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FORAMINIFERAL LIMESTONES FROM ROUGH RANGE,
CARNARVON BASIN, WESTERN AUSTRALIA

by

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Foraminiferal Limestones from Rough Range,
Carnarvon Basin, Western Australia

By I. Grespin

Records No. 1955/48

Six specimens of limestones labelled A to F were submitted for micropalaeontological examination by the West Australian Petroleum Pty. Ltd. from localities in the vicinity of Bore Nos. 2, 3, 5 and 6, Rough Range. The majority of the samples are apparently "floaters". Specimens A, B and D (b), however, have every indication that they have been collected in situ.

These limestones contain an assemblage of larger foraminifera that has not previously been found in the Cape Range or Rough Range areas. The assemblage is typically "e" stage and from the study of the larger foraminifera elsewhere in the Indo-Pacific region, it would appear that they belong to an horizon lower in "e" stage than that containing the huge Lepidocyclinas (Eulepidina) of the Mandu Calcarenite of Cape Range. Another feature of the microfauna of these limestones is the almost complete absence of small foraminifera which are prominent in the rocks of the Trealla Formation, Tulki Limestone and Mandu Calcarenite. Furthermore, the assemblages with their numerous small Eulepidines and many tests of Spiroclypeus together with varying lithologies show no relationships with those of any of the known formations in the Cape Range area. Specimen C. from the vicinity of No. 5 Bore Rough Range with its numerous tests of stout species of Lepidocyclina (Eulepidina) is unique in the Tertiary limestones found in the Carnarvon Basin. Specimen E from the vicinity of No. 2 Bore Rough Range contains mainly tests of Spiroclypeus, Calcarina and Operculinella. Specimen F. from the vicinity of No. 6 Bore Rough Range contains numerous small tests of Eulepidina which is rather an unusual feature of "e" stage assemblages. Many of the species are apparently new.

With ^{the} varying lithologies of these six samples, ^{although} they are of similar age, it seems unlikely that they belong to one bed and consequently would be of little use as a mappable marker as suggested by geologists of the Company.

A short note on each sample is given immediately after the list of foraminifera contained therein.

Specimen A. Gully due south of Mouth Range No. 3 Bore ✓

Cream crystalline limestone with numerous foraminifera including Lepidocyclina and Spiroclypeus and calcareous algae. (Registered No. MF.3232)

Austrotrillina howchini (Schl.)
Borelis sp.
Calcarina sp.
Lepidocyclina (Nephrolepidina) inflata Prevale
Lepidocyclina (Nephrolepidina) ferrerei Prevale
Lepidocyclina (Nephrolepidina) sumatrensis (Brady)
Peneroplia sp.
Serites cf. verbeeki Martin
Spiroclypeus margaritatus (Schl.)

This specimen was taken in situ. It contains numerous tests of the "e" stage form Spiroclypeus margaritatus together with small Nephrolepidines. The matrix of the limestone is similar to that which characterises the limestones of the Trealla Formation. It was probably deposited under similar ecological conditions. The occurrence of Austrotrillina howchini in the rock gives the lowest stratigraphical record of the species in the Carnarvon Basin. It has been often recorded from "e" stage rocks elsewhere in the Indo-Pacific.

A specimen of a similar limestone containing Spiroclypeus was collected from a section in Mouth Range by E.A. Rudd in 1936. In a diagrammatic section showing the position of the specimens collected, the top sample was typical of the Trealla Formation. This was underlain by a rock containing foraminifera typical of the Tulki Limestone and this overlay a limestone containing the assemblage of species present in Specimen A of the present collection.

Specimen B. Gully south-west of No. 6 Bore Mouth Range.

Yellowish crystalline limestone with calcareous algae and foraminifera, including large Eulipidines. (Registered No. MF.3232)

Amphisterina sp.
Austrotrillina howchini (Schl.)
Gypsina howchini Chapman
Lepidocyclina (Nephrolepidina) verrucosa Scheffer
Lepidocyclina (Nephrolepidina) angulosa Prevale

Lepidocyclina (Nephrolepidina) sumatrensis (Brady)
Lepidocyclina (Eulepidina) manduensis Crespin
Lepidocyclina (Eulepidina) cf. pausensis Chapman

This limestone, which has been taken in situ, is an "e" stage rock, with species of Eulepidina. It contains small species of Nephrolepidina which are usually found associated with Eulepidina.

Specimen C. Gully due south-east of No.5 Bore Rough Range

Dense, cream, crystalline limestone with abundant large Eulepidina and calcareous algae. (Registered No.MF.3234)

Austrotrillina howchini (Schl.)
Lepidocyclina (Nephrolepidina) acuta Prevale
Lepidocyclina (Eulepidina) insulaenatalis Jones & Chapman
Lepidocyclina (Eulepidina) spp.
Sorites martini Verbeek

This rock, with its numerous tests of Eulepidina, belongs to "e" stage. The tests are irregularly orientated and it has been difficult to obtain sections of the Lepidocyclinae in horizontal direction so that specific determinations could be made. However, few small Eulepidines have been described.

Specimen D. Second Gully north-east of No.2 Bore Rough Range.

(a) Weathered limestone with abundant calcareous algae and with foraminifera not as abundant as in other samples. Registered No.MF.2235

Calcarina sp.
Lepidocyclina (Eulepidina) manduensis Crespin
Lepidocyclina (Eulepidina) sp.
Spiroclypeus margaritatus (Schl.)

(b) Porous yellow limestone with poorly preserved foraminifera. (Registered No.MF.3236)

Calcarina sp.
Lepidocyclina (Eulepidina) sp. (small tests)
Spiroclypeus margaritatus (Schl.)

Both D (a) and D (b) are "e" stage rocks. However, (a) is apparently a "floater" and (b) has been taken in situ. The lithologies of the two samples are entirely distinct.

Specimen E. Gully north-east of No.2 Bore Rough Range

Ochreous limestone with abundant calcareous algae and numerous small Lepidocyclinae and Spiroclypeus. (Registered No.MF.323)

Amphistegina sp.
Austrotrillina howchini (Schl.)
Borelis sp.
Calcarina sp.
Lepidocyclina (Nephrolepidina) transiens Umbgrove
Lepidocyclina (Nephrolepidina) verrucosa Scheffen
Lepidocyclina (Eulepidina) sp.nov.
Onereulinella sp.

Spiroclypeus margaritatus (Schl.)

This specimen apparently a "floater" is referable to "e" stage. However, the faunal assemblage is different from the other "e" stage rocks in the present collection. Many of the tests are fragmentary. A new species of a small Eulepidina is present. It is similar to a species described and figured by Scheffen (1932, Waten. Meded. No.21, p.32, pl.6, figs. 1-3) as L.(E.) crassata Gushman. Gushman described his species from Cuba and comparison of the type figure with that given by Scheffen from Tjisadap, Java shows many differences. A species of Calcarina is common and a few tests of Operculinella are present. Tests of Spiroclypeus are fairly common. This genus has not been recognised in the Cape Range area.

Specimen F. Gully south of No.6 Bore, Rough Range.

Foraminiferal coquina with abundant Lepidocyclina, and calcareous algae, and with a few eolitic grains. (Registered No. MF.3238)

Lepidocyclina (Nephrolepidina) ferrerof Prevale
Lepidocyclina (Nephrolepidina) inflata Prevale
Lepidocyclina (Eulepidina) insulaenatalis Jones & Chapman
Lepidocyclina (Eulepidina) sp.nov.
Lepidocyclina (Eulepidina) sp. (Form B.)

This rock, which is apparently a "floater" belongs to "e" stage. It is quite unique amongst the Lepidocyclina-bearing rocks in the Carnarvon Basin. Except for fronds of calcareous algae and a few eolitic grains, the only genus present is Lepidocyclina. The distinctive feature of the Lepidocyclina assemblage is the numerous tests of small Eulepidines. The only record of numerous small Eulepidines being characteristic of a limestone is given by Corby (1951, Geology and Oil Possibilities of the Philippines p.274) who notes that a feature which distinguishes the lower "e" stage beds in part of the Philippines is the occurrence of Lepidocyclines with a Eulepidine-type of nucleococh in association with L.(N.) angulosa and L.(N.) ferrerof.