GERMINATION OF SEEDS OF *ANTHURIUM*

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In my attempts to prepare a systematic revision of *Anthurium*, I have come to appreciate the value of living plants for study and I have consequently been attempting to assemble a more complete living collection of *Anthurium*. In addition to being used to prepare more complete and accurate descriptions, the plants are useful for associated studies with cytology, anatomy, floral fragrance chemistry and hybridization studies to determine relationships between species.

Cuttings and even whole plants of a species are preferable to fruit because flowering individuals may be obtained more quickly with such adult material. Nevertheless, the convenience of starting plants from seed, especially the facility of sending them from tropical areas, makes this form of propagule very useful. Consequently, I have been experimenting with different methods of planting and germinating seeds and will report on these here.

The fruits of the genus *Anthurium* are berries, generally with two seeds (one seed per locule), but some species regularly have four seeds and rarely species may have up to ten (two-five per locule) seeds. At maturity, fruits emerge from between the tepals and are exposed more fully, being held in place by four slender, flat filaments which are derived from the epidermis on the inner surface of the tepals (a word which is used for a flower part which cannot be distinguished as either petal or a sepal).

The seeds are usually surrounded by a gelatinous, usually sticky coating called the mesocarp. In nature, this probably serves in dispersal because fruits of *Anthurium* appear ideally suited to dispersal by birds. Though admittedly speculative, the sticky seeds (at least those which do not pass through the birds' digestive tract) seem suited for adhering to trees where they may germinate. Some *Anthurium* fruits, such as *A. siebertii*, have a mesocarp that is mealy or pulpy and not at all sticky. This type of mesocarp is usually somewhat astringent, even though it is initially rather tasty and sweet. This sweet, then astringent, phenomenon is quite common among tropical fruits and has been observed, for example, in the genus *Passiflora*. I suspect that fruits of this type might be mammal dispersed because animals such as monkeys would be more likely to try to remove the mesocarp and

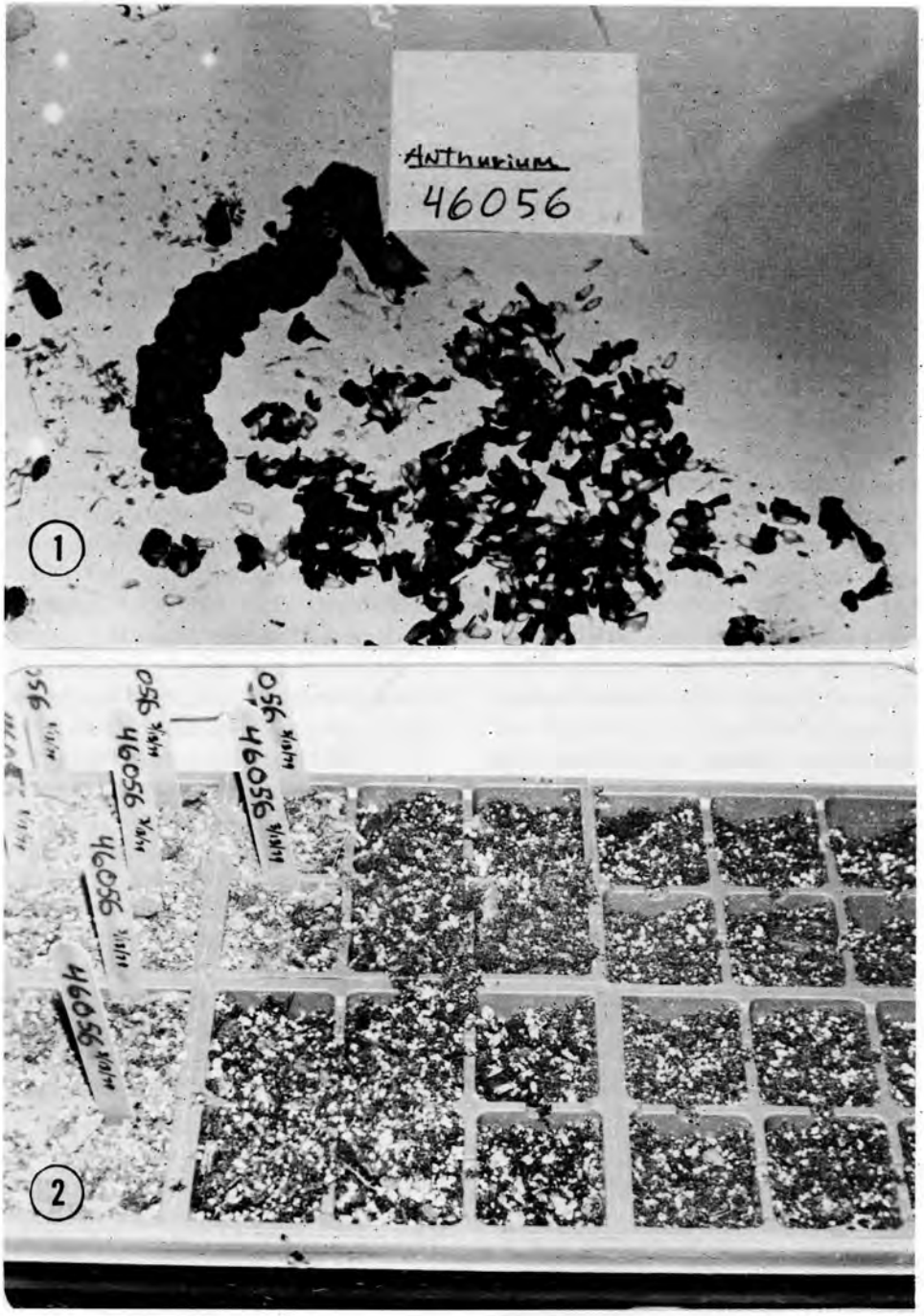
spit the seeds out. In such cases, wide dispersal of the seeds might be more readily insured than if numerous seeds were ingested and allowed to pass through the animals to be deposited in perhaps a single site. Again, this is pure speculation, but it makes sense.

Most species of *Anthurium* are either enveloped in a sticky gelatinous sack or they have a sticky appendage at the apex. Because of these sticky structures, handling seeds of most species of *Anthurium* directly is difficult since they are difficult to place, preferring to stick to whatever utensil you are using to plant them. If the fruits are fresh, seeds are squeezed out by laying them on a flat surface and squashing them at the apical end (Fig. 1). Since the bottom end of the fruit is usually open, the seeds readily emerge. Though most species have rather hard seeds, care must be taken in squashing seeds as a few species have soft seeds which might be crushed in the process of mashing the fruits. After squashing out the seeds, all the material including old pericarps, seeds, old tepals, etc. are scraped into an open dish and water is added. The softer, lighter material is then easily separable from the seeds. The seeds, which are heavier, tend to sink to the bottom unless still attached to the pericarp. I have found that by swirling the dish, pouring off the lighter residue and repeating this operation several times, one can quickly remove all residue and have only seeds in the dish. Since the seeds are in water, they are no longer sticky.

Seeds which arrive from long distances by mail are sometimes severely desiccated and, if so, they are soaked for several hours (or up to 24 hours) in a mild soap solution (I use a dish detergent). I have had success with germinating such dried-up seeds which may have spent up to two weeks in the mail. After soaking in a soap solution, the seeds then are usually swollen and look fresh though perhaps if they were desiccated too severely, they will not survive. Even fruits which arrive somewhat moldy may have good viable seeds because the mold generally attacks the sweet mesocarp without damaging the more resistant seed.

Perhaps the best way to ship seeds would be to place the entire fruits in moist sphagnum, but it should not be too wet or the fruits mold. Generally seeds are sent in a packet or a fold of newspaper with no special provisions to keep them moist.

Seeds may be planted in compartmentalized plastic trays 21.5 X 11 inches (28 X 54 cm) (Fig. 2). Each tray contains six smaller removable trays, each with six compartments, two inches by two and one-fourth inches in diameter and two and one-fourth inches deep. The compartmentalized trays have the advantage of being compact and easy to transport when compared with separate small pots. The compartments are filled two-thirds to three-fourths full of soil mixture. I use the Cornell epiphytic-African Violet mix (See Appendix 1) or Jiffy-mix (Jiffy Products of America). This is mostly peat and vermiculite with some perlite.


Anthurium
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Seeds are planted six to twelve per compartment depending on their size and number. The seeds are left suspended in water while planting and are spooned into the compartments in order to scatter them evenly. The soil mixture in each compartment should be flattened so that seeds do not tend to float to the lowest spot. The compartments are then best topped off with Jiffy-mix or milled sphagnum. Cornell epiphytic mix has too many large chunks of fir bark to use for topping off.

I have tried several different approaches of storing planted seeds and all have met with a degree of success. Some trays were placed in a misting chamber and left there until the first seeds germinated. I believe this may provide too much moisture. Others have been placed in a semi-closed compartment (i.e. shaded from the sun to some extent) and still others have been left on open shelves with moderate light in my office until they germinated. Still others have been placed directly on the shelves of a humidity-controlled greenhouse (45 -50% humidity) with ca. 76% shade cloth. The best method I have found is to place them in a partially shaded but light area where they are watered frequently.

Mr. Curt Pedersen, an Aroid Society member from Poway, California, claims excellent success with the method he uses. After potting the plants, Pedersen places the pot within a plastic bag, then seals the plastic bag and places the bagged pot in a small, moist polyethylene envelope box which has moisture at the bottom of the box. He does not reopen the plastic bag until the seeds germinate. I have had success with placing pots in a closed plastic bag and merely leaving them on an open shelf in my office, but I found that some bags leaked moisture and I had to add water to some of them.

It is my hope that this article might stimulate similar reports from other aroid growers concerning successful methods of germinating aroid seeds.

Appendix 1.

Cornell Epiphytic - African Violet Mix

- 4½ wheelbarrows = 1½ bales Peat moss
- 3 - 3 cu. ft. bags fir bark (1/4 x 1/4 or 1/8 x 1/4)
- 2 - 4 cu. ft. bags Perlite, +8 Medium Grade
- 7 lbs. Columbia Lime
- 4½ lbs. Superphostate (0-20-0)
- 2½ lbs. Fertilizer (12-12-12)
- ½ lb. Iron sulfate (Ferrous sulphate)
- 1 lb. Potassium nitrate (14-0-44)
- 2 oz. Fritted trace elements
- 1½ lbs. Aqua-Gro (wetting agent)

Sterilize the mix at 180° for 30 min. after being mixed thoroughly.