

Salinity Responses among Wild Cucurbits.

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Melon is a vegetable crop usually grown in regions with potential salinity or drought problems due to its moderate salt tolerance (Maas and Hoffman, 1977). Nevertheless important losses in productivity are undergone year by year. The intraspecific variation has been the source of salt tolerance exploited until now (Shannon et al, 1984; Anastasio et al., 1987). Experimental data support the idea that only a partial degree of salinity tolerance exists in the genetic pool of this species. Therefore the search of new sources of tolerance beyond the species limit, now that the interspecific hybridization is more feasible through biotechnological manipulation, could be a useful tool for the breeding of melon.

Nine accessions of wild Cucurbitaceae: Cucumis zeyheri, C. myriocarpus, C. metuliferus, C. ficifolius L-1 and L-4, C. anguria L-1 and L-2, Cucurbita martinezii and Citrullus colocynthis were studied under two salt conditions of 5 (ST-5) and 35 dS/m (ST-35) and a control experiment. Culture ran from July to December 1987. Trials were in hydroponics with 10 x 0.5 x 0.4 mts. plastic beds and sand as a substrate in a 400 m² plastic covered shelter. Irrigation solutions were built up by adding to the Hoagland solution amounts of marine salt to reach the mentioned EC. Eight plants per accession were allocated in each treatment. All treatments were irrigated with fresh water after transplanting. Saline treatments started two weeks after the transplant.

Every week all plants were surveyed for possible symptoms of salt stress and their state of health was individually listed. At the end of the cultivation period fruits were harvested, counted and weighed. The whole plants were also harvested and dried and the shoots and roots weighed separately on a per plant basis.

Salinity strongly reduces the dry matter in the plants both in the shoot and in the roots (Table 1a). The greater the salinity level applied the lesser the development rate reached by the plants. No plant set any fruit in the ST-35 (Table 1b) although blossoming and first stages of fruit set were noticed in Cucumis myriocarpus, C. ficifolius L-4 and C. zeyheri.

A plant of C. zeyheri displayed an unusual growth in the ST-5 (Table 1a) together with a different pattern of behaviour in contrast to the other plants of the accession. This plant was removed from the data monitored in Table 1a.

Citrullus colocynthis, an accession from the Canary Islands where it grows in environments with salinity and drought problems, had the smallest reduction in dry matter, however it reached a very poor development both in the control and in the ST-5, dying in the ST-35. We think that the culture condition was possibly not the most suitable for a species adapted to drought and therefore the cause of the lack of growth.

Table 1. Relative shoot and root dry weight and fruit yield based upon performance under salt treatment (a)ST 5 dS/m, b)ST 35 dS/m) expressed as the percentage of their growth under nonsaline conditions.

Species	Shoot d.wt.	Root d.wt.	Fruit no.	Fruit avg.wt.
a) ST-5				
<u>Cucumis zeyheri</u>	0.36	0.65	1.94	0.82
<u>Cucumis metuliferus</u>	0.21	0.22	-	-
<u>Cucumis myriocarpus</u>	0.41	0.73	0.48	0.71
<u>Cucumis ficifolius</u> L-1	0.45	0.96	3.77	1.81
<u>Cucumis ficifolius</u> L-4	0.35	0.41	0.41	0.54
<u>Cucumis anguria</u> L-1	0.54	0.92	0.05	0.07
<u>Cucumis anguria</u> L-2	0.38	0.62	0.19	0.22
<u>Cucurbita martinezii</u>	0.18	0.24	-	-
<u>Citrullus colocynthis</u>	0.57	0.57	-	-
b) ST-35				
<u>Cucumis zeyheri</u>	0.12	0.29	-	-
<u>Cucumis metuliferus</u>	0.03	0.28	-	-
<u>Cucumis myriocarpus</u>	0.13	0.66	-	-
<u>Cucumis ficifolius</u> L-1	0.01	0.08	-	-
<u>Cucumis ficifolius</u> L-4	0.14	0.08	-	-
<u>Cucumis anguria</u> L-1	0.03	0.75	-	-
<u>Cucumis anguria</u> L-2	0.10	0.41	-	-
<u>Cucurbita martinezii</u>	0.05	0.39	-	-
<u>Citrullus colocynthis</u>	-	-	-	-

Cucumis ficifolius L-1 and C. anguria L-1 coped fairly well at low salinity ST-5 but collapsed in ST-35.

There has not been found any real source of salt tolerance among the wild species of Cucurbits tested in the trial, although Citrullus colocynthis is a promising species if tested in another environment closer to its natural conditions.

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