SINDULITES, A NEW GENUS OF THE NUMMULITIDAE (FORAMINIFERIDA)

by F. E. EAMES

ABSTRACT. Operculina sindensis L. M. Davies 1927 is made the type of a new genus Sindulites (Nummulitidae).

The subgenus Chordoperculinaoides Arni 1965 of the genus Nummulites was proposed to incorporate all real 'nummulites cordeles', and has as its type species Operculina bermudezi Palmer, a Caribbean Palaeocene species. However, Arni (1966) in discussing his subgenus gave two plates of illustrations of what he regarded to be 'Chordoperculinaoides bermudezi (Palmer)', but all his illustrated specimens had their origin in the Palaeocene of Libya. On the other hand, the writer's experience of Palaeocene foraminifera from Libya indicates to him that (a) none of the Libyan specimens illustrated by Arni (1966, pl. 1–2) are either conspecific or congeneric with O. bermudezi, and (b) the specimens illustrated by Arni (1966, pl. 2, figs. 9–11) are not the megalospheric generation of the microospheric form he illustrates (ibid., figs. 7–8, 13–14), and probably belong to the genus Operculina.

DISCUSSION

The species O. bermudezi has been well illustrated by Cole (1953, pl. 1, figs. 5–7; pl. 2, fig. 4; pl. 3, figs. 2–12) and by Sachs (1957, pl. 14). The spiral lamina is coarsely perforate throughout, a feature which has led some authors to suggest that it belongs to the genus Miscellanea, but the presence of a well-developed perforate marginal cord precludes placing it in the family Miscellaneidae. The subgenus Chordoperculinaoides as exemplified by its type species O. bermudezi is apparently restricted to the Palaeocene of the Caribbean region.

The species to which the Libyan megalospheric forms illustrated by Arni (1966) belong is known to the writer from work he has carried out on material from West Pakistan, India, and Libya; it is the form originally described by L. M. Davies (1927, cum syn.) as 'Operculina sindensis', a species sometimes referred by some subsequent authors to the genus Ranikothalia Caudri, 1944. The species O. sindensis is here made the type of a new genus.

Family NUMMULITIDAE de Blainville, 1825

Genus SINDULITES gen. nov.

Type species. Operculina sindensis L. M. Davies (1927, p. 274, pl. 19, figs. 10–13), Palaeocene.

Diagnosis. Involute, axial section showing very long alar prolongations; wall structure as in Nummulites (i.e. not coarsely perforate except at the marginal cord); septal filaments visibly continuous from margin to centre on external surface; marginal cord

developed into a strongly swollen and coarsely perforate structure; microspheric form little larger than and similar in form to the rather flat megalospheric form.

Remarks. It was Davies (1952) who first suggested that there might be a link between the Palaeocene larger foraminiferal faunas of the East and West Indies when he described Ranikothalia sahii and its megalospheric form R. sahiri from West Africa. This species is very closely related to S. sindensis, is obviously congeneric with it, and might perhaps by some be considered conspecific with it. Nummulites mutallii Davies 1927 is the type species of Ranikothalia, and it differs from the above forms in lacking a strongly swollen marginal cord and in its megalospheric form (N. thalictus Davies 1927) being considerably smaller and more inflated than the microspheric form. Prior to 1927, N. mutallii had been referred to N. planatus (Lamarck), 1804, and the writer considers that both planatus and mutallii are just lenticular Nummulites with rather numerous septa and high chambers in equatorial section, and that Ranikothalia is a synonym of Nummulites.

De Ciancourt and Cuvillier (1954) reported Nummulites (Operculinoides) bermudezi (Palmer) from the Palaeocene of Senegal. Only one text-figure, a line drawing of an axial section, was given. There is no indication of the coarse perforations in the spiral lamina, so well illustrated by Cole (1953) and Sachs (1957). De Ciancourt and Cuvillier also recorded several other Caribbean species from the Palaeocene in Senegal, but in all cases the illustrations consisted merely of line drawings, and in all cases but one only an axial section was illustrated. The writer would suggest that it is undesirable to identify firmly in Senegal a nummuloid species from the other side of the world on the basis of an axial section only, without any good indication of the wall structure and characters of the equatorial section.

Haynes (1962) recorded and illustrated from the Palaeocene of Libya a form he referred to as Operculina canaifera sindensis (L. M. Davies). The quality and clarity of his illustrations are such that one can be quite sure that the wall structure is the same as that of O. sindensis (Davies) and that it lacks the coarse perforations in the spiral lamina so characteristic of O. bermudezi and excellently illustrated by Cole (1953) and Sachs (1957). However, Davies considered O. canaifera and O. sindensis to be different species, and Haynes evidently overlooked the fact that O. canaifera is completely evolute, whereas O. sindensis is completely involute. From what the writer has seen of these two forms in India and West Pakistan, he can confirm Haynes's identification of the taxon 'sindensis' in Libya.

Castelain (1965) recorded the occurrence of 'probable' Operculinoides bermudezi from the Palaeocene of Senegal, and also the occurrence of four discoocyclid forms: Discocyclina grimsidei Vaughan and Cole, D. harrisoni Vaughan, D. Barkeri Vaughan and Cole, and D. vel Pseudophragmata (Alloecocyclina) soldadensis Vaughan and Cole. There were no descriptions or illustrations at all, and the reader feels that it would be inadvisable to accept these identification of species from the other side of the world without further detailed information.

Arni (1966) recorded Chordoperculinoides bermudezi from the Palaeocene of Libya. The microspheric forms illustrated by Arni (1966, pl. 1, figs. 1–6; pl. 2, figs. 7–8, 13–14) have all the characters of the genus Sindulites and of the taxon referred to as sindensis by Haynes (1962). The megalospheric forms illustrated by Arni (1966, pl. 2, figs. 9–11)
seem to be an Opressinina rather than the A Form of S. sindensis. The megalospheric of
S. sindensis is fairly large, that of a representative specimen from the Palaeocene of
Libya being bilocular, the outside dimensions being: protoconch 0.42 x 0.34 mm.,
deutoconch 0.4 x 0.21 mm. The Palaeocene in Libya is richly fossiliferous, and quite
a number of species of Opressinina are known to occur in association with S. sindensis.
In my opinion the above information lends considerable doubt to the occurrence of
Caribbean species of shallow water larger foraminifers in West Africa, and, if correct,
would avoid all the difficulty of trying to understand how they could have got from
one side of the Atlantic Ocean to the other. All the forms now suggested to belong to
the genus Sindulites occur in beds of Palaeocene age, the genus being known from
West Pakistan, Somalia (unpublished information), Iran (unpublished information),
Iraq (unpublished information), Libya, Sicily (unpublished information), and Togoland.
It is relatively easy to comprehend how these species of Sindulites could have developed
as a closely knit group in geographical continuity during Palaeocene times when it is
recalled that the Palaeocene sea with its faunas extended from Indonesia through
Burma and West Pakistan to the Middle East and East Africa, thence through Egypt
and Libya and the Sahara (Lake Tahed) to West Africa.
The species sindensis has at various times been referred to the genus Opressinina,
Opressinoides, Nummulites, Ranikothaila, Miscellaneous, and the subgenus Chordopercul-
inoides, and now to the new genus Sindulites; the reasons why the species sindensis
should not be referred to any of the first six taxa are:
(a) Except occasionally for the first whorl or two, Opressinina is completely involute.
(b) Opressinoides and Opressinella, both of which are synonyms of Palaeoammonites, are
microscopic forms, even the microospheric form of which rarely exceeds 5 mm. in diameter, the nucloconch of the
megalospheric form rarely exceeding 0.15 mm.; sindensis is quite large, has a double nucloconch each
chamber of which is large, attaining a diameter of 0.4 mm. approximately, and the species possesses
a very strongly swollen marginal cord which is not present in Palaeoammonites.
(c) Nummulites does not have a very strongly swollen marginal cord, and its megalospheric forms are
considerably smaller and often much more inflated than the microospheric forms, in contrast to sindensis; on these bases Ranikothaila would be a synonym of Nummulites.
(d) Miscellaneous lacks the perforate marginal cord of the Nummulitidae, whereas sindensis possesses
this; moreover, Miscellaneous has a coarsely perforate spiral lamina, whereas sindensis does not.
(e) In Chordoperculinoides, as exemplified by its type species, the spiral lamina is coarsely perforate
throughout, whereas it is not in sindensis.
For these reasons the writer considers that Sindulites, as exemplified by its type
species O. sindensis, is generically distinct from Opressinina, Palaeoammonites (synonyms
Opressinula and Opressinoides), Chordoperculincoides, Miscellaneous, and Nummulites
(synonyms Ranikothaila).

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