

**Novel understanding of the water cycle as a link
between unsuspected habitats of airborne pathogens
-what consequences for plant disease management?**

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O01.004 Novel understanding of the water cycle as a link between unsuspected habitats of airborne pathogens -what consequences for plant disease management?

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Recent research on the ecology of the phytopathogenic bacterium *Pseudomonas syringae* has revealed that its life history is intimately linked to the water cycle. As a consequence, the current vision of its ecology is moving away from that of a ubiquitous epiphytic plant pathogen to one of a multifaceted bacterium *sans frontières* in fresh water and other ecosystems linked to the water cycle. Its life history involves adaptation to ubiquity that is facilitated by dissemination via the water cycle and includes an important aspect of atmospheric transport as well as infiltration through soil. This new vision of its life history also integrates spatial and temporal scales spanning billions of years and traversing catchment basins, continents, and the planet and confronts the implication of roles that are potentially conflicting for agriculture (as a plant pathogen and as an actor in processes leading to rain and snowfall). Overall, it sets the stage for the integration of more comprehensive contexts of ecology and evolutionary history into comparative genomic analyses to elucidate how *P. syringae* subverts attack and defense responses of the cohabitants of the diverse environments it occupies. In practical terms this new ecological perspective has also yielded insight into epidemiological phenomena linked to disease emergence. This latter point will be explored in particular in this presentation and its pertinence for other plant pathogens will be discussed.

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