

PUBLICATIONS

SECONDARY METABOLITES FROM THE FLOWERS OF *Helichrysum maracandicum*

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Helichrysum maracandicum Popov ex Kirp. is a medicinal plant species of the family Asteraceae, widely distributed in the mountainous regions of Uzbekistan. The species exhibits considerable morphological polymorphism, with forms differing in leaf shape and size, capitulum size, and stem pubescence. Such morphological variability may be associated with differences in the accumulation of secondary metabolites. Despite its wide distribution, the phytochemical composition of *H. maracandicum* populations in Uzbekistan remains insufficiently studied.

Flowers of *H. maracandicum*, characterized by broad leaves, large capitula, and pubescent stems, were collected from the spurs of the Pskem Range in Bostanlyk District, Tashkent Region. The air-dried flowers were extracted with 95% ethanol, and the resulting extract was successively partitioned with petroleum ether, chloroform, ethyl acetate, and *n*-butanol. The obtained fractions were subjected to chromatographic separation, yielding several classes of secondary metabolites.

The chloroform fraction yielded α -spinasterol (**1**). The ethyl acetate fraction afforded gallic acid (**2**), cinnamic acid (**3**), kaempferol (**4**), quercetin (**5**), isoquercitrin (**6**), naringenin (**7**), rutin (**8**) and D-pinitol (**9**). The structures of the isolated compounds were established by ¹H and ¹³C NMR spectroscopy and other spectroscopic methods, together with comparison of the obtained data with literature data and, where available, authentic samples.

Thus, phytochemical investigation of *H. maracandicum* flowers resulted in the isolation and identification of nine secondary metabolites, including a phytosterol, phenolic acids, flavonoids, and a cyclitol. The identification of kaempferol, quercetin, isoquercitrin, naringenin, and rutin indicates a diverse flavonoid profile of the flowers, while the detection of α -spinasterol, gallic acid, cinnamic acid, and D-pinitol further expands the known chemical composition of the species. These findings contribute to the phytochemical characterization of *H. maracandicum* growing in Uzbekistan and provide a basis for further investigation of its chemical constituents and biological activities.