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A preliminary checklist of coleopteran species in Ri Bhoi District Meghalaya, India

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Abstract
The present study provides one of the first systematic assessments of Coleopteran diversity in the Ri Bhoi District, Meghalaya, conducted from April 2024 to August 2025 across varied habitat types. A total of 71 species belonging to 59 genera and 9 families were documented during the survey, highlighting a considerable richness of beetle fauna in the region. The family Scarabaeidae represented the highest species proportion (31%), followed by Carabidae (14%), whereas other families contributed comparatively fewer species. Habitat-wise analysis revealed that forest ecosystems and agricultural landscapes supported a greater diversity of Coleoptera than urban and anthropogenically disturbed sites, indicating the influence of habitat complexity on species distribution. A notable proportion of species recorded were found to be pest species, emphasizing the agricultural significance of the order**.**

Keywords: Diversity, Meghalaya, Ri Bhoi, coleopteran

Introduction

The largest and most varied class of animals is the class Insecta, which belongs to the phylum Arthropoda. With 5–10 million species worldwide, arthropod is the largest phylum of the animal kingdom and account for about 80% of all animal species currently known (Das *et al*., 2024) [1]. This is the largest category of organisms at the order level, with different adaptations to various environmental conditions and habitats (Kritika *et al*., 2017) [8]. Forewing development into sclerotized elytra has been identified as a key element in effective adaption. In most beetles, the elytra protect the membrane flight wings and abdomen. The elytra are supposed to shield beetles against environmental stressors and predators. It is impossible to even count the number of described species of beetles, as well as to estimate the number of undescribed species, due to their extreme diversity and the lack of knowledge about the majority of species (Bouchard *et al*., 2017) [2]. Beetles are extremely diverse, both environmentally and biologically. Diversity adds to ecosystem dynamics, functioning, and productivity. Diversity is correlated with the number of species and functional groups that have distinct ecological roles. Beetles are primarily terrestrial herbivores, but some are predators with specialized host ranges and life cycles. Beetles make up almost 40% of all known insect species, and new species are frequently discovered (Thakkar *et al*., 2017). Numerous beetles are thought to be significant pests of stored products and agricultural plants. They target processed fibers, cereals, and wood products, as well as every portion of living plants. Wood boring beetles and scavengers are beneficial for recycling and decomposing organic materials. Aphids and scale insects are biologically controlled by predatory species like lady beetles. Not every part of the planet is equally familiar with the beetle fauna. Studying and reporting coleopteran fauna of a region is a vast study. Several authors presented their reports on particular families of Beetles. According to Kazmi *et al*., (2004) [9] of the 3,50,000 species in the Coleoptera order, approximately 15,088 are found in India. Bouchard *et al*., (2017) [2] reported there are almost 3,86,000 species of beetles that are still alive and are thought to be legitimate. Based on his estimation most of the insect's species belongs to 6 mega diverse families, *viz*., Staphylinidae, Curculionidae, Carabidae, Chrysomelidae, Cerambycidae, and Scarabaeidae. Scarab beetle species diversity and abundance were examined in Assam and 44 species of scarabs were found in 21 genera and 6 subfamilies, 41 of which are new records (Bhattacharyya *et al*., 2017) [5]. Many of the coleopteran species are regarded as bioindicators. A bioindicator species is one that represents the biotic and abiotic conditions of the environment; it also symbolizes the diversity of other species and changes in the habitat, community, or ecosystem (Gerhardt, 2002) [7]. Tiger and carabid beetles have been employed as bioindicators in a number of reports from various nations (Rainio & Niemela, 2006) [11]. Considering the significance of this group of arthropods and scarcity of detailed information, this present study aims to explore the Coleopteran diversity and to prepare a checklist of Coleopteran Species in Ribhoi, Meghlaya. This work can be used as a starting point for further investigations on habitat preferences, seasonal variations, and the impact of environmental factors on beetle diversity.

Material and Methods

Ri Bhoi District, located in the northern part of Meghalaya, India, lies approximately between 25°40′ N to 26°20′ N latitude and 91°45′ E to 92°15′ E longitude. It forms an important geographical region bordering Assam in the north and east, and is known for its hilly terrain, rich biodiversity, and extensive forest cover. The district's administrative headquarters is Nongpoh, situated along the National Highway connecting Guwahati and Shillong, making the region strategically significant. With varied elevations, lush subtropical forests, and diverse ecological habitats, Ri Bhoi plays a crucial role in conservation and ecological research in Northeast India, particularly in studies related to flora, fauna, and environmental gradients. The field survey was

carried out in the study area on weekly basis from April 2024 to August 2025. Beetles were collected by using the method of Hand picking, Light trapping, and plant jerking techniques, for the aquatic beetles use aquatic hand net for collection and all the methods were use randomly in the morning 8 to 11 AM, Evening 3 to 5 PM and during night time use light Trapping 7 PM to 10 PM. For the light trapping method use LED light, Handpicking method use in the soil, dung and forest areas of the study area. After Collection some samples were preserved by 70% ethanol and some of them are preserved by dry method. All the digital images of all the specimens were obtained with the Smartphone used macro lens and the specimens were identified on basis of their morphological characters and it was done by taking help of the identification literature of Lindroth C.H 1992 [10], Bousquet Y 1990 [3], Chandra K *et al*., 2005.

Result

During the survey period from April 2024 to August 2025, a total of 71 species of Coleoptera were recorded from various habitats of Ri Bhoi District, Meghalaya. These species were distributed across 59 genera and 9 families, indicating a rich and diverse beetle fauna in the region. The most dominant families observed were Scarabaeidae (31%) Carabidae (14%), followed by the others families and which together accounted for a major proportion of the total species recorded. Most of the species are pest in nature. Species richness was found to vary among different habitats, with forest areas and agricultural fields supporting a higher number of species compared to urban or disturbed sites. The presence of both common and rare species highlights the ecological heterogeneity of the district. Fig 1: Showing the family wise distribution of all the coleopteran species. Table 1 showing the coleopteran species checklist with their importance.

Table 1: Showing the coleopteran species checklist with their importance

Sl No	Family	Genus	Species	Author, year	Importance
1.	Carabidae	Anthia	*A. sexguttata*	Fabricius,1775	Pest predator
2.		Bembidion	*B. conforme*	Dejean,1831	-
3.		Brachinus	*B. explodens*	Duftschmid 1812	-
4.		Chlaenius	*C.bimaculatus*	Bonelli 1810	-
5.		Drypta	*D. lineola*	Latreille,1796	-
6.		Laemostenus	*Laemostenus spp*	Gyllenhal,1835	-
7.		Pheropsophus	*P. catoirei*	Dejean,1825	-
8.			*P. verticulis*	Dejean,1825	-
9.		Pterosticus	*P. aethiops*	Panzer,1796	Pest predator
10.		Tachyta	*T. nana*	Kirby,1837	-
11.	Scarabaeidae	Anomala	*A. bengalensis*	Blanchard,1851	Decomposers, enricher
12.		Aphodius	*A. fossor*	Linnaeus,1758	Decomposers, enricher
13.		Chrysina	*C. lecontei*	Horn,1882	-
14.		Onitis	*O. vanderkelleni*	Fabricius, 1798	-
15.		Copris	*C.incertus*	Say,1835	Enricher
16.			*C.numa*	Lansberge,1886	Enricher
17.			*C.lunaris*	Geoffroy,1762	Improve soil structure
18.			*C.repertus*	Walker,1858	Improve Nutrient cycle
19.		Cyclocephala	*C. pasadenae*	Casey,1915	-
20.		Heliocopris	*H. gigas*	Linnaeus,1758	-
21.			*H. dominus*	Bates,1868	Help to control the spread parasites and diseases
22.		Onthophagus	*O. alropolitus*	Fabricius ,1798	Decomposers, enricher
23.		Gametis	*G. versicolor*	Fabricius ,1775	Pestof Cotton, millets, Oilseed, lentils
24.		Onthophagus	*O. tweedensis*	Blackburn,1903	Decomposers, enricher
25.			*O. gazella*	Fabricius,1787	Decomposers, enricher
26.			*O. mopsus*	Fabricius,1792	Enricher
27.			*O. taurus*	Schreber,1759	Decomposers, enricher
28.		Phyllophaga	*P. nebulosa*	Polihronakis,2007	Pest predator
29.			*P. obsoleta*	Blanchard,1851	Pest of maize
30.		Catharsius	*C. molossus*	Linnaeus,1758	Decomposers, enricher
31.		Protaetia	*P. fusca*	Herbst,1790	Pest of mango.
32.		Lepidiota	*L. stigma*	Fabricius,1798	Pest of sugarcane
33.	Dysticidae	Cybister	*C.tripunctatus*	Olivier,1795	Feed on Mosquito larvae
34.		Liybius	*Llybius spp*	Fabricius,1882	-
35.		Cybister	*C. fimbriolatus*	Say,1825	-
36.		Laccophilus	Laccophilus spp	Leach,1815	Predators
37.		Hydaticus	*Hydaticus spp*	Leach,1817	Predators
38.		Herophydrus	*H. musicus*	Klug,1834	-
39.	Coccinalidae	Adonia	*A. variegata*	Goeze,1777	Predator of Indian grain aphids
40.		Brumoides	*B. suturalis*	Fabricius,1789	Predator of mealybug
41.		Chilocerus	*C. nigritus*	Fabricius,1798	Predator of aphids
42.		Coccinella	*C. undecimpunctata*	Linnaeus,1758	Pest predator
43.		Harmonia	*H. axyridis*	Pallas,1773	Pest of cauliflower
44.		Menochilus	*Menochilus spp*	Fabricius,1781	Natural predators
45.		Micraspis	*M. discolor*	Fabricius ,1798	Predator of brown plant hopper

46.	Curculionidae	Bagous	*B. alismatis*	Marsham,1802	Leaf miner
47.		Cosmopolites	*C. sordidus*	Germar,1824	Bannana root borer
48.		Notaris	*N. scirpi*	Germar,1817	-
49.		Odoiporus	*O. longicollis*	G.A.K. Marshall,1930	Banana Stem borer
50.		Polydrusus	*P. formosus*	Mayer,1779	Pest of oak and hazel
51.			*P. mollis*	Strom,1768	-
52.		Sitophilus	*S. oryzae*	Linnaeus,1763	Pest of stored grain
53.	Hydrophilidae	Hydrophilus	*H. triangularis*	Say,1823	Scavanger
54.			*H. piceus*	Linnaeus ,1758	Scavanger
55.	Cerambycidae	Cholorophorus	*C.anmularis*	Fabricius ,1758	Bamboo borer
56.		Stromatium	*S. barbatum*	Fabricius,1775	Teak borer
57.		Batocera	*B. rufomaculata*	Oe, Geer,1775	Pest of fig trees
58.		Niphona	*N. fuscatrix*	Fabricius,1792	-
59.		Arhopalus	*A. productus*	LeConte,1850	House borer
60.		Celosterna	*C. scabratoea*	Fabricius,1781	Pest of mango, cauarina
61.		*Olenecamptus*	*O. bilobus*	Fabricius,1801	Pest of mullberry, Oak, banyan etc
62.		*Apomecyna*	*A. histrio*	Audinet -Serville,1835	Pest of cucurbit crops
63.	Tenebrionidae	Tribolium	*T. castenium*	Herbst,1797	Pest of stroed grains
64.		Gonocephalum	*Gonocephalum spp*	Chevrolat,1849	Pest of oilseed, legumes.
65.		Tenebrio	*T. molitor*	Linnaeus,1758	Pest of grains, vegetables
66.		Alphitobius	*A. diaperinus*	Panzer,1797	Predator of flies, mites, fungi etc.
67.		Eleodes	*Eleodes spp*	Eschscholtz,1829	-
68.		Opatrum	*O. sabulosum*	Fabricius ,1775	Pest of sprouts
69.	Buprestidae	Acmaeodera	*A. viridaenea*	Eschscholtz,1829	Wood borer
70.		Sternocera	*S. aequisignata*	E. Saunders,1866	-
71.			*S. sternicornis*	Linnaeus,1758	-

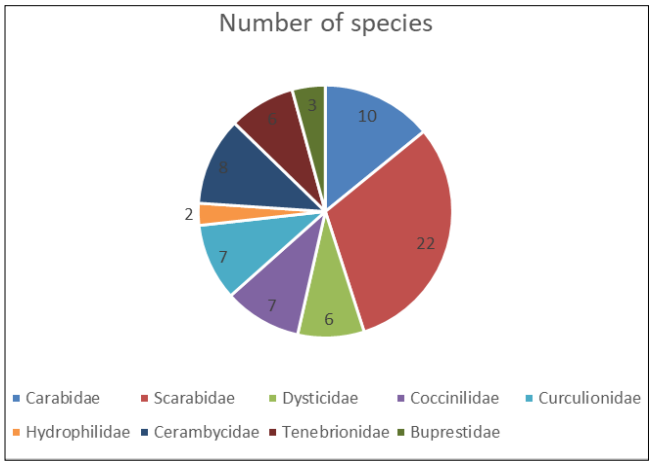

Fig 1: Showing the family wise distribution of all the coleopteran species.

Discussion

The present study represents one of the first attempts to document the diversity and distribution patterns of Coleoptera in Ri Bhoi District, Meghalaya. A total of 71 species belonging to 59 genera and 9 families were recorded during the survey period from April 2024 to August 2025. The results indicate that the order Scarabaeidae contributed the highest number of species, followed by Carabidae, Cerambycidae, and Coccinellidae, while families such as Hydrophilidae and Buprestidae were comparatively less represented. This dominance of Scarabaeidae and Carabidae is consistent with general patterns observed in tropical forest ecosystems, where these families are known to be both taxonomically rich and functionally diverse, often associated with soil turnover, decomposition, and predation on other arthropods. The diversity recorded in the study area reflects the heterogeneous nature of habitats within Ri Bhoi, which includes forested regions, agricultural landscapes, and semi-urban patches. Although no distinct distributional pattern was observed among the families, the presence of both terrestrial and aquatic beetle taxa suggests a wide range of microhabitats supporting different ecological guilds. The occurrence of aquatic families such as Dytiscidae and Hydrophilidae, albeit in low numbers, indicates the availability of freshwater habitats conducive to their survival. The use of multiple collection techniques—hand picking, light trapping, plant jerking, and aquatic hand netting—proved effective in capturing both diurnal and nocturnal species. Light trapping, conducted between 7:00 PM and 10:00 PM, particularly enhanced the sampling of nocturnal families such as Scarabaeidae and Cerambycidae, which are known to be strongly phototactic. Similarly, hand collection from soil, dung, and forest litter yielded a considerable number of ground-dwelling beetles, especially from the families Carabidae and Tenebrionidae. The complementary use of ethanol and dry preservation methods ensured proper maintenance of the collected specimens for further taxonomic verification. Although this preliminary study did not reveal any clear spatial or seasonal distribution patterns, the richness of species recorded underscores the potential of Ri Bhoi as a biologically significant region for Coleopteran diversity. The lack of comparative data from adjacent districts or other regions of Meghalaya limits broader biogeographical interpretation; however, the findings serve as a baseline for future studies. Further research incorporating standardized sampling across seasons and habitat gradients could help elucidate patterns of endemism, population dynamics, and the effects of anthropogenic activities on beetle assemblages. Overall, the results emphasize that Ri Bhoi harbors a considerable diversity of Coleoptera, reflecting the ecological complexity and conservation value of this subtropical landscape. Expanding such studies at both taxonomic and ecological levels would contribute significantly to understanding the biodiversity status of northeastern India and support conservation planning in the region.

Photo Plate

Chlorophorus anmularis

Hydrophilus triangularis

Lepidiota stigma

Protaetia fusca

Stromatium barbatum

Onthophagus gazelle

Batocera rufomaculata

Anomala bengalensis

Cosmopolites sordidus

Cyclocephala atricapilla

Heliocopris dominus

Sitophilus Oryzae

Conclusion

The present preliminary investigation provides a foundational understanding of Coleoptera diversity in Ri Bhoi District, Meghalaya. A total of 71 species under 59 genera and 9 families were recorded, reflecting a moderate level of beetle richness within the region. The dominance of families such as Scarabaeidae and Carabidae highlights their ecological significance in maintaining soil health, nutrient recycling, and predatory balance. The coexistence of both terrestrial and aquatic taxa further indicates that Ri Bhoi supports a range of microhabitats capable of sustaining diverse beetle assemblages. Although no distinct distributional patterns were observed, the findings underline the importance of continued and systematic monitoring of Coleopteran fauna in the area. This study can serve as a baseline for future research aimed at assessing seasonal variations, habitat preferences, and the influence of environmental factors on beetle diversity. Given the increasing pressures from deforestation and land-use changes in Meghalaya, such faunal assessments are crucial for framing region-specific conservation strategies. In conclusion, the present work emphasizes that Ri Bhoi District harbors a rich and varied beetle fauna deserving of further ecological and taxonomic attention. Continued long-term surveys, along with the integration of molecular and geospatial tools, would significantly enhance our understanding of the region's entomofaunal diversity and contribute to the broader goal of biodiversity conservation in northeastern India.

Reference

1. Das AN, Bhagawati S, Kalita M, Das M, Das K. Exploring Edible Insects: An Investigation in Kamrup District, Assam and Ri-Bhoi District, Meghalaya, North-Eastern India. Asian Journal of Biological and Life Sciences,2024:13(1):187.
2. Bouchard P, Smith AB, Douglas H, Gimmel ML, Brunke AJ, Kanda K. Biodiversity of *Coleoptera*.

Insect Biodiversity: Science and Society, 2017, 337–417.
3. Bousquet Y. Beetles Associated with Stored Products in Canada, An Identification Guide. Research Branch, Agriculture Canada, Canada, 1990, 220.
4. Biswas S. Studies on the scarab beetles, *Coleoptera*: *Scarabaeidae* of north eastern India, A new species and notes on other Indian species of subgenus *Strandius*, genus *Onthophagus*. 1981.
5. Bhattacharyya B, Handique G, Pujari D, Bhagawati S, Mishra H, Gogoi D, *et al.* Species diversity and relative abundance of scarab beetle fauna in Assam, northeast India. Journal of Entomology and Zoology Studies,2017:5(1):711–716.
6. Chandra K, Gupta D, Ghosh J, Das P, Bhunia D. *Insecta*, *Coleoptera*. Faunal Diversity of Biogeographic Zones of India: North-East, 2021, 377–451.
7. Gerhardt A. Bioindicator species and their use in biomonitoring. Environmental Monitoring,2002:1:77–123.
8. Kritika T, Jaimala S. Diversity and ecology of *Coleoptera* in India, A review. Journal of Entomology and Zoology Studies,2017:5(2):1422–1429.
9. Kazmi SI, Ramamurthy VV. *Coleoptera*, *Insecta* fauna from the Indian Thar Desert, Rajasthan. Zoos' Print Journal,2004:19(4):1447–1448.
10. Lindroth CH. Ground Beetles, *Carabidae* of Fennoscandia, A Zoogeographic Study Part I. Amerind Publishing Co. Pvt. Ltd., New Delhi, India, 1992.
11. Rainio J, Niemelä J. Comparison of carabid beetle, *Coleoptera*, *Carabidae* occurrence in rain forest and human-modified sites in south-eastern Madagascar. Journal of Insect Conservation,2006:10(3):219–228.
12. Rahman I, Sonowal C, Nath M. Diversity pattern of beetles, *Insecta*, *Coleoptera* in and around the historic Joysagar Tank of Assam, India. Trends in Biosciences,2013:6(1):78–79.
13. Thakkar B, Parikh PH. A study on diversity and abundance of coleopterans in Gujarat, India. Journal of Entomology and Zoology Studies,2016:4(5):1082–1089.