# Occurrence of some Beetle Species in Taunggoke Degree College Campus, Taunggoke Township, Thandwe District, Rakhine State

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**Abstract**

The present study deals with the occurrence of some beetle species in Taunggoke Degree College Campus. The study period was from November, 2016 to June, 2017. A total of 25 species belonging to 25 genera 11 families under two suborders Adephaga and Polyphaga was recorded. Among them, nine species of family Scarabaeidae were the largest number and the highest percentages of species composition throughout the study period. The percentages of occurrence and individual number were (36%, 9) in family Scarabaeidae, (12%, 3) in each family Carabidae, Cerambycidae, Chrysomelidae and (4%, 1) in each family Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, Coccinellidae, Tenebrionidae and Curculionidae during the study period. The total species number of monthly collection showed that the largest number of beetle species was recorded in May and June during the study period. Their habits, types of antenna, diversity and abundance and their beneficial or harmful effects for the nature were also recorded.

**Keywords:** Beetles, Occurrence, Habits, individual number

## Introduction

Beetles of the Order Coleoptera, with nearly 400,000 described species, comprise one of the most diverse and important groups of animals on Earth. One out of every five species of plants and animals is beetle.

Depending on the species, elytra can help stabilize beetles in flight, protect their delicate hind wings and internal organs, conserve precious bodily fluids, capture bubbles of air underwater and insulate them from extreme temperatures. In beetles, the larvae and adults eat a variety of organisms, living and dead, especially plants. Those that prefer leaves, flowers, fruits, needles, cones and roots can inflict serious damage to food stores, gardens, crops, and managed timber. Some predatory beetles are used as biological control agents against agricultural or forestry pests, while scavenger species provide an essential service to clean study skeletons in natural-history collections around the globe. Beetles are one of the most diverse and important groups of animals on earth one out of every five species. According to their riot of forms, colors, patterns and behaviors, all beetles share a select suite of physical attributes, the most conspicuous of which are the leathery or hardened forewings or elytra (Darwin, 1871).

Most beetles have hardened front wings, termed elytra, which cover the folded hind wings like a sheath. The elytra serve to protect the more delicate hind wings as well as the dorsal surface of the abdomen and may have been a key factor allowing them to exploit narrow passage ways among litter, and under bark. Insects in the Order Coleoptera are commonly called beetles (Foltz, 1998).

Class insecta is divided into 29 orders on the basis of the structure of usings and mouth parts, the metamorphosis and on various other characters (Richards and Davies, 1977).

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Coleoptera is the most diverse order of class insecta. There are more than 35,0000 identified species of beetles that is about 40% of all insects and 30% of all animals (Choate, 2001).

The order Coleoptera is subdivided into two major suborders, Adephaga and Polyphaga. Polyphaga contains most beetle species. Ground beetles are placed in the suborder Adephaga. This suborder contains relatively few families of beetles, most families belonging to much larger suborder Polyphaga (Choate, 2008).

Beetles still play a role in modern culture such as their use in insect fighting. Some of the most popular are the stag beetle and rhinoceros beetle. They are also used as biological control insects. In Myanmar, some members of beetles are of economic importance. The beetles are not only of economic importance but also threatening as potential pests. Species occurrence of beetles is associated with the environmental conditions. Beetles come in a variety of shapes and colors and can range from 0.4 to about 80 millimeters in length. They have mandibulate mouthparts which are designed for biting and chewing, antennae that are present in a variety of forms and compound eyes in a variety of sizes and shape (CSIRO, 2016).

Beetles in several families infest and damage stores of grains and other cereal products, dried meats and fruits, legumes, nuts, and species. The antennae are beetles primary organs of smell and touch and usually attached to the sides of the head, often between the eyes and the bases of the mandibles. Although the antennae exhibit an incredible diversity of sizes and shapes, they all consist of three basic parts: scape, pedicel, and flagellum (Evans, 2014).

Beetles have cultural significance to societies around the world. The most ubiquitous of these cultural practices is the use of beetles as a food and the traditions around that use. Beetles are recognized by the most indigenous societies as good food (Onore, 1997).

One of the best and widely known example is the ladybug or ladybird (family Coccinellidae). Other ladybugs feed on scale insects and mealybugs.

Ground beetles (family Carabidae) are common predators of many different insects and other arthropods, including fly eggs, caterpillars, wireworms and others. Dung beetles (Coleoptera, Scarabaeidae) have been successfully used to reduce the populations of pestilent flies and parasitic worms that breed in cattle dung (Banerjee, 2014).

In Beetles along with other insect groups, are crucially important in the pollination of cultivated and wild plants. Pollination by beetles is often referred to as cantharophily. The coleopterans are considered to be the most primitive pollinators (Kevan and Baker, 1983).

Beetles have been associated with flowering plants over millions of years, leading in some cases to the evolution of specialized structures in the host plant flowers and in their beetle pollinators (Barth, 1985, Fenster *et al*., 2004).

Beetles have a major effect on the world's agriculture. Hundreds of species of beetles, inclulding many in the families Chrysomelidae, Curculionidae, Elateridae, and Scarabaeidae, feed on crops and ornamental plants as adults and larvae (Campbell *et al*., 1989).

Taunggoke or Taungup is a principal town of the Taungup Township in the Rakhine State, westernmost part of Myanmar. It got 29.1 inches of rainfall on 21 July 2011. Taunggoke or Taungup Township is a coastal strip of Thandwe District in the Rakhine State of Myanmar.

The present study was conducted to know the occurrence of beetles in Tanuggoke Degree College Campus by the following objectives such as to record of beetle species and to assess the species composition of beetles.

## Materials and Methods

### Study area and study period

The present study was conducted at Taunggoke Degree College Campus locating 94˚12ˈ0″ to 94˚15ˈ36″ E and 18˚51ˈ0″ to 18˚52ˈ48″N. It is situated on the Amm Road, Taunggoke Township, Thandwe District, Rakhine State. The total area is 0.85941 km sq. (Fig. 1). This study period lasted from November, 2016 to June, 2017.

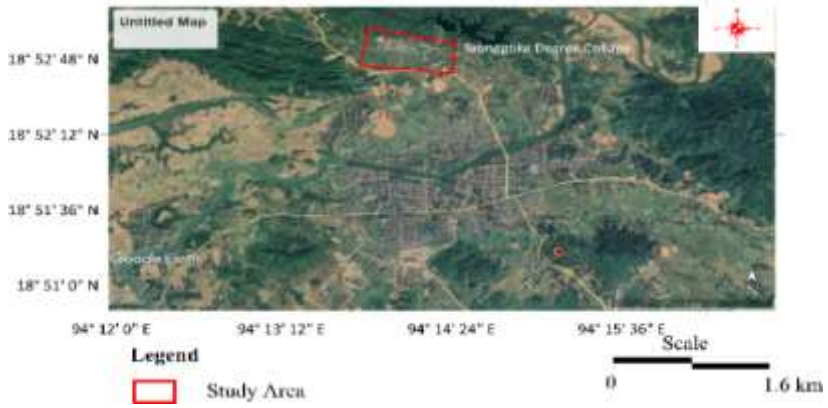



Figure (1) Location map of study area

Plate (1) Study site and apparatus used in the field

### Specimen collection, preservation and identification

The specimens were collected from the campus during daytime and night-time because some beetles are diurnal and some are nocturnal. The studies were carried out by two times in a month. Insect net, hand picking and also digging method were used to collect specimens. The collected specimens were killed by chloroform vapour and preserved with 70% alcohol. The type of antenna of recorded species was studied. The photographs of the specimens were taken at the required profile. The classification and identification of beetle have been followed after Arrow (1917), Borror and Delong (1970) and Bouchard (2014) (Table 1).

Table (1) Types of suborder, species, family, common name, habit and antenna during the study Period

| Sr. No. | Suborder | Scientific name | Family | Common name | Habit | | Types of antenna |
|---|---|---|---|---|---|---|---|
| | | | | | Nocteal | Diunal | |
| 1 | Adephaga | *Scarites bengalensis*, Dejean, 1826 | Carabidae | Ground beetle | ✔ | - | Moniliform |
| 2 | | *Calosoma marginale*, Casey, 1897 | | Ground beetle | ✔ | - | Filiform |
| 3 | | *Chlaenius circumscriptus*, Duffschmid, 1812 | | Ground beetle | ✔ | - | Filiform |
| 4 | | *Pheropsophus jessoensis*, Morawitz, 1862 | Brachinidae | Ground beetle | ✔ | - | Filiform |
| 5 | | *Cicindela fabricii*, W.Horn, 1894 | Cicindelidae | Six spotted, tiger beetle | ✔ | - | Filiform |
| 6 | | *Hydrophilus ingulensis*, Geoffroy, 1762 | Hydrophilidae | Water scavenger beetle | ✔ | - | Clavate (Clobbed shape) |
| 7 | Polyphaga | *Heteronychus lioderus*, Redtenbacher, 1867 | Scarabaeidae | Scarab beetle | ✔ | - | Lamellate |
| 8 | | *Adoretus sinicus*, Burmeister, 1855 | | Chafer beetle | ✔ | - | Lamellate |
| 9 | | *Cyclocephala sp*, Dejean,1821 | | Masked chafers beetle | ✔ | - | Lamellate |
| 10 | | *Leucopholis lepidophora*, Blandford, 1851 | | Scarab beetle | - | ✔ | Lamellate |
| 11 | | *Oryctes rhinoceros*, Linnaeus, 1758 | | Rhinoceros beetle | ✔ | - | Lamellate |
| 12 | | *Xylotrupes gideon*, Linnaeus,1767 | | Elephant beetle | ✔ | - | Lamellate |
| 13 | | *Heliocopris bucephalus*, Fabricius, 1775 | | Dung beetle | ✔ | - | Lamellate |
| 14 | | *Onitis viridis*, Lansberge, 1875 | | Dung beetle | ✔ | - | Lamellate |
| 15 | | *Onthophagus taurus*, Schreber, 1759 | | Dung beetle | ✔ | - | Lamellate |
| 16 | | *Chrysochroa vittata*, Fabricius, 1774 | Buprestidae | Metallic wood boring beetle | ✔ | ✔ | Serrate |
| 17 | | *Coccinella transversalis*, Fabricius, 1775 | Coccinellidae | Lady bird beetle | - | ✔ | Filiform |
| 18 | | *Gonocephalum granulatum*, Fabricius, 1791 | Tenebrionidae | Darkling beetle | ✔ | - | Clavate |
| 19 | | *Xystrocera globosa*, Olivier, 1795 | Cerambycidae | Longhorn beetle | ✔ | - | Filiform |
| 20 | | *Aristobia testudinator*, Fabricius, 1781 | | Longhorn beetle | ✔ | ✔ | Clavate |
| 21 | | *Orthosoma brunneum*, Forster, 1771 | | Brown prionid/Longhorn beetle | ✔ | - | Filiform |
| 22 | | *Aulacophora foveicollis*, Lucas, 1849 | Chrysomelidae | Red pumpkin beetle | - | ✔ | Filiform |
| 23 | | *Monolepta signata*,Olivier, 1808 | | White-spotted leaf beetle | - | ✔ | Lamellate |
| 24 | | *Sagra femorata*,Drury, 1773 | | Frog-legged leaf beetle | - | ✔ | Moniliform |
| 25 | | *Cosmorhetha postivittata*, Boheman, 1837 | Curculionidae | Weevil / Snout beetle | - | ✔ | Geniculate |
| | Suborder (2) | Total (25) | 11 | 17 | 19 | 8 | 6 |

Table (2) Beetle species composition of different families in the study site

| Sr. No | Family | No. of species | Percentage (%) |
|---|---|---|---|
| 1. | Carabidae | 3 | 12 |
| 2. | Brachinidae | 1 | 4 |
| 3. | Cicindelidae | 1 | 4 |
| 4. | Hydrophilidae | 1 | 4 |
| 5. | Scarabaeidae | 9 | 36 |
| 6. | Buprestidae | 1 | 4 |
| 7. | Coccinellidae | 1 | 4 |
| 8. | Tenebrionidae | 1 | 4 |
| 9. | Cerambycidae | 3 | 12 |
| 10. | Chrysomelidae | 3 | 12 |
| 11. | Curculionidae | 1 | 4 |
| | Total | 25 | 100% |

Table (3) Monthly variation of individual of recorded beetle population

| No. | Scientific name | Population | | | | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | November | | December | | January | | February | | March | | April | | May | | June | | |
| | | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | 1st Week | 2nd Week | |
| 1 | *Scarites bengalensis* | 5 | 3 | - | 3 | 4 | - | - | 3 | 2 | - | 5 | 3 | 6 | 5 | 5 | 4 | 48 |
| 2 | *Calosoma marginale* | 4 | - | 3 | 2 | - | 3 | 2 | 3 | - | 6 | 3 | 4 | 4 | 3 | 4 | 3 | 44 |
| 3 | *Chlaenius circumscriptus* | - | 4 | - | 2 | 3 | - | - | - | 5 | 2 | 3 | 1 | 6 | 5 | 4 | 2 | 37 |
| 4 | *Pheropsophus jessoensis* | 2 | 4 | 3 | 4 | - | 4 | - | 2 | 4 | 3 | - | 4 | 2 | - | 3 | 1 | 36 |
| 5 | *Cicindela fabricil* | 4 | 3 | 4 | - | 5 | 4 | 2 | 2 | - | 6 | 3 | 5 | 4 | 3 | 3 | 2 | 50 |
| 6 | *Hydrophilus inquirenda* | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 3 | 24 |
| 7 | *Heteronychus lioderes* | 2 | 3 | - | 3 | 2 | 1 | 3 | - | - | 1 | 2 | 3 | 2 | 2 | 3 | 1 | 28 |
| 8 | *Adoretus sinicus* | 1 | 2 | 1 | - | 2 | 1 | - | 2 | 1 | 1 | 1 | 2 | 2 | - | 2 | - | 18 |
| 9 | *Cyclocephala sp* | 1 | - | 2 | - | - | 2 | 1 | 2 | 2 | - | 1 | - | 1 | 1 | 1 | - | 14 |
| 10 | *Leucopholis lepidophora* | - | 1 | 2 | - | 3 | 1 | 2 | - | 2 | 1 | 2 | 1 | - | 3 | - | 3 | 21 |
| 11 | *Oryctes rhinoceros* | 1 | - | 2 | - | - | 2 | 2 | 2 | 2 | - | 2 | - | 1 | - | 2 | 1 | 17 |
| 12 | *Xylotrupes gideon* | - | - | 1 | - | - | - | 2 | - | 2 | - | 2 | 1 | 1 | 1 | 2 | 1 | 13 |
| 13 | *Heliocopris bucephalus* | - | - | - | - | 3 | 2 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | 1 | - | 12 |
| 14 | *Ontis virens* | - | - | 2 | - | - | - | 1 | 1 | 2 | 2 | - | 3 | 2 | 1 | 4 | - | 18 |
| 15 | *Onthophagus taurus* | - | - | 1 | 1 | 1 | 2 | - | - | 1 | - | - | 2 | - | 2 | 3 | - | 13 |
| 16 | *Chrysochlora vittata* | 5 | 4 | 3 | 4 | 4 | 3 | 2 | 4 | 3 | 5 | 3 | 5 | 4 | 3 | 2 | 4 | 58 |
| 17 | *Coccinella transversalis* | 6 | 4 | 5 | 2 | 5 | 4 | 5 | 5 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 3 | 64 |
| 18 | *Gonocephalum granulatum* | 1 | - | 1 | - | 2 | - | - | - | - | 2 | 2 | - | 1 | 1 | - | 2 | 12 |
| 19 | *Xystrocera globosa* | - | - | - | 1 | - | - | 1 | - | 2 | - | 1 | 1 | - | - | 1 | 1 | 8 |
| 20 | *Aristobia reticulator* | - | - | - | - | 2 | - | 1 | - | - | - | - | - | 2 | - | - | - | 5 |
| 21 | *Orthosoma brunneum* | - | 1 | - | - | 1 | - | 1 | 1 | - | 1 | - | 1 | 1 | - | - | - | 7 |
| 22 | *Aulacophora foveicollis* | - | - | 2 | 3 | 4 | - | 2 | 2 | 2 | 1 | - | 1 | 3 | 2 | 2 | 3 | 27 |
| 23 | *Monolepta signata* | 2 | - | 2 | 1 | 1 | 2 | - | 2 | 1 | 2 | 2 | - | 1 | 1 | 1 | 2 | 20 |
| 24 | *Sagra femorata* | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | - | 1 | - | - | - | 6 |
| 25 | *Conotrachelus posticatus* | - | - | - | 1 | - | - | 1 | - | 2 | - | - | 1 | 1 | 1 | 1 | - | 8 |
| | Total | 34 | 30 | 36 | 27 | 44 | 32 | 32 | 34 | 40 | 39 | 39 | 43 | 52 | 40 | 50 | 36 | 608 |
| | | 64 | | 63 | | 76 | | 66 | | 79 | | 82 | | 92 | | 86 | | |

Table (4) Monthly individual number of beetle species collected in study site

| Sr. No. | Scientific name | Population | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | November | December | January | February | March | April | May | June | |
| 1 | *Scarites bengalensis* | 8 | 3 | 4 | 3 | 2 | 8 | 11 | 9 | 48 |
| 2 | *Calosoma marginale* | 4 | 5 | 3 | 5 | 6 | 7 | 7 | 7 | 44 |
| 3 | *Chlaenius circumscriptus* | 4 | 2 | 3 | - | 7 | 4 | 11 | 6 | 37 |
| 4 | *Pheropsophus jessoensis* | 6 | 7 | 4 | 2 | 7 | 4 | 2 | 4 | 36 |
| 5 | *Cicindela fabricil* | 7 | 4 | 9 | 4 | 6 | 8 | 7 | 5 | 50 |
| 6 | *Hydrophilus inquirenda* | 1 | 2 | 3 | 3 | 3 | 3 | 4 | 5 | 24 |
| 7 | *Heteronychus lioderes* | 5 | 3 | 3 | 3 | 1 | 5 | 4 | 4 | 28 |
| 8 | *Adoretus sinicus* | 3 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 18 |
| 9 | *Cyclocephala sp* | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 14 |
| 10 | *Leucopholis lepidophora* | 1 | 2 | 4 | 2 | 3 | 3 | 3 | 3 | 21 |
| 11 | *Oryctes rhinoceros* | 1 | 2 | 2 | 4 | 2 | 2 | 1 | 3 | 17 |
| 12 | *Xylotrupes gideon* | - | 1 | - | 2 | 2 | 3 | 2 | 3 | 13 |
| 13 | *Heliocopris bucephalus* | - | - | 5 | 2 | 1 | 1 | 2 | 1 | 12 |
| 14 | *Ontis virens* | - | 2 | - | 2 | 4 | 3 | 3 | 4 | 18 |
| 15 | *Onthophagus taurus* | - | 2 | 3 | - | 1 | 2 | 2 | 3 | 13 |
| 16 | *Chrysochlora vittata* | 9 | 7 | 7 | 6 | 8 | 8 | 7 | 6 | 58 |
| 17 | *Coccinella transversalis* | 10 | 7 | 9 | 10 | 7 | 7 | 7 | 7 | 64 |
| 18 | *Gonocephalum granulatum* | 1 | 1 | 2 | - | 2 | 2 | 2 | 2 | 12 |
| 19 | *Xystrocera globosa* | - | 1 | - | 1 | 2 | 2 | - | 2 | 8 |
| 20 | *Aristobia reticulator* | - | - | 2 | 1 | - | - | 2 | - | 5 |
| 21 | *Orthosoma brunneum* | 1 | - | 1 | 2 | 1 | 1 | 1 | - | 7 |
| 22 | *Aulacophora foveicollis* | - | 5 | 4 | 4 | 3 | 1 | 5 | 5 | 27 |
| 23 | *Monolepta signata* | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 20 |
| 24 | *Sagra femorata* | - | - | - | 2 | 2 | 1 | 1 | - | 6 |
| 25 | *Conotrachelus posticatus* | - | 1 | - | 1 | 2 | 1 | 2 | 1 | 8 |
| | | 64 | 63 | 76 | 66 | 79 | 82 | 92 | 86 | 608 |

## Results

### Species composition and individual numbers of recorded beetle species

A total of 25 species belonging to 25 genera, 11 families under order Coleoptera was recorded during the study period. Among them, family Scarabaeidae was found to be the highest in species number and percentages (9 species, 36%) and followed by Carabidae (3 species, 12%), Cerambycidae (3 species, 12%), and Chrysomelidae (3 species, 12%), one species each from Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, Coccinellidae, Tenebrionidae and Curculionidae (4%) (Figs. 2, 3 & Table 2).

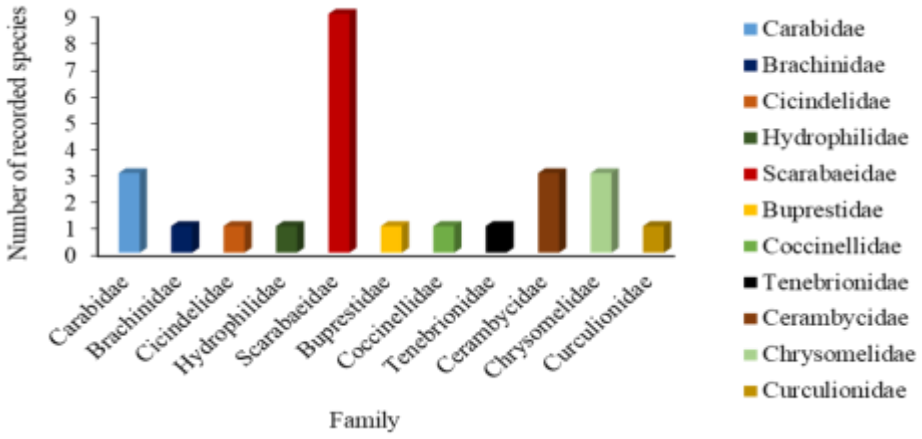



Figure (2) Number of recorded species under different families

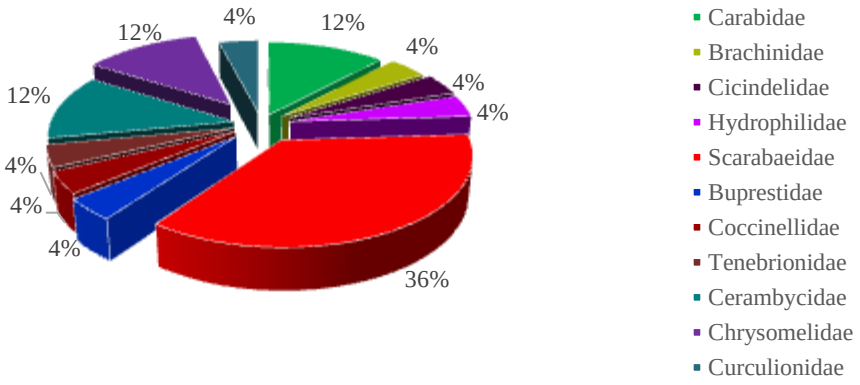
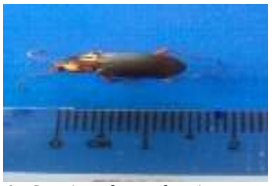


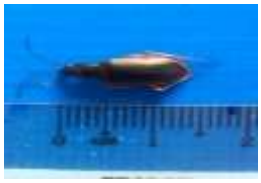

Figure (3) Number of recorded species under different families

### Habits and occurrence of species populations in the study area

Among the recorded species, Eight species of *L. lepidophora, C. vittata, C. transversalis, A. reticulator, A. foveicollis, M. signata, S. femorata* and *C. posticatus* were diurnal in habit whereas two species *C. vittata* and *A. reticulator* were both nocturnal and diurnal habits. The remaining species were nocturnal in habit. A total of 608 individuals of beetle species was recorded. The highest number containing 64 individual in *Coccinella transversalis* was found in every month but the lowest number containing five individual in *Aristobia reticulator* was found in January, February, May respectively. The highest number of beetle species was observed in May, June and lowest in December (Figs. 4 and 5 & Tables 1, 3 and 4).

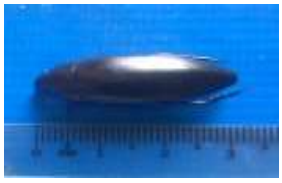

A. *Scarites bengalensis*
(Ground beetle)


B. *Calosoma marginale*
(Ground beetle)


C. *Chlaenius circumscriptus*
(Ground beetle)


D. *Pheropsophus jessoensis*
(Ground beetle)


E. *Cicindela fabricil*
(Six spotted tiger beetle)


F. *Hydrophilus inquirenda*
(Water scavenger beetle)


G. *Heteronychus lioderes*
(Scarab beetle)


H. *Adoretus sinicus*
(Chinese rose chafers/ Chafers beetle)

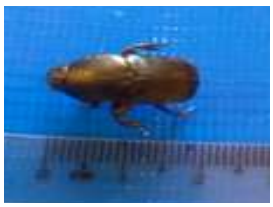

I. *Cyclocephala sp.*
(Masked Chafers beetle)


J. *Leucopholis lepidophora*
(Scarab beetle)


K. *Oryctes rhinoceros*
(Rhinoceros beetle)

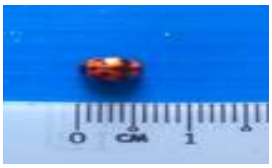

L. *Xylotrupes gideon*
(Elephant beetle)


M. *Heliocopris bucephalus*
(Dung beetle)


N. *Ontis virens*
(Dung beetle)


O. *Onthophagus taurus*
(Dung beetle)


P. *Chrysochlora vittata*
(Metallic wood boring beetle)


Q. *Coccinella transversalis*
(Lady bird beetle)


R. *Gonocephalum granulatum*
(Darkling beetle)


S. *Xystrocera globosa*
(Longhorn beetle)


T. *Aristobia reticulator*
(Longhorn beetle)


U. *Orthosoma brunneum*
(Brown prionid /Longhorn beetle)


V. *Aulacophora foveicollis*
(Red pumpkin beetle)


W. *Monolepta signata* (White spotted leaf beetle)


X. *Sagra femorata*
(Frog legged leaf beetle)


Y. *Conotrachelus posticatus*
(Weevil / Snout beetle)

Plate (2) The recorded beetle species in the study area of Taunggoke Degree College Campus

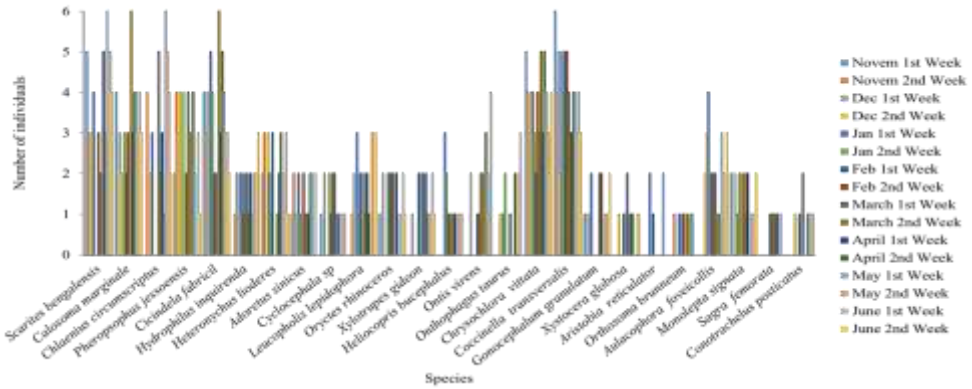



Figure (4) Monthly variation of individual of recorded beetle species during the study period

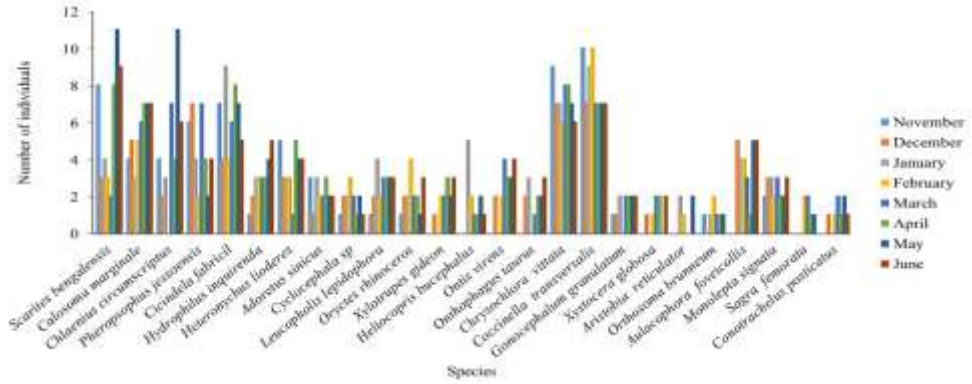



Figure (5) Monthly individual number of beetle specie collected in study site

## Discussion

In the present survey, a total of 608 individuals belonging to 25 species, 25 genera, 11 families under Order Coleoptera was recorded. The colored photographs of each species were presented in plate 2. During the present study, the family Scarabaeidae showed to be the highest species number among the remaining families. The two suborders of the Coleoptera are Adephaga and Polyphaga. Three species of family Carabidae, one species of family Brachinidae and Cicindelidae each were recorded under suborder Adephaga with five species in these three families.

Eight families, Hydrophilidae, Scarabaeidae, Buprestidae, Coccinellidae, Tenebrionidae, Cerambycidae, Chrysomelidae and Curculionidae were recorded under suborder Polyphaga. The family Hydrophilidae consists of one species of water scavenger beetle. The family Scarabaeidae consists of two species (Scarab beetle), two species (Chafers beetle), single species (Elephant beetle), single species (Rhinoceros beetle) and three species (Dung beetle).

During the study period, 13 species were beneficial. The species *Helicopris bucephalus, Qntis virens and Qnthophagus taurus* were the dung beetle of family Scarabaeidae. They feed on cow dungs and decomposing plant materials and they were found in near cow dungs at night-time. They may reduce the population of flies and worms that breed in cattle dungs. The family Scarabaeidae was found to be the largest number of species.

Borrow and Delong (1954) described that the family Scarabaeidae (Dung beetles), Coccinellidae (Ladybird beetles except Genus *Epilachna*) and Carabidae and Brachinidae

(some ground beetles) are some beneficial beetles. All the dung beetles are scavengers and some of them feed upon dungs.

The ground beetles in family Carabidae are predaceous beetles and feed on other insects and their larvae and they are collected from bushes, near grassland and human habitation of lighted areas during night-time. Three species belonging to the family Carabidae inhabit in soil, cropland and among decaying logs, and under barks.

Family Brachinidae includes the species *Pheropsophus jessoensis*, which occurred in human habitation and water edges. It is nocturnal and it is predators and scavengers that feed on animal and plant materials.

The tiger beetles belonging to the family Cicindelidae inhabit orchards, water edges, and human habitation areas. They feed on smaller insects.

Water beetles in family Hydrophilidae are mainly vegetarian feeding on aquatic plants but larvae are Carnivores, feeding on tadpole, snail and small fishes. They live in ponds and quiet streams and water edges.

The species of *Chrysochlora vittata* in family Buprestidae attack a number of leaves of sit plant and bore into the wood of shrubs and trees, especially those are dead.

The ladybird beetles belonging to the family Coccinellidae feed on aphids, eggs of Lepidopterans and other small soft-bodied insects. They also may use pollen and nectar as sources of energy. They are very important in the natural control of many pests.

The darkling beetles in family Tenebrionidae are fangivores, feeding on decaying plant material or organ and dead wood insects and omnivores and they are found in mainly deserts, forests as plant scavengers, under bark, bracket fungi, electric light (human habitation), and beneath logs.

Long horned beetles (family Cerambycidae) bore into the wood of shrubs and trees those are dead. Several species are serious pests with the larvae boring into the wood, where they can cause extensive damage to either living tree or to wood in buildings.

Family Chrysomelidae includes the leaf beetles. The species including the family Chrysomelidae feed on leaves of cucurbit, melons, pumpkins and gourds.

The Weevil beetles including the family Curculionidae were harmful and they destroy commercial products. They possess elongated snout (rostrum) which is used as a boring instrument for egg-placing into the host plant tissues.

The distribution and relative abundance of 45 beetle species from Hlawga Park were studied by Wint War War Myint, 2003. In her result, the percentage of recorded beetle species in family Chrysomelidae (50.33%), Scarabaeidae (15.88%), Carabidae (11.83%), Curculionidae (7.09%), Buprestidae (4.73%), Harpalidae (4.39%), Cerambycidae (2.7%), Hydrophilidae (1.35%), Histeridae and Cleridae (0.68%), and Dytiscidae (0.34%) were recorded from Hlawga Park. The species composition of family Chrysomelidae was the highest in Hlawga Park. The species composition of family Chrysomelidae was the highest in Hlawga Park. In the present study, the species composition in family Scarabaeidae (36 %,) was observed to be the highest. The present finding disagreed that of her finding.

The species diversity, distribution and habitat preference of 40 beetle species under 12 families from Maubin area were recorded by Khin Mar Htwe, 2007. She stated that the percentages of the recorded beetle species were 25% (family Scarabaeidae), 20% (family Chrysomelidae), 15% (family Carabidae), 10% (family Coccinellidae), 7.5% (family Curculionidae), 5% (Bruchinidae and Cerambycidae), 2.5% (family Cicindelidae,

Brachinidae, Hydrophilidae, Buprestidae) and Tenebrionidae in around Maubin area, Ayeyarwady Region. In her study, the family Scarabaeidae (25 %) was reported the highest and the lowest in Carabidae, Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, Coccinelloidae, Tenebrionidae, Cerambycidae, Chrysomelidae and Curculionidae. In the present study, the family Scarabaeidae (36 %) was found the highest and the lowest in family Carabidae, Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, Coccinelloidae, Tenebrionidae, Cerambycidae, Chrysomelidae and Curculionidae. Therefore the present finding was coincided with that of her finding.

Kyaw Min Htike (2012) stated that a total of 17 species, 16 genera, six families was recorded in Hinthada University Campus. He stated that the percentages and individual number of beetle species were the family Scarabaeidae (47.06%, 40). It was found to be the highest at Hinthada University Campus. In the present study, the family Scarabaeidae (36 %, 9) was found to be the highest as the percentages and species number. Therefore, the present finding was coincided with those of Kyaw Min Htike (2012).

Myat Ei Mon (2016) stated that a total of 20 species, 20 genera, 11 families was recorded in Mezaligone Environs, Hinthada District. The percentages and species number of the family Scarabaeidae (40%, 8) were found to be the highest and the lowest in family Brachinidae, Cicindelidae, Chrysomelidae, Buprestidae, Hydrophilidae and Curculionidae (5%, 1 each) in her study. Among them, the percentages and individual numbers of beetle species in family Scarabaeidae were found to be higher than the other families. In the present study, the percentages and the species numbers in the family Scarabaeidae (36%, 9) were found the highest and the lowest in family Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, and Curculionidae (4%, 1 each) during the study period. Therefore, the present finding was similar to that of her finding.

May Zin Sue (2017) stated that a total of 40 species, 31 genera and nine families was recorded in Sittway environs, Rakhine State. Among them, four species *Scarites bengalensis*, *Coccinella transversalis*, *Cicindela fabricil* and *Pheropsophus jessoensis* were similar to the recorded species of the present study. And also she stated that the percentages and individual numbers of beetle species in the family Scarabaeidae (35%, 14), Carabidae (17.5%, 7), Tenebrionidae (12.5%, 5), Coccinellidae and Cerambycidae (10%,4 each), Chrysomelidae (7.5%, 3), Hydrophilidae and Curculionidae and Elateridae (2.5%, 1 each) were reported in Sittway environs, Rakhine State. In the present study, the percentages and individual numbers of beetle species in family Scarabaeidae (36%, 9), Carabidae, Cerambycidae and Chrysomelidae (12%, 3 each), Brachinidae, Cicindelidae, Hydrophilidae, Buprestidae, Coccinellidae, Tenebrionidae and Curculionidae (4%, 1 each) were observed. Therefore, the present finding was coincided with that of May Zin Sue (2017).

The various kinds of habit in beetle species were recorded. In recorded 25 species, nineteen nocturnal species and eight diurnal species were observed during the study period.

## Conclusion

The present study provides information about the diversity and abundance of some beetle species. Beetles provide essential ecological services and are used as tools in many scientific endeavors, some with large effects on humans. On the other hand, beetles continue to have negative effects on vital industries such as agriculture and forestry. Studies on beetle biodiversity and the conservation of their habitats are necessary to ensure the sustainability of natural ecosystems and critical human activities.

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