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SEASONAL VARIATION OF ALGAL VEGETATION IN KARKARI RIVER AT RANCHI, JHARKHAND

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Present paper deals with the seasonal variation of algal vegetation growing in Karkari River at Tamar block of Ranchi district. First report on this river for exploration and documentation of the fresh water algae has been done by the authors. A regular seasonal collection has been made during several field trips between the period of March 2009 to February 2011. In total 74 taxa belonging to four different classes viz. Cyanophyceae (21), Chlorophyceae (36), Euglenophyceae (2) and Bacillariophyceae (15) were identified. All taxa have been allotted to their suggested orders. Important genera recorded were *Gloeotrichia, Nostoc, Scenedesmus, Ulothrix, Cladophora, Zygnema, Sirogonium* etc. It was observed that the algal vegetation was recorded maximum during winter and minimum during rainy season.

Key Words: Algal vegetation, Karkari river, Seasonal variation,

The use of algae as indicator of water quality and pollution has been emphasized by Venkateshwarulu (1986) and Kant (1985), who studied algae as indicator of organic pollution. Kanan and Krishnan (1955) studied diatoms as indicator of water quality. Algal dynamics in relation to some factors causing eutrophication has been investigated by Tiwari and Kumar (1985). Algae are directly affected by chemical water containing major nutrients such as phosphorus and nitrogen. In the presence of excess nutrients, algae are capable of rapid growth and multiplication, if not restricted; the condition may lead to a population shift and dominance of algal bloom, the condition which is indicative of deterioration of water quality.

Several reports on algae of water bodies from time to time have been published (Venkateshwarlu 1986, Kant 1985, Kanan and Krishnan 1955, Singh and Chaudhary 2011). Emergence of Karkari river is from the hills of Khunti district and after passing through Ranchi district it merges in Swarnrekha river at Chandil Dam. This river runs through several villages (Ulidih, Zozodih, Ichadih) of Tamar block and is free from any industrial effluents. This river receives effluents from sewage, fertilized farm lands, cremation spots etc. The collections were made from different habitat spots as above.

MATERIALS AND MEHODS

Algal specimens were collected seasonally from different habitats like free floating, running or still water, submerged or attached form, muddy area etc. from the river Karkari at Tamar block of Ranchi district, during the period of March 2009 to February 2011. Algal specimens were thoroughly washed in tap water and care was taken according to the type of specimens. Temporary slides were prepared after staining and observed under standard microscope. Camera lucida drawings and microphotographs were taken. Identification was rendered with the help of standard monographs eg. Desikachary (1959), Philipose (1967), Prescott (1984), Das and Sahu (1989), Gajraj and Srivastava (1994), Prasad and Srivastava (2005).

RESULTS AND DISCUSSION

The study of algae is useful in determining nature of water quality (Srivastava 2005). It is to be noted that though there were only 26.4% blue green algal taxa were found in this river, a majority of them were non polluting taxa (Palmer 1969). Charophytes usually prefer clean water that's why luxuriant growth of *Chara* and *Nitella* indicated the purity of water. These were observed in the muddy area of Ulidih village under submerged condition. Non-polluting green algae like desmids (Suresh and Krishnan 2011) were abundant in this area. *Gloeotrichia* and *Cladophora* were also found growing luxuriantly attached with the rocks in the running water.

Out of 74 taxa belonging to 4 classes and total 38 genera with their species were identified, which has

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Table 1- Algal vegetation in Karkari river at Ranchi, Jharkhand (March 2009 - Feb.-2011).

Sl. No.	Taxa	Summer Season	Rainy Season	Winter Season
	Cyanophyceae			
	Order-Chroococcales			
1	*Microcystis stagnalis* Lemm.	+	-	-
2	*Chroococcus micrococcus* Kutz.	-	+	+
3	*C. varius* A. Br.	-	-	+
4	*Gloeocapsa kuetzingiana* Nag.	+	-	+
5	*Dactylococcopsis raphidioides* Hansg.	+	-	+
6	*Merismopedia marssonii* Lemm.	+	-	-
7	*M. punctata* Meyen (after Smith)	+	-	-
	Order- Nostocales			
8	*Spirulina platensis* f. *granulate* Desikachary	+	-	-
9	*S. laxissima* West.	+	-	-
10	*Oscillatoria subbrevis* Schmidle	-	+	-
11	*O. acuta* Geitler	++	+	+++
12	*O. proboscidea* Gomont	+	+	-
13	*O. limosa* Gomont	++	-	++
14	*Lyngbya hieronymusii* Lemm.	+++	+	++
15	*L. stagnina* Kutz.	++	+	++
16	*L. majuscula* Harvey ex Gomont	+	-	+
17	*Anabaenopsis circularis* Miller	+	-	-
18	*Nostoc sphaericum* Vaucher	-	-	++
19	*Anabaena azollae* Lamm.	-	-	++
20	*Gloeotrichia intermedia* Lemm.	-	-	+++
21	*Scytonema bohneri* Schmidle	-	-	+
	Chlorophyceae			
	Order-Chlorococcales			
22	*Chlorella vulgaris* Beijeriinek	-	-	*
23	*Characiosiphon rivularia* Iyengar	-	-	+
24	*Pediastrum duplex* Meyen	+	-	+
25	*P. tetras* (Ehr.) Ralfs	+	-	+
26	*P. ovatum* (Her.) A. Braun	+	+	+
27	*Crucigenia quadrata* Morren	-	-	+
28	*Hydrodictyon reticulatum* (Linn.) Lagerheim	-	-	+
29	*Scenedesmus quadricauda* var. *longispina* (Chodat) Smith	+++	-	++
30	*S. quadricauda* var. *quadrispina* Smith	-	+	-
31	*S. bijuga* var. *alternans* (Reinsch.) Hansgirg	+	+	-
32	*S. bijugatus* var. *bicellulae* (Chodat) philipose	-	+	+
33	*S. dimorphus* f. *tortus* Smith	+	-	+
34	*Scotiella* sp. Fritsch	+	+	-
	Order- Ulotrichales			
35	*Ulothrix variabilis* Kutz.	-	-	+
36	*U. rorida* Kutz.	-	+	-
37	*U. flacca* (Dillwyn) Thuret	-	-	+
38	*U. tenuissima* Kutz.	-	+	-
	Order- Cladophorales			
39	*Cladophora glomerata* (L.) Kutz.	++	+	+++
40	*Pithophora varia* Kutz.	+	-	+
	Order- Oedogoniales			
41	*Oedogonium laetervirens* Wittr	+	-	+
42	*O. sociale* Wittr.	-	-	+
43	*O. amphulum* Mag.	+	-	-

	Order- Conjugales			
44	*Spirogyra varians* Kutz.	++	+	+++
45	*S. majuscule* Kutz.	++	+	++
46	*S. lagerheimii* Wittock	+	-	++
47	*Zygnema stellinum* Vauch.	++	-	+
48	*Z. cylindrosporum* Czurdae	-	-	+
49	*Sirogonium stictium* (Smith) Kutz.	++	+	++
50	*Closterium tumidum* Johnson	-	-	+
51	*C. abruptum* G.S. West	+	+	+
52	*C. parvulum* Naegeli	+	-	+
53	*Cosmarium awadhense* Prasad and Mehrotra	+	-	+
54	*C. tetraophthalmum* Breb.	+	-	+
	Order- Charales			
55	*Chara pashanii* Dixit	++	-	+++
56	*C. wallichii* Braun	+	-	+
57	*Nitella stuartii* Branu	++	-	+++
	Euglenophyceae			
	Order – Euglenineae			
58	*Euglena acus* Ehrenberg	-	-	+
59	*E. doses* Ehrenberg	+	-	-
	Bacillariophyceae			
	Order- Bacillariales			
60	*Synedra ulna* (Nitzsch) Her.	-	+	-
61	*S. ulna* var. *danica* Kutz.	-	-	+
62	*S. ulna* var. *amphirhynchus* (Eer.) Grun	-	-	+
63	*S. dorsiventralis* Muller	+	-	-
64	*Fragilaria virescens* Ralfs	+	-	+
65	*Navicula cuspidata* var. *ambigua* Ehr.	+	-	+
66	*N. ulna* var. *amphirhynchus* Ehr.	+	-	+
67	*N. ulna* var. *danica* Ehr.	+	+	+
68	*N. rhynchocephala* Kutz. var. *germainii* (Wallace)	-	+	-
69	*Caloneis silicula* Ehr.	+	-	+
70	*Pinnularia pusilla* Gandhi	+	+	+
71	*Cymbella ventricosa* Kutz.	-	+	++
72	*C. ventricosa* Kuetz. var. *minuta* (Hilse.) Van-Heurck	+	-	-
73	*C. tumidula* Grun.	+	+	+
74	*C. wallaceana* Hust.	-	-	++

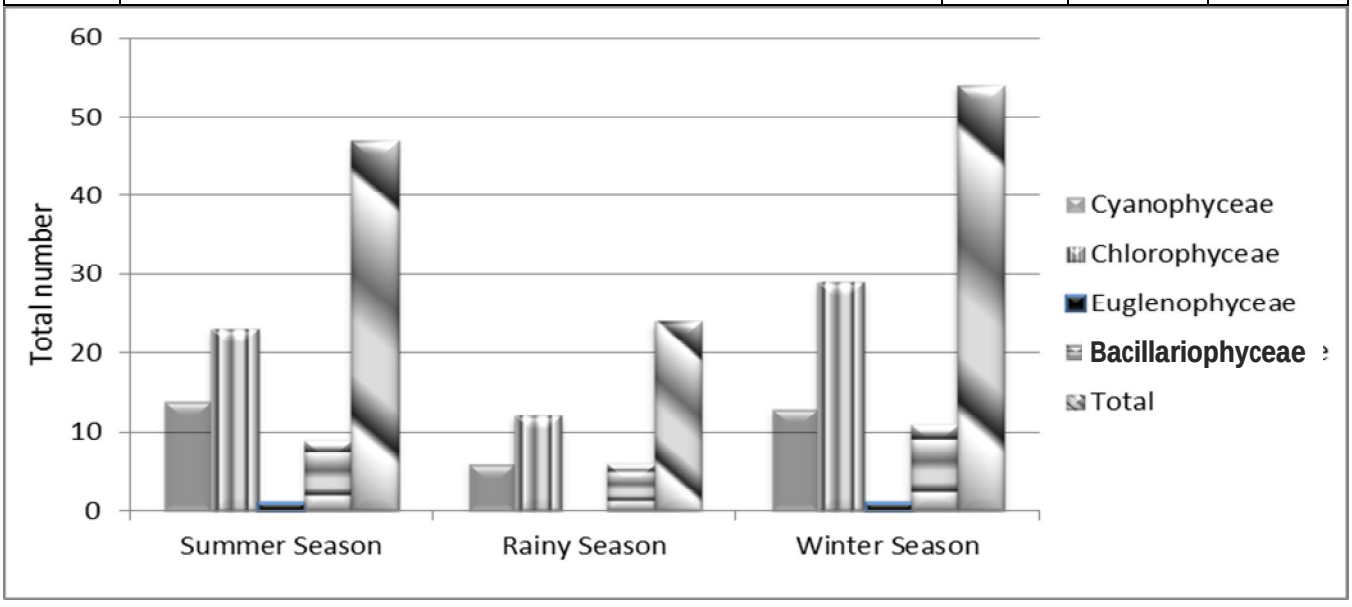

Fig. 1- Seasonal variation of algal vegetation in Karkari river at Ranchi, Jharkhand (March 2009 - Feb. 2011).

been shown season wise in Table-1. as per their abundance. Percentage of different classes has been shown in the histogram (Fig.-1). Cyanophyceae- 21, Chlorophyceae- 36, Euglenophyceae- 2 and Bacilleariophyceae- 15 taxa were identified. Algal vegetation was recorded maximum during winter season and minimum during rainy season. Although all the taxa were not new to the literature, but the area and their habit is new. Exploration and documentation is necessary to know the biodiversity of a particular water body.

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