

Biodiversity of Antarctic nematodes: the 'NEMASLAN' project

S. Vanhove, T. Deprez, G. De Smet, A. Vanreusel, and M. Vincx

Ghent University, Department Biology, Marine Biology Section
Krijgslaan 281, building S8, B9000 Ghent

E-mail: sandra.vanhove@rug.ac.be

Recent biodiversity research reveals that more than 50% of the free-living marine nematode species found in before unexplored environments, such as Antarctica, are new to science. Too few taxonomists remain to describe them all. Additionally, there are problems with the quality control of the identification of nematode samples since fewer labs possess all the literature (and manpower) required to verify the morphological characteristics of the animals.

NEMASLAN, software for a tree-based classification system (Access) is a methodological approach for improving identification, classification and description of specimens in difficult taxonomic groups such as free-living marine nematodes. It seeks to serve as an easy research tool for central management of information of the taxon of the nematodes, and this for people with little training in database technologies.

The program consists of four main modules: (see demonstration)

1. Module for data- entering: provides possibilities to enter geographic, morphological, ecological, and literature data on species in a record database. An additional connection between these database records and the actual digital sources (e.g. scanned literature from original descriptions and good recent publications) enlarges the scientific value of the system.

Personal metadatasets can be created, for example for the use of drawings and/or pictures of undescribed species or not yet published taxonomic papers.

2. Module for document consultation: data sources (PDF documents of original descriptions, text documents, photographs,...) and their references can be consulted.

3. Module for Quick Search: *Morphological data* from the species identification (e.g. *shape and/or position* of amphid, cuticle, buccal cavity, tail, oesophagus, caudal glands and spinneret; *feeding type*; *numerical fields* of de Man ratios, length, setae, nerve ring, excretory porus, spicule, gubernaculum, male supplements) and other information such as *type of biotope* and *water depth distribution* can be consulted; datasheets can be generated.

4. Search Module: The output and search within the database can be user configured (i.e. questions like 'give me all the nematode species so far described from the coastal sites with a spicule longer than 30µm and cuticular punctuations' get an answer from this database). SQL (Structured Query Language) is the formal language used to query databases. An in-depth knowledge of the fairly complex SQL language is not required.

The Windows application functions for multi-users in a local network environment (LAN). The program is distributed free of charge through a website (at present <http://allserv.rug.ac.be/~tdeprez>; later on through a more specified Antarctic database website) at which demonstration datasets are distributed.

NEMASLAN was applied to Antarctic nematodes. The resulting 'Biodiversity of Antarctic Nematodes' CD-ROM version includes an archive of all numerical and nominal information for each species ever described in the Southern Ocean. About 350 species have thus been digitized. There is an urgent need to develop appropriate information tools on Antarctic marine biodiversity for scientific, environmental management and conservation purposes. Therefore, the collaboration of three laboratory pioneers in Antarctic biodiversity databases (e.g. Antarctic nematodes, amphipods and echinids, see other presentations) will seek for further developments such as the construction of a common portal, common mapping applications, or links to pertinent information sources of Antarctic benthic biodiversity. The resulting 'biodiversity information system' will be made available to the scientific community. This will be done within the framework of the OSTC project on Antarctica – BIANZO (BIodiversity of three representative groups of the ANtarctic ZOobenthos). It will contribute to the DIVERSITAS, SA 2000, CoML-OBIS and GBIF initiatives.