Tropical tree species count: Indo-Pacific region equals with the Neotropics

Tropical forests are well known for their species richness, but there exists an uncertainty on the actual number of tree species. A recent research based on pantropical tree inventory database reveals that around 40,000 to 53,000 tree species are found to occur in the tropics. The Indo-Pacific region possesses equal species richness as compared to the tropical America. Continental Africa relatively had fewer tree species. The report further declares that more tree species are extremely rare, therefore under risk of extinction if the current deforestation rate remains unchecked.

Researchers often spell 'the tropics are diverse', but how exactly they are diverse is still unclear. Particularly in case of tree diversity, an accurate enumeration of tropical trees is extremely difficult due to remote access to forest terrains and restricted availability of rare species. Nevertheless based on species abundance data of 6,57,000 individuals belonging to 11,371 species, researchers have developed estimates for each of the world's three major tropical regions namely the Indo-Pacific, the Americas and continental Africa. The work involves a comprehensive report of more than 100 research collaborators representing the tropical nations.

Prof. Ferry Slik from Universiti Brunei Darussalam, co-ordinated the work as lead author which involves 173 scientists representing 126 institutions. The dataset comprises of 207 forest plots distributed across the study areas. Each plot contains at least 250 individual trees identified to species, together ensuring comprehensive coverage of the total species diversity in each geographical area. Centre for Tropical Forest Science - Forest Global Earth Observatory (CTFS-Forest GEO) has provided most of the data from previously standardized pan-tropical survey methods to measure tropical diversity. The work is published as a research paper in *Proceedings of the National Academy of Sciences* (US) recently.

A view of the tropical rainforest at Topslip in Western Ghats, India

The three major regions encompassing the world's tropical rainforest viz., Indo-Pacific, America and Africa exhibit distinct tree assemblages indicating variable evolutionary patterns. Some parts of the rain forest exhibit more than 400 trees species per ha. The study provides an explanation for tree diversity in the regions, stating that topography, geography, and geological history are important factors. 'Most striking feature observed in the present investigation is that the Indo-Pacific region has tree species richness as equal to that of tropical America. Each of the two

regions harbours tree species falling in the range of 19,000 to 25,000', explained the authors. On contrary the continental Africa has relatively less tree species in the range of 4,500 to 6,000. Very few tree species are commonly shared between the three regions.

Non-inclusion of dry as well as moist and wet forests could be the reason for underestimation of tree species richness of the Indo-Pacific region in the previous estimates. The researchers added that 'the high species richness in the Indo-Pacific is understandable given the highly variable topography, complex geological history, steep environmental gradients, past and ongoing merging of several contrasting floras from Madagascar, India, Southeast Asia, and New Guinea–Australia, as well as the large current and time-integrated forest area. On the other hand, the less number of trees in Africa could support the hypothesis that African forests have experienced severe extinction events due to repeated shrinkage of forest area during the Pleistocene'. Though African region lags behind in tree diversity, it still far outstrips European region, whose temperate forests have only 124 species, and North America, with less than 1,000 species.

It must be noted that the researchers' calculations excluded nearly 10 percent of unidentifiable trees in the dataset. If these trees could probably represent rare or previously unknown species, the tropical tree estimates could jump further. Further as the minimum number of tree species of tropical world continues to be high, estimates for the number of insects and other associated microbial populations of these trees would also increase and therefore keeping the expectations high. The authors while stressing for the conservation of tropical trees, especially point out the rare species saying 'Our study shows that most tree species are extremely rare, meaning that they may be under serious risk of extinction at current deforestation rates'.

Source:

http://news.mongabay.com/2015/0601-rainforest-tree-diversity.html

http://www.sciencedaily.com/releases/2015/06/150604162601.htm