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The Phyllosphere Microbiome - Volume II

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Phyllosphere encompasses all aboveground compartments of a plant, including stems, leaves, flowers, and fruits. These plant parts harbor diverse epiphytic and endophytic microorganisms, including bacteria, fungi, and viruses, which consistently colonize the phyllosphere and form a stable core microbiota, whereas sporadically occurring and environmentally derived taxa constitute the satellite microbiota. Studies employing metagenomic and metatranscriptomic approaches have uncovered previously unexplored microbial taxa associated with the phyllosphere and provided insights into their functional potential. However, the phyllosphere microbiome remains an insufficiently explored ecosystem, strongly shaped by harsh environmental conditions, including abiotic factors (UV radiation, desiccation, and rapid temperature fluctuations) and biotic pressures, like human activity and pathogen attacks. Moreover, the functional roles of phyllosphere-associated microorganisms are still not fully understood. A deeper understanding of phyllosphere interactions, plant–microbe and microbe–microbe, has broad applications (e.g., sustainable crop production, plant protection, stress resilience, etc.).

The aim of this Research Topic is to collect a broad range of contributions addressing the phyllosphere microbiome from

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beyond, and iv) elucidate the impact of applied microbial biocontrol agents, plant growth-promoting strains, and/or chemical control measures on the structure and stability of the core phyllosphere microbiome.

To gather further insights in the structure, function, and applications of the phyllosphere microbiome, we welcome articles addressing, but not limited to, the following themes:

- Occurrence and taxonomic and functional diversity of phyllosphere-associated microbes in diverse plant species.
- Assembly and vertical transmission routes of the phyllosphere microbiome.
- Characterization of host-related and environmental factors shaping phyllosphere microbial communities during both vegetative and reproductive stages of plant development.
- Assessment of molecular and physiological plant–microbe interactions involved in the establishment and persistence of microorganisms in the phyllosphere.
- Responses of epiphytic and endophytic phyllosphere microbes to abiotic and biotic stresses, including their functional and adaptive traits.
- Responses of the core microbiota to conventional and biologically based agricultural practices.
- Effects of introduced beneficial microorganisms and conventional agricultural practices on phyllosphere microbiome composition, stability, and plant health in the context of biotic challenges.



Article types and fees

This Research Topic accepts the following article types, unless otherwise specified in the Research Topic description:

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