Thesis Title Preservation of Some Thai Native Orchid Species by Synthetic Seed Technique

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Abstract

Protocorms size 1 ± 0.2 mm of *Doritis pulcherrima* Lindl. and *Dendrobium cariniferum* Rchb. f. were precultured onto modified VW (1949) medium comprising 0.058 , 0.3 and 0.6 M sucrose for 2 days , then subsequently encapsulated in calcium alginate beads to form synthetic seeds. The results showed that the non - dehydrated synthetic seeds of both species had significant higher germination percentages i.e. 85.00 - 97.50 and 80.00 - 95.00 per cent respectively than that obtained from the 0.9 M sucrose treatment. Longer dehydrating period resulted in decreasing germination percentages , but 0.6 and 0.9 M sucrose promoted the 4 and 6 hrs dehydrated *Doritis* synthetic seed to have higher germination percentages than from other sucrose concentrations. The 4 hrs - dehydrated *Dendrobium* synthetic seeds yielded highest germination percentage when sown onto the 0.058 M sucrose medium , but the 6 hrs - dehydrated synthetic seeds gave highest germination on the 0.6 M sucrose medium. The encapsulated protocorms in calcium alginate beads before preculturing onto modified VW (1949) medium comprising 0.6 M sucrose for 2 days , and dehydrated for 4 hrs yielded highest germination in the *Doritis* , *Dendrobium* , *Spathoglottis plicata* Bl. , and *Phaius tankervilliae* (Banks in L' Herit.) Bl.). Increasing dehydrating time to 6 hrs , the first 3 species still had high germination percentages , but not significantly differed from the 4 hrs treatment.

Storage of dehydrated synthetic seeds of *Doritis* , *Dendrobium* , and *Spathoglottis* species for 2 hrs at 4 ± 1 , 8 ± 2 , and 25 ± 2 °C showed that all synthetic seeds could not survive longer than 10 weeks. The non - dehydrated synthetic seeds of the *Dendrobium* could

be preserved at 4 ± 1 °C for 16 weeks , but germination is declined significantly when the time increased. Storage of the non - dehydrated synthetic seeds of all the 3 species at 25 ± 2 °C for 16 weeks , yielded high germination percentages i.e. 80.00 - 100.00 , 62.50 - 80.00 and 87.50 - 100.00 respectively.

In vitro germination of the *Doritis* and *Spathoglottis* species yielded higher germination than those from the *in vivo* germination. Modified VW (1949) medium + 4 per cent sucrose used as synthetic endosperm helped the synthetic seeds to produced highest germination percentage. Synthetic endosperms comprising 0.0 - 1.5 g/l Agrimycin did not significantly improve *in vivo* germination of both species. But , sucrose at 4 per cent level gave highest germination , but only at 8.20 and 18.30 per cent respectively.

Doritis and *Spathoglottis* synthetic seeds were precultured onto modified VW (1949) medium containing 0.6 M sucrose and glycerol at 0.0 , 0.5 and 1.0 M for 2 days , prior to dehydrating for 6 hrs , or dehydrating synthetic seeds of the *Doritis* , *Spathoglottis* and *Phaius* species by PVS2 or PVS3 solutions at 25 ± 2 °C for 2 hrs , before cryopreserving in liquid nitrogen showed that the synthetic seeds could not survive. However , very low germination was also obtained from those treatments without cryopreservation.