

Collecting beetles on Leyte Island, Philippines

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ABSTRACT

Beetles belonging to 67 families were collected during a 3-week survey on coleoptera inhabiting forest floor, aquatic and semi-aquatic habitats, and lower stratum vegetation in the island of Leyte, Philippines. Highest number of species was found in the primary forests around Mount Pangasugan.

Keywords: Coleoptera, Leyte, Philippines

INTRODUCTION

Beetles, scientifically classified under Order Coleoptera, are the species-richest animal group not only among insects but also among all other animals. Earlier estimates indicate about 500,000 different species worldwide, but more recent studies on biodiversity, mainly in the tropical rainforest, suggest a much higher number of species. Many of them are still unknown to science. Beetles occur in nearly all habitats from the seashore to high altitudes in mountains. They also live in freshwater lakes and rivers but are lacking in marine ecosystems.

The knowledge about Coleoptera of the Philippines in general is very poor. No monographs on the total order or even on single families exist. However, during the last century many species were described in numerous taxonomic publications, all over the world. Thus, information on all

beetles ever reported from the Philippines should urgently be compiled.

Nearly nothing is known on Coleoptera (or on other insect groups) in Leyte Island. The ViSCA-GTZ Ecology Program, among other activities, emphasizes on biodiversity as a major resource of Leyte and the need to increase the knowledge about the faunal and floral inventory of the area surrounding the Visayas State College of Agriculture, especially of Mount Pangasugan. Within the framework of this program we visited Leyte to collect beetles from February 18 to March 14, 1991.

LOCALITIES

The field work was focused on the following regions of Leyte:

1. Visayas State College of Agriculture (ViSCA) N Baybay: cultivated area;

2. Above ViSCA: secondary forest up to 200 m above sea level;
3. Above ViSCA to Mount Pangasugan: primary forest between 200-500 m above sea level;
4. Surroundings of Lake Danao SE Ormoc: forest edge and forest about 500 m in altitude;
5. Balinsasayao SW Abuyog: forest above Experimental Station between 100-200 m above sea level;
6. Balinsasayao SW Abuyog: banks of the Layog river below Experimental Station;
7. Diyu Island of the Cuatro Islas: seashore;
8. Jao Island NE Bohol: mangrove ecosystem.

METHODS

The most important method for collecting beetles (and other arthropods) on the forest floor is the use of a soil sifter. The soil litter from different sites in the primary and secondary forest was sifted and then brought in cotton sacks to ViSCA. The substrate was examined on a white cloth and all bigger animals were removed for preservation. The soil litter was placed in so-called winkler-apparatuses, and dried for at least 5 days. During drying the arthropods moved and automatically fell down in a tube filled with 70% alcohol. The results improved by mixing again the soil litter after 1-2 days which increased the activity of the animals. About 30 kg of sifted soil litter were collected from different localities. This soil sifting method is used in quantitative studies when sifting a definitive and comparable square surface. Another method for collecting on forest floor is the turning of stones and wood and the setting of pitfall traps (10 such traps were dug), but in that area these usual methods were not as effective as the soil sifting method.

Arthropods from rotten wood and fungi can be collected also by the sifter. Rotten wood, tree bark, fungi, etc. can be sifted in the same way as

soil litter. The extraction of animals from such substrates on a white cloth is more effective than looking for single specimens in the forest. Since many wood living beetles are active only during night, old trees should be investigated at night with a torch. Many beetles could be picked up using this method.

Beetles from the lower vegetation were collected using the usual insect net. This instead was used to collect insects from inflorescences and below the leaves. It was useful to sweep the net through the vegetation even if no insects can be seen because many specimens fell into the net.

Many insects from different biotypes are attracted by light, so collection must be done some evenings. The diversity of flying insects depends extremely on the weather conditions. Clear sky, and wind make this method less effective. In this method, collection should start before complete darkness as many beetles already fly during twilight to the lamps. Protection against mosquitoes is useful.

Rocks irrigated by water should always be searched. Many creatures feeding on mosses and algae can be picked up there using a pincer.

The exhaustor is very helpful for collecting on pebble of river banks, but the sifter may also be used here. Sandy or muddy banks of rivers and lakes should be watered and/or stamped to expel the dug insects. On the seashore, the washed detritus (wood, remnants of plants) should be turned over. The substrate washed ashore on sandy shores should also be dug. The sifter can also be successfully used for this detritus.

Standing and running freshwater was fished through using a special water net. Beetles occur in the water and on the surface. Some species were collected by taking stones and wood, on which the animals crept out from the water.

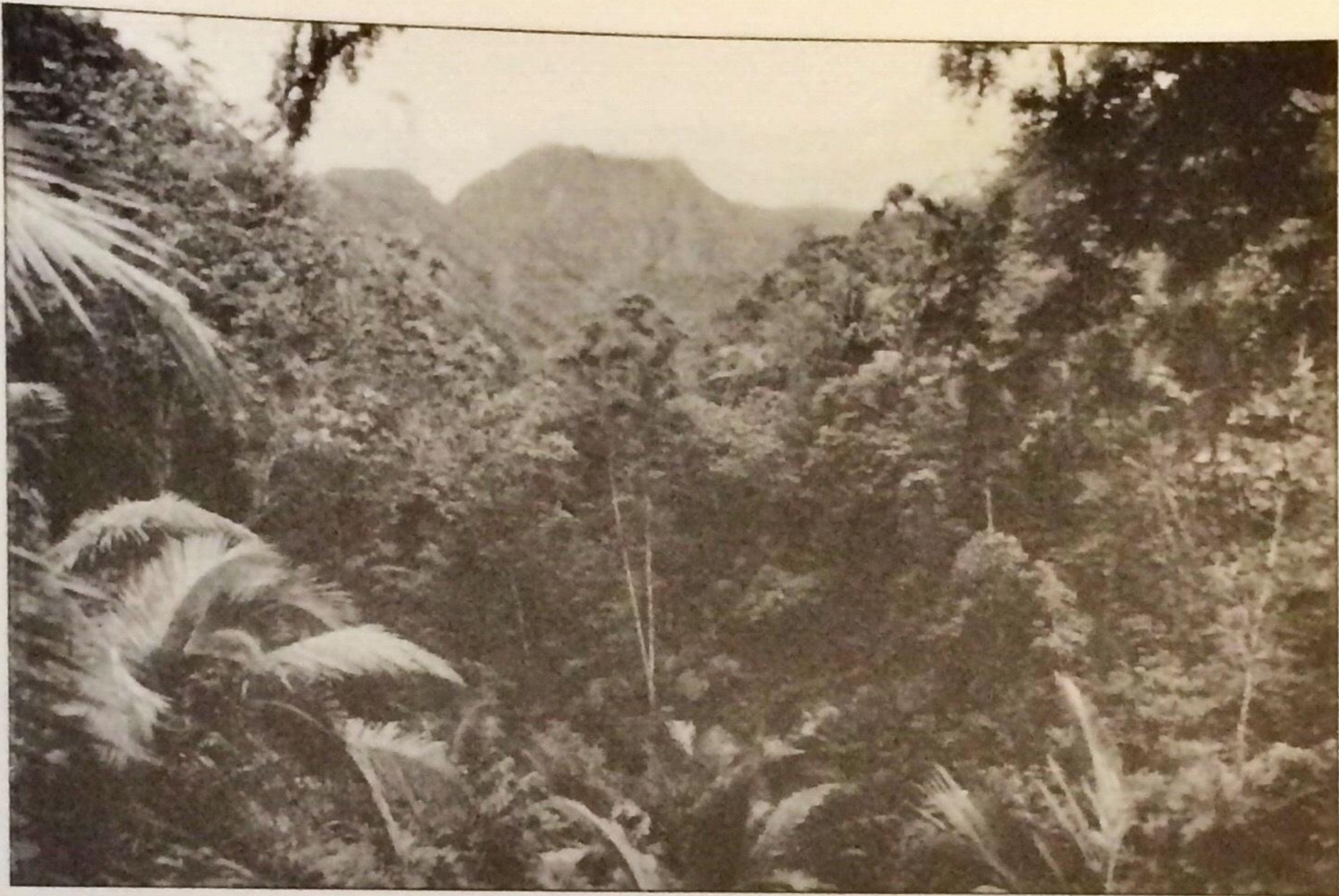
During the fieldwork, members of 67 Coleoptera families (Table 1) were collected. Further detailed sorting and studies may reveal additional families.



Cultivated area around ViSCA



Forest edge of secondary forest above ViSCA with banana plants



Diverse primary forest above ViSCA (Mt. Pangasugan)



River in primary forest above ViSCA with diverse habitats



Forest edge in the surroundings of Lake Danao SE Ormoc



Banks of Layog River with pebbles and sandy areas near Balinsasayao



Seashore and shrub vegetation on Diju Island of the Cuatro Islas



Mangroves on Jao Island during low tide

Table 1. List of collected families.

Alleculidae	Dermestidae	Meloidae
Anobiidae	Discolomidae	Mordellidae
Anthicidae	Dryopidae	Mycetophagidae
Anthribidae	Dytiscidae	Nitidulidae
Bostrychidae	Elateridae	Oedemeridae
Brenthidae	Endomychidae	Orthoperidae
Bruchidae	Erotylidae	Paussidae
Buprestidae	Gyrinidae	Platypodidae
Cantharidae	Helodidae	Pselaphidae
Carabidae	Histeridae	Pterogeniidae
Cerambycidae	Hydraenidae	Ptiliidae
Cerylonidae	Hydrophilidae	Ptinidae
Cholevidae	Lagriidae	Rhizophagidae
Chrysomelidae	Lampyridae	Scaphidiidae
Cicindelidae	Languriidae	Scarabaeidae
Cisidae	Lathridiidae	Scolytidae
Clambidae	Leiodidae	Scydmaenidae
Cleridae	Limnichidae	Serropalpidae
Coccinellidae	Lucanidae	Staphylinidae
Colydiidae	Lycidae	Tenebrionidae
Cryptophgidae	Lyctidae	Trogossitidae
Cucujidae	Lymexylonidae	
Cuculionidae	Malachiidae	

CONCLUSION

The collected material has been transferred to the Staatliches Museum für Naturkunde in Stuttgart/Germany and will be sorted, prepared and labelled in that institution. After that, the beetles will be loaned partly to specialists worldwide for identification and for description in cases of new species or genera. This needs time and it should also be noted that no specialists for many families exist at the moment. The identifications will be compiled later. Finally, the material will be housed mainly in the Stuttgart Museum. Duplicates will be sent to ViSCA Natural History Museum.

Though we collected many thousands of specimens were collected, it was impossible to register the total Coleoptera fauna during that single and short stay. The collection opened only the first window, and the collections should be con-

tinued by Philippine biologists during all seasons of the year and using different methods. The fauna of higher forest trees which is known as very diverse and different from that of the forest floor should also be investigated. Step by step, the primary collections should be followed by biological observations in selected groups (concerning food plants, ecological interrelations etc.).

During the fieldwork, not only Coleoptera but some other arthropod groups were also collected and treated in the same way. Different Arachnida (web spiders, harvestmen, pseudoscorpions, whip scorpions, scorpions) and Myriapoda (centipedes, millipedes) as well as terrestrial Isopoda were observed.

The collection localities as well as many insects and other arthropods were photographed. Parts of this documentation was submitted to the ViSCA-GTZ Ecology Program for further use by the College.

The Mount Pangasugan region was immediately recommended as the most interesting area. Biodiversity of plants and insects is incomparably higher in that virgin forest than in any other (artificial) terrestrial ecosystems of Leyte. Mount Pangasugan is an ark for very numerous species which are unable to survive in cultivated land or even in secondary forest. Many of them are hitherto unknown or endemic species. Cutting of that forest or parts of it will destroy an immense biological capital. The intact ecosystem of that forest with its rich flora and fauna contains voluminous genetic information which could be necessary for future human generations and should urgently be preserved.

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