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Research paper

Studies on Beetles (Insecta: Coleoptera) Diversity and Distribution in the different Elevation Zones of Forest areas of North-West Himalaya of India

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Abstract: Beetles were sampled of study over during 2018-2019 in different elevation zones of forest areas of Himachal Pradesh and Uttarakhand, North-West Himalaya. India. A total of 254 individuals of beetles, representing 37 species, 27 genera and 8 families were recorded during the study period. On the basis of total number of species Scarabaeidae was the most dominant family with 17 (45.94%) species followed by Coccinelidae (8 species, 21.62%), Cerambycidae (4 species and 10.81%) were major families, whereas others Carabidae, Chrysomelidae and Curculionidae (02 species and 5.41% each), Meloidae and Lucanidae (01 species and 2.70% each) respectively. On the basis of total number of individuals,Scarabaeidaewere the most abundant individuals and constituted 37.79% of the total beetles followed by Coccinellidae (25.20%), Cerambycidae (10.24%), Carabidae(7.48%), Curculionidae (7.09), Chrysomelidae (6.30%),Meloidae (3.14%) and Lucanidae (2.76%) respectively.
Beetles community showed a significant variation along different elevation zones as abundance and species diversity of beetles declined with increasing elevations across different forest areas of the North-West Himalaya. Climatic variables significantly influenced the beetle community as higher species richness, abundance and diversity were recorded lower elevation and in mixed forest type. The diversity and distribution were also assessed in different forest types.

Keywords: Coleoptera, Beetles, diversity, distribution, North-West Himalaya, forest ecosystem

Introduction:

Forests are one of the most important global vegetation types, serving functions from supporting healthy watershed, to wildlife habitat, and economic industries through their

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harvesting and tourism value. Understanding and mitigating threats to these resources is therefore of great societal importance. Increasing abiotic and biotic stressors can have a detrimental impact on forests and contribute to the global forest area loss (Shabaraju et al., 2016). Herbivorous insects are essential components of natural forest ecosystems, where their variety and population dynamics both influence and are influenced by forest composition and structure. Insects pests, on the other hand, may have a severe impact on both natural and cultivated forests, causing substantial tree damage and mortality (Sharma, 2016). Insects, for example, can harm up to 1.6 percent of the world's wooded land (35 million hectares) each year and resulting in greater economic losses and food security threats (Andrew et al. 2013; Gupta and Sankaran, 2021). Most of the beetles have been particularly damaging the health of forest ecosystem around the world (Stebbing, 1914; Nair, 2007; Ball et al., 2021).

The order Coleoptera which include beetles is the most diverse order of class Insecta under the Phylum Arthropoda. This is the largest group of comparable units among all animals. India being situated in tropics is well known for richness of Coleopteran fauna.This is the largest order of insects worldwide, as well as in the forests, in terms of number of species (Beeson, 1941; Chandra et al., 2018). It is also of greatest importance in terms of damage caused to tree. Beetles are present everywhere, in all the major forest habitats, feeding on a variety of organic matter. A bewildering variety of beetles feds on leaves, fruits, flowers, woods and other products. Many beetles are regarded as major pests of forestry trees, agricultural plants and stored products in India (Stebbing, 1899, Lefroy, 1909, Beeson, 1941; Browne, 1968, Thakur, 2000; Joshi et al., 2004; Jha and Sen-Sarma, 2015; Patole, 2017; Paunikar, 2021). Scavengers and wood boring beetles are useful as decomposers and recyclers of organic nutrients. Predatory species such as lady beetles are important biological control agents of aphids and scale insects (Nair, 2007).

Beetles are found in almost every habitat and range in size from 1-100 mm. includes more than 3,89,487 extant species under 177 families globally, represents about 40% of all insects and 30% of all animals (Choate, 2003; Zhang, 2013; Chandra et al., 2018), these families divided under 4 suborders, Archostemata, Myxophaga, Adephaga and Polyphaga. The several families of order Coleoptera such as, Scarabaeidae, Curculionidae, Cerambycidae, Bruchidae, Tenebrionidae, Chrysomelidae, Bruprestidae, Elateridae, Bostrychidae, Coccinelilidae, Meloidae, Lucanidae, Carabidae, Cicindelidae are economic importance and play significance role in the forest and agro ecosystem (Nair, 2007, Banerjee 2014; Albert et al., 2021).In India more than 22,334 species of beetles have been documented by Chandra *et al*. (2018). Being distributed globally, they are present in almost all the ecosystems, except arctic snow and seawater.Recently, Gupta *et al*. (2018) compiled the beetle diversity in different biotic provinces of Indian Himalaya, this compilation reports about 10,533 species/subspecies of beetles belonging to 2,684 genera under 107 families, accounting 47.3% of the total beetle diversity of India and nearly 2.7% of its global diversity.

Recent year, some studies on Coleopteran diversity from the different national parks and wildlife sanctuaries areas of Himalaya region but there is large forest areas of protected and unprotected ofNorth-West Himalaya still remains to investigate different groups of fauna including beetles. Therefore, the purpose of the study was to determine the diversity and distribution of beetles in

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different elevation of forest areas of North-West Himalaya.

Material and Methods:

The present survey was conducted to investigate the entomofauna diversity and distribution including Coleoptera fauna fromdifferent forest areas of North-Western Himalayan states, Himachal Pradesh and Uttarakhand during 2018-2019. The insect samples were randomly collected by using various techniques *viz*. hand picking and other manual methods, sweep net and light traps of different light sources in different types of forest such as deodar, chir pine, mixed and sal and teak forest of two states. Field studies were aimed towards compilation of information on diversity of coleopterans. The collected specimens were stored in vials after suitably killing them with killing agents. The identification of specimens was done with the help of related taxonomic material.Specimens were compared with reference collections identified earlier from Zoological Survey of India. Some species of identified by expertise available in ZSI.The details of survey and sampling localities, districts, states, forest types vegetation, GPS coordinates and altitude presented in Table 1.

Table: 1 Details of Surveyed localities of North-West Himalayan states

Sr. No.	Forest areas	District/ States	Forest types	GPS coordinates	Elevation
1	Dharmashala Forest area	Kangra Himachal Pradesh	Deodar and Chir pine forest	N 32° 14. 993' E 076° 17. 984'	2000
2	Khajjar, Kalatop, Khajjiar WLS	Himachal Pradesh	Deodar and Chir pine forest	N $32^0$32.772' 076^0 03.550'E	1457
3	Dalhousie Forest area	Chamba/ Himachal Pradesh	Deodar and Chir pine forest	N 32°33.772′ E 076°03.550′	1970
4	Rajpura Forest area	Chamba/ Himachal Pradesh	Mixed forest, Bushes, Flowering plants	N 32°59.630′ E 076°10.60′	489
5	Govind Wildlife Sanctuary	UttarakashiUttarakashi, Uttarakhand	Chir-Pine, Mixed forest, Bushes, Flowering plants	N $31^0$04'13.05' E $078^0$06'16.01'	1438
6	Corbett National Park		Teak, Sal, Mixed forest, Bushes, Flowering plants	N $29^0$16'39.66' E $079^0$21'01.89'	376

Results and Discussion:

The extensive survey and collections undertaken from different elevation of forest areas of two states of North-West Himalaya, Himachal Pradesh and Uttarakhand and collectecd of 254 specimens belonging to families of Adephaga (1family) and suborder Polyphaga (7 families). The findings depicted in Table 2 and 3, revealed that the 37 coleopteran species belonged to 8 families of Suborder Adephaga (1 family) and suborder polyphaga (7 families). Of these, Carabidae,

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Cerambycidae, Chrysomelidae, Curculionidae, Lucanidae, Meloidae, Scarabaeidae andCoccinellidae were observed the major families. The analysis revealed that Scarabaeidae (17 species and 45.94%) and Coccinellidae (8 species, 21.62%), Cerambycidae(4 species and 10.81%) were major families, whereas Carabidae, Chrysomelidaeand Curculionidae (02 species and 5.41% each), Meloidae and Lucanidae (01 species and 2.70% each) were minor as compare to other families with species compositions.

Species composition:

A total 254 individuals of beetles belonging to 37 species, 26 genera and 8 families were recorded during the study period. On the basis of total number of specimens and families, Scarabaeidae (96 specimens, 37.79%) was the most dominant family with species followed by Coccindellidae (64 specimens, 25.20%), Cerambycidae (26 specimens, 10.24%), Carabidae (19 specimens, 7.48%), Curculionidae (18 specimens, 7.09%),),Chrysomelidae (16 specimens, 6.30%), and Meloidae (8 specimens, 3.14%), (Lucanidae 7 specimens, 2.76%), respectively recorded beetles during the study period.. Percent contribution of relative number of species and individuals of beetles collected from study area are presented in Table 3, Fig 1.

The 37 species, 27 genera of beetles under 8 families were recorded from the different elevation and forest types such as, chir pine, pines, sal, teak and mixed forest areas. The highest population of different families and species recorded in lower elevations as compared to higher elevation. The highest species and individual recorded in the mixed forest types as compared to other forest type. These families play in significant role in forest ecosystem as decomposer, prey, predators, beneficial and harmful insect pests of forestry trees and agricultural crops in worldwide (Beeson, 1941; Browne, 1968; Lawrence et al., 2000; Nair, 2007; Chandra et al., 2018; Albert et al., 2021).

The family Cerambycidae is commonly known as longhorn beetles, longicorns, capricorns, round-headed borers, timber beetles, 4 genera and 4 species recorded during the study period. Cerambycidae are cosmopolitan, the subfamilies Lamiinae, Cerambycinae and Prioninae are species rich in the tropical and subtropical parts of the world (Slipinski and Escalona, 2013). All the members of the family Cerambycidae are either phytophagous or xylophagous (Beeson and Bhatia 1939; Duffy, 1968). They also decompose dead wood, incorporating plant parts into the ground and allowing the renewal of forests by opening spaces and consequent seed germination. The family chrysomelidae commonly called Leaf beetles are the most abundant and harmful coleopteran pests of vegetables and show diverse adaptations to wide range of environmental conditions and habitats. The2 genera and 2 species were recorded during the study period. They are also highly specialized insects feeding on a wide range of plant groups and are important both ecologically and economically due to their worldwide distribution and distinct host range (Jolivet and Verma 2002).The ground beetles (family Carabidae) are common predators of many different insects and other arthropods, including fly eggs, caterpillars, wireworms, 2 genera and 2 species were recorded during the study period.

The family Scarabaeidaeis also called Dung beetles, most diverse family of Coleoptera and 9 genera and 17 species were recorded during the study period from different forest areas. They have been successfully used to reduce the populations of pestilent flies and parasitic worms that breed in cattle dung. Dung beetles are taxonomically as well as functionally very important component of

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terrestrial ecosystem, but also in seed dispersal and the dynamics of some parasite species and regulation of enteric parasites and dung breeding dipterans pests while the harmful phytophagous beetles or leaf-chafers are agricultural pests of various commercial crops, feeding mostly on leaves, flowers, fruits, roots and other parts of the plants (Lawrence et al., 2000; Nair, 2007; Chandra et al., 2012). Majority of the phytophagous species belonged to the subfamily Melolonthinae and Rutelinae while the coprophagous species belonged to Dynastinae and Cetoniinae (Mehta et al., 2010; Chandra et al., 2021).

The coccinellid beetle is commonly known as Ladybird beetles, 7 genera and 8 species were recorded during the study periods in various elevations of forest areas of North-West Himalaya. It comprises a significant group of predatory beetles which are being utilized in biological control of insect pests from more than one hundred years ago throughout the world (Evans, 2009). A Ladybird beetles are mainly predatory in nature and feed upon the phytophagous insects of agricultural, horticultural and forestry species (Agarwala and Ghosh, 1988; Parvez et al., 2020).

Family Curculionidae largest family of order Coleoptera and commonly called weevils, 1 genera and 2 species recorded during the study period. It includes some extremely destructive pests e.g. grain weevils, the rice weevil, neem weevil, the boll weevil and. The genus *Myllocerus* is another important weevils found in India and Subcontinent. Several species of *Myllocerus* are polyphagous feeders of plants of forestry, agricultural and horticultural crops in nurseries and plantations (Beeson, 1941; Browne, 1968; Rammamurthyand Ghai, 1988; Paunikar 2015).The family Lucanidae commonly called Stag beetles, one genera and one species recorded during the study period. They are important saproxylic insects and can be used for biomonitoring forests. Lucanidae species have been used as forest biodiversity indicators. They play important roles in the carbon cycle because their larvae live in and feed on decaying wood, and adults feed on tree sap or decaying fruit (Biswas and Chatterjee, 1985; Songvorawit et al., 2017).The family Meloidae commonly called Blister beetles, one genera and one species recorded during the study period. They act as minor pests for some crops and as major pests for others under certain conditions in several parts of the world (Ghoneim, 2013). Their common name to the fact that is a pharmaceutical product, cantharidin, is prepared from the dried insects. When these insects are handled, they exude a yellow fluid which contains cantharidin and causes blisters on human skin. This product has long been used as a medicine (Bologna and Di Giulio, 2011).

The various studies have revealed that North-West Himalayan Region harbors a rich diversity of Coleopteran beetles. Mani (1956) reported 186 species of beetles belonging to 18 families of order Coleoptera from Nival Zones of North-West Himalaya.Singh (1963) reported 190 species of beetles belonging to 26 families from North-East Himalaya. Biswas (1995) reported 105 species of beetles belonging to 9 families from Western Himalayan Ecosystem. Sharma et al. (2007) enumerated 18 species to 16 genera over nine families of the beetles diversity from Kalatop-Khajjar Wild Life Sanctuary, Himachal Pradesh. Chandra et al. (2007) documented 9 species of 4 subfamilies scarabaeidae from G.N.H.P., Himachal Pradesh. Kumar et al. (2007) have recorded 49 species of Scarabaeid Coleopteran insects belonging to 4 families from Kullu Valley of Himachal Pradesh. Purwar and Agarwal (2009) have been recorded 9 families order Coleoptera from the Kumaon region of Uttarakhand. Among the family Scarabaeidae, twelve

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species of grubs were found from this region. Chatterjee and Biswas (2010) examined and documented 147 examples comprising 44 species Scarabaeidae under 16 genera belonging to 3 subfamilies are included in this paper of which 6 speciesare new record from the Uttarakhand state. Chakraborty (2010) examined and recorded 914 examples of Coccinellidae beetles belonging to 39 species under 23 genera and 5 subfamilies. Out of 39 species 8 species were recorded earlier from Kumaon Hills and other places.

Chandra *et al.* (2012) have reported 11 species of Scarabaeid belonging to 11 genera, 5 subfamilies and 2 families of superfamily Scarabaeoidea from Govind Wildlife Sanctuary, Garhwal, Uttarakhand, India. Arya and Joshi (2014) documented 20 species of Coleopteran insects from Nanda Devi Biosphere Reserve, Western Himalayas, Uttarakhand, India. Arya et al. (2014) have reported 17 species of beetles belonging to 6 families from Shyampur forest range in Shivalik foot hills of Haridwar, India. Pathania et al. (2015) have reported 56 species of Scarabaeid beetles belonging to 20 genera and 4 subfamilies from different landscapes of Himachal Pradesh. Arya et al. (2016) studies on distribution and diversity of beetles in different elevationzones of Binsar Wildlife Sanctuary, Almora, Uttarakhand and reported 23 species, 18 genera and 6 families of beetles. Sharma *et al*. (2017) have given the inventory of the 65 species of predatory Coccinellidae of Himachal Pradesh. Mishra and Yousuf (2019) recorded 15 species of coccinellid beetles from forest ecosystem of Uttarakhand and all other species are predatory feeding on mealy bugs and aphids occurring on forest tree species.Ahmad and Khan (2019) recorded 18 species from five different zoogeographical habitats in Uttarakhand, North India. Arya et al. (2019) prepared a checklist on beetles diversity associated with the protected areas of Uttarakhand, Western Himalaya. Pervez et al. (2020) reported 18 predaceous ladybird beetle species belonging to 15 genera and 3 subfamilies.The six species ladybird beetles are the first time reported from Uttarakhand. Arya and Dayakrishna (2020) studied on the spatial distribution and habitat association of beetle assemblages in the Landscape of Corbett Tiger Reserve, Uttarakhand.

Recently, Ghosh et al. (2021) has given the taxonomic account of 285 species belonging to 98 genera in 5 families of superfamily Scarabaeoidea from Himachal Pradesh. Das et al. (2021) examined and documented 50 species belonging to 30 genera, 6 tribes and one subfamily of Coccinelidae beetles from different localities of Himachal Pradesh. Gupta et al. (2021) compiled 102 species belonging to 52 genera under 11 subfamilies, and 3 families, *i.e.*, Brentidae, Curculionidae and Attelabidae under superfamily Curculionoidea and 85 species of Curculionidae form the Himachal Pradesh. Chandra et al. (2021) compiled the 209 species belonging to 123 genera under 16 subfamilies, and four families, *i.e.*, Cerambycidae, Megalopodidae, Disteniidae, and Chrysomelidae. Chrysomelidae consists of 134 species belonging to66 genera,Cerambycidae consists of 73 species belonging to 55 genera, Megalopodidae, and Disteniidae one species each under one genus each from Himachal Pradesh.Kumar et al. (2022) studied the insect pests of forest and reported 15 species of beetles from high altitudinal transitional zones of North-West Himalaya. Singh and Ramola (2022) also reported 92 species of Coleoptera beetles from Uttarakhand state.

This study provides baseline data regarding Coleopteran species associated with different elevation and forest types, but more extensive studies need to be performed to develop a database on Coleoptera diversity and distribution succession from as many habitats

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as possible so that this kind of data can be used in forest and other ecosystem.

Tables 2: Diversity and Distribution of Coleoptera fauna in different forest areas of North-West Himalaya

SN	Families	Species	Distribution
1	Carabidae	*Anthia* (*Anthia*) *sexguttata sexguttata* (Fabricius, 1775)	Govind Wildlife Sanctuary, Corbett National Park, Uttarakhand
2		*Pheropsophus verticalis* (Dejean, 1825)	TaleruChamera Dam, Dalhousie, Himachal Pradesh
3	Cerambycidae	*Celosterna scabrator* (Fabricius, 1781)	Dainkund, Kalatop-Khajjiar WLS, Himachal Pradesh
4		*Aeolesthes holosericea* (Fabricius, 1787)	Dainkund, Kalatop-Khajjiar WLS, Himachal Pradesh, Corbett National Park, Uttarakhand
5		*Apriona germari* (Hope, 1831)	Taleru Chamera Dam, Dalhousie and Rajpura Forest area, Himachal Pradesh
6		*Batocera rumaculata* (De Geer, 1775)	Dalhousi Forest area, Rajpura, Chamba Forest area
7	Chrysomelidae	*Colasposoma viridicoeruleum* (Motschulsky, 1860)	Dainkund, Kalatop-Khajjiar WLS, Himachal Pradesh, Corbett National Park, Uttarakhand
8		*Zygogramma bicolorata* (Pallister, 1953)	Corbett National Park, Uttarakhand Phogut and Char Khet forest areas under Nainital Forest Division, Uttarakhand
9	Coccinellidae	*Brumoides suturalis* (Fabricius,1798)	Govind Wildlife Sanctuary, Uttarkhand
10		*Harmonia dimidiata* (Fabricius, 1791)	Dharamshal Forest area, Ghararu, Bharmour, Chamba, Himachal Pradesh, Taluka Forest area, Uttarkashi, Corbett National Park, Uttarakhand
11		*Coccinella septempunctata* (Linnaeus, 1758)	Dharmashal Forest area, Ghararu, Bharmour, Chamba, Himachal Pradesh Corbett National Park, Uttarakhand
12		*Coccinella transversalis* (Fabricius, 1781)	Kalatop-Khajjiar WLS, Himachal Pradesh, Corbett National Park, Uttarakhand
13		*Coelophora bissellata* (Mulsant,1850)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh Phogut and Char Khet forest areas under

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			Nainital Forest Division, Corbett National Park, Uttarakhand
14		*Hippodamnia variegata* (Goeze,1777)	Dharamshal Forest area, Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh, Corbett National Park, Uttarakhand
15		*Oenopia sauzeti* (Mulsant, 1886)	TaleruChamera Dam, Dalhousie, Himachal Pradesh
16		*Phrynocaria circumsta* (Mulsant,1850)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh
17	Curculionidae	*Myllocerus discolour* (Boeman, 1834)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh
18		*Myllocerus undecimpustuatus* (Faust , 1891)	Corbett National Park, Govind Wildlife Sanctuary, Uttarakhand
19	Lucanidae	*Prosopocoilus biplagiatus* (Westwood, 1855)	Govind Wildlife Sanctuary, Corbett National Park, Uttarkhand
20	Meloidae	*Mylabris cichorii* (Linnaeus, 1767)	Kalatop, Kalatop-Khajjiar WLS, Chamba Forest area, Himachal Pradesh, Corbett National Park, Uttarakhand
21	Scarabaeidae	*Anomala lineatopennis* (Blanchard, 1851)	TaleruChamera Dam, Dalhousie, Chamba Forest area, Himachal Pradesh
22		*Anomala bengalensis* (Blanchard, 1855)	Govind Wildlife Sanctuary, Uttarkhand,Ghararu, Bharmour, Chamba, Himachal Pradesh
23		*Anomala dorsalis* (Fabricius, 1775)	Rajpura Forest area, Chamba, Himachal Pradesh, Govind Wildlife Sanctuary, Uttarkhand
24		*Anomala dimidiata dimidiata* (Hope, 1831	Govind Wildlife Sanctuary, Uttarkhand Kugati Wildlife Sanctuary, Bharmour Chamba, Himachal Pradesh
25		*Brahmina crinicollis (*Burmeister, 1855)	Govind Wildlife Sanctuary, Uttarkhand
26		*Brahmina coriacea* (Hope, 1831)	TaleruChamera Dam, Dalhousie, Himachal Pradesh, Corbett National Park, Uttarakhand
27		*Copris sacontala* (Redtenbacher, 1848)	TaleruChamera Dam, Dalhousie, Himachal Pradesh
28		*Holotrichia consanguinea*	Rajpura Forest area, Chamba Forest

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		(Blanchard, 1850)	area, Himachal Pradesh, Govind Wildlife Sanctuary, Uttarkhand
29		*Holotrichia problematica* (Brenske, 1899)	Govind Wildlife Sanctuary, Uttarkhand
30		*Holotrichia serrate* (Fabricius, 1787)	Govind Wildlife Sanctuary, Uttarkhand
31		*Melolontha furcicauda* (Ancey, 1881)	Govind Wildlife Sanctuary, Uttarkhand
32		*Catharsius sagax* (Quensel, 1806)	Ghararu, Bharmour, Chamba, Himachal Pradesh , Corbett National Park, Phogut and Char Khet forest areasunder Nainital Forest Division, Uttarakhand
33		*Onitis singhalensis* (Lansberge, 1875)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh
34		*Onitis castaneous* (Redt., 1848)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh
35		*Onitis falcatus* (Wulfen, 1786)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh, Corbett National Park, Uttarakhand
36		*Oniticellus cinctus* (Fabricius, 1775)	Kangra, Himachal Pradesh, Corbett National park, Uttarakhand
37		*Onthophagus bonasus* (Fabricius, 1775)	Kalatop, Kalatop-Khajjiar WLS, Himachal Pradesh,Govind Wildlife Sanctuary, Uttarkhand

Table: 3 Percentage contributions of relative number of species and individuals of different families of order Coleoptera recorded during the study period

S. No.	Family	Total no. of species	Percent (%)	Total no. of Individuals	Percent (%)
1	Carabidae	02	5.41	19	7.48
2	Cerambycidae	04	10.81	26	10.24
3	Chrysomelidae	02	5.41	32	6.30
4	Coccinelidae	08	21.62	48	25.20
5	Curculionidae	02	5.41	18	7.09
6	Lucanidae	01	2.70	7	2.76
7	Meloidae	01	2.70	8	3.14
8	Scarabaeidae	17	45.94	96	37.79

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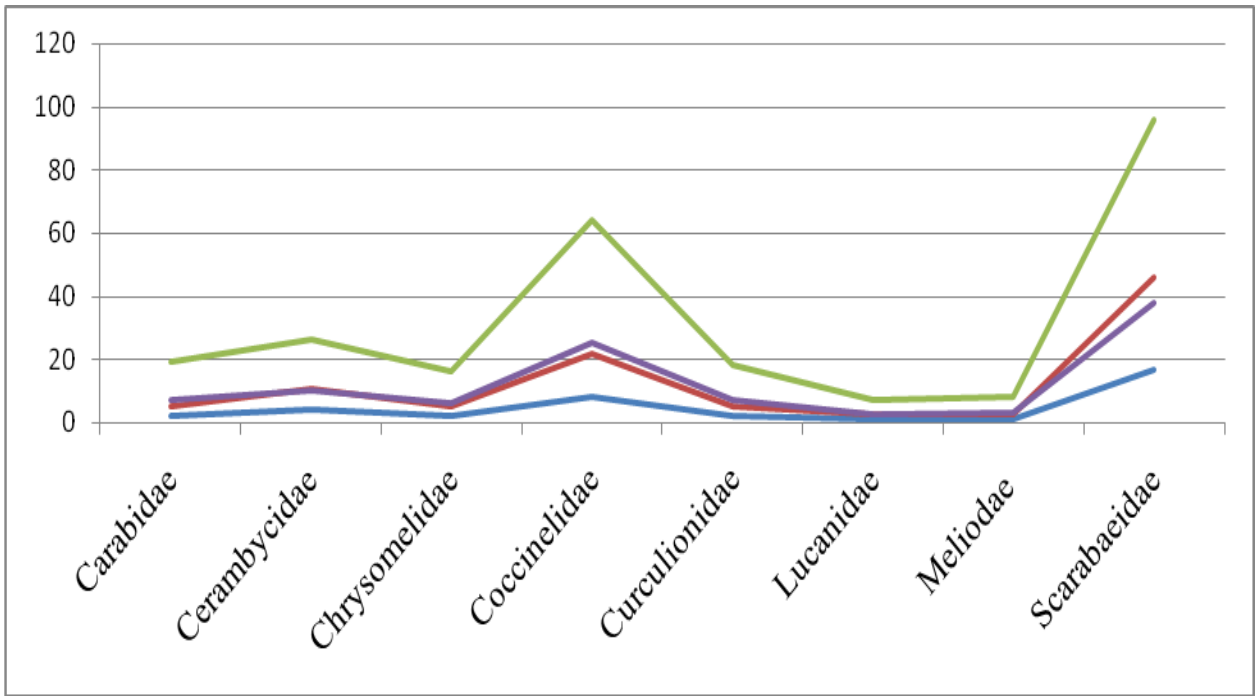

Figure:1 Species composition in different families of Coleoptera

Conclusion:

During this study 27 genera, 37 species were collected belonging to 8 families, among these Scarabaidae family species were abundant with 17 beetle species, Coccinellidae 8 species, Cerambycidae 4 species, Carabidae, Chrysomelidae and Curculionidae with 2 beetle species each and Meloidae and Lucanidae with 1 beetle species each respectively. These beetles were located in different elevation and chir pine forest, teak, sal and mixed forest areas of North-West Himalaya. This study provides useful information about diversity of beetles in the said areas. A long term study is needed to observe the species occurrence in all seasons. It provides base line data for upcoming researchers and gives wide scope for further study.

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