

## Alpine ginger Roscoea tibetica comprises two species

May 20 2020, by Zhang Nannan



Diverse morphological individuals of Roscoea tibetica in morph A, B and C



observed in field. Credit: LI Li

The alpine ginger Roscoea tibetica Batalin is the most widespread and extensively phenotypic-variable herbaceous species in Roscoea in the Hengduan Mountains. Diverse phenotypic variations in one population and similar habitat make this species difficult to identify, especially during the non-flowering phase.

In a study published in the *Journal of Systematics and Evolution*, researchers from Xishuangbanna Tropical Botanical Garden (XTBG) tried to rule out how many <u>evolutionary lineages/species</u> are there in R. tibetica by integrating genomic data, <u>morphological traits</u> and ecological evidence of <u>species distribution models</u> (SDMs).

Roscoea tibetica was classified into two monophyletic groups with 100% supported value in the phylogenetic tree. The researchers named the two monophyletic groups <u>lineage</u> L and lineage T.

Individuals in the lineage L were always recognized as R. tibetica (lineage T) in the field, because morph A, B and C comprised cryptic diversity of R. tibetica. However, phylogenomic reconstruction, genetic structure analysis and species distribution models indicated that the previously reported R. tibetica taxon in fact comprised two species.

Species distribution models illustrated significant ecological divergence between both lineages. Model test of gene flow and effective population size changes in fastsimcoal2 and a negative Tajima's D value suggested that recent contact likely occurred between the two lineages.

Although the rediscovered morphological traits of previously reported R. tibetica could be divided into three groups that comprised cryptic



diversity, two non-sister monophyletic lineages were indicated based on genomic-level variations with significant ecological niche divergence.

Thus, a novel species should be proposed from previously reported R. tibetica, where lineage T is R. tibetica Batalin and lineage L is a new species. The new species was named Roscoea lingbaoshanensis.

"This study reminds us that accurate species delimitation should be done before further research was carried out on widespread species with diverse morphology," said LI Li, a Ph.D candidate of XTBG.

**More information:** Li Li et al. Genomic data reveals two distinct species from the widespread alpine ginger Roscoea tibetica Batalin (Zingiberaceae), *Journal of Systematics and Evolution* (2020). DOI: 10.1111/jse.12596

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