

Root internalization of *Salmonella* Typhimurium in basil plants

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Background:

Foodborne pathogens present in soil or irrigation water have the potential to internalize via root into edible parts of the plants and survive, representing a serious hazard for consumer's health (1). The present work assesses the ability of *Salmonella* Typhimurium (ST) to enter basil plants (*Ocimum basilicum* L., cultivar "Napoletano") from roots. This situation may represent a risk in food safety since that vegetable is largely used raw/undercooked, in the Mediterranean diet.

Methods:

Sixteen basil plants were cultivated in hydroponics, from the seeds. Roots from 14 plants at 4 leaves-stage were individually immersed in liquid media contaminated with a suspension of ST isolated from Aterno river in Abruzzo region, Italy (9 log₁₀ cfu/mL final concentration). Two plants were used as negative controls (no ST challenge); surface swabs were taken from leaves and stems to exclude external contaminations. After 24 hours, plants were tested for detection (UNI EN ISO 6579-1:2017) and enumeration (in-house method) of ST in leaves and stems.

Results:

ST detection gave positive results in 14/14 plants; in particular, ST was present in 14/14 plants in the leaves and for 9/14 plants also in the stems. The internalized ST strains were also enumerated in 10/14 plants. In particular, 3/14 plants gave positive results both in the leaves and stems, 2/14 only in the stems and other 5/14 only in the leaves. The average ST counts were of 4 log₁₀ cfu/g in leaves and stems. All negative ctr/surface swabs were negative to ST.

Conclusions:

Even though antimicrobial properties of basil plants have been described (2), this study demonstrated the potential of ST to internalize, survive and spread to edible parts. The findings highlight the risk of human infections by ST in plant following

root uptake, suggesting the importance of applying appropriate preventive pre-harvest strategies.

Biblio:

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Key messages:

- The ability of Salmonella Typhimurium to internalize, survive and spread to edible parts of basil plants.
- Pathogenic bacteria root uptake represents a potential risk for human health.