

COMMENTARY

research. People also observe and complain about a veil of secrecy in the government administrative culture. We have to consider a series of steps to bring about professionalism and transparency in the management of every sector.

v) In policy formulation, decision making, preparation of developmental plans and implementation, scientists and technologists must be enabled to play an

important role. We may consider how this can be achieved. The vision 2020 documents may be examined for providing a basis for future planning.

vi) We must bring to bear upon our agricultural practices all modern developments in S and T and substantially increase the output from unit area of land and unit volume of water and promote large-scale employment, improving the purchasing power of the people

is a prerequisite for industrial development.

vii) Information technology is advancing at incredible speed. Information is resource by itself. We have to take the information revolution to the people. To-day, information does not percolate beyond the few top layers of the society.

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SCIENTIFIC CORRESPONDENCE

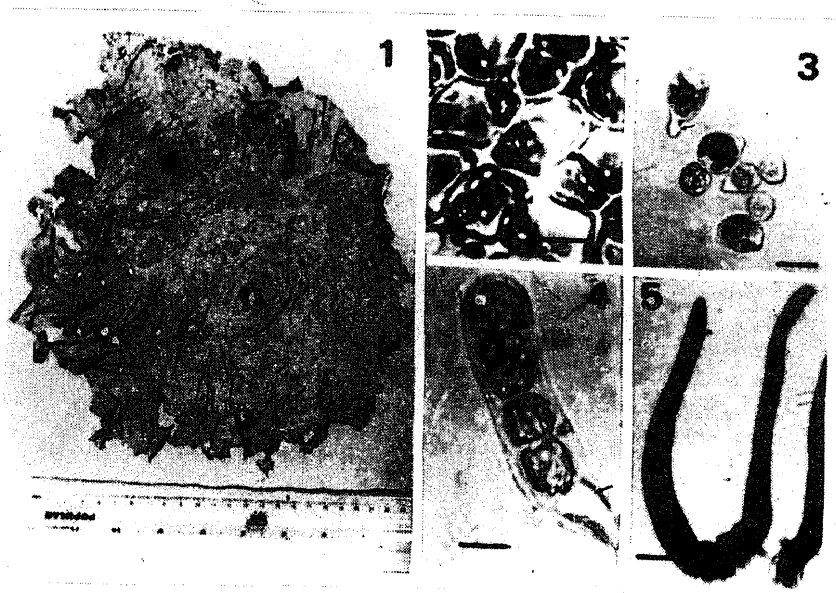
Life history and culture studies of *Monostroma oxyspermum* (Kutz.) Doty (Monostromataceae, Chlorophyceae) growing in estuarine conditions along the central west coast of India

Monostroma (Chlorophyceae) specimens collected specially from mangrove ecosystem of Shirgao creek (Ratnagiri, Maharashtra), Terekhol creek (Goa) and Kali estuary (Karwar, Karnataka) were found to be *M. oxyspermum* (Kutz.) Doty on the basis of the following observations: thallus prostrate, forming

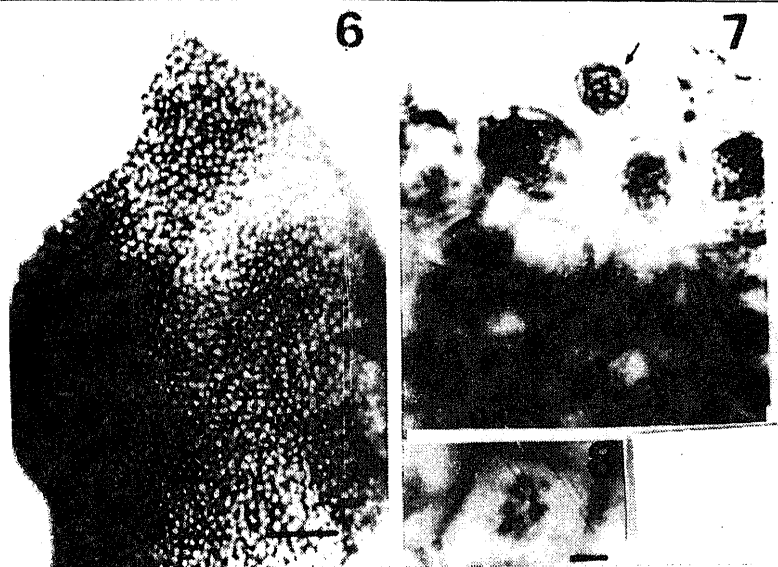
mats in muddy substrata, 20–40 × 15–20 cm in size (Figure 1), monostromatic with frill margins, 20–24 μm thick, outer margin yellowish at maturity, thallus cells polygonal, 10–15 × 18–20 μm (Figure 2) in surface view with single parietal chloroplast and one pyrenoid. The zoospores (swarms) are

liberated, biflagellate, 5–7 × 2–4 μm in size, flagella of the same length. In culture swarms become round, losing flagella and subsequently develop a germination tube (Figure 3). Fusion does not take place among the zoospores. Division of cell in swarms takes place after 4–5 days, the upper cell forming the uniseriate filament and the lower rhizoidal development (Figure 4). Cyst formation does not take place at any stage. Further divisions in the filament are in vertical and transverse plane, resulting in about 1–2 months, in a sachet-like thallus (Figure 5), which becomes monostromatic (Figure 6). On reaching a size of 3–4 cm in about 3–4 months, sporangia develop on the surface (Figure 7) and liberate the swarms. Cytological studies of the thallus and swarm cells revealed the chromosome number to be 8–10 (Figure 8). There is no alternation of generation. The species contain high level of carbohydrates and can be recommended for economic exploitation, as it can be easily cultivated on a large scale, the growth rate being 0.32 g per day.

The species has earlier been reported from swamps and brackish waters in subtropics by Boergessen¹ and Abbott and Hollenberg². Life history of different species of *Monostroma* has been described by Tatewaki³. Another species of *Monostroma* occurring in Okha coast,



Figures 1–5. 1, Macroscopic thallus of *Monostroma oxyspermum* in natural habitat. 2, Vegetative cells (scale bar = 10 μm). 3, Settling zoospores (scale bar = 5 μm). 4, 10-day-old culture spore germination (scale bar = 20 μm). 5, 20-day-old culture showing tube-like thallus (scale bar = 50 μm).



Figures 6–8. 6, Opened up tube forming a monostromatic thallus (scale bar = 100 μ m). 7, Formation of sporangia in culture (scale bar = 10 μ m). 8, Chromosome of *M. oxyspermum* (scale bar = 2 μ m).

Gujarat, differs in the formation of cyst, smaller thallus (2–10 \times 1–2 cm) (ref. 4), presence of alternation of generation

and a seasonal growth. According to Tatewaki (personal communication) this may be *M. latissimum*.

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3. Tatewaki, M., *Sci. Pap Inst. Alg. Res. Fac. Sci. Hokkaido Univ.*, 1969, 6, 1–56.
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A survey of impact and evaluation of water pollution on reservoir fisheries in Kumaun Himalayas, India with special reference to micro-organisms

Water pollution in the reservoirs of the Kumaun Himalayas has been studied with special reference to micro-organisms. Impact and evaluation of the micro-organisms were extensively studied on fish. Various diffuse and point sources of water pollution have been found, which are responsible for the deterioration of the surface water. Various water-borne diseases are prevalent in the fish. Fungal attack on fish is a potential threat to the reservoir fishery.

Kumaun Himalayas is a north-west region of UP, lying between 28°41' and 30°49'N lat. and 78°45' and 81°1'E long., which abounds in several natural and artificial water resources such as rivers (Gori and Kali, Gomti, Gaula, Kosi, Dabka, etc.), natural lakes (Nainital, Bhimtal, Naukuchiatal, etc.), and artificial reservoirs (Jamarani, Nanaksagar, Begul, Haripura, Dhaur and Tumaria). These water resources

have long been explored for irrigation, hydroelectric power and fisheries^{1–4}. Water quality of all these resources especially lakes and reservoirs has been deteriorating due to disposal of garbage, religious offering, sewage, recreational and constructional activities in the catchment areas^{5,6}.

Reservoirs, artificial ecosystem characterized by the existence of both lentic and lotic components, constitute the prime inland fishery resources in the south-east India. The deterioration of surface water quality has incontestably brought a massive increase in fish mortality. Contaminated water provides shelter to a variety of diverse micro-organisms such as planktons, bacteria, actinomycetes, viruses and fungal population which occur as opportunistic potential pathogens of aquatic organisms such as fish. Water molds, the zoosporic fungi, are constant and ubiquitous component of the aquatic

environment and are a continual challenge to fish^{6–13}.

The present communication summarizes (i) the pollution level of the important reservoirs with special reference to the micro-organisms, and (ii) effects of micro-organisms on fish.

A large number of infected fry and adults of fish were collected every month with nylon nets and brought to the laboratory. Fresh living fish collected by the fish department of the UP government were also inspected for mycotic infection. Water samples were also collected in sterilized bottles and analysed for the physiochemical and microbiological parameters¹⁴.

A small portion of the mycelium from the infected portion of the fish was removed with the help of a sterile forcep and washed thoroughly with sterile distilled water. It was then placed in a petri dish containing 20 ml of sterile distilled water and baited with different