

New and Old Species of *Mesembryanthemum*, with critical notes.

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(PLATES 5-10.)

[Read 6th February, 1919.]

THE object of this paper is twofold in its nature. First to describe some new species of *Mesembryanthemum* that are in cultivation, and in the second place I wish to demonstrate to future monographers the necessity for a thorough revision of the nomenclature of this interesting genus, as in the later monographs of it I have found that there are many errors in identification. In justification of the latter remark it is necessary that I should give the details which follow concerning the history of the genus.

For the bulk of our knowledge of the genus *Mesembryanthemum* we are indebted to Haworth, who between 1794 and 1821 published four monographs of this genus. He was the first to make a systematic classification of its species, and as he described from living plants, chiefly cultivated by himself or at Kew, and had a thorough knowledge of them, he made very few mistakes as to species; and his grouping of them into sections has been followed (apart from a shuffling of their sequence) until the present time. A very large proportion of the known species were described by him; but in many cases his descriptions are inadequate for identification, as they are often only comparisons with other known species, yet they are accurate as far as they go. Fortunately, it happens that a large number of his species are represented in the Kew Herbarium by a series of excellent coloured drawings made from the type plants, so that the majority can be correctly determined. These drawings were made by George Bond and Thomas Duncannon, two skilful artists who were employed at Kew Gardens between 1822 and 1835 to make drawings of the plants cultivated there. The result is that there are now preserved in the Kew Herbarium many hundreds of good coloured drawings of plants belonging to a large number of natural orders cultivated at Kew at that period, some of them being made from type plants of Aiton's 'Hortus Kewensis.' These drawings are all unpublished, and their existence is, I believe, generally unknown. I therefore desire to call the attention of Botanists to them. About a quarter of these drawings represent succulent plants, including very many described by Haworth, and therefore depict his types, the drawing being in many cases all that exists to give us a true conception of what some of his species were like.

As many of the drawings of *Mesembryanthemum* will be found upon comparison with the plant to be coloured too green, it may be well to explain to those who have not cultivated these plants that this may be due to many

of the drawings having been made in the early part (January to March) of the year ; for under our dull sunless winter skies much of the white deposit of lime disappears from their tissues during that season, and they often become much greener than in summer time, when it is re-deposited and they resume their more glaucous-green or whitish hue.

Soon after the period when these drawings were being made, the publication of Salm-Dyck's Monograph of *Mesembryanthemum* commenced. This work was issued in seven parts between 1836 and 1863. It is splendidly illustrated and the descriptions of the plants represented are excellent, but unfortunately the names and synonymy attached to the plants figured in many cases do not belong to the species so well figured and so excellently described. This was brought to my notice early in my career when I first came to Kew whilst naming cultivated specimens of *Mesembryanthemum* ; I noticed that some of the species figured by Salm-Dyck were different from the plants bearing the same name that I had been familiar with at Reigate in the rich collection of Mr. W. Wilson Saunders, who had (about 1865 and 1866) over 300 species of *Mesembryanthemum* in cultivation ; some of them, I was informed, were plants that were originally in Haworth's collection and therefore presumably types of his species. This caused me to compare one or two of Salm-Dyck's figures and descriptions with the original descriptions given by Haworth and with the unpublished drawings of the plants at Kew, when it became abundantly evident that mistakes of identification had been made by Salm-Dyck ; and during subsequent years more and more of these wrong identifications were discovered in the same manner. It is well known that plants are often cultivated under wrong names, and the only explanation of Salm-Dyck's misidentifications that seems possible is, that he accepted as correct the name under which the plant was cultivated on the Continent without investigating the authenticity of that name. As a few of these misidentifications are very glaring : it is inexplicable that Berger, who certainly consulted the drawings at Kew, and Sonder, who may or may not have done so, have both failed to detect any of them, but have accepted Salm-Dyck's identifications as being correct, and in several cases have copied from the description given by Salm-Dyck and neglected or ignored the original description given by Haworth, or have combined both, and sometimes added characters derived from dried specimens ; so that it occasionally happens that the name of the species in the monographs of Sonder and of Berger does not belong to the plant described under it, and sometimes the description there given includes characters distinctive of two or more species.

Therefore, finding so much misunderstanding prevalent in books and gardens with regard to many of Haworth's species, it seemed to me desirable to call the attention of any future monographer of the genus *Mesembryanthemum* to the necessity for a thorough revision of the nomenclature of all the species

belonging to it, and to point out that this work *can only be effectually accomplished by an investigation of the information stored up in the Kew Herbarium and at the British Museum*. At the latter establishment there are some drawings made by Masson in South Africa representing some of the species he introduced into this country which were described by Aiton and Thunberg, and some others of cultivated plants by Miss Ann Lee and by Simon Taylor, made between 1776 and 1778 *. In the Kew Herbarium are the numerous drawings above mentioned, which represent the types of Haworth's species, and in some cases, as in those of *M. aloides*, Haw., *M. sulcatum*, Haw., *M. cylindricum*, Haw., &c., the drawing represents all that is accurately known of the plant at the present time. As age prevents me from undertaking the task of revising the whole of this enormous genus, which is undoubtedly the largest in South Africa, I deem it advisable to indicate some (not all) of the species I have found to require revision, and have therefore given descriptions of them compiled from translations of Haworth's original descriptions combined with characters omitted by him taken from the drawings at Kew, accompanied by explanatory notes, so as to give a more complete account of these species than has hitherto been published, as well as to correct their synonymy. Also on the plates illustrating this contribution I have copied in black and white a few of the drawings at Kew, or portions of them, in order to show what some of the imperfectly known species described by Haworth are like. For this privilege I am greatly indebted to the President of the Linnean Society, Sir David Prain, who, in his capacity as Director of the Royal Botanic Gardens, Kew, has kindly granted me permission to copy and publish them. Excluding those species of older authors of which it is necessary to change the name and those figured by Salm-Dyck under wrong determinations to which I have given new names, all the new species except four are described or figured from living plants cultivated by myself or at Kew. Many of them belong to that very remarkable section of the genus generally known as the Sphaeroid group, and of them no illustration nor English description is given, as these will be added in a future monograph of that group and its allies which I have in preparation; for these plants, owing to their very remarkable character and the small amount of pot-room and attention that they require, are rapidly gaining favour with plant-lovers.

With reference to the nomenclature of cultivated species of *Mesembryanthemum*, I will here point out that it cannot be too widely known that seeds produced upon cultivated plants are likely to generate hybrids unless every care is taken to prevent cross-fertilization with another species. Some of those in cultivation under various names are not typical of the species they

* See Britten: "Notes on *Mesembryanthemum*," Journal of Botany, lv. (1917) pp. 65-74.

are supposed to represent, but are certainly hybrids (of which I have seen many) raised from seeds produced in gardens in Europe or in South Africa, which in some cases have replaced the true species where the latter has died out. As an instance of recent origin, and in years to come one that might not be very liable to detection or suspicion, I may mention that there are plants grown under the names of *M. Bolusii* and *M. simulans* that are neither of them the true species, being hybrids between those two plants. There are also hybrids derived from *M. bilobum* in cultivation that are not at all like the true plant although bearing its name. In the course of time plants raised from their seeds will probably differ more and more, and may possibly at length supplant the original species in gardens, especially as (I am credibly informed) they are gradually becoming extinct in their native habitat. Among other informants, Mr. C. J. Howlett, under the date of March 16, 1918, writes concerning *M. Bolusii* and *M. simulans*, that "They are gradually becoming extinct on account of the severe droughts experienced in the Aberdeen and Graaf Reinet districts, where they often go 20 months without rain, every veldt-bush is dried up and cattle forage about for these succulent Mesembryanthemums. There used to be lots of *M. Bolusii*, but now it is hardly to be found."

Descriptions of species of this genus, with perhaps a few exceptions, cannot properly be made from dried material, for distinctive characters which may be very apparent on living plants often absolutely disappear when the specimens are dried, so that they cannot possibly be correctly identified. Much more attention also needs to be taken with regard to their geographical limitation than has hitherto been the case, for according to my experience and from information I have obtained, the same species rarely has a wide range. Two or more allied species often resemble one another so much, especially when out of flower, that when seen growing in distant localities may easily be mistaken for the same species unless compared side by side when alive, and when dried would in some cases be indistinguishable. Hence I believe the localities given in the 'Flora Capensis' are sometimes open to the suspicion that they belong to more than one species.

The succulent plants of South Africa are more varied in type than those of any other region, and form a conspicuous feature in its very remarkable Flora. To many botanists and horticulturists alike these plants are of very great interest, so that it is a matter of great regret to learn from various South African botanists that many species are in danger of complete extermination by ostriches, who hunt for and greedily devour certain kinds. Numbers of them, so far as known, are very restricted in range; therefore, in a few years' time, unless care is taken to preserve them, some of these remarkable plants may have disappeared for ever. In reference to this, Dr. I. B. Pole Evans, Chief, Division of Botany, Pretoria, in a letter to me dated May 25, 1918, writes as follows:—"I have just returned from a tour

through Grahamstown and Port Elizabeth Districts, and what strikes one more than anything else is the rapid change which is being brought about in the vegetation of the country through the introduction of the Ostrich. These birds destroy the majority of the succulent plants, especially *Mesembryanthemums*, and clear out all the young Aloes. They scour every nook and corner of the veldt, and I think it extremely likely that many succulents which grow in these parts will never be seen again. It is therefore highly desirable that we should make an endeavour to place many more of our interesting South African plants in a spot or collection where they will be safe from the depredations of the Ostrich and Man."

This being the case, it seemed desirable to discover and place upon record the localities (which hitherto have remained unknown) of the species of *Mesembryanthemum* discovered by Burchell when travelling in South Africa over a century ago, so that if they still exist they may be sought for and preserved, and also made known to botanists and horticulturists; for at the present time they are mostly unknown plants, since most of those that were in cultivation have died out, and the descriptions of them in modern works are either imperfect or altogether wrong, from being based upon wrongly named plants. Three of them (*M. arboriforme*, *M. coriarium*, and *M. campestre*) were named by Burchell, who preserved dried specimens of them, of which the types are at Kew. The remainder were described by Haworth from plants raised in England by Burchell from seeds he collected in South Africa and of which he preserved no specimens. Living plants of these were given by Burchell to Haworth, who named and described them, and a set of them was given by Haworth to the Royal Botanic Gardens, Kew, from which coloured drawings were made and are now preserved in the Kew Herbarium. These drawings (as I have already stated) represent all that is definitely known of some of the species, for the figures and descriptions of Salm-Dyck (copied without examination into their authenticity by modern authors) are sometimes wrong, and have no connection whatever with the Burchellian plant. I have therefore carefully gone through all the manuscript lists and notes made by Burchell, which are now at Kew, and extracted from them all the information I could find relating to these species; and as Haworth's works are very rare and difficult to procure, I here give translations of the original descriptions or of all the characters contained in them, in combination with any notes of Burchell's, and details obtained from an examination of the drawings and types at Kew, so as to make our present knowledge of these species as perfect as possible.

Although the genus *Mesembryanthemum* is one of the most extraordinary among flowering plants, yet to the botanist and cultivator alike its chief claim in the scheme of Nature is usually associated with the beauty of its flowers, its other peculiarities being generally unknown or ignored. To the student, however, it offers many points of great interest. For instance, to

the best of my knowledge there is no other genus in the Vegetable or Animal Kingdoms in which the evolution of species can be so well demonstrated as by a collection of living plants of *Mesembryanthemum*. I know of no other genus in which a fairly complete series of adult forms can be found in it ranging from those which, except in size, scarcely differ in form from the cotyledonary stage, into other vegetative types, such as bushes and plants with long trailing stems that are utterly different from the cotyledonary or embryonic form. And even if it were claimed that some of the groups into which this genus is at present divided really represent distinct genera, it would not affect the obvious chain of evolution in any way. It is not my intention to deal with this point now, but I hope to do so on another occasion.

A point of interest that I do not remember to have seen mentioned by previous authors is the manner in which the leaves of some of the species of this remarkable genus, which only produce 2-4 leaves on each growth in a year, vary in form and size at different periods, sometimes in such a marked degree that the same individual seen at one season might easily be thought to be a different species when seen at another time of the year, by reason of the two pairs of leaves which form the season's growth being more or less dissimilar. This feature is most evident perhaps in the sections *Marcida*, *Moniliformia*, and *Rostrata*. When a plant commences to make its new growth at first only one kind of leaf is seen, then when the second pair is produced they are often more or less unlike the first pair, so that two forms of leaf may be seen upon the same growth. A typical example of this is represented by *M. candidissimum* on Pl. 7. figs. 25, 26. Finally, when the older pair has withered or fallen away, only one type of leaf will be noticed, which in the case of the *Marcida* and *Moniliformia* groups will be the pairs that form the cones.

Variation in size is probably due to the varying amount of moisture and food the plant obtains; for not only does a little more water in the soil or atmosphere induce increase of size, and may even cause the leaves to crack or burst open, but I have also found that a change of soil will sometimes bring about a similar result. This is well demonstrated by the two figures of *M. provinum* on Pl. 5. Fig. 3 represents a branch with a cluster of three growths upon it cut from a plant and rooted in the autumn of 1917. In May 1918 it was repotted into a different soil, and at that time was very little larger than represented by fig. 3; but by October of that year all the cones had very greatly increased in size, fig. 4 representing in outline one of the largest a week before it commenced to burst and display its component pair of leaves as described below. Yet in spite of the increase in size I believe it had less water than the plant from which the branch was cut and which did not make larger cones than those represented by fig. 3.

Another point of interest is the mode of growth of the *Sphaeroidea*, *Monili-*

forma, and allied sections. These plants constitute collectively a group that is absolutely distinct from all other flowering plants both in appearance and manner of growth, for the way in which the new growth bursts through the skin of the old one more nearly resembles the changing of the skin among insects than anything else I can liken it to. No other plants do this. As an example of this curious mode of growth, I will illustrate it by describing what takes place in *M. dissitum*, N. E. Br., and its allies. On Pl. 5. fig. 9 is represented a branch as it appears when the season's growth is completed in late spring. It is seen to terminate in a fleshy cone bearing two short leaves at its apex, and is supported upon a long internode of stem arising from a pair of longer leaves with a smaller cone in each axil. At this period the cone and leaves are green and remain so for a time, then the two long spreading leaves and the short ones at the tip of the cone wither and dry up, and the green skin of the cone gradually assumes a greyish or pale brownish colour, and the plant then presents a somewhat dead or dying appearance, its leaves being dried up. In late autumn each cone bursts, revealing a fresh pair of long spreading leaves, free to their base, where they are connate around the stem, and bearing upon them the fragmentary remains of the ruptured dried-up skin of the old cone. A few days afterwards there emerges from between them at their base the early stage of a new cone-like growth as I have represented on Pl. 6. fig. 11. At first the young cone is cylindric and almost indistinguishable from the internode below it, as is shown in this figure; afterwards it enlarges and assumes its characteristic cone-like form. The cone is really formed by a pair of leaves being united for the greater part of their length into an apparently solid mass, the tips only being free and spreading. In the centre of the base of the cone a bud forms that gradually develops a pair of leaves that are not united, but have their upper surfaces closely applied to one another. They gradually enlarge within the cone at the expense of the nutriment contained in the latter, so that as the nourishment is gradually absorbed the substance of the cone is gradually being replaced by the new pair of free leaves, which ultimately completely fill the skin of the old cone without materially altering its shape, although in autumn they may greatly increase its size. These changes go on unseen (and, until studied, unsuspected) within the interior of each cone, and until the old dry skin is burst there is no visible evidence that anything of the kind has taken place, any more than there is evidence that a caterpillar is gradually developing a new skin inside the one that is visible.

The flowers also offer some points of interest, such as their response to light, susceptibility to temperature, and daily increase in size after their first expansion. With reference to their fertilization, so far as I have observed in the Sphæroid group, many or possibly most of the species seem infertile to their own pollen, and yet when I have examined the stigmas of various species under a microscope I have always found them to be plentifully

covered with pollen emitting pollen-tubes, some of which can be distinctly traced penetrating the tissue of the stigmas. Yet in no case have the plants produced capsules or seeds. I do not know if this is a new observation, but I do not happen to have seen it recorded. Where, however, I have happened to have two distinct plants (*i. e.*, raised from two separate seeds) of the same species in flower at the same time, and have cross-fertilized them, the formation of fruit readily followed. I believe hybridization is also very common in this genus. It certainly occurs among species cultivated in this country, so that I see no reason why it should not occur in South Africa, although Dr. Marloth, a keen observer of South African plants growing under natural conditions, holds a different opinion I believe, see his Address to the South African Association for the Advancement of Science, given at Kimberley in 1914, p. 20, published in the 'South African Journal of Science' for that year.

As I herein propose to make some changes in the groups or sections to which the species here described are referred, an explanation is necessary. As previously stated, most of the new species belong to what is universally known as the Sphæroid group. But this group, as constituted in the most recent monograph of the genus (Berger, 'Mesembryanthemen und Portulacaceen,' p. 280), contains plants belonging to three distinct types, and in the older monographs, later than the works of Haworth, two distinct types, of which the majority do not belong to the Sphæroid group at all, in the sense that Haworth intended when he founded that section, but to the group to which he gave the sectional name of *Minima*. The section *Sphæroidea* was founded by Haworth in 1821 ('Revisiones Plantarum Succulentarum,' p. 84) upon *M. nuciforme*, Haw., which until 1907 remained the only known species that properly belonged to that section as defined by Haworth. Yet all other authors seem to have misunderstood *M. nuciforme* and failed to recognise its characteristics, so that a few years ago it was re-described by Miss Kensit under the name of *M. cryptopodium*. This plant is allied to *M. Elishæ*, N. E. Br., *M. quesitum*, N. E. Br., and allied species, one of which (*M. bilobum*, Marl.) has been erected by Berger into a distinct section (*Cordiformia*) by itself; whilst *M. nuciforme*, which is only a dwarfer, more spherical, and more shortly bilobed plant of the same type, is included among the species of the *Minimum* type under the section *Sphæroidea*. *M. nuciforme* died out of cultivation, and no other species of that type became known until a few years ago, so that from some mistaken conception of it the sectional names *Minima* and *Sphæroidea* were lumped together and that of *Sphæroidea* adopted to cover both types, but in practice it was really understood to include only the *Minimum* type. Therefore, as the plants originally grouped by Haworth under the sectional name of *Minima* are now universally known as the Sphæroid group, I propose that

the name *Minima* for this group be abolished and the name *Sphæroidea*, by which it is now so well known, be maintained for it, as that name applies to the plants now understood as belonging to that group very much better than it does to the plants which, according to Haworth's definition of the section as given under the description of *M. nuciforme*, would otherwise be included under it, most of these being by no means sphæroidal in shape; so that the term *Sphæroidea* would be quite unfitting if restored to *M. nuciforme* and its allies, which are all well characterised by the top of the growth being distinctly notched or 2-lobed and often more or less compressed or keeled there, as if pinched between the finger and thumb. I therefore propose the sectional name *Biloba* for those plants having this type of structure, which will include *M. nuciforme*, Haw., *M. quersitum*, N. E. Br., *M. Elishæ*, N. E. Br., *M. bilobum*, Marl., and all allied species.

The species belonging to the Sphæroid group are, apart from their shape, all well characterised by the presence in their adult condition of a small central orifice at the top, through which the flower issues. In recent years, however, a few species have been discovered which, although conforming to the Sphæroid type in general shape and also in having a central orifice in the juvenile stages, yet in the adult stage differ by having a fissure extending transversely entirely across the top, and the flowers are also of an entirely different type, the corolla being quite destitute of a tube. These plants I propose to erect into a separate group under the sectional name of *Fissurata*, or the Fissured group, which will include such species as *M. turbiniforme*, Haw., *M. pseudotruncatellum*, Berger, *M. Lesliei*, N. E. Br., and their allies. The fissure across the top gives evidence that the single body of which the growths apparently consist in the Sphæroid group is in reality composed of a pair of opposed leaves completely united, except along a narrow part from base to apex corresponding to the position of the midrib, so as to form a flattened tube down the centre of the fleshy body, the terminal opening of which forms a central orifice to the plant, through which the flower issues. In the sections *Biloba* and *Fissurata* the first stages of the separation of the two leaves of which the body is composed give an indication of the manner in which these plants began to evolve from the simple Sphæroid type through various stemless types into bushy and trailing types.

I am inclined to think that some of these plants should be separated generically from *Mesembryanthemum*, and am investigating certain characters with this end in view. For the present, however, I retain them as sections of *Mesembryanthemum*, and give a diagnostic key to the groups into which the plants now cultivated under the name of "Sphæroids" should be divided, and have included in it the sections *Moniliformia* and *Marcida*, the six groups in this key being perhaps the most remarkable in the genus:—

* Plant very dwarf, tufted or occasionally solitary, stemless or rarely developing forked stems that in nature become buried in the ground. Each growth (really a branch or offset) an apparently solid entire or 2-lobed fleshy body.

† Adult flowering growths with a small orifice like a closed mouth at the centre of the top or in the base of the notch between the lobes. Petals united at their lower part into a tube.

Growths obconic, obcordate, obovate, globose or rarely somewhat clavate, usually entire, with the top convex, flat or depressed, or, if somewhat 2-lobed then with the lobes rounded and not as if pinched into a ridge at the top nor flat on their inner face at the notch SPHÆROIDEA.

Growths usually oblong, sometimes obovoid or subglobose, notched or distinctly 2-lobed at the top, which is often as if pinched between the thumb and finger into a ridge or keel, with the inner lobes of the face flat at the notch BILOBA.

Growths divided part of the way down into two cylindric or turret-like lobes TURRITA.

†† Adult flowering growths or plant obconic or cylindric, with a transverse fissure all across the top dividing it into two very short convex or flat lobes. Juvenile plants have only a small central orifice. Petals widely spreading and free from the base, not forming a tube FISSURATA.

** Plant with distinct erect stems branching above ground or very dwarf and tufted. Each branch or branchlet producing annually one pair of leaves that are free to their base and spread widely or recurve, and a second pair that are united for the greater or lesser part of their length into a globose, cylindric, or conical body which persists, whilst its free-spreading or erect tooth-like tips and the free leaves shrivel and sometimes fall away.

Shrublets or with clustered stems 5-30 cm. high, branching; young leaves papillate, not conspicuously gland-dotted MONILIFORMIA.

Very dwarf tufted plants 2-3 cm. high; young leaves smooth, not papillate, conspicuously pellucid-dotted when held against the light MARCIDA.

The genus *Mesembryanthemum*, like *Euphorbia*, whilst remarkably uniform in the appearance and structure of the flowers of its various species, contains a large number of perfectly distinct vegetative types, around each of which several allied species can be grouped; and these groups have by authors been formed into characterised sections, which, however, more or less graduate into one another, so that they cannot always be rigidly defined by words. Therefore, although averse to the formation of sections where all are bound together by the threads of evolution into one coherent whole, I have arranged the species here dealt with under the sections already characterised, and have made new sections for the few species that cannot well be placed in any existing section.

With the exception of those discovered by Burchell, I have arranged the species alphabetically under each section and maintained the sectional name given to each group by Haworth, which is not always the same as that used by Sonder and by Berger. As no satisfactory arrangement of the sections exists, for convenience of reference I have here arranged the sections alphabetically under two primary headings according to whether the species have an erect or prostrate stem with distant leaf-pairs, or are quite stemless or with crowded leaves on very short more or less decumbent stems. The species discovered by Burchell are all placed together at the end in alphabetical order, with the section to which they belong indicated under the name.

Under the Sphæroid and allied groups the term "growths" or "corpuscula" are used to indicate the separate bodies, heads, or offsets into which the plant may be divided. In reality they are all separate branches, but often do not have that appearance.

A Bibliography and abbreviations will be found on p. 138 at the end of the descriptions.

In conclusion, I have much pleasure in gratefully acknowledging the very efficient help I have received from Mrs. L. Bolus, Mr. J. Burt Davy, Mr. W. J. Doree, Mr. G. Elisha, Dr. F. H. Rodier Heath, the authorities at Kew, Dr. R. Marloth, Messrs. Eustace and N. S. Pillans, Dr. I. B. Pole Evans, and Mr. E. Taylor, to whom I offer my very sincere thanks for the material and information they have so freely accorded, which has enabled me to make the following descriptions much more complete than they otherwise would be.

I.—Stemless, or if with very dwarf branching stems then without distinct intervals of stem (internodes) between the leaf-pairs. (To p. 103.)

§ ACUTA.

M. DIMINUTUM, *Haw.* (Pl. 7. fig. 24). Nearly stemless, branching at the base and forming a tuft. Leaves crowded, equal, ascending or suberect, finally recurving (according to the figure about 3 cm. long, 4 mm. broad, and $3\frac{1}{2}$ –4 mm. thick at the base), linear-subulate or semicylindric at the base and obsoletely triquetrous at the apex, shortly united at the base, flat above and gradually tapering from the base to a very acute apex, which is furnished with a short white point, soft; surface smooth, shining, glaucous-green, dotted, but not roughly so, and with numerous moderate-sized dots on the upper surface when held to the light. Peduncle about 3 inches ($7\frac{1}{2}$ cm.) long, cylindric, glabrous, with 2 bracts at its base. Calyx 5-lobed; lobes unequal, acute, the 2 larger leaf-like, the 3 smaller with more or less membranous margins. Petals about an inch (25 mm.) long, linear, obtuse, at length revolute, reddish. Stamens numerous, erect; filaments purplish;

anthers whitish. Styles 9, greenish, spreading.—*M. diminutum*, Haw. Misc. p. 26; Synop. p. 230; and Rev. p. 107: Ait. Hort. Kew, ed. 2, vol. 3, p. 214. *M. diminutum* var. *pallidum*, Haw. Suppl. p. 99. *M. corniculatum*, Haw. Obs. p. 226, not of Linnæus.

SOUTH AFRICA. Locality and collector unknown. In cultivation before 1789 according to Aiton.

The variety *pallidum* was described by Haworth from a plant cultivated at Kew, as having softer, paler, smoother, and shorter leaves than the type, but in his 'Revisones,' p. 107 he states that it was merely an imperfect plant of *M. diminutum*; from which I should understand that when he described it as var. *pallidum* it was a plant that had got out of condition, and that afterwards it resumed its normal character. Possibly the original drawing at Kew, which I have copied on Pl. 7, was made from that particular plant.

Haworth (Rev. p. 107) also places *M. canaliculatum*, Haw. Suppl. p. 90, as a variety of *M. diminutum*, from which he states that it differs in being about twice as large.

§ ALBINOTA.

M. CIBDELUM, N. E. Br. I propose this name for the plant figured by Salm-Dyck under the erroneous name of *M. aloides*, Haw. and accepted by subsequent authors as being that species, from which it is totally different and is, beyond doubt, the same as the plant described by Haworth as *M. albipunctum* var. *majus*, of which (as well as of typical *M. albipunctum*, Haw.) there is an original coloured drawing at Kew. But it is also certainly distinct from typical *M. albipunctum*, Haw., for its leaves are twice as long and about twice as broad and somewhat different in shape, and the flowers (which Haworth apparently had not seen) have only about half as many petals, which are also much broader and less acute than those of *M. albipunctum*.

M. cibdelum differs from *M. aloides* besides in the very different form and pose of the leaves, by the stamens being erect in a cylindric mass and not forming a distinct cone. The following is its synonymy:—*M. albipunctum* var. *majus*, Haw. in Phil. Mag. (1826), p. 127. *M. aloides*, Salm-Dyck, Mesemb. § 4, fig. 3: Sonder in Fl. Cap. vol. ii. p. 396: Berger, Mesemb. p. 260, not of Haworth.

SOUTH AFRICA. Locality unknown. It was raised at Kew in 1823 from seeds collected by *Bowie*.

§ BILOBA.

M. APIATUM, N. E. Br. Corpuscula $2\frac{1}{2}$ –5 cm. alta, compresso-oblonga, apice biloba, microscopice subpuberula, subglauco-viridia, conspicue punctata, lobis rubro-marginatis. Calyx 5-lobus, glaber; tubus in corpusculum inclusus; lobi sæpe exerti, 6 mm. longi, oblongi, obtusi, pallide virides.

Petala 40–45, patula, 3–4 seriata, circa 1 cm. longa, lutea. Stamina numerosa; filamenta pallide aurantiaca; antheræ luteæ. Stigmata 5–6, staminibus longiora, subulata, aurantiaca.

LITTLE NAMAQUALAND. Western slopes of a ridge between Daunabis and Bethany Drift, *Pearson*, 6058!

This species is allied to *M. bilobum*, Marl., but is readily distinguished by the conspicuous dots which cover the whole body of the plant. In colour it is also of quite a different and much whiter green, and the cells of the epidermis are altogether different, being developed so as to form an almost puberulous surface, slightly velvety to the touch.

M. QUÆSITUM, *N. E. Br.* Corpuscula 10–15 mm. alta, 9–13 mm. lata et 7–9 mm. crassa, late obovoidea, apice subtruncata, brevissime biloba, in carinam subacutam compressa, fissura centrali 2–4 mm. longa, microscopice subpuberula sed oculo nudo glabra, pallide viridia, distincte vel obscure punctata vel omnino immaculata. Flores ignoti.

NAMAQUALAND. Upper south-western slopes of Jackals Mountains, near Sendlings Drift, *Pearson*, 6123!

Described from living plants sent by Prof. Pearson to Kew in 1911, which have not yet flowered. It is one of the most distinct species in the group, and is allied to *M. nuciforme*, but is much smaller and has a quite different epidermal surface. Under cultivation this species varies according to the moisture, light, and soil in which it is grown; sometimes being short and sometimes globosely obovoid, with the dots very conspicuous, at others longer and more oblong-obovoid, with the dots indistinct or not visible except when held to the light.

§ CARINANTIA.

M. CARINANS, *Haw.* Stemless or nearly so, tufted. Leaves more or less incurved, the younger ascending, the older widely spreading, $4\frac{1}{2}$ –9 cm. long, 8–10 mm. broad, and about 8 mm. thick at the base, flat above, rounded on the back at the base and bluntly keeled at the upper part, acute, one leaf of each pair having the keel dilated near the tips so that the leaf is 10–12 mm. thick at that part, the other leaf tapering to an acute point without any dilation of the keel, glabrous, glaucous-green, roughish from being covered with numerous slightly prominent dark green dots. Flowers unknown to Haworth, but G. Don describes them thus:—"Flowers by threes, yellow, expanding in the evening."—*M. carinans*, Haw. Rev. p. 90 (1821): DC. Prodr. vol. iii. p. 423: G. Don, Gen. Syst. vol. iii. p. 131: Sonder in Fl. Cap. vol. ii. p. 400, not of Berger.

SOUTH AFRICA. Locality and collector unknown.

This plant Haworth states was sent to him by Salm-Dyck, and in the Kew Herbarium there is an original coloured drawing of it, labelled "*Mesemb. carinans*, Haw. Received from the Prince of Salm in the year 1823" and

dated "Nov. 21, 1823." From this drawing and Haworth's description the above is compiled, which I give here because a much smaller allied plant, entirely different in appearance, has been described by Berger as being *M. carinans*. See *M. granulatum*, N. E. Br.

M. GRANULATUM, N. E. Br. Planta acaulis vel subacaulis, basi cæspitoso-ramosa, absque floribus 3-4½ cm. alta. Folia cruciatim opposita, conferta, 2-5½ cm. longa, basi 5-7 mm. lata et 3-5 mm. crassa, attenuato-subulata, acuta, supra plana, subtus basi convexa superne carinata, carina sæpe prope apicem dilatata, glabra, dense minute granulato-tuberculata, hebetato-viridia, vix glaucescentia, tuberculis atro-viridibus vel fusco-viridibus. Pedunculus uniflorus, 4-5 cm. longus, basi bibracteatus. Bracteæ 7 mm. longæ, erectæ, acutæ. Calyx 5-lobus; lobi subæquales, revoluti, 5-7 mm. longi, 4-4½ mm. lati, oblongo-ovati, obtusi. Corolla circa 2½ cm. diametro; petala numerosa, 7-10 mm. longa, 1 mm. lata, linearia, acuta, lutea. Stamina numerosa, 3-5 mm. longa. Stigmata 5, staminibus longiora, circa 11 mm. longa, filiformia.

Plant stemless or nearly so, branching at the base and forming a clump 3-4½ (or including the flowers about 7-8) cm. high. Leaves 6-8 to a growth, cruciately opposite, crowded, connate, the outer widely spreading, the inner incurved-ascending, 2-3½ cm. long, 5-7 mm. broad and 3-4 mm. thick at the base, flat above, with obtuse side angles, rounded on the back at the base and obtusely keeled (often obliquely) at the apical part, gradually tapering from the base to an acute apex when viewed from above, and in side view most of them of about the same thickness for three-fourths of their length, then tapering to an acute point, others with the keel at the apical third dilated so that the leaf is there about 5-5½ mm. thick, acute; surface glabrous, rough, from being densely covered with minute tubercles all over, dull green, with a slight greyish (or scarcely glaucous) tint and the dot-like tubercles dark green. Perhaps when exposed to the sun in the open air the leaves may be more or less purple-tinted. Peduncle terminal, 1-3-flowered, 4-5 cm. long and about 2 mm. thick, with a pair of bracts 5-7 mm. above its base. Bracts about 7 mm. long, erect, resembling reduced leaves, acute. Calyx 5-lobed, green or reddish, tuberculate-dotted like the leaves; lobes subequal, revolute at the tips, 5-7 mm. long and 4-4½ mm. broad, oblong-ovate, obtuse, one of them narrowly membrane-margined at the apex. Corolla about 2½ cm. in diameter, but only seen when faded; petals numerous, apparently in 2-3 (or more?) series, 7-12 mm. long, 1 mm. broad, linear, acute, light yellow, not gland-dotted when dry. Stamens numerous, 3-5 mm. long. Stigmas 5 in the flower examined, free to the base, much exceeding the stamens, about 11 mm. long, filiform.—*M. carinans*, Berger, Mesemb. p. 245 (1908), not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

Described from a living plant which flowered in August, although according to Berger it also flowers in May.

This species has been mistaken by Berger for *M. carinans*, Haw., which is two or three times larger and different in general appearance, although undoubtedly allied.

§ FISSA.

M. HEATHII, *N. E. Br.* Acaulis. Folia 2 vel 4; si 2 erecta et in corpus 3-4½ cm. altum, 2-3 cm. latum et 15-20 mm. crassum, compresso-ovoideum vel oblongum obtusum ad medium vel ultra fissum connata, si 4 inferiora subpatula, glabra, albida vel albo-virentia. Pedunculus foliis subæquans compressus, 10-13 mm. latus. Calyx 7-8 lobus, glaber; lobi 6-8 mm. longi, 3½-5 mm. lati, oblongi vel ovati, obtusi. Corolla ad 4 cm. diametro; petala numerosa, 3-4 seriata, libera, 1½-2 cm. longa, ½-1½ mm. lata, linearia, obtusa, alba. Stamina numerosa in annulum erectopatentia.

SOUTH AFRICA. Ladismith Div. Between Garcias Pass and Ladismith, Pillans, 890!

Living plants of this species were sent in 1906 by Mr. N. S. Pillans to Kew, where they unfortunately soon died; a seed-pod on one of them was, however, given to Dr. F. H. Rodier Heath, after whom I have much pleasure in naming it, and who succeeded in raising a number of plants from the seeds and has subsequently distributed several of them. *M. Heathii* is allied to *M. fissum*, Haw., but is a very much larger plant and whiter in colour.

N.B.—*M. fissum* has been placed by authors under the section *Obtusa*, but it is obviously different in character from *M. fissoides*, Haw. (*M. obtusum*, Haw.), upon which that section was founded, and appears to me to have no affinity with that species, for *M. fissoides* is evidently a hard-leaved species with the fully developed leaves always spreading, and seems not to differ in any character except size from the section *Magnipuncta*; whilst *M. fissum* is a soft-leaved species, and its pair of leaves for a considerable period are closely applied to one another so as to form an oblong body cleft down the centre nearly to the base by a fissure resembling a knife-cut that divides but does not separate them.

I therefore would place *M. fissum* and its close ally *M. Heathii* in a group by themselves, for which the sectional name *Fissa* may be used.

§ FISSURATA.

M. DAMARANUM, *N. E. Br.* Corpuscula 2-3 cm. alta, 2½-3½ cm. lata et 17-23 mm. crassa, obconica, truncata, fissura transversa 6-10 mm. alta biloba, lobis apice subplanis vel levissime convexis, glabra, pallidissime brunnea vel cinereo-brunnea lineis ramosis impressis brunneis notata. Calyx exsertus, 5-lobus, compressus, 10-11 mm. latus; tubus nullus; lobi 5-6 mm.

longi, 4–5 mm. lati, ovati vel oblongi, obtusi, subrufo-brunnei. Corolla 18–20 mm. diametro; petala libera, subbiseriata, 10–12 mm. longa, $1\frac{1}{2}$ –2 mm. lata, linearia, obtusa, alba. Stamina numerosa, in columnam 4–5 mm. longam exsertam collecta; filamenta alba, antheræ luteæ.

DAMARALAND. At Omaruru and Great Namaqualand at Aus. Collectors unknown.

Described from living plants. Flowering in October and November.

M. LOCALE, *N. E. Br.* Radix 10–12 mm. crassa lignosa ramosa. Corpuscula 6–12 mm. alta et 10–15 mm. lata, obconica, apice truncata cum fissura transversa brevissime biloba, glabra. Pedicelli 6–11 mm. longi, compressi, $2\frac{1}{2}$ mm. lati, angustissime alati. Calyx 5-lobus, glaber; lobi 4 mm. longi, 2–3 mm. lati, ovati vel oblongi, obtusi. Petala libera, circa 35, laxa, 8 mm. longa, $\frac{3}{4}$ mm. lata, linearia, obtusa. Stamina numerosa. Stylus brevissimus vel subnullus; stigmata 5, filiformia, 2 mm. longa.

BEAUFORT WEST DIV. Near the Gamka River, *Burke*!

Described from a unique dried specimen in the Kew Herbarium. When alive the growths may be larger than the above measurements indicate, but as the pedicels of the flowers of this group are usually about as long as the growths, it is doubtful if they will be greatly exceeded, so that this species will therefore be one of the smallest of the group.

M. MARMORATUM, *N. E. Br.* Corpuscula 2– $2\frac{1}{2}$ cm. alta, 2– $2\frac{1}{2}$ cm. lata et 15–18 mm. crassa, subobconica, apice truncata, biloba, cum fissura transversa 10–12 mm. alta, levia, glabra, apice lactea et viride marmorata, lateribus leviter cinereo-violaceo tincta. Flores (fide *Pillans*) albi.

SOUTH AFRICA. Locality not stated, *Pillans*!

Described from living plants that have not yet flowered.

§ LINGUIFORMIA.

From the many investigations I have made of this group I have become convinced that it requires complete revision, with adequate modern descriptions made from living plants that undoubtedly grow wild in South Africa; for many of those now in cultivation in Europe under the names of various species published by Haworth that have come under my notice are not those species at all, but either other species or more probably hybrids raised from seeds produced in European gardens masquerading under names that do not belong to them. I think some or perhaps several of the species described by Haworth have died out of cultivation and these hybrids have gradually filled their places. It may be from this cause that Berger in his monograph of the genus places several perfectly distinct species as varieties of *M. linguiforme*, which in his work is a composite species and not confined to the typical *M. linguiforme*, Linn. It should also be noted that some of Salm-

Dyck's figures of this group are incorrectly named, as drawings of Haworth's typical plants at Kew clearly demonstrate. These plants hybridise freely, but with me fail to produce seeds when fertilised with their own pollen, as they seem to require to be cross-fertilised, so that seeds obtained from a nursery or any source where every care has not been taken to prevent hybridisation are quite likely to produce hybrids for the unsuspecting cultivator instead of the typical species.

The type species of this group is *M. linguiforme*, Linn., which was founded upon a plant figured and described by Dillenius as *M. folio scalprato*. Under this species Linné enumerates three varieties, which he called vars. β , γ , and δ , without giving them names, all founded upon plants figured and described by Dillenius. As these four plants of Dillenius certainly do not all belong to one species, Haworth separated them and gave each a distinct specific name; for they differ from one another in appearance, in the size and shape of their leaves, in details of their flowers, and in their capsules and seeds. In modern monographs the distinctive characters of their capsules and seeds are ignored. Of these four species I have only seen seeds of the true *M. linguiforme*, Linn., which is remarkable in having the tubercles upon them covered with a minute pubescence as seen under a microscope—a structure that I have not seen on any other species in the genus that I have examined. I have examined seeds of some of the garden hybrids that are cultivated under the name of *M. linguiforme*, but they are quite different.

Unfortunately, when Haworth separated these plants specifically he selected the variety β of Linné as being the type of *M. linguiforme*, and gave a new name to the Linnean type of that species. Willdenow corrected this error, but other authors have copied and perpetuated without investigation the mistake made by Haworth. The correct synonymy of these four plants as I understand it is as follows:—

M. LATUM, Haw. Obs. p. 186 (1794); Misc. p. 32; Synop. p. 220; & Rev. p. 98; Willd. Sp. Pl. vol. ii. p. 1026; DC. Prodr. vol. iii. p. 422; Berger, Mesemb. p. 241 under *M. linguiforme* var. *obliquum*, Berger. *M. medium*, Haw. Suppl. p. 88 (1819); & Rev. p. 95; DC. Prodr. vol. iii. p. 421. *M. lingueforme*, Lodd. Bot. Cab. t. 1307, not of Linnæus. *M. linguiforme* var. β , Linn. Sp. Pl. ed. 1, p. 488 (1753). *M. linguiforme* var. *lata*, Weston, Univ. Bot. vol. i. p. 172 (1770), corrected to var. *latum*, Weston, English Fl. p. 162 (1775); Salm-Dyck, Mesemb. § 8, fig. 8 β : Sonder in Fl. Cap. vol. ii. p. 404. *M. folio linguiformi latiore*, Dill. Hort. Elth. p. 236, t. 184, fig. 225, not fig. 226 as quoted by Linnæus.

SOUTH AFRICA. Locality and collector of the type unknown, but probably from the southern coast region (see under *M. medium*, p. 132).

According to an original coloured drawing at Kew of the typical *M. medium*, which was described from a plant introduced by Burchell, there

appears to me no doubt whatever that it should be referred to *M. latum* ; for this drawing seems to me to represent exactly the same species as that figured by Dillenius above quoted, but I have not seen it. The locality where *M. medium* grows (see p. 133) is one from which the Dillenian plant might also have been obtained, as it was quite accessible to the older collectors.

M. LINGUIFORME, Linn. Sp. Pl. ed. 1, p. 488 (1753) : Weston, Univ. Bot. vol. i. p. 172 : & Willd. Sp. Pl. vol. ii. p. 1026, not of other authors. *M. linguæforme*, Spreng. Syst. Veg. vol. ii. p. 514. *M. scalpratum*, Haw. Obs. p. 187 (1794) ; Misc. p. 32 ; Synop. p. 220 ; & Rev. p. 94 : Salm-Dyck, Mesemb. § 8, fig. 1 : DC. Prodr. vol. iii. p. 421, excluding syn. *M. obliquum*, Willd. : Sonder in Fl. Cap. vol. ii. p. 402. *M. linguiforme* var. *scalpratum*, Berger, Mesemb. p. 242, fig. 51, copied from Salm-Dyck's figure. *M. folio scalprato*, Dillen. Hort. Elth. p. 235, t. 183. fig. 224.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation before 1732.

I think it very probable that *M. lucidum*, Mill. Diet. ed. 8, no. 43 (1768), is a synonym of this species. Miller thus describes it : " Mesembryanthemum without a stalk, and tongue-shaped lucid leaves, indented at the top." And as *M. linguiforme*, Linn. was in cultivation at that time, and is well marked by having a sort of notch near the top of the upper margin of many of its very broad and particularly tongue-shaped leaves, I think it most probable that *M. lucidum*, Mill. is the same plant, in spite of the fact that Miller also enumerates *M. linguiforme*, Linn. But it is certain that Miller did not possess all the species he enumerates, but included in his Dictionary plants that were in cultivation that had been described by other authors, and he did not always recognise the plant he had as being the same as one described by another author, and I think his *M. lucidum* is a case in point. The *M. lucidum* of Haworth is certainly a different plant, and, I believe, is only a variety of *M. longum*.

M. LONGUM, Haw. Obs. p. 177 (1794) ; Misc. p. 34 ; Synop. p. 221 ; & Rev. p. 96, excluding varieties : Willd. Sp. Pl. vol. ii. p. 1027 : DC. Prodr. vol. iii. p. 421 : Sonder in Fl. Cap. vol. ii. p. 404. *M. linguiforme*, DC. Pl. Grass. t. 71, not of Linnæus. *M. linguiforme* var. δ , Linn. Sp. Pl. ed. 1, p. 488. *M. linguiforme* var. *longa*, Weston, Univ. Bot. vol. i. p. 172 (1770). *M. linguiforme* var. *longum*, Weston, English Fl. p. 162 (1775) : Berger, Mesemb. p. 240, excluding all varieties. *M. folio linguæformi longiore*, Dill. Hort. Elth. p. 238, t. 185. fig. 227.

SOUTH AFRICA. Locality and collector unknown. Introduced before 1732.

M. longum var. *flaccidum*, Haw. Synop. p. 222 ; *M. lucidum*, Haw. Suppl. p. 89, not of Miller, may be a variety of *M. longum*, as Haworth originally

considered it to be. I have not seen it, but the true *M. longum* existed formerly in the collection of Mr. Wilson Saunders of Reigate; all the other specimens cultivated under this name that I have seen are not that species at all, having long widely spreading (instead of ascending) leaves, and are possibly only garden hybrids.

Berger, Mesemb. p. 240, quotes Salm-Dyck, Mesemb. § 8, fig. 9, as representing this species, but so far as I have been able to discover, Salm-Dyck never published such a figure. He did, however, publish a plate numbered § 8, fig. 9 β , representing a plant which he named *M. longum* var. *declivum*, which is quite different from *M. longum*. So if Berger intends this plate and this plant by his quotation, the reference to Salm-Dyck's work above quoted must be erased, for Salm-Dyck's plant is certainly not *M. longum*, Haw.

M. OBLIQUUM, Willd. Sp. Pl. vol. ii. p. 1027 (1799): Spreng. Syst. Veg. vol. ii. p. 514. *M. lingueforme*, Haw. Obs. p. 182. *M. lingueforme*, Haw. Misc. p. 33; Synop. p. 221; & Rev. p. 97, excluding varieties: DC. Prodr. vol. iii. p. 422, not of Linnæus. *M. linguiforme* var. γ , Linn. Sp. Pl. ed. 1, p. 488. *M. linguiforme* var. *angusta*, Weston, Univ. Bot. vol. i. p. 172 (1770). *M. linguiforme* var. *angustum*, Weston, English Fl. p. 162 (1775). *M. folio lingueformi angustiore*, Dill. Hort. Elth. p. 237, t. 184. fig. 226, not p. 238, t. 185 as quoted by Linnæus.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation before 1732.

The plant figured and described by Salm-Dyck, Mesemb. § 8, fig. 8, by Mordant de Launy and Loiseleur Deslongchamps, Herb. Gen. de l'Amateur, vol. i. t. 66, and by Drapiez, Herb. de l'Amateur, vol. iv. t. 229, under the name of *M. lingueforme*, Haw., seems to be the plant that Sonder in Fl. Cap. vol. ii. p. 404 has described under that name, and Berger, Mesemb. p. 241, under the name of *M. linguiforme* var. *obliquum*. But it is certainly not the true *M. obliquum*, Willd. (*M. lingueforme*, Haw.), which names were both founded upon the plant figured by Dillenius above quoted. That figure is a very fair representation of the plant, which is not at all like the plant of Salm-Dyck and Berger, being smaller and quite different in its appearance. Haworth (Obs. p. 185) mentions as a proof of its distinctness from the other species he had of this group, that the numerous seedlings he raised from it were always "exactly like their parents in every particular."

For *M. obliquum*, Haw. and other authors, see *M. lique*, N. E. Br., p. 103.

§ MAGNIPUNCTA.

M. OPTATUM, N. E. Br. Planta acaulis, 5-6 cm. alta, basi ramosa. Folia sæpe 4, æqualia, patula, $2\frac{1}{2}$ -5 cm. longa, 7-11 mm. lata et 7-10 mm. crassa inferne semicylindrica, superne obtuse trigona, supra plana ve convexa subtus leviter et obtuse carinata, glabra, viridia, punctis atroviridibus dense

sed inconspicue notata, apice ad angulos purpureo-tincta. Flos sessilis, bibracteatus. Bracteæ 5-6 mm. longæ, 4-5 mm. latæ, ovatæ obtusæ vel subacutæ, obtuse carinatae. Calyx campanulatus, 5-lobus; tubus 6-7 mm. longus, $6\frac{1}{2}$ -7 mm. diametro; lobi 4-5 mm. longi, ovati, obtusi, revoluti. Corolla $3\frac{1}{2}$ -4 cm. diametro; tubus nullus; petala 50-60, subbiseriata, 25 mm. longa, $1\frac{1}{2}$ - $1\frac{3}{4}$ mm. lata, spathulato-lineararia, apice sæpe obtuse dentata, lutea, basi alba. Stamina numerosa; filamenta alba; antheræ luteæ. Stylus nullus; stigmata 10-11, staminibus subæquilonga, filiformia, flavida.

Nearly stemless, branching at the base, 5-6 cm. high. Leaves 4 or occasionally 2 to each growth or branch, equal, ascending-spreading, $2\frac{1}{2}$ -5 cm. long, 7-11 mm. broad, and 7-10 mm. thick, of about equal breadth and thickness throughout, flat or convex on the upper side, with obtusely rounded margins, very rounded on the back, obtusely or obscurely keeled at the apical part, obtuse or subacute and trigonous at the apex, smooth, glabrous, dull green, thickly but inconspicuously dotted with darker green, and tinted with purplish at the apical part. Flower solitary, terminal, sessile, with a pair of small sessile bracts at its base 5-6 mm. long and 4-5 mm. broad. Calyx cup-shaped, 5-lobed, smooth, glabrous; tube 6-7 mm. long and $6\frac{1}{2}$ -7 mm. in diameter, pale green; lobes revolute or reflexed, 4-5 mm. long, 3-5 mm. broad at the base, ovate, obtuse. Corolla $3\frac{1}{2}$ -4 cm. in diameter, scentless; petals 50-60, free, in about 2 series, spreading, later in the day becoming revolute, 25 mm. long and $1\frac{1}{2}$ - $1\frac{3}{4}$ mm. broad, spathulate-linear, often obtusely toothed at the apex, bright yellow, white at the base. Stamens numerous, at first collected into a cylindric or slightly conical dense bundle about 6 mm. long, finally some of the outer stamens separate from the bundle and stand erect around it; filaments white; anthers deep yellow. Style none; stigmas 10-11, about 6 mm. long, filiform, pale yellowish.

SOUTH AFRICA. Locality unknown, *Simpson-Hayward*!

Described from a living plant brought to Kew in 1910 by Mr. G. H. Simpson-Hayward, who collected this and other species during a cricketing tour in South Africa. Allied to *M. sororium*, N. E. Br., differing in having more ascending, smaller, and differently coloured leaves, which differ also in transverse section, and by its flowers being sessile.

M. SORORIUM, N. E. Br. Planta nana, 7-10 cm. alta, basi ramosa, ramis 6-8 mm. crassis. Ramuli 4-6-foliati. Folia $3-6\frac{1}{2}$ cm. longa, 11-15 mm. lata, basi 8-12 mm. crassa et prope apicem 9-13 mm. crassa, late patula, vel interiora adscendentia, supra plana vel leviter concava, dorso basi convexa, superne obtuse carinata, obtusa, glabra hebetato-cinereo-viridia, ubique punctis atroviridibus dense conspersa. Pedunculus 2 cm. longus, basi 4 mm. crassus, superne incrassatus, basi breviter bibracteatus viridis punctis magnis prominulis parce conspersus. Calyx 6-lobus; lobi subæquales, circa 10 mm. longi et 5 mm. lati, ovati, obtusi vel dorso breviter apiculati, punctati.

Corolla 5–6 cm. diametro ; petala numerosissima, 4–5-seriata, exteriora $2\frac{1}{2}$ –3 cm. longa, $1-1\frac{1}{4}$ mm. lata, linearia, apice acuta, obtusa vel denticulata, lutea, dorso albida et apicem roseo-tincta. Stamina numerosissima, in annulum collecta ; filamenta et antheræ lutea. Stigmata 10–14, filiformia, staminibus longiora, basi radiata, deinde erecta, pallide lutea.

A dwarf plant forming clumps about 7–10 cm. high, with short branching stems 6–8 mm. thick. Leaves 4–6 to a growth, all ascending or the outer widely spreading, very stout, $3-6\frac{1}{2}$ cm. long, 11–15 mm. broad, 8–12 mm. thick at the base and 9–13 mm. thick near the apex, straight or occasionally slightly incurved and often curved to one side, flat or slightly convex on the upper side, rounded on the back at the base and obtusely keeled at the upper part, viewed from above with nearly parallel sides or slightly widened upwards to the middle or for three-fourths of their length, then tapering to a bluntly-pointed apex, and in side view usually slightly thicker near the apex than at the base, glabrous, dull grey-green, densely and conspicuously dotted with dark green all over the upper surface and back ; the dots slightly prominent, viewed under a lens. Peduncle 1-flowered, 2 cm. long, 4–5 mm. thick at the base, thickening upwards, terete, not at all flattened, with two bracts 6–18 mm. long at its very base, light green, with some slightly darker green dots scattered along it. Calyx 6-lobed ; lobes subequal, about 10–12 mm. long and 5–6 mm. broad, ovate, acute or obtuse, with a short dorsal point just below the tip, some of them with membranous margins, green or perhaps sometimes purplish-tinted, dotted with darker green. Corolla 5–6 cm. in diameter, expanding late in the afternoon ; petals more than 100, in 4–5 series, the outer about $2\frac{1}{2}$ –3 cm. long, the inner shorter, $1-1\frac{1}{4}$ mm. broad, linear, acute or obtuse or some of them notched at the apex, rich yellow and slightly shining on the inner face, whitish and tinted with rosy at the apex on the back. Stamens very numerous, at first erect, then erectly-spreading, somewhat in a circle so as to leave a central space in which the base of the stigmas can be seen ; filaments yellow above, whitish at the base ; anthers deep yellow. Style none ; stigmas 10–14, arising from the stout conical grooved top of the ovary, filiform, 10 mm. long, much longer than the stamens, radiately spreading at the base, then erect, covered with short hair-like papillæ or processes all along their inner face and of a paler greenish-yellow than the anthers.

SOUTH AFRICA. Locality and collector unknown.

Described from a living plant which was sent to me by Dr. F. H. Rodier Heath, who received it from a friend in South Africa, and believes that it was collected in the Karoo region, possibly in Ceres Division.

This species is allied to *M. magnipunctatum*, Haw., from which it differs by its smaller leaves marked with smaller and less conspicuous dots, and by its distinct peduncle, the flowers of *M. magnipunctatum* being sessile. From *M. optatum*, N. E. Br. it differs by its larger and very much more spreading leaves, which are more distinctly triangular in transverse section ; the flowers are also larger and distinctly pedunculate.

§ OBTUSA.

M. fissoides, Haw. (Pl. 10. fig. 40). Stems of old plants prostrate or underground, up to 5 cm. long, with very short branches, or plant nearly stemless, branching at the base. Leaves 2-4 to a growth, unequal, 17-25 mm. long, 6-8 mm. broad, and 5-6 mm. thick at the base, one of each pair a little longer than the other, viewed from above linear-oblong or of nearly equal breadth for the greater part of their length and rather shortly narrowed to an obtuse apex according to the figure, but according to Haworth "slightly attenuated at both ends *particularly* downwards" (he may, however, have meant when viewed from the side), semiterete, flat on the upper side, rounded on the back, the larger of each pair often dorsally thickened near the apex or subgibbous, "not glaucous but subglaucous or greenish with an obsolete bluish tint," or "rather of a bluish green than a glaucous colour." Flower solitary, terminal, nearly sessile, with two leaf-like bracts at its base. Calyx thick, 6-lobed; lobes subequal, obtuse, some of them with membranous margins, reflexed when the flower is fully expanded. Corolla large and showy, expanding in the morning, with the facies of that of *M. linguiforme*, Haw. (not of Linn.), but the petals are somewhat revolute, much narrower, more than 1 in. (25 mm.) long, acute or emarginate at the apex, bright red or purple, somewhat paler at the base, and more distant (more lax) than in most species. Stamens erect; filaments white, slightly tinted with reddish on the upper part; anthers white or slightly yellowish. Stigmas 6, recurved above, white.—*M. fissoides*, Haw. Obs. pp. 135, 450 (1794); *M. obtusum* (a mere change of name for *M. fissoides*), Haw. Misc. p. 25 (1803); Synop. p. 206; & Rev. p. 86; Ait. Hort. Kew. ed. 2, vol. iii. p. 214; DC. Prodr. vol. iii. p. 418; Don, Gen. Syst. vol. iii. p. 127; Sonder in Fl. Cap. vol. ii. p. 394; Berger, Mesemb. p. 273.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1792.

Haworth (Obs. p. 135) states that this species is very much like *M. fissum*, Haw., but much less glaucous. I have not seen it, but judging from the drawing of it at Kew (copied on Pl. 10), which was made from the Kew plant and therefore typical, it would appear to be a species of much firmer substance than *M. fissum*, which is soft and somewhat pulpy. The habit also is not much like that of *M. fissum*, as the leaves are larger and widely spreading. It appears to me that *M. fissoides* should be placed in the same group as *M. magnipunctatum*. Haworth seems to have changed the specific name from mere caprice, no reason being given for having done so. The above description is compiled partly from those of Haworth and partly from the drawing at Kew, which is labelled "*M. obtusum*, Haw. March 22nd, 1825." Haworth states that it is a very delicate species, very liable to be killed by too much moisture.

§ RINGENTIA.

M. ERMININUM, *Haw.* Plant very dwarf, forming tufts from the short growths or branches being crowded together, each 10–25 mm. high, including the flower. Leaves 6–8 to each flowering growth, crowded, ascending-spreading, 9–13 mm. long, 5–8 mm. broad, and 4–6 mm. thick near the apex, where they are about twice as thick as at the base, oblong or very slightly narrowed at the base, obtuse or obtusely pointed, flat above, with 2–3 small conical acute teeth on each margin at the apical half, keeled on the back at the upper part and rounded at the base, the entire surface rough from being thickly covered with minute conical tubercles, greyish-green, not shining. Flower solitary, terminal, sessile, or with the pedicel very much shorter than the leaves. Calyx 5-lobed; tube somewhat pear-shaped, very shortly campanulate above the ovary, slightly compressed, green, rather thinly sprinkled with more or less elongated and slightly prominent dark green dots; lobes revolute, 6–7 mm. long, 3–4 mm. broad. Corolla about 3 cm. in diameter, expanding about 6 P.M., closed during the day, somewhat half-globose, from the varying position of the petals, very faintly scented; petals very numerous, in 5–6 series, somewhat lax, the outermost series about 12 mm. long, very widely spreading or more or less bent downwards, the other series less and less spreading and the innermost erect and about 8 mm. long, all about $\frac{1}{2}$ mm. broad and slightly incurved, very narrowly linear, acute, of a bright rich clear yellow on both sides, or reddish at the tips on the back, slightly shining. Stamens numerous, about 5–6 mm. long, erect and clustered, surrounded by the erect innermost petals and shorter than them; filaments and anthers yellow. Style about 1 mm. long, rising from the conical top of the ovary; stigmas 5, about $1\frac{1}{2}$ mm. long, stout, contiguous, collected into a head about 2 mm. in diameter, pale green.—*M. ermininum*, Haworth in *Phil. Mag.* 1826, p. 127: Salm-Dyck, *Mesemb.* § 5, fig. 6 (the rough surface of the leaves badly represented): Sonder in *Fl. Cap.* vol. ii. p. 398: Berger, *Mesemb.* p. 272.

SOUTH AFRICA. Cradock, *Mrs. Bottomley* (*Pole Evans*, 1427)! Introduced by *Bowie* about the year 1823.

As this very distinct and interesting species is not well known, I here give a more complete description of it than exists in books. Its rough leaves are unlike those of any other species known to me and readily distinguish it from its allies. It is also somewhat remarkable as being one of the few night-flowering species with bright yellow flowers. The pose of the petals is described as I saw them between half-past eight and nine o'clock (Greenwich time) in the evening of July 14, 1918, when, from the various series of petals spreading at different angles, the flower was half-globose in form and exceedingly pretty, but whether it expands more fully at a later hour I do not know, as I was unable to observe it further that night, and the next morning I found it had been destroyed by some insect. As I was

unable to see the style and stigmas that evening, they are described as I saw them in the partly devoured flower, so that they may not be quite as they were in the fully expanded flower or at maturity.

M. FELINUM, *Hill*. In all the monographs of this genus the authority for this name is credited to Haworth : there are, however, three much earlier publications of the name, two of them being quoted by Haworth himself. All authors have founded the name upon the plant figured by Dillenius as quoted below, the correct citation for this species being as follows :—

M. FELINUM, *Hill*, *Hort. Kew.* p. 155, name only (1769) : *Weston*, *Univ. Bot.* vol. i. p. 172, with description (1770) : *Lam. Encycl.* vol. ii. p. 486 (1786) : *Haw. Obs.* p. 161 (1794) ; *Misc.* p. 31 ; *Synop.* p. 216 ; & *Rev.* p. 89 : *Ait. Hort. Kew.* ed. 2, vol. iii. p. 218 : *DC. Pl. Grass.* t. 152 (not 158 as quoted by authors) ; & *Prod.* vol. iii. p. 419 : *Salm-Dyck*, *Mesemb.* § 5. fig. 2 : *Don*, *Gen. Syst.* vol. iii. p. 128 : *Sonder in Fl. Cap.* vol. ii. p. 397 : *Berger*, *Mesemb.* p. 267, f. 58. *M. ringens* var. *felinum*, *Linn. Sp. Pl.* ed. 1, p. 487 (1753). *M. rictum felinum representans*, *Dillen. Hort. Elth.* p. 240, t. 187. fig. 230 (1732).

SOUTH AFRICA. Locality and original collector unknown. It was, however, also sent into this country about 1860 by Mr. T. Cooper, who did not remember where he collected it, but thought that it was somewhere between the Port Elizabeth and Albany districts, where the Dillenian plant was quite likely to have been collected.

Miller, in his *Dictionary*, ed. 8, no. 40, has united this species (by reference only, not by name) with *M. rostratum*, *Linn.*, so that it is probable that he did not know either of these two utterly different species. I have reason to believe that South African botanists confuse *M. felinum* with *M. tigrinum*, *Haw.* When seen growing side by side, the typical plants are certainly very distinct and can be recognised at a glance, but there are hybrids between the two species or between *M. tigrinum* and some other species raised from seeds in Europe and perhaps also in South Africa that vary immensely and have caused the names to be used indiscriminately. The true *M. felinum* has from 4–6 teeth on each side of the leaf, which is not quite so much spotted as in *M. tigrinum*, and is somewhat lanceolate in outline, viewed from above. *M. tigrinum* has much broader leaves that are somewhat abruptly widened near the middle, with 9–12 teeth on each side, and are conspicuously and thickly spotted with white.

§ ROSTRATA.

In this group it may be well to explain that when in late autumn and winter the vegetating period commences, the first growth that develops from the old pair of leaves is usually a flowering growth, and often has a

much longer cylindrical basal part than the vegetative growth that afterwards develops by the side of it. In the following descriptions the longest measurement of the cylindric body that is given usually refers to this flowering growth. Generally one vegetative growth only is formed, but occasionally two are developed, one on each side of the base of the flowering growth from the axils of the two old leaves. If the flower fails to develop, as frequently happens in this country from want of sunlight and heat, then the flowering growth subsequently develops a vegetative growth, and may possibly do so even when flower and fruit are formed, but of this I have no evidence.

M. BIBRACTEATUM, Haw. (Pl. 6. fig. 14). Stemless or nearly so, branching at the base. Leaves 6–8 cm. long, 8–10 mm. broad and 6–8 mm. thick at the base, thence, viewed from above, gradually tapering to an acute apex, and in side view of nearly equal thickness throughout, with one leaf of each pair acute or subacute and the other more or less dorsally rounded at the apex, flat on the upper side, rounded on the back at the basal part and keeled at the apical part, apiculate, each pair united at the base into a cylindric body or sheath 13–25 mm. long; surface smooth, glabrous, but probably with the keel and margins at the apical part very minutely puberulous-ciliate, glaucous-green, thickly dotted with dark green. Peduncle 10–12½ cm. long, according to Haworth with 4 bracts in two pairs, always much shorter than it, but the lower pair is really the pair of leaves from between which the peduncle arises, the true bracts (represented in bud on the Kew drawing, copied on Pl. 6. fig. 14) are placed a little below the middle of the peduncle, and are united into a sheath for half their length, their free portions very much shorter than the peduncle, 2–2½ cm. long, leaf-like, acute. Calyx usually 5-lobed. Corolla about 4 cm. in diameter, closed at night; petals in about 3 series, yellow. Stamens numerous. Stigmas 10, as long as the stamens and finally longer than them, subulate, erect, with spreading tips.—*M. vibracteatum*, Haw. Synop. p. 213 (1812); & Rev. p. 92. *M. rostratum* var. *brevibracteatum*, Salm-Dyck, Mesemb. § 3, fig. 7β.

SOUTH AFRICA. Locality and collector unknown. Introduced into cultivation about the year 1803.

The above description is compiled partly from the account of it given by Haworth (all the characters given in his description being included), partly from Salm-Dyck's excellent figure of the plant in flower.

Haworth's description of this species is to a great extent a comparison of its characters with those of the plant he called *M. rostratum* (*M. tuberculatum*, Mill.), not the true *M. rostratum*, Linn. Haworth states that *M. vibracteatum* is very like his *M. rostratum* but a little more robust (whereas the true *M. rostratum*, Linn. is much stouter than *M. vibracteatum*),

the leaves more glaucous, with fewer and larger dots, the peduncle longer, the bracts always much shorter (instead of being as long as or longer) than the peduncle, the calyx usually 5-lobed instead of always 4-lobed, the petals longer and more slender, the stamens larger and not hidden, and the stigmas, 10 (not 8), as long as or longer than the stamens, with spreading tips instead of very short and incurved, as they are in the plant Haworth understood as *M. rostratum*.

The relative amount to which the leaves become glaucous or green depends upon the amount of direct sunlight they receive ; so that to contrast this character with that of another species is not always of any value, unless both plants are grown side by side and equally exposed to light. Salm-Dyck's figure of this species is excellent.

Fig. 14 is copied from a drawing at Kew, labelled "*Mesembr. bibracteatum*, Haw. March 26. 1825."

M. BIFIDUM, Haw. (Pl. 9. figs. 34-35). Nearly stemless or with age developing short stems 4-5 mm. thick, branching at the base. Leaves subequal, mostly 4-5 cm. long, 6-10 mm. broad and 5-8 mm. thick at the base, and of about the same thickness throughout, viewed from above gradually tapering from the base to an acute or somewhat obtuse apex, and in side view both leaves equally more or less obtusely rounded at the apex or one leaf more acute than the other, flat above, rounded on the back at the basal part and keeled at the apical part, very shortly or scarcely apiculate, with the keel at the apex cartilaginous, semitransparent and minutely denticulate, each pair united at the base into a cylindric body or sheath 13-20 cm. long ; surface smooth, glabrous, with the keel at the apex and sometimes (but not always) the margins microscopically puberulous-ciliate, of a bluish glaucous-green, thickly dotted all over, on the upper side as well as on the back with dark green, the united part or sheath usually more or less purplish or sometimes deep purple, or in winter of a lighter green than the leaves and very shining, the leaves being dull. Peduncle 8-10 cm. long, green or tinted with reddish, with a pair of bracts at its base 2-2½ cm. long, quite like the leaves. Calyx 4-lobed, the two outer lobes 10-12 mm. long, leaf-like, keeled, dotted, the two inner about 7 mm. long, with broad membranous margins, mucronate at or behind the apex. Corolla about 3½ cm. in diameter, expanding in the morning or about mid-day ; petals numerous, in about 3 series, the outer about 13-15 mm. long, the inner shorter, linear, acute, yellow. Stamens numerous, in several series, erect, not converging, the outer about 7 mm. long, somewhat spreading from the rest, the inner shorter, anthers whitish. Stigmas 8-10, erect or incurved, 3 mm. long, much shorter than the stamens, subulate, pale yellowish.—*M. bifidum*, Haw. Misc. p. 29 (1803) ; Synop. p. 212 ; & Rev. p. 92 : Ait. Hort. Kew. ed. 2, vol. iii. p. 216 : Sonder in Fl. Cap. vol. ii. p. 394 :

Berger, Mesemb. p. 258. *M. multipunctatum*, Salm-Dyck, Hort. Dyck. p. 357 (1834); & Mesemb. § 3, fig. 6: Sonder in Fl. Cap. vol. ii. p. 395: Berger, Mesemb. p. 257.

SOUTH AFRICA. Locality and collector unknown. In cultivation in 1795 according to Haworth.

The drawing of this species at Kew (partly copied on Pl. 9) was made on "March 25, 1825," and is not very characteristic of the plant, being made at the end of the winter season before it had attained its proper growth. At the same period of the year I have seen the plant with exactly the appearance represented by the drawing, although later in the season it resumed the appearance so well shown in Salm-Dyck's figure of *M. multipunctatum*, which is certainly the same species as *M. bipidum*. Salm-Dyck states that *M. multipunctatum* is near *M. denticulatum*, but it bears no resemblance whatever to that species either in shape or colour, so that the *M. denticulatum* of Salm-Dyck is probably totally different from the plant Haworth described under that name.

The name *bipidum* was given to this plant because the first flower that Haworth saw had an abnormal 2-lobed calyx. He subsequently found that the calyx was 4-lobed, which is its normal condition.

M. CANDIDISSIMUM, N. E. Br. (Pl. 7. figs. 25-26). Planta acaulis 6-13 cm. alta, basi ramosa, candida. Rami 2-4-foliati. Folia 2-9½ cm. longa, basi 8-14 mm. lata et 6-14 mm. crassa, deinde ad apicem acutum attenuata, supra plana, dorso basi rotundata, superne obtuse carinata, carina apice dilatata, alia integra, alia apice dorso dentata, omnino candida. Pedunculus 4-7 cm. longus, 3-4 mm. crassus, basi bibracteatus. Bracteæ foliiformes, integræ, 1-4 cm. longæ. Calyx 5-6-lobus; lobi 10-15 mm. longi, 8-10 mm. lati, elliptico-ovati, acuti vel obtusi, quorum tres membranaceo-marginati. Corolla 5-6 cm. diametro; petala numerosa, 3-4 seriata, 10-25 mm. longa, linearia, apice acuta vel bidentata. Stamina numerosa, erecta, 4 mm. longa. Stigmata circa 17-19, erecta, circa 2 mm. longa, acuta.

Plant 6-13 cm. high, stemless, branching at the base. Leaves 2-4 to each growth, with the alternating pairs dissimilar; one pair entire at the apex and one of them more pointed than the other, the other pair with 1-5 teeth on the dilated keel at the apex; in the living plant seen and figured the toothed leaves are 2-3 cm. long, 8-10 mm. broad and 8 mm. thick at the base, and 10-12 mm. thick where the keel is dilated at the compressed apex, and the entire leaves are 3½-5 cm. long, 8-10 mm. broad and 6-7 mm. thick at the base, but according to dried specimens and the figure given by Mrs. Bolus, quoted below, on some plants they are 7-10 cm. long, 10-14 mm. broad and as much in the thickness at the base, the inner leaves erect, the outer more or less spreading, flat on the upper side and

gradually tapering from the base to an acute and usually mucronate apex, very convex on the back at the basal part and keeled at the apical part, and the keel more acute and more dilated on the toothed than on the entire leaves, at the base united into a cylindrical body or sheath 10–25 mm. long; surface smooth, but appearing under a strong lens to be microscopically somewhat granular or very minutely papillate, not puberulous, entirely white or whitish, but when viewed with a lens faint scattered pallid dots can be seen on the back and along the margins. Flowers not seen on the living plant, but according to the dried specimens and the figure quoted, the peduncle is 4–7 cm. long and 3–4 mm. thick, with two leaf-like entire bracts 1–4 cm. long at its base. Calyx 5–6-lobed; lobes about 10–15 mm. long and 8–10 mm. broad, elliptic-ovate or ovate, acute or obtuse, three of them with broad membranous margins. Corolla 5–6 cm. in diameter; tube none; petals numerous, very spreading, in three to four series, the inner gradually smaller, 10–25 mm. long, linear, acute or notched at the apex, “white to pale pink” (*vide* Pearson). Stamens numerous, erect, in a dense cluster 10–12 mm. in diameter and about 4 mm. long. Stigmas 17–19 or perhaps sometimes fewer, about 2 mm. long, subulate, acute, erect. Capsule 17–19-celled. Seeds smooth, shining, pale brownish.—*M. denticulatum* var. *candidissimum*, Haw. Obs. p. 151 (1794); Synop. p. 216; & Rev. p. 91: L. Bolus in Ann. S. Afr. Mus. vol. ix. p. 142 with fig., and pl. 3. fig. B.

LITTLE NAMAQUALAND. Stinkfontein, *Pearson*, 5556! 6432! Eenriet, *Pearson*, 4068! 4072!

My drawing was made from a living plant of *Pearson's* 5556, cultivated at Kew, but the plant figured by Mrs. Bolus (*Pearson* 6432) is a larger form, stated to be from the same locality, the actual specimen from which her figure was made being now in the Kew Herbarium. The Eenriet specimens are smaller, and similar to the specimen I have figured. The white surface of the leaves is peculiar in its texture.

Haworth does not state who introduced the plant at Kew, but in all probability it was sent home by Masson.

M. DENTICULATUM, *Haw.* (Pl. 9. fig. 33). Stemless. Leaves about 2 in. (5 cm.) long, somewhat curved inwards, the upper part compressed-triquetrous, dilated and keeled and often with 1–2 teeth on the back at the apex, somewhat attenuate downwards and towards the base, becoming rounded on the back, united at the base, dull whitish, rather hoary than glaucous, very slightly pubescent under a microscope. Flowers unknown.—*M. denticulatum*, Haw. Obs. p. 149 (1794); Misc. p. 30; Synop. p. 215; & Rev. p. 91: Ait. Hort. Kew. ed. 2, vol. iii. p. 217.

Var. *GLAUCUM*, *Haw.* Leaves broader (probably thicker from front to back is meant) at the points than in the type, very glaucous or glaucous-white, 2–3 toothed at the apex. Peduncles 4 in. (10 cm.) or more long, with

two leaf-like 2-toothed bracts at its base. Calyx 5-lobed; lobes parabolic, more equal than in most species, 3 of them more or less membranous. Corolla 3 in. ($7\frac{1}{2}$ cm.) in diameter, petals narrow, acute or rarely bifid at the apex, pale straw-coloured, with the basal part white for a good way up, tinted on the back at the apical part with very pale rosy, very shining. Stamens numerous, 3 lines (6 mm.) long, the outer erectly-spreading, the inner crowded; filaments white; anthers straw-coloured, not shining. Stigmas about 15, hidden among the stamens, connivent, short, plumose-subulate, yellowish-green.—*M. denticulatum* var. *glaucum*, Haw. Obs. p. 151 (1794); Synop. p. 215; & Rev. p. 91.

SOUTH AFRICA. Locality unknown, introduced in 1793 by Grimwood and Wykes, who raised it from seeds sent to them from South Africa.

According to the drawing at Kew, labelled "*Mesm. denticulatum*. Aug. 23rd, 1826" (copied on Pl. 9), the leaves are of pale bluish-green with purple tips and without dots. In all probability they are whitish-green.

Haworth (Obs. p. 150) remarks that "The attenuation at the base of the leaf and its tendency to curve inwards, added to its being compressed-triquetrous upwards, will alone abundantly distinguish it from all its congeners." It is difficult to understand what Haworth meant by the leaves being attenuated *downwards*. The drawing does not represent anything of the kind, unless it be the narrowing at the base from the back to the front of the three old spreading leaves at the base of the plant.

Only the flowers of the variety *glaucum* are described, and the description of them only occurs in the "Synopsis." It is stated to flower at the end of April, and the flowers to expand at midday and in the afternoon.

M. INSPERSUM, *N. E. Br.* (Pl. 6. figs. 19–20). Planta subacaulis, basi ramosa. Rami procumbentes 5–18 mm. longi, 2–3 mm. crassi. Folia 5–7 cm. longa, basi 7–8 mm. lata et 4–5 mm. crassa, subaequalia, acuta, supra plana, dorso basi valde convexa apice obtuse carinata, basi in corpusculum cylindricum vel vaginam 2–4 cm. longum et 6–9 mm. crassum connata, glabra, glauco-viridia vel purpureo-tincta, dorso crebre punctata, intus basi pustula viride vel purpurea notata. Flores ignoti.

Nearly stemless, branching at the base and forming a clump. Branches prostrate, slender, 5–18 mm. long, 2–3 mm. thick. Leaves 5–7 cm. long, 7–8 mm. broad and 4–5 mm. thick at the base, subequal, viewed from above gradually tapering from the base to an acute apex, and in side view of nearly equal thickness throughout or slightly tapering to the apex, flat on the face, rounded on the back at the base and obtusely keeled at the apical part, but the keel is never dilated at the apex, united at their base into a cylindric body or sheath 2–4 cm. long and 6–9 mm. thick; surface smooth, glabrous, glaucous-green, or, when exposed to the sun in the open air, of a

leadens or bluish-green, suffused or tinted with purple and thickly dotted with darker green on the back, usually without dots on the upper surface unless held to the light, when a few pellucid dots become visible; the tumour at the base of the upper surface is of a rich dark purple. Flowers unknown.

SOUTH AFRICA. Locality unknown, *Pillans*!

Described from a living plant sent to me by Mr. Pillans in 1911, which has never flowered. It is nearly allied to *M. tuberculatum*, Mill., but is a much smaller plant, the leaves being shorter and less stout than those of that species; they are also rather smoother to the touch, as the dots are not prominent unless the leaves are shrivelled. The dark purple tumour at the base of the upper surface of the leaves is a very conspicuous feature of this plant when it is fully exposed to the sun. I have never seen the tumour of *M. tuberculatum* coloured in the same manner. From both *M. tuberculatum*, Mill. and *M. bibracteatum* it is at once distinguished by its longer and more slender branches.

M. LECTUM, *N. E. Br.* (Pl. 9. fig. 36). Planta 5–6½ cm. alta. Caulis prostratus, brevis, ramosus. Rami 2–4-foliati. Folia inaequalia, 2½–4 cm. longa, basi 5–10 mm. lata et 6–8 mm. crassa, apice 7–10 mm. crassa et dilatato-carinata, supra plana, altera apice obtusa vel acuta, altera uncat-acuta, glabra, leviter glauco-viridia, ubique dense punctata. Flores ignoti.

Plant 5–6½ cm. high, forming a clump. Stem subterranean or prostrate, branching. Branches short, about 5 mm. thick, each bearing 2–4 leaves according to season. Leaves unequal, at first erect, becoming spreading when the new growth is formed, 2½–4 cm. long, 5–10 mm. broad and 6–8 mm. thick at the base, and 7–10 mm. thick at the apex, where the obtuse dorsal keel is more or less dilated and compressed; the face or upper surface is flat and gradually tapers from the base to the apex, which on the larger leaf is incurved-hooked and acute with a short point directed forward, and on the smaller leaf is obtuse or acute; in side view the larger leaf is broadly rounded at the top and the smaller leaf less so; surface smooth, glabrous, of a slightly glaucous-green, thickly dotted all over on the face and back with darker green. Flowers unknown.

VAN RHYNSDORP DIV. Near Bakhuis, *Pearson*, 5485!

Described and figured from a living plant cultivated at Kew.

M. PRESSUM, *N. E. Br.* (Pl. 10. fig. 46). Planta 6–7 cm. alta, subacaulis, basi ramosa. Ramuli 2–4-foliati. Folia 3½–6 longa, basi 9–14 mm. lata et 7–9 mm. crassa, erecta vel exteriora patula, supra plana, dorso basi valde convexa et obtusissime carinata et apice valde compressa et subacute carinata leviter dilatata, acuta vel obtusa et apiculata, basi in corpusculum cylindricum 15–25 mm. longum et 10–15 mm. crassum connata, glabra, glauco-viridia, punctis pellucidis atroviridibus crebre notata. Flores ignoti.

Plant nearly stemless, branching at the base and forming clumps 6–8 cm. high. Leaves 2–4 to each growth according to season, erect or the outer pair more or less spreading, the alternating pairs often dissimilar in size and thickness, equal or slightly unequal, $3\frac{1}{2}$ –6 cm. long, 9–14 mm. broad and 7–9 mm. thick at the base, whence, viewed from above, they gradually taper to an acute or subacute apex, and in side view are of equal thickness throughout or slightly dilated at the apex, which is obtuse and apiculate or one leaf of a pair is acute, flat above, very convex and very obtusely keeled on the back at the basal part and at the apical part subacutely keeled and some of the leaves very much compressed there, others less so, united at the base into a cylindric body 15–25 mm. long and 10–15 mm. thick; surface smooth, glabrous, very pale glaucous-green or whitish-green, thickly sprinkled on the back and sides and sometimes, but not always, sparingly so on the upper surface with darker green pellucid dots, which along the keel are usually more or less prominent, at least on the young growths, and at the apical part of the keel forming a slightly horny semi-transparent edge. Flowers not seen.

ORIGIN UNKNOWN.

Described and figured from a living plant. I believe that this plant is rather widespread in gardens, but I have no information as to its origin, and am inclined to think that it may be a hybrid between *M. rostratum*, Linn. and *M. tuberculatum*, Mill. raised from seeds produced in Europe, especially as some plants that I have seen and believe to be the same had their leaves very much less compressed than in the plant I have figured, yet otherwise quite the same. I have therefore dealt with the plant in this way, so that if found in South Africa it may be recognized.

M. PURPURASCENS, *Salm-Dyck* (Pl. 8. fig. 28). Nearly or quite stemless, branching at the base. Leaves erect or suberect, 6–8 cm. long, 10–14 mm. broad and 7–8 mm. thick at the base, flat on the upper side and gradually tapering from the base to a subacute or subobtuse apex, rounded on the back except at the apical part, where they are obtusely keeled, in side view of about equal thickness throughout and obtuse at the apex or shortly tapering to an acute point, united at the base into a cylindric body or sheath 10–15 mm. long; surface smooth, glabrous, light bluish-green, when fully exposed to the sun becoming more or less suffused with purple at the base and the apical part often bluer, dotted all over the back (but not on the flat upper surface) with dark green. Flowers unknown.—*M. purpurascens*, *Salm-Dyck*, Obs. Bot. p. 28, name only (1822): DC. Prodr. vol. iii. p. 420: Sonder in Fl. Cap. vol. ii. p. 395: Berger, Mesemb. p. 259.

SOUTH AFRICA. Locality and collector unknown.

The above description is made partly from an original drawing at Kew (copied on Pl. 8), labelled "*Mesemb. purpurascens*, Haw. Received from

the Prince of Salm in the year 1823," and dated "Nov. 24th, 1823," and partly from a living plant. This species is allied to *M. rostratum*, Linn., but is not so stout, of a much bluer-green (not of such a whitish) colour and very much more thickly dotted all over the back; the purplish basal part is also a distinguishing feature, for I have never seen the sheaths of *M. rostratum* coloured in that manner.

M. ROBUSTUM, *Haw.* (Pl. 9. fig. 37). Stem prostrate, in old plants 2-6 in. (5-15 cm.) long, stout, branching, woody. Branches very short, stout, about 12 mm. thick in the drawing, clustered. Leaves (according to the drawing, very stout, about $5\frac{1}{2}$ cm. long, 15 mm. broad at the base, thence tapering to an acute apex) subulate, half-cylindric at the base, where they are gibbous-pustulate on the upper side (keeled on the back), trigonous at the apex, rather obtuse (in side view), glaucous-green, dotted (all over on the upper surface and back, according to the drawing).—*M. robustum*, *Haw.* Misc. p. 28 (1803); Synop. p. 211; & Rev. p. 91; Ait. Hort. Kew. ed. 2, vol. iii. p. 216; Sonder in Fl. Cap. vol. ii. p. 395; Berger, *Mesemb.* p. 259.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1795.

The above description is a translation of that given by Haworth, combined with characters taken from a drawing by Mr. Duncanson (no. 205) at Kew, labelled "*Mesemb. robustum*, *Haw.*," which I have copied on Pl. 9. Although the drawing is not dated it was probably made between 1823 and 1826, and doubtless represents typical *M. robustum*, *Haw.* It would appear that this is even a stouter plant than *M. rostratum*, Linn. (*M. quadrifidum*, *Haw.*), since Haworth states (Misc. p. 29) that *M. quadrifidum* resembles *M. robustum*, but is smaller, with more obtuse and less dotted leaves. The leaves may not always be more obtuse than those of *M. rostratum*, for, as I have pointed out on p. 58, alternating pairs of leaves often vary in this character on the same growth, but according to the drawing the dots on *M. robustum* are very much more numerous than they ever are on *M. rostratum*.

M. ROSTRATOIDES, *Haw.* (Pl. 7. fig. 27). Stem prostrate, 2-3 in. (5-7½ cm.) long, branching (according to the drawing, about 6-7 mm. thick, with branches 3-4 mm. thick). Leaves subulate-subtriquetrous, convex on the back at the base, obtuse, the older spreading, pustulate-gibbous at the base on the upper side, glaucous, dotted. (The drawing represents the leaves as being 12-25 mm. long, 7-9 mm. broad, and 3-4 mm. thick, with the flat upper surface tapering from the base to an acute apex, the back keeled and the apex in side view obtusely rounded or more or less acute, at the base they are connate into a sheath 5-10 mm. long; the upper surface as well as the back of the older leaves is represented as dotted). Peduncle terminal, long, cylindric, smooth, with 2 leaf-like bracts at the base. Calyx unequally 5-lobed, the 3 smaller lobes with membranous margins. Corolla yellow, almost as in *M. canum*; petals uniform, acute. Stamens erect; filaments

short, white; anthers somewhat yellow. Stigmas 9, after fertilization as long as the stamens, revolute at the tips, plumose on the inner side.—*M. rostratoides*, Haw. Obs. p. 154 (1794). *M. ramulosum*, Haw. Misc. p. 29 (1803); Synop. p. 215; & Rev. p. 92: Ait. Hort. Kew. ed. 2, vol. iii. p. 217: Sonder in Fl. Cap. vol. ii. p. 394.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1791.

The above description is a combined translation of those given by Haworth together with characters taken from a drawing at Kew, labelled "*Mesembr. ramulosum*. March 26th, 1825," of which a part is copied on Pl. 7. I have maintained the name Haworth originally gave to it, as there is no reason evident or given for its being subsequently changed by him. The "pustulate-gibbous" character or swelling at the base of the upper side of the leaves is not a specific character of any of this group known to me, as it is common to all of them and also to some species belonging to other groups, when a new growth or a flower is being formed, and remains afterwards. I have not seen this species, and doubt if it is rightly placed in the section *ROSTRATA*.

M. ROSTRATUM, *Linn.* (Pl. 8. figs. 29–31 & Pl. 9. fig. 32). Stemless or nearly so, branching close to the ground and forming a clump with age. Leaves normally 2–4 to each growth, 5–8½ cm. long, 12–18 mm. broad and 8–10 mm. thick at the lower part, ascending, more or less diverging except when very young, sometimes curved to one side, sometimes straight, flat on the upper side, which gradually tapers from the base to an acute apex, rounded on the back at the lower part, keeled at the apical part, united at the base into a cylindric body or sheath 12–20 mm. long, and usually 15–20 (or on small growths about 10) mm. thick, which for part of the year is invested with the dried-up sheath of withered leaves, smooth, glabrous, uniformly of a pale whitish-green or somewhat chalky-green, dotted with darker green on the back, chiefly at the apical part and along the margins and keel, but sometimes there are a few dots on the back towards the base; in winter the dots are scarcely evident, and usually none are visible on the upper side, but if held against the sun or other strong light a thin sprinkling of immersed pellucid dots are visible on both surfaces and on the basal as well as the upper part of the leaves; the keel at the apex is somewhat pellucid and minutely crenulate or rough; often the alternating pairs of leaves are more or less different in form at their tips. Flowers unknown to me, but see note below—*M. rostratum*, *Linn.* Sp. Pl. ed. 1, p. 486 (1753), not of other authors. *M. quadrifidum*, Haw. Misc. p. 28 (1803), Synop. p. 212; & Rev. p. 91: Ait. Hort. Kew. ed. 2, vol. iii. p. 216: Sonder in Fl. Cap. vol. ii. p. 394: Berger, *Mesemb.* p. 257. *M. rostrum* *Ardea referens*, *Dill.* Hort. Elth. p. 240, t. 5186. fig. 229 (1732).

SOUTH AFRICA. Locality unknown. Introduced into cultivation before 1732 by an unknown collector, and by *Masson* in 1795.

It is very extraordinary that this very old garden plant, which was introduced into this country at least 186 years ago, should have missed recognition as being the typical *M. rostratum*, Linn. by all monographers since the time of Linné, who founded that species upon the excellent figure and description of the plant given by Dillenius, which is so good that it would scarcely seem possible to mistake any other species for the plant he represented. Yet all authors since Linné have mistaken the totally different *M. tuberculatum*, Mill. for *M. rostratum*, Linn. This mistake seems incomprehensible, as any comparison of that plant with the figure and description given by Dillenius would at once show that they could not be the same species, the true *M. rostratum* being a very much stouter plant, with very much broader and thicker leaves of a whiter green, and with much fewer and less conspicuous dots than the species (*M. tuberculatum*) mistaken for it has, as may be seen at a glance by comparing the figure I give of *M. rostratum* on Pl. 8 with that of *M. tuberculatum* on Pl. 6 or with that of a flowering plant of *M. tuberculatum* published by Salm-Dyck under the erroneous name of *M. rostratum*.

The leaves of *M. rostratum* vary in size and curvature in different seasons and, I think, also in different soils, but none of the leaves represented on my drawing (which was made from a living plant) are as large as the two largest represented by Dillenius, and they are sometimes shorter and straighter than shown in my drawing, even on the same individual, and exactly as represented on Pl. 9. fig. 32 by the figure of *M. quadrifidum*, Haw., copied from a drawing at Kew, labelled "*Mesemb. quadrifidum*, Haw. Received from the Prince of Salm," and dated "March 22nd, 1825," which is certainly identical with *M. rostratum*, Linn.; for the very same growth of *M. rostratum*, represented on the right-hand bottom corner of Pl. 8, with curved leaves drawn in August 1917 after a damp sunless season, became in August 1918 after a drier and sunnier season exactly like the figure of typical *M. quadrifidum* on Pl. 9. fig. 32. From all this, I am inclined to believe that neither Haworth nor subsequent authors can have compared either *M. tuberculatum* or *M. quadrifidum* with the figure of *M. rostratum* given by Dillenius, or they could scarcely help recognising that *M. tuberculatum*, which they have considered to be *M. rostratum*, was not that species; whilst *M. quadrifidum* was specifically identical with it, as may be seen from the copy of the drawing at Kew, together with a comparison of the above description with the following combined translation of the descriptions given by Haworth of *M. quadrifidum*:—Nearly stemless or stems of old plants 2–4 in. (5–10 cm.) long, decumbent, stout (about 7 mm. thick according to the Kew drawing), branching. Branches very short, clustered. Leaves half-cylindric at the base, trigonous and very obtuse at the apex (according to the drawing, 5½–6 cm. long, about 10–12 mm. broad and 8 mm. thick at the base and nearly as thick at the apex, flat on the upper side and there gradually

tapering from the base to an acute apex, in side view one pair obtusely rounded at the apex and the alternating pair or one of them more or less acute, keeled on the back at the apical part), whitish-glaucous, with a few dots towards the tips or almost dotless (the drawing represents dots all over the back of some of the leaves, but none on the upper surface, except along the edges). Peduncle terminal, longer than the leaves, cylindric, thickened and somewhat rugose at the upper part. Calyx unequally 4-lobed, the two smaller lobes with white membranous margins. Corolla expanding in the morning; petals numerous, the inner gradually smaller, linear, mostly entire and acute, yellow. Stamens numerous; filaments pale; anthers whitish. Stigmas about 10, about as long as the stamens, subulate. Haworth remarks (Rev. p. 92) that *M. quadrifidum* is easily recognized by its whitish and nearly unspotted leaves and stout stem—a remark that equally applies to *M. rostratum*.

Dillenius figures some of the leaves as having a tooth or irregularity on each side near the tip, but this is an accidental or abnormal development, for they are normally quite entire, although occasionally they have 1–2 irregularities or teeth on their margins; indeed, the plant I have figured, in the following spring produced one leaf very similar to one of the toothed leaves represented by Dillenius. I believe this malformation is in some way connected with insufficient heat in winter, when the new growth is forming; it is certainly not of regular occurrence. It is either this toothing or irregularity that Linné refers to in his description by the words “*externe tuberculatis*,” or else he has mistaken the dots on the back of the leaf as represented by Dillenius for tubercles, for there are no tubercles or raised dots on the back of the leaves either figured or described by Dillenius.

Miller, in his Dictionary, ed. 8, no. 40, has confused *M. rostratum* with *M. felinum*, quoting the references to these two species as belonging to the same plant, which he certainly would not have done had he been familiar with either or both of them.

I have not seen the type specimen of *M. rostratum*. Thunb., so am quite unable to say if it is the same as *M. rostratum*, Linn. or not. Dried specimens of this group would be very difficult to determine, as several species have much superficial resemblance to one another when alive, and their distinctive characters would disappear when the plants are dried.

M. TUBERCULATUM, Mill. (Pl. 6. figs. 12–13). Stemless, branching at the base. Leaves mostly 6–10 (sometimes up to 12) cm. long, 8–11 mm. broad, and 5–7 mm. thick at the base, whence they gradually taper to an acute apex when viewed from above, and viewed sideways are of nearly equal thickness throughout and acute or somewhat rounded at the apex, or one of each pair more acute than the other, flat on the upper side, rounded on the back at the basal part, keeled at the apical part, with the keel (under a lens)

cartilaginous, semitransparent, and more or less tuberculate-crenate at the apex, and minutely pubescent when young, each pair united at the base into a cylindric body or sheath $1\frac{1}{2}$ – $3\frac{1}{2}$ cm. long and 10–15 mm. thick ; surface glabrous to the eye, but (as in other species of the group) microscopically puberulous at the margins and keeled on the apical part, slightly tuberculate from the dots being slightly prominent, or, when very plump with water, nearly smooth, of a somewhat bluish-glaucous-green, tinged with purple at the tips when fully exposed to the sun, thickly dotted with dark green on the whole of the back and a thin sprinkling of rather less conspicuous dark green dots on the basal part of the flat upper surface, with the basal tumour whitish. Peduncle 7–10 cm. long, terete, without bracts, the so-called bracts of descriptions being the two terminal leaves of the growth, from between which the peduncle arises, and which are about as long as the peduncle. Calyx 4 (perhaps sometimes 5)-lobed, the inner lobes with membranous margins. Corolla about 4 cm. in diameter ; petals numerous, in about 3 series, linear-lanceolate, acute, entire, unequal in length, yellow, shining. Stamens numerous, convergent, with white filaments and pallid anthers according to Haworth, collected into an erect group and yellow according to Salm-Dyck. Stigmas 8–10, subulate, much shorter than the stamens, closely incurved according to Haworth, but represented as erect by Salm-Dyck ; both may be different stages of maturity, yellowish.—*M. tuberculatum*, Miller, Dict. ed. 8, no. 32 (1768), not of De Candolle. *M. rostratum*, Weston, Univ. Bot. vol. i. p. 171 (1770) : Lam. Encycl. vol. ii. p. 486 : Ait. Hort. Kew. ed. 1, vol. ii. p. 191 ; & ed. 2, vol. iii. p. 217 : Haw. Obs. p. 152 ; Misc. p. 29 ; Synop. p. 214 ; & (including var. *tuberculatum*) Rev. p. 92 : Salm-Dyck, Mesemb. § 3, fig. 7 : Berger, Mesemb. p. 255, f. 55, I–III, not of Linné, and excluding from all authors synonyms not quoted here.

SOUTH AFRICA. Locality and collector unknown. Introduced into England before 1768.

This very old garden plant has been confused with *M. rostratum*, Linn. by all authors since Miller. From its being so confused it appears to me doubtful if it could have been compared with the figure and description of Dillenius upon which Linné founded that species, or it could never have been mistaken for it, as it is not nearly so stout and is quite different in appearance and colour from *M. rostratum*. In the length of its leaves *M. tuberculatum* varies considerably : Haworth, writing of it in 1794 (under the mistaken name of *M. rostratum*), states that they are “generally $2\frac{1}{2}$ or 3 inches long ; in the plant before me, some of them nearly six.” Where the plant gets plenty of air and sunlight 3 to 4 inches is probably about the average, but where direct sunlight is absent in winter and the air confined, they often become much longer. The dots on the back of its leaves are much more prominent than in any species allied to it that I have seen, and on the newly-produced leaves in their most plump condition are distinctly

perceptible to the touch and sight, when older ; if much swollen with water, they often seem quite smooth. I have not seen its flowers, and have compiled my description of them from those of Haworth and Salm-Dyck. My drawing on Pl. 6. fig. 12 represents a branch developing a new growth early in the year, whilst fig. 13 represents in outline the longer two leaves of that same branch in the late summer of the same year.

M. VESCU, *N. E. Br.* (Pl. 6. figs. 15-18). Planta 3-4 cm. alta, subacaulis, basi ramosa. Ramuli 2-4-foliati. Folia 2-5½ cm. longa, 3-10 mm. lata et basi 2½-5 mm. crassa, erecta vel exteriora patula, supra plana, dorso basi convexa apice carinata, acuta vel obtusa et dilatata, apiculata, basi in corpusculum cylindricum 5-13 mm. longum et 4½-8 mm. crassum connata, glabra, glauco-viridia, apice et basi purpureo-tincta punctis pellucidis atroviridibus dense notata. Flores ignoti.

Plant forming clumps 3-4 cm. high, nearly stemless, branching close to the ground. Branches short, slender, prostrate. Leaves 2-4 to each growth, according to season, erect or the outer pair more or less spreading, the alternating pairs slightly dissimilar, those of one pair equal, of the other pair unequal, 2-5½ cm. long, 3-10 mm. broad and 2½-5 mm. thick at the base, flat on the upper side and there gradually tapering from the base to the acute or obtuse apiculate apex, the back rounded at the base and obtusely keeled at the apex, and the keel entire or minutely toothed, of nearly equal thickness throughout or one of each unequal pair in side view dilated and obtusely rounded at the apex, the other rather shorter and somewhat acute, united at their base into a cylindric body 5-13 mm. long and 4½-8 mm. thick ; surface glabrous, glaucous-green, very densely marked with darker green pellucid immersed dots, which are also present but less crowded and more inconspicuous on the flat upper side, with the keel at the apex and the united basal part under strong sunlight more or less of a dull purple colour.

LAINGSBURG DIV. Matjiesfontein, *Pillans* !

This very distinct species appears to be the smallest of the section *Rostrata* at present known. But it varies much in size ; the small growths figured represent the plant as it was in July 1917, whilst the outline (fig. 17) represents a growth on the same plant in November 1918, caused perhaps partly by a change of soil and a larger supply of water. In winter or late autumn, however, the species of this (and other groups) always increase in size under cultivation in England.

§ SEMIOVATA.

M. DUALE, *N. E. Br.* Planta caespitosa, brevissime ramosa, 2-3½ cm. alta. Ramuli bifoliati. Folia 8-17 mm. longa, 7-10 mm. lata et 5-6 mm. crassa, supra visa anguste oblonga et obtusa vel elongato-triangularia et acuta, supra

leviter convexa, dorso valde convexa apice leviter carinata, marginibus et carina subcornibus, glabra, glauco-viridia vel argenteo-viridia. Flores ignoti.

VAN RHYNSDORP DIV. Ridges near Bakhuis, *Pearson & Pillans*, 5483!

Allied to *M. necopinum*, N. E. Br., differing by its smaller size and more acute leaves, of which the edges are more distinctly horny than are those of *M. necopinum*. The whole appearance of the two plants when seen side by side is entirely different although not easy to express in words. *M. duale* is also less hardy or more delicate than *M. necopinum*.

M. NECOPINUM, N. E. Br. Planta 3-4 cm. alta, basi ramosa, dioica. Folia sæpe 4, interdum 2 vel 6, basi connata, subpatula, 15-25 mm. longa, 10-16 mm. lata, 6-9 mm. crassa, basi crassiora, deltoidea vel deltoideo-oblonga, obtusa, supra plana, subtus valde convexa, apice obscure carinata, glabra, albida. Pedunculus inclusus, bibracteatus. Calyx exsertus, 6-lobus; tubus obconico-campanulatus, 4 mm. longus, 5 mm. diametro; lobi 2-4 mm. longi, ovati vel ovato-oblongi, obtusi, pallide virides, membranaceo-marginati. Corolla 14-18 mm. diametro; tubus nullus; petala numerosa, 2-3 seriata, 6-8 mm. longa, $\frac{1}{2}$ - $\frac{3}{4}$ mm. lata, linearia, obtusa, lutea. Stamina numerosa, pallide lutea. Stigmata ad tuberculum reducta.—*M. testiculare* var. γ , Haw. Misc. p. 24; & Synop. p. 205. *M. octophyllum* var. β , Haw. Rev. p. 85.

SOUTH AFRICA. Locality unknown, *Masson, Pillans*!

This very distinct species was first placed by Haworth as a variety of *M. testiculare*, Ait., and afterwards as a variety of *M. octophyllum*, Haw., from both of which it widely differs. From the former by its much narrower differently shaped leaves and smaller flowers, and from the latter by its rather larger and broader leaves being as thick as or much thicker at the base than at the apical part, the reverse being the case in *M. octophyllum*; it is also a larger plant than the latter.

M. POLE-EVANSII, N. E. Br. Planta acaulis, solitaria, usque ad 3-4 cm. alta, 4-5 cm. lata et 3-4 cm. crassa, pyriformis, apice convexa vel leviter emarginata, fissura angustissima vix ad medium bipartita vel in foliis duobus divisa, glabra, sub lente minutissime granulata, pallide subluteo-alba. Flores ignoti. Capsula 18-25 mm. diametro, ambitu elliptica, apice leviter convexa, circa 15-locularis. Semina numerosissima, minutissima, subgloboso-obovoidea, minute tuberculata, pallide brunnea.

PRIESKA DIV. Locality unknown, *McLeod*!

Described from photographs, drawings, and material kindly sent to me by Dr. Pole Evans, after whom I have much pleasure in naming this very distinct species, which is perhaps more nearly allied to *M. lapidiforme*, Marl. and *M. testiculare*, Ait. than to any others. Its two leaves, however, are more than half-globose and not at all angular as they are in the former, and are not so long nor so much spreading as in the latter, their flat faces being

closely applied to one another or very narrowly separated, whilst the opaque minutely granular surface distinguishes it from both of those species.

M. SOCIUM, *N. E. Br.* Planta circa $2\frac{1}{2}$ cm. alta, basi ramosa; ramuli brevissimi, 2-4-foliati. Folia 8-20 mm. longa, 7-9 mm. lata et 5-6 mm. crassa, suberecta vel erecto-patula, semi-cylindrica, supra plana, dorso valde convexa, apice rotundata et obscure carinata, basi in corpus 8-10 mm. longum connata, levigata, glabra, glauco-viridia vel purpureo-tincta, im-maculata. Flores ignoti.

VAN RHYNSDORP DIV. Dry ridges south-west of Bakhuis, *Pearson* 5489!

Described from living plants sent to Kew by Prof. Pearson in 1911, which have not yet flowered.

M. SUBALBUM, *N. E. Br.* (Pl. 9. figs. 38-39). Planta parva, cæspitosa, brevissime ramosa, $1\frac{1}{2}$ - $2\frac{1}{2}$ cm. alta. Ramuli bifoliati. Folia 5-10 mm. longa, 8-10 mm. lata et 5-8 mm. crassa, semiorbiculata vel breviter ovato-oblonga, apice obtuse rotundata, supra leviter convexa, dorso valde convexa et interdum ad apicem leviter carinata, subalbida vel argenteo-viridia. Flores ignoti.

VAN RHYNSDORP DIV. Near Bakhuis, *Pillans*, 5476!

Allied to *M. duale* and *M. necopinum* described above, but differs in having shorter and much more obtuse leaves than either of those species, and they are entirely without a horny margin.

§ SPHÆROIDEA.

M. AGGREGATUM, *Haw.* Corpuscula 10-13 mm. alta, 7-9 mm. diametro, obconica, apice subplano-truncata obscure angulato-circulare cum carinula obscura et fissura centrali 1- $2\frac{1}{2}$ mm. longa, glabra, subcinereo-viridia vel subglauco-viridia punctis in lineas confluentibus vel distinctis inconspicue notata. Calyx 4-lobus; tubus plus minusve exsertus vel inclusus; lobi $1\frac{1}{2}$ -2 mm. longi, 1 mm. lati, oblongi, obtusi, rubri. Corolla 7-9 mm. diametro; tubus $2\frac{1}{2}$ mm. longus; petala 12-16, laxè radiata, $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. longa, $\frac{1}{4}$ - $\frac{1}{2}$ mm. lata, angustissime linearia, rubro-purpurea. Stamina 12-16; antheræ exsertæ, pallide luteæ. Stylus $\frac{1}{2}$ mm. longus; stigmata 4, staminibus breviora, rubra.—*M. aggregatum*, *Haw. Obs. Mesemb.* pp. 131 & 419.

SOUTH AFRICA. Locality and collector unknown.

Haworth gives no description of this species; all that he states concerning it is as follows:—On p. 131 under *M. nuciforme* he mentions that he has “some distant conjectures that this plant (i.e. *M. nuciforme*) may be the same as that called *aggregatum*.” And on p. 419 he writes: “At Mr. Lee’s there is a *Mesembryanthemum* called by the name of *aggregatum*, which I remember very little more about than the name. It is a small plant and can

scarcely be the same as my *nuciforme*. I have not seen the flowers and never had any specimen of it." It is not mentioned in his other books.

The plant above described is the one known to me as *M. aggregatum* for very many years. I first saw it in the collection of Mr. Wilson Saunders under that name about the year 1865, so that it may reasonably be accepted as the species intended by Haworth under that name, although it is somewhat remarkable that no other author has described it.

This species flowers in late October and November, and requires warmth to enable it to develop its flowers, which are, I think, the most unattractive in the whole group.

In the 'Index Kewensis,' *M. aggregatum* is stated to be the same as *M. grossum*, Ait. But that is an entire mistake, as is also the enumeration of *M. grossum*, Haw. as distinct from *M. grossum*, Ait., for that name of both authors belongs to one and the same plant, which is a branching leafy species, with terete channelled papulose leaves, and is utterly unlike any of the group to which *M. aggregatum* and *M. nuciforme* belong.

M. ALBERTENSE, *N. E. Br.* Corpuscula 10–15 mm. alta, 8–15 mm. lata et 8–13 mm. crassa, obconica, apice subplana vel leviter convexa, fissura centrali $1\frac{1}{2}$ –3 mm. longa, glabra, subnitida, leviter cæruleo-viridia, punctis paucis atroviridibus conspersa. Flores ignoti.

PRINCE ALBERT DIV. Near Prince Albert, *Pearson*.

Described from living plants, sent to Kew by the late Prof. H. H. W. Pearson.

M. ALTILE, *N. E. Br.* Corpuscula 20–27 mm. alta, 17–25 mm. lata et 15–20 mm. crassa, obconico-obcordata vel apice breviter biloba, fissura centrali 7–10 mm. longa et lobulis rotundatis, glabra, herbea, haud glauca, inferne purpureo-tincta, supra punctis atroviridibus dense notata. Calyx partim exsertus, 5-lobus; tubus 5–6 mm. longus; lobi oblongi vel ovato-oblongi obtusi. Corolla circa 2 cm. diametro, pulchre purpurea.

SOUTH AFRICA. Locality and collector unknown.

Described from living cultivated plants.

M. ASSIMILE, *N. E. Br.* Corpuscula 12–17 mm. alta, 9–12 mm. lata et 7–10 mm. crassa, obconica, apice plus minusve obcordata, fissura centrali 2–3 mm. longi, glabra, subcinereo-viridia vel leviter subcæruleo-viridia, apice punctis atroviridibus in lineas confluentibus et paucis distinctis et interdum punctis purpureis conspicue notata. Calyx 4–5-lobus; tubus plus minusve exsertus vel inclusus, 3–4 mm. longus, membranaceus; lobi oblongi, obtusi. Corolla 15–18 mm. diametro; tubus 5–6 mm. longus; petala circa 30, subbiseriata, 8–9 mm. longa, $\frac{1}{3}$ – $\frac{1}{2}$ mm. lata, acuta vel obtusa, lactea.

Stamina circa 30, triseriata, superiora subexserta ; antheræ lacteæ. Stylus brevis ; stigmata 4, staminibus breviora, 2-3 mm. longa, albida.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which flower in October and November.

M. CATERVUM, *N. E. Br.* Planta parva, cæspitosa. Corpuscula 10-15 mm. alta, 7-12 mm. lata et 7-11 mm. crassa, obconica, apice ambitu orbiculata vel latissime elliptica, convexa, fissura centrali $1\frac{1}{2}$ -3 mm. longa, glabra, glauco-viridia, lineis tribus o punctis confluentibus formatis, fissura utrinque radiatis cum punctis distinctis conspersis hebetato-viridia notata. Flores ignoti.

LAINGSBURG DIV. Grootfontein, *Pole Evans*, 4975 !

Described from a living plant kindly communicated by Dr. Pole Evans, which has not yet flowered. By its subglobose appearance when viewed from above, pale glaucous-green colour, and the three rather faint radiating lines of confluent dots on each side of the orifice, this species is very easily distinguished from any other known to me.

M. GRATUM, *N. E. Br.* Corpuscula 13-15 mm. (vel interdum ad 20) mm. alta et 12-15 (vel interdum ad 21) mm. diametro, obconico-subglobosa, fissura centrali depressa 3-7 mm. longa, glabra, pallide subcæruleo-viridia, punctis opaco-viridibus conspersis et interdum fissura utrinque puncto rubro notata. Flores ignoti.

LITTLE NAMAQUALAND. On a barren slope north of Daunabis, *Pearson*, 6063 !

Described from living plants, which have not yet flowered in this country.

M. JUCUNDUM, *N. E. Br.* Planta cæspitosa cum caulibus parce ramosis $1\frac{1}{2}$ -4 cm. longis vestigiis vaginarum investis. Corpuscula 10-17 mm. alta et 10-16 mm. diametro, obconico-subglobosa, fissura centrali $1\frac{1}{2}$ -4 mm. longa, glabra, pallide glauco-viridia, primum plus minusve distincte punctata, demum absque punctis. Calyx 3-4-lobus ; tubus exsertus vel inclusus, 5-7 mm. longus ; lobi 2-2 $\frac{1}{2}$ mm. longi, $1\frac{1}{2}$ -2 $\frac{1}{2}$ mm. lati, oblongi vel ovati, obtusi, virido-reticulati. Corolla 15-23 mm. diametro ; tubus 10 mm. longus, subaurantiacus ; petala 30-40, 2-3-seriata, 6-12 mm. longa, $\frac{1}{2}$ -1 mm. lata, linearia, obtusa, pulchre purpurea. Stamina 30-40, 3-4-seriata, superiora exserta ; filamenta subaurantiaca ; antheræ luteæ. Stylus 8-10 mm. longus ; stigmata 4-5, subpatula vel adscendentia, $1\frac{1}{2}$ -2 $\frac{1}{2}$ mm. longa, filiformia, viridia.

LITTLE NAMAQUALAND. In dry stony stream-beds, one mile south of Bethany Drift, locally common, *Pearson*, 6067 !

Described from a living plant. This is very distinct from any other species at present described. In form and colour of its flowers perhaps

more nearly resembling *M. minutum*, Haw. than any other, but is very much larger in its growths and also differs by the formation of a distinct stem-system.

M. JUGIFERUM, *N. E. Br.* Corpuscula 18-26 mm. alta, 15-23 mm. lata et 13-16 mm. crassa, crasse obconico-obcordata, fissura centrali 5-10 mm. longa, lobulis obtuse carinatis, glabra, cinereo-viridia, punctis atroviridibus conspicue et crebre notata, et carina cum punctis in lineam confluentibus notata. Calyx 4-5-lobus; tubus 6-8 mm. longus; lobi 2-6 mm. longi, oblongi vel ovato-oblongi glabri, virides vel rubescentes. Corolla 18-30 mm. diametro, pulchre purpurea; tubus 7-10 mm. longus; petala 65-75, subquadriseriata, 9-15 mm. longa, $\frac{3}{4}$ -1 $\frac{1}{2}$ mm. lata, linearia, obtusa. Stamina numerosa, superiora exserta, alba. Stylus 3 mm. longus; stigmata 5, circa 2 mm. longa, plumoso-subulata.

SOUTH AFRICA. Locality unknown, *Pillans*.

Described from living plants. Flowering from October to December.

M. LABYRINTHEUM, *N. E. Br.* Planta pusilla, caespitosa. Corpuscula 6-15 mm. alta, 5-10 mm. lata et 4-7 mm. crassa, obconica, apice ambitu elliptica vel elliptico-oblonga, convexa, fissura centrali 1-3 $\frac{1}{2}$ mm. longa, glabra, cinereo-viridia vel viridia, purpureo-tincta, lineis brunneo-sanguineis vel atroviridibus pulchre labyrinthice notata. Flores ignoti.

SOUTH AFRICA. Locality and country unknown.

A small species allied to *M. pusillum*, *N. E. Br.*, but differs from that species by the outline of the larger growths that are not flattened by having divided, being much more oblong in outline or much broader in proportion to their thickness, and by the more numerous and more crowded lines on the top, which form a somewhat labyrinth-like pattern. It has not yet flowered in this country so far as known to me.

M. LEVICULUM, *N. E. Br.* Corpuscula 10-15 mm. alta, 7-13 mm. lata et 7-14 mm. crassa, obconica, truncata, apice fere plana vel transverse depressa, cum fissura centrali 2-4 mm. longa, glabra, cinereo-viridia, punctis et lineis purpureo-brunneis vel atro-viridibus notata et fissura linea lata purpureo-brunnea vel atro-viride circumdata. Calyx 4-lobus, glaber; tubus 2 $\frac{1}{2}$ -4 mm. longus inclusus vel parte exsertus; lobi 1 $\frac{1}{2}$ -2 mm. longi, ovati, obtusi, rubescens. Corolla 10-14 mm. diametro; tubus 3-5 mm. longus, petala 20-25, laxa, patula, 4-9 mm. longa, $\frac{1}{3}$ - $\frac{1}{2}$ mm. lata, linearia, acuta, pallidissime lutescentia. Stamina circa 15-20 exserta, pallide lutea. Stylus 2 mm. longus; stigmata 4, subulata, acuta, pallide virescentia, 2 mm. longa.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants. Flowering in October and November. This species is allied to *M. pictum*, but is flatter and usually more circular

at the top, of a more greyish-green with different markings, and the fissure or orifice is surrounded by a very distinct dark green or purple-brown rather broad line; whilst in *M. pictum* the line surrounding the fissure is very inconspicuous and different in outline.

M. NEVILLEI, *N. E. Br.* Corpuscula 8–10 mm. alta, 10–18 mm. lata et 8–15 mm. crassa, late obconica, apice truncata vel leviter transversim depressa, fissura centrali 2–5 mm. longa, glabra, viridia, punctis opacoviridibus vel purpureis conspersis vel confluentibus notata. Calyx 5–6-lobus; tubus 3–4 mm. longus; lobi 2–2½ mm. longi, oblongi, obtusi, rubescentes. Corolla 12–15 mm. diametro; tubus 4–6 mm. longus; petala 45–50, biseriata vel triseriata, laxa, 5–8 mm. longa, ½ mm. lata, linearia, acuta, pallide luteo-albida. Stamina 30–36, triseriata, superiora breviter exserta, pallidissime lutea. Stylus ½ mm. longus; stigmata 4–5, adscendentia, apice recurva, 1–3 mm. longa, subulata, acuta, luteo-alba.

VAN RHYNSDORP DIV. Near Van Rhynsdorp, *Pillans*!

Described from living plants sent to me in November 1916 by Mr. Neville Stuart Pillans, after whom I have much pleasure in naming it. The flowers open in the evening and are closed during the day.

M. OBMETALE, *N. E. Br.* Corpuscula 10–20 mm. alta, 9–15 mm. diametro, obconica, apice truncata, fere plana, fissura centrali 1½–4 mm. longa, glabra, viridia vel cinereo-viridia, punctis distinctis et in lineas ramosas vel simplices confluentibus atroviridibus vel purpureo-brunneis notata. Calyx 4-lobus; tubus plus minusve inclusus, 5 mm. longus; lobi 2–3 mm. longi, oblongi, obtusi, rubescentes. Corolla 10–11 mm. diametro; tubus calyce brevior; petala 25–30, subbiseriata, 5 mm. longa, ½ mm. lata, linearia, acuta vel subdenticulata, lactea, nitida. Stamina circa 20–25, biseriata, superiora brevissime exserta; antheræ luteæ. Stylus 1½ mm. longus; stigmata 4, erecta, 3 mm. longa, plumoso-subulata, albida.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants. Flowering in October.

M. OVIFORME, *N. E. Br.* Planta pusilla, cæspitosa. Corpuscula 8–10 mm. alta et 4–7 mm. crassa, subcylindrica vel cylindrico-obovata, apice valde convexa, fissura centrali 2–5 mm. longa, glabra, viridia, punctis minute tuberculiformibus crebre notata. Pedicelli 6–8 mm. longi, 1–1½ mm. lati, inclusi. Calyx 6–7-lobus; lobi plus minusve exserti, 2–3 mm. longi, 1–2 mm. lati, ovati, obtusi, basi in tubum 1–1½ mm. longum contracti. Corolla circa 11–13 mm. diametro, alba; tubus 2–2½ mm. longus; petala circa 30–40, patula, 5–6 mm. longa, ½ mm. lata, linearia obtusa. Stamina numerosa, 2–2½ mm. longa. Stylus nullus; stigmata 6, filiformia, 3 mm. longa. Capsula 4–5 mm. diametro, 6-locularis.

VAN RHYNSDORP DIV. On the Hardeveld, *Marloth*!

Described from a living plant kindly sent to me by Dr. R. Marloth. This species is one of the most distinct of the whole group, being easily recognized by its young growths being thickly covered all over with minute shining tubercle-like dots. When received, every growth was completely covered by the brown withered skin of a previous growth, through the orifice of which the calyx was partly or entirely exerted. The flowers were all withered, but the calyx is not at all membranous, and the petals I am informed are white.

M. PAGEÆ, *N. E. Br.* Corpuscula numerosa, dense cæspitosa, 8–10 mm. alta, 6–10 mm. lata et 5–9 mm. crassa, obconica, apice leviter convexa vel subplana fissura centrali 2–4 mm. longa, glabra, pulchre viridia cum fissura et lateribus purpureis absque punctis vel lineis. Calyx 5-lobus; tubus $2\frac{1}{2}$ –3 mm. longus; lobi 1– $1\frac{1}{2}$ mm. longi, ovati, obtusi, rubescentes. Corolla 8–12 mm. diametro, odorata; tubus 5 mm. longus, albidus; petala circa 24, subbiseriata, 4–6 mm. longa, linearia, obtusa, lutea ad apicem rubro-tincta. Stamina 2–3-seriata, superiora breviter exserta; antheræ luteæ. Stigmata 4–6, filiformia, 2 mm. longa.

LITTLE NAMAQUALAND. Near Garies, *Burke*!

Partly described from a living plant kindly sent to me by Prof. R. H. Compton, and partly from an excellent drawing of the plant in flower by Miss Mary M. Page, after whom I have much pleasure in naming this pretty species, as a slight acknowledgment of the great help she in conjunction with Mrs. L. Bolus has afforded me by sending and allowing me to make use of a considerable number of admirable coloured drawings of these plants as they grow in South Africa.

M. Pageæ is one of the prettiest and most distinct species of this group with which I am acquainted, for when the growths are in a fresh state the bright apple-green top and rich purple orifice and sides make an exceedingly effective and charming contrast. I have not yet seen its flowers.

M. PALLIDUM, *N. E. Br.* Corpuscula 17–35 mm. alta, 12–22 mm. lata et 9–20 mm. crassa, obcordato-obovoidea, apice breviter biloba, lobis obtuse rotundatis, fissura centrali 4–10 mm. longa, glabra, pallide calcareo-viridia, lobis lineis subcruciformibus et punctis subinconspicuis hebetato-viridibus notata. Calyx 3–5-lobus; tubus 4–6 mm. longus, inclusus vel plus minusve exsertus; lobi circa 3 mm. longi, oblongi, obtusi, pallide virides, rubro-tincti. Corolla $2\frac{1}{2}$ –3 cm. diametro; tubus 7–9 mm. longus, albus; petala 45–55, laxa, 2–3-seriata, 12–15 mm. longa, $\frac{1}{2}$ –1 mm. lata, anguste linearia, integra acuta, basi alba, superne rosea. Stamina circa 30, superiora brevissime exserta; antheræ albidæ. Stylus $1\frac{1}{2}$ – $2\frac{1}{2}$ mm. longus; stigmata 4, plumoso-subulata, 2–3 mm. longa, pallidissime virescentia.

WORCESTER DIV. On a mountain near Worcester, *Cooper*!

Described from living plants, which were introduced into this country by Mr. T. Cooper in 1860, and are now widely distributed in collections. It flowers in October and November.

M. PARVIPETALUM, *N. E. Br.* Corpuscula 12–13 mm. alta, 9–13 mm. lata et 7–10 mm. crassa, obconica, apice breviter truncato-biloba, fissura centrali 3–5 mm. longa, levia, glabra, lateribus purpureis, apice viridia punctis atroviridibus conspersa; fissura purpureo-tincta. Calyx 5-lobus; tubus valde compressus, 5–5½ mm. latus, inclusus vel breviter exsertus, pallide viridis; lobi 2–3 mm. longi, ovati vel oblongi, obtusi, rubelli. Corolla valde compressa, 6–7 mm. diametro, pallidissime sublutea vel petalis pallidissime roseo-tinctis; tubus 4–5 mm. longus; petala circa 50, subbiseriata, 2–3 mm. longa, ⅓–½ mm. lata, linearia, acuta, erecto-patula. Stamina 40–50 breviter exserta, pallide lutea. Stylus vix ½ mm. longus; stigmata 5, erecta, 3 mm. longa, pallide viridia.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which flower in October. The rich purple coloration of the sides, the broad V-shaped notch that forms the lobes at the top of each growth, the stout flattened tube of the corolla, and the very small petals, readily distinguishes this species from all others.

M. PAUXILLUM, *N. E. Br.* Corpuscula 10–15 mm. alta, 7–12 mm. lata et 6–9 mm. crassa, obconica, apice convexa vel levissime obcordata, elliptico-oblonga, fissura centrali 1½–4 mm. longa, glabra, cinereo-viridia vel hebetato-viridia, punctis et lineis brunneo-purpureis vel atroviridibus notata. Calyx 4-lobus; tubus inclusus vel plus minusve exsertus, 3–4 mm. longus; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, rubidi. Corolla 8–14 mm. diametro; tubus 5–6 mm. longus; petala 20–26, subbiseriata, laxa, 4–6 mm. longa, ½ mm. lata, linearia, subacuta, pallide straminea. Stamina 16–20, biseriata, superioribus exsertis, pallide flavescentia. Stylus 1–2 mm. longus; stigmata 4, staminibus breviora, 2–3 mm. longa.

SOUTH AFRICA. Without precise locality, *Pillans*!

Described from living plants, which flower from September to November.

M. PICTUM, *N. E. Br.* Corpuscula numerosa, 8–15 mm. alta, 6–10 mm. lata et 5–8 mm. crassa, obconica, apice sæpe transversim depressa vel interdum subplana, fissura centrali 1½–2½ mm. longa, glabra, hebetato-viridia, punctis et lineis opaco-purpureis notata. Calyx 4-lobus; tubus exsertus vel inclusus, 3 mm. longus; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, rubelli. Corolla 6–15 mm. diametro, pallidissime straminea; tubus 5–6 mm. longus; petala 18–24, laxa, 5–8 mm. longa, ½ mm. lata, linearia, acuta. Stamina 12–20, superiora exserta; antheræ luteæ. Stylus 1–1½ mm. longus; stigmata sæpe 4, staminibus breviora vel æquilonga, 2–3 mm. longa, helveola.

SOUTH AFRICA. Locality unknown, sent to Kew and to myself by Prof. *MacOwan* in 1878.

Described from living plants. Flowering during September to November.

M. PILOSULUM, *N. E. Br.* Corpuscula 6–12, conferta, 12–20 mm. alta, 10–20 mm. lata et 8–15 mm. crassa, obovata, apice leviter obcordata, fissura centrali 3–5 mm. longa, breviter et molliter pilosa, omnino viridia vel apice purpureo-suffusa, impunctata. Flores circa 15 mm. diametro, pulchre purpurei.

LADISMITH DIV. South of Touwsberg, *Pole Evans*, 6927 !

Described from a living plant and a photograph, for which I am greatly indebted to Dr. I. B. Pole Evans, who very kindly sent it to me in July 1919. This species is readily distinguished from every other in the Sphæroid group by its very distinctly hairy surface, the hairs being very fine, soft, and standing straight out from the surface. When received, the top of each growth was entirely purplish, but now the purple colour has entirely vanished and the whole plant is light green, without any markings. This may be due to lack of bright sunshine, and it is likely that the purple may return in the summer, being perhaps a colour protection from the fierce rays of the sun experienced in South Africa.

M. PILULIFORME, *N. E. Br.* Planta parva, caespitosa. Corpuscula globoso-obconica, 3–4½ mm. diametro, apice convexa, fissura centrali ½–1½ mm. longa haud depressa, glabra, levia, hebetato-purpurea vel hebetato-viridia, punctis paucis atropurpureis vel atroviridibus notata et fissura centrali linea atropurpurea vel atroviridia circumdata. Flores ignoti. Capsula 2½ mm. diametro, tetragona, 4-locularis.

SOUTH AFRICA. Locality and collector unknown.

Described from a living plant sent to me by the kindness of the authorities of the National Botanic Garden at Kirstenbosch. This minute species is one of the smallest known to me, its individual growths resembling in size and shape (as viewed from above) a small pill, thus suggesting the name.

M. PISINNUM, *N. E. Br.* Planta perpusilla, caespitosa. Corpuscula 8–10 mm. alta, et 5–7 mm. diametro, obconica, apice ambitu suborbiculata, convexa, fissura centrali 1–2 mm. longa, levigata, microscopicè puberula, subcinereo-viridia vel viridia, punctis paucis conspersis inconspicue notata. Flores ignoti.

SOUTH AFRICA. Karoo, *Marloth* !

Described from a living plant communicated by Dr. R. Marloth. Its small size and microscopically puberulous surface readily distinguish this species from all others at present described, *M. jimbriatum*, Sond. (which is wrongly described as being glabrous) being its nearest ally, but that species

is a very much larger plant, and the flowers of the two species are probably also different.

M. PLACITUM, *N. E. Br.* Corpuscula numerosa, cæspitosa, circa 8–16 mm. alta, 7–13 mm. lata et 5–9 mm. crassa, obconica, apice leviter obcordata, fissura centrali $2\frac{1}{2}$ – $3\frac{1}{2}$ mm. longa instructa, levia, glabra, viridia vel plus minusve purpureo suffusa et lineis biarcuatis utrinque fissura et punctis atroviridibus vel atropurpureis conspicue notata. Calyx 4-lobus, glaber; tubus 4–6 mm. longus, plus minusve exsertus, pallidus, rubro-tinctus; lobi 2–3 mm. longi, lanceolati, obtusi, rubescentes. Corolla 15–20 mm. diametro, odorata; tubus $4\frac{1}{2}$ –9 mm. longus, albus; petala 40–60, subæqualia, 2–3-seriata, 7–10 mm. longa, $\frac{1}{3}$ – $\frac{1}{2}$ mm. lata, linearia, obtusa vel subacuta, alba, vel pallidissime luteola, vel pallide rosea. Stamina circa 15–16, triseriata, superiora exserta; filamenta alba; antheræ luteæ.

ROBERTSON DIV. Near Robertson, *Marloth*, 7985!

Allied to *M. ficiforme*, Haw., but smaller, with different coloration and smaller flowers, which expand in the evening and last for about a week.

M. PUSILLUM, *N. E. Br.* Planta pusilla, cæspitosa. Corpuscula 5–14 mm. alta, $4\frac{1}{2}$ –7 mm. lata et $3\frac{1}{2}$ –6 mm. crassa, obconica, apice ambitu orbiculata vel elliptica vel elliptico-oblonga, fissura centrali 1–2 mm. longa, cinereo-viridia vel viridia, lineis brunneo-sanguineis vel atroviridibus irregulariter notata. Flores ignoti.

SOUTH AFRICA. Locality and collector unknown.

This small species is allied to *M. labyrinthicum*, *N. E. Br.*, but its fully-developed growths that are not more or less compressed by having divided are usually nearly circular instead of elliptic-oblong in outline when viewed from above, and the lines with which it is marked are much fewer, less crowded, and do not form such a labyrinth-like pattern, which varies much on different growths. From *M. signatum*, *N. E. Br.* its convex top and fewer markings at once distinguish it. I believe it has not yet flowered in England.

M. SAXETANUM, *N. E. Br.* Corpuscula numerosissima, densissime conferta, 4–6 mm. longa, $2\frac{1}{2}$ –5 mm. crassa, obconica, apice convexa, fissura centrali 1 mm. longa instructa, vaginis albidis circumdata, glabra, impunctata. Calyx 4(–5?)-lobus; tubus $1\frac{1}{2}$ –2 mm. longus, membranaceus; lobi 1 mm. longi, ovati, obtusi, rubescentes. Corolla 6–7 mm. diametro, albida; tubus 3– $3\frac{1}{2}$ mm. longus, gracilis; petala 14–20, laxa, $2\frac{1}{2}$ mm. longa, $\frac{1}{4}$ mm. lata, linearia, obtusa vel acuta. Stamina circa 6, plus minusve exserta; antheræ $1\frac{1}{4}$ mm. longæ, luteæ. Stylus 1– $1\frac{1}{2}$ mm. longus; stigmata 4, staminibus breviora vel subæquilonga, circa $1\frac{1}{2}$ mm. longa, filiformia.—*M. fimbriatum*, *Marloth* in *Trans. Roy. Soc. South Afr.* vol. i. p. 406, not of *Sond.*

GREAT NAMAQUALAND. In fissures of rocks near Angra Pequena, flowering in May, *Marloth*, 4676, at Kew (4674 ex *Marloth*) !

Described from dried material sent to Kew by Dr. Marloth.

M. SCITULUM, *N. E. Br.* Corpuscula 13–15 mm. alta, 8–14 mm. lata et 7–13 mm. crassa, obconica, apice convexo-truncata vel leviter transversim depressa, fissura centrali 2–5 mm. longa, glabra, cinereo-viridia, lineis ramosis purpureo-brunneis pulchre notata. Calyx 4-lobus, membranaceus; tubus inclusus vel plus minusve exsertus, 3–3½ mm. longus; lobi 1½–2 mm. longi, ovati vel oblongi, obtusi, virides vel rubelli marginibus membranaceis. Corolla 6–16 mm. diametro; tubus 5–7 mm. longus; petala 30–35, biseriata vel triseriata, 5–8 mm. longa, ⅓–½ mm. lata, anguste linearia, acuta vel sub-obtusa, lactea. Stamina 15–20; filamenta alba; antheræ plus minusve exsertæ, pallide luteo-albæ. Stylus 2 mm longus; stigmata 4, subulata, 3–4 mm. longa, albida.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants. Flowering in October. A very distinct species, easily recognized by the way in which the top is rather prettily marked out in a somewhat map-like manner by dark purple-brown or violet-brown branching lines.

M. SIGNATUM, *N. E. Br.* Planta cæspitosa. Corpuscula 8–15 mm. alta, 7–10 mm. lata et 5–8 mm. crassa, obconica, apice subplana vel leviter convexa, ambitu elliptica vel oblonga, fissura centrali 1½–2½ mm. longa, glabra, subcinereo-viridia, lineis atropurpureis vel atroviridibus confertis labyrinthice notata. Flores ignoti.

SOUTH AFRICA. Locality unknown, *Pillans*.

Described from living plants. I have not yet seen the flowers of this species, although on two successive years it tried to flower in November, but, probably owing to insufficient sun and heat, failed to develop its flowers, as only the tips of the calyx-lobes protruded from the orifice.

This species is nearly allied to *M. labyrinthicum* and *M. pusillum*, but differs from both of them by the top of the plant being flattish or but slightly convex and very abruptly rounded into the sides or somewhat overhanging them, whilst those two species have the top of the plant convex and gradually rounded into the sides from the very apex.

M. SUBRISUM, *N. E. Br.* Corpuscula 20–25 mm. alta, 14–16 mm. diametro, obconica, truncata, fissura clausa centrali 4–5 mm. longa utrinque impressa, glabra, albido-viridia, immaculata; vaginæ coriaceæ. Flores ignoti.

VAN RHYNSDORP DIV. On the top of a hill near Atties, *Pearson*, 5466!

Described from living plants, originally discovered and sent to Kew by

the late Prof. Pearson in 1911. The plant has not flowered at Kew, nor with myself during the period it has been in cultivation.

It is allied to *M. calculus*, Berger, but is truncate instead of rounded at the top, the orifice is more depressed, with much more conspicuous dimples at the ends of it, and the colour is a rather whiter green. In appearance it is a very distinct species.

M. VIRIDICATUM, *N. E. Br.* Corpuscula 12–23 mm. alta, 10–15 mm. lata et 9–15 mm. crassa, obconica, apice elliptica vel suborbiculare leviter convexa transversim emarginata, fissura centrali 3–6 mm. longa, utrinque depressa, glabra, subprasina, omnino immaculata vel punctis distinctis vel in lineis confluentibus inconspicue notata. Flores ignoti.

SOUTH AFRICA. Locality and collector unknown.

Described from living plants, which I have not yet seen in flower.

§ TERETIFOLIA.

M. CYLINDRICUM, *Haw.* (Pl. 7. fig. 23). Nearly stemless, branching at the base; branches crowded. Leaves about 3 inches ($7\frac{1}{2}$ cm.) long, according to Haworth (Synopsis, p. 209), but according to the drawing at Kew only about $3\frac{1}{2}$ –4 cm. long, triquetrous-cylindric (apparently, from the drawing, nearly cylindric, with the upper side flat on the basal half; they are probably faintly and very obtusely keeled on the back), obtuse, glaucous-green, dotted. (The drawing represents the leaves as being of a rather dull green, with darker green dots, and apparently faintly striate; the very tips are blackish brown and there are brown marks on some of the leaves, perhaps caused by some injury.) Peduncle 1–2 inches ($2\frac{1}{2}$ –5 cm.) long, somewhat slender, compressed at the basal part, and bearing a pair of bracts at or above the middle. Bracts large, overtopping the flower, leaf-like. Calyx unequally 4-lobed; lobes leaf-like, terete or slightly subulate, very obtuse, two pairs of them nearly three times as small as the others, with membranous margins at the lower part. Petals numerous, imbricate, the longer about equalling the larger calyx-lobes in length, entire, obtuse, dark reddish (saturatissime rubicundis), shining. Stamens numerous, shorter than the petals; filaments rosy; anthers fuscous; pollen white. Stigmas 10–12, short, small, at length spreading, plumose, parabolically acuminate, whitish-green.—*M. cylindricum*, *Haw. Obs.* p. 411 (1794); *Misc.* p. 27; *Synop.* p. 209; & *Rev.* p. 105: *Ait. Hort. Kew. ed. 2, vol. iii.* p. 215.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* about the year 1792.

This distinct-looking species appears to have disappeared from cultivation. Haworth states that the leaves are “more glaucous, longer, more regular and more upright and cylindrical than those of *M. corniculatum*” (not the *M. corniculatum* of *Linnaeus*, but the plant Haworth at first mistook for that

species and afterwards named *M. diminutum*, see p. 63). Also (Misc. p. 27) that they are "longer and twice as narrow as those of *M. teretiusculum*." Whilst under *M. teretifolium* (Synop. p. 210) he states that they are "thicker and more glaucous, and less cylindric than in *M. teretifolium*."

The figure of *M. cylindricum* on Pl. 7. fig. 23 is copied from an original drawing at Kew, labelled "*M. cylindrica*, Aug. 25th, 1826."

§ TURRITA.

M. TURRIGERUM, *N. E. Br.* Corpuscula 10–13 mm. alta, 9–12 mm. ad apicem lata, 6 mm. crassa, ad medium biloba, parte inferiora leviter compresso-cylindrica, lobis 5–6 mm. longis erectis inferne subcylindricis apice subangulatis lineis elevatis in areas subdepressas irregulariter divis, glabra, cinereo-viridia, apice lineis atro-viridibus notata, lateribus purpurpeo-tinctis et atro-viride punctatis. Flores ignoti.

MALMESBURY DIV. Vicinity of Klipheuveld Station, *Pillans*!

Described from a living plant in the collection of Mr. G. Elisha. A very remarkable species, totally unlike any other at present known, its two turret-like lobes being very distinctive.

Affinity doubtful.

M. EXIGUUM, *N. E. Br.* Stem almost none. Leaves 4 to each growth (evidently very small); the lower pair about one line (2 mm.) long, broadly connate and sheathing at the base, spreading, trigonous at the apex, acute, scabrid on the angles, glabrous, withering; the upper pair about the length of a finger-nail, erect, connivent, semiterete, flat above, convex beneath, papillose, with the keel below the apex serrulate and the angles scabrid, green or greenish-white? [literally translated, Thunberg's description of the colour is as follows:—semiterete or flat above, greenish, white (possibly greenish-white may be intended), convex beneath, papillose, green, angles scabrid]. Peduncle arising from the centre of the leaves, erect, 1-flowered, shorter than the leaves, angular. Corolla yellow.—*M. difforme*, Thunb. Fl. Cap. Ed. Schultes, p. 423 (1823), not of Linné nor of Haworth or other authors.

CALVINIA DIV. Karoo, between the Olifants River and Bokkeland, in Hantam and the Roggeveld, *Thunberg*.

I have given this plant a new name and added a translation of Thunberg's description of it, in order to call attention to what is evidently a somewhat peculiar species, so that in future it should not be overlooked; for it has been altogether misunderstood by all authors, although it is evidently a very distinct and remarkable species. Its affinities are doubtful, but on account of its papillate leaves it may have some affinity with the section *Moniliformia*, otherwise, from the outer pair of leaves being spreading and withering and

the inner pair erect and connivent, I should conjecture that its affinity is with the section *Rostrata*. Thunberg probably never saw the figures in Dillenius, 'Hortus Elthamensis,' p. 252, t. 194. figs. 241–242, upon which *M. difforme*, Linn. was founded, or he could not possibly have associated this plant with that utterly different species. Sonder (who saw Thunberg's specimens), in the 'Flora Capensis,' vol. ii., actually refers this plant to two very different species, for on p. 395 he places it as a synonym of *M. denticulatum*, Haw., which has leaves several times as long, and, as the figure on Pl. 9. shows, is otherwise different; whilst on p. 399 he places it as a synonym of *M. namaquense*, Sond., which has peduncles "three or four times longer than the leaves" instead of shorter than the leaves as in Thunberg's plant, which, according to description, differs from all three of the above-mentioned species by having papillate leaves. *M. namaquense* also comes from a different region, these plants mostly being very local in their distribution.

II. Stem evident, erect or prostrate, with distinct intervals (internodes)
between some or all of the leaf-pairs. (To p. 123.)

§ ASPERICAULIA.

M. LIQUE, *N. E. Br.* I propose the above name for the plant described as *M. obliquum* by Haworth and published 22 years later than *M. obliquum* of Willdenow. The name *lique* has the same meaning. The synonymy of this species will therefore be:—*M. obliquum*, Haw. Rev. p. 183 (1821); & in Bot. Reg. t. 863: DC. Prodr. vol. iii. p. 442: Salm-Dyck, Mesemb. § 50, fig. 5: Sonder in Fl. Cap. vol. ii. p. 443: Berger, Mesemb. p. 96, not of Willdenow.

SOUTH AFRICA. Locality and collector not stated. Introduced into Kew Gardens in 1819, probably by *Bowie*.

The figure in the 'Botanical Register' was made from Haworth's type plant, and a good description of it is given there by Haworth himself.

§ CORALLINA.

M. LÆVE, *Ait.* (Pl. 10. fig. 44.) An erect shrub two or more feet high, thickly covered with shoots and leaves, white-wooded. Leaves crowded, cylindraceous, curved, obtuse, amplexicaul, smooth, very glaucous. Flowers purple. Calyx 5-lobed; lobes oblong, obtuse.—*M. leve*, Ait. Hort. Kew. ed. 1, vol. ii. p. 187 (1789): Haw. Obs. p. 254; Miscel. p. 64; Synop. p. 302; & Rev. p. 154: Willd. Sp. Pl. vol. ii. p. 1044: DC. Prodr. vol. iii. p. 440: Don, Gen. Syst. vol. iii. p. 143.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1774.

This species is entirely omitted from the works of Sonder and Berger, who have maintained a totally different species (see *M. Thunbergii*, p. 106) under the name of *M. lœve*, Thunb., which was published two years later than *M. lœve*, Ait., and is a very different plant. The above description is compiled from those given by Aiton and by Haworth, who remarks (Obs. p. 254): "I have seen this plant, but have no specimen proper for description—it is a shrub." And (in Misc. p. 64) he states that "This rare species acquires an erect shrubby stem two or more feet high, thickly covered with shoots and leaves: it is very liable to rot in the winter and has never produced its flowers with me; they are said to be purple by Willdenow." Aiton states that it flowers from July to September, and places it in the red- or purple-flowered group, so that he evidently saw its flowers. He calls it the "Upright white-wooded Fig Marigold." From Haworth's remark that it is liable to rot in the winter, I suspect that it grows in a very dry region and has long since died out of cultivation. Haworth remarks of it: "This species strikes less easily from cuttings than most others, and although possessed of stiff upright woody shoots of one or two feet in height, never survives the third winter with me; but rarely dies under that age; and then appears to perish first at the root; for the branches survive many weeks after the root is dead. I have not heard of its flowering anywhere; nor is its bark white, but fuscous, which now causes me to doubt its being the true *M. lœve* of Hort. Kew. above cited." The above is practically all that has hitherto been published concerning this plant, but in the Kew Herbarium there is a drawing of a branch of the Kew plant without flowers, labelled "*M. lœve*, June 31 (sic), 1826." This drawing, of which I have copied a portion on Pl. 10. fig. 44, quite corresponds with Aiton's description, except that the stem is light brown with white reflections as if it were very smooth and polished. Possibly with age the stem gets a white bark, and that Aiton described from an imported plant; for it is scarcely probable that the plant Haworth mentions as having seen in his earliest work upon the genus, published in 1794, would not be the true plant of Aiton, for it is evident that he knew and had complete freedom to inspect at all times the plants cultivated at Kew.

The Kew drawing represents a flowerless branch about 15 cm. long and 4 mm. thick at the base, branching in a pyramidal manner, woody below, with internodes 5–10 mm. long, those of the lateral branchlets being 1–5 mm. long, brown with white reflections, as if shining. Leaves 15–30 mm. long, $2\frac{1}{4}$ – $3\frac{1}{2}$ mm. thick, rather closely placed on the branchlets, and having the appearance of being subcylindric, with the upper side more or less flattened, obtusely pointed at the apex, of a very glaucous-green.

This plant belongs to the section *Corallina* as defined by Haworth, which is quite different from the section *Corallina* of Berger, the latter being based upon *M. corallina*, Thunb.—a totally different plant, which Haworth doubtfully thought might be the same species as *M. lœve*.

Since writing the above, Mr. N. S. Pillans has called my attention to some "Notes on *Mesembryanthemum*" by J. Britten in the 'Journal of Botany' for 1917, where, on p. 73, Mr. Britten also remarks that *M. læve*, Ait. and *M. læve*, Thunb. cannot be one and the same species, but adds no information that I have not already given in the above account.

§ CORNICULATA.

M. DISSIMILE, *N. E. Br.* As the plant figured and described as being *M. validum*, Haw. by Salm-Dyck (from whom both Sonder and Berger have copied their descriptions) is a totally different species from the true *M. validum* of Haworth (see p. 121) with solitary yellow flowers having 17–20 stigmas, and belongs to quite a different group, I propose the above change of name for it, the following being its synonymy:—*M. dissimile*, *N. E. Br.* *M. validum*, Salm-Dyck, Mesemb. § 15, fig. 8: Sonder in Fl. Cap. vol. ii. p. 409: Berger, Mesemb. p. 138, fig. 24, III (copied from Salm-Dyck), not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

§ CRASSULINA.

M. INVALIDUM, *N. E. Br.* A change of name for the plant wrongly called *M. incomptum* in modern books.—*M. invalidum*, *N. E. Br.* *M. incomptum* (including var. *Ecklonis*), Salm-Dyck, Mesemb. § 56, figs. 4 & 4β: Sonder in Fl. Cap. vol. ii. p. 451: Berger, Mesemb. p. 73, not of Haworth.

SOUTH AFRICA. Locality unknown. Probably introduced by *Ecklon*.

This is a plant with weak stems or branches 1–2 feet long, and is totally unlike the true *M. incomptum* of Haworth (see p. 131).

Salm-Dyck wrongly quotes Burchell as the introducer of this plant, for evidently some mistake has been made, as it is certainly not the same species as Burchell's plant, and I suspect that as the variety *Ecklonis* was introduced by Ecklon, that which Salm-Dyck calls typical *M. incomptum* was sent by him also, and some mistake made as to the labels, which often happens in large gardens. I see no difference between the two plants represented by Salm-Dyck on the two plates quoted other than any two specimens of one plant might show.

§ CYMBIFORMIA.

M. LEHMANNI, *Eckl. & Zeyh.* Since the publication of my description of *M. seapartitum* the plant has altered its character and become exactly like *M. Lehmanni*, so that it must be placed as a synonym of the latter. When

I first saw the plant it appeared so distinct that I made the mistake of considering it to be a new species. Its synonymy is therefore as follows :—

M. LEHMANNI, *Eckl. & Zeyh. Enum. Pl. Afr. Austr.* p. 310 : Salm-Dyck, *Mesemb.* § 42, fig. 1 : Sonder in *Fl. Cap.* vol. ii. p. 430 : Berger, *Mesemb.* p. 129, fig. 22. *M. seapartitum*, N. E. Br. in *Kew Bull.* 1908, p. 407.

UITENHAGE DIV. Near the Zwartkops River, *Zeyher*, 2576 ; Karoo, *Pillans* !

M. THUNBERGII, *Haw.* Stem about 1 ft. (30 cm.) long, decumbent, branching, terete, jointed, half as thick as a quill-pen, glabrous, greyish. Branches short, erect, leafy, similar. Leaves about 1 inch (25 mm.) long, erect, closely placed, decussately opposite, connate (at the base), trigonous or subterete, flattish above, obtuse, smooth, glabrous, not dotted. Flowers terminal on the branchlets, solitary, yellow. Calyx 4-lobed ; lobes opposite, two of them shorter than the others.—*M. Thunbergii*, *Haw. Misc.* p. 86 (1803) ; & *Rev.* p. 150 : DC. *Prodr.* vol. iii. p. 437 : G. Don, *Gen. Syst.* vol. iii. p. 141. *M. lave*, Thunb. in *Nov. Act. Ephem. Nat. Curios.* vol. viii. App. p. 16 (1791), & *Fl. Cap.* ed. Schultes, p. 425, not of Aiton.

UITENHAGE DIV. Near the Sundays River, flowering in December, *Thunberg*.

I give a translation of Thunberg's description of this plant in order to call attention to it, because although Haworth correctly perceived that the plant which Thunberg described as *M. lave* could not possibly be the same as that which Aiton had two years earlier (in 1789) described under the same name, yet subsequent authors, not quoted above, have not only ignored Thunberg's description by replacing it with a description of *M. dubium*, Haw., but have also quite ignored the earlier *M. lave*, Aiton, which is a tall plant, differing in having a 5- instead of a 4-lobed calyx and purple instead of yellow flowers. Sonder and also Berger (who throughout his work seems to have compiled from Sonder and the descriptions given by Salm-Dyck without investigation) gives a description of *M. dubium*, Haw., based upon that of Salm-Dyck, as being a description of *M. lave*, Thunb. As I have not seen the type of *M. lave*, Thunb. I cannot say if they are correct in supposing it to be the same as *M. dubium*, Haw. or not. Yet, as Thunberg describes the leaves of *M. lave* as being 1 inch long, obtuse, smooth, without dots, and the calyx as 4-lobed, whilst *M. dubium* (the *M. lave* of Sonder and of Berger) is described and figured as having leaves 2 inches long, acutely mucronate, slightly scabrous, with numerous very minute dots, and a 5-lobed calyx, it is clear from these discrepancies either that *M. lave*, Thunb., and *M. dubium* are distinct species, or that one of them has been wrongly described. It should be noted, however, that the descriptions of *M. lave* given by Sonder and by Berger refer exclusively to *M. dubium*, Haw., and do not accord with

either the description of *M. leve*, Aiton or that of Thunberg. Therefore, for the present I think the following references must be excluded from the synonymy of *M. Thunbergii*, viz. :—*M. leve*, Sonder in Fl. Cap. vol. ii. p. 408 : Berger, Mesemb. p. 136, fig. 24, II (copied from Salm-Dyck). *M. dubium*, Haw. Misc. p. 39 (1803) ; Synop. p. 231 ; & Rev. p. 110, not of Obs. p. 471, which is *Odontospermum pygmaeum*, O. Hoffm. : Ait. Hort. Kew, ed. 2, vol. iii. p. 222 : Salm-Dyck, Mesemb. § 15, fig. 4 (not § 16 as quoted by Berger, nor t. 6 as quoted by Sonder). *M. decipiens*, Haw. Rev. p. 110 (1821).

It should be noted that the plant collected on the shore below Slang Kop, on the Cape Peninsula, by Wolley Dod (no. 3144), and distributed under the name of *M. leve*, Thunb., is scarcely likely to be the same as the Sundays River plant described by Thunberg, for apart from locality the label with the Slang Kop plant bears the record that its leaves are cylindric, whilst those of *M. leve*, Thunb. are flattish above ; and it is certainly not *M. dubium*, Haw., as the epidermis of the leaves is totally different in structure—a character that has not been taken into consideration by monographers. The Slang Kop plant should be compared with *M. dissimile*, N. E. Br., see p. 105.

§ DIGITIFLORA.

M. ACUMINATUM, Haw. Extraordinary confusion seems to have been made by modern authors concerning this plant, as Salm-Dyck and those following him mistook another species (see *M. nothum*, N. E. Br.) for it, and then figured the real *M. acuminatum* under the names of *M. sulcatum* and *M. flexuosum*, which certainly represent one species only, and are again wrong determinations. As in these errors subsequent authors have followed him, I here give the synonymy of the four species in question (see p. 135). As Salm-Dyck has published (under wrong names) two good figures and descriptions of *M. acuminatum*, a description here is unnecessary ; the following is its correct synonymy :—

M. ACUMINATUM, Haw. in *Phil. Mag.* 1824, p. 426 : DC. Prodr. vol. iii. p. 445 : Don, Gen. Syst. vol. iii. p. 147, not of other authors. *M. sulcatum*, Salm-Dyck, Mesemb. § 44, fig. 1 : Sonder in Fl. Cap. vol. ii. p. 432 : Berger, Mesemb. p. 119, not of Haworth. *M. flexuosum*, Salm-Dyck, Mesemb. § 44, fig. 7 : Sonder in Fl. Cap. vol. ii. p. 433 : Berger, Mesemb. p. 122, not of Haworth.

SOUTH AFRICA. Locality unknown. Introduced by *Bowie* about the year 1823.

In the Kew Herbarium is preserved an original coloured drawing of this species, labelled "*M. acuminatum*. Jan. 21st, 1826," which well agrees with Salm-Dyck's figures named *M. sulcatum* and *M. flexuosum* above quoted, but not with the figure of the plant he has named *M. acuminatum*. The tufts of

small leaves in the axils of the stem-leaves are very characteristic of this species. The origin of this plant as stated by Salm-Dyck does not apply to it.

M. FLEXUOSUM, *Haw.* A shrublet 30–60 cm. (1–2 ft.) high. Stem somewhat flexuose, slender, shining, with opposite branches, at first erect then weakly decumbent, terete, glabrous to the eye but scarcely so to the touch (perhaps this indicates that they are slightly papillate?), greyish, the younger branches thicker, as in *M. fastigiatum*. Leaves crowded, flexuose-recurved, semiterete, very green. Flowers terminal, solitary. Peduncle nearly naked, terete, thickened above, with glistening papillæ. Calyx 5-lobed; lobes large, the two larger finger-like, as in *M. splendens*. Corolla larger than that of *M. reflexum* and the petals broader, in many series, obtuse, notched, yellowish, tinted with red on the back, the inner series gradually smaller and almost setaceous, pale yellowish. Stamens short; filaments white; anthers yellow. Stigmas 4 (not 5), short, very erect, subulate, longer (as they are described as short, this is possibly an error for shorter?) than the stamens, greenish-yellow. Ovary united to the sides of the calyx, not separated from it as in *M. reflexum*. Capsule 4-celled.—*M. flexuosum*, *Haw. Misc.* p. 61 (1803); *Synop.* p. 257; & *Rev.* p. 172: *Ait. Hort. Kew. ed. 2, vol. iii.* p. 231: *DC. Prodr. vol. iii.* p. 445: *G. Don, Gen. Syst. vol. iii.* p. 147, not of later authors.

SOUTH AFRICA. Locality unknown. Introduced by *Masson* in 1795.

The above is a translation of Haworth's original description of this species. He obtained it from Aiton, and states that it is larger and greener than *M. reflexum* and its flowers expand in the morning during July and August.

Unfortunately there is no drawing of this species at Kew, but from Haworth's description of the petals, stigmas, etc., it must be very distinct from the plant figured by Salm-Dyck (*Mesemb.* § 44, fig. 7) as *M. flexuosum*, which, as stated on p. 107, is identical with *M. acuminatum*, *Haw.*

M. HERBEUM, *N. E. Br. (Pl. 10. fig. 43).* Planta humilis omnino herbacea, 7–15 cm. alta, basi in caulibus 3–5 ramosa. Caules 2–3 mm. crassi, erecti, superne sparsim dichotomo-cymosi, minute papulosi, rubescentes. Folia subpatula, 2–4 cm. longa, $2\frac{1}{2}$ –4 mm. lata, $2\frac{1}{2}$ –3 mm. crassa, lineari-semiteretia, acuta vel subacuta, supra canaliculata, basi subconnata, minute papulosa, sordide viridia. Flores in furcis cymæ solitarii. Pedicelli 2–6 mm. longi. Calyx sæpe 5- (interdum 4-) lobus, minute papulosus; lobi inæquales, 3–7 mm. longi, foliiformes, acuti. Corolla 10–18 mm. diametro; petala circa 30, uniseriata, 5–8 mm. longa, $\frac{1}{2}$ mm. lata, linearia, acuta, primum alba, demum alba apicibus purpureo-tincta. Stamina numerosa, circa 3 mm. longa, exterioribus absque antheris petaliformibus, primum erecta, demum patula. Stigmata 5, erecta, $2\frac{1}{2}$ mm. longa, subulata, acutissima, flavo-viridia, basi 5-tuberculata.

A dwarf herb, branching at the base into 3-5 erect stems 7-15 cm. high and 2-3 mm. thick, subterete, slightly flattened on the sides opposite the leaves, with internodes 5-20 mm. long, perhaps shorter on native grown plants, rather leafy, with very short branches in the axils of the leaves, the terminal part forking and by degrees developing into a leafy cyme with 2-3 alternate branches, minutely papillose, dull reddish or pale reddish-grey. Leaves ascending-spreading, sometimes recurving at the tips, 2-4 cm long, $2\frac{1}{2}$ -4 mm. broad and $2\frac{1}{2}$ -3 mm. thick, half-cylindric, acute, shallowly channelled down the face, rounded on the back, slightly united at the base, soft and flexible, glabrous, minutely papillose, green, not at all glaucous nor shining. Flowers developing one at a time in the forkings of the cymosely branched terminal part of the stem, odourless. Pedicels 2-6 mm. long, green. Calyx 4-5-lobed, minutely papillose, green; tube obconic; lobes unequal, 3-7 mm. long, resembling very reduced leaves, acute or subacute. Corolla on the first day of opening 8-10 mm. in diameter and usually entirely white, afterwards enlarging to 12-18 mm. in diameter, with the tips of the petals tinted with pale mauve-purple, expanding fully only in direct sunlight; tube none; petals about 30, in one series, widely spreading, 5-8 mm. long, $\frac{1}{2}$ mm. broad, narrowly linear, acute. Stamens numerous, 2-3 mm. long, the outer without anthers and resembling short petals, at first bunched together, finally more or less spreading; filaments white, anthers light yellow. Stigmas 5, erect, $2\frac{1}{2}$ mm. long, stoutly subulate, very acute, pale yellowish-green, surrounded at the base by 5 green tubercles on the top of the ovary, besides a series of green glands around the margin of the flat top of the ovary.

TRANSVAAL. Near Johannesburg, *Whiting*!

Described from living plants raised from seeds collected near Johannesburg, and sent to me by Mr. G. E. Whiting, who states that it grows in a red sandy soil plentifully mixed with stones. It is nearly allied to *M. Mahoni*, N. E. Br., which is quite wrongly placed in the *Crassulina* group by Berger. Both are dwarf plants and both develop their cymes in the same manner. Perhaps both should be placed near *M. sulcatum*, Haw.

M. NOTHUM, N. E. Br. This name I propose should be substituted for the plant masquerading in modern monographs under the name of *M. acuminatum*, which is not at all the same as *M. acuminatum*, Haw. As it is well figured and described by Salm-Dyck, it is unnecessary to give a fresh description of it here. Its synonymy will be as follows:—*M. nothum*, N. E. Br. *M. acuminatum*, Salm-Dyck, Mesemb. § 44. fig. 4: Sonder in Fl. Cap. vol. ii. p. 433: Berger, Mesemb. p. 121, not of Haworth.

SOUTH AFRICA. Locality and collector unknown.

The remarks of Salm-Dyck as to the origin of this plant apply only to the true *M. acuminatum* (see p. 107) and not to *M. nothum*. This species appears

to be allied to *M. longistylum*, DC., but differs in having larger flowers with stigmas not half as long as in that species.

§ MACRORHIZA.

M. NAPIFORME, *N. E. Br.* Root tuberous, turnip-shaped. Stem $2\frac{1}{2}$ – $7\frac{1}{2}$ cm. high. Leaves crowded, spreading, obtusely triquetrous (probably trigonous is meant), connate (at the base), resembling those of the Salt-wort (*Salsola kali*) in substance and taste. Flowers 1–3 together, subterminal, pedicellate, small, white. Calyx 5-lobed, with 2 lobes very long. Stigmas 5. Capsule subglobose.—*M. macrorrhizum*, DC. Prodr. vol. iii. p. 425 (1828): Don, Gen. Syst. vol. iii. p. 132: Berger, Mesemb. p. 219, not of Haworth. *M. sp.*, Du Petit Thouars, Mélanges de Botanique, p. 37.

ISLAND OF BOURBON. Growing among volcanic rocks near the sea, *Thouars*.

I have changed the name for this plant, as *M. macrorrhizum* of Haworth was published two years earlier than that of De Candolle, see p. 121.

§ MARCIDA.

M. PYGMÆUM, *Haw.* Plant tufted, 2–3 cm. high, with very short repeatedly forked branches above the soil. When at rest quite leafless, each branchlet clothed with fibrous sheaths and terminated by a small dead-looking whitish fibrous cone 4–7 mm. long and 3–4 mm. thick, from which during the growing season in late autumn there first bursts forth a pair of widely spreading leaves united only at their very base, 5–6 mm. long, 3– $3\frac{1}{2}$ mm. broad and $1\frac{1}{2}$ –2 mm. thick, deltoid-lanceolate, subacute or obtuse, slightly convex above, rounded beneath; from between the bases of this pair is soon after developed a second pair, which are united into at first a cylindric body with two small erect tooth-like points (representing the free tips of the leaves of which it is composed) at its apex; this cylindric body is soon followed by the development of a similar body at its base from one or both axils of the free leaves; with age the cylindric bodies become ovoid-conical; all are smooth and glabrous, not at all papillose, green, with numerous large and conspicuous pellucid dots when held against the light. The free leaves finally shrivel and dry up into brownish or greyish remnants 1–2 mm. long, whilst the cone gradually becomes fibrous and whitish, and assumes its resting appearance of being dead. Within it, however, are formed a pair of free leaves that will appear when the next season's growth takes place. Flowers not seen, but evidently developed when the new growth commences. Pedicels of young and mature fruit on dried specimens 10–12 mm. long, overtopping the growths. Sepals 6, about $2\frac{1}{2}$ mm. long, deltoid-ovate, subobtusate. Capsule 5 mm. in diameter, 6-celled.—

M. pygmaeum, Haw. Suppl. p. 98 (not 99 as quoted by authors); & Rev. p. 134: Berger, Mesemb. p. 116. *M. pigmaeum*, Sonder in Fl. Cap. vol. ii. p. 425 (description very bad). *M. cigarettiferum*, Berger in Engl. Jahrb. vol. xlv. p. 225 (1910).

WORCESTER AND LAINGSBURG DIV. Karoo beyond Hex River, *Rehmann*, 2896! and in *Herb. Bolus*, 5647! Matjesfontein, *MacOwan*, 3316! *Brunnthal*!

This curious little plant was discovered and introduced by Bowie about one hundred years ago, according to an original drawing at Kew of a type plant, which is labelled "*Mesembr. pygmaeum*, Haw. Raised from seeds in 1817 collected by Mr. James Bowie." Haworth correctly describes its peculiar mode of growth, but places it in his section *Microphylla*, whilst Berger has referred it to the section *Rostellata*; yet there is no species in either of these groups that resembles it in any way either in habit or appearance. Its peculiar mode of growth is almost identical with that of the section *Moniliformia*, and it should be placed next that group, from which it differs by its dwarf tufted habit and small size, smooth (not papillate) leaves, and conspicuous pellucid dots; the flowers may also differ, but I have not seen those of either group. Therefore, as sections are maintained for the grouping of this genus, I have characterized (p. 62) a fresh section for its reception. Judging from the dried specimens seen, it does not flower very freely under natural conditions, and, although I have watched it for very many years, I have never seen it flower under cultivation.

M. cigarettiferum, Berger, is described from a plant of *M. pygmaeum* at the period when the spreading leaves have not fully withered, whilst the conical terminal bodies have dried up into whitish bags of papery consistence containing a new pair of free leaves.

§ MONILIFORMIA.

This remarkable section is characterized by Haworth in his 'Revisiones' p. 93, and previous works as follows:—Deciduous, leafless in summer, with nodose-beaded or necklace-shaped branching stems 1–3 inches ($2\frac{1}{2}$ – $7\frac{1}{2}$ cm.) long. Leaves 4 each year to each branchlet; the two primary connate nearly to the tips or constantly truncate at the sheaths; the two following elongated, 1–6 inches ($2\frac{3}{4}$ –15 cm.) long, united at the base, withering-deciduous. Calyx or leaves crystalline-papillose.

In his 'Miscellanea,' p. 23, he gives the following account of the peculiar mode of growth of this group:—"At the approach of warm weather in spring, their leaves all decay, their vegetative faculties appear perfectly at a stand, and they seem more dead than alive until the following autumn; when they send forth from every extremity one or two pairs of the short

connate leaves above described (under *M. pisiforme*) ; which, after an interval of a month or two, protrude from their common centres, the secondary pairs of long proper leaves ; the daily increasing sizes of which, soon burst asunder the sheathing bases of the foliage of the preceding year ; and in a great measure push them off."

Haworth places under this section two species only—*M. pisiforme*, Haw. and *M. moniliforme*, Thunb. The former is quite unknown to me, but *M. moniliforme* was in cultivation at Kew Gardens many years ago ; unfortunately, I made only a small and very crude sketch of it without taking any notes, so am unable to say if Haworth's statement of its mode of growth is quite accurate, but as *M. clivorum*, N. E. Br. and *M. cognatum*, N. E. Br. described below seem to me to belong to the same group as *M. moniliforme* (compare for instance the short beaded branch of *M. clivorum*, Pl. 5. fig. 6, with the stem of *M. moniliforme* represented on the same plate), I am inclined to believe that the sequence of the development of the two kinds of leaves will be the same in *M. moniliforme* as it is in *M. clivorum*, *M. cognatum*, *M. proximum*, and *M. dissitum* described below, which takes place as follows :—During the summer the free tips of the pair of leaves that are united for a considerable or the greater part of their length into a cylindric or conical body terminating each branch gradually wither and dry up, and the skin of the united part also withers and becomes greyish, that part then assuming a more or less dried-up or dead appearance (really a resting condition), so that the plant appears leafless. Within this dead-looking terminal body, however, although quite invisible to any observer, a fresh growth is slowly developing, its formation taking place at the expense of the substance of the body enclosing it, so that finally it entirely replaces the latter, only the dried-up skin remaining and enveloping the new formation. Between October and February the dried skin ruptures and the new growth emerges from it, consisting of one pair of spreading or recurving leaves that are free except at the very base, and (or shortly followed by) another pair that are united for a considerable part of their length or nearly to their tips into a cylindric or conical body forming the termination of the stem or branch bearing it. Both pairs of leaves are minutely crystalline-papillate when young and remain green for some time, then they wither and the same process of renewal, as above described, takes place in due season.

From this it will be seen that if Haworth's statement of the sequence of development of the two pairs of leaves annually produced by *M. moniliforme* is correct, then in that species their order of production is exactly the reverse of that which occurs in *M. clivorum* and allies, which I place in the same section with *M. moniliforme*. All of these species are very remarkable in appearance.

M. CLIVORUM, *N. E. Br.* (Pl. 5. figs. 5-8). Fruticulus succulentus 25-30 cm. altus. Caules 6-14 mm. crassi, rami 6-10 mm. crassi, teretes ad nodos constricti, internodiis 10-30 mm. longis, glabri, pallide cinerei, junioribus viridibus vel rubro-brunneis. Folia mollia, glabra, minutissime papillata, viridia vel rubescentia; alia e basi brevissime connato libera 2-5 cm. longa, basi 6-10 mm. lata et 6-8 mm. crassa, attenuata, subobtusa, supra canaliculata, subtus obtuse carinata; alia inferne in corpusculum cylindricum caule simillimum 2-3 cm. longam et 7-11 mm. crassum connata, apicibus liberis patulis vel recurvis $2\frac{1}{2}$ -5 cm. longis et 4-6 mm. latis et crassis ad apicem subobtusum leviter attenuatis supra leviter canaliculatis subtus obtuse carinatis. Flores ignoti.

A small succulent bush 25-30 cm. high in the plants seen. Main stems 6-14 mm. thick, branches 6-10 mm. thick, terete, usually with an annular constriction at the nodes, with internodes 1-3 cm. long, glabrous, at first green or reddish-brown, becoming pale grey with age. Leaves of two kinds, two pairs (one pair of each kind alternating) forming the growth of one year; soft and pulpy, glabrous, when young covered with minute green (not crystalline) glittering watery papillæ, which dry up with age, those on the keel at the apex larger than the rest, but quite obtuse, not at all pointed, of a rather dull dark green or reddish; one kind free except at the very base, where they are united for their own thickness (but not more) around the stem, widely recurved-spreading, 2-5 cm. long, 6-10 mm. broad and 6-8 mm. thick at the base, thence tapering to a subobtuse point, concave-channelled above, obtusely keeled beneath; the other kind united below into a cylindric body 2-3 cm. long and 7-11 mm. thick, similar to or scarcely distinguishable from the internode of stem separating it from the pair of leaves below it, with the terminal part of the leaves free, widely spreading or recurving, $2\frac{1}{2}$ -5 cm. long, $3\frac{1}{2}$ -6 mm. broad and as much in thickness at the base, very slightly tapering to a subobtuse point, slightly concave-channelled or flattish above, obtusely keeled beneath. Flowers unknown.

LITTLE NAMAQUALAND. Slopes of the pass between the Stinkfontein Plateau and Chubiessis, *Pearson*, 6200 !

Described from living plants collected and sent to Kew by Prof. H. H. W. Pearson in 1911. They have not yet flowered.

This species is allied to *M. cognatum* described below, and by reason of the constrictions at the nodes of its stems, leaves, and mode of growth is evidently closely related to *M. moniliforme*, Haw. on the one hand, and on the other to *M. nitratum*, Marl., *M. proximum*, and *M. dissitum* described here, so that the whole of these species belong to one and the same group.

M. COGNATUM, *N. E. Br.* (Pl. 7. figs. 21-22). Fruticulus succulentus circa 15 cm. altus. Caules 8-10 mm. crassi, rami 6-7 mm. crassi, teretes ad nodos subincrassati, internodiis 5-25 mm. longis, glabri, pallide cinerei.

Folia mollia, glabra, juvenilia minute papillata, papillis secus margines et carinam acutis dentiformibus, viridia vel rubescentia; alia $1\frac{1}{2}$ – $3\frac{1}{2}$ cm. longa, basi 6–8 mm. lata et 3–4 mm. crassa, attenuata, subacuta, trigona, supra leviter canaliculata vel subplana, subtus obtuse carinata, recurvo-patula, basi in vaginam 5–8 mm. longam connata; alia inferne in corpusculum cylindricum caule simillimum $1\frac{1}{2}$ – $2\frac{1}{2}$ cm. longum et 5–7 mm. crassum connata, superne libera, patula, 18–32 mm. longa, 4– $5\frac{1}{2}$ mm. lata et $3\frac{1}{2}$ –5 mm. crassa, sublinearia, obtusa, trigona, supra leviter canaliculata vel subplana, subtus obtuse carinata. Flores ignoti.

A dwarf succulent bush about 15 cm. high in the plant seen. Main stems 8–10 mm. and the branches 6–7 mm. thick, terete, with internodes 5–25 mm. long and the nodes usually slightly thickened, glabrous, pale grey. Leaves of two kinds, a pair of each kind alternating with one another and the two pairs forming the growth of one year, soft and pulpy, glabrous, when young minutely crystalline-papillate, with the papillæ on the margins and keel acute, tooth-like, drying up and disappearing with age, green or tinted with reddish; one kind connate only at their base for more than their own thickness into a short sheath 5–8 mm. long, recurved-spreading, $1\frac{1}{2}$ – $3\frac{1}{2}$ cm. long, 6–8 mm. broad and 3–4 mm. thick at the base, thence gradually tapering to a subacute point, slightly concave-channelled or flattish above, obtusely keeled beneath; the other kind united below into a cylindric body $1\frac{1}{2}$ – $2\frac{1}{2}$ cm. long and 5–7 mm. thick, scarcely distinguishable from the stem except in colour, supported on an internode that frequently does not exceed in length the sheath formed by the pair of leaves at its base, with the free tips widely spreading, 18–32 mm. long, 4– $5\frac{1}{2}$ mm. broad and $3\frac{1}{2}$ –5 mm. thick, linear-trigonous, of nearly equal breadth throughout, obtuse, slightly concave-channelled or flattish above, obtusely keeled beneath. Flowers unknown.

LITTLE NAMAQUALAND. On the upper slopes of hills south-west of Chubiessis, *Pearson*, 6179!

Described from living plants sent by Prof. H. H. W. Pearson to Kew in 1911, which have not yet flowered.

M. cognatum is closely allied to *M. clivorum*, but it appears to be a dwarfer plant, and is easily distinguished by its less stout stems, which are thickened at the nodes instead of being constricted there; its leaves are smaller, and distinctly united at their base into a cup-shaped sheath a little longer than their own thickness, which is not the case in *M. clivorum*; they are of a rather lighter green, with the papillæ on them more crystalline, and those on the margins and keel acute and tooth-like, instead of very obtuse.

M. DISSITUM, *N. E. Br.* (Pl. 5. fig. 9 & Pl. 6. fig. 11). Suffrutex succulentus ad 30 cm. altus. Caules senecti 3–5 mm. crassi, sordide violaceo-grisei; rami 3 mm. crassi, internodiis $2\frac{1}{2}$ – $6\frac{1}{2}$ cm. longis, glabri,

rubro-brunnei. Folia biformia, glabra, viridia vel rubro-tincta; altera fere libera, basi tantum connata, patula, 2-4½ cm. longa, basi 8-11 mm. lata, deinde attenuata, acuta, supra plana vel leviter concava, subtus obtuse carinata; altera partibus inferioribus in conum longe stipitatum 2½-4½ cm. longum et 7-10 mm. crassum connata, apicibus liberis erectis vel adscendentibus 1-3 cm. longis 4-6 mm. latis et 3-5 mm. crassis obtuse trigonis acutis supra planis. Flores ignoti.

A small succulent bush up to 30 cm. high under cultivation. Old stems 3-5 mm. and branches 3 mm. thick, terete, slightly thickened at the nodes, with the rather slender internodes 2¼-6½ cm. long, glabrous, at first reddish-brown, changing to a dark and slightly violaceous grey. Leaves of two kinds, a pair of one kind alternating with and separated by a long internode from a pair of another kind, the two pairs usually forming one season's growth, soft and pulpy, glabrous, but in their earliest stage minutely crystalline-papillate, especially at the tips, and with minute acute tooth-like papillæ along the margins, which after a time disappear, green or reddish, or green with reddish tips; one kind free except at the very base, where they unite around the stem, widely spreading, 2-4½ cm. long, 8-11 mm. broad at the base, thence tapering to an acute apex, flat or slightly concave above, obtusely keeled on the rounded back; the other kind united throughout the greater part of their length into a conical fleshy body 2½-4½ cm. long and 7-10 mm. thick at the base, tapering to a thickness of 4-7 mm. at the top, with free erect or slightly spreading trigonous tips 10-26 mm. long, 4-6 mm. broad and 3-5 mm. thick at the base, thence slightly tapering to an acute apex, flat above, obtusely keeled on the back. Flowers unknown.

LITTLE NAMAQUALAND. Among bushes on the upper slopes of hills above Daunabis, *Pearson*, 6116!

Described from living plants sent to Kew in 1911, which have not yet flowered.

This species, although allied to *M. mitratum* and *M. proximum*, is well distinguished from them by the long slender internodes separating the pair of free leaves from those united into a cone. These three species are distinguished from all others in the genus by the peculiar cone-shaped body which terminates the growth of each year. Nevertheless, they cannot be disassociated from the section *Moniliformia*, because in all other characters they conform with those of that section, and if the bodies were spherical instead of conical there would be no character whatever to distinguish them. The true position of this remarkable section *Moniliformia* is that it is related on the one hand to the section *Spheroidea* and on the other to the section *Rostrata*. In my opinion it should be placed next to the latter.

M. MITRATUM, *Marl.* (Pl. 5. figs. 1 & 2). A shrublet about 30-60 cm. high. Branches erect, 7-15 mm. thick, with ring-like thickenings at the

nodes, dark reddish when young, becoming dark brown. Leaves of two kinds ; one kind free except at the very base, where they are united around the stem, evidently spreading, but they are not described and only their withered remains are represented in Dr. Marloth's figure ; the other kind united for the greater part of their length into a fleshy conical body 3-6 cm. long and 18-25 mm. thick, terminating each branch. Flowers bursting through the dried-up skin at the side of the conical body. Peduncle about 1 cm. long. Calyx 5-lobed, 3 of the lobes with membranous margins. Petals apparently about 1 cm. long, linear, white at the base, pale pink at the upper part.—*M. mitratum*, Marl. in Tr. Roy. Soc. S. Afr. vol. ii. p. 35, pl. 1. fig. 4 (1910), & Fl. South Afr. vol. i. p. 205, pl. 51. fig. C.

LITTLE NAMAQUALAND. Sandy deserts about 10 miles east of Port Nolloth, *Alston* in *Herb. Marloth*, 4690.

The above description is compiled from that given by Dr. Marloth and from his figures of the plant, partly copied on Pl. 5. figs. 1-2. He appears not to have seen the plant in a vegetative condition, as he does not describe both kinds of leaves, nor if they are or are not crystalline-papillate when young. The mode of growth is undoubtedly the same as that of *M. proximum*, *M. dissitum*, etc., which I describe on p. 59, and not quite the same as detailed by Dr. Marloth. I have included this species here to contrast it with *M. proximum*, from which *M. mitratum* seems to differ by its much stouter conical bodies, which are also solitary instead of clustered.

Dr. Marloth has placed this plant in a separate section (§ *Mitrata*), but as *M. mitratum*, *M. proximum*, and *M. dissitum*, which are certainly all allied, do not differ in any way in their very peculiar mode of growth from *M. elivorum* and *M. cognatum* described here, all of these species must be associated under one group or section ; and as there is evidently a relationship between *M. elivorum* and *M. moniliforme*, as indicated by some of the branches on the plants of *M. elivorum*, one of which I have represented on Pl. 5, where the internodes are much shorter than usual, so that they then somewhat resemble the bead-like joints of *M. moniliforme*, it appears to me that all these plants should be placed under the section *Moniliformia* of Haworth, as I have here done.

M. MONILIFORME, *Thunb.* (Pl. 5. fig. 10). Plant 3-4 inches ($7\frac{1}{2}$ -10 cm.) high, branching. Stems or branches 4-6 lines (8-12 mm.) in diameter, beaded or necklace-like from being constricted at the nodes into depressed-globose segments, brown. Leaves of two kinds, one pair of each kind (*i. e.* 4 leaves) produced annually at the end of each stem or branch ; one kind 4-6 inches (10-15 cm.) long, linear-semicylindric, obtuse, recurving, soft, minutely pubescent according to Thunberg, but probably minutely crystalline-papillate, united at the base for about half an inch (12 mm.) into a globose body, green ; the other kind united nearly to the tips into a fleshy oblong

sphæroid body. Peduncle solitary, terminal, 2 inches (5 cm.) long, cylindric (angular according to Thunberg), crystalline-papillate. Calyx deeply 4-lobed, the smaller lobes with membranous margins. Petals numerous, a little longer than the calyx-lobes, linear, entire, subobtusely, white. Stamens numerous, spreading; filaments and anthers yellow. Stigmas 7, as long as the stamens, spreading, greenish-yellow.—*M. moniliforme*, Thunb. in Nov. Act. Ephem. Nat. Curios, vol. viii. Append. p. 7 (1791); & Fl. Cap. ed. Schultes, p. 413: Haw. Obs. pp. 132, 440, & 441; Misc. p. 24; Synop. p. 207; & Rev. p. 93.

VAN RHYNSDORP DIV. On hills near the Olifants River, towards the North, *Thunberg, Masson*.

As this species seems to be very imperfectly known, the above description is compiled from those of Thunberg and Haworth and from what I remember of a plant of this species cultivated many years ago in Kew Gardens (see p. 112), but of which I made no notes. My figure of it is made partly from a small, imperfect, and very crude sketch I made of a part of the plant at Kew and partly from memory, but although not accurate, it is sufficiently correct to give some idea of what this very remarkable species looks like.

M. PROXIMUM, *N. E. Br.* (Pl. 5. figs. 3 & 4). Suffrutex succulentus 20–25 cm. altus, ramosus. Caules usque ad 6 mm. crassi, rami 4–5 mm. crassi, teretes, nodis leviter incrassatis et internodiis 6–25 mm. longis, glabri, pulluli. Folia biformia glabra viridia; altera fere libera basi tantum connata, patula, $1\frac{1}{2}$ –8 cm. longa, 8–14 mm. lata, basi 6–8 mm. crassa, attenuata acuta, supra plana, subtus convexa, apice breviter carinata; altera partibus inferioribus in conum sæpe subsessilem 3–7 $\frac{1}{2}$ cm. longum et 10–18 mm. crassum connata, apicibus liberis patulis 8–25 mm. longis. Flores ignoti.

A small succulent bush 20–25 cm. high under cultivation. Old stems about 6 mm. thick, branches about 4–5 mm. thick, terete, slightly thickened at the nodes, with internodes 6–25 mm. long, glabrous, dark violaceous grey. Leaves of two kinds, a pair of one kind alternating with a pair of another kind, the two pairs usually forming the growth of one season, soft and pulpy, glabrous, but in their earliest stage minutely crystalline-papillate, especially at the tips, and with minute acute tooth-like papillæ along the margins, which afterwards disappear, uniformly light green; one kind free except at the very base, where they unite around the stem, widely spreading, $1\frac{1}{2}$ –8 cm. long, 8–14 mm. broad, and 6–8 mm. thick at the base, thence gradually tapering to an acute or subacute apex, concave, flat, or sometimes at length slightly convex on the face, obtusely keeled on the back; the other kind united throughout the greater part of their length into a stout conical fleshy body, sometimes supported on a short internode, sometimes sessile or subsessile, 3–7 $\frac{1}{2}$ cm. long, 10–18 mm. thick at the lower part, tapering to 6–8 mm. thick at the top when fully developed, with free ascending or

diverging tips 8–25 mm. long, 2–6 mm. broad and 2–4 mm. thick at the base, thence tapering to an acute or subacute apex, at first concave, becoming flat above, obtusely keeled on the back. Flowers unknown.

LITTLE NAMAQUALAND. Without precise locality, *Pearson*!

Described from living plants sent to Kew by Prof. Pearson with *M. dissitum* in 1911, so that it may perhaps have come from the same neighbourhood.

M. proximum is undoubtedly closely allied to *M. mitratum*, Marl., but distinctly differs from that species by the tendency of the plant to produce its conical growths or cones in clusters, and by the cones themselves being more elongated and not nearly so thick; the flowers may also differ, but it has not yet flowered in this country. (See also p. 58.)

From *M. dissitum* the short internodes and different colour of the much stouter stem at once distinguishes this species.

§ MURICATA.

M. DELTOIDES, *Linn.* There is considerable confusion both in books and gardens concerning this plant, because Haworth changed the name of the typical plant to that of *M. muricatum* and preserved the name *M. deltoides* for a large-flowered variety of it. In gardens three distinct forms of this species are cultivated under various names, which may be recognized by the following characters and revised synonymy:—

M. DELTOIDES, *Linn.* Peduncle not or scarcely exceeding the leaves, 2–12 mm. long, with a pair of bracts at the middle. Corolla 10–12 mm. in diameter.—*M. deltoides*, *Linn. Sp. Pl. ed. 1, p. 482 (1763)*: *Miller, Dict. ed. 8, no. 11 (not 13 as quoted by authors)*: *Haw. Obs. p. 364. M. deltoides var. muricatum*, *Berger, Mesemb. p. 190. M. muricatum*, *Haw. Misc. p. 75 (1803)*: *Salm-Dyck, Mesemb. § 30, fig. 3*: *Sonder in Fl. Cap. vol. ii. p. 421. M. deltoides et dorso et lateribus muricatis minus*, *Dillen. Hort. Elth. p. 255, t. 195, fig. 246 (1732).*

Var. *MAJUS*, *Weston.* Peduncle not or scarcely exceeding the leaves, 2–12 mm. long, with a pair of bracts at the middle. Corolla about 18 mm. in diameter.—*M. deltoides var. majus*, *Weston, Univers. Bot. vol. i. p. 169 (1770)*: *Haw. Obs. p. 366. M. deltoides var. β*, *Linn. Sp. Pl. ed. 1, p. 482 (1763). M. deltoides*, *DC. Pl. Grass. t. 53*: *Haw. Misc. p. 74, not of Linnæus. M. deltoides et dorso et lateribus muricatis majus*, *Dillen. Hort. Elth. p. 254, t. 196 as to fig. 247 only.*

Var. *PEDUNCULATUM*, *N. E. Br.* Peduncle much longer than the leaves, 25–50 mm. long, with a pair of bracts at the middle. Flower 18–22 mm. in diameter.—*M. deltoides*, *Salm-Dyck, Mesemb. § 30, fig. 2*: *Sonder in Fl. Cap. vol. ii. p. 421*: *Berger, Mesemb. p. 190, not of Linn. M. deltoides et dorso et lateribus muricatis majus*, *Dillen. Hort. Elth. p. 254, as to t. 195, fig. 245 only.*

TULBAGH DIV. New Kloof, near Tulbagh, *MacOwan* ! *Schlechter*, 9045 ! *Scott Elliot*, 228 ! near Tulbagh Waterfall, *Bolus*, 5054 ! All three varieties were introduced before 1732.

It is difficult to distinguish the varieties from dried material, but I believe *Bolus* 5054 represents the typical form and *MacOwan*'s specimen the variety *majus*.

§ PARIFERA.

M. BINUM, *N. E. Br.* (Pl. 10. figs. 41-42). Suffrutex circa 10-15 cm. altus, cruciatim ramosus. Rami ancipiti, internodiis 10-18 mm. longis. Folia 10-18 mm. longa, 5-9 mm. lata et 8-10 mm. crassa, adscendentia, ad medium connata, compressa, trigona, supra leviter convexa, dorso acute carinata, e latere visu semilunata, subacuta, apiculata, microscopice puberula, subcaeruleo-viridia, purpureo-carinata. Flores non vidi, sed ex icone corolla 28-30 mm. diametro ; petala circa 30, libera, 12-13 mm. longa et $2\frac{1}{2}$ -3 mm. lata, lineari-oblongata, obtusa. Stamina collecta, 6 mm. longa.

A dwarf shrublet, apparently about 10-15 cm. high, branching in a cruciate manner. Stem slightly compressed and 2-edged, about 4 mm. thick in one direction and 3 mm thick in the other, with internodes 10-18 mm. long, at first green, becoming brown and woody with age ; branches spreading 4-7 cm. long in the specimens seen. Leaves 10-18 mm. long (measured from the base at the back), 5-9 mm. broad and 8-10 mm. thick, laterally compressed, ascending or ascending-spreading and united at the base for 7-9 mm. of their total length, each leaf viewed from the side being somewhat half-moon-shaped, subacute or obtuse and minutely apiculate at the apex, slightly convex or flattish on the upper surface, and viewed from above elongated triangular or ovate in outline, acute, acutely keeled all down the back, and with the keel continuing down the stem ; surface smooth, microscopically puberulous, velvety to the touch, faintly bluish-green, dull purplish or reddish along the cartilaginous keel, not dotted. Flowers not seen, but according to a photograph representing a small plant of the natural size, the corolla is 28-30 mm. in diameter, with about 30 petals free to the base, 12-13 mm. long and $2\frac{1}{2}$ -3 mm. broad, linear-oblongate, obtuse. Stamens numerous, collected into a bundle 6 mm. long, apparently of a dark colour at the tips.

LAINGSBURG DIV. Near Matjesfontein, *Pillans* !

This species is very singular in appearance and quite distinct from all that are known to me. The soft fleshy compressed leaves, being united in pairs for about half their length into flattened obovate 2-lobed bodies, suggest a process of evolution where species of the type of *M. bilobum* have developed internodes between the successive growths and so developed into a shrublet. The oblique stripes on the leaves are not evident to all seasons of the year.

§ PLANIFOLIA.

M. OCULATUM, *N. E. Br.* When I described this species in the Kew Bulletin, 1911, p. 313, I stated that it was allied to *M. viridiflorum*, Ait., but at that time the plant was in vigorous growth and did not show its real character, for I have since found that its leaves wither, persist and become somewhat skeleton-like in the same way that those of *M. anatomicum*, Haw. do. Therefore, although its leaves are not flat, I think it should be placed in the same group as the latter species.

LITTLE NAMAQUALAND. Between quartzite ledges on the upper north-western slopes of hills south-west of Chubiessis, *Pearson*, 6172!

The flattish papillæ on the leaves of this species are very large and are arranged in longitudinal rows.

§ SARMENTOSA.

M. SCHOLLII, *Salm-Dyck*. The validity of this name to stand for this species rests upon whether the imperfectly known *M. recurvum*, Moench (see p. 123), which was published in 1802, is identical with any species published before Haworth's 'Miscellanea Naturalia' appeared in 1803. For if *M. recurvum*, Moench proves to be a synonym of any previously described species, as I suspect it will, then the name *M. recurvum*, Haw. must replace that of *M. Schollii*, the following being the dates and particulars of the nomenclature :—

M. RECURVUM, Haw. Suppl. p. 90 (1819).—This name was given to the plant described and figured under the name of *M. aduncum* by Jacquin in his 'Fragmenta Botanica,' p. 43, t. 51. fig. 2, because Haworth had already published in 1803 (Misc. p. 87) another species under the name of *M. aduncum*, and so was justified in giving a fresh name to Jacquin's plant. Jacquin's 'Fragmenta' is dated 1809, but it was issued in six parts between 1800 and 1809. I have failed to discover when each part was published, but there is internal evidence that gives a clue to a date before which certain pages could not have been published. Thus, from the evidence given on p. 40 under *Eugenia balsamica*, it is clear that p. 43 and accompanying plates could not have been published until or after the year 1804, which is one year later than the date of *M. aduncum*, Haw.

M. SCHOLLII, *Salm-Dyck*, Obs. Bot. p. 10 (1820). At this place *Salm-Dyck* quotes *M. recurvum*, Haw. and *M. aduncum*, Jacq. as synonyms.

SOUTH AFRICA. Locality unknown, raised from seeds, which were probably sent by *Scholl*.

M. VALIDUM, *Haw.* Branches stout, rigid, decumbent. Leaves long, pale green, with a rough margin. Flowers subternate, with the keels of the bracts entire. Petals rosy, with a red mid-line.—*M. validum*, *Haw.* in *Phil. Mag.* 1826, p. 329.

SOUTH AFRICA. Locality unknown, introduced by *Bowie*.

This species is entirely omitted from the monograph of Sonder and of Berger, because they have both copied the unaccountable error made by Salm-Dyck, who figured and described a totally different plant with solitary yellow flowers as being the *M. validum* of Haworth, which, although there is not a drawing of it at Kew, is evidently, as Haworth states, closely allied to *M. rigidicaule*, *Haw.* and not in the least like the plant figured and described by Salm-Dyck, Sonder, and Berger under that name (see *M. dissimile*, *N. E. Br.*, p. 105). In comparing *M. validum* with *M. rigidicaule*, Haworth states that it differs in having shorter, more contiguous and more erect branches, paler leaves that are always shorter (not sometimes longer) than the internodes, entire bracts not lacerate on the back, and fewer, less pedunculate flowers.

§ SPINULIFERA.

M. VIGILANS, *L. Bolus*. Mrs. Bolus desires that the above name should replace that of *M. hesperanthum* for the Bechuanaland plant described by her in 1915 under that name, because the same name had been used by Dinter and Berger in 1914 for a very different species belonging to the section *Dolabrifolia*. Therefore its synonymy will be:—*M. vigilans*, *L. Bolus*. *M. hesperanthum*, *L. Bolus* in *Ann. Bolus Herb.* vol. i. p. 190 (1915), not of Dinter and Berger.

BECHUANALAND. Gaberones, *Rogers*.

§ TRICHOTOMA.

M. MACRORRHIZUM, *Haw.* This name was published by Haworth in 1826, and was changed to *M. megarhizum* by Don in 1834, because another species had been described by De Candolle under the name of *M. macrorrhizum*, and all authors have subsequently upheld Don's name. But Haworth's name was published two years earlier than that of De Candolle, and therefore must be restored and another name given to the plant described by De Candolle as *M. macrorrhizum*, for which I propose that of *M. napiforme*, *N. E. Br.*, see p. 110.

The synonymy of Haworth's plant will therefore be as follows:—*M. macrorrhizum* *Haw.* in *Phil. Mag.* 1826, p. 331: *Salm-Dyck*, *Mesemb.* § 49, fig. 3. *M. megarhizum*, *Don*, *Gen. Syst.* vol. iii. p. 145 (1834): *Sonder* in *Fl. Cap.* vol. ii. p. 441: *Berger*, *Mesemb.* p. 101.

CAPE DIV. The locality from which this plant was originally introduced by *Bowie* is unknown, but *Schlechter's* no. 7546, collected on Lion Mountain near Cape Town, appears to be this species.

§ TUMIDULA.

M. FESTIVUM, *N. E. Br.* Frutex ultra 30 cm. altus. Caules erecti, 3-4 mm. crassi, internodiis 3-8 cm. longis. Folia axillaria tantum vidi, suberecta, 3 cm. longa, semiteretia, acuta, apice recurva, glabra, glauca? Cymæ 5-7 cm. diametro, 10-20-floræ, ramis 4-8 cm. longis suberectis. Bracteæ 7-15 mm. longæ, late deltoideæ, acutæ, subpatulæ, cupulato-connatæ. Pedicelli 10-12 mm. longi. Calyx 6-lobus; lobi 5-7 mm. longi, 4-5 mm. lati, deltoideo-ovati, acuti vel dorso apiculati, membranaceo-marginati. Petala numerosissima, 6-10 mm. longa, $\frac{1}{3}$ - $\frac{1}{2}$ mm. lata, linearia, acuta, interioria filiformia. Stamina 30-40?, circa 2-3 mm. longa. Stigmata 5, parva, crassa, acuta, 1 mm. longa.

A shrub over 30 cm. high. Main stems or branches with internodes 3-8 cm. long and 3-4 mm. thick, branching into cymes at the top, brown, gland-dotted on the young parts. Leaves of the main stems fallen, only seen in the axillary tufts, erect or suberect, 3 cm. long and $1\frac{1}{2}$ mm. thick (dried), apparently semiterete and of about the same breadth and thickness throughout, flat or concave above and rounded or obtusely keeled on the back, acute and recurved at the tips, probably smooth and glaucous-green. Cymes 5-7 cm. in diameter, 10-20-flowered, with the flowers all nearly at the same level, its branches 4-8 cm. long, suberect. Bracts 7-15 mm. long, broadly deltoid-ovate, acute, ascending, spreading, united at the base into a cup-like sheath, the upper with membranous margins. Pedicels 10-13 mm. long. Calyx 6-lobed, glabrous, gland-dotted in the dried state; tube at the base of the lobes 6-8 mm. in diameter; lobes 5-7 mm. long, 4-5 mm. broad, deltoid-ovate or ovate, with membranous margins, acute or with a dorsal point 1-2 mm. long just below the apex. Corolla probably 25 mm. or more in diameter; petals very numerous, 6-10 mm. long, $\frac{1}{3}$ - $\frac{1}{2}$ mm. broad, narrowly linear, acute, the inner (or possibly these may be barren stamens) filiform, all gland-dotted (dried). Stamens apparently about 30-40, not very numerous in proportion to the number of petals (unless the supposed inner petals are antherless stamens), about 2-3 mm. long. Stigmas 5 in the only flower examined, 1 mm. long, stout, erect, with recurved acute tips.—*M. tumidulum*, Sonder in Fl. Cap. vol. ii. p. 426: Berger, Mesemb. p. 114 (partly), not of Haworth.

VAN RHYNSDORP DIV. Driefontein, *Zeyher*, 698!

This is the plant Sonder has described as being *M. tumidulum*, but it is entirely different from that species in habit, number of flowers in a cyme,

and much larger size of the flowers etc., and comes from a totally different region. All the measurements in the above description are made from dried specimens, so that probably some of them will be found to be less than those of the same parts of the living plant.

Affinity doubtful.

M. RECURVUM, *Moench*. A decumbent shrub with a glabrous bark. Leaves 6 lines (12 mm.) long, subtriquetrous, connate-sessile, recurved at the apex, glabrous, subpapillose. Flowers solitary, white. Bracts none. Calyx 5-lobed. Stamens all fertile. Stigmas 5. Capsule 5-celled.—*M. recurvum*, Moench, Meth. Pl. Suppl. p. 190 (1802), not of Haworth.

Locality and collector unknown, but probably of South African origin.

The above is a translation of the original description, which represents all that is known of this plant. It appears to have been overlooked by all authors, as I have failed to find it in the works of either Haworth, De Candolle, Sonder, or Berger; but it is quite probable that it has been also described by Haworth under another name. The section to which it belongs is doubtful. The *M. recurvum*, Haw. was not published until 1819 (see under *M. Schollii*, p. 120).

III. Species discovered by Burchell. (To end.)

M. ALOIDES, *Haw.* (§ *Aloides*). Stemless, tufted, with fusiform roots. Leaves numerous, spreading, scarcely regularly decussate, semicylindric, thick, gradually enlarged upwards, somewhat concave on the upper side, carinate-triquetrous at the apex, entire, greenish, with somewhat pearl-like white dots, especially beneath. Flowers central, sessile, of moderate size, yellow, produced in the autumn.

The above are all the characters given by Haworth in his two descriptions of this plant. Burchell in his MSS. describes it as follows:—"Stemless; roots fusiform, edible. Leaves spatulate, connate at the base, entire, acute, flat above, convex beneath, twice as broad as thick, dull green sprinkled with white dots. Flower sessile, yellow."

In the Kew Herbarium is preserved an excellent coloured drawing of the typical plant, inscribed "*M. aloides*, Haw. Received from Mr. Haworth in the year 1822, who obtained it from Mr. Burchell." This drawing shows the following characters:—Plant stemless, tufted. Leaves 8–12 to a growth or cluster, some perhaps belong to axillary growths, widely spreading, opposite, but forming a rosette 6–7 cm. in diameter; each leaf 2–3 cm. long, 8–10 mm. broad, and about 5 mm. thick, lanceolate or somewhat rhomboid-lanceolate, acute, flat, or perhaps slightly concave above, keeled beneath, at least at the apical part, rather dark dull green, with purplish margins, thickly dotted with white on both surfaces, the dots along the margins

crowded and almost touching one another. Flower sessile. Calyx not represented. Corolla 25 mm. in diameter; petals in about 2 series, widely spreading, the outer about 10 mm. long and 1 mm. broad, the inner a little shorter, linear, acute, yellow, with red tips. Stamens numerous, collected into a cone about 6 mm. broad at the base and 3 mm. broad at the apex; filaments white, anthers dull purplish.—*M. aloides*, Haw. Suppl. p. 88 (1819); & Rev. p. 87: Burch. Trav. vol. ii. p. 332: DC. Prodr. vol. iii. p. 419, not of Salm-Dyck, Sonder, or Berger.

BECHUANALAND. At Matlowing River, July 7, 1812, *Burchell*, 2197, and at Jabiru Fontein, near Takun, Aug. 31 and Sept. 5, 1812, *Burchell*, 2249–8.

I have given the above three descriptions of this species in order to call attention to it, for at present it is quite an unknown plant, as that figured by Salm-Dyck and described in modern books as being *M. aloides* is not that species at all (see *M. cibdelum*, N. E. Br., p. 64).

In gardens two or three species are cultivated under the name of *M. aloides*, but none are correctly named. The only species that I have seen which bears any resemblance to the true *M. aloides* is *M. rubrolineatum*, N. E. Br., which is very similar in its habits and foliage. But the latter species comes from the widely distant locality of the Graaff Reinet region and has different flowers, the red midribs of its petals being very distinctive.

Burchell states in his 'Travels' that the roots are "eaten by the natives as a substitute for better food." Of no. 2197 he collected only seeds, but of nos. 2249–8 he collected both seeds and a dried specimen, which latter was in his herbarium when it came to Kew, but according to the list made, was not mounted for Kew, but treated as a duplicate, so that the type is probably in the Asa Gray Herbarium at Harvard University, Cambridge, Mass., U.S.A.

M. ARBORIFORME, *Burch.* (§ *Spinosa*). A small shrub 1–2 feet high, branched, and mostly with a simple trunk. Cymes 8-times forked. Flowers minute, of a testaceous colour.

The above is a translation of the original description. The following I have made from the dried type specimen:—

A shrublet, densely and alternately much branched so as to form a mass of small dead rigid and somewhat spiny cymes. Main branches woody, 4–5 mm. thick, with internodes 5–15 mm. long; bark smooth, dark brown. Young flowering branches alternate, at first appearing to be 1–5 cm. long below the first forking of the cyme, but sometimes by the development of fresh cyme-branches from its nodes, the ultimate length below an old cyme is often only 5–15 mm., about 1½–2 mm. thick, with internodes 5–15 long, papillose, whitish. Leaves opposite, contiguous but (on dried specimens) scarcely connate at the base, spreading, 5–15 mm. long, 1–1½ mm. thick, doubtless larger when alive, when swollen in boiling water appearing semiterete, or slightly convex or slightly channelled above and convex beneath,

but some appear as if they may have been obtusely keeled, obtuse, apparently smooth. Primary cymes 3–6 cm. in diameter, many-flowered, 3–6-times forked, but by the development of fresh cymes from the lower part of an old one the ultimate cyme formed of dead and living cymes becomes up to 8-times forked, as Burchell states. By the branching from the lower part of each old cyme and one of the branches thickening and becoming stem-like a thick mass of branches and dead cymes is formed. Bracts like reduced leaves, 2–5 mm. long. Pedicels $1\frac{1}{2}$ –4 mm. long. Calyx 5-lobed; lobes 1–2 mm. long, unequal, 3 with membranous margins. Corolla 7–10 mm. in diameter; petals apparently about 20–25 but perhaps up to 30, in 1–2 series, about $3\text{--}4\frac{1}{2}$ mm. long and $\frac{2}{3}$ – $\frac{3}{4}$ mm. broad, linear, obtuse. Stamens numerous, apparently not collected into a column or cone, $1\frac{1}{2}$ –2 mm. long. Stigmas apparently 4–5, partly destroyed in the flowers examined, nearly 1 mm. long, subulate, with recurving tips.—*M. arboriforme*, Burch. Trav. vol. i. p. 343 (1822): DC. Prodr. vol. iii. p. 451: Sonder in Fl. Cap. vol. ii. p. 459: Berger, Mesemb. p. 292.

GRIQUALAND WEST. Hay Div., between Wittewater and Rietfontein, Feb. 15, 1812, *Burchell*, 2004! This is the type, but what appears to be the same species was also collected in Philipstown Div., near Petrusville, on March 2, 1813, *Burchell*, 2681! Also collected near the Diamond Fields by *Dr. Shaw*, 14!

Burchell collected only four small branches of no. 2004 and one larger branch of 2681, from which the above description is made; all are at Kew. Burchell places this species in the alliance of *M. parviflorum*, Haw., but it is evidently nearly allied to *M. spinosum*, which, as understood by South African botanists, includes 3 or 4 distinct species, and, I believe, *M. arboriforme* among others.

M. BIDENTATUM, Haw. (§ Difformia). This specimen was described from plants raised from seeds collected by Burchell, who preserved no specimen of it, either of the South African plant or that grown in England. But it is well known, and there is an original coloured drawing of the type at Kew. I cannot find any clue as to the locality where Burchell collected it.—*M. bidentatum*, Haw. Suppl. p. 89 (1819); & Rev. p. 103: DC. Prodr. vol. iii. p. 423: Salm-Dyck, Mesemb. § 7, fig. 1: Sonder in Fl. Cap. vol. ii. p. 400: Berger, Mesemb. p. 231.

M. BLANDUM, Haw. (= *M. multiradiatum*, Jacq.). (§ Blanda.) This species is well known and commonly cultivated at the present time. The name, however, should give place to that of *M. multiradiatum*, Jacq., which antedates it by more than ten years; the correct synonymy being:—*M. multiradiatum*, Jacq. Fragm. p. 44, t. 53. fig. 1 (between 1804 & 1807). *M. blandum*, Haw. Suppl. p. 95 (1819); & Rev. p. 147: DC. Prodr. vol. iii. p. 436: Lodd.

Bot. Cab. t. 599 : Lindl. Bot. Reg. t. 582 : Salm-Dyck, Mesemb. § 26, fig. 1 : Sonder in Fl. Cap. vol. ii. p. 418 : Berger, Mesemb. p. 162.

BATHURST DIV. Near Barville Park, Oct. 14, 1813, *Burchell*, specimens raised from seed of no. 4125 !

Salm-Dyck and others following him, without investigation, have wrongly placed *M. multiradiatum*, Jacq. as a synonym of *M. roseum*, Willd.

A drawing of the typical plant of *M. blandum* is preserved at Kew. The figures in the 'Botanical Cabinet' and 'Botanical Register' are excellent, that of Salm-Dyck rather poor, representing a "drawn up" plant.

M. BREVICAULE, *Haw.* (§ Capitata). Seeds only of this species were collected in South Africa, from which living plants were raised in England, but no specimen of them was preserved by Burchell. A coloured drawing of the type plant is preserved at Kew, which seems to be the same as that figured by Salm-Dyck, so that it is correctly understood in modern works.—*M. brevicaule*, *Haw.* Suppl. p. 91 (1819) : & Rev. p. 113 : DC. Prodr. vol. iii. p. 426 : Salm-Dyck, Mesemb. § 16, fig. 2 : Sonder in Fl. Cap. vol. ii. p. 409 : Berger, Mesemb. p. 216.

SOUTH AFRICA. Collected during a journey made between the Vaal River and Graaff Reinet, March to May 1812, *Burchell*, 2128-2 ! (Seed 111).

M. CAMPESTRE, *Burch.* (§ Vaginata). An erect shrub about 1½ ft. high. Branches (dried) 2-3 mm. thick, bearing short branchlets 8-28 mm. long, from one axil only of the leaf-pairs and directed to one side of the branch ; internodes 5-10 mm. long ; bark grey. Leaves ascending or ascending-spreading, 6-10 mm. long, 2½-3½ mm. broad and 2-2½ mm. thick at the base, thence tapering in a nearly straight line to an acute apex, which bears a small recurved-hooked point, slightly concave (or when alive perhaps flat) on the upper side, obtusely keeled on the rounded back, united at the base into a sheath 3-6 mm. long, glabrous, apparently not serrulate on the keel. Flowers solitary, terminating the short lateral branchlets. Pedicels shorter than the leaves, 3-5 mm. long. Calyx 5-lobed ; tube or ovary very shortly and broadly obconic ; lobes 4-5 mm. long and 2-3 mm. broad, deltoid-ovate, acute. Petals rosy, according to Burchell, but these and the other parts of the flower are not present on the specimens, there being only one imperfect flower and two immature capsules on the Kew specimens.—*M. campestre*, *Burch. Trav.* vol. i. pp. 259-260 (1822) : DC. Prodr. vol. iii. p. 451 : Sonder in Fl. Cap. vol. ii. p. 459 : Berger, Mesemb. p. 292.

SUTHERLAND DIV. Near Sutherland, Aug. 8, 1811, *Burchell*, 1340 !

Burchell states that "*M. campestre*, now in bloom, everywhere decorates the road." So that it must be plentiful in the locality where he found it. He only collected three specimens of this species, two of which are at Kew

and the other is probably in the Asa Gray Herbarium at Harvard University, United States, where the first set of duplicates of Burchell's plants were sent.

Burchell has stated that it is "allied to *M. pulchellum*, Haw." But this is quite a mistake, for it belongs to the very different section *Vaginata*, and is very similar to *M. parviflorum*, Haw., having the same stout branches and the same hooked apiculus to the leaves, which are also similar in pose and shape, but the flowers are rosy instead of white, and I do not detect any minute serrulation on the keel of the leaves such as is characteristic of *M. parviflorum*, Haw. Berger has wrongly placed *M. parviflorum* as a synonym of *rigidum*, Haw., but the latter has more slender branches and its leaves are more spreading, less stout, and without the hooked apiculus at their tips, whilst the flowers of *M. rigidum* are 12–14 mm. in diameter and those of *M. parviflorum* only 6–8 mm. The dried leaves of *M. campestre* are remarkably wrinkled, so that they are probably larger than the dimensions above given both in length and thickness.

M. CORIARIUM, Burch. (§ *Vaginata*). A shrub or shrublet. The type specimen consists of a single piece, branching so as to form a pyramidal panicle about 27 cm. long and 18 cm. broad, with numerous cymes, appearing leafless in the dried state. Main stem 4 mm. thick, probably stouter when alive, with internodes $1\frac{1}{2}$ –2 cm. long, distinctly tuberculate, and rough to the touch, but possibly through shrinkage in drying, light brown; branches alternate, the lower about 10 cm. long, the upper gradually shorter, very spreading, straight or slightly recurving, about 3 mm. thick, with internodes 8–15 mm. long, the lower with 2–3 (the upper with fewer) alternate branchlets 5–20 mm. long, bearing cymes of apparently 5–12 flowers, the cymes of each branch collectively forming an apparently one-sided compound cyme $2\frac{1}{2}$ –4 cm. broad. Leaves opposite, very small, 1– $1\frac{1}{2}$ mm. long and about as broad, $\frac{1}{2}$ mm. thick at the base, resembling flat deltoid acute scales, probably larger when alive, spreading, connate at the base. Bracts like the leaves, but rather smaller. Calyx and corolla not seen, as the specimen is in ripe fruit. Capsule 4–5 mm. in diameter, 4–5-celled.—*M. coriarium*, Burch. Trav. vol. i. p. 243 (1822), name only. DC. Prodr. vol. iii. p. 451: Sonder in Fl. Cap. vol. ii. p. 460: Berger, Mesemb. p. 292.

PHILIPSTOWN DIV. Near Petrusville, March 2, 1813, Burchell, 2679!

De Candolle has wrongly quoted Burchell's number 2487–3 for this species, but that number, as stated by Burchell himself, belongs to a species of *Ficus*. As there may also arise a misconception that *M. coriarium* was collected in the same region (Little Roggeveld) where he was on July 11, 1811, when he mentions in his 'Travels' that he found the Hottentots using the bark of an *Acacia* for tanning leather, and states that this *Mesembry-*

anthemum was also used for the same purpose, I here quote the full text concerning *M. coriarium*, which is as follows:—"The *Acacia-bark* possesses a large portion of the tanning principle, and imparts a reddish colour to the leather; but in other districts, several other sorts of barks are applied to the same purpose*." The asterisk refers to this footnote: "* Of which a kind of *Ficus*, C. G. 2487. 3. has been found to have powerful properties: and *Mesembryanthemum coriarium*, B. a new species allied to *M. uncinatum* has been seen used for this purpose by the Hottentots." These two plants were collected in the "other districts" alluded to—the *Ficus*, no. 2487-3, near the sources of the Kuruman River in Bechuanaland, and the *Mesembryanthemum* at the locality above stated; and doubtless it was Burchell's intention to give a description of the latter at the proper place in his 'Travels,' of which unfortunately only two volumes were ever published.

Burchell collected only a single specimen of *M. coriarium*, which is at Kew, and from it I have made the above description. Although in its very small leaves it may somewhat resemble *M. uncinatum*, yet the cymose arrangement of its flowers shows that it belongs to the section *Vaginata*, but is totally different from any other species in the group.

M. FLAVOCROCEUM, Haw. (§ *Crocea*). Stems taller, more woody and more bent than in *M. purpureocroceum*. Leaves somewhat crowded or distant, shorter than the internodes, terete-semicylindric, very obtuse, mealy-glaucous or glaucescent, more remote and firmer and less sensitive to cold, and flowers rather smaller than those of *M. purpureocroceum*. Calyx-lobes very much produced (elongated), fleshy or pulpy, especially when in fruit. Corolla yellow on both sides, saffron-coloured after fertilization or decay. Stamens and anthers short when mature, yellow. Styles (stigmas) about 7, very short, spreading, acute, ramentaceous (*i.e.*, densely and minutely plumosely branched) under a lens.—*M. flavocroceum*, Haw. in Phil. Mag. 1826, p. 129 (under the section *Crocea*). *M. purpureocroceum* var. *flavocroceum*, Haw. Rev. p. 155 (1821). *M. croceum* var. *flavocroceum*, DC. Prodr. vol. iii. p. 438 (1828).

SOUTH AFRICA. Locality unknown, Burchell.

The above is a translation combining all the characters assigned to this plant by Haworth, who under his description of it as a variety remarks that it is "probably a distinct species"—a view that after five years further knowledge of it he maintained. So that whether De Candolle (who probably never saw the plant) was justified in considering it to be a variety of *M. croceum* (which was well known to Haworth) is somewhat doubtful. Unfortunately, I cannot obtain any clue to the locality where it was collected, as the name is not mentioned in Burchell's MSS. I suspect, however, that it may be the plant entered as being *M. croceum* under number 1420-2, collected near Fraserburg, between Karree River and Klein Quaggas

Fontein, in Fraserburg Division, on Aug. 24, 1811. Of this no specimen, but only seeds (no. 53) were collected, and it is possible that from them this plant may have been raised.

No drawing of this plant exists at Kew, but there is a coloured drawing of typical *M. purpureocroceum*, Haw., which appears to me to be either a colour variety of *M. croceum* or a hybrid derived from it.

M. HISPIDUM var. *PLATYPETALUM*, Haw. (§ *Hispicaulia*). Taller (than the type), with more distant and more simple branches, more remote leaves, and fewer, broader, and darker purple petals. Probably a distinct species.—*M. hispidum* var. *platypetalum*, Haw. Rev. p. 186 (1821) : DC. Prodr. vol. iii. p. 442.

SOUTH AFRICA. Division? *Burchell*.

The above is a translation of Haworth's description, and nothing more is known of this plant. No specimen of it exists at Kew, and the varietal name is not entered by Burchell in his MSS., but it is just possible that it may have been the plant entered in his catalogue under no. 2128-12 as being *M. hispidum*. Of this number, seeds only were collected and no specimen preserved. Burchell's descriptive note of the plant, made on the spot where it was found, is as follows:—"Stems erect, branching, hispid. Leaves vermiculate, terete, naked, obtuse, shining. Flowers small, of a beautiful purple; petals spathulate, obtuse. Styles (really stigmas) 5, caudate. Capsule 5-celled." If this was the plant Haworth described, as is not improbable, it was found by Burchell during a journey made between the Vaal River and Graaf Reinet, March to May 1812. According to this it would not be likely to be the same species as *M. hispidum*, Linn., which was founded upon the plant figured in Dillenius, Hort. Elth. p. 289, figs. 277-278. The locality from which the Dillenian plant came is unknown, but it is scarcely likely to have been obtained from the interior region at that date (1732); also Burchell notes that the flowers of his plant are small, which is not the case with the Dillenian plant. There are, however, specimens collected by Burchell (no. 6406) on the eastern side of the Gouritz River, in Mossel Bay Division, on Nov. 5, 1814, that so well agree with the figures of Dillenius, that there can be no doubt they belong to typical *M. hispidum*, Linn., and the region where Burchell collected them is one from which the Dillenian plant might well have been obtained. Of no. 6406 Burchell collected 7 specimens, of which 5 are at Kew and the other two are probably in the Asa Gray Herbarium at Harvard University. The specimens are in full flower and no seeds of it were collected, so that, as these two nos. 2128-12 and 6406 are all that have the name *M. hispidum* assigned to them in Burchell's MSS., it tends to confirm the supposition that no. 2128-12 (seed 130) was the variety *platypetalum*, which has been omitted from the works of Sonder and Berger.

M. IMBRICATUM var. *RUBRUM*, *Haw.* (= *M. tumidulum*, *Haw.* § *Tumidula*). All mention of this plant is omitted from the works of Sonder and of Berger. At a later date Haworth placed it as a variety of *M. multiflorum*, *Haw.* But I find that it is quite identical with Salm-Dyck's figure of *M. tumidulum*, so that its synonymy is as follows :—

M. TUMIDULUM, *Haw. Synop.* p. 286 (1812) ; & *Rev.* p. 129 : Salm-Dyck, *Mesemb.* § 37, fig. 3, excluding the synonym *M. foliosum*, *Haw.*, not of Sonder nor of Berger. *M. imbricatum* var. *rubrum*, *Haw. Suppl.* p. 95 (1819). *M. multiflorum* var. *rubrum*, *Haw. Rev.* p. 128 (1821) : *DC. Prodr.* vol. iii. p. 431.

SWELLENDAM DIV. By the right bank of the Zondereinde River, Jan. 27, 1815, *Burchell*, 7500 ! Seed 832.

Haworth described this as a variety of *M. imbricatum* from a plant raised in England from seed collected by Burchell in South Africa. In Burchell's MSS. seed-list (or 'Hortus Fulhamensis') the name *M. imbricatum* (without the varietal name, as was usually his custom) is entered under seed no. 832, which is stated to belong to no. 7500 of his Herbarium, and he remarks that the plant is showy, and its "flowers small, red in Africa, but white in England." As there is no evidence that the plant had flowered in England, since Burchell has no entry of its having done so, and Haworth remarks of it "I have only seen a living plant and dried flowers from Mr. Burchell," the remark that the flowers are white in England is doubtless intended to apply to the typical *M. imbricatum* and not to his own plant, which was then supposed to differ from *M. imbricatum* only by having red flowers. The habit of the plant and the number, size, details, and colour of the flowers are, however, all quite different from those of *M. imbricatum* and allies. No dried specimen of the cultivated plant appears to have been preserved, nor is there any drawing of it at Kew. But of no. 7500 Burchell collected five specimens—two of them are at Kew, and the others are probably in the Asa Gray Herbarium at Harvard University in the United States, and that at Petrograd.

The description of *M. tumidulum* by Sonder, more or less copied by Berger, is based upon a totally different plant with much larger flowers (see *M. festivum*, *N. E. Br.*, p. 122) collected by Zeyher (no. 698) at Drieffontein in Van Rhynsdorp Division. Besides this plant of Zeyher's, Schlechter 8267, Wolley Dod, 1473, Pearson 3047, 3048, 3059, and Stephens & Glover 8734 have all been distributed under the name of *M. tumidulum* ; but they are all quite distinct from that species, and represent among them four perfectly distinct species, which all come from quite a different region, where *M. tumidulum* is not at all likely to grow.

At Kew there is an original coloured drawing of the type of *M. tumidulum*, but it represents merely a young branch without flowers. The leaves, however, well agree with those of Salm-Dyck's figure of *M. tumidulum*

which I believe to be correctly named, and Burchell's specimens accurately agree with that figure.

M. foliosum, Haw., which Sonder, and Berger following him, have placed as a synonym of *M. tumidulum*, Haw., is quite a different plant, with much stouter leaves.

M. INCOMPTUM, Haw. (Section doubtful). A shrub half a foot (15 cm.) or more high, bushily very much branched; branches usually erect or with age decumbent. Leaves scarcely an inch ($2\frac{1}{2}$ cm.) long, crowded, erectly subimbricate, subulate, sausage-like semiterete, minutely papillose or sub-papillose, pale green. Flowers terminal, usually ternately or biternately cymose or rarely solitary, at first neat, afterwards decaying, and at length untidy from the persistent finally decaying large bracts, clavate peduncles, and the swollen and as if finger-bearing calyces of the whole cyme. Peduncles terete, thickened above the ordinary leaf-like bracts, and the upper part almost fig-like after flowering. Calyx 5-lobed; lobes unequal, spreading, all at length more or less acutely finger-like, "præ alios persistentia tumida" (the meaning of which is obscure). Corolla small, as long as the calyx, expanding in the daytime; petals subequal, subentire, rather acute, white, shining. Stamens collected almost into a cone, the outer erectly recurved, without anthers, and by degrees becoming petal-like; filaments white; anthers white, becoming yellow; pollen yellow. Stigmas 5, erect, as long as the stamens, ramentaceous (*i.e.*, densely and minutely plumosely branched).—*M. incomptum*, Haw. Suppl. p. 96 (1819): & Rev. p. 171: DC. Prodr. vol. iii. p. 445: Lodd. Bot. Cab. t. 1311: G. Don, Gen. Syst. vol. iii. p. 147, not of Salm-Dyck, Sonder, or Berger.

PRIESKA DIV. Between Brak River and Vaal River, May 19, 1812, Burchell, 2128-13 (Seeds 131 & 175).

The above is a translation of the description given by Haworth in his 'Revisiones Plantarum Succulentarum,' and to it may be added the following particulars I have obtained from a drawing in the Kew Herbarium and the excellent figure in Loddiges's 'Botanical Cabinet,' which is not quoted by either Sonder or Berger:—Stem, in the drawing (which was probably made from a plant grown under glass) with internodes 16-22 mm. long, and in the published figure (which was probably made from a plant grown in the open air) with internodes 2-10 mm. long, bearing axillary tufts of leaves at the nodes. Leaves more or less crowded, ascending, straight or slightly incurved, 10-20 mm. long, 2 mm. thick, acute. Cyme, in the drawing, about 5-flowered, on a peduncle-like internode about 5 cm. long and gradually developing one flower at a time in its forkings, but in the published figure the cymes are not clearly shown; they are evidently on very short peduncles and 3-flowered. Bracts like the leaves but smaller. Pedicels 1-2 cm. long, much thickened in a clavately obconical manner at the apical part. Calyx

abruptly dilated at the base of the lobes so as to form a distinct rim overhanging the ovary or clavate part of the pedicel; lobes 5–10 mm. long, leaf-like, acute, apparently separated from each other at the base by distinct but narrow intervals. Corolla 20–25 mm. diameter; petals in 2 distinct series of apparently about 30 in each series, the outer 8–10 mm. long and 1 mm. broad, incurved-spreading, forming a somewhat saucer-like cup or perhaps later widely spreading, the inner about 5 mm. long and 1 mm. broad, erect, with recurved tips, forming a tubular cup surrounding and slightly overtopping the stamens, all linear, obtuse, pure white. Anthers yellow.

Burchell has the following note of this species in his MSS.:—"Stems many, erect and diffuse. Flowers small, unattractive, white. Stamens incumbent (perhaps collected together is meant). Nectaries 5, reddish, at the bottom of the calyx within the stamens. Styles (stigmas is meant) 5, subulate, hairy." He collected seeds only of it, from which living plants were raised in England, and no dried specimen of it was preserved by him. The thickened pedicels, the spaces between the calyx-lobes, and prominent overhanging rim or bulge at their base are very distinctive characters of this species.

The *M. incomptum* and var. *Ecklonis*, of Salm-Dyck, Sonder, and Berger, is a totally different plant, with weak stems 1–2 feet long and a flat (not cup-shaped) corolla, for which I propose the name *M. invalidum* (see p. 105).

M. MAGNIPUNCTATUM, Haw. (§ Magnipuncta). This species is in cultivation and correctly understood, although sometimes mistaken for *M. nobile*, Haw., from which it differs by its leaves being broader and more obtuse and flat (not concave) on the upper side.—*M. magnipunctatum*, Haw. Suppl. p. 87 (1819): Burch. Trav. vol. i. p. 272: Sonder in Fl. Cap. vol. ii. p. 396: Berger, Mesemb. p. 264. *M. magnipunctum*, Haw. Rev. p. 86 (1821): DC. Prodr. vol. iii. p. 419.

FRASERBURG DIV. Between Karree River and Klein Quaggas Fontein, near Fraserburg, Aug. 24, 1811, *Burchell*, 1402–3 (Seed 85).

No dried specimen of this species was preserved by Burchell, who collected only seeds of it, from which he raised living plants in England, and from these the species was described by Haworth. It varies considerably in the size of its leaves, which vary from 15 to 25 mm. in breadth. A fine coloured drawing of the typical plant collected by Bowie is preserved at Kew. Burchell notes in his MSS. that the leaves are "glaucous, obscurely dotted. Calyx equal. Styles (stigmas) 12."

M. MEDIUM, Haw. (a synonym of *M. latum*, Haw.). (§ Linguiformia.) Nearly stemless. Leaves very broadly tongue-shaped or cultrate, without a hook at the tip, sloping downwards, 3–4 in. ($7\frac{1}{2}$ –10 cm.) long, 1 in. ($2\frac{1}{2}$ cm.) broad, deep green. Peduncle 1 in. ($2\frac{1}{2}$ cm.) long. With the general

appearance of *M. scalpratrum*, but much smaller, yet much larger than the rest of its allies. It flowers in the autumn.

The above is a translation of Haworth's descriptions combined. The following is a description made from a coloured drawing of the type plant preserved at Kew :—Leaves apparently about 6–8 to a growth, spreading right and left in two rows close to the ground, turned edgeways to the sky, 5–7½ cm. long, 2–2½ cm. broad, straight, strap-shaped or tongue-shaped, very obtusely rounded at the apex and not hooked or curved there, flat above, convex on the back, deep green. Peduncles erect, 10–15 mm. long, 5 mm. thick, acutely angular as is evidently the calyx, green. Calyx-lobes about 15–18 mm. long and 10 mm. broad, broadly oblong or ovate-oblong, with the apex apparently broadly rounded and abruptly contracted into a short point. Corolla large, represented as only partly open, but probably 7–8 cm. in diameter when expanded; petals apparently 40–45, about 4 cm. long and 1½ mm. broad, linear, obtuse, bright yellow, perhaps tinted with red on the back. Burchell in his MSS. *Ephemeris*, p. 111, describes the flower as follows :—“Calyx acutely triquetrous, with unequal sides; lobes 4, with membranous margins, 3 of them keeled. Stamens numerous. Stigmas 12, depressed-spreading, papillose, purplish. Ovary 12-celled.”—*M. medium*, Haw. Suppl. p. 88 (1819); & Rev. p. 95: DC. Prodr. vol. iii. p. 421.

MOSSSEL BAY DIV. On the eastern side of Little Brak River, Oct. 10, 1814, *Burchell*, 6197–7 (the type). Somerset Div. at Commadagga, July 5, 1813, *Burchell*, 3309.

Seeds only were collected of both the numbers quoted, and no specimen of the cultivated plant was preserved by Burchell, but there is a good coloured drawing of it at Kew, from which I have made the description given above.

This species is placed as a synonym of *M. cultratum* var. *perviride* by Salm-Dyck, and Sonder and Berger have followed him in this view, but it is quite distinct from *M. cultratum* and undoubtedly identical with *M. latum*, Haw. (see p. 69), which may well have been obtained from the Mossel Bay region, where, as I have pointed out (p. 129), the true *M. hispidum*, Linn. may also have been procured. Although Burchell has also entered the name *M. medium* under no. 3309, the type, as noted above, is no. 6197–7, and I doubt if the Commadagga plant is really identical with it.

M. MULTIFLORUM var. *RUBRUM*, Haw. This is *M. tumidulum*, Haw. See under *M. imbricatum* var. *rubrum*, Haw.

M. PUSTULATUM, Haw. (§ Linguiformia). This species appears to be correctly understood, and is well figured by Salm-Dyck.—*M. pustulatum*, Haw. Suppl. p. 88 (1819); & Rev. p. 96: DC. Prodr. vol. iii. p. 422:

Salm-Dyck, Mesemb. § 8, fig. 10 : Sond. in Fl. Cap. vol. ii. p. 404. *M. linguiforme* var. *pustulatum*, Berger, Mesemb. p. 240.

PORT ELIZABETH DIV. Near Port Elizabeth, Dec. 1813, *Burchell*, 4378-2.

No dried specimen of this plant was preserved by Burchell, who collected only seeds of it, from which the living plants described by Haworth were raised. No drawing of the original plant appears to have been made.

M. SALMONEUM, *Haw.* (§ *Spinulifera*). Roots of old plants swollen at the upper part. Stems or branches of old plants 2-3 ft. (60-90 cm.) long ; branches somewhat filiform, weak, elongated, pendulous or prostrate. Leaves of plants grown in the open air longer than the internodes, linear, attenuate at each end, almost always channelled, pale or bright green, dully (sordide) papillose. Flowers trichotomous, of moderate size or smallish at first, especially outside, fulvous or salmon-coloured, yellow at the base, afterwards paler or rosy, and finally rosy outside and more or less whitish within. Peduncle clavate and together with the calyx glitteringly papulose. Calyx 5-lobed. Stamens erect, of various lengths ; filaments white ; anthers or pollen yellow. Stigmas 5, erect, smooth, yellowish-white. Ovary elevated a little above the calyx, slightly convex, 5-celled.—*M. salmoneum*, *Haw. Rev.* p. 176 (1821) : *DC. Prodr.* vol. iii. p. 444 : Salm-Dyck, Mesemb. § 56, fig. 2 : Sonder in Fl. Cap. vol. ii. p. 451 : Berger, Mesemb. p. 71.

SOUTH AFRICA. Without locality, *Burchell*.

The above is a translation of Haworth's original description, from which this species would appear to be one of those in which the colour of the flowers changes from day to day. No specimen of it was preserved by Burchell, nor has he made any entry of the name in his MSS. lists, so that the locality where he collected it cannot be traced, and there is no drawing of the plant at Kew. The figure and description of Salm-Dyck, Sonder, and Berger do not quite accord with Haworth's description, but may be intended for the right plant.

M. SESSILIFLORUM var. *ALBUM*, *Haw.* (§ *Platyphylla*). Root subbiennial. Lower leaves ovate, petiolate ; the upper lanceolate and subalternate, glitteringly papillose, especially beneath. Flowers paniculate, sessile, small, white.—*M. sessiliflorum* var. *album*, *Haw. Rev.* p. 158 (1821) : *DC. Prodr.* vol. iii. p. 448. *M. sessiliflorum* var. *β*, *Haw. Suppl.* p. 93 (1819).

GRAAFF REINET DIV. Along the Sundays River, near Monkey Ford, March 30, 1813, *Burchell*, Seed 428, according to a list of species named by Haworth at the end of Burchell's list of seeds (*Hortus Fulhamensis*, MSS.).

The above is a translation of Haworth's description, to which he adds the remark that he doubts if it is a variety of *M. sessiliflorum*, *Ait.*, as it differs from that species in the following particulars :—"The flowers are white, not

yellow. The branches suberect-decumbent, *paniculate*, with the branchlets scarcely spreading and in a manner rather decumbent-ascending." Burchell collected seeds only of this species, from which the plants described by Haworth were raised in England.

Sonder, and Berger copying from him, places this plant as a synonym of *M. clandestinum*, Haw., which it is scarcely likely to be, as that plant is stated to have been introduced in 1874 by Masson, who so far as known did not go to the Graaff Reinet Region. In 1873 he collected in the coastal districts only, and in 1774 went to the Roggeveld with Thunberg. *M. clandestinum* differs according to the descriptions of it in being a perennial with pedicellate (not sessile) flowers, 1-3 together or in cymes, not paniculate. Also Haworth had both plants in cultivation, and would therefore know them to be different.

M. SULCATUM, Haw. (§ Digitiflora). (Pl. 10. fig. 45.) An erect shrub up to 90 cm. (3 ft.) high, leafy. Branches about 3 mm. thick, dividing at the top into a large lax cyme composed of 3 smaller leafy flat-topped cymes, each about 6 cm. in diameter, with 4-6 (or perhaps more) flowers, which appear to develop one at a time; internodes $1\frac{1}{2}$ -4 cm. long, green. Leaves 2-3 $\frac{1}{2}$ cm. long, 3-3 $\frac{1}{2}$ mm. broad and about as thick, spreading, clustered at the nodes, linear-subulate, semiterete, channelled down the upper side, at least when young, rounded on the back, acute or subobtusely, apparently glabrous, pale green. Peduncle 10-15 mm. long. Calyx 5-lobed; lobes unequal, 10-15 mm. long, resembling the leaves, but smaller, acute, green. Corolla about 25 mm. in diameter; petals very numerous, about 12 mm. long and $\frac{1}{2}$ mm. broad, very narrowly linear or almost setaceous, very spreading, with recurved tips, according to Haworth white or silky-white within and at first somewhat straw-coloured outside, shining, but according to the drawing the basal part is of a very pale yellowish and the tips tinted with reddish-buff. Stamens mostly collected into a dense erect column about 5 mm. long, with a few of the outer without anthers, and spreading away from it, and gradually becoming petal-like. Stigmas 5, erect, not overtopping the stamens.—*M. sulcatum*, Haw. Rev. p. 173 (1821): DC. Prodr. vol. iii. p. 445: Gr. Don, Gen. Syst. vol. iii. p. 147, not of other authors.

SOUTH AFRICA. Locality unknown, *Burchell*.

The above description is made partly from Haworth's original description, all the characters given by him being embodied in it, and partly from an original drawing of a portion of the type plant preserved at Kew, labelled "*M. sulcatum*, Haw. Received from Mr. Haworth in 1823, who obtained it from Mr. Burchell." This drawing represents a portion of a branch with a large 3-branched cyme, of which only one branch is coloured, the remainder being outlined in pencil; the coloured branch I have copied upon Pl. 10.

fig. 45. The whole drawing is evidently only a portion of a large plant. Haworth compares it with *M. fastigiatum* and states that it is perhaps a variety of *M. splendens*, but at the same time mentions several characters whereby it differs from that plant. Although this statement has been repeated by subsequent authors, a glance at the figures of the two species is sufficient to show that they are totally distinct. Haworth describes the leaves as crowded, but the drawing does not represent them to be so, although it is evidently a rather leafy species. According to Haworth it flowers in September.

I have failed to obtain from Burchell's MSS. any clue to the locality where he collected the seeds of this species from which the living plants that Haworth described were raised, for there is no dried specimen of it among those that he collected, and I do not find the name entered in either his catalogue or seed-list (*Hortus Fulhamensis*) at Kew.

M. TESTACEUM, Haw. (§ *Trichotoma*). Old stems shrubby, erect, 2-3 ft. (60-90 cm.) high, branched. Leaves semiterete, subtriquetrous, glaucescent, somewhat papulose-shining. Flowers terminal, umbellate-trichotomous, small, pedunculate. Calyx short, with subequal lobes. Petals in one series, testaceous-saffron-coloured. Stamens and imperfect filaments collected into a cone, white, shining.

The above is a combined translation of Haworth's two descriptions of this plant. The following are made from two coloured drawings of it at Kew. One drawing, labelled "*Mesembr. testaceum*, Haw. Received from Mr. Haworth in 1823, who obtained it from Mr. Burchell," represents an erect straight flowerless branch 2 mm. thick, with internodes 8-13 mm. long, whose leaves spread horizontally or are recurved or reflexed from their base, 2-4 cm. long and 2 mm. thick, trigonous, acute, with tufts of smaller leaves in their axils, giving it a very leafy appearance. This drawing was probably made from a plant grown under glass. The other is labelled "*Mesm. testaceum*, Aug. 4th, 1826," and was probably made from the same plant at a later date grown in the open air. It represents a short branch $1\frac{1}{2}$ mm. thick, with 2 branchlets 1 mm. thick having internodes 5-10 mm. long, bearing one terminal flower. The leaves are 10-18 mm. long, $1\frac{1}{2}$ - $2\frac{1}{2}$ mm. thick, horizontally spreading, slightly curved, trigonous, acute, with tufts of smaller leaves in their axils. Pedicel apparently about 5 mm. long, but hidden. Calyx not shown. Corolla 16 mm. in diameter; petals apparently about 50 in about 2 series, 6 mm. long, 1 mm. broad, linear, obtuse, of a peculiar red colour. Stamens collected into a cone 3 mm. long, 3 mm. in diameter at the base, and $1\frac{1}{2}$ mm. in diameter at the top; filaments white; anthers yellow.—*M. testaceum*, Haw. Suppl. p. 97; & Rev. p. 178: DC. Prodr. vol. iii. p. 443.

SOUTH AFRICA. Collected during a journey made between the Vaal River and Graaff Reinet in March to May 1812, *Burchell*, 2128-3.

Haworth's description was made from living plants raised in England from seeds collected by Burchell, who did not preserve any specimen of it, so that the two drawings at Kew and the description represent all that is known of it. Burchell has noted in his MSS. that the root is "fusiform, multiplex," which may mean that it either has a fleshy or woody much-divided root or a cluster of roots something like those of a Dahlia on a small scale. Haworth states that it is similar to *M. fastigiatum*, Haw., but has thicker and less erect branches and leaves nearly three times as large.

The *M. testaceum* of Sonder in Fl. Cap. vol. ii. p. 441, and of Berger, Mesemb. p. 101, is based upon a plant collected by Zeyher on hills near the Zwartkops River, in Port Elizabeth Division, which is so far out of the region where Burchell found the plant that there is no probability of its being the same species.

M. TURBINIFORME, Haw. (§ Fissurata). Plant stemless, obconic, exactly truncate at the top, obscurely dotted, two or three more times larger than *M. truncatellum* etc.—*M. turbiniforme*, Haw. Rev. p. 84 (1821) : Burchell, Trav. vol. i. p. 310 : DC. Prodr. vol. iii. p. 417 : Don, Gen. Syst. vol. iii. p. 126 : Berger, Mesemb. p. 291.

PRIESKA DIV. At Zand Vlei, between Keikams Poort and the Orange River, growing among siliceous and white calcareous stones, Sept. 14, 1811, *Burchell*, 1630-2.

As I am preparing a monograph of the group to which this species belongs and will there give a full account and figure of it, I merely include it here to make complete the enumeration of the species described from Burchell's collection. For, as I write, the news comes to hand that this species, which has remained quite unknown to botanist and gardener alike for over one hundred years since Burchell found it, has now been re-found in the same locality where Burchell discovered it. Burchell did not introduce it into cultivation, and, according to his catalogue, only collected two dried specimens of it, but as their number has been crossed out by Burchell himself and there were no specimens of it in his Herbarium when it came to Kew, they were probably lost or destroyed by insects. Haworth's description (translated above) was prepared from a drawing that Burchell made in South Africa. He made a large number of such drawings, but they appear to have disappeared, as I have quite failed to discover what became of them.

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- | | |
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| Ait. f. Hort. Kew. | Aiton, W. T. — Ed. 2, vol. iii. (1811). |
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| Berger, Mesemb. | Berger, Mesembrianthemum und Portulacaceen (1908). |
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EXPLANATION OF THE PLATES.

(Unless otherwise stated, all the drawings are of natural size and made from living plants.)

PLATE 5.

- Figs. 1 & 2. *M. mitratum*, Marl. Copied from Dr. Marloth's figures.
Figs. 3 & 4. *M. proximum*, N. E. Br. 3, a cluster of three cones as seen in June; 4, outline of one of those cones, showing the size it had attained in October of the same year.
Figs. 5-8. *M. clivorum*, N. E. Br. 5 & 6, two branches from the same plant as seen in April; 7, the terminal body (corresponding to the cone of fig. 1) of the larger branch of fig. 6 in its resting stage at the end of August of the same year; 8, apex of leaf enlarged, showing papillate surface.
Fig. 9. *M. dissitum*, N. E. Br.
Fig. 10. *M. moniliforme*, Haw. Drawn partly from a very crude sketch and partly from memory, therefore only approximately correct.

PLATE 6.

- Fig. 11. *M. dissitum*, N. E. Br. This figure represents the terminal cone of fig. 9 making its new growth: A, A, being the new pair of leaves formed and concealed within the cone, the dark patches on them being the dried-up fragments of the exhausted cone; B, a new internode of stem developing; C, early stage of a new cone, at this time scarcely distinguishable from the internode.
Figs. 12-13. *M. tuberculatum*, Mill. 12 represents two growths in April, and 13 the outline of the larger growth when fully developed in October.
Fig. 14. *M. bibracteatum*, Haw. Copied from a drawing of a type plant.
Figs. 15-18. *M. vescum*, N. E. Br. 15-16, two growths as seen in July; 17, outline of a growth in October, with sections below the tips of the leaves; 18, enlarged outline of the tip of the larger leaf of a pair.
Figs. 19-20. *M. inspersum*, N. E. Br. With sections of the leaves.

PLATE 7.

- Figs. 21-22. *M. cognatum*, N. E. Br. 22 is an enlarged tip of a leaf.
Fig. 23. *M. cylindricum*, Haw. Copied from a drawing of a type plant.
Fig. 24. *M. diminutum*, Haw. Copied from a drawing of a type plant.
Figs. 25-26. *M. candidissimum*, N. E. Br. A small plant and tip of a leaf from a dried specimen of a larger plant.
Fig. 27. *M. rostratoides*, Haw. Copied from a drawing of a type plant.

PLATE 8.

- Fig. 28. *M. purpurascens*, Salun-Dyck. Copied from a drawing of a type plant.
Figs. 29-31. *M. rostratum*, Linn. Two growths representing the plant as seen in June and one growth as seen in November of the same year; 31, enlarged apex of leaf.

PLATE 9.

- Fig. 32. *M. quadrifidum*, Haw. Copied from a drawing of a type plant. This supposed species is really the true *M. rostratum*, Linn.
Fig. 33. *M. denticulatum*, Haw. Copied from a drawing of a type plant.

Figs. 34-35. *M. bifidum*, Haw. 34 is copied from a drawing made in March 1825 from a type plant; 35, outline of a full-grown growth with section of a leaf, made from a living plant in Oct. 1918.

Fig. 36. *M. lectum*, N. E. Br.

Fig. 37. *M. robustum*, Haw. Copied from a drawing of a type plant.

Figs. 38-39. *M. subalbum*, N. E. Br.

PLATE 10.

Fig. 40. *M. fissoides*, Haw. Copied from a drawing of a type plant.

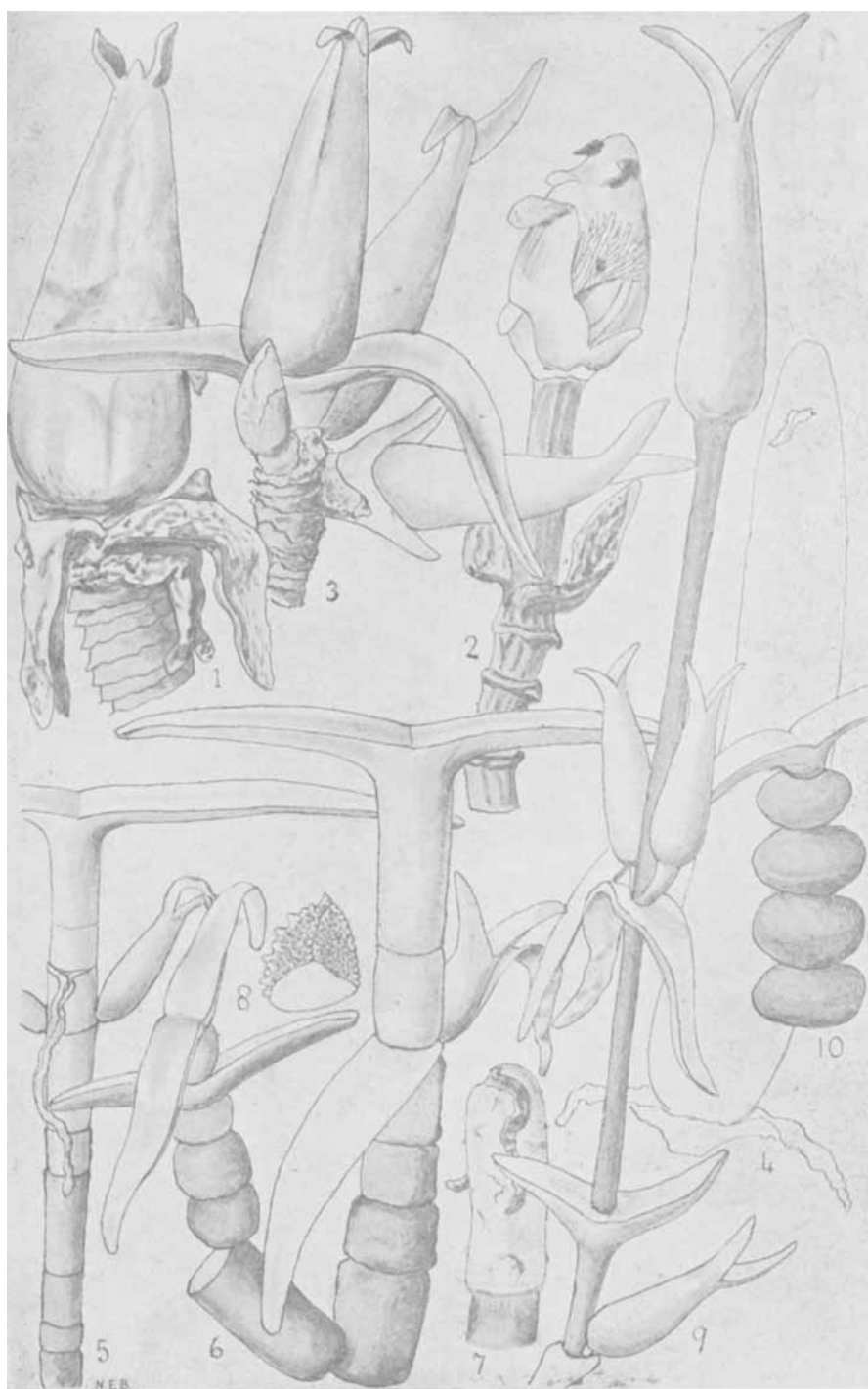
Figs. 41-42. *M. binum*, N. E. Br.

Fig. 43. *M. herbeum*, N. E. Br.

Fig. 44. *M. laeve*, Ait. Copied from a drawing of a type plant; only half of the branch represented on the drawing is here reproduced.

Fig. 45. *M. sulcatum*, Haw. Copied from a drawing of a type plant.

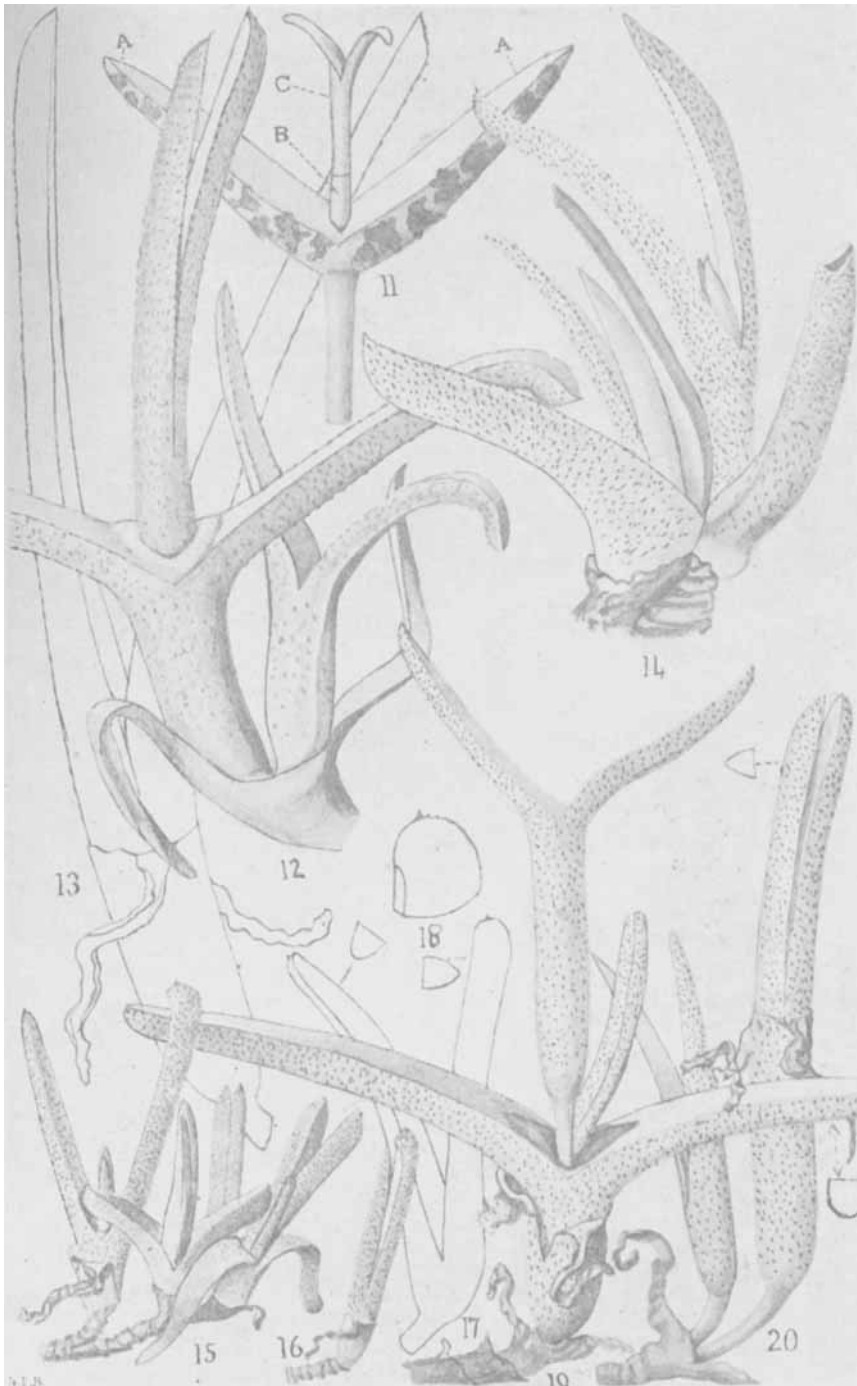
Fig. 46. *M. pressum*, N. E. Br., with sections of both forms of leaf taken at half an inch below the apex.



N. F. P. del.

SPECIES OF MESEMBRYANTHEMUM.

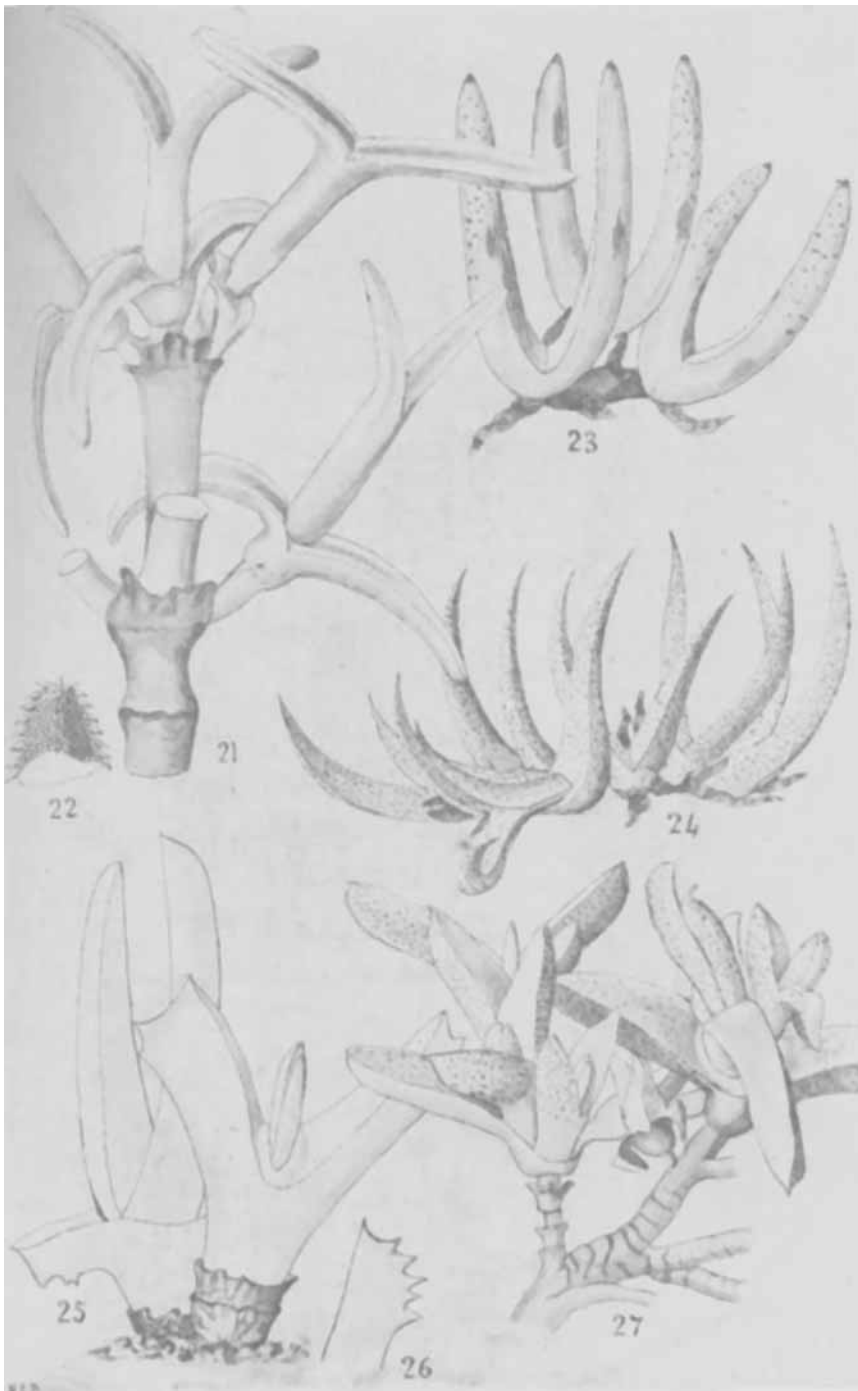
Grout Sc. and imp.



N. E. B. del.

Grout Sc. and imp.

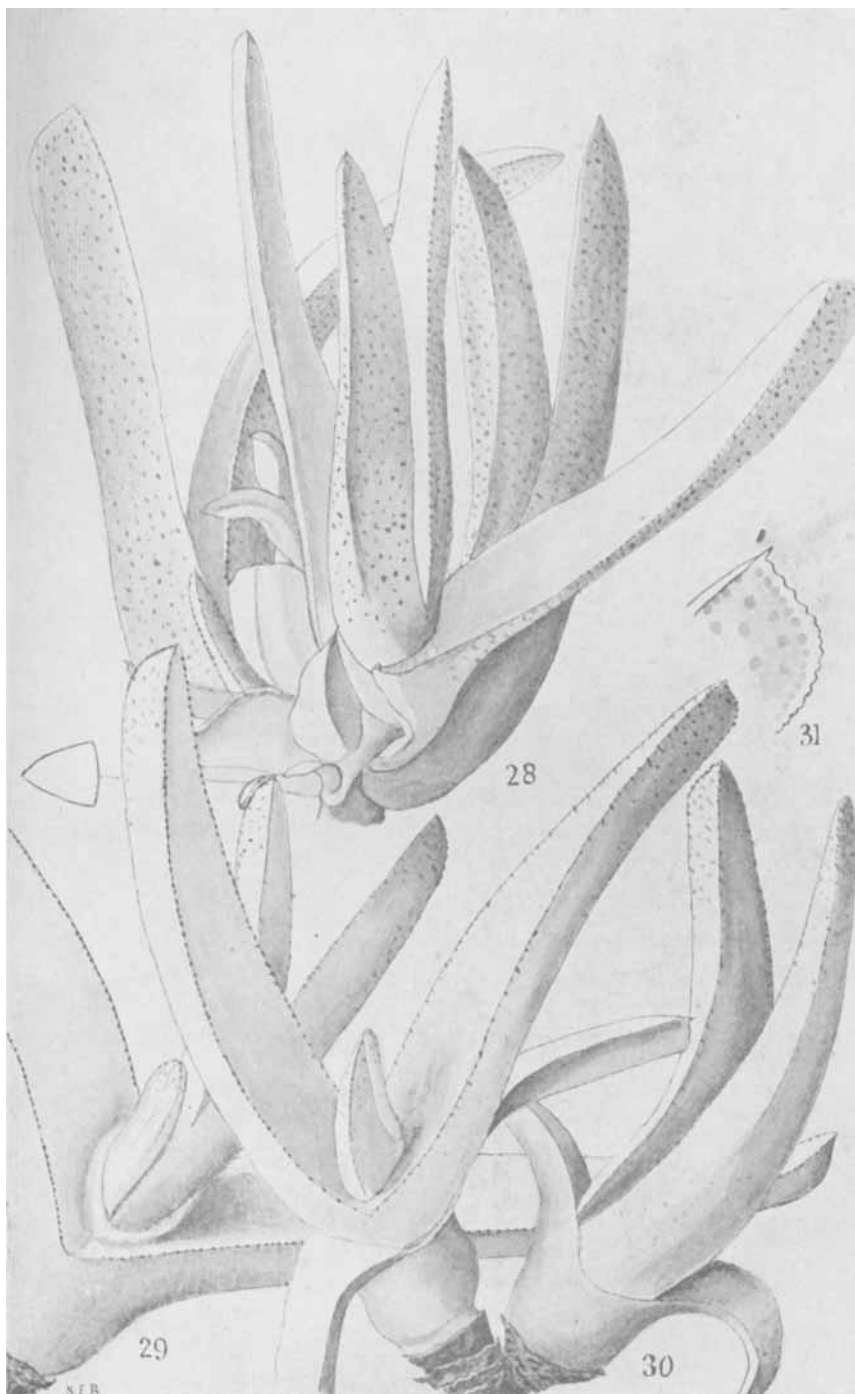
SPECIES OF MESEMBRYANTHEMUM.



N. E. B. del.

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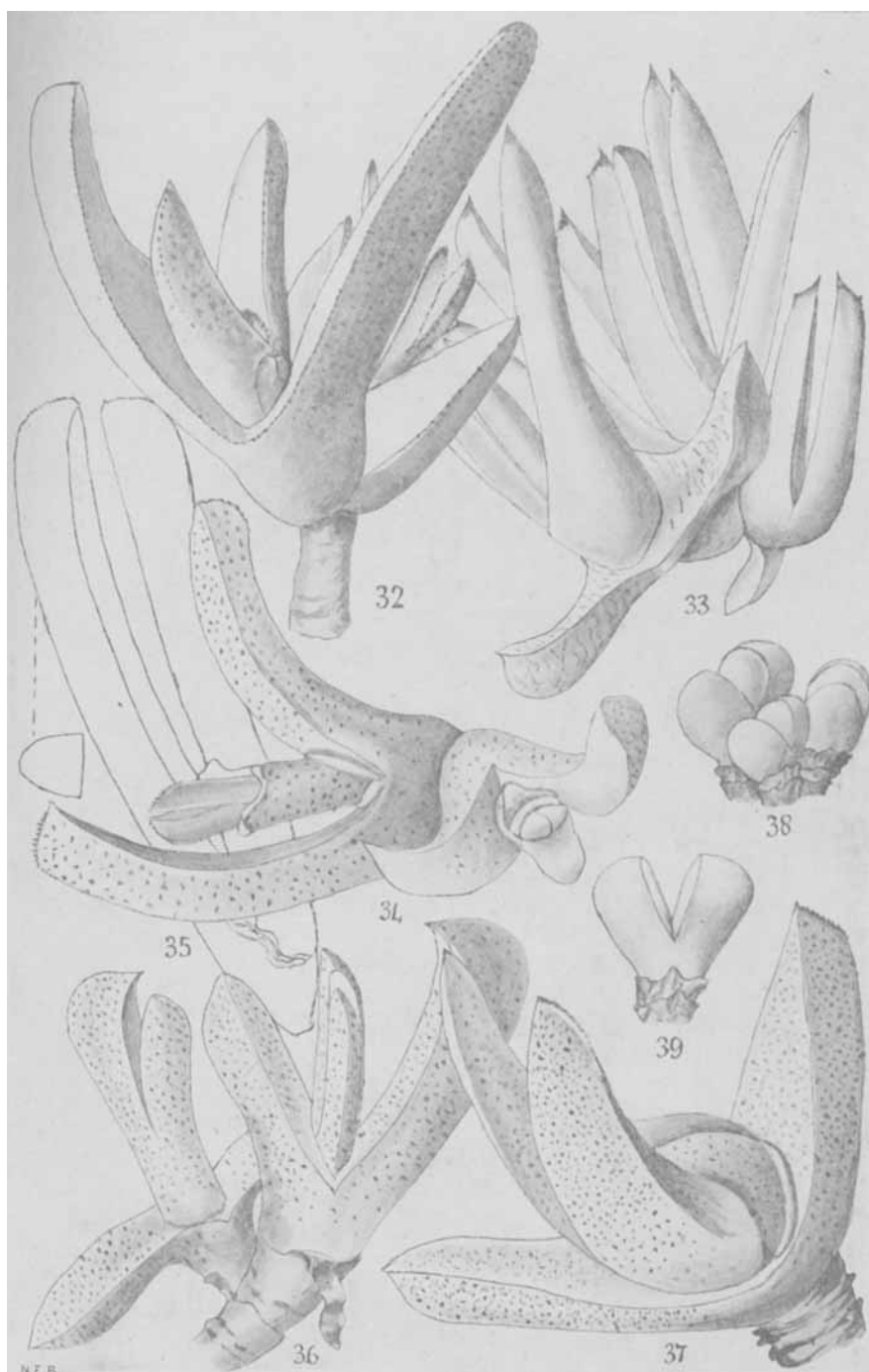
SPECIES OF MESEMBRYANTHEMUM.



N. E. B. del.

Grout Sc. and imp.

SPECIES OF MESEMBRYANTHEMUM.



N. E. B. del.

Grout Sc. and imp.

SPECIES OF MESEMBRYANTHEMUM.



N. E. B. C.

SPECIES OF MESEMBRYANTHEMUM.

Grout Sc. and imp.