

Scarab Beetles (Coleoptera: Scarabaeoidea) of Melghat Tiger Reserve, Central India

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Abstract: The paper presents an account of thirty two species of scarab beetles belonging to twenty genera, eight subfamilies and three families under superfamily Scarabaeoidea from Melghat Tiger Reserve, Vidarbha, Maharashtra (India). The family Scarabaeidae includes 30 species while both Geotrupidae and Hyborsoridae are represented by single species. Within Scarabaeidae, the dominant subfamily Scarabaeinae constitute 17 species followed by Cetoniinae (4 species), Melolonthinae (3 species) and Orphninae, Rutelinae and Dynastinae (each with 2 species).

Key words: Scarab Beetles • Melghat Tiger Reserve • Central India and Maharashtra

INTRODUCTION

The superfamily Scarabaeoidea is one of the largest superfamilies in the order Coleoptera and includes approximately 31,000 species worldwide, of which the family Scarabaeidae composed of about 91% of all scarabaeoids and includes about 27,800 species throughout the world [1]. The family Scarabaeidae possesses both beneficial (dung beetles) and harmful beetles (chafers). Among them the dung beetles play an important role in nature's sanitation and perform a series of ecological functions such as nutrient cycling, soil aeration [2], seed dispersal [3,4] and regulation of enteric parasites and dung breeding dipterans pests [5,6]. On the other hand the chafers which are phytophagous in nature are pests of various commercial crops. The first comprehensive account on the scarab beetles of the Indian region was published by Arrow [7-9] in three volumes of '*Fauna of British India*'; where in 58 species were reported from Madhya Pradesh, which was earlier part of Central India. Recently, Thakare *et al.* [10] studied the diversity and abundance of the scarab beetles in Kolkas region of MTR and reported the occurrence of 26 species distributed in 8 subfamilies.

Since a comprehensive research on the Coleopteran (beetle) diversity of Amravati district is lacking completely. Thus the main objective of our study was to

study and analyse the diversity of the scarab beetles in the Melghat Tiger Reserve. Specimens collected from the tiger reserve resulted in the identification of 32 species belonging to 20 genera, 8 subfamilies and 3 families under superfamily Scarabaeoidea.

Study Area: Faunistic surveys were conducted during 2009-2010 in Melghat Tiger Reserve (MTR), Vidarbha, Maharashtra which lies between 21°29.96'N and 077°12.338'E coordinates (Fig.1). MTR is located at southern offshoot of Satpuda hill range in Central India also called as Gawilgarh hill range in Maharashtra. The forest area of MTR is tropical dry deciduous, dominated with teak plantations (*Tectona grandis*).

Specimens for the study were collected using handpicking method and baited pitfall traps. For compiling the species structure of the scarab beetle of the MTR, the preserved specimens were identified by the experts of Central Zone Regional Centre, Zoological Survey of India, Jabalpur using available faunal work and identification keys given by Arrow [7-9], Balthasar [11] and Kuijten [12]. Classification adopted for the superfamily Scarabaeoidea is after Smith [13]. Species are listed with their valid names. Details of material examined and distributional records of species identified up to species level are also provided. All the three specimens of subfamily Melolonthinae, one specimen of Rutelinae, one specimen

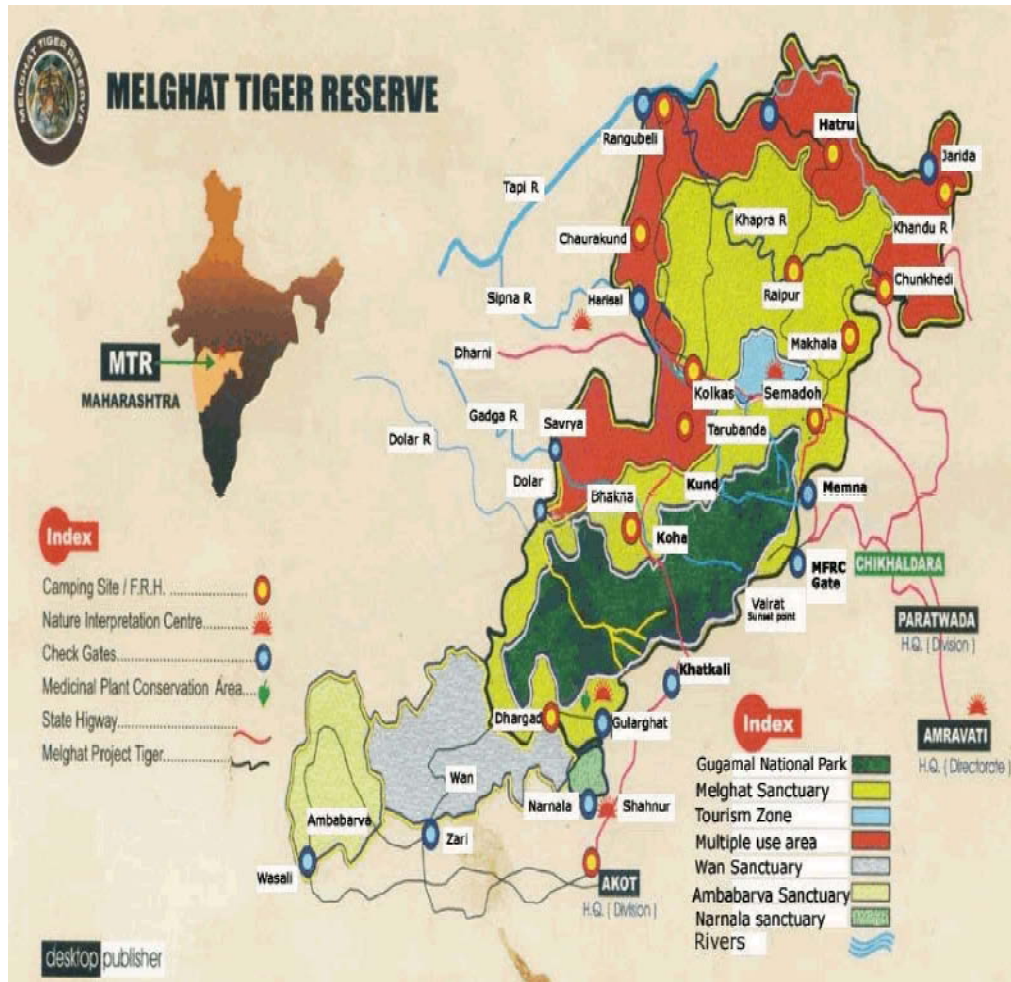


Fig. 1: Map of study area

of Cetoniinae and one specimen of Bolboceratinae were identified only up to generic level. Specimens are temporarily deposited in the Museum of Department of Zoology, Government Vidarbha Institute of Science and Humanities, Amravati (Maharashtra), India and later they will be deposited as per the guidelines of Forest Department.

List of Scarab Beetles from Melghat Tiger Reserve:

Family: Geotrupidae:

- Subfamily: BOLBOCERATINAE
- *Bolboceras* sp.

Family: Hybosoridae

Subfamily: Hybosorinae

- *Hybosorus orientalis* Westwood

Family: Scarabaeidae

- Subfamily: ORPHNINAE
- *Orphnus impressus* Westwood
- *Orphnus parvus* Wiedmann

Subfamily: SCARABAEINAE

- *Heliocopris bucephalus* (Fabricius)
- *Catharsius (Catharsius) molossus* (Linnaeus)
- *Catharsius (Catharsius) sagax* (Quenstedt)
- *Copris (Paracopris) imitans* Felsche
- *Copris (Copris) sinicus* Hope
- *Onthophagus (Colobonthophagus) hindu* Arrow
- *Onthophagus (Digitonthophagus) gazella* (Fabricius)
- *Onthophagus (Onthophagus) abreui* Arrow
- *Onthophagus (Onthophagus) dama* (Fabricius)

- *Onthophagus* (*Onthophagus*) *quadridentatus* (Fabricius)
- *Onthophagus* (*Onthophagus*) *ramosus* (Wiedmann)
- *Onthophagus* (*Onthophagus*) *turbatus* Walker
- *Onthophagus* (*Proagoderus*) *pactolus* (Fabricius)
- *Onitis lama* Lansberge
- *Onitis philemon* Fabricius
- *Onitis subopacus* Arrow
- *Tiniocellus spinipes* (Roth)

Subfamily: RUTELINAE

- *Anomala bengalensis* (Blanchard)
- *Rhinyptia* sp.

Subfamily: CETONIINAE

- *Anatona* sp.
- *Chiloloba acuta* (Wiedmann)
- *Clinteria klugi* (Hope)
- *Oxycetonia versicolor* (Fabricius)

Subfamily: DYNASTINAE

- *Phyllognathus dionysius* (Fabricius)
- *Eophileurus platypterus* (Wiedmann)

Subfamily: MELOLONTHINAE

- *Apogonia* sp.
- *Holotrichia* sp.
- *Scizonycha* sp.

RESULTS AND DISCUSSION

Altogether thirty two species of the scarab beetles belonging to 20 genera, 8 subfamilies and 3 families under superfamily Scarabaeoidea were studied from Melghat Tiger Reserve, Vidarbha, Maharashtra (India). Of these the family Scarabaeidae includes highest number of species (30 species) followed by Geotrupidae and Hybosoridae (1 species each). Under the family Scarabaeidae, dung beetles, within the subfamily Scarabaeinae are composed of seventeen species while the chafers are represented by eleven species distributed in four subfamilies viz. Melolonthinae, Rutelinae, Cetoniinae and Dynastinae. The dominant genus in the tiger reserve comes out *Onthophagus* which includes eight species under four subgenera.

Systematic Account:

- Order: Coleoptera Linnaeus, 1758
- Suborder: Polyphaga Emery, 1886
- Super family: Scarabaeoidea Latreille, 1802
- Family: Geotrupidae Latreille, 1802
- Subfamily: Bolboceratinae Mulsant, 1842
- Tribe: Bolboceratini Mulsant, 1842
- *Bolboceras* sp.
- *Material examined:* MTR, Kolkas Forest Rest House (21°29.897'N, 077°15.560'E), 03.x.2010(2ex.), Coll. V.G. Thakare.

Family: Hybosoridae Erichson, 1847

- Subfamily: Hybosorinae Erichson, 1847
- *Hybosorus orientalis* Westwood, 1845
- 1845. *Hybosorus orientalis* Westwood, *Trans. Ent. Soc. Lond.*, 6: 159.
- *Material examined:* MTR, Rangubeli (21°40.089'N, 077°06.566'E, Elevation-456m) 19.vii.2010(1ex.), Coll. V.G. Thakare.
- *Distribution:* India: Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra (MTR), Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal. *Elsewhere:* England, Nepal, Pakistan and U.S.A.

Family: Scarabaeidae Latreille, 1802:

- Subfamily: Orphninae Erichson, 1847
- Tribe Orphnini Erichson, 1847

***Orphnus impressus* Westwood, 1846:**

- 1846. *Orphnus impressus* Westwood, *Trans. Ent. Soc. Lond.* 4: 177.
- *Material examined:* MTR, Rangubeli (21°40.057'N, 077°06.788'E, Elevation-477m), 19.vii.2010(1ex.), Coll. V.G. Thakare.
- *Distribution:* India: Haryana, Maharashtra (MTR) and Uttarakhand.

***Orphnus parvus* Wiedmann, 1823:**

- 1823. *Orphnus parvus* Wiedmann, *Zool., Mag.*, 6(1): 6.
- *Material examined:* MTR, Rangubeli (21°39.884'N, 77°06.727'E, Elevation-486m), 19.vii.2010(1ex.), Coll. V.G. Thakare.

- *Distribution*: India: Chhattisgarh, Madhya Pradesh, Orissa and West Bengal.
- Subfamily: Scarabaeinae Latreille, 1802
- Tribe Coprini Leach, 1815

***Heliocopris bucephalus* (Fabricius, 1775):**

- 1775. *Scarabaeus bucephalus* Fabricius, *Syst. Ent.* : 24.
- 1931. *Heliocopris bucephalus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 88.
- 1963. *Heliocopris bucephalus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, I: 303-304.
- *Material examined*: MTR, Kolkas Forest Rest House (21°29.897'N, 077°15.560'E), 03.x.2010 (2ex.), Coll. V.G. Thakare.
- *Distribution*: India: Bihar, Chhattisgarh, Haryana, Himachal Pradesh Madhya Pradesh, Maharashtra (MTR), Rajasthan, Uttar Pradesh and West Bengal. *Elsewhere*: Myanmar, Malay, Peninsula and Java.

***Catharsius (Catharsius) molossus* (Linnaeus, 1758):**

- 1758. *Scarabaeus molossus* Linnaeus, *Syst. Nat.* ed.: 347.
- 1931. *Catharsius molossus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 94.
- 1963. *Catharsius (Catharsius) molossus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, I: 307-308.
- *Material examined*: MTR, Kolkas (21°30.107'N, 077°12.578'E), 15.v.2009 (1ex.), Coll. V.G. Thakare.
- *Distribution*: India: Andaman's Island, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kerala Madhya Pradesh, Meghalaya, Orissa, Sikkim, Uttar Pradesh, Uttarakhand and West Bengal.

***Catharsius (Catharsius) sagax* (Quenstedt, 1806):**

- 1806. *Copris sagax* Quenstedt, *Schonh. Syn. Ins.*, I : 43.
- 1931. *Catharsius sagax*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 96.

- 1963. *Catharsius (Catharsius) sagax*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, I: 309-310.
- *Material examined*: MTR, Jarida, (21°39.987'N, 077°29.252'E; Elevation-660m), 06.vii.2009 (2ex.), Coll. V.G. Thakare.
- *Distribution*: India : Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal. *Elsewhere*: Bhutan.

***Copris (Paracopris) imitans* Felsche, 1910:**

- 1910. *Copris imitans* Felsche, *Deutsche Ent. Zeits.*, 347.
- 1931. *Copris imitans*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae) 3: 124.
- 1963. *Copris (Paracopris) imitans*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, I: 367.
- *Material examined*: MTR, Tarubanda, Compt. no. 762 (21°24.546N, 077°48.33'E Elevation-505m), 12.x.2010 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Madhya Pradesh, Goa, Karnataka and Maharashtra (MTR).

***Copris (Copris) sinicus* Hope, 1842:**

- 1842. *Copris sinicus* Hope, *Proc. Ent. Soc. Lond.* : 60.
- 1931. *Copris sinicus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 115
- 1963. *Copris (Copris) sinicus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, I: 342.
- *Material examined*: MTR, Tarubanda, Compt. no. 762 (21°28.198'N, 077°10.281'E Altitude-505m), 12.x.2010 (2ex.), Coll. V. G. Thakare.
- *Distribution*: India: Central Province (Sarda), Maharashtra (MTR). *Elsewhere*: Myanmar, Pegu, Java, Tenasserim, Siam, Tonkin and South-East china.

Tribe Onthophagini Burmeister, 1846:

- *Onthophagus (Colobonthophagus) hindu* Arrow, 1931
- 1931. *Onthophagus hindu* Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 289.

- 1963. *Onthophagus (Colobonthophagus) hindu*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 381-382.
- *Material examined*: MTR, Tarubanda, Camp no. 762 (21°24.546'N, 077°482.33' E Elevation- 505), 12.x.2010 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Madhya Pradesh, Maharashtra (MTR) and South India. *Elsewhere*: Sri Lanka.

Onthophagus (Digitonthophagus) gazella (Fabricius), 1787:

- 1787. *Scarabaeus gazella* Fabricius, *Mant. Ins.*, II: 377.
- 1931. *Onthophagus catta*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 230-231.
- 1963. *Onthophagus (Digitonthophagus) gazella*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, II: 365.
- *Material examined*: MTR, Chourakund (21°38.078'N, 077°07.286' E, Elevation-458m), 18.vii.2010(4ex.), Coll. V. G. Thakare.
- *Distribution*: India: Andhra Pradesh, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra (MTR), Punjab, Rajasthan and Tamil Nadu. *Elsewhere*: Africa, Arabia, Madagascar, Pakistan and Sri Lanka.

Onthophagus (Onthophagus) abreui Arrow, 1931:

- 1931. *Onthophagus abreui* Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae) 3 : 239.
- 1963. *Onthophagus (Onthophagus) abreui*, Balthasar, V., *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 260-261.
- *Material examined*: MTR, Chourakund (21°38.609'N, 077°07.515' E, Elevation-476m), 19.vii.2010(1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Haryana, Kerala, Madhya Pradesh, Maharashtra (MTR) and Uttarakhand.

Onthophagus (Onthophagus) dama (Fabricius, 1798):

- 1798. *Copris dama* Fabricius, *Ent. Syst. Suppl.*, : 32.
- 1931. *Onthophagus dama*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 279-280.

- 1963. *Onthophagus (Onthophagus) dama*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 325-326.
- *Material examined*: MTR, Kolkas (21°30.107'N, 077°12.578'E), 21.viii.2009 (4 ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra (MTR), Orissa, Tamil Nadu, Uttar Pradesh and Uttarakhand. *Elsewhere*: Bhutan and Sri Lanka.

Onthophagus (Onthophagus) quadridentatus (Fabricius, 1798):

- 1798. *Copris quadridentatus* Fabricius, *Ent. Syst. Suppl.*, 34.
- 1931. *Onthophagus quadridentatus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 279.
- 1963. *Onthophagus (Onthophagus) quadridentatus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 494.
- *Material examined*: MTR, Chourakund (21°38.226'N, 077°07.555'E, Elevation- 495m), 19.vii.2010(1ex.), Coll. V. G. Thakare.
- *Distribution*: India : Arunachal Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra (MTR), Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. *Elsewhere*: Sri Lanka.

Onthophagus (Onthophagus) ramosus (Wiedmann, 1823):

- 1823. *Copris ramosus* Wiedmann, *Zool. Mag.* II, 1: 13.
- 1931. *Onthophagus ramosus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 236-237.
- 1963. *Onthophagus (Onthophagus) ramosus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 497.
- *Material examined*: MTR, Kolkas (21°29.96'N, 077°12.338'E), 21.viii.2009 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kashmir, Madhya Pradesh, Maharashtra (MTR), Orissa, Punjab, Uttarakhand, Uttar Pradesh and Tamil Nadu. *Elsewhere*: Thailand.

***Onthophagus (Onthophagus) turbatus* Walker, 1858:**

- 1858. *Onthophagus turbatus* Walker, *Ann. Mag. Nat. Hist.* (3) ii: 209.
- 1931. *Onthophagus turbatus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3: 329-330.
- 1963. *Onthophagus (Onthophagus) turbatus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 569.
- *Material examined*: MTR, Chourakund (21°38.248'N, 077°07.228'E, Elevation-458m), 18.vii.2010 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Maharashtra (MTR) Tamil Nadu and Pondicherry.
- *Onthophagus (Proagoderus) pactolus* (Fabricius, 1787)
- 1787. *Scarabaeus pactolus* Fabricius, *Man. Ins.*, I: 12.
- 1931. *Onthophagus pactolus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 203.
- 1963. *Onthophagus (Proagoderus) pactolus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, II: 466.
- *Material examined*: MTR, Kolkas Forest Rest House, (21°30.020'N, 077°12.515'E), 20.viii.2009 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra (MTR), Mysore, Uttar Pradesh and Uttarakhand.
- Tribe Onitini Laporte, 1840

***Onitis lama*, Lansberge, 1875:**

- 1875. *Onitis lama* Lansberge *Ann. Soc. Ent. Belg.* xviii : 123.
- 1963. *Onitis lama*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 40.
- *Material examined*: MTR, Kolkas (21°31.107'N, 077°12.588'E, Elevation-441m.), 07.vii.2009 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Punjab, Maharashtra (MTR), Uttarakhand and Uttar Pradesh.

***Onitis philemon* Fabricius, 1801:**

- 1801. *Onitis philemon* Fabricius, *Syst. Eleut.* I : 30.
- 1931. *Onitis philemon*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 393-394.

- 1963. *Onitis philemon*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, II: 41.
- *Material examined*: MTR, Semadoh (21°30.119'N, 077°19.012'E, Elevation-1731 ft), 02. vii.2010 (3ex.), Coll. V. G. Thakare.
- *Distribution*: India: Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal. *Elsewhere*: Myanmar, Pakistan, Sri Lanka, Thailand and Vietnam.

***Onitis subopacus* Arrow, 1931:**

- 1931. *Onitis subopacus* Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae), 3 : 395-396.
- 1963. *Onitis subopacus*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera : Lamellicornia), Coprinae, II: 38-39.
- *Material examined*: MTR, Semadoh Forest Rest House (21°29.875'N, 077°18.881'E elevation-511 m.), 07.vii.2009 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Punjab, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal.
- Tribe Oniticellini Kolbe, 1905:

***Tiniocellus spinipes* (Roth, 1851):**

- 1851. *Oniticellus spinipes* Roth, *Arch., F. Nat.*, xvii, I: 128.
- 1900. *Tiniocellus spinipes*, Perringuey, *Trans. Phil. Soc. S. Afr.* xii: 116.
- 1931. *Tiniocellus spinipes*, Arrow, *Faun. Brit. India*, (Lamellicornia: Coprinae) 3: 378.
- 1963. *Tiniocellus spinipes*, Balthasar, *Mon. der Scarabaeidae und Aphodiidae der Palaeark. und Orientalis. Region* (Coleoptera: Lamellicornia), Coprinae, II: 108.
- *Material examined*: MTR, Belkund, camp. no. 813 (21°23.111'N, 077°06.935'E, Elevation-619m), 15.x.2010 (1ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra (MTR), Punjab, Tamil Nadu and Uttarakhand. *Elsewhere*: Africa and Uganda.
- Subfamily: Rutelinae MacLeay, 1819
- Tribe Anomalini Streubel, 1839

Anomala bengalensis (Blanchard, 1850):

- 1850. *Rhinoplia bengalensis* Blanchard, *Cat. Coll. Ent. Mus. Paris.*: 182.
- 1917. *Anomala bengalensis*, Arrow, *Faun. Brit. India* (Lamellicornia: Rutelinae), 2: 137.
- *Material examined*: MTR, Raipur, (21°33.913'N, 077°17.573'E, Elevation-691m), 02.vii.2009 (1ex.), Coll. V.G. Thakare.
- *Distribution*: India: Andhra Pradesh, Bihar, Haryana, Karnataka, Madhya Pradesh, Maharashtra (MTR), Tamil Nadu and West Bengal.
- *Rhinoptia* sp.
- *Material examined*: MTR, Raipur (N21°33.913, 'E 077°17.573', Elevation-691m), 02.vii.2009 (1ex.), Coll. V.G. Thakare.
- Subfamily: Cetoniinae Leach, 1815
- Tribe Cetoniini Leach, 1815
- Subtribe Cetoniina Leach, 1815
- *Anatona* sp.
- *Material examined*: MTR, Belkund, Camp no. 868 (N 21°23.034', E077°06.871' Elevation- 512m), 14. X.2010 (2ex.), Coll. V.G. Thakare

Oxycetonia versicolor (Fabricius, 1775):

- 1775. *Cetonia versicolor* Fabricius, *Syst. Ent.*: 51.
- 1910. *Oxycetonia versicolor* Arrow, *Faun. Brit. India*, (Lamellicornia: Cetoniinae), I : 164.
- *Material examined*: MTR, Belkund, Compt. no. 868 (N21°23.034' E077°06.871' Elevation-512m), 14.x.2010 (2ex.), Coll. V.G. Thakare
- *Distribution*: India: Assam, Karnataka, Madhya Pradesh, Maharashtra (MTR), Tamil Nadu and West Bengal. *Elsewhere*: Bhutan, Mauritius, Madagascar, Pakistan and Sri Lanka.

Chiloloba acuta (Wiedmann, 1823):

- 1823. *Cetonia acuta* Wiedmann, *Zool. Mag.*, ii, I : 87.
- 1910. *Chiloloba acuta* Arrow, *Faun. Brit. India*, (Lamellicornia: Cetoniinae) I : 172.
- *Material examined*: MTR, Rangubeli (21°40.008'N, 077°06.647'E, Elevation-474m), 19.vii.2010 (1ex.), Coll. V.G. Thakare.
- *Distribution*: India: Haryana, Karnataka, Madhya Pradesh, Maharashtra (MTR), Sikkim, Tamil Nadu, Uttar Pradesh and Uttarakhand. *Elsewhere*: Pakistan.
- Tribe Gymnetini Kirby, 1827

Clinteria kulgi (Hope, 1831):

- 1831. *Cetonia kulgi* Hope, *Gray's Zool. Misc.*, : 25.
- 1910. *Clinteria kulgi* Arrow, *Faun. Brit. India*, (Lamellicornia: Cetoniinae) I : 187.
- *Material examined*: MTR, Kund, camp. no. 772 (21°26.034'N, 077°11.435' E, Elevation-521m), 15.x.2010 (2ex.), Coll. V.G. Thakare.
- *Distribution*: India: Haryana, Karnataka, Madhya Pradesh, Maharashtra (MTR), Uttar Pradesh, Uttarakhand, Tamil Nadu and West Bengal. *Elsewhere*: Nepal and Sri Lanka.
- Subfamily: Dynastinae MacLeay, 1819
- Tribe Pentodontini Mulsant, 1842:

Phyllognathus dionysius (Fabricius, 1792):

- 1792. *Scarabaeus dionysius* Fabricius, *Ent. Syst.*, 1: 20.
- 1910. *Phyllognathus dionysius*, Arrow, *Faun. Brit. India*, (Lamellicornia: Dynastinae), I : 307.
- *Material examined*: MTR, Raipur (21°33.647'N, 077°17.807'E, Elevation-688m), 02.vii.2009 (1ex.), Coll. V.G. Thakare.
- *Distribution*: India: Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra (MTR), Mysore Orissa, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and Tamil Nadu. *Elsewhere*: Sri Lanka.

Tribe Phileurini Burmeister, 1847:

- *Eophileurus platypterus* (Wiedmann, 1910)
- 1823. *Geotrupes platypterus* Wiedmann, *Zool. Mag.* ii. 1 : 5.
- 1910. *Eophileurus platypterus*, Arrow, *Faun. Brit. India*, (Lamellicornia: Cetoniinae and Dynastinae), I: 289.
- *Material examined*: MTR, Tarubanda, camp. no. 762 (21°28.198'N, 077°10.281'E, Elevation-505m), 16.x.2010 (3 ex.), Coll. V. G. Thakare.
- *Distribution*: India: Chhattisgarh, Haryana, Madhya Pradesh, Maharashtra (MTR), Tamil Nadu, Uttar Pradesh.
- Subfamily: Melolonthinae MacLeay, 1819
- Tribe Melolonthini Leach, 1819
- *Holotrichia* sp.
- *Material examined*: MTR, Semadoh, Forest Rest House, (N 21° 29.875' E 077° 18.881' Alt.- 1679 ft.), 07.vii.2009 (1ex), Coll. V. G. Thakare.
- *Scizonycha* sp.

- Material examined: MTR, Chourakund (21°38.078'N, 077°07.286'E, Elevation-458m) 18.vii.2010 (4ex.), Coll. V. G. Thakare.
- Tribe Diplotaxini Kirby, 1837
- *Apogonia* sp.
- Material examined: MTR, Jarida (21°39.987'N, 077°29.252'E, Elevation 660m), 06. vii.2009 (2ex.), V. G. Thakare.

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REFERENCES

1. Jameson, M.L. and B.C. Ratcliffe, 2001. Scarabaeoidea: Scarabaeoid beetles (=Lamellicornia) (URL:<http://www-museum.unl.edu/research/entomology/Guide/Scarabaeoidea/Scarabaeoidea-pages/Scarabaeoidea-Overview/ScarabaeoideaO.html>). In, B.C. Ratcliffe and M.L. Jameson (eds.), 2012. Generic Guide to New World Scarab Beetles (URL: <http://www-museum.unl.edu/research/entomology/Guide/index4.htm>). Accessed on: 15.02.2012
2. Mittal, I.C., 1993. Natural manuring and soil conditioning by dung beetles. *Tropical Ecology*, 34(2): 150-159.
3. Estrada, A. and R. Coates Estrada, 1991. Howler monkeys, dung beetles (Scarabaeidae) and seed dispersal: Ecological interactions in the tropical rainforest of Los tuxlas, Mexico. *Journal of Tropical Ecology*, 7: 459-474.
4. Larsen, T., 2004. Dung beetle extinctions and ecological function. (URL: <http://www.princeton.edu/kremen/trond.htm>)
5. Borenmissza, G.F., 1970. Insectary studies on the control of dung breeding flies by the activity of dung beetle, *Onthophagus gazella* F. (Coleoptera: Scarabaeinae). *Journal of Australian Entomological Society*, 9: 31-41.
6. Fincher, G.T., 1981. The Potential value of dung beetles in pasture ecosystem. *J. Georg. Entomol. Soc.*, 16(2): 316-333.
7. Arrow, G.J., 1910. The Fauna of British India including Ceylon and Burma. Col, Lamellicornia I, (Cetoniinae and Dynastinae) Taylor & Francis. London V-XIV, 322 pp+ 76figs.+2pls.
8. Arrow, G.J., 1917. The Fauna of British India Including Ceylon and Burma, Col. Lamellicornia II, (Rutelinae, Desmonychinae and Euchirinae). Taylor & Francis, London: V- XIII, 387pp + 77figs. + 5pls.
9. Arrow, G.J., 1931. The Fauna of British India including Ceylon and Burma. Col, Lamellicornia III (Coprinae), Taylor & Francis, London : V-XII, 428 pp.: 61 figs. 19 pls., map.
10. Thakare, V.G., V.S. Zade and K. Chandra, 2011. Diversity and Abundance of Scarab Beetles (Coleoptera: Scarabaeidae) in Kolkas Region of Melghat Tiger Reserve (MTR), District Amravati, Maharashtra, India. *World Journal of Zoology*, 6(1): 73-79.
11. Balthasar, V., 1963. Monographie der Scarabaeidae und Aphodiidae der Palaearktischen und Orientalischen Region. (Coleoptera: Lamellicornia), Verlag der Tschechoslowakischen Akademie der Wissenschaften Prag, I, 1-391, 137 figs., 24pls.
12. Kuijten, P.J., 1983. Revision of the Genus *Hybosorus* Macleay (Coleoptera: Scarabaeidae, Hybosorinae). *Zoologische Verhandelingen*, 201: 1-49
13. Smith, B. and T. Andrew, 2006. A Review of the Family-Group Names for the Superfamily Scarabaeoidea (Coleoptera) with Corrections to Nomenclature and a Current Classification, *Coleopterists Society Monograph*, 5: 144-204.