

Introduction

Corema album (L.) D. Don (Ericaceae) is a dioecious shrub which rarely exceeds 1 m in height, endemic of the Atlantic dunes of the Iberian Peninsula, spread along the coast from Finisterre in the NW of Galicia to Gibraltar. The growing period takes place from February to July, reaching its maximum between April and June, while flowering occurs from February to April, with fruits ripening from June to July. Female plants produce white or pink-white berry-like drupes (5-8 mm diameter) in the middle of the branch as the terminal bud continues to grow, generally with three large pyrenes. The pyrenes (seeds) have a thick woody endocarp. Fruits are considered to be mildly acidic with a lemony flavor, rich in water and antioxidants, which are edible and very refreshing. Based on this, *C. album* has the possibility to become a new niche berry crop. Considering the agronomic and market possibilities for this specie, initial breeding would be by mass clonal selection on plants grown from seed collected from populations in their native habitat. This populations need to be characterized and plants selected for large fruits, good fruit quality and small seeds. So, the initial research step is the development of a seed germination protocol.



Material and Methods

White, soft fruits of *C. album* were collected in August 2011 from 7 locations in Portugal (12 genotypes each location). Additionally, fruits from 18 genotypes were collected in November 2012 from Aldeia do Meco. After each collection date, seeds were separated from the pulp and kept at 4°C. In the first year trial (2013) germination experiments were done with seeds from Duna de Quiaios, Comporta collected in 2011 and from Aldeia do Meco in 2011 and in 2012. Seeds were divided into four replications of 25 randomly selected seeds each and used for each pretreatment and location during all germination experiments. **2011 Experiment** - before pretreatment with GA₃, all seed replicates were exposed to concentrated sulfuric acid for 30, 60 and 120 minutes. Seed replicates were then put into flasks containing 1000 ppm GA₃ for 24 hours in the dark. **2012 Experiment** - All seeds were treated with 30 minutes sulfuric acid and 1000 ppm GA₃ for 24 hours in the dark.

Locations

Table 1. Location, Latitude and Longitude of seven sites of *Corema album* D. Don in Western Portugal collected in August 2011, and the Mean Berry Weight, Percent Translucency after 19 days at 4°C and 100 Seed Weight of 12 plants at each site.

Location	Latitude/Longitude	Date harveste d	Mean Berry Weight gm	% Translucency after 19 days	100 seed weight gm
Lagoa S. André	38°07'11" N 8°47'40" W	4 Aug.	0.31	30.4	1.48
Pego	38°17'31" N 8°46'38" W	4 Aug.	0.41	21.3	1.52
Carvalhal, Comporta	38°18'04" N 8°46'40" W	4 Aug.	0.38	49.7	1.25
Aldeia do Meco	38°28'07" N 8°11'10" W	12 Aug.	0.42	27.6	1.25
S. Pedro de Moel	39°47'57" N 8°59'23" W	16 Aug.	0.49	38.3	1.23
Duna de Quiaios	40°13'43" N 8°52'02" W	16 Aug.	0.36	36.5	1.04
Dunas do Mira	40°26'22" N 8°17'06" W	16 Aug.	0.40	28.4	0.93
LSD (P=0.05)			0.052	19.6	0.163
Mean			0.39	33.0	1.24
Minimum			0.21	7.1	0.57
Maximum			0.55	100	1.99

From: Oliveira, P. B. & Dale, A., 2012. *Corema album* (L.) D. Don, the white crowberry - a new crop. *Journal of Berry Research* 2:123-133.

Results

First trial (2013)

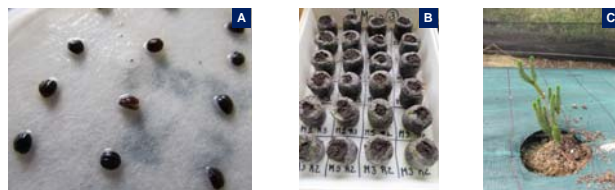
Second trial (2014)

Effects of acid scarification duration and gibberellic acid on germination responses.



A - *Corema* seed after scarification (30 minutes in H₂SO₄). B - Seeds were placed in the germination chamber with 8 hours dark at 15°C and 16 hours light (32 µmol m⁻² s⁻¹) at 25°C for six months. C - Radicle emergence (> 1mm) was the criterion used for scoring a seed as germinated.

Germination to seedling



A - Petri dish with seeds opening. B - Jiffy pots with seeds after emergence of the radicles. C - Seedling planted in the field.

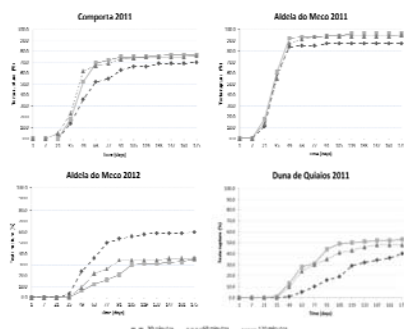


Figure 1. Effect of acid scarification (30, 60 and 120 minutes) followed by 1000 ppm of gibberellic acid on the time courses of testa rupture of *C. album* seeds from Comporta 2011 (a), Aldeia do Meco 2011 (b), Aldeia do Meco 2012 (c) and Duna de Quiaios 2011 (d). The incidence of testa rupture was scored with time (days) after the start of incubation; N=4 Petri dishes of 25 seeds each per acid scarification duration.

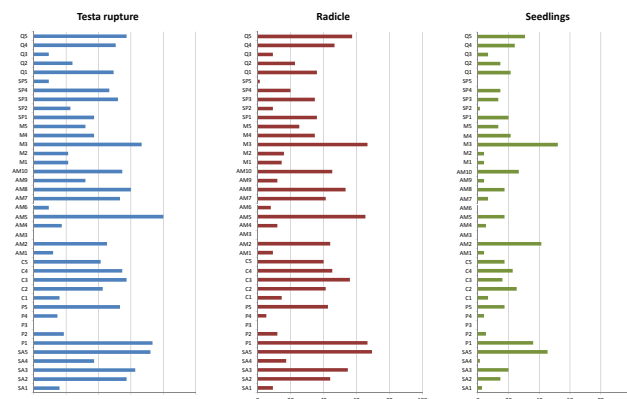


Figure 2. Percentage of seeds with testa rupture, radicle emergence and seedlings for seven different locations and five genotypes per location. All seeds were treated with sulfuric acid (30 minutes) followed by 1000 ppm of gibberellic acid after six months. N=5x3, Petri dishes of 25 seeds each per location. AM1 to 5 seeds from Aldeia do Meco (2011), AM 6 to 10 seeds from Aldeia do Meco 2012.

Discussion and conclusions

First trial (2013):

In the first study, there was site-to-site variation in the same year and year-to-year variation in a particular site in percentage of germinated seeds. Our results suggest that the overall probability of germination for a seed collected from Aldeia do Meco in 2011 is more than that of seeds collected from Comporta in 2011, from Duna de Quiaios in 2011 and from Aldeia do Meco in 2012.

Second trial (2014):

In the second trial it was possible to increase the percentage of radicles per location but the number of seedlings is still too low. The best combination location/clone was Mira/clone 3 with 67% testa rupture, 67% radicle emergence and 53% seedlings. These results suggest that the germination success is clone dependent and not location as we have assumed in the previous experiment.

Acknowledgments

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