

## Reinstatement of *Squilla* Steinh., a priority name against the illegitimate *Charybdis* Speta (Hyacinthaceae, Urgineoideae)

Mario Martínez-Azorín<sup>1</sup> , Manuel B. Crespo<sup>1</sup> , María Ángeles Alonso-Vargas<sup>1</sup> 

Received: 5 October 2021 / Accepted: 16 December 2021 / Published online: 21 March 2022

**Abstract.** *Squilla* Steinh. was considered to be an orthographic variant of *Scilla* L., and therefore the new genus *Charybdis* Speta was created to include *Scilla maritima* L. and related taxa occurring in the Mediterranean. Molecular phylogenetic studies recovered *Charybdis* as distant from *Urginea*; this finding was also supported by morphology and phytochemistry data. However, after typification of *Scilla* using *S. maritima* by Rafinesque, *Charybdis* became illegitimate under Art. 52 of the *Shenzhen Code* as its name became superfluous when published. A binding decision was requested from the Nomenclature Committee for Vascular Plants (NCVP) on whether *Scilla* L. and *Squilla* Steinh. are sufficiently alike to be considered orthographic variants and, hence, to be confused. Most members of the committee favour treating *Squilla* as not confusable with *Scilla*, which leaves the former name available for the current concept of *Charybdis*. In this context, we reevaluate the taxonomy of the genus, accepting 12 species of which eight are accommodated in *Squilla* as new combinations. Conversely, one of the species of *Charybdis* is transferred here to *Urginavia*. Nomenclatural types (including designation of 13 lectotypes, one neotype and one epitype) and the most relevant synonyms are given for each accepted taxon. An identification key is also presented for *Squilla* to assist future taxonomic studies in this group. We also include a revision of the taxonomic circumscription of the taxa related to *S. undulata*.

**Keywords:** *Charybdis*, nomenclature, *Squilla*, taxonomy, typification, *Urginavia*.

**How to cite:** Martínez-Azorín, M., Crespo, M.B. & Alonso-Vargas, M.Á. 2022. Reinstatement of *Squilla* Steinh., a priority name against the illegitimate *Charybdis* Speta (Hyacinthaceae, Urgineoideae). *Mediterr. Bot.* 43, e78272. <https://doi.org/10.5209/mbot.78272>

### Introduction

*Scilla* L. was described to include eight species occurring in the Mediterranean Basin, Europe, and SW Asia, currently placed in eight different genera belonging to three different subfamilies of Hyacinthaceae (cf. Pfosser & Speta, 1999; Manning *et al.*, 2004). Lectotypification of *Scilla* has been widely attributed to Hitchcock (in Hitchcock & Green, 1929: 146) using *Scilla bifolia* L. (vide *Index Nominum Genericorum* 2016: <http://botany.si.edu/ing/>). In this way, *Scilla* s.str. is applied to plants of Hyacinthaceae subfam. Hyacinthoideae (Asparagaceae subfam. Scilloideae trib. Hyacintheae) with bracts minute or absent, bracteoles absent, blue perigone segments (from almost free to fused up to 40 % of their length), blue, ovoid ovary, and globose seeds with an elaiosome (Speta, 1998a,b). However, as recently shown by Martínez-Azorín & Crespo (2016a), Rafinesque (1837a: 8) had previously typified the Linnaean *Scilla* on *Scilla maritima* L. (as '*Skilla maritima*'). This fact has important nomenclatural consequences as it affects two generic names included in two different subfamilies: the name of one of those subfamilies, and also that of a tribe for those who place these species in Asparagaceae s.l. Pending the decision of the Nomenclature Committee for Vascular Plants (NCVP) about conservation of *Scilla* with *S. biflora* as a conserved type (see Martínez-Azorín

& Crespo, 2016a) here we summarise the matter as it stands.

Steinheil (1836) described the genus *Squilla* Steinh. to segregate *Scilla maritima* (*Urginea scilla* Steinh.) from previously described *Urginea* Steinh. The latter genus includes *U. fugax* Steinh. as the nomenclatural type (cf. Adamson, 1942: 237), contrary to a general assumption that *U. maritima* (L.) Baker is the nomenclatural type, following Maire (1958: 156) as shown in the *Index Nominum Genericorum* site. In the original description of *Squilla*, Steinheil (1834) implicitly states that *Scilla maritima* strongly differs from species of *Ornithogalum* L., *Stellaris* Fabr. and *Scilla*, and argues for the necessity to create a new genus to accommodate that species. By doing so, he proposed to apply the name *Squilla* to two species [*Squilla maritima* (L.) Steinh. and *S. pancration* Steinh.], implicitly mentioning *Squilla* to be different from the name *Scilla*, the latter being used to include other species, as he described in his observations on the *Scilla* species found in 'Barbary' (= northwestern Africa; Steinheil, 1834).

Similarly, Speta (1998b) accepted separation of both *Urginea* and *Squilla*, but proposed the new name *Charybdis* Speta, with *C. maritima* (L.) Speta as the type, to replace *Squilla* since he considered the latter to be an orthographic variant of both *Scilla* and *Skilla* Raf. However, based on Rafinesque's typification of *Scilla*

<sup>1</sup> Dpto. de Ciencias Ambientales y Recursos Naturales (dCARN), Universidad de Alicante, P.O.Box 99, E-03080 Alicante, Spain. Email: [mmartinez@ua.es](mailto:mmartinez@ua.es)

*maritima*, *Charybdis* is illegitimate under Art. 52 of the *Shenzhen Code* (ICN, Turland *et al.*, 2018) as it was superfluous when published, a fact that makes the name *Charybdis* unavailable for use.

Martínez-Azorín & Crespo (2016b) have recently requested the NCVF for a binding decision on whether *Scilla* (subfam. Hyacinthoideae) and *Squilla* (subfam. Urgineoideae  $\equiv$  Asparagaceae subfam. Scilloideae trib. Urgineae) are sufficiently alike to be considered orthographic variants and hence creating a potential confusion. The result of the Committee points out to most of its members favouring acceptance of *Squilla* as not confusable with *Scilla*, but still votes of a majority (at least 60 %) are required to formally decide whether a “binding decision” about confusability is necessary (W. Appelquist, pers. comm.). The Committee at best could take many months before having a reportable answer, and that answer might be that there is no need to make a decision and there is no real possibility that the Committee will treat *Scilla* and *Squilla* as homonyms (W. Appelquist, pers. comm.), which would leave the latter name available for the current concept of *Charybdis*.

The acceptance of *Squilla* as not confusable with *Scilla* fully agrees with Steinheil’s (1836) protologue where he pointed out the differences between the two names, which he also applied deliberately to two very different taxa belonging to two different subfamilies, Hyacinthoideae and Urgineoideae, respectively. Furthermore, those two generic names show important orthographic differences that also are pronounced distinctly.

The generic circumscription of Urgineoideae has been especially controversial in recent decades (Martínez-Azorín *et al.*, 2013a,b, 2016c, 2017, 2019a,b; Pinter *et al.*, 2013; Crouch & Martínez-Azorín, 2015). On the one hand, Manning *et al.* (2004) choose to recognise only two genera (*Bowiea* Harv. ex Hook.f. and *Drimia* Jacq. ex Willd.) in the entire subfamily. *Drimia* is circumscribed by these authors in extremely broad terms as it includes several traditionally accepted genera, such as *Litanthus* Harv., *Rhadamanthus* Salisb., *Rhodocodon* Baker, *Schizobasis* Baker, *Tenicroa* Raf., *Thuranthos* C.H.Wright, and *Urginea*, all easily identifiable by distinct syndromes of morphological characters. On the other hand, Speta (1998a,b, 2001) and Pfosser & Speta (2001) accepted about 20 different genera but some of these were shown or interpreted as para- or polyphyletic in phylogenetic analyses (Pfosser & Speta, 2001, 2004; Manning *et al.*, 2004; Pfosser *et al.*, 2012). A similar scenario is found in the sister subfamily Ornithogaloideae which also shows contrasting taxonomic treatments (Speta, 1998a; Manning *et al.*, 2004, 2009; Martínez-Azorín *et al.*, 2011). A combination of sufficient plastid and nuclear DNA regions in the phylogenetic analyses generate well supported clades congruent with distinct syndromes of morphological characters, and these can be accepted at the generic rank (Martínez-Azorín *et al.*, 2011). An ongoing study on Urgineoideae supports the recognition of a multigeneric treatment of the subfamily (Martínez-

Azorín *et al.*, submitted), as partially already shown in Martínez-Azorín *et al.* (2019a). In this new classification, species of *Squilla* (recently treated as *Charybdis*) form a well-supported clade with distinct morphology and biogeography, rendering further support for recognition of a well-circumscribed genus – a fact also supported by previous phylogenetic analyses (Pfosser & Speta, 2001, 2004; Manning *et al.*, 2004; Pfosser *et al.*, 2012). Many authors recently accepted *Charybdis* to be different from *Urginea* and *Drimia* at generic rank (cf. Speta, 1998a; Pfosser & Speta, 2001, 2004; Conti *et al.*, 2005; Jeanmonod & Gamisans, 2007; Bacchetta *et al.*, 2012; Ali *et al.*, 2013; Tison & Foucault, 2014; Véla *et al.*, 2016), although others (e.g. Manning *et al.*, 2004; Manning & Goldblatt, 2018; WCSP, 2019) still maintain the broadly-circumscribed *Drimia*.

Accepting the possibility that the Committee will never make a reportable decision, or this decision would take many months (or years) to come, and because we are engaged in revising the subfamily in which the “*Charybdis* clade” is accepted at the generic rank, we suggest recovering *Squilla*. We trust that this deed might contribute new arguments to assist the Committee’s decision. Although several names in *Squilla* are already available, here we suggest further eight new combinations in *Squilla* to accommodate all 12 currently accepted species in this genus. We also exclude one species, accepted by Speta, and we suggest its transfer to *Urginavia* Speta. Nomenclatural types (including designation of 13 lectotypes, one neotype and one epitype) and the most relevant synonyms are presented for each accepted name. Based on the study of new herbarium and living material, a re-evaluation of the taxonomic circumscription of the species related to *Squilla undulata* is also presented (Crespo *et al.*, 2020).

## Materials and methods

Detailed morphological studies were undertaken on wild specimens and plants cultivated in the glasshouses of University of Alicante (Spain) and dried herbarium material. Terminology used for species characterisation follows Martínez-Azorín *et al.* (2007, 2009). Herbarium specimens and/or digital images from the herbaria ABH, BC, BCN, BOL, C, CAG, CAT, FI, GZU, GRA, HUJ, K, L, LG, LY, M, MA, MPU, NBG, ORT, P, PRE, TFC, TUB, VAL, and W (acronyms according to Thiers, 2021) were studied as well. The numbers following the acronyms correspond to barcode numeration of the specimens. The authors of the cited taxa follow IPNI (2021).

## Taxonomic treatment

As demonstrated by Pfosser & Speta (2001, 2004), ample molecular and phytochemical differences are available, allowing a confident separation of *Urginea* (with *U. fugax* as type species) and *Squilla* (with *S. maritima* as type species, recently treated as *Charybdis*). The

molecular tree obtained by those authors placed *Urginea* as sister to *Indurgia* Speta, *Ebertia* Speta and *Vera-duthiea* Speta, whereas *Squilla* (as *Charybdis*) was connected to *Sekanama* Speta, although with low support. Similarly, our preliminary phylogenetic results (see Martínez Azorín *et al.*, 2019a), which include a wider sampling of urgineoid taxa and three plastid regions, show an equivalent phylogenetic scenario in which both genera are placed in distant clades, with similar evolutionary relationships. These data together with the morphological differences emphasised by Speta (1998a, 2001), allow treatment of the *Charybdis* clade at generic rank. Species of *Urginea* s.str. are characterised by linear and filiform leaves, and short and few flowered inflorescences lacking bracteoles with thin peduncle and flower pedicels. Those included here in *Squilla* (= *Charybdis*) are distinguished by broad and flat leaves, tall and many flowered inflorescences with distinct bracteoles, and stout peduncle and flower pedicels. Below, a new taxonomic arrangement including new nomenclatural data is reported for all taxa of the latter genus. For the arrangement and circumscription of taxa in the aggregate of “*Drimia undata* Stearn” (*Scilla undulata* Desf.) we follow the recent treatment of Crespo *et al.* (2020) with minor adjustments.

*Squilla* Steinh. in Ann. Sci. Nat., Bot. sér. 2, 6: 276 (1836) - Type species (see Pfeiffer, 1874: 1252): *S. maritima* (L.) Steinh.

≡ *Charybdis* Speta in Phytion (Horn) 38(1): 58 (1998), nom. nov. et nom. illeg. superfl. [Art. 52 of the ICN]

*Description.*— Bulb usually large and hypogaeal, rarely somewhat epigeal, ovoid to globose, up to 20 cm in diameter. Leaves (4)6–10, proteranthous, from narrowly lanceolate to widely ovate, up to 35 cm long, margin entire or sometimes undulate with pilose or minutely papillose edge, green or somewhat glaucous, smooth, glabrous. Scape dull green with grey to purple tinge, terete, erect, smooth and glabrous. Inflorescence a long, multiflowered raceme, with up to 1000 flowers, erect, up to 2 m long including peduncle; flower pedicels shorter than to much longer than the perigone, subpatent and usually arquing upwards, sometimes erect or patent at anthesis. Bracts narrowly lanceolate, usually dry and wrinkled at flowering time, the lowermost with a short spur. Bracteoles present and evident. Flowers stellate, sometimes with strongly reflexed lobes, lasting several days, the unfertilised ones remaining dry on the pedicels after anthesis. Tepals 6, 5.5–18 mm long, free from the base or connate for less than 1–2 mm, lanceolate-ovate to spatulate, usually white or rarely purple, with a purplish or green longitudinal band mostly visible on the abaxial side, sometimes also distinguishable on the adaxial side, withering and abscising from the base remaining attached from their tips to form a cap on top of the capsule. Stamens 6, filaments smooth, spreading, usually white and lanceolate to narrowly triangular, flattened or rarely filiform and purplish. Ovary superior, ovate-oblong, usually with three

apical protuberances, green to yellow, with ca. 5–10 ovules per locule. Style 3–12 mm long, erect, white or rarely greenish-yellowish or tinged with purple, with trigonous stigma. Capsule ovate, 7–19 mm long, green first and papyraceous after ripening, valves completely dehiscent from the base. Seeds 4–12 mm long, ovate-oblong to linear-oblong, flattened, black, with reticulate testa cell walls.

*Number of species and distribution.*— It includes 12 species, occurring mostly along the Mediterranean Basin, reaching the Canary Islands in the West, and S Iran and Saudi Arabia in the East (Speta, 1998a).

*Caryology.*— Chromosome numbers:  $2n = 20, 30, 40, 50, 60$  ( $x = 10$ ) (cf. Battaglia, 1957a,b,c, 1964; Valdés-Bermejo, 1980; Speta, 1980; Pfosser & Speta, 2001; Rico, 2013; Bacchetta *et al.*, 2012; Véla *et al.*, 2016).

*Remarks.*— The size and number of flowers in the inflorescence is broadly variable in the genus. Taxa related to the “*Drimia undata*” group (*sensu* Crespo *et al.*, 2020) usually produce shorter racemes, often to 30(–50) flowers, whereas those in the “*Drimia maritima*” group (*sensu* Crespo *et al.*, l.c.) usually exhibit much longer racemes, often to 250 flowers. Only in the case of *D. numidica* (Jord. & Fourr.) J.C.Manning & Goldblatt racemes can bear to 1000 flowers, and in both *D. anthericoides* (Poir) Véla & Bélair and *D. secundiflora* (Maire) M.B.Crespo, Mart.-Azorín & M.Á.Alonso they can exhibit 30–150 flowers (see Véla *et al.*, 2016; Crespo *et al.*, 2020).

#### Accepted species and new combinations

1. *Squilla anthericoides* (Poir.) Jord. & Fourr., Icon. Fl. Eur. 2: 2 (1868) ≡ *Scilla anthericoides* Poir., Voy. Barbarie 2: 149 (1789), basionym ≡ *Ornithogalum anthericoides* (Poir.) Link ex Steud., Nomencl. Bot. 1: 573 (1821) ≡ *Urginea anthericoides* (Poir.) Steinh. in Ann. Sci. Nat., Bot. sér. 2, 1: 328 (1834) ≡ *Charybdis anthericoides* (Poir.) Véla & Bélair in Phytotaxa 288: 155 (2016) ≡ *Drimia anthericoides* (Poir.) Véla & Bélair in Willdenowia 49: 423 (2019) ≡ *Urginea maritima* var. *anthericoides* (Poir.) Maire & Weiller, Fl. Afrique N. 5: 163 (1958). *Ind. loc.*: “Nous avons trouvé cette belle espèce avec M. Desfontaine [sic] dans le bois de Fréje, en allant de Bonne à la Calle” [Algeria]. – Lectotype (designated by Véla *et al.* 2016: 155): [Algeria], ex Numidia, herb. Poiret (P barcode P02157340!; specimen on the upper right side of the sheet). Image available at: <https://mediaphoto.mnhn.fr/media/1550669443461ZaMZYz0MwmqSJyO>

*Chromosome number.*—  $2n = 2x = 20$  (Véla *et al.*, 2016).

*Distribution.*— NE Algeria (Figure 2) (see Véla *et al.*, 2016), perhaps extending to NW Tunisia.

2. *Squilla aphylla* (Forssk.) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. nov.** ≡ *Anthericum aphyllum* Forssk., Fl. Aegypt.-Arab.: 209 (1775), basionym ≡ *Urginea aphylla* (Forssk.) Speta in Linzer Biol. Beitr. 12(1): 229 (1980) ≡ *Charybdis aphylla* (Forssk.) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Drimia aphylla* (Forssk.) J.C.Manning & Goldblatt



in Edinburgh J. Bot. 60(3): 556 (2004). *Ind. loc.* “In insula *Rhodo*” [Greece]. – **Lectotype (designated here)**: [Greece], “*Anthericum*” F. Herb. Forskålii n° 10 [IDC microfiche foto: Forsskål nr. 129 III, 1–2] (C barcode C10001668 [digital image!]). Image available at: <http://www.daim.snm.ku.dk/digitized-type-collection-details-simple?catno=C10001668>

= *Ornithogalum elatum* Andrews in Bot. Repos. 8, pl. DXXVIII (1808) ≡ *Charybdis elata* (Andrews) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Drimia excelsa* J.C.Manning & Goldblatt in Edinburgh J. Bot. 60(3): 556 (2004), replac. name [non *Drimia elata* Jacq., *Collectanea* 5(Suppl.): 38 (1797)]. *Ind. loc.*: “Egypt on the plains of Alexandria”. – **Lectotype (designated here)**: [icon in] Andrews (1808), pl. DXXVIII: only the flowering scape and the flower dissection.

*Chromosome number*: –  $2n = 4x = 40$  (Speta, 1980; Pfosser & Speta, 2004).

*Distribution*. – E Mediterranean basin, from Greece, Crete, Turkey and Cyprus to Egypt and the Middle East (Figure 2) (see Pfosser & Speta, 2004).

*Remarks*. – Among Forsskål’s collections in Museum Botanicum Hauniense (University of Copenhagen, Denmark), two specimens (C barcode C10001667, C barcode C10001668) are conserved which can be considered original material and therefore relevant for typification of *Anthericum aphyllum* Forssk. The voucher C10001668, belonging to Forsskål’s personal collection, is selected here as lectotype of the name, since it includes a flowering scape matching the current concept of *Squilla aphylla*; the voucher C10001667 (Herb. Forskålii n° 945) was reinserted in Forsskål’s collection from Hornemann’s herbarium and bears a flowering scape of *S. aphylla* plus a fragment of a scape with linear, amplexicaul, subalternate basal leaves with wide membranous sheaths, not belonging to any urgineoid species. This latter voucher bears the label “*Urginea maritima* (L.) Bak. / Da Forsk. besøgte Rhodos / 1 Sept. 1761 (fra 21–22) / er den dermed dateret. / det. A.H.”. However, no unequivocal evidence exists that both specimens come from a single collection, and therefore they should not be treated as duplicates. Although Speta (1998b) accepted *Ornithogalum elatum* Andrews as a separate species in *Charybdis*, it seems better placed as synonym of *S. aphylla*. Andrews’s protologue (1808) includes a poorly informative diagnosis and a colour illustration of plants collected near Alexandria (Egypt). That picture is rather confusing, since it shows an apparently synanthous plant, which produces bulbs with white-reddish scales, leaves broad and glaucous-green, and racemes long, with many white flowers with short purple-coloured marks on tepals (visible in bud) and bearing yellowish-green to greenish anthers and ovary. According to the distribution and general features of *O. elatum*, it fits well with the current concept of Forsskål’s *Anthericum aphyllum*, a plant described from Rhodos Island (Greece), morphologically akin to Andrews’s taxon. Plants from both territories also share the same chromosome set (tetraploid,  $2n = 40$ ) and are nested in the same molecular clade (cf. Pfosser & Speta, 2004). Therefore, both names are merged here under the earlier *A. aphyllum*, which is transferred to *Squilla*.

3. *Squilla glaucophylla* (Bacch., Brullo, D’Emerico, Pontec. & Salmeri) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. nov.** ≡ *Charybdis glaucophylla* Bacch., Brullo, D’Emerico, Pontec. & Salmeri in Phytotaxa 69: 18 (2012), basionym ≡ *Drimia glaucophylla* (Bacch., Brullo, D’Emerico, Pontec. & Salmeri) Raus in Willdenowia 46(3): 424 (2016). *Ind. loc.*: “Currently, only four populations are known, three of them [S. Pietro (Carloforte), Pranu Sartu (Buggerru and Iglesias) and Monte Linas (Gonnosfanadiga)] occur in rocky habitats and the other one [Scivu (Arbus)] is typical of sandy dunes” [Sicily]. – Holotype: Italy. Sardinia: Isola di San Pietro: Cala Vinagra, Carloforte, 63 m a.s.l., 38°09′47.49″N, 8°14′37.75″E, 19 July 2004, G. Bacchetta & C. Pontecorvo s.n. (CAT). Isotypes: CAG, CAT).

*Chromosome number*: –  $2n = 2x = 20$  (Bacchetta *et al.*, 2012).

*Distribution*. – SW Sardinia (Italy) (Figure 2) (Bacchetta *et al.*, 2012).

4. *Squilla hesperia* (Webb & Berthel.) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. nov.** ≡ *Urginea hesperia* Webb & Berthel., Hist. Nat. Iles Canaries (Phytogr., sect. 3) 3(2): 339 (1848), basionym ≡ *Charybdis hesperia* (Webb & Berthel.) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Drimia hesperia* (Webb & Berthel.) J.C.Manning & Goldblatt in Edinburgh J. Bot. 60(3): 556 (2004) ≡ *U. maritima* var. *hesperia* (Webb & Berthel.) Svent., Index Sem. Acclim. Pl. Aautapae 1969: 41 (1970) ≡ *Drimia maritima* var. *hesperia* (Webb & Berthel.) A.Hansen & Sunding, Fl. Macaronesia, Checklist Vasc. Pl., rev. ed. 2, 2: iv. (1979) (Figure 1A). *Ind. loc.*: “In Teneriffae littore adusto hanc plantam cum *U. Scillâ* confusam legimus. /.../ Species est Canariensis et forsan Mauritanica.” – **Lectotype (designated here)**: SPAIN. Canary islands. *Urginea hesperia* Nobis “3”, Herbarium Webbium n° 182548 (FI barcode FI000284 [digital image!]). Image available at: <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.fi000284>

*Chromosome number*: –  $2n = 4x = 40$  (Battaglia, 1964; Ruiz Rejón *et al.*, 1978; Speta, 1980; Pfosser & Speta, 2004).

*Distribution*. – Canary Islands (Spain) (Figure 2). Also cited in N Morocco, where it is regarded as doubtfully present (see Fennane, 2018).

*Remarks*. – Tetraploid populations occurring mostly in the Tingitan Peninsula (N Morocco), and also near Nador (NE Morocco), have been sometimes connected to *S. hesperia* (see Pfosser & Speta, 2004). The Moroccan plants however show different morphological traits (e.g. the bulb up to 5–6 cm in diameter; leaves up to 2.5–3 cm wide, linear-lanceolate to narrowly lanceolate; scape usually up to 80 × 0.7 cm, slender; pedicels up to 1.5 times longer than tepals; among others) and a distinct ecology, often connected to clayish heavy substrates in rainy areas. Further morphological and molecular work is being undertaken to clarify this point.



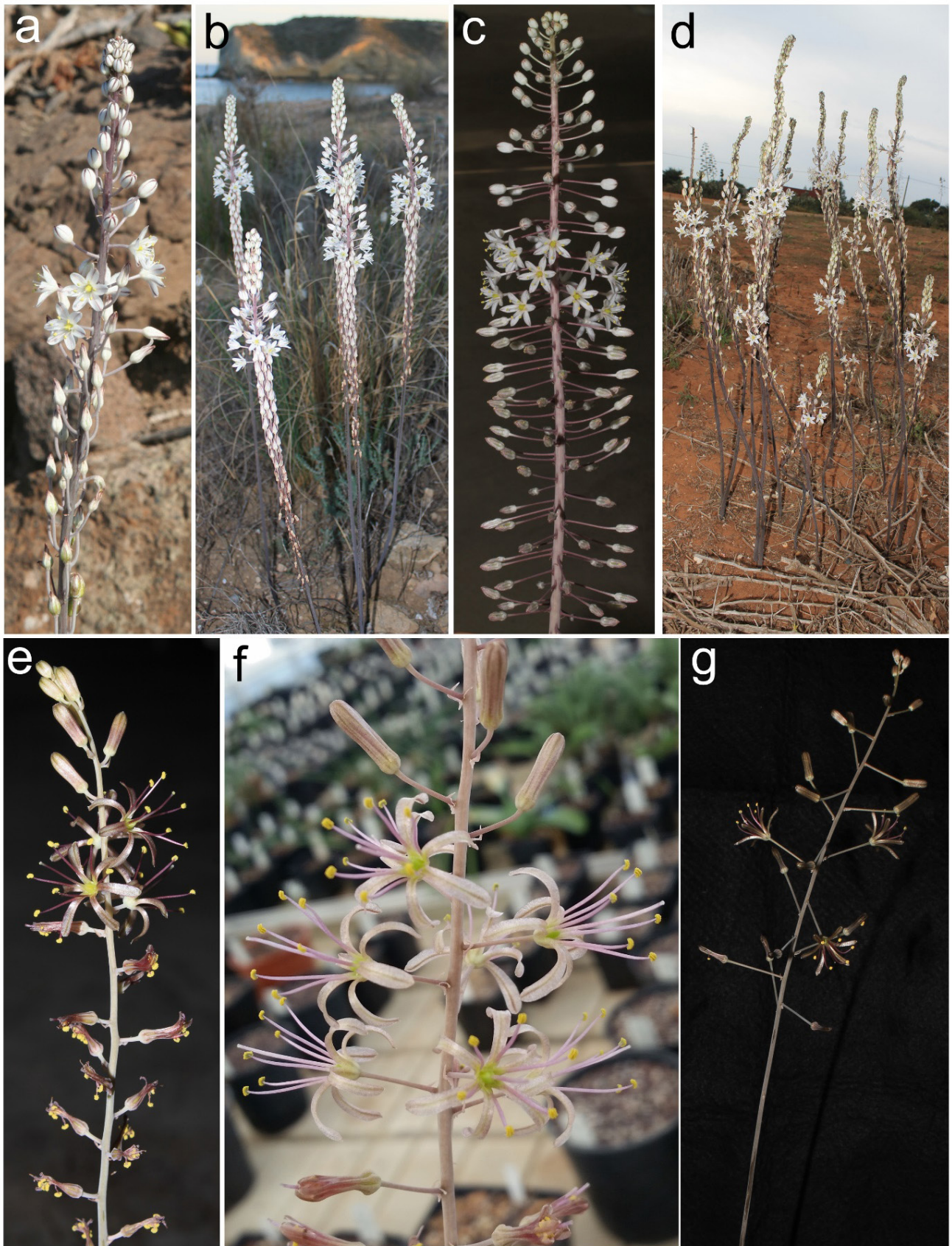


Figure 1. Inflorescences of some *Squilla* species. A, *S. hesperia*; B, *S. maritima*; C, *S. pancration*; D, *S. secundiflora*; E, *S. undulata*; F, *S. serotina*; G, *S. palaestina*.

5. *Squilla maritima* (L.) Steinh. in Ann. Sci. Nat., Bot. sér. 2, 6: 279 (1836) ≡ *Scilla maritima* L., Sp. Pl.: 308 (1753), basionym ≡ *Ornithogalum maritimum* (L.) Lam., Fl. Franç. 3: 276 (1779) ≡ *Urginea maritima*

(L.) Baker in J. Linn. Soc., Bot. 13: 221 (1872) ≡ *Drimia maritima* (L.) Stearn in Ann. Mus. Goulandris 4: 204 (1978) ≡ *Charybdis maritima* (L.) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Stellaris scilla*



Moench, *Methodus*: 304 (1794), nom. illeg. [Art. 52 of the ICN]  $\equiv$  *Ornithogalum squilla* Ker Gawl. in *Bot. Mag.* 23, t. 918 (1806), nom. illeg. [Art. 52 of the ICN]  $\equiv$  *U. scilla* Steinh. in *Ann. Sci. Nat., Bot. sér.* 2, 1: 331 (1834), nom. illeg. [Art. 52 of the ICN] (Figure 1B). – *Ind. loc.*: “*Habitat ad Hispaniae, Siciliae, Syriae littoria arenosa*” – **Lectotype (designated here)**: [icon in] Clusius (1601: 171), “*Scillae hispanicae flos & semen*”: only the illustration of the bulb with a flowering scape (but see also Ferrer-Gallego, 2013: 40). **Epitype (designated here)**: PORTUGAL. Sierra de Monsanto, environs de Lisbonne, pentes pierreuses, Jul–Aug 1877, *J. Daveau* (P barcode P02166423!). Image available at:

<https://science.mnhn.fr/institution/mnhn/collection/p/item/p02166423>. Isoepitypes: P barcode P02166260!, P barcode P02166417!, P barcode P01811235!, P barcode P01811236!  
 = *Scilla rubra* Garsault, *Descr. Pl. Anim.* 4: 313–314, pl. 527 (1767). *Ind. loc.*: “En Spagne, en Portugal, en Sicile” – **Lectotype (designated here)**: [icon in] Garsault (l.c.), pl. 527 “*Scilla rubra*”: only the illustrations of the bulb with a flowering scape, and the flowers.  
*Chromosome number*:  $2n = 6x = 60$  (Battaglia, 1957c, 1964; Ruiz Rejón *et al.*, 1978; Speta, 1980).  
*Distribution*. – Iberian Peninsula (Spain and Portugal) (Figure 2). Occasionally recorded in Algeria (Oran) (see Pfosser & Speta, 2004).

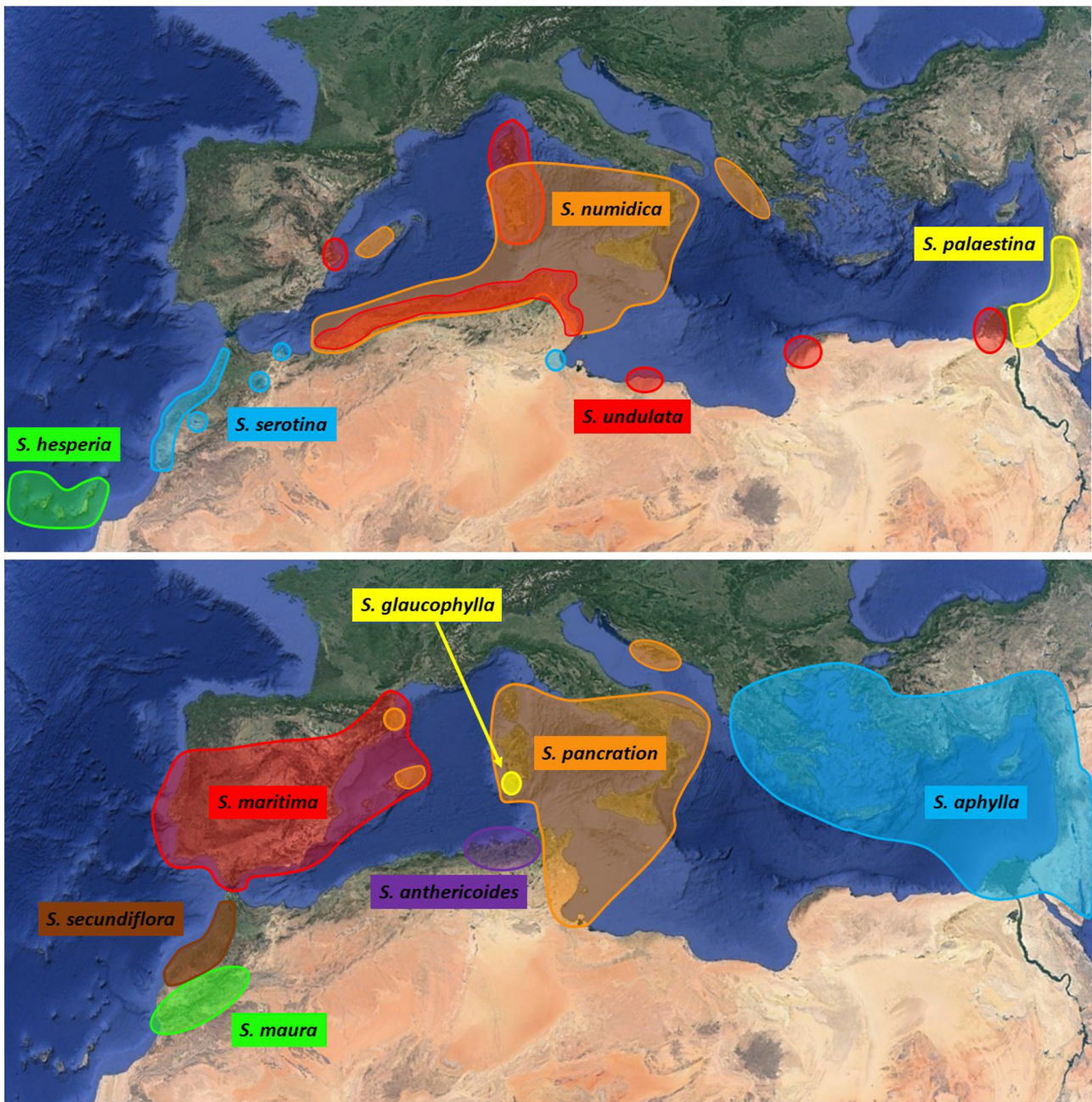


Figure 2. Distribution maps of *Scilla* species in the Mediterranean Basin and Canary Islands.

*Remarks*. – *Scilla maritima* seems to be restricted to the Iberian Peninsula. Previous references to its presence in N & NW Morocco through hexaploid

counts (see Battaglia, 1957b as *Urgineas maritima* var. *tadlaensis* and var. *stenophylla*; 1964 as *U. maritima* var. *stenophylla*) are truly attributable to *S. secundiflora*.



Recently, Ferrer-Gallego (2013) designated a lectotype for the name *Scilla maritima* (L barcode L 0052807) from Van Royen's collection at Leiden, which includes a flowering scape mounted among four wide green leaves. However, such designation is problematic and should be disregarded. On one hand, as mentioned by Clusius (1601: 171), leaves and flowers in this species (he referred to as "*Scilla hispanica*") are not coetaneous: "Copiose nascitur supra Olyssipponem, & plerisque aliis Lusitaniae & Hispaniae locis. Floret Augusto & Septembri, semen Octobri & Novembri maturescit: folia maturo iam semine, & exarido caule, emergunt Novembri & Decembri." This fact was also noted by Linnaeus (1738: 123) in his *Hortus Cliffortianus* as follows: "Singularis est quod foliis destituta floreat." It is well-known that taxa in the *Scilla maritima* group are hysteranthous and hence leaves and flowering scapes are never found together in a single population or plant as it apparently occurs in the voucher L barcode 0052807. This implies that the selected "lectotype" includes evidently two specimens collected at different times (leaves and the flowering scape). According to Art. 8.2 of the ICN, the voucher L 0052807 cannot therefore be regarded as lectotype of *S. maritima* as designated by Ferrer-Gallego (2013) and should be superseded. See Martínez-Azorín & Crespo (2014) for further details related to the issue. On the other hand, the morphological traits of the inflorescence in L 0052807 are not compatible with the current concept of *Squilla maritima* when applied restrictively to the hexaploid populations of the Iberian Peninsula, as narrowed by Stearn (1978) and Speta (1980, 1998a,b). It most probably corresponds to *S. pancration* or *S. aphylla*, on account of the relatively small flowers, very numerous on long, slender, almost patent pedicels. However, the lack of bulbs, fruits and seeds do not allow an unequivocal identification. Bearing in mind that the material in Van Royen's, albeit assignable to *Scilla maritima* s.l., does not match the widely accepted narrower circumscription of the species, an effective lectotypification should be established in that narrower sense as made here. This will preserve the current usage of the concerned name for those who prefer treating that Linnaean's species to include only the Iberian hexaploid populations. According to Stearn (1978) and Speta (1980), the illustrations of Clusius (1601) representing a plant from the surroundings of Lisbon (Portugal) are a good choice as lectotype of the Linnaean *Scilla maritima*. Three illustrations are shown for Clusius's *Scilla hispanica*: one representing a bulb with leaves (winter-spring stage), another showing a bulb with a flowering scape (summer stage), and the third depicting a raceme with ripe fruits (autumn stage). Therefore, among the three illustrations in Clusius (l.c.), that of the flowering raceme is designated here as lectotype for *Scilla maritima*, since it shows diagnostic characters allowing separation from other taxa in the aggregate. Furthermore, an epitype (P02166423) is also designated from material collected near Libon, in Portugal ("Sierra de Monsanto, environs de Lisbonne, pentes pierreuses, Jul–Aug 1877, J. Daveau"), which is the type locality from where Clusius described and

illustrated the material selected here as lectotype. Daveau's exsiccata at P includes well preserved material matching perfectly the current concept of the Linnaean taxon when treated in a narrow sense according to Stearn (1978) and Speta (1980, 1998a,b). Furthermore, it favours further detailed morphological characterisation of the species and provides an unequivocal connection to the hexaploid representatives of the aggregate (see chromosome counts from Sierra de Monsanto by Battaglia, 1957b). The "lectotype" indication by Speta (1980: 229) in the expression "Lectotypus (STEARNS 1978): Umgebung von Lissabon" is not valid, since Stearn (1978) did not effectively designate as type (or lectotype) either specimen or concrete illustration of Clusius's *Scilla hispanica*. Similarly, Speta's (1980) comment cannot be regarded as a valid indirect type citation.

6. *Squilla maura* (Maire) Mart.-Azorín, M.B. Crespo & M.Á. Alonso, **comb. nov.**  $\equiv$  *Urginea maura* Maire in Bull. Soc. Hist. Nat. Afrique N. 14: 158 (1923), basionym  $\equiv$  *Charybdis maura* (Maire) Speta in Phytion (Horn) 38(1): 60 (1998)  $\equiv$  *Drimia maura* (Maire) J.C. Manning & Goldblatt in Edinburgh J. Bot. 60(3): 557 (2004)  $\equiv$  *Urginea maritima* var. *maura* (Maire) Maire, Fl. Afrique N. 5: 165 (1958)  $\equiv$  *Drimia maritima* subsp. *maura* (Maire) Förther & Podlech in Sendtnera 7: 86 (2001). *Ind. loc.*: "Hab. in rupestribus schistosis, calcareis, porphyricis, graniticis, arenaceis Atlantis Majoris, ad alt. 2300 m. ascendens, et a julio usque ad augustum florens". – **Lectotype (designated here)**: MOROCCO. Grand Atlas: Mentaga, rocailles calcaires, 400–1000 m, feuilles glauques, 14 April 1922, R. Maire (MPU barcode MPU000488 [digital image!]). Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU000488>
- $\equiv$  *Urginea maritima* subsp. *maura* var. *angustifolia* Maire in Bull. Soc. Hist. Nat. Afrique N. 29: 454 (1938)  $\equiv$  *Urginea maritima* var. *maura* f. *angustifolia* (Maire) Maire, Fl. Afrique N. 5: 165 (1958), basionym. *Ind. loc.*: "Anti-Atlas: montagnes de Kerdous" [Morocco] – **Lectotype (designated here)**: MOROCCO. Anti Atlas: près de Kerdous, pentes rocheuses (quartzites), 800 m, 38 March 1937, R. Maire (MPU barcode MPU003971 [digital image!]). Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU003971>
- Chromosome number.* –  $2n = 2x = 20$  (Battaglia, 1957b; Rankou *et al.*, 2015).
- Distribution.* – C and SW Morocco (High-Atlas Range) (Figure 2) (see Maire, 1958).
- Remarks.* – The lectotype we designate here (MPU000488) includes a completely withered fruiting scape (corresponding to the autumn season), together with green leaves (corresponding to the following spring season). As both parts belonging to different seasons can be found coetaneous, no particular designation of any of those fragments seems to be necessary in this case to lectotypify the present name.

Regarding *Urginea maritima* var. *tadlaensis* Nègre, nom. inval., it applies to a plant described from Tadla region in Morocco (Nègre, 1954), which still remains as a not validly published since no Latin description or diagnosis was included in the protologue (Art. 39.1 of the ICN). Although we have not found any original material and therefore no safe synonymisation of that name can be made, its morphological characters undoubtedly relate Nègre's taxon to *S. maura*, and it is regarded here as an extreme of variation of the latter, close to *Urginea maritima* subsp. *maura* var. *angustifolia* Maire which is also included in synonymy of *S. maura*.

7. *Squilla numidica* Jord. & Fourr., Icon. Fl. Eur. 2: 1 (1868) ≡ *Urginea numidica* (Jord. & Fourr.) Grey, Hardy Bulbs 2: 632 (1938) ≡ *Urginea maritima* var. *numidica* (Jord. & Fourr.) Baker in J. Linn. Soc., Bot. 13: 221 (1873) ≡ *Charybdis numidica* (Jord. & Fourr.) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Drimia numidica* (Jord. & Fourr.) J.C.Manning & Goldblatt in Edinburgh J. Bot. 60(3): 557 (2004). – *Ind. loc.* “Algeria: Bône.” – **Lectotype (designated here)**: [Algeria.] “*Squilla maritima numidica* / de Bône (Algerie) 6 Novembre 1867 (LY barcode LY0073734 [digital image!]).

= *Squilla sphaeroidea* Jord. & Fourr., Icon. Fl. Eur. 2: 1 (1868) ≡ *Urginea maritima* var. *sphaeroidea* (Jord. & Fourr.) Baker in J. Linn. Soc., Bot. 13: 221 (1873) ≡ *U. sphaeroidea* (Jord. & Fourr.) Grey, Hardy Bulbs 2: 632 (1938). – *Ind. loc.* “Algeria” – **Lectotype (designated here)**: [icon in] Jordan & Fourreau (1868): Tab. CII “278. *Squilla sphaeroidea*”: only the illustrations of the flowering scape, flowers and bracts (figs. 1–12); excluding bulb, leaves, fruits and seeds (figs. 13–16).

*Chromosome number.* –  $2n = 4x = 40$  (Battaglia, 1957c, 1964; Speta, 1980; Pfosser & Speta, 2004).

*Distribution.* – Central Mediterranean Basin (Algeria, Tunisia, E Morocco, Sicily, S Italy, Sardinia). Disjunct localities in the Balearic Islands (Ibiza, Mallorca), Ionian Islands of Greece (Kefaliinia, Levkás, etc.) and Albania should be checked (Figure 2) (see Battaglia, 1957b; Pfosser & Speta, 2004).

8. *Squilla palaestina* (M.B.Crespo, Mart.-Azorín & M.Á.Alonso) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. nov.** ≡ *Drimia palaestina* M.B.Crespo, Mart.-Azorín & M.Á.Alonso in Pl. Syst. Evol. 306: Art. 67, 13 (2020), basionym. (Figure 1G) – Holotype: PALESTINE. [Palestinian Authority], Judean Mts. South of Yata, submediterranean batha, 23 September 1970, *Y. Plitmann & M. Raviv 26089* (HUJ barcode 132724!)

*Ind. loc.* – “E Mediterranean basin (Palestine, Jordan, North Sinai and inland areas of northeastern Egypt between Cairo and Suez).”

*Chromosome number.* –  $2n = 4x = 40$  (Feinbrun-Dothan, 1978).

*Distribution.* – SE Mediterranean Basin (from E Egypt to Lebanon) (Figure 2).

9. *Squilla pancration* Steinh. in Ann. Sci. Nat., Bot. sér. 2, 6: 279 (1836) ≡ *Scilla pancration* (Steinh.) Nyman, Syll. Fl. Eur.: 369 (1855) ≡ *Urginea pancration* (Steinh.) Schroff in Z. Allg. Oesterr. Apotheker-Vereines 3 (Oesterr. Z. Pharmazie 13): 42 (1865) ≡ *Charybdis pancration* (Steinh.) Speta in Phytion (Horn) 38(1): 60 (1998) ≡ *Drimia pancration* (Steinh.) J.C.Manning & Goldblatt in Edinburgh J. Bot. 60(3): 557 (2004) ≡ *Urginea maritima* var. *pancracion* (Steinh.) Baker in J. Linn. Soc., Bot. 13: 221 (1873) ≡ *U. maritima* subsp. *pancracion* (Steinh.) K. Richter, Pl. Eur. 1: 218 (1890) (Figure 1C) – **Neotype (designated here)**: MALTA. Gozo Island (Għawdex), pr. Ir-Ramla, between San Blas and S. Philip, 33SVV359908, 70 m elevation, flowered in cultivation at the University of Alicante on 04 September 2013, *J.L. Villar & E. Martínez s.n.* (ABH barcode ABH 70437! corresponding to Figure 1C).

= *Squilla insularis* Jord. & Fourr., Icon. Fl. Eur. 2: 2 (1868) ≡ *Urginea maritima* var. *insularis* (Jord. & Fourr.) Baker in J. Linn. Soc., Bot. 13: 221 (1873) ≡ *U. maritima* subsp. *insularis* (Jord. & Fourr.) K. Richt., Pl. Eur. 1: 218 (1890) ≡ *U. scilla* var. *insularis* (Jord. & Fourr.) Rouy, Fl. France 12: 425 (1910) ≡ *U. insularis* (Jord. & Fourr.) Grey, Hardy Bulbs 2: 632 (1938). – *Ind. loc.* “Cors. Ajaccio” [Corsica, France]. – **Lectotype (designated here)**: [icon in] Jordan and Fourreau (1868): Tab. CIII “279. *Squilla insularis*”: only the illustrations of the flowering scape, flowers and bracts (figs. 1–12); excluding bulb, leaves, fruits and seeds (figs. 13–16).

= *Squilla littoralis* Jord. & Fourr., Icon. Fl. Eur. 2: 2 (1868) ≡ *Urginea maritima* var. *littoralis* (Jord. & Fourr.) Baker in J. Linn. Soc., Bot. 13: 221–222 (1873) ≡ *U. maritima* subsp. *littoralis* (Jord. & Fourr.) K. Richt., Pl. Eur. 1: 218 (1890) ≡ *U. littoralis* (Jord. & Fourr.) Grey, Hardy Bulbs 2: 632 (1938). – *Ind. loc.* “Sicilia” [Italy] – **Lectotype (designated here)**: [icon in] Jordan & Fourreau (1868): Tab. CIV “280. *Squilla littoralis*”: only the illustrations of the flowering scape, flowers and bracts (figs. 1–12); excluding bulb, leaves, fruits and seeds (figs. 13–16).

*Ind. loc.* – “A la fin de 1834, M. Martins reçut de Malte...” [Malta].

*Chromosome number.* –  $2n = 2x = 20$  (Battaglia, 1957b; Speta, 1980).

*Distribution.* – Central Mediterranean Basin (Sicily, Sardinia, Corsica, S Italian Peninsula, Croatia, Malta, Lampedusa, and Tunisia) and some localities in the Iberian Peninsula (Gerona) and the Balearic Islands (Mallorca, Menorca and Cabrera) (Figure 2) (see Pfosser & Speta, 2004; Rosselló *et al.*, 2005; Bacchetta *et al.*, 2012; Véla *et al.*, 2016).

*Remarks.* – No original material was found for that name. Therefore, a neotype is selected from flowering material collected in Malta, matching the protologue and the current concept of the species. Living plants, from which the selected type material was harvested, are currently in cultivation in the bulb collection of the University of Alicante (Spain). Some populations



referred to this species in Morocco (see Pfosser & Speta, 2004) need to be confirmed.

**10. *Squilla secundiflora*** (Maire) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. & stat. nov.**  $\equiv$  *Urginea anthericoides* var. *secundiflora* Maire in Bull. Soc. Hist. Nat. Afrique N. 24: 229 (1933), basionym  $\equiv$  *Drimia secundiflora* (Maire) M.B.Crespo, Mart.-Azorín & M.Á.Alonso in Pl. Syst. Evol. 306: Art. 67, 15 (2020) (Figure 1D). *Ind. loc.*: “Hab. in silva Mamora Imperii Maroccani occidentalis, solo arenoso” – Lectotype (designated by Crespo *et al.* 2020: 15): MOROCCO. Forêt de la Mamora, bulbes cultivés à Alger ayant fleuri en septembre 1932, 28 October 1932, *R. Maire s.n.* (MPU barcode MPU 003124!) [as “*U. anthericoides* var. *secunda* Maire”]: only the flowering scape. Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU003124>

?= *Urginea maritima* var. *stenophylla* Maire in Bull. Soc. Hist. Nat. Afrique N. 20: 204 (1929). *Ind. loc.*: “Hab. in collibus et montibus Imperii Maroccani centralis frequens, usque ad alt. 1300–1400 m, solo calcareo nec non siliceo, augusto et septembri florens” – **Lectotype (designated here)**: MOROCCO. Azrou, cultivé à Alger de bulbes, 19 February 1925, *R. Maire s.n.* (MPU barcode MPU 002252!). Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU002252>

*Chromosome number.* –  $2n = 6x = 60$  (Battaglia, 1964 as *U. maritima* var. *stenophylla* et var. *tadlaensis*; Vêla *et al.*, 2016 as *Ch. maritima*).

*Distribution.* – W Morocco, from Larache and Forêt de la Maâmora (near Rabat) to Safi and probably also southwards (Figure 2) (cf. Maire, 1958; Crespo *et al.*, 2020). Relationships to populations from SE Iberian Peninsula (Almería) should be investigated.

*Remarks.* – This taxon was described as *Urginea anthericoides* var. *secundiflora* Maire from the deep sandy soils of Forêt de la Maâmora, near Rabat (NW Morocco), an outstanding biodiversity hotspot hosting several narrow endemic plants and a remarkable area for plant conservation in the context of Gharb region (see Radford *et al.*, 2011). However, recent field work has demonstrated that it extends from Larache to the surroundings of Safi, and probably also southwards. *Squilla secundiflora* is characterised by its smaller bulbs (up to 8 cm diameter) with greenish to withish scales; smaller leaves (up to 30 × 3 cm); shorter and slender scapes (up to 80 × 0.7 cm); floral pedicels often to 1.5–2 times longer than the perigone (sometimes about equalling perigone); flowers with white tepals 10–12.5 mm long, showing a conspicuous reddish midrib, stamen filaments 6–8 mm long, and oblong yellowish ovary 4.5–5 mm long; fruits 13–16 mm long, unilateral, obtuse to subemarginate, not apiculate or with an inconspicuous apiculus up to 0.6 mm long and seeds 8–9.5 mm long. In some extent, the flower characteristics of *S. secundiflora* resemble *S. maritima*, an otherwise hexaploid taxon from the Iberian Peninsula, well-characterised and differing by its robust, taller scapes; flowers more numerous, larger, with tepals up to

14 mm long; stamen filaments up to 10 mm long; and ovary 6–7 mm, greenish-yellow; fruits 12–14 mm long, not unilateral, subacute, with a marked apiculus ca. 1 mm long and seeds 6–8 mm long (see Crespo *et al.*, 2020). Although Maire (1933) described this Moroccan taxon as a variety of the Algerian endemic *S. anthericoides*, as *Urginea anthericoides* var. *secundiflora*, morphological differences mostly concerning the flower, fruit and seed characteristics allow easy separation of the Moroccan plant (cf. Vêla *et al.*, 2016). In fact, Maire (1958) reconsidered later his proposal and synonymised his *U. anthericoides* var. *secundiflora* with *U. maritima* var. *stenophylla* Maire in Bull. Soc. Hist. Nat. Afrique N. 20: 204 (1929), a taxon described from Azrou, in the Middle Atlas (central Morocco). That proposal is provisionally accepted here until new chromosome counts from the Azrou populations are available. According to Crespo *et al.* (2020) we consider Maire’s (1933) *U. anthericoides* var. *secundiflora* at specific rank based on the morphological, chorological and caryological differences with regard to its closest relatives. Chromosome counts for plants from W Morocco identified as *U. maritima* var. *stenophylla* (Mâamora: Battaglia, 1964), *U. maritima* var. *tadlaensis* (Beni Moussa Derouate: Battaglia, 1964) and *Ch. maritima* (Kenitra and Ben-Slimane: Vêla *et al.*, 2016) yielded hexaploid numbers ( $2n = 60$ ) in all cases, and they are here regarded as belonging to *S. secundiflora*.

**11. *Squilla serotina*** (Schousb.) Mart.-Azorín, M.B.Crespo & M.Á.Alonso, **comb. nov.**  $\equiv$  *Scilla serotina* Schousb., lagttag. Vextrig. Marokko: 165 (1800), basionym  $\equiv$  *Urginea anthericoides* var. *serotina* (Schousb.) Font Quer in Bol. Real Soc. Esp. Hist. Nat. 27: 45 (1927)  $\equiv$  *Drimia serotina* (Schousb.) M.B.Crespo, Mart.-Azorín & M.Á.Alonso in Pl. Syst. Evol. 306: Art. 67, 11 (2020) (Figure 1F). *Ind. loc.*: “Vulgaris in campis arenosis juxta Saffy.” [Morocco] – Lectotype (designated by Crespo *et al.*, 2020: 11): Herb. Liebm[ann]. Morocco, *Schousboe* (C barcode C10000939 [digital image!]) [IDC microfiche foto: Type Herbarium nr. 183 I,4]. Image available at: <https://plants.jstor.org/stable/10.5555/al.ap.specimen.c10000939>. Isotype: C barcode C10000940 [digital image!]) [IDC microfiche foto: Type Herbarium nr. 183 I,5]

= *Urginea undulata* var. *tazensis* Batt. & Maire in Bull. Soc. Hist. Nat. Afrique N. 22: 318 (1931)  $\equiv$  *Urginea tazensis* (Batt. & Maire) Maire in Bull. Soc. Hist. Nat. Afrique N. 31: 43 (1940)  $\equiv$  *Urginea undulata* subsp. *tazensis* (Batt. & Maire) Maire & Weiller, Fl. Afrique N. 5: 158 (1958)  $\equiv$  *Drimia tazensis* (Maire) Stearn in Ann. Mus. Goulandris 4: 208 (1978)  $\equiv$  *Charybdis tazensis* (Batt. & Maire) Speta in Stapfia 75: 167 (2001). *Ind. loc.*: “Hab. in collibus aridis Imperii Maroccani centralis prope Taza” [Morocco] – Neotype (designated by Crespo *et al.*, 2020: 11): MOROCCO. Tiznit, bulbs cultivated in Alger (Algeria), 18 September 1939, *R. Maire* (MPU004613 [digital image!]). Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU004613>

- = *Urginea undulata* var. *major* Gatt. & Weiller in Bull. Soc. Hist. Nat. Afrique N. 28: 539 (1937). *Ind. loc.*: “sw. Djorf el Ioudi, S de Safi. s. Plaine sableuse au N de Tiznit” [Morocco] – Neotype (designated by Crespo *et al.*, 2020: 11): MOROCCO. Tiznit, sandy soils, cultivated in Alger (Algeria), 8 September 1936, R. Maire (MPU001417 [digital image!]). Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU001417>
- Chromosome number.* – Apparently not studied yet.
- Distribution.* – C, W & S Morocco, mainly in the Middle Atlas and Anti-Atlas ranges, getting rare southwards to the Saharan Atlas range (Maire, 1958; Rankou *et al.*, 2015; Crespo *et al.*, 2020) extending to Melilla, and southern coastal areas of Tunisia (Gabes) (Figure 2).
- Remarks.* – See Crespo *et al.* (2019) for further details on the nomenclatural history and typification of this name. The reference by Font Quer (1927) to populations of “*Urginea anthericoides* var. *serotina*” near Chiclana, Cádiz Province (southern Spain) growing in coastal sandy soils together with *U. maritima*, are to be discarded. Conversely, those populations show morphological features much closer to *Squilla secundiflora*. New chromosome counts and molecular data are needed to clarify this point. The study of new living material from southern coastal areas of Tunisia allows us to extend the distribution of this species to the surroundings of Gabes, an area where *S. undulata* was cited based on incomplete material (Crespo *et al.*, 2020). The distribution pattern of this species fits with other southwestern Mediterranean endemics, such as *Biscutella eriocarpa* DC. var. *riphaea* A. Vicente *et al.* (see Vicente *et al.*, 2020).
- 12. *Squilla undulata*** (Desf.) Mart.-Azorín, M.B. Crespo & M.Á. Alonso, **comb. nov.** ≡ *Scilla undulata* Desf. in Méd. Eclairée Sci. Phys. 3(6): 161 (1792), basionym ≡ *Urginea undulata* (Desf.) Steinh. in Ann. Sci. Nat., Bot. sér. 2, 1: 330 (1834) ≡ *Epimenidion undulatum* (Desf.) Raf., Fl. Tellur. 2: 13 (1837) ≡ *Prospero undulatum* (Desf.) Salisb., Gen. Pl.: 28 (1866) ≡ *Drimia undata* Stearn in Ann. Mus. Goulandris 4: 208 (1978), replac. name [non *Drimia undulata* Jacq. in Willd., Sp. Pl. ed. 4, 2(1): 166 (1799), nec Jacq., Collectanea 5 (Suppl.): 41 (1797), nom. inval.] ≡ *Charybdis undulata* (Desf.) Speta in Stapfia 75: 167 (2001), nom. illeg. [Art. 52 of the ICN] (Figure 1E). *Ind. loc.*: “Frequentissima circa Tunetum, Constantine, Algeriam, et aliis locis.” – Lectotype (designated by Crespo *et al.*, 2019: 91): ALGERIA. Herbar de la Flore Atlantique, no. 707 Scilla undulata [Tunis et Alger, collines arides, elle fleurit en hiver, 1787], *Desfontaines* (P barcode P00320347!): the flowering scape with bulb on the left side of the sheet). Image available at: <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00320347>; isolectotype: MPU barcode MPU017529 [digital image!]: only the flowering raceme on the left side of the sheet; Image available at: <https://herbier.umontpellier.fr/zoomify/zoomify.php?fichier=MPU017529>
- = *Urginea undulata* f. *caeculi* Pau in Butl. Inst. Catalana His. Nat. 16: 136 (1916), basionym ≡ *Urginea undulata* var. *caeculi* (Pau) Pau, Bol. Soc. Ibér. Ci. Nat. 23: 91 (1924) ≡ *Drimia undata* subsp. *caeculi* (Pau) Mateo & M.B. Crespo, Fl. Abrev. Comun. Valenciana: 430 (1995) ≡ *Urginea undulata* subsp. *caeculi* (Pau) M.B. Crespo & Mateo in Flora Montiber. 5: 58 (1997). *Ind. loc.*: “Alginet... Alcira (Valencia)... va a resultar una especie frecuente en Valencia, y quizás en Alicante y Murcia” [Spain] – Lectotype (designated by Crespo & Mateo, 1997): SPAIN. Valencia prov., Alginet, cultivada, August 1916, F. Moroder (MA barcode MA 21517!): the scape on the right side of the sheet, from a bulb with incipient leaves]
- = *Drimia purpurascens* J. Jacq., Ecl. Pl. Rar. 1(3–4): 48, t. 30 (1812) ≡ *Idothea purpurascens* (J. Jacq.) Kunth, Enum. Pl. 4: 342 (1843) ≡ *Idothearia purpurascens* (J. Jacq.) C. Presl, Abh. Königl. Böhm. Ges. Wiss. ser. 5, 3: 544 (1845), nom. illeg. superfl. [Art. 52 of the ICN]. *Ind. loc.*: “Das Vaterland ist zwar unbekannt, aber wahrscheinlich das Vorgebürge der guten Hoffnung.” [Although its homeland is unknown, it comes probably from the Promontory of Good Hope] (see further comments on the probable European provenance of that plant in Crespo *et al.* (2020) – Lectotype (designated by Crespo *et al.*, 2020: 9): [icon in] J. Jacq., Ecl. Pl. Rar. 1(3–4), t. 30 (1812) (Fig. 1A): only the flowering scape with bulb. Epitype (designated by Crespo *et al.*, 2020: 9): ITALY. Sardinia [Sardinia], 1838, E. Thomas (P02166250!): the fragment on the left side of the sheet. Image available at: <http://mediaphoto.mnhn.fr/media/1441308118475YugdzUb1wb0czBPY>
- Chromosome number.* –  $2n = 2x = 20$  (Martinoli, 1949; Battaglia, 1957a; Valdés Bermejo, 1980; Bartolo *et al.*, 1984).
- Distribution.* – W and central Mediterranean Basin [SE Spain, Corsica, Sardinia, Sicily and northern coastal areas in Algeria, Tunisia, Lybia and N Egypt (Alexandria) (Figure 2) (see Crespo *et al.*, 2020)]. The distribution pattern of this species fits with other southwestern Mediterranean endemics, such as *Biscutella maritima* Ten. (see Vicente *et al.*, 2020).
- Remarks.* – Plants from SE Iberian Peninsula were separated as *Urginea undulata* f. *caeculi* Pau, based on some differences in flowers and fruits, as well as in features of leaf margin (cf. Crespo & Mateo, 1997; Rico, 2013). This taxon has been treated at different ranks, and in recent times it has been considered to differ from the North African populations at the subspecific rank (Mateo & Crespo, 1995; Crespo & Mateo, 1997). The Iberian plants are conspecific to those occurring in Corsica and Sardinia, and the name *Drimia purpurascens* J. Jacq. has recently been revived at species rank for them (Crespo *et al.*, 2020). Similarly, populations from N Egypt (Mandara and Lake Mariout, near Alexandria) are morphologically closer to the European plants (see Crespo *et al.*, 2020). Although no recent gatherings appear to exist from that area, current ongoing research including molecular work is being undertaken to clarify the intraspecific relationships



and taxonomic status of the diverse populations of *S. undulata* s.l. The study of new living material from southern coastal areas of Tunisia allows us to exclude the presence of *S. undulata* in that region, where it is replaced by *S. serotina* (Crespo *et al.*, 2020).

### Excluded taxa

*Epimenidion* Raf., Fl. Tellur. 2: 13 (1837)

**Type species (lectotype, designated here):** *E. hyacinthoides* Raf., replac. name [*Scilla hyacinthoides* Jacq. (1787), nom. illeg. [Art. 53 of the ICN] non L. (1767)]

**Remarks.**—*Epimenidion* was described by Rafinesque (1837b) to include two species: *E. hyacinthoides* Rafin. (*Scilla hyacinthoides* Jacq., nom. illeg. [Art. 53 of the ICN] non L. ≡ *Scilla campanulata* Aiton, nom. illeg. superfl. [Art. 52 of the ICN] ≡ *Hyacinthoides hispanica* (Mill.) Rothm.) and *E. undulatum* (Desf.) Raf. (*Scilla undulata* (Desf.) Rafin. ≡ *Squilla undulata* (Desf.) Mart.-Azorín, M.B.Crespo & M.Á.Alonso). The new genus was said to differ from *Scilla* L. by the six campanulate tepals fused at base and the racemose inflorescence (“*Scilla* L. diff. Petalis 6 campanulatis basi coalitis. fl. racemosis ut in *Skilla*”). That short diagnosis does not allow further interpretation of Rafinesque’s (1837b) concept of his own genus, which remains confusing based on the included taxa. Nonetheless, we select here *E. hyacinthoides* Rafin. as the type species (lectotype) of the genus, given that *Scilla hispanica* Miller (*Hyacinthoides hispanica* (Mill.) Rothm.) fits better with the original diagnosis of *Epimenidion*. This makes it synonym to *Hyacinthoides* Heist. ex Fabr.

***Urginavia simensis*** (Hochst. ex A.Rich.) Mart.-Azorín, M.B.Crespo & M.Á.Alonso **comb. nov.** ≡ *Scilla simensis* Hochst. ex A.Rich., Tent. Fl. Abyss. 2: 327 (1850), basionym ≡ *Drimia simensis* (Hochst. ex A.Rich.) Stedje in Nordic J. Bot. 15(6): 597 (1996) ≡ *Charybdis simensis* (Hochst. ex A.Rich.) Speta in Phytom (Horn) 38(1): 60 (1998), nom. illeg. [Art. 52 of the ICN]—**Lectotype (designated here):** ETHIOPIA, Ad latus meridionale montium simensium prope Abbu Mekanna et Debra Dschoa, 2 March 1840, *W. Schimper 1317* (P barcode P02057842!); only the bulb on the right side of the sheet bearing a scape with flowers and fruits, and the bulb into the affixed envelop. Image available at: <https://science.mnhn.fr/institution/mnhn/collection/p/item/p02057842>. Isolectotypes: K barcode K000257332 (digital image!); K barcode K000257333 (digital image!); L barcode 1459048 (digital image!); LG barcode BR0000090026478 (digital image!); M barcode M0107240 (digital image!) (P barcode P02057845!); TUB barcode TUB006926 (digital image!).

**Ind. loc.:**—“Crescit in regione montosa *Touglete* in regno *Choa* (Ant. Petit), et ad latus meridionale montium simensium prope *Abbu-Mekanna* et *Debra-Dschoa*, mense Martio (Schimper).”

**Chromosome number.**—Apparently not studied yet.

**Distribution.**—NE Africa (Ethiopia).

**Remarks.**—*Scilla simensis* was described from plants collected by A. Schimper from Ethiopia. Type indication by Stedje & Thulin (1995: 597) and Stedje (1997: 143) was not effective, since they merely cited the existence of syntypes in P and K. The study of the type material evidence that the withered perigone segments remain at the base of fruits, not forming an apical cap as it occurs in all species of *Squilla* from the Mediterranean Basin and in most genera in Urgineoideae. This peculiar character, however, agrees with the species of *Urginavia* Speta, a genus occurring mainly in southern and East Africa. Hence, distribution of *S. simensis* and its general morphology fit better with *Urginavia*, and therefore we establish here the necessary combination in that genus. Among syntypes of *S. simensis*, a duplicate at P from Schimper’s exsiccata (P02057842!) is selected here as lectotype. Another voucher at P from Richard’s herbarium (P00486304!), collected in Choa by R. Quartin-Dillon & A. Petit, bears the annotation “non distincta a *Scilla maritima* L.” which was commented in the protologue. However, it lacks a bulb and is therefore discarded as lectotype.

***Scilla lanceolata*** Viv., App. Fl. Cors. Prodr. 2: 3 (1830)

**Remarks.**—This species was described by Viviani (1830) from littoral of Corsica, with a short diagnosis largely lacking relevant data on taxonomically diagnostic characters (e.g. bulb and tunic characteristics, number of flowers per scape, pedicel length, tepal size and colour, ovary colour, capsule features, etc.). It was said to be close to “*Squilla maritima*” (as *Scilla*), from which it differed mostly by its narrowly lanceolate leaves; linear-acuminate bracts equalling the pedicel length; and flowers more loosely disposed. No original material was found to facilitate clarification of the identity of *S. lanceolata*. Although *S. lanceolata* has long been neglected, sometimes it has been synonymised to a broadly circumscribed “*Drimia maritima*” (see Govaerts, 2011). However, the only member of *Squilla* known to occur in Corsica is *S. pancration*, a species not matching Viviani’s protologue. Conversely, *S. anthericoides* exhibits morphological traits fitting well with Viviani’s description, but it occurs exclusively in Algeria (see Vêla *et al.*, 2016). No recent data are available on the existence of populations from Corsica matching *S. lanceolata*. According to those data the latter name should be proposed to be rejected as *nomen ambiguum*, a fact that should benefit stability of nomenclature in the *S. maritima* aggregate.

### Tentative key for the accepted species of *Squilla*

1. Leaves usually undulate on margins. Tepals reddish-pink to greenish with darker pinkish midrib; style longer than 7 mm, several times longer than the ovary at anthesis and exceeding the withered perigone. Seed 4–5 per locule ..... 2
- Leaves not undulate. Tepals white to yellowish, with greenish to purplish-brown midrib; style up to

- 5 mm long, about equalling to slightly longer than the ovary at anthesis and hidden into the withered perigone. Seed 5–10 per locule ..... 4
2. Perigone 9–13 mm long, purplish, midrib dark purplish. Pedicels 3–5 mm long at anthesis, shorter than to equalling perigone. Capsule 11–14 mm long. Fruiting pedicels 9–13 mm long, shorter than to slightly longer than capsule ..... ***S. undulata***
- Perigone (11–)13–18 mm long, olive-green suffused purple, midrib dark purplish to brownish. Pedicels 7–18 mm long at anthesis, often longer than to equalling perigone. Capsule 13.5–19 mm long. Fruiting pedicels 12–35 mm long ..... 3
3. Leaves glaucous-green, appressed to substrate, from almost entire to shortly papillate on margins. Fruiting pedicels (14–)20–35 mm long. Seeds (8.5–)10–12 mm long ..... ***S. palaestina***
- Leaves bright green, mostly erect, distinctly ciliate-papillate on margins. Fruiting pedicels 12–15(19) mm long. Seeds 5–9 mm long ..... ***S. serotina***
4. Bulb of adult plants 1.5–5(6) cm in diameter. Leaves 0.5–2.5(–3) cm wide, linear-lanceolate to narrowly lanceolate. Scape usually 20–80 × 0.2–0.5(–0.7) cm, slender ..... 5
- Bulb of adult plants 6–15 cm in diameter. Leaves (2.5–)3–10 cm wide, broadly lanceolate to broadly elliptic-lanceolate. Scape usually 60–150(–200) × (0.5–)0.6–1.5 cm, often robust ..... 6
5. Flowers white, with dark purplish midrib; pedicels longer than tepals, erect-patent to subpatent at anthesis. Capsules 13–16 mm long, ovoid; seeds 8–9.5 mm long. Bulb tunics brownish-red ..... ***S. secundiflora***
- Flowers yellowish, with brown midrib. Pedicels shorter than to equalling tepals, suberect at anthesis. Capsules 12–14 mm long, oblong-cylindrical. Seeds 6–7 mm long. Bulb tunics greenish or rarely white-reddish ..... ***S. anthericoides***
6. Leaves evidently glaucous-pruinose ..... 7
- Leaves bright green, sometimes glaucescent when young ..... 9
7. Bulb tunics brownish-red to white-reddish. Tepals 5.5–7.5 mm long. Ovary yellow to greenish-yellow at anthesis. Tetraploid plants ..... ***S. aphylla***
- Bulb tunics whitish to greenish-white. Tepals 7–9 mm long. Ovary green at anthesis. Diploid plants ..... 8
8. Leaves broadly oblanceolate. Raceme with 150–200 flowers; axis greenish, tinged with violet above. Capsule 8.5–10 × 6–7.5 mm, mucicous ..... ***S. glaucophylla***
- Leaves narrowly lanceolate. Raceme with up to 100 flowers; axis purplish-black, pruinose. Capsule 10–15 × 6.5–9 mm, apiculate ..... ***S. maura***
9. Plants up to 2 m tall. Bulb tunics brownish-red to white-reddish. Raceme bearing more than 250 flowers. Tepals with a greenish midrib, often partially inconspicuous. Stamen filaments 7–9 mm long. Tetraploid plants ..... ***S. numidica***
- Plants up to 1.5 m tall. Bulb tunics whitish to greenish-white. Raceme bearing up to 200 flowers. Tepals with a reddish to dark purplish midrib, usually conspicuous. Stamen filaments 4–6(–7) mm long. Diploid, tetraploid or hexaploid plants ..... 10
10. Roots reddish. Pedicels 2.5–3.5 times longer than tepals, patent at anthesis. Tepals 5.5–8 mm long. Ovary green to yellowish-green. Capsule mucicous to slightly mucronate. Seeds 4–7 × 2–4 mm long. Diploid plants ..... ***S. pancration***
- Roots whitish. Pedicels 1–2.5 times longer than tepals, erecto-patent at anthesis. Tepals 6–14 mm long. Ovary yellow to greenish-yellow. Capsule with an apiculus up to 1 mm long. Seeds 6–9 × 4–5 mm long. Tetraploid or hexaploid plants ..... 11
11. Bulb tunics greenish. Pedicels 7–15 mm, ca. 1–1.5 times longer than tepals. Tepals 9–14 mm. Anthers yellow to green-olive. Hexaploid ..... ***S. maritima***
- Bulb tunics reddish. Pedicels 13–21 mm, ca. 1.5–2.5 times longer than tepals. Tepals 6–11 mm long. Anthers light green. Tetraploid ..... ***S. hesperia***

### Acknowledgements

We thank the curators of the herbaria cited in the text for facilitating access to the examined specimens and/or digital images of *Squilla* material. In particular, we thank Cécile Aupic and Véronique Andro (Herbier P, Muséum National d'Histoire Naturelle, Paris) who kindly helped respectively with Desfontaines's historical herbarium and digital images of *Scilla undulata* at P. Mélanie Thiebaut (Université Lyon 1, Villeurbanne) kindly supplied images of Jordan's collection at LY. We also thank Wendy L. Applequist (Missouri Botanical Garden, St. Louis) for providing information on the Nomenclature Committee for Vascular Plants (IAPT). José Luis Villar kindly provided material of *Squilla pancration*. Michael Pinter (Institute of Biology, Karl-Franzens University, Graz) provided literature on *Squilla*, and Ladislav Mucina (Harry Butler Institute, Murdoch University, Perth) made interesting suggestions during the review process that improved the final version of the text. This work was partly supported by the grants ACIE18-03, UAUSTI18-02 and UAUSTI19-08 from the University of Alicante.

### References

- Adamson, R.S. 1942. Some Peninsula species of *Urginea*. *J. S. African Bot.* 8: 237–242.
- Ali, S.S., Pfosser, M., Wetschnig, W., Martínez-Azorín, M., Crespo, M.B. & Yu, Y. 2013. Out of Africa: Miocene dispersal, vicariance, and extinction within Hyacinthaceae subfamily Urgineoideae. *J. Integr. Pl. Biol.* 55: 950–964. doi:10.1111/jipb.12065
- Andrews, H.C. 1808. *The botanists's repository, for new, and rare plants*, vol. 8. T. Bensley, London.
- Bacchetta, G., Brullo, S., D'Emerico, S., Pontecorvo, C. & Salmeri, C. 2012. *Charybdis glaucophylla* (Asparagaceae), a new species from Sardinia. *Phytotaxa* 69: 16–26. doi:10.11646/phytotaxa.69.1.4
- Bartolo, G., Brullo, S., Pavone, P. & Terrasi, M.C. 1984. Cytotaxonomical notes on some Liliaceae of N.



- Cyrenaica. *Webbia* 38: 601–622. doi.org/10.1080/00837792.1984.10670329
- Battaglia, E. 1957a. Filogenesi del cariotipo nel genere *Urginea*. I–III: *U. maritima* (L.) Baker, *U. fugax* (Moris) Steinh. ed *U. undulata* (Desf.) Steinh. *Caryologia* 9: 234–273. doi:10.1080/00087114.1957.10797593
- Battaglia, E. 1957b. Ricerche citotassonomiche nel genere *Urginea*: *Urginea maritima* (L.) Baker e *Urginea maura* Maire. *Caryologia* 10: 244–275. doi:10.1080/00087114.1957.10797623
- Battaglia, E. 1957c. *Urginea maritima* L.: biotipi 2n, 3n, 4n, 6n e loro distribuzione geografica. *Caryologia* 9: 293–314. doi:10.1080/00087114.1957.10797597
- Battaglia, E. 1964. *Urginea maritima* (L.) Baker: nuovi reperti di biotipi cariologici 2n, 3n, 4n, 6n. *Caryologia* 17: 509–518. doi:10.1080/00087114.1964.10796147
- Clusius, C. 1601. *Rariorum plantarum historia, quae accesserint, proxima pagina docebit*. Officina Platiniana, Antverpiae [Antwerpen].
- Conti, F., Abbate, G., Alessandrini, A. & Blasi, C. (Eds.). 2005. An annotated checklist of the Italian vascular flora. Palombi Editori, Roma.
- Crespo, M.B. & Mateo, G. 1997. El género *Urginea* Steinh. (Hyacinthaceae) en la flora ibérica. *Flora Montiber.* 5: 56–60.
- Crespo, M.B., Martínez-Azorín, M. & Alonso, M.Á. 2019. Lectotype designation for *Scilla undulata* Desf. (Asparagaceae) from among the mixed original material. *Phytotaxa* 411: 89–92. doi:10.11646/phytotaxa.411.1.9
- Crespo, M.B., Martínez-Azorín, M. & Alonso, M.Á. 2020. The identity of *Drimia purpurascens*, with a new nomenclatural and taxonomic approach to the “*Drimia undata*” group (Hyacinthaceae = Asparagaceae subfam. Scilloideae). *Pl. Syst. Evol.* 306: Art. 67, 1–18. doi:10.1007/s00606-020-01689-1
- Crouch, N.R. & Martínez-Azorín, M. 2015. *Drimia edwardsii* (Asparagaceae, Scilloideae), a new urgineoid species from the Mkhomazi River Valley of eastern South Africa. *Phytotaxa* 195: 135–144. doi:10.11646/phytotaxa.195.2.2
- Feinbrun-Dothan, N. 1978. *Flora palaestina*, vol. 3. Israel Academy of Sciences and Humanities, Jerusalem.
- Ferrer-Gallego, P.P. 2013. Los tipos nomenclaturales de *Scilla autumnalis* L. y *Urginea maritima* (L.) Baker (Liliaceae). *Lagascalia* 33: 37–42.
- Font Quer, P. 1927. Notas sobre la flora gaditana. *Bol. R. Soc. Esp. Hist. Nat.* 27: 39–46.
- Hitchcock, A.S. & Green, M.L. 1929. Standard-species of Linnean genera of Phanerogamae (1753–54). In: Sprague, T.A. (Ed.). *International Botanical Congress, Cambridge (England), 1930. Nomenclature. Proposals by British Botanists*. Pp. 110–199. Wyman & Sons, London.
- Jeanmonod, D. & Gamisans, J. 2007. *Flora corsica*. Édisud, Aix-en-Provence.
- Jordan, A. & Fourreau, J. 1868. *Icones ad floram Europae novo fundamento instaurandam spectantes*, vol. 2, fasc. 41–42. F. Savy, Paris.
- Linnaeus, C. 1738. *Hortus Cliffortianus*. The author, Amstelaedami [Amsterdam].
- Maire, R. 1933. Contributions à l'étude de la flore de l'Afrique du Nord. Fascicule 20. *Bull. Soc. Hist. Nat. Afrique N.* 24: 194–232.
- Maire, R. 1958. *Flore de l'Afrique du Nord*, vol. 5. Lechevalier, Paris.
- Manning, J.C., Forest, F., Devey, D.S., Fay, M.F. & Goldblatt, P. 2009. A molecular phylogeny and a revised classification of Ornithogaloideae (Hyacinthaceae) based on an analysis of four plastid DNA regions. *Taxon* 58: 77–107. doi:10.1002/tax.581011
- Manning, J.C. & Goldblatt, P. 2018. Systematics of *Drimia* Jacq. (Hyacinthaceae: Urgineoideae) in southern Africa. *South African National Biodiversity Institute, Pretoria*.
- Manning, J.C., Goldblatt, P. & Fay, M.F. 2004. A revised generic synopsis of Hyacinthaceae in Sub-Saharan Africa, based on molecular evidence, including new combinations and the new tribe Pseudoprosperaeae. *Edinburgh J. Bot.* 60: 533–568.
- Martínez-Azorín, M. & Crespo, M.B. 2014. Validation of several names in Hyacinthaceae. *Taxon* 63: 1327–1334. doi:10.12705/636.21
- Martínez-Azorín, M. & Crespo, M.B. 2016a. (2483) Proposal to conserve the name *Scilla* (Hyacinthaceae) with a conserved type. *Taxon* 65: 1427–1428. doi:10.12705/656.19
- Martínez-Azorín, M. & Crespo, M.B. 2016b. (48) Request for a binding decision on whether *Scilla* L. (Hyacinthaceae subfam. Hyacinthoideae) and *Squilla* Steinh. (Hyacinthaceae subfam. Urgineoideae) are sufficiently alike to be confused. *Taxon* 65: 1437–1438. doi:10.12705/656.27
- Martínez-Azorín, M., Crespo, M.B., Alonso-Vargas, M.Á., Dold, A.P., Crouch, N.R., Pfosser, M., Mucina, L., Pinter, M. & Wetschnig, W. 2019b. New combinations in the tribe Urgineae (Asparagaceae subfam. Scilloideae) with comments on contrasting taxonomic treatments. *Phytotaxa* 397: 291–299. doi:10.11646/phytotaxa.397.4.3
- Martínez-Azorín, M., Crespo, M.B. & Dold, A.P. 2013a. *Drimia cochlearis* (Hyacinthaceae), a new species from South Africa. *Syst. Bot.* 38: 332–338. doi:10.1600/036364413X666831
- Martínez-Azorín, M., Crespo, M.B., Dold, A.P., Wetschnig, W., Pinter, M., Pfosser, M. & van Jaarsveld, E. 2013b. *Sagittanthera* (Hyacinthaceae, Urgineoideae), a new buzz pollinated genus from the Eastern Cape Province of South Africa. *Phytotaxa* 98: 43–54. doi:10.11646/phytotaxa.98.2.2
- Martínez-Azorín, M., Crespo, M.B. & Juan, A. 2007. Taxonomic revision of *Ornithogalum* subg. *Cathissa* (Salisb.) Baker (Hyacinthaceae). *An. Jard. Bot. Madrid* 64: 7–25. doi:10.3989/ajbm.2007.v64.i1.47
- Martínez-Azorín, M., Crespo, M.B. & Juan, A. 2009. Taxonomic revision of *Ornithogalum* subg. *Beryllis* (Hyacinthaceae) in the Iberian Peninsula and the Balearic Islands. *Belg. J. Bot.* 142: 140–162.
- Martínez-Azorín, M., Crespo, M.B., Juan, A. & Fay, M.F. 2011. Molecular phylogenetics of subfamily Ornithogaloideae (Hyacinthaceae) based on nuclear

- and plastid DNA regions, including a new taxonomic arrangement. *Ann. Bot. (Oxford)* 107: 1–37. doi:10.1093/aob/mcq207
- Martínez-Azorín, M., Crespo, M.B., Pinter, M., Slade, J.M. & Wetschnig, W. 2019a. *Iosanthus* (Hyacinthaceae subfam. Urgineoideae), a new genus from Southern Africa to include *Ornithogalum toxicarium* and its removal from *Ornithogaloideae*. *Plant Biosyst.* 153: 580–588. doi:10.1080/11263504.2018.1527793
- Martínez-Azorín, M., Crespo, M.B., Pinter, M. & Wetschnig, W. 2017. *Aulostemon* (Asparagaceae, Scilloideae), a new genus from South Africa. *Phytotaxa* 321: 287–293. doi:10.11646/phytotaxa.321.3.6
- Martínez-Azorín, M., Dold, A.P. & Crespo, M.B. 2016c. *Drimia trichophylla* (Hyacinthaceae, Urgineoideae), a new species from the Eastern Cape Province, South Africa. *Syst. Bot.* 41: 944–949. doi:10.1600/036364416X694044
- Martinoli, G. 1949. Ricerche citotassonomiche sui generi *Urginea* e *Scilla* della flora sarda. *Caryologia* 1: 329–357. doi.org/10.1080/00087114.1949.10797517
- Mateo, G. & Crespo, M.B. 1995. Flora abreviada de la Comunidad Valenciana. Gamma, Alicante.
- Nègre, R. 1954. Les variations d'*Urginea maritima* (L.) Baker au Maroc. *CR. Soc. Sci. Nat. Maroc* 20: 47–50.
- Pfeiffer, L.K.G. 1874. *Nomenclator Botanicus*, vol. 2 (pars altera). Sumptibus Th. Fischeri, Cassellius [Kassel].
- Pfossner, M. & Speta, F. 1999. Phylogenetics of Hyacinthaceae based on plastid DNA sequences. *Ann. Missouri Bot. Gard.* 86: 852–875.
- Pfossner, M. & Speta, F. 2001. Bufadienolides and DNA sequences: on lumping and smashing of subfamily Urgineoideae (Hyacinthaceae). *Stapfia* 75: 177–250.
- Pfossner, M. & Speta, F. 2004. From *Scilla* to *Charybdis* - is our voyage safer now? *Pl. Syst. Evol.* 246: 245–263.
- Pfossner, M., Knirsch, W., Pinter, M., Ali, S., Dutta, S. & Wetschnig, W. 2012. Phylogenetic relationships of Malagasy Hyacinthaceae. *Pl. Ecol. Evol.* 145: 65–72.
- Pinter, M., Crespo, M.B., Ilg, I., Luidold, A.K., Martínez-Azorín, M., Müller-Doblies, U., Müller-Doblies, D., Pfossner, M. & Wetschnig, W. 2013. *Mucinaea* (Hyacinthaceae-Urgineoideae), a remarkable new genus from Namaqualand (Northern Cape Province, South Africa). *Phyton (Horn)* 53: 289–304.
- Radford, E.A., Catullo, G. & de Montmollin, B. (Eds.). 2011. Important plant areas of the south and east Mediterranean region: priority sites for conservation. IUCN, Gland & Málaga.
- Rafinesque, C.S. 1837a. *Flora Telluriana* vol. 3. H. Probasco, Philadelphia.
- Rafinesque, C.S. 1837b. *Flora Telluriana*, vol. 2. H. Probasco, Philadelphia.
- Rankou, H., Culham, A., Taleb, M.S., Ouhammou, A., Martin, G. & Jury, S.L. 2015. Conservation assessments and Red Listing of the endemic Moroccan flora (monocotyledons). *Bot. J. Linn. Soc.* 177: 504–575. doi:10.1111/boj.12258
- Rico, E. 2013. *Urginea*. In: Rico, E., Crespo, M.B., Quintanar, A., Herrero, A. & Aedo, C. (Eds.). *Flora iberica*, vol. 10. Pp. 210–217. Real Jardín Botánico, Madrid.
- Rosselló, J.A., Castro, M. & Fraga, P. 2005. New records of the diploid *Urginea pancracion* (Hyacinthaceae) in Cabrera (Balearic Islands). *Flora Montiber.* 31: 44–46.
- Ruiz Rejón, M., Fernández Piqueras, J. & Oliver, J.L. 1978. Números cromosómicos para la flora española. Número 71. *Lagascalia* 8: 118–120.
- Speta, F. 1980. Karyosystematik, Kultur und Verwendung der Meerzwiebel (*Urginea Steinh.*, Liliaceae s.l.). *Linzer Biol. Beitr.* 12: 193–238.
- Speta, F. 1998a. Hyacinthaceae. In: Kubitzki, K. (Ed.). *The families and genera of vascular plants* 3. Pp. 261–285. Springer, Berlin.
- Speta, F. 1998b. Systematische Analyse der Gattung *Scilla* L. s.l. (Hyacinthaceae). *Phyton (Horn)* 38: 1–141.
- Speta, F. 2001. Die echte und die falsche Meerzwiebel: *Charybdis* Speta und *Stellarioides* Medicus (Hyacinthaceae), mit Neubeschreibungen und Neukombinationen im Anhang. *Stapfia* 75: 139–176.
- Stearn, W.T. 1978. Mediterranean and Indian species of *Drimia* (Liliaceae): a nomenclatural survey with special reference to the medicinal squill, *D. maritima* (syn. *Urginea maritima*). *Ann. Mus. Goulandris* 4: 199–210.
- Stedje, B. 1997. 194. Hyacinthaceae. In: Edwards, S., Demissew, S. & Hedberg, I. (Eds.). *Flora of Ethiopia and Eritrea*, vol. 6. Pp. 138–147. University of Addis Abeba, Addis Abeba & Uppsala.
- Stedje, B. & Thulin, M. 1995. Synopsis of Hyacinthaceae in tropical East and North-East Africa. *Nordic J. Bot.* 15: 591–601. doi:10.1111/j.1756-1051.1995.tb02127.x
- Steinheil, A. 1834. Note sur le genre *Urginea* nouvellement formé dans la famille des Liliacées. *Ann. Sci. Nat., Bot. sér. 2* 1: 321–332.
- Steinheil, A. 1836. Quelques observations relatives aux genres *Scilla* et *Urginea* - Deux genres à établir dans la famille des Liliacées et description d'une espèce nouvelle. *Ann. Sci. Nat., Bot., sér. 2.* 6: 272–286.
- Tison, J.-M. & de Foucault, B. 2014. *Flora Gallica. Flore de France*. Biotope, Mèze.
- Turland, N.J., Wiersema, J.H., Barrie, F.R., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Kusber, W.-H., Li, D.-Z., Marhold, K., May, T.W., McNeill, J., Monro, A.M., Prado, J., Price, M.J. & Smith, G.F. (Eds.). 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. *Regnum Vegetabile* 159. Koeltz Botanical Books, Glashütten. doi:10.12705/Code.2018
- Valdés-Bermejo, E. 1980. Números cromosómicos de plantas occidentales, 55–63. *An. Jard. Bot. Madrid* 37(1): 193–198.
- Véla, E., De Bélair, G., Rosato, M. & Rosselló, J.A. 2016. Taxonomic remarks on *Scilla anthericoides* Poir. (Asparagaceae, Scilloideae), a neglected species from Algeria. *Phytotaxa* 288: 154–160. doi:10.11646/phytotaxa.288.2.5



- Vicente, A., Alonso, M.Á & Crespo, M.B. 2020. Born in the Mediterranean: comprehensive taxonomic revision of *Biscutella* ser. *Biscutella* (Brassicaceae) based on morphological and phylogenetic data. *Ann. Missouri Bot. Gard.* 105: 195–231. doi:10.3417/2020554
- Viviani, D. 1830. Appendix altera ad florae corsicae prodromum. *Typographia paganu, Genève.*
- Websites**
- Fennane, M. 2018. Eléments pour un Livre rouge de la flore vasculaire du Maroc. Fasc. 10. Monocotyledonae (version 1, Novembre 2018). *Tela-Botanica, Montpellier.* <https://www.tela-botanica.org/> [Accessed: August 2021].
- Govaerts, R.H.A. 2011. World checklist of selected plant families published update. Royal Botanic Gardens, Kew. [https://wmsp.science.kew.org/namedetail.do?name\\_id=288581](https://wmsp.science.kew.org/namedetail.do?name_id=288581)
- IPNI 2021. The international plant names index. <http://www.ipni.org> [Accessed: August 2021].
- Thiers, B. 2021 (continuously updated). Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/ih/> [Accessed: August 2021].
- WCSP. 2019. World checklist of selected plant families. Royal Botanic Gardens, Kew. <http://wmsp.science.kew.org> [Accessed: August 2021].