**Table 1.** Shoot height (cm), root length (cm), shoot and root number in media with different growth

regulators (mg L-1) or without them (control) at three pH levels after 4-week growth period.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | pH | Control | 1.0 GA3 | 0.5 GA3+1.0 BA | 0.5 IAA+1.0 BA |
|  | 4.6 | 6.2 (0.69) d | 7.4 (0.56) c | 1.8 (0.18) ef | 1.1 (0.08) f |
| Shoot height | 5.8 | 8.5 (0.53) b | 11.6 (0.73) a | 2.5 (0.21) e | 1.2 (0.07) f |
|  | 7.4 | 8.2 (0.61) b | 11.9 (0.69) a | 3.0 (0.28) e | 1.5 (0.08) f |
|  |  |  |  |  |  |
|  | 4.6 | 2.3 (0.31) b | 2.5 (0.34) b | 2.3 (0.31) b | 2.0 (0.00) b |
| Shoots / explant | 5.8 | 2.0 (0.39) b | 2.2 (0.25) b | 3.5 (0.19) a | 2.0 (0.00) b |
|  | 7.4 | 1.9 (0.25) b | 2.0 (0.00) b | 4.1 (0.35) a | 2.0 (0.00) b |
|  |  |  |  |  |  |
|  | 4.6 | 2.5 (0.29) d | 2.3 (0.41) d | - | - |
| Root length | 5.8 | 2.9 (0.55) c | 3.2 (0.43) b | - | - |
|  | 7.4 | 2.6 (0.41) cd | 3.8 (0.40) a | - | - |
|  |  |  |  |  |  |
|  | 4.6 | 4.5 (0.85) bc | 4.3 (0.74) c | - | - |
| Roots / explant | 5.8 | 5.8 (0.79) b | 9.3 (1.01) a | - | - |
|  | 7.4 | 4.7 (0.77) b | 8.5 (0.92) a | - | - |
|  |  |  |  |  |  |
|  | 4.6 | - | + | ++ | +++ |
| Callusing et base | 5.8 | - | + | ++ | +++ |
|  | 7.4 | - | + | ++ | +++ |

Values represent mean ± SD (parenthesis) of 12 replicates. Different letters within parameter indicate

significant difference at p < 0.05. + denotes increase in the amount of callus.

**Table 2.** Shoot height (cm), root length (cm), shoot and root number in media with different concentrations

of auxins (mg L-1) or without them (control) after 4-week growth period.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Shoot height | Shoots / explant | Root length | Roots / explant | Callusing at base |
| Control | 8.5 (0.53) bc | 2.0 (0.39) c | 2.9 (0.55) c | 5.8 (0.79) c | - |
|  |  |  |  |  |  |
| IAA 0.5 | 10.1 (1.29) a | 2.8 (0.30) bc | 2.0 (0.28) b | 13.3 (1.48) a | ++ |
| IAA 1.0 | 7.6 (0.79) cd | 2.3 (0.21) c | 1.2 (0.11) c | 9.5 (1.34) b | ++ |
| IAA 1.5 | 7.3 (0.78) cd | 4.0 (0.42) a | 1.2 (0.11) c | 9.2 (1.37) b | ++ |
|  |  |  |  |  |  |
| IBA 1.5 | 9.4 (1.01) ab | 3.5 (0.43) ab | 2.1 (0.16) b | 12.1 (0.65) a | ++ |
| IBA 1.5 | 6.8 (0.69) d | 2.6 (0.33) bc | 1.0 (0.10) c | 9.1 (1.08) b | ++ |
| IBA 1.5 | 4.1 (0.35) e | 2.0 (0.00) c | 0.9 (0.06) c | 6.0 (0.90) c | ++ |
|  |  |  |  |  |  |

Values represent mean ± SD (parenthesis) of 12 replicates. Different letters within parameter indicate

significant difference at p < 0.05. + denotes increase in the amount of callus.

**Table 3.** DPPH radical scavenging activity (%) of plants cultivated in different media after 4-week growth period.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Leaf |  |  | Callus |  |  | Root |  |
|  | pH | 4.6 | 5.8 | 7.4 | 4.6 | 5.8 | 7.4 | 4.6 | 5.8 | 7.4 |
| Control |  | 92.9 bcd | 90.3 de | 91.1 cd | - | - | - | 90.6 de | 82.7 g | 86.3 f |
| 1.0 GA3 |  | 90.7 de | 93.1 abc | 86.5 f | 92.6 bcd | 93.9 abc | 92.2 bcd | 83.7 g | 89.9 de | 77.7 h |
| 0.5 GA3+1.0 BA |  | 95.5 ab | 93.4 abc | 95.2 ab | 90.7 de | 92.8 bcd | 94.7 ab | - | - | - |
| 0.5 IAA+1.0 BA |  | 95.8 ab | 92.1 bcd | 89.8 e | 92.7 bcd | 96.1 a | 95.8 ab | - | - | - |
| IAA 0.5 |  | - | 91.1 bcd | - | - | 92.7 abc | - | - | 87.7 de | - |
| IAA 1.0 |  | - | 91.7 bcd | - | - | 92.5 abc | - | - | 81.9 f | - |
| IAA 1.5 |  | - | 66.2 h | - | - | 95.2 b | - | - | 83.8 ef | - |
| IBA 0.5 |  | - | 76.9 g | - | - | 93.3 abc | - | - | 80.7 fg | - |
| IBA 1.0 |  | - | 89.8 cd | - | - | 92.8 abc | - | - | 91.2 bcd | - |
| IBA 1.5 |  | - | 96.0 a | - | - | 92.1 bcd | - | - | 90.2 cd | - |
| Ascorbic acid |  | 93.1 |  |  |  |  |  |  |  |  |
| Gallic acid |  | 96.6 |  |  |  |  |  |  |  |  |

Values are means of 4 replicates. SD were less than 10% of the averages. Different letters indicate significant difference at p < 0.05.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 4.** Correlation coeficients (R) between polyphenols and DPPH in different media. | | | | | | | | | |
|  |  | Media - different pH and growth regulators | | | | | | | |
|  |  | Leaf | |  | Callus | |  | Root | |
|  |  | Flavonoids | DPPH |  | Flavonoids | DPPH |  | Flavonoids | DPPH |
| Phenols |  | 0.91\*\* | 0.87\*\* |  | 0.85\* | 0.87\*\* |  | 0.95\*\* | 0.86\*\* |
| Flavonoids |  |  | 0.92\*\* |  |  | 0.95\*\* |  |  | 0.93\*\* |
|  |  |  |  |  |  |  |  |  |  |
|  |  | Media - auxins | | | | | | | |
|  |  | Leaf | |  | Callus | |  | Root | |
|  |  | Flavonoids | DPPH |  | Flavonoids | DPPH |  | Flavonoids | DPPH |
| Phenols |  | 0.99\*\* | 0.80\* |  | 0.89\* | 0.90\*\* |  | 0.90\*\* | 0.86\*\* |
| Flavonoids |  |  | 0.82\* |  |  | 0.91\*\* |  |  | 0.91\*\* |
| Significance level at \*p < 0.05, \*\*p < 0.01 | | | | |  |  |  |  |  |