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Study of History and Paleoclimatic Situation of Fossil Development in Salkhan, Sonbhadra, India

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Abstract: Salkhan Fossils Park, officially known as Sonbhadra Fossils Park, is a fossil park in Uttar Pradesh, India. It is located 12 km from Robertsganj, near Salkhan village on state highway SH5A in Sonbhadra district. The fossils in the park are estimated to be nearly 1.4 billion years old. The fossils appear as rings on the boulders and are scattered in Fossil rings on boulders in the park which is spread over an area of about 25 hectares in the Kaimoor Wildlife range.[1].

Keywords: Salkhan, Fossils, Uttar Pradesh, Sonbhadra, Park, history, paleoclimatic, development, boulders, fossil rings.

Introduction

The fossils found in the Sonbhadra Fossils Park are algae and stromatolites types of fossils. The park is spread over an area of about 25 hectares in Kaimur Range, adjacent to Kaimoor Wildlife Sanctuary.¹



Sonebhadra Fossils Park, Sonbhadra Fossils Park



It comes under jurisdiction of the State forest department.^[1] Geologists have been aware of the fossils found in the present-day park area since the 1930s. People who have carried out research in the area include Mr. Auden (1933), Mr. Mathur (1958 and 1965), and Professor S. Kumar (1980–81). On 23 August 2001, the area was featured in an article written by journalist Vijay Shankar Chaturvedi for the Hindi newspaper Hindustan. Subsequently, it was formally inaugurated as a fossil park by District Magistrate Bhagawan Shankar on 8 August 2002.^[1]

An international workshop was organised in December 2002, attracting participation from 42 delegates from India and abroad. Canadian geologist H.J. Hoffman was impressed by the fossils, and remarked that he had not seen such "beautiful and clear fossils" anywhere else in the world.^[2] In 2004, researcher Mukund Sharma further explored the area.^[1]

In 2013, the state government sanctioned ₹ 12.5 million for the development of the Salkhan Fossils Park.^[3]

Sonbhadra (also known as Sonebhadra) or Sonanchal is the second largest district by area of Uttar Pradesh after Lakhimpur Kheri. It is the only district in India which borders four states, namely Madhya Pradesh to the west, Chhattishgarh to the south, Jharkhand in the south-east and Bihar to the north-east. The district has an area of 6,788 km² (2,621 sq mi) and a population of 1,862,559 (2011 census),⁴ with a population density of 270 inhabitants per square kilometre (700/sq mi). It lies in the extreme south-east of the state, and is bounded by Mirzapur district to the northwest, Chandauli district to the north, Kaimur and Rohtas districts of Bihar state to the north-east, Garhwa district of Jharkhand state to the east, Balrampur⁵ District of Chhattisgarh state to the south, and Singrauli district of Madhya Pradesh state to the west. The district headquarters is in the town of Robertsganj. Sonbhadra district is an industrial zone and it has much bauxite, limestone, coal, gold, etc.⁶ It is called the "Energy Capital of India" because there are multiple power plants.^[2]

Sonbhadra lies between Vindhya and Kaimur hills, and its topology and natural environment prompted First Prime Minister of India Jawaharlal Nehru to refer to Sonbhadra as the "Switzerland of India".^[3]

In 2018 Uttar Pradesh's chief minister Yogi Adityanath recognised Sonbhadra as a tourist hub in Purvanchal region and further promoted by Uttar Pradesh Tourism Department.^[4]

In February 2020, a Press Trust of India (PTI) news report incorrectly claimed that Geological Survey of India (GSI) has found 3,000 tonnes (3,300 tons) of gold deposits in Sonbhadra district. PTI later clarified on Twitter that the GSI had told PTI that there had been no such discovery of large gold deposits in the district.^{[5][6]}

The Valley of Son and Belan Rivers abounds in caves which were the earliest dwellings of the primeval inhabitants. This area had been the centre of activities of pre-historic man which is evident from the rock paintings (pre-historic cave art) found in abundance in this region. These paintings are of the periods ranging from Mesolithic to Paleolithic ages.^[7]

Based on evidence from religious and cultural perspectives of Ramayana and the Mahabharat, Huyen found here is the cultural symbol. By Jarasandh many rulers in the Mahabharat were maintained prisoner here. Sonbhadra, whose ancient name was Gramputra or Gupt Kashi, was built by the ancient king Putrak for his queen Paatali.^[8] It is said that 'Bhars' had settlements along with Chero, Searis and Kharwar communities in the district up to fifth century there was the rule of "Chandel Rajput" kings on Vijaygarh Fort.⁹ This district was famous as second Kashi during 11th to 13th centuries. In the 9th century B.C.¹⁰, the Brahmadutt dynasty was subdivided by Nagas. Kushan and Nagas also held supremacy over this region before the advent of the Gupta period. After the death of Harshvardhan in the latter half of the 7th century, it remained under the control of the Gurjara-Pratihars till 1025 before they were driven out by Mahmud of Ghazni. This area was under the administration of various Governors of Mughal emperors. Some of the forts such as Agori Fort were under the control of Madan Shah.¹¹

During the 18th century, the district came under the control of the Narayan rulers of Benares State, who built or occupied several fortresses in the district. In the decade after 1775, the British took over administrative control of most of the territory of the rajas of Benares. The British district of Mirzapur included present-day Mirzapur and Sonbhadra districts¹², with all of present-day Sonbhadra district included in Robertsganj tehsil. On 4 March 1989, Sonbhadra district was divided from Mirzapur district.^[8]

The forts located in the district

- Agori Fort
- Vijaygarh Fort
- Sodhriagarh Durg

The heroine of Famous Novel Chandrakanta written by Devaki Nandan Khatri was the princess of Vijaygarh and the daughter of king Jay Singh.¹³

Paragnas of Sonbhadra

Agori Barhar was an impartible estate, it originally comprised of parts of the present districts of Sonbhadra and part of Mirzapur district. It was divided into two parganas of Agori and Barhar. Chandel Rajput Raja Paramardideva of Mahoba, ancestor of the family and contemporary of Raja Prithviraj III of Delhi, who attacked Mahoba as the Raja was the ally of Raja Jaichand of Kannauj, and occupied it for a time. Raja Paramardi Deva fled for his life with his friends and family, and though Mahoba was re-occupied by the Raja with the help of Jaichand of Kannauj, the glory of the capital never returned. During this time one of the sons of Raja Paramardi Deva, called Ashajit¹⁴, fled eastwards in the turmoil that followed. His sons or grand sons called Barimal and Bharimal, captured Agori from the Kaharwar Raja and made themselves the independent rulers of Agori and Barhar. The elder brother Barimal took the kingdom of Agori and Barhar, and the younger brother Bharimal became the ruler of Bardi state ruled by Chandel -Rajput.¹⁵

Another Princely state in sonbhadra in Vijaygarh.it was also ruled by Chandel Dynasty after that by Narayan dynasty.

All of these erstwhile kingdoms were defeated by the Kingdom of Singrauli in the 9th century by Maharaja Kot Rai Singh and were made as feudatories of the main ruler. The Kingdom extended from Singrauli to Sasaram in Bihar (includes Sonebhadra).¹⁶

The northern part of the district lies on a plateau of the Vindhya Range, and is drained by tributaries of the Ganges including the Belan and Karmanasha rivers. South of the steep escarpment of the Kaimur Range is the valley of the Son River, which flows through the district from west to east. The southern

portion of the district is hilly, interspersed with fertile stream valleys. The Rihand River, which rises to the south in the highlands of Surguja district of Chhattisgarh, flows north to join the Son in the center of the district. The Govind Ballabh Pant Sagar, a reservoir on the Rihand, lies partly in the district and partly in Madhya Pradesh. East of the Rihand, the Kanhar River, which originates in Chhattisgarh, flows north to join the Son.

The district has historic, cultural, and ecological affinities with the Bagelkhand region. Robertsganj is the district headquarters.¹⁷

Climate

Sonbhadra has a relatively subtropical climate with high variation between summer and winter temperatures. The average temperature is 30 to 46 °C (86 to 115 °F) in the summer and 2 to 15 °C (36 to 59 °F) in the winter. The weather is pleasant in rainy season from July to October.

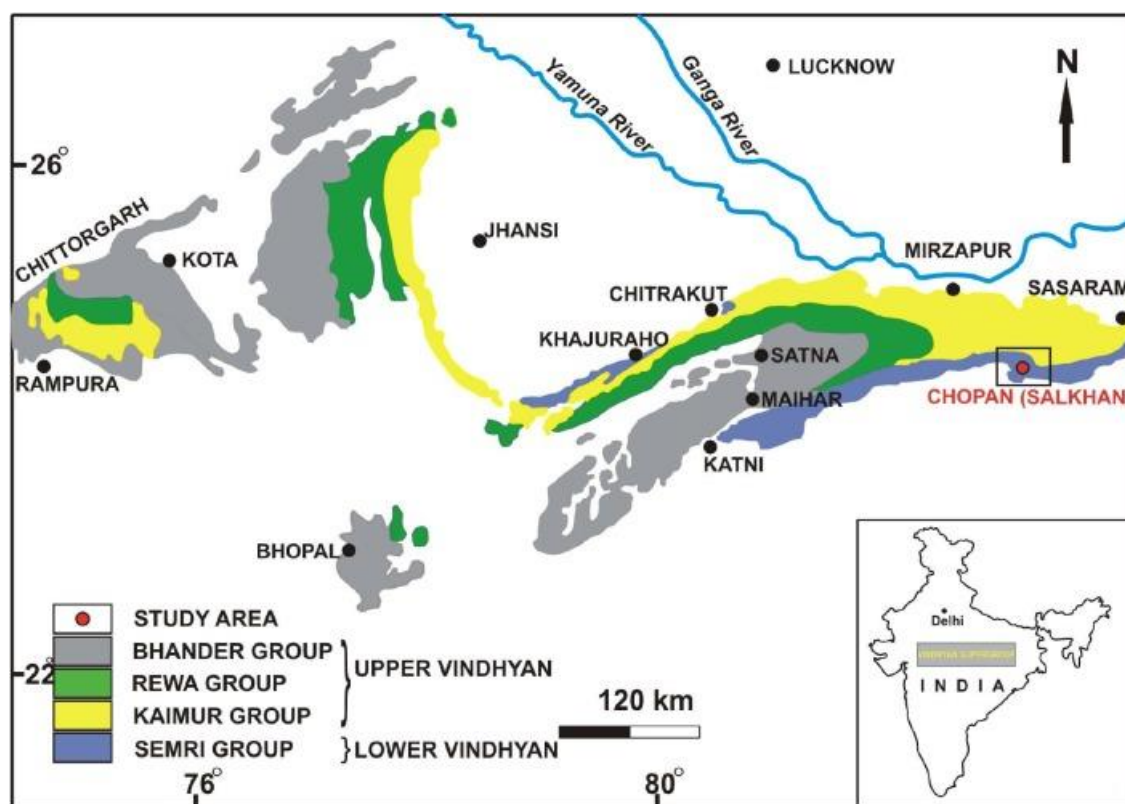
Ecology

The portion of the district north of the Son River lies in the Lower Gangetic plains moist deciduous forests ecoregion. The portion south of the Son lies in the Chhota Nagpur dry deciduous forests ecoregion.

Kaimoor Wildlife Sanctuary lies mostly within the district, reaching generally east and west along the spine of the Kaimur Range, and extending to the Son River at its eastern end.¹²

Discussion

The Vindhyan Supergroup is situated in central India and is characterized by a 4500–5000-m-thick sedimentary succession belonging to the Proterozoic Era. This mostly undeformed and unmetamorphosed thick succession represents a sequence of sandstone, shale, limestone, and dolomite with minor conglomerate as well as volcanoclastic rocks. The Vindhyan Supergroup is exposed over a large area from Bihar (Sasaram) in the east to Chittorgarh, Rajasthan in the west, and Dholpur, Rajasthan in the north to Hoshangabad (Madhya Pradesh) in the southwest. The outcrops of the Vindhyan Supergroup are present between the Archaean Aravalli-Bundelkhand province (to the north and east) and the Cretaceous Deccan Traps (to the south and bounded by the Great Boundary Fault to the west)¹⁵. Lithostratigraphically, the Vindhyan Supergroup represents four groups, namely the Semri Group, the Kaimur Group, the Rewa Group, and the Bhandar Group. The Semri Group is considered as the Lower Vindhyan, whereas the Kaimur, Rewa, and Bhandar Groups together constitute the Upper Vindhyan. The Kheinjua Subgroup, part of the Semri Group, is lithostratigraphically divided into the three formations, namely the Olive Shale, the Salkhan Limestone, and the Glauconitic Sandstone. In a broader context, the Vindhyan Basin is further divided into two parts which are the eastern part and the western part. The eastern part is known as the Son Valley Section, whereas the western part is the Chambal Valley Section. The best exposure of the Semri Group is in the Son Valley area, from east to west, Rohtas district, Bihar, Sonbhadra district, Uttar Pradesh, and Satna district, Madhya Pradesh. The Salkhan Limestone is a ~90-m-thick unit of fawn and dark grayish color, mainly constituted of dolomitic, siliceous limestone, and chert bands. The Vindhyan basin is believed to be deposited under the shallow marine environment. More specifically, the depositional environment of the Salkhan Limestone of the Semri Group has been proposed to be intertidal to a supratidal environment based on the microbial assemblages.¹⁶



Results

As per geologists, these are tree fossils which are a petrified or concretised form of the organic matter found in tree stumps. The whole park is dotted with unique ring-shaped stony formations over the boulders which are spread across 25 hectares in the Kaimoor Wildlife range. If you want to understand the park's area, it is nearly three times larger and older than the USA's famous Yellowstone National Park!¹⁴

Geologists have traced the origin of these fossils to the Proterozoic period, which is the longest geologic eon, starting 2.5 billion years ago and ending 541 million years ago. This place is an invaluable geological treasure not only for Uttar Pradesh, but for the entire world. Understanding the importance and value of this age-old treasure, the government of Uttar Pradesh has decided to develop the park as a tourist hotspot. Recently, Tourism and Culture Minister Jaiveer Singh announced that the park will be developed as a tourist destination and that the officials in Sonbhadra have been directed to prepare an action plan soon. The minister said, "Its natural structure is amazing from the point of view of geologists. It is in the vicinity of Kaimur Wildlife Sanctuary and situated at a distance of about 16 km from Robertsganj, the headquarters of Sonbhadra".

Undoubtedly, the fossils here are an important source of information about the origin of the Earth and surely are very important to the world.¹⁶

Shaktinagar Special Area Development Authority (SSADA), Sonbhadra's Headquarter is situated at a small town Pipri-231221 (Central place of Development Area) in District Sonbhadra, Vindhyaachal Division, near 02-03 km away from Renukoot Railway Station and Rihand Dam, Pipri in Uttar-Pradesh, India. Shaktinagar Special Development Area covers "all area within south of Sone River in Tehsil Robertsganj and all the area of Tehsil Duddhi in District Sonebhadra". Development Area has many view spots like Rihand Dam, Chilika lake, Rimjhim Vatika, Technology park. also has great temples which include Radha Krishna Temple, Renukeshwar Mahadev Temple, Jwala Devi Temple (near Shaktinagar),

Vandevi Temple (near Rihand Dam) Hanuman Mandir, Ram mandir and one shopping mall is present with hil cinema theater near ramlila ground(Hindalco colony) in Renukoot, Sonebhadra.¹⁵

Results

Climate, Environment and Weather data, climate change reports etc. for Salkhan is available as professional paid service. You may contact us for further details and sample data.

A brief summary of available data for Salkhan is given below:

Category	Resolution	Period
Precipitation - h	Half Hourly / 0.1 deg (11 kms) grid	2001 - 2022
Precipitation - l	Daily / 0.25 deg (28 kms) grid	1901 - 2022
Temperature - h	Monthly / 0.5 deg (55 kms) grid	1901 - 2022
Temperature - l	Daily / 1 deg (111 kms) grid	1951 - 2022

As per available data from the year 2009, 10552 persons live in 1935 house holds in the village Salkhan. There are 4991 female individuals and 5561 male individuals in the village. Females constitute 47.3% and males constitute 52.7% of the total population.

There are 3414 scheduled castes persons of which 1621 are females and 1793 are males. Females constitute 47.48% and males constitute 52.52% of the scheduled castes population. Scheduled castes constitute 32.35% of the total population.¹¹

There are 2697 scheduled tribes persons of which 1331 are females and 1366 are males. Females constitute 49.35% and males constitute 50.65% of the scheduled tribes population. Scheduled tribes constitute 25.56% of the total population.

Population density of Salkhan is 1059.68 persons per square kilometer.

Total sown/agricultural area is 839 ha. About 433.66 ha is un-irrigated area. About 405.33 ha is irrigated area. About 201.56 ha is irrigated by canal water. About 50.12 ha is irrigated by wells/tube wells. About 100.05 ha is irrigated by tanks/lakes. About 53.6 ha is irrigated by other sources of water.

About 94.53 ha is in non-agricultural use. About 2.22 ha is under miscellaneous tree crops.

About 32.51 ha is lying as current fallow area. About 2.12 ha is culturable waste land. About 5.49 ha is lying as fallow land other than current fallows. About 12.14 ha is covered by barren and un-cultivable land.¹⁰

Conclusions

Uttar Pradesh is a treasure trove of all things historic, spiritual and religious! But only a handful of people must be aware of the state's geological heritage which is equally rich and significant. The state hides myriad secrets in its heart which are still waiting to be uncovered.

One among such lesser-known geological treasures is the Sonbhadra Fossil Park (or Salkhan Fossils Park) in the Sonbhadra district. Located some 12 km from Robertsganj, close to the Salkhan village, this park has fossils which are estimated to be over 1.4 billion years old! As per geologists, these are tree fossils which are a petrified or concretised form of the organic matter found in tree stumps. The whole park is dotted with unique ring-shaped stony formations over the boulders which are spread across 25 hectares in the Kaimoor Wildlife range. If you want to understand the park's area, it is nearly three times larger and older than the USA's famous Yellowstone National Park!¹³

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