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Checklist of Leaf beetles of Navsari Agricultural University, Navsari, Gujarat, India

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A B S T R A C T

An investigation on biodiversity of leaf beetles was carried out at N. M. College of Agriculture, Navsari Agricultural University (NAU) campus Navsari, Gujarat, India during 2018-19. A total 14 species of Leaf beetles were recorded belonging to 11 genera and 6 subfamilies *viz*., Alticinae, Cassidinae, Criocerinae, Eumolpinae, Galerucinae and Hispinaefrom different ecosystems *i.e.*, paddy, bottle gourd, cruciferous crops, sponge gourd, sweet potato, okra and surya vartiplant (*Chrozophora rottleri*). Among them 21.43% belongs to Alticinae and Criocerinae each whereas Cassidinae, Eumolpinae, Galerucinae and Hispinae constitute 14.29% each and prepared the pictorial checklist of 14 species of leaf beetles was prepared.

Introduction

Insects are very important part of human life. They are considered as pests of many crops and had a great economic importance. Among various insect pests, the order Coleoptera (beetles and weevils) are considered as very important group. Among the Coleoptera the insects of the family Chrysomelidae are commonly known as leaf beetles, which includes over 35,000 species and more than 2,000 genera distributed worldwide except in the arctic regions and is one of the largest and most commonly encountered among all the beetle families (Jolivet *et al*., 2009; Thormann *et al*., 2016). Leaf beetles are the most abundant and harmful coleopteran pests of vegetables and show diverse adaptations to wide range of environmental conditions and habitats. 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. To fill up the gaps in knowledge about different species of leaf beetles with their photographic catalogue in NAU campus, the present study was done.

Materials and Methods

A study was carried out at N. M. College of Agriculture, Navsari Agricultural University (NAU) campus, Navsari, Gujarat, India from March 2018 to December 2018 under different agroecosystems. The ecosystems that are likely to support the leaf beetles in the study area such as paddy, bottle gourd, cruciferous crops, sponge gourd, sweet potato, okra and suryavarti plant (*Chrozophora rottleri*) were searched for leaf beetles. When leaf beetles are observed they are photographed and collected by the hand-picking method. The unidentified leaf beetle specimens were sent to Dr. K. D. Prathapan, Professor, Department of Entomology, College of Agriculture, Kerala Agricultural University, Vellayani, Trivandrum, Kerala. The pictorial checklist is a useful tool for the identification of leaf beetlesin the state. Therefore, close up photographs of species and their behavioral patterns were captured with the help of digital camera. Live specimens from the field conditions were photographed, so that natural colouration and specific behavioural postures can be documented. The picture of small leaf beetles was taken by dissecting stereo-trinocular microscope having SCAPE software.

Results and Discussion

During the present study a total of 14 leaf beetle species were recorded from different ecosystems, belonging to 6subfamilies. Among them 21.43% belongs to Alticinae and Criocerinae each whereas Cassidinae, Eumolpinae, Galerucinae and Hispinae constitute 14.29% each (Table 1 and Fig. 1). Basu *et al.,* (1981) recorded 25 species spread over 12 genera under 6 subfamilies from Tripura. Pawara *et al.,* (2012) recorded two Chrysomelid beetle species *viz*., *Callosobruchus maculates* (Fabricius, 1775) and *C.chinensis* (Linn, 1758) from Jalgaon district of Maharashtra, India. Arya *et al.,* (2016) recorded 5 species of Chrysomelidae in different elevational zones of Binsar Wildlife Sanctuary, Almora, Uttarakhand, India.

During the present study, the subfamilies recorded were Alticinae (3 spp.), Cassidinae (2 spp.), Criocerinae (3 spp.), Eumolpinae (2 spp.), Galerucinae (2 spp.) and Hispinae (2 spp.). In the present study Alticinae (3 genera) and Criocerinae (2 genera) was the most dominant subfamily comprising of 3 species each with 21.43 per cent species distribution. Kalaichelvan and Verma (2005) prepared a checklist of total 95 species, belonging to 10 subfamilies from Bhilai-Durg (Central India). The subfamilies include Criocerinae (10 spp.), Clytrinae (6 spp.), Cryptocephalinae (8 spp.), Chlamisinae (1 sp.), Eumolpinae (6 spp.), Chrysomelinae (4 spp.), Galerucinae (15 spp.), Alticinae (23 spp.), Hispinae (4 spp.), and Cassidinae (18 spp.).

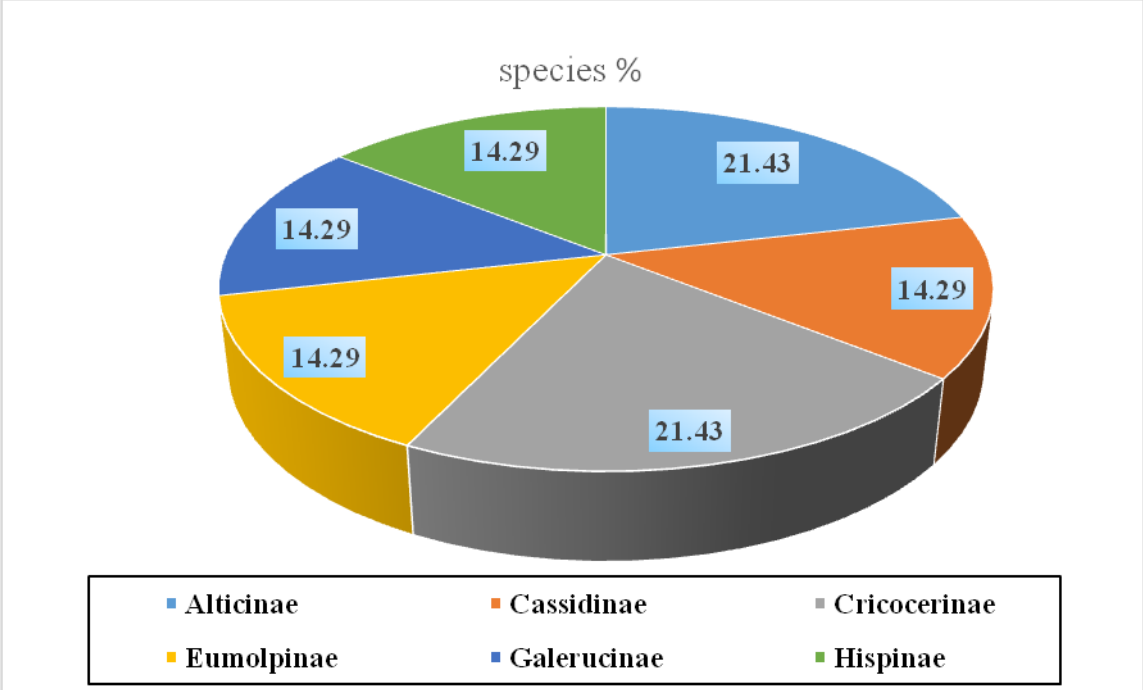
Table.1 Species distribution of leaf beetles of different subfamilies in the NAU, Navsari campus

Sr. No	Subfamily	Genera	No. of species	Species %
1.	**Alticinae**	3	3	21.43
2.	**Cassidinae**	2	2	14.29
3.	**Criocerinae**	2	3	21.43
4.	**Eumolpinae**	1	2	14.29
5.	**Galerucinae**	1	2	14.29
6.	**Hispinae**	2	2	14.29
	Total	**11**	**14**	**100**

Table.2 Pictorial checklist of leaf beetle species (Chrysomelidae) of NAU, Navsari campus

Sr. No.	Leaf beetle species	Habitat
1.	*Hermaeophaga ruficollis*(Lucas, 1849)	Suryavarti (*Chrozophora rottleri*)
2.	*Phyllotreta cruciferae* (Goeze, 1777)	Cruciferous vegetables *viz*., mustard, radish, cabbage and cauliflower
3.	*Podagrica* sp.	Okra and other allied plants of the same family Malvaceae
4.	*Cassida circumdata* (Herbst, 1799)	Sweet potato
5.	*Chiridopsis bipunctata* (Linnaeus, 1767)	Sweet potato
6.	*Lema* sp.1	Paddy ecosystem
7.	*Lema* sp.2	Paddy ecosystem
8.	*Oulema melanopus* (Linnaeus, 1758)	Paddy ecosystem
9.	*Colasposoma* sp.1	Sweet potato
10.	*Colasposoma* sp.2	Sweet potato
11.	*Aulacophora foveicollis* (Lucas, 1849)	Cucumber and Bottle gourd
12.	*Aulacophora lewisii* (Baly, 1886)	Sponge gourd
13.	*Chaeridiona picea* (Baly, 1869)	Paddy Ecosystem
14.	*Dicladis paarmigera* (Oliver, 1808)	Paddy Ecosystem

Fig.1 Distribution of different subfamilies of Chrysomelidae



Hermaeophaga ruficollis (Lucas, 1849)

Phyllotreta cruciferae (Goeze, 1777)

Podagrica sp.

Cassida circumdata (Herbst, 1799)

Chiridopsis bipunctata (Linnaeus, 1767)

Lema sp.1

Lema sp.2

Oulema melanopus (Linnaeus, 1758)

Colasposoma sp.1

Colasposoma sp.2

Aulacophora foveicollis (Baly, 1886)

Aulacophora lewisii (Baly, 1886)

Chaeridiona picea (Baly, 1869)

Dicladispa armigera (Oliver, 1808)

In the present investigation, a total of 14 species of leaf beetles in 11 genera belonging to 6subfamilies were recorded and the pictorial checklist of different leaf beetles from NAU, Navsari campus was prepared (Table 2).

The checklist of the Chrysomelidae of different countries/continents/ecozones were published in recent past by several authors, Baselga and Novoa (2002), Lopatin *et al.*, (2003), Mohamedsaid (2004), Andrews and Gilbert (2005), Kalaichelvan and Verma (2005), Petitpierre (2005), Bardin and Timraleev (2007), Barney *et al.*, (2007), Ekiz *et al.*, (2013), Alekseeva and Bukejs (2014), Baviera and Biondi (2015), Borowiec and Świętojańska (2015), Gajendra and Prasad (2016), Maican and Serafim (2016), Maican and Serafim (2017), Nie *et al.*, (2017), Rodríguez-Mirón (2018), Maican and Serafim (2018) and Moseyko *et al*., (2018). The present compilation was also more or less similar in accordance with the earlier checklist, as most of the subfamilies and species were found in these checklists. In the present study the leaf beetle subfamilies Alticinae, Cassidinae, Criocerinae, Eumolpinae, Galerucinae and Hispinaewere commonly found in Navsari Agricultural University, Navsari, Gujarat, India.

In conclusion, the pictorial checklist was prepared of total 14 species of leaf beetles which belongs to 11 genera and 6subfamilies from different habitats with their taxonomic position.

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