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This Week's Citation Classic®

Gerlach S A. On the importance of marine meiofauna for benthos communities. *Oecologia* 6:176-90, 1971.
[Institut für Meeresforschung, Bremerhaven, FRG]

One million meiofauna individuals 1 mm in size live on 1 m^2 of sea bottom; their biomass, however, is only 3 percent of that of the larger animals. Meiofauna produce three generations per year, but their mass-specific metabolism is five times higher than that of macrofauna. Therefore, 3 percent of the meiofauna biomass need 15 percent of the available food. [The *SCI*® indicates that this paper has been cited in over 130 publications.]

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I was a specialist in marine nematodes, interested in the morphology, phylogeny, and distribution of this meiofauna group when, in 1963, I applied for the directorship of the Bremerhaven Marine Research Institute; I had realized that I should have a broader concept in directing the work of chemists, bacteriologists, and botanists. I therefore promised the election board that I would concentrate the activities of the institute on what happens in 1 ml of marine sea bottom—a research topic as fascinating today as it was 24 years ago. I got the position as director either in spite of or because of the fact that I did not promise that this kind of research could pay in economic terms.

In the years following I worked together with M. Schrage and two PhD students, K. Stripp and W. von Thun, and we filled in some of the gaps concerning what is known about my favorite meiofauna group, nematodes. At the same time I critically read the published papers on meiofauna ecology and on correlations between small body size and high respiration rates. After five years, I summarized the research, made some rather harsh generalizations and extrapolations, and presented the results in this review paper.

It is easy to understand why this paper became a *Citation Classic*: during the 1970s it was fashionable to construct ecosystem models, especially after 1974 when John H. Steele demonstrated in his classic booklet[1] the possibilities, as well as deficiencies, that one encounters when putting together information from the water column with information from the sea bottom. In each of the many subsequent ecosystem models, "meiofauna" was the term for a compartment. The authors were happy with my compilation and adopted my extrapolations without criticism. They had enough trouble knitting together other loose ends.

Fortunately, new data published since 1971 have confirmed my estimate of about three for the production to mean biomass (P/B) ratio per generation[2] and simply refined my other assumptions. My own contributions on this subject[3,4] will, I hope, be well accepted. Recently, however, G. Vranken and coauthors[5] extrapolated from culture experiments annual P/B rates of 20-58 for nematodes, values much higher than my 1971 estimate of 9.

Most life history data on meiofauna are based upon species that can be cultured in the laboratory. But these data are from a selection of fast-growing species with short generation times and high productivity; they live on seaweeds or in the flocculate detritus layer on top of the sediment.[6] It is hazardous to generalize from such data about nematodes, which live deeper in the sediment. We do not know anything about their life in the mud that covers most of the sea bottom of the world. But their generation time is probably lower than that for culturable species.

1. **Steele J H.** *The structure of marine ecosystems*. Cambridge, MA: Harvard University Press, 1974. 128 p. (Cited 290 times.)
2. **Heip C, Vincx M & Vranken G.** The ecology of marine nematodes. *Oceanogr. Mar. Biol.* 23:399-489, 1985.
3. **Gerlach S A.** Food-chain relationships in subtidal silty sand. *Oecologia* 33:55-69, 1978. (Cited 80 times.)
4. **Gerlach S A, Hahn A & Schrage M.** Size spectra of benthic biomass and metabolism. *Mar. Ecol.—Progr. Ser.* 26:161-73, 1985.
5. **Vranken G, Herman P M J, Vincx M & Heip C.** A re-evaluation of marine nematode productivity. *Hydrobiologia* 135:193-6, 1986.
6. **Jensen P.** Ecology of benthic and epiphytic nematodes in brackish waters. *Hydrobiologia* 108:201-17, 1984.

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