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RNAi delivery by feeding in the pinewood nematode *Bursaphelenchus xylophilus*

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RNA interference (RNAi) is a valuable tool for studying gene function *in vivo* and provides a functional genomics platform in a wide variety of organisms. The pinewood nematode, *Bursaphelenchus xylophilus*, is a prominent invasive plant-parasitic nematode and has become a serious worldwide threat to forest ecosystems. Currently, we constructed an effective silencing vector, pDH-RH, which contains a transcriptional unit for a hairpin loop structure. Utilizing this vector, double-stranded (ds) RNAs with sequences homologous to the target genes can be expressed in a transformed filamentous fungus *via Agrobacterium tumefaciens* mediated transformation technology and can subsequently induce the knockdown of target gene mRNA expression in *B. xylophilus* by allowing the nematode to feed on the fungal transformants. Dumpy related genes were used as targets to detect RNAi efficiency. By allowing the nematode to feed on target gene transformed *Fusarium oxysporum* strains, target transcripts were knocked down significantly compared with those feeding on the wild type strain as determined by real-time quantitative PCR (RT-qPCR). Morphological RNAi phenotypes were observed, displaying obviously reduced body length; weak dumpy or small (short and thin) body size or general abnormalities. Moreover, compensatory regulation and non specific silencing of *dpy* genes were found in *B. xylophilus*. Our results indicate that RNAi delivery by feeding in *B. xylophilus* is a successful technique. This platform may provide a new opportunity for undertaking RNAi-based, genome wide gene functional studies *in vitro* in *B. xylophilus*. This platform may also be applicable to other parasitic nematodes that have a facultative, fungivorous habit.

Biography

Xinyue Cheng has obtained her PhD degree in the Chinese Academy of Sciences in 1998 and presently she is working as a Professor at Beijing Normal University. Her current researches focus on biology, ecology and molecular biology of invasive species, mainly plant parasitic nematodes and insects.

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