

# A checklist of beetle diversity (Insecta: Coleoptera) from Sakri region, Dist- Dhulia (M.S.) India.

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## Abstract

The study presents taxonomic account of 33 coleopteran beetles belonging to 8 families viz., Buprestidae, Carabidae, Cerambycidae, Chrysomelidae, Hybosoridae, Meloidae, Scarabaeidae and Tenebrionidae from Sakri region, District - Dhulia (M.S.) is provided for the first time. Interactive identification keys of species were prepared by studying thoroughly the morphological characters of all collected beetle specimen. Based on collection data, the highest number of specimen were recorded from scarabaeidae family.

**Key words:** Coleopteran beetle, Buprestidae, Carabidae, Cerambycidae, Scarabaeidae.

## Introduction

Coleopteran beetles are a globally distributed insect group, with their high diversity in tropical forest and are member of largest order coleoptera. Mostly beetles feed on the microorganism rich liquid component of mammalian dung and other decaying material (Kailash Chandra and Devanshu Gupta, 2013).

A perusal of literature on the diversity of beetles from different state of India were reported by some earlier workers viz.,

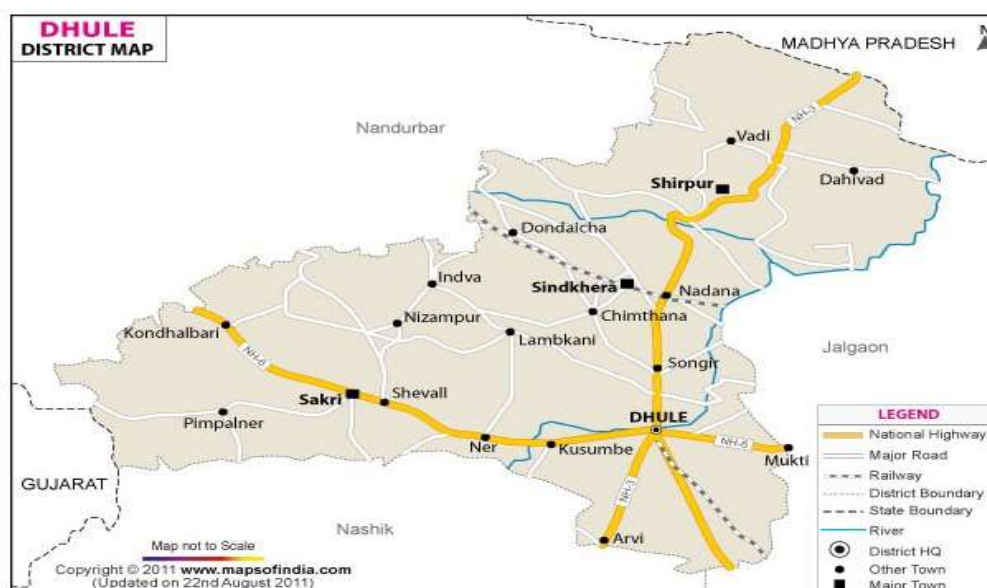
- Bhawane et al (2012) reported 29 species of family scarabaeidae. Most of these are polyphagous and serious pest of agricultural, horticultural and silvicultural crops.
- Deanshu Gupta et al (2014) updated 61 species of scarabaeoid beetles belonging to 30 genera, 19 tribes, 3 families and 7 subfamilies from Pench Tiger Reserve, Madhya Pradesh, India.
- Hegde and Lal (2014) studied 20 species under 10 genera of 8 tribes belonging to 4 sub families of darkling beetles of family Tenebrionidae from Andaman Islands.
- Hegde and Vasanthakumar (2017) reported rediscovery of darkling beetle (*Penthocoides seriatoporus* F)
- Kailash Chandra and Ahirwar (2005a) made comprehensive survey of Bandhavgarh National Park in Madhya Pradesh revealed 44 species in 24 genera and 8 sub families.
- Kailash Chandra and Ahirwar Gupta (2005 b) made comprehensive list of total 61 species of scarabaeidae beetles pertaining to 27 genera under 8 sub families from Kanha Tiger Reserve, Madhya Pradesh, India.
- Kailash Chandra and Devanshu Gupta (2012 a) reported taxonomic account of 4 species of genus *Bolbohamatum* and one species of genus *Bolbogonium* from Central India (Madhya Pradesh and Chhattisgarh).
- Kailash Chandra and Devanshu Gupta (2012 b)) diversity and relative abundance of Pleurostict scarabaeidae were studied and analyzed in Achanakmar-Amarkantak Biosphere Reserve, Chhattisgarh.

- Kailash Chandra and Devanshu Gupta (2012 c) made survey of 52 scarab beetles belonging to 24 genera and 5 sub families of family scarabaeidae from Achanakmar-Amarkantak Biosphere Reserve, Chhattisgarh, India.
- Kailash Chandra and Devanshu Gupta (2013) represent taxonomic account of 52 species of dung beetles belonging to 22 genera, 12 tribes and 3 families from Chhattisgarh.
- Kailash Chandra et al (2015) reported scarab beetles belonging to 53 species, 27 genera and 6 sub families from Sidhi district of Madhya Pradesh, India.
- Sarkar et al (2014) recorded 8 genera from Buxa Tiger Reserve, West Bengal, India.
- Kalawate and Patole (2018) recorded a trogid beetle from the weatern ghats, India.
- Patole (2017 a) reviewed on the beetle world and their relationship with human.
- Patole (2017 b) reported review on coleopteran beetles an agricultural major crops pests of the world.
- Sarkar et al (2014) reported systematics of Dynastinae fauna under 8 genera from Buxa tiger reserve, West Bengal.
- Thakare et al (2012) studied diversity of darkling beetles at different sites in Melghat Tiger Reserve during 2009-2010. They were recorded 8 new species of darkling beetles belonging to family tebebrionidae from study area.
- Vaibhao et al (2012) reported the diversity of darkling beetles at different sites in Melghat tiger reserve, from Satpuda hill ranges in Central India. They were reported 8 species of darkling beetles belonging to family Tenebrionidae.

A perusal of literature on the diversity of coleopteran beetles revealed that there are scanty reports on the taxonomic studies and distribution of beetles of the Maharashtra State. Keeping in view, the present work is aimed to prepare the identification keys and reports on the distribution and diversity of these beetles from study area.

## Materials and method

**Study area** - Sakri is a largest tahsil in Dhule district of Maharashtra State, India. It belongs to Khandesh and Northern Maharashtra region of Nashik division. It is located 70 Km towards west from District head quarters Dhule and 307 KM from State capital Mumbai towards South.



**Altitude/Latitude and Longitude:** Altitude: 215 meters above Sea level; Latitude: 21.08715 and Longitude: 74.3601.

Sakri taluka is bounded by Baglan taluka towards South, Navapur taluka towards west, Nandurbar taluka towards North, Uchchhal taluka towards west. Nandurbar City, Satana City, Dhule City, Malegaon City are the nearby Cities to Sakri.

Both extensive and intensive surveys were conducted during 2015-2016 in different villages of study area. Field visits were made on holiday during the period of survey. For collection of beetles, sweep nets, bush beating and collection in inverted umbrella and hand picking techniques were used. Decaying vegetable matter and dung of various animals was also examined to make collection. In evening hours light trap was used to collect nocturnal beetles. Sample after collection were killed in chloroform and preserved in 70 % ethyl alcohol in glass vials. Necessary data regarding locality, date of collection etc noted in notebook. They were then brought to the laboratory, where stretching, pinning, labeling, and drying and photograph is done as per the guidelines laid by zoological survey of India. For authentication, the preserved samples were periodically send to Zoological Survey of India, Western Regional Station, Akurdi, Pune (M.S.), India.

## Results and Discussion

Altogether, collected specimens from study area, which yielded the identification of 33 species belonging to 8 families and 19 sub families, are listed in table-1. The highest number (15) species were reported from family Scarabaeidae (45.45 %) followed by Tenebrionidae 5 species (15.15 %), Carabidae 4 species (12.12 %), and Meloidae 3 species (9.09 %), Cerambycidae 2 species (6.06 %) whereas family Buprestidae and Hybosoridae has single species (3.03 %) contribution. The classified lists of beetles were followed by least description of families.

**Family- 1: Buprestidae:** These are metallic wood borers. Minute or large flat or cylindrical metallic colored; often golden, bronzy, green or blue. Antennae short; serrate, 11 segments. Thorax and abdomen firmly united. Tarsi with membranous expansions. The adults are lovers of bright sunshine and inhabit wooded areas. The beautiful and iridescent colors of elytra have attracted the attention of man from very early times and the buprestid beetles have been utilized in embroidery and other works of art in India and other countries. *Sternocera chryscoides*, a brilliant green species from India, China and Japan is thus much sought for by jewelers (Mani, 1982).

**Family-2: Carabidae:** Ground beetles. Lacinia without a movable lobe; clypeus not extending laterally in front on the antennal sockets. Antennae with 11 segments. Basal 3 abdominal sternites connate. Wings absent in many; then with the elytra soldered together along the suture; when present, with areola oblongata. Tarsi with 5 segments. Black, brown, yellowish, reddish or metallic blue, green, bronzy or golden; striated, punctate or smooth. Largely ground living forms and are found under stone, bark, in moss, rotten wood and other similar situations. Adults are carnivorous but many species often feed on seeds (Mani, 1982).

**Family-3: Cerambycidae:** Long horned beetles, longicorns, cerambycids. Usually large, somewhat flat; with very long antennae. Smooth, shiny, variously sculptured and often clothed with hairs and scales, often cryptically colored and spotted. Eyes large, irregular. antennae simple. Head in front obliquely inclined, sometimes subvertical. Clypeo-frontal sutures mostly truncate. Fore tibiae not sulcate. Mandible large and in some species enormously developed like antlers. The adults are usually nocturnal or diurnal, sluggish and live on woody plants. The family includes many injurious species to timber and forest trees (Mani, 1982).

**Family- 4: Chrysomelidae:** Beetle minute to small, hard, often brightly colored. Head hypognathus. Antennae short, rarely as long as body. Hind femora sometimes saltatorial. Wings well developed. The adults feed exclusively on leaves of a variety of plants; mine inside the leaves or sometimes in stem of submerged aquatic plants. Some species are serious pest of agriculture. Probably the most injurious species is the Colorado beetle, a pest of potato (Mani, 1982).

**Family-5: Hybosoridae:** Clypeus with antero-lateral angles obtuse often rounded not protruding forward; pronotum with lateral sides not deplanate; external claws of fore tarsi simple (Kailash Chandra and Devanshu Gupta, 2013).

**Family-6: Meloidae:** Blister beetles, oil-beetles. Medium sized, soft-bodied, often with the elytra loosely connected; mostly black, brown or sometimes bright metallic-blue or green. Eyes large, widely separated. Wings well developed, vestigial or absent. Elytra longer or shorter than body. Tarsi with 5 segments. Fore and mid coxae contiguous. Apical segments of abdomen often exposed. Development with hypermetamorphosis. The adults are mostly phytophagous, but often also destroy the eggs of grasshoppers. The meloid beetles yield the cantharidin, a crystalline solid from dried beetles, used medicinally as vesicant and diuretic and in the manufacture of hair oils. Genus *Mylabris pustulata* is large black and red striped species, common throughout the old world, particularly on yellow-coloured flowers (Mani, 1982).

**Family-7: Scarabaeidae :** Dung beetles, scarabs. Small or very large, robust, smooth, shiny, often nocturnal. The beetles mostly feed on dung of various herbivorous mammals, which they roll into convenient sized ball, bury them in underground chambers and feed at leisure. The brood balls are also made from dung. The sacred scarab, *Scarabaeus sacer*, has attracted the attention of man from very ancient times. *Heliocopris bucephalus* is a common Indian species. Other important and widely distributed genera include *Onthophagus copris*, *Carthasius* and *Gymnopleurus*. Most of the species are ornamented with often enormously produced horns and spines on the prothorax and head (Mani, 1982).

**Family - 8: Tenebrionidae :** Small or large, somewhat flat, elongated, hard, often sculptured, mostly black, sometimes reddish-brown. Antennae simple, clavate, moniliform, short, with 11 segments. Eyes prominent. Tarsi heteromeric, with 5-5-4 segments. Claws simple. Wings usually vestigial or absent. Elytra often immovably soldered together along the middle. Usually nocturnal beetles, phytophagous scavengers or feeding on dead and decaying vegetable matter, dungs, dried seeds, cereals and other stored products. Few species are pest of flour, cereals and cereal products (Mani, 1982).

## Conclusion

Biodiversity survey provides fundamental information needed for conservation planning, design and development of management plan. To conclude, species collected in study area represents pattern of diversity, richness and abundance and variation in beetles. The study will no doubt help in the conservation plans and in maintenance of biological health of the ecosystem. This preliminary information on coleopteran beetle diversity may be utilized in future to assess diversity and conservation problems from the region and also help in solving the beetle as pest problem along with in formulating effective control strategy.

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## References

1. Bhawane, G. P., Mamlayya, A. B., Wagh, S. R. and Chaugule, A. K. (2012). Diversity of white grub beetles and their host range from northern western ghats, Kolhapur district (MS), India. *The Bioscan* 7(4): 589-596, 2012.
2. Devanshu Gupta, Kailash Chandra and Salma Khan (2014). An updated checklist of scarabaeoid beetles (Coleoptera: Scarabaeidae) of Pench Tiger Reserve, Madhya Pradesh, India. *J. Ent. Zool. Studies*. 2(5): 225-240.
3. Hegde, V. D. and Lal, B. (2014). Darkling beetles of Andaman islands with some new records (Tenebrionidae: Coleoptera). *Uttarpradesh State Biodiversity Board*. P. 131-133.
4. Hegde, V. D. and Vasanthakumar, D. (2017). Darkling beetles. Rediscovery of *Penthicoides seriatoporus* Fairmaire, 1896 (Coleoptera: Tenebrionidae: Tenebrioninae) from India. *Bugs R All, New Letter of South Asia (ICINSA)*, 32(9): 13-16.
5. Kailash Chandra and Ahirwar, S. C. (2005 a). Scarabaeid beetles (Coleoptera) of Kanha Tiger Reserve, Madhya Pradesh. *Rec. Zool. Surv. India*:105 (1-2): 147-155.
6. Kailash Chandra and Ahirwar, S. C. (2005 b). Scarabaeid beetles of Bandhavgarh national park, Madhya Pradesh. *ZOOS' Print Journal*. 20(8): 1961-1964.
7. Kailash Chandra and Devanshu Gupta (2012 a). Bolboceratine scarabs of genera *Bolbohamatum* Krikken, 1980 and *Bolbogonium* Boucomont, 1911 (Coleoptera:Geotrupidae) from central India. *Taprobanica* 4(2): 69-76.
8. Kailash Chandra and Devanshu Gupta (2012 b). Diversity and relative abundance of Pleurostict Scarabaeidae (Coleoptera) in Achanakmar-Amarkantak Biosphere Reserve, Central India. *World J. Z.* 7(2): 147-154.
9. Kailash Chandra and Devanshu Gupta (2012 c). An inventory of scarab beetles (Coleoptera:Scarabaeidae) of Achanakmar-Amarkantak Biosphere Reserve, Chhattisgarh, India. *I. J. S. N.* 3(4):886-891.
10. Kailash Chandra and Devanshu Gupta (2013). Taxonomic studies on dung beetles (Coleoptera:Scarabaeidae, Geotrupidae, Hybosoridae) of Chhattisgarh, India. *Mun. Ent. Zool.* 8(1): 331-360.
11. Kailash Chandra, Devanshu Gupta and S. C. Goel (2015). On Scarab beetles (Coleoptera: Scarabaeidae) from Sidhi district of Madhya Pradesh, India. *Uttar Pradesh J. Zool.* 35(3): 235-243.
12. Kalawate, A. S. and Patole, S. S. (2018). First record of a trogid beetle (Coleoptera: Scarabaeidae: Trogidae) from the western ghats, India. *J of Threatened Taxa*. 10(7): 11988-11991, 2018.
13. Mani, M. S. (1982). *General Entomology* (3<sup>rd</sup> ed.). Oxford And IBH Publishing Company, New Delhi.
14. Patole, S. S. (2017 a). Review on the beetle world and human relationship. *GIRA- Global Journal for Research Analysis*. 6(10): 441-444, October 9; 2017.
15. Review on beetles (Coleoptera): An agricultural major crop pests of the world. *Int. J. Life. Sci. Scienti. Res.*, 3(6): 1424-1432, Nov. 2017.

16. Sarkar, S. K., Saha, S. and Raychaudhari, D. (2014). Taxonomic account of Dynastinae fauna (Coleoptera: Scarabaeidae) of Buxa Tiger Reserve (West Bengal, India). *Rom. J. Biol.- Zool.*, 59(2): 89-111.
17. Thakare, V. G., Zade, V. S. and Hegde, V. D. (2012). Darkling beetles (Coleoptera: Tenebrionidae) of Melghat Tiger Reserve, Central India. *J. New Biol. Repor* 1(1): 29-32.

**Table-1: A list of Coleopteran beetles from Sakri region.**

| Sr. No. | Family        | Subfamily                              | Name of the species                              |
|---------|---------------|--|--|
| 01      | Buprestidae   | Bupreninae                             | <i>Sternocara aequisignata</i> Saunders, 1866    |
| 02      | Carabidae     | Brachininae                            | <i>Brachinus hexagrammus</i> Chaudoir            |
| 03      |               | Harpalinae                             | <i>Anthia sexguttata</i> Fabricius, 1775         |
| 04      |               |  | <i>Chlaenius ruffemortus</i> M.                  |
| 05      |               |  | <i>Chlaenius impunctifrons</i>                   |
| 06      | Cerambycidae  | Cerambycinae                           | <i>Stromatius barbatum</i> Fabricius, 1775       |
| 07      |               | Lamiinae                               | <i>Batocera rufomaculata</i> De Geer, 1775       |
| 08      | Chrysomelidae | Chrysomelinae                          | <i>Zygogramma bicolorata</i> Pallister, 1953     |
| 09      |               | Scutelleridae                          | <i>Chrysocoris purpureus</i> , Westwood, 1837    |
| 10      | Hybosoridae   | Hybosorinae                            | <i>Hybosorus orientalis</i> Westwood, 1845       |
| 11      | Meloidae      | Eleticinae                             | <i>Mylabris pustulata</i> Fabricius, 1775        |
| 12      |               | Meloninae                              | <i>Meloe proscarabaeus</i> Linnaeus, 1758        |
| 13      |               | Tetraonyicinae                         | <i>Psalydolytta aegyptica</i> Peringuey, 1909    |
| 14      | Scarabaeidae  | Dynastidae                             | <i>Phyllognathus Dionysius</i> Fabricius.        |
| 15      |               |  | <i>Oryctes rhinoceros</i> Linnaeus               |
| 16      |               |  | <i>Eophileurus platypterus</i> Wiedemann, 1823   |
| 17      |               | Rutelinae                              | <i>Anomalla rufficapilla</i> Burmeister, 1855    |
| 18      |               |  | <i>Adoretus lasiopygus</i> Burmeister, 1855      |
| 19      |               | Scarabaeinae                           | <i>Catharsius pithecius</i> Fabricius, 1775      |
| 20      |               |  | <i>Gymnopleurus cyaneus</i> F                    |
| 21      |               |  | <i>Gymnopleurus gemmata</i> Harold, 1871         |
| 22      |               |  | <i>Onitis philemon</i> Fabricius, 1801           |
| 23      |               |  | <i>Onthophagus hindu</i> Arrow, 1931             |
| 24      |               |  | <i>Heliocopris gigas</i> Linnarus                |
| 25      |               |  | Cetoniinae                                       |
| 26      |               | <i>Oxycetonia versicolor</i> Fabricius |  |
| 27      |               | Melolonthinae                          | <i>Maladera amboliensis</i> Ahrens & Silvia 2016 |
| 28      |               |  | <i>Holotrichia</i> Sp.                           |
| 29      |               | Tenebrionidae                          | Platynotini                                      |
| 30      | Tenebrioninae |  | <i>Gonocephalam byline</i> Walker, 1858          |
| 31      |               |  | <i>Platinotus punctipen</i> Mulsant & Roy, 1853  |
| 32      | Pimellinae    |  | <i>Rhytinota indica</i> Schaufuss, 1872          |
| 33      |               |  | <i>Adesmia monilis</i> , Klug, 1830              |