

Biodegradation of plasticizers by Antarctic soil bacteria

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In recent years, the release of plastics into the environment has increased, and with it, environmental pollution from plasticizers has become more serious. Plasticizers are additives necessary for molding plastics and are easily leachable. DEHP is one of the most widely used plasticizers, but it has been reported to cause carcinogenicity and reproductive dysfunction, and its removal from the environment is required¹. Bioremediation, which utilizes the degrading ability of bacteria, is effective in removing DEHP from the environment. Bioremediation has the advantages of low environmental impact and low cost, but also has disadvantages such as high levels of contamination and dependence on environmental conditions. This study aims to analyze the properties of DEHP-degrading bacteria obtained from Antarctic soil and apply them to bioremediation.

One of the three bacteria obtained in the screening from the Antarctic soil-derived flora was designated as strain HP5, and was tested for properties such as optimum temperature and salt tolerance, degradation using HPLC, substrate diversity using DMP, DBP, and BBP, and esterase and dihydrogenase activities.

The strain HP5, which is *Rhodococcus*, possesses very good salt tolerance and can grow in marine environments. Degradation tests showed that strain HP5 degraded 25.2% of DEHP in the culture medium on day 3 and 33.9% on day 15. It was also found that the strain HP5 strain preferentially utilizes and proliferates long-chain PAEs such as BBP and DEHP, rather than short-chain PAEs such as DMP and DBP.

References

1) Naling Bai, Shuangxi Li, Juanqin Zhang, Hanlin Zhang, Haiyun Zhang, Xianqing Zheng, Weiguang Lv, Efficient biodegradation of DEHP by CM9 consortium and shifts in the bacterial community structure during bioremediation of contaminated soil, Environmental Pollution, Volume 266 Part2, 2020.