



The LifeWatch ERIC Biodiversity
& Ecosystem eScience Conference

PLOVDIV, BULGARIA

7-10 JULY 2026

Microbiome shifts in *Cuscuta campestris* galls: a shotgun metagenomic study

*Stefan Savov*¹, *Denitsa Teofanova*¹, *Monika Tothova*², *Peter Toth*³, *Lyuben Zagorchev*¹

¹ Faculty of Biology, Sofia University 'St. Kliment Ohridski', 8 Dragan Tsankov blvd., 1164, Sofia, Bulgaria

² Faculty of Agrobiological and Food Resources, Slovak University of Agriculture in Nitra, A. Hlinku 2, 94976 Nitra, Slovakia

³ bioToma, Ltd., Rúbaň 176, 941 36 Rúbaň, Slovakia

10 July 2026



SOFIA UNIVERSITY
ST. KLIMENT OHRIDSKI



FACULTY OF BIOLOGY
SOFIA UNIVERSITY

Cuscuta campestris – a plant parasite

- *Cuscuta* (dodders) is a genus of parasitic flowering plants, represented with 9 species in Bulgaria
- *C. campestris* is an invasive species, that has a wide range of hosts and causes crop damage



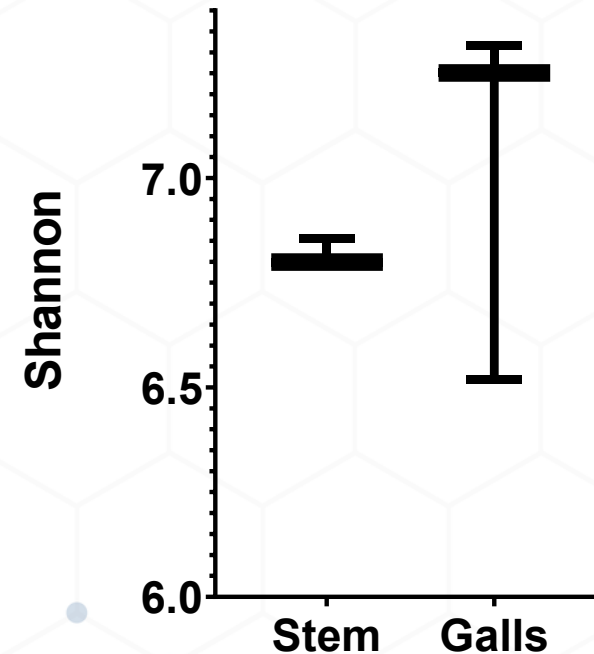
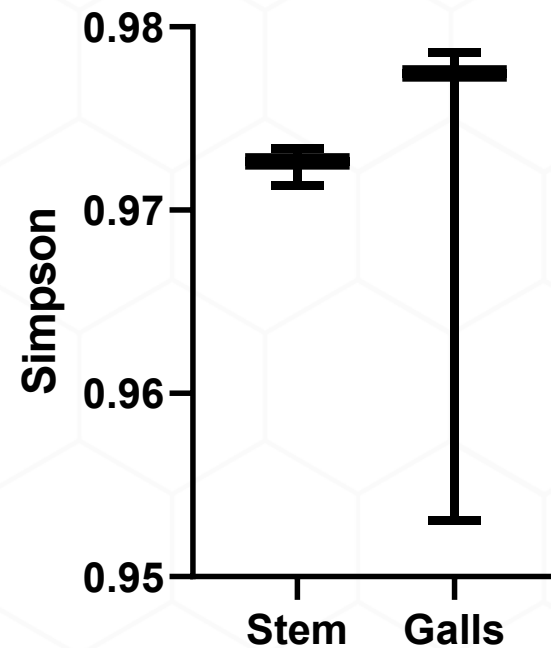
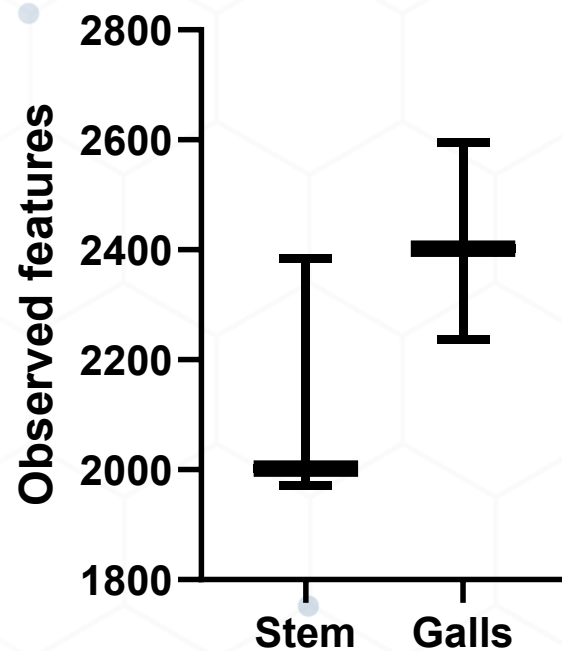
Smicronyx spp. – epiparasitic insects

- Weevils of the genus *Smicronyx* are known to lay their eggs in stems or inflorescences of *Cuscuta*, leading to formation of galls
- Galls have altered physiology, morphology and microbiome, relative to the non-infected plant

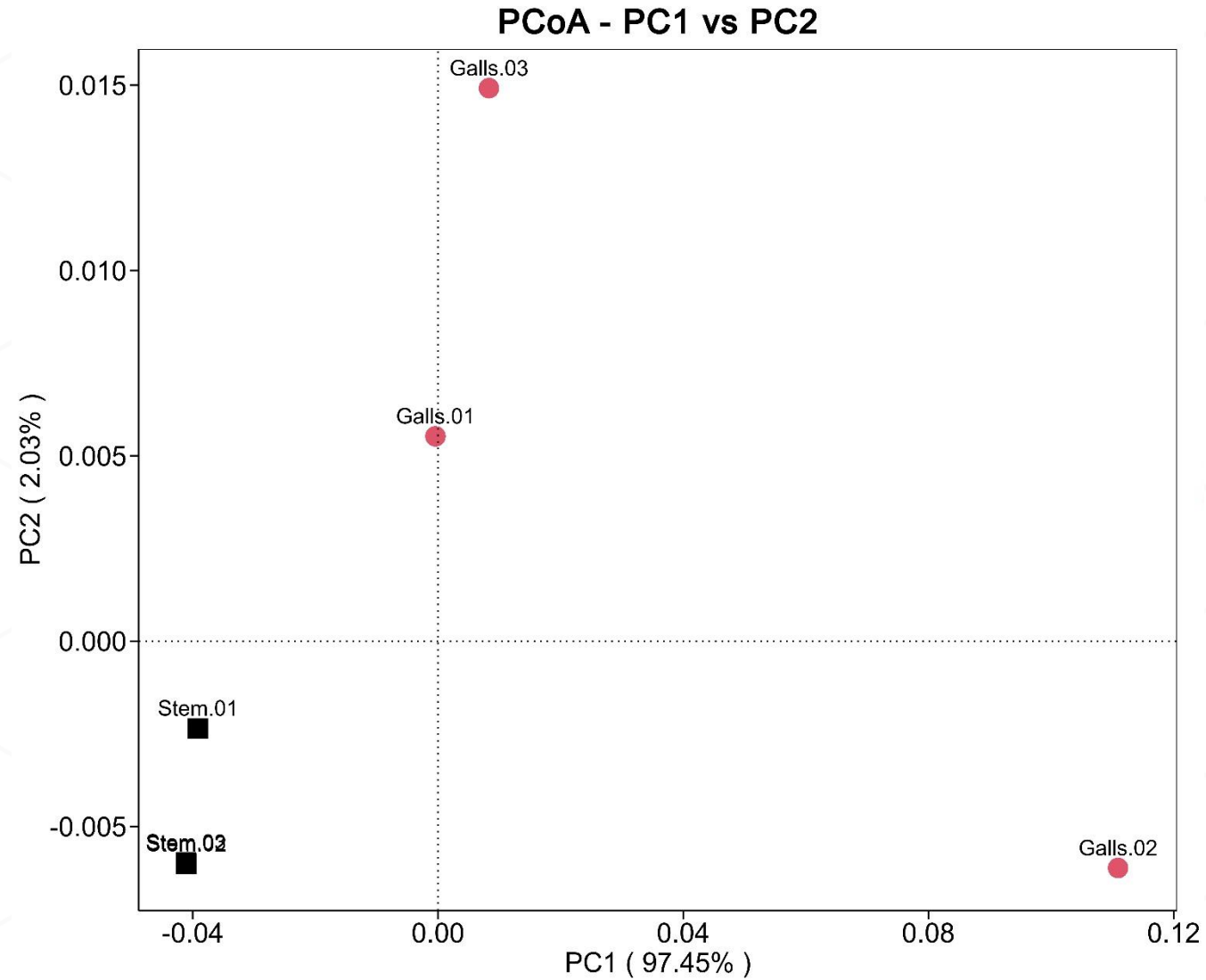


Alpha diversity

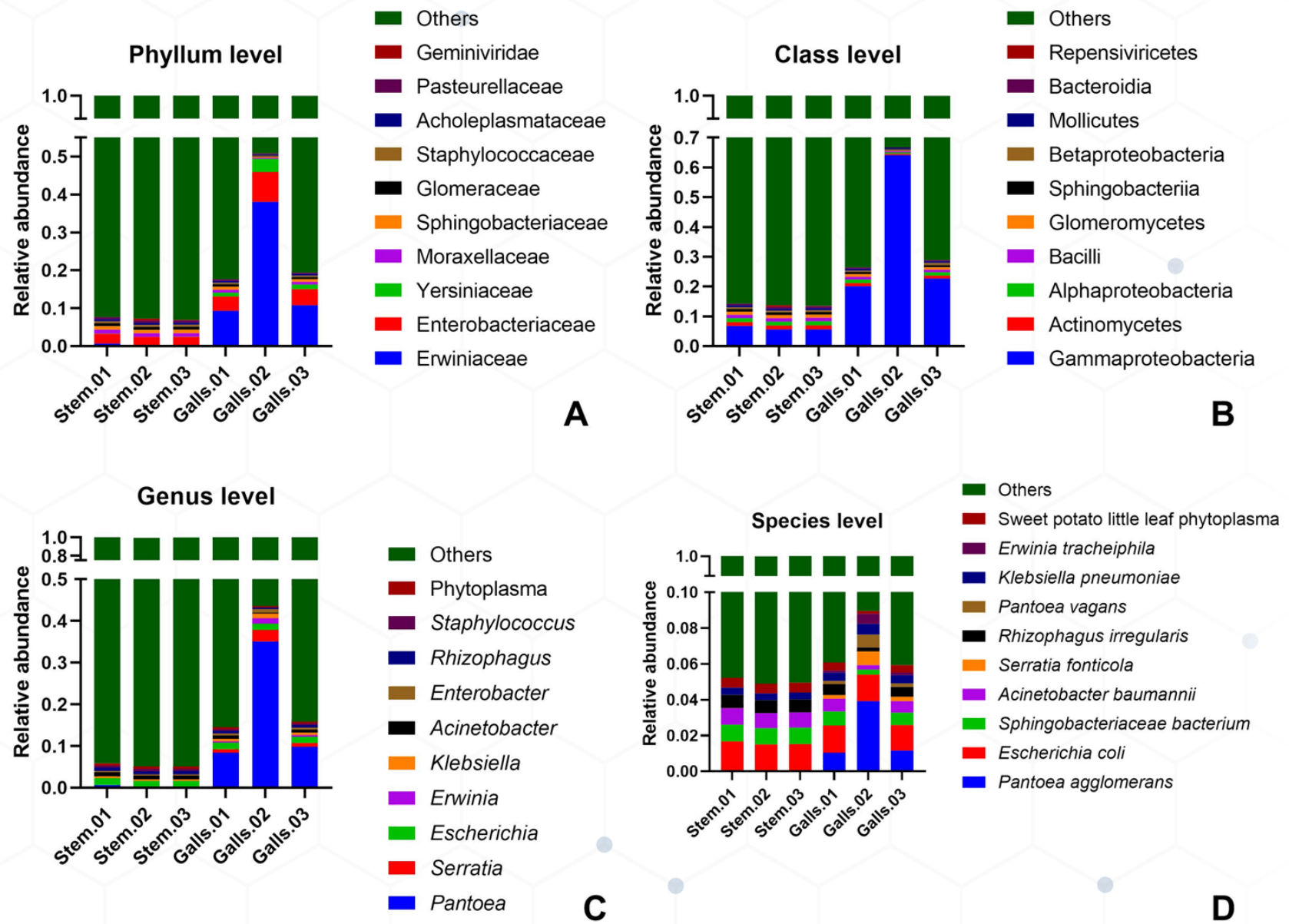
- Galls present a shift in the number and distribution of microorganisms



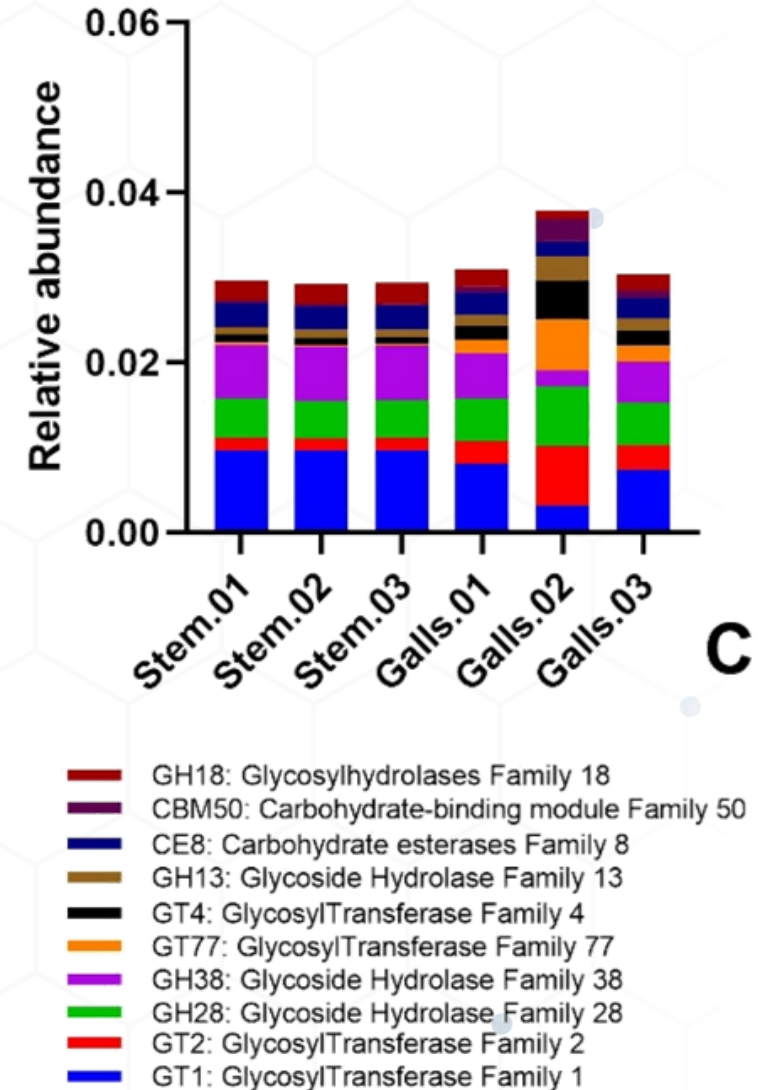
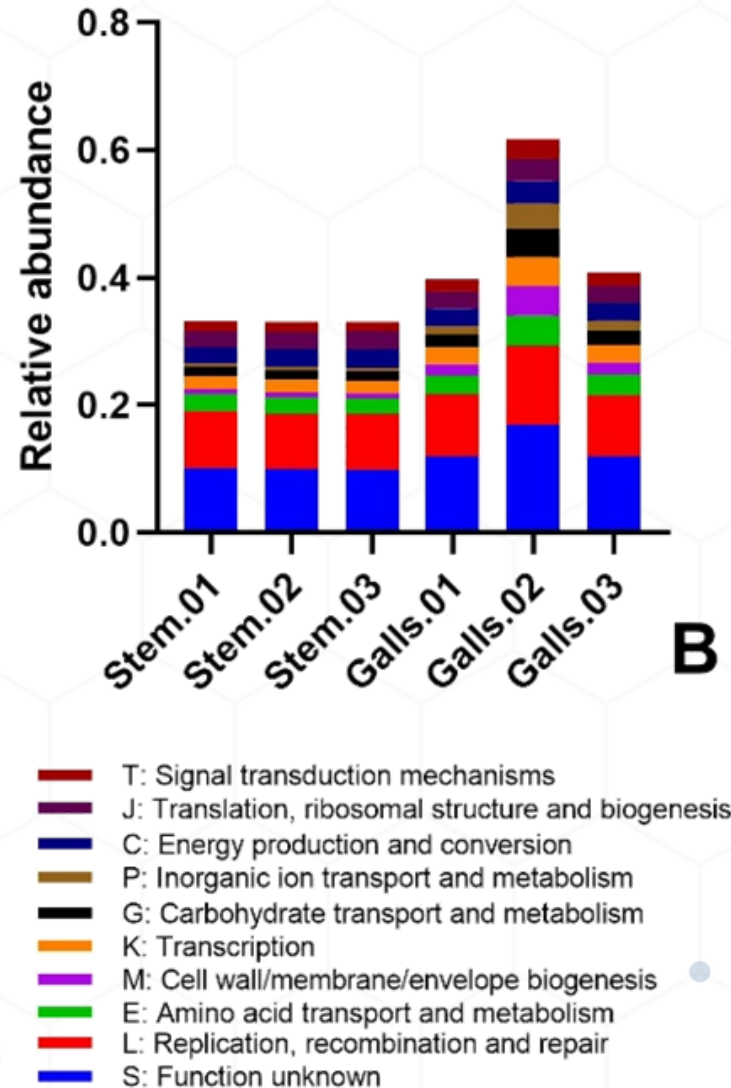
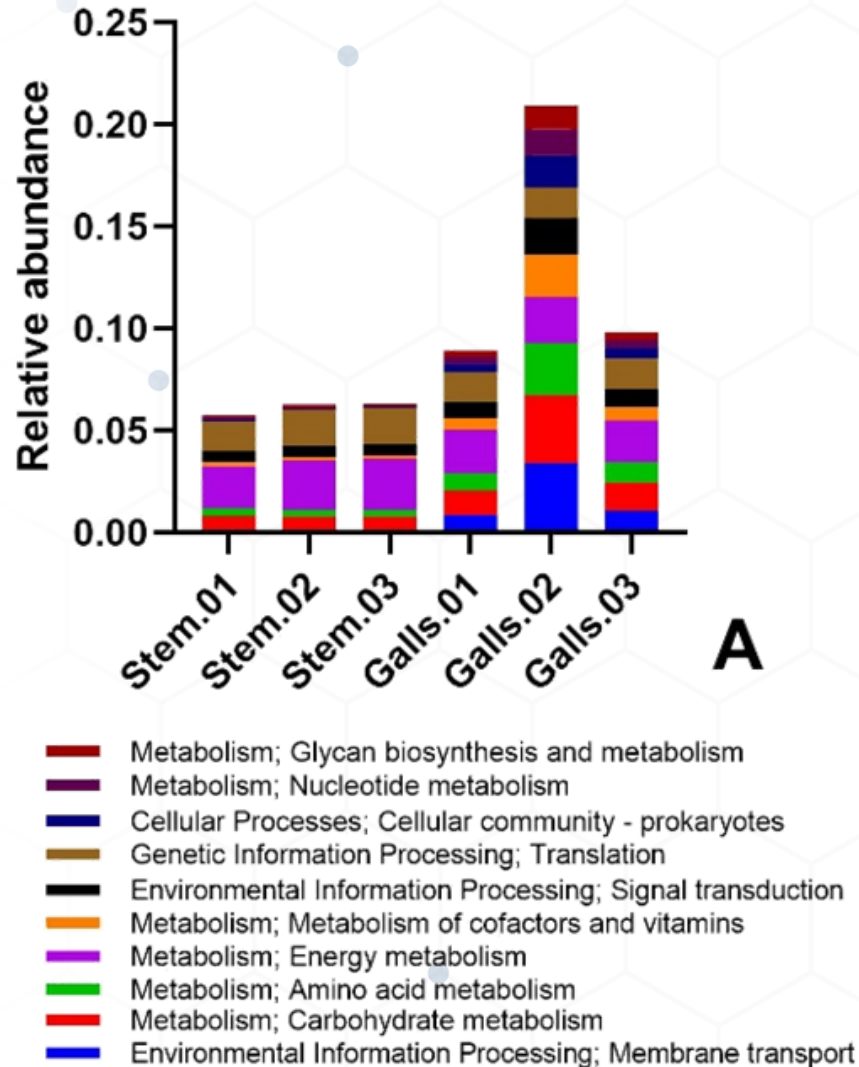
Beta diversity



■ Significant enrichment of Gammaproteobacteria, particularly members of the genera *Pantoea* and *Serratia*,

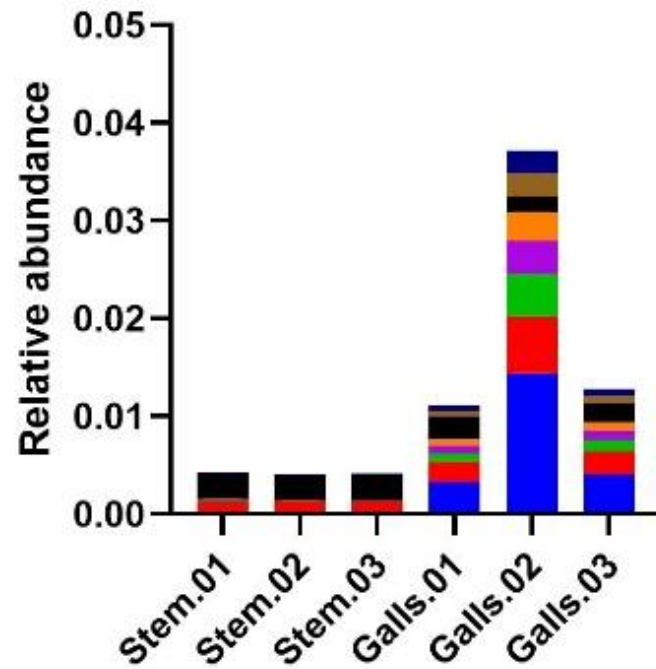


Functional annotation - KEGG, eggNOG, and CAZy enrichment of pathways



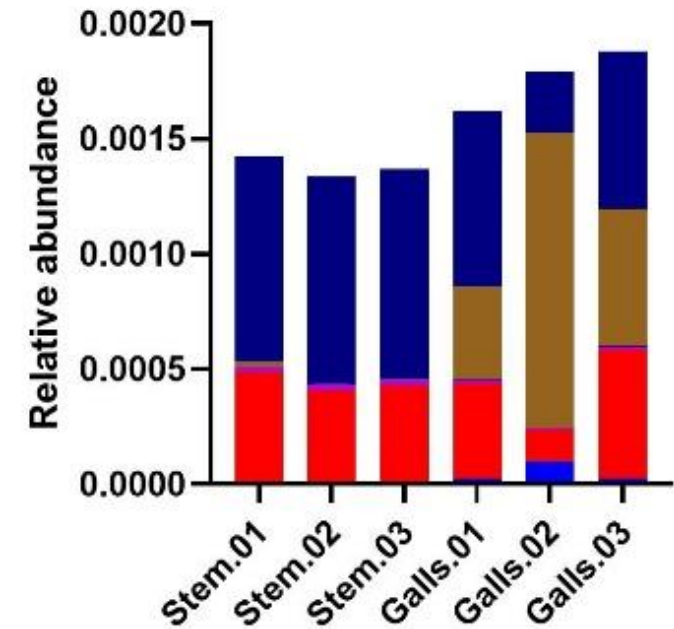
Presence of phytopathogens

Phytopathogens



A

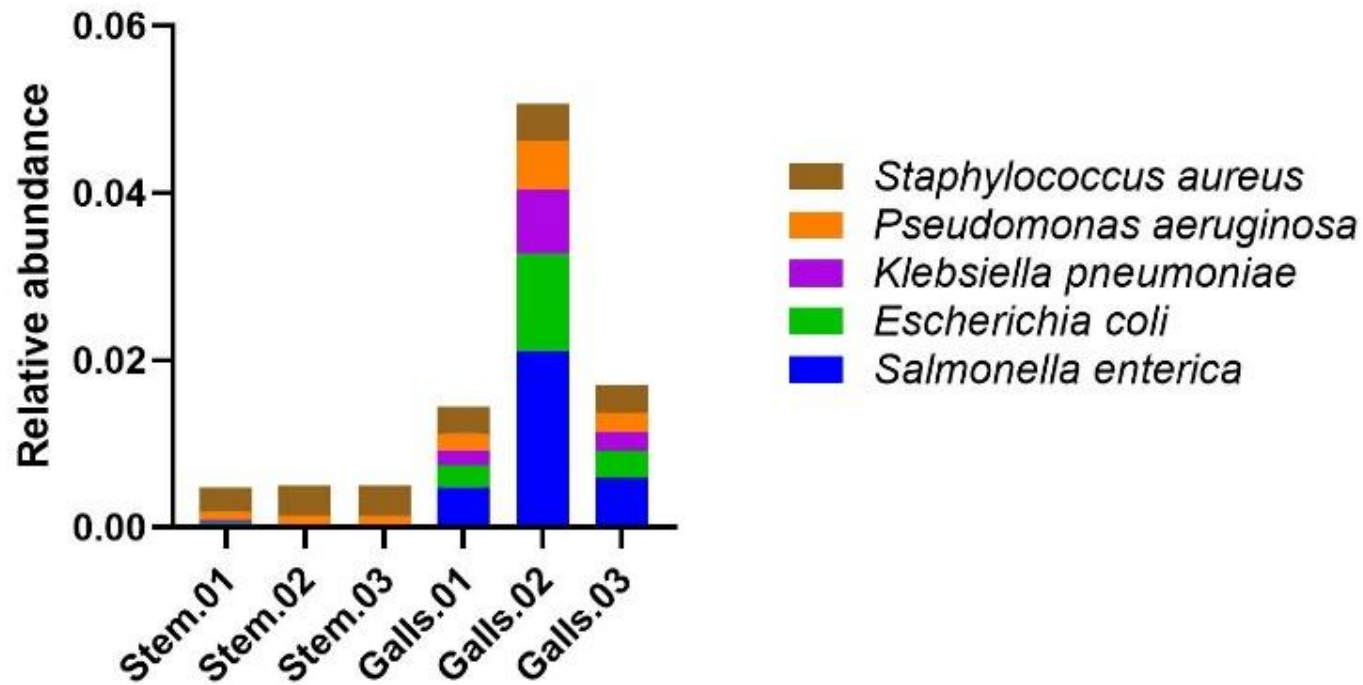
Phytopathogens_microNR



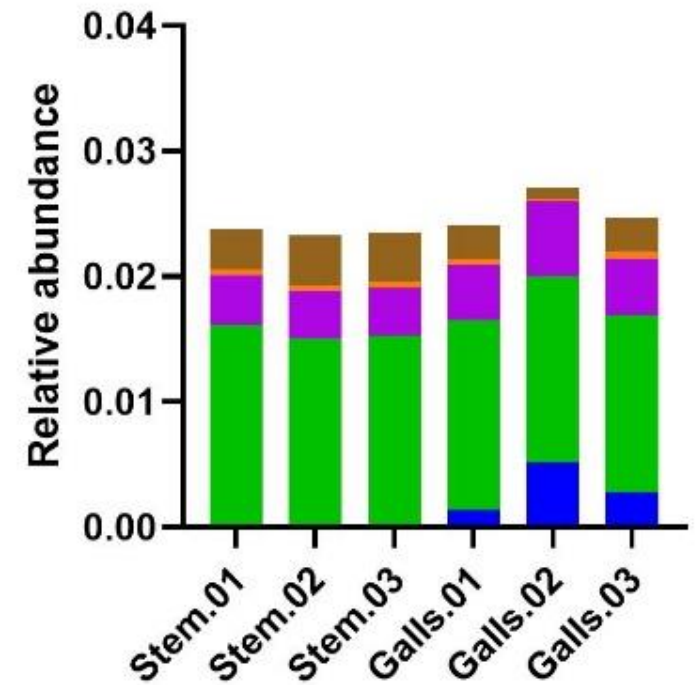
B

Presence of human pathogens

Pathogens



Pathogens_MicroNR



Conclusions

- 1) Gall formation is accompanied by a shift in the endophytic microbiome, with numerous taxa, associated with the weevil vector
- 2) The shift in the microbiome possibly benefits the development of the larvae by a shift in the metabolic features



The LifeWatch ERIC Biodiversity
& Ecosystem eScience Conference
PLOVDIV, BULGARIA 7-10 JULY 2026

THANK YOU!

Questions?

sssavov1@uni-sofia.bg

This study is financed by grants № KP-06-Slovakia/5 from 13.08.2024 of the National Science Fund, Ministry of Education and Science, Bulgaria and № SK-BG-23-0019 of the Slovak Research and Development Agency.

