

XANTHOPHYCEAE AND EUGLENOPHYCEAE OF KANGRA DISTRICT OF HIMACHAL PRADESH

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In the present paper a total of 5 taxa (3 taxa of Xanthophyceae and 2 taxa of Euglenophyceae) have been enumerated from Kangra district of Himachal Pradesh. All 5 taxa are first reports to Himachal Pradesh.

Key Words : Euglenophyceae, Himachal Pradesh, Kangra, Xanthophyceae.

Himachal Pradesh lies between 28°22' to 33°12' N latitude and 75°47' to 79°04' E longitude and has 12 districts namely Bilaspur, Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Lahul &Spiti, Mandi, Shimla, Sirmaur, Solan and Una. The aquatic ecosystems of the state have a wide range of diversified ecological and geographical features. There were few cursory reports on the Xanthophyceae and Euglenophyceae flora by Jha and Kaushal (1983), Khan (1971),Singh and Mahajan (1986, 1987) and Srivastava and Gupta (2004) from Himachal Pradesh.

MATERIALS AND METHODS

Samples were collected randomly from different localities of district Kangra of Himachal Pradesh. All these collections were fixed in 4% formalin immediately in the field and the collection number and date were also marked and the samples were deposited at Wood Science, Forest Biodiversity and Plant Resources Laboratory, Dept. of Bio-Sciences, Himachal Pradesh University, Shimla. Microphotography was done with attached digital camera model DFC320 to Leica DMLS2 microscope. The specimens were identified with the authentic illustrations and



Map of District Kangra showing sample collection sites

descriptions available in published data (Prescott 1931, 1982, Tiffany and Britton 1952, Venkataraman 1961).

RESULTS

Enumeration of Xanthophyceae taxa :

1. *Botrydium granulatum* (L.) Greville (Plate 1, Fig. 1)

Prescott, 1931. Iowa algae. Univ. Iowa Studies Nat. Hist. 13 (6): 48.

Cells single, multinucleate, green, terrestrial; epiterranean portion vesicular, pear-shaped to spherical or dichotomously branched, with many discoid chromatophores; cell wall thin, often encrusted with lime; rooted by a system of dichotomously branched colourless rhizoids; variable in size from 0.5-2.5 mm in diameter.

Collection number & date: R. K.-03, 25th June, 2006.





Plate 1 (Figures 1–5) : Xanthophyceae and Euglenophyceae

1. *Botrydium granulatum* (L.) Greville **2.** *Vaucheria dichotoma* Agardh 3. *Vaucheria sessilis* (Vaucher) de Candolle **4.** *Phacus longicauda* (Ehr.) Duj. **5.** *Phacus pleuronectes* (O.F.M.) Duj.

Locality : Pong Dam Wetland at Nagrota Surian.

2. Vaucheria dichotoma Agardh (Plate 1, Fig. 2)

Venkataraman, 1961a. Vaucheriaceae. I. C. A. R. monograph. 56. f.33a-f.

Filaments 50-225 μ m broad; Dioecious; oogonia solitary or a few together, sessile, subspherical to obovoid to globose, 260-460 μ m broad, 280-380 μ m long.

Collection number & date : R. K.-07, 29th March, 2005.

Locality : Pond at Raja Ka Talab.

3. *Vaucheria sessilis* (Vaucher) de Candolle (Plate 1, Fig. 3)

Tiffany & Britton, 1952. The algae of Illinois. 213, t.36, f.378.

Filaments 50-130 μ m in diameter; oogonium single, sessile, ovate or oblong-ovate, 57-85 x 75-102 μ m, more or less oblique, with short beak; antheridium beside a single oogonium, straight, hooked or circinate.

Collection number & date : R. K.-36, 15th April, 2005.

Locality : Pond at Raja Ka Talab.

Enumeration of Euglenophyceae taxa :

1. *Phacus longicauda* (Ehrenb.) Duj. (Plate 1, Fig. 4)

Prescott, 1931. Iowa algae. Univ. Iowa Studies Nat. Hist. 13: 144; 1982. 400, t.87, f.1.

Cells broadly ovoid to pyriform tapering gradually posterior to form a long, straight, sharply pointed caudus; anteriorly broadly rounded; cells 45-70 μ m in diameter, 85-170 μ m long.

Collection number & date : R. K.-39, 8th November, 2005.

Locality : Fisheries farm at Kangra Mandir.

2. *Phacus pleuronectes* (O.F.M.) Duj. (Plate 1, Fig. 5)

Prescott, 1931. Iowa algae. Univ. Iowa Studies Nat. Hist. 13: 144; 1982. 402, t.88, f.16.

Cells broadly ovoid to suborbicular in outline, slightly spiral and produced posterior to form a stout, sharp pointed caudus which is obliquely turned to the right; cells $30-50 \ \mu m$ in diameter, $42-100 \ \mu m$ long.

Collection number & date: R. K.-39, 8th November, 2005.

Locality : Fisheries farm at Kangra Mandir.

DISCUSSIONS

Members of Xanthophyceae have been reported from Kangra, Kullu, Mandi and Sirmaur districts of Himachal Pradesh, whereas Euglenophyceae from Bilaspur, Sirmaur, Mandi and Kangra districts. There is a need to explore these algal floras from other districts of the state. The Euglenophyceae taxa were noted from time to time either as sub-dominant or isolated individuals without showing any regular periodicity. Some of the taxa like Euglena, Phacus, etc. which usually form water blooms help in bacterial decomposition of sewage by producing O_2 , in addition they recover the mineral nutrients from sewage which would otherwise have been lost in the effluent (Kamat, 1982). The two species of *Phacus* reported in this paper are the algae of the organically polluted water. The type of pollution cannot be correctly indicated solely by the presence of the single species. Different species of the same genus may behave differently, some may occur in polluted water, while other require unpolluted water for their growth (Kamat, 1982). Taxa of Xanthophyceae like Tribonema, Vaucheria are the algal hosts for the parasitic fungal genera (Canter, 1972). Soil algae like Vaucheria etc. grow extensively on large pieces of land and impart beauty to the land by providing greenery to the surroundings (Kamat, 1982).

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