

Effect on madwort species

The net impact of individual and combined stress on plant physiology

The table shows the effect of individual and combined heavy metal and fungus stress on the physiology of madwort species

Crop: Madwort (*Alyssum serpyllifolium ssp. lusitanicum* A. *murale* and A. *saxatile var. compactum*)
Fungus: *Pythium mamillatum* and *P.ultimum*
Stress 1: Ni treatment-Seeds were treated with NiSO₄.6H₂O @ concentrations of 0, 20, 40, 60, 80 or 100 µg/ ml- Ni
Stress 2: Seeds were infected by incubating in petridishes with Ni treated sand wherein disks with *P.mamillatum* and *P. ultimum* infected hemp seeds were placed.
Stage of the plant: Seedling

Species	Stress treatments	Plant response to stress
		Type B parameter*
		% of healthy plants
<i>A. serpyllifolium ssp. lusitanicum</i>	Ni 20µg/ ml	76
	Ni 60µg/ ml	85.5
	Ni 80µg/ ml	81.5
	Ni 20µg/ ml + <i>P. mamillatum</i>	0
	Ni 60µg/ ml + <i>P. mamillatum</i>	4
	Ni 80µg/ ml + <i>P. mamillatum</i>	10.5
	Ni 60µg/ ml + <i>P. ultimum</i>	1
	Ni 60µg/ ml + <i>P. ultimum</i>	12
	Ni 80µg/ ml + <i>P. ultimum</i>	35.5
<i>A. murale</i>	Ni 20µg/ ml	63.5
	Ni 60µg/ ml	62
	Ni 80µg/ ml	56
	Ni 20µg/ ml + <i>P. mamillatum</i>	9.5
	Ni 60µg/ ml + <i>P. mamillatum</i>	21
	Ni 80µg/ ml + <i>P. mamillatum</i>	27
	Ni 20µg/ ml + <i>P. ultimum</i>	10
	Ni 60µg/ ml + <i>P. ultimum</i>	25.5
	Ni 80µg/ ml + <i>P. ultimum</i>	45
<i>A. saxatile var. compactum</i>	Ni 20µg/ ml	87
	Ni 60µg/ ml	62.5
	Ni 80µg/ ml	49
	Ni 20µg/ ml + <i>P. mamillatum</i>	0
	Ni 60µg/ ml + <i>P. mamillatum</i>	0
	Ni 80µg/ ml + <i>P. mamillatum</i>	0
	Ni 60µg/ ml + <i>P. ultimum</i>	0
	Ni 60µg/ ml + <i>P. ultimum</i>	0
	Ni 80µg/ ml + <i>P. ultimum</i>	6.6

Control value for Ni only treatment-81.5(*A. serpyllifolium*), 61(*A. murale*), 84 (*A. saxatile*)

For raw data – Click here (.xlsx file)

Reference-

Ghaderian YSM, Lyon AJE, Baker AJM (2000). Seedling mortality of metal hyperaccumulator plants resulting from damping off by *Pythium* spp. *New Phytologist* 146: 219-224.

Note: *Values are presented as it is from the source article without subjecting to the calculation.*

‘’ - For more information on parameter classification, please refer to the ‘methodology’ tab.*

The inference from the study: Ghaderian et al., 2000 studied the effect of nickel on damping off disease caused by *Pythium sp* in madwort species, *A. serpyllifolium*, *A. saxatile* and *A. murale*. *A. serpyllifolium* and *A. murale* are Ni hyperaccumulators whereas *A. saxatile* is a non-hyperaccumulator. Ni hyperaccumulation was found to confer enhanced protection to the pathogen. Thus, the study indicates that combined **Ni stress and *Pythium sp* infection was less damaging to madworts as compared to pathogen-only treatment.**