HOST SPECIALISATION
of wood- and fruit-boring insect larvae
in a lowland rainforest in Papua New Guinea

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Abstract
The host specificity of longhorn beetle larvae (Coleoptera: Cerambycidae) and fruitfly larvae (Diptera: Tephritidae) was studied in a species-rich lowland rainforest in Papua New Guinea. We have reared >2,000 cerambycid and more than 7,000 fruitfly larvae from numerous hosts and quantified their host selection with regards to congeneric species, confamilial genera and different families of plants.

Cerambycidae project
We studied the species richness and the host specificity of long-horned beetles (Cerambycidae) in the wood of lowland tropical rainforest in Madang, Papua New Guinea. Baits of freshly cut wood from selected trees are exposed in the forest to allow oviposition by cerambycids. The samples are then placed into the rearing cages (Fig. 3) and the emerging beetles are collected. Fieldwork is being carried out in humid rainforest at Ohu village, Madang district, Papua New Guinea.

Fruit-flies project
The host specificity and species richness of fruit flies was studied in a lowland tropical rainforest around Madang, Papua New Guinea. We have reared fruit flies from almost 8,000 fruit flies from 53 plant species, moreover we collected 21,000 fruit flies using the Steiner traps baited with eucalyptus and methyl eugenol. Overall we obtained 72 identified species of fruit flies.

Preliminary results
Most Cerambycidae are rather wide generalists even among relatively unrelated host species. For example, all species found on Pimelepodron ambrosioides (Lam. Euphorbiaceae) are also found on at least two of Monocoeus species. Generally, most of the species are found on more than three host species (Fig. 4).

Host specificity of fruit flies
Fruit flies were highly host specific, as they were mostly specialised to a single plant family (83% of species) and within each family to a single genus (80% species). Only 30 from the 53 plant species were colonised by fruit flies. Plant species hosted 0-3 fruit fly species at densities characterised by the median of 1 (0-12) fruit flies per kg of fruits and 1 (0-17) fruit flies per 100 fruits. Steiner traps were highly efficient in sampling the fruitfly species as they re-collected 84% of all species trapped in the same rainforest area five years ago. From the results above we estimated the local species pool of fruit flies at 152.

The Parataxonomy concept
To understand complex communities with numbers of species and relationships, such as the insect community of tropical rainforests, demands through quantitative analysis. Such analysis could be reliable only when long-term and large-scale approach is employed. To achieve this, the Parataxonomist Training Center in Madang, Papua New Guinea, has adopted the concept of parataxonimist — trained people from local villages trained to carry out various scientific tasks. The Ohu Bush Laboratory is led by senior parataxonimist and local landowner Brus Bola.