complicates slightly the use of chromosome numbers in identification of major Meloidogyne species. Among the minor species, three reproduced by amphimixis and had n = 18 chromosomes; five reproduced by facultative meiotic parthenogenesis and had a haploid chromosome number of 18, or 14 to 18; and the rest were mitotically parthenogenetic with diploid, triploid and intermediate chromosomal complements. As a consequence of this extensive variation, cytogenetic characters are very useful in elucidation of phyletic relationships and evolutionary trends in root-knot nematodes and can be used as valuable, supplemental taxonomic characters. The four major Meloidogyne species and several minor species could be identified with a high degree of accuracy on the basis of esterase phenotypes of adult females. Three other enzymes (malate dehydrogenase, superoxide dismutase and glutamate-oxaloacetate transaminase) proved to be less species specific. Department of Genetics, N. C. State University, Raleigh, NC 27695-7614.

S21

VINCX, M., G. VRANKEN and C. HEIP. Marine nematodes as indicators in ecological monitoring and bio-assays.

Nematodes are the most abundant metazoans in marine sediments and constitute between 50-100 % of the meiofauna. In the Belgian coastal waters of the North Sea a clear decrease in trophic and family and species diversity, but not in abundance, is observed following a gradient in pollution. The number of species decreases from about fifty per station in open waters to four and even less in strongly polluted stations. This decrease is correlated with an increase in the levels of heavy metals in the sediments. The log-normal model proposed by Gray & Mirza (1979) to describe communities in equilibrium cannot be applied to impoverished communities in these coastal waters. Dominance curves, as proposed by Lambshead et al. (1983) may be more useful in these situations. The toxicity of several heavy metals was tested for Monhystera disjuncta, M. microphthalma and Rhabditis marina. These species show surprisingly high tolerance to heavy metals when LD 50 values are considered. However, effects on reproduction are apparent at much lower levels and there are specific differences: e.g. juvenile mortality and generation time increase in M. microphthalma with increasing dosis, but generation time remains constant in M. disjuncta. R. marina is much more tolerant to increased levels of heavy metals than both other species. Marine Biology Section, Zoology Institute, State University of Gent, Belgium.

S22

WARD, SAMUEL. C. Elegans sperm development.

Although C. elegans spermatozoa are crawling cells they contain very little of the common cytoskeletal proteins actin and tubulin. These proteins are abundant in spermatocytes, but during spermatogenesis they are preferentially segregated into the residual body and lost from spermatids. Tubulin is segregated as an intact spindle. In contrast, both cytoplasmic and membranous sperm-specific proteins are preferentially segregated to spermatids. This is accomplished by assembly of these proteins into a transient organelle, the fibrous body. The fibrous contents of this body subsequently disassemble to become the cytoplasm of the pseudopod. Using specific antibody staining, at least three different sperm proteins are found associated with the fibrous bodies. The most abundant of these is a small basic protein that comprises 15% of the total sperm protein. This protein is encoded in the genome by a large multigene family that is expressed only in spermatocytes. We have cloned and sequenced several genes