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FORAMINIFERA FROM ROCK SAMPLES FROM THE FIJI ISLANDS

by

Irene Crespín



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A small collection of rock samples were recently received from Dr. N. J. Guest of the Geological Survey of Fiji, Suva, Vitilevu. Samples 1, 2 and 3 were collected by the writer in company with Dr. Guest and two other geologists during a one day visit to the island in January last. Sample 4 is from a locality in the interior of the island of Vitilevu. Sample 5 consists of Pleistocene to Recent sands from the island of Lau.

Sample 2, which was collected from an excellent cliff section of the Suva Marl near the Shell Depot on Edinburgh Drive, along the shore of Walu Bay, Suva, is of considerable interest because it was hoped that it would give further evidence for the exact age of the Suva Marl which is rich in smaller foraminifera (Cushman 1934). The sample was taken with the hope of finding larger foraminifera such as those described by Whipple (1934) from material collected by Ladd (1934) from the Walu Bay section. Larger foraminifera were collected from the base of this section by the writer during a short visit in 1934. Unfortunately the southern cliff face which was visited earlier, is now densely covered with tropical growth and it seems that the bed containing Lepidocyclina is now obscured. The foraminifera recently collected at Walu Bay appear to be younger in age than those of the Lepidocyclina assemblage. However, with careful collecting throughout the Walu Bay section, the stratigraphical sequence and the age of the beds in the Suva area, should be satisfactorily solved.

A detailed examination of the samples is given below.

Sample 1.

"Tuffaceous agglomerate overlain by Suva Marl, from the top of the tuff, Waidrauso Creek, about 1 mile west of Adi Cakobau School, Prince's Road".

Alveolinella quoyi (d'Orb.)
Amphistegina lessonii d'Orb.
Amphistegina cf. acuta Cushman
Alabamina tubulifera (Heron-Allen and Earland)
Anomalinella rostrata (Brady)
Bolivina sp.
Cibicides mundulus (Brady, Parker and Jones)
Cibicides sp.
Cycloclypeus cf. reticulatus Caudri
Elphidium crispum (Linne)
Globigerinoides trilobus (d'Orb.)

Operculinella venosa (F. and M.)
Operculina cf. japonica Yabe and Hanzawa
Orbulina universa d'Orb.
Osangularia sp.
Peneroplis pertusus (Forskal)
Quinqueloculina costata d'Orb.
Quinqueloculina lamareckiana (d'Orb.)
Spiroloculina cf. manifesta Cushman and Todd

The age of this foraminifera-bearing tuff, on present evidence, is uncertain. It may be "g" stage (Upper Miocene) or "h" stage (Pliocene). The rock contains numerous well-preserved tests of Alveolinella quoyi, which although characteristically Recent is known to range from at least "f₃" stage (Middle Miocene). Operculinella venosa and Cycloclypeus reticulatus are characteristic of beds younger than "f" stage. Peneroplis pertusus is a Recent species characteristic of tropical assemblages in the Pacific region but it is also characteristic of Pliocene deposits in parts of southern Australia.

The Suva Marl overlies this tuffaceous agglomerate at Waidrauso Creek and is considered by some workers to be not older than "g" stage (Upper Miocene). Until the stratigraphical sequence in the Suva area, where species of Lepidocyclina are known to occur in the section, is studied in detail a definite age cannot be given for the formation. Consequently the age of the tuffaceous agglomerate which contains no restricted Miocene species, can only be referred on present evidence to either "g" stage or "h" stage.

Sample 2.

"Raised coral reef within Suva Marl - possibly the old type section of Ladd (Walu Bay) behind Shell Depot, Edinburgh Drive, Suva."

Foraminifera were examined from crushings and thin sections of the rock.

Amphistegina lessonii d'Orb.
Calcarina spengleri d'Orb.
Calcarina calcar d'Orb.
Cycloclypeus cf. reticulatus Caudri
Gypsina vesicularis d'Orb.
Globigerinoides trilobus d'Orb.
Operculinella venosa (F. and M.)
Operculina sp.
Textularia sp.

No foraminiferal species is present in this assemblage to suggest an age older than "g" stage (Upper Miocene) and without the examination of the fauna in the Suva Marl, no definite age can be given. The assemblage is found associated with coral reefs.

Sample No. 3.

"Raised Coral Reef within the Suva Marl near cemetery, Reservoir Road, Suva."

Foraminifera were examined from crushings and thin sections. Calcareous algae including Halimeda and Lithophyllum were common in the thin sections of the rock.

Amphistogina lessonii d'Orb.
Cycloclypeus cf. reticulatus Caudri
Elphidium craticulatum (F. and M.)
Gypsina globula Reuss
Lepidocyclina sp.
Operculina cf. japonica Yabe and Hanzawa
Operculinella venosa (F. and M.)

The algal form Halimeda is prominent as a reef-forming organism throughout the Pacific region and Chapman (1906) mentions the occurrence of fossil Halimeda in the raised reefs of Fiji and Tonga.

Numerous tests of a large and coarsely bedded species of Operculina (Operculina cf. japonica) are present in the rock. Two poorly preserved tests of Lepidocyclina were found in the crushings and their preservation suggests that they may be derived. No other evidence is available to suggest that the rock is older than "g" stage (Upper Miocene).

Sample 4.

"Viti Limestone, about 2 miles east of Korokula village, S.W. Vitilevu."

Dense, hard, reddish limestone with large tests of Lepidocyclina (Eulepidina) very abundant. The following foraminifera were recognised in thin section.

Amphistogina sp.
Acervulina inhaerens Schultze
Carpenteria sp.
Cycloclypeus sp.
Gypsina globula Reuss
Lepidocyclina (Nephrolepidina) sumatrensis (Brady)
Lepidocyclina (Eulepidina) murrayana Jones and Chapman
Lepidocyclina (Eulepidina) ephippioides Jones and Chapman

This handsome limestone is referable to the lower part of "e" stage (Upper Oligocene to basal Lower Miocene), which, at present is the oldest known Tertiary horizon on Vitilevu. Eocene rocks are known from Eua, Tonga (Whipple, 1932). This rock from Vitilevu contains abundant large tests of Eulepidina, some having a diameter of 20 millimetres. The writer at present refers the large four-rayed species to L.(E.)murrayana and the saddle-shaped form to L.(E.) ehippioides; both these species were described by Jones and Chapman (1900), from Christmas Island, Indian Ocean. L.(E.) murrayana is used in preference to L.(E.) formosa Schlumberger, 1905 which is considered to be synonymous with L.(E.) murrayana (Crespin 1938). It is hoped to study specimens of the Christmas Island limestone at a later date. It is quite possible that the suggestion put forward by Grimsdale (1952) that L.(E.) murrayana and L.(E.) ehippioides are one and the same species with the latter having page priority, may be substantiated.

This four-rayed species is widely distributed in the Indo-Pacific region but as far as the writer has been able to discover, there is no record of its occurrence east of Fiji. Whipple (in Ladd, 1934) recorded the species as L.(E.) formosa from Ladd's locality 130, which is about 1½ miles south-east of the point where the main road leading south from Lautoka crosses the Sambeto River and from locality 302, which is a hill close to Korosuli, 330 feet above sea-level. The species has been found in Saipan, the Philippines, Japan, Dutch New Guinea, Central Highlands of New Guinea, Papua, Java and Borneo.

Two tests of the small species of Lepidocyclina (Nephrolepidina) sumatrensis were noted in thin sections. The species ranges from "e" stage to "f₁-f₂" stage in the Tertiary of the Indo-Pacific where it is widely distributed.

Sample 5.

"J.G.214. Oneata Island, Korosiga Point, Lau Islands."

Foraminifera are poorly preserved.

Elphidium craticulatum (F. and M.)

Globorotalia sp.

Operculinella cummingi (Carpenter) (common)

This sample is Pleistocene to Recent in age. Operculinella cummingi is a common species in Pleistocene to Recent deposits in the Pacific region and Elphidium craticulatum is found in deposits from Pliocene to Recent in age.

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