



MORPHOLOGY AND HISTOCHEMISTRY OF GLANDULAR TRICHOMES OF *OROBANCHE ALBA* STEPHAN EX WILLD

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Orobanche alba Stephan ex Willd is an achlorophyllous root parasite rare in Poland. It prefers dry and sunny slopes, xerothermic grasslands and pastures, mountain pastures, light scrubs, and rock fissures and ledges. The hosts of *O. alba* include *Thymus polytrichus* A. ern. ex Borbás, *Clinopodium vulgare* L. and *Origanum vulgare* L. The tick and fleshy 10-70 cm high stem in this species bears an inflorescence composed of zygomorphic, white or yellow “spotted” flowers covered by purple glandular trichomes. Glandular trichomes of this type are also borne on other parts of the plant, i.e. on the stem, scaly leaves, sepals, filaments, and the style. The secondary metabolites secreted by the glandular trichomes are related to defense of plants against the attack of herbivores and pathogens or act as attractants to pollinators or for fruit dispersal.

The micromorphology and histochemistry of the glandular trichomes in *O. alba* were examined using scanning electron and light microscopes. In order to determine the type of secondary metabolites produced by the trichomes, the flowing histochemical assays were used: Sudan III and neutral red for detection of lipophilic compounds, IKI for detection of starch, and FeCl₃ for detection of phenolic compounds.

The peltate glandular trichomes of *O. alba* were characterised by a varied length

(0.15-0.48 mm) and different activity phases. The trichome was composed of one larger basal epidermal cell, 1-3 hyaline stalk cells with a striated cuticle, a neck cell with a smooth cuticle on the surface, and a globose head formed of 8-18 secretory cells arranged in a circle. Many stalk cells of the trichomes, particularly those located on the corolla, contained anthocyanins, which give the trichomes dark carmine colour. In turn, the colour of the heads was dependent on trichome age: the heads were brown in older trichomes and yellow in younger hairs. Secretion was produced by both young and older trichomes. It penetrated through the walls of secretory cells of the heads and accumulated in the subcuticular space, wherefrom it was released as smaller or larger droplets through cuticle micropores. Aging of trichomes was accompanied by shrinkage and corrugation as well as collapse of the secretory cells of the head and stalk cells.

Results of histochemical tests showed positive reaction to polyphenols and lipids. Polyphenols occurred abundantly in the heads, neck cells, and stalk cells, particularly in older trichomes, whereas lipophilic compounds were detected in the subcuticular space and in the heads of some trichomes. No starch was detected in the trichomes.