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## MIMULUS SECTION SIMIOLUS

**Important note:** Much of the need for this key revolves around past interpretations of *M. luteus* L. The true plant is a tall, yellow-flowered plant in the Chilean Andes, but the name was misapplied to N American plants (i.e. *M. guttatus*) when they were introduced to Europe, causing confusion, especially in horticultural literature, that persists to this day. Further, when another Andean *Mimulus* was discovered and brought into cultivation last century, this too was assumed to be *M. luteus*, though differing from it in a number of 'good' taxonomic characters. This latter plant is the one still called '*M. luteus*' in current British botanical literature and the parent of hybrids attributed to *M. luteus*. It is, indeed, validly referred to *M. luteus* var. *rivularis* Lindl., but should be treated as a distinct species, except that it lacks a valid name at specific level. In the hope of avoiding rather than creating confusion, it is named '*M. nummularius*' in this key, but this name is, as yet, an unpublished combination.

*Mimulus* sect. *Simiolus* Greene comprises aggregates of critical species originating in both N and S America. The N America complex is represented in Britain by *M. guttatus*, which here seems much less genetically variable than in its native country. The S American complex comprises a group of species including *M. nummularius* (Clos) comb. ined. (*M. luteus* auct., pp.), *M. cupreus* hort. ex Dombrain and *M. variegatus* hort. ex J. St.-Hil. This complex requires much further study and hence any treatment of British cultivated plants and naturalised taxa must remain tentative. The monograph by Grant (1924) remains the standard account, but the treatment of *M. nummularius* and its varieties and related species was based on limited material and is consequently misleading. A summary of the main taxa in cultivation is given by Silverside (1994 and in press).

As far as British naturalised taxa are concerned, hybrids between *M. nummularius* and its allies are at least partly fertile, while their hybrids with *M. guttatus* are effectively sterile. The hybrids of *M. guttatus* with *M. nummularius* and *M. cupreus* have been well described by Roberts (1964, 1968).

Sterility is used as an identification character in the following key. Where pollen is examined, the criterion of fertility is that at least 50% of pollen grains should be well formed and stainable with acetocarmine when examined under a microscope. Sterile hybrids should have less than 20% of the pollen grains well formed; often there will be none. Staining with acetocarmine is not essential, but more clearly distinguishes viable pollen from inviable pollen. A useful but not totally reliable field test is to insert a finger gently into the throat of a mature flower. Sterile hybrids generally have indehiscent anthers and so a dusting of pollen on the withdrawn finger is a likely indication of fertility. However, at least one clone of *M. guttatus* × *M. nummularius* will also release pollen. This test is not practicable on wet days.

Where mature capsules are present, presence or absence of well formed seeds usually provides a simple test of fertility. Failure of the capsule to swell, leaving an empty non-inflated calyx, is a sign of sterility. The converse is not true and fertility cannot be judged by feel. Furthermore, corolla release (a self-fertilisation mechanism) may fail in hybrids between the S American species and they may set very little seed, even though potentially able to do so.

In using the key it should be noted that corolla patterning is variable in most taxa. The presence or absence of minute glandular hairs is of no taxonomic significance, but is determined by the prevailing weather. "Simple white hairs" refers to hairs visible with a hand lens and not to microscopic bristles less than 0.04 mm in length. Sizes of all parts of the plant are readily modified by habitat conditions, hence estimates of size are best made in comparison with other locally occurring taxa (*M. guttatus* and *M. guttatus* × *M. nummularius* may be regarded as 'average'). Leaf characters are best judged from the lower cauline leaves or the summer vegetative growth.

The key given below should provide a reasonable chance of identifying plants occurring wild, but does not take full account of the potential variation of these very plastic plants and does not cover a number of garden cultivars that might appear as transient escapes.

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- 1 Simple white hairs present on the inflorescence, though sometimes hidden amongst dense, long, glandular hairs; simple hairs sometimes restricted to keels and bases of the calyces; plant fertile or sterile 2
- 1 Simple white hairs absent (check calyx base with good lens) other than inside the calyx; minute glandular hairs often present though sparse; plant fertile 7
- 2 Corolla basic colour predominantly coppery orange, at least at maturity 3
- 2 Corolla basically yellow, often spotted or blotched orange, red or purple 5
- 3 Calyx petaloid, forming apparent 'double' flowers; plant relatively robust; usually sterile but rarely setting a few viable seeds. Very locally established, from Selkirkshire northwards.  
*M. × burnetii* S. Arn. (*M. cupreus* × *M. guttatus*, petaloid form)
- 3 Calyx normal; plant sterile 4
- 4 Corolla spotted but not blotched; plant slender, sprawling or creeping. Locally abundant on river-shingle in N England and Scotland *M. cupreus* × *M. guttatus*
- 4 Corolla with darker blotches and sometimes tinted red; plant relatively robust. A rare, transient garden escape, or forming very distinctive local populations, or spontaneous with *M. guttatus* and *M. cupreus* × *M. nummularius*. *M. cupreus* × *M. nummularius* × *M. guttatus*
- 5 Throat of corolla more or less closed, spotted with red; corolla lobes unblotched (in Britain), lower lip held horizontally, much exceeding upper lip; cauline leaves typically abruptly contracted into the petiole or sessile, often no longer than wide, teeth deltoid or becoming longer and more irregular towards the leaf-base; uppermost bracts sessile, orbicular, cuspidate, entire or very finely serrate; inflorescence tall, robust, many-flowered, clothed with simple white hairs and stalked glands in variable proportions; long stolons produced in autumn; plant fertile. Widespread and locally common by lowland rivers and lakes, rare and much over-recorded at altitude *M. guttatus* DC.
- 5 Throat of corolla more usually open; corolla lobes often blotched, lower lip angled downwards; cauline leaves sometimes twice as long as wide, base often cuneate, teeth often longer than wide and twisted; uppermost bracts usually broadly lanceolate, serrate; inflorescence usually short, few-flowered, simple white and glandular hairs sparse to relatively abundant; stolons short and robust; plant sterile. Hybrids of *M. guttatus* (sometimes hardly distinguishable morphologically from *M. guttatus*) 6
- 6 Leaves typically longer than wide, teeth often longer than wide and twisted; blotches of corolla lobes, if present, orange to red or red-brown, infrequently covering the entire lobes, very often just one central spot on the lower lip. Widespread and locally abundant by rivers and streams in N and W Britain and Ireland. Much the most common taxon on high ground where it is usually mistaken for one or other parent *M. × robertsii* Silverside (*M. guttatus* × *M. nummularius*)  
[Synthesised plants of *M. cupreus* × *M. nummularius* × *M. guttatus* are often indistinguishable from *M. guttatus* × *M. nummularius*, or may differ only in the more diffuse blotching, hence many wild populations of this parentage may key out here.]
- 6 Leaves often as broad as wide, sometimes rounded, teeth even, broadly based; corollas very large, lobes heavily blotched with red or orange-red, the entire lobes often so coloured but varying in depth of colour. Difficult to separate from the last in the case of herbarium and some living material. Still cultivated as a Scottish cottage-garden plant and locally well naturalised from Yorkshire (Teesdale) northwards *M. guttatus* × *M. nummularius* × *M. variegatus*
- 7 Corolla coppery orange, at least when mature 8
- 7 Corolla cream to yellow or pink, often blotched red, purple or chocolate 9

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- 8 Corolla uniformly copper, sometimes yellow at first; calyx 12 mm or less at flowering; plant very small, slender, decumbent, often annual; leaves small, rhomboidal, often 3-veined, evenly and neatly toothed. Often reported as an escape, but always in error (?) for its hybrids; unlikely to establish itself in Britain and becoming replaced in cultivation by more colourful, vigorous and longer-lived hybrid cultivars *M. cupreus* Dombrain
- 8 Corolla variable, but typically yellow and covered in confluent small blotches of coppery orange; calyx exceeding 14 mm at flowering; plant medium-sized to robust, often erect, perennial; leaves variable but usually with some teeth longer than wide and somewhat twisted. Very locally established *M. × maculosus* hort. ex T. Moore (*M. cupreus* × *M. nummularius*)
- 9 Corolla yellow, throat spotted but lobes unblotched 10
- 9 Corolla variously coloured, usually blotched 11
- 10 Leaves rather small, tending to be evenly and neatly toothed; lower fruiting pedicels less than 6 cm (described above) *M. × maculosus* hort. ex T. Moore (*M. cupreus* × *M. nummularius*)  
[Some cultivars of *M. × hybridus* would key out here but are unlikely to be naturalised]
- 10 Leaves larger, toothed untidy, individual teeth frequently parallel-sided, to twice as long as wide, twisted; lower pedicels of well grown plants exceeding 6 cm at fruiting (unblotched variant readily produced in cultivation, not yet seen wild) *M. nummularius* comb. ined.
- 11 Annual or short-lived perennial usually producing little lateral growth; leaves rhomboidal, hardly longer than broad, teeth shallowly deltoid; corolla cream or pale yellow, often with lobes diffusely or heavily spotted and blotched, or else corollas deep yellow to red or red brown and often unmarked; flowers medium to large, often with only one open on the inflorescence at any one time; fruiting pedicels usually short, not exceeding 6 cm. Grown as a bedding plant and an occasional, transient escape *M. × hybridus* Siebert & Voss (*M. cupreus* × *M. nummularius* × *M. variegatus*)  
[*M. variegatus* would key out here but it is unknown as an escape and lost from cultivation. Some cultivars and variants of *M. cupreus*, notably 'Andean Nymph', which might escape, would also key out here.]
- 11 Perennial, usually producing abundant lateral non-flowering shoots or at least forming robust clumps; corolla yellow, rarely creamy yellow, lobes with single, dark-red blotches; fruiting pedicels of well-grown plants exceeding 6 cm 12
- 12 Often a robust plant to 60 cm; corollas large, creamy to bright yellow, lower central lobe or all five lobes occupied by single, cherry-red to purplish red blotches; leaves very broad, often almost rounded, with teeth mostly broader than long. Long established in N Scotland, rare elsewhere *M. × smithii* Paxton (*M. nummularius* × *M. variegatus*)
- 12 Mat-forming to erect, flowering stems to 40 cm; leaves often twice as long as broad, irregularly-serrate; at least some individual teeth more or less parallel-sided, twice as long as wide, twisted; corolla pale yellow, the lower central lobe or more often each lobe marked with a single, round, dark-red to deep red-brown blotch; corollas not conspicuously large. A rare plant of hill-streams, Durham and Wigtownshire northwards; S W Ireland *M. nummularius* comb. ined

- References** Grant, A. L. (1924). *Annals Missouri Botanical Garden* **2**: 99-388.  
 Roberts, R. H. (1964) *Watsonia* **6**: 70-75.  
 Roberts, R. H. (1964) *Watsonia* **6**: 371-376.  
 Silverside, A. J. (1994). Pp 59-64 in *The common ground of wild and cultivated plants*. National Museum of Wales, Cardiff.  
 Silverside, A.J. (in press) *Mimulus* L. in *European Garden Flora* **6**.

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