Towards sustainable agriculture: Innovative solutions for Psa from the microbiome of *Actinidia deliciosa*

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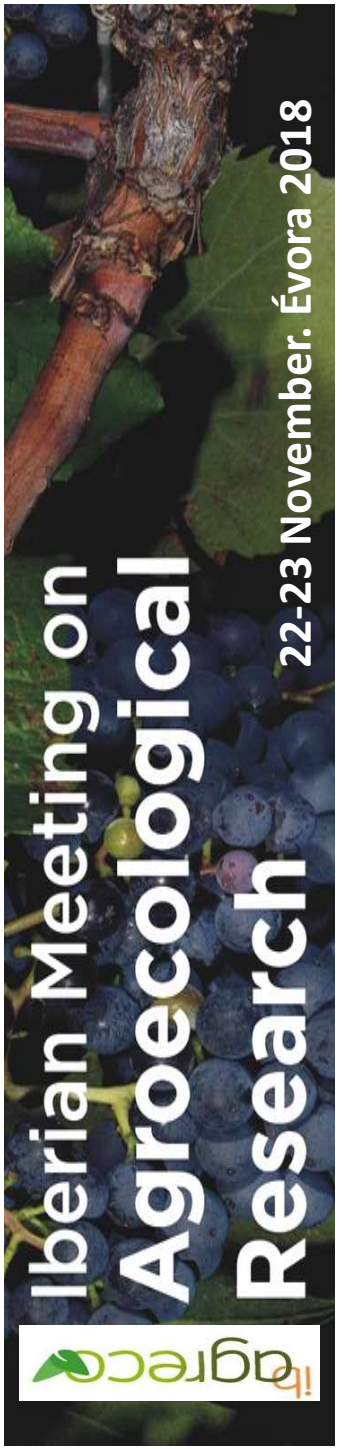
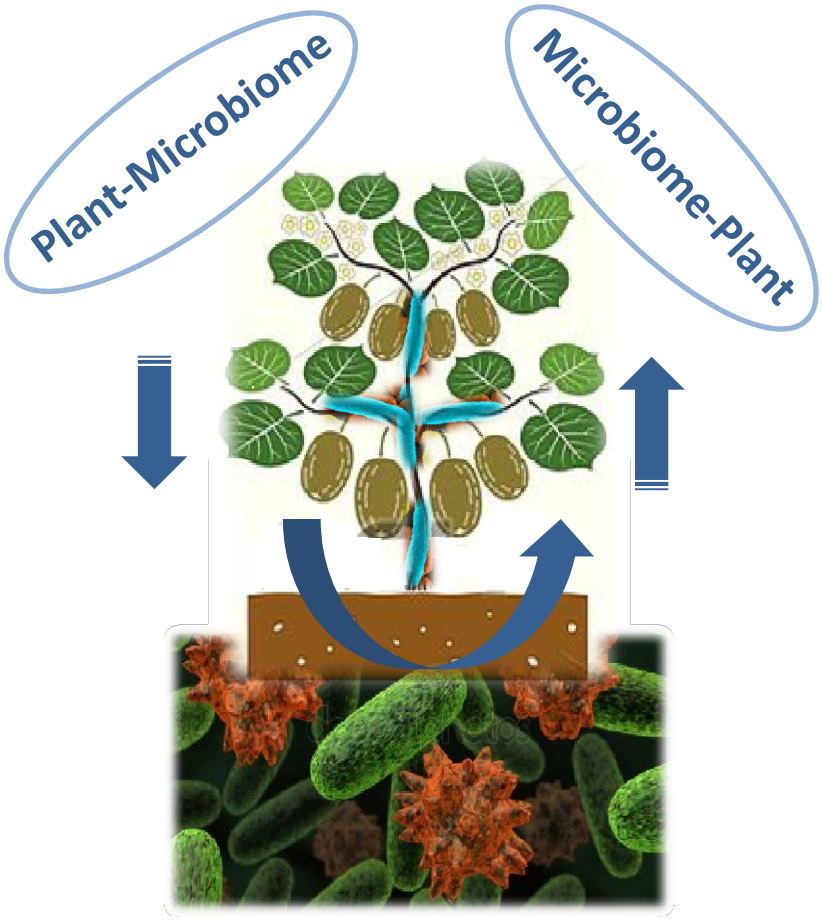


Microbiome *versus* microbiota

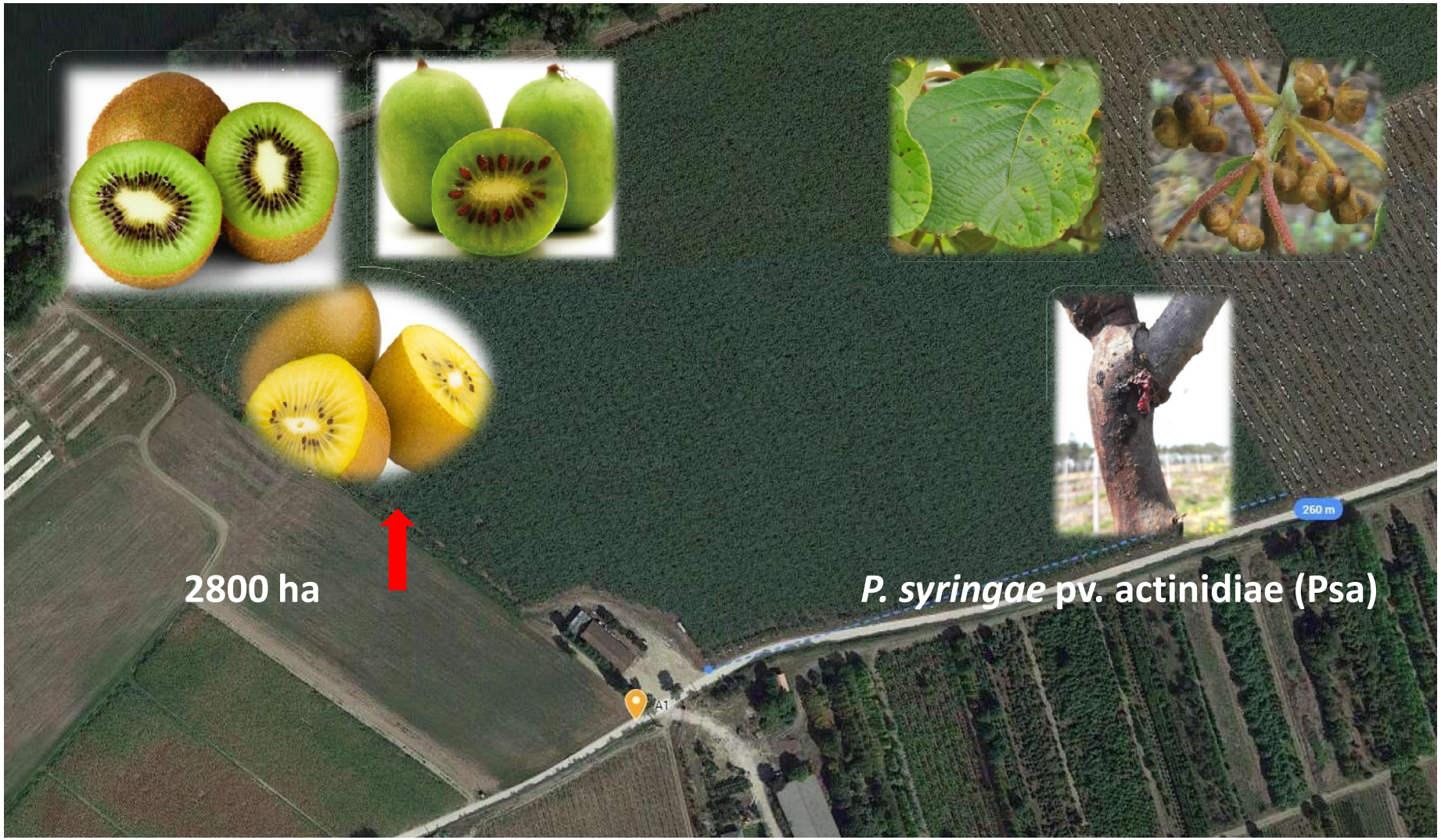
Introduction

- **Bulgarelli *et al.* (2013)** refer to the **microbiome** as the all genomes of the microorganisms in a particular habitat, whereas they define the **microbiota** as the set of microorganisms of a particular habitat **(microbiota =microbiome)**.
- **Nelson 2017** designated **microbiome plant** as **the** microbial communities associated with the plant which can live, thrive, and interact with different tissues such as roots, shoots, leaves, flowers, and seeds.



Characterization of *Actinidia* sp. microbiome

Introduction



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Characterization of *Actinidia* sp. microbiome

Material and methods

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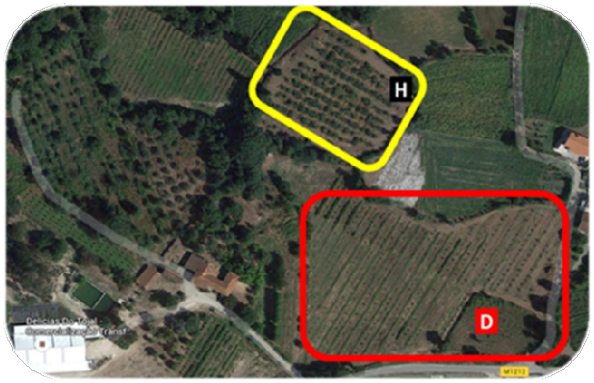
Characterization of *Actinidia* sp. microbiome

Material and methods

June (spring)

5 ♀ 5 ♂



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October(autumn)

culture-independent microbiome

culture-dependent microbiome

culture-independent microbiome

culture-dependent microbiome

Next Generation Sequence

Next Generation Sequence

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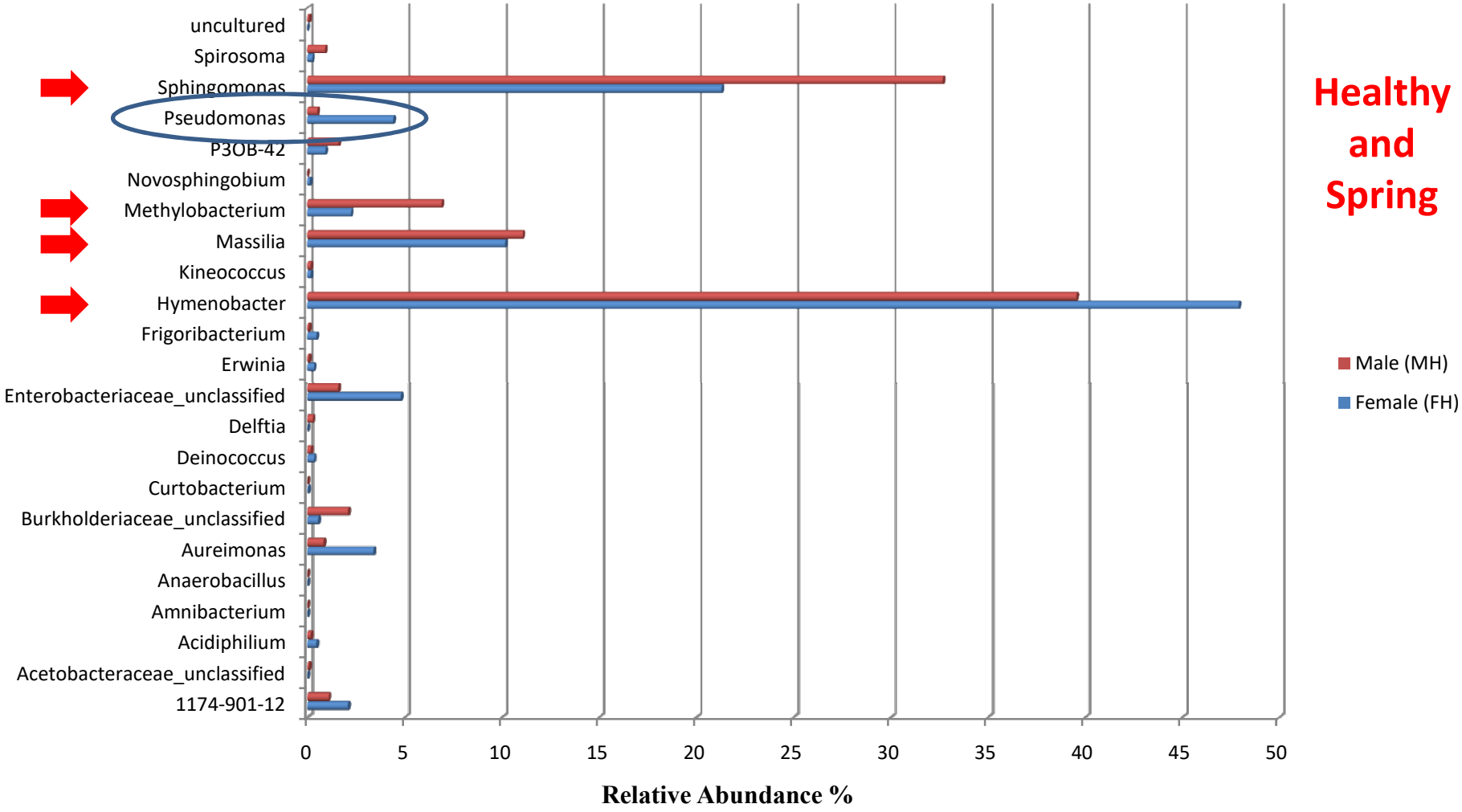
Results culture-independent microbiome



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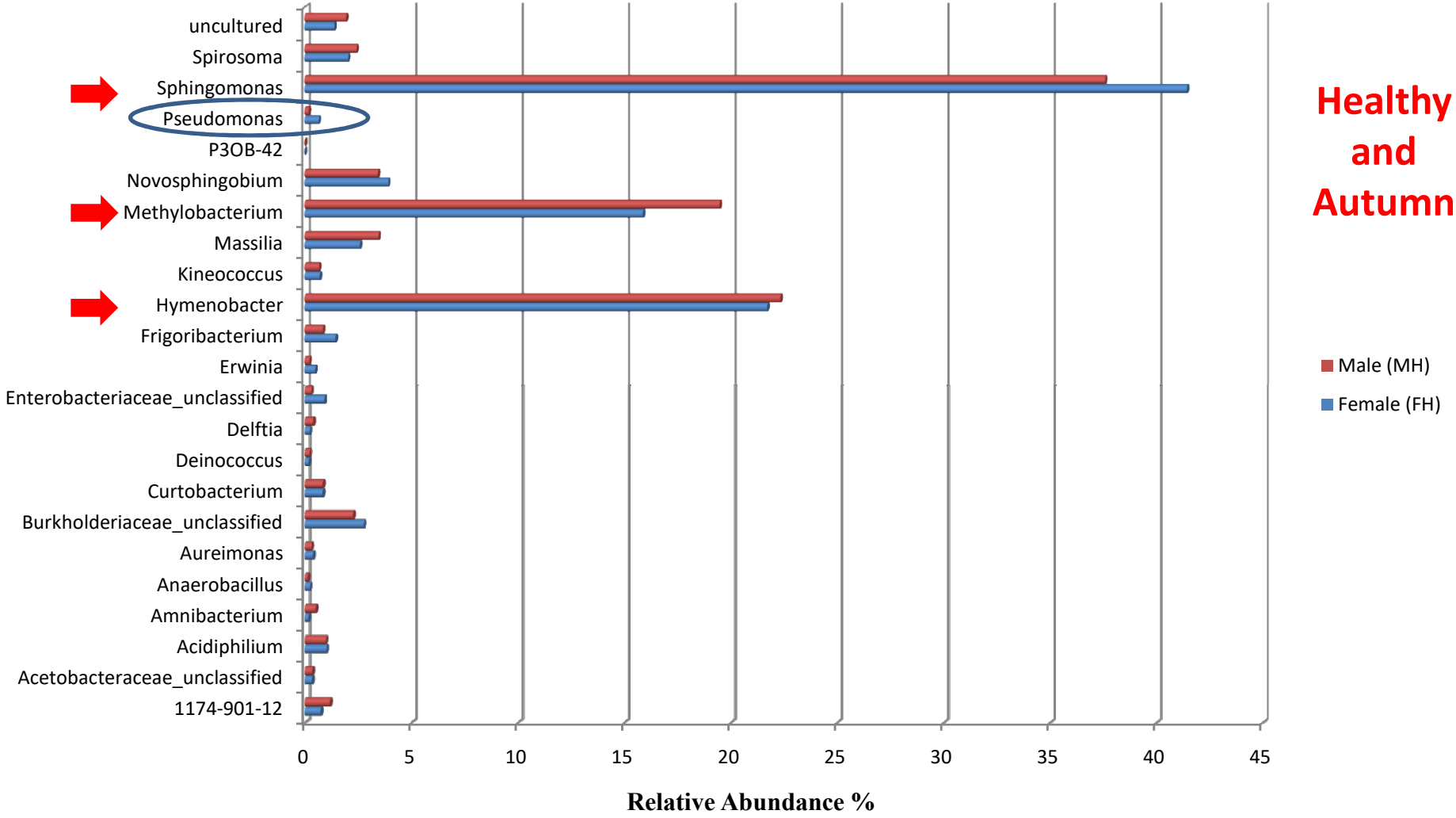

Healthy and Autumn

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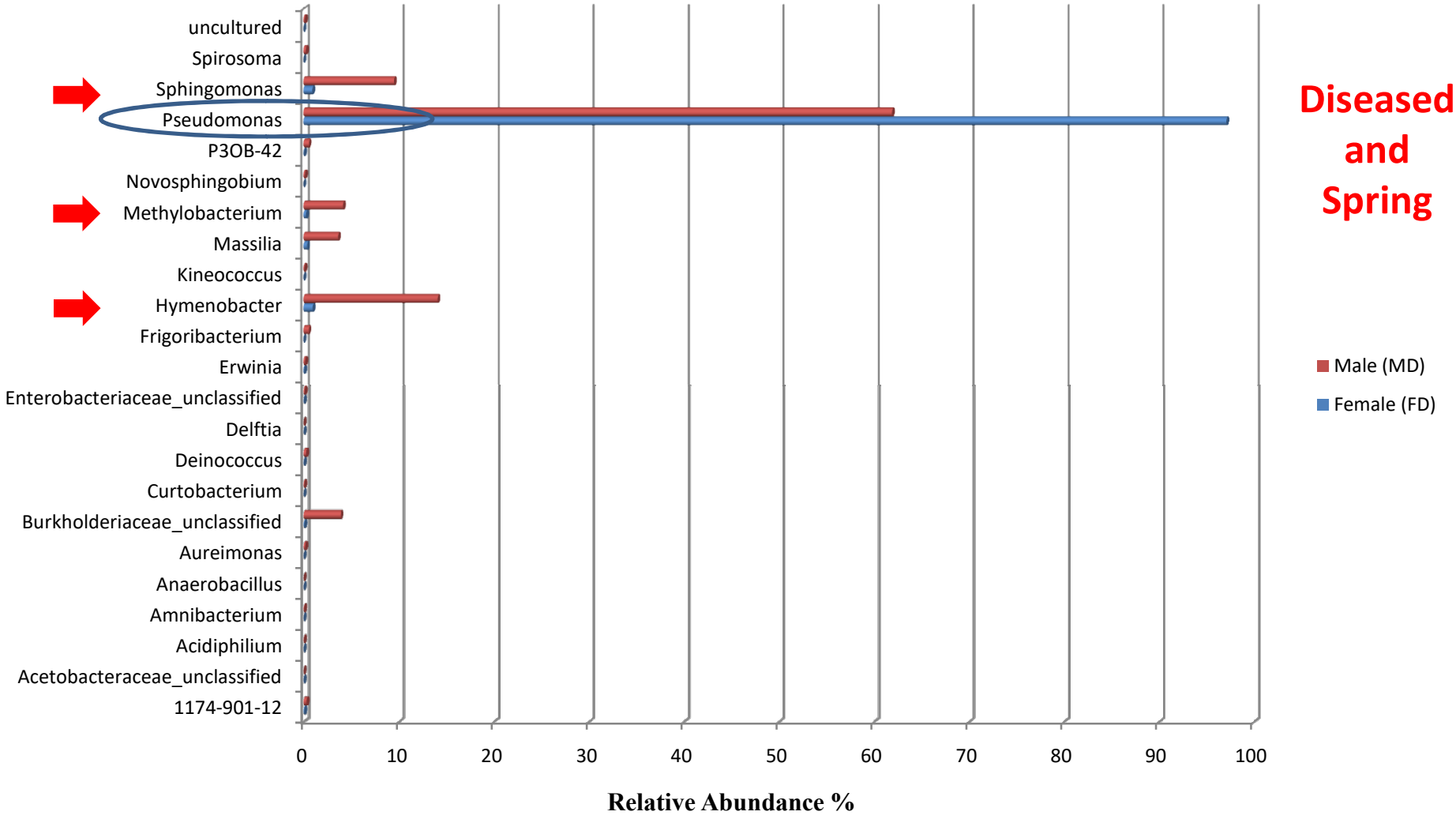

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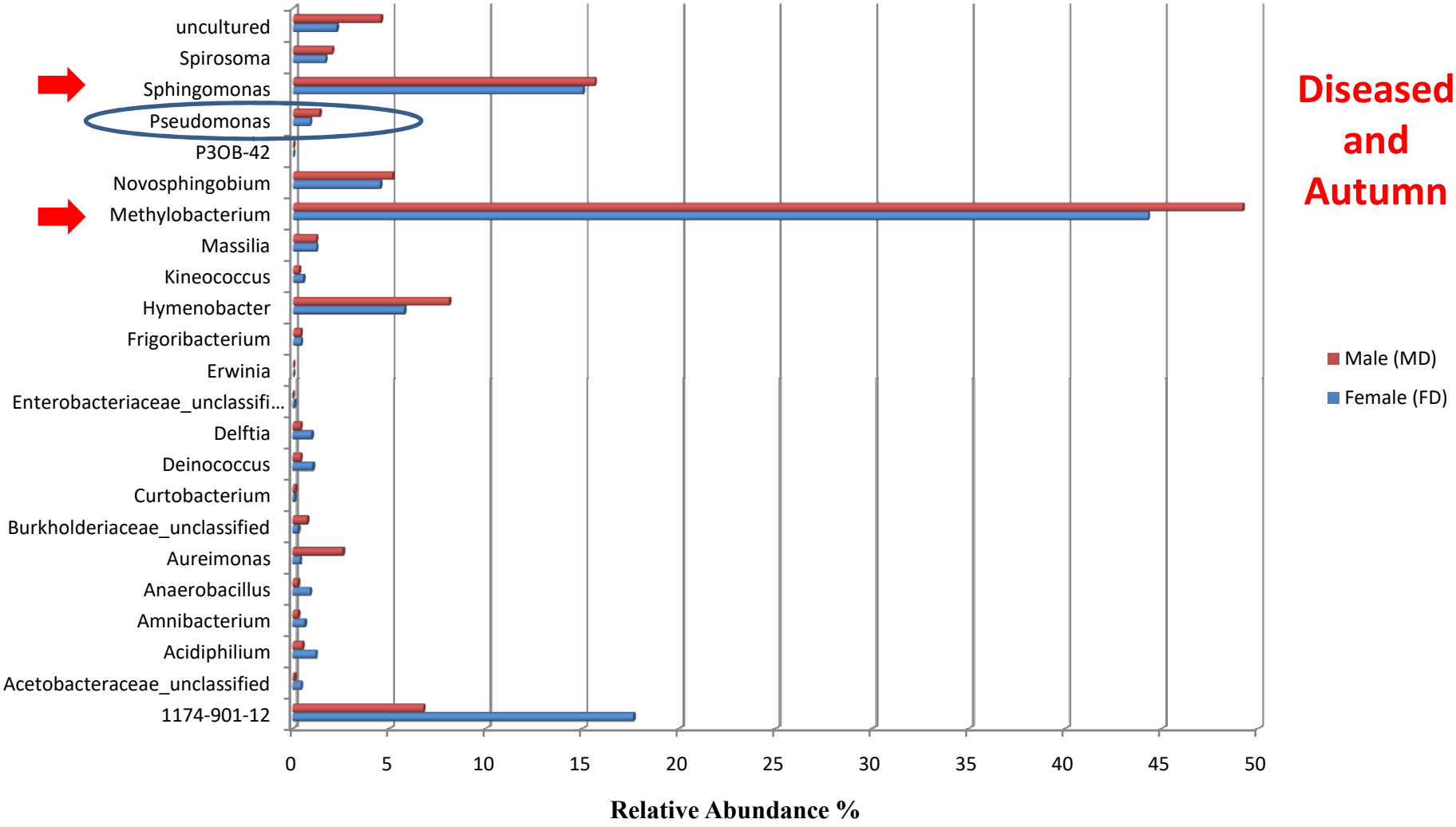

Diseased and Autumn

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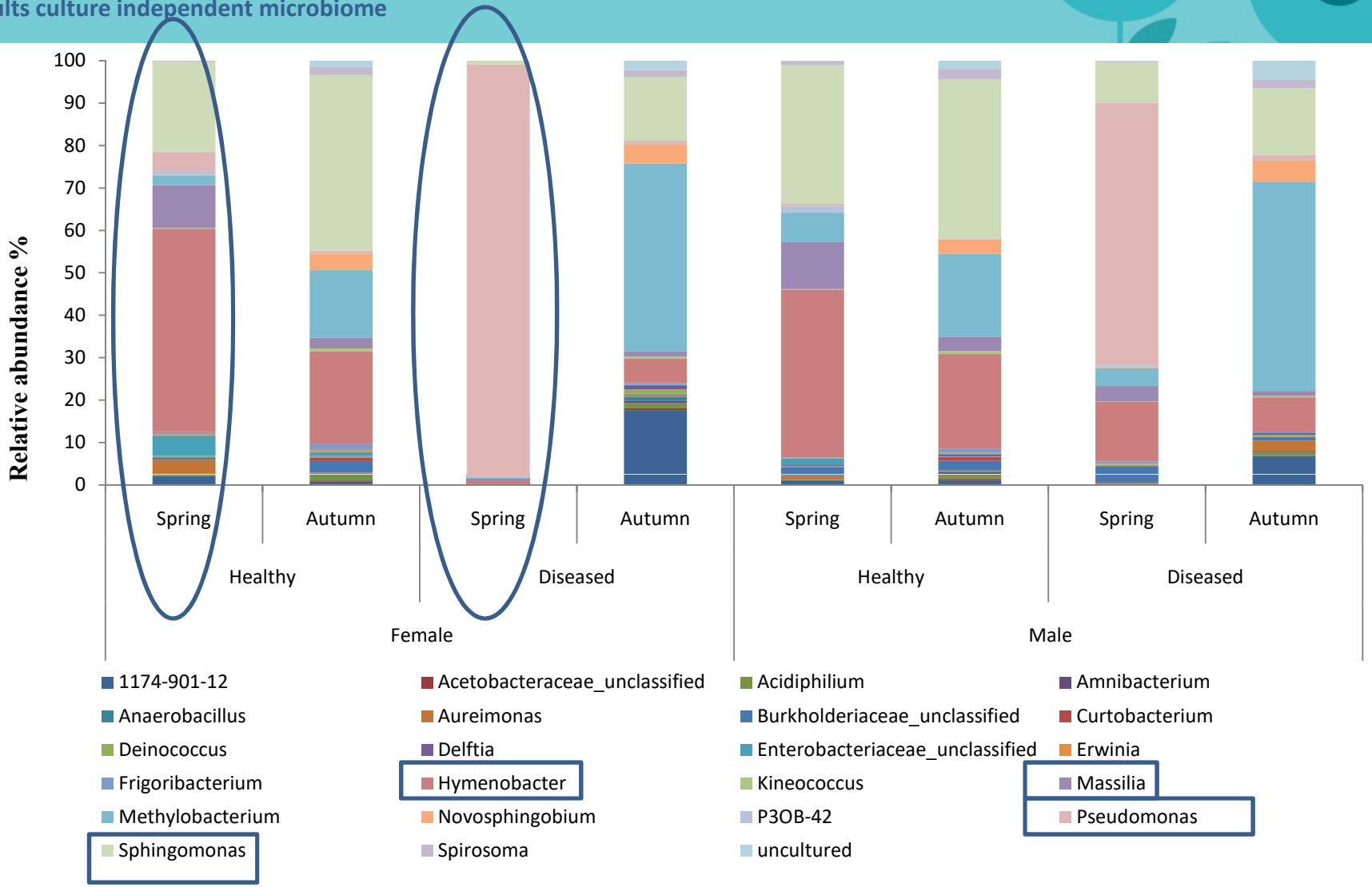

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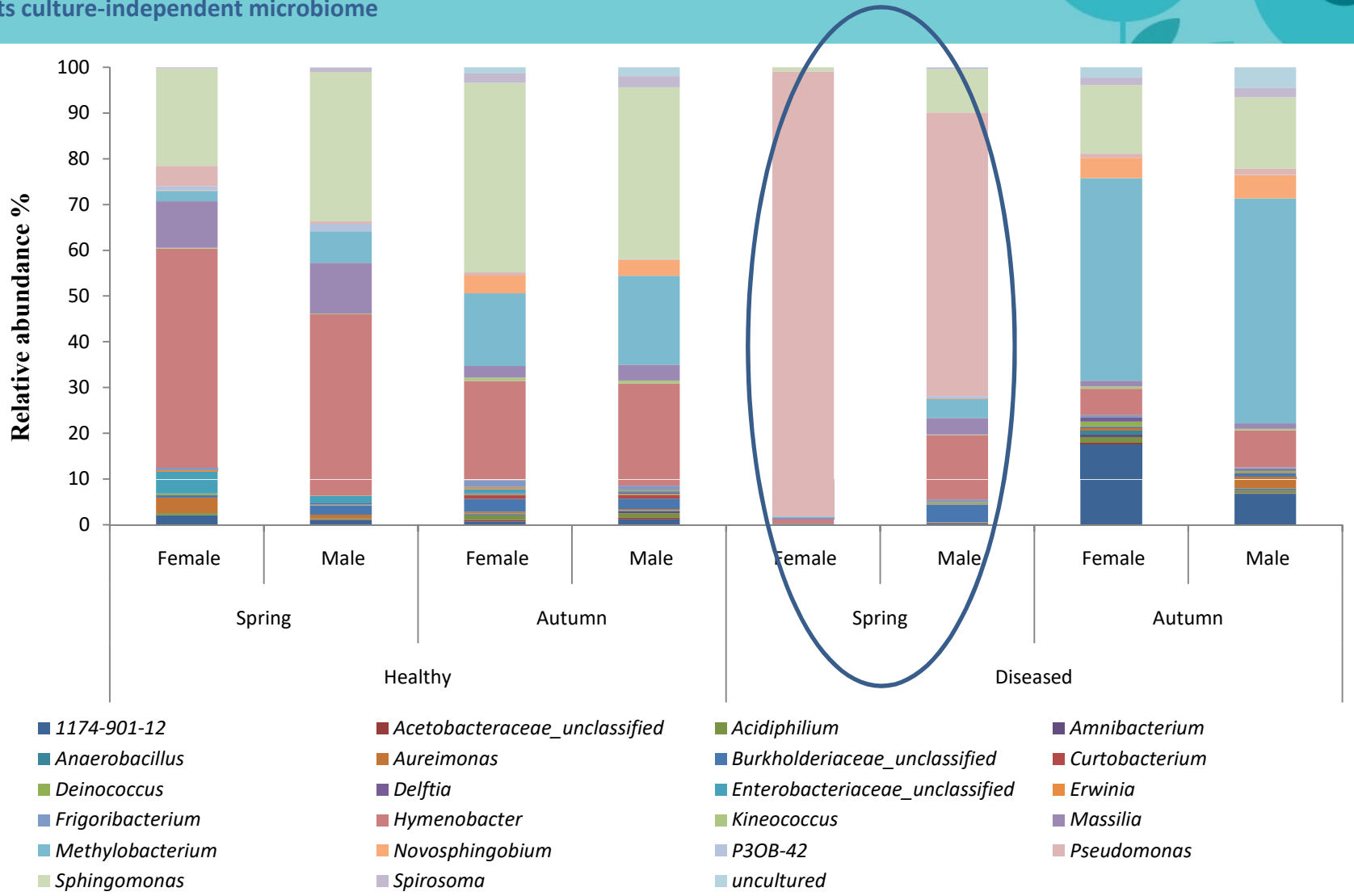

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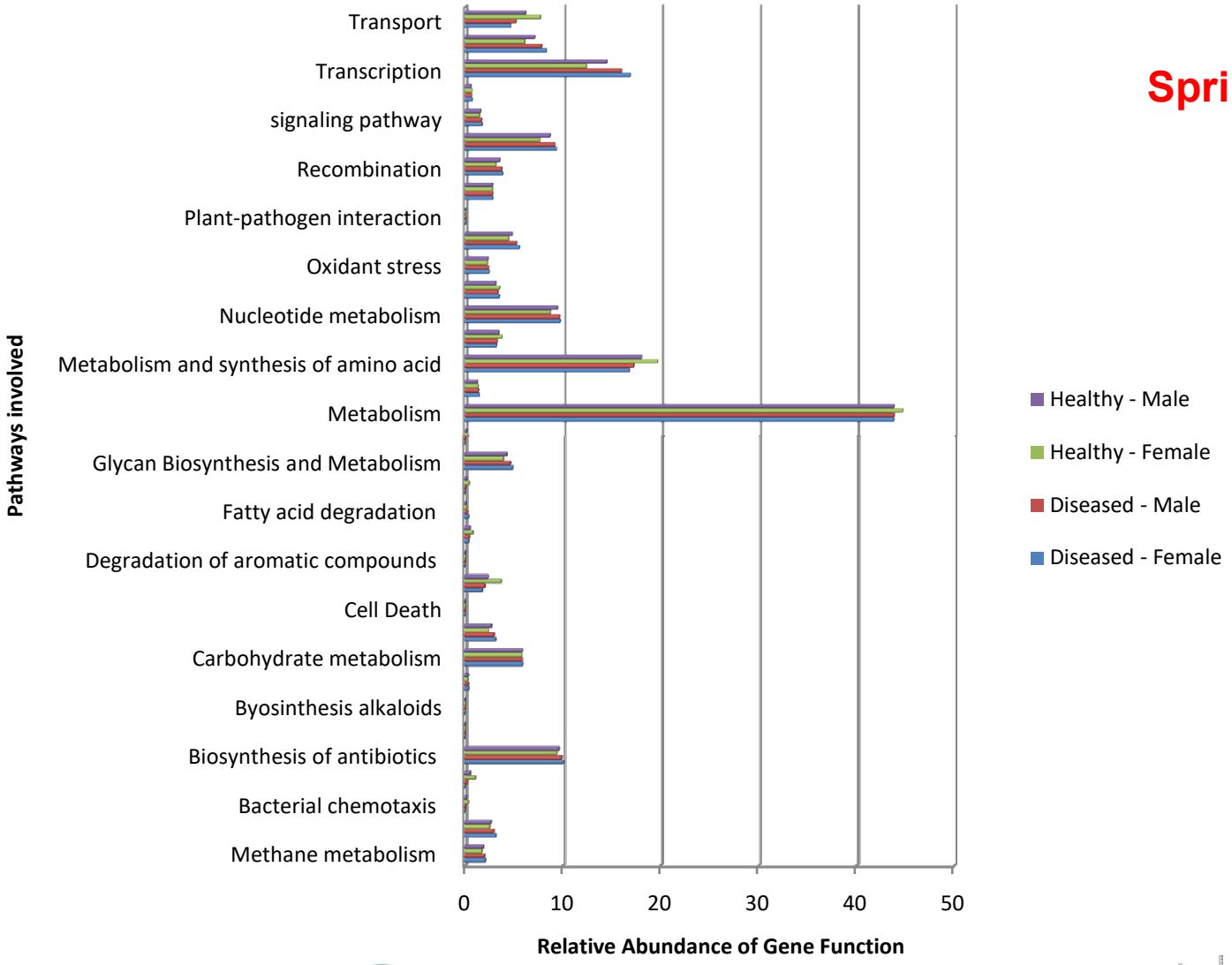
What can microbiome do?

Results culture-independent microbiome



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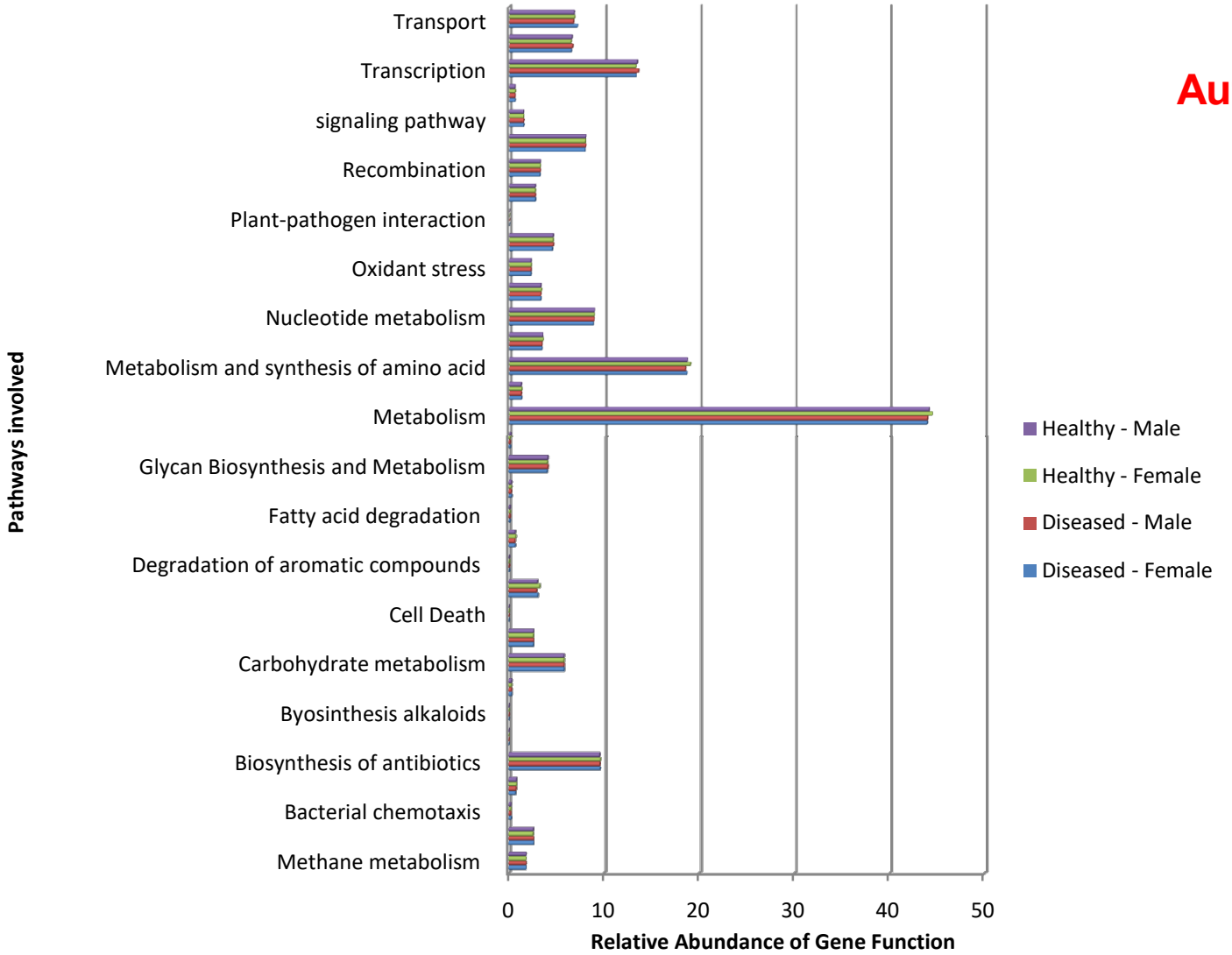

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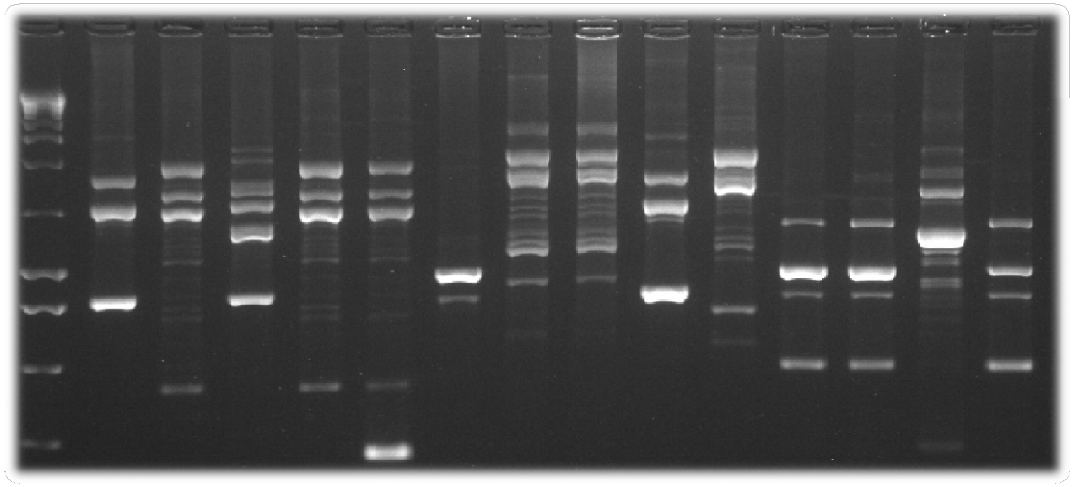
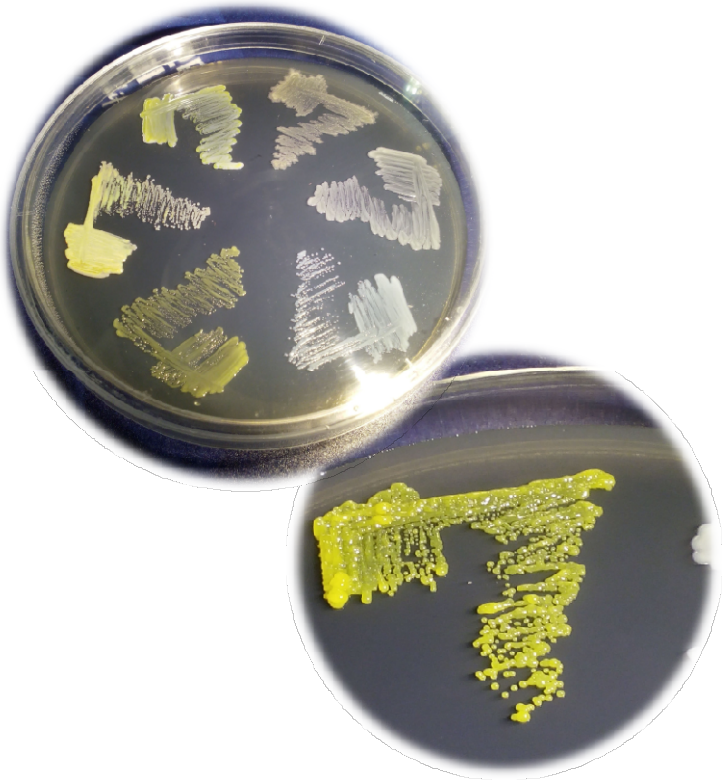
In study…

Type of samples	Nº of samples
Healthy female	291
Healthy male	384
Diseased female	270
Diseased male	313
Total	**1258**





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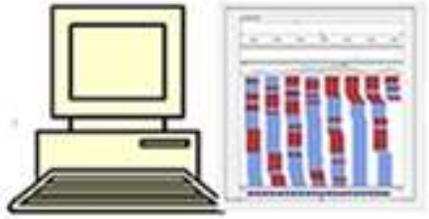
Bioinformatics applied to sustainable agriculture

Elucidate the effect of small **microbial consortia** against pathogens or on plant host resistance induction



Structure definition.
How is it?

Taxonomic assigment.
Who is it?

Feature identification. **What does it contain?**

Putative function
What can it do?

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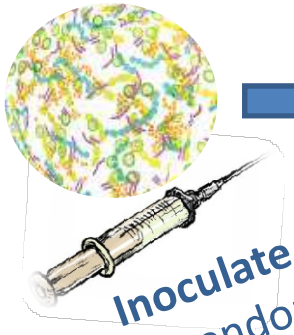
Biotechnology of the plant Microbiome

Wicaksono *et al*. (2017)

Leptospermum scoparium

Antimicrobial oils



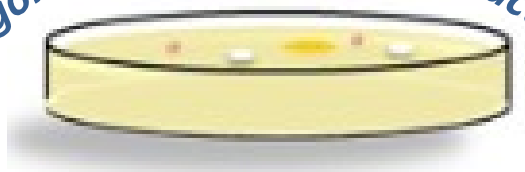
Inoculate bacterial endophytes

confer **resistance** to *P. syringae* infection

This study…

Sphingomonas sp.

Mecthylobacterium sp.



Pseudomonas sp.

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Conclusions

❖The combination of **culture -independent** microbiome and **culture-dependent** microbiome allowed a detailed analysis of the **bacterial structural diversity** associated with the phytossanitary status of *A. deliciosa*.

❖Like **Lamichhane and Venturi, 2015** we think that cooperative Interactions among different microbial species (pathogenic consortium), can increase disease incidence and development.

❖There were differences between male and female plants during spring from diseased orchard (**confirms the evidences in crop**).

❖The diseased male plants present higher bacterial diversity than diseased female plants.

❖This study helps to have more knowledge in two key points of control of bacterial canker of kiwifruit: spring and autumn.

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Perspectives futures

❖Finish the study regarding culture-dependent microbiome.

❖Test in vitro the bacteria isolates and/or bacterium consortium potential as biological control agent.

❖Test selected bacteria and/or bacterium consortium in plants.

❖Transfer bleeding-sap from healthy plants to diseased plants.

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i9Kiwi

Trabalho realizado no âmbito da Ação 1.1 Grupos Operacionais "I9K – InovKiwi – Desenvolvimento de estratégias que visem a sustentabilidade da fileira do kiwi através da criação de um produto de valor acrescentado" promovida pelo PDR2020 e co-financiada pelo FEADER, no âmbito do Portugal 2020.

PROGRAMA DE DESENVOLVIMENTO RURAL 2014·2020

PORTUGAL 2020

UNIÃO EUROPEIA

Fundo Europeu Agrícola de Desenvolvimento Rural

A Europa Investe nas Zonas Rurais

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Acknowledgment

Thank you very much for your atention

Joana Pereira, Eva García, Joana Costa, Igor Tiago

Aitana Ares acknowledges financial support by postdoctoral grants from FCT/MEC through national funds and the co-funding by the FEDER, within the PT2020 Partnership Agreement, and COMPETE 2020, within the project UID/BIA/04004/2013.