J Indian bot Soc Vol 74 (1995) 25-27

SEED GERMINATION STUDIES IN INDIAN RHODODENDRONS

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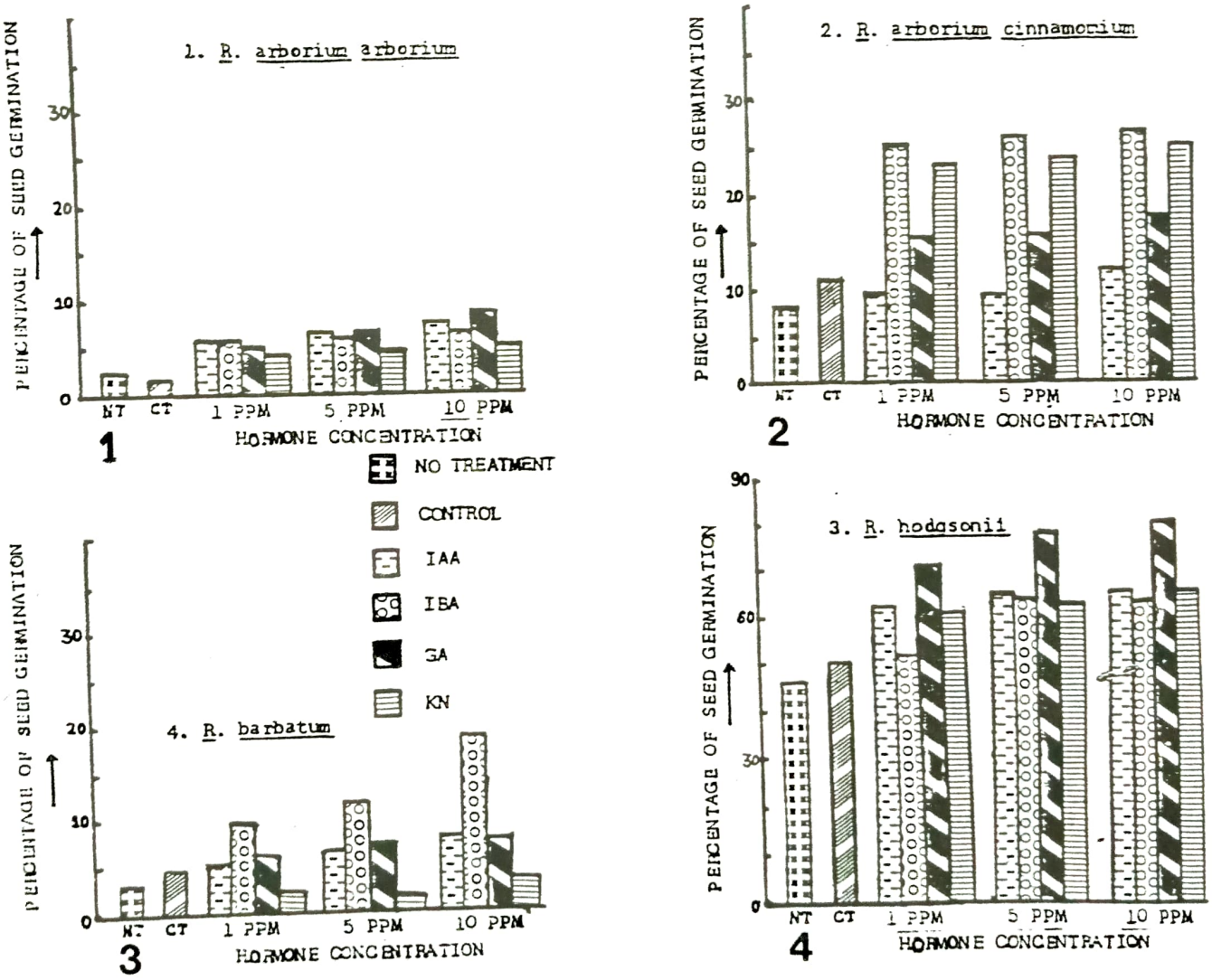
(Accepted July, 1995)

Rhododendron seeds are minute and produced in large number. Seeds undergo a period of dormancy and germination in soil is very poor. However, in Petriplate the higher germination percentage is achieved. Hormonal treatments revealed that GA_3 and IBA enhanced percent germination. The seeds remain viable for 7 months or more under low temperature±10°C.

Key Words : Seed viability, Longevity, *Rhododendron*.

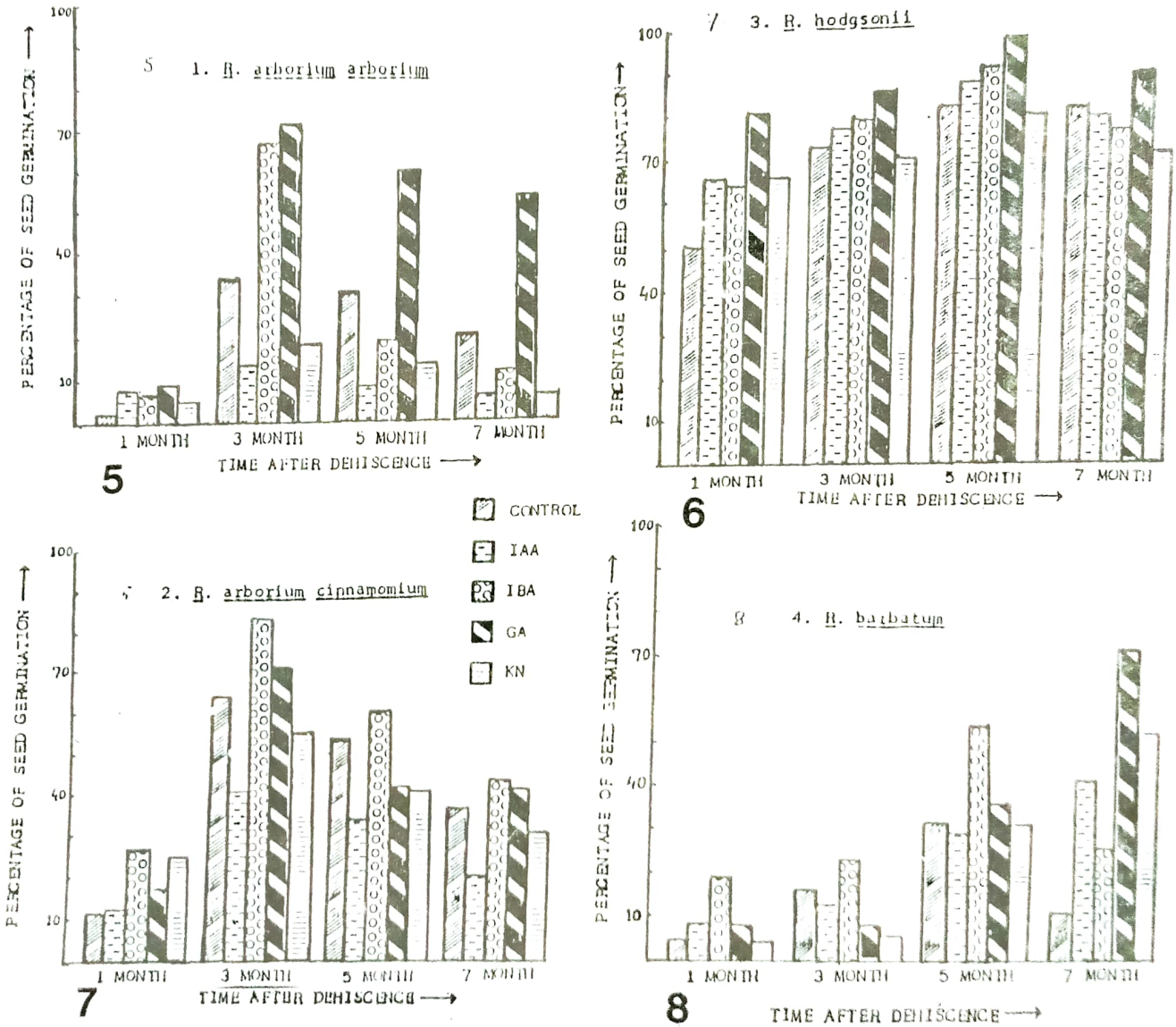
Rhododendron seeds are produced in large number and are dispersed by wind. However, seed germination and seedling establishment is poor. An acid based medium of Sphagnum peat or oak leaf mold and sharp sand is used by various workers (Cox, 1985). Improved germination of immature seeds of *R. simiarum*



Figures 1-4. Histograms showing percentage of seed germination in different treatments of hormones.

Received August 1993

is achieved by Arisumi *et al.* (1988) by giving cold treatment to either capsule, seeds or both synergestically. Application of GA3 to over come dormancy and better seed germination was made by Bewley and Black (1982) and Ellis *et al.* (1983). Padrutt *et al.* (1992) in *R. prinophyllum* seeds also reported enhanced seed germination in GA_3 treated seeds. All these workers have used either Australian or American species. A perusal of the literature reveals that no work has been done on Indian Rhododendrons. Therefore, the present experiments are designed to study seed germination and their longevity taking some Indian *Rhododendron*.



Figures 5-8. Histograms showing percentage of seed germination in different treatments and different time interval after dehiscence.

MATERIALS AND METHODS

Capsules of *Rhododendron arboreum* var. *arboreum*, *R. arboreum* var. *cinnamomeum*, *R. hodgsonii* and *R. barbatum* were collected from Varsey Hilley, Sikkim in the first week of October, 1992. Capsules were kept in cotton bags and stored in laboratory at 25°C. These capsules ruptured within 15-20 days and the seeds were collected in paper bags and stored in refrigerator at 8-10°C. Periodical samples were taken from the stored seeds for further experimentation. For hormonal treatments IAA, IBA, GA_3 and Kn (1, 5, 10 ppm) were taken. Seeds were soaked for 48 hours in aqueous solutions of these hormones in each solution separately. A control water treatment set was also run simultaneously. The germination experiments were done in Petriplates lined with cotton and filter

paper. Petriplates were watered at intervals. Sets were kept in triplicates and the experiments were performed after two months interval. Emergence of radicle was used as the indicator of germination.

OBSERVATIONS AND CONCLUSIONS

Seed germination recorded after 30 days of sowing was found to be poor in all the species studied except *R. hodgsonii* where it reached up to 80%. However, in all the cases the germination was higher in GA_3 and IBA (10 ppm) treated seeds as compared to the controlled ones (Figs. 1-4).

Further experiments were done for studying the storage effect and the seeds were treated with all the hormones under investigations taking 10 ppm concentration only. It was observed that after two months of storage the percent seed germination increased in all cases (Figs. 5-8). After 5 months of storage there was a decrease in germination percentage in *R. arboreum* var. *arboreum* and *R. arboreum* var. *cinnamomeum* but in *R. hodgsonii* and *R. barbatum* germination percentage further increased and reached up to 97% in GA_3 treated and 54% in IBA treated seeds respectively. In 7 months of storage the first three species showed decreased germination while the fourth species, *R. barbatum* showed enhanced germination (70%) in GA_3 treated seeds while in other treatments the germination was poor and the minimum was in water treated seeds (10%) (Figs. 5-8). In the next months of storage there was a gradual loss in germinability of seeds, and in 12 months less than 20% seeds germinated in all the treatments.

The seeds of *Rhododendron* studied showed a short period of dormancy as revealed from the observations that immediately after dehiscence there was poor germination but after storage the germination increased. Further, different species show different level of germination. This may be due to the presence of abortive seeds, as it appears that in many ovules there may not be fertilization and proper embryos are not formed. Both GA_3 and IBA enhanced seed germination. GA_3 was found effective in *R. arboreum* var. *arboreum* and *R. hodgsonii*, while IBA stimulated seed germination of *R. arboreum* var. *cinnamomeum* and *R. barbatum*. IAA and Kn were found to be inhibitory in their effects. Role of GA_3 in enhancing seed germination percentage has also been reported earlier by Padrutt *et al.* (1992) in *R. prinophyllum*. In this regard our results are in conformity with these authors.

The authors acknowledge the Department of Science and Technology for the research grant.

REFERENCES

Arisumi K, E Matsuo Y Sakata & K Tsukiashi 1988 The improvement of germinability of the immature *Rhododendron* seeds by cold treatment. *Mem Faculty Agr Kagoshima Univ* **24** 1323-128.

Bewley J D & M Black 1982 *Physiology and Biochemistry of Seeds in Relation to Germination,* **Vol. 2** Springer-Verlag, Berlin.

Cox P A 1985 *The Smaller Rhododendrons*. Timber Press, Portland, Ore.

Ellis R H, T D Hong & E H Roberts 1983 Long term seed storage of major temperate fruits (From : *Intl. Board Plant Genet. 1985*). *Vitis* **22** 211-219.

Hartmann H T & D E Kester 1975 *Plant Propagation, Principles and Practices*. Prentice Hall, Englewood Cliffs, N J P 153-154.

Kains M G & L M Mc Queston 1942 *Propagation of Plants*. Orange Judd Publishing, New York.

Padrutt J, H Pellett & P. Ascher 1992 Post-pollination reproductive biology of *Rhododendron prinophyllum* (Small) Millais. *J Amer Soc Hort Sci* **117(4)** 656-662.