Study Tour Report

Department of Geology

At

Anuskura Ghat, Chunakolvan, Kankavli – Achara Road,

Achara Beach

Batch 2024-25

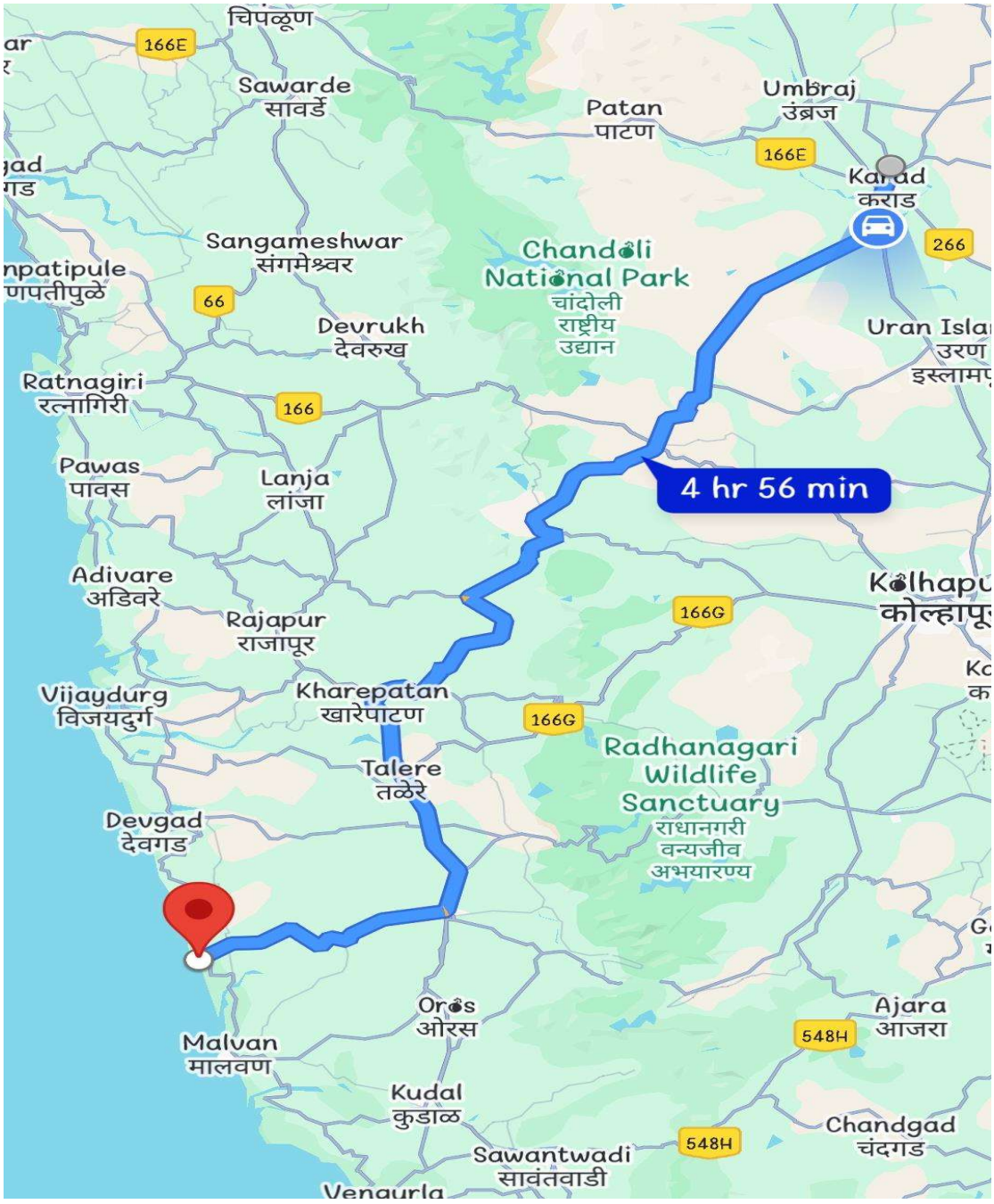
Study Tour In Charge

Hod

HEAD
Department of Geology
Yashwantrao Chavan College of Science,
Karad

Index

Route Map



Road map from Yashwantrao Chavan college of science, Karad to Achara

Spot :- 1

1] **Red bole, laterite soil, Landslide retaining wall** :-

Location – Anuskura ghat

Latitude – 16.759276

Longitude – 73.793197

- **Red bole** :- Red bole is a type of soft, earthy, red-colored material commonly found as a thin layer between lava flows in volcanic sequences, particularly in continental flood basalt provinces such as the Deccan Traps in India. It is primarily composed of altered volcanic ash or weathered basaltic material, rich in iron oxides (mainly hematite), which give it the characteristic red color.

Key Features of Red Bole:

1. **Color**: The reddish color comes from the high concentration of iron oxides, which form due to the weathering and oxidation of minerals in the soil.
2. **Composition**: Red bole soil is typically rich in iron and aluminum oxides but tends to be low in nutrients such as nitrogen and phosphorus, making it less fertile compared to other soil types.
3. **Texture**: This soil can range from sandy to clayey in texture, with a granular structure. The texture often depends on the amount of weathering the area has undergone.
4. **Location**: Found in areas with a tropical climate, such as parts of India, Africa, Southeast Asia, and Australia, red bole soil forms in regions with high rainfall, which leads to the intense weathering of parent rocks.

- **Laterite Soil :-** Laterite soil is a type of soil that develops in tropical and subtropical regions with high temperatures and heavy rainfall. It undergoes intense leaching, which washes away soluble minerals, leaving behind iron and aluminum-rich soil.

Characteristics of Laterite Soil

- **Color:** Reddish-brown due to high iron oxide content.
- **Texture:** Coarse, porous, and crumbly.

- **Nutrient Content:** Poor in key nutrients like nitrogen, phosphorus, and potassium.
- **pH Level:** Generally acidic.
- **Moisture Retention:** Limited water-holding capacity.
- **Mineral Content:** Rich in iron and aluminum oxides.

- **Landslide retaining wall :-** A landslide retaining wall is a structural barrier designed to prevent or stabilize landslides by resisting the lateral pressure exerted by soil or rock material on slopes. These walls are commonly used in hilly or mountainous regions to protect infrastructure, roads, and buildings from slope failures.

Causes of Landslides:

- **Natural Causes:**
  - **Heavy Rainfall:** Saturates the soil, reducing its stability.
  - **Earthquakes:** Shaking loosens rock and soil.
  - **Volcanic Eruptions:** Trigger sudden slope failure.
  - **Snowmelt:** Rapid melting can oversaturate soil layers.
- **Human Activities:**
  - **Deforestation:** Reduces root structures that stabilize soil.
  - **Unplanned Construction:** Alters natural slopes.
  - **Mining and Quarrying:** Destabilizes land.
  - **Poor Drainage Systems:** Increases soil erosion risk.

Spot No :- 2

2] Okenite mineral

Location :- Anuskara ghat

Latitude :- 16.763026^0

Longitude :- 73.788501^0

- **Okenite Mineral :-** Okenite is a mineral belonging to the silicate group, known for its delicate, fibrous crystal structure. It is a hydrated calcium silicate mineral commonly found in basaltic cavities and geodes, often forming soft, cotton-ball-like clusters.

Physical and Chemical Properties:

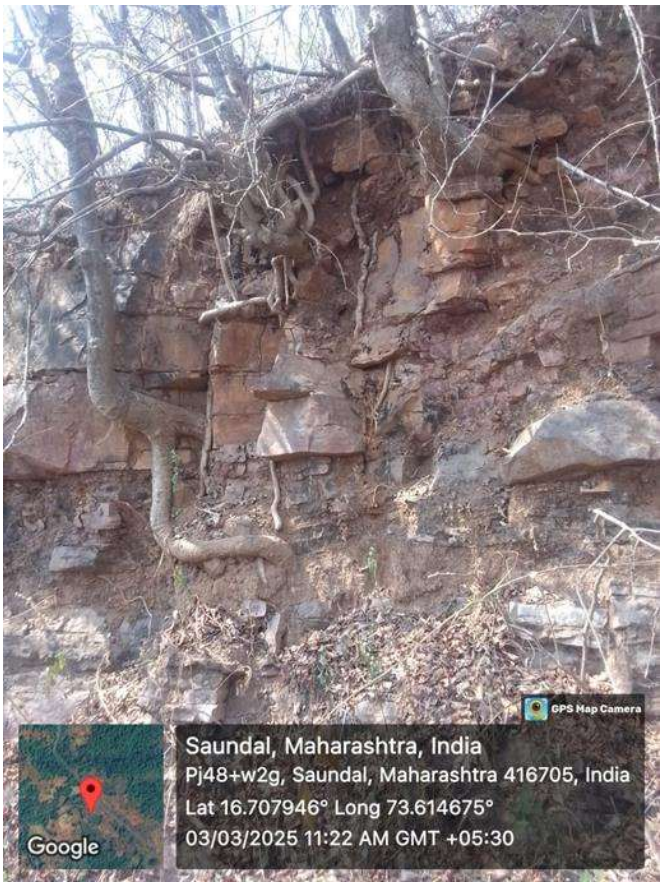
- **Chemical Formula:** $Ca_2Si_5O_{13} \cdot 4H_2O$
- **Crystal System:** Triclinic
- **Color:** White, colorless
- **Luster:** Silky to vitreous
- **Transparency:** Transparent to translucent
- **Hardness:** 4.5–5 (Mohs scale)
- **Specific Gravity:** ~2.28
- **Cleavage:** Poor
- **Fracture:** Uneven
- **Streak:** White

Occurrence and Associations:

- Commonly found in **basaltic cavities** and **geodes**.
- Frequently associated with **apophyllite**, **stilbite**, **gyrolite**, **prehnite**, and **calcite**.
- Major deposits are found in the **Deccan Traps** (India), **Iceland**, and the **Faroe Islands**.

Spot :- 3

3] Kaladgi Sandstone



Location – Saundal

Latitude – 16.707946

Longitude – 73.614675

- **Kaladgi Sandstone** :- The Kaladgi Basin is a geological region in India known for its extensive Proterozoic sedimentary rock formations, particularly sandstone, along with other rock types like limestone and shale. The Kaladgi Basin is situated primarily in Karnataka, extending across parts of the Belgaum, Bagalkot, and Bijapur districts.

Kaladgi Sandstone - Key Features

1. **Geological Age**: The Kaladgi Basin rocks are part of the Proterozoic Eon, dating back over 1.5 billion years.
2. **Composition**: The sandstone is primarily composed of quartz grains, often cemented with silica or iron oxide, giving it a distinctive red or brown color.
3. **Stratigraphy**: The Kaladgi sandstone belongs to the Kaladgi Supergroup, which is further divided into lower and upper groups:
    - **Lower Kaladgi Group**: Dominated by conglomerates, sandstones, and shales.
    - **Upper Kaladgi Group**: Contains limestone, shale, and additional sandstone formations.
4. **Depositional Environment**: The sandstone was deposited in shallow marine, fluvial, and lacustrine environments, indicating a dynamic geological history.
5. **Economic Importance**: The Kaladgi sandstones are often used in construction due to their durability. The region is also known for limestone deposits that support the cement industry.
6. **Fossil Evidence**: Although fossil content is limited, stromatolitic structures (fossilized microbial mats) are sometimes found in associated limestone beds.

Spot No 4

4] Columnar Joint

Location :- Saundal

Latitude :- 16.707347

Longitude :- 73.615051

- **Columnar Joint** :- A columnar joint (also called columnar jointing) is a distinctive geological feature that occurs in volcanic rocks, particularly basalt. These joints form as a result of the cooling and contraction of lava flows, forming polygonal columns that resemble tightly packed pillars.

Formation Process

1. **Lava Cooling**: When a thick lava flow cools gradually, it contracts and cracks.
2. **Fracture Development**: The contraction leads to fractures that propagate perpendicular to the cooling surface.
3. **Hexagonal Columns**: The most efficient pattern for minimizing stress is a hexagonal shape, though some columns may form with pentagonal or heptagonal patterns.

Key Characteristics

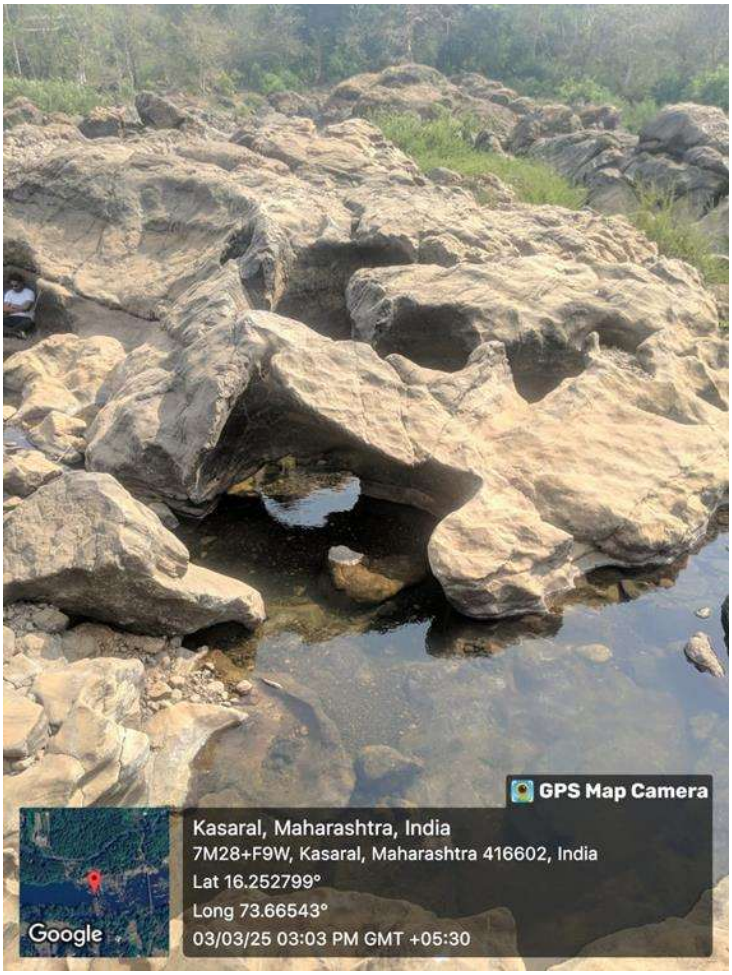
- **Shape**: Typically hexagonal but can vary.
- **Size**: Columns can range from a few centimeters to several meters in diameter.
- **Orientation**: Columns are usually vertical but can appear inclined or curved in complex lava flow conditions.

Significance

- Columnar joints provide insights into igneous rock cooling rates and lava flow dynamics.
- They are popular tourist attractions due to their striking, geometric appearance.

Spot No 5

5] Potholes



Location :- Kasaral

Latitude :- 16.252700^0

Longitude :- 73.66543^0

- **Potholes :- Potholes** in rivers are circular depressions or holes that form in the rocky beds of fast-flowing rivers, especially in areas with strong currents and turbulent water flow. These geological features are common in rivers with hard rock beds.

Formation Process

1. **Erosion Initiation:** Small depressions or cracks in the riverbed trap pebbles, gravel, or sand.
2. **Abrasion:** As the river water swirls, these trapped particles grind against the bedrock.
3. **Deepening and Widening:** Over time, this abrasive action deepens and expands the depression, forming a distinct pothole.
4. **Continuous Erosion:** The process repeats, gradually enlarging the pothole.

Examples in India

- **Narmada River (Madhya Pradesh)** — Notable pothole formations in marble rock regions.
- **Indrayani River (Maharashtra)** — Features distinct potholes due to strong water currents.
- **Betwa River (Madhya Pradesh)** — Known for large pothole formations in rocky riverbeds.

Significance

- Potholes indicate erosional power and flow dynamics of the river.
- They contribute to the riverbed's shaping over geological timescales.

Spot No 6

6] Hot water spring

Location :- Unhale

Latitude :- 16.648725^0

Logitude :- 73.525362^0

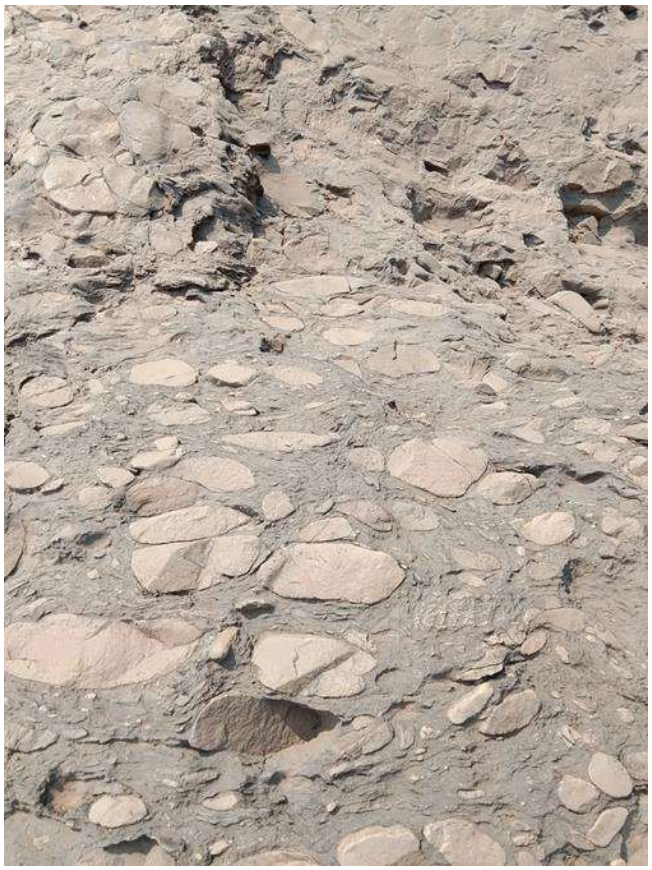
- **Hotspring :-** "Unhale" is a place in Maharashtra, India, known for its hot water springs. Located near Rajapur in the Ratnagiri district, Unhale's geothermal springs are popular for their believed medicinal properties.

Key Features of Unhale Hot Springs

- The water here is rich in sulfur and other minerals, which are said to have therapeutic benefits for skin conditions, joint pain, and other ailments.
- People often visit these springs for natural remedies and relaxation.
- The area holds cultural and historical significance, attracting both locals and tourists.

Spot No 7

7] Meta conglomerate



Location -: Pisekamte

Latitude -: 16.254438

Longitude -: 73.658318

- **Meta-conglomerate: -** A meta-conglomerate is a metamorphic rock composed of pebbles and gravel that have been flattened due to directed pressure. Sometimes, strongly directed metamorphism results in a stretched-pebble conglomerate. The parent rock for a meta-conglomerate is a sedimentary rock conglomerate. The rock forms from large, rounded sediment grains such as pebbles and cobbles deposited by a stream. If the sedimentary deposit becomes buried, compaction and cementation occur forming conglomerate rock. If burial continues to great depth, the pebbles and cobbles become flattened from the pressure. In some cases the pebbles may become stretched from linear movement.


Thank
you!