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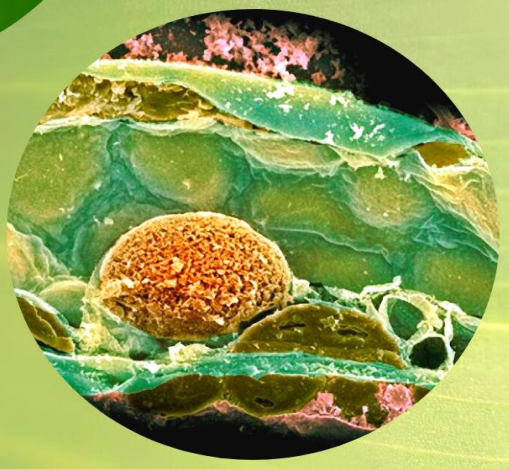
RESEARCH INTERVENTIONS AND ADVANCEMENTS IN PLANT SCIENCES



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MORPHOLOGICAL OBSERVATION OF *CHARASOCOTRENSIS* NORDST F. *PASHANII* (DIXIT) R.D.W. FROM SATARA DISTRICT (MAHARASHTRA)

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Abstract:

Present communication deals with morphological observation of aendemic species of *Chara*viz. *Charasocotrensis* Nordst f. *pashanii* (Dixit) R.D.W. along the foothills of Sahyadri ranges within Satara district.Comparison with the specimen described by R.D.Wood, and that originally described by S.C.Dixitis also made in this account. Present study focused only on endemic species of *Chara* occurring abundantly along the foothills of Sahyadri ranges, their correct identification and correlates their distribution, morphology with that of Indian charophyte flora. In order to update knowledge of taxonomy of the charophytes from Maharashtra this attempt has been made.

Keywords: Chara, Pashanii, Morphology, Satara

Introduction:

Charophytes are the macroscopic green algal forms which have puzzled biologists since long time. Due to their close morphological resemblance with angiosperms, many times they are confused with aquatic higher plants.Evolutionary biologists are paying special attention to these aquatic macrophytes due to their characteristic, morphology, physiology and cytological features. Thorough survey of literature on charophytes reveals that voluminous information is available with us from the world over (Pal, 1962; Wood and Imahori, 1965; Kundu, 1965). In India, the studies on charophytes have been restricted to either North or South region. However meagre information on charophytes is available from Maharashtra State (Dixit, 1935; Kamat, 1965; Jawale, 1986; Patil and Chaugule, 1992; Karande and Chaugule, 1999).

While screening different localities for algal collection it was found that Satara District harbours number of localities where luxuriant growth of charophytes is observed. Of these we

are paying special attention to ecorticate, monoecious species viz. *Charasocotrensis* Nordst f. *pashanii* (Dixit) R.D.W.

Material and Methods:

Plants were collected after the post monsoon shower from the temporary pools, puddles, ditches, permanent water reservoirs, small weirs, constructed dams, back water of dams, foothills of Sahyadri ranges around Satara and within Satara, Morphological observations were made and plants were preserved in 4% formaldehyde solution. Camera lucida drawings and micro-photographs were taken from temporary preparations.Identification was made using monographs by Wood and Imahori 1965, Zaneveld, J.S. 1940, Pal and Kundu.1960 and D.Subramanian 2002 and recent publications.

Observations:

In our survey of charophytes from Satara district *C. socotrensis* f. *pashanii* occurred at wide localities and was abundant in its occurrence around Satara and within Satara district than other species of charophytes. This species was collected from following localities:

Table 1: Survey localities for study of charophytes from Satara district

Sr. No.	Taluka of Satara district	Name of Localities
1.	Wai	Kavathe,Ozarde
2.	Jawali	Medha
3.	Koregaon	Jarandeshwar, Satararoad
4.	Mann	Pingali Lake, Dahiwadhi, Rajewadi
5.	Karad	Masur
6.	Satara	Godoli, Parali,Pateghar,Pateshwar, Degoan,Urmodi Dam, Ajinkaytara fort, Kas

***Charasocotrensis* f. *pashanii* (Dixit) R. D. W. :**

Plants monoecious, 4 – 15 cm. high, Stem slender, erect, stout, 234 - 460 µm in diameter; internodes 0.5 – 2 cm long 1 – 3 times as long as branchlets. Stipulodes present in 1 tier but rudimentary. Branchlets 10 – 12 in a whorl, 0.7 to 2 5 cm. long; 2 – 5 segments; terminal segment one celled conical, acute, the lower one to two segment short and curved.Cortex entirely absent. Bract cells present only at fertile nodes 2, 115 – 180 µm long. Bracteoles 2, shorter or nearly equal to the mature oogonium 215 – 420 µm long.Gametangia conjoined and aggregate at lowest 1 – 2 branchlet nodes, usually 2 antheridia below 1 – 2 oogonia. Oogonia 1 – 2 together.Oogonium 360 – 805 µm long, 175- 530 µm broad (incl. coronula), 400-820 µm long 200 -580 um wide (excl. coronula) convolutions 9; coronula 60 – 150 µm high, 146 - 175 µm

wide. Oospores orange to black in colour 215 -270 µm long, 210 – 270 µm wide; striae of 8 – 10 prominent ridges; fossa 58 µm across; Antheridia 205 – 265 µm in diameter; octosutate.

Results and Discussion:

1. The plants always occurred along the margins of pools, puddles and on wet mud where the soil was rich in calcium.
2. *Charasocotrensis* f. *pashanii* is endemic taxon of the complex having very restricted distribution in the foot – hills of the Western Ghats (Chaugule and Patil, 1992). Our collection revealed that f. *pashanii*also has very restricted distribution.
3. Compared with the specimen described by R.D.Wood and that originally described by S.C.Dixit most of our specimens showed some distinguishing features like downwardly growing corticating threads running over the main axes and presence of stipulodes.
4. Our observations after screening of large number of specimens revealed that there is tendency of forming corticated threads in *Charasocotrensis* f. *pashanii*. The cortication may be said vestigial or imperfect but definitelythere is tendency of cortication in these plants.

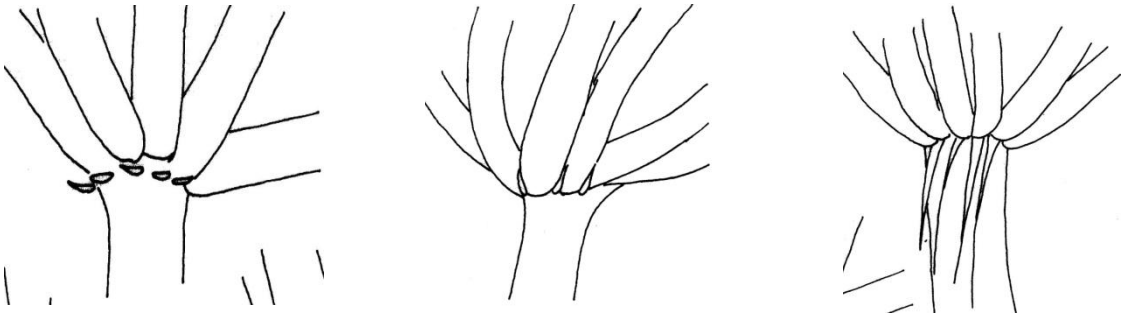
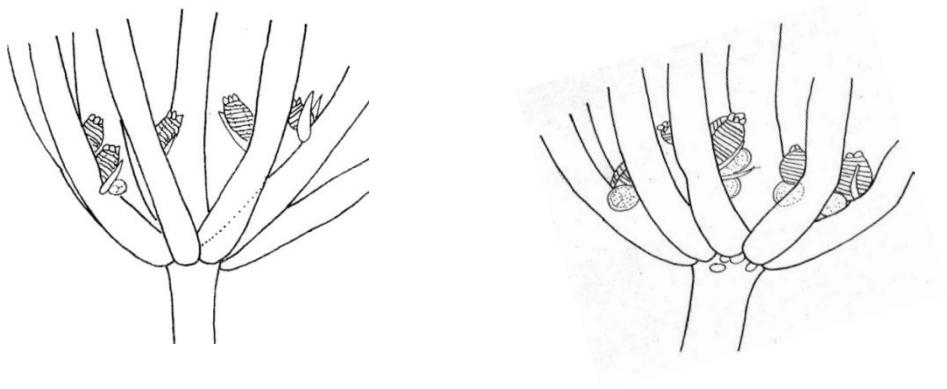
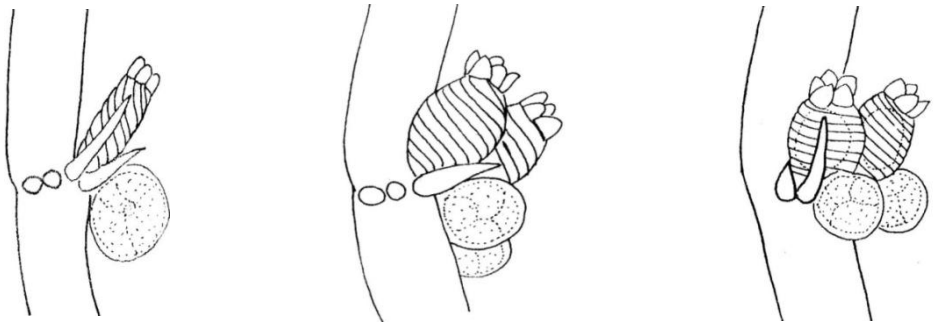


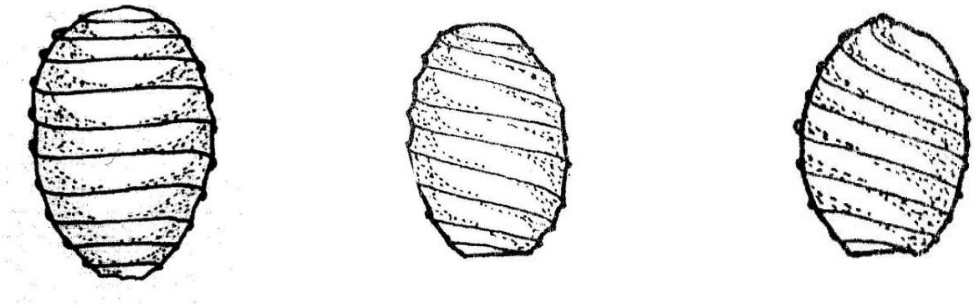
Plate 1:



Axial node showing branchlet whorl and gametangia X15

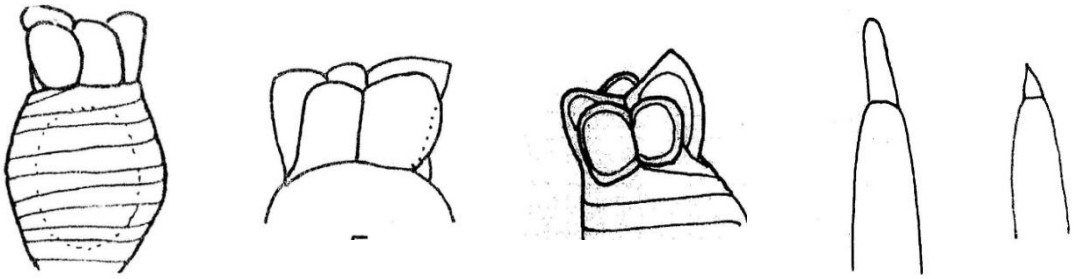


Branhlet node with conjoined gametangia, bracts and bractioles X50



Oospore X50

Plate 2:



Mature Oogonium X50

Coronula with spreading cells X 100

Tip of branchletX 50

Plate 3:

Habit

Entire Plant

Gametangia

Comparative account of *Charasocotrensis* f. *pashanii* (Dixit) R. D. W.

Sr. No.	Character	R. D. Wood ' 65	Satara. Specimen
1.	Habit	Monoecious, c 16 cm. long	Monoecious, 4 – 15 cms long
2.	Axes (diameter)	200 -400um	Slender, stout 234 -460 µm in diameter
3.	Internodes	Elongated	0.5 - 2 cm shorter than branchlet
4.	Stipulodes	Absent	Rudimentary in 1 tier.
5.	Cortex	None	Absent
6.	Branchlets Number Length Segments	 8 -10 in a whorl 2 cm long 2 – 3	 10 -12 in a whorl 0.7 – 2.5 cm long 2 – 5
7.	Bract cells	Only at lowest nodes	2 , only at fertile nodes
8.	Bracteoles	Not mentioned	2, shorter or nearly equal to mature oogonium
9.	Gametangia	Conjoined and aggregated at 1 – 2 lowest nodes usually 2 antheridia	Conjoined, geminate at lowest 1 – 2 nodes, branchlet nodes.
10.	Oogonia Length Breadth Convolutions	2 – 3 together 525 – 615 µm 460 – 480 µm 8 – 10	1 – 2 together 360 – 805 µm 175 – 530 µm 9
11.	Coronula Height Width	 85 – 95 µm 170 – 180 µm	 73 – 100 µm 146 – 175 µm
12.	Oospore Colour	Dark brown to black	Orange to black
13.	Length Breadth Ridges Fossa Membrane	420 – 450 µm 270 – 310 µm 8 – 10 53 µm Obscurely granulate	215 – 270 µm 210 – 270 µm 8 – 10 58 µm Not seen
14.	Antheridia (diameter)	180 – 220 µm octoscutate	205 – 265 µm octoscutate

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References:

Chaugule, B.B. and Patil, S.R. (1992): List of the Charophytes from the State of Maharashtra. Ind. Bot. Reporter, 11(1and 2): 75 – 77.

Dixit, S.C. (1931): Some Charophytes from Salsette. J.Ind. Bot. Soc. 10 (3)*:* 205 – 208.

Dixit, S.C. (1935): Charophytes of Bombay Presidency.J.I.B.S. 14*:*257 – 263.

Dixit, S.C. (1940a): Algal investigations in the Bombay Persidency. J. Science (Bangalore) 9 (10)*:* 453 – 454.

Dixit, S.C. (1940b): The Charophytes of Bombay Presidency. II J.Ind.Bot.Soc18 (4 – 6)*:* 231 - 239.

Dixit, S.C. (1942): The Charophytes of Bombay Presidency. III J .Ind. Bot. Soc21 (5 – 6)*:* 355 - 362.

Kamat, N.D. (1965): Ecological notes on Algae of Kolhapur.J .Biol. Sci.8 (2): 47 - 51

Karande V. C. (1999): Biology of some charophytesfrom Western Maharashtra. Ph. D.Thesis, Pune University, Pune.

Karande, V.C. and Chaugule, B.B. (1998): Karyological observations on CharasocotrensisNordst. f. pashanii (Dixit) R.D.W. Phykos37 (1and 2)*:*171 -174

Pal, B.P. Kundu, B. S. (1962): CHAROPHYTA I.C.A.R. New Delhi, pp130

Subramanian, D.2002. Monograph on Indian charophyta. Bishen Singh and Mahendra Pal Singh, Deharadun.

Vidya, B.S. (1967): Study of some environmental factors affecting the occurrence of Charophytes in Western India. Hydrobiologia, 29*:* 256-262.

Vidya, B.S. E.Gonzalvis (1963): Asystematic enumeration of Charophytes of Western India. Phykos2*:* 33-37

Wood, R.D. (1962): New combinations in the revision of Characeae. Taxon 11(1)*:* 7 – 25.

Wood, R.D. and Imahori, K. (1965): The Revision of Characeae. Vol. I and II. Pub. Vertag Von J. Cramer, Weinhein, West Germany .pp. 279–282.

Zaneveld, J. S. (1940): The Charophyta of Malaysia and adjacent countries. Blumea, 4 (1); 1-224.