



## Morphological, ecological and molecular characterization of *Pyropia vietnamensis* (Bangiales, Rhodophyta) from the Konkan region, India

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### Abstract

*Pyropia vietnamensis* is one of the most luxuriously growing seaweed in Konkan coast, India. In the present study we attempted to explore the morphology, ecology and molecular characteristics exhibited by *P. vietnamensis* and its taxonomic implications. We described the effects of ecological parameters on the variability of morphological characters. The water motion was found to be one of the most important ecological parameter that governs the plant morphology. The plant was found to grow on entire intertidal region and this may be one of the possible reasons for high morphological variation among the taxa in this region. The molecular analysis utilizing *cox 1* gene sequences clearly revealed the close relation of Indian and Brazilian specimens with only 0-1 bp intraspecific variation. The present study provides a beginning to a clearly required detailed study of the morphology, ecology and genetic diversity showed by *Pyropia* species from Indian waters.

**Key words:** *Pyropia*, morphological plasticity, morphometrics, *cox1*, phylogenetic analysis, taxonomy

### Introduction

The marine macroalga *Pyropia vietnamensis* (Tak. Tanaka & P.H. Ho) J.E. Sutherland & Monotilla was first described from the upper littoral zone of Vung-Tau (Cap. St. Jacques), Vietnam by Tanaka & Ho (1962). The taxon was distinguished from its closest relative *Pyropia denticulate* Levring based on its difference in frond size and the division formula of spermatia. *P. vietnamensis* is one of the most important and abundantly growing seaweed in India (Sahoo *et al.* 2001). Its occurrence was first reported by Sreeramulu (1952) as *Porphyra naiadam* Anderson from Waltair, Visakhapatnam, India during the summer season (February to June) and later on same specimen was identified as *P. vietnamensis* by Umamaheswara Rao & Sreeramulu (1963). *P. vietnamensis* was also reported from Dona Paula, Goa (Dhargalkar *et al.* 1981) and Colaba Coast, Maharashtra (Deodhar 1985) in monsoon season during the months of June to September. Both Dona Paula and Colaba Coast falls within the Konkan region situated along the West coast of India.

Konkan is a northern part of the western coastal plain of India, situated between the Western Ghats and the Arabian Sea. It is a narrow strip of about 50 km width that stretches from 15°37' to 20°20' latitude and 70°07' to 74°13' longitude. The Konkan coast is characterized by numerous backwaters, lagoons and rocky cliffs. However, from the above reports it is clear that very few attempts have been made to explore the diversity of *P. vietnamensis* from this region. It was surprising to note that, the world's highly important and commercialized algal genus remained underutilized by phycologist, despite its abundance on the Konkan coast.

We realized the possible reasons for such apparent apathy during the collection of *Pyropia*. It is amply clear from our survey that the occurrence of the alga was visible during monsoon season (June-September). During this period, the coast experienced very heavy rain, coupled with strong and huge waves hitting the coast. Consequently, the fishing activities in this region also cease. These prevailing odd environmental conditions might have been deterrent for phycologists to plan and execute collections of *Pyropia* during the monsoon period.

Recently, biodiversity assessment study of economically important seaweeds was undertaken by authors along the west coast of India. We observed two different species of *Pyropia* along the Konkan region. Among these two species, one was identified as *P. acanthophora*, a new report from the Indian region and subsequently reported as a