PA-69

Microbial Cell Chromatography (MCC) as a new concept for concentration of specific microbial cell from environmental communities

Yu-ji Kaneko[1], Yoshi-teru Aoi[2], Satoshi Tsuneda[1]
[1]Department of Life Science and Medical Bio-Science, Waseda University , [2]Waseda Institute for Advanced Study, Waseda University

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A simple separation technique for concentration and purification of specific microorganisms from microbial consortia increases an efficiency of isolation and cultivation of target uncultured microorganisms. We investigated the potential of Microbial Cell Chromatography (MCC) which enables chromatographic separation of target microorganisms from a mixture of various types of microbial cells without losing their viability, based on differences in surface physicochemical properties, especially surface electric properties. Several typical pure cultured samples, a mixture of two different types of cells were used as model samples and a known uncultured microbial sample such as PAOs (Polyphosphate Accumulating Organisms) was selected as an environmental sample. First, microbial cell suspension was applied into a column packed with glass beads as a carrier material. Second, elution was performed with a linear pH gradient. Finally, fractions were collected and target cell concentration was assayed by FISH analysis. As a result, each typical pure culture cell showed a different chromatograph, which indicates that each cell type can be separated from a mixture of several cell types. In fact, the mixture of model target was clearly separated. In the environmental sample, the uncultured target was successfully concentrated into twice to five times. Because environmental microorganisms would show variety of surface structure among cell types, these results indicate that MCC is a powerful tool for microbial research and applications.
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y.kaneko.6@toki.waseda.jp

PA-70

広島北部の冷温帯林における変形菌類

原紺勇一[1]，　大賀祥治[2]
[1]九大生物資源環境科, [2]九州大学農院

冷温帯（夏緑樹）林における変形菌類の調査は、ヨーロッパなどの高緯度地域で行われている。しかし、中緯度で定点を設けて複数年に渡って行われた調査はほとんどなされていない。そこで、広島県北西部に位置する恐羅漢山北西斜面（広島県山県郡安芸太田町、N34° 36'13"、E132° 7'14"）のブナ林にて、腐朽木上に発生する変形菌類の発生を調査した。調査は、現地が雪に閉ざされる期間を除いた5月から11月に行った。調査の結果、455コロニー、29種（品種変種を含む）を確認することができた。これらについて、発生の季節性や、発生基物の状態に対する嗜好性を検討した。その結果、いくつかの種で季節性や状態に対する嗜好性が確認されたので報告する。