Diversity of PHB-producing bacteria associated with crop plants

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Among terrestrial ecosystems, plant-associated habitats represent microenvironments with high microbial activity. Especially in the rhizosphere, according to root exudation, plants are densely colonised by specific bacterial and fungal communities. Along with the growth of the roots, the biotic and abiotic conditions dynamically change. Indigenous microorganisms must be adapted to the changing conditions of their environment and to fluctuations in the concentration of nutrients exuded by plant roots. Bacteria are known to produce Polyhydroxybutyrate (PHB) as a storage substance to resist detrimental periods. In the present study, rhizosphere-associated bacteria from oilseed rape, wheat and sugar beet were tested on their ability to produce PHBs by applying a multiphasic approach. By the cultivation-dependent approach, bacterial isolates originated from different plants were screened on their ability to form PHBs *in vitro* as well as on the presence of PHB synthase genes using polymerase chain reaction (PCR). To get an overview about the diversity of PHB-producing bacteria, total DNA extracts from rhizosphere samples were analysed for the occurrence of the PHB synthesis gene *phaC* by Single Strand Conformation Polymorphism analysis (SSCP). SSCP profiles of *phaC* revealed a high specificity for each plant species. Comparing the results obtained by single colony PCR, sugar beet was found to be associated with a higher number (90%) of PHB-producing bacteria than oilseed rape (32%) and wheat (31%).