

News on nectaries in Aizoaceae

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Nectary types in Aizoaceae. Three of the 4 subfamilies possess plain nectaries: in basal position in Sesuvioideae in a perigynous flower; in apical position in Aizooideae, also in a perigynous flower; in apical position but in an epigynous flower in the genus *Tetragonia* and in basal position as ‘coilomorphic’ nectaries in Mesembryanthemoideae. The fourth subfamily, the Ruschioideae, differ from those 3 subfamilies in developing bulging nectaries, either as holonectaries (a complete nectary-ring between the androeceum and the gynoeceum) or as meronectaries (no closed ring, but the single nectaries arranged on a ring).

Nectary types in the tribe Ruschieae. As a rule, both, mero- and holonectaries appear as smooth or crested glands, varying in shape to some extent. In the case of meronectaries, the number of glands is often the same as the number of carpels, an exception occurs, e.g. in the genus *Malephora*: 10 carpels are combined with only 5 meronectaries in one sample.

Size of the nectary slits. The average size of the guard cells forming the ‘slit’ is about 20 µm, (the same size has been found in some Cactaceae samples); the smallest slits have been found in *Brianhuntleya* (8 µm) and the biggest have been recorded in a sample from *Conophytum bilobum* (26 µm).

Position and distribution of nectary slits. The bulging nectaries, forming a kind of “koppie” (hillock) in longitudinal section, possess an inner surface and an outer surface, connected by a central ridge. In most cases, 1–3 rows of nectary-guard-cells are located on the outer surface, but a distribution of the guard cells all over the gland is realized as well in both, mero- and holonectaries. A very special case has been observed in *Cheiridopsis purpurea*: the pairs of guard cells forming the slit are not separated by subsidiary cells or normal epidermal cells, as is the case in the homologous stomata in the leaf epidermis but are placed immediately next to each other lacking subsidiary cells – their ontogeny is still a secret.

Special features. Most glands in Ruschieae are dark green, caused by numerous chloroplasts in the cells. It remains an open question, however, how the variation of the green in the glands to pale colours or yellow to brownish-reddish colours can be explained. In *Dracophilus dealbatus*, red granules of different sizes have been found, obviously responsible for the dark reddish colour of the gland. Normally a genus shows either holo- or meronectaries. In *Delosperma* and *Drosanthemum*, however, examples have been found that differ from this rule, raising the question of delimitation of these two genera.

Outlook. Three fields are to be explored further: 1. Investigate as many genera as possible to accomplish a complete overview over the subfamily; 2. Study the ontogeny of the guard cells in the nectary region; 3. Analyse flower morphology in relation to pollination.

Reference

HARTMANN, H.E.K. & NIESLER, I.M. (2009). On the evolution of nectaries in Aizoaceae. *Bradleya* 27: 69–120.