

ALLELOPATHIC ACTIVITY OF
HALIMIONE VERRUCIFERA (M. BIEB.) AELLEN

Ganusyak A. P., Simagina N. O.

V. I. Vernadsky Crimean Federal University, Simferopol, Crimea, Russia
E-mail: golden-1392@mail.ru

The formation and existence of plant communities are based on interspecific interactions, one of the forms of which is allelopathy. Allelopathy is a cycle of physiologically active substances in phytocenosis, which play the role of regulator of internal and external relationships. Allelopathic activity of a particular species is determined by a certain set of different nature chemicals. It is known that the allelopathic activity of many plants is quite high. In the process of growth and development they release biological inhibitors through the root system into the soil, which can substantially inhibit neighboring plants. This work is devoted to the study of the allelopathic effect of water-soluble extracts from the aqueous extract of *Halimione verrucifera* (M. Bieb.) Aellen on the *Suaeda prostrata* Pall. test object. The high inhibitory activity of the aquatic extract of *H. verrucifera* on germination of seeds and the initial growth of seedlings of test objects was revealed.

The laboratory experiment was performed to determine the effect of water extracts *H. verrucifera*, in concentrations of 1 %, 5 %, 10 % and moistened with distilled water (control) for laboratory germination of *S. prostrata* seeds. The seeds of the test object germinated in Petri dishes, at a temperature of 23°C in an amount of 10 seeds by moistened with aqueous extracts.

In the majority cases, the seed germination of *S. prostrata* has decreased in comparison with the control. Under the action of the was extract *H. verrucifera*: 72 % (1 % concentration), 68 % (5 % concentration) and 52 % (10 % concentration), respectively at 90 % in the control. Germination of *S. prostrata* seeds at the concentration of 1 % is close to the control value. Complete suppression of germination was revealed in variants with the extract of 10 % extracts concentration from the leaves. Number of germinated seeds *S. prostrata* at the influence of 10 % concentration of *H. verrucifera* extracts is an average 42 % less than in the control. Seedling of the test object under the action of 10 % concentration extract from the roots reached length $2,4 \pm 0,1$ cm, under the action of the extract from the inflorescences – $1,4 \pm 0,1$ cm, and the stems – $3,6 \pm 0,2$ cm. The highest lengths of seedlings of the test object at a high concentration (10 %) were noted when exposed to water extracts from the stems.

As a result of the action of the aqueous *H. verrucifera* extract (1 % concentration) from leaves and stems, the stimulating effect on the length of the seedlings were observed. The length of seedlings in this case was $4,9 \pm 0,2$ cm in the control, and under the action of aqueous leaves extract $5,0 \pm 0,3$ cm, the effect on the length of seedlings moistened with the extract from the stems was $5,3 \pm 0,2$ cm, in the control $5,2 \pm 0,1$ cm.

As a result of the study, it can be concluded that aquatic extracts from aboveground and underground parts of *H. verrucifera* had inhibitory and stimulating effect on germination and growth of seedlings *S. prostrata*.

Keywords: allelopathy, *Halimione verrucifera* (M. Bieb.), *Suaeda prostrata* Pall.

References

1. Grodzinsky A.M., *Allelopathy of plants and soil fatigue*, 430 (Naukova Dumka, Kiev, 1991).
2. Simagina N.O., *Allelopathic interactions in the Halophyte communities of the Crimea*, Scientific notes of Taurida National V.I. Vernadsky University. Series: Biology, Chemistry, **14**, 1, 203 (2001).
3. Kotov S. F. *Analysis of interspecific interactions in community association Halimionetum (pedunculatae) salicorniosum*, Scientific notes of Taurida National V. I. Vernadsky University. Series: Biology, Chemistry, **17** (56), 1, 137 (2004).
4. Kotov S. F., Simagina N. O. *The influence of perennial plants on annual succulent species in halophyte vegetation communities in the Crimea*, Scientific notes of Taurida National V. I. Vernadsky University. Series: Biology, Chemistry, **18** (57), 2, 50 (2005).
5. Kotov S. F., Zhaldak S. N. and Simagina N. O., *The Influence of humidity, salinity, competition, and of interactions between plants on the vitality and growth Suaeda in halophytic communities of the Crimea*, Scientific notes of Taurida National V.I. Vernadsky University. Series: Biology, Chemistry, **19** (58), 1, 57 (2006).
6. Shamsutdinov N. Z., Shamsutdinov Z. S., *World plant resources of halophytes and problems of their multipurpose use in agriculture*, Agricultural Biology. A series of plant biology, **1**, 3 (1998).
7. Ivanov V. P. *Plant extracts and their significance in the life of phytocenoses*, 293 (Science, Moscow, 1973).
8. Lakin G. F., *Biometrics*, 293 (Higher School, Moscow, 1990).
9. Grodzinsky A. M., Bogdan G. P., Golovko E. A., *Experimental allelopathy*, 226 (Naukova Dumka, Kiev, 1987).