

First Steps

Longhorned beetles of Fiji

By Sunil R. Prasad, Sanjana Lal, Akanisi Caginitoba, & David Olson

Fiji is home to three species of Longhorned beetles: *Xixuthrus heros*, *X. ganglbaueri* and *X. terribilis* (a Taveuni endemic). After much confusion regarding the taxonomy of the beetles these three names have been decided to identify the longhorns. Reaching a goliath size of 140 mm, the longhorn beetle holds the title of world's second longest beetle, only out-competed by the South American Longhorn beetle *Titanus giganteus* that measures up to 170 mm.

The distribution of the *Xixuthrus* beetles is restricted to the three main island; Viti Levu, Vanua Levu and Taveuni. *Xixuthrus ganglbaueri* and *X. heros* are known from Viti Levu only, while *X. terribilis* is known from specimens from Taveuni and Vanua Levu. Judging from their flight capacity, the distance between the closest point of Taveuni and Vanua Levu (Natewa Peninsula with adjacent forests) can be easily conquered by *X. terribilis*. The adults have to be powerful flyers in order to journey long distance to find mate through pheromones attraction. Some villagers describe the lumbering and awkward flight of the adults resembling “B52s buzzing around and smashing into things”. Simmonds in 1964 ingeniously described the *Xixuthrus* beetles in his article as “my weapons had wings”.

When handled, the adults make a warning sound by rubbing the posterior

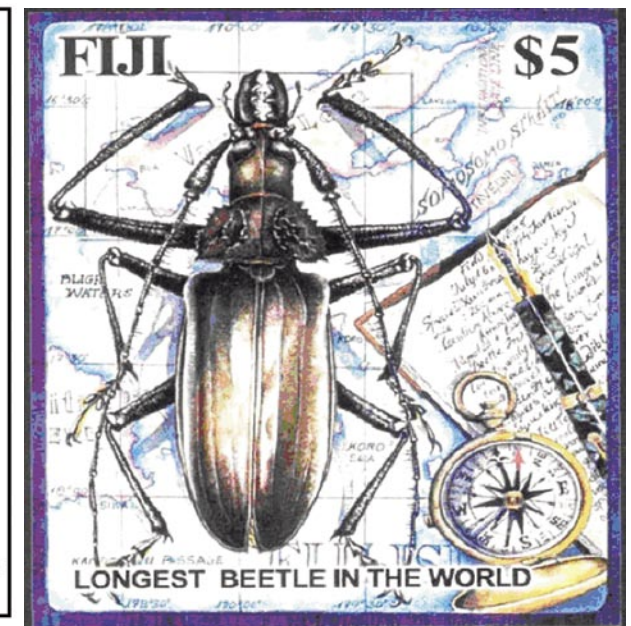
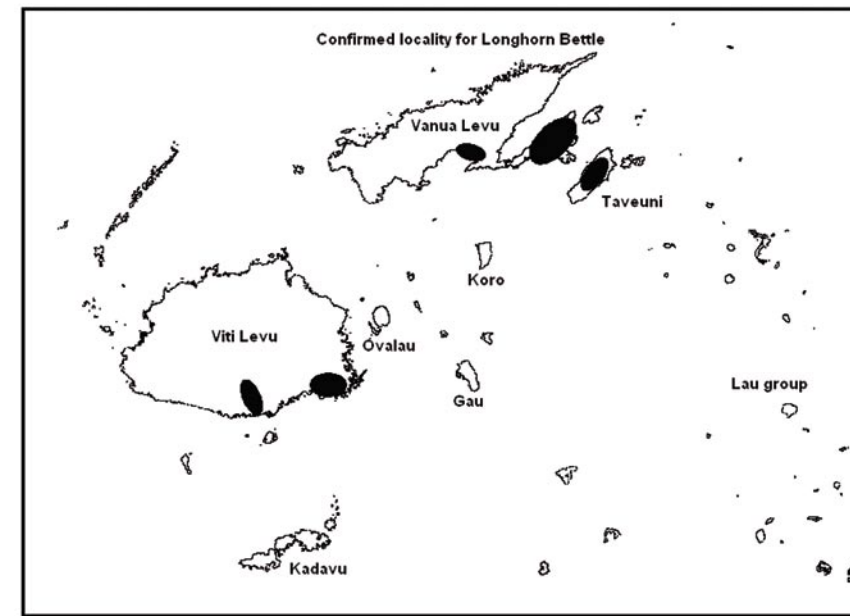


wing ribs against the edge of the anterior wings. This is a way of communicating with other individuals. These *Xixuthrus* beetles have been erroneously described by some as being extinct. They are very however, rare and are vulnerable to extinction. The Wildlife Conservation Society (WCS) recently conducted a reward-based population survey across Fiji for 24 months, during which only six specimens were collected. The lack of conservation measures and paucity in biological information will most likely lead to the extinction of these rare beetles.

Reproduction

The adults are attracted to lights and sometimes come towards human habitation; however in its natural range they should occur near coastal forest where water-logged decomposing trees are abundant. This is vital for the larva as moisture is needed for unrestricted growth and for easy excavation of burrows within the logs.

Olfactory glands situated in the antennae are used for attracting potential mates and it is anticipated that this works over long distance. Most Prioninae copulate at night or late in the day, and it is believed that the *Xixuthrus* beetles also follow this rule of thumb. The mating ritual could be very dramatic as male-male confrontation



can arise and might lead to the demise of one individual, since the adults have very heavy armour with spines and they possess mighty jaws. After much exhaustion from mating rituals,

and it stays in this stage for about 11 months. During this stage the pupae blocks the rear passage of the tunnel using its fecal matter. This keeps the front of the passage clear and clean

by the authors in captivity for as long as one and a half months without food but with water.

Threats

The main threat to the *Xixuthrus* beetles and probably other biota is the loss of large tracts of primary rainforest. *Xixuthrus* beetle larvae are believed to help in the eventual degradation of large fallen trees, thus playing a pivotal role in the cycling of the forest nutrients.

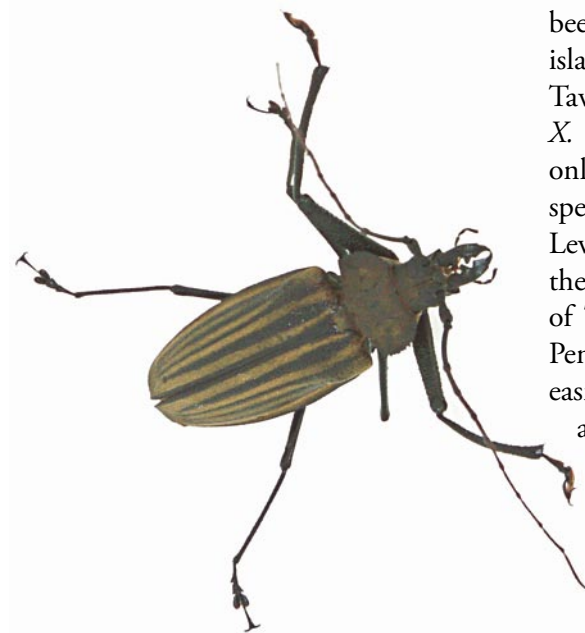
the female would deposit her eggs in a host tree and may mate again. Host specificity is thought to be very strong in the *Xixuthrus* beetles, and suspected trees include *Mako Trichospermum richii*, *Kaudamu Myristica castaneifolia*, *Vota* or *Vure Geissois* spp, and *Bau Palaquiu fidjense*.

A pupa develops once the egg is laid

for eating, and makes a network of tunnels. Blocking the rear passage of the tunnel has its advantages as well; the larvae remain protected from external environmental changes and predators.

Very little is known about the natural longevity of the *Xixuthrus* beetles however they have been kept

Deforestation, invasive species, harvesting from the wild for food (grubs) and trade (selling pinned adults to insect collectors) are the main threats for the *Xixuthrus* beetles. Dry pinned adults are in demand and prices as high as AUD\$100 have been quoted. Some sites have even listed *Xixuthrus* specimens for auction. To combat the



Above: *Xixuthrus* beetle. **Top:** Akanisi gladly volunteering to hold a live *Xixuthrus* specimen. **Page 27: Above left:** Map showing the confirmed localities where the *Xixuthrus* beetles have been found in Fiji. **Above right:** The new \$5 cover stamp with longhorn (wrongly labelled as the world's longest beetle). **Below:** Forest of Fiji and habitat of *Xixuthrus* beetles being altered by agriculture such as the planting of coconut plantations.



The main threat to the *Xixuthrus* beetles and probably other biota is the loss of large tracts of primary rainforest.

Left : *Xixuthrus* beetle and at right on Fiji two dollar stamp.



rise in demand for trade of the *Xixuthrus* beetles, the Ministry of Environment and the National Scientific Council of Fiji has recently decided to include the three species of the *Xixuthrus* beetles under Schedule Two of the Endangered and Protected Species Act. This will prevent the movement of the *Xixuthrus* beetles out of Fiji and hopefully will encourage the repatriation of specimens which are already out of the country.

The main threat to the *Xixuthrus* beetles and probably other biota is the loss of large tracts of primary rainforest. *Xixuthrus* beetle larvae are believed to help in the eventual degradation of large fallen trees, thus playing a pivotal role in the cycling of the forest nutrients. It is estimated that the larva spends about 10-12 years in the larval stage before metamorphosing and emerging as adults. The time scale is indicative of the low nutrient content of the logs, and because of the time scale the logs have to be big enough to sustain the larva for that period of time. Intact rainforests consequently provide a high

abundance of large rotting logs, which is essential for larval nurseries. The conversion of the *Xixuthrus* beetles habitat to plantations is probably a major factor in the decrease of huge logs, available to be used as larval nurseries. Therefore, forests with identified heritage trees are an important habitat for their conservation.

Invasive species such as *Felis catus* (feral cats), *Rattus rattus*, *Rattus exulans*, *Rattus norvegicus* (rats), and *Herpestes javanicus* (small Indian mongoose) are probable decimators of adult and larval populations of *Xixuthrus* beetles. The harvesting of the larval stage by locals for food is thought to contribute significantly to the decrease of the *Xixuthrus* beetles. To a smaller extent harvesting from the wild, especially the final stages may also have an impact on the dwindling population of the *Xixuthrus* beetles. Some researchers believe that harvesting from the wild for food has driven the decline of this species. The survey conducted by Wildlife Conservation Society also found that *Xixuthrus* beetles were absent from Gau island. Since Gau is one of the larger predator (invasive

species) free islands, this might indicate that the *Xixuthrus* beetles already have a limited range.

Conservation

Apart from being listed in the Endangered and Protected Species list for Fiji; there have been no major efforts to conserve the *Xixuthrus* species. This species may be "incidentally" present in a few reserves and un-logged areas such as Colo-i-Suva and surrounding intact areas on Viti Levu, the Waisali reserve and adjacent forested areas in Vanua Levu, and Bouma and Ravi Levu reserves on Taveuni Island.

For tribes in the province of Namosi (South-eastern Viti Levu) the Cerambycidae larvae, yavato, are considered sacred and its consumption is only reserved as a special treat for their traditional chief (Tui Namosi). The larvae are considered taboo in this region and destruction of the larvae or even verbally citing its name can be taken as an insult to their chief.

Sunil R. Prasad is working as an Entomology Research Assistant with the Biology Division, USP. The project 'Focus on Fiji: Insect inventories and research' is funded by the Darwin Initiative Project and as its latest project of raising the profile of the terrestrial arthropods, a "Field Guide to the Fijian Butterflies" is in preparation. Sanjana Lal is an entomologist at the Department of Forestry, Fiji government. She is a very experienced taxonomist and has assisted in the curation of the Forestry Department's insect specimen collection. Akanisi Caginitoba currently works for the Wildlife Conservation Society, based in Suva, Fiji, where David Olson was a former country program director. Together the authors have revived interest in research on the *Xixuthrus* beetle in Fiji.

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