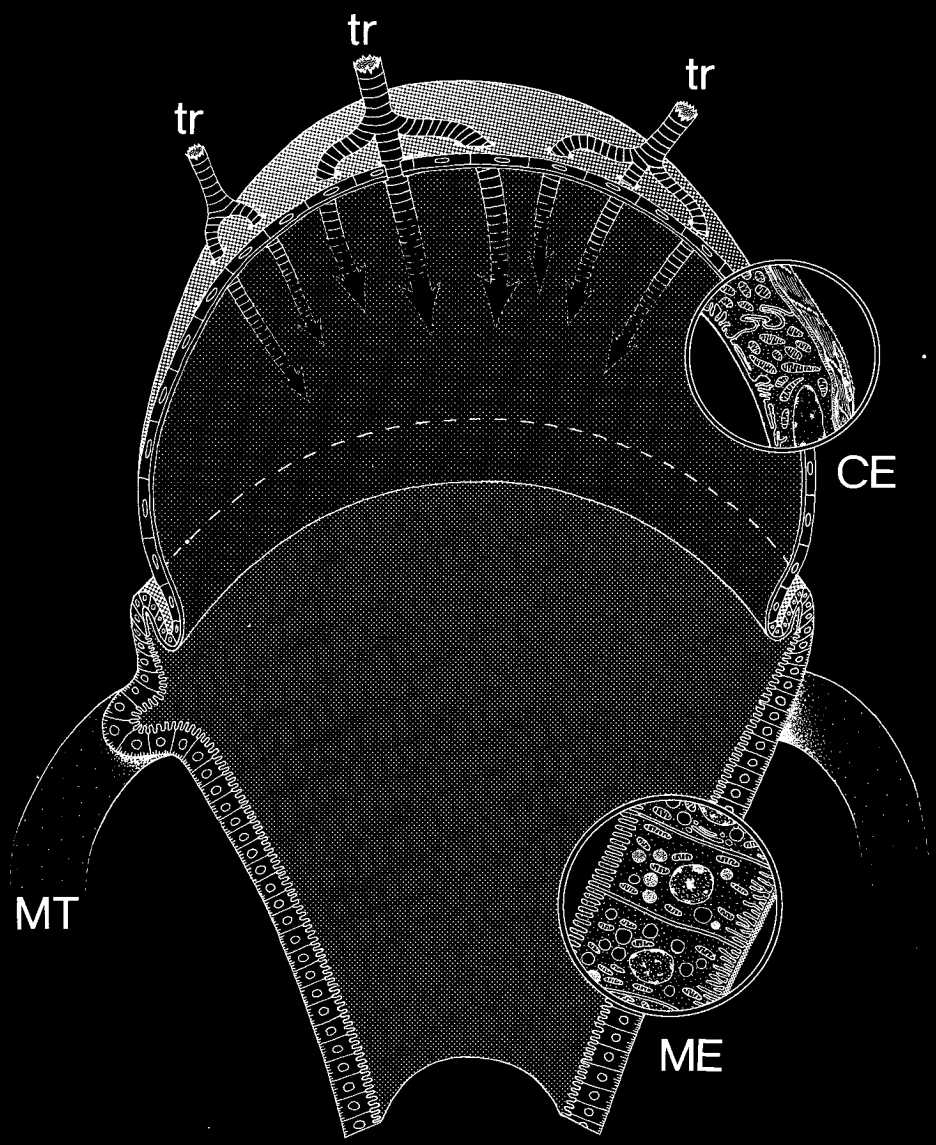

Fig. 2. Schematical survey showing structural organization of bacterial pouch with belt-like occurrence of fold at transition between thin distal cuticle-lined epithelium (CE) and thick proximal microvillar epithelium (ME). MT, Malpighian tubules; tr, tracheoles.

[Fig. 1(d)]. The flattened ectodermal cells contain numerous dark mitochondria, and are characterized by folded intercellular contacts and an irregular microvillar differentiation of their apical plasmalemma. An obvious cuticular layer forms the luminal lining of the cells, and consists of a thin electron-dense outer epicuticle (approx. 30 nm) and an electron-lucid procuticle with a thickness of approx. 0.2 μm [Fig. 4(b)]. Numerous tracheal branches penetrate the epithelium towards the pouch interior. The penetrating branches appear as naked tracheoles, that are surrounded by a thin layer of the cuticular epithelium [Fig. 4(a) and (c)].

3.5. Bacterial contents

The lumen of the pouch is almost entirely filled with

Fig. 3. Electron micrographs of proximal thick lining of bacterial pouch (A–E: *T. nitida*, F: *T. binghami*). (a) Microvillar epithelium, showing cylindrical cells with accumulations of clear (cv) and dark vesicles (dv), scale bar 10 μm. (b) Detail of apical region showing microvillar differentiation (mv), scale bar 1 μm. (c) Cytoplasm with clear (cv) and dark vesicles (dv), scale bar 1 μm. (d) Detail of Golgi apparatus (arrows) in cytoplasm, scale bar 0.5 μm. (e) Basal portion of thick epithelium showing abundant invaginations of basal plasmalemma. Note thick basement membrane and well developed muscle fibres (MF). Scale bar 1 μm. (f) Detail of epithelial fold in transition zone between thin cuticle-lined distal epithelium (towards upper left) and thicker proximal microvillar epithelium (lower right), scale bar 5 μm. M, mitochondria; mv, microvilli; N, nucleus.