**AIM**

*Salmonella enterica* and plant tissues

- Important human pathogens
- Consumption of plants has been associated with the risk of salmonellosis

Pathogenicity

Several factors have to be checked as infection requires the expression of genes not only coding virulence factors but also physiological processes such as stress response and adaptation.

Study

The ability of *Salmonella Typhimurium* to develop a biofilm community on rocket tissue in *silico* and *in situ*.

**MATERIALS and METHODS**

- **Rocket extract preparation**
  - Rocket extract
  - 4h at 4°C
  - 10-15 cfu/mL or cm² *Salmonella Typhimurium* (CDC 6516-60)

- **Inoculation**
  - LB or Rocket or Rocket Extract

- **Microbiological analysis**
  - Inoculated LB, Rocket Extract, Rocket
  - Serial Dilutions
  - 20°C

- **RNA extraction and cDNA synthesis**
  - Frozen cells (−80°C) stored in RNA later
  - Total RNA extraction (The PureLink® RNA Kit, Ambion)

- **Real time PCR and data analysis**

**RESULTS**

- The final population of *Salmonella Typhimurium* was affected from the rocket extract and rocket tissue as a difference of 1 log cfu/mL and 4 log cfu/cm² was observed regarding the laboratory medium.

- Regarding seven studied genes i.e. starvation, stress response, adaptation to nutrient deficiency, attachment, pathogenicity and quorum sensing, the differential expression was more associated with the planktonic and biofilm grown cells.

- *Salmonella* reacts as exposed to different types of stress when inoculated to a heat sterile plant extract and plant tissue.

- dps gene expression was found to be also affected when the pathogen was inoculated on stomata.

**CONCLUSION**

- The findings of the present study could show that *Salmonella Typhimurium* reacts as exposed to different types of stress when inoculated to a heat sterile plant extract at lower temperature.

- Further studies are needed to better determine the survival and / or growth of the pathogen as “real” biofilm cells on plant tissues.

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**Table 1. Target genes and primer synthesis**

**Table 2. Total population (log cfu/mL or cm²) of the examined samples at 20°C**

*This work was found by the action THALIS: “Biological Investigation Of the Forces that Influence the Life of pathogens having as Mission to Survive in various Lifestyles, BIOFILMS”, falls under the Operational Programme (OP) “Education and Lifelong Learning (EdLL)” and is co-financed by the European Social Fund (ESF) and National Resources.*
MONITORING THE GROWTH OF SALMONELLA ENTERICA SEROVAR TYPHIMURIUM IN SILICO AND IN SITU WITH A VIEW IN GENE EXPRESSION

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Salmonella is an important human pathogen capable of causing a diverse array of diseases, while it is recognized to be the one of the most related microorganism for foodborne diseases. However, several factors have to be evaluated for better understanding of bacterial pathogenesis as infection is a process which requires the expression of genes not only coding virulence factors but also physiological processes such as stress response and adaptation. In the present study, the ability of S. Typhimurium to develop a biofilm community on rocket tissue was investigated at 20°C. The differences on expression of genes associated with several functional roles during growth of S. Typhimurium on rocket extract and rocket tissue regarding a laboratory growth medium (Luria – Bertani broth, LB) was also monitored. The final population of S. Typhimurium was affected from the rocket extract (ca. 8 log cfu/mL) and tissue (ca. 5 log cfu/cm²) as difference was observed regarding LB (ca. 9 log cfu/mL). Regarding seven studied genes i.e. starvation, stress response, adaptation to nutrient deficiency, attachment, pathogenicity and quorum sensing, the differential expression was more associated with the planktonic and biofilm grown cells. The findings of the present study could show that Salmonella reacts as exposed to different types of stress when inoculated to a heat sterile plant extract and plant tissue. However, further studies are needed to better determine the survival and/or growth of these as “real” biofilm cells on plant tissues.

Acknowledgments
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