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## Save *Asteriscus*, sink *Nauplius* (*Compositae*)

### Abstract

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The history of the taxonomy and nomenclature of taxa previously assigned to *Asteriscus* Mill. (sensu lato) is outlined. While the taxonomy of the group is presently well understood, two clearly defined genera being recognized, the nomenclature is messy. It is demonstrated that the genus that came recently to be known as "Asteriscus" must bear the name *Pallenis* Cass., while *Asteriscus* replaces *Nauplius* Cass. As a result some nomenclatural transfers, here effected in the frame of a synopsis of the included taxa, cannot unfortunately be avoided.

### Introduction

This paper, aimed at the clarification of the taxonomy and nomenclature of a Mediterranean group of *Compositae*, denotes the onset of preparatory work for volume 2 of *Med-Checklist* (Greuter & al. 1984), to be devoted entirely to that family.

Three species, described by Linnaeus (1753) under *Buphthalmum*, were assigned to *Asteriscus* by some later authors, while others placed them variously in two or three different genera. A summary of past taxonomic and nomenclatural treatments is provided in Table 1, which bears witness of a striking inconsistency in the application of generic names, quite apart from the underlying taxonomic discrepancies.

Miller (1754), when validating the generic name *Asteriscus* under the present rules of botanical nomenclature, did no more than reasserting Tournefort's (1700) original concept of that genus, as opposed to Linnaeus's mixed *Buphthalmum* notion – which he was to embrace in the next following edition of his work (Miller 1768). Opinions on generic boundaries would continue to vary ever since, but the number of those who took a close look at the plants themselves, studying critically the relevant characters, is quite small. As usual for almost any group of *Compositae*, the pioneer was Cassini (1818, 1822, 1825) who, noting structural differences between *B. aquaticum* (with which, too generously, he associated *B. maritimum*) and *B. spinosum* created distinct subgenera then genera, *Nauplius* and *Pallenis*, to accommodate the two. Briquet & Cavillier (1917), based on the former's separate, analytical study announced as being in print but never in fact published,

stressed the differences between Cassini's *N. aquaticus* and *N. maritimus*. They reinstated Miller's *Asteriscus* in a restricted sense, for the latter species alone, while maintaining Cassini's two genera for *N. aquaticus* and *P. spinosa*.

Table 1. A summary of the taxonomic placement, by various authors, of the three Linnaean *Bupthalmum* species later transferred to *Asteriscus*.

References:	<i>B. spinosum</i>	<i>B. maritimum</i>	<i>B. aquaticum</i>
Linnaeus (1753), Miller (1768), etc.	<i>Bupthalmum</i>	<i>Bupthalmum</i>	<i>Bupthalmum</i>
Miller (1754), Godron (1850), etc.	<i>Asteriscus</i>	<i>Asteriscus</i>	<i>Asteriscus</i>
Hill (1761)	<i>Bubonium</i>	<i>Bubonium</i>	<i>Bubonium</i>
Cassini (1822, 1825)	<i>Pallenis</i>	<i>Nauplius</i>	<i>Nauplius</i>
Lessing (1832), Candolle (1836), etc.	<i>Pallenis</i>	<i>Asteriscus</i>	<i>Asteriscus</i>
Schultz (1844), Hoffmann (1890), etc.	<i>Asteriscus</i>	<i>Odontospermum</i>	<i>Odontospermum</i>
Kuntze (1891)	<i>Athalmum</i>	<i>Asteriscus</i>	<i>Asteriscus</i>
Briquet & Cavillier (1917)	<i>Pallenis</i>	<i>Asteriscus</i>	<i>Bubonium</i>
Wiklund (1985), Halvorsen & Borgen (1986)	<i>Asteriscus</i>	<i>Asteriscus</i>	<i>Bubonium</i>
Wiklund (1987), Anderberg (1991), etc.	<i>Asteriscus</i>	<i>Asteriscus</i>	<i>Nauplius</i>
Greuter & al. (1993)	<i>Pallenis</i>	[ <i>Pallenis</i> ]	<i>Nauplius</i>
Present paper	<i>Pallenis</i>	<i>Pallenis</i>	<i>Asteriscus</i>

Modern studies (Merxmüller & Grau 1977, Wiklund 1985, 1987, Anderberg 1991), mostly of a micromorphological and anatomical nature, agree in placing *Asteriscus spinosus* and *A. maritimus* in the same genus while assigning most of the remaining species, including *A. aquaticus*, to a second genus for which Cassini's name *Nauplius* is used in a restricted sense. Although Briquet's trigeneric scheme remains a defensible option, there is something to be said for not multiplying *Compositae* genera beyond what is necessary from a practical point of view. I shall therefore adhere to the modern bigeneric model, but will create distinct subgenera for *A. spinosus* and *A. maritimus*.

In what follows, I shall try to demonstrate that the nomenclatural scheme proposed by Wiklund (1985, 1987) to accommodate her taxonomic views is fundamentally flawed, and cannot be salvaged technically even through the mechanisms of conservation and rejection. In the absence of a convincing alternative, I shall conclude that in this case it is best to just follow the *Code* (Greuter & al. 1994), even though some nomenclatural transfers will ensue.

### The generic names and their types

*Bupthalmum*. – This name was validated by Linnaeus (1753: 903) for a genus with 7 species, currently assigned to 5 or 6 different genera. It was first typified [for *B.* subg. *Bupthalmum*] by *B. salicifolium* by Cassini (1818: 166), in agreement with current usage, and is of no direct concern for the nomenclature of the *Asteriscus* group. Awkwardly, and

inexplicably, Jarvis & al. (1993: 27) designated *B. aquaticum* as the type of *Buphthalmum*, a completely unacceptable suggestion that has no standing and should be disregarded.

*Asteriscus*. — A name validated by Miller (1754: [152]) who accepted both the generic concept and its designation as proposed by Tournefort (1700: 497). Both authors included 7 largely coincident, technically unnamed species in that genus, which by modern standards correspond to only three species, all first named by Linnaeus (1753): *Buphthalmum spinosum*, *B. aquaticum*, and *B. maritimum*. Under the provisions of Art. 10 of the *Code*, [the type of] one of these names must be chosen as the [ultimate] nomenclatural type of *Asteriscus*. With Miller's 1754 generic names remaining generally unnoticed until 1914, and with Briquet's revision announced for 1917 never being published, it took a long time before a type was designated for *Asteriscus*. If the *Code* did provide for implicit type designation by circumscription, Briquet & Cavillier (1917) would have been the first, fixing the name on *A. maritimum*; but they did not use the term type or an equivalent so they did not actually effect typification (*Code*, Art. 7.11).

In recent years, and in quick succession, all three available type options were formally proposed: Jeffrey (1982) chose *Asteriscus aquaticus*; Wiklund (1985: 304, with qualifications [see below]), and again Anderberg (1991, unrestrictedly), *A. spinosus*; and Stafleu (in Farr & al. 1986: 11), *A. maritimum*. Only the first of these type designations has standing under Art. 10.5; each, however, calls for some comments.

Jeffrey, in his choice, neither followed tradition (which would have favoured *Asteriscus maritimum*, to conform with Briquet & Cavillier 1917 and previous majority usage), nor did he opt for the element best known to Miller (which would have been *A. spinosus*); as he wrote to Wiklund (1985: 304), his intent was "to preserve the current usage of the name" [i.e., to restrict the need for coining new combinations to a minimum]. Had Wiklund accepted this, as would have been reasonable, we would not now face the muddled situation she did in fact create.

Wiklund (1985: 304), well aware of Jeffrey's earlier choice, rejected it on spurious grounds, pretending that it was in "serious conflict with the protologue". However the alleged conflict rests on her confusing "protologue" with "validating description" (in fact, elements clearly corresponding to *Asteriscus aquaticus*, adequately described, are part of the generic protologue); she furthermore misrepresented Miller's generic description by placing undue stress on the vague statement "plain seeds" and ignoring the restriction "for the most part" qualifying the two other alleged discrepancies. She then proceeded by misinterpreting Art. 10 of the *Code*, choosing as her own preferred type one of Miller's polynomial designations [i.e., an element other than the type of a name of an included species]. On the same page, she also stated however that "*Pallenis spinosa* ... is the type of both *Asteriscus* and *Pallenis*", which prompted Anderberg (1991) to attribute the latter (alternative?) choice of type to her.

Stafleu (in Farr & al. 1986), finally, cited *Asteriscus maritimum* as type. He attributed that type designation, not to himself but to Moench. However, Moench (1794) neither refers to Miller (he credits *Asteriscus* to its original, pre-Linnaean author, Tournefort), nor does he validate the name of a genus of his own, nor indeed does he narrow down the original Miller/Tournefort circumscription of *Asteriscus* [he happens to mention just one of its species, corresponding to *A. aquaticus* but misinterpreted by him as *A. maritimum*, for which his new name *A. sessilis* thus becomes an illegitimate though misapplied

substitute; see Wiklund 1987: 21]; and of course, Moench would never have used the term type, or an equivalent, as early as 1794.

*Bubonium*. — The genus named *Bubonium* by Hill (1761) originally included three named species, *B. aquaticum*, *B. spinosum*, and *B. frutescens*, all based on Linnaean species of *Buphthalmum* but of which the last is presently assigned to *Borrchia* Adans. None of these three elements is “the original type ... or ... the previously designated type” of a generic name that ought to have been adopted under the rules. Contrary to the belief of Wiklund (1987: 7) and Jeffrey (1988: 26), *Bubonium* is therefore a legitimate name, not an illegitimate renaming of *Asteriscus*. Halvorsen & Borgen (1986), accepting Wiklund’s mistypification of *Asteriscus*, adopted *Bubonium* in their revision. The first author to typify *Bubonium* was apparently Jeffrey (1988), who designated it as homotypic with *Asteriscus* that he had previously typified by *A. aquaticum*. [Dandy (1967) had done the same before but without typifying *Asteriscus*, which cannot be accepted as type designation under the *Code*.] Any attempt to retypify *Asteriscus* would thus reinstate *Bubonium* in preference to its homotypic synonym *Nauplius*.

*Pallenis* and *Nauplius*. — Both names were originally published as subgeneric epithets by Cassini (1818) who later (Cassini 1822) raised them simultaneously to generic rank. Both are legitimate under, e.g., Art. 52.3 of the *Code*, and both have an original type: *Buphthalmum spinosum* and *B. aquaticum*, respectively. Due to subsequent type designation (see above), *Nauplius* became a junior homotypic synonym of both *Asteriscus* and *Bubonium*. *Pallenis*, however, has no earlier synonym in the currently accepted classification. In Appendix III of the *Code*, it is listed as a nomen conservandum without corresponding rejected name, the reason being that *Athalmum* Necker (see below), originally listed as rejected, is not a validly published name (Rickett & Stafleu 1960; see *Code*, Appendix V).

*Odontospermum*. — An invalid Necker designation validated by Schultz (1844) as a generic name. The genus, as circumscribed by Schultz, included the original type of the earlier and legitimate generic name *Nauplius*, so that *Odontospermum* must be considered an illegitimate substitute name automatically typified by *Buphthalmum aquaticum*.

*Saulcya*. — This new monotypic genus was described and named by Michon (1854: 383; not seen) for what he considered the true rose of Jericho, *S. hierochuntica*. The name is not in current use but remains available for those who, not unreasonably, would want to follow Briquet & Cavillier (1917) in assigning *Asteriscus maritimus* and *A. spinosus* to separate genera.

*Athalmum*. — Again an invalid Necker designation, validated by Kuntze (1891) as a generic name. It is an illegitimate substitute for *Pallenis*, and is automatically typified by *Buphthalmum spinosum*.

## Discussion

The above analysis leaves us with *Asteriscus* as the correct name for a genus of 8 species mainly centred on N. Africa and the Atlantic Islands, revised under the name *Bubonium* in 1986 then under the name *Nauplius* in 1987, but previously widely known as either *Asteriscus* or *Odontospermum*; the name *Pallenis* being correct for a second genus

of 5 species, two of which, traditionally known as *Asteriscus*, might be further segregated as *Saulcyia*. The question then arises whether anything can be done to minimize consequent nomenclatural change.

The first option that comes to mind, to conserve *Asteriscus* with *A. spinosus* as the conserved type, is technically unavailable. The reason is that the generic name *Pallenis*, based on its single available element *P. spinosa*, is a nomen conservandum. Wiklund's choice of *A. spinosus* as type would, if effective, have neatly killed the name *Asteriscus* (*Code*, Art. 14.4), which is why *NCU-3* (Greuter & al. 1993) had only *Pallenis* not *Asteriscus* listed. Sanctioning Wiklund's action by conservation would be equivalent to removing a conserved name from App. III of the *Code*, which is explicitly ruled out by Art. 14.13 (a provision that was added in 1981 by the Sydney Congress; see Greuter & Voss 1982: 109-112).

The second option, to conserve *Asteriscus* with *A. maritimus* as the conserved type, sounds better and would be in line with much of this century's botanical tradition. Proposing this, however, would be asking the competent nomenclatural Committees to accept the indirect killing of a present nomen conservandum (*Pallenis*), just to sanction one author's recent, ill-advised nomenclatural doings. This is unlikely to pass, especially when one considers that the present situation is the one that Jeffrey had thought preferable for the sake of stability (since it leaves the well known name *Asteriscus* with the largest group of species) – in which he would have succeeded had Wiklund followed suit.

Worse, neither of the above two proposals would do the whole job, since *Nauplius* would still – unless it be conserved itself, for which there is little hope – have to yield to *Bubonium*. Incidentally, all required combinations are presently available under both generic names, and most of them, also, under the traditional *Asteriscus*.

I have therefore eventually come to the conclusion that there is no clear case for submitting a conservation proposal. It is best, for once, to let the *Code* have its way and accept the consequent changes. Wiklund's nomenclatural treatment, while now adopted by specialists of the *Compositae* (e.g., Fayed & Mohamed 1991, Bremer 1994), has scarcely yet begun to make its way into floristic literature (an exception being Hansen & Sunding 1993). Changes introduced now are not therefore disruptive but, rather, stabilizing in the long run.

### Conclusions

The following is a synopsis of the correct names of all taxa currently recognized in *Pallenis* and *Asteriscus*, down to subspecies. Except at the genus level, only essential, minimal synonymy is provided. Full lists of synonyms can be found in the revisions of Wiklund (1985, 1987), Halvorsen & Borgen (1986), and Aurich & Podlech (1989).

*Asteriscus* Mill., Gard. Dict. Abr., ed. 4: [152]. 1754 ≡ *Bubonium* Hill, Veg. Syst. 2: 74. 1761 (by type designation: Jeffrey 1988: 26) ≡ ?*Bupthalmum* subg. *Nauplius* Cass. in Bull. Sci. Soc. Philom. Paris 1818: 166. 1818 ≡ *Nauplius* (Cass.) Cass. in Cuvier, Dict. Hist. Nat. 23: 566. 1822 ≡ *Odontospermum* Neck. ex Sch. Bip. in Webb & Berthelot, Hist. Nat. Iles Canaries 3(2,2): 231. 1844, nom. illeg. — Type (Jeffrey 1982: 35): *A. aquaticus* (L.) Less. (*Bupthalmum aquaticum* L.).

- Asteriscus aquaticus* (L.) Less., Syn. Gen. Compos.: 210. 1832 ≡ *Bupthalmum aquaticum* L., Sp. Pl.: 903. 1753 (*Bubonium aquaticum* (L.) Hill, *Nauplius aquaticus* (L.) Cass.).
- Asteriscus daltonii* (Webb) Walp. in Ann. Bot. Syst. 2: 844. 1852 ≡ *Odontospermum daltonii* Webb in Hooker, Niger Fl.: 140. 1849 (*Bubonium daltonii* (Webb) Halvorsen, *Nauplius daltonii* (Webb) Wiklund); subsp. ***daltonii***.
- Asteriscus daltonii* subsp. ***vogelii*** (Webb) Greuter, **comb. nova** ≡ *Odontospermum vogelii* Webb in Hooker, Niger Fl.: 140. 1849 (*Bubonium daltonii* subsp. *vogelii* (Webb) Halvorsen, *Nauplius daltonii* subsp. *vogelii* (Webb) Wiklund).
- Asteriscus graveolens* (Forssk.) Less., Syn. Gen. Compos.: 210. 1832 ≡ *Bupthalmum graveolens* Forssk., Fl. Aegypt.-Arab.: 151. 1775 (*Bubonium graveolens* (Forssk.) Maire, *Nauplius graveolens* (Forssk.) Wiklund); subsp. ***graveolens***.
- Asteriscus graveolens* subsp. ***odorus*** (Schousb.) Greuter, **comb. nova** ≡ *Bupthalmum odorum* Schousb. in Kongel. Danske Vidensk.-Selsk. Skr. 1800(1) [Iagttag. Vextrig. Marokko]: 199. 1800 (*Bubonium graveolens* subsp. *odorum* (Schousb.) Wiklund, *Nauplius graveolens* subsp. *odorus* (Schousb.) Wiklund).
- Asteriscus graveolens* subsp. ***stenophyllum*** (Link) Greuter, **comb. nova** ≡ *Bupthalmum stenophyllum* Link in Buch, Phys. Beschr. Canar. Ins.: 150. 1828 (*Bubonium graveolens* subsp. *stenophyllum* (Link) Halvorsen, *Nauplius graveolens* subsp. *stenophyllum* (Link) Wiklund).
- Asteriscus imbricatus* (Cav.) DC., Prodr. 5: 487. 1836 ≡ *Bupthalmum imbricatum* Cav. in Anales Ci. Nat. 4: 94. 1801 (*Bubonium imbricatum* (Cav.) Maire, *Nauplius imbricatus* (Cav.) Wiklund).
- Asteriscus intermedius* (DC.) Pitard & Proust, Iles Canaries: 224. 1909 ≡ *Asteriscus sericeus* var. *intermedius* DC., Prodr. 5: 486. 1836 (*Bubonium intermedium* (DC.) Halvorsen & Wiklund [= *Nauplius intermedius* Webb]).
- Asteriscus schultzei* (Bolle) Pitard & Proust, Iles Canaries: 224. 1909 ≡ *Odontospermum schultzei* Bolle in Bonplandia 7: 295. 1859 (*Bubonium schultzei* (Bolle) Svent., *Nauplius schultzei* (Bolle) Wiklund).
- Asteriscus sericeus* (L. f.) DC., Prodr. 5: 486. 1836 ≡ *Bupthalmum sericeum* L. f., Suppl. Pl.: 379. 1782 (*Bubonium sericeum* (L. f.) Halvorsen & Wiklund, *Nauplius sericeus* (L. f.) Cass.).
- Asteriscus smithii* (Webb) Walp. in Ann. Bot. Syst. 2: 844. 1852 ≡ *Odontospermum smithii* Webb in Hooker, Niger Fl.: 139. 1849 (*Bubonium smithii* (Webb) Halvorsen, *Nauplius smithii* (Webb) Wiklund).
- Pallenis*** (Cass.) Cass. in Cuvier, Dict. Hist. Nat. 23: 566. 1822 ≡ *Bupthalmum* subg. *Pallenis* Cass. in Bull. Sci. Soc. Philom. Paris 1818: 166. 1818 ≡ *Athalmum* Neck. ex Kuntze, Revis. Gen. Pl. 1-2: 319. 1891, nom. illeg.; subg. ***Pallenis***. — Type: *P. spinosa* (L.) Cass. (*Bupthalmum spinosum* L.).

*Pallenis cuspidata* Pomel in Bull. Soc. Sci. Phys. Algérie 11: 38. 1874 (*Asteriscus cuspidatus* (Pomel) Aurich & Podlech); subsp. *cuspidata*?

*Pallenis cuspidata* subsp. *canescens* (Maire) Greuter, **comb. nova**  $\equiv$  *Pallenis spinosa* var. *canescens* Maire in Bull. Soc. Hist. Nat. Afrique N. 20: 25. 1929 (*Asteriscus cuspidatus* subsp. *canescens* (Maire) Aurich & Podlech).

*Pallenis cyrenaica* Alavi in Jafri & El-Gadi, Fl. Libya 107: 109. 1986 ("1983").

*Pallenis spinosa* (L.) Cass. in Cuvier, Dict. Hist. Nat. 37: 276. 1825  $\equiv$  *Bupthalmum spinosum* L., Sp. Pl.: 903. 1753 (*Asteriscus spinosus* (L.) Sch. Bip. ); subsp. *spinosa*.

*Pallenis spinosa* subsp. *asteroidea* (Viv.) Greuter, **comb. nova**  $\equiv$  *Bupthalmum asteroideum* Viv., Fl. Libyc. Spec.: 57. 1824 (*Asteriscus spinosus* subsp. *asteroideus* (Viv.) Aurich & Podlech).

*Pallenis spinosa* subsp. *aurea* (Willk.) Salzm. ex Nyman, Consp. Fl. Eur.: 391. 1879  $\equiv$  *Asteriscus spinosus* var. *aureus* Willk. in Willkomm & Lange, Prodr. Fl. Hispan. 2: 48. 1865 (*Asteriscus spinosus* subsp. *aureus* (Willk.) Aurich & Podlech).

*Pallenis spinosa* subsp. *maroccana* (Aurich & Podlech) Greuter, **comb. nova**  $\equiv$  *Asteriscus spinosus* subsp. *maroccanus* Aurich & Podlech in Mitt. Bot. Staatssamml. München 28: 275. 1989.

*Pallenis* subg. *Saulcya* (Michon) Greuter, **comb. & stat. nov.**  $\equiv$  *Saulcya* Michon, Voy. Relig. Orient 2: 383. 1854. — Type: *Saulcya hierochuntica* Michon (*Pallenis hierochuntica* (Michon) Greuter).

*Pallenis hierochuntica* (Michon) Greuter, **comb. nova**  $\equiv$  *Saulcya hierochuntica* Michon, Voy. Relig. Orient 2: 383. 1854 (*Asteriscus hierochunticus* (Michon) Wiklund).

*Pallenis maritima* (L.) Greuter, **comb. nova**  $\equiv$  *Bupthalmum maritimum* L., Sp. Pl.: 903. 1753 (*Asteriscus maritimus* (L.) Less.).

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