STUDY TOUR REPORT

GEOLOGY

AT

Pawankhind, Hindalco Bauxite Mine, Kolhapur

DATE –: 14th October 2025

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Class: B.Sc - III

Study Tour In charge

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SPOT :- 1

1] Deccan trap: -

Location: - Kokrud Malkapur Ghat

Latitude: - 16°58'13"N

Longitude: - 73°58'09"E

Deccan Trap: -

The Deccan Traps is a large volcanic province located predominantly in the Deccan Plateau of west-central India. This geological formation consists of thick layers of volcanic basalt rock that were laid down over a period of several million years during the late Cretaceous period, around 65 million years ago. The Deccan Traps are believed to be the result of one of the largest volcanic events in Earth's history. The volcanic activity associated with the Deccan Traps is thought to have played a role in the mass extinction event that occurred around the same time, including the extinction of the dinosaurs. Some scientists propose that the volcanic activity may have contributed to environmental changes, such as the

release of gases like sulphur dioxide and carbon dioxide, leading to climate disruptions and a decline in biodiversity.

SPOT: - 2

2] Red Bole: -

Location: - Kokrud Malkapur Ghat

Latitude: - 16°58'13"N

Longitude: - 73°58'09"E

Red Bole: -

In geology, a "red bole" typically refers to a type of red or reddish-brown soil or sedimentary rock that contains a high concentration of iron oxide minerals. The term "bole" is often used to describe clayey or earthy materials with distinctive colours. The red colour in these formations is usually attributed to the presence of hematite or other iron-bearing minerals.

Red boles are commonly found in areas with oxidizing conditions, where iron minerals have undergone weathering and oxidation. These formations can be seen in various geological settings, such as desert environments or areas with well-drained soils. It's worth noting that the specific characteristics and composition of red boles can vary depending on the geological context and the types of minerals present in the region.

SPOT: - 3

3] Spheroidal Weathering: -

Location: - Kokrud Malkapur Ghat

Latitude: - 16°58'13"N

Longitude: - 73°58'09"E

Spheroidal Weathering: -

Spheroidal weathering is a type of chemical weathering that affects fractured rocks, particularly those with a blocky or jointed structure, like basalt or granite. Over time, weathering processes such as water infiltration and chemical reactions (like oxidation and hydrolysis) erode the sharp edges and corners of the rock. This causes the rock to break down into rounded or spherical shapes, hence the term "spheroidal." This weathering process can

create fascinating landscapes, with smooth, rounded rock formations scattered across the terrain.

SPOT: - 4

4] Lava Flows: -

Location: - Kokrud Malkapur Ghat

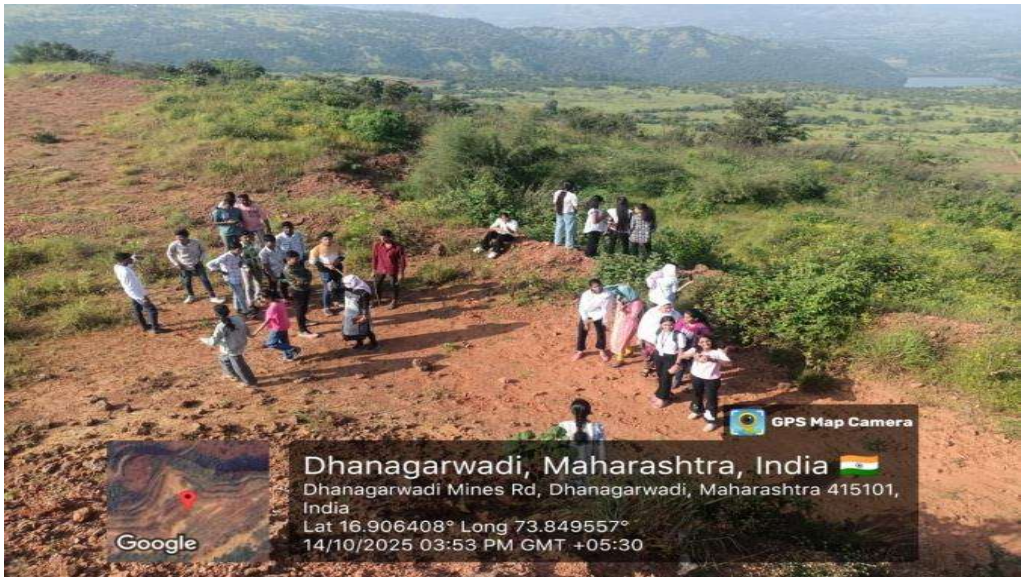
Latitude: - 16°58'13"N

Longitude: - 73°58'09"E

Lava Flows: -

Basaltic flows can be differentiated by their surface textures, mineral composition, and cooling features. Pahoehoe flows have smooth, ropy surfaces, while Aa flows are rough and jagged. Basalt's fine-grained texture sets it apart from coarser rocks like gabbro, and it's darker than higher silica rocks like andesite or rhyolite. Columnar jointing and pillow structures in basalt indicate cooling patterns, while its mafic composition (rich in iron and magnesium) distinguishes it from felsic rocks. On Sadashivgad we differentiate basaltic flows with the help of red bole, vesicular and amygdaloidal basalt.

SPOT : - 5



Location: - Kokrud Malkapur Ghat

Latitude: - 16°90'13"N

Longitude: - 73°84'51"E

5] Bauxites at Bharate Bauxite Mine and Hindalco Bauxite Mine:

Bauxites are formed due the in situ chemical weathering of underlying rock basalt **(Plate).** Bauxite is an aluminum ore that forms from the weathering of rocks rich in aluminum**,** such as granite or basalt, in hot and humid tropical or subtropical climates**.** When rainwater and groundwater move through these rocks, they dissolve and remove soluble materials like silica, iron, and other minerals, leaving behind the insoluble aluminum hydroxides. Over a long time, this process of intense chemical weathering and leaching concentrates minerals such as gibbsite, boehmite, and diaspore, which make up bauxite. The ore usually forms as a soft, reddish or brownish layer near the Earth's surface. Thus, bauxite forms mainly by the residual accumulation of aluminum-rich minerals in areas with good drainage and high rainfall**.**

SPOT : -6

Location: - way towards Hindalco Bauxite Mine

Latitude: - 16°54'24"N

Longitude: - 73°50'51"E

6] Columnar Joints of way towards Hindalco Bauxite Mine:

Best exposure of columnar joints is observed on the way of Hindlco Bauxite Mine, Kolhapur **(Plate).** Columnar joints are formed due to homogeneous lava cools with uniform rate of cooling. Different cooling centres are formed. One centre is surrounded by six other centres at equal distance. Due to contraction cracks are developed between two centres. Lava cools from top to bottom and joints also forms according to cooling. Piller like structure with hexagonal or pentagonal shape is developed which called as columnar joints. We can found columnar joints at many places of Maharashtra.

SPOT : -7

Location: - Hindalco Bauxite Mine

Latitude: - 16°90’66"N

Longitude: - 73°84'92"E

7] Mud-Cracks at Hindalco Bauxite Mine:

Mud cracks, also known as desiccation cracks, form when fine-grained sediments such as clay or silt dry out and shrink. This process typically occurs in environments that experience alternating wet and dry conditions, such as floodplains, lake beds, tidal flats, and playa lakes. Initially, mud is deposited in a water-saturated environment where fine particles settle out of suspension. When the water begins to evaporate due to exposure to sunlight, heat, or wind, the moisture between the particles is lost, causing the sediment to shrink. Because the mud layer is constrained by the surface beneath it, the shrinkage creates tension within the layer. Once the stress becomes too great, the mud cracks to relieve it, forming characteristic polygonal patterns on the surface. These cracks usually start at the surface and extend downward. Later, new sediment may be deposited into the cracks during a flood or windstorm, filling them in. Over time, both the cracked mud and the infilling material can harden into rock, preserving the cracks as sedimentary structures known as mud crack casts.

Mud cracks are important geological indicators, as they signify periodic drying and wetting cycles and point to shallow water or subaerial environments that were once exposed to air.

SPOT : -8

8] Waterfall – Pawankhind

Location: - Pawankhind

Latitude: - 16°53'21"N

Longitude: - 73°48'40"E

Waterfalls often form in regions made of basalt rock, which is a hard, dark volcanic rock formed from cooled lava. Basalt forms horizontal layers or flows during volcanic eruptions. Over time, rivers or streams flowing over these layers begin to erode the softer materials beneath the hard basalt. When the underlying layer is weaker (such as shale or tuff) and erodes faster, the harder basalt layer on top eventually breaks and collapses, creating a steep drop or waterfall. Basalt is highly resistant to erosion, so waterfalls formed in basaltic terrain are often tall, narrow, and long-lasting.


Thank
you!