

Effect of Lead and Salicylic Acid on Some Plant Growth Parameters in *Pisum sativum* L.

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Abstract: Lead is a ubiquitous pollutant in the environment widely distributed in soil and waters. Lead-polluted soils may be the major reason for reduction of agricultural products. Therefore, search of compounds with antitoxic properties seems a very actual task. This study was performed to investigate the possible antitoxic effect of salicylic acid using plants of pea (*Pisum sativum* L.) as experimental objects. It was detected that salicylic acid displayed selective action on plant growth parameters in pea. The possible explanations for the observed phenomena were presented.

Key words: Pea • Lead • Toxicity • Salicylic acid • Growth • Plants

INTRODUCTION

Lead is a ubiquitous pollutant in the environment widely distributed in soil and waters [1-3]. In plants, the toxicant may provoke growth alterations like production reduction, yellowing of leaves and disturbing photosynthesis [4]. Besides, it may present serious problems for human health [5]. Many methods of environmental monitoring of lead pollution were suggested [6] and a lot of approaches for lead detoxication were discussed [7, 8]. Among other detoxicants, salicylic acid was stated as potential agent in regulation of plant stress response [9-12]. Moreover, this compound was showed to be able to alleviate cadmium toxicity in plants [13]. Thus, the aim of the present study was to investigate lead action on some plant growth characteristics of *Pisum sativum* and the potential antitoxic effects of salicylic acid that was chosen as antitoxicant to lead.

MATERIALS AND METHODS

Agricultural property (55°47' N, 49°10' E) was provided by Ecological-Biological Center of Kazan, Republic of Tatarstan, Russia. The land plot had loamy soil and was open to sun. Pea seeds (*Pisum sativum*, breed Venetz) was provided by Tatar Scientific Research Institute of Agriculture, Russian Academy of Agricultural Sciences. In the control variant, plants were not treated. There were 3 experimental variants – with lead acetate (Pb(CH₃COO)₂- 0.25 mg/L, lead acetate plus salicylic acid (C₆H₄(OH)COOH) 10(-4)M and with salicylic acid alone. All variants received the same amount of irrigation. During 5 weeks, the following parameters were monitored -plant height, a number of tendrils, a number of leaves, leaf length and leaf width. For each variant, 50 individual plants were analyzed. Experimental data were presented as mean ± standard error.

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