Common faunal diversity on forest floor of Bonai Forest Division, Odisha, India and their importance in forest ecosystem

ABSTRACT

Bonai forest division is enjoying the tropical moist deciduous, tropical dry deciduous, and tropical semi-evergreen forest. Among the biotic and abiotic factors, faunal species that are found on the forest floor are very important. They are important members of the forest food chain, feed upon the dead and decaying matter, and after death, add organic matter to the soil as a source of nutrients for the floral communities. For a better understanding of the role and functions of these faunal species, there is a need for study and documentation. Keeping the importance of faunal species of forest floor, we made an attempt to document common faunal species of Bonai Forest Division, Odisha during 2021-2022. From the study, we observed 54 common faunal species found on the forest floor and discussed their importance in the forest ecosystem in the present study.

Keywords: Food chain, factors, components, insects

INTRODUCTION

The ecosystem serves humankind directly or indirectly by providing us with food to eat, water to drink, oxygen to breathe, raw materials, purified air, regulating climate, preventing soil erosion, and also provides aesthetical and cultural services (Tian et al., 2015; Martín-López et al., 2010). Forests are the principal component of the ecosystem (Pohjanmies et al., 2017). Forest ecosystems constitute different types of animals, plants, and microorganisms and their related genetic diversity. Temperate, boreal, and tropical forests are the habitat of more than 80% of terrestrial plants, animals, and insects. The forest ecosystem comprises of biotic and abiotic factors, like, flora, fauna, and microbes (producers, consumers, herbivores, carnivores, omnivores, and decomposers), and abiotic factors like; air, water, soil, temperature, light, minerals, pH, humidity, topography (atmosphere, chemical elements, sunlight/temperature, wind, and water) etc. Forest floor is one of the important characteristics of the forest ecosystem which is mainly made up of non-living organic materials, many floral and faunal species. Non-living organic materials such as shaded parts of trees and plants like; leaves, branches, stems, bark, fallen flowers, fruits, and detritus (fecal matters, dead bodies of faunal species), those existing in various stages of decomposition above the soil surface. From the point of view of biodiversity, the forest floor is one of the richest components of an ecosystem because it consists of a huge number of predators like invertebrates, fungi, algae and archaea, and decomposers. Insects are major contributors to tropical diversity (Lewinsohn et al. 2005) as well as ecosystem functioning (Wilson 1987) making them the most important members of the forest floor. Keeping the importance of forest floor, authors have taken an attempt to enumerate the most common faunal species including insects of Bonai Forest Division, Odisha, India.

METHODOLOGY

Schedule field tours and preliminary surveys were made from 2021-2022 in Bonai Forest Division, Sundargarh district of Odisha, India. A total of 13 surveys were made inside the forest areas. All the field surveys were done during the day as well as at night time at different forest ranges of Bonai Forest Division. Inside the forest areas, we collected common faunal species, documented them, and then we released them to their natural habitat. All the faunal species were identified by the authors using their morphological characteristics with the help of available literature.

RESULTS AND DISCUSSION

Results revealed that about 54 common faunal species are recorded from the forest floor of Bonai Forest Division, Odisha, India. Details are listed in Table 1. Out of those 54 common faunal species, 02 nos. of species of class Reptilia are restricted to India, and 02 nos. species of class Insecta are used as food supplements and also have medicinal values. It was observed that all 54 nos. of faunal species are belonging to 06 different classes (Plate 1). From them, 33 are from class Insecta, 08 are from Reptilia, 06 are from Arachnida, 03 are from Diplopoda, and 02 are from each of Gastropoda, and amphibia. All these faunal species are interconnected by prey and predator relationship to balance the ecosystem. The forest floor of Bonai Forest Division is dominated by class Insecta, Reptilia, and Arachnida which helps to maintain a well-balanced food chain and allows the floral and faunal diversity to flourish.

Table. 1. Check list of common faunal species recorded in the forest floor of the study area

Class	Common name	Scientific name	Descriptor name
Insecta	Black carpenter ant	*Camponotus vagus*	Scopoli, 1763
	Red weaver ant/emerald ant	*Oceophylla smaragdina*	Fabricius,1775
	Scarab beetle	*Scarabaeus gangeticus*	Castelnau,1840
	Dung beetle	*Gymnopleurus cyaneus*	Fabricius, 1798
	Tiger beetle	*Calochora bicolor haemorrhoidalis*	Wiedemann,1823
	Domino beetle	*Anthia sexguttata*	Fabricius,1775
	Peacock pansy	*Junonia almana*	Linnaeus, 1758
	Lime swallowtail	*Papilio demoleus*	Linnaeus, 1758
	Indian sunbeam	*Curetis thetis*	Drury, 1773
	Clear sailer	*Neptis clinia*	Moore, 1872
	Common Pierrot	*Castalius rosimon*	Fabricius, 1775
	Common grass yellow	*Eurema hecabe*	Linnaeus, 1758
	Annual cicada	*Platypleura capitata*	Olivier, 1790
	Crepuscular cockroach	*Therea nuptialis*	Gerstaecker, 1861
	Black cricket	*Teleogryllus emma*	Ohmachi & Matsuura, 1951
	Banded cricket	*Gryllodes sigillatus*	Walker, 1869
	Japanese burrowing cricket	*Velarifictorus micado*	Saussure, 1877
	Ground skimmer	*Diplacodes trivialis*	Rambur, 1842
	Common glow-worm	Lampyris noctiluca	Linnaeus, 1767
	Grasshopper	*Xenocatantops humilis*	Serville, 1838

	Hooded grasshopper	*Teratodes monticollis*	Gray,1832
	Coffee locust	*Aularches miliaris*	Linnaeus, 1758
	Greater angle-wing katydid	*Microcentrum rhombifolium*	Saussure, 1859
	European mantis	*Mantis religiosa*	Linnaeus, 1758
	Moth	*Macrobrochis gigas*	Francis Walker, 1854
	Lantern bug	*Kalidasa lanata*	Drury, 1773
	Orange sharpshooter leafhopper	*Bothrogonia addita*	Walker, 1851
	Flower-spike bug	*Phromnia rosea*	Melichar, 1901
	Soap berry bug	*Leptocoris dispar*	Hsiao,1963
	Flying termite	*Nasutitermes lacustris*	Bugnion, 1912
	Laboratory stick insect	*Carausius morosus*	Sinety, 1901
	webspinner	*Aposthonia ceylonica*	Enderlein, 1912
	Leaf footed bug	*Leptoglossus phyllopus*	Linnaeus, 1767
Arachnida	Red velvet mite	*Trombidium sp.*	Fabricius, 1775
	Wolf spider	*Lycosidae spp.*	Sundevall, 1833
	Lynx spider	*Oxyopes salticus*	Thorell, 1869
	Asian blue smokey tarantula	*Chilobrachys dyscolus*	Simon, 1886
	Huntsman spider	*Heteropoda venatoria*	Linnaeus, 1767
	Giant forest scorpion	*Gigantometrus swammerdami*	Simon, 1872
Diplopoda	House centipede	Scutigera coleoptrata	Linnaeus, 1758
	Red-headed centipede	*Scolopendra morsitans*	Linnaeus, 1758
	Yellow-spotted millipede	*Harpaphe haydeniana*	Wood, 1864
Gastropod	Horntail snail	*Macrochlamys indica*	Benson, 1832
	Asian Trampsnail	*Bradybaena similaris*	Ferussac, 1821
Amphibian	Common Indian Toad	*Duttaphrynus malanosticus*	Schneider, 1799
	Fungoid frog	*Hydrophylax malabaricus*	Tschudi, 1838
Reptilia	Banded krait	*Bungarus fasciatus*	Schneider, 1801
	Indian rat snake	*Ptyas mucosa*	Linnaeus, 1758
	Common cat snake	*Boiga trigonata*	Schneider, 1802
	Indian green pit viper	*Craspedocephalus gramineus*	Shaw, 1802
	Golden skink	*Eutropis carinata*	Schneider, 1801
	Common dotted garden skink	*Riopa punctata*	Linnaeus, 1758
	Indian garden lizard	*Calotes versicolor*	Daudin, 1802
	East Indian leopard Gecko	*Eublepharis hardwickii*	Gray, 1827

Plate. 1. Some common faunal species found on the forest floor of Bonai Forest Division, **a.** *Oceophylla smaragdina* **b.** *Teleogryllus emma* **c.** *Therea nuptialis* **d.** *Kalidasa lanata* **e.** *Leptocoris dispar* **f.** *Duttaphrynus malanosticus* **g.** *Scolopendra morsitans* **h.** *Macrochlamys indica* **i.** *Diplacodes trivialis* **j.** *Leptoglossus phyllopus* **k.** *Chilobrachys dyscolus* **l.** *Phromnia rosea* **m.** *Harpaphe haydeniana* **n.** *Castalius rosimon* **o.** *Anthia sexguttata* **p.** *Calochora bicolor haemorrhoidalis* **q.** *Aposthonia ceylonica* **r.** *Aularches miliaris* **s.** *Gigantometrus swammerdami* **t.** *Trombidium sp.*

CONCLUSION

The study area is dominated by Insecta, Reptilia, and Arachnid, its untouched ecosystem is home of many important species that are building blocks of the forest ecosystem and food chain. The study area is home of 02 Reptilia species that are restricted to India i.e., *Eublepharis hardwickii* and *Craspedocephalus gramineus*, and 02 edible insect species i.e., *Oceophylla smaragdina* and *Phromnia rosea*. From the present study, it is concluded that Bonai Forest division is enjoying a rich biodiversity with its various floral and faunal species. All the faunal species found on the forest floor are very important for the ecosystem as prey or as a predator at different trophic levels and also these faunal species play important role in nutrient cycling and carbon cycling after their death adding vital nutrients for the floral species. As most of its forest areas are untouched by human activity the forest floor is very lively with many floral and faunal species. The forest's rich biodiversity is an indicator of a healthy ecosystem and brings attention to conserving the area from human interference.

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