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Editorial Special Issue

Adding spice to life: A special issue on the Myristicaceae

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This special issue of *Tropical Conservation Science* contains seven articles. These papers address a variety of issues concerning the ecology, taxonomy and conservation of the pantropical tree family Myristicaceae R. Br., known to many by the spices nutmeg and mace. Despite the easily-identifiable branching pattern and characteristic fruit (important as a food source for many birds and primates), and commercial value of these spices, the family as a whole remains poorly known, both in terms of the phylogenetic relationships among the genera [1], as well as basic natural history (apart from classic studies of *Virola*, which is now a model system for studying seed dispersal [2,3]). Many Myristicaceae species are tall canopy or emergent trees, and access to flowers and fruits is thus restricted to abscised organs, and many species are rare and occur at low-densities further inhibiting access to taxonomic material. The papers in this special issue bring together reviews of pollination and seed dispersal of the family, as well as exciting new observations on some of the rarer species. Below are brief accounts of each paper in the current issue.

First, **Sharma and Armstrong** provide an in-depth review of our current knowledge of Myristicaceae pollination. They highlight the role of deception in aiding pollination in the family, and call for further research on the factors driving pollen flow and seed set – of importance both economically and for conservation. The next two manuscripts provide further documentation of flowering and pollination in two understorey species that enable detailed information to be collected on flower production, insect visitors, and demography. **Queenborough et al.** make use of a large permanent plot in Amazonian Ecuador to investigate how differences in investment in flowers and fruits between males and females of *Iryanthera* is correlated with differences in demography, growth and flowering. **Sinu and Sharma** document a wide diversity of insect visitors to *Myristica* flowers in India, and find a large discrepancy in the numbers visiting males and females.

Kitamura and Poonswad tell a different tale, collating all mentions of fruit and seed dispersal of nutmegs by frugivores in the Asia-Pacific region. Whilst highlighting the extensive network of interactions, they describe a dearth of research on the effectiveness of dispersers, much as with

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effectiveness of potential insect pollinators, and call for further research in this area. Three further papers then attempt to do just that. **Chetana and Ganesh** highlight the danger of drawing conclusions about the ecology of one species from the ecology of another, and discuss how effective dispersers may change over time. **Datta and Rane** present detailed data on almost the entire life cycle of a rare Indian nutmeg, from flowering to dispersal by hornbills and subsequent recruitment. **Ratiarison and Forget** assess the role of primate versus toucan dispersers in shaping seed size in two *Virola* species from French Guyana.

Future research in the family should focus on a number of areas. First, developing a robust phylogeny is key to understanding patterns of floral and fruit evolution within the family. For example, is the curiously indehiscent fruit of *Compsonuera capitellata* basal or derived within the genus? Reliable species-level markers will also enable more accurate estimates of the number of species of Myristicaceae – many *Virola* species names are likely synonyms and the whole family is in need of revision (J. Janovec, *personal communication*, 2013). Second, linking this phylogenetic and taxonomic work with the broad network of tropical forest plots and long-term ecological monitoring sites across the world's forests would shed light on broad patterns and drivers of community structure and forest composition. Third, the family is an ideal model system for addressing many other fundamental questions in biology, from the division of resources between male and female function [4] and mechanisms of species coexistence [5,6] to plant-animal interactions [7,8], the effects of animal behaviour on tree species distributions [9,10,11], and seedling ecology [12,13]. Thus, the stage is set for some extremely interesting developments in ecological theory, as well as understanding the consequences of disrupting animal-plant interactions that result from biodiversity reduction and loss. Further, there are a whole suite of interesting questions to be addressed in the conservation and management of tropical forests. How does harvesting wild nutmegs impact population viability? What is a viable population size? How do climate, environment and neighbourhood interact to determine fruit production? Many of these questions could be simultaneously addressed in pristine forest, managed forest and nutmeg plantations.

[1] Sauquet, H., Doyle, J.A., Scharaschkin, T., Borsch, T., Hilu, K.W., Chatrou, L.W. and Le Thomas, A. 2003. Phylogenetic analysis of Magnoliales and Myristicaceae based on multiple data sets: implications for character evolution. *Botanical Journal of the Linnean Society* 142:125–186.

[1] Howe, H. F. and Vande Kerckhove, G. A. 1980. Nutmeg dispersal by tropical birds. *Science* 210:925-927.

[2] Howe, H. F. and Vande Kerckhove, G. A. 1981. Removal of wild nutmeg (*Virola surinamensis*) crops by birds. *Ecology* 62:1093–1106.

[3] Queenborough, S.A., Burslem, D.F.R.P., Garwood, N.C. and Valencia, R. 2007. Determinants of biased sex ratios and differential costs of reproduction in dioecious tropical forest trees. *American Journal of Botany* 94:67-78.

[4] Queenborough, S.A., Burslem, D.F.R.P., Garwood, N.C. and Valencia, R. 2007. Neighborhood and community interactions determine the spatial pattern of tropical tree seedling survival. *Ecology* 88:2248-2258.

[5] Queenborough, S.A., Burslem, D.F.R.P., Garwood, N.C. and Valencia, R. 2007. Habitat niche partitioning by 16 species of Myristicaceae in Amazonian Ecuador. *Plant Ecology* 192:193-207.

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[6] Russo, S.E. and Augspurger, C.K. 2004. Aggregated seed dispersal by spider monkeys limits recruitment to clumped patterns in *Virola calophylla*. *Ecology Letters* 7:1058-1067.
[7] Forget, P.-M., Milleron, T., Feer, F., Henry, O. and Dubost, G. 2000. Effects of dispersal pattern and mammalian herbivores on seedling recruitment for *Virola michelii* (Myristicaceae) in French Guiana. *Biotropica* 32:452-462.
[8] Russo, S.E., Portnoy, S. and Augspurger, C.K. 2006. Incorporating animal behavior into seed dispersal models: Implications for seed shadows and an example for a primate-dispersed tree. *Ecology* 87:3160-3174.
[9] Forget, P.-M. and Milleron, T. 1991. Evidence for secondary seed dispersal in Panama. *Oecologia* 87:596-599.
[10] Forget, P.-M. and Cuijpers, L. 2008. Survival and scatterhoarding of frugivore-dispersed seeds as a function of forest disturbance. *Biotropica* 40:380-385.
[11] Forget, P.-M. 1991. Comparative recruitment pattern of two non-pioneer tree species in French Guiana. *Oecologia* 85:434-439.
[12] Forget, P.-M. and Sabatier, D. 1997. Dynamics of a seedling shadow in a frugivore-dispersed tree species in French Guiana. *Journal of Tropical Ecology* 13:767-773.

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