

## Occurrence of Some Beetles in Kalay University Campus, Kalay, Sagaing Region, Myanmar

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### Abstract

The aim of the study is to investigate the occurrence and species composition of the beetle species from Kalay University Campus, Sagaing Region from June 2018 to November 2018. A total of 23 species of beetles belonging to 20 genera and 10 families under order Coleoptera were recorded from the study area. The specimens were collected from different localities, a few were collected during the night time, when they fall under electric lamppost. Detailed description of the studied species was provided with scale color plates and photographs. The family Scarabaeidae was more dominant by nine species (39.13%) and less dominant in Curculionidae, Coccinellidae, Cerambycidae, Buprestidae and Hydrophilidae by a single species (4.35%) in each. The family Scarabaeidae species was widely distributed in Kalay University Campus. It has a good habitat of host plants and various food and water resources for beetle species.

**Key words:** Beetles, Coleoptera, Scarabaeidae, Kalay University Campus

### Introduction

Insects are the most dominating and diverse creatures on earth. They are truly ubiquitous and usually quite conspicuous members of the phylum Arthropoda under class Insecta. Order Coleoptera which includes 350,000 species beetles is the most diverse order of class Insecta. Coleopteran insects are found in nearly all natural habitats that are vegetative foliage, from trees and their bark to flowers, leaves and underground near roots even inside plants like galls, tissue, including dead or decaying ones (Kumar *et al.*, 2016).

Class Insecta is divided into 29 orders on the basis of the structure of wings and mouth parts, the metamorphosis and on other various characters. Among them, the order Coleoptera is the largest order of insects and contains about 40 percent of the known species. Over a quarter of a million species of beetles have been described (Richard and Davis, 1977).

Invertebrates, especially insects, play a crucial role in most ecological processes and are considered key components of functional ecosystems. Insect abundance and richness are related not only with other taxa diversity, but also with specific environmental characteristics. Beetle is almost every conceivable terrestrial and freshwater habitat, including living and dead trunks and stems, fruit, seeds, leaves, fungi, soil, sand, leaf litter, nests of birds, ants and termites, vertebrate and invertebrate carasses, stored products, timber, intertidal rocks, ponds and streams (Watt, 1983).

The present study aimed to investigate the occurrence and species composition of the beetle species in the Kalay University Campus.

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## Materials and Methods

### Study period

The present study was conducted from June 2018 to November 2018.

### Study area and Study site

The study area is located in Kalay University Campus. It lies above the sea level at 140 m. It is about 14.48 km from Kalay Town (Figure 1). The study sites are selected based on the habitat types, such as trees, grass lawns, shrubs, electricposts, sparsely distributed medium, tall trees, ponds, water canal area and human habitation.



Figure 1. Map showing the study of Kalay University Campus.  
(Source: Google Earth)

### Collection and preservation of the specimens

Specimens collections were made monthly in study area during June 2018 to November 2018 and caught mainly by means of an insect collection net and a few were picked up by hand. Many beetles are collected while resting or feeding on plants and trees. The specimens were preserved in alcohol and some were kept in the insect box. The insect box was smeared with creosote and naphthalene to prevent the entry of ants.

### Identification of the beetle species

Species identification was made by following Arrow (1931), Borror et al. (1992) and Bousquest (1990).

### Species composition

The data collected was analyzed as following:

$$\text{Species composition} = \frac{\text{No: of individuals of a species}}{\text{Total no: of Individual of all species}} \times 100 \quad (\text{Bisht } et al., 2004)$$

## Results

A total of 23 species of beetle belonging to 20 genera, representing 10 families, two suborders under coleopteran were recorded from June 2018 to November 2018 (Figure 2, Table 1 and 2 and Plate 1).

### Systematic position of recorded beetle species

Phylum-	Arthropoda
Class	- Insecta
Order	- Coleoptera
Suborder	- Adephaga
Family	- Carabidae
Genus	- <i>Bembidion</i> Latreille, 1802
Species-	<i>Bembidion properans</i> (Stephens, 1828)
Genus	- <i>Pherossophus</i> Solier, 1833
Species-	<i>Pherossophus jessoensis</i> A. Morawitz, 1862
Genus	- <i>Scarites</i> Fabricius, 1775
Species-	<i>Scarites subterraneus</i> Fabricius, 1775
Family	- Dytiscidae
Genus	- <i>Agabus</i> Leach, 1817
Species-	<i>Agabus bipustulatus</i> (Linnaeus, 1767)
Genus	- <i>Dytiscus</i> Linnaeus, 1758
Species-	<i>Dytiscus verticalis</i> Say, 1823
Suborder	- Polyphaga
Family	- Scarabaeidae
Genus	- <i>Anomala</i> Leach, 1819
Species	- <i>Anomala cupripes</i> Hope, 1839
	- <i>A. bilobata</i> Arrow, 1912
	- <i>A. grandis</i> Hope, 1839
Genus	- <i>Catharsius</i> Hope, 1837
Species-	<i>Catharsius molossus</i> (Linnaeus, 1758)
	- <i>C. pithecius</i> (Fabricius, 1775)
Genus	- <i>Heliocopris</i> Hope, 1837
Species-	<i>Heliocopris bucephalus</i> (Fabricius, 1775)
Genus	- <i>Onitis</i> Fabricius, 1798
Species-	<i>Onitis virens</i> (Lansberge, 1875)
Genus	- <i>Lepidiota</i>
Species-	<i>Lepidiota stigma</i>
Genus	- <i>Xylotrupes</i> Hope, 1837
Species-	<i>Xylotrupes gideon</i> (Guerin-Meneville, 1830)
Family	- Tenebrionidae
Genus	- <i>Tenebrio</i> Linnaeus, 1758
Species-	<i>Tenebrio molitor</i> Linnaeus, 1758
Genus	- <i>Merinus</i> Leconte, 1866
Species-	<i>Merinus laevis</i> (Olivier, 1795)
Family	- Curculionidae
Genus	- <i>Hypomeces</i> Schoenherr, 1823

Species-	<i>Hypomeces squamosus</i> (Fabricius, 1792)
Family	- Coccinellidae
Genus	- <i>Coccinella</i> Linnaeus, 1758
Species-	<i>Coccinella transversalis</i> Fabricius, 1781
Family	- Cerambycidae
Genus	- <i>Batocera</i> Castelnau, 1840
Species-	<i>Batocera rufomaculata</i> (De Geer, 1775)
Family	- Chrysomelidae
Genus	- <i>Sagra</i> Fabricius, 1792
Species-	<i>Sagra femorata</i> Druty, 1773
Genus	- <i>Aspidomorpha</i> Hope, 1840
Species-	<i>Aspidomorpha furcata</i> Thunberg (1789)
Family	- Buprestidae
Genus	- <i>Chrysochra</i>
Species-	<i>Chrysochra vittata</i>
Family	- Hydrophilidae
Genus	- <i>Hydrophilus</i> Geoffroy, 1762
Species-	<i>Hydrophilus triangularis</i> Say, 1823

#### Species composition of beetle species based on different families during June 2018 to November 2018

A total of 23 beetle species of 20 genera belonging to 10 families, two suborders under order Coleoptera were recorded from Kalay University Campus during the study period. Nine species were recorded under family Scarabaeidae (39.13 %), followed by three species under Carabidae (13.04%), two species each under Dytiscidae, Tenebrionidae, and Chrysomelidae (8.69%) and one species each under Curculionidae, Coccinellidae, Cerambycidae, Buprestidae and Hydrophilidae (4.35%). The highest composition of species was recorded in family Scarabaeidae (39.13%) and the lowest composition of species was found in five families (Table 1 and Figure 2).

#### Monthly occurrence of the recorded beetle species in Kalay University Campus during June 2018 to November 2018

The lowest number of species (one) was found in *S. subterraneus* and *C. molassus*. In the study period, *P. fessoensis*, *A. bipustulatus* and *C. versalis* were found in all study months. The lowest number of species was found in September and the highest number of species in June and November and also recorded in July (Table 2).

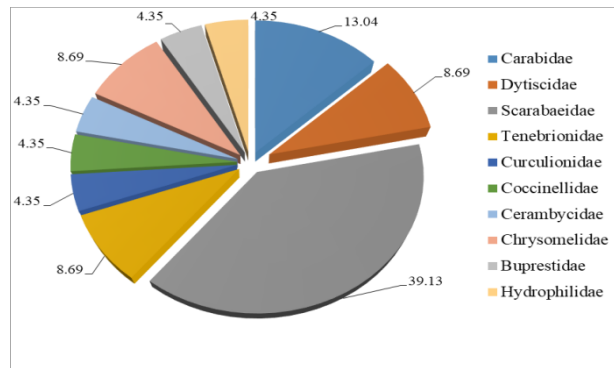


Figure 2. Occurrence percentage of beetle species in different families recorded from Kalay University Campus from June 2018 to November 2018

Table 1. Species composition of recorded beetle species from Kalay University Campus during the study period

Family	No. of species	Species composition (%)
Carabidae	3	13.04
Dytiscidae	2	8.69
Scarabaeidae	9	39.13
Tenebrionidae	2	8.69
Curculionidae	1	4.35
Coccinellidae	1	4.35
Cerambycidae	1	4.35
Chrysomelidae	2	8.69
Buprestidae	1	4.35
Hydrophilidae	1	4.35
<b>Total</b>	<b>23</b>	<b>100</b>



A. *B. properans*



B. *P. jessoensis*



C. *S. subterraneus*



D. *A. bipustulatus*



E. *D. verticalis*



F. *A. cupripes*



G. *A. bilobata*



H. *A. grandis*



I. *C. molossus*



J. *C. pithecius*



K. *H. bucephalus*



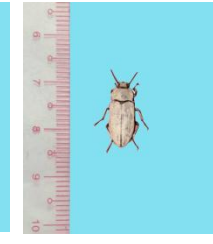
L. *O. virens*



M. *L. stigma*



O. *X. gideon*



P. *T. molitor*



Q. *M. laevis*



R. *H. squamosus*



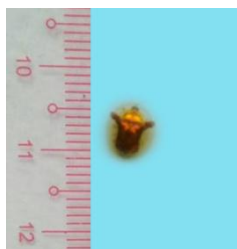
S. *C. transversalis*



T. *B. fomaculata*



U. *S. femorata*



V. *A. furcata*



W. *C. vittata*



X. *H. triangularis*

Plate 1. Beetle species recorded under the family Carabidae, Dytiscidae, Scarabaeidae, Tenebrionidae, Curculinidae, Coccinellidae, Cerambycidae, Chrysomelidae, Buprestidae and Hydrophilidae

Table 3. Monthly occurrence of beetle species at Kalay University during the study period

No	Scientific name	Ju n	Jul	Aug	Se p	Oct	Nov	Total no.of month
1	<i>Bembidion properans</i>	✓	✓	✓	-	✓	✓	5
2	<i>Pheropsophus jessoensis</i>	✓	✓	✓	✓	✓	✓	6
3	<i>Scarites subterraneus</i>	-	✓	-	-	-	-	1
4	<i>Agabus bipustulatus</i>	✓	✓	✓	✓	✓	✓	6
5	<i>Dytiscus verticalis</i>	✓	-	✓	-	-	✓	3
6	<i>Anomala cupripes</i>	✓	✓	-	-	✓	✓	4
7	<i>Anomala bilobata</i>	✓	✓	✓	-	-	✓	4
8	<i>Anomala grandis</i>	✓	-	✓	-	-	✓	3
9	<i>Catharsius molossus</i>	-	-	-	✓	-	-	1
10	<i>Catharsius pithecius</i>	✓	-	-	✓	-	✓	4
11	<i>Helicopriss bucephalus</i>	✓	-	-	✓	✓	✓	4
12	<i>Onitis virens</i>	✓	-	-	✓	-	✓	3
13	<i>Lepidiota stigma</i>	✓	✓	✓	-	✓	-	4
14	<i>Xylotrupes gideon</i>	✓	-	✓	✓	-	✓	4
15	<i>Tenebrio molitor</i>	✓	✓	-	-	✓	✓	4
16	<i>Merinus laevis</i>	✓	-	-	-	✓	✓	3
17	<i>Hypomeces squamosus</i>	-	✓	-	-	-	✓	2
18	<i>Coccinellatrans versalis</i>	✓	✓	✓	✓	✓	✓	6
19	<i>Batoceraru fomaculata</i>	-	-	✓	-	-	✓	2
20	<i>Sagra femorata</i>	✓	✓	-	-	✓	-	3
21	<i>Aspidomorpha furcate</i>	✓	-	✓	-	✓	✓	4
22	<i>Chrysochra vittata</i>	-	✓	-	-	✓	-	2
23	<i>Hydrophilus triangularis</i>	✓	✓	✓	-	-	✓	4
Total species		18	13	12	8	12	18	

### Discussion

In the present study, a total of 23 species and 20 genera belonging to 10 families, two suborders under order Coleoptera were recorded in Kalay University Campus and its environs. Out of 10 families recorded Scarabaeidae was the dominant family in terms of species composition with 9 species and 39.13 %, followed by Carabidae (13.04%), Dytiscidae, Tenebrionidae, and Chrysomelidae (8.69% each), Curculionidae, Coccinellidae, Creambycidae, Buprestidae, and Hydrophilidae (4.35 % each). Kumar *et al.*, (2016) stated that order Coleoptera is the largest order of living organisms with an estimated 350,000 described species in some genera.

In the present study, the family Scarabeoidea was found in all study months and appeared as one of the most important and diverse in Kalay University Campus, because of the presence of rich vegetation, and husbandry practice producing mammal's dung for feeding and nesting of beetles. A similar pattern of predominance species of Scarabaeidae was also reported by Ni Hup (2011), Win Ei Khaing (2015) and Nan Cherry Oo (2016).

*D. verticalis* is aedeagous insect, belonging to superfamily Carabaeidae, family Dytiscidae and genus Dytiscus. These species are aquatic beetles. The dytiscids are very similar to another group of freshwater beetles; the hydrophilids. *D. verticalis* has long filiform antennae and *H. triangularis* has short and clubbed antennae. These two species were also reported by Zaw Min Thu (2018) in Kyaring Village and its environs. Only one of the genus *Hydrophilus* was recorded by Lal Eng Kim (2017) Kalay environs. In the present study, *D. verticalis* and *H. triangularis* was recorded during the study period.

Gahan (1906) described 135 species under Cerambycidae members of family Cerambycidae are characterized by the presence of striking long antennae. They are tropicopolitan species. In the present study, only one species under Cerambycidae was recorded.

Based on monthly observation throughout the study period, the total number of species was highest in June and November with various kinds of food resources, domestic's dung and most lightening area during the study period. Therefore, the differences in beetle species recorded were mainly due to the availability of food resource, lightening and depend on different types of habitats. Win Ei Khaing (2015) and Nan Cherry Oo (2016) recorded that the maximum number was observed in rainy and cold seasons. Therefore, the highest species was observed in June and November (rainy season and cold season).

Based on the findings, it may be concluded that the number of species has a close relationship with the environmental parameter, habitants, vegetation, water resources, available animal dungs, lightening area and various food resources and depends on habitants in the study period.

### Conclusion

The study area has a large number of food resources microhabitat type included, grass lawns, shrub, electric posts, sparsely distributed medium, tall trees, ponds, water canal area, human habitation, available animal's dung. This area is very important for beetles because a great number of beetle species of endemic species and diversity of beetles can be found in this region.

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