

Notes brèves

AN ECOLOGICAL STRATEGY IN THE GENUS *MONHYSTERA* — AN HYPOTHESIS

Ludo J. JACOBS and Juan HEYNS

Rijksuniversiteit Gent, Instituut voor Dierkunde,
K.L. Ledeganckstraat 35, 9000 Gent, Belgium

and Department of Zoology, Rand Afrikaans University, P.O. Box 524, Johannesburg 2000, Rep. South Africa.

Refractive crystalloids of less than a few micrometers long are found in the freshwater genera *Monhystera* *sensu* Jacobs (1987), *Ironus*, *Tobrilus* and *Tripyla* (e.g. Alekseyev & Dizendorf, 1981; Andrassy, 1958, 1981, 1984; Juget, 1969; Micoletzky, 1922, 1925; Riemann, 1970) as well as in the marine genera *Sabatieria*, *Sphaerolaimus* and *Terschellingia* (Nicholas, Goodchild & Stewart, 1987; Vincx, pers. comm.). In *Monhystera*, these crystalloids have been suggested as either occurring subcutaneously (Micoletzky, 1922, 1925; Riemann, 1970), in the pseudocoel (Andrassy, 1958, 1981, 1984; Eder, 1979; Goossens, 1976; Juget, 1969) or in the intestinal cells (Cobb, 1918). However, in accordance with the T.E.M.-observations of Nuss (1984) for *Tobrilus gracilis* and of Nicholas, Goodchild and Stewart (1987) for *Sabatieria wieseri*, in cross sections of *Monhystera* specimens, crystalloids are only located in the non-contractile part of the muscle cells of the body wall (Fig. 1 c). In the Monhysteridae, the presence of these crystalloids is characteristic only for the genus *Monhystera* (Andrassy, 1981, 1984; Jacobs, 1987). The abundance of the crystalloids may vary to some extent, but they are always present in the cardinal region of older adults, females in particular (unpubl. observ.). According to Nicholas, Goodchild and Stewart (1987), similar crystalloids occur also in the other two Monhysteroidea families: the Xyalidae (*Terschellingia longicaudata*) and the Sphaerolaimidae (*Sphaerolaimus papillatus*).

Ultrastructural, ecophysiological and physical microanalysis on *T. gracilis* revealed a high sulphur content of the osmiophilic and homogeneous crystalloids linked to sulphidic conditions of the habitat in which the species occurred (Nuss, 1984; Nuss & Trimkowski, 1984). Hence Nuss (1984) considered the crystalloids as part of a detoxification system for sulphid ion and which is expressed in the sulphide tolerance of the species. Nicholas, Goodchild and Stewart (1987) used X-ray microanalysis to identify prominent Ca, P and S secondary X-ray peaks in the crystalloids of *S. wieseri*, *S. papillatus* and *T. longicaudata* which are collected from black, hydrogen sulphide rich, mangrove mud-flats. In both studies, the results suggest that the formation of the crystalloids prevent harmful accumulation of metal sulphides building up in the tissues. Although no such ultrastructural or physical microanalysis has been con-

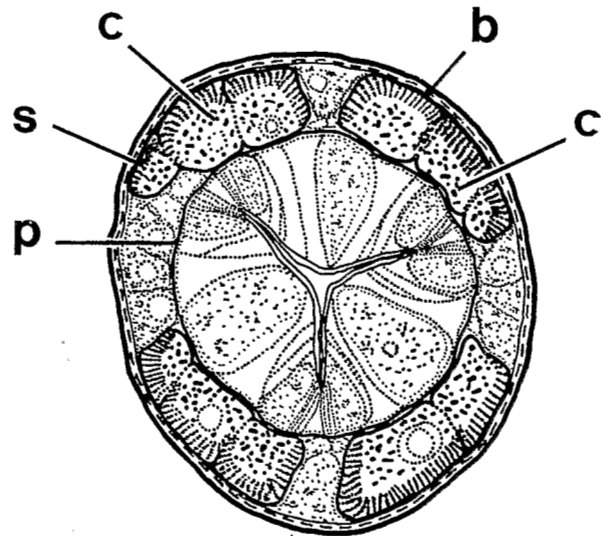


Fig. 1. Cross section of the neck region posterior of nerve ring of *Monhystera* sp. b : Body wall; c : Crystalloids; s : Somatic muscle cell; p : Pharynx. (From a hand made cross section of a new *Monhystera* sp. from Algeria, to be described by Jacobs and Heyns.)

ducted on *Monhystera* species, many similarities exist between the benthic and limnic genera *Tobrilus* and *Monhystera*: same feeding type (non-selective deposit feeders; Wieser, 1953), similar location and morphology of the crystalloids in different specimens (e.g. absence in juveniles, increase in abundance with age, relation with sulphidic conditions in habitat; Nuss, 1984; unpubl. observ.), ecological distribution (facultative anaerobic conditions, sulphide tolerance; Micoletzky, 1922; Andrassy, 1958; Juget, 1969; Schiemer, Loffler & Dollfuss, 1969; Prejs, 1977; Schiemer, 1978; Nuss, 1984; Jacobs, 1987). In view of these similarities, the presence of crystalloids in the genus *Monhystera* can be speculatively interpreted as an element of a (sulphide) detoxification system.

However, in some marine thiobiotic* invertebrate groups like bivalves (Cavanaugh, 1983), oligochaetes

* For the definition of " thiobios " see Boaden and Platt (1971), and Jensen (1987).

(Felbeck *et al.*, 1983), pogonophores (Southward *et al.*, 1981) and mouthless marine nematodes (Ott *et al.*, 1982), species were described with other internal refractive inclusions. As these inclusions are identified as procaryotic symbionts, we cannot exclude without T.E.M.-analysis the possibility that the crystalloids of *Monhystera* species represent internal procaryotic symbionts. Should this be the case, then it is evident that within the Monhysteridae the genus *Monhystera* is specialised in colonising the thiobios successfully.

Many *Monhystera* species are characterised by a specialised uterus (spermatheca, high number of associated cells and glands, elongation of the uterus : vulva-anus distance proportional to the inverse of age, the pharynx-vulva distance and the tail length; Jacobs & Heyns, unpubl. observ.). This specialised uterus makes it possible to hold and protect the most vulnerable juvenile stages in stressed conditions like saline, anaerobic or sulphidic habitats (Ott & Schiemer, 1973; Otto, 1936; Schiemer, Löffler & Dollfuss, 1969). In regard to spatial distribution of different reproductive modes between and within *Monhystera* species, Hofmänner (1913) and Hofmänner and Menzel (1915) suggested a causal relation between the presence of vivipary in *M. paludicola* and its occurrence in the littoral zone of the Lake of Geneva. According to Juget (1967) the spatial segregation in the Lake of Geneva, between the viviparous *Monhystera* specimens in the littoral zone and the oviparous ones in the profundal zone is due because eggs are easily washed away in the sandy, littoral sediments whereas juveniles with well developed caudal glands can stick themselves on the substrate.

The occurrence of the crystalloids (regarded as an element of a detoxification system or as procaryotic symbionts) in combination with the presence of vivipary (prolonged protection of juveniles), the well developed ovary (high fecundity) and the obligate bisexuality (female/male = 1-3; high genetic variation of the gene pool) can be understood as important pre-adaptations to survive stressed conditions as are found in thiobiotic habitats. These observations agree with the ecological distribution of this genus which suggest that at least several species in the genus *Monhystera* are well adapted to invade and occur in thiobiotic environments.

ACKNOWLEDGEMENTS

This paper has benefited from critical comments by Prof. Dr A. Coomans and Dr M. Vincx. We also thank Mrs. R. Van Driessche for her technical assistance.

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Accepté pour publication le 15 avril 1989.

MULKORHYNCHUS JAIRAJPURI, 1988 AND PATHOTYLENCHUS EROSHENKO & VOLKOVA, 1987, JUNIOR SYNONYMS OF TYLENCHORHYNCHUS COBB, 1913 AND GEOCENAMUS THORNE & MALEK, 1970, RESPECTIVELY (NEMATA : BELONOLAIMIDAE)

Renaud FORTUNER and Michel LUC*

California Department of Food and Agriculture, Analysis and Identification (Nematology), 1 220 N Street, Sacramento, CA 95814, USA, and Muséum national d'Histoire naturelle, Laboratoire des Vers, 61, rue de Buffon, 75005 Paris, France.

The genus "*Dolichorhynchus*" Mulk & Jairajpuri, 1974, a primary homonym of *Dolichorhynchus* Willey, 1901 (Cephalocordata), was considered a junior synonym of *Tylenchorhynchus* Cobb, 1913 by Fortuner and Luc (1987) who offered detailed arguments for establishing such a synonymization.

Jairajpuri (1988) reestablished the genus "*Dolichorhynchus*", renaming it *Mulkorhynchus* Jairajpuri, 1988 *nom. nov.* He transferred to the new genus some species formerly contained in the genus "*Dolichorhynchus*" with the exception of *D. cristatus*, *D. elegans*, *D. gladiolatus*, *D. judithae*, *D. microsphasmsis*, *D. solani*, and *D. sulcatus*.

Jairajpuri (1988) considered that arguments and counter arguments for or against the validity of the

genus shall continue to be offered by successive authors, and that this question can only be settled when more information is available. Already available information shows that the two criteria used by Mulk and Siddiqi (1982), i.e. structure of the body longitudinal ridges and lateral fields, are not consistently present in all the species placed in this genus (Fortuner & Luc, 1987). Revalidation of the genus requires that either the facts discussed by Fortuner and Luc (1987) be disproved, or that a different interpretation of these facts be offered. Jairajpuri (1988) did not discuss these facts or their interpretation. Consequently, we do not consider *Mulkorhynchus* a valid taxon, and we place it as a junior synonym of *Tylenchorhynchus*, to which genus the following species are reverted :

* Nematologist ORSTOM.