HYBRIDS IN THE GENERA ARACHNIS AND RENANTHERA

by

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I have already published in the Malayan Orchid Review, 1936, pp. 104—109, a brief account of two artificial hybrids in the genera *Arachnis* and *Renanthera,* and since then have had flowers of a third for examination. The account already written is of a semipopular nature, intended chiefly for orchid-growers, and a more detailed description with some remarks on the botanical aspects of the question appear to be worth publishing. The three hybrids concerned are *Arachnis flos-aeris* × *A. Hookeriana, Arachnis Hookeriana* × *Renanthera coccinea* and *Arachnis Hookeriana* × *Renanthera Storiei.* All three were raised at the Botanic Gardens, Singapore. The first is of interest because the hybrid is practically identical with *Arachnis Maingayi,* which has been described as a natural species. The intergeneric hybrids are the first of their kind to be described, and the way in which the different generic characters interact in the formation of the lip of their hybrids is of great interest. First hybrids between orchid species are usually closely intermediate between the two parents, but where the characters contrast strongly, as in the midlobe of the lip of the genera concerned, a strictly intermediate condition is not possible.

1. Arachnis flos-aeris × A. Hookeriana.

The first named species was the female parent, though by oversight the names were transposed in the publication above quoted. *A. flos-aeris* is the well known scorpion or spider orchid, native in the Malay Peninsula, Sumatra, Borneo, Java and Bali. *A. Hookeriana* is apparently absent from Java, but otherwise has a similar distribution. Both species are commonly cultivated, and *A. Hookeriana* has become very popular in recent years in Singapore, as it flowers almost continuously. The hybrid seedlings prooved indistinguishable vegetatively from *A. Maingayi,*

a species described originally from a specimen collected in Malacca by Dr A. C. MAINGAY. When they flowered, the resemblance to *A. Maingayi* was complete.

A. Maingayi has been collected only on few occasions by botanical collectors, the recorded localities being chiefly on the S.W. coast of the Malay Peninsula (Johore, Negri Sembilan and Selangor). RIDLEY records its occurrence on the islands to the south of Singapore. CARR collected a specimen in the Kadamaian valley at Koung, B. N. Borneo, on the route to Mt Kinabalu, at 400 m alt. Many plants have been brought into cultivation in Malaya, and their origin is in most cases unrecorded. Among these plants are three distinct varieties, which I described in the Malayan Orchid Review, 1935. The variety which I regard as typical is the commonest; it agrees with wild specimens from Sepang, Selangor, kindly supplied by Mr F. C. FOGH. A smaller variety, which I called var. *maculata,* seems to be fairly common in cultivation, but the third, var. *tricolor,* is still rare, and is said (by the dealer who sold it) to have come from Sumatra. In Dr J. J. SMITH's list of the orchids of Sumatra this species is not mentioned, but its occurrence is likely. Apart from the size of var. *maculata,* these three forms differ only in colour characters, the shape of their floral parts, including the characteristic features of the lip, being identical. Vegetatively they are, so far as I can discover, indistinguishable.

The flowers of the artificial hybrid differ from those of typical *A. Maingayi* in the following characters. The artificial hybrid has slightly smaller flowers, but the sepals and petals are slightly wider, especially the broadened distal parts (measured flattened out); the column is somewhat more massive; the side lobes of the lip are a little larger, with the forward margins more recurved; the keel on the mid-lobe, though approximately of the same shape as in *A. Maingayi,* is more massive, and the apex blunt instead of pointed. The general background colour of the artificial hybrid is distinctly yellowish, whereas that of *A. Maingayi* is pale cream. The purple markings of the artificial hybrid are deeper in colour, more numerous, and smaller. The markings on the side lobes of the lip are more distinct and more numerous; the midlobe is suffused with deep purple throughout, not striped. The scent of the artificial hybrid is the same as the curious musky odour of *A. flos-aeris,* but fainter. That of *A. Maingayi* is different, a rather sickly unpleasant smell, somewhat reminiscent of Ivy (*Hedera helix*).

As regards the inflorescences, the artificial hybrid has produced some unbranched as in *A. Hookeriana,* some branched as normally occurs

in *A. flos-aeris,* the flowers identical on both. Whether the inflorescence is branched or not is probably dependent on the vigour of the plant bearing it, as is the case in *A. flos-aeris* itself. *A. Maingayi* usually has branched inflorescences.

The differences therefore between the artificial hybrid and *A. Maingayi* are very slight. *A. Maingayi* may well be the results of various natural crosses, possible back-crosses, and self-pollination of hybrids. More collections of wild plants with detailed notes of their characters are desirable to find the full range of variation of *A. Maingayi.*

In the genus *Arachnis,* the general shape of the flower is very constant, the chief differences occurring in the mid-lobe of the lip. It is interesting therefore to see how the mid-lobe of *A. Maingayi* and the artificial hybrid compares with the two parent species. *A. flos-aeris* has a broad convex mid-lobe with a small keel not very much raised; there is a large acute forward-pointing callus near the apex, which is curved downwards. In *A. Hookeriana* the midlobe is much narrower, with a higher keel which descends obliquely forwards to the apex without any callus; the margins are reflexed towards the apex and are almost joined together beneath, the whole apex forming a solid fleshy mass.

In the hybrid the width of the midlobe is about intermediate. The keel is high, as in *A. Hookeriana* but more nearly horizontal. The callus of *A. flos-aeris* is present, less acute and more continuous with the keel, having almost the appearance of being the apex of the lobe. The depressed apex beyond the callus has the appearance of the two margins being folded over and meeting together as in *A. Hookeriana,* but to a lesser extent. The condition is thus very nearly intermediate between the two parent species.

2. Arachnis-Renanthera hybrids.

These were both made with *Arachnis Hookeriana* as female parent. The two species of *Renanthera* which were used as male parents are closely similar in the structure of the flower, differing chiefly in the lip, the midlobe of which is larger and somewhat recurved in *R. coccinea,* smaller and straight in *R. Storei,* the side lobes larger and tending to embrace the column in *R. Storiei,* smaller and standing away from the column in *R. coccinea.*

The chief differences between the two genera lie also in the lip. In *Arachnis* the lip is somewhat moveable, it is hardly spurred, and the mid-lobe is fleshy with some sort of calli. In *Renanthera* the lip is not hinged, it has a well-developed spur, and the midlobe is small not

fleshy. In both species of *Renanthera* here concerned there are two calli, one at the base of each side lobe, close to the insertion of the midlobe, but in the *Arachnis* there are no calli in this position.

The flowers of the two hybrids agree very closely together. The chief differences, as might be expected, are in the lip, and one of the same kind as distinguish their male parents. The *R. coccinea* hybrid has more spreading side lobes, and a larger midlobe, tending to be recurved; the spur is also a little more acute and more downwardly directed. The differences therefore are trivial and are not discussed further here. The point of interest is the way in which the generic characters of the two parents are shared by the hybrids.

The hybrid lip is slightly moveable, being thereby intermediate. It is spurred almost exactly as in the *Renanthera* parents, but is larger, the additional size being derived from the *Arachnis*. The calli at the base of the side lobes of *Renanthera* are represented in the hybrids by two keels springing from the base of the side lobes and continuous with the basal part of the midlobe; they are fleshy with rounded crests, a deep narrow gap between them. The midlobe is not fleshy, but is considerably larger than in the *Renanthera* parents (where it is very small), and the margins towards the apex are reflexed as in the *Arachnis* parent. The lip characters, except in size, are thus much nearer *Renanthera* than *Arachnis*.

In other floral characters the hybrids are about intermediate between the parent species. The same is true of the form of the inflorescence, which is simple and erect in *Arachnis Hookeriana*, horizontal and much branched in the *Renantheras*, obliquely ascending and slightly branched in the hybrids.

The distinction of the genera of the group of orchids to which *Arachnis* and *Renanthera* belong is a difficult one, upon which there is still no complete agreement. The fact that species of *Vanda* (including *Euanthe*, *Vandopsis*, etc.), *Phalaenopsis*, *Arachnis* and *Renanthera* are in most cases freely inter-fertile indicates their close relationship. Records of the distinctive features of the hybrids produced by such inter-generic crosses may help to throw light on the mutual relationships of the genera and on their status. The fact that the lip characters of *Renanthera* are in this case almost entirely dominant in a first generation cross is of interest. Now that so many bi-generic hybrids in this group are being raised in the eastern tropics we may expect a good deal of further information of this nature, which systematics may do well to study.

Explanation of Plate.

1. Flower of *Arachnis flos-aeris* × *A. Hookeriana*.
2. Labella of *Arachnis Maingayi* (left) and *A. flos-aeris* × *Hookeriana* (right); one side lobe removed to show midlobe in lateral view. Nearly twice natural size.
3. Central portion of flowers of *Arachnis-Renanthera* hybrids: *A. Hookeriana* × *R. Storiei* (left) and × *R. coccinea* (right). Nearly twice natural size.
4. Lateral view of labella of *Arachnis-Renanthera* hybrids, with lower sepals removed. *A. Hookeriana* × *R. coccinea* (left) and × *R. Storiei* (right). Nearly twice natural size.

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(Explanation p. 56)