**Isolation and Characterization of a Theta-Type Cryptic Plasmid from *Bifidobacterium longum* FI10564**

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A number of bifidobacterial species of human origin were screened for the presence of cryptic plasmids. One strain *Bifidobacterium longum* FI10564 harboured plasmids of approximately 2.2 kb, 3.6 kb, and 4.9 kb in size. The smallest plasmid, pFI2576 (2197 bp), was studied in detail and its complete nucleotide sequence was determined. Computer-assisted analysis of this novel plasmid (G+C content 62%) identified 9 putative open reading frames (orfs), 3 of which were shown to be significant. These putative genes are arranged in an operon-like structure, in which the overlapping orfs 1 and 2 encode putative Rep proteins and are highly homologous to the *rep* genes of the *B. longum* plasmid pMB1 (1847 bp). The mechanism of replication of pFI2576 was investigated using southern blot analysis of whole cell lysates, with and without S1 nuclease treatment, and atomic force microscopy (AFM). The results indicate that pFI2576 is likely to use the theta mode of replication.

**Keywords:** Cryptic plasmid, *Bifidobacterium longum*, theta replication