

# ❖Odontoglossum Alliance❖

Newsletter

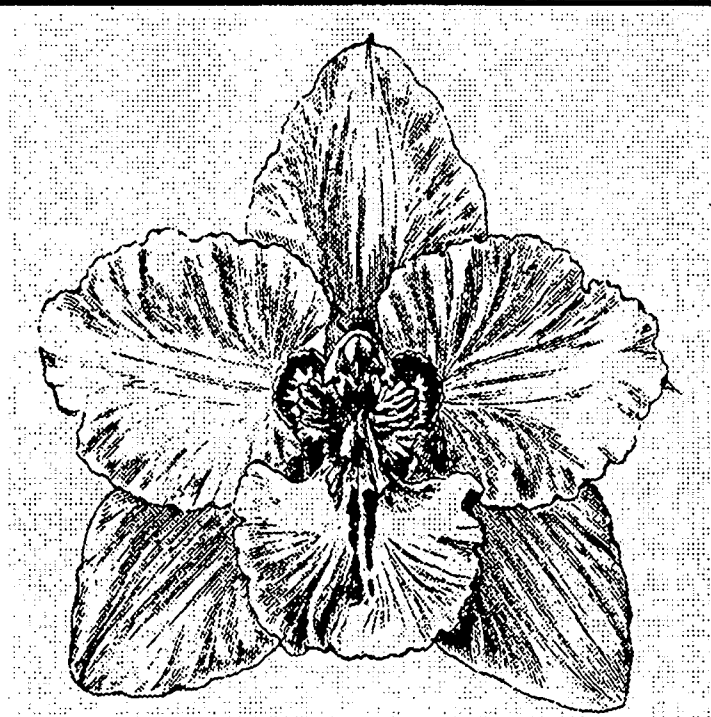
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## The Genus *Odontoglossum* - Taxonomically Endangered

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### Abstract

The taxonomic structure and future status of *Odontoglossum* Knuth (Orchidaceae; Oncidiinae) is discussed, based on ecological and morphological studies in combination with DNA sequence analysis (N.H. Williams, M. Chase and others, unpubl. data and pers. Comm). The genus, as presently accepted, can be divided into "typical" *Odontoglossum* species (dealt with here), which includes the type of the genus (*O. epidendroides* Knuth) and species (subgenera *Serratolaminata* Bockem., *Unguiculata* Bockem., genus *Dasyglossum* Krg. & Schildh.) that can be transferred to a revised *Cyrtorchilum* Knuth, which will be dealt with later.



During a trip to Ecuador in 1979 I encountered *Odontoglossum* plants in nature for the first time. It was a truly memorable moment and the beauty and grace the orchids displayed in their natural habitats fascinated me (1. Odm. cirrhosum). During a couple of busy week I was fortunate to locate several different species, some of which were easily recognized while others were pure enigmas, defying all attempts of identification. What puzzled me was that the genus consisted of two vegetatively very different groups of plants that obviously did not have much in common except for one minor floral feature. It also struck me as odd that this one feature, the angle between the column and the lip (2. Odm. epidendroides) had such an impact on the classification while so many other morphological characteristics indicated something else. As a matter of fact, *Odontoglossum* was not the only genus where this was apparent. The genus *Oncidium* Sw. consisted of groups of different looking plants as well, and the same was true for many other related genera. I also realized that literature was scarce, contradictory and confusing. Some plants were de-

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scribed under different names and some were not to be found at all. Challenged by this lack of information I decided to do something about it.

The strategy has been to study plants in nature and wild collected specimens primarily. Cultivated material has been treated with caution because these orchids are notoriously variable. I decided to follow my own lead from the beginning and form an independent opinion before comparing with other taxonomists, in an attempt to avoid earlier mistakes that are abundant in literature. I also tried to study natural populations first to get an idea of what "reality" looks like before finding appropriate names, rather than attaching established names on something from nature. There is a subtle but important difference between working with reality and somebody else's opinion of reality, which may not correlate with your own. In this paper I will use the term species (without quotes) for entities that I have found natural, as opposed to "species" that represent a traditional concept that may or may not be natural.

*Odontoglossum*, as presently accepted (Bockemühl, 1989) consists of two groups of vegetatively different looking plants. Even without flowers they can easily be separated from a distance of several meters, with a little experience. Logically, the type of the genus, *Odontoglossum epidendroides* Knuth, belongs to one group that we can call "true" *Odontoglossums*. This group (3. Odm. *kegeljanii*) has plants with rather slender roots, slightly compressed and distinctly edged, generally bifoliate, pseudobulbs with a glossy surface. The other group (subgenera *Serratolaminata* Bockem., and *Unguiculata* Bockem.; Genus *Dasyglossum* Kgr. & Schildh., 1994 (4. Odm. *tetraplasium*) consists of plants that look very similar to the type of the genus *Cyrtorchilum* Knuth (*C. undulatum* Knuth), with thicker roots, generally unifoliate pseudobulbs with a rounded cross-section and duller surface. However, the taxonomic status of *Cyrtorchilum* is complicated and will be dealt with separately elsewhere.

*Odontoglossum* consists of a number of natural taxa, which are variably distinguishable. These taxa are generally described as "species", although terms such as "Garden forms" (Reichenbach, 1882) "varieties" and "subspecies" (Bockemühl, 1989) are also used. Virtually all species descriptions are based on flower morphology. The "species" form groups, or complexes, with members having greater resemblances with each other than with members of other complexes. Rarely, individual "species", such as *Odontoglossum nevadense* Rehb.f. (Dalström, 1998), and *O. povedanum* Ortiz (Ortiz, 1997) are so distinct that they cannot be confused with anything else and it becomes questionable which complex they belong to, if any. The species complexes have extended geographic distributions throughout the Andes, generally with one ((infra-complex) "species" connected to the next by intermediate forms. These intermediate forms are sometimes referred to as "varieties", "subspecies" or "natural hybrids" (Bockemühl, 1989). When plants from far apart are compared they may appear distinct but when plants from neighboring areas are compared, they commonly merge into each other, making it difficult, sometimes impossible, to distinguish them. Members of the same species complex do not seem to occur together in nature, but rather represent geographically restricted subspecies not yet satisfactorily evolved to maintain a specific distinction. Members of different complexes often occur together in nature, generally without producing natural hybrids, although it does seem to happen occasionally (Veitch, 1887). This causes even more confusion because natural hybridization limits the use of flower morphology as a reliable taxonomic tool. The shape of the flower is also susceptible to other factors, such as size (age) of the plant, health, growing conditions etc., and certain floral features seem to be more sensitive than others are. The size, coloration and number of flowers, shape of callosity on the lip, branching pattern and length of the inflorescence are examples of notoriously unreliable features, particularly for plants in cultivation (pers. obs.). In order to use floral features at all in a taxonomic system it is necessary to divide them into important (constant) features versus unimportant (variable) features. This is very time consuming and involves an abundance of plants and experiences, which unfortunately are not always available. Each natural species, or species complex, is distinguished by a unique combination of features that constitute a particular pollination syndrome that generally prevents cross-pollination

with other species. Several complexes can then form larger groups, characterized by other unique combinations of features, and so on. At some level in this escalating structure we combine species and complexes into genera, although it is not clear exactly where, how, and why. This is where "truth" becomes hypothetical and a matter of opinions, in traditional taxonomy.

*Odontoglossum epidendroides* was originally collected in northern Peru. It belongs to a species complex distributed from Bolivia in the south to Venezuela in the north, throughout the Andes (Dalström 1995). This complex is typical of how many orchids in general, and Oncidiinae in particular, behave in a large area of distribution where allopatric taxa have been described as separate species (pers. obs.). In the *O. epidendroides* complex *Odontoglossum subuligerum* Rchb.f. is known from Bolivia and southern Peru. In northern Peru and southern Ecuador we find *O. epidendroides* in its typical form (5. Odm. *epidendroides*), also known as *Odontoglossum lacerum* Lindl. *Odontoglossum kegeljanii* Morren occurs in central Ecuador and may appear distinct when first viewed, but merges perfectly into *O. epidendroides* and a clear line between them is not possible to discern. The next "species" in this complex occurs to the north of *O. kegeljanii*. It has alternately been called *O. epidendroides* (Bockemühl, 1989) or *O. spectatissimum* Lindl. (Dodson, 1984). The Colombian form of this "species" is characterized by a somewhat flatter lip versus the Ecuadorian form, which has a lip with slightly revolute margins. However, when the flower parts are flattened they are very similar and no consistent difference can be detected. This pattern, with a number of geographically restricted forms merging into each other indicates that we are dealing with subspecies rather than distinct species. The same pattern is repeated in the other complexes of the genus. Occasionally we find a local taxon that appears distinct. This distinction can be real and consistent and validate a specific status, or be superficial, based on variable features, occasional freak flowers or simply from having seen too few plants.

The "true" *Odontoglossum*s can be divided into two basic groups. One with the lip of the flower attached to the column by a narrow elongate strap of tissue, sometimes called the claw (Bockemühl, 1989) which creates a flexible lamina (*O. crispum* (6. Odm. *crispum*), *O. cristatum*, *O. cruentum* (7. Odm. *cruentum*) and the *O. epidendroides* complexes). The other group has flowers with a rigid attachment between the lip and the column (*O. cirrhosum*, *O. harryanum* (8. Odm. *harrayanum* 'Tumbedmin'), *O. lidleyanum*, *O. nevadense*, *O. wallisii* and the *O. astranthum* complexes (9. Odm. *multistellare*)). This attachment is structured in various ways and it is merely a matter of opinion how to organize them. In addition to the species listed here there are others that at one time or another were described as *Odontoglossum* species but later transferred to other genera due to differing floral features. *Oncidium aurarium* Rchb.f. (Reichenbach, 1884), later described again as *Odontoglossum trilobum* Schltr. (Schechter, 1921; Königer, 1997) and subsequently transferred back to *Oncidium trilobum* by Garay & Stacy (1974) illustrates the confusion we are dealing with. It is a species (or complex) that has typical vegetative and ecological *Odontoglossum* features and a flower that resembles the *O. astranthum* complex (Dalström, 1984, 1993). The only difference is that the angle between the column and the lip is more open in *Oncidium aurarium*. Senghas and Bockemühl (1997) created the genus *Collare-Stuartense* for species with an anther hood in this complex, but this feature is commonly seen in many genera and not satisfactory for generic distinction.

The genus *Cochlioda* Lindl. (10. *Cochlioda noezliana*) differs from *Odontoglossum* by having brightly orange red to purple flowers, indicating bird pollination, and a stigma divided by the ristellum. Whether this justifies a separate generic status is questionable, considering that many other genera have similar variations in pollination adaptation. *Odontoglossum tigroides* C. Schweinf. (Schweinfurth, 1945) became the type for the genus *Solenidiopsis* Sengh. based on the presence of a divided stigma (Senghas, 1986). *Solenidiopsis* is distinguished from *Cochlioda* by a free lip versus a lip fused to the column. However, subsequent research shows that this is not a consistent feature and that these genera should be combined (Dalström 1999, in press). The similarity in morphology, ecology and the ease of intergeneric hybridization indicate a close relationship between *Cochlioda*

and *Odontoglossum*. The only difference appears to be a divided, versus a single stigmatic surface. However, species of *Oliveriana* Rchb.f. and *Systeloglossum* Schltr. share this feature as well. In *Odontoglossum cirrhosum* Lindl. a superficially similar feature has evolved where the viscidium of the pollinarium sometimes divides the stigma into two lobes. It demonstrates that a divided stigma alone is not a suitable feature for generic distinction but in fact has evolved independently in different Oncidiinae complexes. *Mesospinidium sanguineum* Rchb.f. (Reichenbach, 1864); (11. *Symphyglossum sanguineum*) was later transferred to *Cochlioda* by Bentham and Hooker (1883). Schlechter (1918) created *Symphyglossum* Schltr. for this orchid based on floral features that were different from *Cochlioda* and *Odontoglossum*. It has subsequently been accompanied by several species that show great resemblances to the *Cyrtorchilum* complex and have little in common with *S. sanguineum* (Chase & Zelenko, 1997, pers. obs.). Vegetatively and ecologically, *S. sanguineum* is a typical *Odontoglossum* with a modified flower morphology, probably adapted to bird pollination (Dodson, pers. obs. comm.). Other genera also fit in the discussion here, such as *Solenidium* Lindl. but more material needs to be analyzed.

Is there any other way to settle the relationships between these troublesome orchids, that can minimize personal opinions and provide a more indisputable "scientific" view? The answer to this centuries-old question may recently have arrived in terms of DNA sequence analysis, done by Norris Williams, Mark Whitten, Mark Chase and others (pers. obs. comm.). Early and very promising results indicate that similar floral features have developed independently among various groups of Oncidiinae, and probably indicate a similar pollination strategy rather than a close relationship. This discovery limits the importance of floral taxonomy in favor of vegetative features on a generic level. It also indicates that natural groups of plants, which we may call genera can consist of species with very different looking flowers, adapted to different pollination syndromes, which prevent unfavorable cross pollination. Another advantage of using DNA in taxonomy is that we can verify or reject older hypothesis and treatments based on traditional taxonomy. As an example, when we compare the conclusions outlined in this paper with DNA sequence analysis for compatibility (N. Williams et al., unpubl. data, pers. obs. comm.) it clearly shows that the various *Cyrtorchilum* complexes indeed belong together. It also shows that the "typical" *Odontoglossum* complex includes *Symphyglossum*, *Cochlioda* and *Solenidiopsis*; that *Oncidium aurium* (syn. *Odontoglossum trilobum*) belongs in the *O. astranthum* complex, and that "typical" *Odontoglossum* species are closer to certain groups of *Oncidium* than to *Cyrtorchilum*. It also provides a surprise: *Oncidium chrysomorphum* Lindl. (12. *Oncidium chrysomorphum*) looks like a very "typical" *Oncidium* with a cluster of small, yellow rather insignificant flowers. Traditionally, nobody seems to have had second thoughts about the generic status of this species, but DNA evidence indicates that it is closer to the "typical" *Odontoglossum* than to *Oncidium*. When analyzing this species it becomes evident that despite "typical" *Oncidium* looking flowers, the vegetative features are "typical" of *Odontoglossum*. Plants without flowers have also been sold repeatedly by collectors and growers as *Odontoglossum* species (Beckendorf, pers. comm. and pers. obs.). A definite "drawback" with the DNA results is that *Odontoglossum* is taxonomically endangered as well. A voice has been raised (Chase pers. comm.) claiming that this genus should be combined with *Oncidium*, which also needs an entire taxonomic overhaul. Fortunately (for the members of the Odontoglossum Alliance), other voices (Atwood, Beckner, Cribb, Dodson, Dressler, Whitten, Williams and others, (pers. comm.) speak differently. Apparently there are options available even when "generic fingerprints" are at hand. This topic is presently discussed at length among concerned participants associated with the Oncidiinae Research Program at Mire Selby Botanical gardens, Sarasota, Florida. It is of the greatest importance that we analyze and discuss this matter now, so that we can reach broad agreements before transfers and recombinations are made into a system that hopefully may last for a "long" time.

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- Editors Note: This material was the talk delivered by Stig Dalstrom at the 16th World Orchid Conference, Vancouver, BC, Canada. April 1999**

# ODONTOGLOSSUMS

by L. Duval

## CHAPTER FOUR COMPOST AND REPOTTING

The materials which serve to repot Odontoglossums are, up to the present, used by many amateurs, and in the commercial culture, the same as those which were used ten or more years ago. If, for some time, one has recognized other materials, it is because of the experiments of serious growers, experiments which appear - until more fully informed - to make sense to their authors; We will speak of these presently, in a special chapter; for the moment, let us concern ourselves with the well known composts.

Sphagnum with large heads, which grows in the streamlets of certain forests, or at the edge of puddles, and even in ponds, is the best, and is that which one must prefer; It is necessary to pluck it with care, to remove the smallest particles of foreign material... This sphagnum must be living, with no odour of mould, it must always be sheltered from contact with acid materials, or foul odour.

The best means of having sphagnum living and in good condition is to buy it the moment one begins the repotting, or, if one must obtain it earlier, to place the head above, in little piles, either in a terrarium, or under the benches in the cool greenhouse; It will thus continue to vegetate and will be in a very good state at the time when it is to be used.

One provides oneself with a billhook or cleaver, and one chops the sphagnum so as to form fragments one or two centimetres in length; - too fine, and it decomposes very easily - too coarse, and it is very difficult to use.

The other substance is *Polypodium vulgare*, a type of fern whose very long haired roots form a thick bushy network; This fern lives on the rocks, where one may lift large quantities with relative ease.

This polypodium is generally delivered in boxes; It is essential that it have a beautiful russet colour; and that it has no odour indicating excessive warmth or excessive dampness. To avoid this difficulty, it is necessary, on the arrival of the box, to dry it out, to shake it to remove the dust, and to place it in a warehouse with as much ventilation and shade as possible.

One may profit from the moments lost in preparation of the polypodium. This consists in pulling apart the root masses by hand and putting the long hairs to the side - removing the large roots with care. These have the inconvenience of latent eyes which can give rise to new growth, which develop in the pot to the detriment of the Odontoglossum.

Now, the polypodium, well plucked, looks like tobacco, very fine, very supple, and very clean, one then chops the material to a fine state with the same instrument which has already served the sphagnum.

Next, on a very clean table, one mixes the two substances, sphagnum and polypodium, in close to equal parts... We will speak of close to equal parts because we estimate that this is not a matter of mathematical precision, and one may use a little more sphagnum, or, a little more polypodium; The mix is carried out thus, if the substances are dry, which happens often enough; One must moisten the pile with a watering can with a flow divided into fine streams, and use clean water, and vigorously stir the compost; It must be absolutely homogeneous throughout all the parts.

Everything must also be ready to be used for the repotting.; but before passing on this operation, since we have already spoken of different composts which have been tried, we must cite: Coco fibres, of which the least inconvenience is that it is very dry, very hard, and sometimes dangerous for the Odontoglossum roots; one has also tried, without great success heath peat, the leaves of certain trees, Rhododendrons, moss, pure sphagnum, and finally, leaf mould, to which we will devote a special chapter.

It is, then, well established, that wherever one cultivates Odontoglossums, experiments have been made; the results are not known to us; and we do not wish to speak of things other than certain.. Until now, the compost which we have indicated, is used almost universally; But the compost is not the only game in Odontoglossum culture; It is also the manner of repotting. And it is this operation with which we are now going to concern ourselves, paying attention to being as explicit as possible.

It is, in reality, a sufficiently simple operation, which requires taste, attention, and much practice. First of all, one carries the plants to the area where one wishes to repot them; but only as you need it; because it is perfectly useless to encumber oneself. Each plant is examined; When one holds the plant in the hand, one is able, at a glance, to calculate to what size of pot the plant is destined. One must then bring out the clod of medium, tap it gently on the side of the pot, and hold the plant in the fingers; But, if it happens that there is a problem with bringing out the clod, if it is too dry, it is prudent to dampen it in water to help to keep the roots from sticking to the wall of the pot, without causing too much breakage.

Holding the plant in the left hand, one must let the pieces fall; Then, with a little pointed stick, but not in a way which would damage the roots, operate to disengage them from the old decomposing compost, and, if there are any, also any dead roots, or those which are simply rotted. It then happens that all the compost will fall, and one will find oneself in the presence of a plant with more or less good roots. If it is more, one will repot in the destined pot right away, in view of the clod; If it is less, one decreases the size of the pot..

The operation of repotting, as we have said, is very simple; After having placed some clean shards in the bottom of the pot, one holds the plant suspended above, in such a fashion as to calculate the place, and the height which it will occupy, and one then slips delicately, with the fingers, the compost, taking care to make it pass between the roots as much as possible, without letting them reunite into a floor; If, however, the plant loses its clod; if, on the contrary, the clod removes itself from what was supposed to give support to keep a solid form, the arrangement of the compost, below, around, above, becomes very easy. The little stick with the blunted end also renders service when it serves to push the compost lightly throughout with the same pressure and the same suppleness in such fashion as to form a flexible ensemble which, under pressure of the finger, gives the impression of the kind of cushion called a *pouf*. This is a comparison which may appear baroque, but it seems useful to us since we lack the terms to satisfactorily describe the manner of setting up the compost.

One important observation consists of the obligation to always place the plant in the pot in the manner which permits the bulb which carries the new growth sufficient space for at least two vegetations; For certain masses, which present multiple faces, if they are important, one increases somewhat the size of the container, and one will be obliged to place the plant in

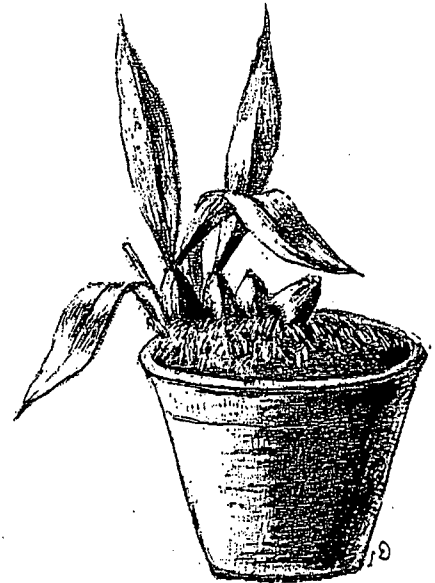


Figure 12  
Potting poorly done;  
the plant is too close to the edge of the pot

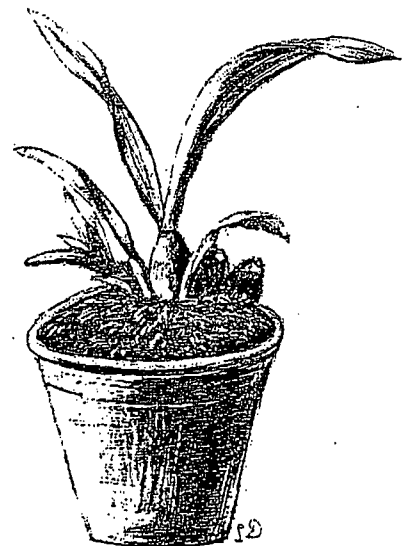


Figure 13  
Re-potting properly done, the plant can grow  
two years

the centre of the pot.(fig. 12, 13) When the plants are repotted, although the compost has been moistened beforehand, one must water at the bottom with a watering can with a very fine spray.

The same care must be given to Odontoglossums newly repotted as to those which have been imported, with this difference, that the watering and sprinkling can be more abundant; However, it has been well observed that plants which have just been repotted and those which have been completely dried out must have very strict surveillance and it will not be good to water them too freely; It is necessary to frequently observe what is happening to the roots and the growths, what is the general state of the plant; A little attention is very necessary in this case. It is not necessary, during the first few days at least, to give them too much ventilation, and above all, not dry air. It is also necessary to observe them for greenfly; All plants which have been subject to revision, and a bit of fatigue may be attacked by these little pests.

It also happens that, after the repotting, a certain number of leaves turn yellow; that is inevitable; it is not something to worry about; It is better that the reaction should be to cut off the leaves which have become completely yellow..

One accident occurs often enough after repotting, especially after repotting out of season; that is the almost immediate rotting of growths when they are very tender. This indicates the fatigue suffered by the roots, and a little excess of moisture.. It is an indications to water less; It suffices to cut off this growth right at its foot and detach it putting carbon powder at the point of removal. and placing the plant under observation where it will not have as much watering. (Fig. 14) We have spoken of the season for repotting; In essence, the best time for repotting Odontoglossums is generally recognized to be before september to the end of october.; According to the climate of the centre and north of France, of Belgium, and of Germany, Odontoglossums, in effect, have a sort of rest imposed on them during the hot months of the year. One may, therefore, repot them one time toward the end of the hot season, which recalls what has been said before, that, if september is very hot, it is necessary to wait; also, if the beginning of october persists in staying hot and dry, it would be well to take extra precautions in regard to watering, sprinkling, and ventilation.

Odontoglossums may, however, be repotted in all seasons, and, if one has a plant which truly needs nourishment, and one feels that repotting is necessary for it, one may perfectly well proceed, even during the very hot period. Everything is said for the inexperienced grower. It is quite evident that the experienced grower will be able to triumph over difficulties sufficiently large that an inexperienced one who possessed several Odontoglossums could not deliver the operations which, by their complicated nature, will often be the cause of the loss of his plants.



Figure 14  
The decomposed growth having been cut at the side of the new growth

## CHAPTER FIVE ODONTOGLOSSUM GREENHOUSES

The question which asks itself about Orchids in general and Odontoglossums in particular, will always be the same. Is it necessary to have special greenhouses, erected by builders who are acquainted with the basis of the needs of the Orchids? - That is to say, with all the desirable perfections, the most complicated inventions, the thousand and one improvements which have the gift of catching the interest of a great many horticulturalists, but which may be a passing fad, since they build the greenhouses to lodge their own plants?

Since we have undertaken to treat, in this book, all the details concerning the culture of Odontoglossums, it seems permissible to us to speak frankly, and to tell our readers, supposing they pose the clear ques-



tion: "Is it necessary to have greenhouses specially for *Odontoglossums*?" Yes, at the least, it is necessary to arrange your cool greenhouse in a manner which is able to give your plants a shelter, which will not compromise their health and progress.

The best system consists for the cool house, to build traps at the lower part of the walls, and, up above, in the construction, to put in transoms; It is necessary to put screens or cloth at a reasonable distance from the glass, about 20 to 30 centimetres; also to render the soil of the path very permeable to the water of the sprinkling; to have plenty of rain water in reserve, and, if possible, in the greenhouse itself; to arrange the benches in such a manner that the plants can be watered without allowing the water to remain in a stagnant condition.

Keep the greenhouse very clean and do not mix the *Odontoglossums* with plants which are completely different, and susceptible to transferring insects to them.

Do not seek to use a greenhouse which faces full south, nor one which faces full north; Choose instead a greenhouse with two slopes, in which the gables are orientated to north and south. In iron? in wood? It doesn't matter very much provided that the heating is controlled; that one can maintain the winter night temperature at 6 degrees, and that day temperature at 10 to 14 degrees. These are nearly all the conditions necessary for a greenhouse which has never served as a cool house for Orchids, to become serviceable to either an amateur or a horticulturalist.

But, if the question is to indicate the best greenhouses for *Odontoglossums*, the proportions which they should have, the manner in which they should be constructed, the elements of success which they will be able to bring in the form of new improvements, etc., etc., we do not lack for examples. It is sufficient to cite the growers who have had success in the culture of these beautiful plants, and to assume that amateurs and professionals alike hasten to instruct at the source, even before seeing how the greenhouses of these clever practitioners have been understood. We do not think, and we do not reckon that it is always the greenhouses which are the principle reason for success, but, often enough the intelligent care, the sustained attention, and the perfect conditions in which the plants are held, contribute, for the most part, to the success of certain growers, and not the greenhouses.

That is so true, is that we can cite the names, taken from everywhere, of very good growers who possess superb *Odontoglossums*, and whose greenhouse differs greatly in its mode of construction; Some are in wood; others in iron, none in wood and iron; their dimensions and arrangements also vary greatly.

We have no problem in making known to our readers the names of MM. Vinck of Bruges, whose accompanying greenhouses are in iron and glass; Mr. Wuysteke, at Loochrysty, whose greenhouses in wood are on a steep slope, and of a very simple construction; Mr. Peeters of Brussels, whose greenhouses, quite perfection, are equipped with screens which are completely special; Mr. Jules Hye, the great gloved amateur, who owns the most beautiful collection of *Odontoglossums* on the continent, whose greenhouse has been, for a long time, almost primitive.; Mr. Madoux, whose greenhouse has obsolete proportions; Mr. Linden, whose greenhouses of Mortebeck are remarkably simple, and none-the-less perfect; Mr. Dallemagne, at Rambouillet, whose greenhouses have been perfected in perfect condition; Mr. Doin, whose *Odontoglossum* greenhouse is perhaps the latest type and the most excellent; Mr. Lesueur of Saint-Cloud. whose greenhouses are quite simple, very simple even; and finally our own greenhouses where the *Odontoglossums* are cultivated, since 1885, which houses were originally constructed for azaleas. (fig. 15) All of that does not mean that it is not necessary to follow the rules, and that the amateur as horticulturalist does not need to be instructed concerning the proportions and dispositions of an *Odontoglossum* greenhouse; We shall, therefore give the indications which are no more than a resume of the rigorous qualities which the structures must have; One may always bring to this the modifications which one wishes; at bottom, it will remain always the same, since it concerns itself with nothing more than the accumulation of puddles which are disagreeable to visitors,

Let us say also that the greenhouse will be furnished with excellent screens, or cloth, which one may un

roll, as one wishes, to one side, or to the other, and very quickly; these must be at least 25 or 30 centimetres from the glass. We next say that we always give preference to greenhouses where the glass rests, at its lower part, on a piece of wood, or metal placed on a wall, and not on a glass foot., for this reason that, although it is more elegant, more stylish, it is infinitely worse in summer because of the difficulty of testing for the moisture of the plants which receive, constantly and in spite of all precautions, the injury of heat, whereas walls can remain fresh with sprinkling.

Let us also say that rain water will be received alike by the glass of the greenhouse, and the overflow into the reservoirs under the benches, and remain always very clean. In addition to everything we have already said, we add that the greenhouse so constructed, which will keep itself perfectly tidy. and permits heating of a sort which is able to maintain itself against the outside cold, and in which, if one fears insufficient moisture, one can bear the cost of putting aside, at each side of the path and below the benches, two hoses pierced by fine holes which are able, with a bit of pressure, to project, in the form of fine rain, the ordinary water under the benches and into the path. This makes a perfect *Odontoglossum* greenhouse.

If, instead of having imported plants, one wishes to carry out culture on the grand scale, and prepare *Odontoglossums* for sale in pots or for cut flowers, one increases the dimensions of the greenhouse which we have described and gives to it the proportions of a greenhouse in which one will have a bench down the centre, two benches on each side measuring 1 metre to 1.10, and a bench with a base of 1 metre. 70 to 1 metre.80, with two pathways having a width of 70 to 80 centimetres; We arrive thus at dimensions varying from 5 metres.50 to 6 metres in size, which is reasonable for a beautiful greenhouse for culture. The conditions of ventilation, shading, heating, etc., remain exactly the same as those which are indicated for the small greenhouse, and, when, in the same way, one again changes the dimensions, they will only be rendered more urgently.

After the explanations which we have just given, it seems useful to us to insist on a series of questions which we seem to have resolved, to know: To lodge the *Odontoglossums* in a greenhouse with perfect ventilation, where the ground must always be thoroughly saturated with moisture, where the shading is able to change rapidly and reliably, and where the orientation is always, as much as possible, from south to north, but never in full south, because there the heat and dryness become very difficult to deal with, and one may lose, in summer, all the benefit of the qualities of construction.

## CHAPTER SIX

### Of Watering, of Sprinkling, and of Ventilation

One of the most difficult things to do in horticulture is the watering of plants; However, with orchids of the *Odontoglossum* type, this becomes an occupation which requires, above all, sustained attention, and, naturally, some common sense. It is necessary, therefore, above all, to familiarize oneself with the state of the plants, and to know if they possess more or less abundant roots; if the compost is in a perfect state; if the pots are not clogged; if, in essence, the water can distribute itself in a rapid passage, and not be held up on the top of the pots; In that case, it happens that one will be using degraded material and one is unable to supply a clearly well rounded surface.

Watering must always be carried out in the evening about four or five o'clock, up to seven o'clock in



Figure 15  
Group of beautiful *Odontoglossum Crispum*  
(Alexander)

the summer, and towards two or three o'clock in winter.

The water must be very clean, and must always be rain water; At the very least, it must be excellent and must contain no limestone.

One should take the precaution of having a watering apparatus with a long tube which carries, at its end, a very fine spray.

The water is poured in a fine rain which does not disturb the compost; Each plant must be watered plentifully if it is in summer, and the weather is very hot, in such a manner that the compost is equally watered throughout. It is not always sufficient to have just moistened a plant to believe that it is completely soaked; It is a good idea, in order to

inform oneself, to take the pot in your hands; If one sees that, in effect, the water distribution has reached only one portion of the compost, which happens quite often, it is necessary to soak the pot in one of the containers in the greenhouse, because the watering of the mound will not otherwise be accomplished; The very dry portion will not be reached by the water which is poured from the watering can; This has the tendency to follow the pathway which is already moist.

It is therefore understood that the day when one waters the Odontoglossums, that must be in a very complete and attentive fashion, because it is better to water the Orchids thoroughly one time and then let them thus distribute the water than to always have to water them by hand.

During each watering period, at least during exceptionally warm days, it will be possible to flow through at a frequency of one or two days. In the bad season a frequency of three or four days may suffice, for example.

This is why all the growers of orchids are of the opinion that it is better to water the pot from the bottom, and let the plant distribute the water itself completely, especially during the winter, because in this season, there is no evaporation; One must be restrictive in the distribution of water and not moisten the plants more than just enough to keep the compost fresh, but not wet.

From what has been said, and its suitable application, this results in plants which preserve their roots in a strong state, which is essential.

Concerning sprinkling, one may follow the same mistakes as in the watering; When it is very hot, that is to say from the end of april to september, it will always be necessary to sprinkle the Odontoglossums well, but one must not do this after the shade has come, and the leaves are not heated by the glass. Therefore, it is from about three or four o'clock at the earliest and towards six or seven o'clock in the evening or later when one is able to sprinkle.

When one sprinkles, it is necessary to use a syringe with very fine holes, and to use it lavishly on the leaves, the flowers or the buds, without making any distinction. It goes without saying that one doesn't sprinkle on the flowers in winter, since it is hardly necessary to sprinkle if the weather is misty or simply damp. It is only if a lovely ray of sunshine appears or shows itself during the day, that one may, around two or three o'clock, give a light sprinkling, to relieve the dryness of the warmth provided by the heating, which, as well as being very moderate, is never the same as that coming from outside.

It is well understood, one must never sprinkle the plants before watering them; The water thus projected will be unsuitable for lightly watering the compost and allows uncertainty concerning the hygrometric state to the person in charge of the watering.

The sprinklings can be very abundant in summer during the heat; One may perfectly well sprinkle up to two or three or more times during the long days, in the morning, around 8 o'clock on the one hand, to about five o'clock, on the other, and, if necessary, even towards seven or eight o'clock. But, let it be understood, it is necessary that the water be in a very fine stream and be rapidly placed on the leaves, the pots, and the benches of the greenhouse.

We are not at all opposed to sprinkling in the morning, but we always advise, after the final sprinkling of

the evening, in the summer, allowing access of the night air to the plants, to permit them to breathe. If, following a prolonged dry period with hot nights, in the necessity of giving a light dew, it is necessary to do so at a very early hour, before

the sun has its strength. It would be wise then to shade completely, since the water stays in droplets on the plants, forming little lenses which are quite capable, with the sun, of burning the leaves of the odontoglossums. We have seen that these plants grow on the trees, in a cool region well ventilated, and even windy. It is therefore important above all to seek to imitate the best possible conditions in which the plants grow, and to not give them reasonable moisture which they will not reclaim from watering and sprinkling; This is why we recommend saturating the Odontoglossum greenhouse in a very particular fashion; To this end it is sufficient to prepare the subsoil in such a manner that it is quite permeable to water, but it retains, however, a portion of the flow.

The best arrangement seems to us to be a dry concrete base, made with rocks, that is to say, clinkers, pieces of brick and dry stones as we have already said.

When it becomes warm, from april to june and very hot from june to september, it is necessary to be guided by the extremes of temperature; for the gardeners to direct variable quantities of water under the tables, in the pathways and under the terracing; For this one uses ordinary water. During periods of great heat, in order to give an exact idea of the amount of water to pour, one may evaluate from eight to twelve full watering cans poured out twice per day, in a greenhouse fifteen metres long and three or four metres wide; This quantity of water will be largely gone if the temperature is not only very hot, but also dry; Additional water thus will be required on the ground, it goes without saying, on the walls of the greenhouse, the benches which support the plants; in front of the greenhouse on the outside, and at the base of the walls, if these are remote and can be largely watered.

Some amateurs very much dread all these precautions and find them complicated What, however, could be simpler than this? It is, in reality, a question of giving plants which grow in fresh and well ventilated areas the same conditions, as far as is possible, as those in which they are found.

It is not with the heat, often dry, which we have in the north and central parts of France, that it is necessary to hope to conserve Odontoglossums in a good state, if one does not take the measures required for the hot spells.

It is understood that when the heat is past, one decreases the waterings of the ground, and it is from time to time that one will water in winter in order to always maintain a good freshness, above all if the greenhouse is constructed on dry terrain, or even in a town, and on an embankment.

Ventilation of Odontoglossum greenhouses is an essential matter, as we have indicated when speaking of greenhouse construction. The practice of ventilation consists in knowing how to distribute the air more or less generously according to whether the weather is very hot and very dry, or whether the weather is hot and humid, or cold, or simply misty. Each time that one finds oneself in the hot season, it is necessary to recall that the Odontoglossums do not like dry heat. Therefore, during the hours of heat, the operations which have been described above having been carried out, it is only necessary to provide the ventilation quite late, that is to say, towards four or five pm, firstly, just enough, then, more generously.

If one is fairly certain that the night will be calm and the temperature warm, one may leave the fanlights wide open, and close them again close to morning by the time the sun arrives in force and one is obliged to provide shading. (See Culture in Winter).

But, in principle, at least when the weather is not abominable with wind, snow, or heavy freezing, after the month of september, october, until the months of april and may, one must leave the ventilation hatches open from morning to evening and let them stay slightly open continually, if the weather is very mild, even in winter, that is to say, december and january.

There is not a single inconvenience experienced when one enters an Odontoglossum greenhouse; the air caresses the stockings of your legs while you admire the beautiful flowers. Similarly, from the bottom of the greenhouse, you will feel a slight lively breeze on the head; It is in these conditions that the plants like to live during the winter months; at least during weather which is sufficiently harsh that one is obliged to

provide ventilation for its renewal, because the atmosphere will always, and in spite of all, be too overheated. One operates therefore, with precaution, during the best hours of the day, that is to say, from ten o'clock in the morning until four o'clock in the evening; When it freezes outside to crack the stones, one must allow some air to pass, from the moment that it does not directly hit the plants.

It is well understood, in the springtime, at least in strong wind the doors of the greenhouse will be widely open, but one must take care to replace them with screen doors and such structures, because it can happen that the weather changes suddenly while the grower is absent. If he has placed the flowering plants at the entrance to the greenhouse, they may be shaken by the wind, and salted by the dust; Besides, as soon as the weather becomes windy, it is always prudent to close off such air from the orchid greenhouses; There is not the slightest necessity to introduce wind of such strong force, accompanied by all the inconveniences which may thereby result, of which the very least is damaging the apparatus which provides the ventilation.

## The Odontoglossum Compendium

The Odontoglossum Compendium has been re-printed and is available for sale. The best way to describe the book is to re-print the foreword.

### *Foreword*

The Odontoglossum Alliance is an organization devoted to the exchange of information of and about the orchid plants in the *Odontoglossum* Alliance. A meeting of the Alliance is held annually and announced in the newsletter. The newsletter is published quarterly containing information on plants in the *Odontoglossum* Alliance, notices of upcoming meetings and reports on events of interest to the Alliance organization members. Since the initial organization of the Alliance in 1988 there have been 30 newsletters from 1988 through February 1999. In celebration of the 16th World Orchid Conference in Vancouver, BC, Canada it was thought appropriate and fitting that a Compendium of material on the *Odontoglossum* Alliance be assembled from the newsletters. The Compendium contains material assumed to have some archival substance. Deliberately left out of the Compendium is the color material, probably some of the most valuable information. The inclusion of color would have escalated the Compendium costs by a factor of ten. It is hoped that a future professional and quality publication devoted to the *Odontoglossum* Alliance will contain such material. Perhaps this Compendium will fill a void in the literature on aspects of the *Odontoglossum* Alliance as well as an incentive for someone to write and publish such a book. This material may be a reference and reminder to a future author.

Assembling this Compendium would not have been possible without the use of today's computer technology. Never the less assembling the material, even though it was stored on a hard drive, has taken many hours and days to compile. The editing task has been tedious and trying. Help was received from a number of sources who wish to be anonymous, and I am indebted to them for their help and support. While some consistency and uniformity has been attempted, the articles, as written by the various authors, have been taken as their text.

The Odontoglossum Alliance welcomes new members and it is hoped that through this publication more orchid enthusiasts and growers will add these beautiful flowers to their growing collection. In Section 12, page 12-5 is a membership application.

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With this newsletter is an order form. The cost of the book per copy, including shipping is \$25.00.

Funds must be in US dollars collectible through US banks. A postal money order or check collectable through a US bank may be used. Please use the order form for clarity of your order.

John Miller  
Shipping Clerk

## Odontoglossum Alliance Meeting

The meeting of the Odontoglossum Alliance this year will be an informal meeting held at the time of the San Francisco Orchid Society's Pacific Orchid Exposition, 25-27 February 2000.

### Show Particulars

Preview Night - 24 February 2000 - 6-10 PM  
Admission \$25.00 (\$20.00 in advance)

Friday	25 February	10 AM - 6 PM
Saturday	26 February	9 AM - 6 PM
Sunday	27 February	10 AM - 5 PM

General Admission \$10.00      Seniors (65+) \$8.00

Festival Pavilion, Fort Mason Center, San Francisco

For Show & Sale tickets or Information call 415-665-2468

We will have a dinner on Saturday night, 26 February at a restaurant to be selected. On Saturday and maybe on Sunday a number of local greenhouses will be opened for touring. We expect these to include the greenhouses of Steve Beckendorf, Robert Hamilton, Tom Perlite, Steve Gettel, and maybe others. Information on the dinner and greenhouse locations will be available in three ways:

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1. E-Mail to Steve Beckendorf your dinner reservation, and he will return e-mail you confirmation, the dinner location and time, and the tour information. Steve's E-Mail Address is: [beckendorf@uclink4.berkeley.edu](mailto:beckendorf@uclink4.berkeley.edu).

Phone: **510-524-1854**

Fax: 510-642-7000

2. At the show booth of the San Francisco Orchid Society there will be material for the dinner, the tour and a place to sign up for the dinner.

3. John Miller will be staying at the Cow Hollow Motor Inn ; Phone **415-921-5800**. You may call and tell John Miller or leave a message for him with your dinner reservation.

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## Letter from President Steve Beckendorf

I want to say just a few words as the new president of the Odontoglossum Alliance. First, and most important, remember that John Miller really deserves all the credit for making this an active and ongoing organization. Like most of my predecessors, I am really a figurehead.

I just got back from a trip to Venezuela to look for odonts. While there I noticed that the excellent Field Guide to Venezuelan Orchids had many mis-identifications of Odontoglossums. This seems to typify the condition at the beginning of the millennium for the genus we all love. There is a lot of confusion about what an Odontoglossum is and even whether the genus will continue to exist. As Stig Dalström warned us at the Vancouver WOC, Odontoglossum is taxonomically endangered.

Let me give you a short review from my perspective. When my wife Juliann first got me interested in odontoglossums in the early 1980s, it was pretty clear to us what they were. They were mostly hybrids, mostly based on crispum, and at least to us, Odontiodas were pretty much Odontoglossums, just ones with more red coloring. We knew there were quite a few species other than crispum, but there wasn't any recent description of the genus. We soon learned that many species had recently been removed from Odontoglossum, things like the Rossioglossums, Osmoglossums, Lemboglossums and a few others, but we were not sure what remained. Since then the trend of reducing the number of species in Odontoglossum has continued with only an occasional addition to the genus.

A major milestone was the publication of Leonore Bockemühl's monograph defining the genus Odontoglossum and reducing it to 58 species. Although many have disagreed with some of Bockemühl's decisions about which species to include, we had for the first time an accessible description of the entire group, and in addition, descriptions of the distribution and habitat of each species.

Recent DNA studies by Norris Williams, Mark Whitten and Mark Chase are likely to reduce the number of species in Odontoglossum further, if they don't lead to its elimination altogether. It is now clear that many of the large, high altitude species such as ramosissimum, lindleyanum and pardinum are more closely related to Cyrtochilums than they are to Odontoglossums like crispum, harryanum and cirrhosum. These plants will soon

be officially separated from Odontoglossum by Dalström, William's, Chase and colleagues. This will remove about 15 species from Odontoglossum.

Finally, there is the possibility that the remaining odontoglossums will be moved into Oncidium. This change is by no means certain, in part because the DNA sequences being studied differ so little between the traditional odontoglossums and a large group of Oncidiums. Thus, relationships between the two are not yet certain. Further data will probably produce a more secure relationship tree that either will solidify Odontoglossum with just a few further changes or will sink Odontoglossum into Oncidium. Only time and more data will tell.

Lest this appear to be a negative review, let me point out that these revisions will define Odontoglossum in a more natural way and should prove beneficial to hybridizers as well as those interested in the species for their own sake. Looking at the DNA trees helps explain why some crosses don't work or why they produce sterile or near sterile progeny. For example, Lemboglossums (now Rhynchosteles) have been crossed many times with Odontoglossums or Odontiodas and some of the hybrids are wonderful. But to my knowledge, further breeding, though desirable, has been impossible. The DNA trees show that Rhynchosteles are quite distantly related to Odontoglossums, perhaps explaining the hybrid sterility. The trees also suggest more appropriate hybrids. For example, Rhynchosteles are quite close to the Tolumnias or equitant "Oncidiums".

Similarly, the trees explain why Odontiodas have been so successful (Cochliodas are very close to the core Odontoglossums) and suggest new crossing partners for Odontoglossums. For example, Oncidium chrysomorphum, which has densely packed inflorescences with hundreds of small flowers, is even closer to the core Odontoglossums.

In summary, while the confusing changes in Odontoglossum taxonomy appear in some ways to threaten the genus, the better approximation to true relationships represented in the molecular trees opens up new possibilities.

I look forward to seeing many of you at the San Francisco Show.

Steve Beckendorf

## New Zealand Odontoglossum Alliance Newsletter

No New Zealand Odontoglossum Newsletters have been received. For our subscribers to this newsletter, when I receive them I will include the copies in the next mailing.





Figure 1. Odm. cirrhosum



Figure 2. Odm. epidendroides



Figure 3. Odm. kegeljanii



Figure 4. Odm. tetraplasium



Figure 10. Odm. multistellare



Figure 11. Symphglossum sanguineum



Figure 5. Odm. epidendroides



Figure 6. Odm. crispum



Figure 7. Odm. cruentum



Figure 8. Odm. harryanum  
'Tumbedmin'



Figure 9. Cochlioda noeziiana



Figure 12. Onc. chrysomorphum