

# ***Serapias, Ophrys,* *Anacamptis* and *Orchis***

I grow the frost-tender mediterranean orchids indoor during winter, but casualties have been high. In December, before the first frost, I move the pots into a cool room, and then they are hit by basal rot. First the leaves start to flip over and within a week they are dead. Luckily, the new (quite small) tuber may often be saved by replanting it in fresh sand mix.

The first year, I planted the tubers in a 4:1 mix of sand and sifted peat. It was a disaster, all rotted, both leaves and tubers. The following year, I tried a mix of sand and clayey loam (4:1). The result was almost as bad, all the seedlings died during the first winter, and also many of the mature tubers. After this trial and error, I now use a 1:1 mix of washed 0-4 mm sand and 0-3 mm cat tray litter (baked moler clay pebbles similar to Seramis), and on top a layer of sharp granite grit. I only water the plants from below using rainwater with liquid fertilizer at 1/ strength. The mortality rate during winter has now come down to 5-10% which is acceptable.

The high indoor mortality is probably caused by high temperature combined with stagnant air, because outside, the pots can take all the rain that the Danish winter throws at them in November and December.



Basal rot. You know something is not OK when the leaves start to flip over.



The same plant five days later. The roots are gone, but the tuber is OK and has a high chance of surviving if transferred to fresh compost.



*Ophrys sicula*. Many Mediterranean orchids flower in the middle of the dark and depressing Danish winter.

During winter, I grow the Mediterranean orchids in an unheated room at 5-10 degrees Celsius under two 20-W ProPlant6 red/blue LEDs or a 50-W cold white LED flood-light with some additional light from a west-facing window. They get LED light for 10 hours a day, and a little longer when spring comes. The flood-light is placed 35 cm above the pots and spreads the light in a 120 degree angle, the PropPlant6 lights are more narrow and placed 70 cm above the pots.

It is, unfortunately, necessary to control aphids in late autumn. A few aphids will soon infest all the plants when they are moved indoor and will

eventually kill all the leaves and may also transmit virus infections. I do not like spraying my orchids with pesticides but for the indoor *Orchis*, *Anacamptis*, *Ophrys* and *Serapias*, I make an exception. In late December, right before they are moved indoor, I spray with an insecticide based on pyrethrum (pyrethrin I and II) that is allowed for use in organic farming.



Extra light during winter. Here is a 12W red/blue ProPlant3 LED. The 20W ProPlant6 is better.



The seedlings look almost black under red/blue LEDs because they absorb all the emitted light. Here it is *Ophrys tenthredinifera* seedlings.

In nature and in an alpine house, the soil would stay dry until the showers from a September storm, but I try to get as long outside growing season as possible. When the leaves die down in spring, I let the pots dry out completely, then I add 10 ml of water and wrap each pot tightly in a plastic bag. The pots are placed in the garden shed until the first shoots appear. The pots must be checked weekly as the new leaves may pop up already in late July. I then move the pots to an outside frame. With this procedure, the plants start growing three to four weeks earlier than in nature, which means they get all the sun they need to initiate new replacement tubers during late summer and autumn.



April. Ready for summer dormancy.



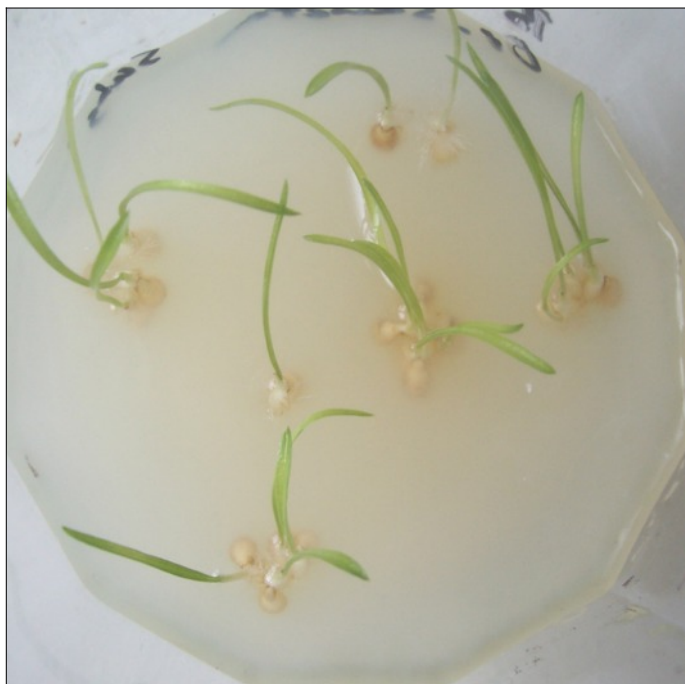
Early August. The first shoot has appeared, time to wake up.

### Propagation

I am no expert in propagation of these genera, and most of my methods are based on information in Svante Malmgrens article in Svensk Botanisk Tidsskrift (1) and on his homepage (2). I sow the seeds right after harvest and let them follow a natural temperature cycle with low temperatures (<5 degrees Celcius) during winter.

The few *Serapias* species that I have tried (*S. parviflora*, *S. neglecta* and an unidentified *Serapias*) were straight forward with standard methods. Germination from fresh seeds was almost 100%. *Anacamptis coriophora*, *A. fragrans*, *A. sancta*, *A. papilionacea*, *A. morio*, *A. palustris*,

and *A. laxiflora* have also been easy to germinate and deflask from mature seeds with standard treatment. This is probably the case for most *Anacamptis*. One exception is *A. pyramidalis* which has a very thick seed coat like many *Orchis*. For me, *A. pyramidalis* has never germinated from mature seeds,



*Anacamptis sancta* germinates a few days after sowing and quickly develops small leaves and tubers.



*Anacamptis fragrans* first year in soil. They grow a little long in the dim December light and should have had more light from the LEDs.

My results with *Ophrys* have been mixed. According to Svante Malmgren's homepage, most *Ophrys* should be easy, which has also been the case for me with *tenthredinifera*, *eleonora*, *helenae* and *apifera*, but germination percentages for *speculum* and *lutea* have varied a lot and *insectifera* has been all negative in spite of trying three different batches of seeds.

Species from the genus *Orchis* are more tricky. This may be caused by the often very thick seed coats that prevent the uptake of water, sugar and salts. I have had acceptable germination of *O. militaris*, both from old seeds that were sulphuric acid treated, and from completely fresh seed that were not acid treated. I have also germinated a few seeds from fresh seeds of *O. anatolica*, but *O. mascula* and *O. purpurea* have been all negative.

The difficult *Orchis* species and *Anacamptis pyramidalis* can probably be germinated from immature green capsules, but so far I have no experience with this.



*Ophrys eleonora*.



*Ophrys tenthredinifera* first year in soil.

Most northern species need a cold winter to initiate leaf growth. Many Mediterranean orchids are different as they will make leaves when they reach a certain size. At this time, the flasks should no longer be incubated in the dark, I place them in a bright room out of direct sunlight, preferably

under 20W red-blue LEDs or 50W LED floodlight with 10 hours light per day during winter. The seedlings can be transferred to soil when they have made tubers. Some species do not make tubers the first year, or make only tiny tubers, they need an additional "winter" in the fridge to initiate the tuber formation.



*Serapias parviflora* flowering 7 months after deflasking. The flowers are small (and some would say ugly) which is because this species is autonomously self-pollinating (3) and therefore does not need showy flowers to attract pollinators.



*Ophrys reinholdii*



*Ophrys tenthredinifera*.



*Ophrys reinholdii* close-up.



*Ophrys helenae* seedlings ready for replating.

### Taxonomy

How many species are there in the genera *Orchis*, *Anacamptis*, *Serapias* and *Ophrys*? This is an interesting question that cause much debate between taxonomist where lumpers ignore many of the ecological differences and splitters find a new species behind every rock. The numbers of recognized species in these genera therefore vary greatly depending on personal preferences and the choice of methodology.



*Ophrys phryganae* ready for deflasking.

The greatest differences are seen for *Ophrys* where some DNA analyses suggest that there are only 9 variable species (5) whereas Delforge recognize 252 species arranged in 32 groups (6). Most DNA approaches, however are based on sequencing of only a few genes which may introduce errors in the phylogenetic trees. In the coming years, it will be interesting to see the results of the increasingly available high-throughout sequencing methods.



*Anacamptis pyramidalis* in the garden, difficult in-vitro, but green pods should work.



*Anacamptis fragrans* ready for deflasking.

### *Ophrys* in the garden

*Ophrys insectifera* reaches as far north as Bodø in Norway (4) and also grows in Denmark. I have bought tubers on two occasions, but both were short-lived in the garden. I have tried to germinate *insectifera* seeds several times, but never had any germination, the seeds were probably too old.

It was a small sensation when *Ophrys apifera* was found in Denmark in 2004 in a marl pit at Søvind and later on a south-facing slope at Roskilde. In 2016, a few plants were also found at an industrial site where soil was dumped in Fåborg

and in 2019 on the island Tåsinge. This suggest, that with the warmer Danish winters, *apifera* may now survive outside in the garden. I got seeds of English origin that germinated well and they have now flowered in the garden since 2020. I grow them in a frame that is covered with a transparent PVC-plate during winter. Maybe other semi-hardy species such as *O. sphegodes*, *O. holoserica*, *O. tenthredinifera* and perhaps *O. lutea* may also survive in a sheltered frame?



*Ophrys apifera*.

## References

- (1) Malmgren, S. 1993. Asymbiotisk fröförökning i stor skala av *Anacamptis*, *Ophrys*, *Orchis* och andra orkideer med runda rodknölar. Svensk Botanisk Tidskrift v87p221-234.
- (2) Malmgren S, Nyström H. Orchidpropagation. [www.lidaforsgarden.com/Orchids/engelsk.htm](http://www.lidaforsgarden.com/Orchids/engelsk.htm)
- (3) Bellusci et al., 2009. Different levels of inbreeding depression between outcrossing and selfing *Serapias* species (Orchidaceae). *Biologia Plantarum* 53: 175-178).
- (4) [http://www.olsvik.info/Diverse/Reiser/Norway\\_Bodo\\_wildflowers.html](http://www.olsvik.info/Diverse/Reiser/Norway_Bodo_wildflowers.html)
- (5) Bateman RM, Sramkó G, Paun O. 2018. Integrating restriction site-associated DNA sequencing (RAD-seq) with morphological cladistic analysis clarifies evolutionary relationships among major species groups of bee orchids. *Annals of Botany*, 121:85–105, <https://doi.org/10.1093/aob/mcx129>
- (6) Delforge, P. 2005. *Orchids of Europe, North Africa and the Middle East*. Third edition. A&C Black Publishers Ltd.



*Ophrys apifera*.