

# Terrestrial nematodes as part of indication system for ecosystem functions/services assessment in the frame of STACCATO project

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STACCATO ("SusTainable AgriCultural ChAnge Through ecological engineering and Optimal use of natural resources") is a BiodivERsA funded EU project which will focus on the analysis and evaluation of Ecosystem Functions (ESF) and Services (ESS) and their sensitivity to land use patterns in agriculturally dominated landscapes. The project receives funding within the BiodivERsA/FACCE initiative. The consortium of 10 partners from different European countries, combining the expertise of scientists from various research fields, will focus on investigating land use intensity at local as well as regional scale, the prevalent socio-economic backgrounds of farmers and stakeholders, and the potential impacts of future climate and land use change on biodiversity and the affiliated ESF/ESS.



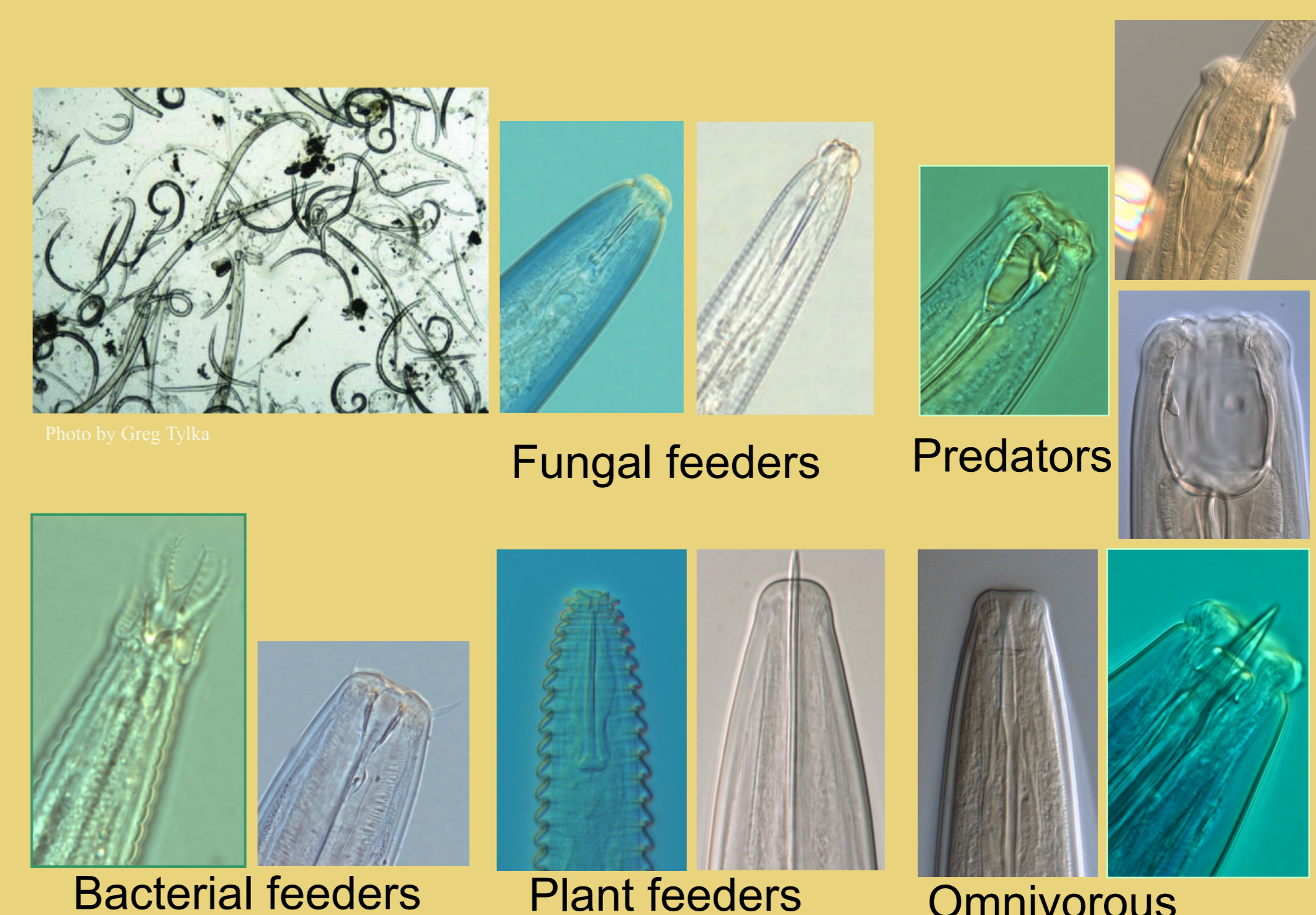
In order to advance the sustainability in long-term development of agro-ecosystems **STACCATO** plans to quantify the sensitivity of ecosystem functions and the generated services to environmental pressures in representative agriculturally dominated landscapes in Europe. Landscapes will comprise annual crops like oilseed or winter wheat, and semi-natural grasslands.

In particular we intend to investigate the interactions between annual crops and the surrounding landscapes including the sprawling urban areas, and the potentials of ecological engineering as a tool for eco-functional intensification.

Ecological Engineering is an emerging discipline, concerned with design, monitoring and construction of agro-ecosystems in order to maximize ecosystem services through exploiting natural regulation mechanisms instead of suppressing them.

The overall objective is the elaboration and testing of generally applicable principles within the frame of ecological engineering, and to contribute to the loss of valuable soil and land for agricultural productivity

Five case study areas have been selected in Romania, Bulgaria, Germany, Switzerland and Sweden for data collection. Ten target sites along a gradient of intensive agriculture (up to 100% of land) and high percentage (up to 20%) semi-natural grassland will be studied and ESF/ESS will be assessed based on different indicators.



Nematodes are major component of soil micro-fauna and soil food webs. They are both taxonomically and functionally diverse and play significant ecological role, not only as pests but also in organic matter transformation. Studies on nematode community structure in relation to environmental changes or disturbances showed that nematodes can be useful indicators of soil quality and ESF/ESS.

Soil samples for nematode analyses will be collected from the field after sowing, during flowering and after harvesting, 3 multiple core samples/per target field and grassland, respectively. The generic structure and various community parameters (TNN, functional groups distribution, maturity and biodiversity indices etc.) will be analyzed by CANOCO, PRIMER, NINJA software.

Faunal analyses (Ferris et al. 2001) and metabolic footprints (Ferris 2010) will be used for assessing ESF and services provided by the nematodes.

As a core output, STACCATO aims at developing guidelines for optimizing ecosystem functions and services provision and their stabilization under future climate and land use change.

Ferris H (2001) Form and function: metabolic footprints of nematodes in the soil food web. *European Journal of Soil Biology* 46: 97–104.  
 Ferris H, Bongers T, Goede RGM de (2001) A framework for soil food web diagnostics: extension of the nematode faunal analysis concept. *Applied Soil Ecology* 18: 13–29.



Bulgarian teams at their first working meeting in Plovdiv region where a case study areas were selected.

Participants in the STACCATO kick-off meeting, 19-22 April, Sofia.

