Graphosoma lineatum is a species of the Pentatomidae family known as the striped shield bugs. This species is distributed throughout Europe including Turkey and preferentially feed on the generative organs of Apiaceae family and found on umbels. Due to agricultural and economical losses resulting from the insect damage to the crops, it is important to examine digestive system of G. lineatum. In this study, proventriculus and midgut of G. lineatum are examined in detail using light microscope, scanning electron microscope (SEM) and transmission electron microscope (TEM). The connection of proventriculus and midgut is indistinguishable. In general, proventriculus and all parts of midgut have similar properties. Midgut is differentiated into three distinct portions: Anterior, median, posterior. Anterior region is similar to a wide elongated sac. Median region is narrower and tubular in shape. Posterior region is a short dilated portion. Proventriculus and midgut which have role in digestion of the nutrients are surrounded by trachea and muscles. Both SEM images and cross section images illustrate that outer and inner surfaces of proventriculus and anterior midgut regions are indented. Cells of inner surface are simple cylindrical epithelium. Apical membranes of these cells are abundant in microvilli and there are many basement membrane invaginations. A continuous basal lamina lies down under the epithelium. Cells are rich in mitochondria especially under the microvilli and also abound with rough endoplasmic reticulum and lysosomes. There are many spherocrystals that are rod or spherical in shape and varisized lipid droplets. Outer surface of median region is less indented than proventriculus and anterior midgut regions. Cells of median region of the midgut vary in height and have microvillus towards lumen. In addition cells which have great numbers of vacuoles and different electron densities are observed. The posterior midgut assists to absorption of water in nutrients before passing to hindgut. Its outer surface is quite smooth. Epithelium cells in membrane structure are shorter than those of previous parts. Cells contain plenty of lysosomes and lipid granules. Lateral membrane foldings among cells are distinguished. In addition basal membrane infoldings are observed.
Fig. 1: General view of proventriculus and all region of midgut of Graphosoma lineatum-Stereomicroscope

Fig. 2: Longitudinal section of the proventriculus and anterior region of midgut of Graphosoma lineatum-Light Microscope

Fig. 3: The outer surface of the median region of midgut of Graphosoma lineatum-SEM

Fig. 4: Thin section of the posterior region of midgut of Graphosoma lineatum-TEM