x Ruttyruspolia, a Natural Intergeneric Hybrid in Acanthaceae

by

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A plant recently collected near Wyllie's Poort, Transvaal (*Meeuse* 9793) exhibited characteristics of both the genera *Ruttya* Harv. and *Ruspolia* Lindau and could not be matched by any herbarium specimens from tropical or South Africa. This, together with the fact that this plant, of which only one single specimen was seen, did not produce seeds, led to the assumption that it could be a hybrid between the only representatives of these genera occurring in the Soutpansberg area, viz., *Ruttya ovata* Harv. and *Ruspolia hypocrateriformis* (Vahl) Milne-Redh. var. *australis* Milne-Redh. As natural intergeneric hybrids are rare and had not before been reported in Acanthaceae, additional evidence was required to support the assumption.

Material and Methods

Flowers of the supposed *Ruspolia* parent were emasculated when the buds just began to show colour and pollinated two days later with *Ruttya* pollen. Root-tips for a study of the chromosome numbers were fixed in Randalph's (1935) " CRAF " fluid, dehydrated using n-butyl alcohol and embedded in a mixture of paraffin, beeswax and rubber. Sections were cut 12 μ thick and stained in Stockwell's (1934) solution. For a study of meiosis, anthers were fixed in 3:1 alcohol and propionic acid, squashed and stained in a propionic acid-carmine solution as described by Swaminathan, Magoon and Mehra (1954).

Results and Discussion

From the numerous pollinated flowers a few viable seeds were obtained. Two plants were raised which started flowering six months after planting. These plants are morphologically very similar to the clone *Meeuse* 9793 and differ from it only slightly in the colour of the corolla. This provides a strong indication of the hybrid origin of the plant discovered in Wyllie's Poort.

In the artificial hybrid the corolla has a peculiar mauvish-pink colour which is nearest " Rocellin Purple " (Ridgway, 1912, XXXVIII, 71" V. RR. *b*); in the wild plant the colour of the corolla is of a deeper hue. In the *Ruspolia* parent the corolla is a clear scarlet red (Bruce 1954) and in *Ruttya ovata* it is white with minute mauve-purple dots in the throat on the side of the lower lip.

The generic characters of the two parent genera involved are practically identical as regards genitalia, pollen morphology, fruit and seeds. The only essential difference between them is in the shape of the corolla which is more or less distinctly bilabiate with a short tube gradually widening into the throat in *Ruttya*, and sub-equally 5-lobed with a long narrow cylindric tube in *Ruspolia*. Cytologically they differ in basic chromosome number, but not in chromosome size. Both genera are characterised by extremely small chromosomes in multiples of $n = 9$ ($2n = 36$) in *Ruttya*, and $n = 7$ ($2n = 42$) in *Ruspolia*. During pollen development the chromosomes associate into 18 pairs in *Ruttya ovata* and into 21 pairs in *Ruspolia hypocrateriformis* var. *australis*.

The hybrids under discussion have most of the morphological characters of the *Ruspolia* parent, but a markedly shorter and somewhat wider corolla-tube. The inflorescence is elongated and pseudo-spicate and the corolla-limb subregularly 5-fid as in *Ruspolia*. The colour of the corolla in the hybrids is found in neither parent, but is characteristic of both the natural and the artificial hybrids. The corolla-lobes are marked on the inside (upper surface in open flowers) near the base with fine dots of a deep, somewhat purplish red to deep amaranth red, a character which is also derived from the *Ruspolia* parent.

The natural and artificially produced hybrids are completely sterile. Back-crossing with either of the parents proved unsuccessful. The natural hybrid has not been studied cytologically. The artificial one has 39 small somatic chromosomes. During pollen development pairing is almost completely absent between the two parental sets of chromosomes. In the pollen mother cells 39 univalents are usually present and these chromosomes are distributed at random over the two poles with an appreciable number of laggards which are excluded from the two daughter nuclei. Only very occasionally a maximum number of two bivalents was observed.

In our opinion this hybrid has excellent potentialities as an ornamental. Upon introduction into horticulture a convenient name is desirable, but as the hybrid is a sterile F_1 it is not deemed advisable to give it a scientific name at the specific level. Apart from the formal description of the hybrid genus, only a horticultural name is proposed. It is thought that the artificial hybrid and the natural one do not differ sufficiently to warrant different horticultural names for each of them.

× *Ruttyruspolia* A. Meeuse et de Wet, gen. hybr. nov. (*Ruttya* Harv. × *Ruspolia* Lindau), a *Ruttya* tubo corollae subcylindrato longiore, limbo subregulare 5-fido differt, a *Ruspolia* tubo corollae breviore recedit.

Ruttyruspolia ' Phyllis van Heerden ' = *Ruttya ovata* Harv. ♂ × *Ruspolia hypocrateriformis* (Vahl) Milne-Redh. var. *australis* Milne-Redh. ♀.

In order to distinguish this hybrid from other theoretically possible *Ruttya* × *Ruspolia* hybrids, this name is intended only to include all F_1-hybrids (hybrid clones and subclones, respectively) which are derived from the parent species indicated above and resemble *Ruspolia hypocrateriformis* var. *australis* in morphological characters, except in the much shorter corolla tube. The colour of the corolla is a shade of " Rocellin Purple " (Ridgway XXXVIII, 71". V. RR. *b*), or approximately so. The corolla lobes are in addition marked near the base inside with fine dots of a deep red to amaranth red colour.

The horticultural name proposed commemorates the fact that it was Mrs. P. van Heerden of Louis Trichardt, Northern Transvaal, who first discovered the natural hybrid and subsequently introduced it into horticulture.

It is feasible that other intergeneric hybrids in Acanthaceae can be artificially produced, because although the basic chromosome number varies rather widely in this family, the same number (or a near number) is sometimes found in different genera (Grant, 1956, Raghavan, 1957, Takizawa, 1957, Mangenot and Mangenot, 1957). In this way horticultural novelties could be developed. Most Acanthaceae can easily be propagated by means of cuttings and the sterility in intergeneric crosses need, therefore, not be a hindrance. It may even be an asset because the flowers do not become fertilized and, as we have observed in × *Ruttyruspolia*, remain fresh for several days instead of wilting soon after having been pollinated (as is the rule in this family). Judging by our example, experimental cross-breeding work in this family for horticultural purposes seems promising and is to be strongly recommended.

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