Bagalkot Study Tour Report 2021_01.docx

KARWAR-ANKOLA Study Tour 2021_02.pdf

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Ratnagiri report 2020_03.docx

Ulavi report 2019_04.docx

GEOLOGICAL STUDY TOUR REPORT KARWAR-ANKOLA 2019_04a.pdf

Malvan report 2019_05.docx

Pondichery report 2019_06.pdf

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GEOLOGICAL STUDY TOUR REPORT AURANGABAD 2019_08.pdf

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Badami_Pattadkal 2017_11.docx

Rajasthan Study Tour report 2017_12.docx

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GEOLOGICAL STUDY TOUR REPORT KARWAR 2015_14.pdf

Bagalkot Study Tour Report 2015_15.docx

SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO A SANDSTONE QUARRY NEAR MURADI, BAGALKOTE; AND AN OPEN CAST LIMESTONE MINE AT LOKAPUR

The field visit was organized jointly with Mining Engineers' Association of India, Belgaum Chapter as a MoU continuation activity

Date of visit 31 January 2021

B.Sc. FIFTH SEMESTER

GEOLOGY (OPTIONAL)

SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. V Semester with Geology as optional subject has attended the Geological Study Tour to **GEOLOGICAL STUDY TOUR TO A SANDSTONE QUARRY NEAR MURADI, BAGALKOTE; AND AN OPEN CAST LIMESTONE MINE AT LOKAPUR** on 31 January 2021.

Exam Seat No. _____

Date: Head, Dept. of Geology

LOCATION AND ACCESSIBILITY

Bagalkot district is an important commercial centre for Limestone and Dolomite minerals because of extensive carbonate deposits. The area is also known for other building materials such as Sandstones, Shales, Quartzites etc. The National highway 13 from Hubli to Sholapur passes 10 Km. west of Bagalkot. Recently the railway route from Sholapur to Hubli has been converted to broad gauge too.

PHYSICAL FEATURES AND CLIMATE

It is learnt from the Mines and Geology Department reports that the area is a plain land with general northerly slope. There are two parallel chains of bold ridges running in WNW-ESE direction on either side of Raichur Belgaum State highway. These ridges are comprised of low mounds with an average attitude of (1800' N 600 M) above M.S.L. The tallest mound of 2000' is situated NW of Bagalkot town. There are number of small seasonal streams draining into Ghataprabha River which flows E- W due north of Bagalkote town.

The vegetation in the area is not very conspicuous due to dry climate. The region is under arid and semi arid zone. The months of March to May are the hottest. This is followed by SW monsoon from the mid June to the end of September. December is the coldest period reading the lowest temperature drop of 14.8^0 C. The highest temperature recorded is 43°C. The average annual rainfall is 570 MM.

The region is spread over by medium and deep black soil and red sandy soil derived from sandstones, limestone-dolomite and shales. The average soil thickness is 1 to 1.5 mts.

It is reported that, the pioneering survey for limestone-dolomite was conducted by Capt. Newbold in 1842- 45 in the Kaladagi basin.

GEOLOGY OF THE AREA

The geology of the area is quite well known World over for the Proterozoic sedimentary basins popularly known as “Kaladgi Formation”. These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village “Kaladgi” now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity “The Great Eparchaean Unconformity” typically exposed near “Yellamma Gudda”. The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The basin is located in the northern part of the Dharwar Craton, Karnataka. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy: The Kaladgi has now been accorded a Supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group. Following is the details of Bagalkot Group.

BAGALKOT GROUP	Badami Group(285)	Katageri Limestone (150) Kerur Arenite (135)	Limestone, shale Conglomerate, arenite, shale
	Angular Unconformity		
	Intrusives: Quartz veins, pegmatite, dolerite dykes		
	Simikeri Subgroup (1150)	Hosakatti Argillite(700) Arlikatti Dlolmite (130) Niralkeri Breccia (40) Kundargi Quartzite (280)	Argillite Dolomite, hematite bed Chert Breccia Conglomerate, quartzite, argillite
	Disconformity		
	Lokapur Sub-group (2750)	Yadahalli Argillite (60) Muddapur dolomite (5650 Chikshillikeri Limestone (800) Yargatti Argillitte (720) Mahakut Breccia (130) Saundatti Quartzite (475)	Argillite Dolomite,Limestone,argillite Limestone,shale Argillite,dolomite Chert breccias Conglomerate, quartz, shale
	Nonconformity and angular Conformity		
	Gneisses/Granites and Schist Belts of Dharwar craton		

DISCRIPTION OF ROCK UNITS

The megascopic characters and mode of occurrence of different rock types encountered in the field are as follows:

Laterites: Along the highway, the laterites were observed, occurring as isolated hill caps representing the youngest among the succession, overlying the Kaladagi's. These laterites are ferruginous porous and highly altered formations owing to residual weathering. The extent of outcrops is less conspicuous.

SRP Sandstone Quarry (Photos 1-6: We visited SRP Sandstone Quarry owned by Shri H G Shripada, Member of Mining Engineers' Association of India, Belgaum Chapter. He welcomed us and explained in detail about the sandstone quarry, how the blocks of sandstone are being cut, used as building material as polished tiles, M-sand preparation, fine material used for painting etc, which he told is "0 – waste management" mine. Our teachers explained us about the structures observed in these sandstone deposits such as ripple marks, sole marks etc. They also explained the importance of conglomerate/breccia in stratigraphy and as building material.

Quartzites: The Quartzites occurs as prominent and well demarcated outcrops. These Quartzites range from pale gray to pinkish colored hard and compact coarse grained, highly jointed trending WNW-ESE with general southerly dip ranging from 50°-65°.

Conglomerates: The basal conglomerates lie immediately below Quartzites indicating a break in deposition. The siliceous matrix encloses ferruginous quartz pebbles, which are oval to sub oval shaped ranging in size from few centimeters to 2.3 inches.

High Calcium Limestone: Bluish Crystalline limestones occur parallel to the quartzites underlying conglomerate beds. These are of two types viz. bluish to bluish gray high calcium limestones and variegated limestone of various colors of bluish gray, green and pale pink linear bands. The general trend of the formation is similar to quartzites with southerly dip ranging from 35° to 65°. At places the trend changes to NNW-SSE with easterly dip of 15° to 20° signifying folded nature. At Nandi Minerals Limestone mines, majority of the deposits are Limestone (Photos 7-8). Lime Kankar/Gossan deposits are observed on the surface near the mines. Shri GSN Murty, Member of Mining Engineers' Association of India and Mining Engineer, elaborated how the mineral is mined, grading and marketing etc. He also explained how the ore estimation is done using core drilling.

Dolomites: The dolomite occurrences are not very extensive but appear as isolated and scattered outcrops of varying dimensions associated with high calcium limestones. The bands are linear and pale gray to ash gray hard and compact with typical elephant skin weathered outer surface. The trend is also variable due to flexibility resulting in folding and contortion into arcs. The general trend of the formation is WNW-ESE with low angle Easterly dip. The major joints are disposed at right angles to the strike direction.

Overall, we were enlightened with mining types, mine planning, resource estimation, aforestation, benches, bench width, core drilling, blasting, ore transportation, mine closure, estimation of ore, uses etc. During the field visit we could observe various geological features such as weathering effect giving rise to leaching/dissolution effect.

Acknowledgements:

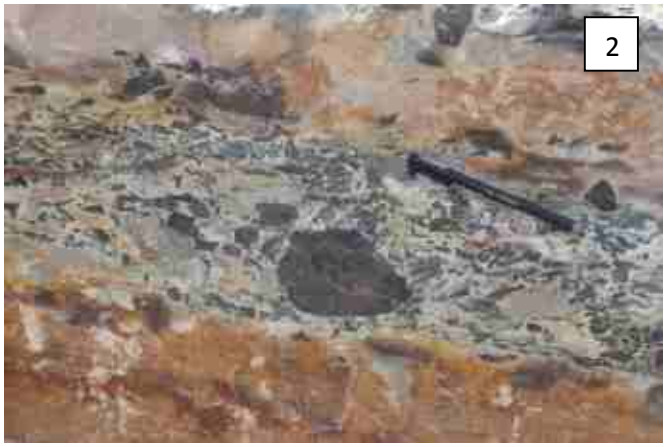
We are grateful to Dr.P.T.Hanamgond, Head Department of Geology; Prof.Suraj Mense and Prof Yogesh Kutre of Geology department, for conducting this study tour. We thank Shri. Shri H G Shripada, MEAI Belgaum Chapter Member & Mine owner, Bagalkote; and Shri GSN Murty, MEAI Belgaum Chapter member and Consultant Mining Engineer for explaining us the mining techniques.

Reference

M.S.Anand, R.Srinivasiah and B.S.N.Shetty, 1999. Investigation for Limestone Dolomites in the Submersion Zone from Bagalkot to Kaladgi, Bagalkot District (Field Session 1980-81), Dept of Mines and Geology, Bangalore, No.310, 12p.

Name:	Class: **B.Sc. VI Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Prof. Suraj S Mense Prof. Yogesh M Kutre

FIELD PHOTOGRAPHS



SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

GEOLOGY DEPARTMENT

REPORT

GEOLOGICAL STUDY TOUR AROUND KARWAR AND ANKOLA

B.Sc III Semester

Date of visit **6-7 February 2021**

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. III Semester with Geology as optional subject has attended the **"Geological Study Tour around Karwar and Ankola"** on **6 – 7 February 2021**.

Exam Seat No. _____

Head, Dept. of Geology

GEOLOGICAL STUDY TOUR REPORT

Places of visit: Karwar and Ankola

Date of Journey: 6 – 7 February 2021.

Geological study tour was conducted for B.Sc.III students for two days on dates mentioned above. We visited to Karwar and Ankola to study the geological features.

On first day we visited Nadibag beach near Ankola, we were shown variety of geological structures that are equivalent to text book examples such as Dyke, Sill, Fault, Joints, Fold, Ptygmatic folding, Boudign structure etc., and variety of rocks exposed on the beach such as Granitic Gneiss, Amphibolite, Pegmatite with Graphic texture, laterite, migmatite etc. We were also shown various coastal landforms such as pocket beaches, headlands, bay beaches, wave cut tunnel etc. At Belekeri beach, we could see an igneous intrusion, pegmatite intrusion with a clear cut contact with Granitic-gniess. The granitic gneiss also shows spheroidal weathering. We could see wave cut notches in laterite rock which shows tidal fluctuation.

On second day we visited Karwar, were taken to show the coastal landforms such as beach, estuary/river mouth, headland, island, tombolo, spit, bars, wave action, longshore currents etc. We were explained in brief the coastal processes operating along the beaches. At Majali and Tilmathi, we were shown various rock types such as, amphibolites, Granitic gneisses, quartz veins, dyke intrusions, ladder vein structure, micro fault, joints, black sand (placer) deposit, wave cut caves, shell deposit etc. On the way to Karwar, near Aversa, on the road cut, we could see dyke a discordant feature an igneous intrusion.

Geological Setting of the study area:

The coast of Uttara Kannada is bounded by Western Ghats on the east, which exhibit deep winding valleys, waving wooded hills, high peaks etc., and by Arabian sea in the west. The topography is in general hilly and wooded with broken and irregular hills averaging 600-700 m above sea level. Deep or wide mouthed bays & estuaries break the coast. It is varied and scenic with rocky Islands and capes, stretches of palm-fringed sandy beaches, which enclose between rocky headlands or knobs.

The coast presents a narrow strip of hinterland between the seashore and the Western Ghats, which varies between 5 to 20 km. It scarcely exists towards Karwar since the mountains dip in to the sea with scenic bays & Islands offshore. The hinterland area is normally plain & is covered with sandy soil and usually under cultivation.

Based on the distinct landscapes, the coastal stretch of Uttara Kannada district has been classified into two physiographic units, the high lands and the narrow lowlands (Gazetteer of India, 1985).

The coastal tract of Karnataka is characterized by Precambrian crystalline rocks (Granites, Granitic gneisses and Schists), laterites & basic dykes. The rocks of the Uttara Kannada district form part of the Chitradurga group of Dharwar supergroup comprising metasediments and metavolcanics together with manganese and limestone formations, all of which overlie the basement migmatites and associated granitoids.

Geology of the Uttara Kannada district comprises of gneisses and granites with Dharwarian rocks like schists and amphibolites as older metamorphics within them. Other rock types present are, orthoquartzites, manganiferous chert and argillites, banded magnetite/haematite quartzite, limestone & dolomites, greywackes, laterites and basic dykes.

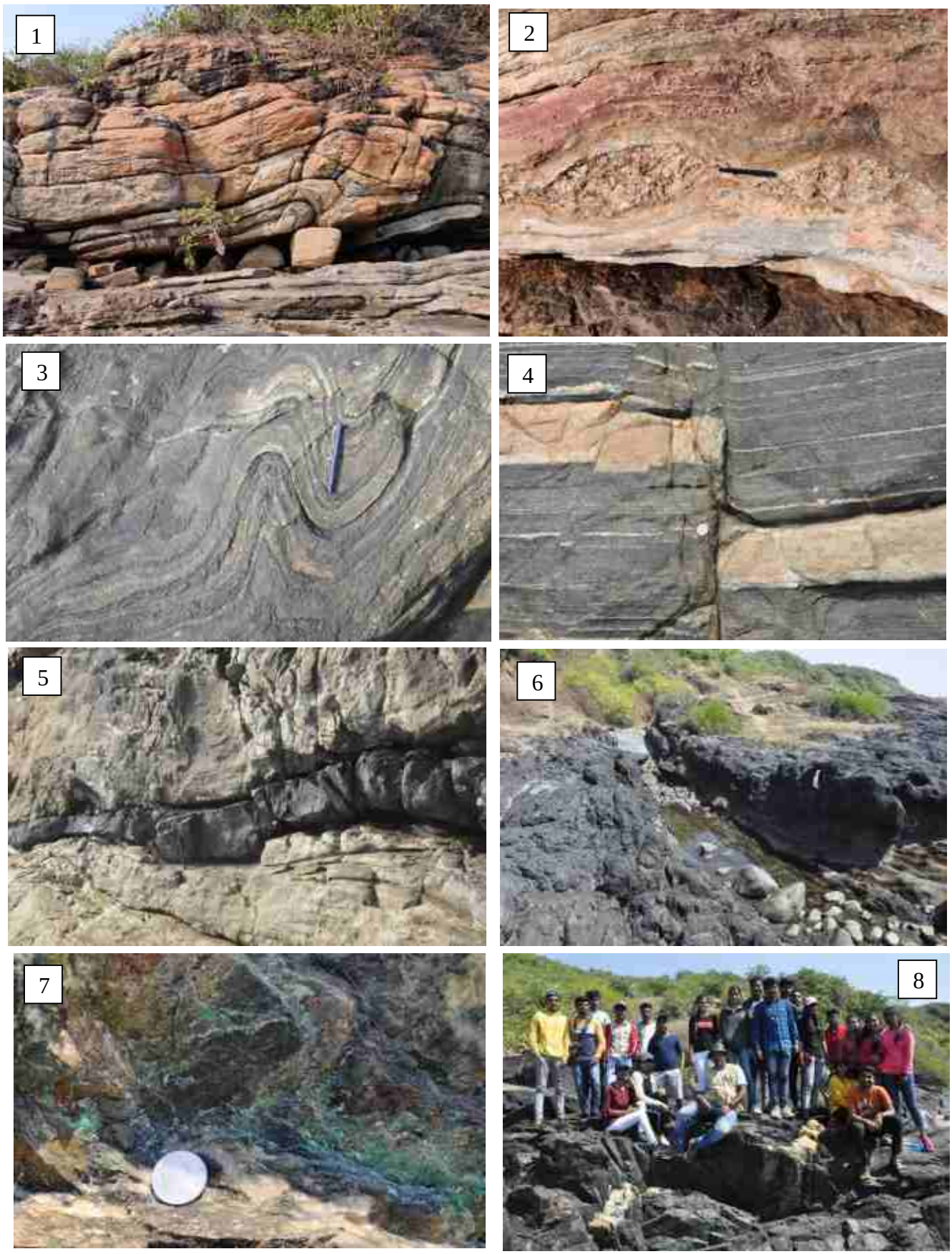
Granitic gneisses/granites cover major portion of the coastal tract, which is northwestern coastal continuation of peninsular gneisses or northern continuation of south canara gneisses/granites. The gneisses form prominent hills & headlands along the coast. The granites however are present as patches within gneisses. The granites/granitic gneisses of Karwar area are surrounded on the northeast by the rocks of Chitradurga group and on the south east by hornblende schist (Gupta et al, 1988). These granites/granitic gneisses at places near the coast have undergone chemical weathering giving rise to the conspicuous laterite deposits, well exposed in the southern part of the area.

Stratigraphic position	**Rock formation**	**Age values determined for the corresponding rock formation in South Kanara Precambrian block (after Balasubramanian,1978).**
Subrecent to recent	Sands/Soils	---
Tertiary (?)	Laterites	---
Middle Cddapahs	Dolerites	2.2 b.y.K-Ar age obtained for the younger ENE striking set of dolerites
Archaeans	Granites Gneiss	2.6 b.y.Rb-Sr age obtained for Karnara granites 3.2-3.6 b.y.K-Ar, Rb-Sr and Pb-Pb age obtained for Kanara Gneiss.
Older Metamorphics	1) Orthoamphibolites 2) Schists	Not dated but from field relation these are older. 3.2-3.6 b.y.

Acknowledgements: We are grateful to our teachers Dr.P.T.Hanamgond and Mr Suraj Mense and Mr Yogesh Kutre, for conducting this study tour.

Name:	Class: **B.Sc.III** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	**Mr. Suraj S Mense**

FIELD PHOTOGRAPHS



Description of field photos: 1. Isoclinal fold; 2. Boudin structure; 3. Ptygmatic folds; 4. Fault; 5. Sill; 6. Wave cut tunnel at Nadibag beach. 7. Oxidation and Precipitation of Copper (Malachite); and 8. Fault showing displacement of Pegmatite vein (Strike slip fault) at Majali (Tilmati beach) coast, Karwar.

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT OF

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

Date of visit 30 August 2019

B.Sc. FIRST SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. I Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological Study Tour To Godchinamalki And Gokak Falls"** on **30 August 2019**.

Exam Seat No. _____

Head, Dept. of Geology

SKE Society's GSSc Degree College,

DEPARTMENT OF GEOLOGY

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

REPORT

Date of visit 30 August 2019

We the B.Sc.I students of Geology Department visited Godchinamalki, Gokak Falls and Yogi Kolla as a part of curriculum. We started our journey on 30 August 2019morning and returned on the same day evening.

Geological Background of the Area:

The geology of the area is quite well known World over for the **Proterozoic** sedimentary basins popularly known as "**Kaladgi Formation**". These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village "**Kaladgi**" now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity "The Great Eparchaean Unconformity" typically exposed near "Yellamma Gudda". The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy:

Upper	Shales, Limestones and Haematite Schists Quartz-arenites, local Conglomerates & Breccia
Lower	Limestones, Clays and Shales, Siliceous Limestones and Hornstone Breccia Quartz-arenite, Conglomerate & Sandstones.

The Kaladgi has now been accorded a supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group.

Geological structures seen during the field study

We were taught the Geological action of River and various features such as water falls, cascade, potholes, meandering, joints, hogback, mesa, natural levee etc. We were shown the sedimentary rocks conglomerate & breccias, graded bedding, stratification etc., in the field. We were taught the use of the GPS to locate the Latitude and Longitudes.

Following are the geological features observed during the study tour:

a) On the way to Gokak were shown the Congomerate deposit, Conglomerate is a rock which is a unique feature of sedimentary rock that indicates energy condition, long transport etc (Photo A)

b) **Cascade: A**t Godchinamalki, the water falls on step like sedimentary rocks due to erosion of sandstone/quartzite beds giving rise to cascade type of water fall. The formation of step like feature is mainly due to the joints present in the quartz arenites. Field photo C shows the differential weathering and horizontal beds of sandstone/Quartz arenites, where as Photo D shows the biological weathering mainly by roots of plants.

c) **Free Water Fall at Gokak**: It is thought that, the waterfall has been developed mainly due to faulting of rocks, where the water from River Ghataprabha jumps about 80 ft. The water from the waterfalls is being used for hydroelectric power generation, mainly used for the Gokak Cotton Mills. Here we could see extensive distribution of potholes. These potholes have been interconnected and have been eroded at the water fall (Photo E). The potholes are formed due to the swirling currents of the river using rocks & pebbles as tools developed these. This is an important erosional feature. River meandering with natural levee is seen in front of the Gokak falls (Photo F). The hogback and mesa landforms are clearly seen far off from the water falls. We were also shown the effect of recent floods near the temple (Photo H)

d) **Yogi Kolla Valley:** The Yogi Kolla is a valley which shows head ward erosion. After climbing about 230 steps, we could reach the cave temple in the hillock. The rocks show horizontal bedding and beautiful joint patterns.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond & Mr. Suraj Mense, of Geology department, for conducting this study tour.

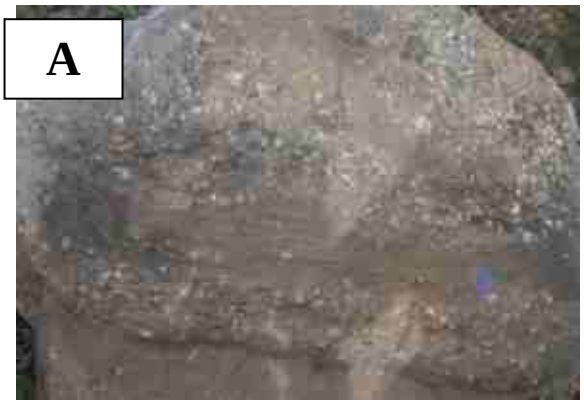
Description of Field Photographs:

(A); Sequence of coarse (Conglomerate) and fine (Sandstone) beds on the way to Gokak. (B); Godchinmalki Cascade, (C) Stratification showing differential weathering & joints in rocks at Godchinmalki; (D) Biological weathering; (E) At Gokak water falls observing pot holes, (F) Meandering & levee deposit at Gokak falls; (G) Gokak Water fall; and (H) Effect of recent flood that has destroyed the protection wall.

Name:	Class: **B.Sc.I** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	**Mr. Suraj Mense**

FIELD PHOTOGRAPHS

A



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D

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SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO RATNAGIRI, MAHARASHTRA AND SURROUNDING PLACES OF GEOLOGICAL INTEREST

Date of visit 21-24th February 2020

B.Sc. SIXTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. IV Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological study tour to Ratnagiri, Maharashtra, and surrounding places of Geological interest "** on **21-24th February 2020**

Exam Seat No. _____

Date: Head, Dept. of Geology

FIELD STUDY REPORT

Date of visit 21-24th February 2020

We the B.Sc.VI Semester students of Geology Department visited Ratnagiri as a part of curriculum. We started our journey on 20th February evening and reached back on 25th morning.

Geological Background of the Area:

Table 1. Stratigraphic sequence in Maharashtra (After Deshpande, 1998)

Stratigraphic Sequence	Age in million years	Representative rock formation	Geographic distribution
Recent - Pleistocene	0.01 – 1.65	Alluvium, laterite, sand, soils	Younger and older alluvia in Nagpur, Bhandara, Chandrapurm Wardha, Yavatmal, Akola, Amravati, Jalgaon Districts; Laterite in Kolhapur, Satara, Sangli, Kolaba and Thane districts. River terraces of Vainganga, Wardha and Painganga rivers; raised beaches along west coast.
Miocene- Pliocene	1.65 - 23.5	Tertiary sediments, lignite, shales	Ratnagiri and Sindhudurg districts
Eocene – Upper Cretaceous	34 - 135	Deccan Trap basalt flows with intertrappeans and infratrappeans (Lametas, Bagh beds)	Basalt flows cover most of the state from west of Nagpur and Chandrapur up to the Arabian Sea coast excepting in the eastern parts of Nagpur, Bhandara-Chandrapur, Gadhiroli, and Rathnagiri districts. Intertrappeans occur in Nagpur, Yavatmal and Chandrapur districts; Infratrappeans in parts of Nagpur and Chandrapur districts and Bagh beds in Dhule district.
Jurassic – Up Gondwana	135 - 300	Limestone Chikiala and Kota formations	Gadchiroli district and Achalpur Tahsil of Amaravati district
Triassic	205 - 245	Clays and sandstones Pachmari & Maleri Fm.	Sironcha Tahsil, Gadchiroli district and Achalpur Tahsil of Amaravati district
Permian	245 – 295	Sandstones and shales (Magli Fm.) Sandstones and shales (Kamthi Formation) Sandstones, shales and coal (Barakar Fm.)	Nagpur, Chandrapur and Yavatmal districts
Upper Carboniferous	295 - 360	Talchir Formation	Nagpur, Chandrapur and Yavatmal districts
Proterozoic	540 - 2500	Limestone, shales and sandstones (Vindhyan supergroup) Penganga beds, limestones and shales (Pakal Group) Conglomerates, sandstones and shales (Kaladgi Group)	Yavatmal and Chandrapur districts Gadchiroli district Rathnagiri and Sindhudurg districts
Archaean	2500 - 3500	Sausar group, Nandgaon group, Sakoli group, Amgaon Group, Unclassified Gneissess	Nagpur, Bhandara, Chandrapur, Gadchiroli, Rathnagiri and Sindhudurg districts. Bhandara district Nagpur, Bhandara, Chandrapur, Gadchiroli, Rathnagiri and Sindhudurg districts.

The geology of the area (Table 1) is quite well known- The important rock formations are **Proterozoic** sedimentary exposures probably extensions of

"**Kaladgis**". These rocks are succeeding the Archaean rocks and overlain by Deccan traps. The quaternary and recent sediments are covering all these along the coast. The principal rock types include- orthoquartzite, sandstones, Granitic gneisses, banded hematite quartzite, varieties of schist , laterite and dykes. The granites occur from the sea level to a height of 30 meters and restricted mostly to the northern parts of Vengurla. The hilly regions of Pat and Parule in the North, the Vengurla and Mochemad hills in the central part of Vengurla area, Redi hill in the Southern region; and Parule-Malvan plateu regions indicate alteration and formation of residual deposits (Laterite). The Vengurla hill is structurally controlled. The Northern part of Vengurla near Kelus and the Southern part near Redi are all elevated regions, which are controlled by faulting. The rock garden of Malvan area is an example of tombolo effect. The entire Malvan city is having beach ridges (Hanamgond and Mitra, 2007).

Vast areas consisting of aluminous laterite are common in Sindhudurg District. The laterite tops, forming plateaus and tablelands between Redi and Malvan, is a significant feature. The overall topography is undulating.

The Aluminous rich laterite and ferruginous laterite are generally used as building materials, whereas the BHQs in southern region have given rise to valuable Iron ore deposits at Redi. Many mining companies have profitably exploited iron ore deposits here for a long period of time.

Geological and Geomorphological structures seen during the field study

On first day 21st afternoon we visited Ratnagiri fort cave and had the cave trekking with the help of Ratnadurga Mountaineering club, where we were shown the coastal erosion such as wave cut tunnel, cliffs, wave cut platform, coastal protection wall, bat habitat in wave cut cave and seepage effect. On 22nd we visited Oni Sand mine and water fall. At Oni sandstone mine we could see ripple structure and mud crack structures imprinted on sandstone. The weathering of sandstone is quite high which has given rise to sand for construction and glass industry. On 23 we visited local beaches and we were shown various coastal landforms such as beach, estuary/river mouth, headland, island, tombolo, spit, bars, wave action, longshore currents, formation of ripple structures, rill structures, placer mineral deposits, Alveolar structure etc. Afternoon we took a boat ride to mangrove island in Bhatye estuary, where we could see clamps of mangrove vegetation, mud flat deposits etc. On 24th on our return journey we visited the Geography department of Gogte College where we were introduced to topomaps, landforms study etc., and later ancient sculptures on laterite plateau. We reached Belgaum on 25th early morning.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond, Head; and Prof. Yogesh Kutre Lecturer, Dept of Geology for conducting this study tour and for the beautiful photographs. We thank Dr Surendra Thakurdesai, Geography Department, Rathnagiri. for his guidance.

References: Deshpande, G.G., 1998. Geology of Maharashtra, Geological Society of India, Text Book Series 10, 223 p.

Hanamgond P T and Mitra D., 2007. Evolution of Malvan Coast, Konkan, West Coast of India – A case study using Remote Sensing Data. Journal of Coastal Research, USA, V.24(3), pp 672-678.

Name:	Class: **B.Sc. VI Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Mr. Yogesh M. Kutre

FIELD PHOTO DESCRIPTION

Field Photo 1: Lateritic shore platform at Bhogwa beach.

Field Photo 2: Ripple marks at Bhogwa beach.

Field Photo 3: Cross bedding at Rock Garden, Malvan.

Field Photo 4: Joints in Quartz-arenites, Rock Garden, Malvan

Field Photo 5: Collection of variety of sea shells of Lamellibranch and Gastropods

Field Photo 6: Exposure of Quatermary Beach rock at Kolamb Estuary.

Field Photo 7: Laterite cliff erosion with sea stack

Field Photo 8: Beach scarp, backshore and foreshore at Kolamb Beach.

FIELD PHOTOGRAPHS


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SKE SOCIETY'S

G.S.Sc. College, Belgaum

GEOLOGICAL STUDY TOUR TO ULAVI CAVES

FIELD REPORT

Date of visit Thursday, 24 February 2019

B.Sc. SECOND SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. College, Belgaum

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. II Semester with Geology as optional subject has attended the Geological Study Tour to **"Ulavi Caves"** on 24 February 2019.

Exam Seat No. _____

Date: Head, Dept. of Geology

GSS COLLEGE, DEPARTMENT OF GEOLOGY

GEOLOGICAL STUDY TOUR TO ULAVI CAVES

STUDY TOUR REPORT

Date of visit 24 February 2019

(We started our journey at 8.0 am and returned at 10 pm)

We the B.Sc. II sem students of Geology Department, were taken to Sintheri Rock and Ulavi caves as a part of curriculum. Sintheri Rock is well known for huge rock cliff and water fall (Photo A). Ulavi is well known for the Channabasaveshwara temple. The place is known for its historical aspects. Geologically the area is well known for Karst topography (limestone caves) and huge rock cliffs. The rock formations are mainly of crystalline limestone with chert/silica bands. There are numerous caves carved out of cracks and chemical weathering due to water action, showing beautiful stalactites and stalagmaites, which is a geologists and speleologists' paradise. We were taken to several of these caves and cliffs made of crystalline limestone. Mahamane Gavi, is located about 8km and is the farthest of the caves in the dense forest. Akka Nagamma cave (Photo B) is situated on the way to Akalgavi, where two entrances one goes steep below the underground, where the other is at shallow level. Here too beautiful stalactites and beds formed due to leaching are seen. At Akka Nagamma Cave, we could observe Anticlinal fold with plunge towards north. Vibhuti Mantapa cave is situated further on the left side is quite huge, where one can walk in easily. Here we could see huge stalagmite that has joined the roof making it a column (Photos C-F).

Aakalu Gavi, is one of the famous, the limestone rock cliff here is about 800 ft tall and the cave is situated about 50 ft above the ground (Photo G), and a ladder is kept to reach the cave. Here, one need to crawl through the narrow mouth of the cave. The beautiful stalactites are observed in this cave. The stalactites look like a cow's mamillary glands (Photo H). .

All these caves show the effect of weathering by plants and water action on limestone.

We were shown sedimentary structures such as bedding, folding, differential weathering, elephant skin weathering, etc and the use of Brunton compass and GPS in the field.

Name:	Class: **B.Sc. II Sem** Examination No.:
Signature and Name of the staff: **Dr.P.T.Hanamgond**	
Prof. S.S.Mense	
Prof. Y.M.Kutre	

Description of Field Photographs

A. Sintheri Rock Water fall showing folded struture
B. Akka Nagamma Cave showing fold and plunge.
C. & E. Shows huge Stalagmite at Vibhuti Kanaja Cave.
F. & H. Akalgavi Cave and Stalactite structures.

Field Photographs

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR AROUND KARWAR & ANKOLA

Date of visit **15-16th Sept 2019**

B.Sc. THIDR SEMESTER
GEOLOGY (OPTIONAL)

Black Sand beach at Tilmati, Karwar

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. Third Semester with Geology as optional subject has attended the Geological Study Tour to **"GEOLOGICAL STUDY TOUR AROUND KARWAR AND ANKOLA"** on 15-16^{h} Sept 2019.

Exam Seat No. _____

Date: Head, Dept. of Geology

GEOLOGICAL STUDY TOUR REPORT
Places of visit: Karwar and surrounding places.
Date of Journey: 15th to 16th Sept 2019.

Geological study tour was conducted for B.Sc.III Sem students for two days. We visited to Karwar-Ankola to study the geological features.

On first day 15th we visited Nadibag beach, Ankola, where we were shown the coastal landforms such as beach, estuary/river mouth, headland, island, tombolo, spit, bars, wave action, longshore currents etc. We were explained in brief the coastal processes operating along the beaches. At Nadibag beach headland, we were shown the Dolerite dyke the discordant intrusions as well as small scale intrusion with sill – the concordant intrusions. We were also shown and explained the occurrence of boudinage structures which are eye-like features of quartz and feldspars occurring in a line along the granitic-gniess foliation. We were also shown 'A large isoclinal fold apart from many small scale folds. There are many ptygmatic fold structures too in migmatite rock.

At Belekeri beach, we could see an igneous intrusion, pegmatite intrusion with a clear cut contact with Granitic-gniess. The granitic gneiss also shows spheroidal weathering.

Enroute Karwar, along road cut, we could see several dykes intrusions.

Geological Setting of the study area:

The coast of Uttara Kannada is bounded by Western Ghats on the east, which exhibit deep winding valleys, waving wooded hills, high peaks etc., and by Arabian sea in the west. The topography is in general hilly and wooded with broken and irregular hills averaging 600-700 m above sea level. Deep or wide mouthed bays & estuaries break the coast. It is varied and scenic with rocky Islands and capes, stretches of palm-fringed sandy beaches, which enclose between rocky headlands or knobs.

The coast presents a narrow strip of hinterland between the seashore and the Western Ghats, which varies between 5 to 20 km. It scarcely exists towards Karwar since the mountains dip in to the sea with scenic bays & Islands offshore. The hinterland area is normally plain & is covered with sandy soil and usually under cultivation.

Based on the distinct landscapes, the coastal stretch of Uttara Kannada district has been classified into two physiographic units, the high lands and the narrow lowlands (Gazetteer of India, 1985).

The coastal tract of Karnataka is characterized by Precambrian crystalline rocks (Granites, Granitic gneisses and Schists), laterites & basic dykes. The rocks of the Uttara Kannada district form part of the Chitradurga group of Dharwar supergroup comprising metasediments and metavolcanics together with manganese and limestone formations, all of which overlie the basement migmatites and associated granitoids.

Geology of the Uttara Kannada district comprises of gneisses and granites with Dharwarian rocks like schists and amphibolites as older metamorphics within them. Other rock types present are, orthoquartzites, manganiferous chert and argillites, banded magnetite/haematite quartzite, limestone & dolomites, greywackes, laterites and basic dykes.

Granitic gneisses/granites cover major portion of the coastal tract, which is northwestern coastal continuation of peninsular gneisses or northern continuation of south canara gneisses/granites. The gneisses form prominent hills & headlands along the coast. The granites however are present as patches within gneisses. The granites/granitic gneisses of Karwar area are surrounded on the northeast by the rocks of Chitradurga group and on the south east by hornblende schist (Gupta et al, 1988). These granites/granitic gneisses at places near the coast have undergone chemical weathering giving rise to the conspicuous laterite deposits, well exposed in the southern part of the area.

Stratigraphic position	**Rock formation**	**Age values determined for the corresponding rock formation in South Kanara Precambrian block (after Balasubramanian,1978).**
Subrecent to recent	Sands/Soils	---
Tertiary (?)	Laterites	---
Middle Cddapahs	Dolerites	2.2 b.y.K-Ar age obtained for the younger ENE striking set of dolerites
Archaeans	Granites Gneiss	2.6 b.y.Rb-Sr age obtained for Karnara granites 3.2-3.6 b.y.K-Ar, Rb-Sr and Pb-Pb age obtained for Kanara Gneiss.
Older Metamorphics	1) Orthoamphibolites 2) Schists	Not dated but from field relation these are older. 3.2-3.6 b.y.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond and Prof.Suraj Mense, for conducting this study tour. We thank our Principal, for allowing us for this study tour.

Name:	Class: **B.Sc.III Sem** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	 **Suraj S Mense**

DESCRIPTIONS OF FIELD PHOTOGRAPHS:

KARWAR-ANKOLA: 1) Beach study at Nadibag 2) Dyke structure at Nadibag 3) Fault structure in granitic gneiss, at Nadibag. 4) Dyke near Aversa, 5) Inclined dyke near Aversa, 6) Black Sand deposit at Tilmati beach, Karwar 7) Dyke exposure with weathered rock at road cut near Aversa.

FIELD PHOTOGRAPHS

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SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO MALVAN AND SURROUNDING PLACES OF GEOLOGICAL INTEREST

Date of visit 8-9th February 2019

B.Sc. FOURTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. IV Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological study tour to Malvan"** on **8-9th February 2019**

Exam Seat No. _____

Date: Head, Dept. of Geology

FIELD STUDY REPORT

Date of visit 8-9th February 2019

We the B.Sc.IV Semester students of Geology Department visited Malvan as a part of curriculum. We started our journey on 8th February morning and reached back on 9th night.

Geological Background of the Area:

Table 1. Stratigraphic sequence in Maharashtra (After Deshpande, 1998)

Stratigraphic Sequence	Age in million years	Representative rock formation	Geographic distribution
Recent - Pleistocene	0.01 – 1.65	Alluvium, laterite, sand, soils	Younger and older alluvia in Nagpur, Bhandara, Chandrapurm Wardha, Yavatmal, Akola, Amravati, Jalgaon Districts; Laterite in Kolhapur, Satara, Sangli, Kolaba and Thane districts. River terraces of Vainganga, Wardha and Painganga rivers; raised beaches along west coast.
Miocene- Pliocene	1.65 - 23.5	Tertiary sediments, lignite, shales	Ratnagiri and Sindhudurg districts
Eocene – Upper Cretaceous	34 - 135	Deccan Trap basalt flows with intertrappeans and infratrappeans (Lametas, Bagh beds)	Basalt flows cover most of the state from west of Nagpur and Chandrapur up to the Arabian Sea coast excepting in the eastern parts of Nagpur, Bhandara-Chandrapur, Gadhiroli, and Rathnagiri districts. Intertrappeans occur in Nagpur, Yavatmal and Chandrapur districts; Infratrappeans in parts of Nagpur and Chandrapur districts and Bagh beds in Dhule district.
Jurassic – Up Gondwana	135 - 300	Limestone Chikiala and Kota formations	Gadchiroli district and Achalpur Tahsil of Amaravati district
Triassic	205 - 245	Clays and sandstones Pachmari & Maleri Fm.	Sironcha Tahsil, Gadchiroli district and Achalpur Tahsil of Amaravati district
Permian	245 – 295	Sandstones and shales (Magli Fm.) Sandstones and shales (Kamthi Formation) Sandstones, shales and coal (Barakar Fm.)	Nagpur, Chandrapur and Yavatmal districts
Upper Carboniferous	295 - 360	Talchir Formation	Nagpur, Chandrapur and Yavatmal districts
Proterozoic	540 - 2500	Limestone, shales and sandstones (Vindhyan supergroup) Penganga beds, limestones and shales (Pakal Group) Conglomerates, sandstones and shales (Kaladgi Group)	Yavatmal and Chandrapur districts Gadchiroli district Rathnagiri and Sindhudurg districts
Archaean	2500 - 3500	Sausar group, Nandgaon group, Sakoli group, Amgaon Group, Unclassified Gneissess	Nagpur, Bhandara, Chandrapur, Gadchiroli, Rathnagiri and Sindhudurg districts. Bhandara district Nagpur, Bhandara, Chandrapur, Gadchiroli, Rathnagiri and Sindhudurg districts.

The geology of the area (Table 1) is quite well known- The important rock formations are **Proterozoic** sedimentary exposures probably extensions of

"**Kaladgis**". These rocks are succeeding the Archaean rocks and overlain by Deccan traps. The quaternary and recent sediments are covering all these along the coast. The principal rock types include- orthoquartzite, sandstones, Granitic gneisses, banded hematite quartzite, varieties of schist , laterite and dykes. The granites occur from the sea level to a height of 30 meters and restricted mostly to the northern parts of Vengurla. The hilly regions of Pat and Parule in the North, the Vengurla and Mochemad hills in the central part of Vengurla area, Redi hill in the Southern region; and Parule-Malvan plateu regions indicate alteration and formation of residual deposits (Laterite). The Vengurla hill is structurally controlled. The Northern part of Vengurla near Kelus and the Southern part near Redi are all elevated regions, which are controlled by faulting. The rock garden of Malvan area is an example of tombolo effect. The entire Malvan city is having beach ridges (Hanamgond and Mitra, 2007).

Vast areas consisting of aluminous laterite are common in Sindhudurg District. The laterite tops, forming plateaus and tablelands between Redi and Malvan, is a significant feature. The overall topography is undulating.

The Aluminous rich laterite and ferruginous laterite are generally used as building materials, whereas the BHQs in southern region have given rise to valuable Iron ore deposits at Redi. Many mining companies have profitably exploited iron ore deposits here for a long period of time.

Geological and Geomorphological structures seen during the field study

On the way at Amboli Ghat we were shown the Nangar Taas water fall in a columnar basalt; basaltic flows, escarpments, valley etc along the Ghat section.

At Bhogwe beach, we were shown the coastal landforms such as wave cut platform (Photo 1), Coastal protection wall built with basaltic rocks and also learnt how unscientifically the authorities select such rocks without consulting Geologists. These rocks get weathered easily and the purpose of coastal erosion is lost. We were shown the rocky beach, sandy beach, beach with coastal protection wall, headlands, spit, estuary, pocket & estuarine beach etc. The important sedimentary structures observed along the beaches are- ripple marks (Photo 2), Rill/diamond marks, bioturbation marks etc.

At rock garden, we saw stratification (Photo 3), cross lamination, joints (Photo 4) etc. We visited Kolamb beach where in we could collect shells of Arca, Cyprea, Trochus, coral etc (Photo 5). We could observe Quaternary beach rock exposed along the Kolamb creek mouth (Photo 6) which is an evidence of sea level fall. We also saw coastal erosion of laterite cliff (Photo 7) and on the beach (Photo 8).

Acknowledgements: We are grateful to Dr.P.T.Hanamgond, Head; and Prof. Yogesh Kutre Lecturer, Dept of Geology for conducting this study tour and for the beautiful photographs. We thank GSS College for allowing us for this study tour.

References: Deshpande, G.G., 1998. Geology of Maharashtra, Geological Society of India, Text Book Series 10, 223 p.

Hanamgond P T and Mitra D., 2007. Evolution of Malvan Coast, Konkan, West Coast of India – A case study using Remote Sensing Data. Journal of Coastal Research, USA, V.24(3), pp 672-678.

Name:	Class: **B.Sc. IV Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Mr. Yogesh M. Kutre

FIELD PHOTO DESCRIPTION

Field Photo 1: Lateritic shore platform at Bhogwa beach.

Field Photo 2: Ripple marks at Bhogwa beach.

Field Photo 3: Cross bedding at Rock Garden, Malvan.

Field Photo 4: Joints in Quartz-arenites, Rock Garden, Malvan

Field Photo 5: Collection of variety of sea shells of Lamellibranch and Gastropods

Field Photo 6: Exposure of Quatermary Beach rock at Kolamb Estuary.

Field Photo 7: Laterite cliff erosion with sea stack

Field Photo 8: Beach scarp, backshore and foreshore at Kolamb Beach.

FIELD PHOTOGRAPHS


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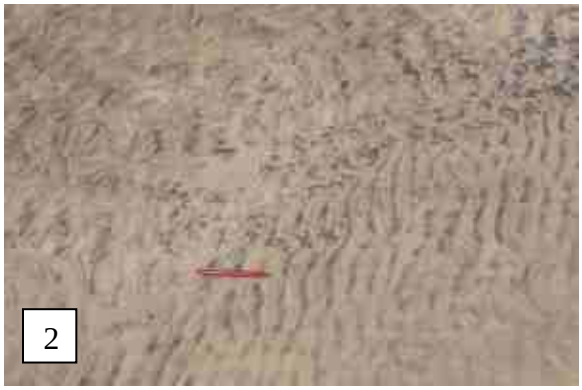
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SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO PLACES OF GEOLOGICAL INTEREST AROUND PONDICHERY

Date of visit 5-11th March 2019

B.Sc. SIXTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of

B.Sc. VI Semester with Geology as optional subject has attended the

Geological Study Tour to **"GEOLOGICAL STUDY TOUR TO PLACES OF GEOLOGICAL INTEREST AROUND PONDICHERY"**

Exam Seat No. _____

Date: Head, Dept. of Geology

FIELD STUDY REPORT

Date of visit 5-11th March 2019

We the B.Sc. VI Semester students of Geology Department visited Pondicherry and surrounding places of Geological interest, as a part of curriculum. We started our journey on 5th March morning by Puduchery Express and returned back on 11th night by Puduchery Express.

We reached Pondicherry on 6th morning. We visited botanical garden and the famous Aurbindo Ashram and the Pondicherry beach (which is protected by seawall). On 7th we hired a vehicle and visited the famous Geo-tourism place Thiruvakkarai Fossil wood park which is protected by Geological Survey of India.

Thiruvakkarai Fossil Wood Park:

Thiruvakkarai is situated about 40km to the NNE of the Neyveli lignite field exhibiting spectacular petrified tree trunks, embedded in coasse, pebbly and unsorted sandstones. We visited the fossil wood park protected by Geological Survey of India, where huge tree trunks and pieces are brought and kept. There are few insitu tree trunks too. Outside the park nearby fields are exposed with natural sites of petrified wood deposits covering may be about few square kilometres. We could collect some open specimens for our Geology Museum.

The occurrence of lignite in the lower horizon in Neyveli and petrified tree trunks in the higher horizon in Thiruvakkarai, both within Tertiary sediments suggest a well defined a drastic change in the environment of deposition of sediments admixed with abundant vegetal matter. The carbonization of the vegetation matter has led to formation of lignite owing to reduced environment with lack of oxygen. The silicfication lit-per-lit transformation of wood to petrified wood is mainly due to availability of silica. It is known that in highly alkaline waters, with a pH exceeding 10 silica goes in to solution. The rise in the pH value, leading to higher alkalinity of waters is accompalished by the photosynthetics activity of algae or by sodium carbonate lavas. In Thiruvakkarai there pH

value of the water could be due to the presence of algae. The released silica replaced the organic matter of the tree trunks lit-per-lit or molecule by molecule.

Neyveli Lignite Mines:

On 8th March we had an opportunity to visit the Lignite mines at Neyveli, for which we had sought the permission earlier. Shri.Sampathkumar, Sr Geologist took us to various levels of mining and explained us in detail.

The lignite field extends over a distance of 40km in a N-S directioin and is about 10km wide in an E-W direction. The lignite seam, varying in thickness from 8-22 m, is underlain by sands with artesian aquifers which exert an upward pressure (hydrostatic pressure). The lignite seam is overlain by argillaceous and ferruginous sandstones, clay and sands. The overburden above the lignite seam is about 55 m. These lignite bearing tertiary sediments of the Neyveli area have been for long considered to be of Mio-Pliocene age.

Lignite is a low grade, immature coal of low calorific fossil fuel (2000-3000 Kcal/ Kg), popularly known as Brown Diamond / brown coal. Lignite belongs to geologically younger member in coal family (i.e. tertiary age). Coal is the primary source of energy and become a cornerstone in power generation. In India, coal reserves (i.e. geological reserves) estimated 234 billion tones as on 1/1/2002 and produced 327.78 million tones during 2001-2002. Indian coal has high ash content ranges from 20 to 80% or more ash.

The lignite deposits of India mostly occurs as sub-surface deposits except in the states of Jammu and Kashmir, Gujarat and Kerala in Tertiary formations. The lignite occurs in a distinct and widely varying in nature, especially with regards to their lateral and vertical structured disposition, multiplicity of seams, quality, nature of occurrences, associated overburden and interburden formation, etc. The principal states of lignite deposits in India are Tamil Nadu, Rajasthan, Gujarat and Jammu and Kashmir.

The lignite treasure is buried 25 million years ago underneath a village, called Neyveli in the Cuddalore district, Tamil Nadu. The Nayveli lignite deposits occur at shallow depth of 50 to 120 m below ground level (bgl). It is the biggest source of lignite in India, which is fully exploited mainly for electricity generation and also used in Briquetting and Carbonization plants and Urea manufacturing. The Neyveli Lignite Field is spread over an area of about 480.00 sq. Km. and total geological reserves estimated to be about 3300.00 million tones. Lignite deposits at Neyveli occur in a single seam with an average

thickness of 14.00 m. The Neyveli mine is one of the Asia's largest open cast lignite mine and produce 18.36 million tones of lignite during 2001- 2002.

We visited the Mine II open cast mines. It is located 5 km south of mine-I, spread over an area of 27.74 sq. Km with 398MT of lignite reserves. The Mine-II was opened in 1981 with a capacity of 4.70MTAr linked to Thermal Power Plant-II (TPS-11) with a capacity of 630 MW. The total current production at Mine II is given in table.

On 9th we visited the famous historical and the ruined archaeological wonder Mahabalipuram. On 10th we visited the Pondicherry beach, and returned by Puducherry express on 11th to Belgaum.

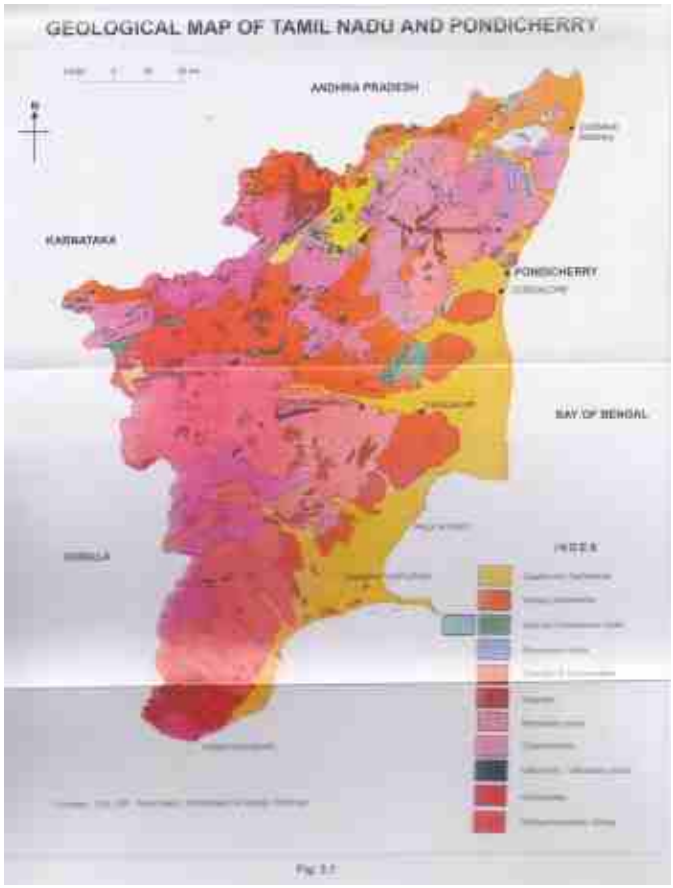
Acknowledgements: We are grateful to Dr.P.T.Hanamgond, Head; and Prof. Suraj S Mense, Lecturer, Dept of Geology for conducting this study tour. We thank GSS College for allowing us for this study tour.

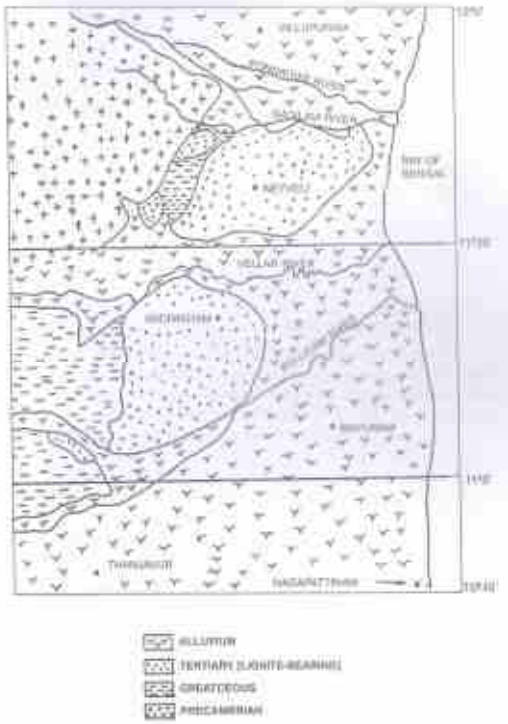
References:

Name:	Class: **B.Sc. VI Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Mr. Suraj S Mense

FIELD PHOTO DESCRIPTION

Photos 1-3 Thiruvakkarai fossil wood park.
Photo 4 Auroville Golden Globe peace centre, Pondicherry.
Photos 5-8 Students visit to Department of Earth Sciences, Pondicherry University.
Photos 9-13 Visit to Neyeli Lignite Mines
Photo 14 TANCEM Fossiliferous Limestone Mines, Ariyalur
Photos 15-16 Visit to Mahabalipuram.





Geological map around Neyveli

MINE-II Production Details 18-03-2019				
	Output	Mon	Quart	yearly
OB	252000	44.62	172.20	779.09
SME Lignite	42500.00			
SMD Lignite	10440.57			
Total Lignite	52940.57	9.37	37.48	118.90
TS-2 Supply	19000.00			
TS-2 Expn.Supp	0.00			
Total Supply	19000.00	6.70	31.03	131.10
Mine-2 Stock	2009001.53			
TS-2 Stock	106939.07	slag	19x28	
TS-2 Expn Stock	73977.58			
TS-2 Gen	882/1470	7x126	MU	23.45
TS-2 Expn Gen	0		MU	
OS OB	1532/30640			
OS LIG	393/10440.57			
Max.Rain fall	Nil			
Diesel (NLCIL)	12033	SMD/ADR 5000		322277
Scarp	49.26		Cum	7393.664

FIELD PHOTOGRAPHS

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SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO AN OPEN CAST DOLOMITE MINE AT NEELKERI, BAGALKOTE

Date of visit 7th April 2019

B.Sc. SIXTH SEMESTER

GEOLOGY (OPTIONAL)

SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. VI Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological study tour to open cast Dolomite mines at Neelkeri, Bagalkote"** on 7th April 2019.

Exam Seat No. _____

Date: Head, Dept. of Geology

LOCATION AND ACCESSIBILITY

Bagalkot district is an important commercial centre for Limestone and Dolomite minerals because of extensive carbonate deposits. The National highway 13 from Hubli to Sholapur passes 10 Km. west of Bagalkot. Recently the railway route from Sholapur to Hubli has been converted to broad gauge too.

PHYSICAL FEATURES AND CLIMATE

It is learnt from the Miines and Geology Department reports that the area is a plain land with general northerly slope. There are two parallel chains of bold ridges running in WNW-ESE direction on either side of Raichur Belgaum State highway. These ridges are comprised of low mounds with an average attitude of (1800' N 600 M) above M.S.L. The tallest mound of 2000' is situated NW of Bagalkot town. There are number of small seasonal streams draining into Ghataprabha River which flows E- W due north of Bagalkote town.

The vegetation in the area is not very conspicuous due to dry climate. The region is under arid and semi arid zone. The months of March to May are the hottest. This is followed by SW monsoon from the mid June to the end of September. December is the coldest period reading the lowest temperature drop of 14.8^0 C. The highest temperature recorded is 43°C. The average annual rainfall is 570 MM.

The region is spread over by medium and deep black soil and red sandy soil derived from sandstones, limestone-dolomite and shales. The average soil thickness is 1 to 1.5 mts.

It is reported that, the pioneering survey for limestone-dolomite was conducted by Capt. Newbold in 1842- 45 in the Kaladagi basin.

GEOLOGY OF THE AREA

The geology of the area is quite well known World over for the Proterozoic sedimentary basins popularly known as “Kaladgi Formation”. These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village “Kaladgi” now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity “The Great Eparchaean Unconformity” typically exposed near “Yellamma Gudda”. The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The basin is located in the northern part of the Dharwar Craton, Karnataka. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy: The Kaladgi has now been accorded a Supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group. Following is the details of Bagalkot Group.

BAGALKOT GROUP	Badami Group(285)	Katageri Limestone (150) Kerur Arenite (135)	Limestone, shale Conglomerate, arenite, shale
	Angular Unconformity		
	Intrusives: Quartz veins, pegmatite, dolerite dykes		
	Simikeri Subgroup (1150)	Hosakatti Argillite(700) Arlikatti Dlolmite (130) Niralkeri Breccia (40) Kundargi Quartzite (280)	Argillite Dolomite, hematite bed Chert Breccia Conglomerate, quartzite, argillite
	Disconformity		
	Lokapur Sub-group (2750)	Yadahalli Argillite (60) Muddapur dolomite (5650 Chikshillikeri Limestone (800) Yargatti Argillitte (720) Mahakut Breccia (130) Saundatti Quartzite (475)	Argillite Dolomite,Limestone,argillite Limestone,shale Argillite,dolomite Chert breccias Conglomerate, quartz, shale
	Nonconformity and angular Conformity		
	Gneisses/Granites and Schist Belts of Dharwar craton		

DISCRIPTION OF ROCK UNITS

The megascopic charecters and mode of occurrence of different rock types encountered in the field are as follows:

Laterites: Along the highway, the laterites were observed, occuring as isolated hill caps representing the youngest among the succession, overlying the Kaladagi's. These laterites are ferruginous porous and highly altered formations owing to residual weathering. The extent of outcrops is less conspicuous.

Quartzites: The Quartzites occurs as prominent and well demarcated outcrops. These Quartzites range from pale gray to pinkish colored hard and compact coarse grained, highly jointed trending WNW-ESE with general southerly dip ranging from 50°-65°.

Conglomerates: The basal conglomerates lie immediately below Quartzites indicating a break in deposition. The siliceous matrix encloses ferruginous quartz pebbles, which are oval to sub oval shaped ranging in size from few centimeters to 2.3 inches.

High Calcium Limestone: Bluish Crystalline limestones occur parallel to the quartzites underlying conglomerate beds. These are of two types viz. bluish to bluish gray high calcium limestones and variegated limestone of various colors of bluish gray, green and pale pink linear bands. The general trend of the formation is similar to quartzites with southerly dip ranging from 35° to 65°. At places the trend changes to NNW-SSE with easterly dip of 15° to 20° signifying folded nature.

Dolomites: The dolomite occurrences are not very extensive but appear as isolated and scattered outcrops of varying dimensions associated with high calcium limestones. The bands are linear

and pale gray to ash gray hard and compact with typical elephant skin weathered outer surface. The trend is also variable due to flexibility resulting in folding and contortion into arcs. The general trend of the formation is WNW-ESE with low angle Easterly dip. The major joints are disposed at right angles to the strike direction. At Neelkeri mines, majority of the deposits are dolomite (Photos 1-5), at one mine the dolomite occurs with shale beds.

Lime Kankar: Extensive Kankar deposits are not frequently seen in the area, however visible patches of Kankar are observed about 4 Km. north of Gaddanakere cross on Hubli-Sholapur roadside, south of Yedehalli village and around Kaladagi village.

Stromatolite: Stromoatolites are one of the first life existing on the earth mainly formed by the cynobacteria (Photo 1). They are exposed along Yargatti-Gokak road about 2km from Yargatti.

We visited three open cast mines (Photos 2 - 5), wherein we were enlightened with mining types, mine planning, resource estimation, aforestation, benches, bench width, core drilling, blasting, ore transportation, mine closure, estimation of ore, uses etc.

During the field visit we could observe various geological features such as weathering effect on dolomites giving rise to elephant skin weathering (Photo 2), leaching/dissolution effect and cave formation (3), and fracture fill deposit with angular fragments (4). On the way to Bagalkote after Yargatti about few kilometers, we could see folded limestone deposit with quartz veins (Photo 6).

Acknowledgements:

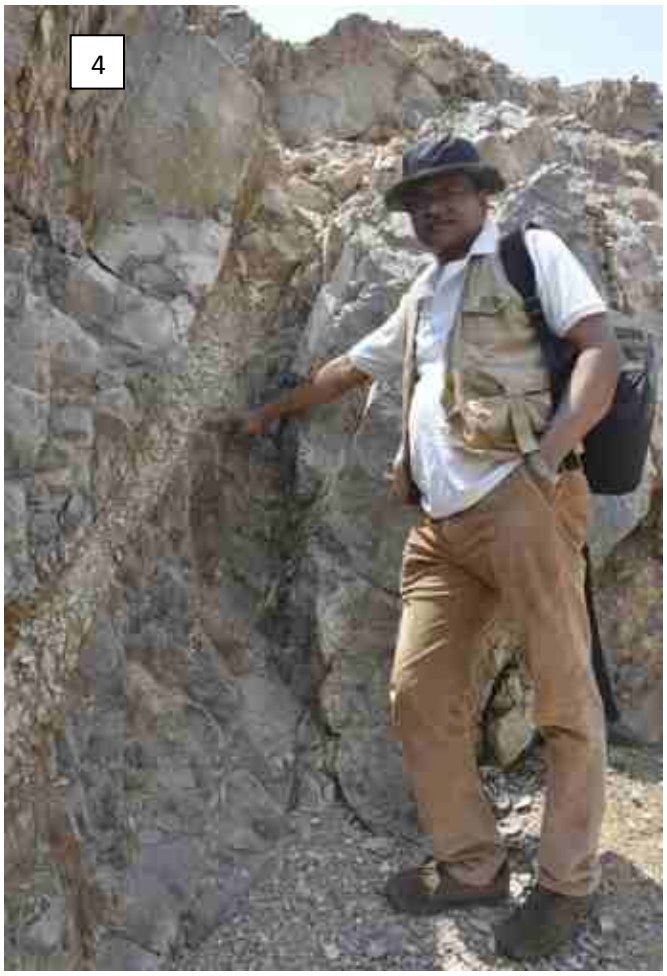
We are grateful to Dr.P.T.Hanamgond, Head Department of Geology; Prof.Suraj Mense and Prof Yogesh Kutre of Geology department, for conducting this study tour. We thank Shri. Anil Hadagli, Mine owner, Bagalkote, for explaining us the mining techniques.

Reference

M.S.Anand, R.Srinivasiah and B.S.N.Shetty, 1999. Investigation for Limestone Dolomites in the Submersion Zone from Bagalkot to Kaladgi, Bagalkot District (Field Session 1980-81), Dept of Mines and Geology, Bangalore, No.310, 12p.

Name:	Class: **B.Sc. VI Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Prof. Suraj S Mense Prof. Yogesh M Kutre

FIELD PHOTOGRAPHS



SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR AROUND AURANGABAD, MAHARASHTRA

Date of visit **27 Sept to 1st Oct 2019**

B.Sc. FIFTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. Fifth Semester with Geology as optional subject has attended the Geological Study Tour to **"GEOLOGICAL STUDY TOUR AROUND AURANGABAD, MAHARASHTRA"** from 27 Sept to 1st Oct 2019.

Exam Seat No. _____

Date: Head, Dept. of Geology

GEOLOGICAL STUDY TOUR REPORT
Places of visit: Aurangabad and surrounding places.
Date of Journey: 27th Sept to 1st Oct 2019.

Geological study tour was conducted for B.Sc.V Sem students for five days. We started our journey on 27th Sept night at 8.0 pm via Kolhapur.

In this study tour we visited to Ajanta, Ellora and Basalt quarry around Aurangabad. On the way back we visited GARGOTI, one of the best mineral museum of India, in Sinnar taluka of Nasik district, Maharashtra.

Geological Background of the Area:

Aurangabad is one of the historic city of Maharashtra state. The majority of Maharashtra state is covered by the Deccan Traps which contain lava flows erupted from Upper Cretaceous to Lower Eocene age well known as Deccan Volcanic Province (DVP). The Deccan flood basalt erupted approximately around 65 My ago in the Indian peninsula and currently covers more than 500000 km^2 .These are best developed in the Western Ghat escarpment in the SW part of the province where they are 1.7 –2.0 km thick. They thin out gradually towards the east. Dykes, sills and plugs are important components of the magmatic plumbing system of the Deccan Trap.

Aurangabad district is completely covered by the basaltic lava flows, which are horizontal and each flow has two distinct units. The upper layers consist of vesicular and amygdaloidal zeolitic; while the bottom layer consists of massive basalt. The soil is black derived from weathering of basaltic rocks. Many structural features (e.g. faults, fractures, joints, veins and dykes) are exposed around.

Location 1: Tisgaon [N19.8689, E75.2480]

We visited a huge basaltic quarry, which has compact Basalt. The rock has amygdaloidal structure and contain zeolite minerals. We could observe the water seepage along the junction of weathered zone and hard rock. The surface water percolates through the weathered zone and seeps out from the hard rock junction.

Location 2: Ellora Caves [20.0268°N 75.1771°E]

Ellora caves are well known historic monument recognized by UNESCO as heritage site during 1983. There are over 34 caves which are carved within the massive basaltic layer. Of these the Monolithic Vishnu temple is famous which has been carved from top and from front.

Most of the caves were constructed during the period ranging from 2nd century BC to 6th century AD.

Location 3: Ajanta Caves [20°33′12″N 75°42′01″E]

The caves were built in two phases, the first phase starting around 2nd century BC, while the second phase was built around 400–650 BC, according to older accounts, or in a brief period of 460–480 BC according to later scholarship. The site is a protected monument in the care of the Archaeological Survey of India. They were

covered by forest accidentally "discovered" and brought to light in 1819 by a colonial British officer Captain John Smith. The caves are carved in the Basaltic rock exposed along the northern wall which is U shaped gorge cut by the river Waghur. Within the gorge there are number of waterfalls.

Location 4: Majnu Hills [N19°53.968',E075°20.900']

Strike: N75°W, Dip: 5°NE

The site is peculiar where an igneous dyke is seen with horizontal columnar structures which were formed due to tensional forces. Hanamgond et al., (2011) have reported a preliminary observations on this dyke. They have reported that there is a displacement of this dyke and attributed it to localized tectonic disturbance or deformation. These dykes are made up of amygdaloidal basalt, which cuts through the porphyritic basalt flow, thus developing a horizontal contact of the lower porphyritic basalt with the upper amygdaloidal basalt. The compact basalt dyke cuts through these two flows.

Location 5: Lonar Lake [19°58′35″N 76°30′30″E]

We visited the world famous Lonar Lake, located at Lonar in Buldhana district, Maharashtra, India. It is created by the impact of a meteorite. Lonar crater, is notified National Geoheritage Monument. The crater has water that is saline, soda lake,. Lonar Lake was created by a asteroid collision with earth impact during the Pleistocene Epoch. It is one of the four known, hyper velocity, impact craters in basaltic rock anywhere on Earth. The other three basaltic impact structures are in southern Brazil. A Max. diameter of 1.2 kilometres (3,900m).The crater's age has been estimated to be 52,000 ± 6,000 years (Cretaceous). The United States Geological Survey, Geological Society of India have conducted extensive studies of the site Biological nitrogen fixation was discovered in this lake in 2007 and also found that the minerals, in the lake soil, are very similar to the minerals found in moon rock brought back during Apollo Program. The crater has an oval shape. The meteorite impact came from the east, at an angle of 35 to 40 degrees.

Max. length 1,830 m (6,000m); Surface area 1.13 km2 (0.44 sq miles) Average depth 137 m (449 ft); Max. depth 150 m (490 ft)

Location 6: Gargoti Mineral Museum

It is one of the best mineral museums in India and is the 1st Museum in "Sinnar taluk of Nasik district" that came in to existence in April 2001. Gargoti Museum displays the personal collection of Connoisseur Mr.K.C.Pandey. His collection consists of:

Natural Indian Zeolite Minerals & Crystals, Natural Gems Stones, Natural Precious/Semi-Precious Stones, Natural Precious/Semi Precious Metals, Fossils, Stone Handicrafts (Statues) collected from all around the world. Very unique & rare Statue of Lord Ganesha and Jain Teerthankar carved out of a single piece of Himalayan Clear Quartz; gold nuggets, native metals, etc., are worth mentioning.

We reached Belgaum night at 1.30 am on 2 October.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond and Yogesh Kutre, for conducting this study tour. We thank our Principal, for allowing us for this study tour.

Name:	Class: **B.Sc.V Sem** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	**Yogesh Kutre**

DESCRIPTIONS OF FIELD PHOTOGRAPHS:

Field Photo 1: Exposure of a cliff at a basaltic quarry.
Field Photo 2: Mural joints exposed in the basaltic quarry
Field Photo 3: Infront of famous Vishnu temple cave at Ellora
Field Photo 4: Geological features are being explained by Prof. Dnyaneshwar Wayal
Field Photo 5: View of one of the cave at Ajanta
Field Photo 6: View of the Lonar Lake
Field Photo 7: The dried up tree branches at Lonar lake owing to saline water action
Field Photo 8: A view of mesa structure with a Basaltic lava flow
Field Photo 9: Sharp contact of the porphyritic basalt separated by a thin burnt rock and top massive basaltic flow at Ajanta caves indicating two distinct flows.
Field Photo 10: Students collecting specimen of amygdaloidal, vesicular basalt and zeolite specimen.
Field Photo 11: Close up of a zeolite mineral cavity
Field Photo 12: Waterfall at Ajanta caves.
Field Photo 13: Visit to Gargoti mineral museum. Guide explaining about the mineral collection.
Field Photo 14 & 15: Visit to Gargoti mineral museum.

FIELD PHOTOGRAPHS

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Geological study tour Bandiwade, Kolhapur, Maharashtra

Date of Visit 12 October 2018

REPORT

We visited, the Columnar Basalt exposure exposed near Panhala, at a village Bandiwade, Kolhapur district. The place is well known for the famous geological columnar basalts exposed in a cliff. Each column is about 1.5 m diameter and varying height of 5 to 15 m. The basaltic rock belong to Deccan Volcanic Province (Deccan Traps). On the way, we could observe similar columnar exposures all along Panhala hill range.

We visited the Panhala hill, where similar structures all along the fort area were seen. We visited the botanical garden and laterite deposits with varying colors in the garden premises. The students were shown various structures like basaltic layers, amygdaloidal and vesicular structures, columnar structures etc.

FIELD PHOTOGRAPHS

1

2

3

4

5

6

7

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT OF

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

Date of visit 5 August 2017

B.Sc. FIRSTSEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. I Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological Study Tour To Godchinamalki And Gokak Falls"** on 5 August 2017.

Exam Seat No. _____

Head, Dept. of Geology

SKE Society's GSSc Degree College,
DEPARTMENT OF GEOLOGY

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

REPORT

Date of visit 05 August 2017

We the B.Sc.I students of Geology Department visited Godchinamalki, Gokak Falls and Yogi Kolla as a part of curriculum. We started our journey on 05 August 2017 morning and returned on the same day evening.

Geological Background of the Area:

The geology of the area is quite well known World over for the **Proterozoic** sedimentary basins popularly known as "**Kaladgi Formation**". These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village "**Kaladgi**" now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity "The Great Eparchaean Unconformity" typically exposed near "Yellamma Gudda". The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy:

Upper	Shales, Limestones and Haematite Schists Quartz-arenites, local Conglomerates & Breccia
Lower	Limestones, Clays and Shales, Siliceous Limestones and Hornstone Breccia Quartz-arenite, Conglomerate & Sandstones.

The Kaladgi has now been accorded a supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group.

Geological structures seen during the field study

We were taught the Geological action of River and various features such as water falls, cascade, potholes, meandering, joints, hogback, mesa, natural levee etc. We were shown the sedimentary rocks conglomerate & breccias, graded bedding, stratification etc., in the field. We were taught the use of Brunton and Clinometer compass to note the strike and dip direction of an outcrop; the GPS to locate the Latitude and Longitudes.

Following are the geological features observed during the study tour:

a) On the way to Gokak were shown the Boulder Congomerate which is a unique feature of sedimentary rock (Photo A)

b) **Cascade: A**t Godchinamalki, the water falls on step like sedimentary rocks due to erosion of sandstone/quartzite beds giving rise to cascade type of water fall. The formation of step like feature is mainly due to the joints present in the quartz arenites. Field photo C shows the differential weathering and horizontal beds of sandstone/Quartz arenites, where as Photo D shows the biological weathering mainly by roots of plants.

c) **Free Water Fall at Gokak**: It is thought that, the waterfall has been developed mainly due to faulting of rocks, where the water from River Ghataprabha jumps about 80 ft. The water from the waterfalls is being used for hydroelectric power generation, mainly used for the Gokak Cotton Mills. Here we could see extensive distribution of potholes. These potholes have been interconnected and have been eroded at the water fall (Photo E). The potholes are formed due to the swirling currents of the river using rocks & pebbles as tools developed these. This is an important erosional feature

d) **Meandering, Hogback, mesa, Natural levee (Photo F):** River meandering with natural levee is seen in front of the Gokak falls. The hogback and mesa landforms are clearly seen far off from the water falls.

e) **Yogi Kolla Valley:** The Yogi Kolla (Photo G) is a valley which shows head ward erosion. After climbing about 230 steps, we could reach the cave temple in the hillock. The rocks show horizontal bedding and beautiful joint patterns.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond & Mr. Suraj Mense, of Geology department, for conducting this study tour. We thank our Principal, Prof.A.K.Mense, for allowing us for this study tour.

Description of Field Photographs:

(A); Boulder conglomerate on the way to Gokak. (B); Stratified sedimentary rocks at Godchinmalki falls showing Cascade, (C) Stratification showing differential weathering & joints in rocks at Godchinmalki; (D) Biological weathering; (E) At Gokak water falls, (F) Meandering & levee deposit at Gokak falls; (G) Panormic view of Gokak falls. and (H) Yogi Kolla Valley;

Name:	Class: **B.Sc.I** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	**Mr. Suraj Mense**

FIELD PHOTOGRAPHS

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT OF

GEOLOGICAL STUDY TOUR TO BADAMI

Date of visit Sunday, 1 October 2017

B.Sc. THIRD & FIFTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. III/V Semester with Geology as optional subject has attended the Geological Study Tour to **"Badami"** on 1 October 2017.

Exam Seat No. _____

Date: Head, Dept. of Geology

GSS COLLEGE, DEPARTMENT OF GEOLOGY

GEOLOGICAL STUDY TOUR TO ULAVI CAVES

STUDY TOUR REPORT

Date of visit 8th February 2018

(We started our journey at 8.0 am and returned at 10 pm)

We the B.Sc. II sem students of Geology Department, were taken to Ulavi caves as a part of curriculum. Ulavi is well known for the Channabasaveshwara temple. The place is known for its historical aspects. Geologically the area is well known for Karst topography (limestone caves) and huge rock cliffs. The rock formations are mainly of crystalline limestone with chert/silica bands. There are numerous caves carved out of cracks and chemical weathering due to water action, showing beautiful stalactites and stalagmaites, which is a geologists and speleologists' paradise. We were taken to several of these caves and cliffs made of crystalline limestone. Mahamane Gavi, is located about 8km and is the farthest of the caves in the dense forest. Aakalu Gavi, is one of the famous, the limestone rock cliff here is about 800 ft tall and the cave is situated about 50 ft above the ground (Figure 1), and a ladder is kept to reach the cave. Here, one need to crawl through the narrow mouth of the cave. The beautiful stalactites are observed in this cave. The stalactites look like a cow's mamillary glands (Figure 2). The other cave, Vibhuti Mantapa, is at the ground level with a fairly large entrance, where in Stalagmite and the pillar (joining the stalactite and stalagmite) is seen (Figure 3).

Akka Nagamma cave is situated on the way to Akalgavi, where two entrances one goes steep below the underground, where the other is at shallow level. Here too beautiful stalactites (Figure 4) and beds formed due to leaching are seen.

All these caves show the effect of weathering by plants and water action on limestone.

We were shown sedimentary structures such as bedding, folding, differential weathering, elephant skin weathering (Figure 5), etc and the use of Brunton compass and GPS in the field.

Name:	Class: **B.Sc. III/V Sem** Examination No.:
Signature and Name of the staff: **Dr.P.T.Hanamgond**	
Prof. S.S.Mense	

Field Photographs

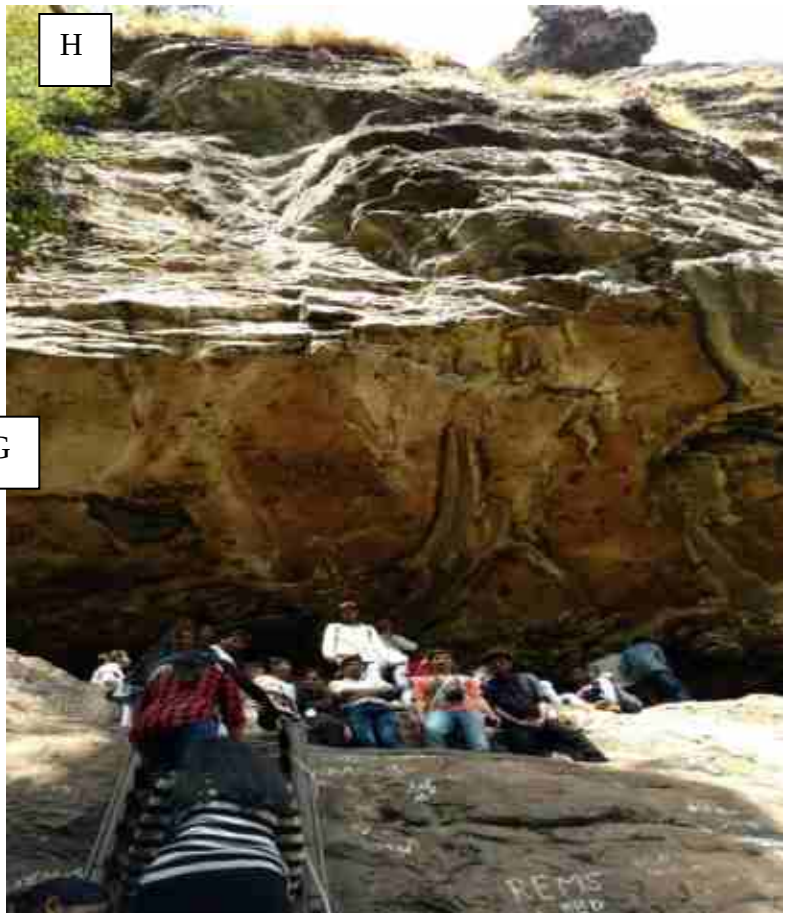
A

B

C

D

H



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SKE SOCIETY'S

G.S.Sc. COLLEGE, BELAGAVI

REPORT OF

GEOLOGICAL STUDY TOUR AROUND JODHPUR-JAISELMER-UDAIPUR AND MT. ABU OF RAJASTHAN

Date of visit from 3rd to 15th January 2017

B.Sc. SIXTH SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELAGAVI

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. VI Semester with Geology as optional subject has attended the Geological Study Tour around **"Jodhpur-Jaiselmer-Udaipur and Mt. Abu of Rajasthan"** from **3rd to 15th January 2017**.

Exam Seat No. _____

Date: Head, Dept. of Geology

GEOLOGICAL STUDY TOUR AROUND JODHPUR-JAISELMER-UDAIPUR AND MT. ABU OF RAJASTHAN

STUDY TOUR REPORT

As a part of curriculum, a study tour to Rajasthan, especially to Jodhpur, Jaisalmer, Udaipur & Mount Abu was conducted. We started our journey from Belgaum by train on 3 Jan, 2017 morning to Jodhpur and returned on 15 Jan, 2017 morning. Following is the details of our study tour.

Jodhpur:

We reached Jodhpur on 4 January 2017. We visited local geological places of interest such as sandstone mines at the outskirt of Jodhpur where in we could see variety of ripple marks (Photo 1), cutting & polishing units (Photo 2); Mehrangarh fort which is built with red sandstone, Ummaidbhavan which is also built by red sandstone.

Jaiselmer:

On 6-7th we visited Jaislmer. We visited Tanot Mata mandir which is located near Indo-pak border. On the way, we trekked on the desert pavements, collected fossiliferous limestone samples (Photo 3); we visited Habur which is famous for red fossiliferous limestone. We visited Sam Dunes (Photo 4) wherein we could see longitudinal dunes, barchan dunes, ripple structures etc. The sand dunes covered a vast area and watching the desert landscape was a wonderful experience. On 7th we visited Kuldhara village ruins and we collected Ammonite (Ammonite/Ceratite, Belemnites) and Brachiopod (Rhynconella) fossils along the Kuldhara River valley (Photo 5),. We visited the famous Fossil Wood Park at Akkal, while returning to Jodhpur (Photos 6). Akkal Fossil woods are thought to be formed about 180 my ago during Jurassic period.

Udaipur:

We reached Udaipur on 8th evening. We visited the Udaipur City Palace and some Jain temples built by marble and sandstone. We visited Geology Department of MS University, Udaipur. We could see the Geology Museum which has vast collection of rocks, minerals, gemstones and fossils (Photo 7).

Ranakpur:

On 10th we visited the wonderful Ranakpur Jain temple built with marble. The temple is known for its delicate and carving and architect grandeur and fine art (Photo 8). On our way back we visited the Kumbhalgarh Fort, one of the longest fort walls in India. On the way we could see variety of dykes, quartz and feldspar veins (Photos 9-12).

Mount abu

On 12th we started our journey to Mt.Abu. On the way to Mt.Abu, we could see many geological structures (fold, dykes, multiple intrusions etc) along the road

cuttings. Mt. Abu is a part of the Aravalli hill ranges located in Sirohi district, is situated at 1290 meters above mean sea level, with a plateau of 16 km in length and 3 – 6 km in width. The Gurushikhar is the highest hillock in this range raging about 5653 km above msl. The rocks of this hill range are mainly, quartzite, greenstone schist, mica schist, gneiss, limestone, marble etc. The serpentine elevating road leading to Mt. Abu, shows high peaks of gneissic and schist rocks.

The huge batholith of Mt. Abu is almost entirely composed of Erinpura Granite (Coulson, 1933). The massif of Mt. Abu is long and narrow and is parallel to the tectonic axis of the Aravali Mountains, which trend NNE-SSW. The granite occurring in this vicinity is a grey colored, coarse grained and shows well marked foliation. However, according to Coulson (1933), it is hornblende gneiss. The rock consists of microcline quartz, plagioclase and biotite. The grey granite gradually grades into pink granite-gneiss from Abu Bazar to sunset point. The micaceous minerals from these rocks have been weathered chemically forming many caves in this area (Photo 13).

We had an opportunity to learn the physiographic of the region along the way like valleys, gorges, weathering effects, spurs, drainage patterns, multiple intrusions, mega joints, chemical leaching/erosion effects leading to rock undercutting forming caves of various sizes. At places, the road protection walls for landslides have been built with warning signboards.

Around Mt. Abu, we visited the famous Nakki Lake (Photo 14), the world famous Dilwara Jain Temples known for their excellent, delicately carved architecture in marble, which are of 11^{th} and 12^{th} centuries rightly been called “a dream in Marble”. Dilwara temples are a composite cluster of 5 temples. The rocks around Dilwara are made up of grey colored augen gneiss. Large augens of K-felspar, are seen set between biotitic bands which wrap around these augens.

We also visited Achalgarh, well known for fort and Achaleshwar temple situated at 4000 ft. high above msl. This is further north from Dilwara. The augen-gneissic rocks grade into a coarse granite which eventually pass into a fine grained massive granite with blue quartz.

Further north, we visited Guru Shikhar, the loftiest peak of Mt. Abu, is about 15 Km. from Mt. Abu. The place is known for Guru Dattatreya and his footprints are sanctified here in a rock cave. This hill consists of porphyroblastic granite with large anhedral porphyroblasts of perthite set in a finer matrix consisting of quartz and felspars. The geological significance of this hill range is that, according to M.S.Krishnan (1982), Aravallis are thought to constitute a true tectonic range.

An effort was also made to identify the important features on land using google earth images; the same have been enclosed separately as pages 7-9.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond, Head; and Prof. Suraj Mense of Geology department, for conducting this study tour. We also thank Prof.A.K.Mense, Principal, for allowing us for this study tour.

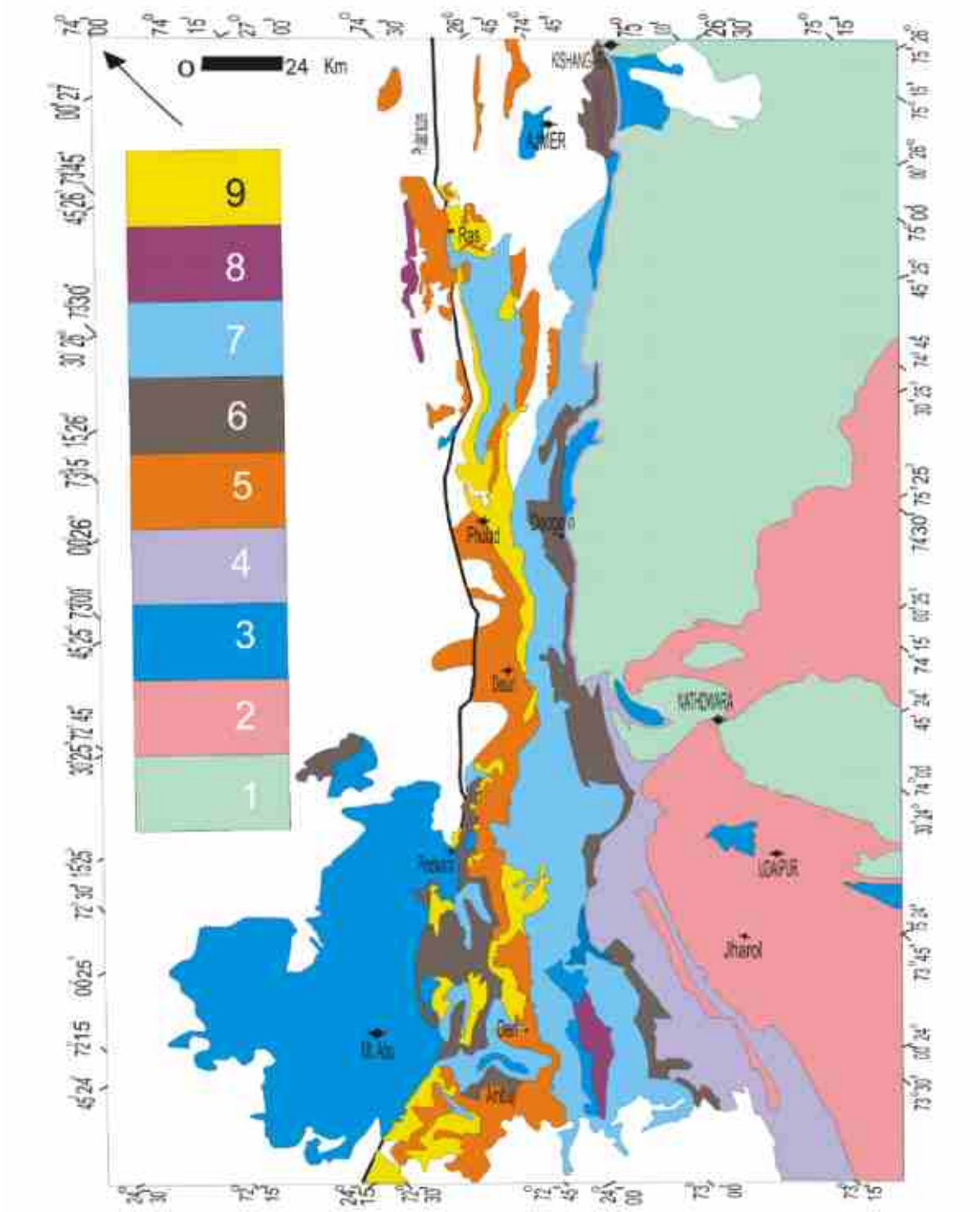
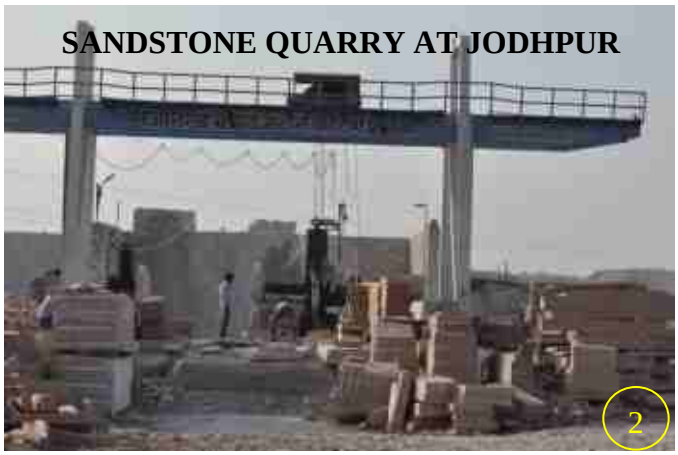
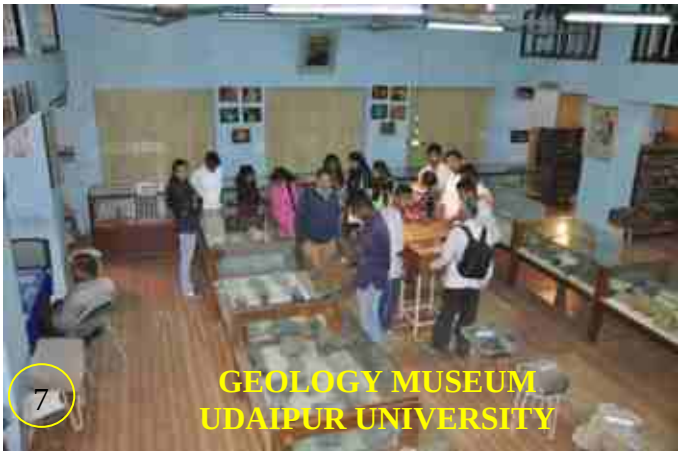


Figure 1. Geological map of Aravalli mountain range (After Sychanthavong and Merh, 1984). 1 – Banded Gneissic Complex; 2 – Aravalli Supergroup; 3- Pre and post Delhi Granites; 4- Gogunda Group; 5- Kumbhalgarh Pelitic Gneisses and Granulites; 6- Kumbalgarh Pelitic Gneisses and Schist; 7- Kumbalgarh Calc Gneiss; 8 – Kumbalgarh marbles; and 9 – Phulad Ophiolite

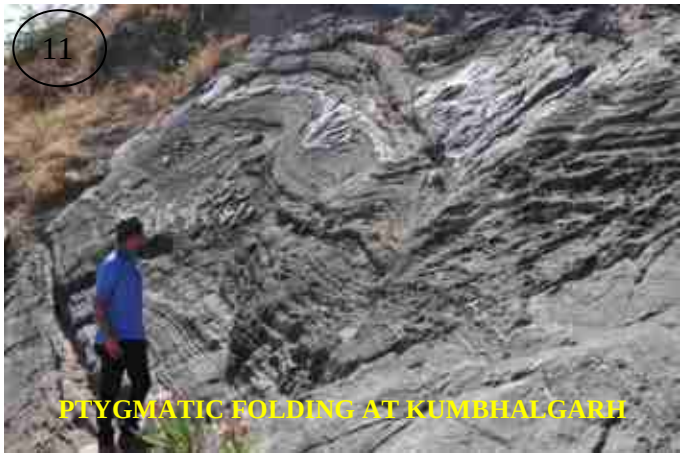
Field Photographs



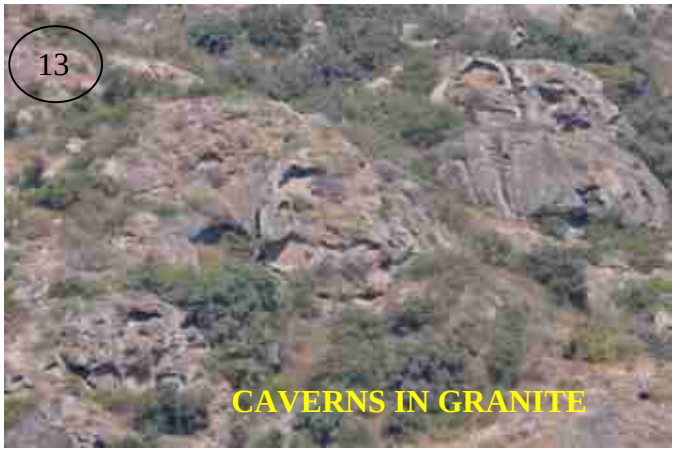



FIELD OBSERVATION ON WAY
TO RANKAPUR
9


10
DYKE SHOWING LADDER VEINS


11
PTYGMATIC FOLDING AT KUMBHALGARH


12
PEGMATITE INTRUSION


13
CAVERNS IN GRANITE


NAKKI LAKE MT. ABU
14

JAISELMER SATELLITE PICTURES WITH GROUND TRUTH SIGNATURES

SAM DUNES: GOOGLE EARTH

JAISELMER FORT: GOOGLE EARTH

JAISELMER FORT: GOOGLE EARTH

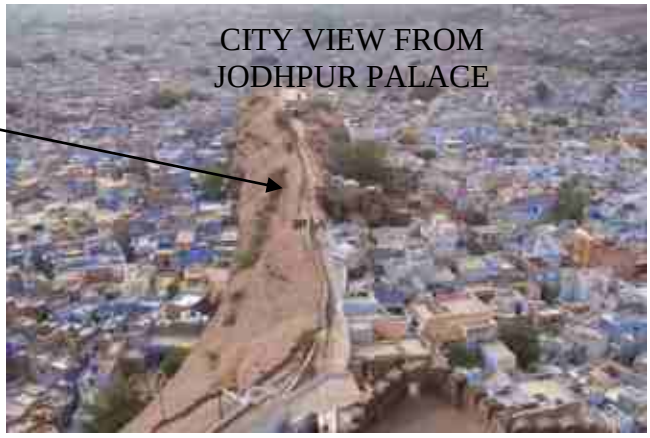
KUMBHALGARH AND UDAIPUR SATELLITE PICTURES WITH GROUND TRUTH SIGNATURES

KUMBHALGARH FORT: GOOGLE EARTH

UDAIPUR PICHORA LAKE: GOOGLE EARTH

JODHPUR SATELLITE PICTURES WITH GROUND TRUTH SIGNATURES

MEHRANGARH FORT HILL: GOOGLE EARTH



UMMAID BHAVAN: GOOGLE EARTH

Name:	Class: **B.Sc. VI Sem** Examination No.:
Signature and Name of the staff: **Dr.P.T.Hanamgond**	
Prof. S.S. Mense	

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

REPORT OF

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

Date of visit 03 August 2016

B.Sc. FIRSTSEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. I Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological Study Tour To Godchinamalki And Gokak Falls"** on **03 August 2016**.

Exam Seat No. _____

Head, Dept. of Geology

SKE Society's GSSc Degree College,
DEPARTMENT OF GEOLOGY

GEOLOGICAL STUDY TOUR TO GODCHINAMALKI AND GOKAK FALLS

REPORT

Date of visit 03 August 2016

We the B.Sc.I students of Geology Department visited Godchinamalki, Gokak Falls and Yogi Kolla as a part of curriculum. We started our journey on 03 August 2016 morning and returned on the same day evening.

Geological Background of the Area:

The geology of the area is quite well known World over for the **Proterozoic** sedimentary basins popularly known as "**Kaladgi Formation**". These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village "**Kaladgi**" now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity "The Great Eparchaean Unconformity" typically exposed near "Yellamma Gudda". The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy:

Upper	Shales, Limestones and Haematite Schists Quartz-arenites, local Conglomerates & Breccia
Lower	Limestones, Clays and Shales, Siliceous Limestones and Hornstone Breccia Quartz-arenite, Conglomerate & Sandstones.

The Kaladgi has now been accorded a supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group.

Geological structures seen during the field study

We were taught the Geological action of River and various features such as water falls, cascade, potholes, meandering, joints, hogback, mesa, natural levee etc. We were shown the sedimentary rocks conglomerate & breccias, graded bedding, stratification etc., in the field. We were taught the use of Brunton and Clinometer compass to note the strike and dip direction of an outcrop; the GPS to locate the Latitude and Longitudes.

Following are the geological features observed during the study tour:

- **a)** On the way to Gokak were shown the Boulder Congomerate which is a unique feature of sedimentary rock (Photo A)
- **b)** **Cascade: A**t Godchinamalki, the water falls on step like sedimentary rocks due to erosion of sandstone/quartzite beds giving rise to cascade type of water fall. The formation of step like feature is mainly due to the joints present in the quartz arenites. Field photo C shows the differential weathering and horizontal beds of sandstone/Quartz arenites, where as Photo D shows the biological weathering mainly by roots of plants.

- **c)** **Free Water Fall at Gokak**: It is thought that, the waterfall has been developed mainly due to faulting of rocks, where the water from River Ghataprabha jumps about 80 ft. The water from the waterfalls is being used for hydroelectric power generation, mainly used for the Gokak Cotton Mills. Here we could see extensive distribution of potholes. These potholes have been interconnected and have been eroded at the water fall (Photo E). The potholes are formed due to the swirling currents of the river using rocks & pebbles as tools developed these. This is an important erosional feature

- **d)** **Meandering, Hogback, mesa, Natural levee (Photo F):** River meandering with natural levee is seen in front of the Gokak falls. The hogback and mesa landforms are clearly seen far off from the water falls.

- **e)** **Yogi Kolla Valley:** The Yogi Kolla (Photo G) is a valley which shows head ward erosion. After climbing about 150 steps, we could reach the cave temple in the hillock. The rocks show horizontal bedding and beautiful joint patterns.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond & Mr. Yogesh Kutre, of Geology department, for conducting this study tour. We thank our Principal, Prof.A.K.Mense, for allowing us for this study tour.

Description of Field Photographs:

(A); Boulder conglomerate on the way to Gokak. (B); Stratified sedimentary rocks at Godchinmalki falls showing Cascade, (C) Stratification showing differential weathering & joints in rocks at Godchinmalki; (D) Biological weathering; (E) At Gokak water falls, (F) Meandering & levee deposit at Gokak falls; (G) Panormic view of Gokak falls. and (H) Yogi Kolla Valley;

Name:	Class: **B.Sc.I** Examination No.
Signature and Name of the staff: Dr.P.T.Hanamgond	 Mr.Yogesh Kutre

FIELD PHOTOGRAPHS

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G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR AROUND KARWAR-ANKOLA & YANA

Date of visit **19-20th March 2015**

B.Sc. IV SEMESTER
GEOLOGY (OPTIONAL)

SKE SOCIETY'S

G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. IV Semester with Geology as optional subject has attended the Geological Study Tour to **"GEOLOGICAL STUDY TOUR AROUND KARWAR –ANKOLA & YANA"** on 19-20th March 2015.

Exam Seat No. _____

Date: Head, Dept. of Geology

GEOLOGICAL STUDY TOUR REPORT
Places of visit: Karwar-Ankola and Yana

Date of Journey: 19th March to 20th March 2015.

Geological study tour was conducted for B.Sc.IV students for three days on dates mentioned above. We visited to Karwar-Ankola and Yana to study the geological features.

On first day 19th we visited Karwar. At Karwar, we were taken to show the coastal landforms such as beach, estuary/river mouth, headland, island, tombolo, spit, bars, wave action, longshore currents etc. We were explained in brief the coastal processes operating along the beaches. At Nadibag beach, we were shown the Dolerite dyke the discordant intrusions as well as small scale intrusion with sill – the concordant intrusions. We were also shown and explained the occurrence of boudinage structures which are eye-like features of quartz and feldspars occurring in a line along the granitic-gniess foliation. We were also shown 'A large isoclinal fold apart from many small scale folds. There are many ptygmatic fold structures too.

At Belekeri beach, we could see an igneous intrusion, pegmatite intrusion with a clear cut contact with Granitic-gniess. The granitic gneiss also shows spheroidal weathering.

At Karwar, near Binaga, on the road cut, we could see xenoliths and an igneous intrusion (dyke).

Geological Setting of the study area:

The coast of Uttara Kannada is bounded by Western Ghats on the east, which exhibit deep winding valleys, waving wooded hills, high peaks etc., and by Arabian sea in the west. The topography is in general hilly and wooded with broken and irregular hills averaging 600-700 m above sea level. Deep or wide mouthed bays & estuaries break the coast. It is varied and scenic with rocky Islands and capes, stretches of palm-fringed sandy beaches, which enclose between rocky headlands or knobs.

The coast presents a narrow strip of hinterland between the seashore and the Western Ghats, which varies between 5 to 20 km. It scarcely exists towards Karwar since the mountains dip in to the sea with scenic bays & Islands offshore. The

hinterland area is normally plain & is covered with sandy soil and usually under cultivation.

Based on the distinct landscapes, the coastal stretch of Uttara Kannada district has been classified into two physiographic units, the high lands and the narrow lowlands(Gazetteer of India, 1985).

The coastal tract of Karnataka is characterized by Precambrian crystalline rocks (Granites, Granitic gneisses and Schists), laterites & basic dykes. The rocks of the Uttara Kannada district form part of the Chitradurga group of Dharwar supergroup comprising metasediments and metavolcanics together with manganese and limestone formations, all of which overlie the basement migmatites and associated granitoids.

Geology of the Uttara Kannada district comprises of gneisses and granites with Dharwarian rocks like schists and amphibolites as older metamorphics within them. Other rock types present are, orthoquartzites, manganiferous chert and argillites, banded magnetite/haematite quartzite, limestone & dolomites, greywackes, laterites and basic dykes.

Granitic gneisses/granites cover major portion of the coastal tract, which is northwestern coastal continuation of peninsular gneisses or northern continuation of south canara gneisses/granites. The gneisses form prominent hills & headlands along the coast. The granites however are present as patches within gneisses. The granites/granitic gneisses of Karwar area are surrounded on the northeast by the rocks of Chitradurga group and on the south east by hornblende schist (Gupta et al, 1988). These granites/granitic gneisses at places near the coast have undergone chemical weathering giving rise to the conspicuous laterite deposits, well exposed in the southern part of the area.

Stratigraphic position	**Rock formation**	**Age values determined for the corresponding rock formation in South Kanara Precambrian block (after Balasubramanian,1978).**
Subrecent to recent	Sands/Soils	---
Tertiary (?)	Laterites	---
Middle Cddapahs	Dolerites	2.2 b.y.K-Ar age obtained for the younger ENE striking set of dolerites
Archaeans	Granites Gneiss	2.6 b.y.Rb-Sr age obtained for Karnara granites 3.2-3.6 b.y.K-Ar, Rb-Sr and Pb-Pb age obtained for Kanara Gneiss.
Older Metamorphics	1) Orthoamphibolites 2) Schists	Not dated but from field relation these are older. 3.2-3.6 b.y.

Next day, on 20th we were taken to Yana located about 45 km from Ankola, known for its gigantic cliffs with cocks comb peaks. It is located amongst the evergreen forest of the Sahyadri Mountains. It is reported that, Dr. Francis Buchan a British official, discovered Yana in 1801 while surveying the area on behalf of The East India Company (http://www.kamat.com/kalranga/kar/yana.htm). Locally known as The Bhairaveshwara Shikhara and the Mohini Shikhara or peaks. These unique rock formations have made Yana a popular destination for pilgrims, trekkers, geologists and nature lovers. In the bhairaveshwara shikhara, water seeps from the cracks and trickles from the erosional groves carved naurally, which faintly resembles a hood of cobra, and falls on a slight bulged rock below (projected as Shivalinga). These rock cliffs are formed by crystalline limestone. We were shown erosional features in limestone such as elephant skin weathering, solution cavities, erosional grooves, pinnacles, cocks comb structures etc.

Acknowledgements: We are grateful to Dr.P.T.Hanamgond and Miss.Manisha Dhuri, for conducting this study tour. We thank our Principal, for allowing us for this study tour.

Name:	Class: **B.Sc.IV Sem** Examination No.
Signature and Name of the staff: **Dr.P.T.Hanamgond**	**Miss. Manisha Dhuri**

DESCRIPTIONS OF FIELD PHOTOGRAPHS:

KARWAR-ANKOLA: 1) Sill at Nadibag 2) Fold structure at Nadibag 3) Dyke showing contact with granitic gneiss, at Belekeri. 4) Ptygmatic folding at Nadibag, 5) Isoclinal Fold at Nadibag, 6) Igneous intrusion (dyke) at Nadibag, and 7) Xenoliths at road cut near Binaga.

YANA: 8) Mohinishikara peak, 9 & 12) Bhairaveshwara peak showing effect of water and cocks comb structure, 10) Bhairaveshwara peak, 11) Elephant skin weathering, 13) Effect of water on Bhairaveshwara peak.

FIELD PHOTOGRAPHS
KARWAR - ANKOLA

FIELD PHOTOGRAPHS
YANA

SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

REPORT

GEOLOGICAL STUDY TOUR TO AN OPEN CAST LIMESTONE MINE IN BAGALKOT

Date of visit 12th October 2013

B.Sc. THIRD SEMESTER

GEOLOGY (OPTIONAL)

SKE SOCIETY'S
G.S.Sc. COLLEGE, BELGAUM

Department of Geology

CERTIFICATE

This is to certify that Mr/Miss._____ of B.Sc. III Semester with Geology as optional subject has attended the Geological Study Tour to **"Geological study tour to open cast Limestone mines in Lokapur"** on 11th September 2015.

Exam Seat No. _____

Date: Head, Dept. of Geology

LOCATION AND ACCESSIBILITY

Lokapur in Bagalkot district is an important commercial centre for Limestone and Dolomite minerals. The National highway 13 from Hubli to Sholapur passes 10 Km. west of Bagalkot. Recently the railway route from Sholapur to Hubli has been converted to broad gauge too.

PHYSICAL FEATURES AND CLIMATE

It is learnt from the Miines and Geology Department reports that the area is a plain ground with general northerly slope. There are two parallel chains of bold ridges running in WNW-ESE direction on either side of Raichur Belgaum State highway. These ridges are comprised of low mounds with an average attitude of (1800' N 600 M) above M.S.L. The tallest mound of 2000' is situated NW of Bagalkot town. There are number of small seasonal streams draining into Ghataprabha river which flows E- W due north of Bagalkot town.

The vegetation in the area is not very conspicuous due to dry climate. The region is under arid and semi arid zone. The months of March to May are the hottest. This is followed by SW monsoon from the mid June to the end of September. December is the coldest period reading the lowest temperature drop of 14.8^0 C. The highest temperature recorded is 43°C. The average annual rainfall is 570 MM.

The region is spread over by medium and deep black soil and red sandy soil derived from sandstones and shales. The average soil thickness is 1 to 1.5 mts.

It is reported that, the pioneering survey for limestones was conducted by Capt. Newbold in 1842- 45 in the Kaladagi basin.

GEOLOGY OF THE AREA

The geology of the area is quite well known World over for the Proterozoic sedimentary basins popularly known as “Kaladgi Formation”. These rocks are deposited in an extensive basin (including the areas of Belgaum, Dharwad, Bijapur, Bidar & Gulbarga districts) below sea level. The rocks are succeeding the Archaean rocks. The rocks are named after the village “Kaladgi” now in Bagalkot district. The Kaladgi rocks are separated from the underlying schistose and Granitic rocks of Archaean age by a profound unconformity “The Great Eparchaean Unconformity” typically exposed near “Yellamma Gudda”. The Kaladgi rocks are least disturbed shallow marine sediments. These rock formations are covered by the Deccan Volcanic rocks in the northern part, which are of much younger period. The basin is believed to extend in a NW direction about 40-50 miles. The basin extends EW for nearly 500 km and is hidden beneath the Deccan Traps. The basin is located in the northern part of the Dharwar Craton, Karnataka. The principal rock types include- orthoquartzite, argillite, carbonates (including limestone & dolomite).

Stratigraphy: The Kaladgi has now been accorded a supergroup status consisting of a lower group for which the name Bagalkot Group has been given. The upper sequence is designated as the Badami Group. Following is the details of Bagalkot group.

BAGALKOT GROUP	Badami Group(285)	Katageri Limestone (150) Kerur Arenite (135)	Limestone, shale Conglomerate, arenite, shale
	Angular Unconformity		
	Intrusives: Quartz veins, pegmatite, dolerite dykes		
	Simikeri Subgroup (1150)	Hosakatti Argillite(700) Arlikatti Dlolmite (130) Niralkerr Breccia (40) Kundargi Quartzite (280)	Argillite Dolomite, hematite bed Chert Breccia Conglomerate, quartzite, argillite
	Disconformity		
	Lokapur Sub-group (2750)	Yadahalli Argillite (60) Muddapur dolomite (5650 Chikshillikeri Limestone (800) Yargatti Argillitte (720) Mahakut Breccia (130) Saundatti Quartzite (475)	Argillite Dolomite,Limestone,argillite Limestone,shale Argillite,dolomite Chert breccias Conglomerate, quartz, shale
	Nonconformity and angular Conformity		
	Gneisses/Granites and Schist Belts of Dharwar craton		

DISCRIPTION OF ROCK UNITS

The megascopic charecters and mode of occurrence of different rock types encountered in the field are as follows:

Laterites: Along the highway, the laterites were observed, occuring as isolated hill caps representing the youngest among the succession, overlying the Kaladagi's. These laterites are ferruginous porous and highly altered formations owing to residual weathering. The extent of outcrops is less conspicuous.

Quartzites: The Quartzites occurs as prominent and well demarcated outcrops. These Quartzites range from pale gray to pinkish colored hard and compact coarse grained, highly jointed trending WNW-ESE with general southerly dip ranging from 50°-65°.

Conglomerates: The basal conglomerates lie immediately below Quartzites indicating a break in deposition. The siliceous matrix encloses ferruginous quartz pebbles, which are oval to sub oval shaped ranging in size from few centimeters to 2.3 inches.

High Calcium Limestone: Bluish Crystalline limestones occur parallel to the quartzites underlying conglomerate beds. These are of two types viz. bluish to bluish gray high calcium limestones and variegated limestone of various colors of bluish gray, green and pale pink linear bands. The general trend of the formation is similar to quartzites with southerly dip ranging from 35° to 65°. At places the trend changes to NNW-SSE with easterly dip of 15° to 20° signifying folded nature.

Dolomites: The dolomite occurrences are not very extensive but appear as isolated and scattered outcrops of varying dimensions associated with high calcium limestones. The bands are linear

and pale gray to ash gray hard and compact with typical elephant skin weathered outer surface. The trend is also variable due to flexibility resulting in folding and contortion into arcs. The general trend of the formation is WNW-ESE with low angle Easterly dip. The major joints are disposed at right angles to the strike direction.

Lime Kankar: Extensive Kankar deposits are not frequently seen in the area, however visible patches of Kankar are observed about 4 Km. north of Gaddanakere cross on Hubli-Sholapur roadside, south of Yedehalli village and around Kaladagi village.

Under the guidance of Shri. Narasimhamurthy, Mine Manager, Bagalkot, we visited two open cast mines (Photos A), wherein we were enlightened with mining types, mine planning, resource estimation, aforestation, benches, bench width, core drilling, blasting, ore transportation etc.

During the field visit we could observe various geological features such as weathering effect on dolomites giving rise to elephant skin weathering (Photo B), fold structures (Photo C & D), Stratification and dipping beds (E), leaching/dissolution effect and cave formation (F), and also learnt the drilling and grading techniques (G & H).

Acknowledgements:

We are grateful to Dr.P.T.Hanamgond & Miss. Manisha Dhuri of Geology department, for conducting this study tour. We thank Shri. G.S.Narasimhamurthy, Mine Manager, Bagalkot, for explaining us the mining techniques. We thank our Principal Prof.A.K.Mense, for allowing us to this study tour.

Reference

M.S.Anand, R.Srinivasiah and B.S.N.Shetty, 1999. Investigation for Limestone Dolomites in the Submersion Zone from Bagalkot to Kaladgi, Bagalkot District (Field Session 1980-81), Dept of Mines and Geology, Bangalore, No.310, 12p.

Name:	Class: **B.Sc. III Semester**
Examination No.:	
Signature and Name of the staff:	Dr.P.T.Hanamgond Miss.Manisha Dhuri

FIELD PHOTOGRAPHS

Description of field photos: 1. Quarry of Argillaceous rocks; 2. Panoramic view of the Limestone open cast mine at Shellikeri; 3. Drag fold structure of quartz vein; 4. Syncline fold structure at Shellikeri Limestone mine; 5. Dissolution structure in limestone; 6. Ferrugenous leaching along bedding plane; 7. Core drilling in the mine; and 8. Banded Hematite Quartzite (BHQ) outcrop near Deshnur.