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TAXONOMIC COMMENTS ON *DISCORBIS* LAMARCK 1804 (FORAMINIFERIDA)

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The taxonomic observations of foraminiferal genus *Discorbis* Lamarck, 1804, made by different workers are critically reviewed. Several species assigned to the genus *Discorbis* in fact do not belong to it. It is opined that only those forms which have deep sutural clefts and closed umbilicus (without plug) should be assigned to the genus *Discorbis*.

Key Words : *Discorbis* **Lamarck, 1804**

INTRODUCTION

FORAMINIFEROLOGISTS have always been confronted with the problem of identification of members belonging to the family Discorbidae Ehrenberg, 1838, and a considerable amount of literature has accumulated on the subject. *Discorbis* is one such genus which has been reviewed and re-reviewed by taxonomists from time to time. Although it was erected as early as 1804 by Lamarck[1] but even after nearly two hundred years, the diagnosis of the genus is still not clearly defined and continues to be a topic of controversy amongst foraminiferal taxonomists.

In the present communication, an attempt has been made to clarify the generic concept of the genus *Discorbis* from the topotype material and the available literature.

RESUME OF TAXONOMIC OBSERVATIONS

The foraminiferal genus *Discorbis* was erected by Lamarck[1] with *Discorbis vesicularis* (= *Discorbites vesicularis* Lamarck, 1804) as the type species from the Lutetian of the Paris Basin. Cushman[2,3] described and figured *Discorbis vesicularis* as having a plano-convex test with flat ventral side and aperture at the base of umbilical margin. He[3] treated *Discorbis* in the subfamily Discorbinae of the family Rotaliidae. Glaessner[4] (p. 145) described *Discorbis* as having a trochoid test with more convex dorsal side and aperture on the ventral side as *a narrow slit along the basal suture near the umbilicus.* He placed it under the subfamily Discorbinae belonging to the family Discorbidae.

In a revision of the foraminifera from the Lutetian of the Paris Basin, Le Calvez[5] figured *Discorbis vesicularis* as showing perforate test having deep clefts and imperforate plates along the ventral sutures, coaelescing near the umbilicus. Almost similar views were expressed by Hornibrook and Vella.[6]

Barker[7] and Reiss[8] opined that on the ventral side, *D. vesicularis* lacks an umbilical plug. According to Pokorny,[9] *Discorbis* has a plano-convex test with a low-arched dorsal side, lamella-like extensions in proximal chamber on ventral side and the aperture is basal with a distinct lip.

Hofker[10] classified *Discorbis* under the suborder Deuteroforaminata and, in a subsequent publication, he[11] discussed the taxonomy and phylogeny of *D. vesicularis* based on topotypes. He[10,11] (Hofker, *op. cit.*, p. 146) described it as having simple septa and "*... distinct tooth plate in each chamber dividing the protoforamen from the deuteroforamen and forming a large tenon on the ventral side which partly covers the umbilical hollow. There is a poreless band along the periphery of the test.*"

Hornibrook[12] described *Dircorbis vesicularis* as "*... a low-spired, loosely coiled, rounded species with large tooth plates tending to fuse at their extremities in early whorls. Between the tooth plates are deep clefts leading into the umbilical region. The aperture is a simple arched opening running from the periphery over towards the umbilicus.*" He[12] (*op. cit.*, p. 98) adopted the following diagnosis for *Discorbis* : "*Dorsal side convex to conical, usually evolute, rounded to angular or keeled, gradually increasing in size; apertural lobes typically well developed, tending to fuse, with proto and deutero-foramen, the latter between the umbilicus and the periphery of the preceding whorl; perforation fairly coarse.*"

Reiss[8] observed that *D. vesicularis* shows bilamellid structure and well-developed tooth plates and treated *Discorbis* as a valid genus of the family Discorbidae. However, Reiss's observations were contradicted by Hofker[13] who considered *Discorbis* as a group of genera belonging to the family Rotaliidae and remarked (*op. cit.*, p. 3) that the horizontal sections of *Discorbis vesicularis* reveal that "*... the septa of D. vesicularis are simple and that the tooth plates which at the proximal angle of each chamber form folded parts, continue to form a plate parallel to the septum of a former chamber, which plate forms the distal wall of the hollow between two adjacent chamber wall.*' Loeblich and Tappan[14] considered monolamellid structure and the presence of an umbilical flap separating the two apertures, as a characteristic feature of the genus *Discorbis*.

The wall microstructure of *Discorbis* as revealed by the monumental work of Wood,[15] is optically radial in nature. Hay *et al.*[16] made a detailed study of the wall microstructure of certain foraminifera and observed that *D. vesicularis* is non-canaliculate and has radially arranged crystals of calcite.

A scanning electron micrograph of topotype specimen of *Discorbis vesicularis* provided by Mme.Y. Le Calvez, Paris, and also the topotype material loaned by Miss Ruth Todd, Washington, to the authors show a plano-convex test with high conical dorsal side, 7 to 10 chambers in final whorl, presence of deep sutural clefts and imperforate plates along the ventral sutures, coalescing near the umbilicus and a few specimens show simply closed umbilicus. However, an examination of the specimens of *Discorbis* from Grignon, Paris Basin, and those from the Lower Oligocene of Germany in the personal collection of Professor Herbert Hagn,

Munich, made by the senior author reveals that typical *Discorbis* has a nearly planoconvex test with 5 to 7 rapidly enlarging chambers in the last coil, ventral sutures having deep clefts and sutural notches, and closed umbilicus.

Loeblich and Tappan[14] (pp. C 572-C 573) described *Discorbis* as having a plano-convex test, "*with a flap extending from basal portion from each chamber toward umbilical region, opening extending along proximal side of each radial umbilical flap, connecting through cavity beneath flaps to interior of chambers themselves.*" These authors [Fig. 451 (1-7)] figured specimens to illustrate the genus *Discorbis*. A comparison of these illustrations reveals the presence of the following three groups of forms :

(*a*) Fig. 451, 1-3 illustrate topotype specimens of *Discorbis vesicularis*. Fig. 451 (1) shows low trochospiral test with umbilical flaps having an opening at their proximal ends and coalescing centrally while (3) is an illustration of an abraded topotype without having umbilical flaps but showing secondary apertures as slits along sutures on ventral side.

(*b*) Fig. 451 (4) illustrates *Discorbis turbo* (d'Orbigny) (= *Rotalia turbo* d'Orbigny, 1826). It shows a high spiral side and gently convex umbilical side with sutural slits and a simply closed umbilicus having a few central perforations.

(*c*) Fig 451 (5) elucidates specimen of *D. colliculus* (Bandy) (= *Rotorbinella colliculus* Bandy, 1944), and Fig. 451 (6-7) represent *D. biaperturata* (Pokorny) (= *Biapertorbis biaperturata*)[9] as having a plano-convex test with convex dorsal and almost flat ventral side showing sutural clefts and a distinct rounded umbilical boss.

The above comparison shows that apart from the convexity of the dorsal and ventral sides, the characters of umbilicus also varies in *Discorbis*. While *D. vesicularis* has well-developed flaps, *D. turbo* has closed umbilicus without any flap, and *D. colliculus* and *D. biaperturata* have umbilical plugs. Loeblich and Tappan[14] have given a comprehensive case history of *Discorbis* Lamarck and it is the characters of the umbilical side which is problematic. They have ignored the description of the umbilical characters of this genus. However, when all the above illustrations are grouped together, a variation of the umbilical characters from simply closed to those having flaps or plug is observed. This is in apparent contradiction with the diagnosis of the subfamily Discorbinae Ehrenberg, 1838, as given by these authors wherein the umbilicus has been treated as open.

Conclusion

The examination of the topotype material and also the scanning electron micrograph of the topotype specimen of *Discorbis vesicularis* do not show the presence of umbilical plug. Similar observations have also been made on the specimens of *Discorbis* in the collection of Professor Herbert Hagn.

It appears that, perhaps, Loeblich and Tappan[14] have lumped together a few forms which, in fact, do not belong to *Discorbis*. A thorough re-examination of

both external and internal characters, including ultramicrostructure, of the type material would provide a correct diagnosis for this genus. However, with the present knowledge of the genus, it is preferable to consider *Discorbis* only for those forms which have deep sutural clefts and closed umbilicus (without plug) as shown by the topotype material of *Discorbis vesicularis*.

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