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Mitochondrial DNA evidence for the spread of Pacific rats through Oceania.

In the ten years since we published our first full analysis of mitochondrial DNA variation in *Rattus exulans* as a means for tracking human migration, we have extended the commensal approach through time and space. Not only can mtDNA phylogenies provide information regarding population origins and paths of migration, they have also provided information regarding degrees of contact and interaction between islands. One of the unexpected developments of the *R. exulans* project has been the creation of a genetic database which allows for species identification based on short mtDNA sequences. The development of this database has raised some questions regarding both species identification and species distributions in the Pacific.

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Dispersal of *Clidemia hirta* seeds and reduction of reproductive potential of *Hedychium gardnerianum* by *Rattus* spp. in a Hawaiian rainforest.

This study aimed at determining the role of non-native rats in the reproductive cycles of two highly invasive weed species – *Clidemia hirta* and *Hedychium gardnerianum* – of Hawaiian rain forests. *Rattus* spp. (apparently both *R. rattus* and *R. exulans*) feed on fruits of both *Clidemia* and *Hedychium* based on analysis of rodent droppings collected during fruiting season where the two weed species were common. Tiny (0.6mm) *Clidemia* seeds passed through rodent digestive tracts intact even though germination tests showed no significant differences in germinability ($p = 0.066$) or rate of germination ($p = 0.700$) between *Rattus*-passed seeds and control seeds. However, since seeds of *Clidemia* were shown in a related study to be dispersed on a large scale by common rain forest passerine bird species, dispersal by rodents may not be important ecologically. *Hedychium* seeds are larger (4-5mm) and were fragmented during mastication by rats. Seed production for *Hedychium* during the 1997 fruiting season was reduced on average by almost half by *Rattus* predation on flower buds, flowers, and immature fruits. Despite this at least occasional substantial reduction of its reproductive potential by rats, *Hedychium* remains a highly successful invader of Hawaiian rain forests.

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Rats as transformers of native forests in the islands of French Polynesia (South Pacific).

Three rat species (*R. exulans*, *R. rattus* and *R. norvegicus*) occur in the remote islands of French Polynesia (South Pacific). They are found in almost all the 76 inhabited islands of the Austral, Gambier, Marquesas, Society and Tuamotu archipelagoes. Although their impacts on land and seabirds are well-known (e.g. extirpation or extinction of flycatchers *Pomarea* spp.,

