

# Host-generalist mistletoe exhibits high level of outcrossing

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A sunbird is visiting the mistletoe flowers. Credit: Zhang Ling

Mistletoes are a group of aerial semi-parasitic plants that provide valuable food resources and nesting sites for many vertebrates, mainly birds. Previous studies reported that *Dendrophthoe pentandra*, a

mistletoe with a broad host-plant range, exhibits an aggregated distribution at a local scale in Xishuangbanna, and that different seed dispersers have different effects on the initial distribution template of mistletoes. However, its reproduction mechanism still needs further study.

In a study published in *Molecular Ecology*, researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences attempted to disentangle factors shaping outcrossing rate and [genetic structure](#) of different populations by combining data on the [spatial distribution](#), the behavior of pollinating birds, and the mating system.

The researchers conducted field observations and experiments at two sites over four years (2011–2014) in Xishuangbanna.

Using [microsatellite markers](#) and progeny arrays, the researchers investigated how mating system and spatial distribution affect genetic structure in four populations of the host-generalist mistletoe *Dendrophthoe pentandra* in Xishuangbanna. They also characterized the fine-scale spatial genetic structure among 166 mistletoes from four host trees in one population.

Their hand-pollination experiment indicated that the plant is self-compatible. However, *Dendrophthoe pentandra* exhibits a high level of outcrossing, despite self-compatibility. *Dendrophthoe pentandra* is heavily dependent on many birds for pollination and [seed dispersal](#).

They further found that the outcrossing rate was always quite high, despite the variances in infection density (i.e., the number of mistletoe individuals in a [host tree](#); uninfected individuals excluded) and mistletoe density among populations.

"The high-level outcrossing is possibly ensured by the species' dependence on birds for pollination, its aggregated distribution, and the mixing of genotypes within moderately genetically diverse populations," said Zhang Ling of XTBG.

Moreover, spatial genetic structure was associated with distance between host trees but not at shorter scales (within hosts).

"Our results demonstrate that the combination of bird pollination, bird-mediated seed dispersal, and post-dispersal processes result in outcrossing and maintain relatively [high diversity](#) in the presence of biparental inbreeding, despite very high local densities and possible self-compatibility," said Zhang Ling.

**More information:** Manru Li et al, High outcrossing rates in a self-compatible and highly aggregated host-generalist mistletoe, *Molecular Ecology* (2022). [DOI: 10.1111/mec.16720](https://doi.org/10.1111/mec.16720)

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