IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

AN OVERVIEW OF THE CRYPTOGAMIC PLANTS OF SIKAR DISTRICT OF RAJASTHAN

MANJOOR ALI QURASI

LECTURER

GSSS ALAY NAGAUR RAJ.

Abstract

The present paper deal with the Biodiversity of the Sikar district with the special reference of the cryptogamic plants. The present study for the four groups of phytodiversity viz. 1- Algae 2- Pteridophytes 3-Gymnosperm and 4- Angiosperm.

Key words- Phytodiversity, Cryptogamic plants ,Sikar, Rajasthan

Introduction: – Sikar District is located in the north-eastern part of The Rajasthan Between 27° 21' and 28°12' North latitude and 74. 44' and 75 ° 25'

East Longitudes at an average height of 432.21 m above mean sea level.

It is bound in the North by Jhunjhunun District, in the north-west by Churu district, in the South - west by Nagour district and in the south-east by Jaipur district.
It is Also touches mahendargarh district of Haryana on its north-east comer. GENERAL INFORMATION (i) Geographical area (sq km) 7732

1 . **Average Annual Rainfall** (1971-2011) in mm 463.0

GEOMORPHOLOGY Major Physiographic Units

• The hilly area in the east

• The undulating area in the centre with hillocks

• The western desertic plain (major part of the villages and plains are sandy with development of dunes to the north of Sikar).

2 . *Major Drainage*- Mendha, Kantli, Dohan, Krishnawati and Sabi

LAND USE (sq km) (2011-2012) (a) Forest Area 703.79

3 .(b) Net Sown Area 5261.08

4 .*MAJOR SOIL TYPE*

• Desertic soil • Red desertic soil • Serozems • Saline soil • Lithosols

Flora ;

The flora of this district consist^ of a considerable variety. 1.46% (census-2001) of the total area of the district was classified as forest. In this district especially Anogeissus pendula, Rhus mysorensis, Holoptelia integrifolia, Azadirachta indica, Wrightia tinctoria, Acacia leucophloea, Acacia Senegal, Acacia arabica, Prosopis juliflora, Balanites aegyptiaca, Caparis aphylla, Gymnosporia spinosa, Boswellia serrata, Butea monosperma, Dichrostachys cinerea, Euphorbia caducifolia, Commiphora wightii, Cenchrus ciMaris, Cynodon dactylon, Sorghum halepense, Cenchrus setigerus, Aristida adscensionis and Sacchspontaneum are grown.

Review of work done on Subject:

Prasad (1916) was one of the earliest pioneer Indian workers in the field of limnology who observed the seasonal condition governing the pond life in Punjab. This was followed by the valuable contribution of Pruthi (1933) who worked on plankton in relation to water chemistry in the Indian Museum Tank at Calcutta. Most of the limnological information pertains to temperate waters of America and Europe. Little is known about the limnology and hydrobiology of tropical waters. Though progress of limnology was rather slow in the initial period it gets momentum from 1960 onward. The main aim of early workers was to obtain baseline information of plankton and water chemistry to be used in pisciculture. Prasad and Singh (1980) have reviewed the algal hydrobiology in India.

Any two fresh water resources may neither by identical in physico-chemical characteristics nor be static in biological sense (Elder, 1965). Besides this the seasonal fluctuation brings rapid change in the physico-chemical and biological characteristics of water particularly in smaller fresh water bodies. To understand the relationship between the distribution and the productivity of an aquatic ecosystem, it is necessary to study its physico-chemical properties. Relationship of physico-chemical characteristics of water and quality and quantity of aquatic biota have been extensively studied by various workers (Hutchinson, 1957 ; Ruttner, 1963 ; George, 1966 ; Munawar, 1974 ; Adoni, 1975 ; Munshi and Munshi, 1995 ; Singh and Roy, 1995 ; Sahat et al., 2001 ; Das et al., 2002 ; Dutta Gupta et al., 2004 ; Ravi and Sivakumar (2012) made significant study on seasonal variation of phytoplanktons population and physico-chemical characteristics in three perennial pond of Chidambaram, Tamil Nadu. A comparative assessment of physico-chemical conditions and plankton diversity of river Tons and Asan in Dehradun was done by Isaq and Khan (2013).

Tropical reservoirs are generally characterized by rich population of phytoplankton (Srinivasan, 1964). In spite of the fact that a good amount of work has been done on fresh water ecology of lentic and lotic ecosystem in India, a relatively less information are available with respect to the state of Rajasthan. Limnological study in different parts of Rajasthan has been carried by Ratnam and Joshi (1952), Sarup (1958), Vyas and Kumar (1968), Bohra and Bhargava (1976), (Sharma (1980), Kulshreshtha and Gopal (1981), Goel et al., (1981) etc.

Temerature is an important factor in controlling the fluctuation of plantation and functioning of any water body (Dwivedi and Pandey, 2002; Singh and Mathur, 2005). The development of algae is directly depend upon temperature in association with inorganic nutrients and light (Singh, 1960 ; Hutchinson, 1967 ; Vyas and Kumar (1968) also found a close correlation of phytoplankton production with temperature. Transparency is a physical variable significant to primary production. The maximum transparency was recorded in winter season attributed to the sedimentation of suspended matter (Kadam et al, 2007; Shah and Pandit, 2012).

Hardness of water is principally due to salts of calcium and magnesium salts and generally a significant positive correlation is present among hardness, calcium and magnesium (George, 1966 ; Saran and Adoni, 1984 ; Adoni and Joshi, 1985). Hutchinson (1967) summarized that the hard water with high alkalinity generally exhibit greater phytoplankton population as compared to soft water. Hard water contains large concentration of alkaline earths derived from drainage of calcareous deposits.

higher temperature and activity of microorganism and higher value during winter due to lower temperature which enhanced the oxygen dissolving capacity (Agarwal et al., 1976 ; Sikandar and Tripathi, 1984; Salve and Hiware, 2006).

Carbon dioxide is added to aquatic ecosystem by rainwater inflowing groundwater and respiration of aquatic organisms. It dissolves more readily in water than oxygen and its dissolution depends

on temperature, pressure and mineral content of water. It shows inverse correlation with dissolved oxygen (Singh, 1965 ; Vyas and Kumar, 1968 ; Sankhla, 1981). Free carbon dioxide displayed positive correlation with water temperature, phosphate and total alkalinity and negative correlation with other parameters (Vikal and Tyagi, 2006).

water bodies (Singh, 1960 ; Adoni, 1975). Verma (1967) stated that higher value of chloride in water may be attributed to pollution of animal origin. Shukla et al. (1989) observed maximum value of chloride during summer and minimum during rainy season and suggested that the latter may be due to dilution of water by precipitation. Nitrate content is excellent parameters to judge organic pollution and it represents the highest oxidized form of nitrogen. Similar finding were observed by Kedar et al (2007) and Sahni and Yadav (2012). Unni (1985) detected nitrate in trace from major reservoirs of India. Ganapati (1960) suggested that unpolluted tropical water is deficient in nitrates. Nitrate and phosphate have been accepted as the main casual factor for eutrophication by many workers including Munawar, 1970 ; Zdanowski, 1982 ; Patil and Goudar, 1985 ; Rathore et al., 2006. Vyas (1968) observed lower concentration of phosphate throughout winter and summer and higher in rainy season and suggested that the latter may be due to addition of phosphate through drainage and sewage. Harney et al. (2013) observed higher value of phosphate during summer and suggested that it may be due to rapid evaporation and mineralization of decomposed material in pond water.

PHYTODIVERSITY OF LOWER PLANTS

1. ALGAE

CHARACEAE

CHARA Linn.

Chara zeylanica Willdenow Mem. Ac. Roy. Berlin (= C. verticillata Roxburgh; C. gymnopus Br. var.

macilenata Br.; C. gymnopus var. ceylonica Br.; C. polyphylla var.

ceylonica Br.).

Monoecious; stem stout, firm, 700-800 u thick; heavily incrusted;internodes 1-3 times the length of the branchlets; stipulodes in twoseries, well developed; acute; cortex triplostichous; cells of the primaryand secondary series equally prominent; spines-cells elongate, acute,solitary; whorls of 11-12 rather stout, spreading branchlets; branchletsof 9-11 segments, the lowest segment very short and ecorticate;terminal segment short, hardly exceeding the bracts; bract-cells 7-8anterior ones better developed than the posterior; bracteoles 3-4 timesthe length of the bract cells, exceeding the fruit in length; gametangiaproduced from the second up to the fifth branchlets-nodes.

Ecology : Common in waterlogged areas and ponds.

Spec. & Loo. :Laxmangarh : Sharma & Rashmi: 6670 (DCH). 36

2. PTERIDOPHYTES

1. PTERIDACEAE

ADIANTUM Linn.

Adiantum cap/7/us-vener/s Linn. Sp.Stem

short creeping; scales golden brown to medium brown. Leaves laxarching or pendent, closely spaced, 15-75 cm. Petiole 0.5- 1.6 mmdiam., glabrous, occasionally glaucous. Blade lanceolate, pinnate, 1045 X 4-15 cm, glabrous, gradually reduced distally; proximal pinnae 3pinnate; rachis straight to flexuous, glabrous, not glaucous. Sporemostly 40-50 um diam.

Ecology : Bank of canal region and moist areas, where it will

generally be found growing on sheltered. It is commonly grown as a

houseplant.

Spec. & Loc. :Harshparvat: Sharma & Rashmi :7437 (DCH).

2. ACTINOPTERIDACEAE

ACTINIOPTERIS L.

Actiniopteris radiata L. is a widely distributed fern occuringthroughout India. It is common in deciduous woodland with perenniallyhigh temperature and low rainfall.The distinctive fronds issue from a prostrate rhizome and aresomewhat dimorphic. The laminae are 15-45 mm long and fan shapedwith a spread of some 180 degrees. The tip of each segment bearing2-5 teeth.

Local name: Ray fern

FL & Fr.: February- August

Ecology : Found in hot, dry habitat.

Spec. & Loc.: Kailash : Sharma & Rashmi

3. GYMNOSPERM

GNETACEAE

EPHEDRA Linn.

Ephedra ciliata Fisch. & Mey. ex C. A. Mey. Monogr. Gatt.

Ephedra 100. 1846. E. foliate Boiss. & Kotschy ex Boiss. Diagn. Ser. 1: 7. 101. 1846 & Boiss. Fl Orient. 5 : 716. 1884; Blatt. & Hallb. In Journ.

Bombay Nat. Hist. Soc. 26 :972. 1920; Bhandari, Fl. Ind. Desert 439.

1978; Par\dey in Shetty & Singh, Fl. Rajasthan 2: 815.1991.

Dioecious, much-branched, climbing or scandent shrubs.

Branches smooth, often fascicled, slender. Leaves 2-4 at each node,

shortly connate at the base, upto 25 x 1.6 mm long, setaceous. Malespikes yellow, ovate 1 to 3-together, on 1 -2 cm long peduncles; bractupto 2 mm long, rotund, obtuse, connate upto their length from theapex. Prianth obovate, ciliate, exceeding the bracts. Staminal columnshortly exserted. Female spikes often in cymes or on c.8 mm longpeduncles; bract 3 paired. Fruit c. 8 x 7 mm, white, semi-transparent,fleshy. Seeds 2, plaino-convex, acute at the apex, rounded at the base,glabrous, brown.

Local name: Andho Khimp.

FL & Fr,: January- April

Ecology : Not common, generally found in desert on sandy to

gravelly or even rocky plains.

Spec. & Loo.: Mehroli : Sharma & Rashmi :6642 (DCH). 38

Bibliography; REFERENCES

Adoni, A. D. 1975. Studies on Microbiology of Sagar Lake. Ph. D. Thesis, Sagar University, Sagar. Adoni, A. D. and Joshi G. 1985. Diel variation in a tropical manmade lake for two consequent summers. I. Physico-chemical characteristics. Zoologica Orientalis. 2: 84-88. 143.

Agarwal, D K., Gaur, S. D., Tiwari, I. C., Narayanswami, N. and Marwah, S.M. 1976. Physico-chemical characteristics of Ganga water of Varanasi. Indian J. Environ. Hlth. 18: 201-206.

Bhandari, M. M. 1951. Occurrence of Characiosiphon rivularis Iyengar. Current Sci. 24: 16-17. Bhandari, M. M. 1952. A Preliminary note on collection of algae from Jodhpur and its environs. Univ. of Rajasthan Studies (Bio. Sci. and Medicine), Jaipur. 103-119. Bhandari, M. M. 1990. Flora of the Indian Desert. M. P. S. Repros, Jodhpur. pp-435.

Bohra, O. P. and Bhargava, S. C. 1976. Observations on some abiotic components of the Takhtasagar during winter seasons. Comp. Physiol. Ecol. 1: 35.

Das, A. C., Baruah, B. K., Baruah, D. and Sengupta, S. 2002. Study on wetland of Guwahati city-1, Water quality of ponds and beels. Poll. Res. 21 : 511-513.

Dutta Gupta, S., Gupta, S. and Gupta, A. 2004. Euglenoid blooms in the flood plain wetland of Barak Valley, Assam, North-eastern India. J. Environ. Biol. 25: 369-373.

Dwivedi, B. K. and Pandey, G. C. 2002. Physico-chemical factors and algal diversity of two ponds in Faizabad, India. Poll Res. 21 (3): 361-370. 150.

Elder, H. Y. 1965. Biological effect of water utilization by hydro-electric schemes in relations to fisheries with special reference to Scotland. Proc. Royal Soc. Edin. 69B Pt. III. (No. 4): 246-271.

Ganapati, S. V. 1960. Ecology of Tropical waters. Proc. Symp. Algol. ICAR, New Delhi: 204-218.

Goel, P. K., Sharma, K. P. and Trivedi, R. K. 1981. Ecological observation on some ephemeral ponds around Jaipur. Acta. Limnol. Indica. 1 : 45-48.

George, M. G. 1966. Comparative plankton ecology of five fish tanks in Delhi. Hydrobiol. 27: 81-108.

Harney, N. V., Dhamani, A. A. and Andrew, R. J. 2013. Seasonal variations in the physico-chemical parameters of Pindavani Pond of Central India. Weekly Science. 1 (6): 1-8.

Hem, J. D. 1959. Study and Interpretation of the Chemical Characteristics of Natural Water. Geol. Surv. Water Supply paper 1473. U.S. Govt. Print Office, Washington, D.C. pp. 37-98.

Hutchinson, G. E. 1967. A Treatise on Limnology vol. II. Introduction to Lake Biology and the Limnoplanktons.

Isaq, F. and Khan, A. 2013. Comparative assessment of physico-chemical conditions and plankton diversity of river Tons and Asan in Dehradun district of Uttarakhand. Adv. Appl. Sci. Res. 4 (2): 342-355.

Kadam, , M.S., Pampatwar, D.V. and Mali, R.P. 2007. Seasonal variations in different physico-chemical characteristics in Mosoli Reservoir of Parbhani district, Maharashtra. J. Aqua. Biol. 22 (1) : 110-112.

Kulshreshta, M. and Gopal, B. 1981. Effects of sewage pollution on growth of two aquatic macrophytes. Acta. Limnol. Indica. 1 : 19-24.

Misra, P.K., Srivastava, A.K., Prakash, J. Asthana, D.K. and Rai, S.K. 2005. Some fresh water algae of Eastern Uttar Pradesh. India. Our Nature. 3: 77-80.

Munawar, M. 1970. Limnological studies of fresh water ponds of Hyderabad, India I. Biotype. Hydrobiol. 35: 127-162. Munawar, M. 1970. Limnological studies on the fresh water ponds of Hyderabad, India II. The Biocenose distribution of unicellular and colonial phytoplankton in polluted and unpolluted environments Hydrobiol. 36 : 105-128.

Patil, C. S. and Goudar, B. Y. M. 1985. Ecological study of freshwater zooplankton of a subtropical pond (Karnataka state). Int. Rev. Ges. Hydrobiol. 70: 259-267.

Prasad, B. 1916. The seasonal conditions governing the pond life in the Punjab J. Asiat. Soc. Beng. 12:142-145

Prasad, B.N. and Singh, Y. 1980. Algal hydrobiology in India. Proc. Indian Nat. Sci. Acad. Golden Jubilee Commemoration volume. 271-300.

Pruthi, H. S. 1933. Studies on the bionomics of freshwater in India I. The seasonal changes in the physical and chemical conditions of the water of the tank in the Indian Museum Compound. Int. Rev. Hydrobiol. 28 : 4667.. Rathore, D. K., Sharma, P., Barupal, G., Tyagi, S. and Sonle, K. S. 2006. Analysis of physico-chemical characteristics to study the water quality index, algal blooms and eutrophic conditions of lakes of Udaipur city, Rajasthan. Indian J. Environ. & Ecoplan. 12 (1): 223-230.

Ratnam, B. V. and Joshi, M. C. 1952. An ecological study of the vegetation near about temporary pond in Pilani. Ibid. 3: 45-59.

Ravi, R. and Sivakumar, K. 2012. Physico-chemical parameters and phytoplanktonic richness in certain ponds of Chindambaram, Cuddalore district of Tamil Nadu. International Journal of Research in Environmental Science and technology. 2 (2): 35-44.

Ruttner, F. 1963. Fundamentals of Limnology 3rd ed. (Trasl. From German. D. G. Troy and F. E. V. Frey). Univ. of Toronto Press., Ontario. pp-295.

Salve, B. S. and Hiware, C. J. 2006. Studies on water quality of Wanaprakalpa Reservoir, Nagpur near Parali Vaijnath, Dist.-Beed, Marathwada Region. J. Aqua. Biol. 21 (2): 113-117.

Sankhla, S. K. 1981. Studies in the Hydrobiology of Baghela tank, Udaipur (South Rajasthan). Ph. D. Thesis, Univ. of Udaipur, Udaipur.

Sarup, S. 1958. Hydrophytes of Jodhpur. University of Rajasthan Studies. Biol. Sci. 361-370.

Shah, J. A. and Pandit, A. K. 2012. Physico-chemical characteristics of water in Wular Lake- A Ramsagar site in Kashmir Himalaya. International Journal of Geology, Earth and Environment Sciences. 2 (2): 257-260.

Sharma, M. S. 1980. Studies on Plankton and Productivity of Udaipur Waters in Comparison to the Selected Waters of Rajasthan. Ph. D. Thesis, Univ. of Udaipur, Udaipur.

Sharma, S.C. and Vyas,R. 2012. Study of Phytodiversity of Sikar District of Rajasthan. SHRINKHLA Vol-2 Issue-2.

Shukla, S. C., Kant, R. and Tripathi B. D. 1989. Ecological investigation on physico-chemical characteristics and phytoplankton productivity of river Ganga at Varanasi. Geobios. 16 (1): 20-27.

Sikandar, M. and Tripathi, B. D. 1984. The physico-chemical characteristics of Ganga Water at Varanasi. In: River Ecology and Human Health (Eds. R. S. Ambasht and B. D. Tripathi). Nat. Environ. Cons, Assoc. 53-61.

Singh, M. 1965. Phytoplankton periodicity in a small lake near Delhi. I. Seasonal fluctuation of the physico-chemical characteristics of the water. Phykos. 4 : 61-68.

Singh, R. P. and Mathur, P. 2005. Investigation of variations in physicochemical characteristics of a fresh water reservoir of Ajmer city. Rajasthan. Ind. J. Environ. Science. 9: 57-61.

Singh, V. P. 1960. Phytoplankton ecology of inland water of Uttar Pradesh. Proc. Symp. Algol., I.C.A.R. 243-271.

Srinivasan, A. 1964. Hydrological study of a tropical impoundment Bhavanisagar Reservoir, Madras state, India for the year 1950-61. Hydrobiol. 54 : 514-539.

Verma, M. N. 1967. Diurnal variation in a fish pond in Seoni, India. Hydrobiol. 30 : 129-137.

Vikal, P. and Tyagi, S. 2006. Studies on the physico-chemical characteristics of Lake Pichhola, Rajasthan. Indian J. Environ. & Ecoplan. 12 (3) : 797800.

Vyas, L. N. and Kumar, H. D. 1968. Studies on the phytoplankton and other algae of Indra Sagar Tank, Udaipur, India. Hydrobiol. 31 : 421-434.

Zdanowski, B. 1982. Variability of nitrogen and phosphorus contents and lake eutrophication. Poll. Arch. Hydrobiol. 29: 541-598.