

## Germinability and Viability of Pollen of Selected Commercial *Dendrobium* Hybrids

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*Dendrobium* is one of the highly demanding ornamental orchid genera in Sri Lankan floriculture industry. The assessment of functional quality of the pollinium on the basis of germinability and viability is useful for the development of breeding programs for crop quality improvement and pollen storage protocols in conservation. This research was carried out to determine *in vivo* and *in vitro* pollen germinability and pollen viability of eight commercial *Dendrobium* hybrids (A-H). Percentage of pollen viability was studied by placing crushed pollinia on a cavity slide with 1% 2,3,5-triphenyltetrazolium chloride solution and incubating at dark for 12 hours. Pollinia of *Dendrobium* flowers were placed on the stigma of the same flower on the second day after opening. After three days, pollinia were stained with lacto phenol cotton blue and percentage of *in vivo* pollen germination was calculated. *In vitro* pollen germination of the *Dendrobium* hybrids was studied in three different media. Pollinia were removed from the anthers on the second day after flower opening and placed in (i) 5%, 10%, 15%, 20% and 25% sucrose solutions and (ii) a semi solid medium containing 10% sucrose, 100 mgL<sup>-1</sup> H<sub>3</sub>BO<sub>3</sub>, 300 mgL<sup>-1</sup> Ca(NO<sub>3</sub>).2H<sub>2</sub>O, 200 mgL<sup>-1</sup> MgSO<sub>4</sub>.7H<sub>2</sub>O, 200 mgL<sup>-1</sup> KNO<sub>3</sub>, 8 gL<sup>-1</sup> agar and stigmatic fluid of *Dendrobium* flower and incubated at room temperature. Pollinia of *Dendrobium* hybrids A, G and H placed in a (iii) semi solid medium containing 1%, 2%, 3% sucrose, 75 mgL<sup>-1</sup> H<sub>3</sub>BO<sub>3</sub> and 0.5%, 1%, 2% agar were incubated at 24 °C, 26 °C, and 28 °C. After 48 hours, percentage of *in vitro* pollen germination was calculated. Means were compared using one-way ANOVA with Tukey's pairwise comparison test in IBM SPSS Statistics 22 software. As the percentage values of pollen germination and viability were not normally distributed, the values were transformed to arcsin square root values prior to statistical analysis. There was no significant difference in pollen viability of different hybrids which varied between 94% and 77%. The highest percentage of *in vivo* pollen germination was found in *Dendrobium* cultivar D (67%) and there was a significant difference in *in vivo* pollen germination among the hybrids. Correlation analysis was performed using IBM SPSS Statistics 22 software to determine the relationship between pollen viability and *in vivo* pollen germination and found that there was no significant relationship ( $r = 0.237$ ). The percentage of *in vitro* pollen germination was low and the highest *in vitro* pollen germination (7.2%) was observed in the semisolid medium containing 1% sucrose, 75 mgL<sup>-1</sup> H<sub>3</sub>BO<sub>3</sub>, 1% agar and incubated at 26 °C for *Dendrobium* cultivar H.

Keywords: *Dendrobium*; pollen germinability; pollen viability

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