



## MORPHOLOGICAL DIFFERENTIATION OF NON-GLANDULAR AND GLANDULAR TRICHOMES ON *MARRUBIUM VULGARE* L.

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*Marrubium vulgare* L., commonly known as a white horehound or common horehound, belongs to the plant family Lamiaceae. It is a perennial aromatic herb which grows naturally in Europe, Asia, and America. Since ancient Egypt, this species has been known as a remedy for upper respiratory tract ailments. Nowadays, horehound is used in herbal medicine for treatment of liver diseases, biliary tract disorders, and for increasing the appetite and supporting the function of the stomach. The main biologically active substances in *M. vulgare* organs are: marrubiin, tannins, essential oils, and ursolic acid.

The paper presents micromorphological analyses of non-glandular and glandular trichomes of *M. vulgare*. The research material was sampled from the plant collection in the Botanical Garden of the Maria Curie-Skłodowska University in Lublin (51°14' N, 22°34' E). The above-ground parts of horehound were collected during the flowering period in July 2013. Using light microscopy (LM) and scanning electron microscopy (SEM), the types and sizes of trichomes from the stem, leaf, calyx, and corolla were investigated.

The results of the microscopic observations show that the surfaces of *M. vulgare* vegetative and reproductive organs are densely clothed with glandular and non-glandular trichomes. The glandular trichomes are of two main types: peltate and capitate. Peltate trichomes consist of a short stalk cell and a large head with secretory cells arranged in a circle. The height of a mature trichome is about 31.33  $\mu\text{m}$  and the diameter of the head is 31.47  $\mu\text{m}$ . The substance produced by secretory cells passes through the apical walls and accumulates within a space between the cuticle and the cell wall layer. Capitate long trichomes with a basal cell, long stalk, neck cell, and a unicellular head are 36.65  $\mu\text{m}$  long and the diameter of the head is about 15.6  $\mu\text{m}$ . There are two types of short capitate trichomes: with a bicellular head and a unicellular stalk and with four-celled head and a unicellular stalk. The length of these trichomes is on average 26.32  $\mu\text{m}$  and the diameter of the head is 20.32  $\mu\text{m}$ . Moreover, we observed two types of non-glandular trichomes: multicellular uniserrate and multicellular branched. The length of the non-glandular trichomes is between 60.69  $\mu\text{m}$  and 1130.3  $\mu\text{m}$ .