Floristic:

Floristic studies are very important to assessment the species composition of vegetation and understand the detailed botanical nature. The identification of species is essential for floristic mapping. Floristic study of the algae is important to our knowledge about the aquatic water bodies. In addition, it reflects the seasonal variation, evolutionary processes, ecological functions and stability of aquatic ecosystem. Floristic study on algae has attracted a much attention from different regions and habitats. Belanger et al. (1836) seem to be one of the pioneers on Indian algological researchers. Griffith (1849) made a contribution in the field of Characeae. Carter (1858) was the first to pay attention to the study of planktonic forms. He also collected a few Volvocales from some puddles in Bombay. Wallich (1860) was the first to contribute to the study of desmids. He described seven genera and eight species of Desmidiaceae. Grunow (1865) was the pioneer worker in the field of Diatom flora of the Indian region. Martens (1870a, 1870b) made a contribution to the Bengal algae. Dickie (1882) described twenty eight species of diatoms from the Himalayas. Lagerheim (1888) described fifty two species and varieties of desmids from Bengal. Turner (1892) made a contribution to the fresh water algae of East India. He described 22 Species of Myxophyceae, 60 species of Chlorophyceae and 542 species of desmids.

During the first decade of twentieth century, literature on Indian algae was considerably enriched by the work of West and West (1907). He described 59 species of diatoms, 148 species of desmids and 53 species of other green algae. Ghose (1919, 1923, 1933) made an outstanding contribution of algological researches in India. He described the Cyanophyceae of Lahore and Simla. During the course of his investigations, he described a number of new species and varieties. From the year 1920, Iyengar carried out researches on the various groups of algae and made outstanding contributions towards the knowledge of
Indian algae. His first paper was on the observation on Volvocales of Madras. Iyengar (1925) reported a new species of *Hydrodictyon* and two species of *Botrydium*. In 1932, he discovered the genus *Fritschiella*. The discovery of this genus is of great significance. Bruhl and Biswas (1922, 1922a, 1922b, 1926) have contributed greatly to our knowledge of Indian algae, many papers and monographs containing description of many new species and observation on their habitat, periodicity, ecology and distribution. Biswas (1924, 1925, 1926, 1930, 1934, 1949) made an outstanding contribution to the knowledge of the algae of Eastern India. He studied the algae of Manipur, Assam and the salt lakes of Calcutta, Chilka Lake and Khassi and Jaitia hills. Allen (1925, 1928, 1933, 1936) made extensive studies on the Charophytes of United Provinces and described a number of species. Randhawa (1936a, 1936b, 1939a, 1942b, 1944, 1948, 1958a) has made milestone work on Indian Zygnemaceae and extensively studied the fresh water algae of North India.

Singh (1933) studied the algae of Lahore and added a number of new forms which were reported first time. Dixit (1935, 1936, 1937, 1940, 1942) studies the Charophytes of Bombay presidency. Bharadwaj (1933, 1934, 1935, 1963) and Rao (1936, 1937a, 1937b) made a tremendous contribution to the Cyanophyceae of United Provinces. Banerji (1935, 1936, 1938) made systematic studies of the blue green algae of lower Bengal. Algal flora of paddy field soil and Myxophyceae of the United Provinces was described by Singh (1939a, 1939b). Majeed (1935) has done a pioneer work on the Diatom flora of Punjab. Misra (1937) made detailed studies on the Zygnemaceae of Kashmir. Singh (1938, 1939, 1939a, 1939b, 1942) made a important contribution to the knowledge of the algae of Uttar Pradesh. Ganapati (1940, 1943) was recorded many species of algae from South Indian lakes and ponds. Iyengar and Vimala Bai (1941) studied the desmids of Kodaikanal. Gonzalves and Gangla (1949) made observation on the algae of paddy field soil near Bombay and have described many species which are new record for the country. Mitra (1947, 1950, 1951) studied the algal flora of Indian soil. Rao (1955) worked on the distribution of algae of some small


Rajgopal et al. (2010) studied the phytoplanktons of two perennial ponds of Sattur area, Tamil Nadu. Dube et al. (2010) made extensive studies on the phytoplanktonic distribution in the shallow coastal lagoons of Chilka. Ingole et al. (2010) investigated the phytoplanktons of fresh water reservoir at Majalgaon on Sindphana River, Beed (M. S.). Siddhamallayya and Pratima (2011) investigated the abundance of phytoplanktonic community in relation to physico-chemical characteristics. Quantitative and Qualitative analysis of Chlorophyceae and Bacillariophyceae was taken by Mahadev et al. (2011). Total 21 taxa of Chlorophyceae and Bacillariophyceae were reported by them. Nerpagar and Nandan (2011) observed 36 algal taxa from waste water system of North
genera of algae. Out of them, 129 taxa belongs to Chlorophyceae, 35 to Bacillariophyceae, 11 to Euglenophyceae and 53 taxa to Cyanophyceae. Johnson (2016) worked on the algal diversity of Osmania university campus and recorded 68 algal genera. Salve (2016) studied the algal biodiversity of Dnyanganga reservoir of Dnyanganga wildlife sanctuary (M. S.) and observed the 75 species of 42 genera. Altaff et al. (2016) worked on phytoplanktonic diversity of fresh water bodies of Chennai and described the 51 species. Belkhode and Sitre (2016) analyzed the phytoplanktonic diversity of Dham River in Wardha district of Maharashtra and reported thirty six species represented by six different classes. Jadhavar (2016) made studies on the algal flora of Mehekari Lake in Beed (M. S.). Shamina et al. (2016) reported a new taxa Gloeothecae linearis var. compostita. Bhasin et al. (2016) studied the algal biodiversity of the Kshipra River and observed 32 genera. Sasikala et al. (2017) had studied the Phytoplanktonic communities in Varaha Reservoir of Visakapatnam. Srinivas et al. (2017) described the algal diversity in lower Manair Dam of Karimnagar (Telangana). Joseph (2017) made a significant study on the diversity and distribution of phytoplankton in an artificial pond of Kattakada Thaluk, Thiruvananthpuram. Reddy and Chaturvedi (2017) studied the algae of Chandrapur district of Maharashtra and reported 12 new taxa which were isolated first time from India. Harsha et al. (2017) worked on the diversity of planktonic algae from fresh water ponds of Mahe, Puducherry.

A contribution on algae has been carried out by various workers in the different region of the world. Crow (1923) worked on the fresh water algae of Ceylon. Peterson (1935) had studied the biology and taxonomy of soil algae. Flint worked on the Sarah Lake, New Zealand. Fritsch (1935, 1942) made a significant study on the interrelations and classification of Myxophyceae and also authorized a manual “Structure and Reproduction of Algae” in which he has described all classes of algae. Drouet (1942, 1951) had contributed for algae in a series and also made a significant study on Myxophyceae. Prescott (1951) extensively described the algae of the Western Great Lake in which he accounted all group of algae along with physico-chemical condition. Forest (1965)

Algae from desert area have also received much attention by various workers. Bolyshev and Manucharova (1947) studied the distribution of desert algae. Shield and Drought (1962) recorded the distribution of terrestrial algae of Nevada test site. Shtina and Bolyshev (1963) have described the soil algae of arid Steppes. Friedmann (1964, 1968) studied the endolithic and xerolithic algae of Negev Desert. Ocampo-Pous and Friedmann (1966) have described the Chlorococcalean desert algae. Forest and Wetson (1966) described the Atacama Desert algae and proposed the line of modern algal taxonomy.

**Algal groups: Distribution and Diversity**

In aquatic ecosystems, algae play an important role and form the base of food chain and food web. Studies on planktonic composition and water parameters are necessary to acquire basic knowledge on biodiversity status of water body. The abundance of algae, their seasonal and temporal variations are regulated by various environmental factors. Except a few soil algae, the
majorities of them are aquatic and develop in the water of ponds, lakes, reservoir, stream and oceans.


Pandey (1982) have described the algae from West Bengal and Maity and Sautra (1985) from Kumaon hills. Mahajan and Mahajan (1989) have done work on the blue green algae occurring in four different habitats of Jalgaon district, Maharashtra. He recorded 130 taxa from cultivated fields, 86 from fresh water habitats, 45 from thermal springs and 11 from air. Patil (1990) studied the

Himalayas. Dhingia and Baruah (2017) worked on the Cyanobacterial diversity of rice field soils of Brahmaputra floodplain of Kamrup district, Assam.


A significant study on Volvocales of India was carried out by Iyengar (1920, 1933). Carter (1858) reported some Volvocales from some puddles in Bombay and made observations on the fertilization process in Eudorina elegans. Iyengar and Desikachary (1981) have described the Volvocalean taxa from unicellular to colonial form in their monograph.
A good deal of work has been done from time to time by different workers on the Euglenophyceae of India (Iyengar, 1939; Gonzalves and Joshi, 1943a, 1943b; Gupta, 1956; Kamat and Freitas, 1976). Suxena (1955) studied the Euglenophyceae from Hyderabad. Philipose (1988) described seventy taxa of Trachelomonas from different region of India. Hedge and Sujata (1997) recorded 77 taxa belonging to 35 taxa of Euglenophyceae from rain water pools of Dharwad, Karnataka state. Dutta Gupta et al. (2004) worked on Euglenoid bloom in the flood plain wetland of Barak Valley (Assam). Narkhede (2006) described the eleven taxa of Euglenophyceae from Hatnur dam in which seven taxa were reported first time from North Maharasthra. Yadav (2010) has studied the Euglenophyceae of Beed district of Maharashtra and reported the sixty five taxa of euglenoids. Hosmani (2012) described the 15 species of Euglenophyceae from Karanj Lake of Mysore. Halder and Sinha (2014) have described ten new species of Euglenophyceae from Hooghly, West Bengal. Priya et al. (2015) worked on the distribution and diversity of the Euglenophyceae of Sarrognagar Lake, Hyderabad and observed 22 species of four genera. Varol and Sen (2016) observed new record of Euglenophyceae from different water bodies of Tigris river basin.

made a systematic study on diatom of Himalayan streams. Nandan et al. (2007) recorded 21 taxa belonging to 9 genera of diatoms from Amaravati dam, Maharashtra. Tripathi et al. (2012) studied the diatoms from different aquatic habitats of Western Uttar Pradesh. They were recorded 57 taxa of diatom belongs to 21 genera. Jadhawar and Papdiwal (2012) studied the diatom diversity of Nath Sagar water reservoir, Maharashtra. Muruldhar and Murthy (2014) made a significant study on the distribution and ecology of diatom communities in four lakes of Tukmur district, Karnataka. Dwivedi and Misra (2015) were studied on fresh water diatom of Himalayan state (HP) and reported 31 taxa of diatom. Misra et al. (2015) have studied the diatom flora of the Kumaun region of western Himalaya (Uttarakhand). Floristic study of the Gomphonema Ehrenberg of Vindhya and Himachal river of Indian subcontinent was made by Verma and Nautiyal (2016). Nautiyal et al. (2016) worked on diatom of Himalayan streams. Singh (2016) was studied the Bacillariophyceae of Satna (M.P.).


The richness of biodiversity depends on the climatic conditions and area of the region. A number of factors have been attributed to influence the algal diversity in any aquatic ecosystem. So, the algal diversity of Rajasthan Desert area is very interesting due to its extreme climatic conditions and has been studied by many workers. Anantani and Marathe (1947a, 1947b) studied the soil algae of arid and semi-arid regions of Rajasthan. Singh (1949) studied the sub aerial algae along with ecological factors from Mount Abu. Bhandari (1951, 1952) reported Characiosiphon rivulais and 30 other taxa of blue green algae from Jodhpur. Goyal (1964) reported some blue green algae from Jodhpur. Vyas (1968) described the phytoplanktons and the ecology of the famous “Pichhola Lake” Udaipur. Vyas and Kumar (1968) worked on the phytoplanktons of Indra Sagar Tank, Udaipur. Gupta and Kumar (1968) studied the blue green algal flora of Udaipur and its neighborhood. Kumar and Singh (1977) studied the algae of certain habitats endemic to the Rajasthan. Srivastava and Nigam (1979) worked on the soil algae of arid and semi arid region of Rajasthan. Yadav and Bhardwaj (1979) studied the fresh water algae of Rajasthan especially from Ajmer and Kishangarh. Srivastava and Nigham (1980) reported the soil algae from arid region meanwhile from the same habitat. Srivastava and Dwivedi (1983) described some Chlorococcalean taxa. Dwivedi (1984) described the algae of arid region of Rajasthan. Rao (1984) worked on the phytoplanktons of Jaisamand Lake. Soni and Bhardwaj (1980, 1988) studied the blue green and Chlorophyceae

Sukhija (2010) studied the fresh water algae of Srinagar Pond, Ajmer and observed 47 species belonging to 24 genera. Singh et al. (2010) worked on seasonal variation in diatom of Mansagar Lake, Jaipur. Makandar and Bhatnagar (2010) worked on biodiversity of macro algae and Cyanobacteria of some fresh water bodies of Jodhpur region. Gehlot and Barupal (2010) have done work on seasonal variations in phytoplanktons of Kolayat Lake, Bikaner and reported the 135 phytoplanktonic species of 71 genera. Pareek et al. (2011) described the fresh water diatom of Galta kund, Jaipur. Sharma et al. (2011) studies the phytoplanktonic diversity of Pichhola Lake, Udaipur and observed 58 taxa of phytoplanktons. Summarwar (2012) investigated the plankton diversity in Thalodi area of Bisalpur reservoir, Tonk. Sharma et al. (2012) worked on seasonal phytoplanktonic diversity of Kalisil river of Kela Devi wild life sanctuary in Karauli and total 60 taxa of 36 genera were reported. Barupal and Santosh (2012) studied the Algal flora of Kalyan Sagar Pond of Bikaner and observed 55 species of 37 genera belongs to Chlorophyceae, Cyanophyceae, Xanthophyceae, Bacillariophyceae and Euglenophyceae. Maheshwari (2013) studies the rice field of Bundi and reported 12 species of heterocystous Cyanobacteria. Bhatnagar and Bhardwaj (2013) studied the algal biodiversity of