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Abstract

Phytotoxicity of *Clematis vitalba* L. (Ranunculaceae) Aqueous Extract and Nanostructured Mixture †

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Known in traditional medicine as a good source for the treatment of various diseases, *C. vitalba* L. is also quoted in the dictionary of toxic plants. In this study, the phytotoxic activity of the aqueous extract of *Clematis vitalba* L. and its nanostructure mixture, were evaluated in terms of the impact on the growth of the roots and stem of dicotyledonous *Pisum sativum* L. The overground parts of *C. vitalba* were dried at room temperature and finely ground, then kept in distilled water at 100 °C in a water bath for 15 min, and then for 24 h at room temperature. AgNPs were biosynthesized as described by Sutan et al. [1]. The seeds of *P. sativum* were hydrated in distilled water for an hour and a half, and transferred in the *C. vitalba* extracts with (CAg) and without (C) AgNPs for one hour. Distilled water was used as a negative control (M). The seeds were kept in the dark and watered periodically. After 4 days, the length of the root and stem were measured with graph paper and the fresh and dry biomass were determined [2]. The growth of the root and stem of the dicotyledonate was stimulated by the *Clematis* extract, compared to the control, while the presence of AgNPs in the extract had an opposite effect. The growth inhibition was significant for both root and stem. The biomass was less affected by extract *C. vitalba* prior to and after AgNP biosynthesis. *C. vitalba* extracts, prior to and after AgNP synthesis, showed significant antithetical effects on the growth of *P. sativum* (Figure 1). AgNPs induced a significant reduction in root and stem length.

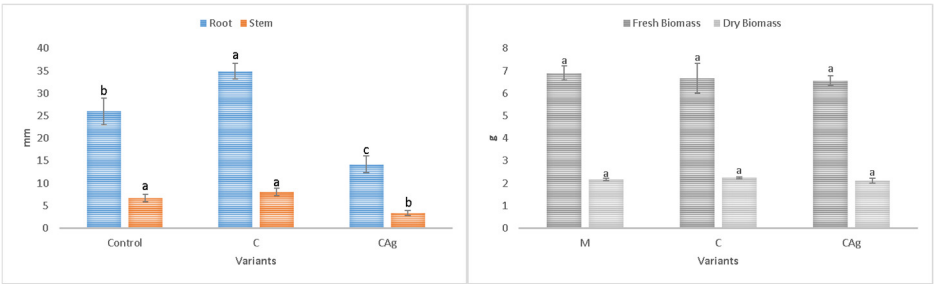

Figure 1. The influence of extracts from aerial parts of *C. vitalba*, prior to and after AgNP biosynthesis on the root and stem length (**left**), and fresh and dry biomass (**right**) of *P. sativum* (a, b, c: interpretation of significance of the differences by means of the Duncan test, $p < 0.05$).

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