

Chapter 1 EXTERNAL STRUCTURE
Yu. S. Balashov

The external structure of ixodid ticks has been described in detail by Balashov (1967), and also in the taxonomic monographs on these animals by Pomerantsev (1950) and Filippova (1977). However, increasing application of scanning electron microscopy in morphological and systematic works on ticks required reinvestigation of their external morphology on the basis of this modern method. Such studies have been made by Arthur (1973a, 1973b) for Amblyomma hebraeum and Boophilus decoloratus. Many morphological details of the genera Ixodes, Haemaphysalis and Dermacentor have been described with the scanning electron microscope (Sixl et al., 1971, 1972a, 1972b, 1973, 1974). The morphological features of H. asiaticum, studied with the scanning electron microscope, are presented in this chapter of the "Atlas", and are compared with those using the light microscope.

When studying ixodid ticks, one should consider the great difference in external and internal structures in unfed and fed animals. The difference between larval, nymphal and adult stages are not as great, except of course, for differences in body size and reproductive system development. Thus, it is necessary to describe the structure of both unfed and fed ticks or to study ultrastructural changes through all developmental stages.

As in other ixodid ticks, unfed H. asiaticum have a dorsoventrally flattened body, which is almost triangle-shaped. The blood-fed ticks are elongate oval. The length of unfed males and females is 6.5-8.0 mm, of nymphs 1.3-1.6 mm, and of larvae 0.74-0.79 mm. During feeding, in addition to increased overall size (length of the female becomes 160-180 mm; nymphs 49-61 mm; and larvae 12-14 mm), a significant dorsal broadening of the body occurs, and the tick becomes oval or round in transverse section. The average weight during feeding increases from 0.037 to 0.571 mg for larvae, from 0.22 to 21.00 mg for nymphs, from 14.2 to 1480 mg for females, and from 12.3 to 23.4 mg for males.

The tick body consists of two major parts: the capitulum or gnathosoma, and the unsegmented body, or idiosoma (figs. 1, 2). The basis capituli is located in the indentation of the idiosoma and articulates with the body by a camerosomal fold of extensible cuticle, allowing the capitulum to move dorsoventrally. The slitlike aperture of Gene's organ opens dorsomedially into the camerostomal fold. The secretion of this glandular organ surrounds the eggs as they are laid and forms a waterproof surface layer. During oviposition, the sac-like distal part of Gene's organ everts and eggs stick to it as they are laid (Balashov, 1967). The capitulum contains a basal sclerotized ring, the basis capituli, anterior to which the elongated mouth cone or