EXPERIMENTAL RESULTS
EXPERIMENTAL RESULTS

4.1 Experiment 1
4.1.1 Growth characteristics
4.1.2 Photosynthetic characteristics
4.1.3 Yield characteristics
4.2 Experiment 2
4.2.1 Growth characteristics
4.2.2 Photosynthetic characteristics
4.2.3 Yield characteristics
4.3 Experiments 3 and 4
4.3.1 Experiment 3
4.3.1.1 Growth characteristics
4.3.1.2 Photosynthetic characteristics
4.3.1.3 Biochemical characteristics
4.3.1.4 Activities of antioxidative enzymes
4.3.1.5 Yield characteristics
4.3.2 Experiment 4
4.3.2.1 Growth characteristics
4.3.2.2 Photosynthetic characteristics
4.3.2.3 Biochemical characteristics
4.3.2.4 Activities of antioxidative enzymes
4.3.2.5 Yield characteristics
4.4 Experimental Summary
4.4.1 Experiment 1
4.4.2 Experiment 2
4.4.3 Experiment 3
4.4.4 Experiment 4
EXPERIMENTAL RESULTS

The chapter 'Experimental Results' reports results on the observations recorded for different growth, photosynthetic and biochemical characteristics, activities of antioxidative enzymes and yield characteristics. The details of the determinations have been described in the chapter 'Materials and Methods'. As mentioned earlier, Experiments 1 and 3 were conducted on mungbean, a short duration crop. Therefore, the observations were recorded at 20, 40 and 60DAS. Experiments 2 and 4 were conducted on mustard, and the observations were recorded at 30, 60, 90 and 120DAS.

4.1 Experiment 1

The aim of the experiment was to assess the influence of 0, 50 and 100mM NaCl salinity stress on growth, photosynthetic and yield characteristics of four cultivars, Pusa Vishal, PDM54, T44 and Tram, of mungbean, and select the salinity tolerant and salinity non-tolerant cultivars on the basis of their performance. Growth and photosynthetic characteristics were observed at 20 and 40DAS and yield characteristics at 60DAS.

4.1.1 Growth characteristics

Growth of all the cultivars decreased with the increasing salinity levels at all the sampling times (Tables 4-10). At initial stage of growth, i.e. 20DAS, the cultivars did not respond significantly to salinity treatment, except for plant dry mass. However, at 40DAS, the effect of salinity on the growth of the cultivars was significant. Maximum decrease in growth resulted with the application of 100mM NaCl.

Among cultivars, Tram exhibited greatest decrease in the growth characteristics due to salinity stress, and Pusa Vishal showed lowest decrease followed by PDM54 and T44. The per cent decrease in the growth characteristics of Pusa Vishal and PDM54 were less compared to T44 and Tram. In Pusa Vishal, the treatment of 50mM NaCl and 100mM NaCl
Table 4: Root length (cm plant⁻¹) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th></th>
<th></th>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>T44</td>
<td>0</td>
<td>16.50</td>
<td>11.30</td>
<td>6.20</td>
<td>11.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>22.80</td>
<td>18.60</td>
<td>14.40</td>
<td>18.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>14.10</td>
<td>9.30</td>
<td>4.60</td>
<td>9.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20.20</td>
<td>16.30</td>
<td>12.50</td>
<td>16.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>18.40</td>
<td>13.88*</td>
<td>9.43*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>S = 1.16</td>
<td>29.60</td>
<td>21.70e</td>
<td>14.10f</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C = 1.34</td>
<td>39.10a</td>
<td>33.90b</td>
<td>28.60c</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28.30cd</td>
<td>20.30e</td>
<td>11.80g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38.00a</td>
<td>32.50b</td>
<td>27.20d</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33.75</td>
<td>27.10*</td>
<td>20.43*</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>S = 0.80</td>
<td>29.60</td>
<td>21.70e</td>
<td>14.10f</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C = 0.93</td>
<td>39.10a</td>
<td>33.90b</td>
<td>28.60c</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28.30cd</td>
<td>20.30e</td>
<td>11.80g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38.00a</td>
<td>32.50b</td>
<td>27.20d</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33.75</td>
<td>27.10*</td>
<td>20.43*</td>
<td></td>
</tr>
</tbody>
</table>

*Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.*  
*indicates significant effect of salinity treatment in comparison to control.*  
The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
Table 5: Root fresh mass (g plant\(^{-1}\)) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>T44</td>
<td></td>
<td>0.84</td>
<td>0.58</td>
<td>0.31</td>
<td>0.58 (^c)</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td></td>
<td>1.15</td>
<td>0.94</td>
<td>0.73</td>
<td>0.94 (^a)</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td></td>
<td>0.76</td>
<td>0.50</td>
<td>0.25</td>
<td>0.50 (^d)</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td></td>
<td>1.04</td>
<td>0.84</td>
<td>0.64</td>
<td>0.84 (^b)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>0.95</td>
<td>0.71*</td>
<td>0.48*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td></td>
<td>S = 0.07</td>
<td>C = 0.08</td>
<td>S×C = NS</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td></td>
<td>2.42(^bc)</td>
<td>1.78(^f)</td>
<td>1.13(^h)</td>
<td>1.77(^c)</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td></td>
<td>2.92(^a)</td>
<td>2.53(^b)</td>
<td>2.13(^d)</td>
<td>2.53(^a)</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td></td>
<td>2.32(^c)</td>
<td>1.64(^g)</td>
<td>0.96(^i)</td>
<td>1.64(^d)</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td></td>
<td>2.82(^a)</td>
<td>2.42(^b)</td>
<td>2.01(^e)</td>
<td>2.42(^b)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>2.62</td>
<td>2.09*</td>
<td>1.56*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td></td>
<td>S = 0.06</td>
<td>C = 0.07</td>
<td>S×C = 0.11</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at *P*<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at *P*<0.05.
Table 6: Root dry mass (g plant⁻¹) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>T44</td>
<td>0.19</td>
<td>0.13</td>
<td>0.07</td>
<td>0.13&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>0.29</td>
<td>0.24</td>
<td>0.19</td>
<td>0.24&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>0.16</td>
<td>0.10</td>
<td>0.05</td>
<td>0.10&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>0.26</td>
<td>0.21</td>
<td>0.16</td>
<td>0.21&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>0.22</td>
<td>0.17&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.12&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>S = 0.01</td>
<td>C = 0.01</td>
<td>SxC = NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>0.57&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.42&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.28&lt;sup&gt;h&lt;/sup&gt;</td>
<td>0.42&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>0.80&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.70&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.59&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.70&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>0.51&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.36&lt;sup&gt;g&lt;/sup&gt;</td>
<td>0.21&lt;sup&gt;i&lt;/sup&gt;</td>
<td>0.36&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>0.74&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.63&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.53&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.63&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>0.65</td>
<td>0.53&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.40&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>S = 0.02</td>
<td>C = 0.02</td>
<td>SxC = 0.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at *P*<0.05.  
* indicates significant effect of salinity treatment in comparison to control.  
The superscript letters on the values in the column of cultivar Mean show significant difference at *P*<0.05.
Table 7: Leaf fresh mass (g plant\(^{-1}\)) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th></th>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>T44</td>
<td>0.80</td>
<td>0.55</td>
<td>0.30</td>
<td>0.55(^c)</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>1.20</td>
<td>0.98</td>
<td>0.77</td>
<td>0.98(^a)</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>0.71</td>
<td>0.47</td>
<td>0.23</td>
<td>0.47(^d)</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>1.10</td>
<td>0.88</td>
<td>0.67</td>
<td>0.88(^b)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>0.95</td>
<td>0.72*</td>
<td></td>
<td>0.49*</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>S = 0.06</td>
<td>C = 0.07</td>
<td>S×C = NS</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>6.87(^b)</td>
<td>5.04(de)</td>
<td>3.27(^f)</td>
<td>5.06(^b)</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>7.72(^a)</td>
<td>6.68(b)</td>
<td>5.69(^c)</td>
<td>6.70(^a)</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>6.62(^b)</td>
<td>4.69(e)</td>
<td>2.73(^f)</td>
<td>4.68(^c)</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>7.55(^a)</td>
<td>6.45(b)</td>
<td>5.40(cd)</td>
<td>6.46(^a)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>7.19</td>
<td>5.72*</td>
<td></td>
<td>4.27*</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>S = 0.30</td>
<td>C = 0.34</td>
<td>S×C = 0.59</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at *P*<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at *P*<0.05.
Table 8: Leaf dry mass (g plant\textsuperscript{-1}) of four cultivars of mungbean (\textit{Vigna radiata} L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>T44</td>
<td>0.21</td>
<td>0.14</td>
<td>0.08</td>
<td>0.15\textsuperscript{c}</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>0.35</td>
<td>0.29</td>
<td>0.22</td>
<td>0.29\textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>0.18</td>
<td>0.12</td>
<td>0.06</td>
<td>0.12\textsuperscript{d}</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>0.32</td>
<td>0.26</td>
<td>0.19</td>
<td>0.25\textsuperscript{b}</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>0.26</td>
<td>0.20*</td>
<td>0.14*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>\textsuperscript{S} = 0.01</td>
<td>\textsuperscript{C} = 0.02</td>
<td>\textsuperscript{S\times C} = \text{NS}</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>1.64\textsuperscript{cd}</td>
<td>1.21\textsuperscript{g}</td>
<td>0.79\textsuperscript{i}</td>
<td>1.22\textsuperscript{c}</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>2.03\textsuperscript{a}</td>
<td>1.76\textsuperscript{b}</td>
<td>1.50\textsuperscript{e}</td>
<td>1.76\textsuperscript{a}</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>1.56\textsuperscript{de}</td>
<td>1.12\textsuperscript{h}</td>
<td>0.65\textsuperscript{j}</td>
<td>1.11\textsuperscript{d}</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>1.95\textsuperscript{a}</td>
<td>1.67\textsuperscript{c}</td>
<td>1.40\textsuperscript{f}</td>
<td>1.67\textsuperscript{b}</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>1.79</td>
<td>1.44*</td>
<td>1.09*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>\textsuperscript{S} = 0.04</td>
<td>\textsuperscript{C} = 0.05</td>
<td>\textsuperscript{S\times C} = 0.08</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\)

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
Table 9: Leaf area (cm² plant⁻¹) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>T44</td>
<td>42.60</td>
<td>29.40</td>
<td>15.40</td>
<td>29.13</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>50.50</td>
<td>41.20</td>
<td>32.10</td>
<td>41.27</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>39.70</td>
<td>26.20</td>
<td>12.40</td>
<td>26.10</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>48.70</td>
<td>39.40</td>
<td>29.90</td>
<td>39.33</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>45.38</td>
<td>34.05</td>
<td></td>
<td>22.45</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 2.90</td>
<td>C = 3.35</td>
<td>SxC = NS</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>143.90</td>
<td>105.30</td>
<td>70.30</td>
<td>106.50</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>166.50</td>
<td>144.40</td>
<td>122.90</td>
<td>144.60</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>138.50</td>
<td>98.10</td>
<td>60.20</td>
<td>98.93</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>160.20</td>
<td>137.40</td>
<td>114.80</td>
<td>137.47</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>152.28</td>
<td>121.30</td>
<td></td>
<td>92.05</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 3.01</td>
<td>C = 3.48</td>
<td>SxC = 6.03</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
Table 10: Plant dry mass (g plant\(^{-1}\)) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th></th>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>T44</td>
<td>1.00(^{b})</td>
<td>0.69(^{ef})</td>
<td>0.36(^{h})</td>
<td>0.68(^{c})</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>1.14(^{a})</td>
<td>0.93(^{cd})</td>
<td>0.72(^{e})</td>
<td>0.93(^{a})</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>0.96(^{bc})</td>
<td>0.63(^{g})</td>
<td>0.30(^{i})</td>
<td>0.63(^{d})</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>1.09(^{a})</td>
<td>0.88(^{d})</td>
<td>0.67(^{fg})</td>
<td>0.88(^{b})</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>1.05</td>
<td>0.78(^{*})</td>
<td>0.51(^{*})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>(S = 0.02)</td>
<td>(C = 0.03)</td>
<td>(S \times C = 0.05)</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>3.19(^{b})</td>
<td>2.33(^{e})</td>
<td>1.51(^{g})</td>
<td>2.34(^{c})</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>3.61(^{a})</td>
<td>3.13(^{b})</td>
<td>2.63(^{d})</td>
<td>3.12(^{a})</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>3.10(^{bc})</td>
<td>2.19(^{f})</td>
<td>1.30(^{h})</td>
<td>2.20(^{d})</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>3.53(^{a})</td>
<td>3.02(^{c})</td>
<td>2.52(^{d})</td>
<td>3.02(^{b})</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>3.36</td>
<td>2.67(^{*})</td>
<td>1.99(^{*})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>(S = 0.07)</td>
<td>(C = 0.08)</td>
<td>(S \times C = 0.13)</td>
<td></td>
</tr>
</tbody>
</table>

 Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).

 * indicates significant effect of salinity treatment in comparison to control.

 The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
decreased root length by 18.42 and 36.84%, root fresh mass by 18.26 and 36.52%, root dry mass by 17.24 and 34.48%, leaf fresh mass by 18.33 and 35.83%, leaf dry mass by 17.14 and 37.14%, leaf area by 18.42 and 36.44% and plant dry mass by 18.42 and 36.84% at 20DAS in comparison to control. At 40DAS, the decreases in the above characteristics due to 50mM NaCl and 100mM NaCl were 13.30 and 26.85%, 13.36 and 27.05%, 12.50 and 26.25%, 13.47 and 26.30%, 13.30 and 26.11%, 13.27 and 26.19% and 13.30 and 27.15%, respectively in comparison to control.

The decreases in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass in Tram with 50mM NaCl and 100mM NaCl were 34.04 and 67.38%, 34.21 and 67.11%, 37.50 and 68.75%, 33.80 and 67.61%, 33.33 and 66.67%, 34.01 and 68.77% and 34.38 and 68.75% at 20DAS, and 28.27 and 58.30%, 29.31 and 58.62%, 29.41 and 58.82%, 29.15 and 58.76%, 28.21 and 58.33%, 29.17 and 56.53% and 29.35 and 58.06%, respectively at 40DAS. The order of the growth performance of the cultivars was: Pusa Vishal > PDM54 > T44 > Tram.

4.1.2 Photosynthetic characteristics

Among photosynthetic characteristics observed, carbonic anhydrase activity and net photosynthetic rate decreased with the increasing salinity levels, and the effect of 100mM NaCl was more conspicuous on all the cultivars at both the sampling times (Tables 11-12).

Carbonic anhydrase activity and net photosynthetic rate decreased maximally in Tram followed by T44 at 20 and 40DAS. The other two cultivars responded equally to NaCl treatment in respect of photosynthetic characteristics. In Pusa Vishal, carbonic anhydrase activity and net photosynthetic rate decreased by 36.05 and 12.35% due to 50mM NaCl and 40.03 and 34.25% due to 100mM NaCl at 20DAS, and 11.23 and 11.76% due to 50mM NaCl and 13.75 and 28.41% due to 100mM NaCl at 40DAS.
Table 11: Carbonic anhydrase activity (m mol m\(^{-2}\) leaf s\(^{-1}\)) of four cultivars of mungbean \((Vigna radiata\) L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>T44</td>
<td>10.23c</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>11.79a</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>9.75d</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>11.25b</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>10.76</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.06</td>
</tr>
<tr>
<td>40</td>
<td>T44</td>
<td>14.24c</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>15.85a</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>13.88de</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>15.28b</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>14.81</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.13</td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
Table 12: Net photosynthetic rate (μ mol CO₂ m⁻² s⁻¹) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>T44</td>
<td>15.36e</td>
<td>12.50i</td>
<td>9.33k</td>
<td>12.40f</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>21.78a</td>
<td>19.09c</td>
<td>14.32g</td>
<td>18.40a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>14.78f</td>
<td>11.72j</td>
<td>8.92k</td>
<td>11.81d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>20.54b</td>
<td>16.77d</td>
<td>13.34h</td>
<td>16.88b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>18.12</td>
<td>15.02*</td>
<td>11.48*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.22</td>
<td>C = 0.26</td>
<td>S×C = 0.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 T44</td>
<td>18.52e</td>
<td>15.45g</td>
<td>12.31i</td>
<td>15.43c</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>23.90a</td>
<td>21.09c</td>
<td>17.11f</td>
<td>20.70a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>17.34f</td>
<td>14.15h</td>
<td>11.40j</td>
<td>14.30d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>22.96b</td>
<td>19.94d</td>
<td>15.59g</td>
<td>19.50b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>20.68</td>
<td>17.66*</td>
<td>14.10*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.22</td>
<td>C = 0.25</td>
<td>S×C = 0.44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
The decreases in carbonic anhydrase activity and net photosynthetic rate in Tram with 50mM NaCl and 100mM NaCl were 43.18 and 20.70% and 70.67 and 39.65% at 20DAS, and 20.24 and 18.40% and 37.61 and 34.26% at 40DAS, respectively. Photosynthetic characteristics in the cultivars were in the order: Pusa Vishal > PDM54 > T44 > Tram.

4.1.3 Yield characteristics

Among yield characteristics, pod length, pod number per plant, seed number per pod and seed yield were noted. Plants treated with 50mM NaCl exhibited a significant decrease over control on the yield characteristics (Table 13). At 100mM NaCl treatment, the plants did not survive up to maturity stage and the yield characteristics, therefore, could not be recorded. The cultivars responded differently to NaCl treatment for yield characteristics compared to growth and photosynthetic characteristics. The cultivars T44 and Tram exhibited about equal and greatest decrease in yield characteristics, whereas Pusa Vishal and PDM54 showed lowest decrease. The decrease in pod length, pod number, seed number and seed yield of Pusa Vishal and Tram was 13.37, 13.26, 13.33 and 13.45% and 29.47, 29.15, 28.70 and 28.63%, respectively due to 50mM NaCl in comparison to control. The order of performance of cultivars for the yield characteristics was: Pusa Vishal > PDM54 > T44 > Tram.

4.2 Experiment 2

In this experiment the influence of 0, 50 and 100mM NaCl was studied on growth, photosynthetic and yield characteristics of Alankar, Pusa Bold, Sakha and PBM16 cultivars of mustard. On the basis of their performance under salinity treatment, the cultivars were categorized as salinity tolerant and salinity non-tolerant. The observations on growth and photosynthesis were recorded at 30, 60 and 90DAS and yield at 120DAS.

4.2.1 Growth characteristics

The effect of salinity on growth was found significant at all sampling times. The effect of salinity and cultivar interaction was also found significant
Table 13: Pod length (cm), pod number plant$^{-1}$, seed number pod$^{-1}$ and seed yield (g plant$^{-1}$) of four cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at harvest, i.e., 60 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td><strong>Pod length</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pod length</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T44</td>
<td>6.27c</td>
<td>4.63g</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>6.73a</td>
<td>5.83e</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>6.04d</td>
<td>4.26h</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>6.54b</td>
<td>5.61f</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>6.40</td>
<td>5.08*</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>$S = 0.07$</td>
<td>$C = 0.10$</td>
</tr>
<tr>
<td>60</td>
<td><strong>Pod number</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pod number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T44</td>
<td>26.40e</td>
<td>19.40g</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>36.20a</td>
<td>31.40c</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>24.70f</td>
<td>17.50h</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>34.50b</td>
<td>29.60d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>30.45</td>
<td>24.48*</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>$S = 0.55$</td>
<td>$C = 0.78$</td>
</tr>
<tr>
<td>60</td>
<td><strong>Seed number</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seed number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T44</td>
<td>11.10c</td>
<td>8.20g</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>12.00a</td>
<td>10.40e</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>10.80d</td>
<td>7.70h</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>11.80b</td>
<td>10.10f</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>11.43</td>
<td>9.10*</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>$S = 0.08$</td>
<td>$C = 0.11$</td>
</tr>
<tr>
<td>60</td>
<td><strong>Seed yield</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seed yield</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T44</td>
<td>7.66d</td>
<td>5.67f</td>
</tr>
<tr>
<td></td>
<td>Pusa Vishal</td>
<td>8.92a</td>
<td>7.72c</td>
</tr>
<tr>
<td></td>
<td>Tram</td>
<td>7.16e</td>
<td>5.11g</td>
</tr>
<tr>
<td></td>
<td>PDM54</td>
<td>8.65b</td>
<td>7.57d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>8.10</td>
<td>6.52*</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>$S = 0.12$</td>
<td>$C = 0.17$</td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at $P<0.05$.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at $P<0.05$. 
except for leaf fresh and dry mass and plant dry mass at initial stage of growth (Tables 14-20).

The increase in salinity levels decreased the growth characteristics of all the cultivars. The observations recorded at all the sampling times showed similar pattern of cultivar response to NaCl concentrations.

Growth reductions in Sakha and PBM16 were significantly greater than in Alankar and Pusa Bold with NaCl concentrations. Maximum reductions in growth were noted with 100mM NaCl.

In Alankar, the treatment of 100mM NaCl reduced root length by 47.84, 36.79 and 27.45%, root fresh mass by 47.47, 37.91 and 26.42%, root dry mass by 47.83, 38.07 and 26.76%, leaf fresh mass by 47.03, 37.03 and 27.84%, leaf dry mass by 46.98, 37.44 and 26.60%, leaf area by 47.16, 36.75 and 27.99% and plant dry mass by 47.57, 37.78 and 26.42% at 30, 60 and 90DAS, respectively over control.

Contrarily, higher decrease in growth was shown by PBM16. Regarding per cent decreases in PBM16 due to 100mM NaCl, root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass were reduced by 78.28, 79.06, 78.26, 76.65, 76.22, 76.86 and 78.44%, respectively at 30DAS. The decreases in these characteristics at 60DAS were 68.92, 67.58, 68.26, 68.62, 66.82, 66.67 and 67.60%, and were 56.43, 56.94, 57.37, 57.25, 58.03, 56.05 and 56.42%, respectively at 90DAS.

4.2.2 Photosynthetic characteristics

Photosynthetic characteristics declined significantly with the increasing salinity levels at all the sampling times (Tables 21-22). The data indicate progressive decrease with the increasing salinity in all the cultivars. The carbonic anhydrase activity and net photosynthetic rate in salinity treatments
Table 14: Root length (cm plant$^{-1}$) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Alankar</td>
<td>25.50a</td>
<td>19.50c</td>
<td>13.30e</td>
<td>19.43a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>25.10a</td>
<td>19.00c</td>
<td>12.80e</td>
<td>18.97a</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>22.60b</td>
<td>14.60d</td>
<td>6.20f</td>
<td>14.47b</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>22.10b</td>
<td>13.40e</td>
<td>4.80g</td>
<td>13.43c</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>23.83</td>
<td>16.63*</td>
<td>9.28*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>S = 0.47</td>
<td>C = 0.55</td>
<td>SxC = 0.95</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td>31.80a</td>
<td>25.90b</td>
<td>20.10c</td>
<td>25.93a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>31.40a</td>
<td>25.30b</td>
<td>19.40c</td>
<td>25.37a</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>26.10b</td>
<td>18.00d</td>
<td>9.40f</td>
<td>17.83b</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>25.10b</td>
<td>16.70e</td>
<td>7.80g</td>
<td>16.53c</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>28.60</td>
<td>21.48*</td>
<td>14.18*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>S = 0.53</td>
<td>C = 0.61</td>
<td>SxC = 1.06</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td>41.90a</td>
<td>36.30c</td>
<td>30.40d</td>
<td>36.20a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>41.80a</td>
<td>35.80c</td>
<td>29.70de</td>
<td>35.77a</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>39.00b</td>
<td>28.60e</td>
<td>18.20g</td>
<td>28.60b</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>38.10b</td>
<td>27.30f</td>
<td>16.60h</td>
<td>27.33c</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>40.20</td>
<td>32.00*</td>
<td>23.73*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>S = 0.55</td>
<td>C = 0.64</td>
<td>SxC = 1.11</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at $P<0.05$.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at $P<0.05$. 

The superscript letters on the values in the column of cultivar Mean show significant difference at $P<0.05$. 
Table 15: Root fresh mass (g plant\(^{-1}\)) of four cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Alankar</td>
<td></td>
<td>6.13(^a)</td>
<td>4.68c</td>
<td>3.22e</td>
<td>4.68(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>5.49(^b)</td>
<td>4.15d</td>
<td>2.82f</td>
<td>4.15(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>2.82f</td>
<td>1.79h</td>
<td>0.79j</td>
<td>1.80(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>2.34g</td>
<td>1.45i</td>
<td>0.49k</td>
<td>1.43(^d)</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>4.19</td>
<td>3.02*</td>
<td>1.83*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.14</td>
<td>C = 0.16</td>
<td>S×C = 0.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td></td>
<td>11.00(^a)</td>
<td>8.99c</td>
<td>6.83f</td>
<td>8.94(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>10.03b</td>
<td>8.12d</td>
<td>6.19g</td>
<td>8.11(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>8.07d</td>
<td>5.49h</td>
<td>3.08j</td>
<td>5.55(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>7.28e</td>
<td>4.78i</td>
<td>2.36k</td>
<td>4.81(^d)</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>9.10</td>
<td>6.85*</td>
<td>4.61*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.19</td>
<td>C = 0.22</td>
<td>S×C = 0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td></td>
<td>15.48(^a)</td>
<td>13.41c</td>
<td>11.39e</td>
<td>13.42(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>14.48b</td>
<td>12.38d</td>
<td>10.16f</td>
<td>12.34(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>11.13e</td>
<td>8.27g</td>
<td>5.39i</td>
<td>8.26(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>9.66f</td>
<td>6.90h</td>
<td>4.16j</td>
<td>6.91(^d)</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>12.69</td>
<td>10.24*</td>
<td>7.78*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.27</td>
<td>C = 0.31</td>
<td>S×C = 0.53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).

* indicates significant effect of salinity treatment in comparison to control.
The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
Table 16: Root dry mass (g plant⁻¹) of four cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Alankar</td>
<td>1.84a</td>
<td>1.41c</td>
<td>0.96e</td>
<td>1.40a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>1.62b</td>
<td>1.23d</td>
<td>0.82f</td>
<td>1.22b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>0.85f</td>
<td>0.53h</td>
<td>0.22j</td>
<td>0.53c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>0.69g</td>
<td>0.43i</td>
<td>0.15k</td>
<td>0.42d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>1.25</td>
<td>0.90*</td>
<td>0.54*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.04</td>
<td>C = 0.05</td>
<td>SxC = 0.08</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td>3.52a</td>
<td>2.87c</td>
<td>2.18f</td>
<td>2.86a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>3.20b</td>
<td>2.59d</td>
<td>1.95g</td>
<td>2.58b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>2.55d</td>
<td>1.72h</td>
<td>0.98j</td>
<td>1.75c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>2.30e</td>
<td>1.51i</td>
<td>0.73k</td>
<td>1.51d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>2.89</td>
<td>2.17*</td>
<td>1.46*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.06</td>
<td>C = 0.07</td>
<td>SxC = 0.12</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td>5.12a</td>
<td>4.43c</td>
<td>3.75e</td>
<td>4.43a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>4.78b</td>
<td>4.09d</td>
<td>3.35f</td>
<td>4.07b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>3.67e</td>
<td>2.72g</td>
<td>1.74i</td>
<td>2.71c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>3.19f</td>
<td>2.25h</td>
<td>1.36f</td>
<td>2.27d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>4.19</td>
<td>3.37*</td>
<td>2.55*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.09</td>
<td>C = 0.10</td>
<td>SxC = 0.18</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.
* indicates significant effect of salinity treatment in comparison to control.
The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
Table 17: Leaf fresh mass (g plant\(^{-1}\)) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Alankar</td>
<td>10.93</td>
<td>8.36</td>
<td>5.78</td>
<td>8.36(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>10.21</td>
<td>7.73</td>
<td>5.28</td>
<td>7.74(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>7.31</td>
<td>4.58</td>
<td>2.00</td>
<td>4.63(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>6.38</td>
<td>3.86</td>
<td>1.49</td>
<td>3.91(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>8.71</td>
<td>6.13*</td>
<td>3.64*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>(S = 0.21)</td>
<td>(C = 0.25)</td>
<td>(S \times C = \text{NS})</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td>20.58(^a)</td>
<td>16.83(^d)</td>
<td>12.96(^f)</td>
<td>16.79(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>19.82(^b)</td>
<td>15.99(^e)</td>
<td>12.10(^g)</td>
<td>15.97(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>17.62(^c)</td>
<td>12.02(^i)</td>
<td>6.85(^i)</td>
<td>12.16(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>16.92(^d)</td>
<td>11.22(^h)</td>
<td>5.31(^j)</td>
<td>11.15(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>18.74</td>
<td>14.02*</td>
<td>9.31*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>(S = 0.32)</td>
<td>(C = 0.37)</td>
<td>(S \times C = 0.65)</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td>26.11(^a)</td>
<td>22.62(^b)</td>
<td>18.84(^d)</td>
<td>22.52(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>25.48(^a)</td>
<td>21.83(^c)</td>
<td>17.89(^e)</td>
<td>21.73(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>23.04(^b)</td>
<td>16.89(^f)</td>
<td>10.89(^h)</td>
<td>16.94(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>22.41(^b)</td>
<td>16.00(^g)</td>
<td>9.58(^i)</td>
<td>16.00(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>24.26</td>
<td>19.34*</td>
<td>14.30*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>(S = 0.36)</td>
<td>(C = 0.41)</td>
<td>(S \times C = 0.72)</td>
<td></td>
</tr>
</tbody>
</table>

*Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).*

*indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
Table 18: Leaf dry mass (g plant\(^{-1}\)) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>30</td>
<td>Alankar</td>
<td>2.81</td>
<td>2.15</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>2.63</td>
<td>1.98</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>1.88</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>1.64</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>2.24</td>
<td>1.58</td>
</tr>
</tbody>
</table>

LSD at $P<0.05$ $S = 0.05$ $C = 0.06$ $S \times C = NS$

| 60  | Alankar     | 5.77\(a\) | 4.71\(c\) | 3.61\(e\) | 4.70\(a\) |
|     | Pusa Bold   | 5.45\(b\) | 4.40\(d\) | 3.29\(f\) | 4.38\(b\) |
|     | Sakha       | 4.76\(c\) | 3.27\(f\) | 1.83\(h\) | 3.29\(c\) |
|     | PBM16       | 4.46\(d\) | 2.93\(g\) | 1.48\(i\) | 2.96\(d\) |
|     | Mean        | 5.11 | 3.83\(f\) | 2.55\(f\) |        |

LSD at $P<0.05$ $S = 0.09$ $C = 0.11$ $S \times C = 0.18$

| 90  | Alankar     | 8.12\(a\) | 7.04\(c\) | 5.96\(f\) | 7.04\(a\) |
|     | Pusa Bold   | 7.74\(b\) | 6.64\(d\) | 5.43\(g\) | 6.60\(b\) |
|     | Sakha       | 6.64\(d\) | 4.82\(h\) | 3.15\(j\) | 4.87\(c\) |
|     | PBM16       | 6.29\(e\) | 4.43\(i\) | 2.64\(k\) | 4.45\(d\) |
|     | Mean        | 7.20 | 5.73\(f\) | 4.30\(k\) |        |

LSD at $P<0.05$ $S = 0.12$ $C = 0.14$ $S \times C = 0.24$

Different letters indicate significant difference in the interaction values of salinity and cultivar at $P<0.05$.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at $P<0.05$. 
Table 19: Leaf area (cm² plant⁻¹) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Alankar</td>
<td>564.00a</td>
<td>432.00e</td>
<td>298.00h</td>
<td>431.33a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>538.00b</td>
<td>408.00f</td>
<td>271.00i</td>
<td>405.67b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>497.00c</td>
<td>318.00g</td>
<td>138.00j</td>
<td>317.67c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>471.00d</td>
<td>289.00k</td>
<td>109.00k</td>
<td>289.67d</td>
</tr>
<tr>
<td>50</td>
<td>Mean</td>
<td>517.50</td>
<td>361.75*</td>
<td>204.00*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 9.96</td>
<td>C = 11.50</td>
<td>S×C = 19.92</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td>762.00a</td>
<td>623.00d</td>
<td>482.00e</td>
<td>622.33a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>744.00a</td>
<td>600.00g</td>
<td>453.00f</td>
<td>599.00b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>698.00b</td>
<td>473.00ef</td>
<td>263.00h</td>
<td>478.00c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>672.00c</td>
<td>443.00g</td>
<td>224.00i</td>
<td>446.33d</td>
</tr>
<tr>
<td>100</td>
<td>Mean</td>
<td>719.00</td>
<td>534.75*</td>
<td>355.50*</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td>1086.00a</td>
<td>943.00b</td>
<td>782.00d</td>
<td>937.00a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>1063.00a</td>
<td>908.00c</td>
<td>746.00e</td>
<td>905.67b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>903.00c</td>
<td>664.00f</td>
<td>432.00h</td>
<td>666.33c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>885.00c</td>
<td>632.00g</td>
<td>389.00i</td>
<td>635.33d</td>
</tr>
<tr>
<td>100</td>
<td>Mean</td>
<td>984.25</td>
<td>786.75*</td>
<td>587.25*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 15.56</td>
<td>C = 17.97</td>
<td>S×C = 31.12</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
Table 20: Plant dry mass (g plant\(^{-1}\)) of four cultivars of mustard *Brassica juncea* L. grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>30</td>
<td>Alankar</td>
<td>6.39</td>
<td>4.89</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>5.87</td>
<td>4.43</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>4.37</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>3.85</td>
<td>2.39</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>5.12</td>
<td>3.61*</td>
</tr>
<tr>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.12</td>
<td>C = 0.14</td>
<td>S(\times) C = NS</td>
</tr>
</tbody>
</table>

| 60  | Alankar     | 14.40\(\text{a}\) | 11.74\(\text{d}\) | 8.96\(\text{f}\) | 11.70\(\text{a}\) |
|     | Pusa Bold   | 13.92\(\text{b}\) | 11.20\(\text{e}\) | 8.50\(\text{g}\) | 11.20\(\text{b}\) |
|     | Sakha       | 12.30\(\text{c}\) | 8.38g | 4.72i | 8.47\(\text{c}\) |
|     | PBM16       | 11.82\(\text{d}\) | 7.83\(\text{h}\) | 3.83j | 7.83\(\text{d}\) |
| Mean|             | 13.11 | 9.78* | 6.50* |      |
| LSD at \(P<0.05\) | S = 0.23 | C = 0.26 | S\(\times\) C = 0.45 |

| 90  | Alankar     | 21.99\(\text{a}\) | 19.03\(\text{c}\) | 16.18e | 19.06\(\text{a}\) |
|     | Pusa Bold   | 21.53\(\text{a}\) | 18.40d | 15.24f | 18.39\(\text{b}\) |
|     | Sakha       | 20.09\(\text{b}\) | 15.02f | 9.26h | 14.79\(\text{c}\) |
|     | PBM16       | 19.62\(\text{b}\) | 13.98g | 8.55i | 14.05\(\text{d}\) |
| Mean|             | 20.81 | 16.61* | 12.31* |      |
| LSD at \(P<0.05\) | S = 0.29 | C = 0.34 | S\(\times\) C = 0.58 |

Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).

\* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
were lower as compared to control. The greatest decrease was observed at the highest level of NaCl concentration.

Alankar had significantly greater carbonic anhydrase activity and net photosynthetic rate than PBM16 followed by Sakha at 0, 50 and 100mM NaCl concentrations. In Alankar, the decrease in carbonic anhydrase activity and net photosynthetic rate with 50mM and 100mM NaCl was 18.12 and 29.00% and 29.00 and 35.93% at 30DAS; 11.24 and 11.94% and 13.72 and 28.82% at 60DAS, and 10.05 and 9.32% and 12.06 and 26.25% respectively at 90DAS.

In PBM16, the carbonic anhydrase activity and net photosynthetic rate decreased by 26.07 and 22.93% due to 50mM NaCl and 48.80 and 42.35% with 100mM NaCl at 30DAS; 20.24 and 18.60% and 37.66 and 34.94% with 50mM and 100mM NaCl at 60DAS, and 19.05 and 16.32% and 36.04 and 33.19% with 50mM and 100mM NaCl, respectively at 90DAS.

4.2.3 Yield characteristics

Yield characteristics were affected by salinity stress in all the cultivars. In pod length, the interaction effect of cultivar and salinity was found non-significant (Table 23). Yield and its attributing characteristics decreased with 50mM NaCl in all the cultivars. The treatment of 100mM NaCl proved deleterious and plants did not survive up to maturity under this treatment. Sakha and PBM16 were very sensitive to salinity stress, therefore, produced lesser yield than Alankar and Pusa Bold.

Treatment of 50mM NaCl caused 11.76, 13.21, 13.31 and 13.21% reduction in pod length, pod number, seed number and seed yield in Alankar. The above characteristics decreased by 30.23, 29.58, 28.17 and 28.45% in PBM16, respectively.
Table 21: Carbonic anhydrase activity (m mol m\(^{-2}\) leaf s\(^{-1}\)) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Alankar</td>
<td></td>
<td>13.69(a)</td>
<td>11.21(e)</td>
<td>9.72(g)</td>
<td>11.54(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>13.24(b)</td>
<td>10.29(f)</td>
<td>8.36(j)</td>
<td>10.63(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>12.18(c)</td>
<td>9.19(h)</td>
<td>7.39(k)</td>
<td>9.59(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>11.70(d)</td>
<td>8.65(i)</td>
<td>5.99(l)</td>
<td>8.78(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>12.70</td>
<td>9.84(^*)</td>
<td>7.87(^*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.08</td>
<td>C = 0.09</td>
<td>S×C = 0.16</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td></td>
<td>17.79(a)</td>
<td>15.79(d)</td>
<td>15.35(e)</td>
<td>16.31(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>17.46(b)</td>
<td>14.66(f)</td>
<td>13.74(g)</td>
<td>15.29(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>16.35(c)</td>
<td>13.25(h)</td>
<td>10.72(j)</td>
<td>13.44(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>16.01(d)</td>
<td>12.77(i)</td>
<td>9.98(k)</td>
<td>12.92(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>16.90</td>
<td>14.12(^*)</td>
<td>12.45(^*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.12</td>
<td>C = 0.14</td>
<td>S×C = 0.25</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td></td>
<td>16.92(a)</td>
<td>15.22(c)</td>
<td>14.88(d)</td>
<td>15.67(^a)</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>16.69(a)</td>
<td>14.18(e)</td>
<td>13.34(f)</td>
<td>14.74(^b)</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>15.52(b)</td>
<td>12.88(g)</td>
<td>10.39(i)</td>
<td>12.93(^c)</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>15.01(cd)</td>
<td>12.15(h)</td>
<td>9.60(j)</td>
<td>12.25(^d)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>16.04</td>
<td>13.61(^*)</td>
<td>12.05(^*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>S = 0.12</td>
<td>C = 0.14</td>
<td>S×C = 0.24</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at \(P<0.05\).

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at \(P<0.05\).
Table 22: Net photosynthetic rate (μ mol CO₂ m⁻² s⁻¹) of four cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th>0</th>
<th>50</th>
<th>100</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Alankar</td>
<td></td>
<td>22.74a</td>
<td>19.75c</td>
<td>14.57f</td>
<td>19.02a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>21.29b</td>
<td>17.74de</td>
<td>13.33g</td>
<td>17.45b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>18.23d</td>
<td>14.47f</td>
<td>10.88h</td>
<td>14.53c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>17.31e</td>
<td>13.34g</td>
<td>9.98i</td>
<td>13.54d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>19.89</td>
<td>16.33*</td>
<td>12.19*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.25</td>
<td>C = 0.29</td>
<td>SxC = 0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Alankar</td>
<td></td>
<td>25.05a</td>
<td>22.06c</td>
<td>17.83f</td>
<td>21.65a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>23.72b</td>
<td>20.58d</td>
<td>16.12h</td>
<td>20.14b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>20.38d</td>
<td>17.05g</td>
<td>13.52i</td>
<td>16.98c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>19.46e</td>
<td>15.84h</td>
<td>12.66j</td>
<td>15.99d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>22.15</td>
<td>18.88*</td>
<td>15.03*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.20</td>
<td>C = 0.23</td>
<td>SxC = 0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Alankar</td>
<td></td>
<td>22.97a</td>
<td>20.83c</td>
<td>16.94f</td>
<td>20.25a</td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td></td>
<td>21.61b</td>
<td>19.08d</td>
<td>15.16h</td>
<td>18.62b</td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td></td>
<td>18.90d</td>
<td>16.33g</td>
<td>12.81i</td>
<td>16.01c</td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td></td>
<td>18.02e</td>
<td>15.08h</td>
<td>12.04j</td>
<td>15.05d</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td>20.38</td>
<td>17.83*</td>
<td>14.24*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.19</td>
<td>C = 0.22</td>
<td>SxC = 0.38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.

* indicates significant effect of salinity treatment in comparison to control.

The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
Table 23: Pod length (cm), pod number plant\(^{-1}\), seed number pod\(^{-1}\) and seed yield (g plant\(^{-1}\)) of four cultivars of mustard (Brassica juncea L.) grown under salinity stress at harvest, i.e., 120 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Cultivar (C)</th>
<th>Salinity (S) level (mM NaCl)</th>
<th></th>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pod length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>Alankar</td>
<td>5.10</td>
<td>4.50</td>
<td>4.80(^{a})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>4.90</td>
<td>4.20</td>
<td>4.55(^{b})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>4.50</td>
<td>3.30</td>
<td>3.90(^{c})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>4.30</td>
<td>3.00</td>
<td>3.65(^{d})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>4.70</td>
<td>3.75*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.22</td>
<td>C = 0.31</td>
<td>S×C = NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pod number</td>
<td>108.56(^{a})</td>
<td>94.22cd</td>
<td>101.39(^{a})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>103.49(^{b})</td>
<td>88.69e</td>
<td>96.09(^{b})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>95.39(^{c})</td>
<td>69.56f</td>
<td>82.48(^{c})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>92.30d</td>
<td>65.00g</td>
<td>78.65(^{d})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>99.94</td>
<td>79.37*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.99</td>
<td>C = 1.40</td>
<td>S×C = 1.98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seed number</td>
<td>12.55(^{a})</td>
<td>10.88d</td>
<td>11.72(^{a})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>12.24b</td>
<td>10.48e</td>
<td>11.36(^{b})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>11.25c</td>
<td>8.24f</td>
<td>9.75(^{c})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>10.90d</td>
<td>7.83g</td>
<td>9.37(^{d})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>11.74</td>
<td>9.36*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.13</td>
<td>C = 0.09</td>
<td>S×C = 19.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seed yield</td>
<td>6.36(^{a})</td>
<td>5.52c</td>
<td>5.94(^{a})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pusa Bold</td>
<td>5.92b</td>
<td>5.07d</td>
<td>5.50(^{b})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sakha</td>
<td>5.01d</td>
<td>3.68f</td>
<td>4.35(^{c})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBM16</td>
<td>4.71e</td>
<td>3.37g</td>
<td>4.04(^{d})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>5.50</td>
<td>4.41*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>S = 0.09</td>
<td>C = 0.13</td>
<td>S×C = 0.19</td>
<td></td>
</tr>
</tbody>
</table>

Different letters indicate significant difference in the interaction values of salinity and cultivar at P<0.05.

* indicates significant effect of salinity treatment in comparison to control.
The superscript letters on the values in the column of cultivar Mean show significant difference at P<0.05.
4.3 Experiments 3 and 4

The experiments were conducted based on the findings of Experiments 1 and 2. The aim of the experiments was to study the effect of salicylic acid (SA) in alleviating the salinity stress effects in mungbean (Experiment 3) and mustard (Experiment 4) and the SA-mediated mechanisms responsible for tolerance against salinity stress. As described earlier Pusa Vishal and Tram cultivars of mungbean emerged as salinity-tolerant and salinity non-tolerant, and Alankar as tolerant and PBM16 as non-tolerant cultivars of mustard. It has also been detailed out that the treatment of 100mM NaCl was found deleterious for yield of both the crop plants as the treatment caused major injury. Therefore, the plants could not survive up to maturity stage. Therefore, in Experiment 3 and Experiment 4, 100mM NaCl treatment was not included in the study. These experiments were designed to study the effect of 0.0, 0.1, 0.5 and 1.0mM SA applied exogenously as foliar spray on tolerant and non-tolerant cultivars grown with 0 or 50mM NaCl. In these two experiments growth, photosynthetic, biochemical and yield characteristics were studied. The timing of samplings for these characteristics was 20, 40 and 60DAS for mungbean, and 30, 60, 90 and 120DAS for mustard. The activities of antioxidative enzymes were also measured in these two experiments at 20DAS in mungbean and 30DAS in mustard. The results noted for both the experiments have been described in detail in the following pages.

4.3.1 Experiment 3

4.3.1.1 Growth characteristics

The effects of SA application on growth were found significant, except for root fresh mass for non-tolerant (Tram) cultivar at 40DAS. SA application increased growth characteristics of both the cultivars grown under non-saline (control) condition, and ameliorating salinity stress effects was also observed.
For both the cultivars, the application of 0.5 mM SA proved most effective in enhancing growth under normal and salinity stress conditions.

The application of 0.5 mM SA on Pusa Vishal and Tram under non-saline condition increased root length by 18.92 and 14.49% at 20DAS, and 19.90 and 15.71% at 40DAS; root fresh mass by 19.17 and 14.81% at 20DAS, and 20.13 and 15.97% at 40DAS; root dry mass by 19.35 and 18.75% at 20DAS, and 20.73 and 15.09% at 40DAS; leaf fresh mass by 19.35 an 14.29% at 20DAS, and 20.00 and 15.95% at 40DAS; leaf dry mass by 18.92 and 15.00% at 20DAS, and 20.00 and 15.82% at 40DAS; leaf area by 18.96 and 14.97% at 20DAS, and 19.96 and 15.94% at 40DAS, and plant dry mass by 18.97 and 15.46% at 20DAS, and 19.83 and 16.03% at 40DAS over control (Tables 24-30).

Plants grown under saline condition (50 mM NaCl) also showed positive response to SA application. SA application increased the growth characteristics but the increases were lesser compared to the increases in growth characteristics of plants grown under non-saline condition (0 mM NaCl).

The per cent decreases in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass due to 50 mM NaCl over the control were 18.47, 18.33, 19.35, 17.74, 18.92, 18.56 and 18.97% at 20DAS, and 13.18, 13.09, 12.20, 13.33, 13.17, 13.21 and 13.22% at 40DAS in Pusa Vishal and 34.06, 33.33, 31.25, 33.77, 35.00, 34.26 and 32.99% at 20DAS, and 28.21, 28.57, 28.30, 28.76, 28.48, 29.35 and 29.17% at 40DAS in Tram, respectively.

The alleviation effects of salinity by SA were observed by comparing the per cent decrease in growth characteristics of plants under 50 mM NaCl and 50 mM NaCl plus 0.5 mM SA in respect to control. The treatment of 0.5 mM SA on plants grown with 50 mM NaCl reduced the effects of 50 mM NaCl. With this treatment (0.5 mM SA plus 50 mM NaCl), the per cent reduction in Pusa Vishal was limited to 7.21 and 0.26% for root length, 6.67 and 0.00% for root...
Table 24: Effect of salicylic acid (SA) spray on root length (cm plant\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 NaCl (0mM)</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>22.20c</td>
<td>13.80b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>23.50b</td>
<td>14.00b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>26.40a</td>
<td>15.80a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>22.60c</td>
<td>13.70b</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>18.10f</td>
<td>9.10d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>18.80e</td>
<td>9.10d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>20.60d</td>
<td>10.00c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>15.50g</td>
<td>7.20e</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.67</td>
<td>0.53</td>
<td></td>
</tr>
</tbody>
</table>

| 40 NaCl (0mM) | SA (mM)         |             |
| 0.0   | 38.70c           | 28.00b      |
| 0.1   | 41.40b           | 28.80b      |
| 0.5   | 46.40a           | 32.40a      |
| 1.0   | 39.40c           | 27.80b      |
| NaCl (50mM) | SA (mM)         |             |
| 0.0   | 33.60e           | 20.10d      |
| 0.1   | 35.20d           | 20.50d      |
| 0.5   | 38.60c           | 22.30c      |
| 1.0   | 28.50f           | 15.80e      |
| LSD at P<0.05 | 1.14           | 1.03        |

Different letters within a column indicate significant difference at P<0.05.
Table 25: Effect of salicylic acid (SA) spray on root fresh mass (g plant\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>1.20c</td>
<td>0.81b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.28b</td>
<td>0.83b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.43a</td>
<td>0.93a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.23c</td>
<td>0.81b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.98e</td>
<td>0.54d</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.02e</td>
<td>0.55d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.12d</td>
<td>0.60c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.84f</td>
<td>0.44e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>2.98c</td>
<td>2.38</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>3.19b</td>
<td>2.45</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>3.58a</td>
<td>2.76</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.04c</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>2.59e</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.72d</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.98c</td>
<td>1.89</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.20f</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.09</td>
<td>NS</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
Table 26: Effect of salicylic acid (SA) spray on root dry mass (g plant\textsuperscript{-1}) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (\textit{Vigna radiata} L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.31c</td>
<td>0.16b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.33b</td>
<td>0.16b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.37a</td>
<td>0.19a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.31c</td>
<td>0.16b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.25e</td>
<td>0.11c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.26e</td>
<td>0.11c</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.29d</td>
<td>0.12c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.22f</td>
<td>0.08d</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.82b</td>
<td>0.53b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.88b</td>
<td>0.54b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.99a</td>
<td>0.61a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.84b</td>
<td>0.52b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.72c</td>
<td>0.38d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.75c</td>
<td>0.38d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.82b</td>
<td>0.42c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.61d</td>
<td>0.30e</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>0.06</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 
Table 27: Effect of salicylic acid (SA) spray on leaf fresh mass (g plant\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.24c</td>
<td>0.77b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.32b</td>
<td>0.78b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.48a</td>
<td>0.88a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.27c</td>
<td>0.77b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.02e</td>
<td>0.51d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.06e</td>
<td>0.52d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.16d</td>
<td>0.56c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.87f</td>
<td>0.41e</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>7.80c</td>
<td>6.71b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>8.35b</td>
<td>6.91b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>9.36a</td>
<td>7.78a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>7.96c</td>
<td>6.67b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.76e</td>
<td>4.78d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.10d</td>
<td>4.87d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>7.78c</td>
<td>5.30c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>5.75f</td>
<td>3.78e</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.23</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
Table 28: Effect of salicylic acid (SA) spray on leaf dry mass (g plant⁻¹) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.37c</td>
<td>0.20b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.39b</td>
<td>0.20b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.44a</td>
<td>0.23a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.37c</td>
<td>0.20b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.30e</td>
<td>0.13d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.31e</td>
<td>0.13d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>0.34d</td>
<td>0.14c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.26f</td>
<td>0.10e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.05c</td>
<td>1.58b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.20b</td>
<td>1.63b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.46a</td>
<td>1.83a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.09c</td>
<td>1.57b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.78e</td>
<td>1.13d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.87d</td>
<td>1.15d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.05c</td>
<td>1.26c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.51f</td>
<td>0.89e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.06</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 29: Effect of salicylic acid (SA) spray on leaf area (cm$^2$ plant$^{-1}$) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>50.10c</td>
<td>39.40b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>53.10b</td>
<td>40.10b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>59.60a</td>
<td>45.30a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>51.10c</td>
<td>39.20b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>40.80f</td>
<td>25.90d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>42.40e</td>
<td>26.10d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>46.50d</td>
<td>28.40c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>35.00g</td>
<td>20.70e</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>1.52</td>
<td>1.67</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>165.80c</td>
<td>138.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>177.40b</td>
<td>142.10b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>198.90a</td>
<td>160.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>169.10c</td>
<td>137.30b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>143.90c</td>
<td>97.50d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>151.00d</td>
<td>99.40d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>165.40c</td>
<td>108.20c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>122.30f</td>
<td>77.00e</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>4.84</td>
<td>5.27</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 
Table 30: Effect of salicylic acid (SA) spray on plant dry mass (g plant\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.16c</td>
<td>0.97b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.23b</td>
<td>0.99b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.38a</td>
<td>1.12a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.18c</td>
<td>0.97b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.94f</td>
<td>0.65d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>0.98e</td>
<td>0.65d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.08d</td>
<td>0.71c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.81g</td>
<td>0.52e</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>3.63c</td>
<td>3.12b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>3.88b</td>
<td>3.22b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>4.35a</td>
<td>3.62a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.70c</td>
<td>3.11b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>3.15e</td>
<td>2.21d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>3.30d</td>
<td>2.25d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>3.62c</td>
<td>2.45c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.67f</td>
<td>1.74e</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.11</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
fresh mass, 6.45 and 0.00% for root dry mass, 6.45 and 0.26% for leaf fresh mass, 8.11 and 0.00% for leaf dry mass, 7.19 and 0.24% for leaf area and 6.90 and 0.28% for plant dry mass at 20 and 40DAS, respectively. In Tram, the decreases in the above characteristics with 0.5mM SA plus 50mM NaCl were limited to 27.54 and 20.36%, 25.93 and 20.59%, 25.00 and 20.75%, 27.27 and 21.01%, 30.00 and 20.25%, 27.92 and 21.59% and 26.80 and 21.47%, respectively at 20 and 40DAS.

4.3.1.2 Photosynthetic characteristics

Photosynthetic characteristics decreased with 50mM NaCl treatment. The effect of SA on the photosynthetic characteristics of tolerant (Pusa Vishal) and non-tolerant (Tram) cultivars was positive under non-saline and salinity stress conditions at 20 and 40DAS. The SA application also reduced the salinity stress effects on the photosynthetic characteristics of both the cultivars at both the sampling times. The concentration of 0.5mM SA was found most effective in alleviating salinity stress (Tables 31-36).

The increases in carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO₂ concentration, chlorophyll content and carotenoid content in Pusa Vishal with the application of 0.5mM SA were 20.45, 18.88, 19.08, 19.20, 18.40 and 18.39%, whereas the increases in Tram were 16.38, 14.62, 15.17, 15.20, 15.00 and 15.29% at 20DAS, and 19.32, 19.74, 20.10, 20.20, 19.78 and 20.00% in Pusa Vishal and 15.42, 15.43, 16.10, 16.20, 15.73 and 16.07% in Tram at 40DAS in comparison to the water-sprayed control.

The treatment of 50mM NaCl decreased carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO₂ concentration, chlorophyll content and carotenoid content in Pusa Vishal and Tram. The decreases due to 50mM NaCl in these characteristics were 36.45, 13.27, 12.08, 14.30, 13.50 and 13.79% at 20DAS, and 11.30, 11.84, 10.77, 12.90, 12.09 and 12.17%, respectively at 40DAS in Pusa Vishal. A higher decreases of 43.09,
Table 31: Effect of salicylic acid (SA) spray on carbonic anhydrase activity (m mol m\(^{-2}\) leaf sec\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>11.44c</td>
<td>9.40c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>12.26b</td>
<td>9.73b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.78a</td>
<td>10.94a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>11.62bc</td>
<td>9.38c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>7.27e</td>
<td>5.35e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.64e</td>
<td>5.47e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>8.38d</td>
<td>5.96d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.16f</td>
<td>4.15f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.69</td>
<td>0.23</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.58c</td>
<td>13.62b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>16.54b</td>
<td>14.01b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>18.59a</td>
<td>15.72a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>15.81b</td>
<td>13.57b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>13.82d</td>
<td>11.04e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.41d</td>
<td>11.20d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>15.81bc</td>
<td>12.15c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>11.86e</td>
<td>8.68f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.82</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 32: Effect of salicylic acid (SA) spray on net photosynthetic rate (μ mol CO$_2$ m$^{-2}$ s$^{-1}$) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>19.60c</td>
<td>13.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>20.70b</td>
<td>13.20b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>23.30a</td>
<td>14.90a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.80d</td>
<td>12.10c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>17.00f</td>
<td>10.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>17.60e</td>
<td>10.10e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>19.30c</td>
<td>11.00d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>14.60g</td>
<td>8.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at $P&lt;0.05$</td>
<td>0.46</td>
<td>0.31</td>
</tr>
</tbody>
</table>

| 40  | NaCl (0mM) |             |      |
|     | SA (mM)    |             |      |
|     | 0.0        | 22.80c      | 16.20b |
|     | 0.1        | 24.30b      | 16.60b |
|     | 0.5        | 27.30a      | 18.70a |
|     | 1.0        | 21.80d      | 15.10c |
|     | NaCl (50mM)|             |      |
|     | SA (mM)    |             |      |
|     | 0.0        | 20.10f      | 13.20d |
|     | 0.1        | 21.10e      | 13.40d |
|     | 0.5        | 23.10c      | 14.80c |
|     | 1.0        | 17.00g      | 10.40e |
|     | LSD at $P<0.05$ | 0.53 | 0.45 |

Different letters within a column indicate significant difference at $P<0.05$. 
Table 33: Effect of salicylic acid (SA) spray on stomatal conductance (m mol m\(^{-2}\) s\(^{-1}\)) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>414.00b</td>
<td>402.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>439.00b</td>
<td>410.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>493.00a</td>
<td>463.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>397.00d</td>
<td>376.00c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>364.00e</td>
<td>314.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>379.00e</td>
<td>318.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>413.00c</td>
<td>346.00d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>312.00f</td>
<td>251.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>9.45</td>
<td>10.23</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>418.00c</td>
<td>410.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>448.00b</td>
<td>423.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>502.00a</td>
<td>476.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>401.00d</td>
<td>383.00c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>373.00e</td>
<td>339.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>392.00e</td>
<td>346.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>430.00b</td>
<td>377.00d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>316.00f</td>
<td>267.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>9.86</td>
<td>9.49</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 
Table 34: Effect of salicylic acid (SA) spray on intercellular CO₂ concentration (μmol mol⁻¹) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>282.29b</td>
<td>280.24b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>299.79b</td>
<td>286.41b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>336.49a</td>
<td>322.84a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>271.00d</td>
<td>262.02c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>241.92e</td>
<td>212.70e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>251.84e</td>
<td>215.04e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>276.03c</td>
<td>234.18d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>207.57f</td>
<td>170.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>6.50</td>
<td>7.28</td>
</tr>
</tbody>
</table>

| 40  | NaCl (0mM) |             |      |
|     | SA (mM)    |             |      |
|     | 0.0        | 286.53c     | 284.21b |
|     | 0.1        | 307.16b     | 293.59b |
|     | 0.5        | 344.41a     | 330.25a |
|     | 1.0        | 275.07d     | 265.74c |
|     | NaCl (50mM)|             |      |
|     | SA (mM)    |             |      |
|     | 0.0        | 249.57e     | 228.50e |
|     | 0.1        | 262.30e     | 233.30e |
|     | 0.5        | 287.26b     | 258.66d |
|     | 1.0        | 211.88f     | 178.00f |
|     | LSD at P<0.05 | 6.83      | 7.20  |

Different letters within a column indicate significant difference at *P*<0.05.
Table 35: Effect of salicylic acid (SA) spray on chlorophyll content (mg g\(^{-1}\) fresh mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>1.63c</td>
<td>1.60b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.72b</td>
<td>1.63b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.93a</td>
<td>1.84a</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.56e</td>
<td>1.49c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>1.41g</td>
<td>1.23e</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.46f</td>
<td>1.24e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.60d</td>
<td>1.35d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.21h</td>
<td>0.98f</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>1.82c</td>
<td>1.78b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.94b</td>
<td>1.83b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.18a</td>
<td>2.06a</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.74d</td>
<td>1.66c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>1.60e</td>
<td>1.45e</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.68d</td>
<td>1.47d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.84c</td>
<td>1.60c</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.36f</td>
<td>1.14f</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>0.06</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
Table 36: Effect of salicylic acid (SA) spray on carotenoid content (mg g\(^{-1}\) fresh mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean \((Vigna radiata\ L.)\) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>0.87c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>0.92b</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>1.03a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>0.83d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>0.75f</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>0.78e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>0.85cd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>0.64g</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td>0.0</td>
<td>1.15c</td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.1</td>
<td>1.23b</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>1.38a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>1.10d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>1.01f</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>1.06e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>1.16c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>0.86g</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.03</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
23.08, 21.89, 24.10, 23.13 and 23.53% in the above characteristics, however, were observed in Tram at 20DAS, and 18.94, 18.52, 17.32, 19.60, 18.54 and 18.75% at 40DAS.

The decreases in carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO$_2$ concentration, chlorophyll content and carotenoid content due to 50mM NaCl were reduced with the application of 0.5mM SA given to NaCl-treated plants. The decreases in these characteristics were limited to 26.75, 1.53, 0.24, 2.22, 1.84 and 2.30% in Pusa Vishal and 36.60, 15.38, 13.93, 16.44, 15.63 and 16.47% in Tram at 20DAS, and 10.79, 8.64, 8.05, 8.99, 10.11 and 9.82% in Tram at 40DAS, and 10.79, 8.64, 8.05, 8.99, 10.11 and 9.82% in Tram at 40DAS due to the treatment 0.5mM SA plus 50mM NaCl compared to 50mM NaCl.

At 40DAS, the effect of 0.5mM SA on salinity-treated plants was also significant. The treatment of 0.5mM SA not only nullified the adverse effects of 50mM NaCl but also increased the characteristics in comparison to the respective control (Tables 31-36).

4.3.1.3 Biochemical characteristics

SA significantly ameliorated the salinity effects on biochemical characteristics. SA application decreased the concentrations of sodium and chloride in both tolerant (Pusa Vishal) and non-tolerant (Tram) cultivars, and the effect of 0.5mM SA was found more pronounced than the other SA concentrations under normal and saline conditions at both the sampling times (Tables 37-38).

SA application significantly enhanced nitrogen, phosphorus, potassium and calcium concentrations under both normal and saline conditions in both the cultivars, but the effect was comparatively more pronounced with 0.5mM SA. (Tables 39-42).

The decrease in sodium and chloride concentrations with 0.5mM SA application was 30.93 and 30.65% in Pusa Vishal at 20DAS, and 35.14 and
35.00% at 40DAS with respect to control. The cultivar Tram showed lesser decrease with 0.5mM SA, which was 25.23 and 25.64% at 20DAS, and 17.86 and 18.32% at 40DAS compared to the control.

SA application on plants treated with 50mM NaCl significantly reduced the concentrations of sodium and chloride in Pusa Vishal and Tram in comparison to the concentrations noted in 50mM NaCl treatment. In 50mM NaCl treatment, the concentrations of sodium and chloride were increased to 6.19 and 12.9% at 20DAS, and 5.41, 5.83% at 40DAS in Pusa Vishal and 9.91 and 16.67% at 20DAS, and 8.33 and 14.50% at 40DAS in Tram compared to 0mM NaCl. However, with the application of 0.5mM SA, the accumulation of sodium and chloride restricted to 30.93 and 27.42% at 20DAS, and 32.43 and 32.50% at 40DAS in Pusa Vishal, and 23.42 and 19.23% at 20DAS, and 17.26 and 12.21% at 40DAS in Tram.

Under no salinity stress, the application of 0.5mM SA on Pusa Vishal increased nitrogen by 32.72 and 31.05%, phosphorus by 32.91 and 30.61%, potassium by 32.26 and 31.11% and calcium by 32.77 and 31.11%, respectively at 20 and 40DAS in comparison to the control. Similarly, in Tram the above characteristics were increased by 29.15 and 28.18%, 29.17 and 28.24%, 28.75 and 28.40% and 29.09 and 28.24% at 20 and 40DAS, respectively.

In contrast, treatment of 50mM NaCl reduced nitrogen, phosphorus, potassium and calcium concentrations by 20.80, 41.77, 8.60 and 15.97% and 13.72, 29.59, 2.78 and 12.78% at 20 and 40DAS in Pusa Vishal. The above characteristics in Tram were decreased by 32.66, 56.94, 8.75 and 19.09% and 16.36, 38.82, 6.51 and 16.47% at 20 and 40DAS, respectively.

In Pusa Vishal, the nitrogen concentration increased with the combined application of 0.5mM SA and 50mM NaCl in comparison to control at 20 and 40DAS. In Tram, the decrease in the above characteristic was restricted to 17.09 and 4.55% at 20 and 40DAS, respectively. In Pusa Vishal, the decrease
Table 37: Effect of salicylic acid (SA) spray on sodium concentration (mg g\(^{-1}\) dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>9.70b</td>
<td>11.10b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.70d</td>
<td>9.10e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.70e</td>
<td>8.30g</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.90c</td>
<td>10.60c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.30a</td>
<td>12.20a</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.60d</td>
<td>9.30d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.70e</td>
<td>8.50f</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.00bc</td>
<td>11.20b</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em> &lt; 0.05</td>
<td>0.14</td>
<td>0.19</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>14.80b</td>
<td>16.80c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.70e</td>
<td>14.10d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>9.60h</td>
<td>13.80e</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>12.60d</td>
<td>16.50c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.60a</td>
<td>18.20a</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.00f</td>
<td>14.20d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>10.00g</td>
<td>13.90d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.60c</td>
<td>17.40b</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em> &lt; 0.05</td>
<td>0.21</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P* < 0.05.
Table 38: Effect of salicylic acid (SA) spray on chloride concentration (mg g\(^{-1}\) dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>6.20b</td>
<td>7.80c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>4.90e</td>
<td>6.40f</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>4.30g</td>
<td>5.80g</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>5.70c</td>
<td>7.50d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>7.00a</td>
<td>9.10a</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>5.20d</td>
<td>7.00e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>4.50f</td>
<td>6.30f</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>6.10b</td>
<td>8.30b</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.16</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>12.00b</td>
<td>13.10c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>8.70f</td>
<td>11.00f</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>7.80h</td>
<td>10.70g</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>10.20d</td>
<td>12.80d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>12.70a</td>
<td>15.00a</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>9.00e</td>
<td>11.70e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>8.10g</td>
<td>11.50e</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>11.10c</td>
<td>14.30b</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.20</td>
<td>0.23</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 39: Effect of salicylic acid (SA) spray on nitrogen concentration (mg g\(^{-1}\) dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>32.70d</td>
<td>19.90c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>38.80b</td>
<td>21.80b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>43.40a</td>
<td>25.70a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>34.00c</td>
<td>19.40c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>25.90f</td>
<td>13.40f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>28.80e</td>
<td>14.60e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>34.00c</td>
<td>16.50d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>25.10f</td>
<td>13.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.82</td>
<td>0.53</td>
</tr>
</tbody>
</table>

40 NaCl (0mM)  
SA (mM)  
0.0  55.40d  44.00c  
0.1  60.40b  46.50b  
0.5  72.60a  56.40a  
1.0  56.90c  43.20c  
NaCl (50mM)  
SA (mM)  
0.0  47.80f  36.80f  
0.1  51.70e  38.80e  
0.5  56.30cd 42.00d  
1.0  46.60g  35.80g  
LSD at P<0.05  1.19  0.90  

Different letters within a column indicate significant difference at P<0.05.
Table 40: Effect of salicylic acid (SA) spray on phosphorus concentration (mg g\(^{-1}\) dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (Vigna radiata L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>7.90d</td>
<td>7.20c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>9.40b</td>
<td>7.90b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>10.50a</td>
<td>9.30a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.20c</td>
<td>7.00c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.60g</td>
<td>3.10f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>5.10f</td>
<td>3.40e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.00e</td>
<td>3.80d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>4.50g</td>
<td>3.00f</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>9.80d</td>
<td>8.50c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>10.70b</td>
<td>9.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>12.80a</td>
<td>10.90a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>10.10c</td>
<td>8.30c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.90g</td>
<td>5.20f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.40f</td>
<td>5.50e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>8.10e</td>
<td>5.90d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.70h</td>
<td>5.10f</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.23</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
Table 41: Effect of salicylic acid (SA) spray on potassium concentration (mg g⁻¹ dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>9.30e</td>
<td>8.00d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.00b</td>
<td>8.80c</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>12.30a</td>
<td>10.30a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.70c</td>
<td>7.80e</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.50f</td>
<td>7.30f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>9.50d</td>
<td>8.00d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>11.10b</td>
<td>9.00b</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.20g</td>
<td>7.00g</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.19</td>
<td>0.17</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.00f</td>
<td>16.90c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>19.60c</td>
<td>17.90b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>23.60a</td>
<td>21.70a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.50e</td>
<td>16.60c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>17.50g</td>
<td>15.80d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>18.90d</td>
<td>16.70c</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>20.60b</td>
<td>18.00b</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>17.10h</td>
<td>15.40e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.37</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
Table 42: Effect of salicylic acid (SA) spray on calcium concentration (mg g\(^{-1}\) dry mass) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 and 40 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>11.90e</td>
<td>11.00c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.10b</td>
<td>12.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>15.80a</td>
<td>14.20a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>12.40d</td>
<td>10.70d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.00g</td>
<td>8.90f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.10f</td>
<td>9.70e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.10c</td>
<td>11.00c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.70h</td>
<td>8.60g</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.26</td>
<td>0.23</td>
</tr>
<tr>
<td>40</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.00d</td>
<td>17.00c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>19.60b</td>
<td>18.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>23.60a</td>
<td>21.80a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.50c</td>
<td>16.70c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.70f</td>
<td>14.20f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>17.00e</td>
<td>15.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>18.50c</td>
<td>16.20d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>15.30g</td>
<td>13.80g</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>0.38</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
in phosphorus was restricted to 24.05% with 0.5mM SA plus 50mM NaCl at 20DAS, and 17.35% at 40DAS. In Tram, the above characteristic was decreased by 47.22% at 20DAS, and 30.59% respectively at 40DAS.

Application of 0.5mM SA treatment had significant effect in restricting the accumulation of potassium and calcium concentrations compared with control (0mM NaCl) and salt treatment (50mM NaCl). In Pusa Vishal, potassium concentration increased by 19.35 and 14.44% with 0.5mM SA plus 50mM NaCl at 20 and 40DAS. In Tram, it was increased by 12.50 and 6.51% at 20 and 40DAS. Application of 0.5mM SA plus 50mM NaCl on Pusa Vishal increased calcium concentration by 10.08 and 2.78% at 20 and 40DAS, respectively in comparison to control. However, in Tram, the SA application restored the decrease to the level of control.

4.3.1.4 Activities of antioxidative enzymes

The effect of SA on the activities of antioxidative enzymes was studied under normal and saline conditions at initial stage (20DAS) of growth. SA enhanced the activities of antioxidative enzymes significantly. At 50mM NaCl, both cultivars Pusa Vishal and Tram showed an increase in the activities of antioxidative enzymes (Tables 43-44).

Under non-saline condition, the activities of antioxidative enzymes in both the cultivars increased significantly with 0.5mM SA application. With the application of 0.5mM SA, catalase activity of Pusa Vishal and Tram increased by 34.40 and 31.47%, superoxide dismutase activity by 34.50 and 31.78%, glutathione reductase activity by 34.78 and 31.66% and ascorbate peroxidase activity by 35.16 and 31.25%, respectively.

Activities of antioxidative enzymes under salinized (50mM NaCl) condition were also increased by SA application and were greater in salinized condition (50mM NaCl). Catalase, superoxide dismutase, glutathione reductase and ascorbate peroxidase activities of Pusa Vishal were increased by 11.72, 7.69, 8.70 and 12.50% in response to 50mM NaCl treatment. The above
Table 43: Effect of salicylic acid (SA) spray on catalase activity (U g\(^{-1}\) FW min\(^{-1}\)) and superoxide dismutase activity (U mg\(^{-1}\) protein) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Catalase</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NaCl (0 mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>145.00g</td>
<td>136.00g</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>182.12d</td>
<td>164.02d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>194.88c</td>
<td>178.80c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>126.90h</td>
<td>125.10h</td>
</tr>
<tr>
<td></td>
<td>NaCl (50 mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>162.00e</td>
<td>158.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>199.75b</td>
<td>187.39b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>211.57a</td>
<td>198.13a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>149.70f</td>
<td>151.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>3.89</td>
<td>3.43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Superoxide dismutase</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NaCl (0 mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>26.00e</td>
<td>18.00f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>32.66c</td>
<td>21.73c</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>34.97b</td>
<td>23.72b</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>22.78f</td>
<td>16.42g</td>
</tr>
<tr>
<td></td>
<td>NaCl (50 mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>28.00d</td>
<td>20.00d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>34.52b</td>
<td>23.72b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>36.51a</td>
<td>25.12a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>25.87e</td>
<td>19.06e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.66</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
Table 44: Effect of salicylic acid (SA) spray on glutathione reductase activity (U mg\(^{-1}\) protein) and ascorbate peroxidase activity (U mg\(^{-1}\) protein) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at 20 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Glutathione reductase</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.230e</td>
<td>0.199e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.289c</td>
<td>0.240c</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.310b</td>
<td>0.262a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.201f</td>
<td>0.182f</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.250d</td>
<td>0.204d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.309b</td>
<td>0.242c</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.326a</td>
<td>0.256b</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.232e</td>
<td>0.195e</td>
<td></td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.006</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ascorbate peroxidase</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.28g</td>
<td>0.96f</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.61d</td>
<td>1.16c</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.73c</td>
<td>1.26b</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.12h</td>
<td>0.88g</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.44e</td>
<td>1.06d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.78b</td>
<td>1.26b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.88a</td>
<td>1.33a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.33f</td>
<td>1.01e</td>
<td></td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.034</td>
<td>0.024</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
characteristics of Tram were increased by 16.18, 11.11, 2.51 and 10.42% respectively, in response to 50 mM NaCl. Application of 0.5mM SA on plants treated with 50mM NaCl exhibited higher increase in the activities of antioxidative enzymes compared with the increase observed in 50mM NaCl treatment. The increase in catalase, superoxide dismutase, glutathione reductase and ascorbate peroxidase activities of Pusa Vishal and Tram was 45.91, 40.42, 41.74 and 46.88% and 45.68, 39.56, 28.64 and 38.54% respectively due to 50mM NaCl plus 0.5mM SA in comparison to control.

4.3.1.5 Yield characteristics

Yield characteristics decreased significantly with 50mM NaCl in both the cultivars, but more adverse effects of salinity were found on Tram. Application of 0.5mM SA treatment had a significant effect in reducing the effect of salinity on yield characteristics (Tables 45-46).

The application of 0.5mM SA on Pusa Vishal and Tram grown under 0mM NaCl (control) increased pod length by 19.88 and 15.89%, pod number by 19.94 and 15.83%, seed number by 20.17 and 15.60% and seed yield by 20.09 and 15.80% in comparison to the control.

At 50mM NaCl, the per cent decrease in pod length, pod number, seed number and seed yield over control in Pusa Vishal was 13.30, 13.39, 13.45 and 13.54%, respectively. In Tram, a decrease of 28.43, 29.34, 29.36 and 28.43% in the above characteristics was recorded with 50mM NaCl.

At 50mM NaCl plus 0.5mM SA treatment, the reductions were less compared to 50mM NaCl treatment alone. It was 0.41 and 20.57% in pod length, 0.57 and 21.62% in pod number, 0.84 and 22.02% in seed number and 0.56 and 20.47% in seed yield in Pusa Vishal and Tram, respectively (Tables 45-46).
Table 45: Effect of salicylic acid (SA) spray on pod length (cm) and pod number plant$^{-1}$ of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at harvest, i.e., 60 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pod length</td>
<td>Pod number</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>6.69c</td>
<td>5.98b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.69c</td>
<td>5.98b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.16b</td>
<td>6.15b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>8.02a</td>
<td>6.93a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.82c</td>
<td>5.95b</td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>5.80e</td>
<td>4.28d</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>5.80e</td>
<td>4.28d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>6.08d</td>
<td>4.36d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.66c</td>
<td>4.75c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>4.93f</td>
<td>3.38e</td>
</tr>
<tr>
<td>LSD at $P&lt;0.05$</td>
<td>0.19</td>
<td>0.22</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 


Table 46: Effect of salicylic acid (SA) spray on seed number pod⁻¹ and seed yield (g plant⁻¹) of Pusa Vishal (salinity tolerant) and Tram (salinity non-tolerant) cultivars of mungbean (*Vigna radiata* L.) grown under salinity stress at harvest, i.e., 60 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Pusa Vishal</th>
<th>Tram</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Seed number</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>11.90bc</td>
<td>10.90b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>12.70b</td>
<td>11.20b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.30a</td>
<td>12.60a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>12.10b</td>
<td>10.80b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>10.30d</td>
<td>7.70d</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.80d</td>
<td>7.80d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.80c</td>
<td>8.50c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.80e</td>
<td>6.00e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.82</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Seed yield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>8.86c</td>
<td>7.28b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>9.48b</td>
<td>7.50b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>10.64a</td>
<td>8.43a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.04c</td>
<td>7.24b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>7.66e</td>
<td>5.21d</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.04d</td>
<td>5.31d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>8.81c</td>
<td>5.79c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.51f</td>
<td>4.12e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.31</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
4.3.2 Experiment 4

4.3.2.1 Growth characteristics

The effect of the application of SA was found significant on growth characteristics at all sampling times. The application of SA increased the growth characteristics and the increases were greater under non-saline (control) condition than under saline condition. Application of 0.5mM SA helped to reduce the adverse effects of salinity on growth characteristics (Tables 47-53).

Growth characteristics increased significantly over control with 0.5mM SA application under non-saline condition. In Alankar, the increase in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass with 0.5mM SA was 18.63, 18.90, 19.10, 19.02, 18.84, 18.96 and 19.13% at 30DAS; 19.87, 20.00, 19.88, 20.01, 20.04, 20.00 and 19.99% at 60DAS, and 20.91, 21.01, 20.87, 21.02, 21.02, 20.92 and 20.96% respectively at 90DAS. In PBM16, the root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass increased by 14.78, 15.00, 15.38, 15.01, 15.19, 14.96 and 15.09% due to 0.5mM SA at 30DAS; 15.98, 16.07, 15.89, 15.98, 16.20, 15.93 and 15.96% at 60DAS, and 16.93, 17.00, 16.78, 16.97, 16.94, 16.92 and 17.02% respectively at 90DAS.

Comparing the salinity effects, it was found that it decreased growth characteristics substantially. In Alankar, the reduction in root length was 23.57, 18.27 and 13.46%, root fresh mass was 23.41, 18.23 and 13.13%, root dry mass was 23.03, 18.44 and 13.58%, leaf fresh mass was 23.56, 18.49 and 13.47%, leaf dry mass was 23.55, 18.26 and 13.43%, leaf area was 23.26, 18.40 and 13.23% and plant dry mass was 23.47, 18.52 and 13.27% at 30, 60 and 90DAS, respectively due to 50mM NaCl. In the cultivar PBM16, a higher decrease in growth was observed. Regarding per cent decrease in PBM16 due to 50mM NaCl, it exhibited 38.26, 39.55, 40.00, 39.48, 39.24, 39.53 and 39.55% decreases in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass, respectively at 30DAS. The decreases
Application of SA alleviated the NaCl stress effects. Under non-saline condition, 0.5mM SA application significantly enhanced growth characteristics. In Alankar, the treatment of 0.5mM SA on plants grown with 50mM NaCl resulted in a lesser decrease than the treatment 50mM NaCl alone. The decrease was 12.93% in root length, 12.54% in root fresh mass, 12.36% in root dry mass, 12.80% in leaf fresh mass, 13.04% in leaf dry mass, 12.52% in leaf area and 12.70% in plant dry mass at 30DAS in comparison to control. At 60DAS, the decreases in the above characteristics were 6.09%, 5.95%, 6.34%, 6.24%, 1.95%, 6.27% and 6.34%, respectively in plants receiving 50mM NaCl plus 0.5mM SA treatment in comparison to control. At 90DAS, the application of 0.5mM SA proved much more beneficial under saline condition. It not only reduced the per cent reduction due to 50mM NaCl but even increased the characteristics in comparison to the respective control. The increases were 0.24%, 0.72%, 0.20%, 0.38%, 0.37%, 0.66% and 0.59% in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass, respectively compared to control. The other cultivar, PBM16 also responded similarly to Alankar with respect to 50mM NaCl plus 0.5mM SA treatment and reduced the adverse effects of salinity. The decrease in root length, root fresh mass, root dry mass, leaf fresh mass, leaf dry mass, leaf area and plant dry mass in PBM16 with 50 mM NaCl plus 0.5 mM SA treatment were only 32.17, 33.64, 33.85, 33.44, 33.54, 33.55 and 33.15% at 30DAS; 26.64, 27.17, 25.70, 26.30, 25.93, 27.31 and 26.66% at 60DAS, and 20.37, 20.94, 20.39, 20.74, 20.36, 20.39 and 20.75% respectively at 90DAS.

The treatment 50mM NaCl plus 0.5mM SA could not enhance the growth characteristics at 90DAS in PBM16 as was observed in Alankar.
Table 47: Effect of salicylic acid (SA) spray on root length (cm plant⁻¹) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>26.30c</td>
<td>23.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>27.80b</td>
<td>23.40b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>31.20a</td>
<td>26.40a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>26.80c</td>
<td>22.80b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>20.10e</td>
<td>14.20d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>20.90e</td>
<td>14.30d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>22.90d</td>
<td>15.60c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>17.20f</td>
<td>11.30e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.94</td>
<td>1.00</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>31.20c</td>
<td>24.40b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>33.30b</td>
<td>25.10b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>37.40a</td>
<td>28.30a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>31.80c</td>
<td>24.20b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>25.50f</td>
<td>16.20d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>26.70e</td>
<td>16.50d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>29.30d</td>
<td>17.90c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>21.60g</td>
<td>12.70e</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>41.60c</td>
<td>37.80c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>44.90b</td>
<td>39.30b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>50.30a</td>
<td>44.20a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>40.70c</td>
<td>37.60d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>36.00e</td>
<td>26.90f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>38.10d</td>
<td>27.70f</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>41.70c</td>
<td>30.10e</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>30.20f</td>
<td>20.90g</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>1.20</td>
<td>1.48</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
Table 48: Effect of salicylic acid (SA) spray on root fresh mass (g plant\(^{-1}\)) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>5.98c</td>
<td>2.20b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>6.33b</td>
<td>2.24b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>7.11a</td>
<td>2.53a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.10c</td>
<td>2.19b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.58e</td>
<td>1.33d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>4.77e</td>
<td>1.34d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>5.23d</td>
<td>1.46c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.94f</td>
<td>1.06e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.75c</td>
<td>7.03b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.50b</td>
<td>7.24b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>12.90a</td>
<td>8.16a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>10.96c</td>
<td>7.00b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.79f</td>
<td>4.61d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>9.23e</td>
<td>4.71d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>10.11d</td>
<td>5.12c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>7.47g</td>
<td>3.65e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.34</td>
<td>0.29</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.23c</td>
<td>9.41c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>16.45b</td>
<td>9.79b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>18.43a</td>
<td>11.01a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>15.53c</td>
<td>9.36c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>13.23e</td>
<td>6.65e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.02d</td>
<td>6.85e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>15.34c</td>
<td>7.44d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>11.11f</td>
<td>5.18f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.46</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 49: Effect of salicylic acid (SA) spray on root dry mass (g plant\(^{-1}\)) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>0.0</td>
<td>1.78c</td>
<td>0.65b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.89b</td>
<td>0.66b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.12a</td>
<td>0.75a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.82c</td>
<td>0.64b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.37e</td>
<td>0.39d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.42e</td>
<td>0.40cd</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.56d</td>
<td>0.43c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.18f</td>
<td>0.31e</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>3.47c</td>
<td>2.14b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>3.71b</td>
<td>2.21b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>4.16a</td>
<td>2.48a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.54c</td>
<td>2.13b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.83f</td>
<td>1.43d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.97e</td>
<td>1.46d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>3.25d</td>
<td>1.59c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.40g</td>
<td>1.13e</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>5.08c</td>
<td>3.04bc</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>5.48b</td>
<td>3.16b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.14a</td>
<td>3.55a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>5.18c</td>
<td>3.02c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.39e</td>
<td>2.16e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>4.65d</td>
<td>2.22e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>5.09c</td>
<td>2.42d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.69f</td>
<td>1.68f</td>
</tr>
</tbody>
</table>

LSD at *P*<0.05

Different letters within a column indicate significant difference at *P*<0.05.
Table 50: Effect of salicylic acid (SA) spray on leaf fresh mass (g plant\textsuperscript{-1}) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (\textit{Brassica juncea} L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.78c</td>
<td>6.13b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.43b</td>
<td>6.25b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>12.83a</td>
<td>7.05a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>11.00c</td>
<td>6.10b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.24e</td>
<td>3.71d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>8.57e</td>
<td>3.75d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>9.40d</td>
<td>4.08c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>7.09f</td>
<td>2.97e</td>
</tr>
<tr>
<td></td>
<td>LSD at \textit{P}&lt;0.05</td>
<td>0.37</td>
<td>0.28</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>20.34c</td>
<td>16.77b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>21.77b</td>
<td>17.27b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>24.41a</td>
<td>19.45a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>20.75c</td>
<td>16.69b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>16.58f</td>
<td>11.14d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>17.41e</td>
<td>11.36d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>19.07d</td>
<td>12.36c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>14.09g</td>
<td>8.80e</td>
</tr>
<tr>
<td></td>
<td>LSD at \textit{P}&lt;0.05</td>
<td>0.64</td>
<td>0.69</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>25.98c</td>
<td>22.28bc</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>28.06b</td>
<td>23.17b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>31.44a</td>
<td>26.06a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>26.50c</td>
<td>22.17c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>22.48e</td>
<td>15.77e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>23.83d</td>
<td>16.24e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>26.08c</td>
<td>17.66d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.88f</td>
<td>12.30f</td>
</tr>
<tr>
<td></td>
<td>LSD at \textit{P}&lt;0.05</td>
<td>0.78</td>
<td>0.86</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \textit{P}<0.05.
Table 51: Effect of salicylic acid (SA) spray on leaf dry mass (g plant\(^{-1}\)) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.76c</td>
<td>1.58b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.92b</td>
<td>1.61b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>3.28a</td>
<td>1.82a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.81c</td>
<td>1.57b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.11e</td>
<td>0.96d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.19e</td>
<td>0.97d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.40d</td>
<td>1.05c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.81f</td>
<td>0.77e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>5.64cd</td>
<td>4.32b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>6.03b</td>
<td>4.45b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.77a</td>
<td>5.02a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>5.75c</td>
<td>4.30b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.61f</td>
<td>2.89d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>4.84e</td>
<td>2.94d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>5.53d</td>
<td>3.20c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.92g</td>
<td>2.28e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.04c</td>
<td>6.14c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>8.69b</td>
<td>6.38b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>9.73a</td>
<td>7.18a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.20c</td>
<td>6.11c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.96e</td>
<td>4.37e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>7.38d</td>
<td>4.50e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>8.07c</td>
<td>4.89d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>5.84f</td>
<td>3.41f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.24</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 
Table 52: Effect of salicylic acid (SA) spray on leaf area (cm² plant⁻¹) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>559.00c</td>
<td>468.00b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>592.00b</td>
<td>477.00b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>665.00a</td>
<td>538.00a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>570.00c</td>
<td>465.00b</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>429.00e</td>
<td>283.00d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>446.00e</td>
<td>285.00d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>489.00d</td>
<td>311.00c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>368.00f</td>
<td>226.00e</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>18.88</td>
<td>21.07</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>750.00bc</td>
<td>659.00b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>802.00b</td>
<td>678.00b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>900.00a</td>
<td>764.00a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>765.00b</td>
<td>655.00b</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>612.00d</td>
<td>432.00d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>642.00d</td>
<td>440.00d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>703.00c</td>
<td>479.00c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>520.00e</td>
<td>341.00e</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>53.22</td>
<td>27.21</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1066.00c</td>
<td>863.00b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1151.00b</td>
<td>897.00b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1289.00a</td>
<td>1,009.00a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1087.00c</td>
<td>858.00b</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>925.00e</td>
<td>614.00d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>980.00d</td>
<td>632.00cd</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1073.00c</td>
<td>687.00c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>777.00f</td>
<td>478.00e</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>32.02</td>
<td>62.97</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 53: Effect of salicylic acid (SA) spray on plant dry mass (g plant⁻¹) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.22c</td>
<td>3.71b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>6.60b</td>
<td>3.79b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>7.41a</td>
<td>4.27a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>6.35c</td>
<td>3.69b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.76e</td>
<td>2.25d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>4.95e</td>
<td>2.27d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>5.43d</td>
<td>2.48c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>4.09f</td>
<td>1.80e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.21</td>
<td>0.17</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>14.36c</td>
<td>11.78b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>15.37b</td>
<td>12.13b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>17.23a</td>
<td>13.66a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>14.65c</td>
<td>11.72b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>11.70f</td>
<td>7.78d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>12.28e</td>
<td>7.94d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.45d</td>
<td>8.64c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.94g</td>
<td>6.15f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.46</td>
<td>0.49</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>21.85c</td>
<td>19.57c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>23.59b</td>
<td>20.36b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>26.43a</td>
<td>22.90a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>22.28bc</td>
<td>19.48c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.95e</td>
<td>13.84e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>20.09d</td>
<td>14.26e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>21.98c</td>
<td>15.51d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>15.92f</td>
<td>10.80f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.66</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 
4.3.2.2 Photosynthetic characteristics

Photosynthetic characteristics of both the cultivars decreased with 50mM NaCl. The application of 0.5mM SA increased the characteristics of plants treated with 0mM NaCl (control) and also of those plants treated with 50mM NaCl (Tables 54-59). The treatment of 0.5mM SA also reduced the adverse effects of 50mM NaCl.

Photosynthetic characteristics increased markedly due to the application of 0.5mM SA under non-saline condition. The increases in carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO₂ concentration, chlorophyll content and carotenoid content in Alankar with 0.5mM SA were 20.09, 18.78, 19.04, 19.20, 18.97 and 19.35% at 30DAS; 19.79, 19.72, 16.76, 20.20, 20.00 and 19.69% at 60DAS, and 18.27, 20.69, 21.22, 21.20, 20.55 and 20.90% at 90DAS, respectively. In PBM16, these increases were lesser. Carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO₂ concentration, chlorophyll content and carotenoid content increased by 16.22, 15.30, 15.00, 15.20, 14.71 and 15.38% due to 0.5mM SA at 30DAS; 15.21, 15.69, 16.01, 16.20, 15.63 and 15.70% at 60DAS, and 15.29, 16.84, 17.17, 17.20, 16.91 and 16.84% at 90DAS.

Photosynthetic characteristics decreased significantly with 50mM NaCl in both the cultivars but more adverse effects of salinity were found on PBM16. The treatment of 50mM NaCl on Alankar and PBM16 decreased carbonic anhydrase activity by 17.85 and 25.63% at 30DAS; 11.06 and 19.87% at 60DAS, and 9.99 and 18.93% at 90DAS; net photosynthetic rate by 13.20 and 22.95% at 30DAS; 11.93 and 18.63% at 60DAS, and 11.33 and 16.32% at 90DAS; stomatal conductance by 12.29 and 21.75% at 30DAS; 10.77 and 17.49% at 60DAS, and 10.24 and 15.15% at 90DAS; intercellular CO₂ concentration by 14.30 and 23.10% at 30DAS; 13.00 and 19.70% at 60DAS, and 12.40 and 17.40% at 90DAS; chlorophyll content by 13.22 and 22.94% at 30DAS; 12.00 and 18.75% at 60DAS, and 11.42 and 16.43% at 90DAS, and
The application of SA showed variable ability to alleviate the NaCl inhibitory effects in the two cultivars. In the cultivar Alankar, the application of 0.5mM SA on plants treated with 50mM NaCl alleviated the adverse effects of 50mM NaCl alone, and the extent of reduction was lesser compared with the combined application of SA and NaCl. Carbonic anhydrase activity, net photosynthetic rate, stomatal conductance, intercellular CO$_2$ concentration, chlorophyll content and carotenoid content in Alankar were decreased by 5.40, 1.52, 0.24, 2.21, 1.15 and 2.15%, respectively at 30DAS. However, at later growth stages (60 and 90DAS) the treatment of 0.5mM SA not only reduced the adverse effects of NaCl but overcome the effect and increased the characteristics. Carbonic anhydrase activity was increased by 2.10 and 2.35%, net photosynthetic rate by 0.92 and 2.46%, stomatal conductance by 2.81 and 4.39%, intercellular CO$_2$ concentration by 0.14 and 1.70%, chlorophyll content by 1.00 and 2.74% and carotenoid content by 1.57 and 2.49% at these two stages in Alankar. In PBM16, the application of 0.5mM SA only reduced the adverse effects of 50mM NaCl at all the growth stages. The per cent reduction in carbonic anhydrase activity was 16.97, 11.40 and 10.92, in net photosynthetic rate was 15.30, 9.80 and 6.32, in stomatal conductance was 13.75, 8.13 and 4.80, in intercellular CO$_2$ concentration was 15.33, 10.79 and 7.40, in chlorophyll content was 15.29, 9.90 and 6.76 and in carotenoid content was 15.38, 9.09 and 6.32 at 30, 60 and 90DAS, respectively.

### 4.3.2.3 Biochemical characteristics

Application of SA proved effective in ameliorating the adverse effects of salinity on biochemical characteristics.

The effects of SA application on sodium and chloride concentrations were found significant at all stages, except for sodium concentration at 60DAS in Alankar (Tables 60-61). The concentrations of sodium and chloride
Table 54: Effect of salicylic acid (SA) spray on carbonic anhydrase activity (m mol m\(^{-2}\) leaf s\(^{-1}\)) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM), SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>0.0</td>
<td>13.89c</td>
<td>11.90c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.94b</td>
<td>12.30b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>16.68a</td>
<td>13.83a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>14.08c</td>
<td>11.85c</td>
</tr>
<tr>
<td>NaCl (50mM), SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>11.41f</td>
<td>8.85e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>12.03e</td>
<td>9.10e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.14d</td>
<td>9.88d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.62g</td>
<td>6.87f</td>
</tr>
<tr>
<td>LSD at (P&lt;0.05)</td>
<td></td>
<td>0.26</td>
<td>0.30</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM), SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.09e</td>
<td>16.31c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>19.21b</td>
<td>16.66b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>21.67a</td>
<td>18.79a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.38d</td>
<td>16.26c</td>
</tr>
<tr>
<td>NaCl (50mM), SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>16.09g</td>
<td>13.07f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>16.83f</td>
<td>13.25e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>18.47c</td>
<td>14.45d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.79h</td>
<td>10.23g</td>
</tr>
<tr>
<td>LSD at (P&lt;0.05)</td>
<td></td>
<td>0.33</td>
<td>0.30</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM), SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>17.02e</td>
<td>15.11bc</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>17.90b</td>
<td>15.34b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>20.13a</td>
<td>17.42a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>17.33d</td>
<td>15.05c</td>
</tr>
<tr>
<td>NaCl (50mM), SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.32g</td>
<td>12.25e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>15.82f</td>
<td>12.31e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>17.42c</td>
<td>13.46d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.25h</td>
<td>9.75f</td>
</tr>
<tr>
<td>LSD at (P&lt;0.05)</td>
<td></td>
<td>0.29</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
Table 55: Effect of salicylic acid (SA) spray on net photosynthetic rate ($\mu$ mol CO$_2$ m$^{-2}$ s$^{-1}$) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard *Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>19.70c</td>
<td>18.30b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>20.80b</td>
<td>18.60b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>23.40a</td>
<td>21.10a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>18.90d</td>
<td>17.10c</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>17.10f</td>
<td>14.10e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>17.70e</td>
<td>14.20e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>19.40c</td>
<td>15.50d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>14.70g</td>
<td>11.20f</td>
<td></td>
</tr>
<tr>
<td>LSD at $P&lt;0.05$</td>
<td>0.47</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>21.80c</td>
<td>20.40c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>23.30b</td>
<td>21.00b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>26.10a</td>
<td>23.60a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>20.90d</td>
<td>19.00d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>19.20f</td>
<td>16.60f</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>20.10e</td>
<td>16.90f</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>22.00c</td>
<td>18.40e</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>16.30g</td>
<td>13.10g</td>
<td></td>
</tr>
<tr>
<td>LSD at $P&lt;0.05$</td>
<td>0.44</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>20.30d</td>
<td>19.00c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>21.90b</td>
<td>19.70b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>24.50a</td>
<td>22.20a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>19.40e</td>
<td>17.70d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>18.00g</td>
<td>15.90e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>19.00f</td>
<td>16.30e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>20.80c</td>
<td>17.80d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>15.10h</td>
<td>12.40f</td>
<td></td>
</tr>
<tr>
<td>LSD at $P&lt;0.05$</td>
<td>0.45</td>
<td>0.43</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at $P<0.05$. 

Table 56: Effect of salicylic acid (SA) spray on stomatal conductance (m mol m\(^{-2}\) s\(^{-1}\)) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>415.00b</td>
<td>400.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>440.00b</td>
<td>408.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>494.00a</td>
<td>460.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>398.00d</td>
<td>374.00c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>364.00e</td>
<td>313.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>379.00e</td>
<td>317.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>414.00c</td>
<td>345.00d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>312.00f</td>
<td>250.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>9.62</td>
<td>10.02</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>427.00c</td>
<td>406.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>457.00b</td>
<td>419.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>513.00a</td>
<td>471.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>410.00d</td>
<td>380.00c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>381.00e</td>
<td>335.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>401.00e</td>
<td>342.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>439.00b</td>
<td>373.00d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>323.00f</td>
<td>264.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>10.04</td>
<td>10.04</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>410.00c</td>
<td>396.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>443.00b</td>
<td>412.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>497.00a</td>
<td>464.00a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>394.00d</td>
<td>370.00d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>368.00e</td>
<td>336.00e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>391.00e</td>
<td>347.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>428.00b</td>
<td>377.00c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>308.00f</td>
<td>261.00f</td>
</tr>
<tr>
<td></td>
<td>LSD at (P&lt;0.05)</td>
<td>10.29</td>
<td>9.49</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at \(P<0.05\).
Table 57: Effect of salicylic acid (SA) spray on intercellular CO₂ concentration (μ mol mol⁻¹) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>283.98b</td>
<td>281.07b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>301.59b</td>
<td>287.25b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>338.50a</td>
<td>323.79a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>272.62d</td>
<td>262.80c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>243.37e</td>
<td>216.14e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>253.35e</td>
<td>218.52e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>277.69c</td>
<td>237.97d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>209.05f</td>
<td>172.70f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>6.40</td>
<td>7.17</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>287.98c</td>
<td>285.26b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>288.19b</td>
<td>294.67b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>346.15a</td>
<td>331.47a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>276.46d</td>
<td>266.72c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>250.54e</td>
<td>229.06e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>263.32e</td>
<td>233.87e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>288.37b</td>
<td>254.49d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>212.71f</td>
<td>180.73f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>6.59</td>
<td>7.22</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>286.36c</td>
<td>284.22b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>309.84b</td>
<td>296.16b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>347.07a</td>
<td>333.11a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>274.91d</td>
<td>265.75c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>250.85e</td>
<td>234.77e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>266.15e</td>
<td>242.05e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>291.24b</td>
<td>263.18d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>210.46f</td>
<td>182.89f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>6.90</td>
<td>7.13</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 58: Effect of salicylic acid (SA) spray on chlorophyll content (mg g\(^{-1}\) fresh mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.74c</td>
<td>1.70b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.84b</td>
<td>1.73b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.07a</td>
<td>1.95a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.67d</td>
<td>1.58c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.51e</td>
<td>1.31e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.57e</td>
<td>1.32e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.72cd</td>
<td>1.44d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.29f</td>
<td>1.04f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.00cd</td>
<td>1.92b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.14b</td>
<td>1.97b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.40a</td>
<td>2.22a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.92de</td>
<td>1.97b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.76f</td>
<td>1.56d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>1.84ef</td>
<td>1.59d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.02c</td>
<td>1.73c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.49g</td>
<td>1.23e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>2.19cd</td>
<td>2.07b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.36b</td>
<td>2.15b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.64a</td>
<td>2.42a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>2.10de</td>
<td>1.93c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>1.94f</td>
<td>1.73d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>2.05e</td>
<td>1.78d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>2.25c</td>
<td>1.93c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>1.62g</td>
<td>1.34e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.09</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 59: Effect of salicylic acid (SA) spray on carotenoid content (mg g\(^{-1}\) fresh mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.93c</td>
<td>0.91b</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.98b</td>
<td>0.93b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.11a</td>
<td>1.05a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.89d</td>
<td>0.85c</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.80f</td>
<td>0.70e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.83e</td>
<td>0.71e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.91cd</td>
<td>0.77d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.69g</td>
<td>0.56f</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.02</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.27c</td>
<td>1.21c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.36b</td>
<td>1.25b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.52a</td>
<td>1.40a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.22d</td>
<td>1.13d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.12f</td>
<td>0.99e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.18e</td>
<td>1.01e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>1.29c</td>
<td>1.10d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.95g</td>
<td>0.78f</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.03</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>2.01d</td>
<td>1.90c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>2.17b</td>
<td>1.98b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>2.43a</td>
<td>2.22a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.93e</td>
<td>1.78d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.78f</td>
<td>1.59e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.89e</td>
<td>1.64e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>2.06c</td>
<td>1.78d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.49g</td>
<td>1.24f</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.04</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
increased significantly with salinity at all sampling times. Accumulation of sodium and chloride was higher in PBM16 than Alankar under saline and non-saline conditions. However, in both the cultivars, application of SA had significant effect in restricting the high accumulation of sodium and chloride compared to control. An application of 0.5mM SA proved most effective in reducing the concentrations of sodium and chloride.

The application of SA decreased sodium and chloride concentrations under non-saline condition. The decreases in sodium and chloride concentrations were 30.43 and 31.25% with 0.5mM SA in Alankar whereas the decreases in PBM16 were 25.76 and 25.61% at 30DAS; 35.56 and 35.63% in Alankar and 18.33 and 18.26% in PBM16 at 60DAS, and 37.25 and 36.86% in Alankar and 17.04 and 17.16% in PBM16 at 90DAS in comparison to the control (0mM NaCl plus 0mM SA).

The treatment of 50mM NaCl increased sodium and chloride concentrations in Alankar and PBM16. The increases due to 50mM NaCl in these elements in Alankar were 13.04 and 12.50% at 30DAS; 3.33 and 11.49% at 60DAS, and 4.90 and 7.89% at 90DAS. A higher increase in the above elements was observed in PBM16, which was 15.15 and 14.63% at 30DAS; 5.83 and 14.78% at 60DAS, and 8.89 and 11.19% at 90DAS.

The effects of 50mM NaCl were reversed with the application of 0.5mM SA. The application of 0.5mM SA on plants fed with 50mM NaCl decreased the concentrations of sodium and chloride in comparison to the control. The decreases in sodium and chloride concentrations were 26.09 and 26.56% in Alankar and 19.70 and 20.73% in PBM16 at 30DAS; 3.33 and 28.74% in Alankar and 19.17 and 12.17% in PBM16 at 60DAS, and 3.33 and 31.58% in Alankar and 16.30 and 14.18% in PBM16 at 90DAS.

Application of SA had significant effect on nitrogen, phosphorus, potassium and calcium concentrations, but statistically non-significant on calcium concentration at 30DAS (Tables 62-65). Nitrogen, phosphorus,
potassium and calcium concentrations decreased significantly with salinity. These nutrient concentrations were significantly greater in Alankar than PBM16. Further, 0.5mMSA application also enhanced the nutrient concentrations under both saline and non-saline conditions.

The application of 0.5mM SA showed significant increase in nitrogen, phosphorus, potassium and calcium concentrations. The increases in nitrogen, phosphorus, potassium, and calcium concentrations with 0.5mM SA application in Alankar were 32.76, 32.68, 32.58 and 33.00% at 30DAS; 31.08, 30.98, 30.81 and 30.83% at 60DAS, and 30.15, 30.23, 30.05 and 30.00% at 90DAS. The cultivar PBM16 showed lesser increase with 0.5mM SA, which was 29.41, 29.21, 29.17 and 28.57% at 30DAS; 28.36, 28.31, 28.17 and 28.46% at 60DAS, and 28.10, 27.87, 28.10 and 27.70% at 90DAS compared to the control.

Nitrogen, phosphorus, potassium and calcium concentrations increased to a significant extent over control with SA application under saline and non-saline conditions. In plants treated with 50mM NaCl, the concentrations of nitrogen, phosphorus, potassium and calcium were decreased to 6.03, 46.46, 4.49 and 13.00% at 30DAS; 6.76, 19.87, 5.95 and 11.28% at 60DAS, and 8.09, 12.65, 6.56 and 8.00% at 90DAS in Alankar and 7.84, 64.85, 5.56 and 18.68% at 30DAS; 7.46, 23.35, 7.75 and 16.26% at 60DAS, and 9.09, 13.31, 7.19 and 10.81% at 90DAS in PBM16 compared to control.

The combined treatment of 50mM NaCl and 0.5mM SA increased nitrogen concentration by 23.28, 10.14 and 0.74% in Alankar and 13.73, 5.22 and 0.00% (became equal to control) in PBM16 at 30, 60 and 90DAS, respectively compared to respective control. In Alankar and PBM16, the decrease in phosphorus concentration due to the combined treatment 0.5mM SA plus 50mM NaCl was less compared to the treatment 50mM NaCl alone. The decreases due to the treatment 0.5mM SA plus 50mM NaCl in the two cultivars were limited to 29.92 and 56.93% at 30DAS; 5.56 and 12.50% at
Table 60: Effect of salicylic acid (SA) spray on sodium concentration (mg g⁻¹ dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>4.60b</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>3.60e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>3.20g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>4.20c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td>0.0</td>
<td>5.20a</td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.1</td>
<td>3.90d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>3.40f</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>4.50b</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.10</td>
<td>0.17</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>6.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>5.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>7.70</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td>0.0</td>
<td>9.30</td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.1</td>
<td>6.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>6.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>8.10</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>NS</td>
<td>0.18</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.0</td>
<td>10.20b</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1</td>
<td>7.10f</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>6.40h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>8.50d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td>0.0</td>
<td>10.70a</td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>0.1</td>
<td>7.40e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5</td>
<td>6.80g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>9.40c</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.16</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 61: Effect of salicylic acid (SA) spray on chloride concentration (mg g⁻¹ dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>6.40b</td>
<td>8.20c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>5.10e</td>
<td>6.70f</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>4.40g</td>
<td>6.10h</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>5.90c</td>
<td>7.90d</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>7.20a</td>
<td>9.40a</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>5.30d</td>
<td>7.20e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>4.70f</td>
<td>6.50g</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>6.30b</td>
<td>8.60b</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.14</td>
<td>0.17</td>
<td></td>
</tr>
</tbody>
</table>

| 60  | NaCl (0mM) |         |       |
|     | SA (mM)    |         |       |
| 0.0 | 8.70b      | 11.50c  |       |
| 0.1 | 6.30f      | 9.70g   |       |
| 0.5 | 5.60g      | 9.40h   |       |
| 1.0 | 7.40d      | 11.30d  |       |
| NaCl (50mM) |         |         |       |
|     | SA (mM)    |         |       |
| 0.0 | 9.70a      | 13.20a  |       |
| 0.1 | 6.90e      | 10.30e  |       |
| 0.5 | 6.20f      | 10.10f  |       |
| 1.0 | 8.50c      | 12.60b  |       |
| LSD at P<0.05 | 0.19 | 0.17 |

| 90  | NaCl (0mM) |         |       |
|     | SA (mM)    |         |       |
| 0.0 | 11.40b     | 13.40c  |       |
| 0.1 | 8.00f      | 11.40e  |       |
| 0.5 | 7.20h      | 11.10f  |       |
| 1.0 | 9.50d      | 13.30c  |       |
| NaCl (50mM) |         |         |       |
|     | SA (mM)    |         |       |
| 0.0 | 12.30a     | 14.90a  |       |
| 0.1 | 8.50e      | 11.90d  |       |
| 0.5 | 7.80g      | 11.50e  |       |
| 1.0 | 10.70c     | 14.60b  |       |
| LSD at P<0.05 | 0.18 | 0.25 |

Different letters within a column indicate significant difference at P<0.05.
Table 62: Effect of salicylic acid (SA) spray on nitrogen concentration (mg g⁻¹ dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>11.60e</td>
<td>10.20d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>13.80c</td>
<td>11.20c</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>15.40a</td>
<td>13.20a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>12.00d</td>
<td>9.90e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>10.90f</td>
<td>9.40f</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>12.10d</td>
<td>10.30d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>14.30b</td>
<td>11.60b</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>10.60g</td>
<td>9.00g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.25</td>
<td>0.21</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>14.80d</td>
<td>13.40c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>16.10b</td>
<td>14.20b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>19.40a</td>
<td>17.20a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>15.20c</td>
<td>13.20cd</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>13.80e</td>
<td>12.40e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>14.90cd</td>
<td>13.10d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>16.30b</td>
<td>14.10b</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>13.50e</td>
<td>12.10f</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.34</td>
<td>0.25</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>13.60c</td>
<td>12.10c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>14.70b</td>
<td>12.50b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>17.70a</td>
<td>15.50a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>13.90c</td>
<td>12.00c</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>12.50d</td>
<td>11.00e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>13.50c</td>
<td>11.30d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>13.70cd</td>
<td>12.10c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>12.20e</td>
<td>10.70f</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.29</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 63: Effect of salicylic acid (SA) spray on phosphorus concentration (mg g\(^{-1}\) dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>25.40d</td>
<td>20.20bc</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>30.20b</td>
<td>22.10b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>33.70a</td>
<td>26.10a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>26.40c</td>
<td>19.60c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>13.60g</td>
<td>7.10ef</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>15.10f</td>
<td>7.80e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>17.80e</td>
<td>8.70d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.20g</td>
<td>6.80f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.86</td>
<td>0.80</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>59.40d</td>
<td>54.40c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>64.70b</td>
<td>57.50b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>77.80a</td>
<td>69.80a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>61.00c</td>
<td>53.50c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>47.60g</td>
<td>41.70f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>51.40f</td>
<td>44.00e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>56.10e</td>
<td>47.60d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>46.40g</td>
<td>40.60f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>1.36</td>
<td>1.22</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>93.30c</td>
<td>87.90c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>100.80b</td>
<td>90.50b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>121.50a</td>
<td>112.40a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>95.50bc</td>
<td>87.30c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>81.50ef</td>
<td>76.20f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>87.80de</td>
<td>78.50e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>89.60cd</td>
<td>83.80d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>79.80f</td>
<td>74.40g</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>6.78</td>
<td>1.79</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 64: Effect of salicylic acid (SA) spray on potassium concentration (mg g\(^{-1}\) dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (Brassica juncea L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>8.90f</td>
<td>7.20e</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.60c</td>
<td>7.90c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.80a</td>
<td>9.30a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>9.20e</td>
<td>7.00f</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>8.50g</td>
<td>6.80g</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>9.50d</td>
<td>7.40d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.10b</td>
<td>8.40b</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.20h</td>
<td>6.50h</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>18.50d</td>
<td>14.20c</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>20.20b</td>
<td>15.00b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>24.20a</td>
<td>18.20a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>19.00c</td>
<td>13.90d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>17.40e</td>
<td>13.10e</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.80cd</td>
<td>13.80d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>20.50b</td>
<td>14.90b</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>17.00f</td>
<td>12.70f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.39</td>
<td>0.27</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>18.30e</td>
<td>15.30c</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>19.80b</td>
<td>15.70b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>23.80a</td>
<td>19.60a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>18.70cd</td>
<td>15.20d</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>17.10f</td>
<td>14.20f</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>18.40de</td>
<td>14.60e</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>18.80c</td>
<td>15.60bc</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>16.70g</td>
<td>13.90f</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.36</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
Table 65: Effect of salicylic acid (SA) spray on calcium concentration (mg g⁻¹ dry mass) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30, 60 and 90 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>10.00</td>
<td>9.10</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>11.90</td>
<td>10.00</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.30</td>
<td>11.70</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>10.40</td>
<td>8.80</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>8.70</td>
<td>7.40</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>9.70</td>
<td>8.10</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>11.40</td>
<td>9.10</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>8.40</td>
<td>7.10</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>60</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>13.30e</td>
<td>12.30c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.50b</td>
<td>13.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>17.40a</td>
<td>15.80a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.60d</td>
<td>12.10c</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>11.80g</td>
<td>10.30f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>12.70f</td>
<td>10.90e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>13.90c</td>
<td>11.70d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>11.50h</td>
<td>10.00g</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.27</td>
<td>0.24</td>
</tr>
<tr>
<td>90</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>15.00de</td>
<td>14.80c</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>16.20b</td>
<td>15.20b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>19.50a</td>
<td>18.90a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>15.40c</td>
<td>14.70cd</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>13.80f</td>
<td>13.20f</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>14.90e</td>
<td>13.60e</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>15.20cd</td>
<td>14.50d</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>13.50f</td>
<td>12.90g</td>
</tr>
<tr>
<td></td>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.34</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
60DAS, and 3.97 and 4.66%, respectively at 90DAS. Moreover, potassium content with the combined application of 0.5mM SA and 50mM NaCl increased in comparison to control at all sampling times. In Alankar and PBM16, the increase in the potassium concentration was 24.72 and 16.67% at 30DAS; 10.81 and 4.93% at 60DAS, and 2.73 and 1.96% at 90DAS. In Alankar, the application of 0.5mM SA reversed the adverse effect of 50mM NaCl on calcium concentration and increased it by 14.00, 4.51 and 1.33% at 30, 60 and 90DAS, respectively in comparison to control. However, in PBM16 also the application of 0.5mM SA reversed the adverse effect of 50mM NaCl on calcium concentration and the concentrations were lower than the control.

4.3.2.4 Activities of antioxidative enzymes

Activities of antioxidative enzymes increased with the salinity treatment, and was greater in tolerant (Alankar) than in non-tolerant (PBM16) cultivar at 30DAS, the time of its measurement. The activities of antioxidative enzymes were also increased with the application of SA under both saline and non-saline conditions (Tables 66-67).

Activities of antioxidative enzymes of both the cultivars increased significantly with SA treatment. The cultivars, Alankar and PBM16 showed an enhancement of 34.80 and 31.40% in catalase activity, 34.70 and 31.50% in superoxide dismutase activity, 31.82 and 33.33% in glutathione reductase activity and 34.67 and 30.91% in ascorbate peroxidase activity with the application of 0.5 mM SA (Tables 66-67).

Activities of antioxidative enzymes of both the cultivars increased significantly with 50mM NaCl. At 50mM NaCl, per cent increases in the catalase, superoxide dismutase, glutathione reductase and ascorbate peroxidase activities in Alankar were 10.74, 6.67, 4.55 and 8.00%, respectively. In PBM16, catalase activity was increased by 16.07%, superoxide dismutase activity by 10.00%, glutathione reductase activity by 5.56% and ascorbate peroxidase activity by 6.36% at 30DAS due to 50mM NaCl.
Table 66: Effect of salicylic acid (SA) spray on catalase activity (U g⁻¹ FM min⁻¹) and superoxide dismutase activity (U mg⁻¹ protein) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Catalase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>NaCl (0 mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>121.00f</td>
<td>112.00g</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>152.34c</td>
<td>134.96d</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>163.11b</td>
<td>147.17c</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>106.24g</td>
<td>102.26h</td>
<td></td>
</tr>
<tr>
<td>NaCl (50 mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>134.00d</td>
<td>130.00e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>165.76a</td>
<td>154.31b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>168.30a</td>
<td>163.54a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>127.57e</td>
<td>123.89f</td>
<td></td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>3.12</td>
<td></td>
<td>2.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Superoxide dismutase</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>NaCl (0 mM)</td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
</tr>
<tr>
<td>0.0</td>
<td>30.00f</td>
</tr>
<tr>
<td>0.1</td>
<td>37.62d</td>
</tr>
<tr>
<td>0.5</td>
<td>40.41b</td>
</tr>
<tr>
<td>1.0</td>
<td>26.22g</td>
</tr>
<tr>
<td>NaCl (50 mM)</td>
<td></td>
</tr>
<tr>
<td>SA (mM)</td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>32.00e</td>
</tr>
<tr>
<td>0.1</td>
<td>39.52c</td>
</tr>
<tr>
<td>0.5</td>
<td>41.79a</td>
</tr>
<tr>
<td>1.0</td>
<td>29.57f</td>
</tr>
<tr>
<td>LSD at <em>P</em>&lt;0.05</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
Table 67: Effect of salicylic acid (SA) spray on glutathione reductase activity (U mg\(^{-1}\) protein) and ascorbate peroxidase activity (U mg\(^{-1}\) protein) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at 30 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Glutathione reductase</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.215f</td>
<td>0.180d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.270d</td>
<td>0.217b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.290b</td>
<td>0.237a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.188g</td>
<td>0.165e</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>0.227e</td>
<td>0.185c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.280c</td>
<td>0.218b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>0.297a</td>
<td>0.233a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.210f</td>
<td>0.176d</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.006</td>
<td>0.004</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ascorbate peroxidase</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.50e</td>
<td>1.10e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.88c</td>
<td>1.33c</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>2.02b</td>
<td>1.44b</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.32f</td>
<td>1.01f</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>1.62d</td>
<td>1.17d</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>2.00b</td>
<td>1.38b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>2.12a</td>
<td>1.47a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.50e</td>
<td>1.12e</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td>0.04</td>
<td>0.03</td>
<td></td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at *P*<0.05.
The activities of antioxidative enzymes were significantly further increased when 50mM NaCl was supplemented with 0.5mM SA. In Alankar, the increase in catalase, superoxide dismutase, glutathione reductase and ascorbate peroxidase activities due to the combined treatment 0.5mM SA plus 50mM NaCl was more compared with the treatment of 50mM NaCl alone, and the increases were 39.09, 39.30, 36.36 and 41.33%, respectively. However, in PBM16, the increment in catalase activity was 46.02%, superoxide dismutase activity was 38.25%, glutathione reductase activity was 27.78% and ascorbate peroxidase activity was 33.64% due to the treatment 50mM NaCl plus 0.5mM SA.

4.3.2.5 Yield characteristics

Salt stress led to a significant reduction in yield characteristics. However, SA application increased the yield characteristics and alleviated the salt stress effects when applied as a combined treatment of NaCl and SA. The application of 0.5mM SA proved most effective (Tables 68-69).

Yield characteristics were increased by SA application and were greater in non-salinized (0mM NaCl) than in salinized conditions (50mM NaCl). At 0mM NaCl, the yield characteristics in both the cultivars increased significantly with SA application. With 0.5mM SA application, pod length of Alankar and PBM16 was increased by 19.61 and 15.38%, pod number by 21.00 and 17.00%, seed number by 20.95 and 16.98% and seed yield by 20.99 and 17.01% in comparison to control.

Pod length, pod number, seed number and seed yield of Alankar were decreased by 13.73, 13.09, 13.47 and 13.51% in response to 50mM NaCl treatment in comparison to control. The above characteristics of PBM16 were decreased by 28.21, 29.40, 29.32 and 29.30% respectively, in response to 50mM NaCl.

Application of 0.5mM SA alleviated the decrease of yield characteristics under saline condition (50mM NaCl). In Alankar, the 0.5mM SA treatment
Table 68: Effect of salicylic acid (SA) spray on pod length (cm) and pod number plant\(^1\) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at harvest, i.e., 120 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pod length</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>5.10c</td>
<td>3.90b</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>5.10c</td>
<td>3.90b</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>5.50b</td>
<td>4.00b</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>6.10a</td>
<td>4.50a</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>5.20c</td>
<td>3.80b</td>
</tr>
<tr>
<td></td>
<td>NaCl (50mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td>4.40e</td>
<td>2.80d</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>4.40e</td>
<td>2.80d</td>
</tr>
<tr>
<td></td>
<td>0.1</td>
<td>4.60d</td>
<td>2.80d</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>5.10c</td>
<td>3.10c</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>3.60f</td>
<td>2.10e</td>
</tr>
<tr>
<td></td>
<td>LSD at P&lt;0.05</td>
<td>0.17</td>
<td></td>
</tr>
</tbody>
</table>

| 120 | NaCl (0mM) | Pod number | | |
|     | SA (mM)    | 105.18c    | 89.68c |
|     | 0.0        | 105.18c    | 89.68c |
|     | 0.1        | 113.59b    | 93.27b |
|     | 0.5        | 127.27a    | 104.93a|
|     | 1.0        | 107.28c    | 89.23c |
|     | NaCl (50mM)|            |          |
|     | SA (mM)    | 91.41e     | 63.31e  |
|     | 0.0        | 91.41e     | 63.31e  |
|     | 0.1        | 96.89d     | 65.21e  |
|     | 0.5        | 106.04c    | 72.81d  |
|     | 1.0        | 76.78f     | 49.38f  |
|     | LSD at P<0.05| 3.16   | 3.45    |

Different letters within a column indicate significant difference at $P<0.05$. 

\(^1\) pod number plant\(^{-1}\).
Table 69: Effect of salicylic acid (SA) spray on seed number pod⁻¹ and seed yield (g plant⁻¹) of Alankar (salinity tolerant) and PBM16 (salinity non-tolerant) cultivars of mustard (*Brassica juncea* L.) grown under salinity stress at harvest, i.e., 120 days after sowing (DAS).

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>12.03c</td>
<td>10.13c</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>12.99b</td>
<td>10.53b</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>14.55a</td>
<td>11.85a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>12.27c</td>
<td>10.07c</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>10.41e</td>
<td>7.16e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>11.03d</td>
<td>7.37e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>12.07c</td>
<td>8.01d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>8.74f</td>
<td>5.58f</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td></td>
<td>0.33</td>
<td>0.36</td>
</tr>
</tbody>
</table>

### Seed yield

<table>
<thead>
<tr>
<th>DAS</th>
<th>Treatments</th>
<th>Alankar</th>
<th>PBM16</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>NaCl (0mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>6.29c</td>
<td>4.88bc</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>6.79b</td>
<td>5.07ab</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>7.61a</td>
<td>5.71a</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>6.41c</td>
<td>4.85c</td>
<td></td>
</tr>
<tr>
<td>NaCl (50mM)</td>
<td>SA (mM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0</td>
<td>5.44e</td>
<td>3.45e</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>5.76d</td>
<td>3.55e</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>6.31c</td>
<td>3.86d</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>4.57f</td>
<td>2.69f</td>
<td></td>
</tr>
<tr>
<td>LSD at P&lt;0.05</td>
<td></td>
<td>0.19</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Different letters within a column indicate significant difference at P<0.05.
reversed the effects of 50mM NaCl and the reduction in the characteristics was restricted to about near control. Pod length was equivalent to the control plants whereas pod number, seed number and seed yield showed a marginal increase of 0.82, 0.33 and 0.32%, respectively.

The decreases in pod length, pod number, seed number and seed yield due to 50mM NaCl were observed, however, lesser decreases were found when 50mM NaCl treatment was supplemented with 0.5 mM SA.

Contrary to the results obtained in Alankar (where 0.5mM SA plus 50mM NaCl increased the characteristics in comparison to 50mM NaCl alone), PBM16 exhibited decreases which were limited to 20.51, 18.81, 20.93 and 20.90% in pod length, pod number, seed number and seed yield, respectively due to 0.5mM SA plus 50mM NaCl compared to 50mM NaCl.

4.4 Experimental Summary

4.4.1 Experiment 1

- The effect of 100mM NaCl decreased the growth and photosynthetic characteristics maximally and was more conspicuous on all the cultivars of mungbean at 20 and 40DAS sampling times.

- The effect of 100mM NaCl on yield characteristics was detrimental and the plants could not survive at maturity.

- Plants treated with 50mM NaCl exhibited a significant decrease over control on growth, photosynthetic and yield characteristics.

- Among cultivars, Tram exhibited greatest decrease in the growth, photosynthetic and yield characteristics due to the salinity treatments, whereas Pusa Vishal showed lowest decrease.

- The order of suitability of the cultivars to salinity stress in terms of growth, photosynthetic and yield characteristics was Pusa Vishal > PDM54 > T44 > Tram.
4.4.2 Experiment 2

- Maximum reduction in the growth and photosynthetic characteristics was noted with 100 mM NaCl at all the sampling times in all the cultivars of mustard. However, treatment of 100 mM NaCl proved deleterious and plants did not survive up to maturity.

- Growth, photosynthetic and yield reductions were significantly greater in Sakha and PBM16 than the Alankar and Pusa Bold with NaCl concentrations.

- The order of tolerance of the cultivars to salinity stress was Alankar > Pusa Bold > Sakha > PBM16.

4.4.3 Experiment 3

- Application of 0.5 mM SA increased growth and photosynthetic characteristics, nitrogen, phosphorus, potassium and calcium concentrations, activities of antioxidative enzymes and yield characteristics of Pusa Vishal (tolerant mungbean type) and Tram (non-tolerant mungbean type) cultivars grown under non-saline (control) condition.

- Non-salinized plants treated with 0.5 mM SA maintained a higher growth and photosynthetic characteristics, nitrogen, phosphorus, potassium and calcium concentrations and yield characteristics than salinized plants at both the stages, indicating adverse effects of NaCl salinity in tolerant (Pusa Vishal) as well as non-tolerant (Tram) cultivars.

- Application of 0.5 mM SA decreased the concentrations of sodium and chloride in both tolerant (Pusa Vishal) and non-tolerant (Tram) cultivars, under normal and saline conditions at both the sampling times.

- Application of 0.5 mM SA increased the activities of antioxidative enzymes of plants grown under non-saline or salinized conditions.
- Growth and photosynthetic characteristics, nitrogen, phosphorus, potassium and calcium concentrations and yield characteristics decreased significantly with 50mM NaCl in both the cultivars but more adverse effects of salinity were found on Tram. However, the concentrations of sodium and chloride and the activities of antioxidative enzymes increased with 50mM NaCl in both the cultivars.

- The treatment of 0.5mM SA was found most effective in alleviating salinity stress on growth, photosynthetic, biochemical and yield characteristics.

4.4.4 Experiment 4

- The application of 0.5mM SA increased growth and photosynthetic characteristics, nitrogen, phosphorus, potassium and calcium concentrations and yield characteristics of mustard. In both the cultivars i.e. Alankar and PBM16 the increases were greater under non-saline (control) condition than under saline condition at all sampling times.

- The positive effect of 0.5mM SA application was found as it decreased sodium and chloride concentrations under both saline and non-saline conditions.

- The activities of antioxidative enzymes of both the cultivars increased significantly with SA under both saline and non-saline conditions.

- Salt stress led to a significant reduction in growth and photosynthetic characteristics, nitrogen, phosphorus, potassium and calcium concentrations and yield characteristics of both the cultivars. The cultivar PBM16 exhibited a higher reduction than Alankar.

- The treatment of 50mM NaCl increased sodium and chloride concentrations in Alankar and PBM16 at all the sampling times, and the accumulation was higher in PBM16 than Alankar.
• Exposure of plants to 50mM NaCl increased the activities of antioxidative enzymes in both the cultivars but to a higher degree in Alankar than PBM16.

• Application of 0.5mM SA helped to reduce the adverse effects of salinity. SA alleviated the salt stress effects when applied on plants treated with 50mM NaCl.