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## ***Heterodera fengi* n. sp. (Nematoda: Heteroderinae) from bamboo in Guangdong Province, China—a new cyst nematode in the *Cyperi* group**

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### **Abstract**

*Heterodera fengi* n. sp. is described and illustrated from bamboo (*Phyllostachys pubescens* Mazel) based on morphology and molecular analyses of rRNA LSU D2D3 region and ITS. This new species belongs to the *Cyperi* group. Cysts are characterized by prominent vulval cone with ambifenestrated, bifurcate underbridge that is thicker in middle and a 47.0 (40.0–60.0) µm long vulval slit, but without bullae. The second-stage juveniles are characterized by a 23.2 (22.0–24.0) µm long stylet with slightly projected or anteriorly flattened knobs, three incisures in lateral field, a 70.2 (62.5–77.0) µm long tail with bluntly rounded terminus and hyaline portion *ca* 58.9 (50.0–62.5)% of the tail length. Males are characterized by a 25.1 (24.5–26.3) µm long stylet with rounded knobs sloping posteriorly, four incisures in lateral field, a 29.8 (27.5–31.3) µm long spicule with bifurcate tip. Phylogenetic analysis shows that the species has unique D2D3 and ITS rRNA sequences and RFLP-ITS-rRNA profiles. *Heterodera fengi* n. sp. is closest to *H. elachista* in dendrograms inferred from both DNA sequences.

**Key words:** cyst nematode, new species, morphology, RFLP-ITS-rRNA, *Phyllostachys pubescens*, phylogeny

### **Introduction**

*Heterodera*, a cyst-forming nematode genus with great economic significance worldwide, currently encompasses about 80 species (Subbotin *et al.*, 2010a). In China, *Heterodera* species are mainly found on some field crops, such as *H. avenae* Wollenweber, 1924 (Nicol & Rivoal, 2008; Peng *et al.*, 2009) and *H. filipjevi* (Madzhidov, 1981) Stelter, 1984 on wheat (Peng *et al.*, 2010), *H. glycines* Ichinohe, 1952 on soybean (Feng, 2001; Wrather & Koening, 2006), *H. oryzaicola* Rao & Jayaprakash, 1978 and *H. elachista* Ohshima, 1974 on rice (Li *et al.*, 1985; Ding *et al.*, 2012). In addition to these five species, four other *Heterodera* species from economically important crops have been reported in China, including: *H. sinensis* Chen & Zheng, 1994 on cogon grass (Chen & Zheng, 1994), *H. koreana* (Vovlas, Lamberti & Choo, 1992) Mundo-Ocampo, Troccoli, Subbotin, Cid, Baldwin & Inserra, 2008 and *H. hainanensis* Zhuo, Wang, Ye, Peng & Liao, 2013 on bamboo (Wang *et al.*, 2012b; Zhuo *et al.*, 2013), and *H. ripae* Subbotin, Sturhan, Rumpfenhorst & Moens, 2003 on nettle (Wang *et al.*, 2012a). In the past three years, a *Heterodera* species has been frequently recovered from bamboo (*Phyllostachys pubescens* Mazel) in Guangzhou, a city in Guangdong Province in the subtropics. Comparative morphological, morphometric and molecular studies of the nematode revealed that it differed from all other nominal species in the genus and belongs to the *Cyperi* group. The new species is described and illustrated herein as *Heterodera fengi* n. sp. Phylogenetic analysis on LSU D2D3 and ITS-rRNA sequences was performed to investigate the relationships of *H. fengi* n. sp.