

IX. OCCURRENCE OF DOMATIA AS A SYSTEMATIC CHARACTER

In our Bulletin no 20, pp. 1272-1273, Dr. M. Jacobs made some notes on the nature and occurrence of domatia. His full paper has now appeared (Proc. Kon. Akad. Wet. A'dam C 69, 1966, 275-316, repr. 1-44) and this means to be a great step forward in the study of these peculiar structures, which are diverse in structure, though still obviously homologous, and not due to the action of acari. Their function is obscure and may be nil; it is remarkable that they are restricted to ligneous plants and that though occurring in plants of both cold and hot climates, they have not yet been found in plants growing in permanently dry climates.

In 'placing' plants, inadequate material in particular, it was in my experience always a great help to me if domatia were present, as they represent an indicator character. This in turn points to their systematical value in specified cases.

I get the impression that Dr. Jacobs is less convinced of this than desirable, as in his judgement "all records of domatia in literature up to now must be regarded with great caution" and in his summarizing remarks he stated only that "domatiae may be of limited taxonomic significance as a supporting character" "the regularity of their occurrence is variable in single leaves, individuals, and taxa, and therefore is to be tested purposely in every case anew."

The first statement is exaggerated, as at least in Malesia several experienced botanists, for example J.J.Smith, C.A. Backer, and F.H.Endert, who possessed a great knowledge of vegetative characters, have paid great care to test specimens on the presence of domatia before using them as a taxonomic character.

The third statement is a truism, as all systematic characters must be tested purposely in every case anew, including domatiae.

The second statement is also a truism, because hardly any systematic character has absolute value, and though even having restricted value in one group, genus, species, etc., it may break down in another allied group or occur erratically in that group. This is one of the general - unexplained - facts with which a systematist is confronted.

It is therefore not surprising that the value of domatia is a relative one; this it shares with almost all taxonomic characters.

This should, however, not lead to the conclusion that the constant occurrence of domatia is to be regarded only as a "supporting character", which means that it should have less value than other vegetative or generative characters.

Jacobs' tendency to mistrust data in literature may be justified in several, or even in many cases; this is partly due to the fact that the concept 'domatium' was not always clearly recognized.

On the other hand he has in his zeal to prove his mistrust in the systematical value of domatia used an inadmissible criterion. This criterion he has for example applied in the genus Nothofagus (l.c. p.11), a fairly large genus, with c. 45 described species. Only two of the species possess domatia, viz. N. menziesii and N. fusca. Almost all authors including myself who monographed the genus and examined a very large amount of material, and Dr. A.L. Poole who made a monographic survey with elaborate detail of the New Zealand species, have found these domatia very constant in these 2 species (Trans. Roy. Soc. New Zeal. 78, 1950, 365) and are in full agreement with Du Rietz's observations of 1930. Especially between N. fusca and N. truncata which are closely allied but differ distinctly in venation of the leaf, the occurrence of domatia is always bound up with domatia in N. fusca which lack in N. truncata. All New Zealand foresters use the domatia character as a mark character of N. fusca. Dr. Jacobs may have been misled by a remark by Allan in his new Flora of New Zealand where it is stated on N. truncata: "domatia very rare", but according to the working method of Dr. Jacobs he should not have trusted such a remark, but have relied on own observations.

As I keep naturally a very great interest in Nothofagus and the problems connected with it, I have asked Miss Lucy Moore to check in the Christchurch Herbarium Allan's remark. She was so kind to do this, including the examination of a number of specimens of N. truncata collected since Poole's paper was written. In all material of N. truncata she did not find any domatia. She also checked five trees of N. truncata in borders round the lawns at the institute without any sign of the clear domatia present in N. fusca.

She wrote that she "would guess that Dr. Allan's statement was based on his personal observation and would have been deliberately included, since it is at variance with Poole's paper which is quoted with general approbation."

It may be of course that Allan derived his remark from hybrid trees, as in New Zealand Nothofagus species, notably with N. fusca hybridize frequently, and even form sometimes 'hybrid swarms'. Nobody will know what evidence Dr. Allan had, but it cannot be traced in the Herbarium where he worked.

To me the presence or absence of domatia is of vital importance for the distinction of N. fusca and N. truncata.

Returning to the inadmissible criterion which Dr. Jacobs used for his fleeting remark that the constancy of the occurrence of domatia in N. fusca is "open to objection", it must be explained that in order to show this Dr. Jacobs seems to be of opinion that each single leaf must have domatia if one maintains that their presence or absence is of the same systematical value as other specific (distinctive) characters.

For this purpose he examined all leaves of N. menziesii in the collection of the Rijksherbarium and found that 113 leaves had 1-3 domatia and 31 had none. This is of course a remarkable procedure, as these leaves belong to only 3 specimens (sheets). Of course none of the sheets has all leaves without domatiae.

This way of looking black and white for judging constancy, id est systematical value of taxonomical characters, is of course an inadmissible procedure.

Were this applied as a general rule, we will have to discard the presence of leaf pitchers of Nepenthes as an absolutely characteristic character of that genus, and degrade the occurrence of pitchers to a 'supporting character', because only part of the mature leaves of a fullgrown fertile pitcher-plant bears a pitcher, though no Nepenthes plant has or will ever be found without pitchers.

In the genus Tococa the leaf blades possess a remarkable auricle-like, saccate appendage at base which Gleason remarked "is sometimes absent in some leaves"; but does this affect the taxonomical value of this remarkable leaf structure?

The same 'variation' can be found in the occurrence of tendrils in Passifloraceae, Gouania, Strychnos, Vitaceae, Lophopyxis, etc., though their occurrence is of the highest taxonomical value for either species, sections, genera, and even higher taxa. Many other examples could be cited of a similar 'variation in the occurrence of spines and other organs of essential taxonomic value', but not observable to the satisfaction of Jacobs' 'absoluteness' which is an absurd condition.

A similar "variation" occurs in fertile parts of plants to which Dr. Jacobs assumedly contrasts the taxonomic value of the vegetative character domatia: merousness of flowers is practically nowhere absolutely constant if sufficient quantities of flowers are examined. In his detailed population studies of Silene cucubalus where each flower was scored, Turrill has found most remarkable deviations, some even affecting subfamily characters of the Caryophyllaceae. And one needs only to have some experience with so-called 'terata' to find that there is a huge body of occasional variation in plant parts.

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