PHENOTYPIC CHARACTERIZATION AND EVALUATION OF A SEGREGATING POPULATION OF SWEET CHERRY (BING X LAPINS)

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This family consists of over 100 genera and 3,000 species that include many important fruit, nut, ornamental and wood crops.

Important agronomical crop species that are members of this family include: almond, apple, apricot, pear, plum, raspberry, sweet cherry, sour cherry and strawberry.
Importance of cherry fruits in the Chilean industry

• The Cherry tree is one of the most important fruit trees in Chile, which is reflected in the strong growth in production and export.

Chilean sweet cherry fruit exportation in (ton)

Time et al. (2017). Source: www.odepa.cl 2018

Area (ha)
Problems in the Chilean Sweet cherry fruits industry

➢ Climate change challenge in fruit production

➢ Ripening/Maturity

➢ Fruits quality
Materials and Methods

Table 1. Description of varieties used as parents to generate the 114 individuals of mapping population to be used.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Parents</th>
<th>Origin</th>
<th>Characteristics</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>Bing</td>
<td>Black Republican x Napoleon</td>
<td>Variety with medium fruit size, mahogany skin color, dark red flesh color, medium firmness, low cracking tolerance, medium flowering time, medium maturity date, no self compatible, Group incompatibility $S_{3S4}$.</td>
<td>Bargioni (1996); Brooks and Olmo (1997); Espada et al. (1988); Kappel (2000); Nugent (1999a); Nugent (1999b); Cai et al. (2017)</td>
<td></td>
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<tr>
<td>Lapins</td>
<td>Stella x Van</td>
<td>Variety with medium-large fruit size, dark red skin color, dark red flesh color, high firmness, very good cracking tolerance, medium flowering time, late maturity date, self compatible, Group incompatibility $S_{1S4}$.</td>
<td>Time et al. (2017).</td>
<td></td>
</tr>
</tbody>
</table>
Materials and Methods

Phenotyping Evaluation

Fruit quality analysis:
- Flowering date
- Weight
- Firmness
- TSS
- Titratable Acidity
- Color
- Size (width and length)
- Maturity date

Sugars: a drop of fruit juice on the laser
Acidity: diluted with 50% of water
5 g of fruit juice
10 ml of distilled H2O
Results and discussion

Fig. 1. Box plot of Diameter (A) and Weight (B) of sweet cherry fruits from the segregating population ‘Bing X Lapins’. Time et al. (2017).
Results and discussion

Fig. 2. Box plot of Firmness (A) and Color (B) of sweet cherry fruits from the segregating population ‘Bing X Lapins’. Time et al. (2017).
Results and discussion

Fig. 3. Box plot of Acidity (A) and Soluble solid content (B) of sweet cherry fruits from the segregating population ‘Bing X Lapins’. Time et al. (2017).
Conclusions

Progeny from a cross between the sweet cherry variety ‘Bing’ and the sweet cherry variety ‘Lapins’ has been established and results from the first sweet cherry fruit season reveals that there is segregation for several fruit quality parameters.

Further analyses of these traits in subsequent fruit seasons as well as co-segregation analyses of these phenotypic traits and molecular markers should reveal insight about the location of possible QTLs segregating in the population.
Conclusions

These results will be used in the identification of candidate genes related to QTLs of interest in population of individuals through the construction of genetic map, using molecular markers. What will facilitate the early selection of individuals with specific features in genetic breeding program (marked assisted selection)
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