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MICROPALAEONTOLOGY OF SAMPLES FROM PORTUGUESE TIMOR

by

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Fifty-six samples labelled 6076 to 6133 inclusive, with the exception of samples 6089 and 6 095, were forwarded for examination and age determination by Timor Oil Ltd. A geological sketch map showing sample localities and also a stratigraphical section have been received from the Company. The positions of the following samples are not shown: 6076, 6084, 6096, 6105, 6107, 6108, 6120, 6121 and 6125.

Reports have previously been made on samples 6092, 6093, 6094 and 6123 (letters to Timor Oil Ltd., dated 11th November, 1960, and 5th December, 1960). Samples 6109, 6110, 6112, 6113, 6116, 6130 and 6133 contain macro-fossils and are not considered in this report.

Samples 6076, 6085, 6090, 6104, 6115, and 6121 are regarded as Permian in age. Two of these, 6085 and 6104, were taken from areas shown on the geological sketch map as Middle Miocene or lower Upper Miocene, and are probably samples from blocks of Permian occurring in the Miocene block clays. 6090 is from an area shown as Quaternary and 6115 is referred doubtfully to the Middle Triassic or lower Upper Triassic.

Sample 6076. Abundant Lagenidae (as casts), rare arenaceous foraminifera, rare ostracods, abundant molluscan fragments.

Foraminifera:
- Geinitzina sp. cf. G.caseyi Crespin
- Lingulina sp. (cf. L.sp.of Crespin, 1958, pl. 24, fig. 9).
- Rectoglandulina serocoldensis (Crespin)
- Dentalina spp. (smooth forms)
- Lenticulina spp.
- Involutina erugata Crespin
- I.sp.
- Ammobaculites sp.

Sample 6085. Abundant foraminifera and ostracods, rare radiolaria.

Foraminifera:
- Lenticulina sp.
- Dentalina spp. (smooth forms)
- Hyperammina elegans (Cushman and Waters)
- H. coleyi Parr
- H. sp.cf. H. fletcheri Crespin
- Trochammina sp.
- Involutina erugata Crespin
- I. sp.

Sample 6090. Abundant small arenaceous foraminifera and common conodonts.

Foraminifera:
- Thuramminoides sp.cf. T.spaeroidalis Plummer
- Hyperammina sp.
- Glomospirella sp.cf. G.nyei Crespin
- Textularia sp.
- Ammobaculites sp.

Sample 6104. Rare poorly preserved arenaceous foraminifera and common conodonts.

Foraminifera:
- Hyperammina sp.
- ?Psammosphaera sp.
- Involutina sp.

Sample 6115. Rare foraminifera and also numerous small reticulate conical bodies with a central raised area, usually replaced by pyrite; these are probably echinoderm fragments.

Foraminifera: Geinitzina sp.
?Haplophragmoides sp.
Lenticulina sp.

Sample 6121. Common foraminifera.

Thuramminoides sphaeroidalis Plummer
Involutina sp.
Hyperammina sp.
Geinitzina sp. (broken)
Lenticulina sp.

Sample 6107 is represented by two lithologies:

(a) A fine-grained grey limestone containing rare smaller foraminifera (Geinitzina, ?Calcitornella), molluscan fragments and algae; this is considered to be Permian in age.

(b) A grey siltstone containing common planktonic foraminifera and rare benthonic forms; species identified are:

Globigerinoides quadrilobatus (d'Orbigny) trilobus (Reuss)
G.quadrilobatus (d'Orbigny) immaturus Le Roy
G.quadrilobatus (d'Orbigny) irregularus Le Roy
G. ruber (d'Orbigny)
Globigerina subcretacea tomnicki
Globoquadrina altispira altispira (Cushman and Jarvis)
Orbulina universa d'Orbigny
Sphaeroidinella dehiscens (Parker and Jones)
Globorotalia cultrata (d'Orbigny)
Rectoglandulina serocoldensis (Crespin) } Permian
Lingulina sp. } Permian
Hyperammina sp. } Permian

This is considered to be an Upper Miocene assemblage with derived Permian foraminifera.

Sample 6128 is also represented by two lithologies containing two different assemblages:

(a) A coarse-grained ?glauconitic limestone with algae, mollusca (including gastropods) and rare small foraminifera (?Calcitornella and a probable nodosarian foraminifer).

(b) Fine-grained limestone with radiolaria, abundant thin filaments and a probable nodosarian foraminifer.

Assemblage (a) is similar to (a) of sample 6107 and is taken to be also of Permian age. By association a Permian age may also be given to assemblage (b).

The following samples all contain abundant radiolaria: 6081, 6083, 6097, 6099, 6101, 6120 and 6122. Other organic remains noted are probable nodosarian foraminifera (6083, 6120), ostracods (6122), molluscan fragments (6083, 6101) sponge spicules (6083) and the very thin filaments recorded in a previous report (Belford, 1960). These filaments, found in samples 6081, 6097, 6099, 6101 and 6122 are now thought to be fragments of thin-shelled mollusca. Sample 6097 in particular is very similar to a section figured by Colom (1955) from beds in the western Mediterranean region considered to be Jurassic in age. The thin filaments in Colom's figure were identified as Halobia, which is however a Triassic genus. If the filaments

in the present samples are in fact fragments of Halobia a Triassic age is indicated, but this identification must be regarded as uncertain. The assemblage is similar to that of (b) in sample 6128, and this may indicate that the samples are Permian in age. The present evidence suggests either Permian or Triassic as the most probable age.

Sample 6102 is probably to be included in this group. It does not contain radiolaria, but has the thin filaments, definite molluscan fragments, rare ostracods and rare, very small chambered bodies, possibly foraminifera.

Samples 6078, 6120, 6125 and 6131 contain only abundant radiolaria, with one fragment of a probable nodosarian foraminifer in 6120. No definite age can be given to these samples but they are possibly of either Permian or Triassic age.

Samples 6096 and 6124 are crystalline limestones. 6096 contains indeterminate smaller foraminifera, algae, ostracods and echinoid spines and 6124 indeterminate smaller foraminifera. They show some similarity to the limestone of sample 6107 and to (a) of 6128, and may also be Permian in age.

Sample 6084 is also considered to be most probably Permian in age. It contains a probable endothyrid foraminifer, other indeterminate smaller foraminifera, fragments of algae, molluscan fragments, an echinoid spine and one doubtful conodont. Another sample possibly referable to the Permian is 6094, which contains one fragment of a nodosarian foraminifer and rare poorly preserved ostracods.

Sample 6133 contains larger foraminifera (Alveolina sp.aff. A.subpyrenaica, A. sp.aff. oblonga, Operculina), miliolidae, indeterminate smaller foraminfera, rare algae and molluscan fragments; the age is Eocene.

Samples 6088, 6098, 6106, 6111 and 6118 all contain the same fauna of abundant large planktonic foraminfera; the genera Globigerina, Orbulina, Globorotalia and Sphaeroidinella may be recognised. These samples are regarded as either Upper Miocene or Pliocene in age.

Sample 61 08 contains abundant smaller foraminfera, both planktonic and benthonic forms; species identified are:

Orbulina universa d'Orbigny
Globigerinoides quadrilobatus (d'Orbigny) trilobus (Reuss)
G.quadrilobatus (d'Orbigny) immaturus Le Roy.
G.quadrilobatus (d'Orbigny) irregularus Le Roy.
Globigerina subcretacea Lomnicki
Pulleniatina obliquiloculata (Parker and Jones)
Sphaeroidinella dehiscens (Parker and Jones)
Globorotalia cultrata (d'Orbigny)
G.scitula (Brady)
Ceratobulimina pacifica Cushman and Harris
Pleurostomella alternans Schwager
Angulogerina sp.
Stilostomella lepidula (Schwager)
Bolivinita quadrilatera (Schwager)
Reussella spinulosa (Reuss)
Pullenia bulloides (d'Orbigny)
Sphaeroidina bulloides d'Orbigny
Planulina wüllerstorfi (Schwager)

This sample is considered to be Upper Miocene in age.

Sample 6126 also contains common planktonic foraminifera, with rare benthonic forms, and is regarded as Upper Miocene in age. Species identified are:

Orbulina universa d'Orbigny
Globorotalia cultrata (d'Orbigny)
Globigerinoides quadrilobatus (d'Orbigny) immaturus Le Roy.
G.ruber (d'Orbigny)
Bolivina robusta (Brady)
Amphistegina sp.

Five samples, 6100, 6114, 6119, 6129 and 6132 all contain radiolaria (doubtfully in the case of 6114). 6119, 6129 and 6132 also contain very small planktonic foraminifera. A general Tertiary age may be given to these samples and they are possibly Miocene as mapped.

Sample 6093 contains only molluscan fragments and no age can be given to it.

No microfossils have been found in the following samples and their age is not known: 6077, 6078, 6080, 6082, 6086, 6087, 6091, 6092, 6103, 6105, 6117 and 6127.

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