DUABANGA TAYLORII JAYAWEERA (SONNERATIACEAE)
A PUTATIVE HYBRID

R. GEESINK

SUMMARY

The differentiating characters of Duabanga grandiflora (Roxb. ex DC.) Walp., D. moluccana Bl., and D. taylorii Jayaweera are given. Most characters of D. taylorii appear to be intermediate between those of the other two species; a few characters represent combinations of those of the two other species; one character is not shared by the other species.
From this evidence it is supposed that D. taylorii is a hybrid.
This suggestion is sustained by the history of the specimens on which D. taylorii is based.
An attempt to count chromosomes of D. taylorii and D. grandiflora failed, probably due to the unsuitability of the fixative for this purpose.

INTRODUCTION

In 1951 Backer & van Steenis revised the Sonneratiaceae, distinguishing in the genus Duabanga two species, viz. D. grandiflora (Roxb. ex DC.) Walp. and D. moluccana Bl.
In 1967, Jayaweera published a revision of the genus Duabanga, in which he distinguished, besides these two species, a new one, D. taylorii Jayaweera. This species was based on specimens growing in the Royal Botanic Garden at Peradeniya, Ceylon. These specimens were grown from seed, introduced in c. 1853, probably from the Botanic Gardens at Bogor, Java.
This drew the attention of Dr. van Steenis who put forward that the new species might be a hybrid between the two species already known, as according to the Catalogue of Hortus Bogoriensis by Teysmann & Binnendijk (1866: 241) both were cultivated in the Bogor Botanic Gardens at that time. Therefore he suggested to me to study this case in detail.

REVALUATION OF THE CHARACTERS

In the table the differentiating characters of the three species of Duabanga are listed. Most of the characters of D. taylorii (in indumentum, pedicel, calyx, corolla, stamens, and ovary) appear to be intermediate between those of the other two species.
A few characters, viz. in the anthers and in the ripe fruit, are not 'simply' intermediate and need further attention. In D. grandiflora the anthers are somewhat longer than in D. moluccana and in D. taylorii. The thecae in D. moluccana are recurved over one end of the anther as in D. taylorii (fig. 1b' & 1c'); in D. grandiflora the thecae are somewhat bent at both ends (fig. 1a'). In D. moluccana the thecae are longer than in D. taylorii which in turn has longer thecae than D. grandiflora. Thus, the anthers of D. taylorii have the shape of those in D. moluccana, but the size of its thecae is intermediate between those of the other two species.
In D. taylorii the fruit is ovoid as in D. grandiflora, whereas D. moluccana has ellipsoid fruits, but that of D. taylorii is distinctly smaller than those of the other two species (fig. 1b, 1a, and 1c resp.).
CHROMOSOMES

An attempt was made to count the chromosomes in *D. taylorii* and in *D. grandiflora*. The method applied was that of Muller & Hou-Liu (1966). Unfortunately, the material at my disposal was fixed in FAPA which is hardly suitable for the counting of chromosomes. The anthers were stained in Fe-aceto-carmin as well as in aceto-orcein (the best fixative for these staining methods is Carnoy’s solution: alcohol abs. and acetic acid in 3: 1 vol. parts).

Flower buds of *D. taylorii* with a length of 12—13 mm contained stamens with pollen-mothercells in metaphase II. The chromosomes were distinguishable but indistinct and very hard to count; in each cell the number was somewhere between *n* = 10 and *n* = 15.

Of *D. grandiflora* 13 mm long flower buds contained stamens in the same stage. Nuclear spindles were distinct, chromosomes were indistinguishable.

J. L. Thomas (1962) counted the chromosomes of *D. grandiflora* and observed *n* = 24.

From *D. moluccana* no fixed material was at my disposal; evidence on the number of chromosomes could not be found in literature.

DISCUSSION

Most of the characters of *D. taylorii* are intermediate between those of *D. grandiflora* and *D. moluccana*. A few characters, viz. in the anthers and in the fruit, look like combinations of characters of *D. grandiflora* and *D. moluccana*; the size of the fruit of *D. taylorii* is different. *D. taylorii* is very variable in the number of the flower parts, as demonstrated by Jayaweera (1967). Furthermore, there is the peculiar fact that *D. taylorii* has never been found in the wild state but is only known from four trees in the Peradeniya Botanic Garden, probably grown from an import from Bogor. However, it has never been grown in the Botanic Gardens at Bogor as far as known from the voucher specimens. As was usual in the Bogor Botanic Gardens species of the same family and genus were located close together in the compartments and parcels. In the 1930 Catalogue by Dakkus (Bull. Jard. Bot. Btzg III. Suppl. 1: 119) *D. moluccana* was in parcel VII. D sub no 44 and *D. grandiflora* in VII. D sub no 43, 39, and 64 (as *D. sonneratioides*), so that hybridisation could occur easily.
All these arguments seem to fit in with the opinion that *D. taylorii* is a primary hybrid.

Further investigation, preferably to be executed at Bogor, should include (i) hybridisation of *D. grandiflora* and *D. moluccana* to check the fertility and to raise seedlings, (ii) in case hybrid seedlings are obtained a comparison of the karyology of the parents, of the seedlings, and of *D. taylorii*.

As a corollary, a conclusive proof of the hypothesis would have some taxonomic consequence. According to Jayaweera (in litt.) the seed of *D. taylorii* is for c. 95% fertile; it is not known to me whether this was produced after selfing or cross-pollination. Whatever may be the case, this would show that *D. moluccana* and *D. grandiflora* are not such 'good species' as formerly assumed, but might be better regarded as disjunct, replacing subspecies. Good species may certainly be capable to hybridize, but then should show reduced fertility, both male and female; this is not realized in *D. taylorii* which has perfectly good pollen and seed.
ACKNOWLEDGEMENTS

This study has been made under supervision of Dr. C. G. G. J. van Steenis, to whom I feel grateful for his criticism and the correction of the manuscript.

To Dr. Ding Hou I feel obliged for his help with and information on the counting of the chromosomes.

To Dr. Don M. A. Jayaweera we feel indebted for sending a large number of flower buds in several stages.

BIBLIOGRAPHY


