

A Geological Field tour to Mohan fort and Amba Dungar Fluorspar mines



1) Group of members with patron of SPG & APG, Vadodara Chapter before leaving for field



2) In field trekking upto Mohan fort to study the rock type and exposure



3) At Kadipani GMDC guest house breaking for lunch

A geological field tour to Mohan fort Section(refer pics at 2), Chikli-Mogra Section and Ambadungar Fluorspar Mine(refer pics at 4) was organized by Vadodara Chapters of SPG and APG on 21st January, 2017.



4) At Ambadungar Fluorspar Mines of GMDC

The Bagh Group of rocks are exposed as detached outcrops in Chhota Udaipur and Narmada districts of Gujarat. In regional setup, the quartzites, mica schist and phyllite of Champaner Group and granitic intrusions of Precambrian age forms the basement. This sequence comprises of marine and non-marine clastic and non-clastic sediments of Late Cretaceous and is studied on various aspects, such as Sedimentology, Paleontology, Stratigraphy; Ichnology; Palaeoecology and Geomorphology. The Bagh group sequence is ranging in age from Cenomanian to Coniacian and divided into three Formations viz. Songir and Uchad (Ray, 1981).

Generalised Stratigraphy of the Bagh Group of Gujarat			
Age	Group	Formation	Member
LATE CRETACEOUS		Deccan Trap Formation	-
		Lameta Formation	-
	BAGH GROUP	Uchad Formation	Galesar
			Bilthana
		Songir Formation	Raisingpur
			Mohanfort

MOHANFORT SECTION

The name of the Member is proposed for the lower sandstone sequence of the Songir Formation after the village Mohanfort. This unit is separated from the underlying Precambrian Champaner by an angular unconformity and is conformably overlain by the Raisingpur member of the Songir Formation. The base of the Mohanfort Member is characterized by the presence of either a thin sequence of conglomerate containing pebbles of quartz, feldspar, jasper and rock fragments of the underlying Precambrian metamorphic, or pebbly and gritty sandstone with pink shale. Mohanfort member mainly comprises of thick, hard, compact, white to dirty white coloured very coarse to fine grained sandstone, the sections is ~ 400 feet thick. The rest of the section is medium to fine grained, cross bedded sandstone. The excellent cross bedding, the exposure at the top of unit, the quality of exposures and the considerable large thickness have been considered to select this as the type area.

CHIKLI-MOGRA SECTION

The Bagh Group of sediments rests unconformably over the Precambrian Champaner. The Champaners comprise dirty white, pinkish white quartzites with weakly developed foliation and

lineations. The Songir Formation comprises 142 feet of the Mohanfort Member and 46 feet of the Raisingpur Member. The sandstones at the contact of the underlying Champaner are indurated and at places contain quartz pebbles of 1.5 inches diameter. The basal 66 feet of the Mohanfort Member is white, loose sandstones. This is successively overlain by 39 feet light pinkish grey hard, fairly bedded sandstone and 37 feet white loose sandstone. The Raisingpur Member comprises light pinkish white, fissile, thinly bedded, ripple marked siltstone. At places fine cross laminations within the ripple marks are noted and at other places very fissile, flaky shales underlain by banded shales are noted. The sandy shales are characterised by excellent ripple marks. The Uchad Formation comprises 3 feet of Bilthana Member and 26 feet of Galesar Member. The Bilthana Member is made of dirty yellow, hard, oyster and shark teeth embedded highly calcareous siltstone. The Galesar Member comprises grey, greyish white, brown, pinkish brown, well bedded limestone.

AMBADUNGAR FLUORSPAR MINE

The Ambadungar Fluorspar deposit was discovered in 1935 during the construction of the forest road. GSI started field work in 1960-61 and established an 11.6 MT estimated reserves for the area. The Ambadungar mines are located at latitude of $21^{\circ} 59' 51.08''$ N and longitude of $74^{\circ} 3' 44.56''$ E. The fluorspar project is located 11 km away from the Taluka headquarter of Kawant of Chhotaudepur district in tribal area and is at an altitude of 330 metres from MSL. Fluorspar mine is located at 600 metres altitude from MSL.

Fluorspar Mining lease at Ambadungar, 5 Kms from Kadipani has been allotted to GMDC since 1964 and erection work of Fluorspar Beneficiation Plant was started in 1967, which was commissioned in 1971 to process 500 TPD Fluorspar ore to produce Calcium Fluoride concentrate, which is a raw material for manufacturing of Hydrofluoric Acid, Refrigerant gases, Aluminium fluoride, Synthetic Cryolite, Fluorine Chemicals and Flux in Metallurgical Industries.

Ambadungar is a world famous locality due to the occurrence of carbonatite rocks in the area, rather than its rich fluorspar deposit. The area is geologically very interesting and complex too. The Cretaceous sandstones and limestones and the overlying Deccan basalts are domed up by basic alkaline intrusive. The domed up basalts have been dropped on a ring fracture and an inner ring of carbonatite cone sheet surrounded by an outer ring of alkaline rocks from the ring complex of an intrusive volcanic centre at Ambadungar. The alkaline solutions have feldspathised the sandstones in the vicinity of the contacts with the carbonatites. These feldspathised zones contain the major fluorspar mineralization. It occurs in form of veins; vary in thickness from 1-3 metres and cavity fillings. Origin of this deposit is considered with some certainty that residual hydrothermal solutions from basic alkaline magma are responsible for the fluorspar mineralization.

The guide for the tour was Prof Satish Patel from MSU. Organisers sincerely thank Dr Patel for his valuable inputs and the guidance and GMDC management for allowing the visit to its mine and providing its guest house premises for the lunch break. Organisers also acknowledge the Basin Manager for encouraging, facilitating and accompanying the tour. Thanks are also due to all the participants.

Team, SPG & APG