SOME CHAROPHYTA FROM SALSETTE

BY

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In the year 1849 Braun(1) described eleven species of Characeae from India. Since then thirty-nine more species have been found and recorded. Groves(2) and Allen(3) have shown that these plants are very widely distributed. The present study is confined to the small island of Salsette situated to the North of Bombay. A part of the island is covered by a forest and has a number of hills. The high level drainage is formed by about fifty-six streams and brooks. The average rainfall is 98 inches. The whole area is 241 sq. miles and is covered by ponds, ditches, and fields which remain under water for nearly four months in the year. Parts of the island near the sea coast being submerged when the tide is in, there is here a good field for studying these plants from an ecological stand-point.

The following species are found at present :—

1. *Nitella acuminata A. Br.*

It is found round about Pavai Lake from August to October in small ditches formed in the basaltic rocks.

2. *Nitella oligospira A. Br.*

This plant is found at the Canary Caves (1,539ft. on the hill top) and at Thana, Andheri from August to March.

3. *Nitella hyalina Agardh.*

The plant being known from freshwater collections has particular interest here as it is found in saltwater mudflat near the sea shore at Santa Cruz from June to April

4. *Chara succincta.*

This plant is for the first time recorded in India. It thrives in saline water having 2.5% NaCl. in the mudflat at Santa Cruz. Along with this plant two species of Spirogyra also thrive here particularly during monsoon when the salinity is rather low. It is found practically all the year round.

5. *Chara flaccida A. Br.*

This plant is found in low level muddy areas at Vile Parle and Khar from July to October.

6. *Chara brachypus A. Br.*

This plant is found at Jogeshvari and Borivali where the soil is rich in calcium. The plant sometimes becomes brittle by a large amount of calcium deposited on it. It is found from July to November.

7. *Chara zeylanica Willd.*

The plant is very common all over the island from August to November. It lives both in fresh and saline waters. The plant was often found with annular coating of calcium or *Rivularia dura* and *Gleotrichia pisum* as epiphytes.

The form *C. macilanta* is found at times.

Notes on C. succincta.

This plant is known to occur in Libyan desert Mauritius and New Caledonia. The writer is thankful to Mr. J. Groves for the identification of the plant.

Characters of the plant:—The length of the plant depends much upon the depth of water. It may be as small as 8 c.m. or as much as 30 c.m. in length. It is delicate and bright green.

1. As a rule one branch at a node but abnormally two or three.

2. Stipulodes develop in a single circle and as many as the number of branchlets at a node. However, they are often suppressed.

3. Stem ecorticate and spineless.

4. Branchlets ecorticate; eight or less in number. Each branchlet consists of four internodal cells. Terminal cell pointed.

5. Bracts; six or less; generally three at the apex.

6. Reproductive bodies:—The plant is monoecious. Relative position of oogonia and antheridia variable. Both reddish in colour when young. Oogonia: twelve or less in a double circle (in the axils and on the outer sides of the branchlets). Oogonium 725–775 μ ×450–500 μ. Allantoid oospore 550–625 μ ×250–300 μ. Antheridium:—solitary and as a rule one node above the oogonia; rounded, 450 μ in diam. and protected by five bract cells.

Variations:—Variations are common in Characeae. However, to find almost every part variable in a single species found at the same place is peculiar to itself. After carefully examining the number of plants at various times the following variations are observed in *C. succincta*.

Antheridium—Raised on a stalk: produced at all the nodes of a branchlet irrespective of the position of oogonia. Sometimes two at a node or side by side with an oogonium at a node.

They may develop in the position of the stipulodes at the stem node. Remarkable instances occur when a branchlet is modified to bear an antheridium at the apex.

Oogonium.—Raised on a stalk and may be produced at all the nodes of a branchlet. Often, as many as three oogonia are produced on a single stalk cell. They are also produced in the position of stipulodes at a stem node. A branchlet may be modified to bear an oogonium at the apex; but these instances occur when a node develops as a stem bulbil.

From these variations it is evident that the reproductive bodies may be formed from the original cells meant to develop a bract, a stipulode or a branchlet. This may be the archaic mode in the evolution of the reproductive bodies in Chara.

Fig. 3.

Vegetative propagation.—So far as the writer is aware the occurrence of bulbils in the species of Indian Characeae is not recorded. *C. succincta* develops a large number of stem-node bulbils in the month of January.

Salinity and Characeae:—It is found that the number of species which grow in freshwater elsewhere are found thriving in the seawater at Salsette. It is a well-known fact in Europe. Richter(4) thought that the cells of Chara thrived in a saline solution by thickening the cell-wall. An attempt was made to find out the osmotic pressure within the cells of the same species of Chara living in different mediums. The following results were obtained by employing Pfeffer's(5) method.

Species	O.P. in terms of atmosphere	
	Freshwater	Saline water
C. zeylanica	3.7	4.5.
C. succincta	4.5	7.6.

In this connection the cell contents were tested to determine if there was any amount of NaCl. It was found that there was no appreciable quantity of NaCl in the cells. This indicates selective absorption by the cells.

Summary.

1. Seven species of Characeae are found at present in Salsette.

2. C. succincta is for the first time recorded from India. This species is highly variable both in its vegetative and reproductive parts. It produces stem-node bulbils in January.

3. Abundance of Charophytes near the sea-coast and living in saline water is found in Salsette. Species of Spirogyra also occur there.

Bibliography.

1. A. Braun.—Characeae Indiae Orientalis et insularum maris pacifici.
—Hooker's Journal of Botany. Vol. I. pp. 292–301. 1849.

2. J. Groves.—Notes on Indian Charophyta. Linn. Soc. Jour. Vol. XLVI. 1924.

3. G. O. Allen.—Charophyta notes from Saharanpur U. P. Jour. Ind. Bot. Soc. Vol. VII. 2. 1928.

4. J. Richter.—Uber Reactionen der Characeen auf aussere Einflusse. 1894.

5. W. Pfeffer.—The Physiology of Plants. (Eng. Ed.) P.146

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Illustrations.

Fig. 1. Mudflat. Santa Cruz.

„ 2. Chara succincta. 2/5 Nat. Size.

„ 3. A stem-node bulbil with a proembryonic shoot. ×20.

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Fig. I.—Mudflat near Santa Cruz. Photo taken at Low water.

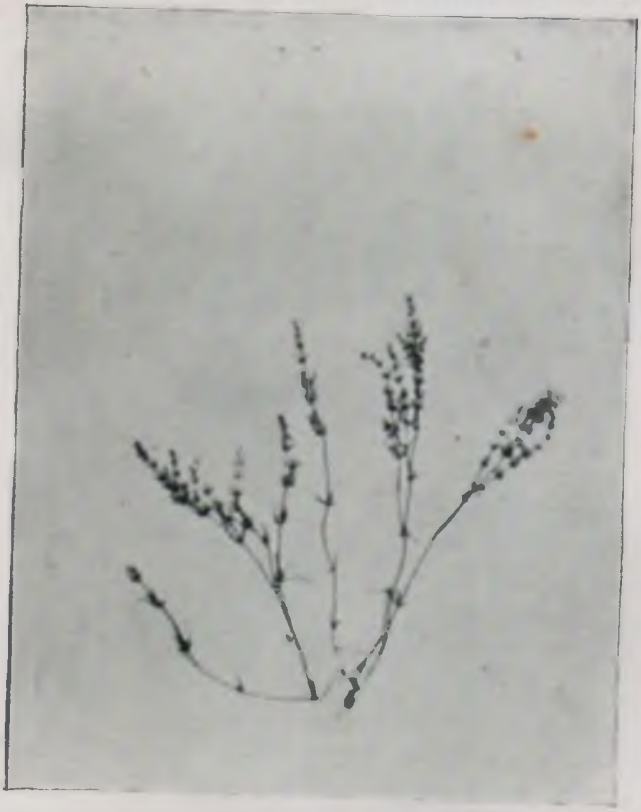

Fig. II —C. Succincta.