ON OCCURRENCE OF THE GENUS PORPHYRIDIUM NAGELI:
NEW TO INDIA

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Abstract

The present communication deals with commercially important fresh water red alga namely Porphyridium purpureum (Bory de Saint Vincet) Ross in Drew and Ross. The alga was collected from Pune (Maharashtra), India on several occasions from moist soils. Detailed morphological and reproductive features are described along with information on taxonomic status of the species in the genus. This is the first report of the genus Porphyridium from India.

Keywords: Porphyridium purpureum, Rhodophyta, First report, India.

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Introduction

The microalga Porphyridium is a member of the division Rhodophyta having therapeutical and nutraceutical applications. The alga has been used biotechnologically for the production of pigments, polyunsaturated fatty acids (PUFA), lipids and polysaccharides (Wang et al., 2007). In addition the alga is extensively used in genetical, physiological and biochemical studies (Barsanti and Gualtieri, 2006). The genus Porphyridium was first reported and described by Nageli in 1849. Although
Kumano (2000) mentioned the genus as having worldwide distribution from shady and eutrophic places, it has not been reported so far from India even though habitats promoting occurrence of this alga are not rare.

**Materials and Methods**

The alga was collected on several occasions from moist soils in Pune (Maharashtra), India. The fresh material was brought to the laboratory and used for morphological observations and for microphotography using Olympus microscope (BX-40). In addition the material was used for isolation and maintaining it in laboratory culture following methods described in Venkataraman (1969) and Andersen (2005). Part of the material was preserved in 4 % formalin.

**Results**

The alga was growing on the moist soils along with other algae in the Regional Fruit Research Centre, Pune giving red colouration to the soils and forming extensive mucilaginous patches (fig. 1). The younger patches were shining blood red in colouration turning brick red as soils dry. The alga was basically unicellular in nature having tendency to form aggregated masses within mucilaginous cover leading to formation of irregular colonies (Fig. 2). The cells were globular in shape and contained distinctly star shaped chloroplast with a pyrenoid in the centre (Fig. 3). As mentioned by Vonshak (1992) amorphous mucilaginous material secreted by the cell forming a capsule around it could be easily seen. In addition to individual sheath cells are also remain embedded in common mucilaginous envelop (Fig. 4). The diameter of the cells varied from 6-12 µm. The cells were observed to multiply by simple division as inferred from dumbbell shaped dividing cells (Fig. 5 arrow). Among the various media tried the alga exhibited its survival and growth in Koch and ASW media.

**Discussion**

In its general morphology the alga collected resembles to the genus *Porphyridium* (Kylin, 1956). The genus *Porphyridium* is with species whose nomenclature is in unresolved status. Ott (1972) in his review on the synonyms and the taxonomic positions of *Porphyridium* recognized 5 species namely *P. purpureum* (Bory de Saint Vincet) Ross in Drew and Ross, *P. aerugineum* Geitler, *P. sordidum*
Geitler, *P. violaceum* Kornmann and *P. griseum* Geitler. According to Ott (loc. cit.) these species could be separated from one another by visual colour of plastid. However in ‘Algaebase’ (2009) only three species have been currently accepted taxonomically as *P. aerugineum*, *P. sordidum* and *P. purpureum*. The Pune *Porphyridium* in its colour, dimensions, nature of chloroplast, position of pyrenoid and mode of reproduction resembles to *P. purpureum* hence it is referred to that species. Fresnel *et al.* (1989) remarked that *P. purpureum* is a euryhaline alga. The Pune *Porphyridium* has exhibited its ability to grow in a medium containing salt concentration up to 30 gm/lit confirming observations of Fresnel *et al.* (loc. cit.). The present report of the genus is the first record on the occurrence of *Porphyridium* in India.

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**References**


Plate 1: Porphyridium purpureum (Bory de Saint Vincet) Ross in Drew and Ross.

Fig. 1: Habit of the alga: red-blood colored patches on soil; Fig. 2: Aggregated mass of cells. Fig. 3: Magnified view of cells showing axile star shaped chloroplast with pyrenoids in the center; Fig. 4: Phase contrast picture of the cells to show individual mucilage sheath; Fig. 5: Dividing cell (arrow).