

SHORT COMMUNICATION
CHEMICAL COMPARISON OF THE ROOTS OF
SELINUM VAGINATUM AND *NARDOSTACHYS JATAMANSI*

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Abstract—Though the roots of *S. vaginatum* and *N. jatamansi* have some external resemblance, they differ in their microscopic characters and markedly in chemical composition which is revealed easily in TLC. Since the coumarin ester, selinidin, is present only in *S. vaginatum* and not in *N. jatamansi* the alternative name jatamansin should be dropped, and since the parent compound was first isolated from *Lomatium nuttalin*, the name lomatin should be preferred to the alternatives.

IN AN earlier communication,¹ the isolation of a new coumarin, selinidin (I), from the light petroleum extract of *Selinum vaginatum* was reported, and its constitution was established by chemical degradation, u.v., i.r. and NMR spectral studies. In the same petroleum extract, more coumarins have been found to be present including oroselol, angelicin and selinetin; they have been studied and will be discussed separately. The present note refers to the nomenclature adopted for the compound and the distinction between the roots mentioned in the title. The presence of selinidin in the petroleum extract of a sample considered to be *Nardostachys jatamansi* has also been reported by Shanbhag *et al.*,² who named it jatamansin. More recently³ they have also reported the isolation, from the same source of oroselol (II), angelicin (III), jatamansinol (IV) (identical with selinetin and lomatin), besides a number of other compounds. But no mention is made of the presence of jatamansone (V), which is the most important component of *N. jatamansi*.⁴

Because *S. vaginatum* and *N. jatamansi* belong to different families, namely Umbelliferae and Valerianaceae respectively, they cannot be expected to have such close resemblance in their root constituents. It has already been mentioned by Mehra *et al.*⁵ that the two roots resemble each other in their casual external appearance though they can be differentiated from a close study of their anatomy, particularly for microscopic characters. They have also reported that *N. jatamansi* is often contaminated with *S. vaginatum* as an adulterant. It appeared that Shanbhag *et al.*^{2,3} were mistaking *S. vaginatum* for *N. jatamansi*. We have, therefore, compared the petroleum extracts of authentic samples of the roots of both plants. The roots of *S. vaginatum* were obtained from the regional research laboratory, Jammu, and those of *N. jatamansi* from Professor R. B. Arora, All India Institute of Medical Sciences, and were identified by the Botany Department of Delhi University.

TLC comparison of the petroleum ether extracts has been useful and has revealed that their chemical components are completely different. The extracts of authentic samples of

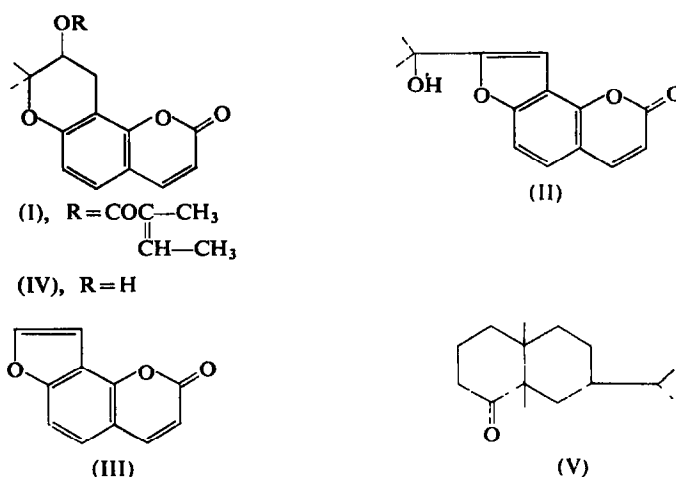
¹ T. R. SESHADRI, M. S. SOOD, K. L. HANDA and VISHWAPPAUL, *Tetrahedron Letters* No. 45, 3367 (1964).

² S. N. SHANBHAG, C. K. MESTA, M. L. MAHESHWARI, S. K. PANIKAR and S. C. BHATTACHARYA, *Tetrahedron* 20, 2605 (1964).

³ S. N. SHANBHAG, C. K. MESTA, M. L. MAHESHWARI, S. K. PANIKAR and S. C. BHATTACHARYA, *Tetrahedron* 21, 3591 (1965).

⁴ T. R. GOVINDACHARI, S. RAJADURAI and B. R. PAI, *Chem. Ber.* 91, 908 (1958).

⁵ P. N. MEHRA and S. S. JOLLY, *Planta Med.* 11, 8 (1963).



the two roots were run on a TLC plate (silica gel) along with pure samples of selinidin, oroselol, angelicin, selinidin and jatamansone using a mixture of benzene, methanol, ether and chloroform (20:1:1:1), a solvent system found to be useful for coumarins.⁶ When seen in u.v. light or sprayed with iodine in potassium iodide solution or sprayed with aq. sulphuric acid (10%), the chromatogram of *S. vaginatum* showed the presence of selinidin, oroselol and angelicin, besides other compounds; jatamansone was absent. On the other hand the chromatogram of *N. jatamansi* was lacking in the characteristic spots of the coumarins but jatamansone was prominent. Further, recently Schulte *et al.*,⁷ who examined another species of *Nardostachys* namely, *N. chinensis*, failed to find any coumarins. Therefore, it appears that Shanbhag *et al.*,^{2,3} were in fact using *S. vaginatum* and not *N. jatamansi*, and so there seems to be no justification for the name jatamansin. Hence selinidin should be accepted as the only correct name for (I). On hydrolysis selinidin gives rise to selinidin, which is identical with lomatin earlier isolated by Soine *et al.*⁸ from *Lomatium nuttallii* (Umbelliferae); so the latter name should be used in preference to selinidin.

A convenient method of identifying *N. jatamansi* roots is as follows: The crude petroleum extract is shaken up with aq. NaHSO_3 when the ketone, jatamansone, goes into the bisulphite layer. It can be recovered by acidification with cold HCl and extraction with ether. The TLC gives a spot corresponding to jatamansone very clearly. The extract from the roots of *S. vaginatum* does not show any spot corresponding to jatamansone when tested in this way.

Another easy distinction is based on the presence of flavonoids in *S. vaginatum* and not in *N. jatamansi*. Alcohol extract of the former gives deep red colour with Mg-HCl, whereas the extract of the latter does not.

Addendum

After this note had been sent for publication Sastry *et al.*,⁹ recorded the study of the dark brown variety of *N. jatamansi*. This agrees with jatamansi proper. What they consider to be greyish-brown variety is obviously *S. vaginatum*.

⁶ MARIA KAWALSKA and LUTOSLAWA S. KSYPEZAKWA, *Dissertation Pharno* 16, 255 (1964).

⁷ K. E. SCHULTZE, G. RUCKER and G. GLANCH, *Tetrahedron Letters* No. 35, 3083 (1965).

⁸ T. O. SOINE and F. H. JAWAD, *J. Pharm. Sci.* 53, 990 (1964).

⁹ S. D. SASTRY, M. L. MAHESHWARI and S. C. BHATTACHARYYA, *Tetrahedron Letters* 10, 1035 (1966).