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Hyacinthella Schur (Hyacinthaceae) in the Balkan countries

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ABSTRACT

PERSSON, K. & J. PERSSON (2000). Hyacinthella Schur (Hyacinthaceae) in the Balkan countries. *Candollea* 55: 213-225. In English, English and French abstracts.

The Balkan taxa of *Hyacinthella* are revised. *H. atchleyi* (A. K. Jacks. & Turrill) Feinbrun is shown to have a wider distribution than earlier assumed, and its distinction from *H. leucophaea* (K. Koch) Schur is found not to warrant the status of species. It is therefore subsumed under *H. leucophaea* as a subspecies. Descriptions, comments on nomenclature, notes on morphologic variation, and chromosome numbers are provided for *H. leucophaea* subsp. *leucophaea*, *H. leucophaea* subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss., and *H. dalmatica* Chouard.

RÉSUMÉ

PERSSON, K. & J. PERSSON (2000). Le genre Hyacinthella Schur (Hyacinthaceae) dans les Balkans. *Candollea* 55: 213-225. En anglais, résumés anglais et français.

Les taxons balkaniques du genre *Hyacinthella* sont révisés. La distribution de *H. atchleyi* (A. K. Jacks. & Turrill) Feinbrun s'avère plus large que ce qui était connu auparavant. Ce taxon ne diffère pas suffisamment de *H. leucophaea* (K. Koch) Schur pour être reconnu au rang spécifique. Il est donc considéré comme sous-espèce de *H. leucophaea*. Leur description, des commentaires nomenclaturaux, des notes sur leur variation morphologique ainsi que leur nombre chromosomique sont fournis pour *H. leucophaea* subsp. *leucophaea*, *H. leucophaea* subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss. et *H. dalmatica* Chouard.

KEY-WORDS: HYACINTHACEAE – *Hyacinthella* – South-eastern Europe – Taxonomy – Chromosome numbers.

Introduction

The genus *Hyacinthella* Schur has been revised twice (FEINBRUN, 1961; PERSSON & WENDELBO, 1981, 1982; PERSSON & PERSSON, 1992), the latter with special reference to the Turkish species which comprise the main part (ten species out of a total of 16). A closer acquaintance with the Balkan representatives of the genus made us realize that also these were in need of a thorough revision.

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Material and methods

All species were studied on living material cultivated in the Botanical Garden, Göteborg, partly in pots in the experimental plots, partly free-planted in the bulb garden. In addition dried material from a number of herbaria (see list in Acknowledgements) has been examined.

All measurements and other features in the descriptions refer to wild material. Shape and size of leaves refer to mature basal leaves, colour of anthers to the condition before dehiscence, size of anthers and length of styles to the condition after anther dehiscence. Note that in cultivation *Hyacinthella* species often turn out rather luxuriant, with broad leaves, 2 or more scapes, and larger more campanulate flowers with more spreading lobes. The colour of the perianth is also often paler than in nature.

Chromosome numbers were determined on cultivated material from localities marked by an asterisk in the specimen lists. Counts made by the authors after the publication of PERSSON & WENDELBO (1982) are distinguished by two asterisks. Preparations were made according to the methods described in PERSSON & PERSSON (1992).

Taxonomic revisions

Key to the taxa treated:

1. Leaves ± recurved, channelled, with rather indistinct veins in the dried state ..... **1. H. dalmatica**

1a. Leaves erect, flattish, with distinctly elevated veins in the dried state 2

2. Raceme narrowly cylindrical to short-oblong; pedicels usually 1–3 mm; perianth erect to erecto-patent, nearly white to pale blue, tubular to campanulate-tubular ..... **2a. H. leucophaea** subsp. **leucophaea**

2a. Raceme oblong to ellipsoid; pedicels usually 2–5 mm; perianth erecto-patent to patent (to nodding), lively sky-blue to deep blue, tubular-campanulate with spreading lobes ..... **2b. H. leucophaea** subsp. **atchleyi**

1. ***Hyacinthella dalmatica*** Chouard in Bull. Mus. Hist. Nat. (Paris) ser. 2, 3: 178. 1931 – Ill.: POLUNIN (1980: tab. 59, fig. 1643e); PHILLIPS & RIX (1989: 153); MATHEW (1987: fig. 53).

≡ *Hyacinthus dalmaticus* Baker in J. Linn. Soc., Bot. 11: 428. 1871 [non Avé-Lall. in Fisch. & al., Index Sem. Hort. Petrop. 11: 71. 1846].

≡ *Bellevalia dalmatica* (Chouard) A. K. Jacks. & Turrill in Hooker's Icon. Pl.: tab. 3329. 1937.

Type: (Croatia) Dalmatia in subalpinis, *Petter Exsicc. 338* (K) .

= *Hyacinthus dalmaticus* Avé-Lall. in Fisch. & al., Index Sem. Hort. Petrop. 11: 71. 1846. ≡ *Hyacinthella dalmatica* (Avé-Lall.) TrinajstiĆ in Biosistematika 10: 3. 1985 [non Chouard in Bull. Mus. Hist. Nat. (Paris) ser. 2, 3: 178. 1931]. – Orig. collection: **(Croatia)** Hab. in Dalmatia.

– *Hyacinthus pallens* auct. non M. Bieb.: Vis., Fl. Dalmat. 1: 150. 1842.

– *Hyacinthella pallens* auct. non Schur: K. Perss. & Wendelbo in Candollea 36: 530. 1981.

Bulb ovoid to ovoid-globose, c. 1.5–2.5(–3) × 1–2.5(–3) cm in diam. Leaves 2, or 3(–4) when more than one scape present, inserted at 1/4–1/2 from base of scape, erecto-patent to recurved, linear to lanceolate-linear (to narrowly oblong), canaliculate, (2.5–)3–10 cm × 2–7(–8) mm, veins obscure, margins smooth or mostly scaberulous. Scape 4–15 cm long, elongating at most to about 20 cm in fruit. Raceme (0.6–)1–2(–3) cm long, (4–)6–20(–30)-flowered, rather dense, short-pyramidal to short-cylindrical with erecto-patent to ± horizontal pedicels 0.5–2(–2.5) mm long. Perianth clear sky-blue, ± patent, 4–5(–5.5) mm long, (tubular-campanulate to) narrowly campanulate; lobes nearly as long as to slightly longer than tube, spread to somewhat recurved, ovate-elliptic to ovate, subobtuse, submucronate. Stamens attached just below base of lobes; filaments about as long as anthers; anthers bluish-black; pollen pale yellow to greyish yellow. – Flowering February–April.

Chromosome number: 2n = 20 (ÖSTERGREN & al., 1958; PERSSON & WENDELBO, 1981, 1982; * in the locality list); 18 + 0–3 "B" (TRINAJSTIĆ & LOVAá EN-EBERHARDT, 1985). We doubt the existence of so-called B-chromosomes in this species. We have never recorded such chromosomes in the genus, nor do the ones stated to be accessory chromosomes in the illustrations of TRINAJSTIĆ & LOVAá EN-EBERHARDT (1985) show the characteristics of such. *Hyacinthella* has fairly small to very small chromosomes, and furthermore, many of the chromosomes have secondary constrictions easily squashed apart in preparations. Such parts of chromosomes may give the impression of small "accessory" chromosomes. There seems to be some real variation in chromosome number, however, from 18 to 20, even in the same population. TRINAJSTIĆ & LOVAá EN-EBERHARDT (1985) investigated two populations, from the island of Hvar, and the Konavli area in southern Dalmatia, respectively.

Nomenclatural comments: The oldest valid description of the species is that of AVÉ-LALLEMANT (in FISCHER & al., 1846), under *Hyacinthus dalmaticus.* The name did not get any public attention, however, so when BAKER (1871) realized the destinction of the species, he was not aware of the previous description and thus described it again, strangely enough under the same name. He later (BAKER, 1874) discovered and published his mistake. CHOUARD (1931) only knew Baker's (illegitimate) name, and he published the species with a description under *Hyacinthella.* The species was thereafter unfortunately generally cited as "*Hyacinthella dalmatica* (Baker) Chouard". PERSSON & WENDELBO (1981) discussed the nomenclatural story so far, and decided that the oldest valid name of the species must be instead *H. pallens* given together with a description by SCHUR (1856: 235), thereby neglecting that author's discussion on a previous page of the work (p. 228) where it is sufficiently clear that he is just combining *Hyacinthus pallens* M. Bieb. under *Hyacinthella.* Unhappily, this name was taken from a misidentification in VISIANI (1842: 150) where "*Hyacinthus pallens* M. B." is said to occur in Dalmatia. Bieberstein's species is really a *Muscari*, viz. *M. pallens* (M. Bieb.) Fisch., thus with *Hyacinthella pallens* (M. Bieb.) Schur as a synonym (for illustration, see e. g., SWEET, 1858: tab. 259).

TRINAJSTIĆ & LOVAá EN-EBERHARDT (1985) penetrated the history of the naming of the Dalmatian *Hyacinthella* in detail but unfortunately decided to make a new combination based on AVÉ-LALLEMANT's original publication (1846), viz. *Hyacinthella dalmatica* (Avé-Lall.) TrinajstiĆ. This must of course be rejected as a later homonym (Art. 53 of the Tokyo Code) of Chouard's name.

A feasible approach to the nomenclatural problem, however, would be to interpret the name *Hyacinthella dalmatica* of CHOUARD (1931) as a *nomen novum*, instead of as a new combination, and then it is quite possible to use the epithet in its new position although it stems from an earlier illegitimate name (cf. Art. 58.3 of the Tokyo Code). We have here decided to follow that route. Accordingly, *Hyacinthella dalmatica* Chouard (1931) is considered the correct name for the species, the type being identical with that of *Hyacinthus dalmaticus* Baker, nom. illeg.

Taxonomic comments: HAYEK (1932: 84) published a new combination for a variety from comparatively high altitudes in the Velez mountains, *Hyacinthella dalmatica* var.

velezensis (Beck) Hayek, which was stated to be a smaller plant with broader glabrescent leaves and smaller flowers (c. 4 mm long) than the type. No material from these mountains has been availble to us, but the morphological characters in question have been noted to be somewhat variable, and the mentioned particulars are found also in other (often lowland) localities, so taxonomic recognition of these forms hardly seems merited.

Distribution and habitat: Coastal areas of Croatia, Bosnia and Montenegro (see TRINAJSTIĆ & LOVAáEN-EBERHARDT, 1985: fig. 1). Gravelly ground in short grass, terra rossa between rocks, rock crevices; limestone; generally at low altitudes up to c. 1000 m. A characteristic member of the spring flora in the tree-free *Cistus/Erica* garigue vegetation (HORVAT & al., 1974) along the Dalmatian coast.

Specimens examined:

Croatia: Clissa [Klis]: auf Waldtriften der Marchesina gredda, 30.4.1875, *Studniczka* (WU). Peljeäac: Monte Vipera, von ca 800 m bis auf dem Gipfel (961 m), 21.4.1930, *Ginzberger* (WU); ibid., bei OrebiŤ, obere Region, 21.4.1930, *Ronniger*; In einer kurzgrasigen Mulde am S-Abhange des Monte Vipera, Kalk, 650 m, 11.4.1914, *Horton* (GB). Dubrovnik: Ragusa, Heidetriften hinterm Font Imperial, Kalk, 350 m, 21.3.1902, *Baumgartner* (WU); Molini di Breno, 23.3.1926, *Zerny* (W); Plateau der Monte Sergio, 400 m, 4.4.1926, *Ronniger* (W); Auf Lapad bei Ragusa, 3.1914, *Jaap* (W); In rupium fissuris montium ad Malfi prope Gravosa [Gruž], 2.3.1898, *Rudolph 47* (WU), 2.1899, *Rudolph 4092* (JE, M, WU); Omblatal, am Wasserleitungsweg, 27.3.1926, *Ronniger* (W); ibid., auf kurzgrasigem Boden, 10.3.1914, *Krafft* (W); Mt Srgj, hillsides between rocks and on paths, 1-6.3.1938, *Martindale* (K); Hills above Dubrovnik, 1969, *Grey-Wilson & Mathew 5306* (K); Dubrovnik–Trebinje bei Bosanka, Hochfläche in Kalk, 380 m, 9.4.1987, *Nydegger* (GB); Dubrovnik to Trebinje road between limestone rocks on seaward side of pass, 27.3.1973, *Mathew 7519* (K); s. loc. (commercial stock, "wild source, Dalmatia"), *van Tubergen** (cult. GB).

Localities from literature:

Croatia: Kameänica pl.: Gornje Voätane (áILIĆ, 1973). Peljeäac: Sv. Ilija (RECHINGER, 1934; TRINAJSTIĆ, 1971), Pijavi‹ino (TRINAJSTIĆ, 1977), Potomje (TRINAJSTIĆ & LOVAáEN-EBERHARDT, 1985). Hvar: Sv. Nikola, Hum (TRINAJSTIĆ, 1977). Kor‹ula: Klupca (TRINAJSTIĆ, 1971). áipan (HE%IMOVIĆ, 1981). Brdo Bosanka (HORVATIĆ, 1958). Dubrovnik: Breno (VISIANI, 1842), Ombla, Petka, Lapad (TRINAJSTIĆ & LOVAáEN-EBERHARDT, 1985). Konavli: Cavtat, PopoviŤi (TRINAJSTIĆ & LOVAáEN-EBERHARDT, 1985).

Bosnia: Dinara pl. (BECK VON MANAGETTA, 1903). Kameänica pl.: Oäljar (áILIĆ, 1973). Trebinje, Dugi dol (TRINAJSTIĆ & LOVAáEN-EBERHARDT, 1985). Veleč pl. (BECK VON MANAGETTA, 1903).

Montenegro: Titograd, Rijeka CrnojeviŤa; Piperi, Crna‹ko brdo; NikäiŤ (PULEVIĆ, 1972).

2. ***Hyacinthella leucophaea*** (K. Koch) Schur in Oesterr. Bot. Wochenbl. 6: 228. 1856.
≡ *Muscari leucophaeum* K. Koch in Linnaea 22: 254. 1849.
≡ *Hyacinthus leucophaeus* (K. Koch) Ledeb., Fl. Ross. 4: 156. 1852.
≡ *Bellevalia leucophaea* (K. Koch) Boiss., Fl. Orient. 5: 305. 1882.

Type: (**Russia**) Aus Südrussland von Wilhelms erhalten (B, probably lost).

Bulb narrowly ovoid to ovoid-globose, c. (1–)1.5–2.5(–3) × (0.8–)1–2.5 cm. Leaves 2, or sometimes 3 when 2 scapes present, inserted at 1/4–1/3(–1/2) from base of scape, erect, or when narrow sometimes slightly falcate, linear or lanceolate-linear to oblong or oblanceolate-oblong, short-attenuate, flattish with distinct veins (raised when dry), 1st leaf (3–)4–12(–20) cm × 3–15(–17) mm, second half as broad or less, margins smooth to ± scabrous (rarely short-ciliate), often slightly undulate. Scape 6–20(–25) cm long, somewhat elongating in fruit. Raceme 1–4 cm long, (5–)8–30(–35)-flowered, somewhat lax to dense, short-oblong or ellipsoid to narrowly cylindrical, with erect to erecto-patent (to nearly horizontal) pedicels 1–5 mm long. Perianth nearly white or pale to deep blue, in blue forms at first often tinged ± violet, erect to ± patent (occasionally nodding), (3–)4–6(–7) mm long, tubular to tubular-campanulate; lobes often shorter than tube (c. 1/3 to 2/5 of perianth), sometimes nearly as long, suberect to slightly spread, ovate-oblong to ovate, subobtuse, submucronate. Stamens attached in upper part of tube; filaments somewhat shorter than anthers; anthers bluish-black; pollen pale yellow to greyish-yellow. – Flowering (February–)March–May.

H. leucophaea differs from other *Hyacinthella* species except *H. pallasiana* (Steven) Losinsk. (from Ukraine and S Russia) in the erect leaves. All the rest have ± patent or recurved leaves.

N o m e n c l a t u r a l c o m m e n t s: *H. leucophaea* (K. Koch) Schur is the type of the genus *Hyacinthella* Schur (cf. GREUTER & al., 1993).

KOCH (1849) got the specific epithet from Steven who had written *Hyacinthus leucophaeus* on the label of the sheet that Koch used as a type. As most of Koch's herbarium in Berlin was destroyed during the second world war (EDMONDSON & LACK, 1977) the type has probably been lost. BARANOVA (1979) quoted the type incorrectly.

T a x o n o m i c c o m m e n t s: When some collections from Serbia (the Niä area), determined as *H. leucophaea* or *H. dalmatica*, first came to our attention, it was obvious that these plants did not represent *H. dalmatica* but that they differed in many ways from "typical" *H. leucophaea* as well. Also TRINAJSTIŚ & LOVAáEN-EBERHARDT (1985) rejected the alleged occurrence of *H. dalmatica* in Serbia (cf. e. g., DIKLIŚ in JOSIFOVIŚ, 1975), and limited its geographical distribution to Dalmatia. We had later the opportunity to cultivate and study living plants from Serbia, and became then convinced that the plants were very close to *H. atchleyi* so that the geographical range stated for this taxon had to be extended. Furthermore, when cultivated and herbarium material of *H. leucophaea* and *H. atchleyi* from large parts of the Balkans was investigated, we realized that the distinction between the two taxa was far from clear-cut, and that many transitional forms are to be found in the central parts of the Balkans. This led us to support FEINBRUN's (1961) proposal of an inferior taxonomic rank for the latter taxon. *H. leucophaea* thus comprises two subspecies.

2a. ***Hyacinthella leucophaea*** subsp. ***leucophaea*** – Ill.: Fig. 1A; BARANOVA (1979: tab. 31, fig. 2); POLUNIN (1980: tab. 59, fig. 1643d).

Leaves 3–10(–17) mm wide, glaberulous to ± scabrid (to short-ciliate) on margins; *raceme* short-oblong to narrowly cylindrical; *pedicels* erect to (erecto-)patent, usually 1–3 mm (rarely to 5 mm); *perianth* erect to (erecto-)patent, nearly white to pale blue, (3–)4–5(–6) mm long, tubular to campanulate-tubular with a rather narrow base, lobes hardly spreading.

C h r o m o s o m e n u m b e r: 2n = 20 (ZAHARJEVA in BARANOVA, 1979; PERSSON & WENDELBO, 1981, 1982, * in locality list).

M o r p h o l o g i c v a r i a t i o n: Subsp. *leucophaea* is distributed over a large geographical area in different though mainly dry and steppic habitats. Morphologically it is rather variable, particularly in flower colour, and size and shape of inflorescence. Transitional forms to subsp. *atchleyi* with more broadly campanulate-tubular flowers of a somewhat more lively shade of blue are found especially in the Hunedoara district of Romania (see below, after subsp. *atchleyi*). Scattered among more "typical" forms with near-white, narrower perigons, plants with decidedly blue, campanulate-tubular, erecto-patent flowers are also to be found in some localities in mountainous areas of NC and SC Bulgaria. Small specimens of these with very narrow leaves tending towards falcate are even superficially like *H. dalmatica*. Dwarf plants with nearly falcate leaves but with pale flowers have also been collected in Ukraine.

Especially on grassy hills at lower altitudes in SC Bulgaria a slightly divergent form with narrow but erect leaves, short, suberect pedicels, and short-tubular pale flowers in a dense, narrow, spikelike raceme, can be recognized. VELENOVSKY (1891) described it at specific level, naming it *H. rumelica*. However, within the geographical range of subsp. *leucophaea,* particularly at lower altitudes, similar or intermediate forms can be found in many places, e. g. in E Romania and Ukraine, so in our opinion HAYEK's (1932) reduction of the taxon to the status of variety seems justified.

A

B

Fig. 1. – *Hyacinthella leucophaea* (K. Koch) Schur. – **A:** Left, subsp. *leucophaea* [Romania, *Pilous 1987*]; right, subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss. [Serbia, *Strindberg & Zetterlund 88–109*]. **B:** subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss. [Greece, *Archibald 5879*]. – Cult. Göteborg Botanical Garden.

Fig. 2. – *Hyacinthella leucophaea* subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss. [Greece, *Horton 1402*]. – Cult. Göteborg Botanical Garden.

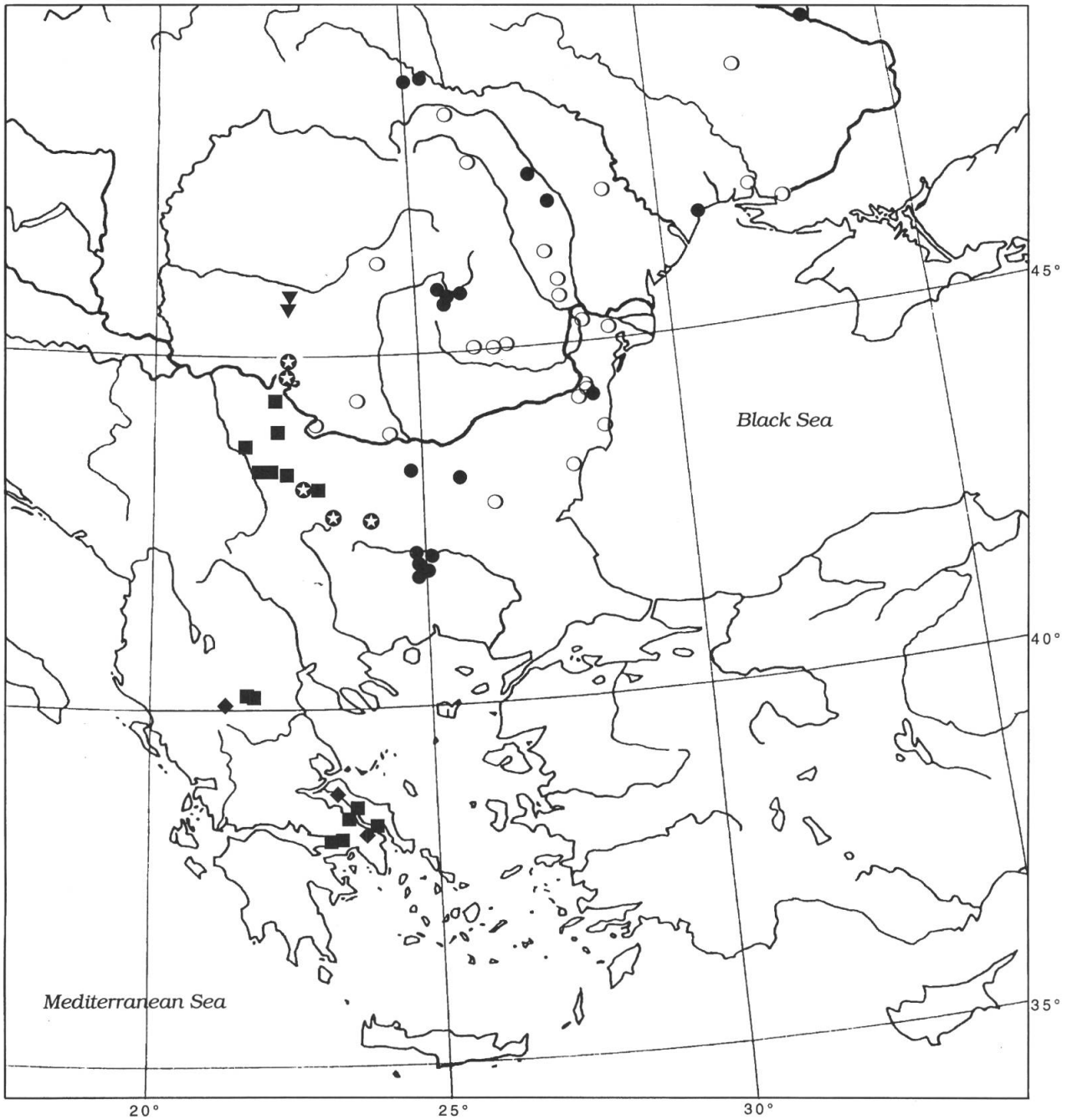

Fig. 3. – Distribution of *Hyacinthella leucophaea* (K. Koch) Schur. ●: subsp. *leucophaea* (○: localities from literature); ■: subsp. *atchleyi* (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss. (◆: localities from literature); ✪: from literature, presumed to represent either subsp. *atchleyi* or possibly intermediary forms; ▼: forms ± intermediary between the subspecies. – Subsp. *leucophaea* occurs also in C Russia: Jelets, Kursk, Voronezh, Tambov and Saratov districts (outside map area).

Hyacinthella leucophaea var. ***rumelica*** (Velen.) Hayek in Repert. Spec. Nov. Regni Veg. Beih. 30(3): 85. 1932.
≡ *H. rumelica* Velen., Fl. Bulg.: 554. 1891.

Type: (**Bulgaria:** Plovdiv) In collinis ad Philippopolin, *ákorpil jun. & St̨ibrnů* (PRC?, n. v.). The type material must have been collected before 1891 (the year of publication). Several other collections by St̨ibrnů from the same area but from later dates (1892–1909, see below) have been seen by the authors, however.

Distribution and habitat: Bulgaria, Romania, Moldavia, Ukraine, SW and C Russia (Fig. 3; see also map in GAJEWSKI, 1937: 67). Dry steppic meadows, rocky and stony slopes, to c. 1000 m; var. *rumelica* particularly on grassy hills, in shrubland and light woodland, generally at low altitudes. According to HORVAT & al. (1974) a typical representative of the spring aspect in steppic plant communities, e. g. in the Dobrogea area, together with *Colchicum triphyllum*, *Ornithogalum refractum*, *Adonis vernalis*, *Adonis wolgensis*, *Paeonia tenuifolia*, and others.

Stated to occur in S.E. Poland by some floras (e. g., GAJEWSKI, 1937), but the localities mentioned are now within the borders of Ukraine.

Specimens examined (*rum* = ± agreeing with description of var. *rumelica*):

Romania: Braşov: In montibus apricis lapidosis calcareis Transsilv. (Kapellenberg bei Kronstadt), 5.[1854], *Schur* (JE); In calcareo-saxosis: Kronstadt [Braşov], 16.4.1878, *Barth* (JE), 19.4.1879, *Barth* (GB); In montosis, Kronstadt, 16.4.1885, 24.4.1886, *Barth* (JE); Kronstadt, 1.5.1887, *Barth* (M); In monte Zinne prope Coronam [Braşov], solo calc., 961 m, 4.1889, *Römer* (M), 4.1890, 4.1892, *Römer* (JE), 4.1895, *Römer 3559* (JE, M), 5.1897, *Römer* (M), 4.1899, *Römer* (JE); Petersberger Berg, 15.4.1884, 4.1885, *Römer* (JE); In reg. opp. Brassó [Braşov], in monte Függökö (Hangestein), 15.4.1902, *Richter* (M); Iaşi: Aroneanu, 8.5.1963, *Toma* (M). Vaslui: In declivibus aridis loco Movila lui Burçel dicto prope pag. Codaeşti, 400 m, 25.4.1965, *Topa 184* (JE, M). Constanta: In declivibus calcareis ad Fîntînita prope vicum Murfatlar, 40 m, 3.4.1970, *Salageanu* (M); Itagieni, *Prasil** (GB).

Bulgaria: Pleven: Ad Love‹ [Lov‹a], 1901, *Urumoff* (GB). Turnovo: In collinis aridis prope Trnovo, 1899, *Urumoff 280* (GB). Plovdiv: In collinis ad Papazli, 27.3.1898, 3.1909, *St̨ibrnů* (*rum*; GB, JE); Im niedrigen Waldgestrüpp bei Nova Mahala, 4.1892, *St̨ibrnů* (*rum*; GB, M); In graminosis ad Nova Mahala (Nova Mahala im Walde), 22.4.1893, *St̨ibrnů* (*rum*; M); In silv. (in Walde) prope Nova Mahala, 7.4.1893, 20.5.1893, *St̨ibrnů* (*rum*; JE); In desertis ad Nova Mahala, 28.4.1895, 4.4.1896, *St̨ibrnů* (*rum*; JE); In agro Stanimakensi, 1893, *JovanoviĆ* (M); Ad Stanimaka [Asenovgrad], 4.1893, *Velenovsky* (JE); In submontanis ad Stanimaka, 3.1909, *St̨ibrnů* (GB, JE, M); Asenovgrad, zwischen Ba‹kovo und Kuru-dere, 2.5.1967, *F.K. & J. Meyer 8727* (JE); Östl. Asenovgrad, Nordhang, 9.6.1971, *F.K. & J. Meyer 10005, 10146* (JE); In dumetis submontanis mt Rhodope, 6.1906, *AdamoviĆ* (*rum*; M).

Ukraine: Podole, steppic meadows near Ostrowcu in distr. Horodenka, 27.4.1911, *Raciborski 540* (GB); Pocutia stepposa, distr. Horodenka, Czortowiec pr. Obertyn, in pratis stepposis, 26.4.1934, *Madalski* (GB). Poltava guv., distr. Kobeljaki, near village Orlik, meadow, 8.4.1897, *N.* (M); Poltava guv., 20.4.1856, *Rogowics* (JE), 4.1903, *Roth* (GB). In campestribus elatis ad Odessam, 4., 5., *Láng & Szovits* (M); Ad Odessam, 27.4.1893, *Kamienski* (GB); Odessa distr., Chadjibeysky liman, steppe, 29.4.1977, *Mordak 1586** (GB).

Russia: Kalkschotterhang bei Chomotowo, 30.5.1843, *Rauh* (JE).

Localities from literature (probably referable to subsp. *leucophaea* as judged from geographic position plus ecology and/or morphologic description):

Romania: Vaslui: Prope Barlad, 4.1922, *Savulescu 224a* (FEINBRUN, 1961). Apart from the provinces already mentioned, *H. leucophaea* (probably subsp. *leucophaea*) occurs also in the following: Dolj, Olt, Sibiu, Suceava, Galati, Buzau, Prahova and Tulcea ("in enclaves of xerophilous vegetation", MORARIU, 1978: map fig. 1).

Bulgaria: Stara Zagora: Sliven; Varna: Varna (VELENOVSKY, 1891).

Ukraine: Bucovina, prope Cernauti [Chernovtsy], 5.1928, *Gusuleac* (FEINBRUN, 1961). Cherson pr. Odessa, *Ledebour*, Nikolajew, *Steven* (LEDEBOUR, 1852); Elisabethgrad, 4.1873, *Wiedemann* (FEINBRUN, 1961).

Moldavia: Kischinew (LEDEBOUR, 1852).

Russia: Kursk, *Höfft*; Woronesch, *Güldenst.*, Tambow, *M. von Bieberstein*, Saratow, *Lepech.* (LEDEBOUR, 1852).

2b. ***Hyacinthella leucophaea*** subsp. ***atchleyi*** (A. K. Jacks. & Turrill) K. Perss. & Jim. Perss., **comb. nova** – Ill.: Fig. 1, 2; PHILLIPS & RIX (1989: 46, fig. e).

≡ *Bellevalia atchleyi* A. K. Jacks. & Turrill in Hooker's Icon. Pl.: tab. 3329. 1937.

≡ *Hyacinthella atchleyi* (A. K. Jacks. & Turrill) Feinbrun in Bull. Res. Council Israel, Sect. D, Bot. 10: 339. 1961.

Type: Greece, [Viotia] Mt Kithaeron, dry hillsides, 620 m, 4.1934, *Atchley 1852* (lecto-, K! here selected).

– *H. dalmatica* auct. serb.: DikliŤ in JosifoviŤ (ed.), Fl. SR Srbije 7: 561. 1975.

Leaves (4–)5–15(–17) mm wide, glabrous to scaberulous on margins; *raceme* oblong to ellipsoid; *pedicels* erecto-patent to ± patent, usually 2–5 mm; *perianth* erecto-patent to patent, occasionally nodding, lively sky-blue to deep blue, 4.5–6(–7) mm long, tubular-campanulate with a rather wide rounded base, lobes spreading.

Chromosome number: 2n = 20 (POPOVA, 1972a, 1972b, as "H. leucophaea"; PERSSON & WENDELBO, 1981, 1982, ***20** in locality list; SPETA, 1982; PERSSON & PERSSON, the present paper, ****20** in locality list), 2n = 18 (PERSSON & PERSSON, d:o, ****18**). Whether the variation in chromosome number is regional, or intrapopulational as in *H. dalmatica* (see above), is impossible to say without a more detailed investigation of populations from the entire area.

Nomenclatural comments: Judging from the localities mentioned (Pirot, Niä, Negotin) for *H. leucophaea* sensu DIKLIĆ in JOSIFOVIĆ (1975: 563), it is probable that also this represents subsp. *atchleyi*. There are no observations known to the authors of *H. leucophaea* s. str. in that area.

Taxonomic comments: Typical forms of subsp. *atchleyi* are recognized by their ± campanulate sky- to deep blue flowers and relatively long, often patent pedicels in broadly oblong to ellipsod racemes. It was first described at specific level under *Bellevalia* on Atchley's collections from Mt Kitheron in Viotia, Greece. Jackson & Turrill admitted that their new taxon undoubtedtly belonged within the genus *Hyacinthella* Schur sensu CHOUARD (1931), but chose to follow BOISSIER (1882) in including *Hyacinthella* within *Bellevalia*. FEINBRUN later (1961) made the formal recombination to *Hyacinthella*, but at the same time expressed some doubts regarding its taxonomic status, suggesting a subspecific or even varietal rank as more suitable.

The new taxon was collected several times in the fifties by Goulimy in Attica and Evvia, and more recently, when collecting in Greece was intensified, by several other botanists. Not until some years after the original description the existence of the taxon also in northern Greece was acknowledged (cf. CONSTANTINIDIS, 1995). In the present study, the range of distribution has been established to extend to E Serbia and W Bulgaria as well (see Taxonomic comments under the species).

Distribution and habitat: Greece, W Bulgaria, E Serbia, SW Romania? (Fig. 3). Gravelly hillsides and meadows, rocky slopes, macchie, clearings in *Pinus* and *Abies* woodland; on limestone and serpentine; 100–1350 m.

Specimens examined:

Greece: Viotia: Mt Kithaeron, dry hillsides, 620 m, 4. 1934, *Atchley 1852* (K), 4.1936, *Atchley s. n.* (K); On hills to west of road leading from Athens to Thebes, c. 55 km from Athens, 18.3.1956, *Goulimy* (K); Chalkis to Thebes, *Horton 1402***20** (GB, K); About a mile S of the village of Erythrae (Kriekouki), S of Thebes, 4.1955, *Goulimy* (K); Close to the chapel Prophet Helias on the Boeotian coast opposite Chalkis, 5.3.1954, *Goulimy* (K). Evvia: On the road from Chalkis to Aliveri, 2.2.1951, *Goulimy* (K); ibid., 1985, *J. & J. Archibald 5879*****20** (GB); 2 km from Psachna–Kamaritsa road to Stavros, macchie and edge of *Pinus halepensis* wood, gravelly ground, 250 m, 15.3.1998, *J. & K. Persson 9838*****20** (C, GB). Makedonia: In monte Vourinon, in declivibus orientalibus, substr. serp., in saxosis, 1300 m, 5–7.7.1956, *Rechinger 17375* (W); Kozani–Grevena road, 5 km beyond Vateron, steep grassy hill, fld at Wisley 10.3.1977, *Linzee-Gordon* (K).

Bulgaria: S o f i y a: M. Stara Planina Occidentalis, in pratis loco dicto Beledje Han, solo calcareo, 880 m, 18.5.1954, *Vel‹ev 228* (JE). V r a t s a: Auf der bulgarischen Seite der Vräka Cuka bei Zaje‹ar, Kalk, 700 m, 4.1890, *AdamoviŤ 50* (W, WU).

Serbia: Locis rupestribus circa Nisch, 4.1883, *Petrovic 1663* (JE, M, W); Nisch, 1889, *IliŤ* (GB); In colle Winik prope Nissam (Nisch), 4.1889, *IliŤ* (GB); E of Niä, Jelasnica gorge, c. 4 km S of Jelasnica village, steep slopes E of the road, limestone outcrops in dry meadows, 24.4.1988, *Strindberg & Zetterlund 88-109***18** (GB); In saxosis montis Belava prope Pirot, 3.1894, *AdamoviŤ* (K); In rupestribus m. Basara, solo calc., 1000 m, 4.1896, *AdamoviŤ* (WU), 5.1897, *AdamoviŤ* (W); In rupestribus calcareis montis Belava prope Pirot, 4.1897, *AdamoviŤ* (M), c. 360 m, 1894, *AdamoviŤ* (W); Pirot, in pascuis siccis, 4.1892, *Jovanovic* (W); Leskovik [NE of Aleksinac], *IliŤ* (M); In saxosis m. Vräka Cuka, 4.1880, *PetroviŤ* (WU); In saxosis calcar. ad Vratna (Serb. austr.), Apr./Jul., *?* (JE).

Localities from literature:

Greece: A t t i k i: Nea Palatia Oropou, 5.1988, *Sfikas* (SFIKAS, 1996). V i o t i a: 9 km W of Chalkis, 290 m, 7.4.1978, *Speta* (SPETA, 1982). E v v i a: Bei Aghios Georghios, 600 m, 9.4.1978, *Speta* (SPETA, 1982). M a k e d o n i a: S of Grevena, between Sarandopotamo and the Venetikos river, 5.5.1996, *Sfikas* (SFIKAS, 1996).

Other localities from literature not definitely referable to one of the subspecies, but judged from geographic position probably subsp. *atchleyi* or intermediary forms (see below):

Romania: M e h e d i n t i: Dudasu Schelei, between Schela Cladovei and Cracul Gaioarei (MORARIU, 1978).

Serbia: Caribrod (VELENOVSKY, 1891).

Bulgaria: S o f i y a: Kostinbrod, Bu‹ina, Dragoman, Petric, Lozen (VELENOVSKY, 1891).

2c. Forms of *H. leucophaea* more or less intermediate between subspecies

As already mentioned, it is not possible to draw a distinct borderline between subsp. *leucophaea* and subsp. *atchleyi* due to transitions in one or the other of the diagnostic characters. Apart from the populations listed below, where the majority of plants are not readily referable to one of the subspecies, plants growing together in other localities in-between the two main areas of distribution may exhibit traits from both or only one of the subspecies, e. g. in Love‹ [Lov‹a], Trnovo and Asenovgrad [Stanimaka] in Bulgaria. Particularly the populations in the latter area seem to be very variable (see also under subsp. *leucophaea*).

Specimens examined:

Romania: H u n e d o a r a: In apricis montium ad Vajdahunyad [Hunedoara], ibidem in monte Kazanyos, solo calcareo, 570–600 m, 3.4.1884, *Simkovics 1043* (GB, JE, M); In saxosis calcareis graminosis montis Kaprucza (Dumbrava Orasului) supra riv. Cserna pr. opp. Vajdahunyad, 7.4.1908, *Richter 5188* (GB, JE, M).

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