

more uniform height of the folds in the wall of the oesophagus, the longitudinal muscle fibres are fairly evenly spaced. A thin connective tissue with associated tracheae is also present. According to Lhoste (1941) the oesophagus of *Forficula auricularia* is not differentiated from the pharynx.

The crop dilates from the oesophagus, becoming widest in the first or second abdominal segment where it is abruptly rounded off to meet the gizzard. The crop can be greatly distended and when full of food occupies virtually the whole of the haemocoel in this region. The food contents are clearly visible through the thin wall. In material immersed in Bouin, the longitudinal and circular muscles are very conspicuous and form a regular network.

The appearance of the crop wall depends upon the degree of distention. In an empty crop the epithelium is deeply and irregularly ridged. The intima is then thick, the epithelial cells are tall, the longitudinal muscle fibres lie chiefly within the ridges, and the circular muscle layer is wide. In a distended crop, however, the ridges have completely disappeared, the intima is very thin, the epithelial cells are much flattened, the longitudinal muscle fibres are widely spaced in a single row and the circular muscle is one fibre thick. Lhoste (1941) describes the large size of the crop of *Forficula auricularia* and the presence of numerous "villosités" of the epithelium forming pockets which become filled with the gut contents. He figures one of these villus-like structures. Parts of the wall of the empty crop of *Anisolabis littorea* would appear at first sight to bear similar structures. Serial sections show, however, that they are the surface view of the cells at the end of a fold of the epithelium. They are most numerous where the crop suddenly rounds off posteriorly, thus increasing the complexity of the internal ridges. The smooth inner surface of a distended crop lacks such structures. In other places where Lhoste describes similar "villosités" it seems rather that sections of epithelial ridges are involved.

The Proventriculus

The proventriculus (Figs. 1, 2) is almost obscured by the overlapping crop in front and midgut behind, only a narrow ring of the tubular structure being visible. Large numbers of muscle fibres bridge the slight gap between the crop and midgut. Judd (1948) figures an outline of the proventriculus and adjacent structures of *Anisolabis maritima* (Gené, 1832). There is close resemblance with *Anisolabis littorea*.

The lining epithelium is raised to six major longitudinal ridges, with a minor fold between (Fig. 4). The ridges are very tall and almost occlude the lumen and the base of each is constricted and stalk-like. Posteriorly the stalk narrows progressively and finally disappears, and the ridge enters into the formation of the cardiac valve.

The cuticular lining of the proventriculus is distinct throughout. In general, it is thin between the ridges and thick on the crests, with the surface everywhere raised up as scales, teeth or spines, which are most numerous on the tops of the major ridges. Anterior to each major ridge is a small rectangular "cushion" of backwardly directed spines (Judd's "cushion of bristles"). In *Anisolabis maritima* this cushion is triangular with the base foremost (Judd, 1948). Cuticular teeth at the opening of the proventriculus of *Forficula auricularia* are described by Lhoste (1941). In the major ridges the epithelial cells are shorter on the crest than on the sides, whereas in the minor ridges they become taller towards the crest. The major ridges are occupied internally by connective tissue, but the minor ridges are formed solely by lengthened epithelial cells. The longitudinal muscle fibres also lie mainly within the major ridges, the circular fibres forming a thick outer layer.