

developed by *Fusarium* spp. strains to such treatments, new strategies for *Fusarium* control need to be developed. In this respect, the antifungal properties of various microorganisms are of great interest.

The aim of our work was to characterize several bacterial antagonists for *F. graminearum* and *F. culmorum*, isolated from natural sources. The antifungal action was evaluated both by dual confrontation assay and in pots, in climatic chamber conditions. Two out of the bacterial strains used in experiments showed significant inhibitory activities against target fungi. The antagonistic action could be due to various mechanisms, including hydrolytic enzymes and biosurfactant production, as it was determined by molecular analysis. The molecular techniques used in experiments allowed the identification of the selected bacterial strains as *Bacillus amyloliquefaciens*. The results show the potential use of the presented bacterial strains as biocontrol agents and as biostimulants for wheat plantlets.

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Biological control of invasive species *Metcalfa pruinosa* Say (Insecta: Hemiptera: Flatidae) in ornamentals plants by using *Coccinellids*



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Metcalfa pruinosa (Insecta: Hemiptera: Flatidae), known as planthopper, is considered an invasive species in Europe. In the place of origin (North America) does not causes serious damage, but in Europe, where the insect has no natural enemies, causes considerable damages quantitative and qualitative (most often aesthetically). The pest is a real problem in urban areas especially for gardens, parks and green spaces. So, serious measures should be taken in its control. Considering the deployment environment, in towns and localities inhabited by people, choosing a non-polluting alternative to chemicals, is absolutely necessary. Biological control using natural enemies is considered environmentally benign tool for pest management with costs effective. In the present study, have been tested several predator species of ladybugs (Coleoptera:Coccinellidae) such as *Coccinella septempunctata* L., *Propylea quatordecimpunctata* L., *Adalia bipunctata* L., *Harmonia axyridis* Pallas and *Psyllobora vigintiduo-punctata* L., considered as common species in western part of Romania. In their choice we took into account indigenous or non indigenous aspects, too. Observations were conducted in field conditions on follow host plants of planthopper: *Hibiscus syriacus*, *Rosa* sp., *Philadelphus* sp. and *Ligustrum vulgare*. The plants were placed in special growth cages. In our study, *Harmonia axyridis* and *Coccinella septempunctata* were the most successful predators, being able to consume between 4.33 and 6.17 larvae of planthoppers per each day. Other predatory species tested showed no significant results (0.05–0.25 larvae/day).

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Aspects regarding calla lily behavior (*Zantedeschia* cv. "Cameo") in different culture systems



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The popularity of Calla Lily increased in last years on international flower market due to distinct inflorescence, the large variety of colors and the usability as a cut flower or pot plant, as well as garden decoration. This paper contains the results of the research conducted for determining the possibility of Calla cultivation (*Zantedeschia* cv."Cameo"), both in protected areas (greenhouse) or outdoors, in Iasi, Romania environment. Tubers were used, having approximately 40–60 g in weight and 15–18 cm in circumference. They were planted in 2014 in three different culture systems: in the greenhouse soil, in pots (greenhouse) and in the field (outdoor). Before planting, the underground organs were soaked for 30 min in a GA3 solution, with a concentration of 250 ppm. Regardless of the culture system, treatment with gibberellic acid delayed the beginning of the vegetation by 4–8 days and caused earlier flowering to the plants that were cultivated outdoor (6 days). Gibberellic acid had the effect of reducing the number of leaves from all three variants, but caused an increase in plant height, including the length of floriferous stems, making them suitable for usage as cut flowers in bouquets. Also, the treatment had a positive influence on floriferous stem's length, in all three culture systems. Concerning the number of flowers, there is an upward trend in the variant treated with gibberellins to control meaning that the largest production was seen in greenhouse soil culture, with an average of 2.4 flowers/plant.

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Population polymorphism *Cistanche deserticola* of Kazakhstan in connection with the development of biotechnological methods of raw material processing



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Flora of Kazakhstan is rich in species with high concentration of biologically active substances. Such valuable plant as *Cistanche deserticola* (CD) currently is popular among consumers, pharmaceutical companies and potential inventors. One of the major supplier countries of the plant in the world is Kazakhstan, although there is no internal production and consumption in the country itself. Initially in our research we studied morphological and biochemical features of different populations of plant. It is important for propagation and gathering raw material.

The study looked into the features of the life cycle, anatomical structure of root, peduncle, stolone and nodule. It was shown that Kazakhstani CD as mentioned in Flora of Kazakhstan is not an annual plant. This is perennial plant. The main methods of propagation are seeds. However, common vegetative type of propagation by the buds, which appear in the points of attachment of haustoria of CD to the roots of saksaul. With help of GCMS the main phys-