Integrative morphological and molecular assessment reveals diversity of Gracilariaceae algae in China

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Gracilaria textorii, collected from Qingdao, China. Credit: IOCAS

Gracilariaceae are economically and ecologically important red algae found worldwide that are used to produce agar. Although Gracilariaceae diversity in China has been well described in morphological studies, molecular phylogenetic studies are rare.

Recently, a research team led by Prof. Wang Guangce from the Institute of Oceanology of the Chinese Academy of Sciences (IOCAS) has reported the diversity of Gracilariaceae by integrating morphological and molecular evidence.

The study was published in *Algal Research* on March 25.

The researchers collected 211 fresh specimens along the entire Chinese coast including the Xisha Islands during 2013–2022, and newly obtained 355 rbcL/COI gene sequences. Based on the DNA sequence database, they constructed maximum likelihood and Bayesian inference trees, showing 22 Gracilariaceae species.

In addition, this study revealed the phylogenetic relationships between Chinese Gracilariaceae species and global taxa.

More importantly, the researchers discovered a novel Gracilaria species from Hainan Island, and presented a formal proposal of the new species as Gracilaria tsengii sp. nov. in honor of Prof. Tseng C. K., a Chinese algologist, for his excellent studies on marine algal diversity in China and around the world. Unlike other known Gracilaria species, in which spermatangia are scattered over the thallus of male gametophytes, G. tsengii has spermatangia restricted to nemathecial sori on the terminal branchlets.

"The major novelty here is the new species, especially regarding the morphology of its special spermatangia," said Prof. Wang.

"This is the first Gracilaria species discovered with specialized spermatangial nemathecial sori, which together with the distinct phylogenetic position of the species, further indicates the complexity of the trait evolution of spermatangial reproductive structures in Gracilaria," said Wang Xulei, first author of the study.

More information: Xulei Wang et al, Diversity of Gracilariaceae (Rhodophyta) in China: An integrative morphological and molecular assessment including a description of Gracilaria tsengii sp. nov., *Algal Research* (2023). DOI: 10.1016/j.algal.2023.103074