

In situ Biodegradation of Endosulfan, Imidacloprid, and Carbendazim Using Indigenous Bacterial Cultures of Agriculture Fields of Uttarakhand, India

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Abstract : In the present study, the presence of endosulfan, imidacloprid, carbendazim, in the soil /vegetables/cereals and water samples was observed in agriculture fields of Uttarakhand. In view of biodegradation of these pesticides, nine bacterial isolates were recovered from the soil samples of the fields which tolerated endosulfan, imidacloprid, carbendazim from 100 to 200 µg/ml. Three bacterial consortia used for in vitro bioremediation experiments were three bacterial isolates for carbendazim, imidacloprid and endosulfan, respectively. Maximum degradation (87 and 83%) of α and β endosulfan respectively was observed in soil slurry by consortium. Degradation of Imidacloprid and carbendazim under similar conditions was 88.4 and 77.5% respectively. FT-IR analysis of biodegraded samples of pesticides in liquid media showed stretching of various bonds. GC-MS of biodegraded endosulfan sample in soil slurry showed the presence of non-toxic intermediates. A pot trial with Bacterial treatments lowered down the uptake of pesticides in onion plants.

Keywords : biodegradation, carbendazim, consortium, endosulfan

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