Oral 15.1 in *Anthropogenic Impacts on Frugivory and seed Dispersal (part II)*: Einstein, 17.06.2010, 14:00-14:15

Human frugivory and seed dispersal in Neotropical forests

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In Neotropical forests, indigenous people gather wild fruits and travel from hundreds of meters to tens of kilometers per day. Thus, they disperse seeds over a wide range of distances. Seeds may be spit out along trails (e.g., *Inga* spp.), discarded on rubbish heaps (e.g., *Oenocarpus* spp.), or purposefully planted (e.g., *Pourouma* spp.). Groups with the least frugivory might consume only a few species of wild fruits, while others, such as the Joti, in Venezuela, consider 222 species of wild tree fruits edible, and regularly consume fruits of two dozen species. Despite these facts, documented primarily by ethnobiologists, ecologists who study distributions of tropical trees almost uniformly ignore the human dimension of seed dispersal, even though historical effects of seed dispersal by humans may persist for centuries. For example, groves of *Ecclinusa guianensis* are apparently maintained and visited regularly by the Joti. Not solely as hunters of frugivorous vertebrates should humans be considered part of the seed dispersal equation, and the effectiveness of seed dispersal by humans should be measured. Human hunting, frugivory and seed dispersal coupled with activities of non-human frugivores, seed dispersers, and seed-eating animals might together impact select tree populations. We will discuss data on human movement patterns, their potential for very long distance dispersal of large seeds, and the known scope of frugivory among different indigenous groups in Neotropical forests.

Oral 15.2 in *Anthropogenic Impacts on Frugivory and seed Dispersal (part II)*: Einstein, 17.06.2010, 14:15-14:30

Vanishing endemic frugivorous birds and endangered plants in the islands of Eastern Polynesia (South Pacific): an extinction cascade?

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Islands are known to be extinction hotspots for endemic birds, including many frugivorous species. Their role as dispersers of native and endemic plants is critical for island colonization, plant succession, and forest regeneration. On the remote oceanic islands of Eastern Polynesia (South Pacific), human colonization by Polynesians around 1,000 years ago triggered a wave of avian extinctions, which have continued with the arrival of Europeans in the 18th century and into the present. Palaeo-archeological and historical records reveal that half of the ca. 50 known frugivorous species (fruit doves *Ptilinopus*, pigeons *Ducula*, starlings *Aplonis* and cuckoo-doves *Macroptygia*) from 29 islands have been lost. All frugivorous species have disappeared on at least seven islands, and more than 50 % on four other islands. We assessed the conservation status of large-fruited (> 1 cm in diam.) endemic woody plant taxa, including large trees (*Nesoluma* and *Planchonella*, Sapotaceae, *Hernandia*, Hernandiaceae), small trees (*Santalum*, Santalaceae, and *Ochrosia*, Apocynaceae), shrubs (*Ixora* and *Psychotria*, Rubiaceae, *Cyrtandra*,Gesneriaceae) and palms (*Pritchardia*, Arecaceae) in these islands, based on IUCN Red Lists and recent botanical surveys. Results show that a high proportion of endangered and presumed extinct plants occur on islands that have lost frugivorous birds, suggesting a cascading extinction effect. Other important factors contributing to the increased vulnerability of the endemic flora are habitat destruction and fragmentation, seed predation by rats and plant invasions.