

Researchers conduct first tissue culture study using Xishuangbanna passion flower

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Passiflora xishuangbannaensis. Credit: ZHU Renbin

Researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences surveyed all known sites of *Passiflora xishuangbannaensis* (known as Xishuangbanna passion flower) over past years. They found only 38 individuals in its native

habitat, confirming it as a plant species with extremely small population. Nine *Passiflora* species are endemic to Yunnan with most species occurring in South America, making *P. xishuangbannaensis* highly significant and emblematic to the conservation work in the region.

Although *P. xishuangbannaensis* can be successfully propagated by grafting onto *P. edulis* stock, major differences in [life cycle](#) between Asian and South American [species](#) makes this technique unsuitable in the long term and could explain high concentration of endophytic fungi and bacteria pathogens.

In a study published in *Global Ecology and Conservation*, researchers from XTBG tried to establish an efficient in vitro organogenesis protocol to produce regenerated plants of *P. xishuangbannaensis*, a rhizomatous species with weak herbaceous stems.

The researchers used internodes, petioles and tendrils as explants. All of the explants produced abundant organogenic calli and shoots under proper treatments. The best callus and shoot induction was achieved in medium supplied with the synthetic cytokinin 6-benzylaminopurine (benzyl adenine, BA) (4.44 μM) in combination with the synthetic auxin 1-Naphthaleneacetic Acid (NAA) (1.08 Mm). Healthy roots can be formed after 30 days of transferring to a rooting medium.

Using Inter Simple Sequence Repeat (ISSR) markers, the researchers assessed the genetic stability of regenerated plants from three types of explant. They revealed a relatively high, although not out of the expected range, genetic variation among mother and regenerated plantlets.

"This is the first tissue culture study using an Asian *Passiflora* species. Due to the endangered status of *P. xishuangbannaensis* and the difficulty to sexually propagate this species, we advise ex-situ conservation methods based on a limited number of in-vitro organogenesis

propagation such as cryopreservation," said Sven Landrein of XTBG.

More information: Yuan-yuan Meng et al, In vitro organogenesis and plant regeneration of *Passiflora xishuangbannaensis*, a species with extremely small populations, *Global Ecology and Conservation* (2021).

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