

Thus, it has been established that the pectin substances of the tuberous roots contain neutral and acid polysaccharides.

It has been established by acid and enzymatic hydrolyses that the acid polysaccharide is a pectin consisting of residues of galactose, rhamnose, xylose, and arabinose and of galacturonic acid, which forms the main chain.

LITERATURE CITED

1. M. I. Igamberdyeva, D. A. Rakhimov, Kh. A. Arifkhodzhaev, and Z. F. Ismailov, *Khim. Prirodn. Soedin.*, 501 (1974).
2. M. Dubois et al., *Anal. Chem.*, 28, 350 (1956).
3. M. N. Zaprometov, *Biochemical Methods of Plant Analysis* [in Russian], Moscow (1970), p. 296.

LACTONES FROM *Artemisia compacta*

R. V. Usynina, L. I. Olishkevets,
V. V. Dudko, and E. B. Martin

UDC 547.913

From the epigeal part of *Artemisia compacta* Fisch., of the subgenus *Seriphidium* (Bess) Rauy, family Asteraceae collected in the following phase in the environs of the village of Kosh-Agach, Gorno-Altai Autonomous Region, we have isolated the combined lactones (0.4%) by Rybalko's method.

These were chromatographed on Al₂O₃ (activity grade IV), and when the column was eluted with chloroform the first fraction yielded a substance with mp 25°C which was identified by its IR and UV spectra as dihydrocoumarin [2, 3].

On standing, fraction II deposited crystals with mp 215-216°C (from ethanol) which were identified by a comparison of IR spectra and by thin-layer chromatography on a Silufol plate as β-santonin. We did not detect α-santonin [4] in *A. compacta*.

When the column was eluted with ethanol-chloroform (1:3), a mixture of substances was isolated. Chromatography on paper in various systems showed the presence in it of nine substances of coumarin nature, two of which corresponded to scopoletin and to umbelliferone. After preparative isolation, their nature was confirmed by their IR spectra [2, 3].

We have previously investigated several Siberian species of wormwood for their scopoletin content and have found it in representatives of the subgenus *Artemisia* — *A. gmelinii* var. *latiloba*, *A. laciniata*, *A. latifolia* — of the subgenus *Seriphidium* — *A. mongolorum* and *A. nitrosa* —, and of the subgenus *Dracunculus* — *A. glauca* var. *humilis* and *A. bargusinensis*. This confirms once more that scopoletin is characteristic of the genus *Artemisia* [5].

LITERATURE CITED

1. K. S. Rybalko and A. I. Ban'kovskii, in: *The Study and Use of the Medicinal Plant Resources of the USSR* [in Russian], Leningrad (1964), p. 274.
2. G. A. Kuznetsova, *Natural Coumarins and Furocoumarins* [in Russian], Leningrad (1967).
3. M. E. Perel'son, Yu. N. Sheinker, and A. A. Savina, *The Spectra and Structures of Coumarins, Chromones, and Xanthenes* [in Russian], Moscow (1975).
4. K. S. Rybalko, A. I. Ban'kovskii, and V. I. Sheichenko, in: *Medicinal Plants* [in Russian], Vol. 15 (1969). p. 168.
5. O. A. Konovalova, K. S. Rybalko, and A. I. Shreter, *Khim. Prirodn. Soedin.*, 97 (1976).

Tomsk Medical Institute. Translated from *Khimiya Prirodnikh Soedinenii*, No. 6, pp. 809-810, November-December, 1976. Original article submitted July 8, 1976.

This material is protected by copyright registered in the name of Plenum Publishing Corporation, 227 West 17th Street, New York, N.Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for \$7.50.

L. I. Dukhovlina, Yu. E. Sklyar,
and M. G. Pimenov

UDC 547.9:582.89

Seseli talassicum (Korov.) M. Pimen. et Sdobn. is a perennial monocarpic plant of the family Umbelliferae which was previously assigned to the genus *Ligusticum* (*L. talassicum*) [1]. According to the results of TLC, the chemical compositions of the roots of plants collected in the Otmek Pass (Talasskii range, Kirghizia) and in the Aksu-Dzhabaglinskii reserve (Kazakhstan) are identical.

The comminuted roots were extracted with petroleum ether, the concentrated extract was distributed between petroleum ether and methanol, and the total coumarins obtained by evaporating the methanolic solution were chromatographed on silica gel L 40/100 μ in the petroleum ether-ethyl acetate system with a gradientwise increase in the concentration of the latter. This yielded the furocoumarin isoimperatorin, $C_{14}H_{14}O_4$, mp 108-109°C, identical according to its IR spectrum and a mixed melting point with an authentic sample, and also a mixture of two diacyloxydihydropyrancoumarins. Rechromatography of this mixture under the same conditions yielded a substance (I), $C_{24}H_{26}O_7$, mp 174-175°C, $[\alpha]_D^{22} -30^\circ$ (c 1.0; $CHCl_3$), and substance (II), $C_{24}H_{26}O_7$, mp 109-110°C, $[\alpha]_D^{22} -12.5$ (c 2.0; $CHCl_3$).

On the basis of the IR and NMR spectra and melting points of mixtures with authentic samples, compound (I) was identified as anomalin and (II) as khellactone disenecioate [2].

Thus, the chemical composition of the species studied confirms the correctness of its assignment to the genus *Seseli* (section *Condensata*) [1].

LITERATURE CITED

1. M. G. Pimenov and L. I. Sdobnina, Bot. Zh., 60, No. 8, 1108 (1975).
2. V. V. Vandyshev, Yu. E. Sklyar, L. I. Dukhovlina, and M. G. Pimenov, Khim. Prirodn. Soedin., 512 (1975).

All-Union Scientific-Research Institute of Medicinal Plants, Moscow. M. V. Lomonosov Moscow State University. Botanical Garden, Moscow. Translated from Khimiya Prirodnkh Soedinenii, No. 6, p. 810, November-December, 1976. Original article submitted May 26, 1976.

This material is protected by copyright registered in the name of Plenum Publishing Corporation, 227 West 17th Street, New York, N.Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for \$7.50.