

MINT NOTES

by R. A. GRAHAM

VII. MENTHA × MAXIMILIANEA F. SCHULTZ IN BRITAIN.

The occurrence in Britain of *M. × maximiliana* F. Schultz* (*Mentha aquatica* × *rotundifolia*) has been suspected since 1950 when two specimens which seemed to be this came to my notice in the herbarium of Cambridge University. For one reason or another the matter was not pursued at the time, but has been recently reconsidered following the discovery by Dr. J. K. Morton of fresh material of this rare hybrid in the Brixham area of South Devon, v.c. 3. The Cambridge specimens have been re-examined. I have seen the holotype (at Geneva, with a photograph at Kew and an isotype at Manchester) of *M. × maximiliana* var. *baileyi* Briquet (1889, 68)—a mint whose existence seems to have remained un-noticed by those who have compiled lists of British plants despite the fact that it originated from Guernsey in 1867—which would seem to constitute yet another British record for the *M. × maximiliana* group: but the specimen is merely a rather hairy water mint [*M. aquatica* L. var. *hirsuta* (Huds.) Huds.] (Graham 1954, 112) whose original identification must therefore be amended. In fact, it shows no indication whatsoever of *M. rotundifolia* in any of its characters.

The acceptable records for Britain of *M. × maximiliana*, so far as I have yet detected them, are in their chronological order as follows:—

1. Orchard, Tresgoddern, Cornwall, (? v.c.), *Borrer* s.n. (Cambridge)
2. Damp meadow, Chyvogue, Perranarworthal, W. Cornwall, v.c. 1, 1911, *Hamilton Davey* 1319 (Cambridge)
3. Man Sands, Brixham, S. Devon, v.c. 3, 1955, *J. K. Morton* (herb. J. K. Morton 4406; herb. R. A. Graham 4730)

Among Schultz' specimens in the Kew herbarium, No. 115 comprises two sheets which are probably isotypes of *M. × maximiliana* (i.e. var. *maximiliana*), while No. 116 similarly comprises isotypes of *M. × maximiliana* var. *exserta* F. Schultz (1854b, 36) (= var. *weissenburgensis* F. Schultz ex H. Braun, 1890, 412). *M. × maximiliana* var. *schultzii* Boutigny ex H. Braun (1890, 412) appears from a specimen, also at Kew, which may be its holotype, to be probably a short-leaved, short petiolate peppermint (*M. × piperita* L. agg.) and will not be further considered here.

The type description of *M. × maximiliana* (Schultz 1854a, 225) is followed by an apparently later description (Schultz 1854b, 34) with, in both cases, additional German text that is rather more informative than the Latin. Schultz 115, from the Lower Rhine, can be described as follows:—*Stem* 50-60 cm. tall, branched, covered with simple, woolly hairs. *Leaves* broadly ovate, sometimes ± rounded, up to 5 × 3.2 cm., apically acute or

*It is possible that *M. pyramidalis* Tenore (1811, 34) may antedate *M. maximiliana* as the correct binomial for this hybrid group, as has been most recently suggested by Litardière (1955, 42). I have seen two of Tenore's Corsican specimens of *M. pyramidalis*, neither of which are necessarily types but both of which although differing from each other may nevertheless be hybrids of *M. aquatica* with *M. rotundifolia*. But the matter does not rest there, as it is first necessary to establish the relationship of the latter species with the apparently closely allied *M. insularis* Req. ex Gren. & Godr. (1850, 649) which, as well as *M. rotundifolia* and *M. aquatica*, grows in Corsica whence *M. pyramidalis* was first described. It is not yet certain that *M. pyramidalis* may not more correctly apply to a hybrid of *M. aquatica* with *M. insularis*. Apart from this, there are certain other binomials whose claim to priority over *M. maximiliana* should be examined, but as the uncertainty regarding *M. pyramidalis*—which seems to be the earliest possible name—remains for the time being, it has been thought advisable to fall back on a binomial about which there is no doubt as to validity and applicability [for a similar view, see Briquet (1891, 63)].

obtuse, basally truncate to cordate, sometimes asymmetrical with up to 5 mm. discrepancy; greenish-white due to white tomentum on both faces but more sparsely hairy above and not thickly felted below; serratures rather jagged, irregular in size, \pm outward-directed, up to 9 on each side: upper leaves tending to be round. *Petioles* short, not exceeding 5 mm. in length. *Inflorescence* a terminal spiciform raceme, 2.6-5 cm. long and 1.2-1.4 cm. broad at maturity, interrupted below. *Corolla* and *calyx* very hirsute with \pm patent white hairs.

This mint is from its outward appearance a reasonably obvious hybrid of the two putative parent mints: the ovate leaves, terminating in a point, suggest *M. aquatica*, while their very short petioles, the broad width in ratio to the length, and the tendency of the upper leaves to roundness suggest *M. rotundifolia*: the inflorescence is \pm intermediate between the capitulum of *M. aquatica* and the spiciform raceme of *M. rotundifolia*: further, a comparison of the calyx and corolla measurements of this putative hybrid with average figures of its putative parent species shows an additional intermediate state, as the following table indicates.

	<i>M. rotundifolia</i>	<i>M. × maximiliana</i> (Schultz 115)	<i>M. aquatica</i>
Calyx teeth	0.85 mm. long	c.1 mm. long	1.25 mm. long
Calyx tube	1.1	c.2	2.75
Corolla overall	2.15	3.75	6.2

Var. *exserta*, from the same district, is a very similar mint, certainly unworthy of taxonomic separation from var. *maximiliana*. It recedes a little further towards normal *M. aquatica* in having slightly broader racemes (up to 1.5 cm.), which are also slightly shorter and more irregularly interrupted into component, \pm capitate verticils: the leaves, too, are rather longer for their width (4.5 × 2.4 cm.). But these differences are of no importance.

Of the British examples of *M. × maximiliana* seen—and all differ from each other in various respects—only the Man Sands material (see Fig. 1) nearly approaches Schultz' specimens, the affinity being in fact very close to var. *exserta* but the calyx of our mint is rather longer (4 mm. overall), likewise the petioles (up to 1.8 cm.). Fortunately both putative parents grew alongside, thus a comparison of the flower characters of all three is possible, as shown below.

	<i>M. rotundifolia</i> (Morton 4405; Graham 4655)	<i>M. × maximiliana</i> (Morton 4406; Graham 4730)	<i>M. aquatica</i> (Morton 4404; Graham 4654 a. & b)
Calyx teeth	0.5 - 1 mm.	1.25 mm.	1.25 mm.
Calyx tube	1.25 - 1.6	2.75	3.0
Corolla overall	4.0	5.0	7.0
Raceme maximum width	11.0	18.0	22.0

The two examples at Cambridge are outwardly very different from each other and from the forms of this hybrid already discussed, from which they differ in one particularly interesting feature in that they both bear some branched hairs (which are characteristic of *M. rotundifolia* but not of *M. aquatica*) among the mass of simple ones. In the Perranarworthal plant there is some resemblance to *M. aquatica × longifolia* (*M. × dumetorum* Schultes = *M. palustris* Sole non Mill.) but unlike this latter the leaves are sessile or almost so, which, with their broadly ovate shape and softly tomentose undersurfaces, suggests the influence of *M. rotundifolia*.

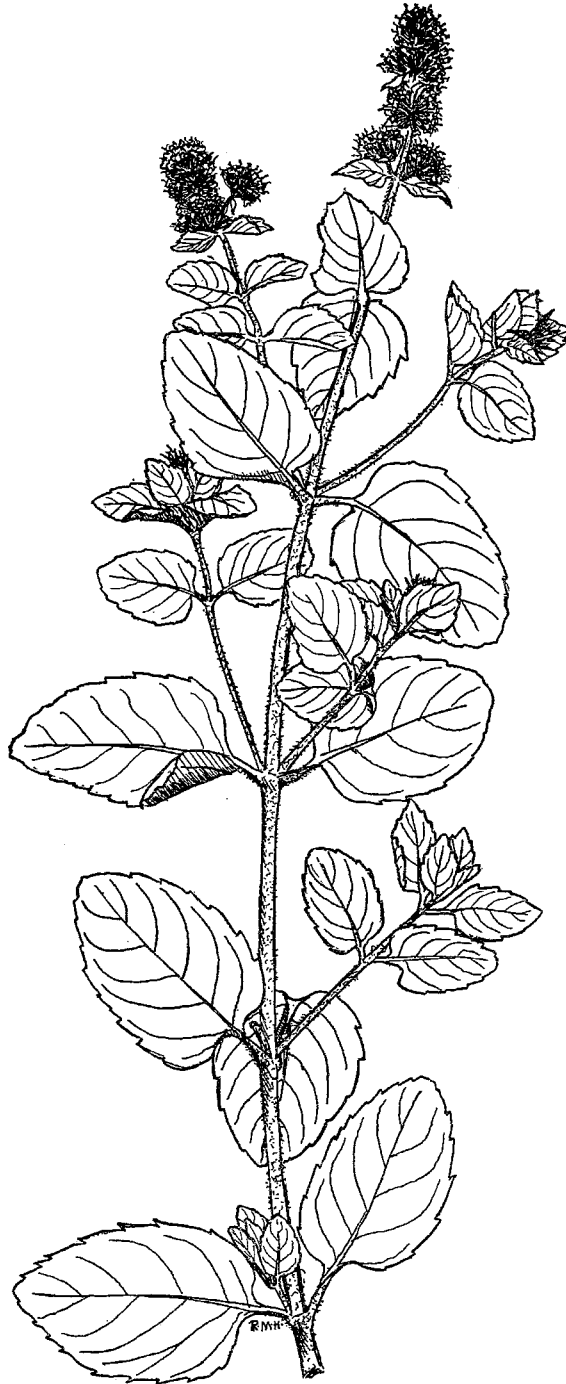


Fig. 1. *Mentha* × *maximiliana* F. Schultz, × $\frac{2}{3}$, from herb. R. A. Graham No. 4730 (Man Sands, v.c. 3).

The Tresgoddern specimen is a reasonably obvious hybrid of the two suggested parents, having ovate, very obtuse, shortly petiolate leaves of which the lower tend towards terminal roundness, and a ± spiciform-racemose inflorescence which seems to be composed of many, small, closely-set capitula, neatly suggesting an intermediate state.

So far as British material is concerned, *M.* × *maximiliana* is apparently very rare,

and, clearly, very variable. Indeed the variability is such that it becomes extremely difficult to indicate reliable characters whereby this hybrid may be detected. Outwardly, an intermediate appearance seems to be the best guide, and bearing this in mind the only British mints with which *M. × maximiliana* could normally be confounded are *M. × piperita* forma *hirsuta* (J. Fraser) R. A. Graham (1951, 32) and *M. × dumetorum*. It can be told from both by having leaves broader in ratio to their length, and sometimes sessile (a feature lacking in either), from the first by the lack of pepperminty flavour (insofar as fresh material of the Man Sands plant has indicated), and in certain cases by the presence of branched hairs. For further distinctions from hybrids of the *M. aquatica × longifolia* group, but referring to continental material, see Schultz (1854a, 226) and Briquet (1891, 62).

I refer now to two mints which may possibly be forms of *M. × maximiliana*. The first of these was found at Sennen Cove, West Cornwall, v.c. 1, by Mr. O. Polunin in 1955 (herb. R. A. Graham 4725), which although outwardly seeming to be a white-shaggy form of *M. aquatica* is worth further study in order to be more certain of any possible hybrid origin. The second was found during 1954 in Bone Valley, Penzance, v.c. 1, by Miss B. M. Sturdy, and has been under observation in my garden for two seasons. It has been exhibited at our annual Exhibition Meeting as *M × maximiliana*, and as such has been privately distributed (herb. R. A. Graham 4918). It is a capitata mint, very similar in this respect to *M. aquatica* as which most collectors would probably dismiss it in the field; indeed it reflects the highest credit on Miss Sturdy that she perceived certain unusual features in it and thought it worth submitting. It differs from normal *M. aquatica* in the leaves, some of which are terminally rounded and whose bases are remarkably cordate with rounded lobes enclosing a basal sinus up to c. 5 mm. deep, while some of the bract-leaves are \pm sessile. These features suggest the influence of *M. rotundifolia*. The capitula appear to be normal for *M. aquatica*, the flowers having exerted stamens with fertile pollen, and producing a large quantity of viable seed which appears to be identical with that of a normal *M. aquatica*, and of which a high percentage was successfully germinated by Mr. R. M. Harley (surviving the winter, the seedlings promptly died off in the spring)*. The calyx, however, is short for this species (3—3.2 mm. long overall), with short teeth (0.75—1 mm. long). The original specimen sent to me gave, owing to the terminally rounded, basally cordate leaves, a strong look of the influence of *M. rotundifolia*, which a glance at the short calyces seemed to confirm. Recently I have examined further examples of *M. aquatica* from various sources, among them a specimen from Folkestone, v.c. 15, which had a nearly exact resemblance to some of the less extreme forms of the Bone Valley plant; indeed the affinity was so great that it was impossible to separate one from the other on any good diagnostic character. This prompted further examination of the Bone Valley mint, and it transpired that the features which seemed to savour of *M. rotundifolia* occurred now and then in normal *M. aquatica*, and that the original Bone Valley specimens were merely forms wherein these several features were all present giving, as a result, a highly deceptive appearance. On this, it would appear that the plant is merely *M. aquatica*. But the chromosomes have been counted, giving a figure $2n=108$ (*M. aquatica* $2n=96$; *M. rotundifolia* $2n=24$), which, since British *M. aquatica* appears to be constantly $2n=96$, is a little surprising. If we assume that this mint is indeed a hybrid of the *M. × maximiliana* group, the figure $2n=108$ can be explained as resulting from the backcross of an amphidiploid hybrid with the *M. aquatica* parent, and it is true that the general appearance of the plant offers reasonable grounds for accepting this—including the production of seed which might be due to the influence of amphidiploidy. But owing to the inescapable fact that this unusual mint agrees fundamentally with *M. aquatica*, but with

*It is worth mentioning that Mr. Harley also, but at low percentage, germinated seed obtained from *M. × niliaca* Juss. ex. Jacq. var. *villosa* (Huds.) Druce, and "*M. × niliaca* var. *sapida* (Tausch) Briq." but both unfortunately suffered the same fate.

certain characters in rather extreme form, to the extent that it appears to be impossible to distinguish it apart, and bearing in mind that in its habitat it occurs with many other examples of apparently normal *M. aquatica* into which its characters merge (*M. rotundifolia* is, so far as I have observed, absent from the immediate neighbourhood of the plant), I believe that my original determination must be amended to one of *M. aquatica* L. (agg.), at any rate until further investigation may satisfactorily prove otherwise.

I am greatly indebted to Professor Baehni, Dr. S. M. Walters, Dr. E. F. Warburg, and to the Curator of the herbarium at Naples for loan of specimens. Foreign material has been photographed, and prints are at Kew. I am also very grateful to Mr. R. M. Harley for the accompanying drawing and for much helpful assistance, and to Dr. J. K. Morton for counting the chromosomes.

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Since writing the above account, there has come into my hands from the Manchester herbarium a specimen which provides adequate evidence, by analogy and inference, for a more definite pronouncement on the Bone Valley mint. This specimen is part of cultivated material which was distributed through the B.E.C. and the Watson Exchange Club under the name *M. pubescens* Willd. var. *palustris* "Sole" (= *M. × dumetorum* Schultes), the root having originated from St. Colomb Minor, near Newquay, v.c. 1; and early comments on its origin, etc., can be read in the Reports of both these Exchange Clubs for 1908. In the example seen, the leaves are too like those of the Bone Valley mint – even to the extent of having basal sinuses – to be distinguishable, and an essential similarity can be accepted. But the inflorescence is not a capitulum, as in the Bone Valley mint, but a stout spiciform raceme, c.7 cm. long × 2 cm. broad, which suggests a hybrid origin, with the influence of *M. aquatica* in its breadth and a "spicate" species in its elongation. It is difficult to accept affinity with *M. × dumetorum*, as there is no character reliably indicative of *M. longifolia* in its appearance, and it is far more likely, from the leaf shape, that the "spicate" parent mint is *M. rotundifolia*. The floral measurements are intermediate between *M. aquatica* and *M. rotundifolia*, viz., calyx tube 2.5 mm. long, calyx teeth 1.5 mm. long, and corolla 5 mm. long. The specimen is rather young, but there is some seed which appears to be developing. As in the Bone Valley mint, there appear to be no branched hairs.

It is reasonable to infer from the leaf characters of this example, and from the fact that its floral measurements, although not exactly agreeing with those of the Bone Valley mint (some variation is inevitable), still suggest intermediacy between *M. aquatica* and *M. rotundifolia*, that both the Bone Valley and St. Colomb Minor mints are essentially the same, with the difference that the inflorescence, in the one case, suggests strongly one parent (*M. aquatica*) while, in the other, its appearance suggests a hybrid between this species and *M. rotundifolia*. It will be remembered that the chromosome number of the Bone Valley mint supports the idea that it is a hybrid of these two mints, and, although no such guide is at hand to help in assessing the origin of the St. Colomb Minor mint, I believe that the form of the inflorescence of the latter is probably one which that of the Bone Valley mint can attain by normal variation. By analogy, a capitate form of *M. × dumetorum*, in my garden see 1953, *B.S.B.I. Year Book*, 1953, p. 109), produced "spicate" inflorescences during the summer of 1955, and has since reverted to the capitate form again. Whether this can apply to the Bone Valley mint, can only be known by observation, and the same applies in a reverse sense in the St. Colomb Minor material. This much can be said, that the inflorescence of the latter is such as would be expected if the Bone Valley mint were to show, in its inflorescence, the hybrid origin which its leaves and chromosome number suggest. On the evidence, it seems that both these mints are *M. × maximiliana*, and that both are essentially the same sort of hybrid which, very different in appearance from Schultz' types and from the Man Sands material, may later come to be regarded as representing a distinct nothomorph.