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TRITERPENE GLYCOSIDES FROM *Hedera caucasigena* LEAVES

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Hedera caucasigena Pojark. (Caucasian ivy) is distributed mainly in western regions of the northern and southern slopes of the Caucasus mountains, in Kakhetiya, near Tbilisi, and in northern Armenia [1]. It is widely cultivated in gardens and parks of the Black Sea coast near the Caucasus mountains.

Triterpene glycosides from this species were previously studied by Dekanosidze *et al.* Two glycosides that were isolated from the leaves were named hederacaucasides B and D. These are the 28-O-α-*L*-rhamnopyranosyl-(1→4)-O-β-*D*-glucopyranosyl-(1→6)-O-β-*D*-glucopyranosyl ester of oleanolic acid and the 3-O-α-*L*-rhamnopyranosyl-(1→2)-O-α-*L*-arabinopyranoside of hederagenin [2].

We studied in more detail the glycoside composition of *H. caucasigena* leaves collected near Tbilisi and compared its glycoside composition with those of similar species, *H. taurica*, *H. helix*, and *H. scotica*, in order to analyze the triterpene glycosides of various *Hedera* species. The isolation, separation, and identification of triterpene glycosides was carried out as described by us earlier [3]. The following compounds were found in *H. caucasigena* leaves: 3-O-α-*L*-arabinopyranosides of oleanolic (**1**) and echinocystic (**2**) acids and hederagenin (**3**); 3-O-α-*L*-rhamnopyranosyl-(1→2)-O-α-*L*-arabinopyranosides of oleanolic (**4**) and echinocystic (**5**) acids and hederagenin (**6**); 3-sulfates of oleanolic (**7**) and echinocystic (**8**) acids; and the 28-O-α-*L*-rhamnopyranosyl-(1→4)-O-β-*D*-glucopyranosyl-(1→6)-O-β-*D*-glucopyranosyl esters of **1** (**9**), **2** (**10**), **3** (**11**), **4** (**12**), **5** (**13**), **6** (**14**), **7** (**15**), and **8** (**16**). Glycosides **1**-**16** (except **14**, idenical to hederacaucaside D) are isolated for the first time from this ivy. We did not find a glycoside with the hederacaucaside B structure.

As it turned out, the glycoside composition of *H. caucasigena* leaves is qualitatively identical to those of *H. helix*, *H. taurica*, and *H. scotica* [3, 4]. The quantitative content of *H. caucasigena* leaves is practically the same as those of *H. taurica* and *H. scotica* but contains more 3-sulfates of oleanolic and echinocystic acids and their 28-O-glycosides than *H. helix*.

H. caucasigena and *H. taurica* were classified as separate species only on the basis of slight differences in macroscopic morphological characteristics and the relatively isolated geographical distributions. Many researchers recognize them only as subspecies (varieties) of the common ivy *H. helix* [*H. helix* subsp. *caucasigena* Kleopt., subsp. *caucasigena* (Pojark.) Takht. et Mulk., and *H. helix* var. *taurica* (Hibberd) Rehd., var. *taurica* Tobler]. Cherepanov [5] generally equates them to *H. helix*.

From a chemotaxonomic viewpoint, there is no obvious reason to classify *H. caucasigena* and *H. taurica* as separate species because their glycoside compositions are qualitatively identical to that of *H. helix*. However, there is no basis to identify them completely as *H. helix* owing to reliable differences in the quantities of glycoside sulfates. Obviously the preference is to recognize them as subspecies (varieties) of the commonly accepted species *H. helix*.

Comparison of the glycoside composition of ivy leaves collected near Odessa, Kishinev, and western regions of Romania with that from samples of Crimean and Caucasian ivy showed that they are qualitatively and quantitatively identical. In our opinion, all this territory and, according to the literature [1], part of the Balkan peninsula (Dobrudzha) represent a common distribution area of the single subspecies *H. helix* var. *taurica* (= var. caucasigena).

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