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DISTRIBUTION AND AFFINITIES OF THE OSTRACOD FAUNA OF THE TIYON FORMATION (MIDDLE EOCENE) OF LAKI RANGE, SINDH

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Abstract

The Ostrocod fauna assemblage of Tiyon formation overlying Laki and underlying Kirthar Formation in Laki Range, Sindh is quite distinct in terms of lithology and microfauna. The investigation was undertaken to assign age to the unit.

Keywords: Late Ypresian, Early Lutetian, Tiyon

1. Introduction

The classic tertiary strata exposed in Southern Indus Basin contain prolific micro-fauna consisting predominantly of foraminifera with subordinate Ostracod population among other groups. The studies were limited to argillaceous limestone shale unit occurring in between underlying Laki Formation and overlying Kirthar Formation. This was earlier taken as part of Kirthar (Noetling, 1905).

Prior to this Siddiqui (1971) carried out detailed biostratigraphic studies based on Ostracods of the Tertiary of Sulaiman Range, He determined five stratigraphic zones based on distinct and dominant Ostracod fauna.

In this study, 45 species of Ostracod fauna belonging to 21 genera were examined. Thirty six of these species are already reported in the literature. Nine species are distinct and do not compare with the known forms.

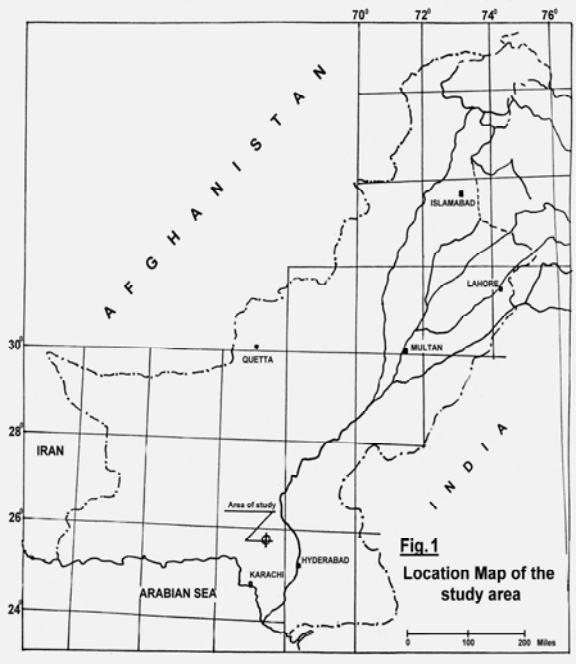


Fig.1 Location Map of the study area

2. Material and Method

Samples of this study were collected from the outcrop of the Tiyon formation, Tiyon Dhoro section (Lat. 26^0 $07^/$ $29^{//}$ N. Long. 67^0 $50^/$ $06^{//}$ E, Fig. 1). The section situated about 24 Km. south of Jhangara village, District Jamshoro, Sindh, Pakistan. The samples were taken at regular interval from the exposed sequence of strata, which is about 137 m. thick. 19 samples were examined for this study. Most of the samples are composed of shale and marly limestone. The lithologic succession of the Tiyon sequence in this area consists of shale, limestone and marl. The shale is soft, crumbly, calcareous, and fossiliferous. **(Fig. 2)** The limestone is thin bedded, nodular and intercalated with marl. Marl is generally hard, nodular, yellowish, cream weathers to yellow, reddish brown and is fossiliferous.

Fig. 2

LITHOLOGICAL LOG

Formation	Sample No.	Lithology	Lithological Description
KIRTHER	19		Limestone hard and compacted yellowish white and brownish white.
T	18		Limestone fossiliferous, hard yellowish white.
	17		Argillaceous limestone, soft, yellow to white.
	16		Calcareous and gypsiferous shale, with intercalation of clay, greenish brown.
I	15		Calcareous and gypsiferous shale, wheathers to yellow, yellowish grey.
	14		Calcareous and gypsiferous shale, greenish brown to yellow.
Y	13		Limestone marly, soft and chalky, yellow to yellowish pink.
	12		Limestone loose and soft, yellowish white and brownish white.
	11		Shale gypsiferous, loose, soft, greenish grey.
O	10		Limestone fossiliferous, hard, yellowish white.
	9		Shale calcareous and gypsifereous, greenish brown.
	8		
N	7		Limestone highly fossiliferous, hard grey and raddish brown.
	6		Shale, hard, raddish brwon, brownish grey and yellowish white.
	5		Marl nodular, fossiliferous, raddish brown.
L	4		
A	3		Limestone, thick bedded, hard and compact, fossiliferous, raddish white and pinkish white.
K	2		
I	1		Limestone hard to splintery, massive, pinkish white.
	0		

50 m.
25 m.
0 m.

3. Discussion

The Ostracod fauna of Tiyon sequence from the type locality of Tiyon formation are more abundant in middle and upper part of the sequence. Samples 10 to l8 **(Fig. 3)** has yielded abundant Ostracods as compared to samples 8, 9 and higher up.

Ten of the species identified in this study are Bairdia sp.cf B. woodwardsensis, Bairdoppilata sp.cf B. gilberti, B. sp.cf. B. Vemoni, Bradleya sp.cf cornueliana, Cytherella sp.cf. C, Beyrichi, C. sp.cf C. Lebanonnensis, Cytherelloidea montqomeryensis, Cytherura sp,cf. C. washburni, Cytheropteron montgomeryensis, Xestoleberis sarsi have also been recorded from the Lower Eocene, i.e., from the Meting Limestone, by Sohn (1959).

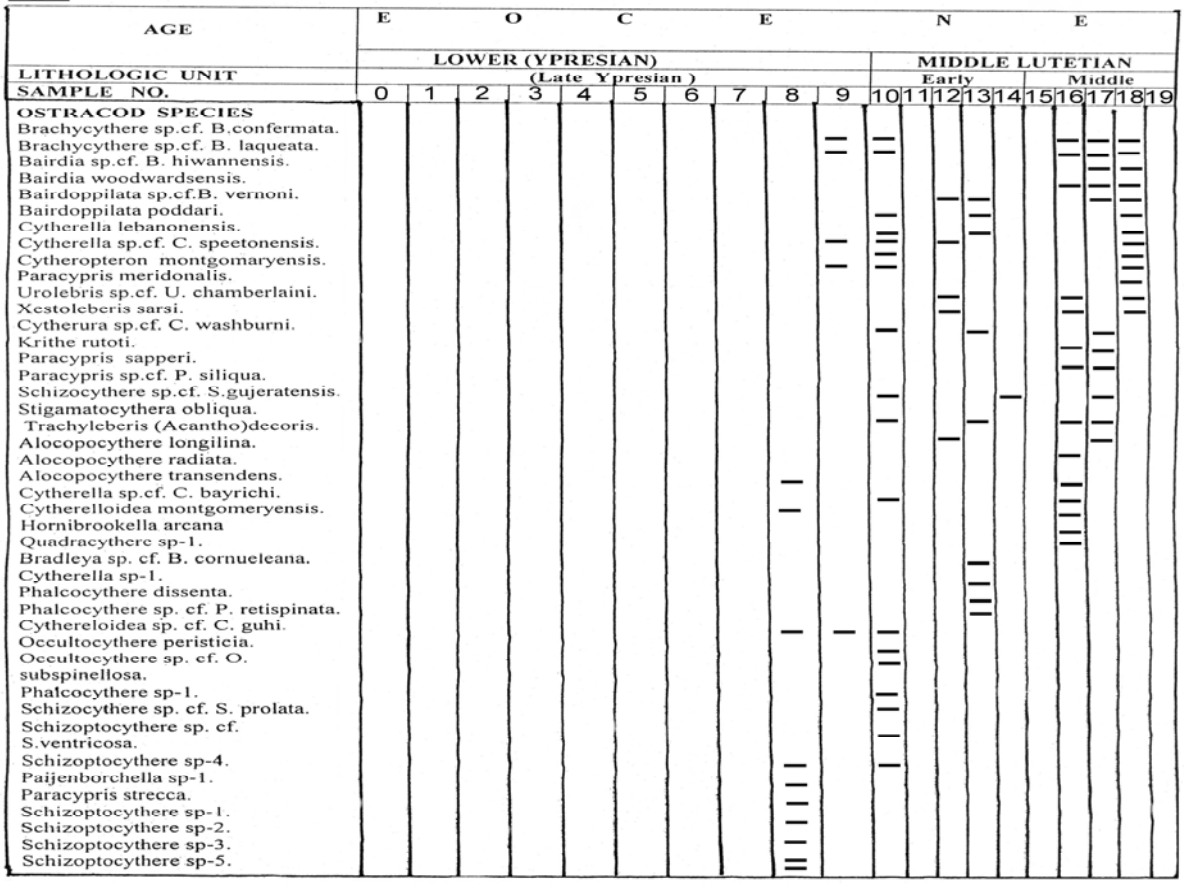
The following seven species belonging to the family Cytheridae and Trachyleberididae have also been recorded and reported by Siddiqui (1971) from the Eocence of Rakhi Nala and Zao River section, Sulaiman Range, Pakistan. Alocopocythere longilinea, A. radiate, A. transcendens, Anommatocythere oblique, Trachyleberis (Acanthocytheries) decoris.

The Ostracod species, Bairdia sp.cf B. kalakotensis, Bairdoppilata poddari, Cytherelloidea sp.cf. C. guhai, Paracypris meridionalis, Schizocythere sp.cf.s. gujaratensis, Quadracythere (Homibrookella) arcane, have been reported from the Eocene to Miocene of Rajasthan, Runn of Kutch and Gujarat, India, by Khosla (1972), Tewari and Singh (1967), Lyubimova *et al.,* (1960), Guha (1968).

The remaining species are reported from Upper Cretaceous to Oligocene. Thus, 18 remaining new species recorded from this region.

DISTRIBUTION OF OSTRACODA IN THE TIYON FORMATION OF LATE YPRESIAN TO LUTETIAN-EOCENE OF SINDH

Fig. 3



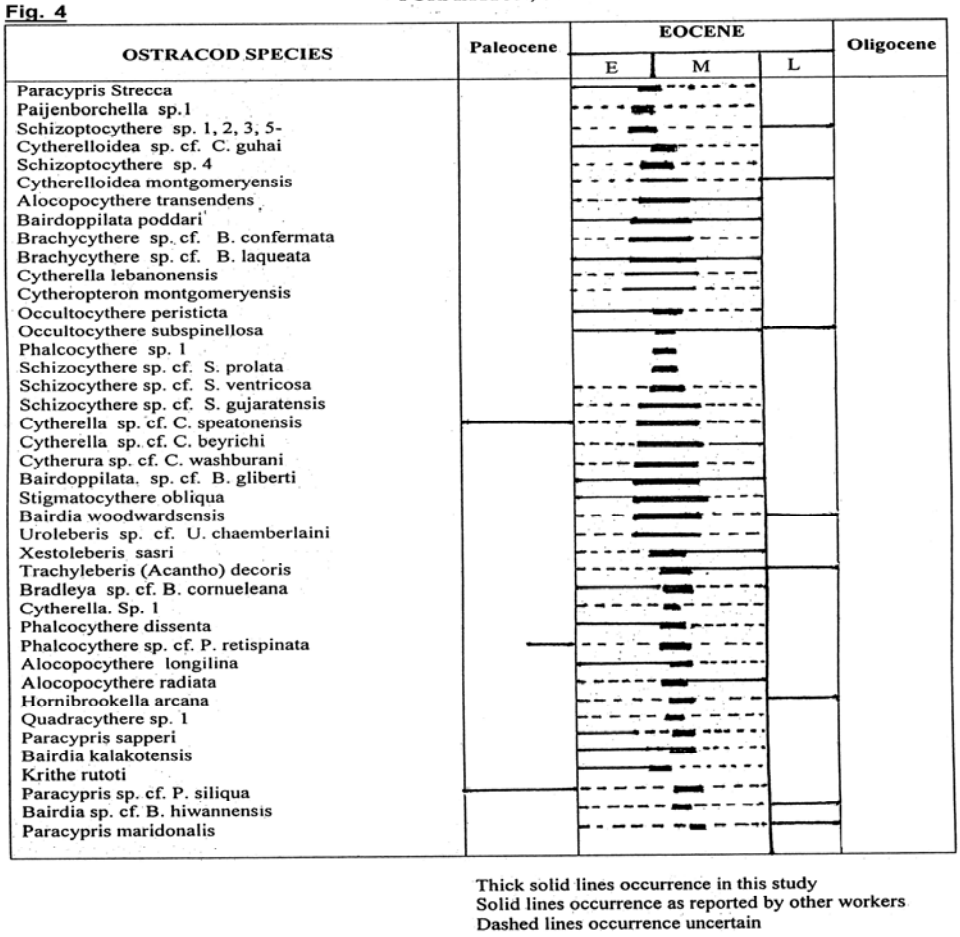
Most of the species under report from this succession have also been recorded from lower or higher horizons of the Eocene, **(Fig. 4)** in the rocks of Laki or Kirthar Formations respectively, or their equivalent horizons. Bairdia woodwardsensis extends to Oligocene as well while the species such as Cytherella sp.cf. C. speetonensis and Paracypris sp.cf. P. siliqua have been recorded from Lower to Upper Cretaceous rocks. As can be seen from the Range Chart **(Fig. 4)** some of the species reported here are restricted to the Lower Eocene (Ypresian) only.

These include Cytherelloidea sp.cf. C. guhai. Occultocythere peristicta, O. subspinellosa, Paijenborchella. Sp. 1, Siddiqui, (1971) have reported Anomatocythere laqueta, Phalcocythere dissenta, and Paracypris strecca, Schizocythere sp.cf. C. prolata, Shizocythere sp.cf. S. ventricosa.

Stiqmatocythere oblique from the Lower Eocene Shale with Alabester horizons of the Rakhi Nala Section. Their occurrence in samples of the succession investigated suggests that the range of these extend to Middle Eocene as well. However, a large number of species in this sequence are in general of Lower to Middle Eocene and are correlative with the Lower-Middle Eocene of Sulaiman Range, in broad term.

RANGE CHART OF OSTRACOD SPECIES FROM LATE YPRESIAN TO LUTETIAN, TIYON FORMATION, SINDH.

Fig. 4



Thick solid lines occurrence in this study
Solid lines occurrence as reported by other workers
Dashed lines occurrence uncertain

4. Conclusion

Tiyon formation was assigned Late Ypresian to Early Lutetian age by Hunting Survey Corporation (Jones, 1960). Iqbal (1973) based on molluscan fauna placed it in Lower Middle Eocene (Early Lutetian) range. The planktonic assemblage identified by Usmani and Baryar, (1985) confirms the Late Ypresian to Early Lutetian age.

However a large number of Ostracod species identified in this sequence are in general of Lower to Middle Eocene and correlative with Lower -Middle Eocene of Sulaiman Range as well as to the adjoining basin of Rajasthan (India) in the East

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