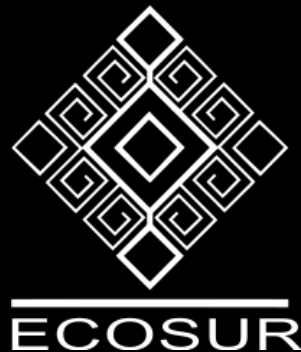


The ecology of marine nematodes

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Overview

- 1 Generalities
- 2 Distribution
 - 2.1 Horizontal (small scale, mesoscale, global scale)
 - 2.2 Vertical Distribution
- 3 Abundance and Diversity
- 4 Nematode communities
- 5 Nematodes as Bio-indicators

1 Generalities

- Ecology is the study of distribution and abundance of organisms, and their interaction with the environment (Krebs, 1978)
- All organisms related with the marine bottom sediments are denominated benthic (macrobenthos, **meiobenthos**, microbenthos)
- **Marine nematodes are the numerically dominant taxon of the meiobenthos (Moens & Vincx, 1997).**
- They are truly interstitial animals

Fig. 3.1 Major marine habitats arranged along hypothetical gradients of resource availability and physical disturbance.

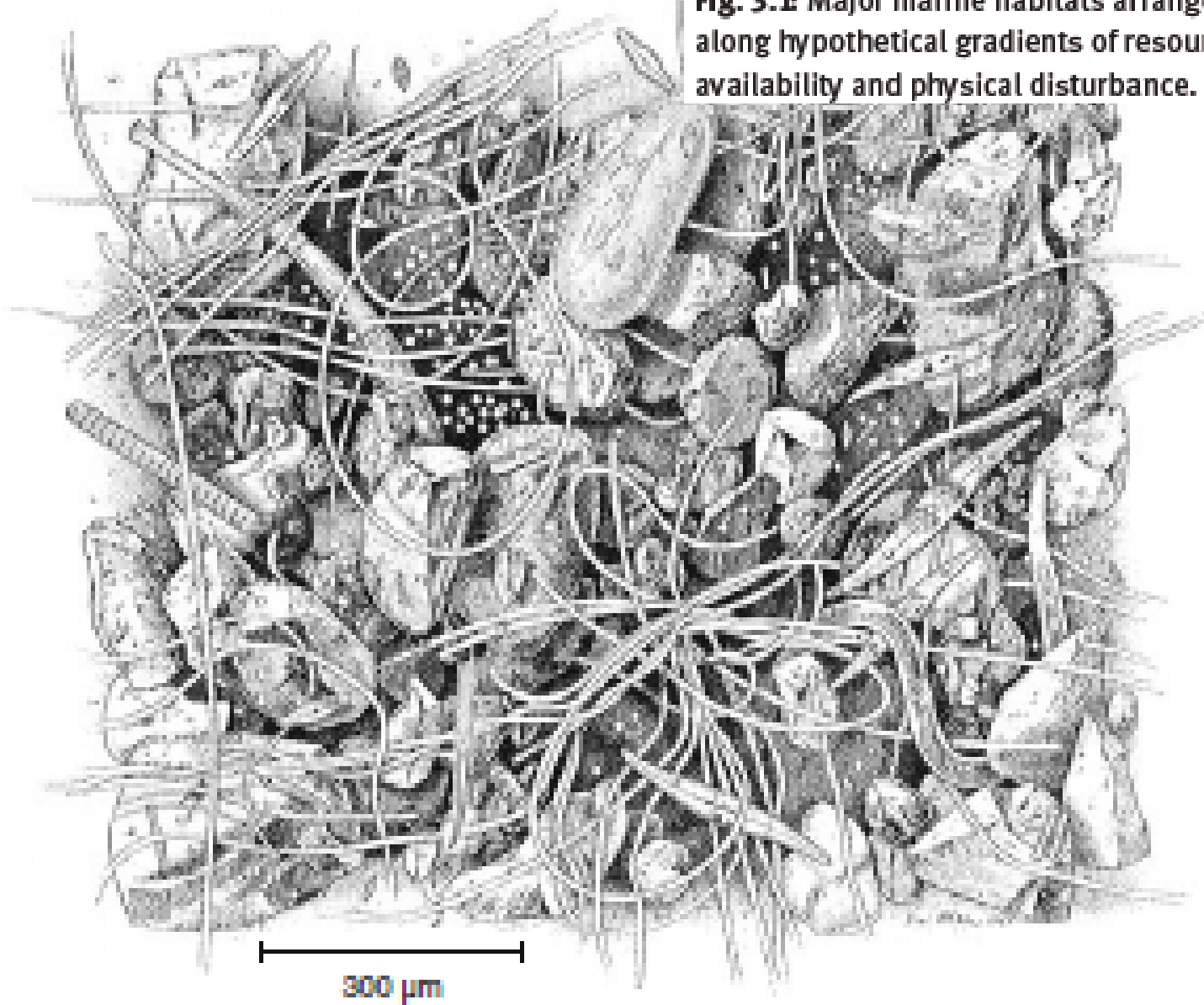


Fig. 5.5 A typical microhabitat of ciliates in microbial mats: various ciliates—*Tracheloraphia*, *Frontonia*, *Diophrys*, *Trochiloider*; cyanobacteria, euglenoid flagellates, one nematode. (Fenchel 1969)

2 Distribution

– 2.1 Horizontal (small scale)

- At the micro- or small scale (mm-cm), nematodes show an aggregated distribution with patch sizes smaller than 4 – 5 cm in diameter (Findlay 1981, Hogue 1982, Blanchard 1990, Hodda 1990, Gallucci et al. 2009).
- The causes for such a clustered distribution are multiple and depend on complex interactions between biotic and abiotic factors (Hogue 1982, Decho & Fleeger 1988, Eckman & Thistle 1988, Hodda 1990, Li et al. 1997, Gallucci et al. 2009, Gaever et al. 2010)

2 Distribution

- 2.2 Mesoscale (m-km)
- Nematode distribution patterns have been linked to variations in the physical chemical properties of the sediment matrix, with sediment grain size being one of the main factors related to the structure of nematode assemblages (e.g. Gray, 1982, Steyaert et al. 2003).
- 2.3 Global scale
- Cosmopolite distribution? (Bik, et al. 2010), Molecular studies shown restricted (endemic) species distribution! (Lee and Riveros, 2012)

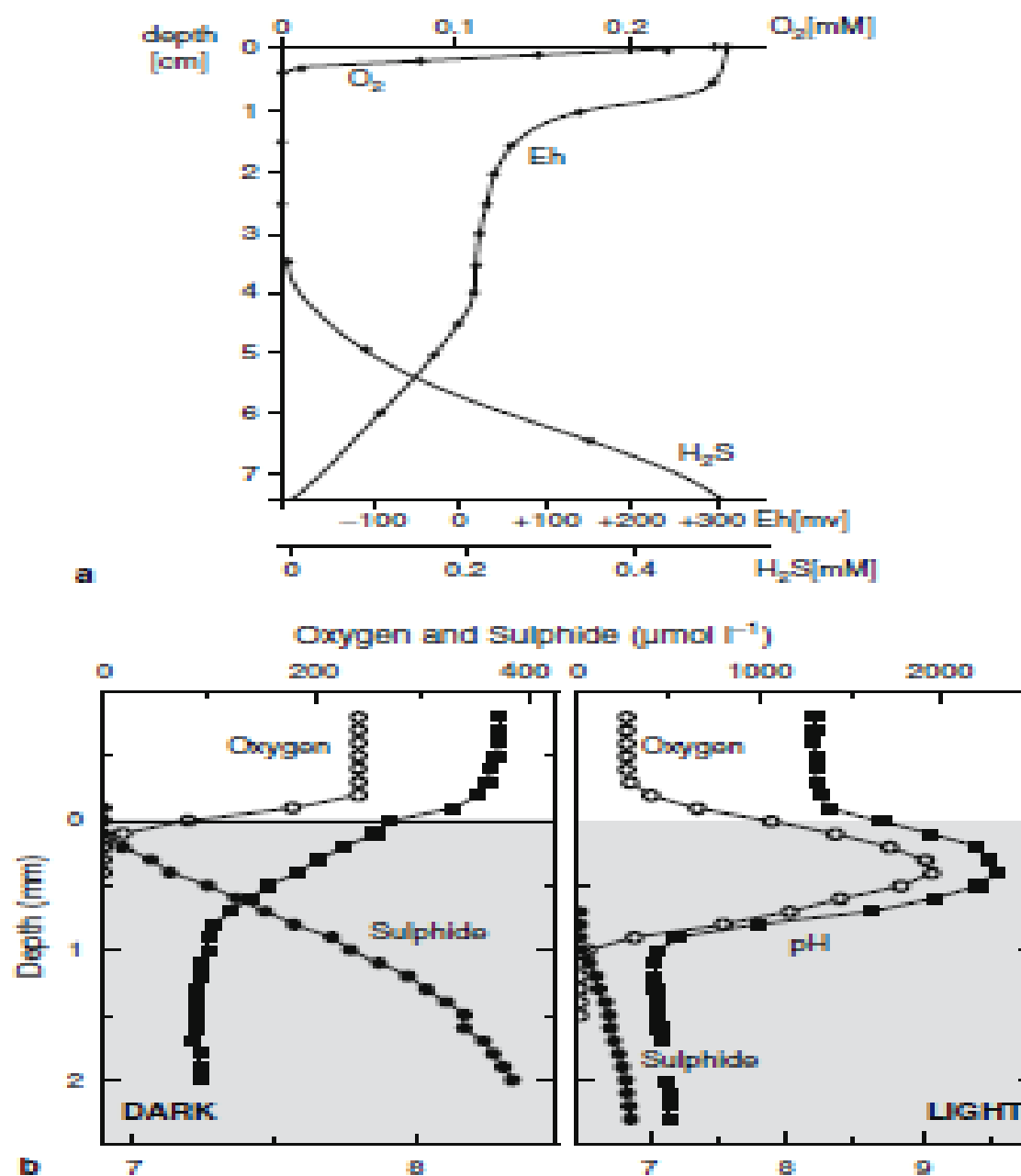


Fig. 2.8a–b Oxygen and hydrogen sulfide gradients in two sediment profiles from tidal flats. a Showing relationship with the redox potential (Eh). b Showing relationship with the acidity (pH) and assimilation-induced changes. (a is after Revsbech and Jørgensen 1986; b is own recordings)

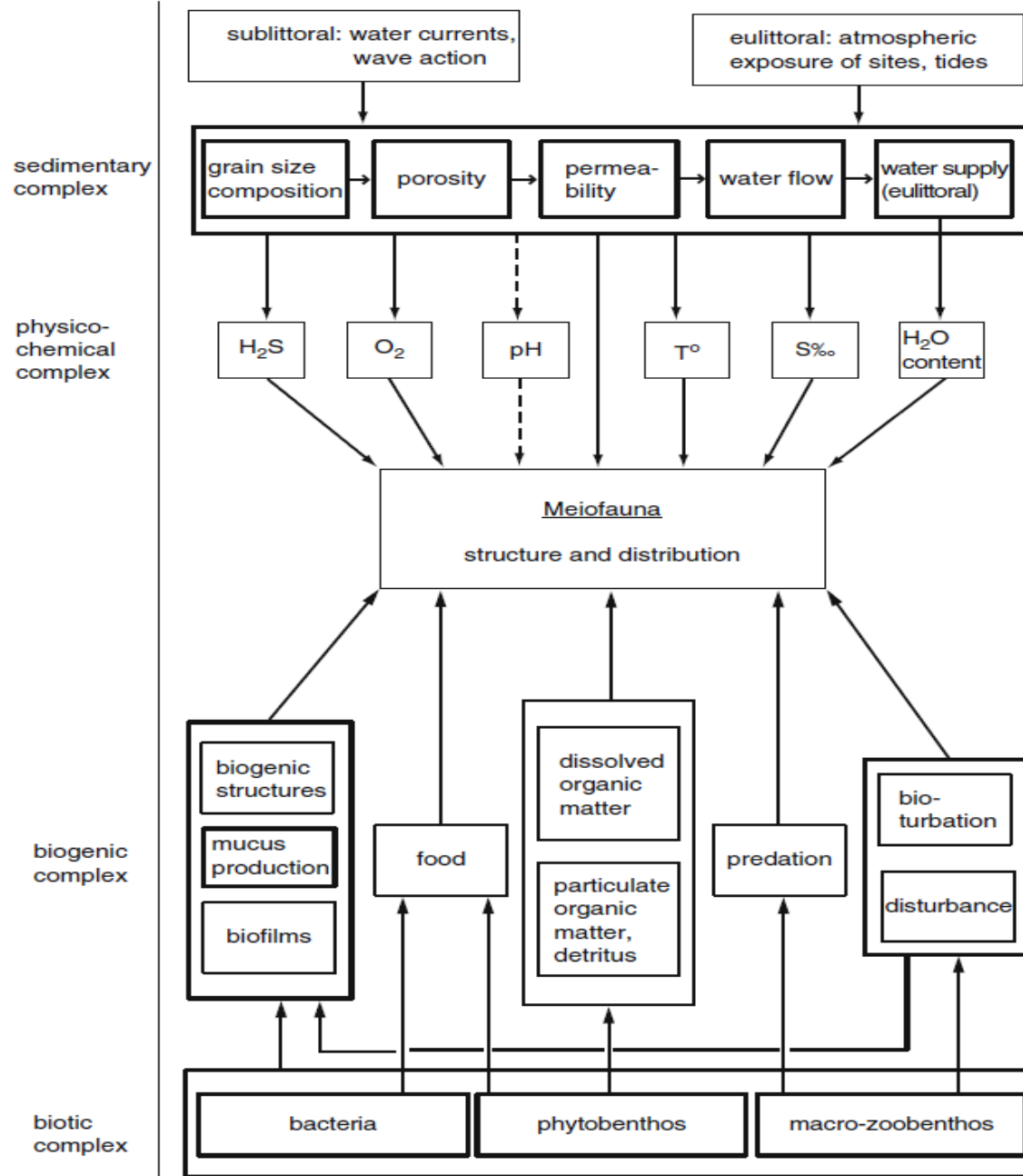


Fig. 2.16 A schematic factorial web structuring the habitat of meiobenthos

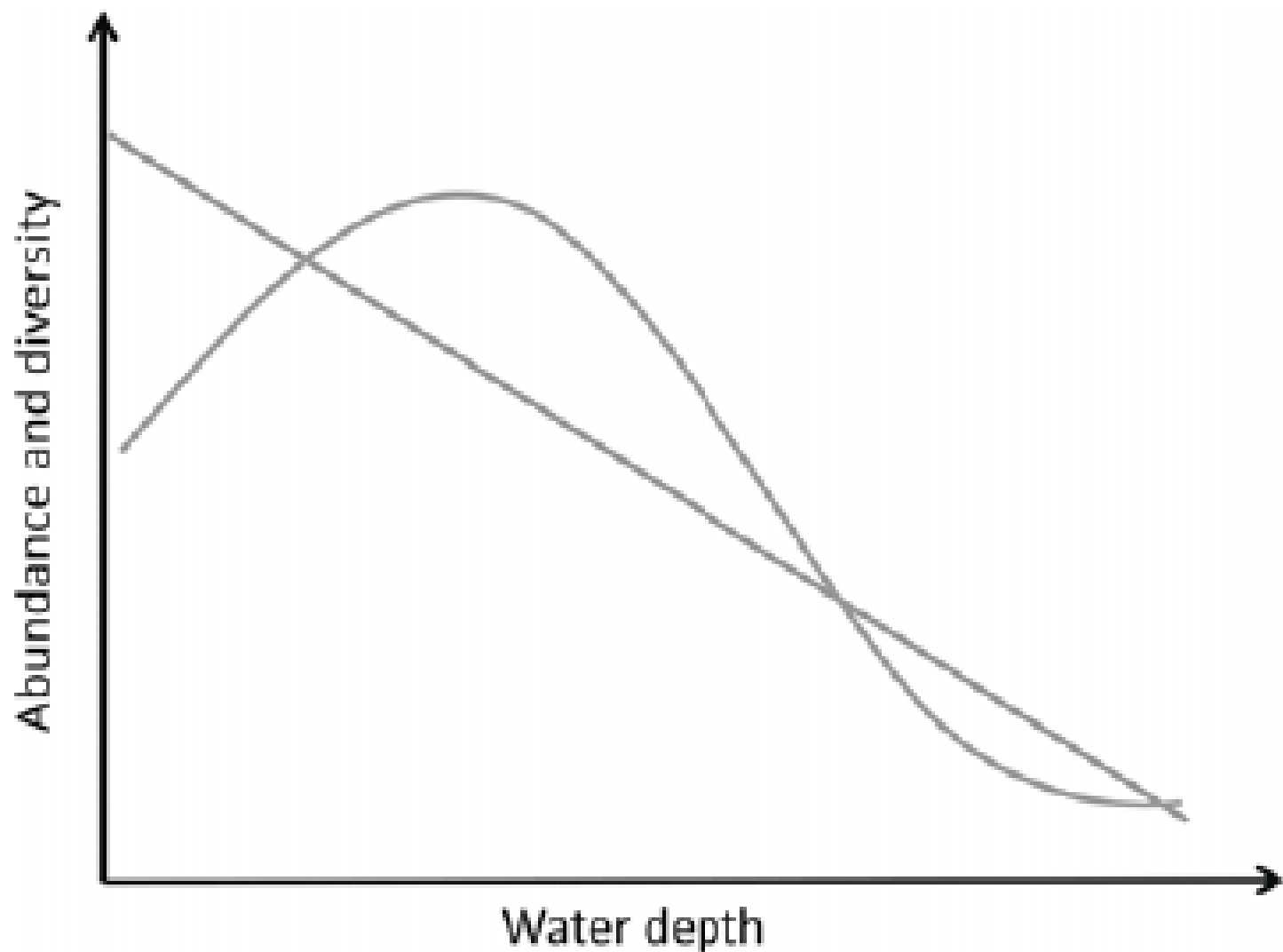


Fig. 3.2: Generalized trends in nematode abundance (straight line) and diversity (curved line) with increasing water depth.

(Mokievsky et al. 2007)

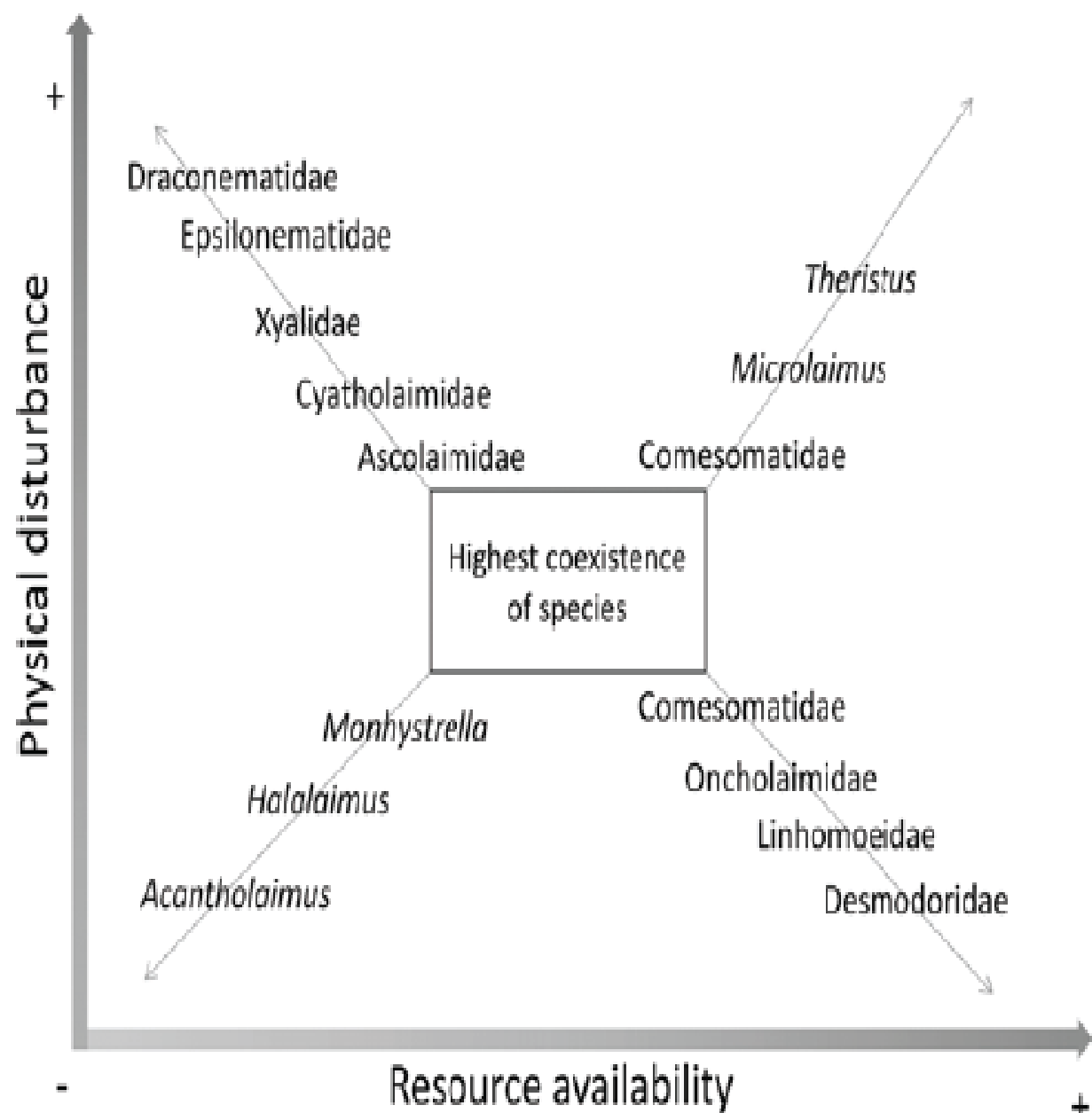


Fig. 3.5: Hypothetical arrangement of the dominant nematode taxa along the gradients of resource availability and physical disturbance based on the habitats plotted in Fig. 3.1 (Section 3.3) and the associations observed by Heip et al. (1985) and Vanreusel et al. (2010b).

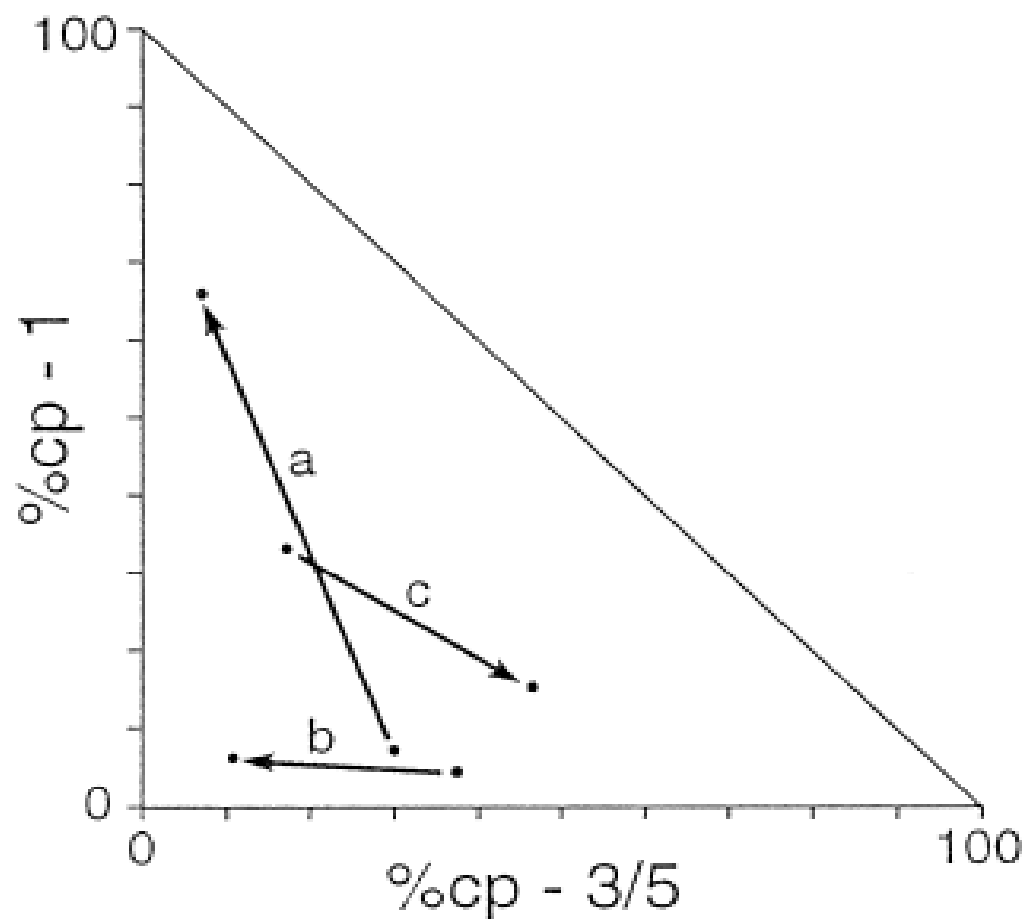


Fig. 1. Cp triangle showing shifts during (a) eutrophication, initial situation and 2 weeks after adding powdered cow dung (Ettema and Bongers, 1993; Table 2); (b) artificial acidification of coniferous forest soil (Hyvönen and Persson, 1990; Table 3) and (c) recovery, 33 and 44 weeks after organic manuring (Ettema and Bongers, 1993) (after Bongers et al., 1995).

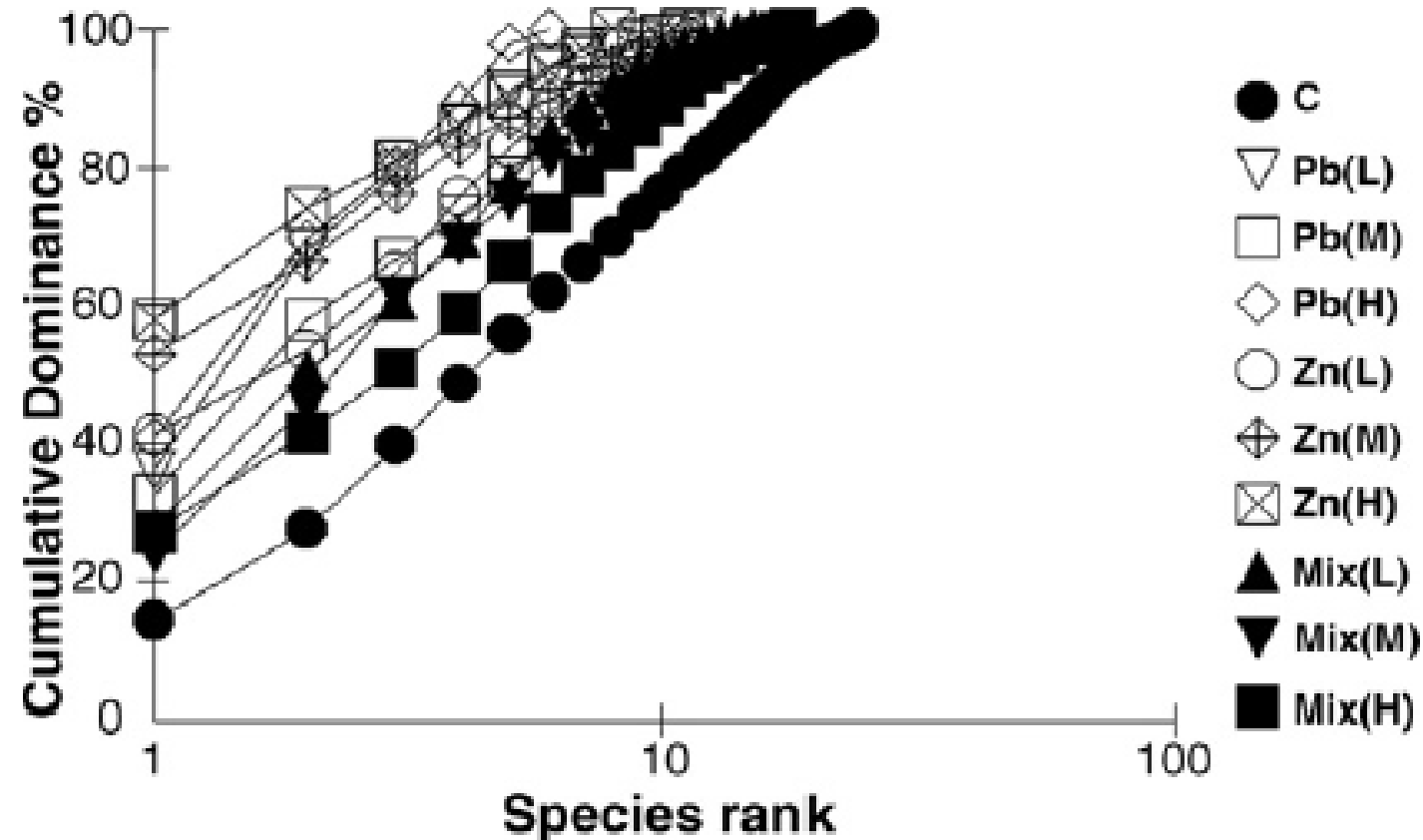


Fig. 1. *k*-dominance curves for uncontaminated sediment control microcosm (C) and lead and/or zinc amended sediment treatments [Pb(L), Pb(M) Pb(H), Zn(L), Zn(M), Zn(H), Mix(L), Mix(M) and Mix(H)].

5 Nematodes as Bio-indicators

- Several genera have been identified as reliable indicators of anthropogenic impacts, (*Pontonema*, *Sabatieria*, *Theristus*), the description of the nematode community structure to genus level is probably one of the most effective ways to detect and describe environmental change (Moens et al 2014).
- Although determining community structure (and diversity) is relatively labor intensive, identification of nematodes is aided by the existence of pictorial keys (e.g., Warwick et al. 1998) and online taxonomic resources (e.g., Nemys; Deprez et al. 2005).
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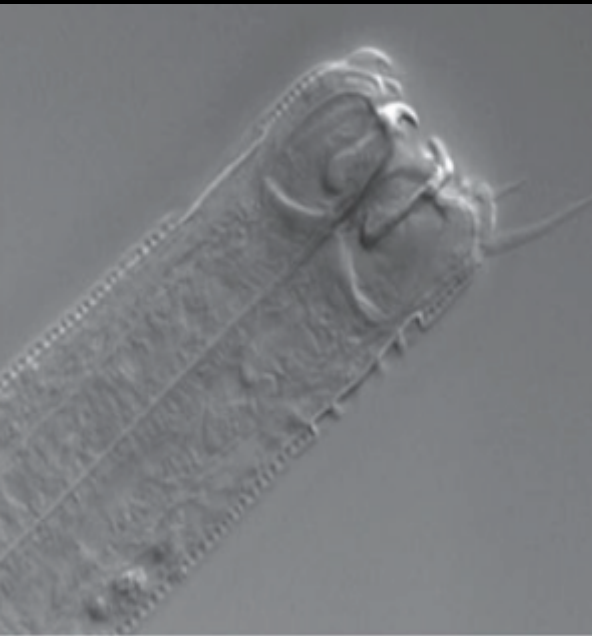
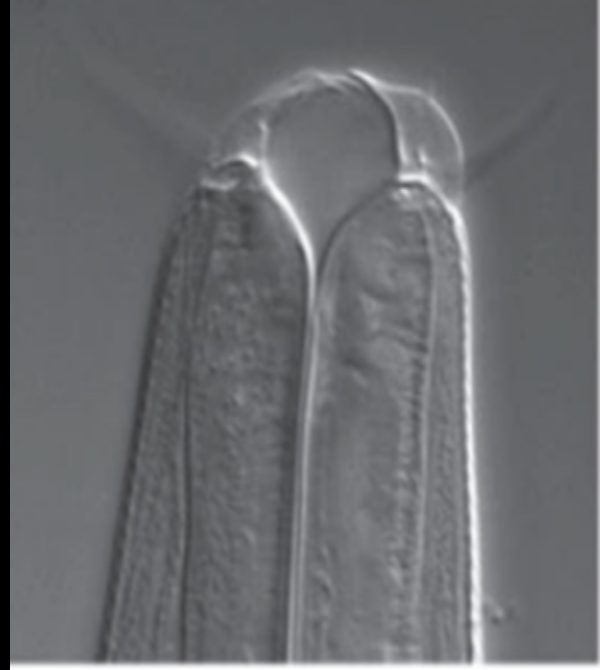
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Thank you!

Obrigado!

Gracias!



**ROUNDWORMS
OF DOGS
(AND CATS)**

