

crenulate ; when freshly moulted, flat and thin, without wax secretions. The bodies of the mature pupæ appear to be raised from the surface of the leaf by a vertical wax fringe, the height of the body then being about one-third of the width. The dorsum is rugose and nearly flat. There are two pairs of marginal spines: the first pair occurs on the caudo-lateral margin, and the second pair on the caudal margin. The second pair in length is between one-tenth and one-eighth the length of the body, and the first pair less than one-fourth the length of the second pair. These last are readily seen by clearing the pupa in xylol and mounting in xylol balsam, or by boiling the pupa-case in KOH and mounting in glycerine. The second pair curve upward and backward, diverging at the base, usually converging posteriorly. There are three pairs of minute dorsal spines as in the previous instars: the first pair is on the cephalic region; the second pair, one on each side of the first abdominal segment; and the third pair one on each side opposite the operculum of the vasiform orifice. Of the three pairs, the third pair is slightly the largest. The segmentation of the abdomen is fairly distinct in the middle; that of the thorax less so. The vasiform orifice is longer than broad, in form similar to a triangle with rounded corners. The orifice is bounded laterally by chitinous ridges, which unite posteriorly, thus differing from previous instars. The operculum is hemielliptical (in the form of an ellipse cut through its shortest axis), reaching from the anterior margin of vasiform orifice to a little over one-half the distance toward the apex. The lingula has one apical lobe and three pairs of side lobes, and is densely covered with longitudinal rows of minute setæ. From the sides of the apical lobe from below arise two spines, one on each side, which extend caudad beyond the apex of the orifice, their length being a little less than one-half the greatest width of the operculum. A second pair, less than one-fifth as long as these, arises one on each side between the first and second side lobes. The anterior pair of side lobes is frequently hidden by the operculum. A shallow furrow extends caudad from the apex of the orifice to the margin of the body.

There is no lateral wax fringe in this instar. The dorsal wax secretion consists of a double submarginal series of glassy waxen rods. The rods of the inner series are never farther away from those of the outer series than the width of their bases. The outer series consists of from about sixty to one hundred (sixty-six to ninety-eight are the limits actually observed) rods of variable length, some being very short, while others are