

## Chlorine-Containing Guainolides from *Rhaponticum serratuloides*

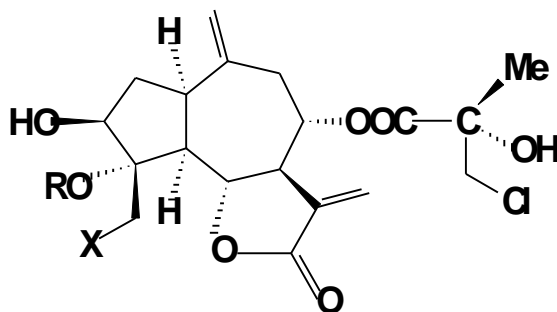
Alexander G. Berdin<sup>a</sup>, Victor A. Raldugin<sup>b</sup>, Makhmut M. Shakirov<sup>b</sup>, Arman T. Kulyjasov<sup>a</sup>,  
and Sergazy M. Adekenov<sup>a</sup>

<sup>a</sup>*Institute of Phytochemistry MS-AS Republic of Kazakhstan,  
470032 Karaganda, Erdzanova av., postbox 19. Fax: +7 (321 2) 51 1023.*

<sup>b</sup>*Novosibirsk Institute of Organic Chemistry, Siberian Branch of the Russian Academy of Sciences,  
9 prosp. Acad. Lavrent'eva, 630090 Novosibirsk, Russian Federation. Fax: +7 (383 2) 34 4752. E-mail: [raldugin@nioch.nsc.ru](mailto:raldugin@nioch.nsc.ru)*

As a part of studies on the occurrence of sesquiterpene lactones in species of the *Cynareae* tribe of the *Compositae* family, a widespread in Kazakstan and Russia plant *Rhaponticum serratuloides* (Georgi) Bobr. have been studied. The only sesquiterpene lactone cynaropicrin have been previously detected by TLC as a major component of «lactone fraction».

Now we report the isolation a series of chlorine-containing guaianolides from the ethanol extract of aerial parts of the plant by column chromatography on silica gel. In addition to known lactones acroptilin (1) and centaurepensine (2), a new guaianolide (3) named rhapsoserin have been isolated. The structure of (3) have been elucidated by NMR-data, including 2D <sup>1</sup>H-<sup>1</sup>H COSY, 2D <sup>1</sup>H-<sup>13</sup>C COSY and 2D long range <sup>1</sup>H-<sup>13</sup>C-COSY (COLOC) experiments. The NMR spectra of (1) and (2) (recorded in Py-D<sub>5</sub>) are interpreted in a first time with employing the same methods.



- (1). R + X = ordinary bond
- (2). R = H, X = Cl
- (3). R = H, X = OAc

Chlorine-containing guaianolides as it well known possess the strong antifeedant activity against main pests in the grain storages and antitumor activity also.