

Secretory Cavity Development in Glandular Trichomes of *Rosmarinus officinalis* L.

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The internal structure of capitate glands of *Rosmarinus officinalis* L. was examined by transmission and scanning electron microscopy. In this study we examined the development of the secretory cavity and its dermal sheath. Our objectives include determination of the origin and early development of the secretory cavity, pattern of compartmentalization of components in the secretory cavity, and origin of the subcuticular cell wall.

There are two kinds of secretory glands, capitate-stalked and capitate-sessile glands on underside of leaves. For both capitate-sessile and capitate-stalked glands an epidermal cell enlarges and divides several times to form a tier of disc cells on a short stipe attached to basal cells in the epidermis of the leaf. The secretory cavity enlarges as secretions are accumulated in it. The outer portion of the wall remains associated with the cuticle to form the subcuticular wall. The cuticle and subcuticular wall increase in thickness as the secretory cavity enlarges and, therefore, precursors for their growth must be present in the secretory cavity.

Secretory vesicles, upon being released from the wall surface, aggregated in the secretory cavity. As new secretory vesicles were deposited in the secretory cavity, existing vesicles were redistributed throughout the secretory cavity. As these new vesicles emerged into the secretory cavity they became surrounded with a surface about one-half the thickness of a typical membrane.

As the glandular trichome continued to enlarge, the secretory vesicles became large in size and closely packed in the secretory cavity. Vesicles were evident through the secretory cavity including the juncture region where the wall of the disc cell joined the cuticle and subcuticular wall. Wall material was released from the disc cell wall and accumulated in the secretory cavity. This phenomenon appeared to occur along the entire wall surface where associated with the wall surface as well as distant from it.