

PUBLICATIONS

EFFECT OF PRE-SOWING SEED TREATMENT WITH *Halimodendron halodendron* LIPIDS ON THE FATTY ACID COMPOSITION OF SOYBEAN (*Glycine max* (L.) MERR.) SEED OIL

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Global water scarcity and increasing soil salinization have intensified interest in halophytes as valuable biological resources. Owing to their unique adaptive mechanisms, halophytes represent a promising source of biologically active compounds that may enhance crop tolerance to abiotic stress. Among these compounds, membrane lipids play a crucial role in stress adaptation by maintaining membrane integrity and participating in lipid-mediated signaling pathways.

In our previous studies, the biological activity of lipids isolated from seeds of halophytic plant species native to Uzbekistan was investigated for the first time. Seed treatment with lipid fractions from selected halophytes was found to alleviate the inhibitory effects of sodium chloride stress on cultivated plants.

The aim of the present study was to evaluate the effect of pre-sowing seed treatment with lipids isolated from *Halimodendron halodendron* seeds on the fatty acid composition of soybean (*Glycine max* (L.) Merr.) seed oil.

Soybean plants (cv. Hosildor) were cultivated at the experimental field of the Institute of Cereals and Leguminous Crops, Andijan Region, Uzbekistan. Seeds treated with lipid fractions were sown on April 26, 2025, and harvested on October 15, 2025. Seed oil content was determined by exhaustive petroleum ether extraction, while fatty acid composition was analyzed using an Agilent 6890N gas chromatograph equipped with a flame ionization detector and an HP-5 capillary column.

Pre-sowing treatment with total lipids isolated from *H. halodendron* seeds increased seed oil content to 22.95%, which was 1.0% higher than that of the untreated control. The treatment also improved the fatty acid composition of soybean seed oil. The proportion of saturated fatty acids decreased from 17.86% to 17.07%, whereas the total content of unsaturated fatty acids increased from 82.14% to 82.93%. In particular, linoleic acid (18:2) increased from 53.97% to 56.08%, while α -linolenic acid (18:3) increased from 5.55% to 5.74%.

These findings demonstrate that pre-sowing seed treatment with lipids derived from *H. halodendron* improves both the oil content and fatty acid composition of soybean seeds, thereby enhancing their nutritional quality and agricultural value.

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