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LABORATORY CERTIFICATE

This is to certify that Mr. /Ms. Dixita Shivanand Venqurlekar has satisfactorily completed the course of practical for M.Sc in Applied Geology.

Experiments conducted are pertaining to paper AGTC-408 Geological field mapping

Practicals prescribed by the University for M.Sc Part I class, during the academic year 2022-2023

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REPORT ON THE GEOLOGICAL MAPPING AND FIELDWORK STUDIES CARRIED OUT IN AND AROUND BAGALKOT, KARNATAKA.

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CLASS:- MSc Applied Geology ||

PAPER:- AGTC – 408 Geological Field Mapping

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INTRODUCTION

The late Archaean period is marked by intense crustal growth with voluminous intrusion of juvenile and intracrustal granites (Taylor and McLennan, 1985; McLennan and Taylor, 1991; Arndt, 2004). This has brought to a fundamental change in the composition of upper continental crust. The post Archaean upper continental crust became more enriched in LIL and REE elements with depletion of Cr, Ni and Sc (Taylor and McLennan, 1985; McLennan and Taylor, 1991; Hemming et al. 2006). Also large part of the continental crust became stable during the onset of Proterozoic era which facilitated intense chemical weathering of the continental crust. The huge pile of sediments, especially the shales, deposited in the Proterozoic cratonic basins world over form natural samples to study the change in continental crustal composition as well as surface processes operated during a large and important period of the Earth's history During the Proterozoic widespread deposition of cratonic sediments also took place in different independent cratonic basins over the Indian Peninsular shield (Kale and Phansalkar, 1991). Sediments deposited in these basins mostly range in age from Late Palaeoproterozoic to Neoproterozoic (Kale and Phansalkar, 1991; Bhaskar Rao et al. 1995; Anand et al. 2003) which occur over the Archaean basement with a prominent angular unconformity (the Eparchaean Unconformity). In case of Dharwar craton (DC), early Palaeoproterozoic (2.5-2.0 Ga) sediments are not documented. So, intense weathering and erosion of a huge thickness of the upper continental crust with repeated recycling must have operated during this period in the DC. The Proterozoic Kaladgi Supergroup occupies the intracratonic Kaladgi-Badami basin and extends over an area of about 8300 sq km in the northern part of the DC with an estimated 4500 m thick column of sediments (Jayaprakash et al. 1987) (Fig. 1). Geological Setting: The Kaladgi Supergroup comprises of cyclic sequence of mainly arenites, shales and carbonates deposited in shallow marine cratonic environment (Vishwanathaiah, 1977; Jayaprakash et al. 1987; Sathyanarayana, 1994; Kale et al. 1996). The Supergroup is divided into Bagalkot and Badami Groups (Table 1). Broadly three cycles of sedimentation are recognized within the Supergroup, represented by the Lokapur and Simikeri Subgroups, and the Badami Group. Each cycle starts with conglomerate and arenite followed by alternate intercalations of shales and carbonates. The basement for the Bagalkot Group comprises of Archaean Peninsular Gneiss, greenstone belts (HungundKushtagi and Dharwar) and Closepet Granite (Fig. 1).

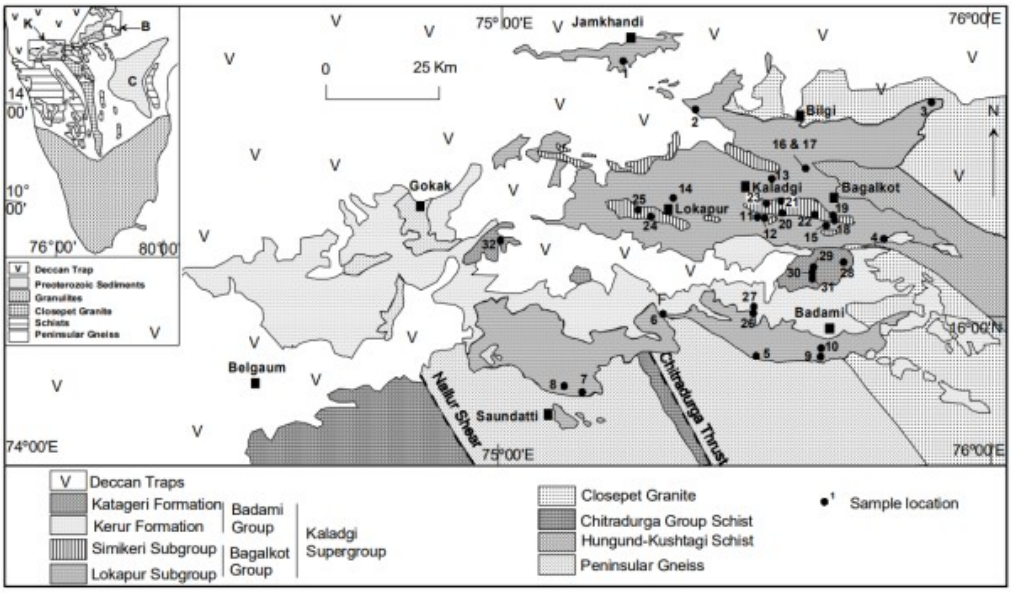


Fig.1. Geological map of the Kaladgi-Badami basin (modified after Jayaprakash et al. 1987). The inset map shows simplified geological map of the Dharwar craton. C, Cuddapah Basin; B, Bhima Basin; K, Kaladgi-Badami Basin.

The Hungund-Kushtagi schist belt is dominated by metabasalts with subordinate felsic volcanics (adakites), meta-ultramafics and metasediments (Naqvi et al. 2006). The Dharwar belt is dominated by Chitradurga Group metagreywackes, metapelites and metabasalts. The Closepet Granite consists of K- and LILE-enriched granodiorites (sanukitoids) and granites (Jayananda et al. 1995; Dey et al. 2003; Dey, 2006). The Badami Group is deposited after the deformation and upliftment of the Bagalkot Group. This younger Group comprises of undeformed horizontal to gently dipping sediments resting with an angular unconformity over the Bagalkot Group as well as the Archaean basement. The source of the Bagalkot Group is the NNW-SSE trending Archaean granitoids and schists encircling the Basin (Fig. 1), as evidenced from the centripetal palaeocurrent directions (George, 1999). Along the northern margin, the basal Salgundi Conglomerate and Saundatti Quartzite contain profuse fresh detrital potassic feldspar derived from a restricted, less weathered K-rich granitic source (Dey, 2006; Dey et al. 2008). In contrast, along the southern margin these members are more mature (quartzrich) derived from a peneplained, highly weathered mixed source consisting of gneisses, granites and schists. The Muchkundi Quartzite, occurring up in the succession, is highly mature and indicates severe weathering of the source (Dey, 2006). The Badami Group is formed by erosion of both the Archaean basement and the Bagalkot Group.

Table 1. Lithostratigraphy of the Kaladgi Supergroup (*after* Jayaprakash et. al. 1987)

	Group	Subgroup	Formation	Member	Thickness (m)
KALADGI SUPERGROUP	Badami Group		Katageri Formation	Konkankoppa Limestone	85
				Halkurki Shale	67
			Kerur Formation	Belikhindi Arenite	39
				Halgeri Shale	3
				Cave-Temple Arenite	89
				Kendur Conglomerate	3
			Angular Unconformity		
		Simikeri Subgroup	Hoskatti Formation	Mallapur Intrusives	7
				Dadanhatti Argillte	695
			Arlikatti Formation	Lakshanhatti Dolomite	87
				Kerkalmatti Haematite Schist	42
				Niralkeri Chert-breccia	39
			Kundargi Formation	Govindkoppa Argillite	80
				Muchkundi Quartzite	182
				Bevinmatti Conglomerate	15
			Disconformity		
	Bagalkot Group	Lokapur Subgroup	Yadahalli Formation	Argillite	58
			Muddapur Formation	Bamanbudni Dolomite	402
				Petlur Limestone	121
				Jalikatti Argillite	43
			Yendigeri Formation	Nagnapur Dolomite	93
				Chikshellikeri Limestone	883
				Hebbal Argillite	166
			Yargatti Formation	Chitrabhanukot Dolomite	218
				Muttalgeri Argillite	502
				Mahakut Chert-breccia	133
			Ramdurg Formation	Manoli Argillite	61
				Saundatti Quartzite	383
				Salgundi Conglomerate	31
			Nonconformity		

Peninsular Gneiss, Hungund-Kushtagi schists, Chitradurga Group schists and Closepet Granite

FIELD OBSERVATIONS

DAY 1: 10 DECEMBER 2022

SPOT 1

LOCATION:- Karadiguddi, ~ 20 km from Belgaum, Samara Bagalkot road nearly 800m above MSL

LATLONGS:- N15°52'55'' E74°41'42''

This traverse is a section exposed on the side of the Samra – Bagalkot road, ~20 Km from Belgaum. These rubbly exposures are partly covered by shrubs in the south of the road, while in the north is open grassland.

The rock exposed was Bevinmatti conglomerate of Simikeri Subgroup of Bagalkot Group. Rocks exposed at lower elevation had clasts of 1.5 cm in size which was matrix supported and had a ferruginous matrix. Clasts had composition of quartz; clasts were angular as well as spherical. They had non uniform layering which had 2 cm, 4 cm, 5cm matrix. Therefore it is Para conglomerate. As we climbed higher, we could see ferruginous and siliceous matrix bands this is because of variation in climate during deposition. Rocks which were at higher elevation had larger clast size which was 3 cm. it was clast supported and composition of matrix was siliceous and mineralogy of clast were Quartz.

STRUCTURAL DATA

TREND OF THE RIDGE(°)
N120

FIG 1: BEVINMATTI CONGLOMERATE SHOWING FERRUGINOUS MATRIX

FIG 2: BEVINMATTI CONGLOMERATE SHOWING BANDS OF CLASTS

LOCATION:- This area is situated 1 KM away from Spot 1

LATLONGS:- N15°52’49’’ E 74°41’17’’

The rock exposed here was showing bulbous kind of structure which are spheroidal weathering by exfoliation. There were vesicles in them. Rock exposed was Deccan type of Basalt. Since the rock was fine grained minerals cannot be identified.

FIG 3 AND FIG 4: BASALT SHOWING SPHEROIDAL WEATHRING

DAY 2:- 11 DECEMBER 2022

SPOT 1

LOCATION:- Kamethgi (village before Ramthal)

LATLONGS:- N16°5’31’’ E75°52’6’’

Rocks exposes here are belong to Hungund Schist belt which is basement of Kaladgi Basin. It is made up of meta volcanics with ultramafics which have been metamorphosed. Metasediments with acid volcanics and greywackes with BIF. Rocks have alternate bands of light and dark colour minerals therefore BHQ. Conglomerate with BIF clasts. Clasts were 9cm in width and 3.5 cm in length. On BHQ we could see some microfolds and also chevron folds with one layer of Class 3-fold. Crenulation hinges defining lineation.

Then there was exposure of phyllite which was chipped dipping towards NE and were steeply dipping.

Structural data

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N130	SW	N120
N161	SW	N38
N133	SW	N76
N155	SW	N40

There was an Intrafoliated fold which was showing two events of folding S_N (intrafoliated fold) S_{N+1}(continuous folding). Both were parallel to each other.

We climbed 600m elevation here conglomerate clasts showed imbrication(Salgundi Conglomerate).

Then from walking distance close to the highway road there was two road cut section exposure both were facing on the sides of the road which were showing the cross bedding and had composition ferruginous Quartzite, were moderately dipping and was trending in N36°

FIG 5: CONGLOMERATE SHOWING BIF CLASTS

FIG 6: BHQ SHOWING TWO EVENTS OF FOLDING

FIG 7: CHIPPED PHYLLITE

FIG 8: FERRUGINOUS QUARTZITE SHOWING CROSS BEDDING

SPOT 2:

LOCATION:- Ramthal, near roadside

LATLONGS : N 16°4’53’’ E 75°52’29’’

We saw weathered exposure of amorphous $CaCO_3$, chlorite, epidote, (convert to feldspar in dry formation), smoky quartz

FIG 9: CALICHE DEPOSIT

SPOT 3

LOCATION: 1 km from spot 2, along the roadside.

LATLONGS: N16.0808321° E75.8684231°

Rocks exposed were alternating BHQ and Phyllite which was shallow or steeply dipping.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP (°)
N130	NE	N84
N325	NE	N76
N326	NE	N80
N338	NE	N80
N332	NE	N86

FIG 10: INTRAFOLIAL FOLDS OF BHQ

FIG 11: INTAFOLIAL FOLD OF PHYLLITE

DAY 3: 12 DECEMBER 2022

SPOT 1

LOCATION:- Markundi

LATLONGS:- N 15°44’23’’ E75°22’28’’

The exposed rock here is metamorphic phyllite intercalated with BIF. The rock is foliated in which the minerals have aligned and arranged themselves very well. There is broad wrap in the foliation, strike is changing and the dip is varying by < 90°. The foliation is penetrative in nature. Quartz veins are present which shows parallel relationship to foliation, foliation is plane of weaknesses. It was easier foe quartz vein to intrude into this weakly metamorphosed rock. The intrusion is synchronous with deformation of rock.

STRACTURAL DATA:-

STRIKE DIRECTION	DIP DIRECTION	AMOUNT OF DIP
N160°	SW	76°
N168°	SW	85°
N148°	SW	79°
N150°	SW	76°
N152°	SW	70°

FIG 12: PHYLLITIC OUTCROP SHOWING WARPING IN ROCK

FIG 13: PHYLLITIC ROCK SHOWING INTRUSION OF QUARTZ VEIN

FIG 14: PHYLLITE SHOWING FOLIATION

FIG 15: ANGULAR UNCONFIRMITY

SPOT 2

LOCATION:- Markundi near Bharuka power plant cooperation limited

LATLONGS:- N15°44’23’’ E75°22’28’’

The outcrop exposed near the powerplant consist of numerous sets of joints. The rock exposed is Fe sandstone turns into Quartzite due to weathering. Structures like Herringbone structure and ripple marks can be seen.

STRUCTURAL DATA:-

TRENDS OF JOINTS (°)
N225

FIG 16: RIPPLE MARKS

FIG 19: HERRINGBONE PATTERN

FIG 20: FE QUARTZITE SHOWING JOINTS

DAY 4:- 13 DECEMBER 2022

SPOT 1

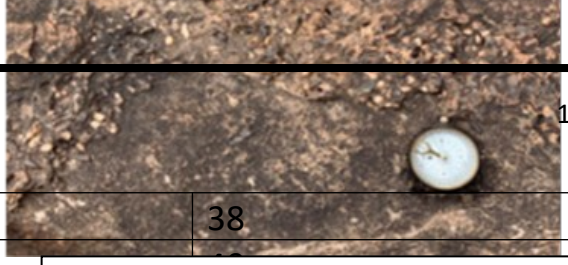
LOCATION:- $^{1}/_{2}$ KM from famous heritage temple Aihole.

LATLONGS: N16°00’49’’ E75°93’05’’

Area is covered by moderate vegetation surrounded by agricultural land, rocks exposed here belongs to Bagalkot Group and are inclined. Exposure here shows presence of clasts which are of varying sizes 1cm, 3cm, 6cm and mineralogy of this clasts are quarts, feldspar, BIF. Rock shows cross bedding. Ferruginous quartzite which has bedding junction shows intercalation of intraformational (not formed from erosional event) conglomerate (6-7 layers).

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION(°)	AMOUNT OF DIP
120	SSW	38
116	SSW	46
114	SSW	36
116	SSW	38



107	SSW	38
120	SSW	

After crossing the road the rocks Exposed here are belongs to Badami Group and are horizontal. Area is covered by scanty vegetation. Rock exposed are ferruginous sandstone, Showing alternate bands of siliceous and ferruginous band and rocks are highly weathered. Rocks have very small dip amount.

FIG 23: BADAMI GROUP OF ROCKS SHOWING HORIZONTAL SERIES.

SPOT 2

LOCATION:- Sirur (near Sirur temple town opposite to the river)

LATLONGS:- N16°05’06’’ E75°46’59’’

If we look perpendicular to the bedding the fault plane we see shows slicken slides (lineation) that are dipping along the dip therefore it is a dip slip fault although there are no shear sense indicators to tell the direction of shear. In the field the amount of dip for different fault plane ranges

from 90°,60°-30°, >60°. Overall we can i
major fault zone there are minor faults. A
on
he
beds of Quartzite towards the north east.

DAY 5: - 14 DECEMBER 2022

SPOT 1

LOCATION:- Aamingad

LATLONGS:- N16°05'06'' E75°46'59''

The exposed area is hilly are, we walked few meters away from road climbed with the help of stairs, the area was covered by thorny and dry bushes. Here large boulders of pink granite were exposed which contain essential minerals as quartz, alkali feldspar (orthoclase) and Accessory minerals as Hornblende. Were showing coarse grained, phaneric, leucocratic, inequigranular porphyritic texture. These were Clospet Granite and tell us that we are in basement of Kaladgi. Xenoliths of length 10.5 cm was found on Granite Body.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION(°)	AMOUNT OF DIP
N130	SE	76
N146	NNE	85

TREND OF JOINT(°)
N21

FIG 26: PORPHYRITIC PINK GRANITE

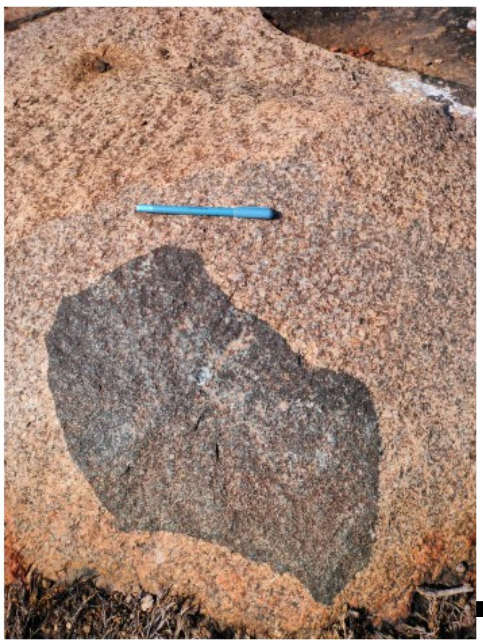


FIG 27: XENOLITH PRESENT IN PINK GRANITE

SPOT 2

LOCATION:- Sunebhave

LATLONGS:- N16°30’32’’ E 75°56’55’’

It is a mountainous area with highest elevation of 670m. here clasts are intercalated with quartzite, clasts are of quartz, BIF. but the amount of BHQ in this location is high as compared to Ramthal.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N115	NNE	20
N128	NNE	19
N116	NNE	21

FIG 28: CLASTS OF BIF, QUARTZ INTERCALATED IN QUARTZITE

SPOT 3

LOCATION:- Hungund schist bely

LATLONGS:- N16°04’08’’ E76°03’33’’

The outcrop here is continuation of Hungund Schist Belt. Shows alternate bands of phyllite and BHQ. At some places outcrop was showing shear lenses in this lenses there are intrafolial fold. As a schist belt is basement for the Kaladgi the change in the dip of the schist belt will tilt the kaladgi sequence.

FIG 29: HUNGUND SCHIST BELT SHOWING ALTERNATE BANDS OF PHYLLITE AND BIF

FIG 30: FOLD IN BHQ

DAY 6:- 15 DECEMBER 2022

SPOT 1

LOCATION: Bilagi

LATLONGS:- N16°20’43’’ E75°37’2’’

Exposure was situated at the right side of the road and is covered by scanty vegetation. Granite is exposed around this exposure, which shows exfoliation. Therefore there is colour variation in Granite and therefore there are grey granite (quartz, plagioclase), pink granite (quartz, orthoclase and hornblende) and white granites are present. Many xenoliths were present having length ~39cm, 33cm and breadth ~ 14.5cm, 17 cm. some of the xenoliths also showed spheroidal weathering. Around 6 pegmatite veins were present mineralogy include quartz and orthoclase). Veins were 4.8m in length and 16 cm in width, trending in N242°. Some veins were deformed and curved. There are potholes present on the surface. Rock is deformed. Recrystallisation takes place in granite and not in pegmatite. Pegmatite vein are intrusive into granite.

FIG 31: PEGMATITE VEIN INTRUDED IN GRANITE

FIG 32: XENOLITHS FORMED IN GRANITE BODY

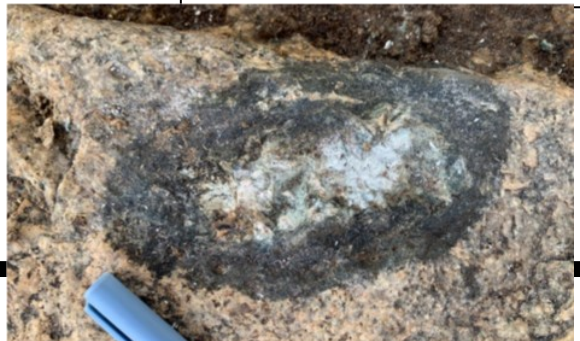


FIG 33: XENOLITH WITHIN XENOLITH

SPOT 2

LOCATION:- Bilagi opposite to Siddheshwar temple.

LATLONGS:- N16°20’14.1’’ E75°36’43.8’’

This is the quarry area. Quartzite are red and white in colour are exposed here showing bedding, vertical joints and fracture.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N125	NS	9
N88	NS	11
N114	NS	6
N110	NS	3
N88	NS	12

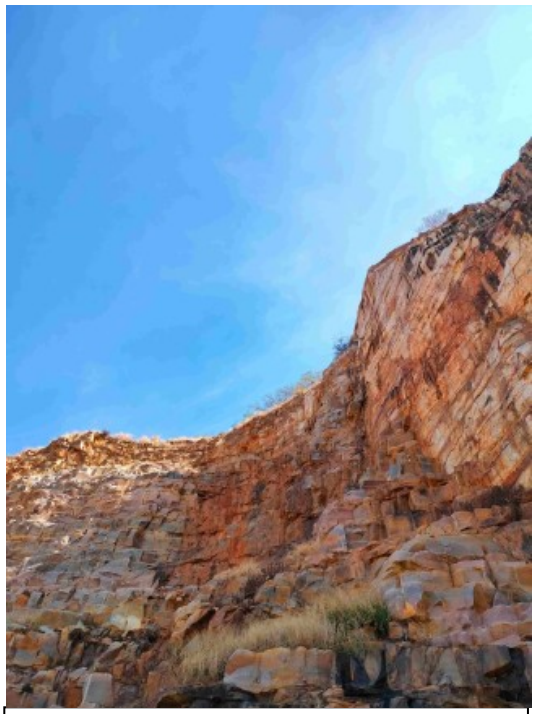


FIG 34: QUARTZITE SHOWING VERTICAL JOINTS, FRACTURES AND BEDDING

SPOT 3

LOCATION:- Behind Rudra Gouda Govt. first grade college

LATLONGS:- N16°20’29’’ E75°36’58’’

It was a hill with elevation of more than 500m. lithology may contain intraformational conglomerate clasts (quartz), matrix supported clast size are 3-12cm. Cross bedding, normal graded bedding and current bedding can be seen.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N115	SW	11

FIG 35: OUTCROP SHOWING INTRAFORMATIONAL CONGLOMERATE

FIG 36: OUTCROP SHOWING CLASTS OF QUARTZ AND SHOWING CURRENT BEDDING

FIG 37: OUTCROP SHOWING GRADED BEDDING

DAY 7:- 16 DECEMBER 2022

SPOT 1

LOCATION:- Budangad KA, NH 367

LATLONGS:- N16°06’46’’ E75°47’07’’

The entire rock is made up of Quartz. There are few joint sets which are continuous rest all are non-continuous. There are numerous joint set which has similar strike but different dip. There are shorter joint sets which are not penetrative across entire outcrop they extend locally the rock is Ferruginous Quartzite consist of Quartz and Feldspar as mineral constituent There are vein sets which are cross cutting each other and some are parallel. The veins are in size from 0-7cm to 15cm. The orientation of minerals varies from one place to the another. Trend of the vein set N57". The veins sets are orthogonal to each other. This are Quartz vein the completely brecciated rock. The fault zone is EW trending.

Another important observation is the presence of Gash vein. These are formed because of extension of fracture within this we can have growth of secondary precipitated mineral. The minerals in vein are elongated in nature which appear like teeth and elongation is perpendicular to vein wall. Such structure is known as "Comb structure". Formation of the Vein: Fluid plays an important role in fault zone. Fluid gets pathways to transverse through rock they crystalises and forms veins.

FIG 38: HIGHLY JOINTED AND FRACTURED QUARTZITE

FIG 39: QUARTZ VEIN WITH COMB STRUCTURE

SPOT 2

Location: NH 367, Budanagad KA

LATLONGS: 16°5'8"N 75°48'46" E

A large expansive outcrop located, around 1-1.5 Km from spot 1. Wherein we observed a coarse-grained Hornblende Rich granite which showed foliation indicating deformation: The outcrop is highly weathered, perpendicular to foliation plane coarse grained quartz vein is intruded which are of same generation, Although they are cross cutting at some places and are younger then foliation.

Width of the veins is 10-12 cm while some were 5-7cm, they are exposed throughout the outcrop while some are metamorphosed. At a distance of ~50m we found a contact between igneous and metamorphic rocks. We also observed pegmatic vein onto a Granitic boulder next to schists. As we move along hills the Granitic exposure had increased percentage of feldspar as compared to Quartz The large phenocryst of feldspar were observed and hence rock was named as Porphyry syenite.

STRUCTURAL DATA

TREND OF VEINS (°)
N275
N60

N189

FIG 40: INTRUSION OF QUARTZ VEIN IN GRANITE

SPOT: 3

LOCATION: Murudi

LATLONGS:- 1672'7" N 75°45'26" E

The expansive outcrop of quartzite is exposed at this place, rock is fractured and intensely weathered. It shows two types of prominent jointing i.e. orthogonal and conjugate joints. Outcrop also shows cross bedding and herringbone structure, quartzite also has clasts in it which are of jasper, quartz and some amorphous variety of minerals and feldspar. Here which were observed they are siliceous and ferruginous which were slightly reddish in colour. This quartzite belongs to Saundatti formation.

FIG 41: OUTCROP OF QUARTZITE

SPOT 4

LOCATION:- Kerkalmatti, Rajyogi road murudi Karnataka

LATLONGN:- N16°04’01’’ E75°41’26’’

A small exposure of phyllitic folded layers were exposed along the road cut section of Rajyogi road. Rock identified here was phyllite.

STRUCTURAL DATA

STRIKE DIRECTION(°	DIP DIRECTION	AMOUNT OF DIP(°)
N95	S	35
N81	NNW	26
N145	S	23
N103	S	19
N105	N	10
N85	N	20

FIG 42: PHYLLITE

SPOT 5

LOCATION:- Niralakeri Dolomite mine

LATLONGS:- N16°07’03’’ E75°41’55’’

The study area observed is a dolomite mine. It is an open cast mining and benches are very steeply dipping. The width of the benches will be around 5m and height of the face will be around 6-7 m.

FIG 43: NIRALAKERI DOLOMITE MINE

DAY 8: 17 DECEMBER 2022

SPOT 1

LOCATION:- Kagalkom

LATLONGS:- N16°06’05’’ E75°38’24’’

Area is exposed 400m away from roadside and covered by moderate bushes. Exposure is of Quartz which shows fractures, vitreous lustre, radiating pattern and hexagonal crystal. Earlier this area was quarried for glass industry. Overall the area is deformed, weathered, highly fractured. Fault plane passes through which it displaces the quartz trend of conjugate joint N151° trend of joint N105°

FIG 44: EXPOSURE OF QUARTZ

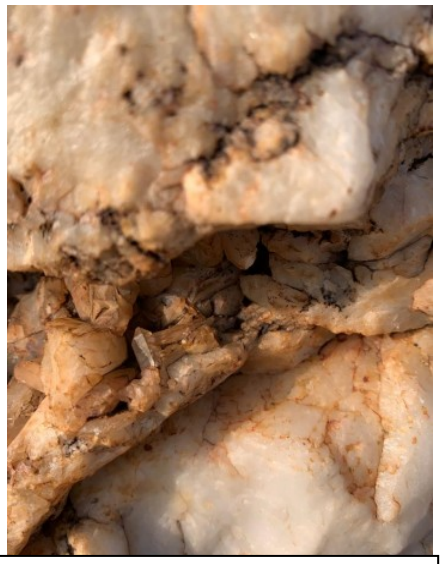


FIG 45 AND FIG 46 : SHOWING HEXAGONAL CRYSTALS OF QUARTZ

FIG 47: RADIATING PATTERN OF QUARTZ

FIG 48:HIGHLY JOINTED QUARTZ

SPOT 2

LOCATION: walking from spot 1

LATLONGS:- N16°07’29’’ E75°35’46’’

Area is situated 50m away from roadside. Rock exposed is foliated dolomite which is present in dry bushes and are scattered everywhere.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N106	SSW	54

N114	SSW	45
N95	SSW	55
N115	SSW	53
N114	SSW	44
N101.	SSW	46

FIG 49: DOLOMITE OUTCROP SHOWING FOLIATION

FIG 50: EXPOSURE OF DOLOMITE

SPOT 3

LOCATION:- Slikuri dolomite mine

LATLONGS:- N16°07’29’’ E75°35’46’’

Rock mined here is dolomite which trend in N100°

FIG 51: SILIKURI DOLOMITE MINE

SPOT 4

LOCATION:- Below the bridge at konkankappa village

LATLONGS:- N16°02’09’’ E75°38’45’’

Here limestones are present and they are called as Konkankappa limestone.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTYION	AMOUNT OF DIP(°)
96	SSW	4
85	SSW	1

SPOT 5

LOCATION: Halkurki shale

LATLONGS:- N16°1’13’’ E75°38’57’’

Ferruginous shale is deep water sedimentary rock with grain size of less than $1/_{256}$ cm. the type of clay are identified using XRD. This shales are called as Halkurki shale. Shale shows lamination with colour variation. In shale laminations are parallel to bends.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N120	SSE	6

FIG 52: HALKURKI SHALE

SPOT 6

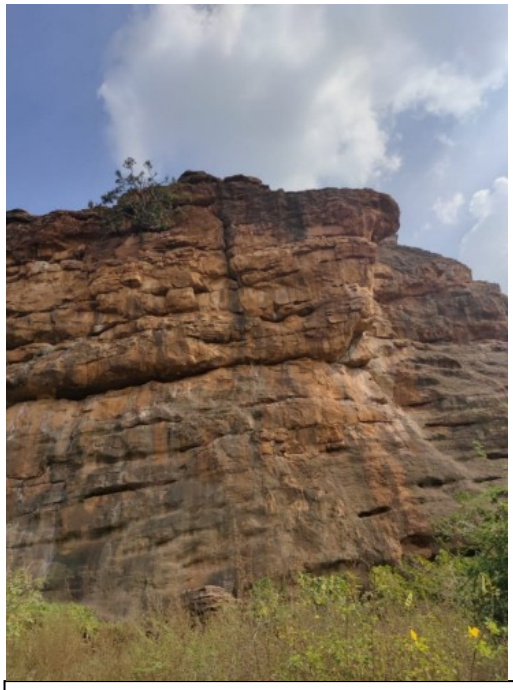
LOCATION:- 2 KM before Badami

LATLONGS:- N15°56’18’’ E75°40’35’’

Huge boulders of sandstone can be seen with alternate bands of Fe sandstone. Beds are horizontal in nature. cross bedding can be seen in the rock.

STRUCTURAL DATA

TREND OF THE JOINTS(°)
N105
N100
N108



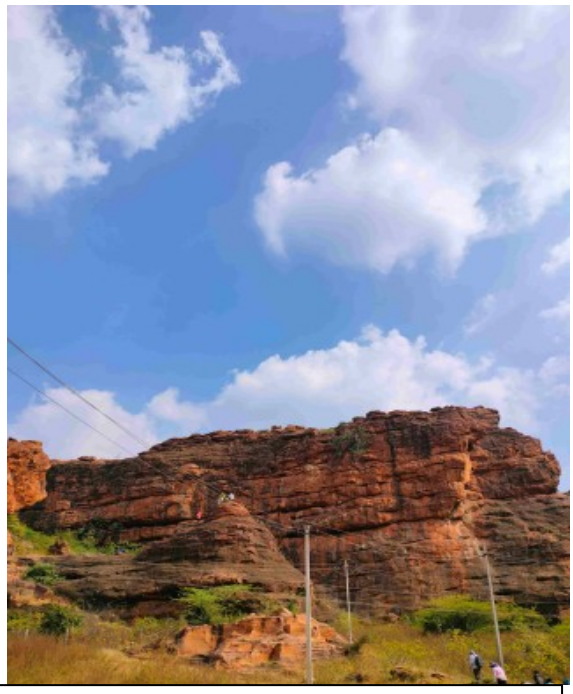


FIG 53 AND FIG 54: FE SANDSTONE

DAY 9: 18 DECEMBER 2022

SPOT 1

LOCATION:- Lokapur (Nagnapur) left side of road

LATLONGS:- N16°10’4’’ E75°21’31’’

Area is exposed 20m away from roadside. Rocks exposed are scattered around dry bushes. The rock exposed is impure limestone which is foliated all over, shows lineation and grey in colour. Rock is steeply dipping and shows presence of feldspar (pale orange colour). We can’t see flower structure because the rock is penetrative. These are deformed stromatolite. Rocks are jointed. Rock is intercalated. We can interpret that as the rock is forming stromatolites are grown on it.

STRUCTURAL DATA

STRIKE DIRECTION(°)	DIP DIRECTION	AMOUNT OF DIP(°)
N121	SSW	75
N120	SSW	71
N125	SSW	75
N124	SSW	80

FIG 55: IMPURE LIMESTONE SHOWING DEFORMED STROMATOLITES

FIG 56: IMPURE LIMESTONE SHOWS FOLIATION

SPOT 2

LOCATION:- 1 KM from Lokapur Jalkatti town.

LATLONGS:- N16°09’35’’ E75°22’57’’

Here dolomite and calcite mining is carried out.

FIG 57:CALCITE MINE

FIG 58: CALCITE

DAY 10: 19 DECEMBER 2022

SPOT 1

LOCATION:- Almatti dam

LATLONGS:- N16°19’09’’ E75°53’09’’

The Lal Bahadur Shastri Dam is also known as Almatti Dam is a hydroelectric project on the Krishna River in North Karnataka, India which was completed in July 2005. The target annual electric output of the dam is 560 MU (or GWh).

The Almatti Dam is the main reservoir of the Upper Krishna Irrigation Project; the 290 MW power station is located on the right side of the Almatti Dam. The facility uses vertical Kaplan turbines: five 55MW generators and one 15MW generator. Water is released in to the Narayanpur reservoir after using for power generation to serve the downstream irrigation needs. Two separate facilities namely, Almatti 1 Powerhouse and Almatti II Powerhouse each separated by distance do provide power generation capabilities.

During the initial stages of the project, estimated costs were projected as Rs.14.70 billion, but following the transfer of project's management to the Karnataka Power Corporation Limited (KPCL), the estimated cost was reduced by over fifty percent to Rs. 6.74 billion. KPCL eventually completed the project at an even lower cost of Rs. 5.20 billion. The entire dam was finished in less than forty months, with construction ending in July 2005. The dam is located on the edge of Bijapur and Bagalkot districts. Geographically, it is located in the large Bijapur district, but areas of Bagalkot district have

also been submerged due to filling of the reservoir. The dam holds a gross water storage capacity of 123.08 TMC at 519 meters MSL. The backwaters of the dam host several migratory birds during summer

FIG 59: ALMATTI DAM

SPOT 2

LOCATION:- Vijayapur

LATLONGS:- N16°20’28” E75°55’34”

In this formation there are 6 types of rocks with their characters are described below as follows.

BEDS	**CHARACTERS**
Pegmatite	It is the youngest. The rock is made up of feldspar and Quartz.
Pink Granite	The rock is rich in Orthoclase feldspar crystals therefore it appears pink.
Grey Granite	It is grey in colour due to presence of mafic minerals
White Granite	Its is the purest granite in the region.
Gneiss	The band of the gneiss show banding. this might be a syn there is no brakeag
Dark coloured mafic rock	It is the oldest rock

FIG 61: PINK GRANITE

CONCLUSION

Kaladgis are better known to have Orthoquartzite carbonate association. The sedimentation is in three cycles: Lokapur, Simikeri and Badami. Schists are found relatively in smaller area. In this fieldwork, we have seen most of the Formations, and correlated it with lithostratigraphic classification. The much-deformed basement of Kaladg, is overlain by conglomerate as unconformity and later younger sediment beds. Conglomeratic horizons are prominent in areas which have unconformable contact between two Formations/Groups. Basaltic extrusion at many the places have given rise to a situation where in the underlying older Formation cannot be seen. Large extent of Folding has taken place in the older Formations which is inferred by the spot 4 of day 2 at Ramthal. The palaeocurrent direction in Ramdurg Formation is centripetal (George, 1999). This implies that the Saundatti Quartzite exposed along the Jamkhandi-Bilgi-Almatti tract (northern margin of the basin) is derived from a source occurring to the north. The younger Formations are shallow dipping to almost horizontal. Angular Unconformity at Aihole was very prominent between the beds of Older Bagalkot and younger Badami. However the fairly huge extent of quartz mineralization at Kagalkomb could not be correlated with the lithostratigraphic chart because of lack of available study on the region. Dolomites and limestones are variegated having dirty buff coloured siliceous material banding in between the layers. On stromatolites structures in Dolomites, Sharma et al. (1998) have indicated that the sedimentation started in the Bagalkot Group around 1800 Ma. Independent geochemical studies based on carbon and strontium isotopic compositions of carbonates and shales support Late Paleoproterozoic to the Early Mesoproterozoic age for

the deposition of the Bagalkot Group of the Kaladgi Basin (Padmakumari et al., 1998; Sambasiva Rao et al., 1999).After studying the shales of Kaladgi, field setting and elemental ratios, critical to provenance, indicate (1) major contribution from highly weathered Archaean silicic source rocks like Peninsular Gneiss and Closepet Granite, (2) the shales lack any systematic time-dependent variation of composition and (3) they record normal weathering history (Dey et.al, 2008). During late Archaean crustal growth, emplacement of juvenile granites into the crust and subsequent intracrustal melting has transferred huge amount of incompatible elements into the upper continental crust. The effect of this change is clearly imprinted in the evolved composition of the Kaladgi shales

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