

4-EPIASHANTIN FROM *Artemisia sieversiana*E. M. Suleimenov,<sup>1</sup> F. M. Smagulova,<sup>2</sup> R. B. Seidakhmetova,<sup>2</sup>  
R. M. Aksartov,<sup>2</sup> V. A. Raldugin,<sup>3</sup> and S. M. Adekenov<sup>2</sup>

UDC 547.972

*Artemisia sieversiana* Willd (Sievers wormwood) is a large weed that inhabits almost all of Kazakhstan [1]. Guaianolides [2, 3], the lignans sieversol and 5-methoxysesamin [3], coumarins [4], and the essential oil, for which the component composition has been determined [5], have been isolated from the extract of the aerial part.

An extensive investigation of the raw material after distillation of the essential oil from this wormwood is timely owing to current promising uses of its essential oil.

Essential oil was steam distilled as usual, after which raw material was extracted with hot EtOH. The extract was filtered. Solvent was vacuum distilled. The resulting resin was chromatographed over silica gel with elution by benzene:EtOAc (7:3). Colorless needles of 4-epiashantin (**1**) formed in the effluent, mp 120-122°C (lit. [6] mp 122-123°C), yield 0.009%.

The PMR spectrum (CDCl<sub>3</sub>) agreed with that published [6, 7]. Mass spectrum (*m/z*, I, %): 400 (100) [M]<sup>+</sup>, 369 (6) [M - CH<sub>3</sub>O]<sup>+</sup>, 265 (3), 250 (4), 224 (21), 222 (10), 207 (31), 203 (12), 197 (53), 181 (37), 176 (14), 169 (50), 161 (20), 154 (10), 149 (68), 135 (45), 131 (15), 121 (9), 117 (6), 110 (5), 107 (3), 103 (9), 95 (4), 93 (6), 91 (7), 79 (4), 77 (11), 65 (7), 55 (7), 28 (21).

High-resolution mass spectrum: C<sub>22</sub>H<sub>24</sub>O<sub>7</sub>.

According to its PMR spectrum and melting point, this compound was identified as the known lignan 4-epiashantin (**1**), which was found earlier in *A. fragrans* [8], *A. arborescens* [6], and *Achillea holoserica* [7].

Because of the availability of **1**, we investigated its antimicrobial activity toward the strains of gram-positive bacteria *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*, and the yeast *Candida albicans* by diffusion in wells with agar—agar.

The tests for biological activity were conducted as before [9].

The tests showed that **1** exhibited moderate antimicrobial activity toward the aforementioned microorganism strains (Table 1).

We also studied **1** for *in vitro* antitrichomonal activity. It was found to be inactive.

Starting material was collected in July 2004 in the vicinity of Karaganda.

TABLE 1. Antimicrobial Activity of **1**

Compound	<i>Staphylococcus aureus</i>	<i>Bacillus subtilis</i>	<i>Escherichia coli</i>	<i>Candida albicans</i>
4-Epiashantin	14±0.3	15±0.2	11±0.1	16±0.2
Gentamycin	26±0.1	24±0.1	23±0.2	-
Nystatin	-	-	-	22±0.1

1) L. N. Gumilev Eurasian University, Astana, Munaitpasova, 5, e-mail: syerlan75@yandex.ru; 2) AO NPT's Fitokhimiya, 100009, Karaganda, Gazalieva, 4, fax 8(3212) 43 37 73, e-mail: arglabin@phyto.kz; 3) N. N. Vorozhtsov Novosibirsk Institute of Organic Chemistry, Siberian Division, Russian Academy of Sciences, 630090, Novosibirsk, prosp. Akad. Lavrent'eva, 9, fax (3832) 34 47 52, e-mail: raldugin@nioch.nsc.ru. Translated from Khimiya Prirodnikh Soedinenii, No. 2, p. 192, March-April, 2007. Original article submitted October 9, 2006.

## REFERENCES

1. N. V. Pavlov, ed., *Flora of Kazakhstan* [in Russian], Vol. 9, Alma-Ata (1965), p. 76.
2. K. Ubaev, S. Z. Kasymov, and M. N. Mukhametzhanov, *Khim. Prir. Soedin.*, 624 (1982).
3. R. X. Tan, H. Q. Tang, J. Hu, and B. Shuau, *Phytochemistry*, **49**, 157 (1998).
4. E. N. Sal'nikova, N. F. Komissarenko, S. E. Dmitruk, and G. I. Kalinkina, *Khim. Prir. Soedin.*, 115 (1992).
5. E. M. Suleimenov, T. Ozek, B. Demirchi, G. A. Atazhanova, K. C. H. Baser, and S. M. Adekenov, *Current Problems in Creating Medicinal Preparations of Natural Origin* [in Russian], St. Petersburg, pp. 382-385.
6. H. Greger and O. Hofer, *Tetrahedron*, **36**, 3551 (1980).
7. A. A. Ahmed, A. A. Mahmoud, E. T. Ali, O. Tzakou, M. Couladis, T. J. Mabry, T. Gati, and G. Toth, *Phytochemistry*, **29**, 851 (2002).
8. F. Bohlmann, C. Zero, and U. Faas, *Chem. Ber.*, **106**, 2904 (1973).
9. S. M. Navashin and I. P. Fomina, *Rational Antibiotic Therapy: Handbook* [in Russian], Meditsina, Moscow (1982).