

THE ULTRASTRUCTURE OF THE DORSAL SHELL WALL OF MESOZOIC AMMONOIDS

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Ultrastructure of the dorsal shell wall at the postembryonic stage was studied and compared in some genera of Mesozoic ammonoid suborders: *Lytoceratina* (*Tetragonites*); *Phylloceratina* (*Phyllopachyceras* and *Hypophylloceras*), and *Ammonitina* (*Quenstedtoceras*, *Aconeceras*, *Yokoyamaoceras*, and *Damesites*). The dorsal shell wall of these ammonoids consists of several components deposited sequentially, beginning at the aperture of the living chamber inwards. It attains a full thickness near the last septum. The outermost element of the dorsal wall, visible in the apertural region, is the "wrinkle layer". The wrinkle layer directly covers the ventral wall of the preceding whorl, and consists of acute-angled triangular elements in longitudinal section. The acute apex of the triangle is oriented adapically, and the steep side of the triangle forms its adapertural end. The above elements seen from inside of the living chamber are variable in size and are arranged in parallel to the growth lines, forming different characteristic patterns (Walliser, 1970). The triangle usually has aragonitic infilling. A further stage of dorsal wall development involves filling the space between the apices of triangles, and then adding one or more layers from the inside.

In all genera studied, the above type of the wrinkle layer occurs at least in the early postembryonic stage. In the *Ammonitina* (*Quenstedtoceras*, *Yokoyamaoceras* and *Damesites*), and *Lytoceratina* (*Tetragonites*), no modification was observed. *Phyllopachyceras* (*Phylloceratina*), however, displays rhythmically recurring incurvation of the outer layers of periostracum towards the posterior of the shell. In *Hypophylloceras* (*Phylloceratina*), the periostracum does not bend toward the posterior, but the free, elevated ends of the periostracum are directed adorally.

In *Aconeceras* of the *Ammonitina*, another modification was noted. In the mature stage, this genus shows a marked thickening of the dorsal wall in the apertural area, indicating continuation of calcium carbonate precipitation there during arrested growth. It is concluded that the wrinkle layer develops as a result of carbonate precipitation in the area of supracephalic fold of the mantle. The precipitation preserves the microornamentation of the periostracum originating at the shell edge.

Walliser, O. H., 1970. Über die Runzelschicht bei Ammonoidea. *Göttinger Arb. Geol. Paläont.*, 5: 115-126.

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