2. I. N. Nazarov and A. V. Kamernitskii, ZhOKh, 25, 1345, 1955.

15 September 1967

Institute of the Chemistry of Plant Substances, AS UzSSR

UDC 547.972+547.982+547.992

POLYPHENOLS OF GERANIUM COLLINUM. II

T. K. Chumbalov and T. N. Bikbulatova

Khimiya Prirodnykh Soedinenii, Vol. 4, No. 1, pp. 67-68, 1968

We have studied the leaves of Geranium collinum Steph. (upland geranium) [1] collected at the beginning of July in the little Alma-Ata gorge of the Trans-Ili Ala-Tau. The freshly collected material was treated with methanol. The extract was concentrated under vacuum at 40-50° C, acidified with acetic acid to pH 3, and exhaustively treated first with petroleum ether and chloroform to eliminate the essential oils and resins, and then with ether to extract the polyphenols. Concentration of the ethereal extract yielded a precipitate with mp 350° C which proved, on the basis of its IR spectrum, elemental analysis, and qualitative reactions, to be ellagic acid [2]. The solution was subjected to partition in the ether—water system. The ethereal fraction was evaporated to dryness, and the residue was dissolved in methanol and chromatographed on Kapron. The first fractions, which contained two phenolic acids, were rechromatographed on Kapron in water and the following acids were isolated: gallic with mp 236-238° C, and 3-methoxygallic with mp 197-199° C. The identification of the latter was confirmed by qualitative reaction [3], elemental analysis, IR spectrum, and a determination of the equivalent.

On further chromatography of the ethereal extract, methanol eluted quercetin (mp 303-305° C), kaempferol (mp 278-280° C), and 3,7,8,4'-tetrahydroxyflavone (mp 310-315° C) [4]. The substances were identified from the results of alkaline fusion, a spectroscopic and chromatographic study of the anthocyanidin derivatives, and the UV spectra with ionizing and complex-forming additives. 3,7,8,4'-Tetrahydroxyflavone has λ_{max} 370, 268 mμ. The spectra with additives showed that it contained OH groups at C-3 and C-7 and ortho- and C-3, 4'-di-OH groupings [5] and lacked a C-5-OH [6]. The methylation of 3,7,8,4'-tetrahydroxyflavone with dimethyl sulfate gave the tetramethyl ether with mp 145-147° C. The identification was confirmed by the results of elemental analysis and by the IR spectrum.

REFERENCES

1. T. K. Chumbalov and T. N. Bikbulatova, Khimiya i khimicheskaya tekhnologiya, 5, 147, 1967.
2. F. Gstirner and K. H. Lisken, Arch. Pharm. 295/67, 11, 823, 1962.
3. Beilstein, Handbuch der organischen Chemie, 10, 472, 480, 1927.
4. J. W. Clark-Lewis and V. Nair, Austr. J. Chem., 17, 1164, 1964.
5. T. A. Geissman, The Chemistry of Flavonoid Compounds, Pergamon Press, New York, 107, 1962.
6. V. I. Litvinenko and N. P. Maksyutina, KhPS [Chemistry of Natural Compounds], 420, 1965.

2 February 1967

Kazakh State University

UDC 547.985 + 547.914

A CHEMICAL STUDY OF EUPHORBIA SERAWCHANICA

Z. N. Nazirov, Kh. A. Khamidova, and M. A. Azimov

Khimiya Prirodnykh Soedinenii, Vol. 4, No. 1, p. 68, 1968

The milky juice and hypogeal organs of some species of Euphorbia contain compounds specific for these plants (euphorbone, euphorbol, and biglandulinic and ferganic acids) [1-3].

We have studied Euphorbia serawchanica Rgl. [4]. A qualitative analysis showed the presence in it of glycosides, flavonoids, and coumarins.

The roots and epigeal part of E. serawchanica were steeped in 8% sulfuric acid and the acid extract was shaken with ether; the ethereal extract was evaporated to dryness. The residue was treated with ether and the ether-insoluble part was dissolved in acetone. The acetone solution was passed through a layer of alumina. This gave crystals with mp

228° C (from ether), R_f 0.69 in the 1-butanol–acetic acid–water (20:1:20) system, the spots being revealed with 4% alkali. Yield 0.05%, composition $C_9H_{12}O_5$. The IR spectrum in the region of the absorption of active hydrogen had a broad band (3000–3600 cm^{-1}) which can be assigned to hydroxy groups forming a strong hydrogen bond with other functional groups. Bands characteristic for a lactone group in conjugation with a double bond and an aromatic ring (Ar–C=C–C–O–) appeared at 1620 and 1690 cm^{-1}.

The substance was readily soluble in alkalis, giving a pink coloration. It is not reported in the literature.

Chromatography of the ethereal extract on alumina yielded 0.1% of a yellow crystalline substance with mp 236–237° C (from ether). The chemical study of these substances is proceeding.

REFERENCES

1. N. P. Kir'yalov, ZhOKh, 8, 740, 1938.
2. N. P. Kir'yalov, ZhOKh, 9, 163, 1941.
3. A. A. Fedorov and N. P. Kir'yalov, Rastitel'noe syr'e SSSR, 1, 1950.
4. Flora UzSSR, 4, 82, 93, 1959.

28 July 1967

Tashkent Pharmaceutical Institute

SECOND ALL-UNION CONFERENCE ON THE CHEMISTRY OF NUCLEOTIDES

N. I. Sokolova

Khimiya Prirodnykh Soedinenii, Vol. 4, No. 1, pp. 68–69, 1968

The Second All-Union Conference on the Chemistry of Nucleotides, set up on the initiative of Moscow State University, the Institute of the Chemistry of Natural Compounds, the Novosibirsk Institute of Organic Chemistry, the Siberian Division AS, and the Councils on the Problems of Molecular Biology and Bioorganic Chemistry was held at Moscow, 21–23 June 1967.

The Conference was attended by about 70 persons, representing the main scientific centers of the USSR. The object of the conference was the exchange of information on investigations being carried out in the Soviet Union on the chemistry of the nucleotides, the development of coordinated programs, and recommendations on the range of reagents required.

The conference took the form of short informative lectures which were followed by discussions on the subject concerned.

One of the main problems of the chemistry of nucleotides at the present stage is the development of convenient methods for obtaining oligonucleotides, since such synthetic models are now widely used in the study of complex biochemical processes.

In recent years, definite advances have been achieved in the chemical synthesis of the oligonucleotides in several Russian laboratories. For example, methods have been developed for obtaining ApUp, UpUp, UpAp, etc. (Institute of Macromolecular Compounds, Leningrad). Chemical methods for the synthesis of di- and trinucleotides have also been worked out at the Institute of Biological Physics (Pushchino-on-Oka) and at Moscow University.

However, all the lecturers stated that with an increase in the length of the nucleotide chain, even in the synthesis of trinucleotides, the yields of the products fell to 10–15%. Consequently, the search for convenient methods of condensation and of obtaining oligonucleotides with better yields continues to remain one of the most important problems in the chemistry of the nucleotides. In view of this, the participants in the conference showed great interest in reports on the enzymatic synthesis of the oligonucleotides. In the presence of pancreatic ribonuclease it has been possible to obtain the corresponding dinucleotides and dinucleoside phosphates from uridine and cytidine 2',3'-cyclophosphates with yields of 50–60% (Institute of Macromolecular Compounds, Leningrad). A number of di- and trinucleotides has been obtained with the aid of guanyl ribonuclease from actinomycetes (Institute of Molecular Biology, Moscow).

A short communication was heard on the synthesis of oligonucleotides on polymeric substrates (Moscow University). The high yields, the purity of the product, and the rate of the reaction all show that this method is very promising.

A principle of creating modifying agents containing an oligonucleotide grouping which ensures the direction of the action of the modifying groups is interesting (Novosibirsk Institute of Organic Chemistry).