Germinating *Nepenthes* seed: Putting myths to rest

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Introduction

The Internet is full of personal accounts and guides on how to grow *Nepenthes* from seed. However, there is a plethora of misinformation available. Many of these myths involve the treatment of *Nepenthes* seeds before they are sown. In particular, whether they require a dark period in order to induce germination. A period of darkness after being sown has been shown to increase germination in other genera of plants such as Cyclamen (Ross & Ellis 2014), but there has been no conclusive study whether *Nepenthes* require a dark period to germinate. Others swear that treating seeds with gibberellic acid (GA3) can aid in the germination of *Nepenthes* seed. Again, no conclusive study has been published on this claim. The final claim is that sowing seeds and putting the pot on top of a heat mat will increase germination. Again, no study has been published legitimizing this claim. This study is an attempt to put many of these myths to rest. We hypothesize that none of the treatments will yield better results than the control treatment.

Materials & Methods

The experiment was replicated three times using seed from a horticultural hybrid created using a female *Nepenthes* 'Rokko' being grown at North Carolina State University and pollen from a male *Nepenthes veitchii* (Pink) from Malesiana Tropicals being grown by Bob Harrel. Mason McNair harvested the seed in early December 2013 by allowing the pods on the mother plant to open naturally into a paper envelope. The seeds were sorted by Mason McNair into lots of 50 seed and then mailed to Jeremiah Harris to be treated and sown. The six treatments in this experiment consisted of an untreated control, a heat mat treatment, a gibberellic acid treatment, and three dark period treatments. The gibberellic acid treatment consisted of soaking the seeds for 12 hours in 250 ppm of gibberellic acid (GA3). The heat treatment consisted of placing each pot of seeds onto a heat mat set for 21°C for the duration of the experiment. The three dark treatments consisted of leaving the pots in a closet for a designated period of time after the seeds were sown. For the first dark treatment, the seeds were in the dark for 4 days before being taken to the greenhouse with the rest of the treatments. For the second dark treatment, the seeds were in the dark for 7 days before being taken to the greenhouse. For the final dark treatment, the seeds were in the dark for 10 days before being taken to the greenhouse. All seeds, including the untreated control, were sown onto sterilized long-fibered sphagnum. Each treatment consisted of 50 seeds. The seeds were checked for germination weekly from the date of being sown until the conclusion of the experiment. All seeds were treated and sown on January 16, 2014. The experiment took place in a naturally lit greenhouse that is kept at 24-27°C during the day, 13-16°C at night, and 70-95% humidity. No artificial lighting was used for this experiment. Data was collected over 22 weeks.

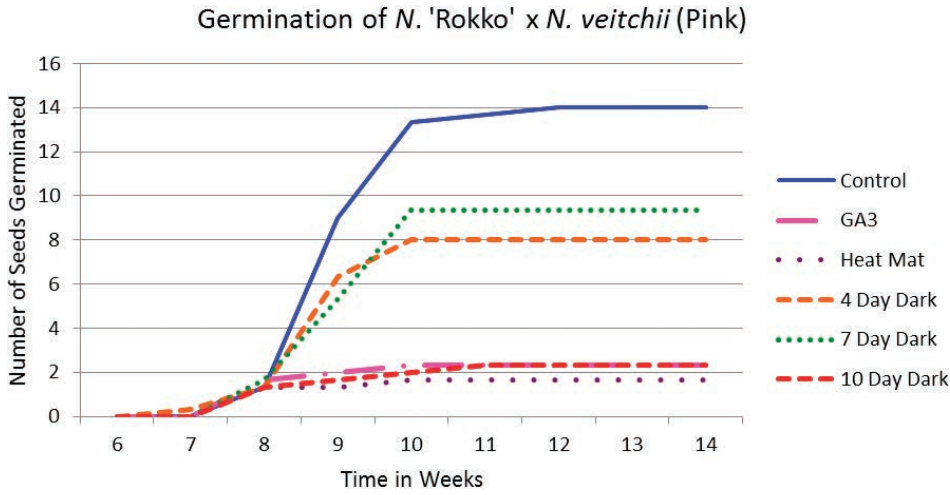

Figure 1: Average total number of seeds that germinated over a period of 14 weeks for each treatment. First germination did not occur until week 7. Data represent the mean of 3 replications.

Data & Results

The average time between sowing seeds and first germination was seven and a half weeks. Maximum germination was achieved by the twelfth week after sowing the seeds. After the twelfth week some treatments saw a slight decrease in plant survival; however, these plant deaths were insignificant for the purpose of this study. The control treatment had the best germination of all of the treatments, followed by the seven-day and four-day dark period treatments (Fig. 1). The GA3 treatment, heat mat treatment, and 10-day dark period treatment appeared to be inhibitive to seed germination.

In order to achieve the best germination for *Nepenthes*, seed should be sown as soon as possible after harvest directly onto fresh media.

Conclusion

The results of this experiment show that using a heat mat, treating seeds with gibberellic acid, or providing a dark period can be detrimental to *Nepenthes* seed germination. It is possible that others may reach different conclusions from personal, at home experiences. The lack of germination in the initial 7 weeks after sowing implies there is some sort of warm stratification needed for successful *Nepenthes* seed germination. Future research is needed to confirm this however. In the future, we suggest people ignore the many myths found on the Internet regarding growing *Nepenthes* from seed and instead sow their seed onto fresh media. We suggest long-fibered sphagnum (LFS), peat moss, a mix of peat moss and perlite, milled LFS, or a mix of milled LFS and peat moss for successful seed germination. In future experiments, we hope to repeat our treatments using true lowland and true highland species seed, artificial lighting, and a range of different media.

References:

Ross, J., and Ellis, C. 2014. Seed germination. The Cyclamen Society. http://www.cyclamen.org/propag_set.html, accessed February 20, 2015.