

STRATIGRAPHY AND MICROPALAEONTOLOGY OF THE CAUVERY BASIN, PART - I. EXPOSED AREA

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ABSTRACT— The stratigraphy of the Meso-Cenozoic sequence of the Cauvery Basin is discussed based on recent geological and micropalaeontological investigations made on various outcrop and subcrop stratigraphic sections in different parts of the basin. The status of various recognized stratigraphic units are defined and separate schemes of classification are proposed for different areas and structural units, which are based on the recommendations of the International Commission on Stratigraphic Nomenclature. In the exposed part of the basin, the earliest sedimentary sequence is continental to paralic in origin, belonging to ? Mid.-Upper Jurassic Lower Cretaceous, and is designated as Sivaganga Formation, whereas the earliest true marine unit of Lower Cretaceous age is Dalmiapuram Formation. Some of the well known stratigraphic units like Uttatur, Garudamangalam, Ariyalur, Pondicherry and Cuddalore Formations are redefined and recognized in outcrop areas. The uppermost Mesozoic sequence is referred here as Kallankurchi Formation with two members. All these units are systematically described along with their type and typical sections, lithology, palaeontology and geologic age. The basinal configuration and geological setting of the regions covered with alluvium will be dealt elsewhere.

INTRODUCTION

The vast sedimentary tract of the Cauvery Basin, of about 25,000 sq. kms in area, extends from latitude 12° N near north of Pondicherry to latitude 09°N near Rameshwaram and is widest in the central and southern parts to about 120 kms. Repeated transgressions of southern sea since late Mesozoic has led to the deposition of a thick sequence consisting of terrigenous clastics and carbonates. Conti-

mental Neogene and marine Mesozoic-Lower Tertiary rocks are exposed in the north-western sector, whereas both Mesozoic and Neogene sediments exposed in the southern sector are largely continental in nature. In rest of the area, a more uniform marine Cenozoic sequence occurs under a thin veneer of alluvium and sub-Recent rocks. The total thickness of the Mesozoic and Cenozoic sections of this basin exceeds 5,000 m. Continued interest in the Cauvery Basin toward,

petroleum exploration has stimulated re-study of various stratigraphic units and sections. These units were first recognized by Blanford (1865) and followed by later workers on the basis of general lithology and mega-fossils. However, the loose and incomplete definition of these units and their varied interpretations by different authors have resulted in endless complications and confusions and demands for their abandonment. The uniformity of applying the present stratigraphic concepts in redefining these units and in reclassifying the entire sedimentary sequence of this basin have long been felt. The latest concepts on the Cretaceous and Tertiary sediments have largely been modified through the knowledge gained by studying the foraminiferal assemblage, especially the planktonic types.

The purpose of this paper is to present new data on stratigraphy and palaeontology of the Cauvery Basin and to examine critically the previous interpretations of age, correlation and geological history of this sequence of rocks in the light of biostratigraphical analysis and to present new systematic interpretations of generalized stratigraphy of the Cauvery Basin and palaeoecological and palaeogeographical interpretations. The task is presented in parts; this paper includes the general geological setting along with a brief reference to previous work and systematic description of individual stratigraphic units outcropping in various parts of the basin.

PREVIOUS WORK

Based on the outcrop geometry, this entire sedimentary belt is subdivided in to two linear parts :

(a) *Exposed area.* Comprises parts all along the western margin of the basin running from

Pondicherry in the north to Sivaganga to the south and includes four major outcrop areas- Ariyalur, Pondicherry, Vridhachalam and Sivaganga areas and a fifth relatively small Thanjavur area at the central part.

(b) *Covered area.* Comprises the eastern and south-eastern parts, where thick Mesozoic sequence is covered with alluvium and sub-Recent rocks.

In the exposed area, the occurrence of thick Mesozoic sediments, continental to brackish during Jurassic-Lower Cretaceous and marine during Upper Cretaceous were known over one hundred years. The first detailed account of the exposed marine sediments was given by Blanford (1865) along with the classification of Cretaceous rocks of Ariyalur (formerly known as Trichinopoly area), Vridhachalam and Pondicherry. On the basis of mega-fossils study (Stoliczka, 1861-73), Blanford (1865) assigned Cenomanian to Danian age to these rocks (Table 1). In Ariyalur area, he proposed three major units- Uttatur, Trichinopoly and Ariyalur Groups (with modified spellings). Three well defined horizons were also recognized within Ariyalur Group, out of which lower and upper horizons were fossiliferous. The Upper Ariyalur Sub-Group, as defined by him containing Danian fossils has been separated to constitute independent stratigraphic unit by later workers (Kossmat, 1897, Rama Rao, 1942), and named as Niniyur Group. The entire marine Mesozoic sequence is overlain by Cuddalore Sandstone of Mio-Pliocene age.

In Pondicherry area, Blanford (1865) recognized two lithological units, the lower Valudavur Group and an upper Ariyalur Group. Later in 1895, Warth distinguished six lithological horizons. Kossmat (1897) con-

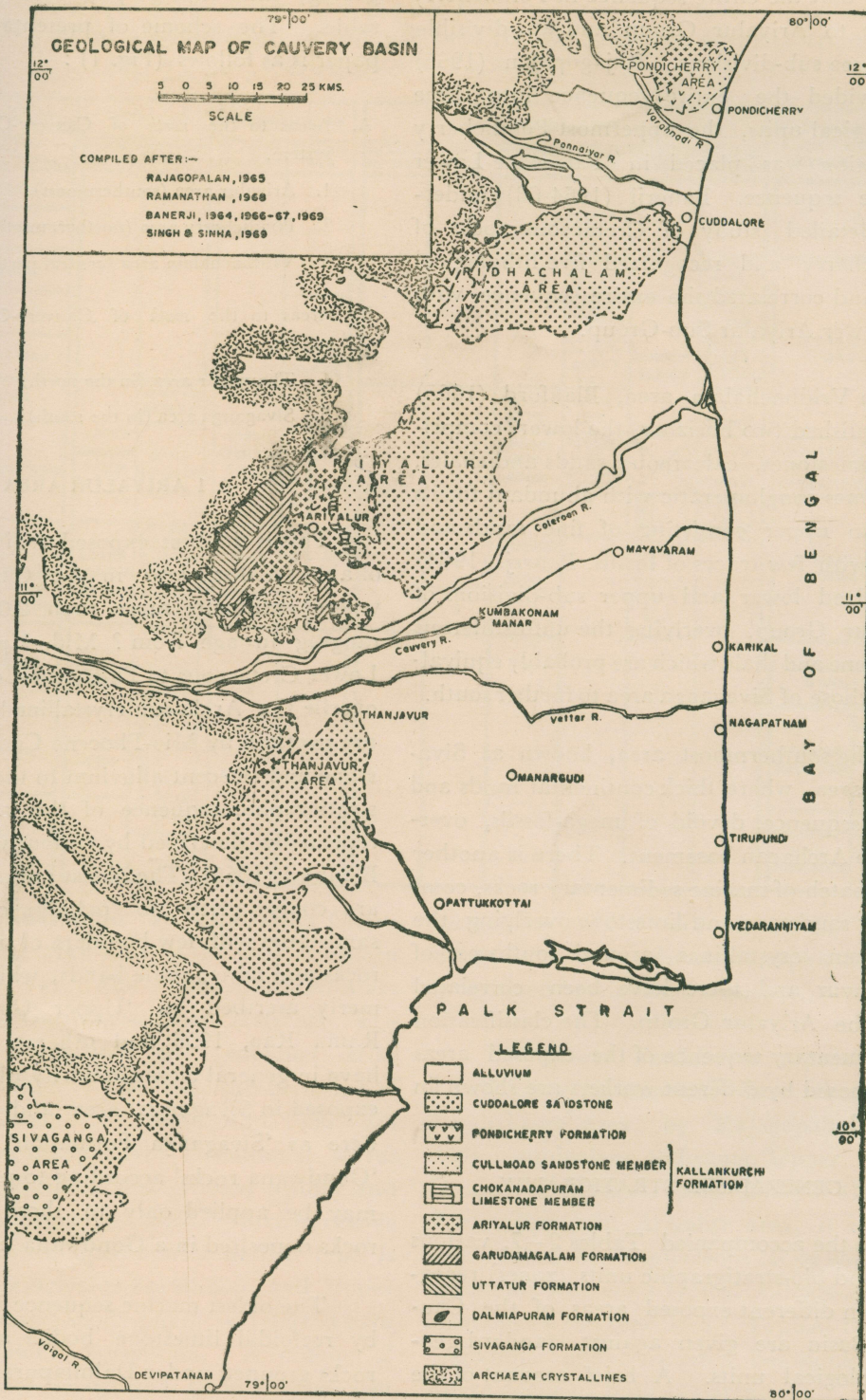


Fig. 1. Geological Map of the Cauvery Basin

cluded that the entire sequence in Pondicherry belong to Ariyalur Group and was divisible into three sub-divisions. Rajagopalan (1965) sub-divided the entire sequence into three lithological units, the uppermost Pondicherry Formation was placed in Paleocene-Lower Eocene sequence. Banerji (1964-68) undertook detailed study of Cretaceous rocks of Pondicherry and recognized five lithological units and correlated the entire sequence with the Lower Ariyalur Sub-Group.

In Vridhachalam area, Blanford (1865) distinguished two horizons, the lower comprising limestones, calcareous sands and shales, sometimes conglomeratic with abundant fossils and an upper consisting of fine sands and shales with few traces of fossils. Banerji (1964) recognized lower and upper sub-divisions of Ariyalur Group, overlying the unfossiliferous sandstone and shale which are probably equivalent to those of Sivaganga area to further south.

The southernmost area, known as Sivaganga area, where thick continental sands and shales sequence, devoid of mega-fossils, overlies the Archaean basement. There is another small patch of marine sedimentary rocks, comprising sandstone and limestone overlying the Archaean crystallines around southwest of Thanjavur and these have been correlated with the Ariyalur Group. The classification of sedimentary sequence of the exposed areas as proposed by different workers are shown in Table 1.

GENERALISED STRATIGRAPHY

In the accompanied Tables 2-7, various rock and bio-stratigraphic units (zones) recognized in different exposed areas of the Cauvery Basin are given against standard geochronological units. A brief account of the

geology and stratigraphy accompanies each table. The scheme of presentation in this paper is as follows (Fig. 1) :

- A. Areas to the *north* of Cauvery-Coleroon river system.
 1. Ariyalur area (southernmost)
 2. Pondicherry area (northernmost)
 3. Vridhachalam area (central part)
- B. Areas to the *south* of Cauvery-Coleroon river system.
 4. Thanjavur area (in the north)
 5. Sivaganga area (in the south)

A. 1 ARIYALUR AREA

This is the best exposed sedimentary area of about 800 sq. kms in the Cauvery Basin, where sediments more than 2,000 m. thick ranging in age from ? Mid.-Upper Jurassic-Lower Cretaceous to Paleocene-Lower Eocene, overlies the Archaean crystalline basement and are overlain by Mio-Pliocene Cuddalore Sandstone and Recent alluvium to the east. The stratigraphic sequence of this area has been repeatedly described by various workers since Blanford (1865). The oldest sedimentary rocks are coarse gritty to pebbly conglomeratic sandstones with few boulders of metamorphic rocks and minor shale bands, which were formerly ascribed to 'Upper Gondwana' (*cit.* Rama Rao, 1956 and others). These rocks have in general close similarity with the beds exposed in Sivaganga area and are referred here as 'Sivaganga Formation'. The term 'Gondwana rocks' according to present author may be applied only to those sequence of rocks deposited in a Gondwana trough.

The oldest marine sequence is represented by reefoidal limestone bodies and associated rocks grouped under Dalmiapuram Formation

TABLE I
CLASSIFICATION OF SEDIMENTARY SEQUENCE OF EXPOSED AREAS BY DIFFERENT WORKERS
(CRETACEOUS—EOCENE)

AREAS		ARIYALUR		VRIDHACHALAM		PONDICHERRY						PROPOSED CLASSIFICATION FOR ALL THREE AREAS				
		BLANFORD, 1865	KRISHNAN, 1964	BLANFORD, 1865	BANERJI, 1964	BLANFORD, 1865	WARTH, 1895	KOSSMAT, 1897	GOWDA, 1964	BANERJI, 1964	RAJAGOPALAN, 1965					
PALEOGENE	EOCENE	PRIABONIAN														
		LUTETIAN														
		YPRESIAN														
		SPARNACIAN														
		THANETIAN														
	DANIAN															
	UPPER CRETACEOUS	MAESTRICHTIAN	UPPER ARIALLOOR GROUP	UPPER ARIYALUR GROUP	UPPER ARIALLOOR GROUP	UPPER ARIYALUR GROUP										
			LOWER ARIALLOOR GROUP	LOWER ARIYALUR GROUP	LOWER ARIALLOOR GROUP	LOWER ARIYALUR GROUP										
		SENONIAN	CAMPANIAN													
			SANTONIAN													
CONIACIAN																
TURONIAN																
GENOMANIAN	UTTATUR GROUP															
ALBIAN																

and is considered as the only Lower Cretaceous marine rock-unit of the Cauvery Basin (Banerji, 1970 a). The Upper Cretaceous are Uttatur and Garudamangalam (formerly Trichinopoly) Formations are redefined after Blanford (1865). The two sub-divisions of 'Ariyalur Group' (of Rama Rao, 1956) are raised to two independent formational status each having different depositional history and lithologic homogeneity. The lower transgressive calcareous unit of open marine neritic type is reclassified as Ariyalur Formation, and upper mainly regressive sandy phase is referred here as Kallankurchi Formation. A number of litho-units are recognized within these two

formations which are shown in Table 2. Seven foraminiferal biostratigraphic zones are recognized in Mesozoic sequence.

The Lower Tertiary is represented by Pondicherry Formation, first recognized in Pondicherry area by Rajagopalan (1965) This is equivalent to former 'Upper Ariyalur Group' of Blanford and 'Niniyur Group' of Rama Rao. In Ariyalur area, it is mainly represented by argillaceous facies with minor limestone, whereas a typical calcareous facies develops in the type area. Typical Paleocene planktonic and associated benthonic foraminifera occur in both the areas.

TABLE 2
STRATIGRAPHIC COLUMN FOR ARIYALUR AREA

GEOLOGIC AGE		ROCK - STRATIGRAPHIC UNITS		BIOSTRATIGRAPHIC ZONES		
RECENT - PLEISTOCENE		(Alluvium and gravel beds)				
UPPER PLIOCENE UPPER MIOCENE		Cuddalore Sandstone				
PALEOCENE		Pondicherry Formation		(Few planktons)		
CRETACEOUS	UPPER	MAESTRICHTIAN	Up.	Kallankurchi Formation	Cuilmoad Sandstone Member	(Vertebrate fossils)
			Mid.		Chokanadapuram Limestone Member	Orbitoides sp. Zone
			Low.	Ariyalur Formation	Sadiyankanpatti Member	Globotruncana linneiana tricarinata Zone
		CAMPANIAN	Sillakuddi Member		Globotruncana globigerinoides Zone	G. ventricosa Sub - Zone
			SANTONIAN TO CONIACIAN		Melmattur Member	Globotruncana concavata Zone
		LOWER			TURONIAN	Garudamangalam Formation
	CENOMANIAN		Uttatur Formation	Sand Member		?
			Clay Member	Rotalipora app. appenninica Zone		
	ALBIAN		Dalmiapuram Formation		Hedbergella planispira Zone	?
				Lenticulina macrodisca Zone		
LOWER CRETACEOUS UPPER JURASSIC		Sivaganga Formation				
PRE-CAMBRIAN		(Crystalline rocks)				

A. 2 PONDICHERRY AREA

This is the northernmost sedimentary area of the basin, covering about 80 sq. kms. in area and extending mainly towards east of river Varahanadi. The nearest sedimentary exposure is about at a distance of 8 kms. from

Pondicherry town. The marine sedimentary units are Ariyalur Formation and Pondicherry Formation, overlain by continental Cuddalore Sandstone. The lower contact of Ariyalur Formation with Archaean rocks is nowhere exposed, as it is covered with Cuddalore Sandstone, however, equivalents of Sivaganga For-

TABLE 3
STRATIGRAPHIC COLUMN FOR PONDICHERRY AREA

GEOLOGIC AGE		ROCK-STRATIGRAPHIC UNITS		BIOSTRATIGRAPHIC ZONES			
RECENT - PLEISTOCENE		(Alluvium and gravel beds)		?			
UPPER PLIOCENE UPPER MIOCENE		Cuddalore Sandstone					
LOWER EOCENE TO PALEOCENE		Pondicherry Formation	Upper Marlstone Member	Globorotalia pseudositula - G. formosa formosa Assemblage Zone			
			Discocylinid Limestone Member	Globorotalia rex Zone			
				Globorotalia velascoensis Zone			
			Algal Limestone Member	Globorotalia whitei Zone			
UPPER CRETACEOUS		Ariyalur Formation	Lower Marlstone Member	Globorotalia uncinata - Globorotalia trinidadensis Assemblage Zone			
			LOWER MAESTRICHIAN	Saiderapet Member	Globotruncana linneiana tricarinata Zone		
			SENONIAN	Karasur Member	Globotruncana globigerinoides Zone	G. ventricosa Sub-Zone	
				CAMPANIAN		Usteri Member	G. marginata Sub-Zone
			SANTONIAN	Valudavur Member	Globotruncana concavata Zone		
	Vanur Member						
?		(Unexposed)		?			
PRE-CAMBRIAN		(Crystalline rocks)					

mation are expected below the cover of Cuddalore. Within Ariyalur Formation, five litho-units and three biostratigraphic zones are recognized (Banerji, 1966). Based on recent field work, these litho-units are redefined (Table 3). Four litho-units and five biostratigraphic zones are proposed by Rajagopalan (1965) in Pondicherry Formation.

A. 3 Vridhachalam Area

The sedimentary area around north of Vridhachalam is about 100 sq. kms. in area and lies between Manimukta river in the south to Gadilum river in the north. The lowermost sedimentary unit is brownish to yellowish grey semi-weathered gritty to coarse grained unfossiliferous sandstone, tentatively considered to be equivalent to Sivaganga Formation. Overlying this is the Upper Cretaceous sequence, divisible into, lower-Ariyalur Formation and upper-Kallankurchi Formation. The former comprises the fossiliferous calcareous to argillaceous sandstone, hard grey to yellowish brown arenaceous limestone and calcareous shale, whereas the latter is mainly fine to medium grained white sandstone with calcareous nodules without any mega-fossil and foraminifera and a distinct hard somewhat argillaceous limestone band with few *Orbitoides* spp. Thus two litho-units comparable to Cullmoad Sandstone and Chokanadapuram Limestone members respectively are also recognized in the upper part. Four litho-units are recognized in Ariyalur Formation.

The Mesozoic sequence is overlain by Paleocene yellowish brown clay, semi-weathered limestones and marls and minor sandstones, designated as Pondicherry Formation. The sequence is overlain in the east by Cuddalore Sandstone and alluvium.

Four planktonic foraminiferal zones and two sub-zones in Ariyalur Formation and three in Pondicherry Formation are worked out.

A close study of these three big outcrop areas to the north of Cauvery-Coleroon river system indicates a wide range of facies variations in the rock types due to different sedimentation and depositional history of the Cretaceous-Tertiary sequence. Therefore, minor litho-units (Members) recognized in different areas can not be precisely inter-correlated, hence, a need for separate sets of litho-units of respective areas is desired. The uppermost part of the Cretaceous sequence represents an uniform regressive phase throughout the outcrop areas, whereas, the fresh transgressive phase during the base of Tertiary resulted a more carbonate sedimentation towards north and shaly towards south.

Structurally, the beds of various stratigraphic units in most parts of the exposed areas are either more or less horizontal or with very little inclination of 3-5 degrees towards east, ESE or ENE., except in case of local erratic variations due to later disturbances. The beds of Garudamangalam and Uttatur Formations in Ariyalur area have more steeper dips recorded upto 20-30 degrees towards ESE. The variations in the strike and amount of dip resulted into some sort of angular unconformable relationship between different units. The rocks are otherwise free of any major structural disturbances except for the local minor folds and faults noticed in bed near crystalline margins.

B. 1 Thanjavur Area

This is comparatively small area of about 50-60 sq. kms., situated almost at the central

TABLE 4

STRATIGRAPHY OF VRIDHACHALAM AREA

GEOLOGICAL AGE		ROCK-STRATIGRAPHIC UNITS		BIOSTRATIGRAPHIC ZONES		
RECENT PLEISTOCENE		(Alluvium and gravel beds)		?		
UPPER PLIOCENE- UPPER MIOCENE		Cuddalore Sandstone				
PALEOCENE		Pondicherry Formation		Globorotalia velascoensis - Globorotalia whitei Assemblage Zone		
				Globorotalia pseudomenardii - G. pusilla laevigata Assemblage Zone		
				Globorotalia uncinata - Globorotalia pseudobulloides Assemblage Zone		
UPPER CRETACEOUS	MAESTRI- CHTIAN	Up.	Kallankurchi Formation	Cullmoad Sandstone Member	? (Few Orbitoides only)	
		Mid.		Chokanadapuram Limestone Member		
		Low.	Ariyalur Formation	Pallakollai Member	Globotruncana linneiana tricarinata Zone	
	SENONIAN	COMPANIAN		Chendamangalam Member	Globotruncana globigerinoides Zone	G. ventricosa Sub-zone
		SANTONIAN		Patti Member	Globotruncana concavata Zone	
		CONIACIAN		Parur Member	Globotruncana linneiana coronata Zone	
	LOWER CRETA- CEOUS TO UPPER JURASSIC		? Sivaganga Formation		?	
PRE-CAMBRIAN		(Crystalline rocks)				

part of the basin towards south-west of Thanjavur town. The sedimentary outcrop area can be best approached on both sides of Thanjavur-

Tiruchirapalli road. Near Vallam, a small patch of Upper Cretaceous sediments is seen overlying the Archaean crystallines towards

TABLE—5

STRATIGRAPHY OF THANJAVUR AREA

GEOCHRONOLOGICAL UNITS	ROCK—STRATIGRAPHIC UNITS	LITHOLOGY
RECENT TO PLEISTOCENE	(Alluvium and gravel beds)	
UPPER PLIOCENE TO UPPER MIOCENE	Cuddalore Sandstone	Gritty to pebbly argillaceous sandstone, lateritised with interbedded clays
LOWER EOCENE TO PALEOCENE	Pondicherry Formation (exposures doubtful)	Calcareous to argillaceous sands and minor limestone and marls in the subcrop sequence only
UPPER TO MIDDLE MAESTRICHtian	Kallankurchi Formation	Cullmoad Sandstone Member <hr/> Chokanadapuram Limestone Member
		Variegated fine grained clayey sandstone Reddish brown to buff argillaceous limestone
LOWER MAESTRICHtian TO SENONIAN	Ariyalur Formation	Grey to yellowish brown limestone and kankary limestone at the base and minor sands.
PRE—CAMBRIAN	(Crystalline rocks)	

east and south-east. Within this area, three broad litho-units are recognized which are correlated with Ariyalur Formation and two members of Kallankurchi Formation of Ariyalur area respectively. The presence of some Eocene rocks in this area has been referred by Krishan (1959), but no definite evidence in the field could be established. However, in some sub-crop sections drilled very near to this area Paleocene sequence has been recognized (Banerji, 1970) (Table 5).

B. 2 Sivaganga Area

This area extends from Sivaganga in the extreme west to the east of Sarugain and Manamadurai to the south. Three well defined litho-units overlying the Archaean crystalline basement are recognized in the field, these are, the Lower Member-boulder beds and coarse conglomerate, the Middle Member-medium to coarse grained, somewhat gritty sandstone and Upper Member-alternating

TABLE 6
STRATIGRAPHY OF SIVAGANGA AREA

GEO CHRONOLOGICAL UNITS	ROCK-STRATIGRAPHIC UNITS
RECENT TO PLEISTOCENE	(alluvium and gravel beds)
UPPER PLIOCENE TO	Cuddalore Sandstone
UPPER MIOCENE	
LOWER CRETACEOUS TO ? UPPER JURASSIC	Sivaganga Formation
	<i>Upper Member</i> : Alternating beds of yellow and ash grey micaceous shales and medium to coarse grained sandstones, <i>Middle Member</i> : Medium to coarse grained, gritty; grey to yellowish brown sandstone. <i>Lower Member</i> : Boulder beds and coarse conglomerate.
PRE-CAMBRIAN	(Crystalline rocks)

TABLE 7

CORRELATION OF STRTIGRAPHIC UNITS IN THE EXPOSED AREAS OF THE CAUVERY BASIN AND MAXIMUM THICKNESS AS RECORDED

Broad Geo-Chronological Units	OUTCROP AREAS					Approx. Thickness In Metres
	Ariyalur	Vridhachalam	Pondicherry	Thanjavur	Sivaganga	
Recent to Pleistocene	(Alluvium and gravel beds)					?
Up. Pliocene Up. Miocene	Cuddalore Sandstone					500
Mid. Miocene Mid. Eocene	(Not exposed in the Basin)					?
Low. Eocene Paleocene	Pondicherry Formation (?)					150
Up-Mid. Maestrichtain	Kallankurchi Formation	(Not exposed)				200
Low. Mae- strichtian- Coniacian	Ariyalur Formation					500
Turonian	Garudaman- galam Formation					650
Genomanian	Uttatur Formation					800
Albian	Dalmiapuram Formation					150
Neocomian Mid.-Up. Jurassic	Sivaganga Formation	(Not exposed)			Siva- ganga Forma- tion	300

beds of yellow and ash grey micaceous shales and medium to coarse grained sandstone. The sequence was formerly attributed by several workers as equivalent to 'Upper Gondwana sequence'. A new name-Sivaganga Formation is proposed for this continental to partially paralic sediments of this area. Other equivalents of this formation are observed in the western margins of Ariyalur and Vridhachalam areas and is supposed to develop below the Cuddalore Sandstone on the western margin of the Pondicherry area. The whole sequence in Sivaganga area is covered by Cuddalore Sandstone and alluvium.

The recorded maximum thickness and inter-correlations of important geochronological units and their equivalent rock-stratigraphic units in various outcrop areas are given in Table 7.

SYSTEMATIC STRATIGRAPHY

The stratigraphic units recognized in the outcrop areas of the Cauvery Basin are defined and described in a systematic way along with a brief description of lithology, palaeontology and geologic age of these units. Their type and typical sections, lower and upper contacts and maximum thickness are also included. A generalized geological map has been prepared to illustrate the outcrops of these units in the Cauvery Basin (Fig. 1).

In this basin, no Palaeozoic rock has been reported and the first sedimentary sequence overlying the Archaean crystallines represented by various types of charnockites, gneissic rocks and schists etc., belong to Mid.-Upper Jurassic in age.

MESOZOIC

?Middle-Upper Jurassic to Lower Cretaceous

Sivaganga Formation

Author. Proposed name, after the type area - Sivaganga.

Type Section. Sivaganga to Kallayarkovil via Natharasankottai and Algapur in Sivaganga area.

Geographic Extensions. Extensive outcrops in Sivaganga area between Sarugain and Manamadurai; isolated outcrops near Veragupadi, Karasur, Terani, Teranipaliyam, Neykulam and Tirupattur etc. in Ariyalur area and near Parur in Vridhachalam area.

Lithology. In the type area, medium to coarse grained felspathic sandstones, overlain by white to greyish shales are the main constituents. In the Ariyalur area, this formation is represented by a sequence of interbedded grey, coarse quartzose and felspathic gritty and ferruginous sandstone. Similar rock types also occur in Vridhachalam area towards north.

Lower Contact. Non-conformable to the Archaeans, marked by major hiatus, followed by the fluviatile to lacustrine and estuarine to brackish deposits of the Sivaganga Formation.

Upper Contact. Unconformable with the overlying Dalmiapuram Formation in some parts and Uttatur Formation in other parts of Ariyalur area and with Ariyalur Formation in Vridhachalam area. In the type area, the formation is overlain by Cuddalore Sandstone.

Thickness. 300 m.

Palaeontology. These beds have mainly yielded plant fossils, represented by families

like coniferales, filicales, and cycadophytes, which indicate ?Mid.-Upper Jurassic age. A few shale samples of Sivaganga area have yielded arenaceous foraminifera like *Bathysiphon taurinensis*, *Ammodiscus cretaceus*, *Ammobaculites* sp., *Haphlophragmoides* sp. etc., which have close similarity with those recorded from Sriperumbudur Beds near Madras, assigned to Lower Cretaceous (Murthy and Sastri, 1962).

Palaeoecology. The major part of this formation is of continental, lagoonal to deltaic in origin. The association of marine beds (shallow to brackish water in nature) in Sriperumbudur indicates that the paleo-shore line was very close to the present Coromandel coast in the northern part, however, some marine incursions took place as west as near Uttatur. Thus the first marine transgression of relatively low magnitude may be attributed to Neocomian times.

Lower Cretaceous

Dalmiapuram Formation

Authors. After Banerji, R. K., 1970, Bhatia and Jain, 1969.

Type Section. Dalmiapuram limestone quarry No. 2, northern face, near Kallakudi, on Tiruchirapalli-Vridhachalam road.

Geographic Extensions. Mainly localized in different quarries of Dalmiapuram area and some other isolated patches found scattered near Maruvattur, Melarasur, Tirupattur etc. in Ariyalur area.

Lithology. In Dalmiapuram area, two distinct lithologies are observed, the lower-Shale Members thin lenticular bands of greyish soft laminated shales with few fossils,

and the upper-Limestone Member, thick crystalline type of limestone and reefoidal limestone with corals etc.

Lower Contact. Non-conformable with Archaeans, the major hiatus is marked by uplift and erosion, followed by subsidence and growth of coral reefs.

Upper Contact. Unconformity with Clay Member of Uttatur Formation at some places and with Gurudamangalam Formation in other.

Thickness. 150 m.

Palaeontology. The limestone is reefoidal in nature and has yielded about forty species of corals (Pascoe, 1959) and a rich assemblage of foraminifera (Gowda, 1964; Banerji, 1970). Two biostratigraphic zones are delineated, lower-*Lenticulina macrodisca* Zone and upper-*Hedbergella planispira* Zone (Banerji, 1970).

Age. Lower to Middle Albian. Bhatia and Jain (1969) have extended the age of this formation up to Aptian.

Palaeoecology. Dalmiapuram limestone is a kind of reefoidal limestone; reefs were developed along the margin of the sea which has transgressed into the land area somewhere from the north east or east of the present area during Aptian-Lower Albian. Reef development is thus a 'fringing reef type'. The black shale generally found at the base indicates a sort of restricted environment, followed by open sea conditions favourable for the growth of reefs. It is not unlikely that the Neocomian transgression which resulted the deposition of Sivaganga and Sriperumbudur beds continued even to this period.

Further details of this formation are available in Banerji (1970).

Upper Cretaceous

Uttatur Formation

Author. Blandford, H. F., 1865.

Type Section. East of Uttatur towards Garudamangalam.

Typical Sections. Best exposed sections are along east of Uttatur to Alandalipur in the south and between Maruvattur and Kunnam in north.

Geographic Extensions. This formation is mainly localized in a triangular area towards the western part of Ariyalur area between Alandalipur towards south and Maruvattur—Odiyam in north. Not exposed in other outcrop areas of the Cauvery Basin.

Members. Lower—Clay Member, and upper—Sandstone Member.

Clay Member

Lithology. The lower member comprises yellowish brown to greenish grey coloured gypseous clays with thin impersistent fossiliferous argillaceous limestone bands and marls. Within clays, the nodules of violet coloured siltstone, buff coloured limestone and veins of gypsum and celestite are observed. The rocks are frequently concretionary, often enclosing large sized well preserved ammonites. Phosphatic nodules are at places abundant occurring as distinct patches. These nodules have yielded rich microfossils including foraminifera. The upper part is rich in evaporites, indicating that during this period the sea became desiccated impregnating sediments with gypsum and salts.

Lower Contact. Non-conformable with charnockites for greater part and with gneisses and granites as its northern and southern ends. Profound hiatus marked by extensive erosion followed by gradual subsidence and first major marine transgression is evident. This transgression was effective in most parts, however, the sediments thus deposited were later got covered with the transgressive deposits of the Ariyalur Formation. Wherever, Clay Member overlies Dalmiapuram Formation, it has a transgressive onlap relationship with the latter marked by a major hiatus.

Upper Contact. Conformable with Sandstone Member.

Thickness. 500 m.

Palaeontology. The clays have yielded well known Lower Cenomanian molluscan fauna (Stoliczka, 1861-73) like species of *Pervinquiera*, *Stoliczkaia*, *Turrilites*, *Desmoceras*, *Mortoniceras*, *Acanthoceras*, *Tetragonites*, *Hamites*, *Baculites* etc. (Pascoe, 1959). Except *Acanthoceras* cf. *rhotamagense*, which is regarded as typical Mid.-Upper Cenomanian form, all other mega-fossils range within Lower Cenomanian. Venkataraman and Rangaraju (1965) have delineated two zones based on the presence and absence of *Belemnites* sp.

The clays are also very rich in smaller foraminifera. Few important species are: *Ammodiscus tenuissimus*, *Astaculus varians*, *Bifarina lungarica*, *Brotzenia ornata*, *Conorboides hofkeri*, *Derbyella browntownensis*, *Dentalina cylindrica*, *D. legumeri*, *D. terquemi*, *Gavelinopsis infracretacea*, *Globigerinelloides eaglefordensis*, *Gyroidinoides gracillima*, *Hoeglundina supracretacea*, *Hedbergella infracretacea*, *H. planispira*, *H. washitensis*, *Lagena acuticosta*, *L. globosa*, *Lenticulina pondi*, *L. rutolata*, *L. spissocostata*, *Marginulina*

hamulus, *Marginulinopsis comma*, *M. robusta*, *Praeglobotruncana stephani*, *Reophax scorpivorus*, *Rotalipora appenninica appenninica*, *R. evoluta*, *Saraceneria crasscostata*, *Textularia anceps*, *Tris-trix excavatum* and many others. Similar assemblage has been reported by Gowda (1964).

Age. Lower Cenomanian.

Palaeoecology. This unit seems to have deposited in an inner neritic type of marine environment, which in later part became, more or less, estuarine to bay type and finally the sea became some what dessicated.

Sandstone Member

Lithology. The lower portion comprises well bedded, fine grained sandstone, which becomes coarse gritty and conglomeratic towards top. Conglomerates are rarely seen in the lower part. Buff coloured clays and argillaceous bands are also present. Sandstone sometimes show cross bedding and ripple marks.

Upper Contact. Transgressive onlap with overlying Garudamangalam Formation, marked by an erosional unconformity.

Thickness. 300 m.

Palaeontology. This unit has yielded typical Middle-Upper Cenomanian molluscan forms like: *Acanthoceras cenomanense*, *A. newboldi*, *Belemnites ultimus*, *Diptyoceras forbesianum*, *Exogyra canaliculata*, *Gaudryceras odiense*, *Holcostephanus superstes*, *Nautilus fleuriausianus*, *Phylloceras ellipticum*, *Puzosia compressa*, *Scaphites similis*, *Schloenbachia obessa*, *Tetragonites timotheanus*, *Turrilites costatus*, *Turritella acanthophora* etc. (Pascoe, 1959). On the other hand, only a few ill-preserved, silicified and ferruginous test of foraminiferal species of *Allomorphina*, *Anoma-*

lina, *Astacolus*, *Cibicides*, *Dentalina*, *Discorbis*, *Epistomina*, *Fronicularia*, *Guttulina*, *Gaudryina*, *Lenticulina*, *Reophax*, *Textularia*, *Trochammina* etc. are found, a majority of them are reworked from lower units.

Age. Middle to Upper Cenomanian (on mega-fossil considerations).

Palaeoecology. The sediments appear to have been deposited in very shallow water conditions under regressive facies. The conglomerates at the top indicate somewhat brackish to ?continental type of deposits for a very short period. The lower part perhaps got deposited under littoral to ?epineritic conditions.

Biostratigraphic Zone: *Rotalipora appenninica appenninica* Zone representing the lower part of Uttatur Formation (Banerji & Mohan, 1970).

Garudamanaglam Formation

Author. Kossmat, F., 1897, *nom. correct.* 'Trichinopoly Group' of Blanford, H. F., 1865.

Type Section. Not well defined; around Garudamangalam.

Geographic Extensions. Exposed only in Ariyalur area, extending from south of Tappay to north of Kunnam.

Lithology. In general, it comprises of highly ferruginous sandstone, sandy limestone, followed by argillaceous limestone, overlain by current bedded, medium to coarse yellowish brown sandstone. Towards south, between Anaipudi and Alandalipur, hard conglomeratic sandstone with yellow quartz and pink felspar pebbles are interbedded with medium to coarse, cross bedded sandstone and ochreous clays. Further south, rocks are simi-

lar to Uttatur Formation, with the development of fine silt, shale and claystone. Towards north of Anaipudi, the rocks are more calcareous, represented mostly by shell limestone. Conglomerate, conglomeratic sandstone and ochreous clay also occur. Reefoidal limestone exposed near Kilpadi, Maruvattur, Periakurukai and north of Kilpaluvur etc. belongs to the basal parts of Garudamangalam Formation.

Lower Contact. Transgressive onlap with underlying Uttatur and Dalmiapuram Formations.

Upper Contact. Angular unconformity, followed by extensive transgressive onlap by Ariyalur Formation.

Thickness. 650 m.

Palaeontology The mega-fossil fauna comprises more than 185 species of echinoderms, brachiopods, molluscs and few crustaceans, bryozoa and corals etc. (Pascoe, 1959). These fossils indicate Upper Cenomanian to Turonian age. Among well known Upper Cenomanian species recorded from the lower part of this formation are : *Alectryonia carinata*, *A. diluviana*, *Alaria parkinsoni*, *Fasciolaria rigida*, *Cerithium trimonile*, *Cymatoceras sassureanum*, *Kossmaticeras bhavani* and *Peroniceras dravidicum* etc. These species are found to be restricted to the Upper Cenomanian horizons in many parts of Europe, Central Asia, northwestern Africa, Madagascar Australia and as far as north and Central America. The well known Turonian species are : *Heteroceras indicum*, *Pachydiscus peramplus*, *Protocardium hillanum*, *Rhynchonella compressa* and *Schloenbachia serraticarinatus* etc. Lower Senonian age was assigned by earlier workers (*cit.* Krishnan, 1964; Sastry, *et al.*, 1968) on

the basis of the species of *Placenticeras*, *Kossmaticeras* and *Lewesiceras* etc., however, these genera are regarded here as Turonian forms.

Compare to mega-fossils, foraminifera and other micro-fossils are extremely rare. Species of *Anomalina*, *Cibicides*, *Gavelinella*, *Hoeglundina*, *Raphanulina*, *Trifarina* etc, occur as rare elements. Amongst other fossils, the occurrence of fossil wood (cycatoidea) are reported (*cit.* Rama Rao, 1956).

Age. The age indicated by mega-fossils ranges from Upper Cenomanian to Mid.-Upper Turonian, and not upto Lower Senonian as referred by others. Typical Lower Senonian index planktonic foraminifera have been reported from overlying Ariyalur Formation (Banerji, 1965, 1968; Rasheed, *et al.*, 1966).

Palaeoecology. The sediments of this formation appear to be a kind of littoral to shallow water deposit. The abundant mega-fossils and fossil woods indicate that the beds were deposited in a shallow sea of transgressive nature and nowhere far off from the adjacent land. The presence of abundant clastic material in the southern outcrop regions indicated the source of supply mainly from the south as a result of uplift within the provenance towards the close of Uttatur time. The northern shell limestone horizon was perhaps deposited in a stable shelf conditions as bank deposit. The supply of abundant clastic sediments resulted the basin to become unfavourable for the growth of reefs.

Ariyalur Formation

Author. Blanford, H. F., 1865, *nom. correct.* 'Lower Ariyalur Group', after Ariyalur town, Tiruchirapalli district.

TABLE 8

ROCK AND BIOSTRATIGRAPHIC UNITS OF ARIYALUR FORMATION

GEOLOGIC AGE	FORAMINIFERAL BIOSTRATIGRAPHIC ZONES	LITHO-UNITS IN ARIYALUR FORMATION IN		
		ARIYALUR AREA	VRI DHACHALAM AREA	PONDICHERY AREA Thickness not Ascertainable
LOWER MAESTRICHIAN	<i>Globotruncana linneiana tricarinanta</i> Zone	SADIYAKANPATTI MEMBER Hard, yellowish brown, argillaceous limestone with some bands crystalline limestone and hard yellowish brown calcareous sandstone 100—120 m	PALLAKOLLAI MEMBER Shell limestone, hard greyish white to yellowish with minor bands of silty sandstone and shale 50 m	SAIDERAPET MEMBER Highly fossiliferous hard sandy limestone and calcareous nodules in sandy shale ?
CAMPANIAN		SILLAKKUDI MEMBER Less compact, greyish to yellow, fine to medium grained calc. sandstone with minor shales or clay bands 60—80 m	CHENDAMANGALAM MEMBER Grey hard compact, fine grained limestone, at times recrystallized and minor shale bands 30 m	KARASUR MEMBER Yellowish brown calcareous shales with phosphatic nodules ÜSTERI MEMBER Soft greyish white fine grained somewhat argillaceous limestone ?
SANTONIAN	<i>Globotruncana concavata</i> Zone	MELMATTUR MEMBER Variegated clayey sandstone, interbedded friable loose conglomeratic sandstone 180 m	PATTI MEMBER Soft weathered yellowish grey sandy limestone and shales and thin band of yellow coloured marls 30 m	VALUDAVUR MEMBER Hard compact shell limestone somewhat concretionary VANUR MEMBER White to yellowish brown sandstone with large nodules or concretions ?
CONIACIAN		<i>Globotruncana linneiana coronata</i> Zone	?	PARUR MEMBER Hard greyish to yellowish calcareous sandstone and minor limestone with calcareous nodules 25 m

(R. K. BANERJI)

Type Section. Around Ariyalur town, mainly towards westerside.

Typical Sections. (i) Patti Nala Section, Vridhachalam (Banerji 1966) (ii) Mel Mattur, Sillakudi and Sadiyakkanpatti sections, near Ariyalur (Banerji, 1970).

Geographic Extensions. In comparison to the underlying formations the rocks of this formation cover a much wider area. Perhaps this is the only formation whose rocks are seen in all the exposed areas north of Cauvery-Coleroon and also near Thanjavur. In Ariyalur area, this formation occupies a broad strip of country over 18 kms in width from east to west and between rivers Coleroon and Vellar. The beds are exposed in Vridhachalam area between rivers Manimukta and Gadilum and again reappear in the northeast of river Varahanadi in Pondicherry area. Small outcrops are seen in the southwest of Thanjavur town.

Lithology. This formation in general composed of friable sandstone with bands of richly fossiliferous argillaceous limestone and calcareous shales. Fossiliferous sections of calcareous ochreous silts, argillaceous limestone and hard sandy limestone are found intercalated. Lithologically the Ariyalur Formation can be subdivided into number of units (Members) in all three major areas (Table 8). Due to wide lithofacies variations, the precise correlation of these units are not possible; a micropalaeontological cum lithological correlation is attempted (Table 8).

Lower Contact. Transgressive onlap with Garudamangalam and Uttatur Formations and Archaean crystallines in Ariyalur area. Non-conformable with Archaeans in Vridhachalam and Thanjavur areas. The contact is not exposed and concealed by the younger

sediments—Cuddalore Sandstones in Pondicherry area.

Upper Contact. Disconformable with Kallankurchi Formation in Ariyalur and Vridhachalam areas; unconformable with Pondicherry Formation in Pondicherry area and with Cuddalore Sandstone in Thanjavur area.

Thickness. Varies from 135 to 400 m. in different places.

Palaeontology. This formation is very rich in all types of invertebrates including molluscs, echinoderms, brachiopods, corals and bryozoa and many vertebrates like fishes and reptiles. The fauna show a definite Senonian affinity. Over 140 species belonging to 45 foraminiferal genera are reported from this formation. Four foraminiferal biostratigraphic zones and four sub-zones have been worked out, which assign the age to Ariyalur Formation as Coniacian to Lower Maestrichtian (Banerji, 1966, 68, 70b).

Palaeoecology. The variations in average lithology of sediments of this formation exposed in Ariyalur area to the south and Vridhachalam and Pondicherry to the north may indicate the existence of separate sources of the sediments. River Vellar and its tributaries from north and Coleroon from south have contributed plenty of clastic materials in Ariyalur basin, whereas rivers Penniar and Gadilum which flows through the central part of Vridhachalam-Pondicherry axis was not very effective. The foraminiferal assemblage indicates a very shallow to inner shelf zone type (20-50 m. depth) environment for the lower part of Ariyalur Formation during Coniacian time. The depth appears to be constantly increasing and a maximum depth upto

middle and upper bathyal zone (200-250 m.) was attained during Upper Campanian. There are clear evidences for the progressive shallowing of the sea during the deposition of the upper parts of Ariyalur Formation during Lower Maestrichtian, when the environment was inner neritic to estuarine, semideltaic type.

Kallankurchi Formation

Author. Proposed name ; after Gowda, S., 1964, named after the village Kallankurchi. First referred in Banerji, 1970b.

Members. Lower—Chokanadapuram Limestone Member.

Upper—Cullmoad Sandstone Member.

Chokanadapuram Limestone Member

Type Section. Limestone exposures in a nala near east of Chokanadapuram, Ariyalur area.

Typical Sections. Between Kallankurchi, Hastinapuram and Kattupirangiyam in Ariyalur area and in well section of Eramanur in Vridhachalam area.

Geographic Extensions. The limestone bands can be traced continuously from Kullmur in the north through Kallankurchi, Hastinapuram upto Esnai in the south and east of Ariyalur. Few occurrences are known in well sections near Eramanur.

Lithology. It is essentially a yellowish brown to greyish white hard compact highly sandy limestone with sections of hard crystalline limestone occurring as thin bands. The succession is marked at the base by a coarse conglomerate with pebbles of mainly quartz and

quartzites. At places quartz content increases to over 30 to 40%.

Lower Contact. Disconformable contact with Ariyalur Formation.

Upper Contact. Conformable with Cullmoad Sandstone Member.

Thickness. 200 m.

Palaeontology. The limestone is very rich in big sized pelecypod shells like *Alectryonia pectinata*, *Cardita* sp., *Gryphaea vesicularis*, *Inoceramus* sp., *Ostrea* sp., *Pecten* sp.; brachiopods like *Terebratula* sp.; echinoids like *Stigmatopygus* sp.; cephalopods like *Scaphites* sp., *Baculites* sp., and few bryozoa and others. Among foraminifera, larger forams like ? *Orbitoides faujasi*, *Orbitocyclina ariyulurensis*, *Lepidorbitoides inornata*, *L. blanfordi*, *Siderolites calcitrapoides* etc. are well known (cit. Rama Rao, 1965). Gowda (1964) has reported large nos. of foraminifera. Some of the important species are : *Alabamina dorso-planata*, *Anomalinoidea pinguis*, *Bolivina incrassata*, *Buliminella pvrula*, *Cibicides subcarinatus*, *Dentalina basiplanata*, *Epistominella minussi*, *Gaudryina faujasi*, *Guttulina trigonula*, *Lagena acuticosta*, *Lenticulina pondi*, *Marginulina inequilis*, *Reusella cristata*, *Spiroplectamina semicomplanata*, etc. Few planktonic species are *Globigerinella aspera*, *G. messinae*, *Hebergella monmouthensis*, *Heterohelix globulosa*, *H. striata* and *Praeglobotruncana bayenensis*.

Age. Lower to Middle Maestrichtian.

Palaeoecology. From the nature of outcrops of this member, it appears that the rocks were deposited along the margins of a regressive Cretaceous sea of very shallow water in nature and in a relatively high energy conditions. It is assumed that there was very little influx of terrigenous material into the basin in

the later stages. This limestone may be considered as a kind of beach deposit within the littoral zone marking the the palaeoshore line during the Middle Maestrichtian.

Cullmoad Sandstone Member

Author. Proposed name, after Cullmoad village. Srivastava *et al.* (1967) proposed this name for Mid.—Upper Maestrichtian sequence.

Type Section. Between Cullmoad and Ottakovil villages.

Typical Section. East of Ottakovil upto Villangudi.

Geographic Extensions. In Ariyalur area the rocks of this member run along a N-S belt from near Sendurai to Killanatham, parallel to exposures of Chokanadapuram Limestone Member in the west. In Vridhachalam area, the beds can be traced almost throughout the central part of the area.

Lithology. It is mainly represented by fine semi-consolidated chalky sandstone, white calcareous sandstone and sandy clays. Sandstone is usually false bedded, fine to occasionally medium grained and friable in nature. Towards the top, few grey shale beds have been located near Villangudi.

Lower Contact. Conformable with Chokanadapuram Limestone Member. Near Ottakovil, the top of limestone band appears to grade into sandstone of Cullmoad Sandstone Member.

Upper Contact. Not well exposed. Unconformable with Pondicherry Formation and Cuddalore Sandstone.

Thickness. 400 m.

Palaeontology. The sandstone is more or less unfossiliferous. Only near Ottakovil some records of invertebrate fossils like species of *Stigmatopygus*, *Baculites* and *Alectryonia* and few dinosaurian remains have been made.

Age. The presence of dinosaurs and being younger than the Ariyalur Formation and Chokanadapuram Limestone, the age of this member can be defined as Middle to Upper Maestrichtian.

Palaeoecology. The sediments of this member have been deposited in a very shallow part of the basin in a regressive phase. The basin has become little turbid in compare to the time of the deposition of underlying limestone and very fine grained terrestrial material were introduced. The absence of fauna may be explained due to the predominance of peculiar environment where the chalk deposition was continuing, resulting in difficulty to flourish such organisms like corals, brachiopods and molluscs. The presence of dinosaur remains near Ottakovil may indicate the marshy land area which was earlier connected through some land bridge with surrounding land area and was marooned by the impounding water of the sea resulting in a barrier for these huge animals to escape and latter got buried.

TERTIARY

Paleocene—Lower Eocene

Pondicherry Formation

Author. Rajagopalan, N., 1965, after Pondicherry town., *non. correct.* 'Niniyur Group, of Rama Rao, 1942.

Type Section. Not defined.

Typical Section. Between Karasur to Saiderapet.

Geographic Extensions. In Ariyalur area, the beds are exposed as far Authencurchy to the north, following east of Nattaguly, Ellai-kadambur, Niniyur, Sendurai, Rayabaram upto Kilimangalam. A thin layer of bed has been observed in the eastern margin of Vridhachalam from Gopurapuram to Matur and further north. In Pondicherry area, this formation is sandwiched between Ariyalur and Cuddalore Formations following NNE—SSW trend.

Lithology. In Ariyalur area, the rock type is purple to greyish white medium grained felspathic compact clayey sandstone in the lower part and buff to green coloured hard compact fossiliferous limestone with minor sand and silt. The chert associated with sandstone around Villangudi are not *in situ* and belong to Cuddalore Sandstone.

In Pondicherry area, according to Rajagopalan (1965), four litho-units are present (Table 3). According to his later classification (1966), Discocyclinid Limestone unit is a facies variant of Upper Marlstone in parts. In Vridhachalam area, there are some exposures of calcareous siltstone grading into claystone marls and limestone at places.

Lower Contact. Unconformable with Cullmoad Sandstone Member in Ariyalur and Vridhachalam areas and Ariyalur Formation in Pondicherry area.

Upper Contact. Unconformable with Cuddalore Sandstone

Thickness. 150 m.

Palaeontology. Among mega-fossils, *Lucina* (*Crassatella*) *percrassa*, *Nautilus* (*Hercoglossa*) *danicus*, *N. (H.) tamulicus*, *Cardita beaumonti*, *Tellina arcotensis*, *Tyria formosa*, *Stylina parbula* etc. (Pascoe, 1959) are important. Rich assemblage of algae belonging to Corallinaceae, Solenoporaceae, Dasycladaceae and Chaetoporaceae are recorded from Authencurchy. The rocks equally rich in smaller foraminifera. Four planktonic foraminiferal zones in Pondicherry area (Rajagopalan, 1965) and three in Vridhachalam area (Mehrotra and Banerji, 1970) have been worked out.

Age. Upper Danian to Lower Ypresian.

Palaeoecology. The Pondicherry Formation was deposited as a result of another marine transgression following the regression during uppermost Maestrichtian. The paleo-shore line during Paleocene almost followed the eastern exposure limits of the Cretaceous rocks. The site of deposition was at first a typical estuarine to bay type, which later became open and deep and the maximum depth of upper bathyal zone type was perhaps attained. The development of coralline algae indicate a euphotic zone environment not deeper than 200 m. in the lower and middle parts.

Middle Eocene to Middle Miocene

(Not exposed in the Cauvery Basin, known only in covered areas)

Upper Miocene—Upper Pliocene

Cuddalore Sandstone

Author. After Blandford, H. F., 1865, *nom. correct.* 'Cuddalore Series' of Vredenberg, E., 1908.

Type Section. Not defined.

Geographic Extensions. Widely extensive throughout the eastern margins of the exposed areas from near Rameshwaram through Pattukotai, Thanjavur, Kilpuluvur, Cuddalore and Pondicherry and further north to Madras, Nellore and Rajahmundry.

Lithology. Gritty to pebbly argillaceous sandstone, somewhat lateritised and ferruginous with interbedded clays and coarse quartz pebble conglomerates. This formation may be divided into lower-arenaceous member and upper-argillaceous member with a lignite horizon separating the two.

Upper Contact. Concealed by river alluvium and coastal sands.

Thickness. 600 m.

Palaeontology. The sandstone beds have yielded gastropods and pelecypods and abundant silicified trunks of angiosperm trees.

Age. Eames (1950) has suggested Pliocene age on the basis of molluscan fauna, whereas the plant fossils have some Upper Pliocene affinity.

Palaeoecology. The rocks of this formation were deposited in a fluvial-lacustrine to estuarine type of environment but generally under continental facies. It is possible that marine deltaic facies may be present in the exposed parts, however, the equivalent marine sub-crop sequence is known as Karikal Beds.

Pleistocene—Recent

The uppermost sequence comprised of some coarse gritty sands with abundant pebbles and gravels and river alluvium. The alluvium deposits by various rivers marks the boundaries of five major outcrops areas of the Cauvery Basin.

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