THE FORAMINIFERA OF PORTO RICO.

by

JAMES M. FLINT,

Medical Director, U. S. Navy.
THE FORAMINIFERA OF PORTO RICO.

By James M. Flint,
Medical Director, U. S. Navy.

The foraminifera belong to the subkingdom Protozoa, class Rhizopoda; that is to say, they are among the simplest forms of animal life, consisting of a minute mass of protoplasm, or an aggregation of such masses, without organs or tissues, capable of protruding any part of the body in the shape of fine threads, which flow together whenever they touch, forming a granular network. They are aquatic, mostly marine animals, generally microscopic in size, and are inclosed in shells or "tests" composed either of calcium carbonate secreted by the animal, or of available foreign material, such as mud, sand, sponge spicules, or dead shells, united by a calcareous cement. A few species are pelagic, but the greater number of species live at the bottom of the sea.

The shells of recent foraminifera are found almost everywhere on the ocean bed, the exceptions being in the polar seas, and in the abyssal depths below about 2,500 fathoms where the shells seem to be dissolved in the dense waters. As fossils they are widely distributed and of great geological significance, since they are the source of all the chalk and much of the limestone all over the world. These calcareous strata are in process of formation at the present day, the same as in past geological ages.

There is but little on record regarding West Indian foraminifera. Few dredgings have been made in that vicinity, and fewer have been studied and reported. The Challenger records one dredging off Culebra Island, in 390 fathoms of water, from which 177 species of foraminifera were identified, showing that foraminifera are very plentiful in these waters in depths below the coral and above the abysses. The Albatross also found foraminifera in great variety and quantity along the northwest coast of Cuba.

The Fish Hawk expedition to Porto Rico obtained foraminifera by shore collecting at Ensenada Honda, Caballo Blanco, and Mayaguez, and with the dredge or tangle at the following seven stations:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6003</td>
<td>San Juan Harbor, NW. angle of Morro Castle</td>
<td>4 to 74</td>
<td>Fine sand</td>
<td>Dredge.</td>
</tr>
<tr>
<td>6009</td>
<td>Off St. Thomas, sail Rock W., by N.</td>
<td>26 to 26</td>
<td>Coral, Tangle</td>
<td>Dredge.</td>
</tr>
<tr>
<td>6086</td>
<td>Off Culebra, Punta Mina light-house NW.</td>
<td>14</td>
<td>Coral sand</td>
<td>Do.</td>
</tr>
<tr>
<td>6091</td>
<td>Off Vieques Island, Culebrinas light-house NE.</td>
<td>15</td>
<td>Coral, Tangle</td>
<td>Do.</td>
</tr>
<tr>
<td>6092</td>
<td>Off Vieques Island, Culebrinas light-house NE.</td>
<td>16</td>
<td>Coral, Tangle</td>
<td>Do.</td>
</tr>
<tr>
<td>6093</td>
<td>Off Culebra, Culebrinas light-house NE.</td>
<td>15</td>
<td>Coral, Tangle</td>
<td>Do.</td>
</tr>
</tbody>
</table>

As will be seen, all the dredgings were in quite shallow water, with coral or coral sand at the bottom. The quantity of material gathered was generally quite small, yielding few foraminifera. Station 6093 furnished only 7 individuals, Ensenada Honda 6, Caballo Blanco 3, and Mayaguez only 2 or 3 exceedingly minute ones.
A considerable number of species is represented, but without exception the individual shells are below the typical size and appear to have been starved by the more vigorous corals among which they were found. The species best represented, both in numbers and development, are Orbiculina advena and Amphistegina lessoni.

The following lists show, by families and stations, the species represented in the collection. Descriptions and figures of these species may be found in the Report of U. S. National Museum for 1897, under the title “Recent foraminifera: a descriptive catalogue of specimens dredged by the U. S. Fish Commission steamer Albatross.”

LIST OF FORAMINIFERA BY FAMILIES.

Family Litholidae:
- Ammonidea incerta d’Orbigny.

Family Textulariidae:
- Textularia granum d’Orbigny.
- Clavulina parvispinosa d’Orbigny, coccula Gumbel.

Family Miliolidae:
- Biloculina levis D’Orbigny.
- Biloculina globuloides d’Orbigny.
- Vertebrelina insigins Brady.
- Milolina limicola Limn.
- bicornis Walker & Jacob.
- tricerata Brady.
- retriculata d’Orbigny.
- revoluta Karrer.
- bacculata var. placatiformis Brady.
- angustula Flint.
- circularis Bornemann.
- Orbiculina advena Fichtel & Moll.
- Orbilites duplex Carpenter.

Family Miliolidae—Continued.
- Orbilites marginalis Lamarck.
- Perisphinctes tuberosus Forskal.

Family Lagenidae:
- Cristellaria calcarea Montfort. gibba d’Orbigny.
- Uvigerina pygmaea d’Orbigny.

Family Globigerinidae:
- Orbitolites unicusrus d’Orbigny.
- Globigerina bulboides d’Orbigny.
- sacculifer Brady.
- dubia Egger.

Family Rotalidae:
- Truncatulina meandrini d’Orbigny.
- trunculata Brady.
- Truncatulina rosea d’Orbigny.
- pygmaea Hantken.
- priscincta Karrer.
- Anomalina ariminensis d’Orbigny.

Family Textulariidae:
- Polystomella striatopunctata Fichtel & Moll.
- Amphistegina lessoni d’Orbigny.

LIST OF FORAMINIFERA BY STATIONS.


Station 6079: Ammonidea incerta d’Orbigny, Textularia granum d’Orbigny, Clavulina parvispinosa d’Orbigny, Milolina limicola Limn., M. tricerata d’Orbigny, M. revoluta Karrer, M. bacculata var. placatiformis Brady, Orbiculina advena F. & M., Orbilites duplex Carpus, Amphistegina lessoni d’Orbigny.

Station 6080: Clavulina parvispinosa d’Orbigny, Milolina limicola d’Orbigny, Orbiculina advena F. & M., Truncatulina priscincta Karrer, Amphistegina lessoni d’Orbigny.

Station 6086: Vertebrrelina insigins Brady, Orbiculina advena F. & M., Polystomella striatopunctata F. & M.

Station 6091: Orbiculina advena F. & M.

Station 6092: Biloculina bulboides d’Orbigny, Milolina limicola d’Orbigny, M. reticulata d’Orbigny, Orbiculina advena F. & M., Orbilites margarita Lamarck, Globigerina sacculifer Brady, Truncatulina pygmaea Hantken, Polystomella striatopunctata F. & M., Amphistegina lessoni d’Orbigny.

Station 6093: Textularia granum d’Orbigny, Orbiculina advena F. & M., Orbilites margarita Lamarck, Globigerina sacculifer Brady, Truncatulina pygmaea Hantken, Polystomella striatopunctata F. & M., Amphistegina lessoni d’Orbigny.

Ensenada Honda, Culebra Island: Milolina angustata Flint, M. circularis Bornemann, Polystomella striatopunctata F. & M.

Caballo Blanco Reef: Milolina bicornis W. & J., Truncatulina rosea d’Orbigny, Pulvinulina trunculata Brady.

Mayaguez: Collection consists of fine sand, with an occasional minute foraminifer.