

Hybrid Capture Resolves the Phylogeny of the Pantropically Distributed *Zanthoxylum* (Rutaceae) and Reveals an Old World Origin

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Abstract : With about 225 species, *Zanthoxylum* L. is the second most species rich genus in Rutaceae. It is the only genus with a pantropical distribution. Economically, it is used in several Asian countries as traditional medicine and spice. In the past *Zanthoxylum* was divided into two genera, the temperate *Zanthoxylum sensu strictu* (s.s.) and the (sub)tropical *Fagara*, due to the large differences in flower morphology: heterochlamydeous in *Fagara* and homochlamydeous in *Zanthoxylum* s.s.. This genus is much under studied and previous phylogenetic studies using Sanger sequencing did not resolve the relationships sufficiently. In this study, we use Hybrid Capture with a specially designed bait set for *Zanthoxylum* to sequence 347 putatively single-copy genes. The taxon sampling has been largely improved as compared to previous studies and the preliminary results will be based on 371 specimens representing 133 species from all continents and major island groups. Our preliminary results reveal similar tree topology as the previous studies while providing more details to the backbone of the phylogeny. The phylogenetic tree consists of four main clades: A) African/Malagasy clade, B) *Z. asiaticum* clade - a clade consisting widespread species occurring in (sub)tropical Asia and Africa as well as Madagascar, C) Asian/Pacific clade and D) American clade, which also includes the temperate Asian species. The merging of *Fagara* and *Zanthoxylum* is supported by our results and the homochlamydeous flowers of *Zanthoxylum* s.s. are likely derived from heterochlamydeous flowers. Several of the morphologically defined sections within *Zanthoxylum* are not monophyletic. The study dissemination will (1) introduce the framework of this project; (2) present preliminary results and (3) the ongoing progress of the study.

Keywords : *Zanthoxylum*, phylogenomic, hybrid capture, pantropical

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