesh, Maharashtra and Karnataka) and Nepal.

15. *Paracopris andrewesi* (Waterhouse, 1891) (Figure 3E)

Specimens examined

Seoni: Karmajhiri, 12.vi.2001 (1♂NC) (A-17762), K Chandra - Barelipar, 11.vii.2001 (1♂1♀) (A-17763), RK Singh.

Distribution

India (Karnataka, Madhya Pradesh, Maharashtra and Rajasthan) and Nepal.

Genus *Copris* Geoffroy, 1762

Subgenus *Copris* Geoffroy, 1762

16. *Copris (Copris) carinicus* Gillet, 1910* (Figure 3F)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (1♂1♀)/ 09.vi.2001 (1♀)/ 18.vi.2001 (1♀), K Chandra - Rukhar, 06.xi.2001 (1♀), ML Koshta. Chhindwara: Ghat Pindrai, 19.ix.2001 (1♀), SK Mishra - Totladoh, 24.viii.2001 (1♀) (I-1024)/ 16.viii.2001 (1♂) (I-9020), YN Gupta.

Distribution

India (Chhattisgarh, Madhya Pradesh, Meghalaya and Manipur), China, Laos, Myanmar and Thailand.

Tribe Ateuchini Laporte, 1840

Genus *Delopleurus* Erichson, 1848

17. *Delopleurus parvus* (Sharp, 1875) (Figure 3G)**

Specimens examined

Seoni: Pysothodi, 14.vii.2001 (1♀), RK Singh.

Distribution New State Record

India (Kerala, Madhya Pradesh, Odisha and Tamil Nadu) and Nepal.

Tribe Onitini Laporte, 1840

Genus *Onitis* Fabricius, 1798

18. *Onitis philemon* Fabricius, 1801 (Figure 3H)

Specimens examined

Seoni: Barelipar, 11.vii.2001 (1♂) (A-842)/ 11.vii.2001 (1♂) (A-7193), RK Singh - Turiya, 23.vi.2001 (1♂) (A-7720), K Chandra - Khamreet, 29.vii.2001 (1♂) (A-7721), ML Koshta - Karmajhiri, 23.vi.2001 (4♂) (A-17437)/ 26.vi.2001 (1♂) (A-17438), K Chandra - Rukhar, 07.vii.2001 (1♀) (A-17439); Barelipur, 11.vii.2001 (1♂1♀) (A-17440); Karmajhiri, 13.vii.2001 (1♀) (A-17441), RK Singh. Chhindwara: Totladoh River Area, 30.viii.2001 (1ex.) (A-7719), YN Gupta.

Distribution

India (Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal), Cochin China, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Taiwan, Thailand and Vietnam.

19. *Onitis subopacus* Arrow, 1931*

Specimens examined

Seoni: Karmajhiri, 08.vi.2001 (1♂NC) (A-17377)/ 09.vi.2001 (1♀) (A-17378)/ Muner Panch, 11.vi.2001 (1♀) (A-17379), K Chandra.

Distribution

India (Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Madhya Pradesh, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal), Myanmar, Nepal, Sri Lanka, Thailand, South China and Sunda Island.

20. *Onitis brahma* Lansberge, 1875 (Figure 3I)

Specimens examined

Chhindwara: Jamtara, 21.xi.2001 (1♂) (A-7197), K Chandra.

Distribution Endemic to India

and Rajasthan).

India (Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra



Fig 3: A. *Catharsius molossus* (Linnaeus) (♂), B. *Catharsius sagax* (Quensel) (♂), C. *Paracopris surdus* (Arrow) (♂), D. *Paracopris imitans* (Felsche), E. *Paracopris andrewesi* (Waterhouse), F. *Copris* (*Copris*) *carinicus* Gillet (♂), G. *Delopleurus parvus* (Sharp) (♀), H. *Onitis philemon* Fabricius (♂), I. *Onitis brahma* Lansberge (♂).

Tribe Onthophagini Burmeister, 1846
Genus *Phalops* Erichson, 1848

21. *Phalops divisus* (Wiedemann, 1823)* (Figure 4A)

Specimens examined

Seoni: Chhindmata, 31.vii.2001 (1ex.) (A-7210), ML Koshta.

Distribution

India (Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan, Uttar Pradesh and Tamil Nadu), Sri Lanka and Pakistan.

Genus *Digitonthophagus* Balthasar, 1959

22. *Digitonthophagus gazella* (Fabricius, 1787) (Figure 4B)

Specimens examined

Seoni: Simaria, Paraspani, 08.vii.2001 (2♂2♀NC) (A-17178)/ 08.vii.2001 (1ex.) (A-6711); Karmajhiri, 19.vii.2001 (1♀) (A-17179), RK Singh - Karmajhiri, 04.vii.2001 (1♀) (A-17180); 05.vi.2001 (1ex.) (A-6742); Muner Panch, 11.vi.2001 (1♂) (A-17181); Alikatta, 05.vi.2001 (1ex.) (A-6708); Ghat Kohka, 22.vi.2001 (1ex.) (A-6709); Turiya, 23.vi.2001 (1ex.) (A-6710), K Chandra. Chhindwara: Totladoh, 19.viii.2001 (1♀) (A-17182); Dam No. 7, 22.viii.2001 (1♂) (A-17183); Anthoni Jhirapa, 28.viii.2000 (2♂1♀) (A-17556), YN Gupta.

Distribution

India (Arunachal Pradesh, Andhra Pradesh, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu and Tripura), Africa, Arabia, Madagascar, Nepal, Pakistan, Russia and Sri Lanka.

Genus *Onthophagus* Latreille, 1802
Subgenus *Proagoderus* Lansberge, 1883

23. *Onthophagus (Proagoderus) pactolus* (Fabricius, 1787) (Figure 4C)

Specimens examined

Seoni: Turiya, 23.vi.2001 (1ex.), K Chandra.

Distribution

India (Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh and Uttarakhand) and Nepal.

Subgenus *Colobonthophagus* Balthasar, 1935

24. *Onthophagus (Colobonthophagus) dama* (Fabricius, 1798)* (Figure 4D)

Specimens examined

Seoni: Alikatta, 05.vi.2001 (1♀) (A-13957); Chawni Ghat, 05.vi.2001 (1♀) (A-13958); Karmajhiri, 05.vi.2001 (1♀) (A-17214)/ 05.vi.2001 (1♀) (A-17259)/ 06.vi.2001 (2♂1♀) (A-17260)/ 09.vi.2001 (1♂) (A-17261)/ 14.vi.2001 (1♂) (A-17215)/ 18.vi.2001 (1♂) (A-17216)/ 28.vi.2001 (1♂) (A-17262)/ 09.vi.2001 (1♂) (A-13959); Turiya, 23.vi.2001 (2♂) (A-17568), K Chandra - Tirkari Camp, 24.vii.2001 (1♀) (A-17569), ML Koshta - Karmajhiri, 12.vii.2001 (1♀) (A-17578)/ 12.vii.2001 (1♀) (A-17582); Simaria, 08.vii.2001 (1♀) (A-17570), RK Singh. Chhindwara: Totladoh, 10.viii.2001 (1♂)

(A-13960)/ 01.ix.2001 (1♂) (A-17264), YN Gupta.

Distribution

India (Arunachal Pradesh, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal), Bhutan, Sri Lanka and Nepal.

25. *Onthophagus (Colobonthophagus) bengalensis* Harold, 1886* (Figure 4E)

Specimens examined

Chhindwara: Ghat Pindrai, 20.viii.2001 (1♂) (A-17036a), YN Gupta.

Distribution Endemic to India

India (Haryana, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu, Uttarakhand and Uttar Pradesh).

26. *Onthophagus (Colobonthophagus) ramosus* (Wiedemann, 1823)* (Figure 4F)

Specimens examined

Seoni: Alikatta, 05.vi.2001 (1♂) (A-5984)/ 05.vi.2001 (1♂) (A-6095)/ 05.vi.2001 (1♂8♀) (A-17121); Karmajhiri, 04.vi.2001 (4♀) (A-17122)/ 09.vi.2001 (1♂) (A-5986)/ 10.vi.2001 (1♀) (A-17124); Chewarighat, 06.vi.2001 (2♀) (A-17123); Kehka, 10.vi.2001 (1♀) (A-17125); Turiya, 23.vi.2001 (1♀) (A-17126); Muneer Panch, 11.vi.2001 (1♀) (A-17127); Kalapahar, 11.vii.2001 (1♀) (A-17128), K Chandra - Karmajhiri, 28.vii.2001 (2♀) (A-17129)/ 30.vii.2001 (1♂) (A-5988)/ 30.vii.2001 (1♀) (A-17130)/ 31.vii.2001 (1♀) (A-17131), ML Koshta - Karmajhiri, 19.vii.2001 (1♂) (A-5987)/ 22.vii.2001 (1♂) (A-5985), RK Singh. Chhindwara: Totladoh, 11.viii.2001 (1♀) (A-17132)/ 27.viii.2001 (1♀) (A-17133)/ 23.viii.2001 (1♂) (A-17134)/ 24.viii.2001 (1♀) (A-17135)/ 29.viii.2001 (2♀) (A-17134)/ 07.ix.2001 (1♀) (A-17137); River Side, 09.xi.2001 (1♀) (A-17136), YN Gupta - Chandrapur, 10.xi.2001 (1♀) (A-17138), ML Koshta.

Distribution

India (Bihar, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Pondicherry, Punjab, Rajasthan and Uttarakhand) and Pakistan.

27. *Onthophagus (Colobonthophagus) hindu* Arrow, 1931* (Figure 4G)

Specimens examined

Seoni: Totladoh, 11.viii.2001 (1♀) (A-17718), YN Gupta - Karmajhiri, 06.vi.2001 (1♀) (A-17719), K Chandra. Chhindwara: Ghat Pindrai Barrier, 19.ix.2001 (1♀) (A-17301)/ 19.ix.2001 (1♀) (A-17717), SK Mishra.

Distribution

India (Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Maharashtra and Karnataka), Afghanistan and Pakistan.

28. *Onthophagus (Colobonthophagus) ramosellus* Bates, 1891* (Figure 4H)

Specimens examined

Chhindwara: Totladoh, 11.viii.2001 (1♂) (I-831), YN Gupta.



Fig 4: A. *Phalops divisus* (Wiedemann) (♂), B. *Digitonthophagus gazella* (Fabricius) (♂), C. *Onthophagus (Pr.) pactolus* (Fabricius) (♂), D. *Onthophagus (C.) dama* (Fabricius) (♀), E. *Onthophagus (C.) bengalensis* Harold (♂), F. *Onthophagus (C.) ramosus* (Wiedemann) (♂), G. *Onthophagus (C.) hindu* Arrow (♂), H. *Onthophagus (C.) ramosellus* Bates (♂), I. *Onthophagus coeruleicollis* Arrow (pronotum and head, ♀). *Onthophagus* species incertae sedis

Distribution

India (Arunachal Pradesh, Assam, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Tripura, Uttarakhand, Uttar Pradesh and West Bengal), Afghanistan, Nepal and Pakistan.

29. *Onthophagus coeruleicollis* Arrow, 1917 (Figure 4I)**

Specimens examined

Seoni: Barelipur, 11.vii.2001 (1♀DC) (A-17605), RK Singh. **Distribution** New State Record, Endemic to India India (Karnataka, Madhya Pradesh, Maharashtra and Odisha).

30. *Onthophagus orissanus* Arrow, 1931 (Figure 5A)

Specimens examined

Seoni: Baghdeo Bar., 27.vii.2001 (1♂) (A/16270), ML Koshta.

Distribution Endemic to India

India (Bihar, Odisha and Madhya Pradesh).

31. *Onthophagus spinifex* (Fabricius, 1781) (Figure 5B)

Specimens examined

Seoni: Turiya, 07.vi.2001 (1♀) (A-17318), K Chandra - Baghdeo Bar., 27.vii.2001 (1♂) (A-17319); Alikatta, 29.vii.2001 (1♀) (A-17320), ML Koshta.

Distribution

India (Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand and Uttar Pradesh) and Sri Lanka.

32. *Onthophagus griseosetosus* Arrow, 1931* (Figure 5C)

Specimens examined

Seoni: Alikatta, 05.vi.2001 (1♂) (A-14912); Turiya, 07.vi.2001 (1♂1♀) (A-14913), K Chandra.

Distribution Endemic to India

India (Chhattisgarh, Himachal Pradesh, Tamil Nadu, Madhya Pradesh and Uttarakhand).

33. *Onthophagus abacus* Boucomont, 1921 (Figure 5D)

Specimens examined

Seoni: Karmajhiri, 04.vi.2001 (1♂) (A-16823); Muner Panch, 11.vi.2001 (1♀), K Chandra.

Distribution

India (Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal) and Nepal.

34. *Onthophagus abreui* Arrow, 1931 (Figure 5E)

Specimens examined

Seoni: Alikatta, 05.vi.2001 (6♂) (A-14918)/ 05.vi.2001 (1♂8♀) (A-14919); Karmajhiri, 05.vi.2001 (1♂1♀) (A-17338)/ 26.vi.2001 (1♂) (A-17342); Turiya, 07.vi.2001 (1♀) (A-17339)/ 23.vi.2001 (1♂1♀) (A-17341); Kohka, 10.vi.2001 (1♀) (A-17340), K Chandra; Karmajhiri, Badanala, 15.vii.2001 (6♂8♀ DC) (A-17337), RK Singh.

Distribution Endemic to India

India (Kerala, Karnataka, Madhya Pradesh and Uttar Pradesh).

35. *Onthophagus agnus* Gillet, 1925 (Figure 5F)

Specimens examined

Seoni: Kohka, 10.vi.2001 (1♂) (A-17282); Karmajhiri, 01.vi.2001 (1♂) (A-17678), K Chandra - Simaria, 08.vii.2001 (1♂1♀) (A-17283); Karmajhiri, 13.vii.2001 (1♀) (A-17284), RK Singh - Tikarai Camp, 24.vii.2001 (1♂) (A-17285), ML Koshta - Anamol, 02.iv.2012 (1♂1♀) (A-17671), SK Mishra. Chhindwara: Totladoh, 19.viii.2001 (1♀) (A-17286)/ 11.viii.2001 (1♂) (A-17287), YN Gupta.

Distribution Endemic to India

India (Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu and West Bengal).

36. *Onthophagus quadridentatus* (Fabricius, 1798)* (Figure 5G)

Specimens examined

Seoni: Alikatta, 07.vii.2001 (1♂) (A-17550), RK Singh. Chhindwara: Swani, 17.viii.2001 (1♀) (A-17549), YN Gupta.

Distribution

India (Arunachal Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal) and Sri Lanka.

Tribe Scarabaeini Latreille, 1802

Genus *Scarabaeus* Linnaeus, 1758

Subgenus *Kheper* Jassens, 1940

37. *Scarabaeus (Kheper) sanctus* (Fabricius, 1798) (Figure 5H)

Specimens examined

Seoni: Muner, 11.vi.2001 (1ex.) (A-6668), K Chandra.

Distribution

India (Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, and Karnataka), Sri Lanka and Pakistan.

Tribe Sisyphini Mulsant, 1842

Genus *Sisyphus* Latreille, 1807

Subgenus *Sisyphus* Latreille, 1807

38. *Sisyphus (Sisyphus) longipes* (Olivier, 1789)* (Figure 5I)

Specimens examined

Seoni: Karmajhiri, 01.vii.2001 (1ex.) (A-7212); Baghdeo, 15.vii.2001 (1ex.) (A-7214), RK Singh - Baghdeo, 27.vii.2001 (1ex.) (A-7213), ML Koshta.

Distribution

India (Andaman and Nicobar Island, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu and West Bengal), Sri Lanka, Thailand, Myanmar and Nepal.



Fig 5: A. *Onthophagus orissanus* Arrow (♂), B. *Onthophagus spinifex* (Fabricius) (♂), C. *Onthophagus griseosetosus* Arrow (♂), D. *Onthophagus abacus* Boucomont (♂), E. *Onthophagus abreui* Arrow (♂), F. *Onthophagus agnus* Gillet (♂), G. *Onthophagus quadridentatus* (Fabricius) (♂), H. *Scarabaeus (K.) sanctus* (Fabricius) (♂), I. *Sisyphus (S.) longipes* (Olivier) (♂).

Subfamily MELOLONTHINAE Leach, 1819
 Tribe Rhizotrogini Burmeister, 1855
 Genus *Holotrichia* Hope, 1837

39. *Holotrichia sculpticollis* (Blanchard, 1850) (Figure 6A)

Specimens examined

Seoni: Karmajhiri, 14.vi.2001 (1ex.) (A-7192); Ghat Kohka,

22.vi.2001 (1ex.) (A-7556), 22.vi.2001 (1ex.) (A-7619); Gumiya, 23.vi.2001 (1ex.) (A-7557), K Chandra - Rukhar, 12.vii.2001 (1ex.) (A-7555), RK Singh.

Distribution Endemic to India
India (Karnataka, Kerala and Madhya Pradesh).

40. *Holotrichia fissa* Brenske, 1894*

Specimens examined

Seoni: Ghat Kohka, 22.vi.2001 (1ex.) (A-7619), K Chandra.

Distribution Endemic to India
India (Andhra Pradesh, Karnataka, Madhya Pradesh, Uttar Pradesh and Maharashtra).

Tribe Schizonychini Burmeister, 1855

Genus *Schizonycha* Dejean, 1833

41. *Schizonycha ruficollis* (Fabricius) (Figure 6B)

Specimens examined

Seoni: Karmajhiri, 26.vi.2001 (1ex.), ML Koshta; Totladoh, 18.ix.2001 (1ex.), SK Mishra.

Distribution Endemic to India
India (Bihar, Madhya Pradesh, Odisha, Uttar Pradesh, Uttarakhand and West Bengal).

Subfamily RUTELINAE MacLeay, 1819

Tribe Anomalini Streubel, 1839

Subtribe Anomalina Streubel, 1839

Genus *Anomala* Samouelle, 1819

42. *Anomala bengalensis* Blanchard, 1851 (Figure 6C)

Specimens examined

Seoni: Ghat Kohka, 22.vi.2001 (8exs.) (A-6676); Karmajhiri, 09.vi.2001 (2exs.) (A-6677), 08.vi.2001 (2exs.) (A-6678), 20.vi.2001 (1ex.) (A-6679); Turiya, 23.vi.2001 (1ex.) (A-6680), K Chandra.

Distribution

India (Andhra Pradesh, Bihar, Haryana, Karnataka, Madhya Pradesh, Tamil Nadu and West Bengal), Bangladesh, Bhutan and Myanmar.

43. *Anomala biharensis* Arrow, 1917 (Figure 6D)

Specimens examined

Seoni: Karmajhiri, 02.vi.2001 (1ex.) (A-6685), 06.vi.2001 (1ex.) (A-7205), 06.vi.2001 (2exs.) (A-7503), 06.vi.2001 (1ex.) (A-7620), 08.vi.2001 (1ex.) (A-6686), 09.vi.2001 (2exs.) (A-6687), 09.vi.2001 (1ex.) (A-7621), 10.vi.2001 (1ex.) (A-6688), 18.vi.2001 (1ex.) (A-6689), 20.vi.2001 (1ex.) (A-6690), 28.vi.2001 (1ex.) (A-7622), K Chandra.

Distribution

India (Bihar, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal) and Nepal.

44. *Anomala dorsalis* (Fabricius, 1775) (Figure 6E)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (5exs.) (A-14617), 09.vi.2001 (2exs.) (A-14618), 16.vi.2001 (5exs.) (A-14615), 17.vi.2001 (4exs.) (A-14616); Ghat Kohka, 11.vi.2001 (1ex.) (A-14619), 22.vi.2001 (1ex.) (A-14621), K Chandra. Chhindwara: Ghat Pendrai Barrier, 20.vi.2001 (1ex.) (A-14620), K Chandra; 19.ix.2001 (1ex.) (A-14622), SK Mishra.

Distribution

India (Andaman and Nicobar Island, Assam, Bihar, Chhattisgarh, Haryana, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal), Afghanistan and Pakistan.

45. *Anomala dimidiata* ssp. *dimidiata* (Hope, 1831) (Figure 6F)

Specimens examined

Seoni: Totladoh, 30.viii.2001 (1ex.), K Chandra.

Distribution

India (West Bengal, Madhya Pradesh, Meghalaya, Manipur, Uttar Pradesh, Himachal Pradesh and Jammu and Kashmir), Afghanistan, Pakistan and Nepal.

46. *Anomala ruficapilla* Burmeister, 1855 (Figure 6G)

Specimens examined

Seoni: Alikatta, 07.vii.2001 (1ex.) (A-7203), RK Singh.

Distribution

India (Assam, Bihar, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal).

47. *Anomala rugosa* Arrow, 1899 (Figure 6H)

Specimens examined

Seoni: Alikatta, 05.vi.2001 (1ex.) (A-14610); Karmajhiri, 09.vi.2001 (1ex.) (A-14611); Ghat Kohka, 22.vi.2001 (2exs.) (A-14612) - Karmajhiri, 06.vi.2001 (1ex.) (A-6681), 08.vi.2001 (1ex.) (A-6682), 05.vi.2001 (A-6683), 09.vi.2001 (1ex.) (A-6684), 27.vi.2001 (1ex.) (A-14613), K Chandra.

Distribution

India (Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal), Nepal and Bhutan.

48. *Anomala varicolor* (Gyllenhal, 1817) (Figure 6I)

Specimens examined

Seoni: Karmajhiri, 01.vii.2001 (1ex.) (A-7506), K Chandra.

Distribution

India (Assam, Bihar, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal), China, Bhutan and Nepal.

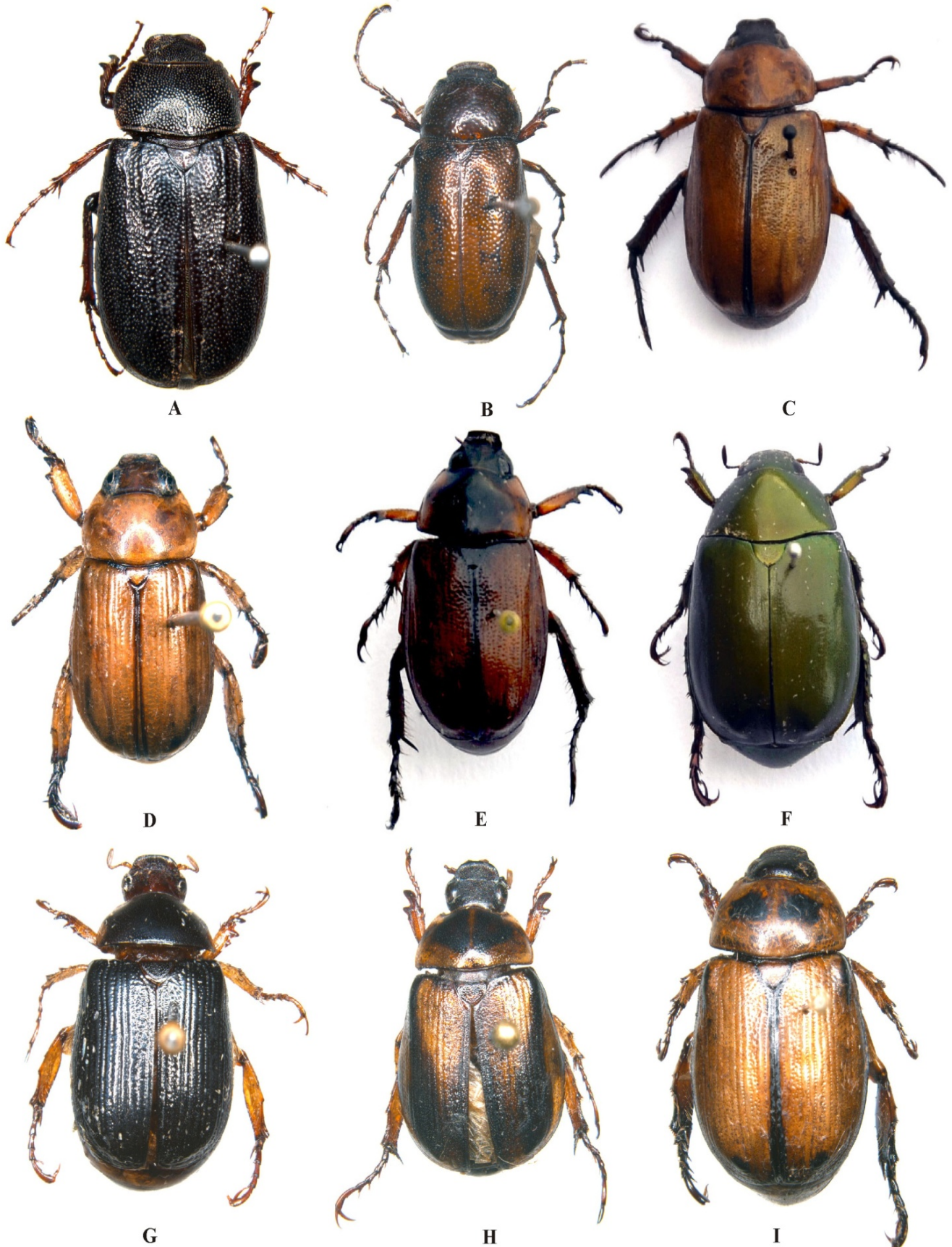


Fig 6: **A.** *Holotrichia sculpticollis* (Blanchard), **B.** *Schizonycha ruficollis* (Fabricius), **C.** *Anomala bengalensis* Blanchard, **D.** *Anomala biharensis* Arrow, **E.** *Anomala dorsalis* (Fabricius), **F.** *Anomala dimidiata dimidiata* (Hope), **G.** *Anomala ruficapilla* Burmeister, **H.** *Anomala rugosa* Arrow, **I.** *Anomala varicolor* (Gyllenhal).

Genus *Mimela* Kirby, 1823

49. *Mimela macleayana* (Vigors, 1825) (Figure 7A)

Specimens examined

Seoni: Karmajhiri, 08.vi.2001 (1ex.) (A-6691), 09.vi.2001 (1ex.) (A-6692), 02.vi.2001 (1ex.) (A-6693), 24.vi.2001 (1ex.) (A-6694), 19.vi.2001 (1ex.) (A-6695), 29.vi.2001 (1ex.) (A-6697), 30.vi.2001 (1ex.) (A-6698), 20.vi.2001 (1ex.) (A-6699); Turiya, 23.vi.2001 (1ex.) (A-6696), K Chandra.

Distribution

India (Andhra Pradesh, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh and Maharashtra) and Sri Lanka.

Tribe Adoretini Burmeister, 1844

Subtribe Adoretina Burmeister, 1844

Genus *Adoretus* Laporte, 1840

Subgenus *Adoretus* Laporte, 1840

50. *Adoretus (Adoretus) bengalensis* Brenske, 1893*

Specimens examined

Seoni: Alikatta, 07.vii.2001 (1ex.) (A-7554), RK Singh.

Distribution

India (Madhya Pradesh and Maharashtra) and Bangladesh.

51. *Adoretus (Adoretus) bicaudatus* Arrow, 1914*

Specimens examined

Seoni: Alikatta, 07.vii.2001 (1ex.) (A-5787), RK Singh.

Distribution

India (Madhya Pradesh, West Bengal and Tamil Nadu) and Sri Lanka.

52. *Adoretus (Adoretus) bimarginatus* Ohaus, 1914*

Specimens examined

Seoni: Karmajhiri, 20.vi.2001 (1ex.) (A-7548), K Chandra.

Distribution

India (Madhya Pradesh, Uttarakhand, Sikkim, West Bengal and Tamil Nadu) and Nepal.

53. *Adoretus (Adoretus) lasiopygus* Burmeister, 1855 (Figure 7B)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (1ex.) (A-7206), 06.vi.2001 (1ex.) (A-7727), 20.vi.2001 (2exs.) (A-7509), 20.vi.2001 (1ex.) (A-7545), 09.vi.2001 (1ex.) (A-7543), 06.vi.2001 (1ex.) (A-7544); Rukhar, 12.vii.2001 (1ex.) (A-7546), K Chandra.

Distribution

India (Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal) Bangladesh, Nepal, Bhutan and Sri Lanka.

Subfamily DYNASTINAE MacLeay, 1819

Tribe Oryctini Mulsant, 1842

Genus *Oryctes* Illiger, 1798

54. *Oryctes rhinoceros* (Linnaeus, 1785)

Specimens examined

Chhindwara: Totladoh 17.ix.2001 (1♀), SK Mishra.

Distribution

India (Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, West Bengal), Pakistan, Bangladesh, Sri Lanka, Myanmar, Thailand, Malaysia, Indonesia (Java, Sumatra), Cambodia, Korea, Laos, Philippines, Taiwan, Vietnam, American Samoa, Fiji, Palau, Papua, New Guinea, Samoa, Tokelau, Tonga, Wallis and Futuna.

Tribe Pentodontini Mulsant, 1842

Subtribe Pentodontina Mulsant, 1842

Genus *Heteronychus* Dejean, 1833

55. *Heteronychus lioderes* Redtenbacher, 1867 (Figure 7C)

Specimens examined

Seoni: Turiya, 23.vi.2001 (1ex.) (A-6672), K Chandra.

Distribution

India (Bihar, Himachal Pradesh, Madhya Pradesh, Odisha, Uttarakhand and West Bengal) Nepal, Myanmar, Thailand, Malay Peninsula, Borneo, Celebes and Java.

Genus *Phyllognathus* Eschscholtz, 1830

56. *Phyllognathus dionysius* (Fabricius, 1792) (Figure 7D)

Specimens examined

Seoni: Karmajhiri, 06.vi.2001 (1 ex.), K Chandra.

Distribution

India (Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Odisha, Uttar Pradesh and West Bengal), Myanmar, Nepal, Sri Lanka and Taiwan.

Subtribe Dipelicina Carne, 1957

Genus *Dipelicus* Hope, 1845

57. *Dipelicus bidens* Arrow, 1910* (Figure 7E)

Specimens examined

Seoni: Ghat Kohka, 16.xi.2001 (1♀); Karmajhiri, 06.vi.2001 (1♀), K Chandra - Rajota, 07.xi.2001 (1♀), ML Koshta. Chhindwara: Jamtara, 21.xi.2001 (1♂1♀); Badanala, 21.xi.2001 (1♀), K Chandra.

Distribution

India (Madhya Pradesh) and Sri Lanka.

Tribe Phileurini Burmeister, 1847

Genus *Eophileurus* Arrow, 1908

58. *Eophileurus platypterus* (Wiedemann, 1823) (Figure 7F)

Specimens examined

Seoni: Ghat Kohka, 22.vi.2001 (1ex.), K Chandra.

Distribution Endemic to India

India (Bihar, Chhattisgarh, Haryana, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal).

Subfamily CETONIINAE Leach, 1815

Tribe Goliathini Griffith & Pidgeon, 1832
Subtribe Coryphocerina Burmeister, 1842
Genus *Heterorrhina* Westwood, 1842

59. *Heterorrhina elegans* (Fabricius, 1781) (Figure 7G)

Specimens examined

Seoni: Chewarighat, 06.vi.2001 (1ex.) (A-7201); Bada Nala, 20.vi.2001 (1ex.) (A-7202); Chhindimata, 21.vi.2001 (1ex.) (A-7200) K Chandra.

Distribution

India (Bihar, Jharkhand, Karnataka, Pondicherry, Madhya Pradesh and Tamil Nadu) Myanmar and Sri Lanka.

Tribe Cetoniini Leach, 1815
Subtribe Cetoniina Leach, 1815
Genus *Gametis* Burmeister, 1842

60. *Gametis versicolor* (Fabricius, 1775) (Figure 7H)

Specimens examined

Seoni: Khamarpani, 05.vi.2001 (1ex.) (A-6673), K Chandra - 28.viii.2001 (4exs.) (A-6105), 28.viii.2001 (1ex.) (A-7199), YN Gupta.

Distribution

India (Assam, Karnataka, Madhya Pradesh, Tamil Nadu and West Bengal), Afghanistan, Bangladesh, Bhutan, Mauritius, Madagascar and Sri Lanka.

Tribe Gymnetini Kirby, 1827
Subtribe Gymnetina Kirby, 1827
Genus *Clinteria* Burmeister, 1842

61. *Clinteria klugi* ssp. *klugi* (Hope, 1831) (Figure 7I)

Specimens examined

Seoni: Baghdeo, 23.vi.2001 (2exs.) (A-6670), K Chandra.

Distribution

India (Haryana, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh, Uttarakhand, Tamil Nadu and West Bengal), Nepal and Sri Lanka.

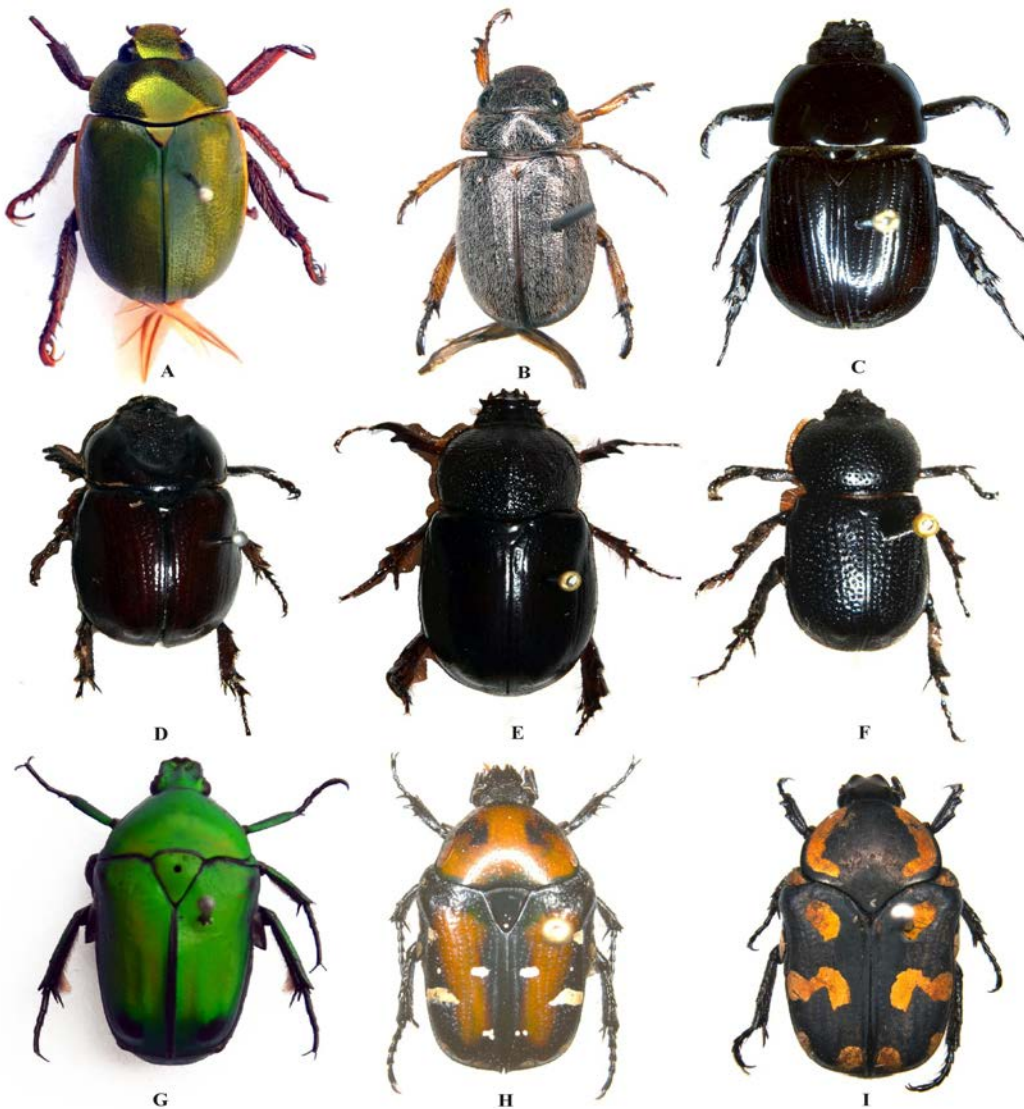


Fig 7: A. *Mimela macleayana* (Vigors), B. *Adoretus* (A.) *lasiopygus* Burmeister, C. *Heteronychus lioderes* Redtenbacher, D. *Phyllognathus dionysius* (Fabricius), E. *Dipelicus bidens* Arrow, F. *Eophileurus platypterus* (Wiedemann), G. *Heterorrhina elegans* (Fabricius), H. *Gametis versicolor* (Fabricius), I. *Clinteria klugi klugi* (Hope).

4. Discussion

A total of 376 specimens of the scarabaeoid beetles collected from 40 localities of the Pench Tiger Reserve were examined which resulted in the identification of 61 species. As a result, the updated inventory incorporates 61 species belonging to 30 genera, 19 tribes and 7 subfamilies under 3 families (Geotrupidae, Hybosoridae and Scarabaeidae) of superfamily Scarabaeoidea. The present study reports 22 species [*Paragymnopleurus sinuatus assamensis*, *Garreta mundus*, *Onitis subopacus*, *Catharsius molossus*, *Paracopris surdus*, *Copris* (C.) *carinicus*, *Delopleurus parvus*, *Phalops divisus*, *Onthophagus* (C.) *bengalensis*, *O.* (C.) *dama*, *O.* (C.) *ramosus*, *O.* (C.) *hindu*, *O.* (C.) *ramosellus*, *O.* *coeruleicollis*, *O.* *griseosetosus*, *O.* *quadridentatus*, *Sisyphus* (S.) *longipes*, *Holotrichia fissa*, *Adoretus* (A.) *bengalensis*, *A.* (A.) *bicaudatus*, *A.* (A.) *bimarginatus* and *Dipelicus bidens*] as new records from the tiger reserve. *Delopleurus parvus* and *Onthophagus coeruleicollis* have been newly recorded from the state of MP, each represented by only a single specimen.

Out of the total 61 species, 38 species were coprophagous or dung beetles belonging to the families; Geotrupidae, Hybosoridae and subfamily Scarabaeinae of Scarabaeidae. The family Geotrupidae is represented by 3 species belonging to 2 genera (*Bolbohamatum* and *Bolboceras*) under subfamily Bolboceratinae. The family Hybosoridae includes a single species, *Hybosorus orientalis*. Scarabaeinae includes 34 species belonging to 14 genera and 7 tribes. Depending up on the nesting strategies, both rollers and tunnellers were collected from the tiger reserve. The species belonging to the genera; *Scarabaeus*, *Sisyphus*, *Gymnopleurus*, *Garreta* and *Paragymnopleurus* were rollers while species in the genera; *Heliocopris*, *Paracopris*, *Catharsius*, *Copris*, *Delopleurus*, *Phalops*, *Onitis* and *Onthophagus* were tunnellers. The species in the subfamilies; Rutelinae, Melolonthinae, Dynastinae and Cetoniinae were phytophagous in feeding habit. Rutelinae includes 12 species, Melolonthinae 3 species, Dynastinae 5 species and Cetoniinae 3 species. In terms of species diversity among genera, the most diverse genus comes out *Onthophagus* (14 species) followed by *Anomala* (7 species), *Adoretus* (4 species), *Catharsius* and *Paracopris* (3 species each) and *Garreta* (2 species). The rest other genera are represented by only a single species. As biodiversity surveys provide fundamental information needed for conservation planning, protected area justification and design, and development of management plans, the rich biodiversity of the scarabaeoid beetles in PTR needs to be conserved and protected so as to maintain the biological health of the tiger reserve.

5. Acknowledgements

The authors thank Dr. K. Venkataraman (Director, Zoological Survey of India, Kolkata) for providing necessary facilities and encouragement. The authors are also thankful to Dr. Ales Bezdek (Czech Republic), Dr. Paul Schoolmeesters (Belgium) and Dr. James Noriega Alvarado (USA) for the literature. The authors are also thankful to Dr. S. Sambath (Officer-in-Charge, ZSI, Jabalpur) for providing necessary facilities.

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