

is partially masked by the signal of the deuteropyridine).

The facts given show that the aglycone of glycoside (I) is neoapigen 6-O-benzoate, and the carbohydrate moiety is identical with the carbohydrate component of turoside A - lycotetraose [9]. Compound (I) is turoside A 6-O-benzoate.

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#### CARDENOLIDES OF *Erysimum repandum*

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We have investigated the seeds of *Erysimum repandum* L. grown in the experimental field of the Institute of the Introduction of Plants and of Plant Resources, Sofia. This species of *erysimum* is widely distributed in Bulgaria [1] and has been identified botanically in the same institute. The presence of cardiac glycosides in it has been reported previously [2-5]. The isolation of *erysimin*, *erysimoside*, and *cheirototoxin* from *Erysimum repandum* and their identification by paper chromatography is also known. In view of the results of our investigations (see below) the presence of *cheirototoxin* appears disputable. From the seeds of this plant we have isolated two cardiac glycosides and have identified them as *periplorhamnoside* and *glucoperiplorhamnoside* [6]. The chemical composition of this plant has been little studied.

Making use of a typical scheme of treating plant material containing cardiac glycosides - namely, comminution, defatting with petroleum ether, extraction with 70% ethanol, purification of the glycosides with lead hydroxide in 40% ethanol and alumina in aqueous solution - we obtained the purified combined glycosides with a biological activity of  $0.349 \pm 0.006$  mg/kg weight of a pigeon (determined by L. Ya. Topchii). We also obtained a fatty oil in an amount of 35% of the weight of the seeds.

On separating the glycosides by adsorption chromatography on alumina (activity grade III) using chloroform-ethanol (98:2-30:7) as eluent we isolated seven cardenolides in the individual crystalline state. Five of them were identified by their physicochemical properties and by direct comparisons with authentic samples, including comparison of their IR spectra, as *periplogenin* [7, 9], *strophanthidin* [8, 9], *periplorhamnoside* [10, 11], *glucoperiplorhamnoside* [6, 12], and *glucostrophalloside* [13]. The other two glycosides, provisionally denoted Er 9 and Er 10, are still being studied. Their properties: Er 9, mp 250-254/278-280°C;  $[\alpha]_D^{21} -12.4 \pm 4^\circ$  (c 0.25; methanol); Er 10, mp 267-270°C;  $\alpha_D^{20} -5.8 \pm 2^\circ$  (c 0.42; methanol).

The presence in the plant of a *strophalloside* monoglycoside was also established by paper chromatography in various solvent systems [14].

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The main glycosides of *Erysimum repandum* are glucostrophalloside, glucoperiplorhamnoside, and Er 10. We assume that the earlier workers [4] when chromatographing glucostrophalloside on paper could have erroneously taken it as cheirotoxin, since these glycosides have very similar polarities. We have not detected cheirotoxin in this plant.

Attention is attracted by the almost complete absence in the seeds of *Erysimum repandum* of such glycosides typical for the genus *Erysimum* as erysimoside and erysimin. This makes the species investigated a definite anomaly in the chemotaxonomic respect. We assume that erysimoside and erysimin are possibly converted completely into glucostrophalloside and strophalloside by hydroxylation at C-2' during the ripening of the seeds of *Erysimum repandum*. In their chemical structure the pairs of glycosides erysimin and strophalloside, and erysimoside and glucostrophalloside, are close, differing by only one OH group.

This is the first time that glucostrophalloside, periplogenin, strophanthidin, and the cardenolides Er 9 and Er 10 have been isolated from *Erysimum repandum*.

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