



Cryopreservation of *Sesame indicum* L. Seed

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Abstract

The study on cryopreservation of *Sesame indicum* L. seed was carried out at Biotechnology Research and Development Office from October 2018 to September 2020. This research was conducted to study seed moisture content (%) which is the main factor affecting seed storage by comparison with ambient conditions for a period of 1 month. Split split plot design was laid out with 4 replicates of each condition. The main plot consisted of 6 certified sesame varieties of Department of Agriculture: 1) White-seeded cultivar "Roi et 1", 2) White-seeded cultivar "Mahasarakham 60", 3) White-seeded cultivar "Ubonratchathani 2", 4) Black-seeded cultivar "Ubonratchathani 3", 5) Red-seeded cultivar "Ubonratchathani 1" and 6) Red-seeded cultivar "Ubonratchathani 2". The sub plot consisted of 4 levels of seed moisture content (%): 8 (initial), 6, 4 and 2 and the sub sub plot consisted of 3 storage periods: 0 day, 7 days and 1 month. Seed viability by monitoring changes in percent of seed germination and oil content were recorded. The result showed that all varieties of sesame could be kept in cryopreservation but the seed moisture content should be reduced to 6 percent or lower to maintain seed viability and oil content of sesame seeds.

MATERIALS AND METHOD



Figure 1. The procedure and experimental method.

RESULT AND DISCUSSION

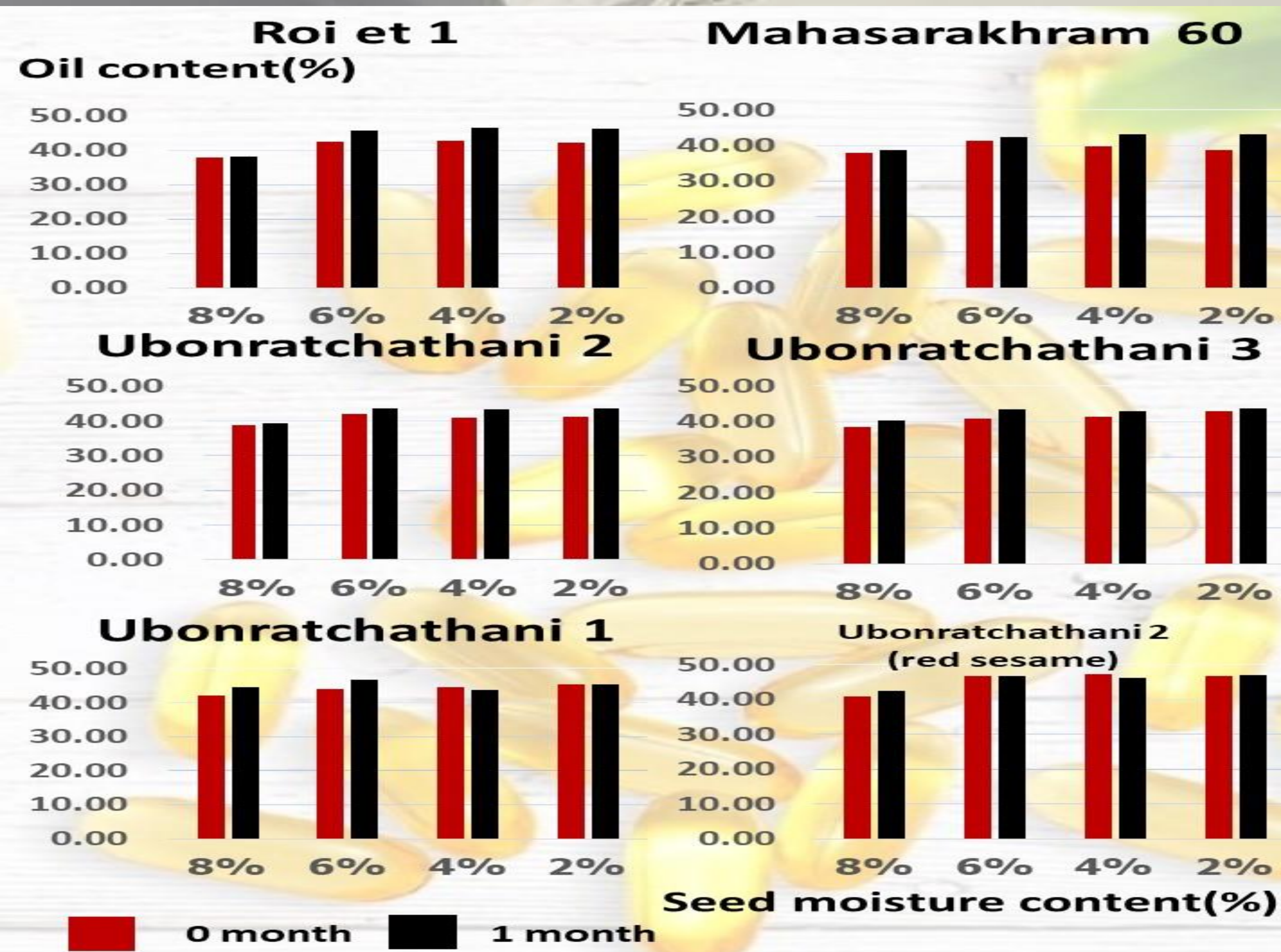


Figure 2. Comparison of Oil content (%) in each seed moisture level before (0 day) and after (1 month) storage in cryopreservation.

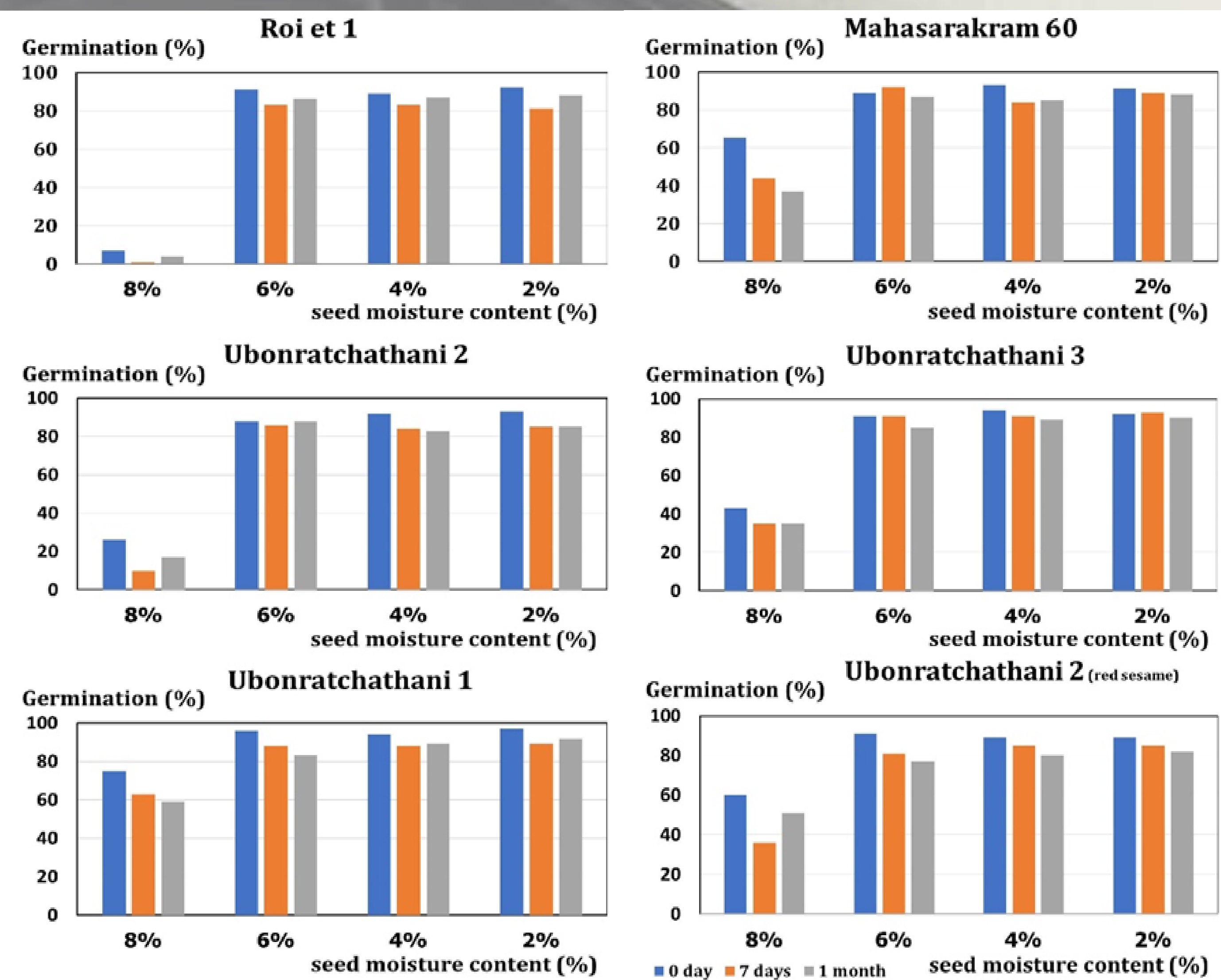


Figure 3. Comparison of germination (%) in each seed moisture level after 0 day, 7 days and 1 month of storage in cryopreservation.

As a result of demonstrating the influence of moisture levels on seeds before storage, moisture in sesame seeds must be reduced to below 8 percent in order to be imported into freezing conditions and can remain stable for a long time. In line with the study of Stanwood (1987), the ability of 6 varieties of sesame seeds to withstand infusions in liquid nitrogen have found that the survival of sesame seeds, in addition to depending on the cooling rate, and the moisture content of the seeds. This study indicated that sesame seeds can either tolerate exposure to liquid nitrogen or survive if their moisture content is below 6 percent.

CONCLUSIONS

All six varieties of sesame seeds could be kept in cryopreservation but the seed moisture content should be reduced to 6 percent or lower to maintain seed viability and oil content of sesame seeds.

LITERATURE CITED

Stanwood, PC. (1987). Survival of sesame seeds at the temperature (-196 °C) of liquid nitrogen. *Crop Sci.* 27, 327-331.