

Occurrence of Some Beetle Species in Magyikan Village, Magway Township

Nyein Nyein Thwe¹, Win Ei Khaing²

Abstract

Insects are the most diverse group of animals; they include more than a million described species and represent more than half of all known living organisms. Occurrence of some beetle species was examined in Magyikan Village, Magway Township within the study period from October 2016 to January 2017. A total of 22 species belonging to 19 genera, 10 families under one order were recorded. The largest species composition was observed in family Scarabaeidae (45.45%), while the smallest species composition was observed in families Dytiscidae, Hydrophilidae, Lampyridae, Buprestidae, Cerambycidae and Curculionidae (4.54%) each. In the present study, six species are encountered through the four months of study period, so that these beetles are regarded as the most common species in the study area. Five species are encountered only in one month of the four months study period, so that these beetles are regarded as the rarest species in the Magyikan Village. Thirteen species are considered as the beneficial insects while nine species are assumed as harmful insects.

Keywords; occurrence, beetle species, beneficial and harmful insects, Magyikan Village

Introduction

Insects are the dominant group of animals on the earth today. One of the highly fascinating biological sciences is entomology, the study of insects. Insects are belonging to Phylum Arthropoda and class insecta (Borror and Johnson, 1992).

A great many insects are extremely valuable to humans, and society could not exist in its present form without them. Their pollinating activities make possible the production of many agricultural crops, they serve as food for many birds, fish, and other beneficial animals; they perform valuable services such as scavengers; they have been useful in medicine and in scientific research. (Davison and Peairs, 1912).

The order Coleopteran is the largest order of insects. The order Coleoptera is divided into four suborders Adephaga, Archostemata, Myxophaga and Polyphaga. The Adephaga is generally predaceous insects, but the Polyphaga is mainly the plant feeders. The Archostemata contains four families of mainly wood-eating beetles and the Myxophaga contains about 100 described species in four families (Imms, 1963).

Beetle may be found in almost every type of habitat in which any insect is found. Many species are of great economic importance. The principle characters of beetles used in identification are those of the head, antennae, characters such as size, shape, and colors. In most cases, the ease of recognizing these characters depends on the size of the beetle (Borror and Johnson, 1992).

Plant-feeding beetles are often important beneficial insects, controlling problem weeds. The beetles make the dung unavailable to breeding pests by quickly rolling and burying in the soil, with the added effect of improving soil fertility and nutrient cycling (Ross, 1965).

A number of insects are beneficial to human, usually by controlling the populations of pests. Both the larvae and adults of some ladybugs are found in aphid colonies. Other ladybugs feed on scale insects and mealy bugs. (Borror and DeLong, 2005).

Some farmers develop beetle banks to foster and provide cover for beneficial beetles. Whole beetles, either by themselves or encased in clear plastic, are also made into everything

¹ Demonstrator, Department of Zoology, University of Yangon

² Dr. Associate Professor, Department of Zoology, University of Yenanchaung

from cheap souvenirs such as key chain to expensive fine- art jewelry. (Gullan and Cranston 2010).

Many agricultural, forestry, and household insect pests are beetles. A coconut beetle feeds on young leaves and damages seedlings and mature coconut palms (Metcalf, 1962).

Thus, beetles are not only of economic importance but also threatening as potential pests, thus of interest to purpose. Hence, the present study aims

- to collect and identify the beetle species and
- to determine its composition in Magyikan Village, Magway Township.

Materials and Methods

Study area and study site

Magway Township is situated at 20° 07' to 20° 15' N and 94° 55' to 94° 92' E. It has an area of 17, 305 square miles. Magyikan Village, Magway Township was chosen as the study area (Fig.1).

Study Period

The present study was conducted from October, 2016 to January, 2017.

Collection of Specimens

This research was conducted based on field survey. Beetles were collected weekly from the study sites in every month. Some were collected while resting or feeding on plants and trees. Some were collected during the night with the help of electric lamps. The adult beetles were caught mainly by means of an insect collection net, and a few will be picked up by hand.

Preparation of the Specimens

The collected specimens were transferred into the killing bottle which contained cotton wool soaked with chloroform. Some beetles were preserved in small glass bottles, containing 70% alcohol with glycerin. The beetles were pinned down as soon as they were killed. Each beetle was mounted with variable insect pins. The pins were inserted into the right elytra of each specimen. Under each specimen, there is a label bearing the name of the species, locality and date of capture and it is transferred into the insect box. There boxes were kept under airtight and dustproof condition, and were painted with a solution of creosote or naphthalene balls for protection against ants and other insects, and for long time preservation.

Identification of the Specimens

The identification of the specimens was based on Gahan (1906), Arrow (1917, 1931), Andrews (1929), Borror and Delong (2005), Imm (1963), Marshall (2006). Insects were differentiated as beneficial and harmful according to David (2014).



Source: *Google Earth* (2017)

Fig.1 A map of Magyikan Village, Magway Township

Results

Systematic position of the study species

A total of 22 species of beetles belonging to 19 genera, 10 families, two suborders and one order were recorded from Magyikan Village. Ten species of family Scarabaeidae, two species from each family of Carabidae, Coccinellidae, Chrysomelidae and one species from each family of Dytiscidae, Hydrophilidae, Lampyridae, Buprestidae, Cerambycidae and Curculionidae were found.(Table 1), (Plate 1).

Species composition of recorded beetle species

The composition of beetles species was found to be highest in family Scarabaeidae (45.45%), followed by (9.09%) in Carabidae, Coccinellidae and Chrysomelidae, (4.54%) in Dytiscidae, Hydrophilidae, Lampyridae and Buprestidae, Cerambycidae, Curculionidae (Table.2).

Monthly Occurrence of Beetles in Magyikan Village

In the present study, six species are encountered in the four months study period, so that these beetles are regarded as the most common species in the Magyikan Village. Two species are distributed in three months of the four months study period. Nine species are recorded in two months of the four months study period. Five species are encountered in only one month of the four months study period, so that these beetles are regarded as the rarest species in the Magyikan Village (Table.3).

Beneficial and harmful recorded beetle species

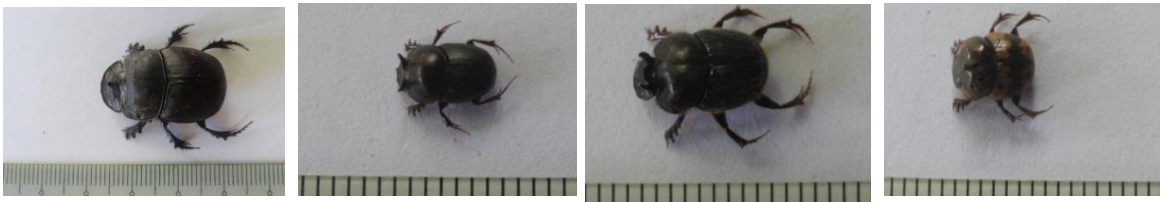
Insects were differentiated as beneficial and harmful according to David (2014). Thirteen species are observed under the criteria of the beneficial insects while nine species as harmful insects. *Pheropsophu verticalis* and *Nebria masrina* in the family Carabidae and *Coccinella transversalis* and *Menochilus sexmaculatus* in the family Coccinellidae are beneficial beetle species. *Dytiscus verticalis* in the family Dytiscidae, *Hydrophilus triangularis* in the family Hydrophilidae and *Photuris congener* in the family Lampyridae are useful beetle species. Six beetle species in the family Scarabaeidae are also beneficial except *Anomala*, *Lissadoretus* and *Oryctes*. *Chrysochora vittata*, *Diorthus simplex*, *Aulacophora foveicollis*, *Cassida circumdata* and *Hypomyces squamosus* are harmful beetle species. (Table 4)



A. *Pheropsophu verticalis* B. *Nebria masrina* C. *Dytiscus verticalis* D. *Hydrophilus triangularis*



E. *Photuris congener* F. *Chrysochora vittata* G. *Coccinella transversalis* H. *Menochilus sexmaculatus*



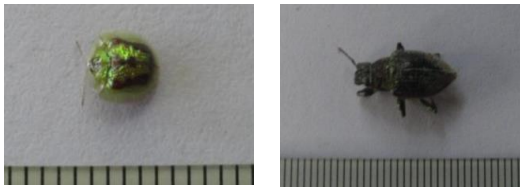
I. *Catharsius platypus* J. *Onthophagus rectecornutus* K. *Onthophagus kuluensis* L. *Onthophagus bifasciatus*



M. *Onitis singhalensis* N. *Anomala antiqua* O. *Anomala Cinderella* P. *Lissadoretus pallidus*



Q. *Xylotrupes gideon* R. *Oryctes rhinoceros* S. *Diorthus simplex* T. *Aulacophora foveicollis*



U. *Cassida circumdata* V. *Hypomyces squamosus*

Plate. 1 Recorded beetles of family Carabidae, Dytiscidae, Hydrophilidae, Lampyridae, Buprestidae, Coccinellidae, Scarabaeidae, Cerambycidae, Chrysomelidae, Curculionidae

Table.1 List of Beetles collected from Magyikan Village

Order	Suborder	Superfamily	Family	Subfamily	Genus	Species		
Coleoptera	Adephaga	Carabaeoidea	Carabidae	Carabinae	<i>Pheropsophu</i>	<i>P.verticalis</i>		
					<i>Nebria</i>	<i>N.masrina</i>		
	Polyphaga	Hydrophiloidea	Hydrophilidae	Dytiscidae		<i>Dytiscus</i>	<i>D.verticalis</i>	
						<i>Hydrophilus</i>	<i>H.triangularis</i>	
						<i>Photuris</i>	<i>P.congener</i>	
						<i>Chrysochora</i>	<i>C.vittata</i>	
		Cucujoidea	Coccinellidae			<i>Coccinella</i>	<i>C.transversalis</i>	
						<i>Menochilus</i>	<i>M.sexmaculatus</i>	
		Scarabaeoidea	Scarabaeidae			Coprinae	<i>Catharsius</i>	<i>C.platypus</i>
							<i>Onthophagus</i>	<i>O.rectecornutus</i>
							<i>Onthophagus</i>	<i>O.kulensis</i>
							<i>Onthophagus</i>	<i>O.bifasciatus</i>
	<i>Onitis</i>						<i>O.singhalensis</i>	
	Rutelinae						<i>Anomala</i>	<i>A.antiqua</i>
		<i>Anomala</i>	<i>A.cinderella</i>					
		<i>Lissadoretus</i>	<i>L.pallidus</i>					
		Dynastinae	<i>Xylotrupes</i>	<i>X.gideon</i>				
	<i>Oryctes</i>		<i>O.rhinoceros</i>					
	Cerambycoidea	Cerambycidae			Lamiinae	<i>Diorthus</i>	<i>D.simplex</i>	
						Chrysomeloidea	Chrysomelidae	
Curculionoidea	Curculionidae			Cassidinae	<i>Cassida</i>			
				Brachyderinae	<i>Hypomyces</i>	<i>H.squamosus</i>		

Table. 2 Composition of beetle's species in different families

No.	Family	Common name	Genus	Species	% composition
1	Carabidae	Ground beetle	2	2	9.09
2	Dytiscidae	Predaceous diving beetle	1	1	4.54
3	Hydrophilidae	Water scavenger beetle	1	1	4.54
4	Lampyridae	Firefly beetle	1	1	4.54
5	Buprestidae	Metallic wood boring beetle	1	1	4.54
6	Coccinellidae	Ladybird beetle	2	2	9.09
7	Scarabaeidae	Dung beetle	7	10	45.45
8	Cerambycidae	Long horn beetle	1	2	4.54
9	Chrysomelidae	Leaf beetle	2	1	9.09
10	Curculionidae	Snout beetle	1	1	4.54
			19	22	100

Table.3 Occurrence of beetles in Magyikan Village during Oct, 2016 to Jan, 2017

No	Species	Oct	Nov	Dec	Jan
1	<i>Pheropsophu verticalis</i>	✓			
2	<i>Nebria masrina</i>	✓			
3	<i>Dytiscus verticalis</i>	✓	✓	✓	✓
4	<i>Hydrophilus triangularis</i>	✓	✓		
5	<i>Photuris congener</i>	✓		✓	
6	<i>Chrysochora vittata</i>	✓	✓	✓	✓
7	<i>Coccinella transversalis</i>	✓	✓	✓	✓
8	<i>Menochilus sexmaculatus</i>	✓	✓	✓	
9	<i>Catharsius platypus</i>		✓	✓	
10	<i>Onthophagus rectecornutus</i>	✓			
11	<i>Onthophagus kuluensis</i>	✓			
12	<i>Onthophagus bifasciatus</i>	✓	✓	✓	✓
13	<i>Onitis singhalensis</i>	✓	✓	✓	✓
14	<i>Anomala antiqua</i>	✓	✓		
15	<i>Anomala cinderella</i>	✓	✓		
16	<i>Lissadoretus pallidus</i>	✓	✓		
17	<i>Xylotrupes gideon</i>	✓	✓		
18	<i>Oryctes rhinoceros</i>	✓	✓	✓	✓
19	<i>Diorthus simplex</i>		✓		
20	<i>Aulacophora foveicollis</i>	✓	✓		
21	<i>Cassida circumdata</i>	✓	✓	✓	
22	<i>Hypomyces squamosus</i>	✓	✓		

Table. 4 Beneficial and harmful insects in Magyikan Village, Township Magway

No	Species	Beneficial insect	Harmful insect	Day/Night
1	<i>Pheropsophu verticalis</i>	✓		Night
2	<i>Nebria masrina</i>	✓		Night
3	<i>Dytiscus verticalis</i>	✓		Day
4	<i>Hydrophilus triangularis</i>	✓		Day
5	<i>Photuris congener</i>	✓		Night
6	<i>Chrysochora vittata</i>		✓	Day
7	<i>Coccinella transversalis</i>	✓		Day
8	<i>Menochilus sexmaculatus</i>	✓		Day
9	<i>Catharsius platypus</i>	✓		Night
10	<i>Onthophagus rectecornutus</i>	✓		Night
11	<i>Onthophagus kuluensis</i>	✓		Night
12	<i>Onthophagus bifasciatus</i>	✓		Night
13	<i>Onitis singhalensis</i>	✓		Night
14	<i>Anomala antiqua</i>		✓	Night
15	<i>Anomala cinderella</i>		✓	Night
16	<i>Lissadoretus pallidus</i>		✓	Night
17	<i>Xylotrupes gideon</i>	✓		Night
18	<i>Oryctes rhinoceros</i>		✓	Night
19	<i>Diorthus simplex</i>		✓	Night
20	<i>Aulacophora foveicollis</i>		✓	Day
21	<i>Cassida circumdata</i>		✓	Day
22	<i>Hypomyces squamosus</i>		✓	Day

Discussion

A total of 22 species of beetles belonging to one order, two suborders, seven superfamilies, 10 families, 10 subfamilies and 19 genera were recorded from Magyikan Village, Magway Township. Out of 10 families, the largest species composition was observed in family Scarabaeidae (45.45%) which were followed by family Carabidae, Coccinellidae and Chrysomelidae (9.09%), Dytiscidae, Hydrophilidae, Lampyridae, Buprestidae, , Cerambycidae and Curculionidae (4.54%) respectively. The recorded beetle species in the present work belong to two suborders Adephaga and Polyphaga. Under suborder Adephaga, only three species belonging to the superfamily Carabaeoidea were recorded. They are rare and predaceous on other insects. Under suborder Polyphaga, 19 species belonging to the superfamilies Hydrophiloidea, Cucujoidea, Scarabaeoidea, Cerambycoidea, Chrysomeloidea and Curculionoidea were recorded. They are common, dung and plant feeders. (Borror and Delong, 2005).

Maximum numbers of beetles were collected in the month of October that coincides with the rainy season. Minimum number on the other hand was collected during the months of November, December and January that coincide with the cold season. The largest numbers of beetles were collected in the month of October but the smallest numbers of beetles were collected in the month of January. Beetles are not only pests, but can also be beneficial, usually by controlling the populations of pests. (Borror and Delong, 2005).

Members of family Carabidae are common predators of many different insects and other arthropods, including fly eggs, caterpillars, wireworms, and others Arrow (1917, 1931). Members of families Dytiscidae and Hydrophilidae feed on aquatic insects and creatures, including small tadpoles. *Photuris congener* is specialized predator and feeds on other larvae, terrestrial snails and slugs. *Chrysochora vittata* feeds on stems and leaves of various types of plants, ranging from trees to grasses. Imm (1963).

Vaibhao *et al.*, (2011) explained that the dytiscids are very integral part of the biotic component of any water body. *Dytiscus verticalis* has long filiform antennae and *Hydrophilus triangularis* has short and clubbed antennae. These two species have been recorded by Mar Mar Thein (2007) and San San Myint (2008). In this present study, *Hydrophilus triangularis* and *Dytiscus verticalis* have been recorded from the study area.

Arrow (1917, 1931) recorded many species under subfamilies Coprinae, Rutelinae, Dynastinae and Cetoniinae from Myanmar. In the present study, five species under Coprinae and three species under Rutelinae have been recorded. Two species have been recorded under Dynastinae in the study area.

Gahan (1906) described 135 species under Cerambycidae. Members of family Cerambycidae are characterized by the presence of striking long antennae. In this present study one species (*Diorthus simplex*) has been recorded. *Diorthus simplex* can cause extensive damage to either living trees or untreated lumber. Several are serious pests.

Meena *et al.*, (2009) reported three predatory species of ladybird beetles like *Coccinella transversalis*, *Menochilus sexmaculatus* and *Micraspis discolor* feeding on aphid of some plants. Both the larvae and adults of ladybird beetles are found feeding on aphid colonies. In the present study, *Coccinella transversalis* and *Menochilus sexmaculatus* have been recorded in the study area.

Bang *et al.*, (2000) described that dung beetles (Scarabaeidae) have been successfully used to reduce the populations of pestilent flies and parasitic worms that breed in cattle dung. The beetles make the dung unavailable to breeding pests by quickly rolling and burying it in the soil, with the added effect of improving soil fertility, filth, and nutrient cycling. In the present study, ten species have been recorded from Magyikan Village, Magway Township.

Nichols *et al.*, (2008) stated that *Anomala* species are not dangerous to people, but they used to be agricultural pests to orchards, groves and crops. In the present study, two species have been recorded from the study area. *Oryctes rhinoceros* beetle bores holes into the young, upper fronds of coconut palm trees. They drink the sap that is released by cutting through the soft plant tissue.

Aulacophora foveicollis was recorded by Mar Mar Thein (2007) and San San Myint (2008). But these species were not described by Ni Ni Win (2001). *Cassida circumdata* was recorded by San San Myint (2008). But these species were not described by Ni Ni Win (2001). *Aulacophora foveicollis* feeds on all sorts of plant tissue, and all species are fully herbivorous. Many are serious pests of cultivated plants.

Ghate *et al.*, (2003) described that *Cassida circumdata* beetles feed on popular garden vines. The adults and larvae chew on leaves and flowers, giving the plants a less than perfect appearance. *Hypomyces squamosus* feeds on leaves of cultivated plants. During the present study, these two species have been recorded in the study area.

During the study period, three adepagous species and 19 polyphagous species of beetles have been recorded. Thus, the polyphagous beetles are predominant in the Magyikan Village, Magway Township. Since polyphagous species inhabit in agricultural lands, they are

of economic importance. Several species are known to cause damage to cultivated crops. Knowing the nature of beetles correlated with their habitat preferences will enlighten everyone how to sustain ecosystem and how to value the beetle life and other organisms in the environment. Thus, it can be seen that there is a great need for the identification of the Coleoptera species of economic importance.

Conclusion

A total of 22 species belonging to 10 families of one order were recorded from Magyikan Village, Magway Township. The largest species composition was observed in family Scarabaeidae (45.45%) which were followed by family Carabidae, Coccinellidae and Chrysomelidae (9.09%), Dytiscidae, Hydrophilidae, Lampyridae, Buprestidae, , Cerambycidae and Curculionidae (4.54%) respectively. The largest numbers of beetles were collected in the month of October but the smallest numbers of beetles were recorded in the months of January 2017. Thirteen species of beetles were observed as the beneficial insects. Nine species of beetles were observed as the harmful insects.

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