

PRESS RELEASE N.5

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The Natural History Museum EXCALIBUR team are putting soil biodiversity on the road map towards sustainable horticulture.

The 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in November 2021 highlighted the need to develop more sustainable approaches for agriculture that can preserve and restore soil quality and biodiversity, and reduce agricultural and horticultural soil degradation, while addressing global food supply demands. The Excalibur project brings together more than 100 researchers from 11 countries in Europe to find nature-based solutions that support the growth and health of tomato, strawberry and apple crops by utilising microbial biodiversity in soils and improving the application of beneficial microorganisms to reduce the use of chemical fertilisers and pesticides in the future.

The Natural History Museum's (NHM) research teams are applying cutting-edge sequencing technologies to characterize microbial biodiversity from soils and botanical museum collections to gain a better understanding of microbe plant interactions. Museum researchers are taking a leading role in the evaluation of how microbes interact with soil minerals to support nutrients available for crop plants. An important component of the project is based on NHM's expertise from the PREDICTS database, where researchers are developing statistical models to estimate and predict how land management and microbial bioinoculants affect biodiversity in agricultural systems.

While the global COVID-19 pandemic and national lockdowns put the project on hold for a year, the NHM team was able to kick off research activities in 2021 and the research is now in full swing with a frenzy of activities happening across the laboratories and offices in the Life and Earth Sciences Departments. Data are already being crunched



Natural History Museum



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in developing biodiversity modelling tools for horticultural landscapes. Earthworms have been counted and species identified from experimental fields across Europe, and will be used as indicators of the soil quality. Similarly, high-throughput 16S and 18S rRNA gene DNA Illumina sequencing is in progress to define the richness and composition of bacteria, archaea, fungi and other microscopic eukaryotes across a range of soil types and climatic zones. Finally, large soil experiments are now set up in the NHM's microbiology laboratory that will allow to find out if and how bacteria and fungi extract nutrients from mineral and turn them into nutrients that can be used by crop plants. In summary, the research work and expected outcomes will form a strong basis to deliver the evaluation of the potential of bioinoculants for economically important crops and sustainable horticultural management – helping farmers to, for instance, be able to get good yields from their strawberry fields forever.

About EXCALIBUR:

EXCALIBUR is an international research project financed by the EU Research and Innovation Programme Horizon 2020 led by the Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA) - Italy, which started in June 2019. With the aim to initiate a biodiversity-driven change in agricultural soil management practices the project received 6.995.197,50 € in funds and brings together 16 European partners. Over a five-years timeline, the researchers will explore how crops, soil and microorganisms interact. The gained understanding will promote a more effective use of biopesticides and biofertilizers for long-term productive and sustainable practices in horticulture. If you would like more information about this project, please contact the Coordinator Dr. Stefano Mocali at (email: stefano.mocali@crea.gov.it), or learn more on [Facebook](#), [Instagram](#), [Twitter](#) and the EXCALIBUR [homepage](#).



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