The Devonian *Lingulipora* Girty is the only genus among the Recent and fossil Lingulidae with a punctate shell; its shell structure, however, has been very poorly known. Micro-ornamentation and internal structure of the shell as well as the structure of its endopuncta are here studied on specimens isolated chemically from various horizons of the Upper Devonian. The material includes specimens with strong radial ornamentation in the form of sharp ridges as well as specimens with strong concentric ornamentation. The internal structure of both the valves was examined. The endopuncta are in the form of simple cylindrical canals 4 to 15 μm in diameter, distally covered by canopy 1.5 to 2.6 μm thick. Canopy is perforated by one opening, usually 1 to 2 μm in diameter but sporadically wider. The hypothetical function of caeca in *Lingulipora* is discussed in comparison to those in living and fossil Brachiopoda.

**Key words:** *Lingulipora*, Upper Devonian, shell micro-ornamentation, shell interior, punctation, function of puncta