



**Figure S1.** Monthly average precipitation (bars) and temperatures (lines) recorded during the study years 2014 and 2015 at the Aula Dei Experimental Station (Zaragoza, Spain). Source: Meteorological data INTRANET EEAD-CSIC.

**Table S1.** Incidence parameters and Colonization parameters of *M. laxa* in the forty-two genotypes derived from the ‘Andross’ × ‘Calante’ cross in 2014 and in the eight genotypes evaluated in 2015. Data are mean ± Standard Error of each studied year (2014 - 2015). The eight genotypes selected in 2014 with LS < 40 mm are shown in bold.

| Genotypes     | Brown rot incidence (%) |                  | Lesion diameter (mm) |                     | Lesion severity (mm) |                      |
|---------------|-------------------------|------------------|----------------------|---------------------|----------------------|----------------------|
|               | 2014                    | 2015             | 2014                 | 2015                | 2014                 | 2015                 |
| AC-1          | 92                      |                  | 55.11 ± 4.55         |                     | 50.52 ± 4.18         |                      |
| AC-2          | 94                      |                  | 55.26 ± 5.58         |                     | 51.80 ± 5.23         |                      |
| AC-7          | 100                     |                  | 61.57 ± 2.50         |                     | 61.57 ± 2.50         |                      |
| AC-10         | 94                      |                  | 64.98 ± 1.05         |                     | 61.16 ± 0.99         |                      |
| <b>AC-11</b>  | <b>69</b>               | <b>100</b>       | <b>45.79 ± 6.24</b>  | <b>49.82 ± 0.98</b> | <b>31.48 ± 4.29</b>  | <b>49.82 ± 0.977</b> |
| AC-14         | 85                      |                  | 56.36 ± 3.71         |                     | 47.90 ± 3.15         |                      |
| AC-17         | 95                      |                  | 44.11 ± 6.55         |                     | 41.90 ± 6.22         |                      |
| AC-21         | 100                     |                  | 54.50 ± 3.82         |                     | 54.50 ± 3.82         |                      |
| <b>AC-24</b>  | <b>45</b>               | <b>85</b>        | <b>40.06 ± 5.14</b>  | <b>41.26 ± 2.21</b> | <b>18.02 ± 2.31</b>  | <b>35.07 ± 1.88</b>  |
| AC-27         | 83                      |                  | 65.34 ± 2.16         |                     | 54.45 ± 1.80         |                      |
| AC-28         | 100                     |                  | 53.02 ± 2.35         |                     | 53.02 ± 2.35         |                      |
| AC-32         | 100                     |                  | 41.30 ± 4.63         |                     | 64.65 ± 3.05         |                      |
| <b>AC-34</b>  | <b>85</b>               | <b>100</b>       | <b>41.30 ± 4.63</b>  | <b>47.43 ± 2.04</b> | <b>35.11 ± 3.94</b>  | <b>47.43 ± 2.04</b>  |
| <b>AC-35</b>  | <b>65</b>               | <b>100</b>       | <b>38.52 ± 6.19</b>  | <b>47.56 ± 1.07</b> | <b>25.03 ± 4.02</b>  | <b>47.56 ± 1.07</b>  |
| AC-39         | 95                      |                  | 44.93 ± 2.46         |                     | 42.68 ± 2.34         |                      |
| AC-40         | 100                     |                  | 62.19 ± 1.052        |                     | 62.19 ± 1.05         |                      |
| AC-41         | 100                     |                  | 61.25 ± 2.15         |                     | 61.25 ± 2.15         |                      |
| AC-44         | 80                      |                  | 55.20 ± 2.21         |                     | 44.16 ± 1.77         |                      |
| AC-45         | 100                     |                  | 54.69 ± 2.42         |                     | 54.69 ± 2.42         |                      |
| AC-52         | 100                     |                  | 49.32 ± 3.33         |                     | 49.32 ± 3.33         |                      |
| AC-53         | 90                      |                  | 50.78 ± 4.15         |                     | 45.71 ± 3.73         |                      |
| AC-54         | 95                      |                  | 45.68 ± 4.36         |                     | 43.40 ± 4.14         |                      |
| AC-56         | 90                      |                  | 63.02 ± 2.11         |                     | 56.72 ± 1.90         |                      |
| AC-57         | 90                      |                  | 55.54 ± 4.59         |                     | 49.99 ± 4.13         |                      |
| AC-58         | 95                      |                  | 42.63 ± 4.30         |                     | 40.50 ± 4.08         |                      |
| AC-59         | 90                      |                  | 59.02 ± 4.18         |                     | 53.12 ± 3.76         |                      |
| <b>AC-61</b>  | <b>65</b>               | <b>100</b>       | <b>38.21 ± 6.11</b>  | <b>49.69 ± 1.52</b> | <b>24.73 ± 3.96</b>  | <b>49.69 ± 1.52</b>  |
| AC-62         | 100                     |                  | 54.40 ± 3.05         |                     | 54.40 ± 3.05         |                      |
| AC-63         | 86                      |                  | 59.69 ± 2.65         |                     | 51.16 ± 2.27         |                      |
| AC-77         | 100                     |                  | 60.87 ± 2.17         |                     | 60.87 ± 2.16         |                      |
| AC-78         | 94                      |                  | 52.92 ± 3.09         |                     | 49.61 ± 2.89         |                      |
| AC-79         | 100                     |                  | 66.62 ± 1.09         |                     | 66.62 ± 1.09         |                      |
| AC-81         | 95                      |                  | 43.60 ± 5.84         |                     | 41.42 ± 5.55         |                      |
| <b>AC-82</b>  | <b>95</b>               | <b>80.</b>       | <b>39.98 ± 4.07</b>  | <b>44.01 ± 3.32</b> | <b>37.98 ± 3.87</b>  | <b>35.21 ± 2.66</b>  |
| AC-83         | 94                      |                  | 50.23 ± 3.56         |                     | 47.44 ± 3.36         |                      |
| AC-88         | 100                     |                  | 42.76 ± 4.01         |                     | 42.76 ± 4.01         |                      |
| AC-89         | 83                      |                  | 58.29 ± 2.78         |                     | 48.56 ± 2.31         |                      |
| AC-90         | 95                      |                  | 52.69 ± 5.77         |                     | 50.06 ± 5.48         |                      |
| <b>AC-93</b>  | <b>80</b>               | <b>100</b>       | <b>33.88 ± 4.68</b>  | <b>42.86 ± 0.66</b> | <b>27.10 ± 3.74</b>  | <b>42.86 ± 0.66</b>  |
| AC-97         | 92                      |                  | 61.16 ± 5.00         |                     | 56.46 ± 4.61         |                      |
| AC-99         | 100                     |                  | 59.89 ± 3.21         |                     | 59.89 ± 3.21         |                      |
| <b>AC-104</b> | <b>80.00</b>            | <b>85</b>        | <b>41.19 ± 4.87</b>  | <b>42.50 ± 1.43</b> | <b>32.95 ± 3.90</b>  | <b>36.13 ± 1.21</b>  |
| <b>Mean</b>   | <b>90 ± 1.83</b>        | <b>94 ± 3.10</b> | <b>52.51 ± 0.68</b>  | <b>45.84 ± 0.65</b> | <b>48.48 ± 0.67</b>  | <b>43.47 ± 0.73</b>  |

| Genotypes     | Colonization (%) |                  | Colonization extent (mm) |                     | Colonization severity (mm) |                      |
|---------------|------------------|------------------|--------------------------|---------------------|----------------------------|----------------------|
|               | 2014             | 2015             | 2014                     | 2015                | 2014                       | 2015                 |
| AC-1          | 75               |                  | 48.69 ± 2.79             |                     | 36.52 ± 2.09               |                      |
| AC-2          | 75               |                  | 59.17 ± 1.89             |                     | 44.38 ± 1.42               |                      |
| AC-7          | 94               |                  | 54.65 ± 1.89             |                     | 51.61 ± 1.79               |                      |
| AC-10         | 94               |                  | 54.37 ± 1.61             |                     | 51.17 ± 1.52               |                      |
| <b>AC-11</b>  | <b>38</b>        | <b>100</b>       | <b>54.21 ± 3.37</b>      | <b>43.34 ± 1.11</b> | <b>20.33 ± 1.26</b>        | <b>43.34 ± 1.11</b>  |
| AC-14         | 85               |                  | 47.66 ± 3.72             |                     | 40.51 ± 3.16               |                      |
| AC-17         | 55               |                  | 61.60 ± 2.18             |                     | 33.88 ± 1.20               |                      |
| AC-21         | 80               |                  | 50.83 ± 2.38             |                     | 40.67 ± 1.90               |                      |
| <b>AC-24</b>  | <b>20</b>        | <b>80</b>        | <b>32.46 ± 2.80</b>      | <b>36.36 ± 1.86</b> | <b>6.49 ± 0.56</b>         | <b>29.09 ± 1.49</b>  |
| AC-27         | 83               |                  | 56.00 ± 2.83             |                     | 46.67 ± 2.36               |                      |
| AC-28         | 80               |                  | 48.00 ± 2.73             |                     | 38.40 ± 2.18               |                      |
| AC-32         | 94               |                  | 59.63 ± 2.05             |                     | 56.12 ± 1.93               |                      |
| <b>AC-34</b>  | <b>55</b>        | <b>95</b>        | <b>40.83 ± 4.16</b>      | <b>40.29 ± 2.31</b> | <b>22.46 ± 2.29</b>        | <b>38.27 ± 2.19</b>  |
| <b>AC-35</b>  | <b>35</b>        | <b>100</b>       | <b>44.31 ± 3.83</b>      | <b>43.74 ± 1.41</b> | <b>15.51 ± 1.34</b>        | <b>43.74 ± 1.41</b>  |
| AC-39         | 45               |                  | 38.52 ± 3.28             |                     | 17.33 ± 1.48               |                      |
| AC-40         | 100              |                  | 56.13 ± 1.20             |                     | 56.13 ± 1.20               |                      |
| AC-41         | 95               |                  | 54.79 ± 1.36             |                     | 51.91 ± 1.29               |                      |
| AC-44         | 60               |                  | 36.67 ± 3.46             |                     | 22.00 ± 2.08               |                      |
| AC-45         | 84               |                  | 43.71 ± 2.23             |                     | 36.81 ± 1.88               |                      |
| AC-52         | 70               |                  | 42.76 ± 3.46             |                     | 29.93 ± 2.42               |                      |
| AC-53         | 70               |                  | 46.94 ± 3.67             |                     | 32.86 ± 2.57               |                      |
| AC-54         | 80               |                  | 38.45 ± 4.08             |                     | 30.76 ± 3.27               |                      |
| AC-56         | 90               |                  | 55.37 ± 2.32             |                     | 49.83 ± 2.08               |                      |
| AC-57         | 70               |                  | 52.12 ± 2.65             |                     | 36.49 ± 1.86               |                      |
| AC-58         | 55               |                  | 44.39 ± 3.33             |                     | 24.41 ± 1.83               |                      |
| AC-59         | 70               |                  | 57.70 ± 2.55             |                     | 40.39 ± 1.79               |                      |
| <b>AC-61</b>  | <b>29</b>        | <b>95</b>        | <b>44.03 ± 4.66</b>      | <b>43.43 ± 1.94</b> | <b>12.95 ± 1.37</b>        | <b>41.26 ± 1.84</b>  |
| AC-62         | 85               |                  | 49.95 ± 2.84             |                     | 42.46 ± 2.41               |                      |
| AC-63         | 86               |                  | 51.82 ± 2.71             |                     | 44.41 ± 2.32               |                      |
| AC-77         | 100              |                  | 51.52 ± 1.93             |                     | 51.52 ± 1.93               |                      |
| AC-78         | 94               |                  | 45.37 ± 3.21             |                     | 42.54 ± 3.01               |                      |
| AC-79         | 100              |                  | 60.15 ± 1.12             |                     | 60.15 ± 1.12               |                      |
| AC-81         | 60               |                  | 55.56 ± 2.43             |                     | 33.34 ± 1.46               |                      |
| <b>AC-82</b>  | <b>90</b>        | <b>60</b>        | <b>30.74 ± 3.99</b>      | <b>41.06 ± 2.91</b> | <b>27.67 ± 3.59</b>        | <b>24.63 ± 1.75</b>  |
| AC-83         | 72               |                  | 43.82 ± 3.43             |                     | 31.65 ± 2.48               |                      |
| AC-88         | 56               |                  | 39.89 ± 3.91             |                     | 22.44 ± 2.20               |                      |
| AC-89         | 83               |                  | 50.25 ± 2.58             |                     | 41.86 ± 2.15               |                      |
| AC-90         | 70               |                  | 60.34 ± 2.38             |                     | 42.24 ± 1.66               |                      |
| <b>AC-93</b>  | <b>25</b>        | <b>100</b>       | <b>40.87 ± 8.40</b>      | <b>38.76 ± 1.06</b> | <b>10.22 ± 2.10</b>        | <b>38.76 ± 1.056</b> |
| AC-97         | 77               |                  | 58.83 ± 1.74             |                     | 45.26 ± 1.34               |                      |
| AC-99         | 93               |                  | 54.33 ± 2.47             |                     | 50.71 ± 2.31               |                      |
| <b>AC-104</b> | <b>40</b>        | <b>85</b>        | <b>46.83 ± 3.34</b>      | <b>37.65 ± 1.61</b> | <b>18.73 ± 1.34</b>        | <b>32.01 ± 1.37</b>  |
| <b>Mean</b>   | <b>72 ± 3.37</b> | <b>89 ± 4.95</b> | <b>49.91 ± 0.54</b>      | <b>40.71 ± 0.64</b> | <b>39.15 ± 0.61</b>        | <b>37.29 ± 0.75</b>  |

**Table S2.** Physicochemical basic quality traits in eight selected genotypes derived from the ‘Andross’ × ‘Calante’ cross evaluated during 2014 and 2015. Data are mean ± standard error (N = 5-20 replications). At harvest, FF was measured in 10 fruits; SSC, pH and TA parameters were evaluated in a mixed pool of 10 fruits. In storage, FF and SSC were measured in 5 fruits non-inoculated and in 20 fruits inoculated.

|      | <u>Genotypes</u> | <u>HD</u> | <u>Ftw</u> | <u>FF at harvest</u> | <u>FF incubated</u> | <u>FF inoculated</u> | <u>SSC at harvest</u> | <u>SSC incubated</u> | <u>SSC inoculated</u> | <u>pH</u> | <u>TA</u> | <u>RI</u> |
|------|------------------|-----------|------------|----------------------|---------------------|----------------------|-----------------------|----------------------|-----------------------|-----------|-----------|-----------|
| 2014 | AC-11            | 259       | 210.00     | 50.63 ± 2.05         | 37.08 ± 6.24        | 33.78 ± 1.26         | 9.50                  | 8.60 ± 0.50          | 8.98 ± 0.36           | 5.72      | 0.24      | 39.41     |
|      | AC-24            | 259       | 203.14     | 45.82 ± 4.65         | 28.81 ± 1.46        | 28.03 ± 1.13         | 10.00                 | 9.26 ± 0.37          | 10.21 ± 0.27          | 4.65      | 0.43      | 23.26     |
|      | AC-34            | 259       | 230.00     | 35.48 ± 2.90         | 26.66 ± 0.65        | 29.06 ± 1.13         | 12.40                 | 11.50 ± 0.47         | 10.47 ± 0.32          | 4.31      | 0.39      | 31.63     |
|      | AC-35            | 232       | 184.52     | 32.05 ± 4.73         | 32.63 ± 0.91        | 26.54 ± 1.27         | 10.80                 | 10.48 ± 0.50         | 9.64 ± 0.33           | 4.13      | 0.43      | 25.41     |
|      | AC-61            | 259       | 203.85     | 45.47 ± 3.79         | 39.03 ± 2.83        | 31.22 ± 1.42         | 9.90                  | 10.67 ± 1.22         | 9.95 ± 0.46           | 4.53      | 0.43      | 23.19     |
|      | AC-82            | 222       | 200.00     | 27.58 ± 1.54         | 29.20 ± 2.35        | 24.89 ± 0.98         | 10.20                 | 10.58 ± 0.36         | 9.60 ± 0.34           | 4.19      | 0.4       | 25.82     |
|      | AC-93            | 259       | 242.11     | 47.16 ± 1.69         | 37.44 ± 1.07        | 33.00 ± 0.89         | 11.60                 | 11.06 ± 0.40         | 9.09 ± 0.35           | 3.9       | 0.57      | 20.49     |
|      | AC-104           | 259       | 187.50     | 36.65 ± 6.43         | 28.71 ± 1.89        | 20.06 ± 1.09         | 8.70                  | 8.74 ± 0.59          | 8.21 ± 0.30           | 4.25      | 0.46      | 19.00     |
| 2015 | AC-11            | 257       | 260.50     | 47.95 ± 2.20         | 35.67 ± 0.55        | 29.79 ± 0.67         | 12.10                 | 11.14 ± 0.53         | 10.98 ± 0.34          | 3.83      | 0.67      | 18.09     |
|      | AC-24            | 266       | 229.78     | 35.00 ± 2.33         | 27.44 ± 1.33        | 24.70 ± 1.03         | 11.50                 | 9.30 ± 1.22          | 11.10 ± 0.30          | 3.97      | 0.86      | 13.33     |
|      | AC-34            | 257       | 273.03     | 34.06 ± 3.28         | 34.01 ± 0.33        | 28.96 ± 0.51         | 12.40                 | 12.48 ± 0.92         | 11.26 ± 0.49          | 3.9       | 0.62      | 20        |
|      | AC-35            | 238       | 266.63     | 32.88 ± 2.40         | 27.44 ± 0.41        | 22.10 ± 0.74         | 11.30                 | 12.30 ± 0.68         | 9.43 ± 0.26           | 3.93      | 0.56      | 20.07     |
|      | AC-61            | 257       | 241.28     | 33.37 ± 2.58         | 33.22 ± 1.41        | 25.36 ± 0.82         | 13.00                 | 12.44 ± 0.58         | 10.88 ± 0.34          | 3.94      | 0.56      | 23.38     |
|      | AC-82            | 231       | 275.93     | 27.88 ± 1.62         | 23.03 ± 2.28        | 21.04 ± 1.05         | 11.60                 | 11.22 ± 0.37         | 10.83 ± 0.27          | 3.81      | 0.61      | 18.95     |
|      | AC-93            | 266       | 231.61     | 32.55 ± 2.56         | 29.41 ± 2.05        | 31.48 ± 1.51         | 8.40                  | 8.74 ± 0.99          | 9.44 ± 0.44           | 3.8       | 0.66      | 12.8      |
|      | AC-104           | 266       | 221.04     | 26.46 ± 5.65         | 24.01 ± 2.05        | 17.30 ± 1.74         | 9.80                  | 9.41 ± 0.99          | 8.34 ± 0.26           | 4.04      | 0.51      | 19.41     |

**Abbreviations and Units:** Harvest day (HD, days); Fruit firmness (FF, Newton, N); Soluble solids content (SSC, °Brix); Titratable acidity (TA, %); Ripening index (RI, SSC/TA).

**Table S3.** Fruit firmness (FF) and soluble solids content (SSC) in flesh of the 42 genotypes selected from the ‘Andross’ × ‘Calante’ population during the two years of study (2014-2015). FF and SSC were measured at harvest and after incubation (non-inoculated or inoculated). Data are mean ± standard error (SE). For each genotype, the number of fruits analyzed were 5-20. N represents the total number of fruits evaluated in both growing seasons.

| Time-Treatment           | N   | FF           |     | N   | SSC*         |     |
|--------------------------|-----|--------------|-----|-----|--------------|-----|
|                          |     | Mean ± SE    |     |     | Mean ± SE    |     |
| At harvest               | 334 | 37.86 ± 0.58 | b   | 50  | 11.04 ± 0.17 | b   |
| Incubated non-inoculated | 229 | 34.13 ± 0.55 | a b | 229 | 10.08 ± 0.13 | a b |
| Incubated and inoculated | 912 | 29.03 ± 0.25 | a   | 910 | 9.60 ± 0.06  | a   |

Student-t test analysis was carried out on raw data. In columns, different letters means differences between treatments. \*At harvest SSC was determined once in a mixed pool of ten fruits. **Units:** FF (Newton, N); SSC (°Brix).

**Table S4.** Fruit firmness (FF) and soluble solids content (SSC) in flesh of the 8 genotypes selected from the ‘Andross’ × ‘Calante’ population during the two years of study (2014-2015). FF and SSC were measured at harvest and after incubation (non-inoculated or inoculated). Data are mean ± standard error (SE). For each genotype, the number of fruits analyzed were 5-20. N represents the total number of fruits evaluated in both growing seasons.

| Time-Treatment           | N   | FF           |      | N   | SSC*         |     |
|--------------------------|-----|--------------|------|-----|--------------|-----|
|                          |     | Mean ± SE    |      |     | Mean ± SE    |     |
| At harvest               | 104 | 36.33 ± 1.00 | b    | 16  | 10.83 ± 0.34 | b   |
| Incubated non-inoculated | 76  | 30.84 ± 0.63 | a ns | 76  | 10.50 ± 0.22 | a b |
| Incubated and inoculated | 310 | 26.60 ± 0.38 | ns   | 308 | 9.93 ± 0.10  | a   |

Student-t test analysis was carried out on raw data. In columns, different letters means differences between treatments. \*At harvest SSC was determined once in a mixed pool of ten fruits. **Abbreviations and units:** Fruit firmness (FF, Newton); Soluble solids content (SSC, °Brix).

**Table S5.** Diseases parameters after inoculation with *Monilinia laxa* in the cultivars studied. N represents the number of the biological replications studied each year (2014-2015). Mean values  $\pm$  standard error (SE) of the parents 'Andross' and 'Calante' evaluated in 2014 and 2015.

|                       |               | 'Andross'        |                  |                   | 'Calante'        |                  |                   |
|-----------------------|---------------|------------------|------------------|-------------------|------------------|------------------|-------------------|
|                       |               | 2014             | 2015             | 2014-2015         | 2014             | 2015             | 2014-2015         |
| Parameters            | N (2014-2015) | Mean $\pm$ SE    | Mean $\pm$ SE    | Mean $\pm$ SE     | Mean $\pm$ SE    | Mean $\pm$ SE    | Mean $\pm$ SE     |
| % Brown rot incidence | 1-1           | 40.00            | 100.00           | 70.00 $\pm$ 30.00 | 100.00           | 75.00            | 87.50 $\pm$ 12.50 |
| Lesion diameter       | 20-18         | 17.42 $\pm$ 3.91 | 39.62 $\pm$ 1.95 | 33.28 $\pm$ 2.60  | 69.37 $\pm$ 1.43 | 32.45 $\pm$ 3.01 | 53.55 $\pm$ 3.48  |
| Lesion severity       | 20-18         | 6.97 $\pm$ 1.56  | 39.62 $\pm$ 1.95 | 30.29 $\pm$ 3.19  | 69.37 $\pm$ 1.43 | 24.34 $\pm$ 2.26 | 50.07 $\pm$ 4.02  |
| % Colonization        | 1-1           | nd               | 90.00            | 90.00             | 100.00           | 30.00            | 65.00 $\pm$ 35.00 |
| Colonization extent   | 20-6          | nd               | 39.93 $\pm$ 0.84 | 39.93 $\pm$ 0.84  | 59.43 $\pm$ 2.06 | 26.06 $\pm$ 4.34 | 51.73 $\pm$ 3.36  |
| Colonization severity | 20-6          | nd               | 35.94 $\pm$ 0.76 | 35.94 $\pm$ 0.76  | 59.43 $\pm$ 2.06 | 7.82 $\pm$ 1.30  | 47.52 $\pm$ 4.63  |

**Abbreviations and units:** Brown rot incidence (BRI, %); Lesion diameter (LD, mm); Lesion severity (LS, mm); Colonization (C, %); Colonization extent (CExt, mm); Colonization severity (CS, mm); LS or CS= [% (BRI or C)] \* (LD or CExt)]; nd: not colonization in 2014.

**Table S6.** Antioxidant compounds contents and relative antioxidant capacity in flesh tissue of the cultivars studied. N represents the number of the biological replications studied each year (2014-2015). Mean values  $\pm$  standard error (SE) of the parents 'Andross' and 'Calante' evaluated in 2014 and 2015.

| Parameters      | N (2014-2015) | 'Andross'        |                  |                  | 'Calante'          |                    |                    |
|-----------------|---------------|------------------|------------------|------------------|--------------------|--------------------|--------------------|
|                 |               | 2014             | 2015             | 2014-2015        | 2014               | 2015               | 2014-2015          |
|                 |               | Mean $\pm$ SE    | Mean $\pm$ SE    | Mean $\pm$ SE    | Mean $\pm$ SE      | Mean $\pm$ SE      | Mean $\pm$ SE      |
| Vitamin C       | 3-2           | 17.34 $\pm$ 0.40 | 12.48 $\pm$ 0.40 | 14.91 $\pm$ 1.11 | 8.74 $\pm$ 0.02    | 12.04 $\pm$ 0.16   | 10.72 $\pm$ 0.81   |
| Total phenolics | 3-3           | 82.92 $\pm$ 1.86 | 71.25 $\pm$ 5.78 | 77.09 $\pm$ 3.77 | 125.47 $\pm$ 19.94 | 61.83 $\pm$ 1.24   | 93.65 $\pm$ 16.80  |
| Flavonoids      | 3-3           | 66.73 $\pm$ 8.35 | 41.11 $\pm$ 7.21 | 53.92 $\pm$ 7.56 | 123.20 $\pm$ 9.63  | 52.61 $\pm$ 4.00   | 87.90 $\pm$ 16.46  |
| RAC             | 2-3           | 93.27 $\pm$ 3.89 | 86.83 $\pm$ 3.33 | 89.41 $\pm$ 2.71 | 151.14 $\pm$ 1.05  | 104.03 $\pm$ 14.26 | 122.87 $\pm$ 13.94 |

**Units:** Vitamin C (mg AsA/100 g FW); Total phenolics (mg GAE/ 100 g FW); Flavonoids (mg CE/100 g FW); RAC (mg TE/100 g FW). **Abbreviations:** RAC = Relative antioxidant capacity; SE = Standard error; GAE = Gallic acid equivalent; CE = Catechin equivalents; TE = Trolox equivalent; FW = Fresh weight.

**Table S7.** Antioxidant compound contents in the flesh and the peel of 8 genotypes selected from ‘Andross’ × ‘Calante’ population evaluated in 2015. For each genotype, means are from N = 3 replicates.

|                          |               | Vitamin C | Total phenolics | Flavonoids | RAC       |
|--------------------------|---------------|-----------|-----------------|------------|-----------|
| <i>Principal factors</i> |               |           |                 |            |           |
| <i>Tissues</i>           |               |           |                 |            |           |
|                          | Flesh         | 7.45 a    | 51.25 a         | 22.77 a    | 91.74 a   |
|                          | Peel          | 11.24 b   | 59.43 b         | 59.64 b    | 166.72 b  |
| <i>Interaction</i>       |               |           |                 |            |           |
| <i>Genotype</i>          | <i>Tissue</i> |           |                 |            |           |
| AC-11                    | flesh         | 6.00 bc   | 57.37 c-e       | 23.39 cd   | 99.80 bc  |
|                          | peel          | 14.48 f   | 73.15 h         | 83.42 j    | 200.51 g  |
| AC-24                    | flesh         | 5.92 bc   | 38.13 ab        | 16.07 ab   | 70.84 a   |
|                          | peel          | 7.86 d    | 57.82 c-e       | 60.66 h    | 186.04 fg |
| AC-34                    | flesh         | 4.93 ab   | 53.51 c         | 18.44 a-c  | 94.12 bc  |
|                          | peel          | 8.16 d    | 62.62 ef        | 58.64 h    | 165.95 e  |
| AC-35                    | flesh         | 7.82 d    | 68.38 gh        | 26.49 de   | 99.47 bc  |
|                          | peel          | 12.12 e   | 67.30 fg        | 64.56 h    | 182.59 f  |
| AC-61                    | flesh         | 10.82 e   | 61.66 e         | 35.23 f    | 85.85 ab  |
|                          | peel          | 16.44 g   | 61.28 e         | 60.71 h    | 178.89 ef |
| AC-82                    | flesh         | 11.90 e   | 41.62 b         | 22.45 b-d  | 88.53 b   |
|                          | peel          | 19.33 h   | 54.17 c         | 45.48 g    | 146.80 d  |
| AC-93                    | flesh         | 4.32 a    | 55.70 cd        | 23.04 cd   | 109.87 c  |
|                          | peel          | 5.90 bc   | 59.82 de        | 31.21 ef   | 137.75 d  |
| AC-104                   | flesh         | 6.82 cd   | 33.66 a         | 15.73 a    | 85.45 ab  |
|                          | peel          | 8.31 d    | 39.25 b         | 67.79 i    | 135.23 d  |

*Significance*

Genotype x Tissue

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\*\*\*  $P \leq 0.001$ . Two-way ANOVA was carried out for lineal model on raw data followed by Duncan test. In columns, different letters indicated significant differences. Units: Vitamin C (mg AsA/100 g FW); Total phenolic content (mg GAE/100 g FW); Flavonoids (mg CE/100 g FW); RAC (mg TE/100g FW). Abbreviations: TPC= Total phenolic content RAC = Relative antioxidant capacity; AsA = Ascorbic -L acid; GAE = Gallic acid equivalent; CE = Catechin equivalent; TE = Trolox equivalent; FW = Fresh weight.

**Table S8.** Pearson's bivariate correlations of all disease parameters in the population studied in 2014-2015 (N=50).

| Parameters            | Lesion diameter | Lesion severity | % Colonization | Colonization extent | Colonization severity |
|-----------------------|-----------------|-----------------|----------------|---------------------|-----------------------|
| % Brown rot incidence | ,445**          | ,758**          | ,782**         | –                   | ,703**                |
| Lesion diameter       |                 | ,918**          | ,646**         | ,691**              | ,863**                |
| Lesion severity       |                 |                 | ,811**         | ,623**              | ,939**                |
| % Colonization        |                 |                 |                | –                   | ,885**                |
| Colonization Extent   |                 |                 |                |                     | ,648**                |

\*\*  $P \leq 0.01$ . **Units:** Brown rot incidence (%); Lesion diameter (mm); Lesion severity (mm); Colonization (%); Colonization extent (mm); Colonization severity (mm).

**Table S9.** Pearson's bivariate correlations of some physicochemical compounds with all disease parameters in the population studied in 2014-2015 (N=50).

| Parameters          | % Brown rot incidence | Lesion diameter | Lesion severity | %Colonization | Colonization extent | Colonization severity |
|---------------------|-----------------------|-----------------|-----------------|---------------|---------------------|-----------------------|
| Fruit firmness      | -                     | -               | -               | -,485**       | -                   | -,414**               |
| pH                  | -,286*                | -               | -               | -             | -                   | -                     |
| Titrateable acidity | -                     | -               | -               | -             | -,330*              | -                     |
| Total phenolics     | -                     | -               | -               | -,281*        | -                   | -                     |
| RAC                 | -                     | -,370**         | -,299*          | -             | -,392*              | -                     |

\*\*  $P \leq 0.01$ , \*  $P \leq 0.05$ . **Units:** Fruit firmness (Newton, N); Titrateable acidity (TA, %); Total phenolic content (mg GAE /100 g FW; RAC (mg TE/100 g FW); Brown rot incidence (%); Lesion diameter (mm); Lesion severity (mm); Colonization (%); Colonization extent (mm); Colonization severity (mm).