Genetics and Molecular Research

Antimicrobial and antitumor activity and diversity of endophytic fungi from traditional Chinese medicinal plant *Cephalotaxus hainanensis* Li

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Genet. Mol. Res. 15 (2): gmr.15028633
Received March 23, 2016
Accepted April 11, 2016
Published May 13, 2016
DOI http://dx.doi.org/10.4238/gmr.15028633

ABSTRACT. Endophytes from *Cephalotaxus hainanensis* Li, an important source of anti-leukemia drugs, have not been widely explored. In this study, 265 endophytic fungal isolates from *C. hainanensis* Li were screened for antimicrobial activities against tilapia, banana, rice, and rape and for antitumor activities against human leukemia cell lines (K562, NB4, and HL-60). Diversity was also analyzed. The results showed that 17.7% of the endophytic fungi had antimicrobial activities against at least three different test microbes, and activity against *Fusarium oxysporum* RKY102 was the highest at 15.8%. Cytotoxicity against at least one tumor cell line tested was observed in 18.5% of the endophytic fungi; with the highest value of 10.6% against K562. The endophytic fungal strains also showed relatively high activities against K562, NB4, and HL-60 while relatively fewer strains were cytotoxic against the human hepatic Hep-G2 and colon LoVo cancer cell lines.

Thirty endophytic fungal strains showed both high antimicrobial and antitumor activities. Moreover, the analyses of the diversity of the 30 highly active strains showed they belonged to 20 species from 14 genera, and this is the first report of endophytic fungi *Albonectria rigidiuscula*, *Colletotrichum magnisporum*, and *Nemania diffusa* being isolated from *Cephalotaxus* plants. These findings suggest that natural antibacterial products for humans and tilapia; antifungal compounds for rice, rape, and banana; and antitumor compounds for leukemia therapy could be isolated from fungal strains derived from *C. hainanensis* Li.

Key words: *Cephalotaxus hainanensis* Li; Endophytic fungi; Diversity; Antimicrobial activity; Cytotoxic activity

