

FORAMINIFERA OF SOUTHERN LIMBURG,
NETHERLANDS, I.

by J. HOFKER

LOCKHARTIA ROESTAE (Visser).

Cibicides roestae Visser, 1950, p. 291, pl. 6, fig. 9.

Dorsal side strongly convex, with many chalk knobs near the centre and only the chambers of the last formed whorl visible with sutures also covered with pustules curving backward. Ventral side flattened or slightly convex with many finer chalk knobs at the centre and fine radiating striae towards the periphery. Periphery acute or even keeled. At the ventral side the chambers show the fine but distinct pores of typical *Lockhartia*, only on the walls of the last formed chambers; otherwise the pores are covered by the chalk knobs. At the ventral side pores are visible between the radiating striae.

Number of chambers in the last formed whorl about 7-8. Sutures curved backward on the dorsal side, straight and radiating on the ventral one. The periphery shows no pores.

Aperture a ventral slit along the suture, extending towards the margin of the test, very narrow. It consists of a ventral part and a more dorsally placed part, which parts are separated by a kind of toothplate.

Transverse sections clearly prove, that the ventral side is the flattened one (contrary to the description by Visser); in the centre of the ventral side a large mass of umbilical filling material is found, pierced by canals deriving from a ventral spiral canal system, typical for the genus. The low chambers are strongly overlapping the dorsal side, which also is typical for *Lockhartia*. The large knobs of chalk in the dorsal side form a kind of pillars for the next row of chambers, so that in horizontal sections the chambers seem to be irregularly shaped. In

the ventral umbilical mass distinct canals run vertically to the surface and open between the bosses of chalk.

Tests are found in all dimensions from 0.22 mm up to 0.60 mm, whereas the thickness of the tests varies between 0.12 and 0.45 mm. Visser describes an aperture near to the margin; since, however, the very thin walls easily break down, total unbroken tests are rare; most of them lack the peripheral parts of the last formed chamber, and these openings may have been seen by Visser.

Comparison with several species of *Lockhartia* from the Eocene of India and of Cuba clearly show the characters found here.

A species which may be closely allied to our species is *Lockhartia bermudezi* Cole (Journ. Pal. 16, p. 641, pl. 92, figs. 1-5) from the Upper Cretaceous of Cuba. In the Montian of the Netherlands a similar species occurs, mentioned by Van Bellen (1946, Meded. Geol. Stichting, Ser. C, V, 4, p. 70, pl. 10, figs 1-6), as *Parrella mariei*.

Lockhartia roestae is found in nearly all samples of the uppermost part of the Md only, and so it forms a conspicuous guide-fossil for this part of the Md. In the lower layers of the Md the tests are very small (0.22 mm or less) and gradually the tests become larger (up to 0.60 mm in the highest Md). It was found in all quarries in which this upper Md is present (Quarry van der Zwaan, Jekerdal; Quarry of the ENCI, Maasdal; Curfs, Houthem; Nekamy, Rooth).

The genus *Lockhartia* is known from the Lower Tertiary; some localities (Cuba) are mentioned as Uppermost Cretaceous, but these may also belong to the lowest Tertiary as well.

Literature:

Visser, M. A., 1950. Monography on the Foraminifera of the type-locality of the Maestrichtian. Thesis, Leyden.

LOCKHARTIA ROESTAE (Visser).

Fig. a. Dorsal, strongly convex side, $\times 130$. — Fig. b. Ventral nearly flat side, with the typical ridges on the surface, $\times 130$. — Fig. c. Apertural face, with the ventral aperture near to the margin, $\times 130$. — Fig. d. Horizontal section, showing the irregularly built lumina of the later chambers, due to the ventral ridges becoming kind of pillars, $\times 130$. — Fig. e. Transverse section, showing the dorsal overlapping of the narrow chambers, the "pillars" to the dorsal part of each of the later chambers, and some of the apertures, which are double in the septal walls, with kind of toothplate between. This structure indicates some alliance with *streblus*. In the chalk, filling up the umbilical area at the edges of the chambers the transversely cut spiral canals from which canals run towards the ventral surface clearly can be seen, $\times 360$.

