

H. C. D. de Wit

## Mainly on *Cryptocoryne*

As a result of efforts to grow *Cryptocoryne* spp. at the National Agricultural College at Wageningen, Holland, with the purpose of obtaining flowering specimens, Mr Legro and I made some observations which will be published more fully later in the year in the dutch periodical „Het Aquarium”, but may be briefly referred to here at present.

In the second half of the winter 1955/56, the following species flowered: *Cr. beckettii* Thw. ex Trim., *Cr. lutea* Alston, *Cr. nevillii* Trim., and *Cr. willisii* Engl. ex Baum.

It was now possible to compare *Cr. lutea* closely to *Cr. beckettii*. This was needed as Alston, on publishing his *Cr. lutea* as a new species, suggested that it might prove to be identical with *Cr. beckettii*. It was, moreover, quite interesting to have *Cr. lutea* in flower, as it was, we believe, the first time that a specimen flowered in Europe. *Cr. beckettii*, a Ceylonese species, flowers easily, if cultivated for that purpose, in the right way.

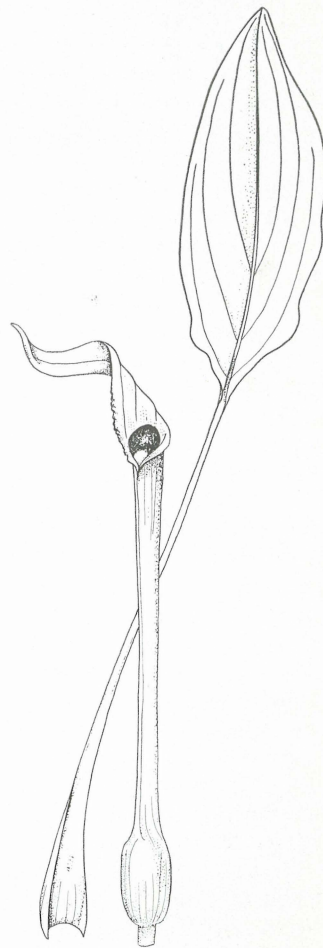
*Cr. beckettii* — if fully developed submerged — shows leaves with widely undulating recurved margins; the blade always is, more or less, olive green above, and the lower surface is usually purplish or brownish. If cultivated on moist soil, emerge, the leaves are shorter and wider, darker green, though they often retain some scattered purple striations along the transverse connecting veinlets on the upper surface, as is usually also seen on submerged leaves.

The inflorescence — of course, the well-known tubular spatha — shows a greenish-yellow to ochre-yellow limb. The throat is dark chocolate-purple at first, after two or three days it becomes reddish brown. The lower left margin of the limb is bluntly dentate.

*Cr. lutea*, also a species described for Ceylon and possibly endemic (I am not quite satisfied on this point) is not conspecific with *Cr. beckettii*.

The leaves of *Cr. lutea* are darker green and the olive hue, a characteristic of *Cr. beckettii*, is wanting. The leaf-shape is more or less identical

though in *Cr. lutea* the leaves seem, generally, somewhat wider. They are never marked by purple striations indicating transverse veinlets. The margin of fully developed submerged leaves is



*Cryptocoryne beckettii* Thw. ex. Trim.

not rolled back and, near the base, delicately undulating or erose, sometimes finely crisped, though this latter character seems to be more developed



in emerse leaves. The petioles are distinctly stouter at the base.

In flower, the differences are still more striking. The limb of the spathe of *Cr. lutea* is greenish-yellow — as is often seen in *Cr. beckettii* too — nearly flat, and the margin is along its full length recurved, rolled back, which results in an entirely differently formed limb; the limb of *Cr. beckettii* is erect and twisted. In addition the dark throat present in *Cr. beckettii* is entirely absent here. The limb of *Cr. lutea* gradually narrows towards the base and there passes smoothly in the tube whereas in *Cr. beckettii* the base of the limb is distinctly wider near the base, one might say cordate.

I am able to add a further point of interest drawn from a paper by Dr van Ramshorst (Mitt. Bl. C.E.V. 2 (4), 1956, p. 52-59). Dr van Ramshorst obtained specimens of *Cr. lutea* from the importer, J. Liet, Airfish, Amsterdam. Van Ramshorst was not acquainted with its name and discussed them as a "*Cryptocoryne*-Art" (*Crypt.* species). As he had his plants from the same lot as I had, and as his pictures and date agree with mine, I do not hesitate to add van Ramshorst's observations to our store or knowledge concerning *Cr. lutea*.

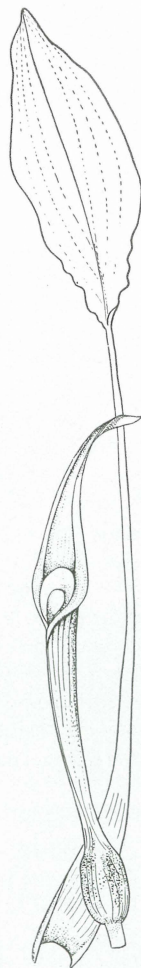
Van Ramshorst was so fortunate as to get some specimens in fruit, freshly imported from Ceylon. He followed the development of the seedling. It appears that the six-celled fruit, having grown to a size of 1½ cm to 1 cm, on a 6 to 7 cm long stalk, falls apart in 6 separate cells, leaving a central, 6-ribbed, acute column on top of the fruit stalk. Each cell contained 8—10 yellowish seeds, which were c. 2 mm long and 0.7 mm wide. When sown immediately the seeds germinated without delay. The development of the seedling, however, was different from the peculiar morphology known or *Cr. ciliata* Fisch. ex Schott.

We know that in *Cr. ciliata* the embryo continues growing within the seed after fertilisation, without a resting pause previous to germination while the fruit is still attached to the plant. The seedling finally becomes detached and by a spongy tissue, produced in advance by the integument, becomes buoyant. The seedling is also provided on top with a bunch of subulate "primary" leaves. These peculiar phenomena were observed and described long ago and drew much attention. This mode of germination was called "vivipary".

Van Ramshorst in establishing that there is no visible trace of spongy floating tissue and fascicled primary leaves on the seedling of *Cr. lutea* found, it would seem, as the only character reminiscent of vivipary, the immediate germination of the ripe seeds in *Cr. lutea*.

I cannot resist the suggestion that, perhaps,

there is a connection between the remarkable seedling morphology and seedling biology of *Cr. ciliata* and its habitat. *Cr. ciliata* is the only *Cr. species* occurring in the mangrove, the vegetation peculiar to the mud flats of tropical, brackish, shallow and tidal coastal waters. *Cr. ciliata* is commonly, if locally, found in association with *Nypa fruticans* and *Barringtonia* (Java, New Guinea). The biology of the seedling of this spe-



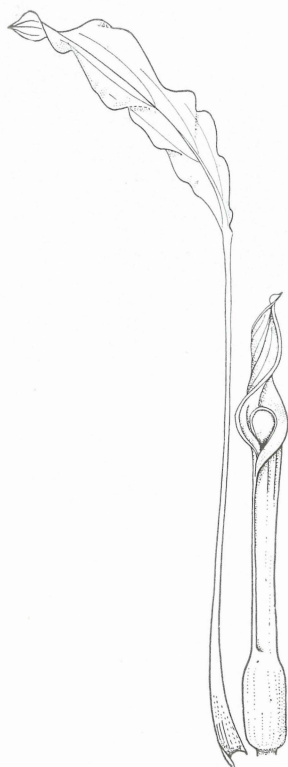
*Cryptocoryne lutea* Alston

cies is strikingly convergent with the seedling biology of numerous mangrove constituents, also characterized as "viviparous". It might well be, I believe, that the seedling morphology of *Cr. ciliata* is not at all common in *Cryptocoryne* as a genus but exceptional, perhaps confined to *Cr. ciliata*, the only mangrove species. Possibly, van Ramshorst has hit upon the way of germinating common in *Cryptocoryne* though, as far as I know, never observed before. If this suggestion proves correct, then *Cryptocoryne* germinates in a similar way as other marsh inhabiting *Araceae* and the



vivipary of *Cr. ciliata* is characteristic for that species, and not for the genus, though *Cr. ciliata* is the type species of the genus and it was commonly assumed that the phenomena seen in *Cr. ciliata* were to be found in the other *Cr.* spp. as well.

The flowering of *Cr. willisii* gave an opportunity for further study as regards the specific status of *Cr. undulata* Wendt, a new species described recently (Aqua. Pfl. Wort Bild 267/269, 1955, 51, 11). There can be no doubt that, if *Cr. willisii* and *Cr. undulata* are really distinct species, they are very closely related indeed. I wish for the moment, to postpone a decision whether they are conspecific or not and mention



*Cryptocoryne Willisii* Engl. ex Baum.

the problem only because I want to draw attention to the desirability of having more flowering specimens of either species available for comparison. If any reader in possession of a flowering plant of what he thinks to be either *Cr. willisii* or *Cr. undulata* would forward it to me — fresh or dried — preferably with a description of flower and leaves as they were at the time of collecting, I should be very grateful.

In the paper, referred to above, which Mr Legro and I hope to publish in time, Mr Legro has in particular discussed the ways and means to in-

duce flowering in *Cryptocoryne* species. Generally speaking, Mr Legro cultivates his plants in glass containers, on moist soils. Plants growing submerged at first, are gradually "acclimatized" by placing them first in shallow water and by letting the water evaporate. Submerged leaves die and the new leaves stay, being adapted to the air. The glass containers are in the hot-house and are again covered by a sheet of glass. There is heating from below (soil temp. 27°), and the air temp. is c. 20°. Direct sunlight is avoided.

It became very evident from Mr Legro's findings that some spp. were adapted to short-day environment (12 hours light) and if flowering was to follow, this rule had to be observed. Other spp. proved to be indifferent as regards day's length. Another point was that some species proved to be difficult to grow outside the water.

Clearly, growing *Cryptocoryne's* with a view to flowering requires much more skill and precautions than cultivating them submerged as aquarium plants. For aquarists this is a thing to be thankful for. On the other hand, a knowledge about the species and the ways to distinguish them can only be acquired by growing them in different environments and by an examination of inflorescences. Here is a valuable contribution to the systematics of aquatics and systematic botany to be made by aquarists. It demands the sacrifice of flowering specimens. These should be sent to a botanist interested in the subject, fresh or well dried or in spirits, accompanied by careful descriptive data. It is, incidentally, the only possible method to solve many of the puzzles still besetting the tangled systematics in the genus. And, finally, I wish to use this opportunity to raise another point.

I notice a growing tendency among the widening circle of plantloving aquarists to publish the observations they make. This is most desirable. But allow me to stress that if an amateur plant-lover believes to have discovered a "new" species among his possessions he should refrain from describing and publishing this new species, at least as long as he has obtained no professional advice in this matter. First of all, it is undesirable to publish new species in periodicals not primarily devoted to systematic botany. To publish new species in periodicals meant to be consulted primarily by hobbyists, aquarists, is strongly to be dissuaded. The hobby periodicals ought to contain scientifically sound contributions, certainly, but not species described and named for the first time. New botanical names should appear in the technical botanical periodicals or books devoted to systematic scientific botany and the publication of new species in other periodicals leads to oversight and error.