BIODIVERSITY 2025

15TH NATIONAL CONFERENCE ON BIODIVERSITY

2ND INTERNATIONAL CONFERENCE ON MEDITERRANEAN BIODIVERSITY

BIODIVERSITY IN THE XXI CENTURY: NEW PARADIGMS FOR NEW CHALLENGES

PROGRAMME

JUNE 3-6, 2025

HOTEL GIÒ - PERUGIA CONGRESS CENTRE
PERUGIA, ITALY

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15th National Conference on Biodiversity
2nd International Conference on Mediterranean Biodiversity

Biodiversity in the XXI century: new paradigms for new challenges

Perugia, Italy

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BOOK OF ABSTRACTS

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WELCOME TO PERUGIA

Dear attendees of the 15th National Conference on Biodiversity - 2nd International Conference on Mediterranean Biodiversity,

Welcome to Perugia!
Perugia, the capital of the beautiful Umbria, is one of the most evocative destinations of the region, a city of artists such as Perugino, Pinturicchio and Raffaello, as well as the contemporary art of Burri and Beuys). Built on a hill in the valley of the Tevere river, the city, with its history and artistic and cultural heritage, is one of the most popular destinations.

Starting from its Etruscan walls and walking through the streets of Old Town, Perugia present a succession of monuments. It is also an important cultural centre, with its historic University and the oldest and most prestigious University for Foreigners in Italy.

In addition to its artistic and cultural riches, Perugia offers tasty itineraries to try food and wine, with all the flavour of simple regional cuisine. Perugia also offers many opportunities for fun, with pubs and discos, or by visiting it on the occasion of its major events, such as the renowned international festival Eurochocolate, which transforms Perugia in October in the most coveted destination for lovers of the food of the gods. Equally noteworthy is the Umbria Jazz Festival in July, which offers ten days of shows and jazz, ranking among the most important jazz events in Europe.

Besides, the beauty of the surrounding towns (Assisi, Todi) and nature (Trasimeno lake, Marmore falls) and the rich cultural heritage of the region will provide an excellent opportunity for scientific presentations and discussions as well as for the informal encounters.

FROM THE ORGANIZING COMMITTEE

Dear Friends and Colleagues,
welcome to the 15th National Conference on Biodiversity - 2nd International Conference on Mediterranean Biodiversity, Perugia, Italy, organized by the Department of Agricultural, Food and Environmental Sciences of the University of Perugia, in cooperation with the Accademia delle Scienze della Biodiversità Mediterranea (ASBM).

Current human activities are leading to a significant loss of biodiversity of both natural and agricultural ecosystems. The new millennium has led to new opportunities for the conservation and the sustainable use of biodiversity, but at the same time has meant about the emergence of new threats. The rapid progress of scientific knowledge (including new and more advanced study methodologies), the impact of climate change, the increasing consumption of land, the spread of invasive alien species and the emergence of new pathogens have profoundly changed the overall picture (including the human perception) of the strategic value of biodiversity, stimulating the research and development of new and more effective solutions for its sustainable use.

The assessment of biological diversity is a key indicator for monitoring the health of terrestrial ecosystems, often subjected to a growing human impact, including the effects of global warming. The correct functioning of the biosphere is based on the presence of multiple biological networks that are resilient to changes, ensuring the continuity of animal, plant and microbial life. The extinction of one or more species can lead to unexpected impacts, sometimes threatening the loss of entire ecosystems. Climate change, loss of biodiversity and degradation of ecosystems are interconnected phenomena, with devastating consequences for the economic, environmental and social stability of the planet.

Globally, plants constitute over 80% of the human diet: 30,000 plant species are considered edible, 7,000 are cultivated for food, but only 30 are used for food purposes on a large scale. Among them, rice, wheat, corn, millet and sorghum ensure 60% of global food resources. Among animals, of the 30 domesticated species, only 14 ensure 90% of food of animal origin. About microorganisms, it has been estimated that less than 1% of total microbial biodiversity has been described and studied so far.

The 15th National Conference on Biodiversity will disseminate the latest basic and applied scientific knowledge on the study, conservation and sustainable use of animal, plant and microbial biodiversity. The topic of the Conference, "Biodiversity in the 21st century: new paradigms for new challenges", was chosen to provide answers to the new challenges imposed by the growing impact of human activities and climate change on animal, plant and microbial biodiversity in natural and agricultural ecosystems, suggesting possible solutions and defining innovative intervention models, both aimed at in-situ and ex-situ conservation, as well as sustainable enhancement, also in light of the principles of circular economy, in line with the EU strategies envisaged within the European Green Deal.

The 15th National Conference on Biodiversity is also associated with the 2nd International Conference on Mediterranean Biodiversity. The Mediterranean basin represents not only an area important for its history, cultures and traditions, but also a complex of natural and agricultural ecosystems that are hotspots of plant, animal and microbial biodiversity still understudied.

Session: Microbial biodiversity in foods: evolving insights and uncharted horizons

Unraveling *Lactobacillus helveticus* species inhabiting cultivable fraction of natural whey starter: a genotype and phenotype-based study

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The lactic acid bacterium (LAB) *Lactobacillus helveticus* is a key player in thermophilic dairy fermentation. LAB also inhabit the human gut, which has often been exploited as a reservoir of potential novel probiotics. We analyzed the cultivable fraction of 12 natural whey starters (NWS) sampled in 2 different sampling times through a DNA barcoding e genotypic approach. Twenty-five candidates were evaluated for tolerance to bile acids (BA), low pH, and lysozyme as probiotic traits.
Pentaplex-PCR and 16S-ARDRA analyses were used as DNA barcoding techniques. (GTG)5 REP-PCR was carried out to estimate the intra-species diversity (Simpson's index) and dereplicate the clones library. BA tolerance and pH tolerance were assessed by cultivating strains in the presence bile salt mixture (0.05%, 0.3%, 0.6%, and 1%), and at pH of 3.5, 4.5, and 5.4, respectively. Lysozyme (0.1 mg/mL) was used to test lysozyme tolerance.
Inter-species diversity was >0.9 Simpson's index for NWS enriched in *L. helveticus* (type-H), while was slightly lower in NWS enriched in *L. delbrueckii* (type-H). Huge phenotypic diversity was found within a pool of 25 genotypically unique strains. Two candidates showed the best growth response to all three stresses tested.
Two *L. helveticus* strains were found as good probiotic candidates.

The project was founded by Consorzio del Formaggio Parmigiano Reggiano and by the NRRP, Mission 4 Component 2 Investment 1.4 - Call for tender No. 3138 of 16 December 2021, rectified by Decree n. 3175 of 18 December 2021 of the Italian Ministry of University and Research funded by the European Union - NextGenerationEU. Project Code CN_00000033, Concession Decree No. 1034 of 17 June 2022 adopted by the Italian Ministry of University and Research, CUP E93C22001090001, "National Biodiversity Future Center – NBFC".

Keywords: Bile salts tolerance, pH tolerance, Lactic acid bacteria, *Lactobacillus helveticus*, Natural whey starter