

Figure 3.47: Sample areas selected for scanning electron microscopy of the emu oropharynx: Rostral pigmented and caudal non-pigmented floor, including the large lateral fold and smaller folds (1), pigmented and non-pigmented roof, including the median palatine ridge (2), ventral surface of the pharyngeal fold including the caudo-lateral protrusion (3), proximal oesophagus (4). Bar = 5mm.

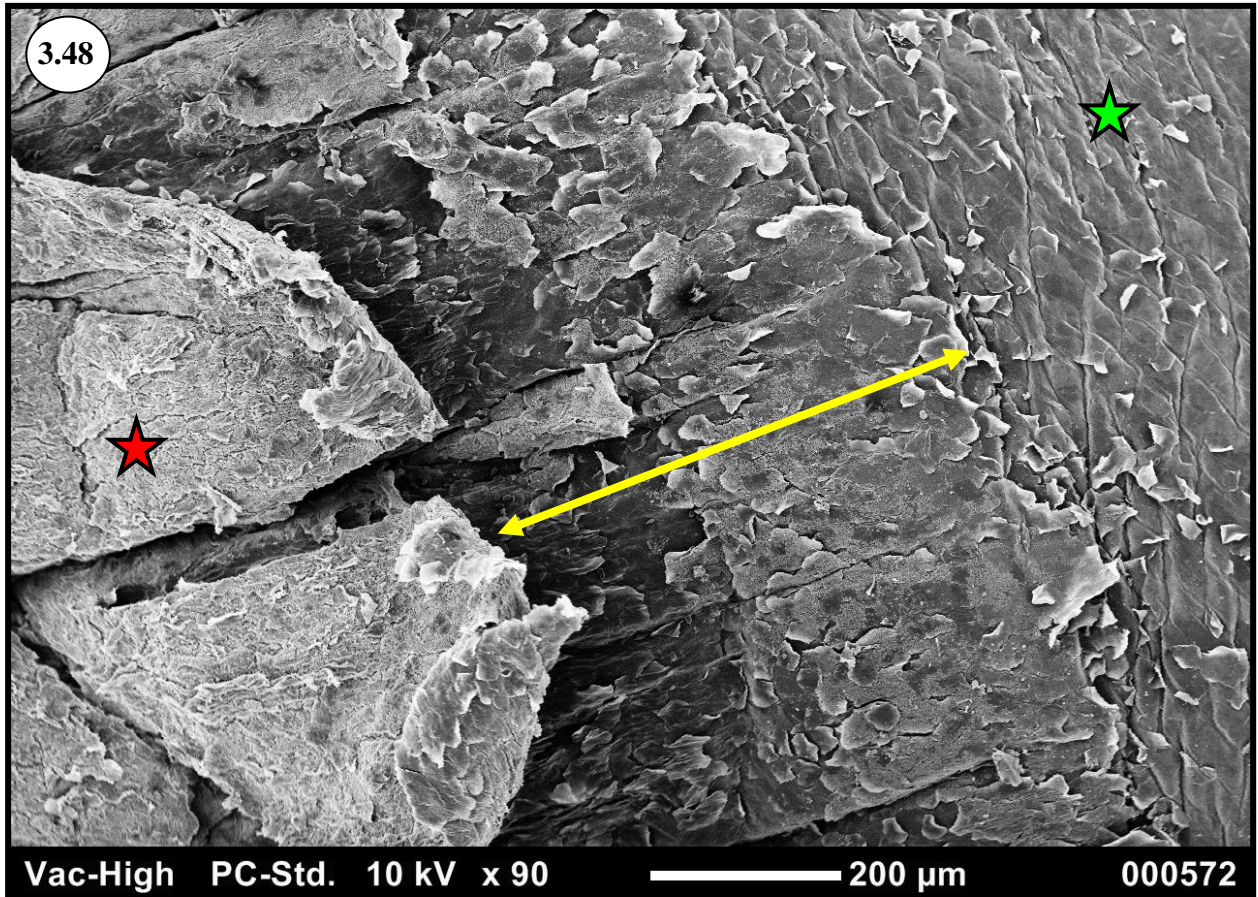


Figure 3.48: Low magnification of the oropharyngeal floor showing the transition (yellow arrow) from the rostral, longitudinally folded, keratinised region (red star) to the caudal non-keratinised region (green star). Note the individual desquamating surface cells in the non-keratinised region and the sheets of desquamating cells in the transitional zone.

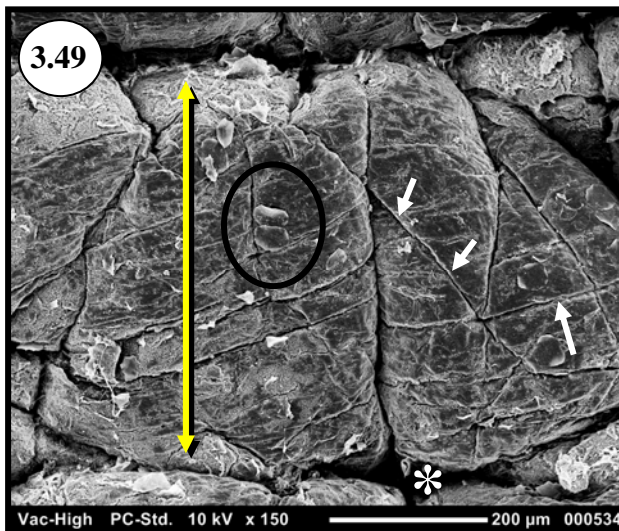


Figure 3.49: Higher magnification of a fine longitudinal fold (yellow arrow) of the keratinised region of the oropharyngeal floor displaying numerous smaller transverse, oblique and longitudinal fissures (white arrows). Groove between the folds (*).

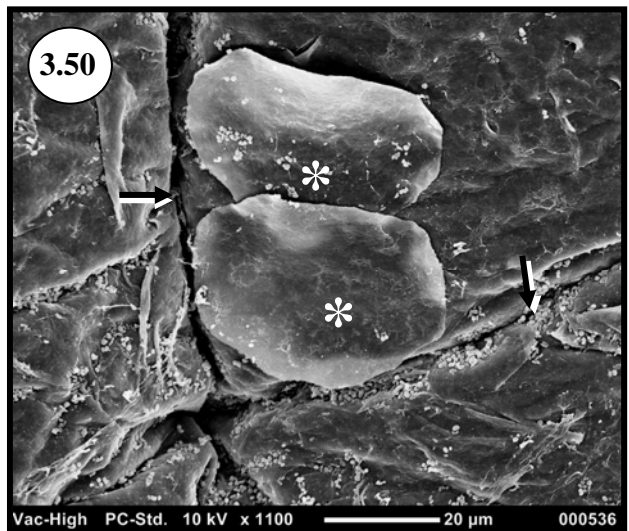


Figure 3.50: Higher magnification of the area encircled in Fig. 3.49. The surface is mainly smooth with only a few individual desquamating cells (*). Fine longitudinal and transverse fissures (arrows).

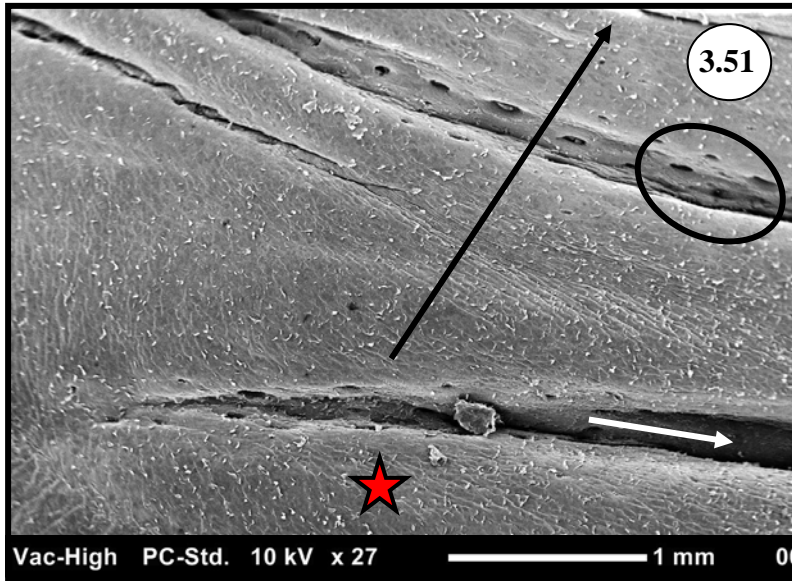


Figure 3.51: Low magnification of the non-keratinised oropharyngeal floor showing the origin of the large lateral mucosal fold (red star), the corresponding recess it encloses (white arrow) and the smaller folds (black arrow) towards the medial aspect of the floor. Note the numerous large gland openings in the grooves (encircled).

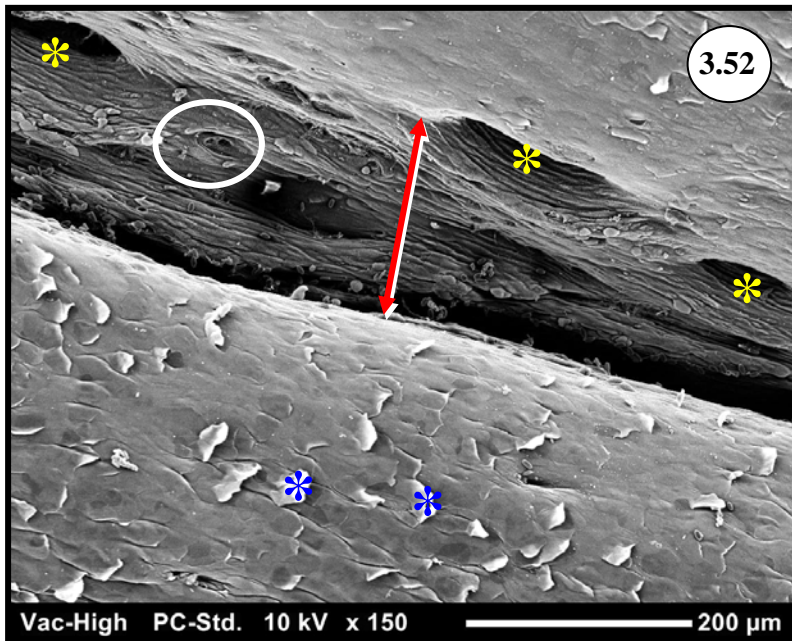


Figure 3.52: Higher magnification of the area encircled in Fig. 3.51. Note the difference in surface pattern from the desquamating cells (blue *) on the folds to a more undulating pattern in the groove (red arrow). Numerous large openings (yellow *) and smaller openings (encircled) are present in the groove.

Figure 3.54: Enlargement of the area encircled in Fig. 3.52 showing two smaller gland openings. The surface of the cells in this region are covered by a dense mass of microvilli. Strands of mucus lie between the two openings (yellow arrow).

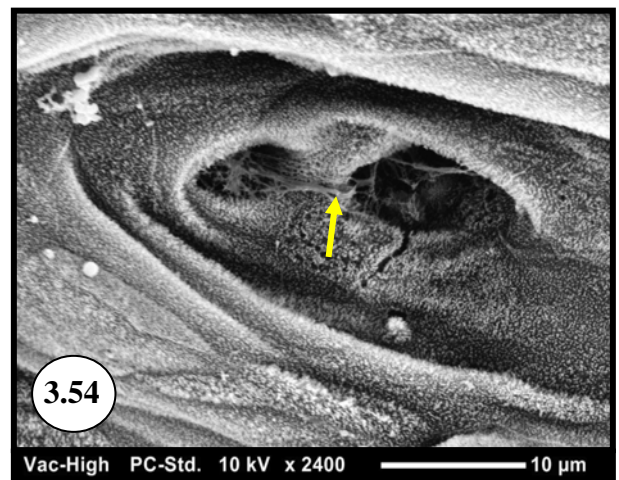
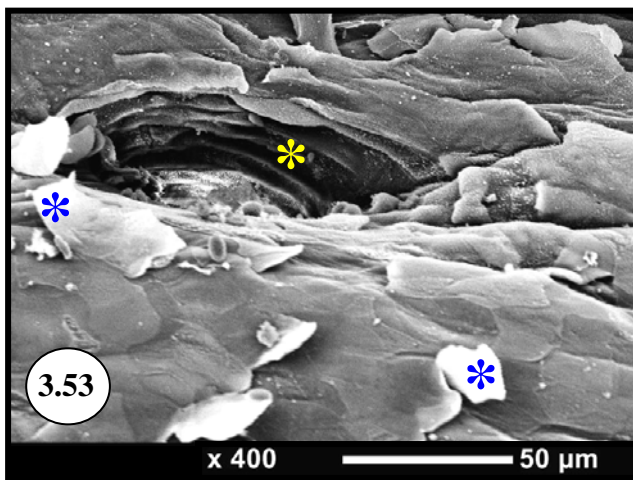


Figure 3.53: Higher magnification of a large gland opening in the groove shown in Fig. 3.52. Note the concentric arrangement of the cells lining the large opening (yellow *). Desquamating surface cells (blue *).

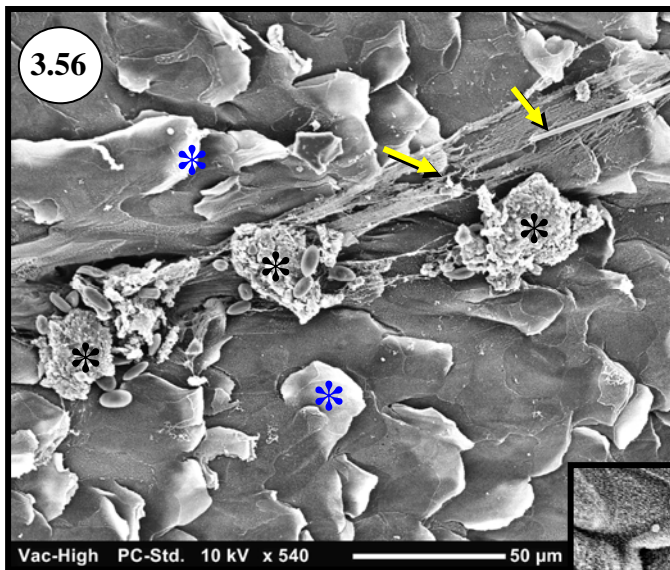
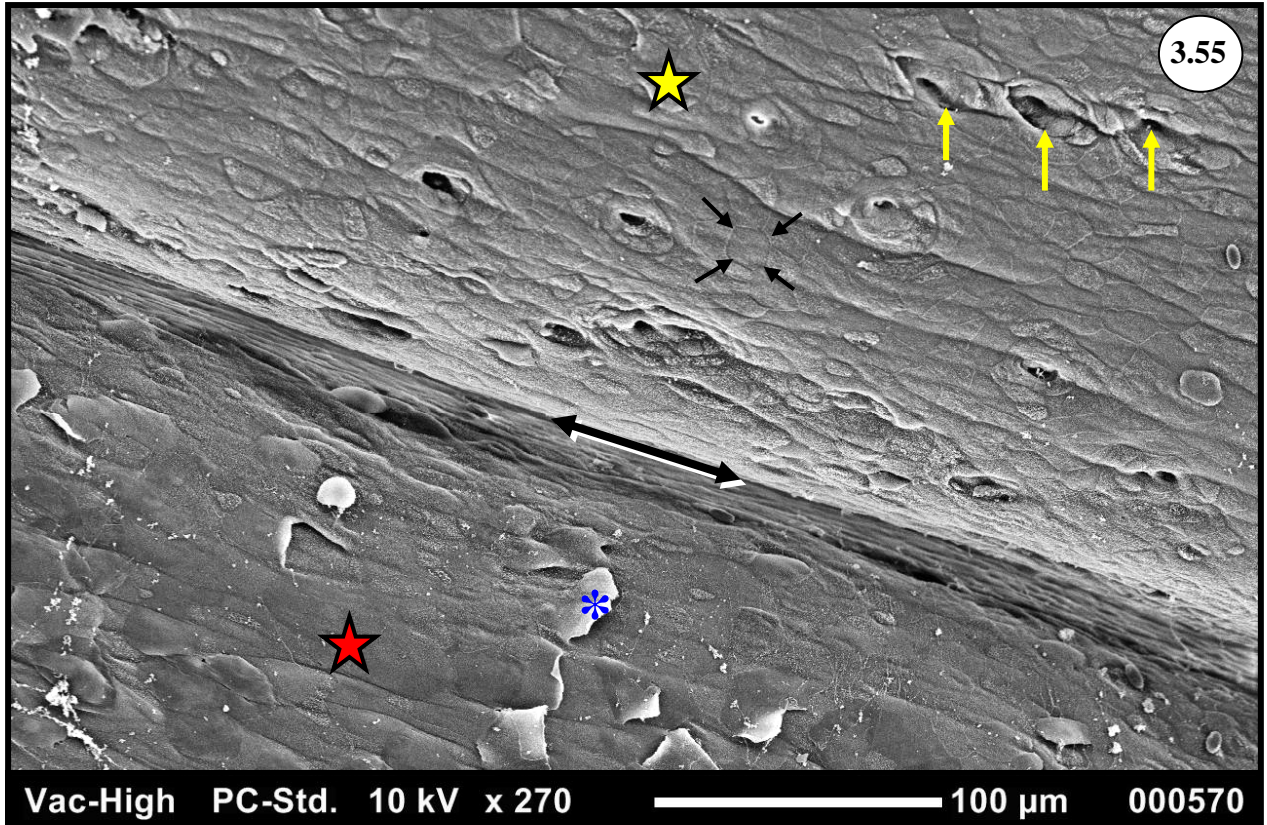


Figure 3.55: Different surface patterns of the smaller folds of the non-keratinised oropharyngeal floor medial to the large lateral fold. One fold (red star) displays a flaky surface due to individual cell desquamation (blue *). A second more medially situated fold (yellow star) shows an uneven surface with clearly demarcated cell boundaries (black arrows) and numerous small openings (yellow arrows). Groove (double-headed black arrow).

Figure 3.56: Higher magnification of the large lateral fold of the oropharyngeal floor. Note the desquamating surface cells (blue *) and large openings obscured by mucus-secretion (black *) from the underlying glands. Strands of mucus (yellow arrows).

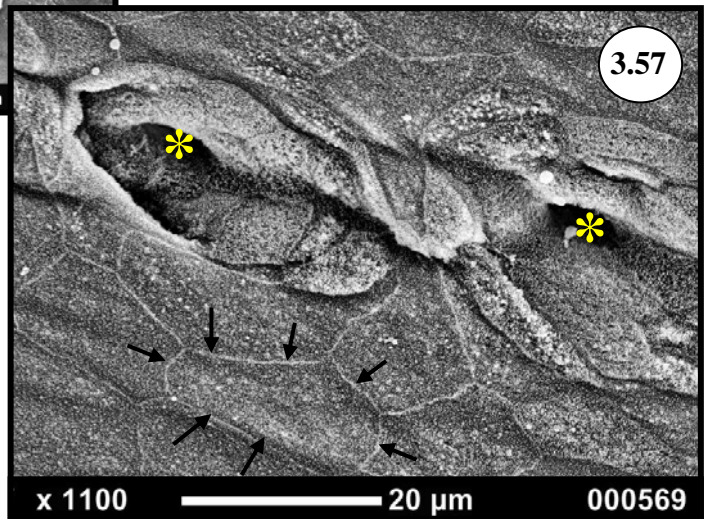


Figure 3.57: Higher magnification of the area depicted by the middle yellow arrow in Fig. 3.55. All the cell surfaces are covered by microvilli which compact to form well demarcated cell boundaries (black arrows). Small gland openings (yellow *).

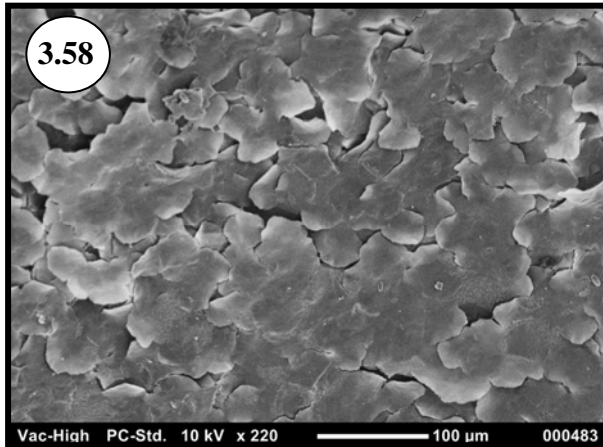


Figure 3.58: The rostral keratinised region of the oropharyngeal roof displaying sheets of desquamating cells.

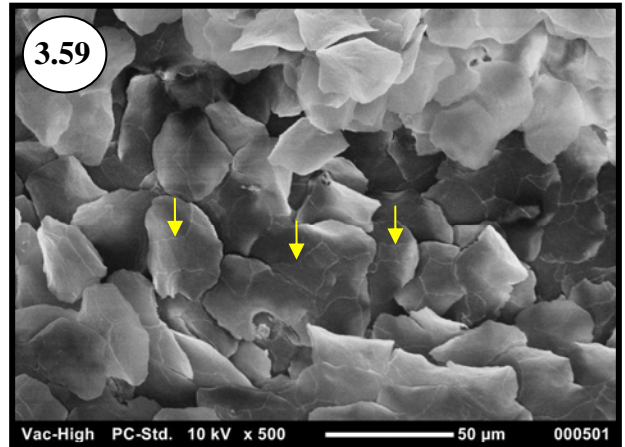


Figure 3.59: Higher magnification of Fig. 3.58 showing the microridges (arrows) on some of the cells.

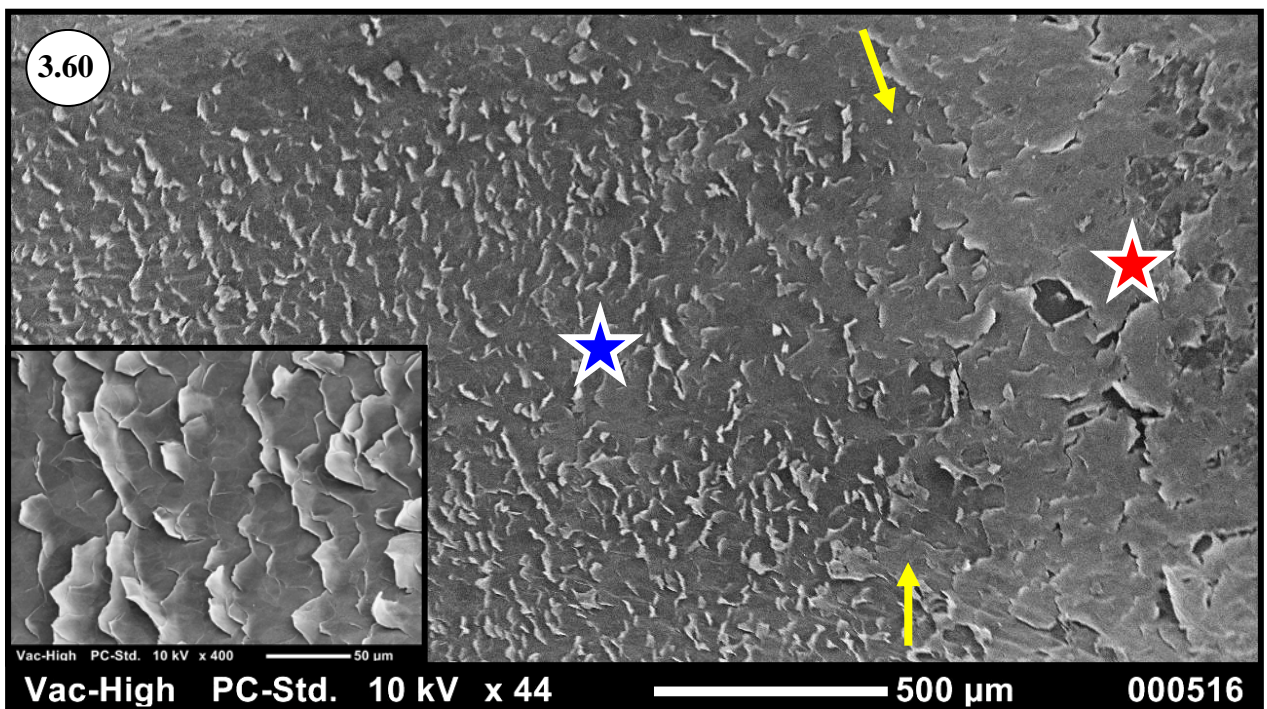


Figure 3.60: Roof of the oropharynx showing the abrupt transition (arrows) from the smooth keratinised region with sheets of desquamating surface cells (red star) to the flaky non-keratinised region with its individual desquamating surface cells (blue star and inset). The inset shows the rows of desquamating cells in the non-keratinised region at higher magnification.

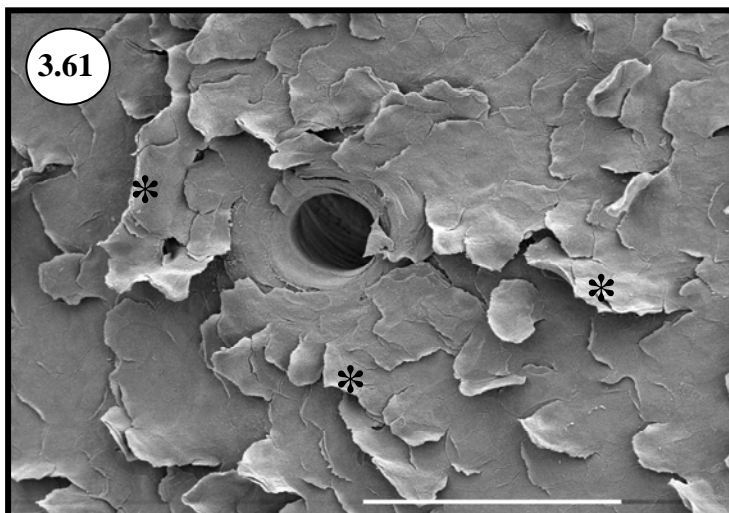


Figure 3.61: Large gland opening between the desquamating cells (*) of the non-keratinised oropharyngeal roof. Note the concentric arrangement of the cells lining the duct. x370; Bar = 100 µm.

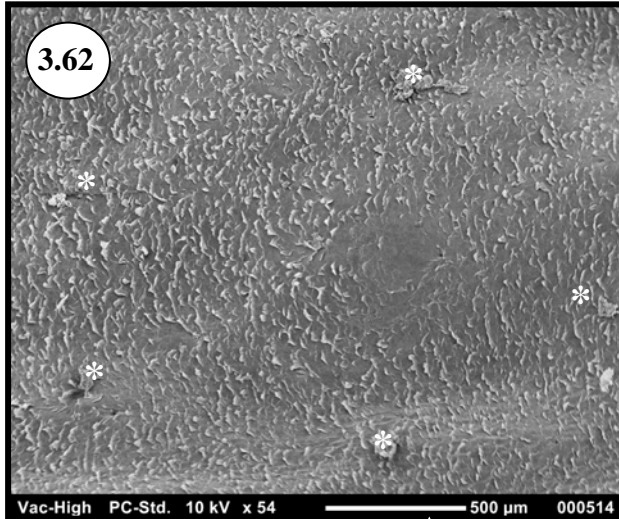


Figure 3.62: The non-keratinised roof of the oropharynx illustrating the wide, evenly distributed large gland openings (*) observed in this region.

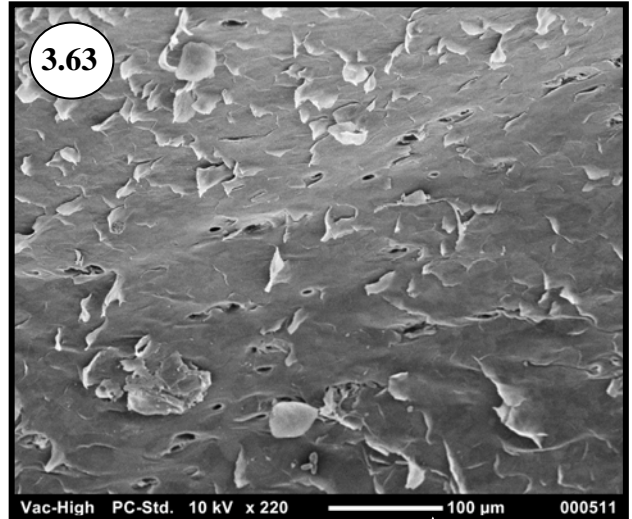


Figure 3.63: The close distribution of small gland openings (small black holes) on the more caudal aspect of the non-keratinised oropharyngeal roof.

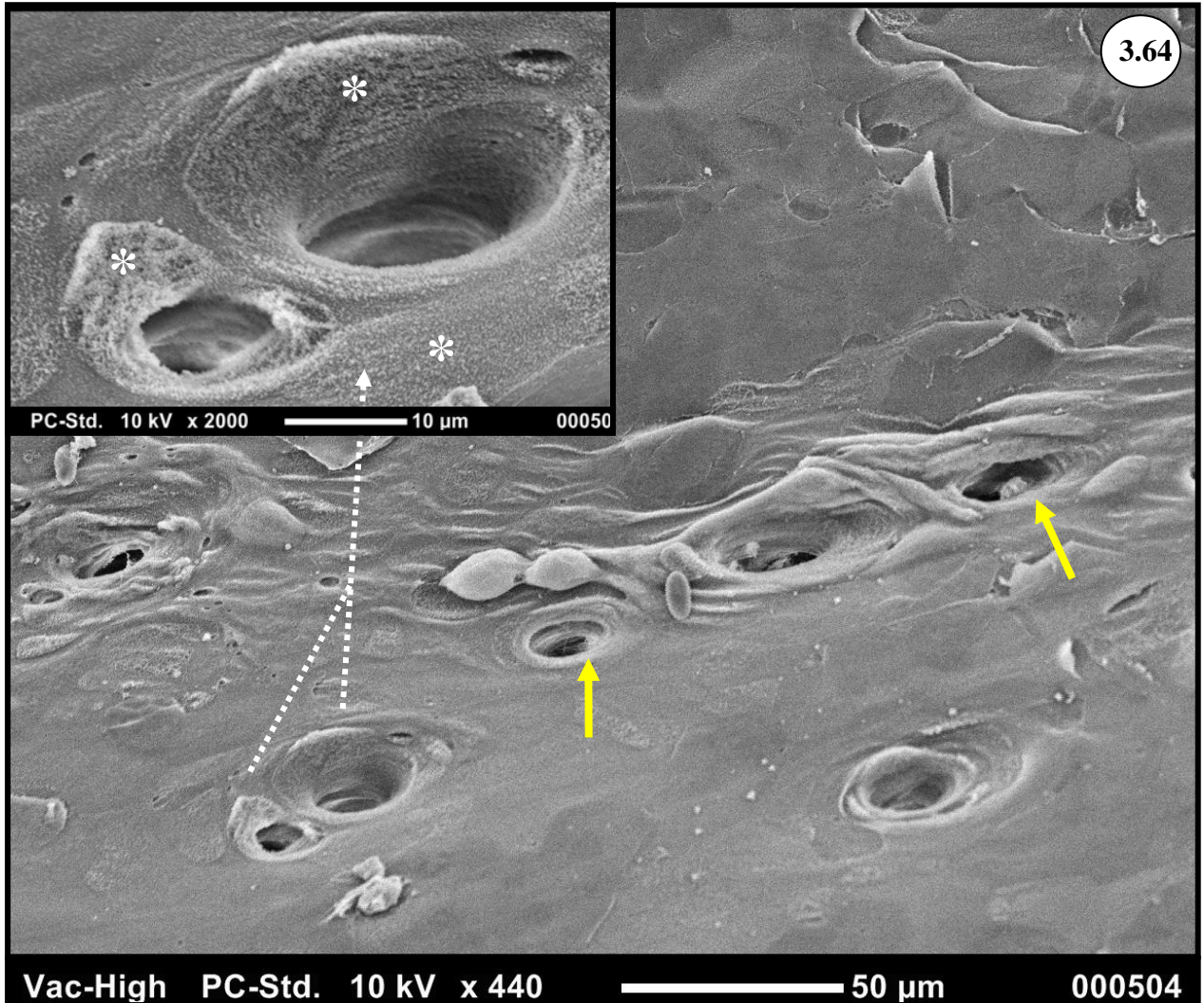


Figure 3.64: The non-keratinised oropharyngeal roof. Note the numerous small gland openings (arrows) and the microvilli (*) on the concentrically arranged cells surrounding the openings. Cells with similar features line the gland ducts (inset).

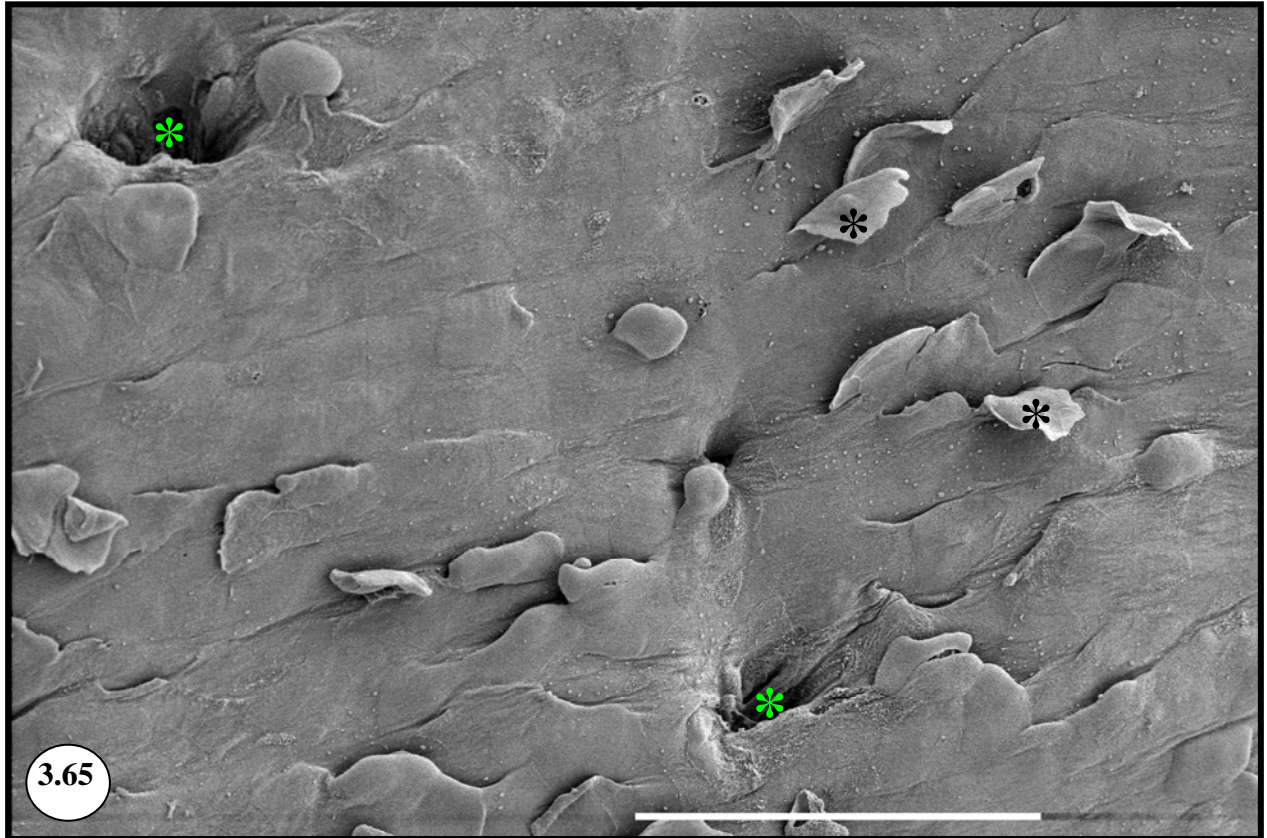


Figure 3.65: Ventral surface of the pharyngeal fold showing individual desquamating surface cells (black *) and large gland openings (green *). The surface appears smooth at this magnification. x350; Bar = 100 μ m.

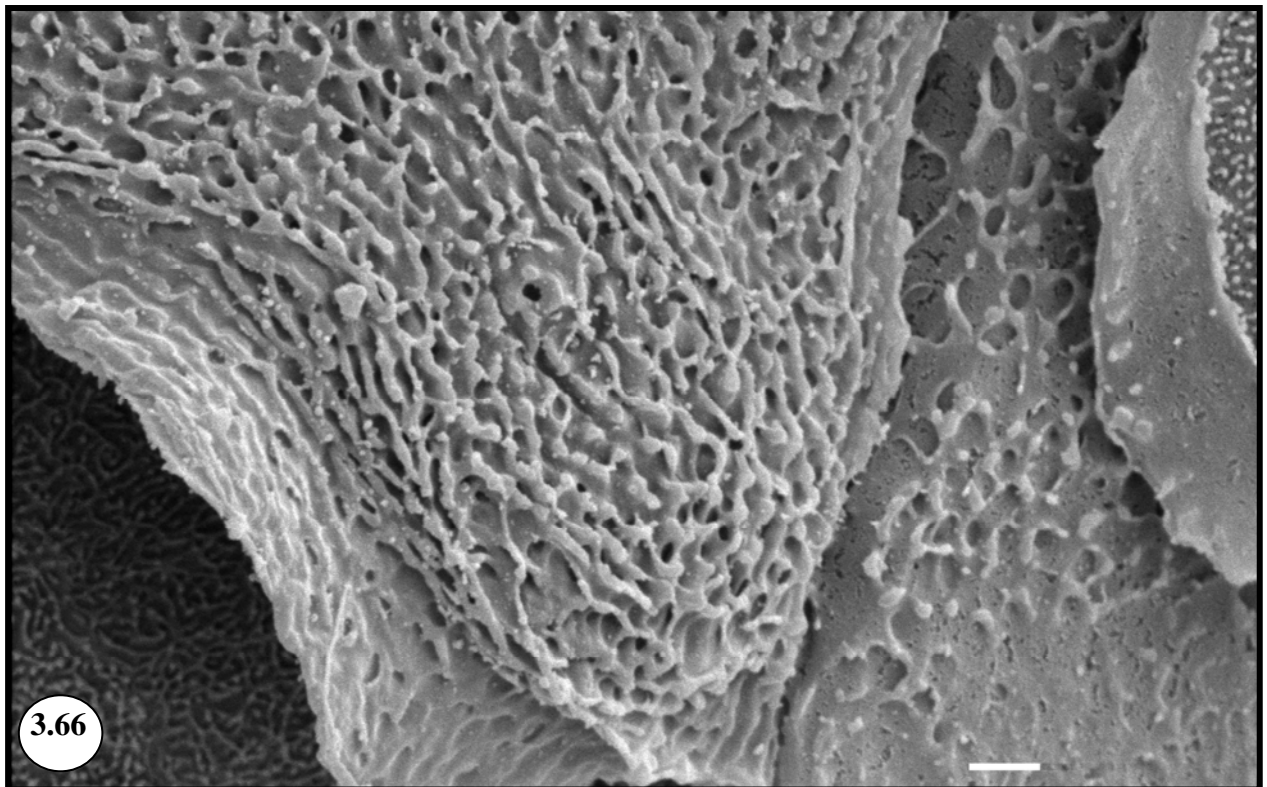


Figure 3.66: Detail of the pattern of microplacae evident on the surface cells of the ventral aspect of the pharyngeal fold. x6000; Bar = 1 μ m.

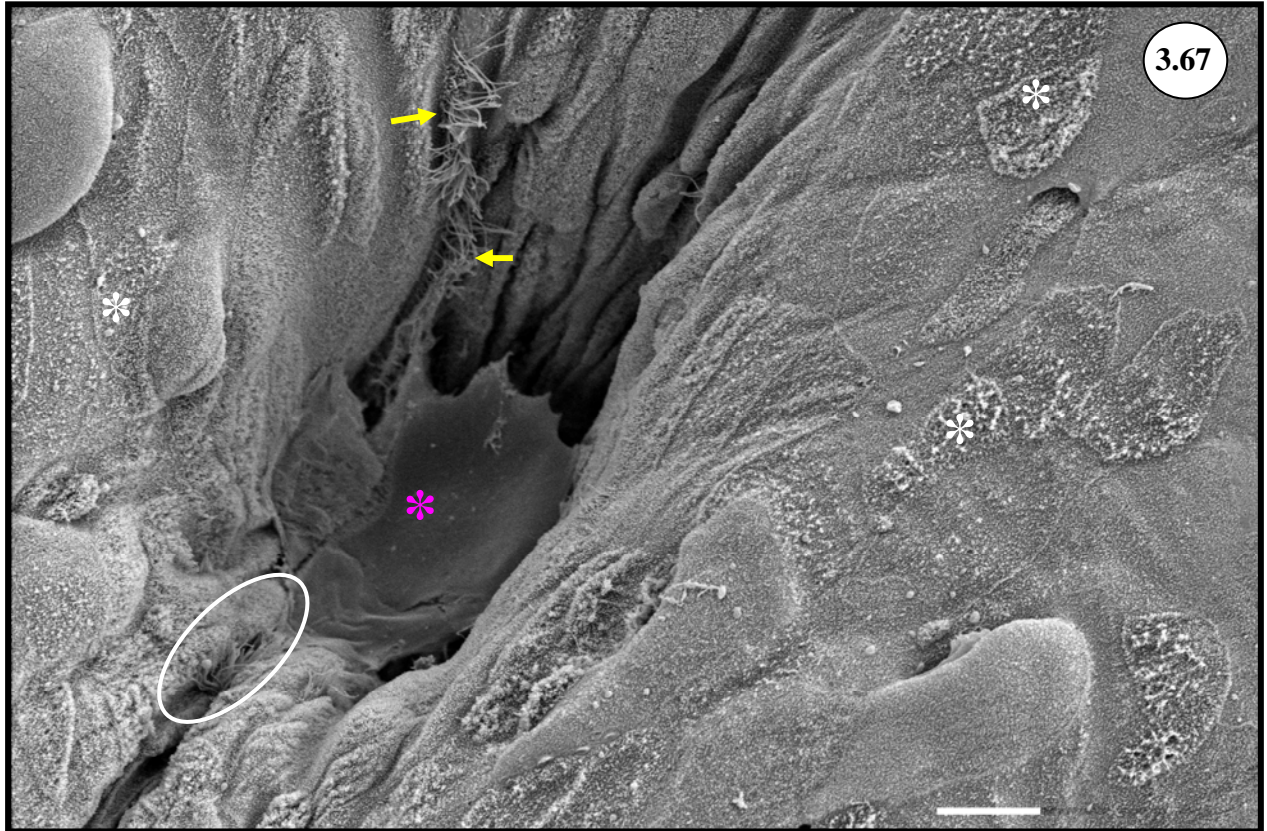


Figure 3.67: Large gland opening on the ventral surface of the pharyngeal fold revealing a mucus plug (pink *) filling the opening. Note the vertically aligned cells and ciliated cells (arrows and circled) associated with the duct opening. The cell surfaces in the vicinity of the opening display masses of microvilli (white *). x900; Bar = 10 μ m.

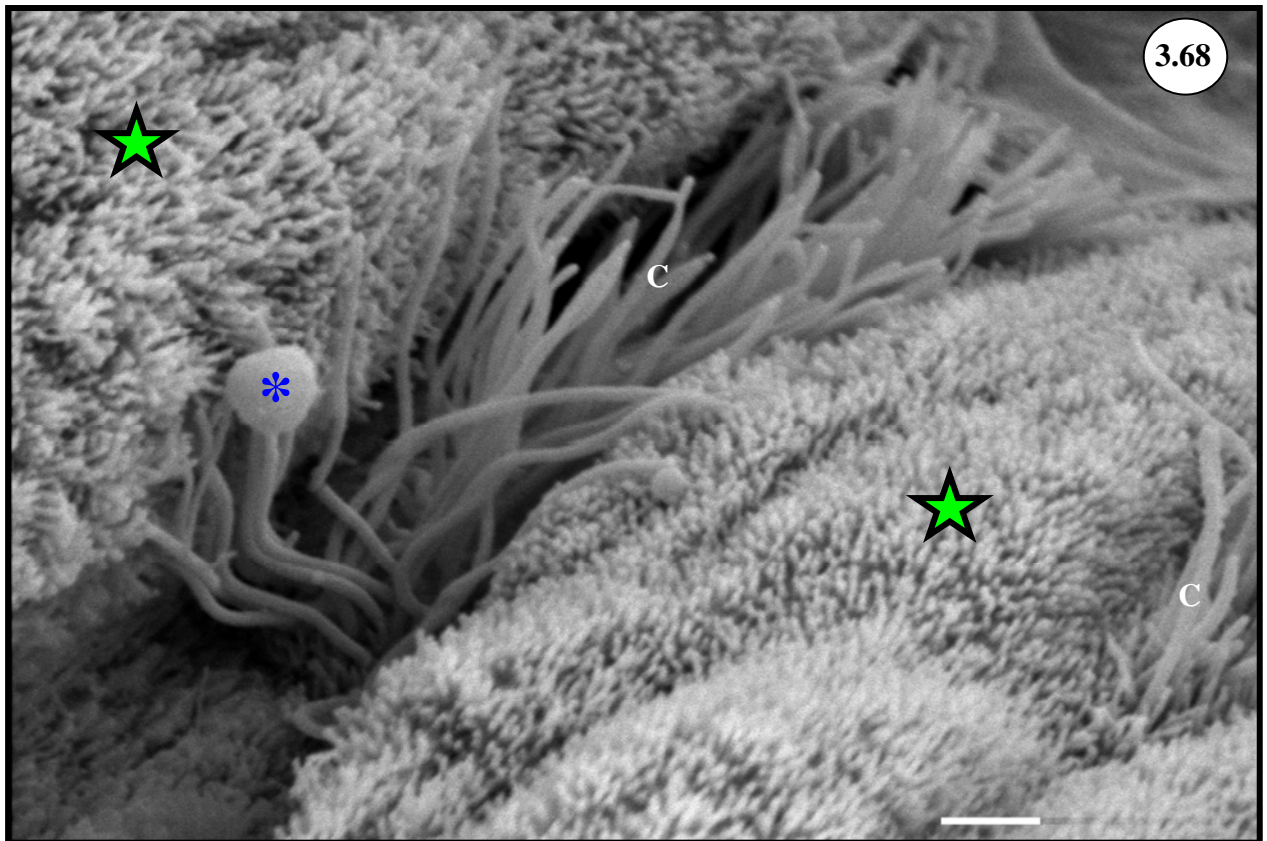


Figure 3.68: Enlargement of the encircled area in figure 3.67. The cell surfaces display masses of microvilli (green stars) and numbers of cilia (C). A globule (blue *) appears trapped by the cilia. x8500; Bar = 1 μ m.

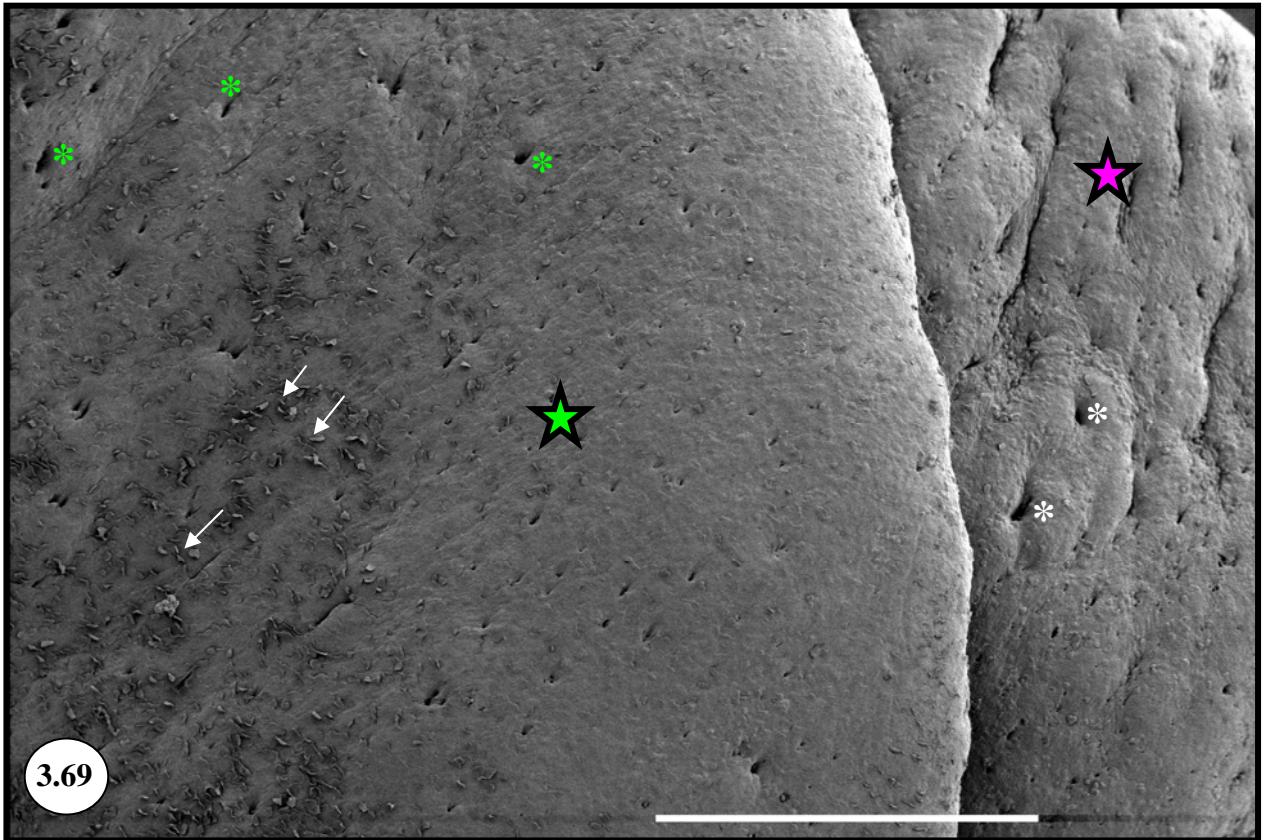


Figure 3.69: Ventral surfaces of the pharyngeal fold (green star) and caudo-lateral tissue projection (pink star). The most notable features are the large gland openings (green *) and desquamating cells (arrows). Note the crater-like features of the large gland openings (white *) on the caudo-lateral tissue projection. x33; Bar = 1 mm.

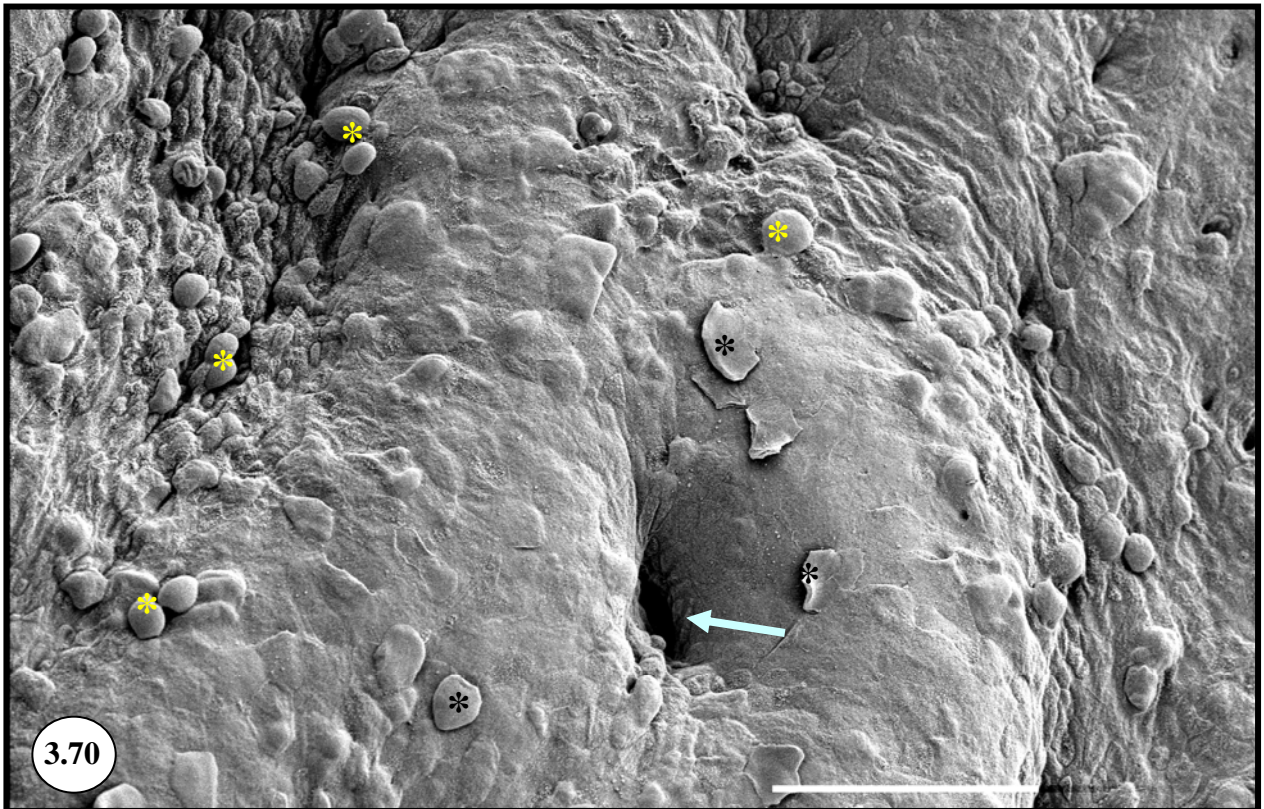


Figure 3.70: Large gland opening (arrow) on the caudo-lateral tissue projection of the pharyngeal fold. Note the raised nodules (yellow *) projecting off the surface, isolated desquamating cells (black *) and the raised rim of the gland opening. x230; Bar = 100 µm.

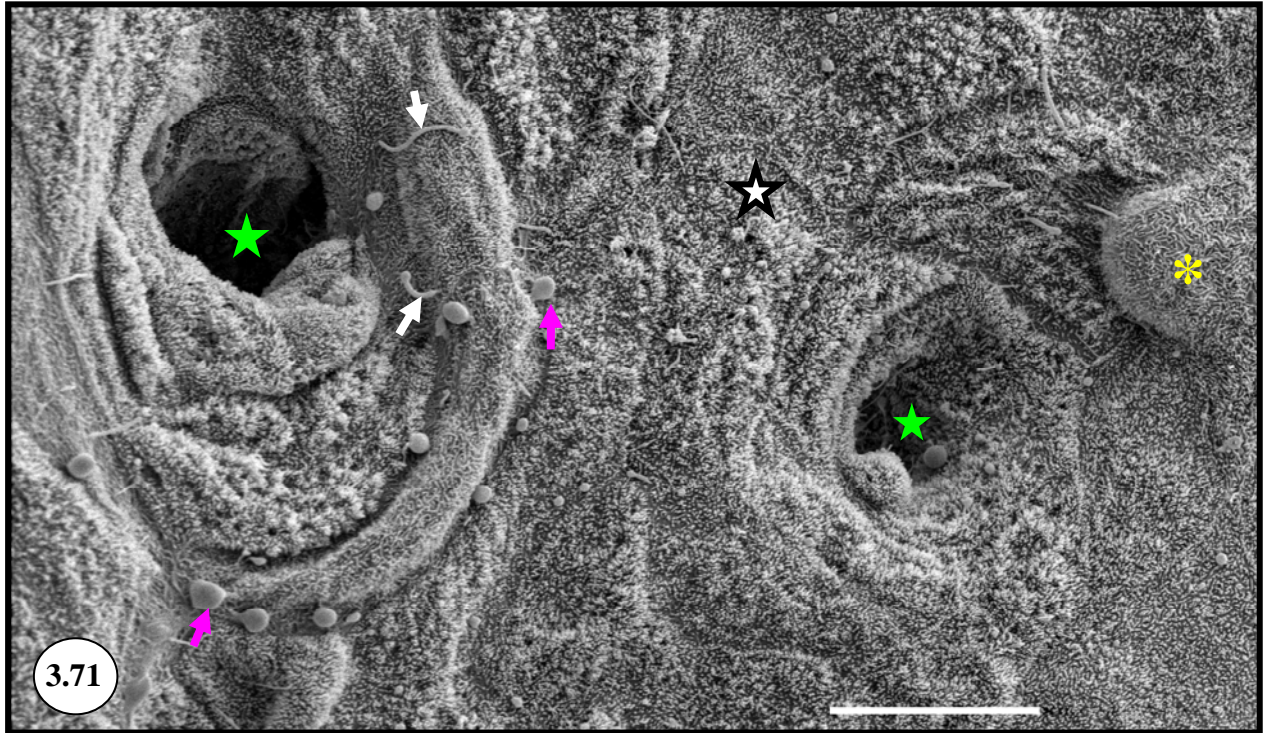


Figure 3.71: Small gland openings (green stars) of the caudo-lateral tissue projection of the pharyngeal fold. Note the microplicae of the nodule (yellow *) in contrast to the dense microvilli (white star) of the surface cells. Note also the circumferential arrangement of cells around the gland openings. Rod-like and club-shaped (white arrows) cell projections and globules (pink arrows). $\times 1800$; Bar = $10\ \mu\text{m}$.

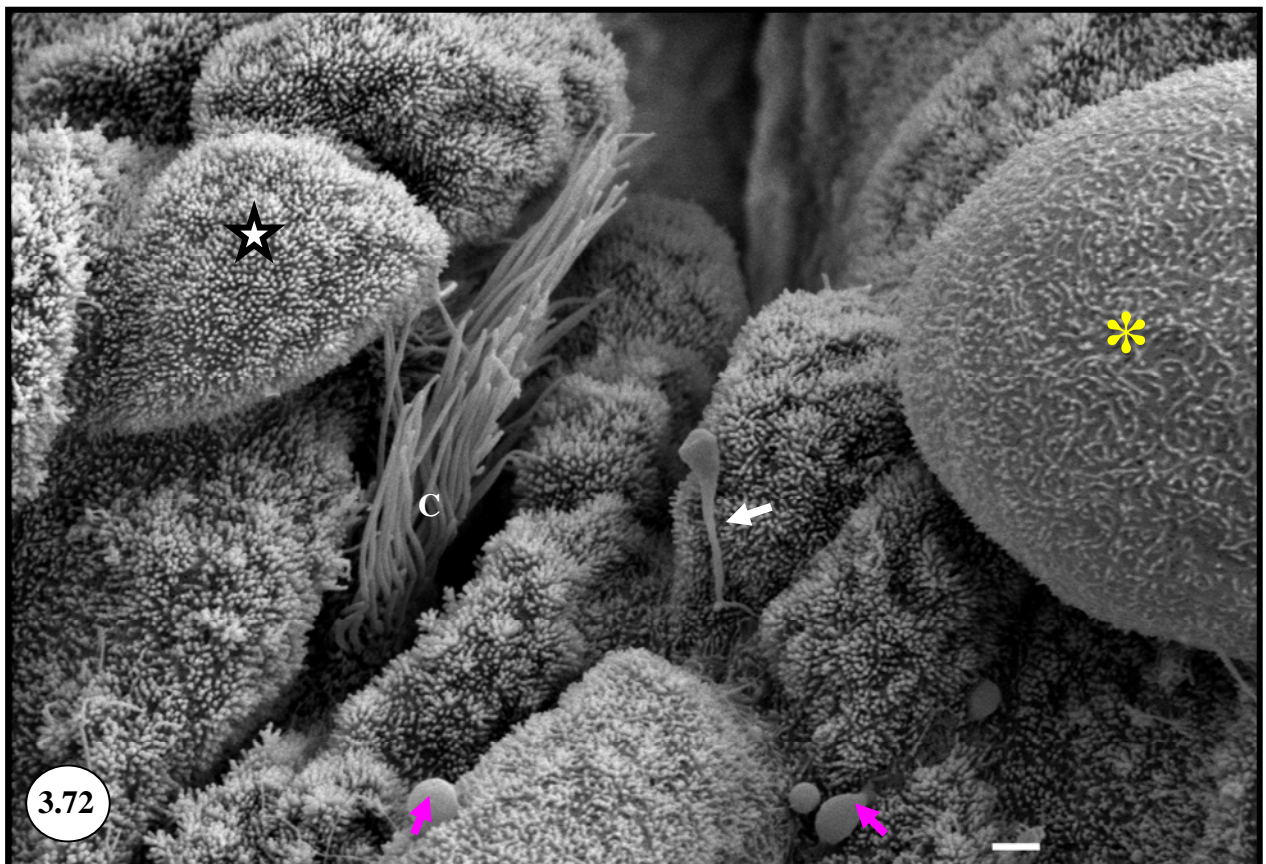


Figure 3.72: Detail of features of the caudo-lateral tissue projection of the pharyngeal fold illustrating the dense microvilli (star), a nodule (yellow *) with microplicae, cilia (C), club-shaped (white arrow) cell projection. Small globular structures are also visible (pink arrows). $\times 4000$; Bar = $1\ \mu\text{m}$.

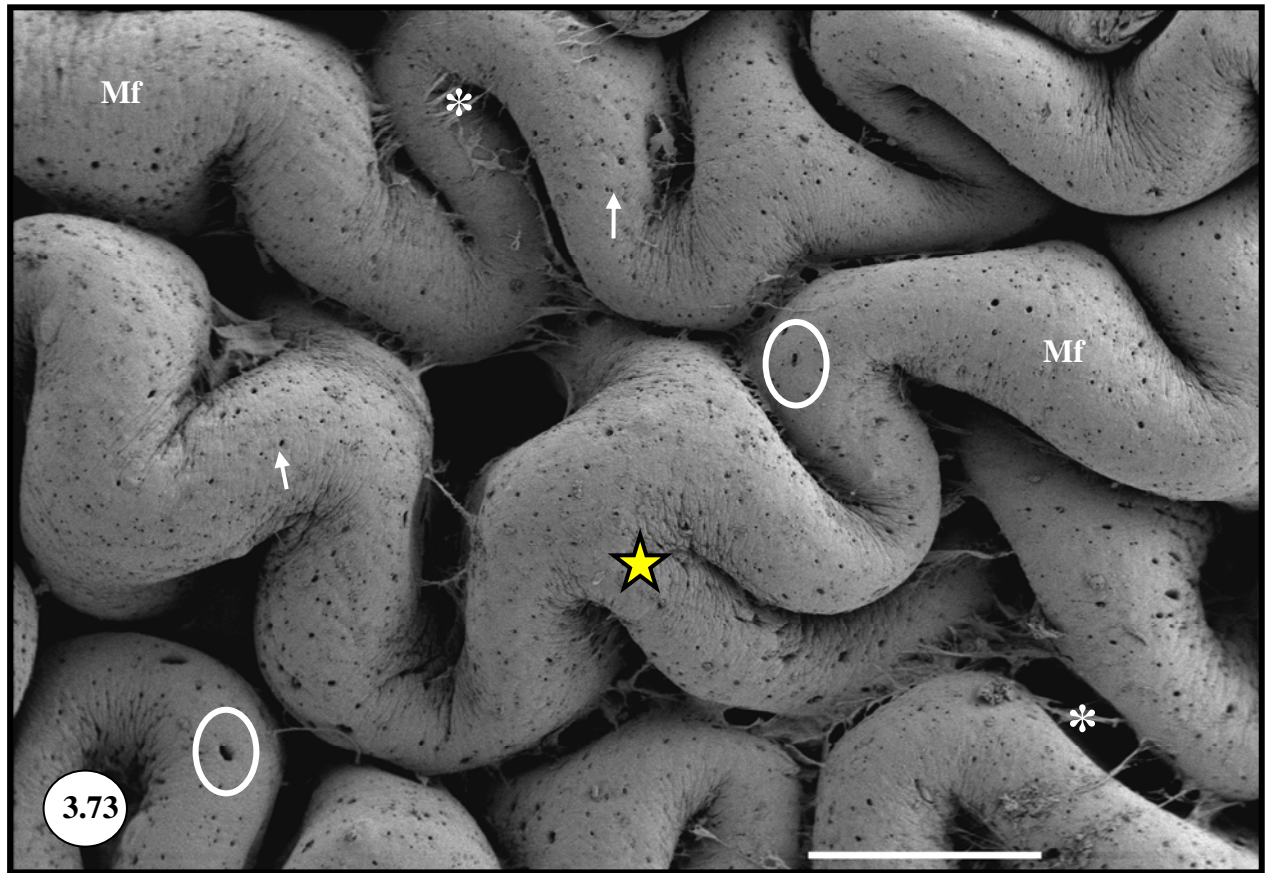


Figure 3.73: Low magnification of the longitudinal mucosal folds (Mf) of the proximal oesophagus. Note the wavy, convoluted appearance of the folds, a degree of branching (star) and the interconnecting strands of mucus (*). Numerous large (encircled) and small (arrows) gland openings occur throughout the folds. x20; Bar = 1 mm.

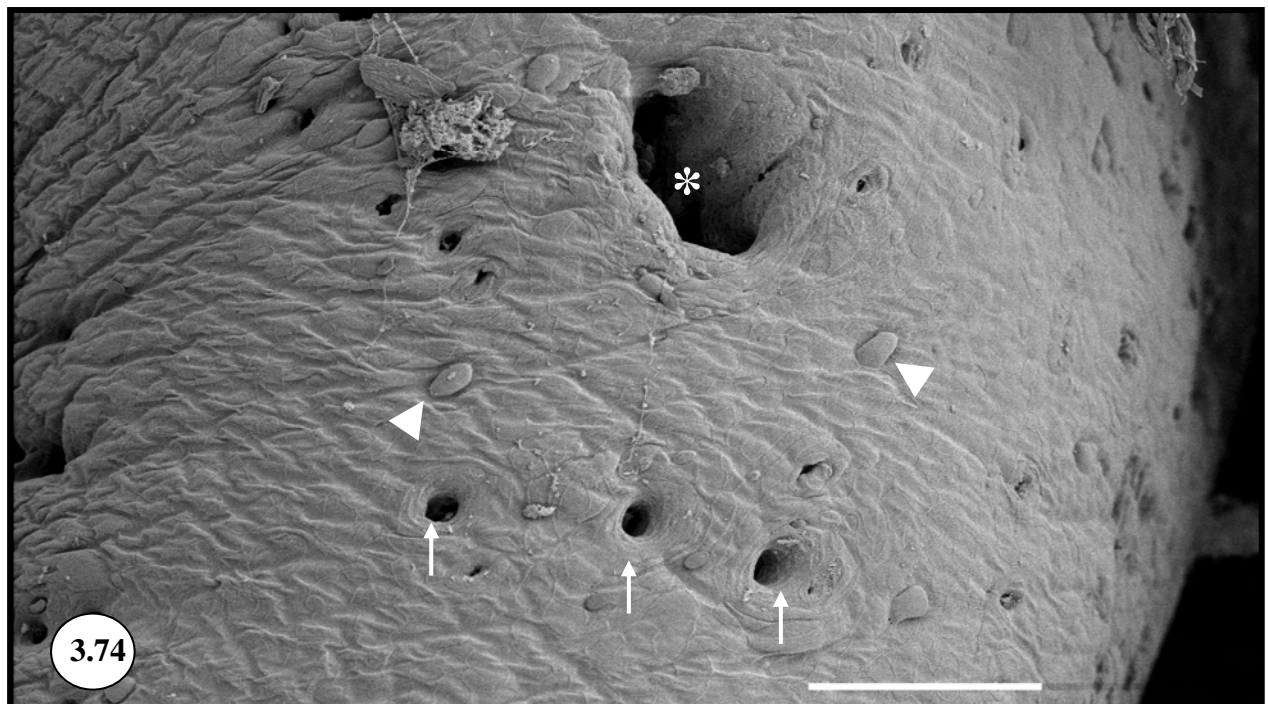


Figure 3.74: Higher magnification showing large (*) and small (arrows) gland openings, as well as raised nodules (arrow heads) on a mucosal fold of the proximal oesophagus. Note the relatively smooth surface devoid of obvious cell sloughing and the concentric arrangement of surface cells around the gland openings. x200; Bar = 100 μ m.

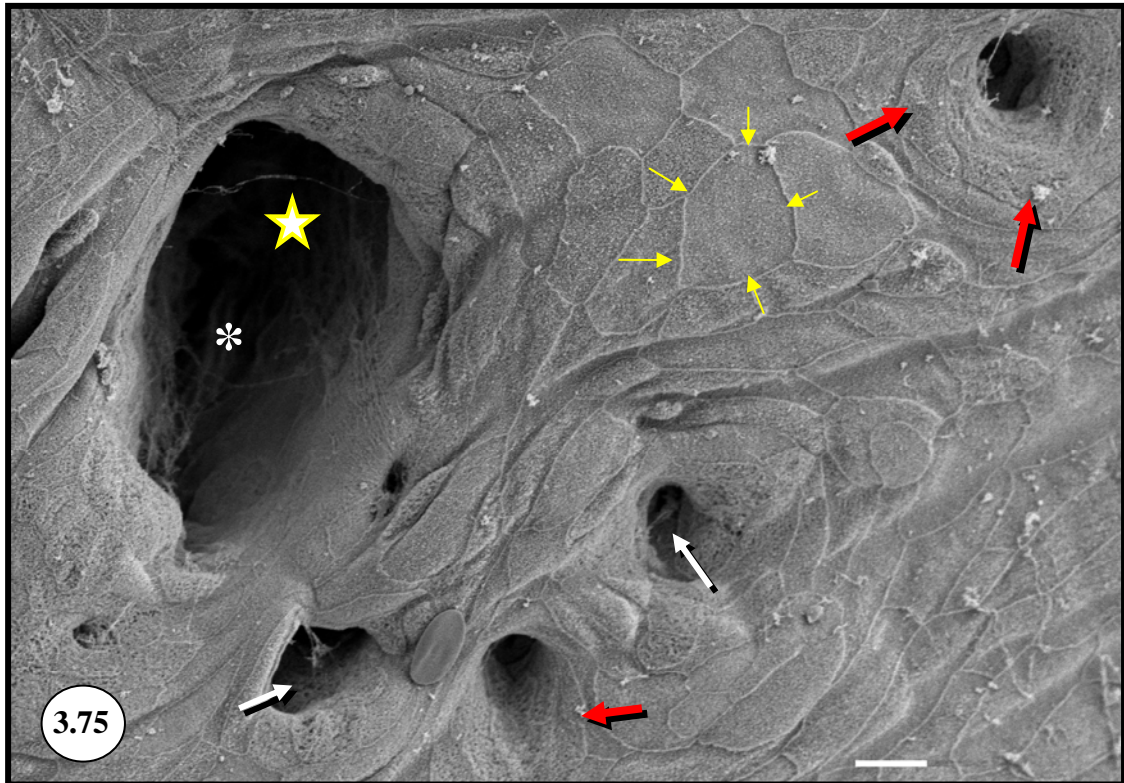


Figure 3.75: A large opening (star) surrounded by a cluster of small openings (white arrows) in the proximal oesophagus. Note the clear demarcation (yellow arrows) of the surface cell boundaries and the concentric arrangement of cells around the openings (red arrows). Mucus-secretion (*). x700; Bar = 10 μ m.

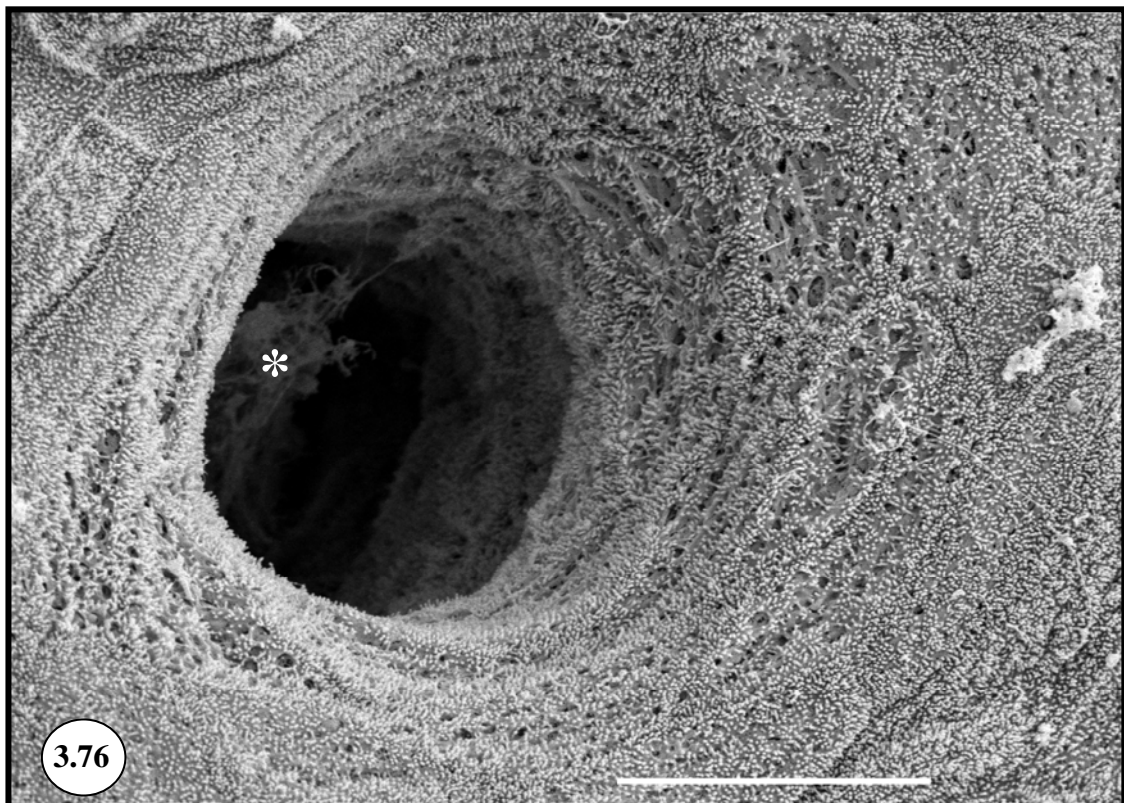


Figure 3.76: Mucus-secretion (*) partially protruding from a small gland opening of the proximal oesophagus. Note that the entire surface is covered by a dense mass of microvilli extending into the gland opening. x3000; Bar = 10 μ m.

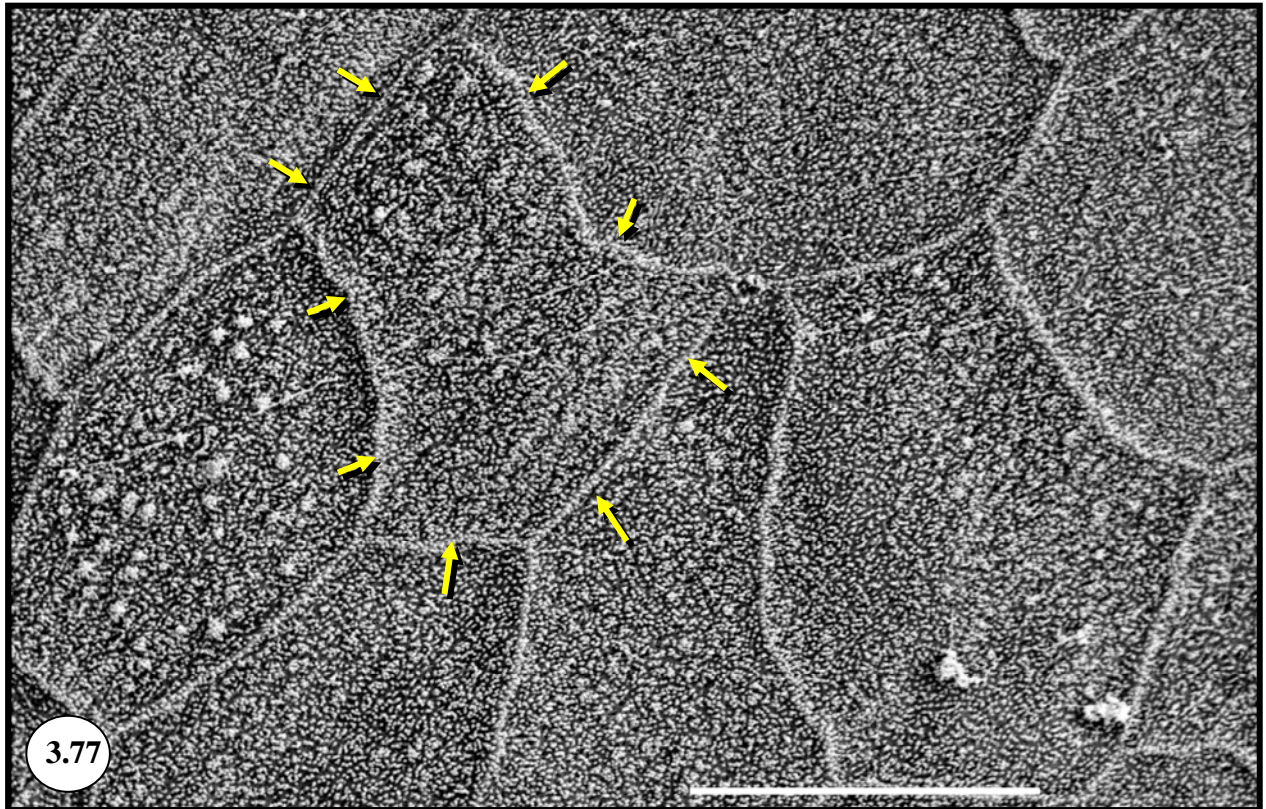


Figure 3.77: High magnification of the surface cells of the proximal oesophagus displaying clearly demarcated cell boundaries (arrows) and densely packed microvilli. Note the polygonal shape of the surface cells. x3000; Bar = 10 μ m.

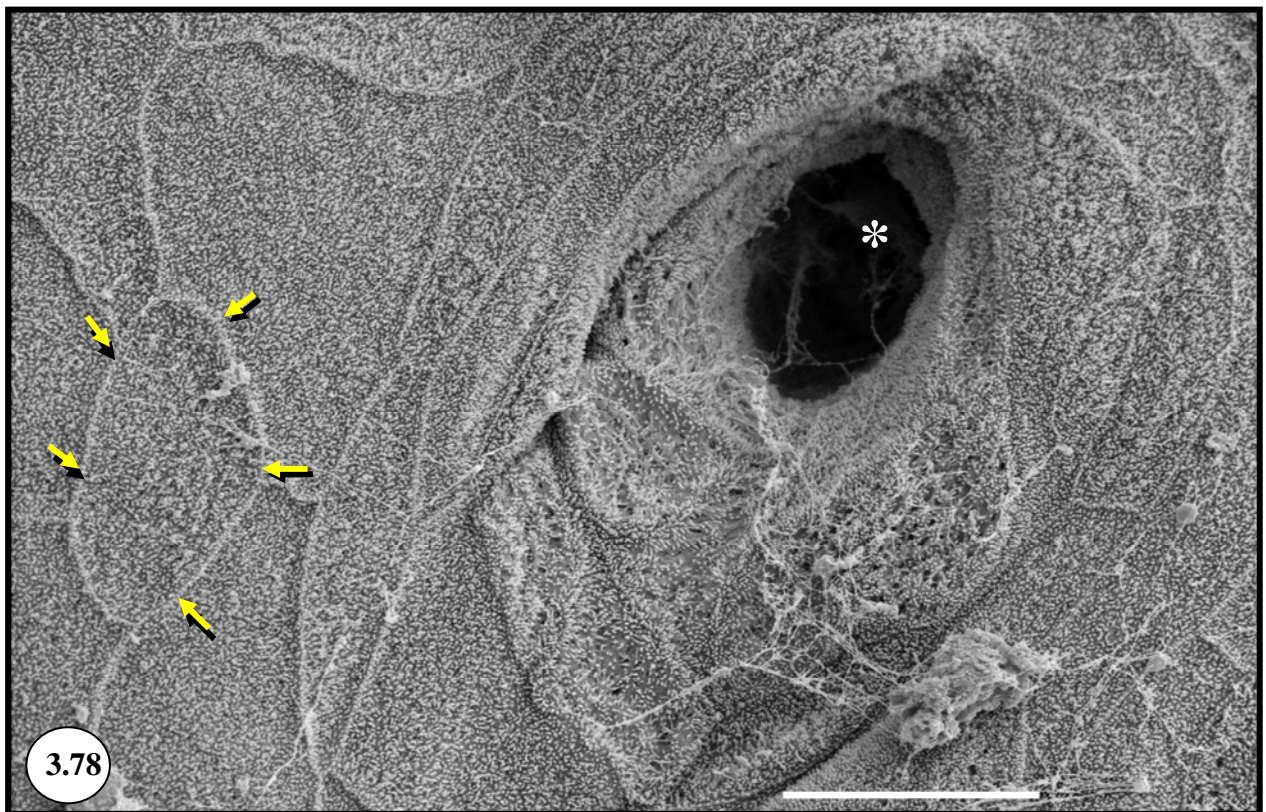


Figure 3.78: A small gland opening surrounded by concentrically arranged surface cells. Thread-like strands of mucus (*) lie in the duct of the gland and on the surface cells. Note the well-defined cell boundaries (arrows) and densely packed microvilli. x2200; Bar = 10 μ m.