Heterorhabditis hepialius and Heterorhabditis marelatus were studied to evaluate their taxonomic position. Results from morphological and morphometric analysis and cross-breeding tests indicated these species are conspecific. Therefore, H. hepialius is considered a junior synonym of H. marelatus. A redescription of this taxon is presented.

Keywords: cross-breeding, morphology, morphometrics.

Entomopathogenic nematodes of the family Heterorhabditidae (Poinar, 1975) have shown to be effective biological control agents of insects (Battisti & Masutti, 1994; Ehlers & Hokkanen, 1996; Ricci et al., 1996; Smith, 1995; Sulistyanto & Ehlers, 1996). This interest has led to numerous studies on their identification and characterization as well as their biology, ecology and geographical distribution.

At present the family Heterorhabditidae is composed of the genus Heterorhabditis Poinar, 1975, and 9 recognized species, including Heterorhabditis bacteriophora Poinar, 1975, which is the type species, from Brecon, Australia; Heterorhabditis megidis Poinar, Jackson and Klein, 1988, from Ohio, USA; Heterorhabditis indicus Poinar, Karunakar and Hastings, 1992, from Tamil Nadu, India; Heterorhabditis argentinensis Stock, 1993, from Santa Fe, Argentina; Heterorhabditis hawaiensis Gardner, Stock and Kaya, 1994, from Hawaii, USA; Heterorhabditis brevicaudis Liu, 1994, from China, Heterorhabditis marelatus Liu and Berry, 1996, from Oregon, USA and Heterorhabditis hepialius Stock, Strong and Kaya, 1996, from California, USA.

Initially, identification of species in this group solely relied on morphological and morphometric characters of adults, particularly second generation males, and infective juveniles. Later on, Dix et al. (1992) demonstrated the usefulness of
cross-breeding tests with second generation amphimictic adults for the identification of biological species of the genus *Heterorhabditis*. In recent years, different molecular approaches (i.e. starch gel electrophoresis, restriction enzyme analyses (RFLPs), isoelectric focussing (IEF) and RAPD markers) have been considered as complementary tools for the identification of this group of nematodes (Akhurst, 1987; Smits et al., 1991; Joyce et al., 1994; Gardner et al., 1994; Liu & Berry, 1995).

Although the morphology of the members of the family Heterorhabditidae is considered to be rather conservative, the use of certain morphometric characters has been demonstrated to be useful for the identification and discrimination of *Heterorhabditis* species (Stock & Kaya, 1996). Using multivariate statistics, Stock and Kaya (1996) were able to discriminate among 8 of the 9 *Heterorhabditis* species (*H. marelatus* was unavailable for the study).

The two newly described species, *H. marelatus* and *H. hepialius* were both isolated in the Pacific coast of USA. The former species was recovered at Seaside Beach, Oregon (Liu & Berry, 1996), whereas *H. hepialius* was isolated from ghost moth caterpillars, *Hepialis californicus* L. at Bodega Bay Marine Reserve in California (Stock et al., 1996). Because of their geographic contiguity and similarities observed in their morphology and morphometrics, a thorough study was conducted to assess whether these two species are actually separated or they represent a single taxon.

**MATERIAL AND METHODS**

For morphological and morphometric analysis, type specimens of *H. marelatus* (2 paratype hermaphrodites, UCDNC 3325-3326; 4 paratype males, UCDNC 3321-3324; 12 paratype females, UCDNC 3327-3330; 19 paratype infective juveniles) (IJs, UCDNC 3331) and *H. hepialius* (1 allotype hermaphrodite, UCDNC 3273; 3 paratype females, UCDNC 3275; 1 male holotype, UCDNC 3273; 3 paratype males, UCDNC 3274; 3 paratype IJs, UCDNC 3276) were examined. Also, live specimens (10 individuals of each stage) of three different isolates (OHIO [*H. marelatus*], Bodega Bay [*H. hepialius*] and Monterey [*H. hepialius*]) were considered for this study. All isolates were propagated in *Galleria mellonella* L. larvae using an inoculum of 40 infective juveniles (IJs)/insect larva. Inoculations were done individually using the 1:1 essay (Kaya & Stock, 1997). First generation hermaphrodites and second generation males and females were obtained by dissecting insect cadavers 3-4 and 6-7 days after initial exposure. IJs were recovered using White traps during the first two days of emergence. All nematodes were fixed in TAF and measured using a Leitz Ortholux micro-