

Entomology work in Fiji

How much do we really know?

by Hilda Waqa-Sakiti

Fiji's arthropod fauna has received scant attention as there is little current comprehensive information published. For the few major groups documented, most are more than 50 years old and in need of revision. In Fiji, currently most entomological research concentrates primarily on economically important insect pests and less on the study of insect biodiversity, ecology and its conservation needs. For Fiji and other Pacific islands, habitat loss (effectively forest loss) remains the most serious threat to the endemic fauna and flora. Virtually all the lowland areas have seen deforestation of some kind with only small pockets of native fauna and flora remaining in protected areas. Therefore there exists a need to document Fiji's unique fauna before they are lost.

The most diverse group under the Class Insecta is in the Order Coleoptera (meaning sheath wings), commonly known as beetles and there are more

than 300,000 currently named species worldwide. The success of beetles is attributed to the capacity for complete metamorphosis, having elytra (a hard cover or protective shield that covers the soft body beneath) and the presence of mouthparts designed for chewing abundant solid foods. They also show exceptionally diverse adaptations to very different environments and habitats, exploit the most varied types of food and use all possible methods of locomotion. Beetles range in size from one millimetre to 200 mm.

Beetles are of great importance in ecosystems. Because of their great diversity, beetles have the largest biomass compared to all other living animals on earth. Therefore, they play an important role to other animals by being at the bottom of food chains and therefore providing food and energy. They allow for

the recycling of vegetation mainly through decomposition and herbivory, and also act as pollinators. Also recently, some invertebrates (including butterflies, ants and beetles) have been

recognized as important indicators of "forest health".

Beetles are also known to have significance with the Fijian culture. Fijian tribes closely identify themselves with animals and plants in their environment, resulting in the adoption of totems. A good example is in the province of Namosi where the cerambycid (long-horn) larva ('yavato' in Fijian) is considered to be sacred and solely for the consumption by their traditional high chief. Other Fijians in the provinces of Naitasiri, Tailevu, Serua and Lau groups also consume these 'yavato' as they provide a rich source of protein to their daily diet. The 'yavato' is also used by Fijians as baits, particularly for catching eels.

One particular species in the beetle family Cerambycidae (longhorns) that has captivated global interest is the *Xixuthrus heros*. This species is endemic to Fiji (recorded from Viti Levu, Vanua Levu and Taveuni) and is possibly endangered. It has been reported to be the worlds'



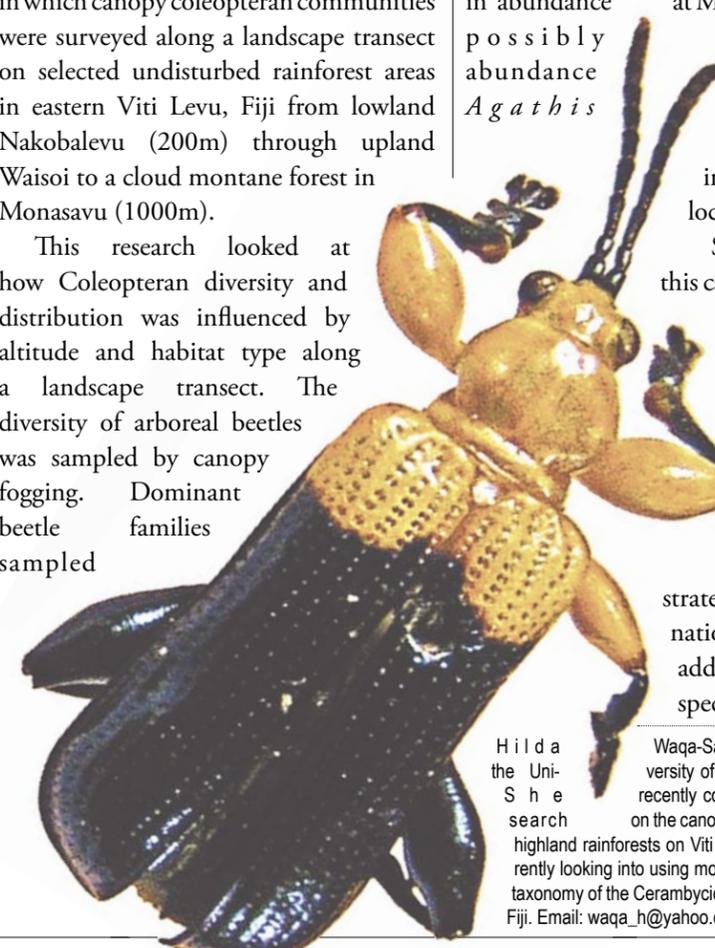
second largest beetle at a massive length of 14-15 cm.

Unfortunately for Fiji and many other Pacific Island countries, the taxonomy, biology and ecology of insects are relatively unknown mainly due to the lack of expertise in this area thus important biodiversity and conservation measures for these unique taxa among our islands will be impossible. In Fiji, virtually no studies of this type have been done. However, a recent study was conducted by the author, in which canopy coleopteran communities were surveyed along a landscape transect on selected undisturbed rainforest areas in eastern Viti Levu, Fiji from lowland Nakobalevu (200m) through upland Waisoi to a cloud montane forest in Monasavu (1000m).

This research looked at how Coleopteran diversity and distribution was influenced by altitude and habitat type along a landscape transect. The diversity of arboreal beetles was sampled by canopy fogging. Dominant beetle families sampled

from the canopy included: Curculionidae (weevils), Chrysomelidae (leaf beetles) and Staphylinidae (rove beetles) and it is probable that this reflects their wide range of feeding habits and exploitation of rainforest habitats. Furthermore, diversity measures revealed a peak at mid-to-high altitude (800-1000m in Monasavu) for the beetle taxa. Plant-host associations with some beetle taxa were also probably evident particularly in the Family Curculionidae which demonstrated a peak in abundance at Monasavu (1000m) possibly due to the abundance of native *Agathis macrophylla* ('dakua makadre' in Fijian) at this location.

Studies such as this can provide further knowledge for these diverse, unique yet understudied taxa so that conservation and management strategies at the national level maybe addressed more specifically.



Hilda Waqa-Sakiti is a PhD student at the University of the South Pacific, Suva. She recently completed her Masters research on the canopy Coleoptera of lowland-highland rainforests on Viti Levu Island. She is currently looking into using molecular tools to clarify the taxonomy of the Cerambycidae (Longhorn beetles) of Fiji. Email: waqa_h@yahoo.com

Page 24. Bottom left: A 10 m x 10 m sampling quadrat at Monasavu, Viti Levu Island, Fiji. Top: A brentid beetle. Centre: A curculionid (weevil). This page. Left: A chrysomelid (leaf beetle). Top left: *Pheidole colaensis* - endemic to Fiji. (Photo: Eli Sarnat.) Top centre: A damselfly, *Nesobasis* sp. This genus is endemic to Fiji. (Photo: Isaac Rounds). Top: A light trap - targets night flying insects. (Photo: Isaac Rounds). Above: The canopy fogging technique that was employed in the surveys.

