

# Beneficial Microbes: Food, Pharma, Aqua & Beverages Industry

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## Bacterial endophytes of grapevine (*Vitis vinifera* L.) as beneficial partners for the effective plant-microbial systems

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The strategy of symbiotic (cooperative) adaptations is at least as common, if not more common, in the living nature as that of individual (autobiotic) adaptations. However, few plants have been studied in respect of their interaction with endophytic microorganisms. Endophytic bacteria are present in all tissues and organs of grapevine but their numbers increase from shoots to roots. *B. pumilus* and *B. cereus* have been found both in flowers and in other parts of grapevine plants. During our study the culturable strains of bacteria inhabiting the endosphere of grapevine cuttings of four cultivars have been isolated and their physiological and beneficial properties were identified and characterized. Colonization process and localization sites of introduced dsRed-labeled strain in the endosphere of grapevine have been studied using confocal scanning laser microscopy. The taxonomic diversity of microorganisms isolated from the inner tissues of grapevine (four cultivars) was identified based on the analysis of the 16S rRNA gene fragments. A characteristic feature of bacterial populations of grapevine of different cultivars and different geographical origin was the presence of bacteria belonging to the genus *Bacillus*. As a result of transformation of several promising strains of endophytic bacteria, DsRED+phenotypes were obtained. Their introduction into the vegetative parts of grapevine plants made it possible to reveal its endophytic localization of DsRED labeled pseudomonads in the vascular tissue of the plants. Endophytic bacteria were localized in pitted vessels of grapevine shoots, single cells or in small groups. The strain was mobile and could move and circulate in the vessels. So, isolated endophytic bacterial strains show biocontrol and phytostimulating activity and may colonize internal tissues of grapevine. The inoculation of grapevine cuttings with these strains before rooting may provide the plants with endophytic PGP microorganisms.

### Biography

Vladimir Kuzmich Chebotar has completed his PhD from All-Russia Research Institute for Agricultural Microbiology. He is presently a Senior Researcher and Head of the Lab of Microbial Technology, All-Russia Research Institute for Agricultural Microbiology. He has published more than 45 papers in reputed journals, 5 monographs and has been serving as Reviewer in a few international journals.

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