

Characterization of Nordic region wild carrot

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Wild carrot - Sjællands Odde, Denmark (Photo S.Ø. Solberg)

Introduction

The Nordic Genetic Resource Center (NordGen) has been a partner in the ECPGR Working Group project on Umbellifer crop wild relatives and has targeted the project in work package 2 on *Characterization of Nordic accessions of wild carrot*. NordGen works on various aspects of conservation and use of plant genetic resources and holds an *ex situ* collection of ca. 32 000 accessions. Out of these, 7600 are classified as wild or semi-wild material, with the grasses as the dominant group (Solberg et al. 2013). Wild or semi-wild material from the Apiaceae family is limited to 69 accessions of *Carum carvi*, 35 of *Angelica archangelica*, 16 of *Daucus carota*, 4 of *Pastinaca sativa*, and a few from other species (ibid). Cultivated and wild carrots (*D. carota*) differ in a lot of characters. Wild carrot has the potential of being used in breeding to introduce new disease and pest resistance genes (GenRes 2002). There are two subspecies of wild carrot in the Nordic region: *D. carota* subsp. *carota* which is common in the southern parts of the region, and *D. carota* subsp. *gummifer* (Syme) Hook., which is rare and only found in coastal areas of parts of

Denmark (Poulsen, 2009). At the start of the project we had only classified one of the accessions in the NordGen collection as subsp. *gummifer*.

Material and methods

Fourteen wild accessions collected from Denmark, Sweden and Norway were characterized. In addition a control – Nantes (NGB547) was included. The collected accessions were all registered as *Daucus carota* subsp. *carota* in our database, but reports from one of the collecting sites found *Daucus carota* subsp. *gummifer*. Therefore it was also relevant to include a verification of this accession's taxon.

All accessions were sown in large plastic pots early March, grown in greenhouse for 60 days and thereafter placed outside in the pots. The IPGRI *Descriptors for wild and cultivated Carrot* were used to score the accessions, but instead of the traditional 3, 5, 7 scores SI units were preferred, such as cm, mm. Ten to fifteen single plants were scored per accession to show the variation within the accessions and to calculate mean values. The data have so far been analysed by Excel software, but we aim to do further statistical analyses later.

Results

Here we will only present the most interesting results, but all characters are scored and will be included in NordGen's database linked to the accessions. Further scoring, especially on the flower characters will be carried out in 2014. So far the results confirm that all the wild carrot accessions in our collection belong to *D. carota* subsp. *carota*.

Seedling root length after 60 days

There were differences in this character ranging from average values of 8 cm to 14 cm, but with large variation within the accessions, as shown by NGB21386 as an example (Figure 1).

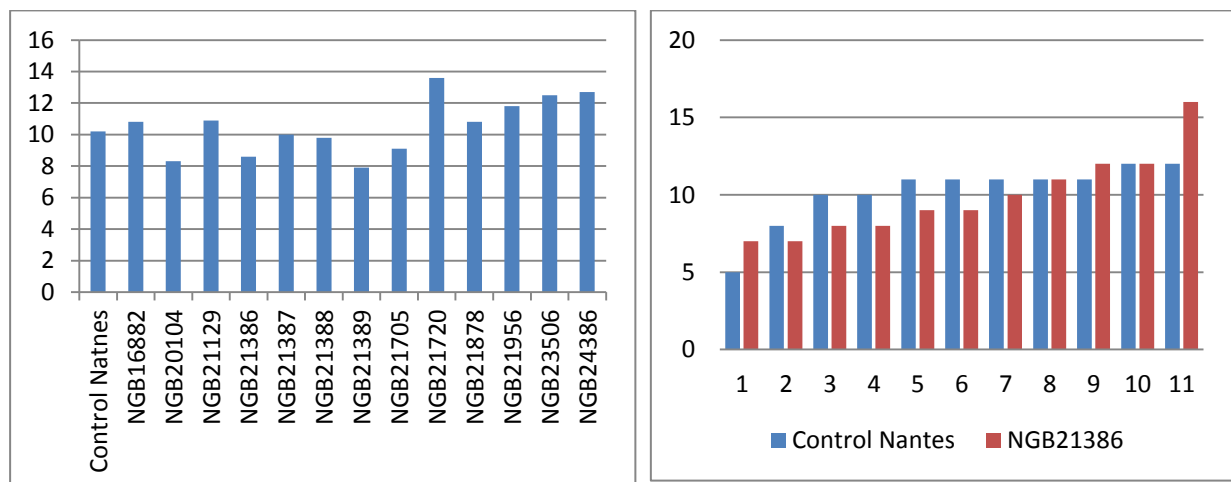


Fig. 1. Seedling root length after 60 days (in cm) – left: average values; right: single plant measures of 11 plants each of the two accessions.

Leaflet length after 60 days

There were also differences in the leaflets growth rate (Fig. 2). The variation within three selected accessions is given in Fig. 3, and confirms that there are big variations within the wild accessions and that this variation is bigger than within the cultivated carrot, here a Nantes type.

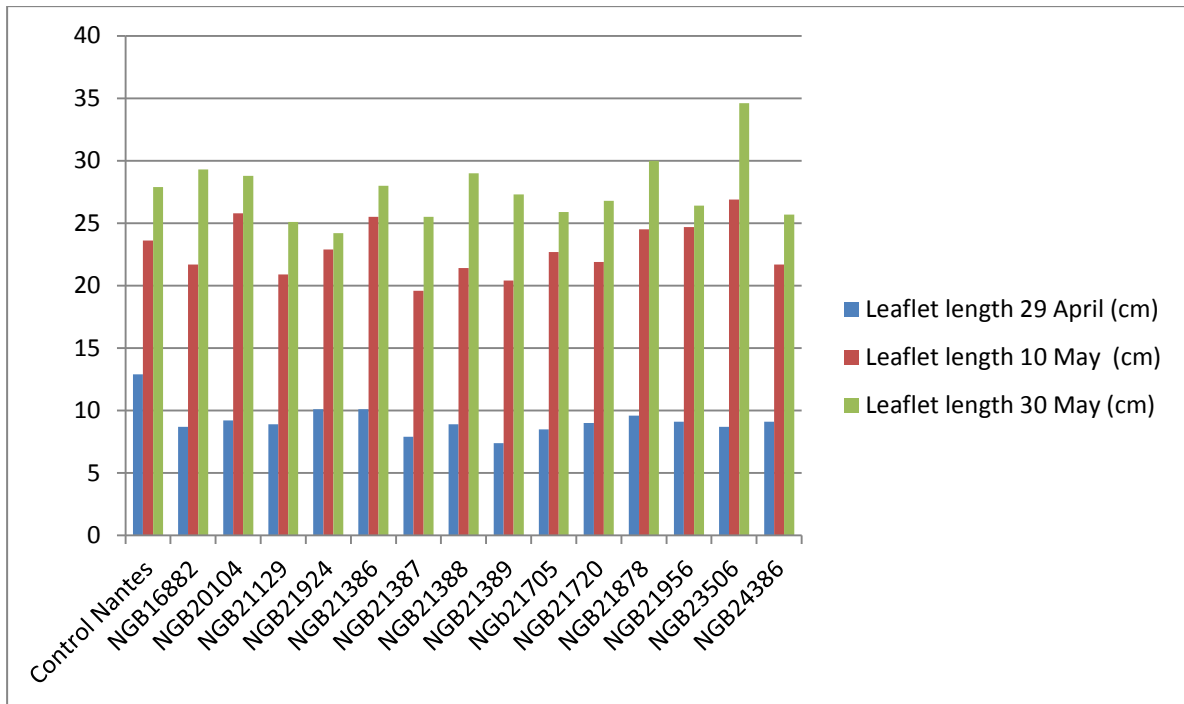


Fig. 2. Leaf growth (in cm) from the end of April to the end of May.

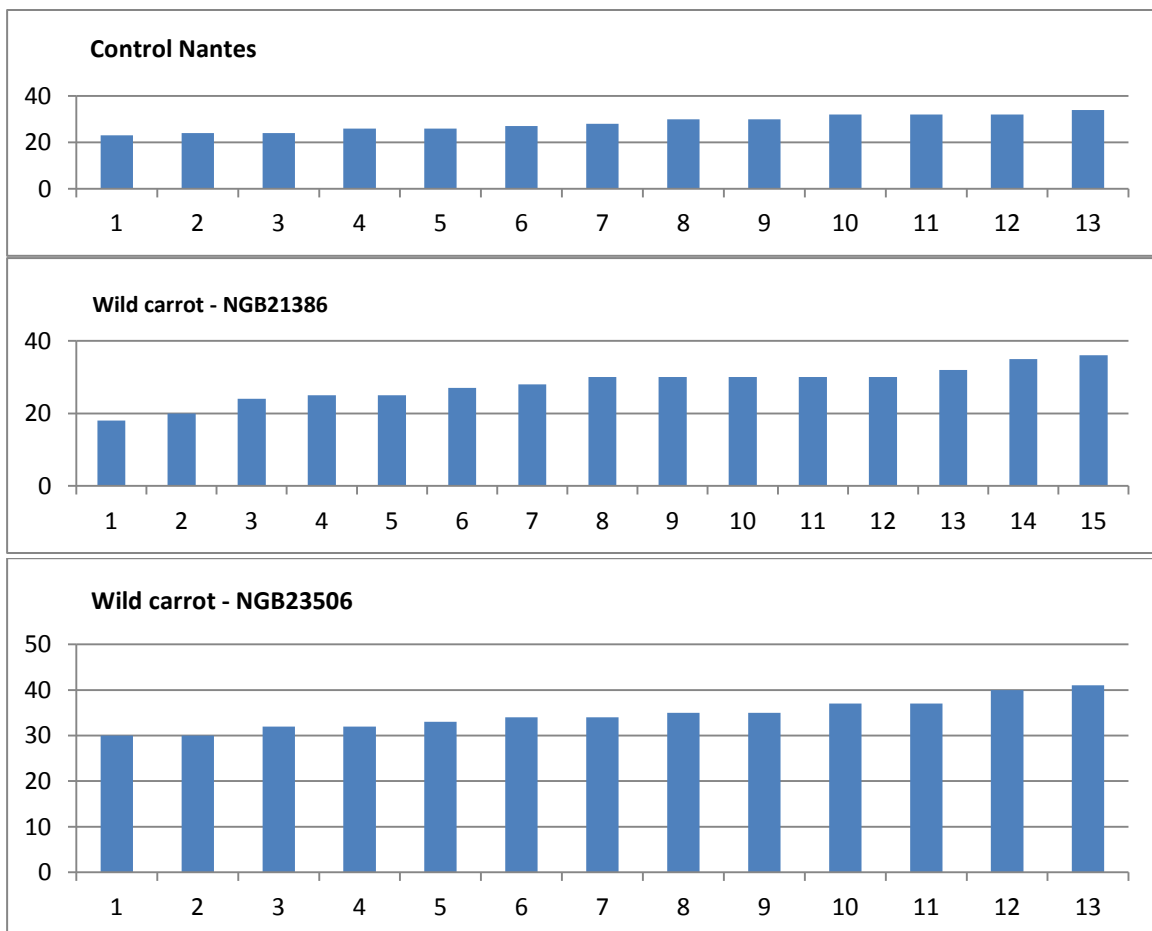


Fig. 3. Leaflet length after 60 days (in cm) of three accessions.

Early bolting

There were very clear differences between the accessions in early bolting (Fig. 4).

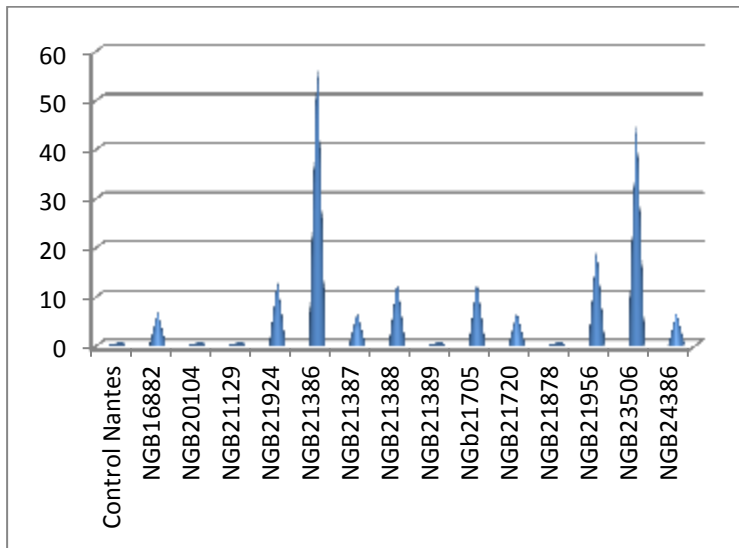


Fig. 4. Early bolting (average % scored 30 May).

Recommendations

Data were collected only for one season. We would like to continue the work, and to score the accessions one more year at least. Especially interesting is the early bolting and the big differences between accessions. This is an interesting agronomic character, especially relevant for the Nordic region.

Bibliography

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