NOTES ON FRESH WATER DIATOMS FROM SAWAI MADHOPUR-PART-III, RAJASTHAN, INDIA

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Abstract

The diatoms are group of photo-assimilate microalgae and are cosmopolitan in their distribution. This is the first report of diatom flora from eastern part of Rajasthan and also part of series investigation of microalgae from Eastern Rajasthan and 28 diatoms species have been identified and characterized.

Key words : Lakes, stream, valves, frustules, phytoplankton.

Introduction

The fresh water algae are found in all habitats with great diversity. The diatoms are major part of freshwater algae and major contributors of oxygen evolving organisms. Therefore, enlisting of diatoms not only contributed as data, but also future hope for scientific community for further research. The research project is carried out in the Sawaimadhopur district of Rajasthan. The district is situated in the western part of the Rajasthan and the rainfall is moderate. It cover area 5042.99.99 sq km and situated in between North longitudinal 25°-45' to 26°-41' and in between 75°-59' to 77°-0 East longitude. The temperature ranges from 4° to 45°C with average rainfall 873.40 mm. The district has rolling hills of Aravalli and Vindhyas ranges. The town founded in 1765 AD was named after its founder Sawai Madho Singh-I of Jaipur. Today Sawai Madhopur is known for Ranthambhor, a wildlife reserve and a place of historical importance. In recent years a number of workers attempted to study the algae of different parts of Rajasthan, but the study of diatoms has been has been neglected aspect since long type.

Materials and methods

The samples were collected from various stations during 2015-2016 for the taxonomic enumeration of diatoms. At each stations the planktons was collected with no. 25 mesh plankton or directly with other objects by scraping of rocks, from aquatic submerged objects like plant twing and every site as well as possible. The various samples were oxidized by using concentrated HCl for five minutes and then repeatedly washing and decanted. Repeat it with concentrated H₂SO₄ and if oxidation was incomplete few drops of perchloric acid were employed to facilitate this process. Samples were repeatedly washing and decanted at each steps. Then samples was spread on slide and mount with high refractive index medium Nephrax for microscopic investigations. Cleaned frustules were examined for their morphological investigations.

Study area

The study is carried out in the Sawaimadhopur district of Rajasthan. The district is situated in the western part of the Rajasthan and the rainfall is moderate. It cover area 5042.99.99 sq km and situated in between North longitudinal 25°-45' to 26°-41' and in between 75°-59' to 77°-0 East longitude. The temperature ranges from 4° to 45°C with average rainfall 873.40 mm. The district has rolling hills of Aravalli and Vindhyas ranges. Sawai Madhopur is known for Ranthambhor, a Wildlife reserve and a place of historical importance. The district is divided in to eight tehsils namely1. Sawai madhopur; 2. Khandar, 3. Chauth ka Barwara 4. Gangapur city. 5. Bonli; 6.
Bamanwas; 7. Vazirpur; 8 Malarna Dungar. The area has many freshwater ponds, Dams and lakes. The perennial river Chambal in the Khandar tehsil is natural boundary between Rajasthan and Madhyapradesh. The samples were collected from all possible sites of sawai madhopur district as shown in fig. 1.

Results and Discussion

In present systematic diatoms taxa classification of Hustedt, 1930, 1930-1962 has as far as possible been used. The halobian and pH spectra are as per works of Neils Foged (N.F.), Boye Petersen (B.P.), Max Muller (M.M.), Ruth Patrick (R.P.) and Nygaard. The pH relation divided in to three categories acidophilous (5.5-6.5) circumneutral (6.5-7.5) and Alkaliphilous (7.6-8.9). The identification was done by works of Neils Foged (1959, 64, 66, 71, 73, 75, 77, 78, 79), Sreenivasan and Duthie (1973), Hendey (1964), Gandhi (1959, 61, 62, 67.). In present abbreviations were used as below Hust. for Hustedt, Parag for H.&M. Perallago (1897-1908), AS for A. Schmidt’s Atlas (1874-1959). Foged for Neils Foged. Ab. For Average. L-Length; W-width; S-longitudinal striae; Sr. radial striae; Pl- Plate; F-figure or figures; P\textsuperscript{II} -I = Acidophilous; P\textsuperscript{II} -II = Circumneutral; P\textsuperscript{II} -III = Alkaliphilous; P\textsuperscript{II} -IV = not recorded;

*Eunotia Eherenberg*


L. 28.0; W.4.0; S. 14; _F.8_, P\textsuperscript{II} –II


*Eunotia serpentina* var. _transilvanica_ (Pant.) Hust.


L.40.0-60.0; W.10.0; S. 9-11; _F.15_, P\textsuperscript{III} –III

Oligohalobolous (indifferent). pH - Alkaliphilous. Previously recorded from Hungary (Fossil), E. Australia,
New Zealand but not reported from Indian subcontinent.

L. 20.0-40.0; W.89.0; S. 10; F.16; P. III
Acidophilous (N.F.) Previously recorded from America, S. Africa, Australia, New Zealand

Cocconeis Ehrenberg
Cocconeis pseudodiruptoides (Foged 1975. P. 18, pl. XI, figs 8, 9)
L. 24.4; W. 13.0; S. 15-16; F.18, 19; P. III
L. 12.3; W. 9.4; F.17; P. III
Alkaliphilous. Previously reported from New Zealand, Europe and N. America

Achnanthes Bory
L. 9.0; W.39.0; F.20; P. III

L. 25.0-32.0; W.7.0-8.0; S. 19-20; F.21, 22; P. III
Oligohalobolous (indifferent), Alkaliphilous. Cosmopolitan.

Achnanthes lanceolata var. genuina May. (A. Cleve, in K.V.A. Handl. 4 : 5, p. 25, fig. 527 a-c)
L.20.0-35.0; W.7.0-8.0; S. 15-18; F.23, 24; P. III
Oligohalobolous(Indifferent), Alkaliphilous.

Achnanthes lapponica var. fennica A.cl (A. Cleve in K.V.A. Handl, 4 : 5, p. 23, fig. 520 e-h)
L.25.0-30.0; W.8.0-10.0; F.25, 26; P. III
Halophilous, Acidophilous (N. F.).

Achnanthes microcephala (Kütz.) Grun. (A. Cleve, 1895, p. 188; Hendey 1951, p. 43. Hust., in Rabenhorst,

L. 20.0; W.5.0; S.30-32; F.27, 28; P – I


**Synedra Ehrenberg**

*Synedra laevigata* Grun. (Hust. 1930-66, II, p. 213, fig 706, a-c. Foged 1975 p. 54, pl. X, figs. 8, 9)

L. 60.0-80.0; W.6.0-7.0; S. 30-35; F.1, 2; P – III.

pH - Alkaliphilous

**Eunotia Ehr.**


L.4.0; W.6.0; F .7; P – III.

Halobolous. Acidophilons. Cosmopolitan (not described as alkaliphilous except present work)


L. 21.0-30.0; W.4.0-5.0; F.3; P – III.

Halobolous, Acidophilons. Cosmopolitan (not described as alkaliphilons except present work)


L.14.0; W.6.0; F .4; P – III.


L.35.0; W.7.0; S. 12; F. 9; P – III

Oligohalobolous (indifferent), pH – Alkaliphilous

*Eunotia lineolata* Hust. (Hust. 1949, p. 73. 1937-39, p. 162. AS 293: 4-13)

L.90.0; W.5.0; S. 10-12; F.10; P – III

Oligohalobolous (Indifferent). pH - Alkaliphilous, previously recorded from America, Africa, Asia, New Zealand.

*Eunotia lunaris* var. *elgantoides* A.Cleve. (Sreenivasa & Dutthi, 1973, p. 178, f.12)

L.38.0; W.4.0; S. 17; F. 5; P – III

*Eunotia monodon* Ehr. (Hust. 1930-66, II, p. 305, fig. 772, 772 a, b. AS 271 : 13, 14; 287 : 1; 381 : 1)

L.60.0; W.11.0-12.0; S. 9; F .11; P – III

Halophobous, Acidiphilons, Cosmopolitan.


L.120.0; W.11.0; S. 10; F .12; P – I

Halophobous, Acidiphilous, presumably cosmopolitan.


L.60.0-95.0; W.6.0-8.0; S. 10, 12; F.6, 13, 14; P – IV

Halophobous (indifferent), pH- not recorded.

Cosmopolitan

**Acknowledgement**

The author is thankful to UGC, New Delhi for providing financial support during the tenure of research work.

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