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Cloning and characterization of polyhydroxyalkanoate (PHA) genes from *Pseudomonas* sp. isolated from Antarctica

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Polyhydroxyalkanoic acids (PHA) are synthesized by a wide variety of bacteria and are deposited in the cytoplasm as insoluble inclusions. Bacteria from seawater of Antarctica were isolated and tested for the PHA production. One of the isolates was tested for growth condition and 16S rDNA characterization. This bacterium survived in a wide range of temperature from 4°C to 30°C but not at 37°C. This strain is capable of producing poly(3-hydroxyalkanoates) (PHAs) as intracellular storage material. Preliminary rDNA sequencing data suggested it to be a member of the pseudomonad family. PHA synthase, the key enzyme for PHA biosynthesis, had been characterized in much detail. By using PCR primers designed to amplify *phaC* genes from pseudomonads, a fragment of the PHA synthase gene was amplified, cloned and sequenced. The DNA sequence of the cloned fragment revealed high identity to *Pseudomonas oleovorans phaC2* gene. A genomic lambda library of this bacterium was constructed and screened using the amplified *phaC* fragment. One of the positively hybridizing plaques was chosen for further analysis. Two positively hybridized DNA fragments from its insert were cloned into pGEM-T vector. One of the fragments, 1.6 kb in size, contained a putative truncated *phaC*1 and a putative truncated *phaZ* gene. The other fragment (4 kb in size) possessed four putative genes, namely, *phaC*2, *phaD*, *phaF* and *phaI* genes.