

Aquatic Biodiversity of the River Mandakini of Chitrakoot

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Introduction

Chitrakoot (the 'Hill of many wonders') is indeed a gift of nature and the gods and located on the banks of river Mandikini and falls in the northern Vindhyan range of mountains spread over the states of Uttar Pradesh and Madhya Pradesh. The Chitrakoot region is included in the district Chitrakoot of Uttar Pradesh and the district Satna of Madhya Pradesh. Chitrakoot Parvat Mala includes Kamad Giri, Hanumaan Dhara, Lakshman Pahari, and Devangana are famous Religious Mountains.

It is a town of religious, cultural, historical and archaeological importance, situated in the Bundelkhand region and surrounded on north, northwest and northeast by Karwi (Chitrakoot) district of Uttar Pradesh and west by Panna district of Madhya Pradesh. It lies between 80° 52' to 80° 73' N latitude and 25° 10' to 25° 52' E longitude, covering an area of 1584 sq km. The general topography is hilly, precipitation and undulating cut off by numerous rivers and rivulets. Mandakini, Chakara and Jhuri rivers drain the region. The Mandakini (a offshoots of the Ganga) is Holy River that is also known as Payasuni in Chitrakoot region.

The forest of the Chitrakoot predominantly consists of tropical dry mixed deciduous type. The climate of the Chitrakoot is dry and the maximum temperature goes up to 49.5°C in the month of May and minimum up to 5 °C in the month of January. Chitrakoot is a place of pilgrimage for Hindus in India. It is surrounded by lush green hills of legendary Vindhya range. Since times immemorial, it is famous for its

religious importance, elegant environment and spiritual peace. Chitrakoot is also well known for its beautiful hill ranges, historical caves, perennial streams and varied flora and fauna.

Chitrakoot's spiritual legacy stretches back to legendary ages: It was in these deep forests that Rama, Sita and his brother Lakshmana spent eleven and half years of their fourteen years of exile. The great sage Atri, Sati Anusuiya, Dattatreya, Maharshi Markandeya, Sarbhanga, Sutikshna and various other sages, seers, devotees and thinkers meditated; and here the principal trinity of the Hindu pantheon, Brahma, Vishnu and Shiva, took their incarnations.

The first known mention of the place is in the *Valmiki Ramayana*, which is believed to be the first ever Mahakavya (epic) composed by the first ever poet. Valmiki speaks of Chitrakoot as an eminently holy place inhabited by the great sages, abounding in monkeys, bears and various other kinds of fauna and flora. Both the sages *Bharadwaja* and *Valmiki* speak of Chitrakoot in glowing terms and advise Rama to make it his abode during the period of his exile. Lord Rama himself admits this bewitching impact of this place. Mahakavi *Kalidas* has described this place beautifully in his epic *Raghuvansha*. He was so much impressed with its charms that he made Chitrakoot (which he calls Ramgiri because of its time-honoured associations with lord Rama) the place of exile of his yaksha in *Meghdoot*.

Tulsidas, the saint-poet of Hindi has spoken very reverently of this place in all his major works- *Ramcharit Manas*, *Kavitawali*, *Dohawali* and *Vinaya Patrika*. The



A view of Aquatic Biodiversity of Mandakini River

last-mentioned work contains many verses which show a deep personal bond between Tulsidas and Chitrakoot. He spent quite some part of his life here worshipping Rama and craving his darshan. His eminent friend, the noted Hindi poet Rahim (*i.e.* Abdur Rahim Khankhana, the soldier-statesmen-saint-scholar-poet who was among the Nav-Ratnas of Akbar) also spent some time here, after he had fallen from favour with Akbar's son Emperor Jahangir.

This holy place has provided spiritual inspiration and energy to many sages and dignitaries like Maharishi Valmiki, Goswami Tulsidas, Abdul Raheem Khankhana, Tansen and even Aurangajeb etc.

Aquatic biodiversity

A floristic study of aquatic biodiversity of Mandakini River of Chitrakoot was carried out by the author during the year 2004-2010. The voucher

specimens were collected, identified and preserved in the Herbarium of Arogyadham, Deendayal Research Institute, Chitrakoot.

A lot of work on aquatic and marshland vegetations of different parts of India has been carried out by various workers viz. Chavan & Sabnis (1961), Kaushik (1969), Maheshwari (1960), Mishra (1991), Mukhopadhyaya (1987), Pattanaik & Pattanaik (1956), Singh & Singh (1972, 1991), Singh & Tomar (1982), Vyas (1964) and Yesoda & Pullaiah (1985) etc. but no work on aquatic and semi aquatic plants of Mandakini River (rich in aquatic biodiversity) of Chitrakoot has so far been carried out. Therefore the present work was conducted.

The plant diversity found in and around the water of the river Mandakini is classified under following life forms on the basis of their contacts with soil, water and air.

1. Fixed floating plants

These are in contact with soil, water and air. Some examples of this group are *Nelumbo nucifera* Gaertn., *Nymphaea stellata* Willd., *Nymphoides hydrophyllum* (Lour.) Kuntze, *N. indicum* (L.) Kuntze, *Aponogeton natans* (L.) Engl. & Krause, *Potamogeton nodosus* Poir., *Monochoria vaginalis* Pres., *Ipomoea aquatica* Forssk., *Alocasia macrorrhiza* (L.) G. Don, *Sagittaria sagittifolia* L. and *S. guayanensis* Kunth.

2. Free floating plants

These are in contact with air and water only. Some species belonging to this group are *Trapa natans* L. var. *bispinosa* (Roxb.) Makino, *Wolffia globosa* (Roxb.) de Hartog & Plas, *Lemna purpusila* Torrey, *Spirodela polyrrhiza* (L.) Schleid and *Eichhornia crassipes* (Mart.) Solms.

3. Fixed submerged plants

Generally vegetative parts of such plants are in contact with soil and water but their flowers are raised to or slightly above the surface of water. Some examples of this group are *Hydrilla verticillata* (L.f.) Royle, *Ottelia alismoides* (L.) Pers., *Vallisneria natans* (Lour.) Hara, *Potamogeton crispus* L., *P. pectinatus* L., *P. perfoliatus* L., *Najas graminea* Del., *Acorus calamus* L. and *Nechamandra alternifolia* (Roxb.) Thw. and *Cryptocoryne retrospyrals* (Roxb.) Wydl.

4. Free submerged plants

These are in contact with water only and are rootless. *Utricularia inflaxa* Forsk. var. *stellaris* (L.f.) P. Taylor, *U. aurea* Lour. and *Ceratophyllum demersum* L. are representative of this group.

5. Emergent amphibious plants

Roots, the lower parts of the stem and in some cases even the lower leaves of these plants are usually submerged under water. *Aechynomene indica* L., *Caesulia axillaris* Roxb., *Limnophila indica* (L.) Druce, *L. rugosa* (Roth) Merr., *Polygonum glabrum* Willd., *P. barbetum* L., *Commelina hasskarlii* Cl., *Typha angustata* Bory & Chaub., *Cyperus alopecuroides* Rottb., *C. exaltatus* Retz., *C. pangorei*

Rottb., *C. pulchellus* R.Br., *C. scariosus* R.Br., *Scirpus littoralis* Schrad., *Ischaemum rugosum* Salisb. *Vetiveria zizanoides* Nash, *Coix lachrymal-jobi* L. are some of characteristic species of this group.

6. Marshy amphibious plants

This group of plants occurs on soft wet mud or forming reed swamp vegetation along the banks. *Bacopa monnieri* (L.) Penell, *B. Hamiltoniana* (Benth.) Wettst., *Eclipta prostrata* (L.) L., *Veronica anagallis-aquatica* L. *Phyla nodiflora* Greene, *Alternanthera sessilis* Br., *Eleocharis palustris* R.Br., *Salvia plebeia* R.Br., *Eriocaulon cinereum* R.Br., *Fimbristylis dichotoma* (L.) Vahl, *F. bisumbellata* (Forsk.) Bub. and *Ammania bassifera* L. are common component of this group.

7. Wetland plants

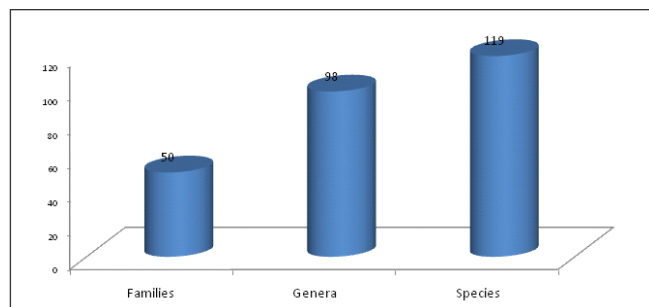
The plants along or slightly away from the banks of river are *Terminalia arjuna* Wt. & Arn., *Syzygium heyneanum* Wall. Ex Wt. & Arn., *Streblus asper* Lour., *Salix tetrasperma* Roxb., *Vitex negundo* L. *Ficus racemosa* L. *Bauhinia vahlii* Wt. & Arn., are common woody plants of river banks. *Portulaca oleracea* L., *Gnaphalium indicum* L., *Cyperus difformis* L., *Fimbristylis dichotoma* Vahl, *Rumex dentatus* L., *Ranunculus sceleratus* L., *Bergia ammanioides* Roxb., *Potentilla supina* L., *Vahlia digyna* (Retz.) Kuntze, *Oxalis corniculata* L., *Arundo donax* L. *Rotala mexicana* Cham. & Schl., *R. serpyllifolia* (Roth) Bremek, *Ludwigia hyssopifolia* G. Don, *L. prostrata* Roxb., *L. perennis* L., *Centella asiatica* (L.) Urban, *Gnaphalium affine* D.Don, *G. pensylvanicum* Willd., *G. polycaulon* Pers., *Xanthium indicum* Koen., *Ageratum conyzoides* L. *Blumia eriantha* DC., *Centipeda minima* (L.) R.Br. *Cotula anthemoides* L., *Cythocline purpurea* (D.Don) O. Kuntze, *Grangea madeeraspatana* (L.) Poir., *Parthenia hysterophorus* L., *Spilanthus calva* DC., *Sphenoclea zeylanica* Gaertn., *Canscora decussata* (Roxb.) R. & S., *C. diffusa* (Vahl) R.Br. ex R.&S., *Exacum pedunculatum* L., *Centaurium meyeri* (Bunge) Druce, *Solanum myriacanthum* Dunal., *S. nigrum* L., *Scoparia dulsis* L., *Hygrophila auriculata* (Schum.) Heyne, *Lantana camara* L. var. *aculeata* (L.)

Moldenke, *Leucas biflora* (Vahl) R.Br., *Piper longum* L., *Chrozophora rottleri* (Geis.) Juss ex Spreng., *Homonoiea riparia* Lour., *Phyllanthus virgatus* G. Foster, *Zingiber zerumbet* Rosc. Ex Sm. *Crinum viviparum* (Lam.) R. Ansari & V.J. Nair, *Zannichelia palustris* L. are characteristic species of this group.

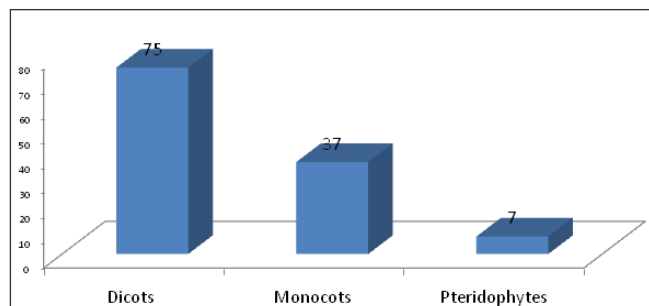
Besides, *Adiantum incisum* Forsk., *A. philippense* L., *Pteris vittata* L., *Ampelopteris prolifera* (Retz.) Copl, *Christella parasitica* (L.) Le'v, *Selaginella crysocholos* L. and *Equisetum ramocissimum* ssp. Debile are common pteridophytes.

Discussion

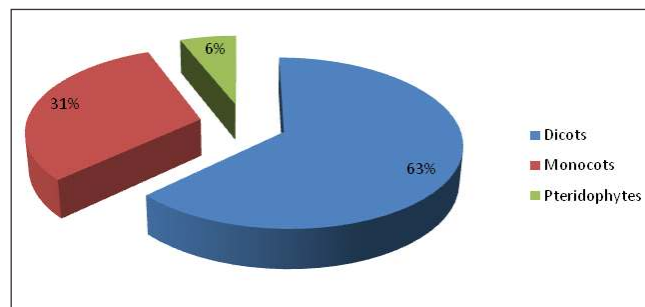
The present study reveals that there are 119 species under 98 genera and 50 families found as aquatic and semiaquatic plants in Mandakini river of Chitrakoot.



The dicots belong to 75 and monocots belong to 37 species and rest 7 species belonging to Pteridophytes.



It is also studied that the dicots represents 63%, monocots represents 31% and pteridophytes 6% of the aquatic and semi-aquatic plant diversity of Mandakini river of Chitrakoot.



Chitrakoot is a holy and pious place and thousands pilgrims take holy bath every day in the Mandakini river and number raises 1-3 million on the occasion of Amavasiya, therefore, the level of water pollution is increasing. Chitrakoot town is situated on the bank of the River Mandakini and gutters and sewer lines are directly connected to the river. Garbage of *hawan* and *pooja* is also thrown in the river, polluting it. Banks of the river are covered by concrete disturbing nature. The water level of the Mandakini river is decreasing day by day. Therefore, for conserving the precious aquatic biodiversity of Mandakini River, the river itself needs to be saved.

Acknowledgements

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Nawabganj Bird Sanctuary (Photo credit : Pratibha Singh)

*“Wetlands have a poor public image... yet
they are among the Earth’s greatest natural assets ...
mankind’s waterlogged wealth”*

–Edward Maltby