

NOTE ON THE OCCURRENCE OF *MIOGYPSINA* (*MIOGYPSINOIDES*)  
*COMPLANATA* IN KUTCH, WESTERN INDIA \*

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**Introduction :** The occurrence of *Miogypsina* in Kutch is known for a long time. Mohan (1958) described, statistically, two species of *Miogypsina*, *M. (M.) irregularis* (Michelotti) and *M. (Lepidosemicyclina) droogeri* Mohan and Tewari, from Vinjhan area, Kutch. The occurrence of *Miogypsina (Myogypsinoidea) dehaarti* Vander Vlerk was reported by several workers and very recently by Chatterji and Mathur (1966). However, to the knowledge of the author, *Miogypsina (Miogypsinoidea) complanata* Schlumberger is not so far reported from Kutch or from any other region in India. An account on the occurrence of *M. (Miogypsinoidea) complanata* in Kutch is presented in this note.

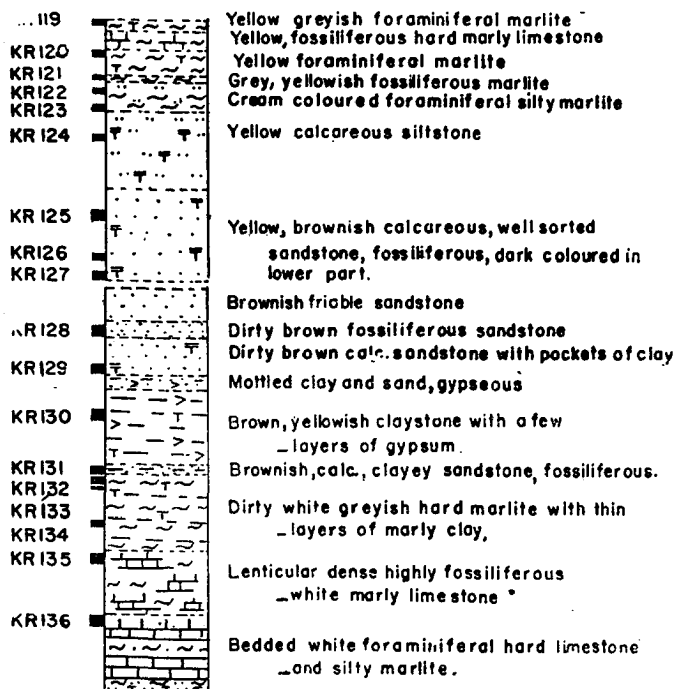


Figure 1.

**Locality details :** The presently described specimens are recorded from two localities, one near Walasara (68°46'30" : 23°25'40") and another near Goyela (68°49'25" : 23°26'40"). The samples from measured stratigraphic sections were collected by the author in January, 1969. The stratigraphic columns are given in Figures 1 and 2.

**Walasara :** The samples in this locality were collected from a two furlongs traverse along a small, deeply cut, stream section located at about five furlongs north east of

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Walasara. The sample numbers KR 122 and KR 123 are from the top two feet of the steeply cut waterfall section of 14 feet thick sediments, and KR 120 and KR 121 are from two beds overlying the previous, but exposed about 50 feet upstream. The sampled section is overlain by an unfossiliferous siltstone and claystone sequence in the downdip direction.

*Goyela*: The four samples are from a small exposure (Fig. 2) along the left bank of Sugandhi Nadi, a tributary to Khari River, at a locality four furlongs southeast of Goyela.

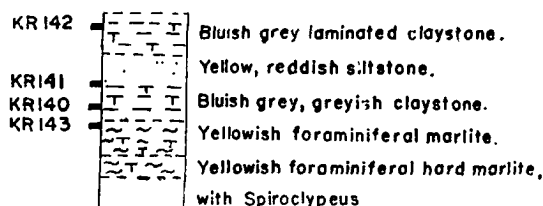


Figure 2.

*Biometric investigation*: In the present investigation, the following characters of *Miogypsinoides* are statistically determined as outlined by Drooger (1963, 1964) in the last 15 years.

DI and DII: are the largest diameters of the protoconch and the deuteroconch respectively, including half the wall thickness.

X: is the number of spirally coiled chambers excluding the two embryonic chambers.

$\gamma$ : is the angle formed by the apical-frontal line through the center of the protoconch and the line connecting the centers of the embryonic chambers. Amato and Drooger (1969) discussed in detail the procedure for measuring the  $\gamma$  — angle.

*Miogypsina (Miogypsinoides) complanata* Schlumberger  
Figures 3–6.

*Miogypsina complanata* Schlumberger, 1900, *Bull. Soc. geol. France, ser. 3*, vol. 28, p. 330, pl. 2, fig. 13-16, pl. 3, fig. 18-21; Drooger, 1963, *Evol. trends, Elsevier*, figs. 4, 6, 9, 13, 16 and 24; Drooger, 1964, *Eclog. Geol. Helv.*, vol. 57. Nr. 2, pp. 513-514.

**Description**: Sample KR 140. The individuals are variable in shape, generally fan shaped. The largest diameter of the test ranges from 0.75 mm to 1.85 mm the largest thickness is about 0.43 mm.

Relatively the individuals are thin. The greatest thickness of the test is generally in apical front corresponding with that of the long trochoid nepionic spire, usually unequally biconvex. The apical portion is broadly rounded to protruding. In larger individuals the frontal margin is undulated. However, in most of the individuals the frontal margin is broken.

The surface of the individuals is pustulated. In general, many of the nepionic as well as the later median chambers are visible from the exterior with ridges as surface ornamentation. The chambers are filled generally with calcareous matter.

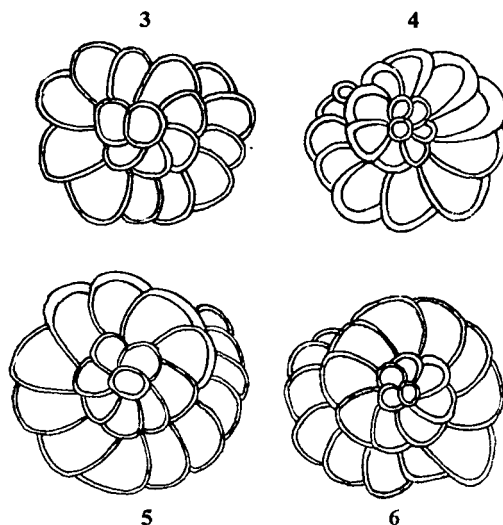
**Sample KR 123**: The largest diameter of the test ranges from 0.75 mm to 2.35 mm. In the majority of individuals the apical portion is broadly rounded.

The frontal margin is often broken. One microspheric form is known in 20 of the thin sectioned individuals. It has  $X \ 30$ .

The following statistical counts and measurements are made for the internal features of the macrospheric individuals:

KR 123	$\times$ (19)	$\gamma$ °(4)	DI (15)	DII (12)
Range	14–21	–180 to –325	0.084–0.184 mm	0.09–0.184 mm
Mean	17–16	–287	0.12 mm	0.117 mm
KR 140	$\times$ (24)	(6)	DI (23)	DII (22)
Range	16–21	–270 to –438	0.067–0.125 mm	0.067–0.13 mm
Mean	17–95	–363	0.092 mm	0.098 mm

The number of observations (N) is given in parentheses.



Figures 3–6. *Miogypsina* (*Miogypsinoidea*) *complanata* Schlumberger. Camera lucida drawings of the embryonic—nepionic stage in median sections of macrospheric specimens, neglecting the stolons. All from sample No. KR. 140.  $\times 42$ .

**Remarks:** Drooger in 1963 and in later publications has used the specific unit *M. (Miogypsinoidea) complanata* in a restricted sense for the assemblage with  $Mx$  greater than 17, while the specific unit *M. (Miogypsinoidea) formosensis* Yabe and Hanzawa is used for  $Mx$  values between 17 and 13. On the basis of the presently evaluated values, the assemblages from both KR 140 and KR 123 are referred here to *Miogypsina (Miogypsinoidea) complanata*. The  $Mx$  value for 19 individuals from sample KR 123 is 17.16, which is very near to the border line of two adjoining species, *M. complanata* and *M. formosensis*. A further study on more individuals from the sample KR 123 is under progress.

**Other occurrences in India:** Several specimens of *Miogypsina (Miogypsinoidea)*, with the values of  $X$  between 13 and 23, which are in general referable to *M. (Mio-*

*gypsinoides*) *complanata-formosensis*, are recorded very recently by the author from (1.) a 21 feet high cliff section along the Waior nala, at a locality two furlongs north of Waior village (69°52'20"; 23°10'32") and (2.) Tirupundi deep well-1 drilled by O. N. G. Commission in Cauvery basin.

**Biostratigraphy:** The presence of two distinct foraminiferal assemblages, *Nummulites fichteli* in the lower part and *N. fichteli* along with *Lepidocyclina* (*Eulepidina*) in the middle part (of Lower Nari Series) indicative of Lower Oligocene (Lattorfian) and Middle Oligocene (Rupelian or Stampian) ages respectively were known in Kutch (Chatterji and Mathur, 1966). Chatterji and Mathur (1966) expressed also that the *Spiroclypeus* limestones and subordinate sandy beds (Lower part of Upper Nari Series) containing *Spiroclypeus ranjanae* Tewari and a few other forms may be assigned to Chattian age in the absence of typical Aquitanian (Lower Miocene) fossils in these beds.

The sample numbers KR 136 to KR 131 have yielded *Nummulites fichteli*, *Lepidocyclina* (*Eulepidina*) sp., *L. (Nephrolepidina)* sp. and other forms. This assemblage suggests a Middle Oligocene age. KR 128 contains very few forms of *Grzybowskia* sp. and others. Samples KR 127 to KR 124 are poorly fossiliferous. Samples KR 123 to KR 120 have yielded abundant foraminifera including *Miogypsinoides*, *Spiroclypeus ranjanae* Tewari, *Operculina* sp., and *Heterostegina* sp. Specimens of *Miogypsinoides* from KR 123 are statistically studied so far and are referred here to *M. complanata*. In the Sugandhi Nadi section (Fig. 2), the sample KR 140 containing *Miogypsinoides complanata* overlies *Spiroclypeus* limestone and underlies an unfossiliferous siltstone-claystone sequence.

Drooger (1964) discussed in detail the problems concerning the Chattian and Aquitanian Stages and commented that, according to *Pecten* zones, the stratigraphic position of the occurrence of *Miogypsina septentrionalis* in the North Sea Basin (Astrup, Droberg) is somewhat higher than that of the type deposits of the Chattian, but still well within the body of the strata commonly accepted as belonging to this stage. This species is thought to be more primitive and therefore older than the type Aquitanian near Bordeaux, *M. gunteri* and *M. tani*. This would prove that the type Chattian is older than the type Aquitanian. Following the principle of nepionic acceleration, the most primitive species *M. complanata* is considered to be the ancestor of *M. septentrionalis*, and *M. gunteri* and *M. tani* (Drooger, 1964, text fig. 2). The Committee on the Mediterranean Neogene stratigraphy, in the meetings at Berne in 1964 and at Bologna in 1967, proposed to place the base of the Neogene (which coincides with the base of the type Aquitanian) at the level of *M. gunteri*. Based on these proposals the beds containing *M. complanata* in Walasara and Goyela areas, Kutch, are assigned here to an Upper Oligocene (Chattian) age. This conclusion will be valid even if the assemblage from KR 123 is proved to be a *Miogypsina* (*Miogypsinoides*) *formosensis* Yabe and Hanzawa, after a more detailed study.

Biswas (1965) erected Waior Stage with the 12 metre thick sequence exposed north of the village Waior as the type section, and suggested an Aquitanian age. By definition of the stage, the level of the occurrence of *M. complanata* in Walasara and Goyela areas falls well within the Waior stage. The present study suggests that Waior stage needs to be placed in the Upper Oligocene.

**Conclusions:** 1. The present record of *Miogypsina* (*Miogypsinoides*) *complanata* suggests that the Upper Oligocene (Chattian) can be well recognized in Kutch.

2. In the section exposed in the area between Ramania and Walasara, Kutch,

three distinct foraminiferal zones could be recognized within the Oligocene. They are successively, *Nummulites fichteli* zone, *N. fichteli-Lepidocyclina* (*Eulepidina*) zone and *M. (Miogypsinoidea) complanata* zone.

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#### RESEARCH NOTES

PILLOW LAVAS FROM MENCHERI HILLS, BELLARY DISTRICT, MYSORE STATE, INDIA by C. N. Venkat Kumaran and S. Jayaram, (*Department of Mines & Geology, Bellary Division*)

Pillow lavas have been described earlier in the basic volcanic rocks of Dharwar age, near Mardihalli, Chitradurga (Pichamuthu, 1957). During a recent survey, pillow lavas were recognised in a new locality in (197) the Mencheri Hills of Bellary District. The exact spot is a mile to the west of the 9th milestone from Bellary on the Bellary-Kanekal road. The basic volcanic rocks forming the Mencheri hills with their associated bands of ferruginous quartzites form the southern extremity of the Copper mountain ranges of Foote in Bellary District.

The pillows are generally oriented with their longer axes parallel to the strike of the traps. Piling up of pillows one over the other is noticed. The size of the pillows varies from 6" to 4' in length, with a width from 5" to 12". Each pillow is rimmed by lighter siliceous material ranging from  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " in thickness. These rims are generally banded.

The pillow lavas of Bellary are similar to the pillow lavas earlier described from the Chitradurga schist belt. The occurrence of pillow lavas interlayered with banded ferruginous quartzites is indicative of submarine palaeo-volcanic activity.