Genetic diversity and structure of the critically endangered *Artocarpus annulatus,* a crop wild relative of jackfruit (*A. heterophyllus*)

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ABSTRACT

Limestone karsts of Southeast Asia can harbor high levels of endemism, but are highly fragmented, increasingly threatened, and their biodiversity is often poorly studied. This is true of the Padawan Limestone Area of Sarawak, Malaysia, home to the endemic *Artocarpus annulatus,* the closest known wild relative of two important and underutilized fruit tree crops, jackfruit (*A. heterophyllus*) and cempedak (*A. integer*). Identifying and conserving crop wild relatives is critical for the conservation of crop genetic diversity and breeding. In 2016 and 2017, five *A. annulatus* populations were located, and leaf material, locality information, and demographic data were collected. Microsatellite markers were used to assess genetic diversity and structure among populations, and to compare levels of genetic diversity to closely related congeneric species. Results indicate no evidence of inbreeding in *A. annulatus*, and there is no genetic structure among the five populations. However, diversity measures trended lower in seedlings compared to mature trees, suggesting allelic diversity may be under threat in the youngest generation of plants. Also, genetic diversity is lower in *A. annulatus* compared to closely related congeners. The present study provides a baseline estimate of *A. annulatus* genetic diversity that can be used for comparison in future studies and to other species in the unique limestone karst ecosystems. Considerations for in situ and ex situ conservation approaches are discussed.

Subjects Biodiversity, Genetics, Plant Science, Natural Resource Management
Keywords Karst limestone, Sarawak, Biodiversity conservation, Endemic species, Habitat fragmentation, Plant genetic resources, Microsatellites, Malaysia

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