
Molecular evidence for an African origin of the Asian *Rothmannia* species and allies (Rubiaceae: Gardenieae)

Arnaud Mouly*^{†1,2}, Joan T. Pereira , Jayson Chavez , Grecebio J.d. Alejandro , and K.m. Wong

¹Jardin Botanique de l'université de Franche-Comté et de la ville de Besançon, Service Sciences Art et Culture – Université de Franche-Comté – Place Leclerc, 25000 Besançon, France

²Laboratoire Chrono-environnement – CNRS : UMR6249, Université de Franche-Comté – UFR Sciences et Techniques 16, route de Gray 25030 BESANCON Cedex, France

Résumé

Rothmannia, as currently circumscribed, is the most widely distributed genus of the *Rothmannia* group sensu Mouly et al. (2014), with c. 40 species in the Old World. Due to their impressive flowers, which have wide white corollas with purple speckling, several species in the genus are used as ornamentals. Interestingly, the genus has two main widely separated centres of diversity: Africa, and tropical South-East Asia. The genus *Kochummenia* has recently been shown to be allied to *Rothmannia* and several *Gardenia* species remain misplaced and possibly belong in *Rothmannia*. These findings question the circumscription of *Rothmannia* in Asia and this then renews questions about the relationship of the Asian species to those in Africa. To assess both the monophyly of the genus and the biogeography of the species, we used sequence data from the cpDNA markers *trnTF*, *atpB-rbcL*, and *rpl32-trnLF(UAG)* and the nrDNA ITS to build a phylogeny. The resulting tree topology was further used to address the position of the Asian representatives of the group and their biogeographical origins. We retrieved a well resolved and supported phylogeny that showed the Asian representatives of *Rothmannia* belonging to a single lineage with *Kochummenia* and a species of *Gardenia* nested within it. The overall tree topology clearly shows that African lineages are basal within the *Rothmannia* group, revealing an African origin of the Asian species. This divergence occurred during the late Miocene. Later, diversification took place during the Pliocene and the Pleistocene resulting in the current complex distribution pattern for the continental and insular tropical Asian species. South-East Asia has more than 20 species, of which several are narrowly endemic and should probably be considered highly threatened.

Mots-Clés: *atpB*, *rbcL*, biogeography, ITS, Ixoroideae, morphology, ornamentals, phylogeny, *rps32*, *trnLF(UAG)*, taxonomy, *trnTF*

*Intervenant

[†]Auteur correspondant: arnaud.mouly@univ-fcomte.fr