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## ***Oscheius onirici* sp. n. (Nematoda: Rhabditidae): a new entomopathogenic nematode from an Italian cave**

GIULIA TORRINI<sup>1</sup>, GIUSEPPE MAZZA<sup>1</sup>, BEATRICE CARLETTI<sup>1</sup>, CLAUDIA BENVENUTI<sup>1</sup>,  
PIO FEDERICO ROVERSI<sup>1</sup>, ELENA FANELLI<sup>2</sup>, FRANCESCA DE LUCA<sup>2</sup>,  
ALBERTO TROCCOLI<sup>2</sup> & EUSTACHIO TARASCO<sup>2,3</sup>

<sup>1</sup>Council for Agricultural Research and Economics - Agrobiological Research Centre (CRA-ABP), Via Lanciola 12/A, Cascine del Riccio, 50125 Firenze (Italy). E-mail: giulia.torrini@isza.it

<sup>2</sup>Institute for Sustainable Plant Protection (IPSP)-CNR, via G. Amendola 122/D, 70126 Bari (Italy). E-mail: francesca.deluca@ipspp.cnr.it

<sup>3</sup>Department of Soil, Plant and Food Sciences, Section of Entomology and Zoology, University of Bari "A. Moro", via G. Amendola, 165/A, 70126 Bari (Italy)

### **Abstract**

*Oscheius onirici* sp. n. (Nematoda: Rhabditidae) was isolated from a karst cave soil of Central Italy. Molecular and morphological analyses were performed. Total DNA was extracted from individual nematodes and the mitochondrial COI, the ITS containing region, the D2-D3 expansion domains of the 28S rRNA gene and the 18S rRNA gene were amplified and sequenced. BLAST search at NCBI by using all molecular markers revealed that this taxon is similar to *Oscheius* species. Phylogenetic trees of ITS, 28S and 18S rDNA revealed that *O. onirici* sp. n. belongs to *Dolichura*-group. *Oscheius onirici* sp. n. is characterized by small body size and stoma rhabditoid type. Female reproductive system is amphidelphic. Males are rare with peloderan bursa, spicules slender and small, nine pairs of papillae of different lengths, arranged in a 1+1+1/3+3 pattern. Entomopathogenicity bioassay revealed that this nematode is capable of infecting larvae of *Galleria mellonella* and *Tenebrio molitor*.

**Key words:** 18S, D2-D3, Description, *Dolichura*-group, entomopathogenicity bioassay, ITS containing region, mitochondrial COI, taxonomy

### **Introduction**

The subterranean environment hosts unique biological communities of remarkable diversity that, however, are still understudied in large parts of Europe (e.g. Gibert & Culver 2009) and species are continuing to be described in well-known taxa (e.g. Mazza *et al.* 2013).

The search for entomopathogenic nematodes (EPNs) has resulted in numerous surveys all over the world, in order to acquire new resources for biological control of insect pests. EPNs are ubiquitous (Hominick 2002), but some habitats, such as the cave soils, are understudied in comparison to the classic ones, at least in Italy (Tarasco *et al.* 2014).

The genus *Oscheius* Andr ssy, 1976 comprises two main groups, *Dolichura* and *Insectivorus* (Sudhaus & Hooper 1994) and until now EPNs were found only in the *Insectivorus*-group (Pervez *et al.* 2013).

During a survey for subterranean entomofauna in a karst cave in Central Italy, soil samples were collected on October 2013. Only one rhabditid nematode was isolated by using the *Galleria* trap method. Morphological and molecular evidence indicated this is a new *Oscheius* species belonging to the *Dolichura*-group. Presently, seven species are recognized in this group, namely: *Oscheius bengalensis* Timm 1956, *O. dolichura* Schneider 1866, *O. dolichuroides* Anderson & Sudhaus 1985, *O. guentheri* Sudhaus & Hooper 1994, *O. pseudodolichura* K rner 1954, *O. sechellensis* Potts 1910 and *O. tipulae* Lam & Webster 1971. *Oscheius pherosophi* Smart & Nguyen 1994 has most of the characteristics of this group, but it is unique in this genus for the presence of fused spicules. The

Tumian and *O. chongmingensis*, with 100% support, suggests a re-examination of this species in order to establish if it belongs to *Oscheius* genus.

Overall, the phylogenetic trees examined here confirm that the *Insectivorus*-group and *Dolichura*-group formed monophyletic groups with high support. The results obtained herein demonstrated that all markers allocated *Oscheius* species to their corresponding groups and in particular *O. onirici* **sp. n.** clustered within *Dolichura*-group.

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