



Hot Springs: Classification and Situation in India.

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Introduction:

A hot spring is which is produced by the emergence of geothermally heated groundwater that is from the Earth's crust. While some of these springs have water, quite safe for bathing, while others are too hot to help the body, they may also result in severe injury.

All over the earth, there is hot water spring on every water place. The water coming from a hot spring which is heated by geothermal heat, i.e., heat from the earth's interior. In general, the temperature of rocks within the earth heightens with depth. The rate of temperature heightens with depth is called as the geothermal gradient. If water percolates deeply enough into the crust, it will be heated as it comes into contact with hot rocks. The water from hot springs in non-volcanic areas is heated in this manner. In volcanic zones, such as, Yellowstone National Park, water may be heated by coming into contact with magma (molten rock). If the water becomes so hot that it builds steam pressure and erupts in a jet above the surface of the earth, it is called a Geyser. And when the water only reaches the surface as the, it is called Fumaroles. If the water is mingling of mud and clay, it is called a Mud pot.

Hot springs range in flow rate from the tiniest "seeps" to variable rivers of hot water. Sometimes, there is enough pressure that the water shoots upward in a geyser, or fountain. Heated water can hold more dissolved solids, warm and especially hot springs also often have a very high mineral content, containing everything from simple calcium to lithium, and even radium, because of both the folklore and the claimed medical value some of these springs have, they are often popular tourist destinations, and locations for rehabilitation clinics for those with disabilities.

Classification of Thermal springs:

There were various types of thermal springs. The base of classification is according to the origin of springs, and some on physical properties such as flow rate or temperature. However some are classified according to morphological criteria, phylentic type, chemical composition or combination of these. According to the temperature the thermal waters could classify like: i) Coldless than 20°C, ii) Hypothermal- between 20-30°C, iii) Mesothermal- between 30- 40°C and iv) Hyperthermal- more than 40°C (Amador, 2001). According to the Vouk (1923) classify springs according to temperature in an arbitrary manner i) Hypothermal (cold)- Below 18 °C, ii) Chliarothermal (tepid)- 18-30 °C, iii) Euthermal (warm)- 30-50°C, iv) Acrothermal (hot)- 50-70 °C, and v) Hyperthermal (steaming)- 70 °C or higher. Another classification origin of temperature, there are two main types of hot springs, a) Heterothermal, the variation of temperature changes daily and seasonally; b) Homothermal, the variation of temperature is negligible both daily and seasonally. On the basis of morphological criteria (Schwabe, 1936; Tuxen, 1944) they are divided in to two hot springs, namely i) Limnotherm- a hot spring having a basin at the head, where surfacing waters collect prior to spilling over; and ii) Rheotherm- a hot spring where there is no collecting basin at the head. The water flows immediately away from the head, as on slope. Yoneda (1925) classified the various hot springs of Japan on the basis of algal flora in 5 types; i) Synechococcus type, ii) Cyanidium type, iii) Mastigocladus type, iv) Oscillatoria type and v) Phormidium type.

In Maharashtra, west coast has near about 60 springs and to note that temperature of these 60 hot springs ranges between 33°C to the boiling point of the water at that height. Out of sixty about 18 hot springs are spread over a linear stretch of nearly 300 km and width of 20 to 30 km, trending NNW-

SSE, Sahyadri mountain range constituting part of the Western Ghats whose western limit is demarcated by the Arabian Sea coast line. Surprising in Ratnagiri district, almost ten thermal springs. The area under investigation is thermal springs of Konkan region. This area has largely unexplored prior to the investigation. A present investigation was therefore undertaken four thermal springs viz., Palvani Unhavra (Tamhane-52.3°C), Vakvali Unhavra (Khed-71 °C), Khed (33 °C) and Aravli (42 °C). The same as a detailed study of physico-chemical parameters and algal flora along the hot springs gradient of Ratnagiri district of Maharashtra.

Major Hot Springs in India:

Hot springs in India are the preserved secrets of nature as well as are found mention in the Indian mythology and are treasured as religious heritage. These hot springs are now become as bath houses near temples and in other places, they flow their natural path. While some of these sites are frequented for the rejuvenating experiences, other hot water springs in India are visited by travelers for the stunning hiking trails that lead to these fantastic locations.

1. Kheerganga, a mystical trek to the hot pools- A trek that starting from Barshiani near Manikaran takes one through the beautiful trail in the Himalayas to the Shiva Temple in Kheerganga. This beautiful hot spring destination of India indeed promises the best rejuvenating experience to tired hikers on reaching the hilltop.
2. Kasol, hippie town of hot springs- There are hot springs in this little hippie town in the Parvati Valley which is yet to unnoticed by travelers. Cross the bridge to Chalal and on the riverside one finds hot springs flowing parallel to the Parvati river.
Panamik
3. in Nubra Valley- Panamik hot water spring which is 10442 feet high from sea level is known for medicinal properties. Even villages residing in vicinity of Nubra arrive and take dip regularly northern most positions of makes Panamik is also a stopover for travelers who pass through this challenging terrain.
4. Chumthang in Leh District- This hot spring destination in India is definitely a life time feast for travelers. Chumthang would give you a unique hot water bathing experience on the Indus riverside.
5. Manikaran Sahib in Parvati Valley- Manikaran is a celebrated pilgrimage for the people of Hindu and Sikh belief systems. This is the spot where hundreds of Sikh pilgrims cheering on the bus and motorcycles. In the Hindu belief system, Manikaran is a sacred spot where Manu recreated human life after the flood.
6. Vashisht, the utopian village of Himachal Pradesh- This small village in the bank of river Ravi is like a ideal village which is hidden from the world tourists. This hot water brook is said to have medicinal and healing effects. Due to the religious and mythological importance of the village, it is one of the famous hot springs in India.
7. Tattapani on the bank of river Satluj- On the bank of river Satluj, this Himalayan town is famous for the hot sulphur springs. For years the locals have believed that the water of these springs has miraculous properties and provides relief from joint pains, fatigue and stress.
8. Gaurikund and Suryakund in Uttarakhand- a village situated almost 2000mts above sea level. On the trek to the holy shrine of Kedarnath. Gaurikund is also popular owing to the natural thermal spring in this village which was destroyed after the recent earthquake in the area but a small stream still flow through the village. Home to a numerous hot water springs in India, the Garhwal region of Uttarakhand has yet another hot spring near the Yamunotri temple.

Major Hot Springs in Maharashtra

1. **Vajreshwari-** The original temple of Vajreshwari was at Gunj - five miles north of Vadavli. It was moved to Vadavli after its destruction by the Portuguese. Vajreshwari is at the foot of

Mandakini Mountain, which was formed out of a volcanic eruption and it is this proximity that accounts for the many hot springs in this region. There exist several hot springs here.

It is reported that there are around twenty-one hot water springs, just within a five-kilometer radius of the temple. The temperature of the water in the springs ranges from 43 C to 49 C. The Tansa River flows through here, rich with its hot waters.. Into most of the springs the locals will jump at once until first they have bathed in the cooler springs. A couple of tanks in front of a Shiva temple trap the water of seven of the hot water springs. Because the waters are laden with minerals, the water appears blackish.

2. **Akloli Kund-** From Vajeshwari one can walk easily to Akloli village, about a kilometre ahead. The springs there are in a wide pleasant valley, clustered round a temple of Rameshwar. Therefore they are called the Rameshwar hot springs. The waters have been gathered into cut-stone cisterns. Back in 1784 it is written that they were much used both by the locals and by the Europeans. The hot springs at Akloli are located on the left bank of the Tansi River.

The hot water temperature of the individual springs varies from 45°C to 48°C. Ten hot springs are found here and a concrete tank is located at each hot spring. There are provisions for hot showers too. The water of the Surya tank is the hottest.

3. **Ganeshpuri** -Ganeshpuri is about 2 km away from Vajreshwari and is also famous for its natural hot springs. Three of the springs are in the bed of the Tansa River, near the temple of Shri Bhimeshvar and they have reservoirs built round them. One of them is called Gorakh Machhindar. Two of the hot springs are in natural hollows in the rock. These springs are usually less crowded than the ones at Vajreshwari.

In Ganeshpuri village just behind the main temple is a small Shiva shrine with tanks in front that hold the water of some of the hot-water springs. The hot water is 52°C. Agni Kund is another hot water spring near the village. The quaint little town revolves around the Nityananda Mandir, built to honour the Saint Nityananda who took Samadhi here, in the 1960s. There are some hot springs that bubble up in circular holes melted out of the black volcanic rock there. Ganeshpuri was a wilderness then, surrounded by hills. It was believed that cannibal tribes of jungle folk lived in the region. Nityananda selected a location with many hot springs around it near the ancient temple of Bhimeshwar Mahadev, and for the next twenty five years, he lived there and built it into a spiritual centre.

4. **Nimboli-** Nimboli is 5 klms from Ganeshpuri. Near Rakadi Baba's homagund, there is the ancient Anasuya Mata temple and the hot springs. Rakhadi Baba was a holy man who was always smeared in ashes from head to toe. In the bed of the Tansa river, near the village of Nimboli, are six hot springs, two at a distance of about 175 paces, in stone tanks, and the remaining four springs at a distance of about 200 paces. The water is moderately hot and of a sulphurous smell.
5. **Banganga, Nandni Gaygotha-** Three miles north of Vajrabai, in the village of Nandni Gaygotha, is the Banganga spring. All year round this hot spring yields a copious supply of hot and very clear slightly sulphurous water.
6. **Unapdev, Dara-** Unapdev, at the village of Dara, is 3 klms from Adavad, near Chopda town. The hot spring has a special mention in the ancient 'Ramayana' for it was created by Rama during his fourteen years exile. The word 'Un-ap' means hot water. The hot waters collect in a twenty-five feet square pond surrounded by a red-brick wall. Within the enclosure, close to the edge of the pond, there is are two small Hindu shrines and a rest-house. Outside the enclosure the hot water collects into a cattle trough. Sunapdev and Nijhardev are two other hot water springs in the same area. They are in the Satpada hills. In the Jalgaon area, hot springs

have so far been recorded at Unabdev, Sunabdev and Najhardev in Chopda. There is a fourth one at Vadla in Shirpur.

Hot Springs in Khandesh			
Districts	Name of Hot springs	Location	Toposheet No.
Dhule	Indve	21 ⁰ 16 : 75 ⁰ 26	46 0/8
Jalgaon	Unabdeo	21 ⁰ 16 : 75 ⁰ 26	46 0/7
	Ramtalab	21 ⁰ 17 : 75 ⁰ 24	46 0/7
	Nazardeo	21 ⁰ 18 : 75 ⁰ 23	46 0/7
	Khadgaon	21 ⁰ 804 : 75 ⁰ 42	46 0/12
Nandurbar	Kundva	21 ⁰ 30 : 75 ⁰ 03	46 K/2
	Anakdeo	21 ⁰ 42 : 75 ⁰ 27	46 K/6

Conclusion:

Without rejection, it may be said that these hot streams spreading at every length and breadth of the country have mythological significant and thousands of tourists throng towards them as per their regional availability and convenience of distance. Geographically hot springs provide the need of special attention of most of the researcher to assemble/visit at these sites and study the geographical features of such sites. Even their medical importance is the buff of fascination as they are comprised of minerals, calcium, lithium and radium. Even comparative study of these hot springs with special reference to temperature water quality and medicinal healing feature can be handily in the coming future. But it is rightly to say that hot springs have not merely significant from mythological point of view but at the same time their geographical positioning is quite crucial.

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