



7th INTERNATIONAL CONFERENCE ON GEOSCIENCES EDUCATION

Hyderabad, September 5-9, 2014

Post-conference Field Trip No. 1

Ariyalur Fossil Park and Neyveli Lignite Mines

September 10-14, 2014



ARIYALUR FOSSIL PARK AND NEYVELI LIGNITE MINE

- *Duration* : September 10-14, 2014
- *Approximate cost* : Rs. 20,000^{1,2}
- *Last date to register* : July 30, 2014
- *Note: A minimum of 10 participants needed to conduct the field trip.*
 - ¹ *To be sent to bank account details given at the end of this document.*
 - ² *Cost includes travel from/ to Hyderabad, vegetarian food and accommodation*

SCHEDULE

09-9-2014 : Depart Hyderabad at 16.00 hours by train to Chennai

10-9-2014 : Arrive Chennai at 06.30 hours

10-9-2014 : Depart Chennai at 10.15 hours to Ariyalur by Mangalore Express (Train no. 16859); Arrive Ariyalur at 14.20 hours

10-9-2014 : 31km journey from Ariyalur by road to Perambalur (the proposed field camp)

FIELD TRIP ITINERARY:

Date	Time (hrs)	Departure from	Fossil site /sedimentary section	Details
11-9-2014	08.00	Perambalur	Uttatur	Archaean basement rock
	10.00	Uttatur	Terani clay mine	<i>Ptillophyllum</i> and <i>Elactoclads</i> plant fossils, clay and ferruginous sandstones
	13.00	Terani clay mine	Karaibadland	Belemnites, ammonites, Phosphate nodules, Gypsum - origin and geological history
14.00 to 15.00 lunch break followed by fossil hunt				
	16.00	Karai	Satannur	18 m-long Fossil wood site
	17.00	Satannur	Perambalur	
19.00-20.00 hrs <i>Talk on Evolution of sedimentary basin</i>				
12-9-2014	8.00	Perambalur	Seeranatham	Biostromal limestone; a look at Cretaceous beach proxy records
	10.00	Seeranatham	Odhyam	<i>Ammonite and shell bed</i>
	13.00	Odhyam	Karumbayam	Giant <i>Ammonites</i> , <i>Innoceramus</i>
14.00 to 15.00 lunch break at field site				
	15.00	Karumbayam	Kallankurchchi Limestone mines	The world of invertebrates
	18.00	Kallankurchchi	Perambalur	
19.30- 20.30 <i>talk on Fossil and past history</i>				
13-9-2014	8.00	Perambalur	Dalmiapuram	Limestone mines and fossil room visit
	12.00	Dalmiapuram	Perambalur	
	14.00	Perambalur	Neyveli	Travel by road
Halt at Neyveli				
14-9-2014	08.00	Neyveli Guest House	Mines visit	Discussion on the origin of lignite and mining methods
	14.00	18.00	Neyveli	Cuddalore Silver beach:Beach morphology, structures
Halt at Neyveli				
15-9-2014	08.00	Neyveli	Chennai	By road
	16.00	Chennai	Hyderabad	By Train

ARIYALUR FOSSIL PARK AND NEYVELI LIGNITE MINES

The Cretaceous succession of southern India has attracted the attention of geoscientists all over the world, the reason being that it occupies a critical geographical position in the Indo-Pacific region during the Cretaceous period. It is a treasure-house of rich and diversified fossils, which helps one to learn the inter-regional correlation of different Cretaceous sections across the globe. It has a faunal affinity with the Mediterranean, West European and South American regions. The fossil field sites have a 130-65 Ma history, which helps in understanding the warm period of the earth, sea level variations and paleoenvironment. The proposed field site is a fossil park of diversified groups of invertebrates and is a type lithosection of the Cretaceous of India. The fossils are of mollucs, brachiopods, echinoderms, fossil wood, scanty vertebrate fragments. This is a natural limestone factory and is known as the cement city of Tamil Nadu.

PROPOSED VISITS OF FIELD SITES

DAY 1



LOCATION 1: UTTATUR VILLAGE-ARCHAEAN CRYSTALLINES

This constitutes the floor of the basin composed of garnetiferous banded gneiss, biotite gneiss, and charnockites. The structural expression of rock exposure depicts the vicinity of fault systems.



LOCATION 2: TERANI CLAY MINE

These are white/yellowish brown clay (thin to thin bedded) with intervening medium to coarse grained friable, limonitic/ferruginous sandstones with parallel bedding. Rich in plant fossils like *Ptillophyllum* and *Elactocladus*. This setting suggests a low-energy lacustrine environment of deposition.



LOCATION 3: KARAI BAD-LAND

Lithotypes of this site are clays of varied colours interbedded with silty/sandy clays. They consist of gypsum, celestite and phosphatic nodules (commonly known as “Uttatur Potatoes” of 5-10 cm size). The lithosection is characterised by trellis type of drainage pattern and bad-land topography with scanty vegetation. Belemnites, ammonite and gastropod fossils are

widespread in the area. They are deep water sediments of 100m bathymetry relative to contemporaneous carbonate facies exposed at Dalmiapuram area and of Middle Turonian age (93.6 Ma). This is the exposed lithofacies formed due to the Marion mantle plume. The

Belemnite isotope analysis has provided the palaeotemperature of this region during the Cretaceous period.



LOCATION 4: SATTANUR FOSSIL WOOD SITE

An 18 m long conifer fossil tree preserved by the Geological Survey of India as a geological monument at Sattanur is shown in the picture alongside.



DAY 2 LOCATION 5: SEERANATHAM

The rock types are steel grey to light brown, fine to coarse grained, very compact, dense with debris of gastropods and lamellibranchs. This is a shelly limestone (popularly known as Garudamangalum limestone) classified as under a sandy flat/ beach to shelf lagoon regime. It is a palaeobeach of Coniacian-Santonian period (88.6 to 83.5Ma)



LOCATION 6: KARUMBAYAM AMMONITE BED

The giant ammonites are exposed on the sandstone bed, which marks the Santonian-Campanian boundary.



LOCATION 7: ODHYAM

The sandstone horizon with abundant ammonites and oyster shells in a sandstone bed.



LOCATION 8: KALLANKURCHCHI LIME STONE MINES

Kallankurichchi Formation exposed in TANCEM mine, northeast of Ariyalur town: This formation 40 m thick and contains the macrofossils - *Gryphaea*, *Alectryonia* and *Inoceramus*.



DAY 3

LOCATION 9: DALMIAPURAM MINES

This 40 m-deep mines exhibits three litho-units: Coral algal limestone, marl bedded limestone with inter-tonguing grey shale, and marl. This sequence is interpreted as a shallow carbonate platform formed about 112 Ma ago. The tectonic upheaval that resulted in faulting is clearly manifested in this geological setting. Molluscans shells are abundant in this mine site. Geoscientifically, this is a structurally disturbed area with evidence of drowning unconformity surface.



DAY 4:

LOCATION 10: NEYVELI LIGNITE MINE

Lignite occurs as a sub-horizontal, tabular lensoidal body, sandwiched between the overlying mottled litho-units of the Cuddalore Formation and the underlying zone of poorly consolidated thick sandstone (aquifer zone), with minor intercalations of thin ash grey to grey clay and shale beds. The Eocene lignite is coffee brown to brownish black, soft, compact and generally massive. At present, it is being mined by the Neyveli Lignite Corporation Limited.



BANK ACCOUNT DETAILS

Name of the Account Holder	: Dr. R SHANKAR GEOSCIED
Name of the Bank	: State Bank of India
Name of the Branch	: Mangalagangothri Branch
Branch Code	: 8034
IFSC Code	: SBIN0008034
Address of the bank	: Mangalore University Campus, Mangalagangothri, Karnataka 574199
Account Number	: 33963881148
Type of Account	: Savings Bank