Phylogenetics and evolution of a newly demonstrated lineage of carnivorous monocots

Carnivorous plants consume animals to obtain mineral nutrients, including nitrogen and phosphorus, to enhance growth, competitive ability and reproduction in nutrient-poor environments. I demonstrate that *Triantha occidentalis* (Tofieldiaceae, Alismatales) is a previously overlooked carnivorous lineage with a sticky-trap inflorescence. Field experiments, isotopic data and mixing models demonstrate significant N transfer from prey, with an estimated 68% of leaf N obtained from capture, comparable to levels for co-occurring sundew. Glandular hairs on flowering stems secrete phosphatase, a digestive enzyme seen in other carnivorous plants. *Triantha* is nearly unique among carnivorous plants in capturing prey on its inflorescence axis close to flowers; however, its glandular hairs capture only small insects. I also studied *Triantha* phylogeography across its mostly North American range, by surveying 11 plastid-encoded *ndh* genes from 75 populations. All three North American species are likely monophyletic, although *T. occidentalis* monophyly requires recognizing *T. japonica* as a synonym, which is consistent with its nested position in *T. occidentalis*, as the sister group of populations in Haida Gwaii (Canada). Plastid *ndh* genes have experienced various degrees of loss or reading frame interruption within *T. glutinosa* and *T. occidentalis*, and a strong geographic signal is evident in patterns of *ndh* gene loss/pseudogenization across the range of *T. occidentalis*.

Short Bio:
I’m now a postdoc in Prof. Sasa Stefanovic’s lab, University of Toronto Mississauga, and working on the genomic evolution of parasitic and mycoheterotrophic plants. I was born in China, and obtained a double degree for B.Sc. and B.A in Fudan University, Shanghai. I just got my Ph.D. degree in University of British Columbia this August. I’m interested in phylogeny and genomic evolution of land plants, especially heterotrophic and carnivorous plants.

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