

REVIEW

J. HUTCHINSON, *Key to the families of Flowering Plants of the World*. — Clarendon Press, Oxford, 1967, pp. 117. Sh. 30/- bound; in paper cover £ 1.—.

In both editions of the author's 'Families of Flowering Plants' was a key for identification of families of the world. This was constantly improved by the author and has now been edited separately as a companion to his new work 'The Genera of Flowering Plants'.

Essentially the structure of the key is not changed. It is made more handable by having instead of 15 groups in former editions, 32 groups in this work. The number of families, already risen to 411 in the 2nd edition of the 'Families', is still increased by some new ones in this key, and new families appear steadily in the 'Genera', so that we will soon end up with half a thousand families of which more than 60 % will be monotypic or almost so.

Although in the technique of the key no basic changes are made, there is a slight improvement, as the first key words of the forks are now in bold type. Personally I still would have preferred numbers; especially for students this would have been handy for indicating the way they have gone.

Though in our Dutch taxonomical institutes Thonner's 'Anleitung' was mostly used, we have for private purpose often checked identities with Hutchinson's key, which is of simpler construction. Though Thonner's key was originally based on African plants, it was later extended to cover the whole world. It proved to be always very good, especially because so many 'exceptions' were taken care of, that is, where species within a genus, or genera within a family had occasionally characters deviating from the 'normal' pattern of the set of characters in that taxon; for example: two species of *Ilex* have opposite leaves; or: within the genus *Sonneratia* two species are without petals, etc.

Though for both keys the knowledge of the female flower structure is a necessity, Hutchinson's key is of simpler construction and may, if exceptions are sufficiently taken care of, appear to be more practical than Thonner's key.

This cannot be verified swiftly by easy means and must show through experience. We have made a few samplings. With *Gaertnera* we arrived correctly on p. 68, but here it is omitted that there is one species with whorled leaves (*G. ternifolia* of Ceylon) which would then wrongly come to the *Retziaceae*. *Sonneratia* is correct. With *Dapania* and *Sarcotheca*, if inserted in the *Lepidobotryaceae*, the statement on p. 52 is wrong as *Sarcotheca* has no aril, and both have no stipules; with the key one arrives at the *Akaniaceae*. And if they are under the *Averrhoaceae* on p. 53 the ovules do not tally, as they have two pendent, superposed ovules (not ascending and horizontal); also in *Averrhoa* ovules are pendent. On p. 108 *Ophiopogon* and *Peliosanthes* are correctly discriminated, but to *Ophiopogon* is added the remarkable 'pseudo-gymnospermous' development of the seeds; this is omitted in *Peliosanthes* where it is similar; this remarkable character should also have been mentioned under that genus. *Scyphostegia* remains erroneously interpreted as to the flower structure and hence taxonomic disposition; this of course now indeterminable.

One should realize that it is a most time-consuming affair to have such a key correct in details (exceptions and aberrant plants). But I cannot agree with Dr. Hutchinson that there are so many 'exceptions' 'that it is doubtful if the botanist has yet to be born who can provide a key to the family of all species of flowering plants'. I believe that this is a mere matter of great patience and time and interest; but it is true that hardly any botanist will try to undertake this task.

The hope of the author 'that by means of this key it should be possible to determine most of the flowering plants' I fully share.

I heartily invite all users of the key to bring their criticisms to his knowledge in order to improve later editions. It is a very important undertaking especially for educational purpose.

I may mention that, during the annual practical course in systematic botany at the Rijksherbarium, Leyden, for 3rd year students, the last week of the month is devoted mainly to full identification of plants. In Oct. 1967 a total of 70 species were identified to the family by means of Hutchinson's key. There were only difficulties in 6 cases, which means that the key worked in more than 90 % of the tested plants.

Two of them were 'exceptions', viz. p. 103 'Ovules few to 1' did not fit *Pollia aclesia* (*Commel.*), as it is the only species of the genus with numerous ovules. It must be easy to cure this and to distinguish the *Bromeliaceae* from the *Commelinaceae sens. lat.* by other characters. The other exception was for p. 72 'Leaves alternate' as a general characteristic for the *Myoporaceae*, but *Eremophila scoparia* and some other

species have opposite leaves. Here one should repair probably best by entering the *Myoporaceae* also in the other lead under opposite leaves.

A third case is p. 64 (top) differentiating the *Diapensiaceae* from the *Epacridaceae*. A conscientious student cutting the anther of an *Epacridaceae* finds it 2-celled. Here should be added in both leads: 'Opened' anthers 4- or 2-celled. But there are also easier characters to distinguish these families.

On p. 72 there is a lapsus: in identifying a *Thunbergia* (*Acanth.*) one gets stuck because this falls under 'Ovules numerous in each cell, or if only 2, then superposed'. However, *Thunbergia* has 2 collateral ovules per cell, at least *T. huillensis*.

Also with the *Verbenaceae* not all is correct: on p. 73 it is claimed that they have opposite leaves, but many species of *Faradaya* have whorled leaves and also *Lantana trifolia*. Furthermore, they fall on p. 72 under 'Ovule solitary in each cell, or if 2, then collateral' and this is difficult to observe sometimes, at least in *Congea griffithiana*, because in this genus, in *Avicennia*, and in some other subfamilies of the *Verbenaceae* the ovary is only celled at the very basis, and so after a cross section one observes the 4 ovules on a central placenta.

Also with the *Rutaceae* there was difficulty; they appear twice in group 14, p. 43 for the woody species, p. 46 for the herbaceous species. On p. 43 the *Rutaceae* should come under 'Stamens double the number of petals', but they are absent there and come on p. 44 under 'Stamens the same number as petals'. This is an error. For Rutaceous herbs we feel that on p. 46 the *Rutaceae* should fall under 'Style gynobasic', but they stand under 'Style not gynobasic'. The plant identified was *Haplophyllum hispanicum* = *Ruta pubescens*.

In identifying *Pteleocarpa*, which Hutchinson has correctly in the *Ehretiaceae*, the key does not work on p. 64, as its fruits are widely winged bringing confusion with the *Cardiopteridaceae*; the latter are vines! But also the difference between the *Ehretiaceae* and Hutchinson's *Chloanthaceae* is incorrect, as the first have the style mostly once forked, not twice; the phyllotaxis were of better use here.

There should be improvement in the figures which are added to illustrate some of the very brief glossary. I find them very primitive, even though I agree to the necessity of schematizing. Fig. 2A, to show a stipulate leaf, is distinctly misleading, as it shows only an exceptional interpetiolar stipule of *Rub.*, *Rhiz.* or *Cunon.*; Fig. 2B is also misleading for an intrapetiolar stipule: I do not know any plant having it in this way. Exstipulate is also only shown in opposite leaves. Fig. 1C as exemplary for verticillate leaves is a very poor figure similar to *Galium* which has no whorled leaves! Pinnate leaves are only shown with opposite leaflets: how can a student decide in the *Sapindaceae* which are mostly paripinnate but with a pseudo-terminal leaflet and an obscure mucro (or its scar) next to this leaflet to show it is paripinnate? Fig. 4H for a corymb is a peculiar drawing both to ramification and absence of bracts. Fig. 4U a dendriform hair: does this consist of one single cell as drawn?

I hope not that the author feels offended by the pointing out of some shortcomings. This is intended as a constructive criticism of an admirable achievement which is doubtless a promising tool especially to work in tropical and subtropical countries by botanists and amateurs who are not fully acquainted with the plants around them.

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