

Davide Ubaldi & Carla Garavaglia

**About *Sesleria nitida* Ten. and *Sesleria feretrana* sp. nova
in Tuscan-Romagna Apennines (Italy)**

(Monocotyledones: Poaceae)

Abstract

The authors report on the presence of *Sesleria nitida* Ten. also in the Tuscan-Romagna area of the Northern Apennines, where this species was considered absent. In fact UJHELYI (1959) and the authors of the Italian floras (ZANGHERI, 1976; PIGNATTI, 1982, 2017) determined the species as *Sesleria italica* (Pamp.) Ujhelyi, whose typus is however recognized here as a sample of plants attributable to one of the forms of *Sesleria nitida* present in the area. Among these, a particular form from the Mugello upland (Tuscany), at the northern edge of the Tuscan-Romagna Apennines, is described here with the name of *Sesleria nitida* var. *candae*. For Montefeltro, the southernmost part of this sector of the Apennines, an area at the boundaries with the Central Apennines, the authors describe a new species under the name *Sesleria feretrana*. It is intermediate between *Sesleria nitida* and the sympatric *Sesleria pulchella* (Chiosi) Ubaldi; this new species, too, was previously determined as *Sesleria italica*.

Key words: Taxonomy, *Sesleria*, sect. Argenteae, *Sesleria nitida* group, *Sesleria feretrana* sp. nova, Northern Apennines (Italy).

Riassunto

[*A proposito di Sesleria nitida Ten. e Sesleria feretrana sp. nova nell'Appennino tosco-romagnolo (Italia)*]

Si riporta la presenza di *Sesleria nitida* Ten. nell'Appennino tosco-romagnolo, dove questa specie era in precedenza considerata assente. Infatti UJHELYI (1959) e gli autori delle flore italiane (ZANGHERI, 1976; PIGNATTI, 1982, 2017) la determinarono sotto il nome di *Sesleria italica* (Pamp.) Ujhelyi, il cui typus viene però qui riconosciuto come un campione attribuibile a una delle forme di *Sesleria nitida* presenti nell'area. Tra queste, una particolare forma per il Mugello (Toscana), al limite settentrionale dell'Appennino tosco-romagnolo, è qui descritta con il nome di *Sesleria nitida* var. *candae*. Per il Montefeltro, la parte più meridionale di questo settore dell'Appennino, un'area ai confini con l'Appennino centrale, gli autori descrivono una nuova specie col nome di *Sesleria feretrana*. Essa è intermedia tra *Sesleria nitida* e la simpatica *Sesleria pulchella* (Chiosi) Ubaldi; pure questa nuova specie fu in precedenza determinata come *Sesleria italica*.

Introduction

This paper deals with the identification of taxa of the genus *Sesleria* belonging to the *Sesleria nitida* group (sect. Argenteae Deyl) of the Tuscan-Romagna

Apennines, the southernmost part of the Northern Apennines. In the Apennines this group (“turma nitida”, according to DEYL, 1946) includes spring blooming plants characterized by dense panicles shorter than 4 - 5 cm and having uppermost leaf rarely shorter than 3 cm. Among these taxa, two species are traditionally supported by Italian floras and check-lists (ZANGHERI, 1976; PIGNATTI 1982, 2017; CONTI et al., 2005): *Sesleria nitida* Ten. and *Sesleria italica* (Pamp.) Ujhelyi. According to the records mentioned by UJHELYI (cit.), the former species is present in central and southern Apennines as well as Sicily, the latter in the Northern Apennines in the Tuscan-Romagna area and in central Apennines, which are held to be an overlap area (PIGNATTI, 2017). Recently, the species *Sesleria pulchella* (Chiosi) Ubaldi has been described (UBALDI, 2016) from a few stations in Montefeltro (a subregion between Romagna and Marche) and adjacent eastern Tuscany at the boundary between northern and central Apennines, thus confirming an early report by CHIOSI (1930). Also this species probably belongs to the *Sesleria nitida* group (UBALDI, 2016).

Particularly critical is the distinction of *Sesleria italica* from *Sesleria nitida* on the basis of the analytical keys in use (UJHELYI, 1959; PIGNATTI, 1982 and 2017) and considering also the detailed description of *S. italica* by UJHELYI (cit.). According to Ujhelyi’s key *Sesleria italica* stands out from *S. nitida* for the surface-smooth panicle due to short adpressed awns, the panicle 8 - 12 mm wide and 2 - 4.5 cm long, the lemma 4 - 4.5 mm long with middle awn of 0.5 - 1 mm and the lateral teeth on each side of this mucronate. In describing *Sesleria italica*, Ujhelyi also mentions the number of cauline leaves of 2 - 3, but this element is not used in the analytical key, so any possible distinction from *Sesleria nitida* based on this feature remains uncertain. The length of the leaves is given up to 25 cm and the width 3 - 5 mm. The same author, however, reports the following characteristic in the key for *Sesleria nitida*: surface-rugged panicle due to long and diverging awns, panicle 10 - 15 mm wide and 2 - 3.5 cm long, lemma 5 - 6 mm long with median awn of 1 - 2 mm and lateral ones of 0.5 mm. In the Flora d’Italia by PIGNATTI (1982, 2017) *Sesleria italica* is considered distinct from *S. nitida* in that the leaves are narrower, 3 - 5 mm vs. 3 - 6(9) mm, for the panicle of 8 - 10 x 20 - 45 mm vs. 10 - 15 x 20 - 45(70) mm, a lemma of 4 - 4.5 mm vs. 5 - 6 mm, the non-divergent central awn of the lemma 0.5 - 1 mm vs. 1 - 2 mm long, the lateral teeth of the lemma briefly mucronate vs. 0.5-1 mm awned.

BRULLO & GIUSSO DEL GALDO (2006) report *Sesleria nitida* subsp. *nitida* occurring in the central and southern Apennines, as having only 1 - 2 cauline leaves located in the lower half of the culm, leaves flat to conduplicate (5)10 - 30 cm long and (3)4 - 7 mm wide; panicle 8 - 12 mm wide and 2 - 3.5 cm long; glumes 8 - 12 mm long, lanceolate, longer than the flowers and the lower one slightly longer than the upper one, simply defined long-awned; lemma sublanceolate, 5.5 - 7 mm long (awn excluded), with a median awn of 2 - 2.5 mm in length and 2 lateral teeth on

each side, the external ones 0.7 - 1.2 mm, the internal 0.3 - 0.7 mm, to mention only the major features reported by other authors. BRULLO & GIUSSO DEL GALDO (2006) describe two further subspecies: *aprutia* Brullo & Giusso and *sicula* Brullo & Giusso; the former distributed on high mountain sites in central Apennines and the latter corresponding to *S. nitida* populations in Sicily.

In a recent article (UBALDI, 2016) materials of *Sesleria italica*, mainly collected in Montefeltro and contiguous eastern Tuscany, were compared with *Sesleria nitida* collections from southern Apennines (southeastern Campania, Basilicata and Calabria). It was found that the length of the lemma awn in *Sesleria italica*, a key distinguishing feature of the species and diagnostic in respect to *Sesleria nitida*, is scarcely significant, being often longer than the canonical measure of 0.5 - 1 mm stated by Ujhelyi and adopted by the other authors of Italian floras. In fact we found 0.5 - 1.5 mm, a size overlapping the value for *Sesleria nitida*, i.e. 1 - 2 mm. By contrast, our own measurements for *S. nitida* specimens from Southern Italy, i.e. 1.2 - 2.5 mm, were similar to those reported by BRULLO & GIUSSO DEL GALDO (2006). We also observed that the length of the glumes awn is more relevant for the distinction of *Sesleria italica* from Southern Italy populations of *S. nitida*: 0.7 - 1.5 mm vs. 1.5 - 3 mm. This particular trait is usually neglected by most authors.

Unlike our previous research (UBALDI, 2016) the current one is based on the analysis of materials from the central Apennines, in comparisons with populations of the northern Apennines traditionally attributed to *Sesleria italica*. After examining the relevant materials, in addition to what is already known for the Northern Apennines, we will propose our conclusions on several points impinging on the complex taxonomy of the *S. nitida* group.

Materials and methods

Our study material consists in samples seen in FI or self-collected, or received in gift by other workers.

For Tuscan-Romagna northern Apennines we have inspected samples collected between Mugello (Tuscany, Florence province), to the N-W end, and Montefeltro (including sites of eastern Tuscany and Republic of San Marino), to the S-E. For Mugello and nearby areas: “Monte Canda (1158 m), 21 aprile 2015, leg. C. Garavaglia” typus of *Sesleria nitida* var. *candae*, FI; “Apennino Mugellano, 1896, Sommier”, FI; “Mugello Giovigiana, 1922, Fiori”, FI; “Madonna dei 3 Fiumi, Mugello (Firenze), 4.5.1958 - B. Lanza, su roccia presso un torrente”, FI; “Giogo di Scarperia, Mugello, 18 maggio 1889, Martelli”, FI; “Ronta, 1908, Sommier, *Sesleria argentea* Savi”, forma spica brevior (a remark by Hackel according to Ujhelyi), MNHN (P) online. For the Casentino plateau, a subregion of Tuscany S-E to Mugello: “Monte Falterona, 30 aprile 1953” without author (?), FI. For central Romagna in Forlì-Cesena province: “Galeata (Forlì), 1917,

Pampanini, *Sesleria coerulea* (L.) Ard. var. *italica* Pamp.”, FI!, typus of *Sesleria italica* (Pamp.) Ujhelyi; samples collected by F. Semprini at Ca’ Montevecchio and Lago di Ponte; plants collected by E. Bugni, G. Faggi and M. Sirotti near Pianetto di Galeata, locus classicus of *Sesleria italica*. For Montefeltro and the adjoining eastern Tuscany, about 30 samples collected by Ubaldi, among these the typus sample of “*Sesleria italica* (Pamp.) Ujhelyi subsp. *mariculensis* Ubaldi”, preserved in BOLO, coming from Mount Simoncello; in addition a sample of the Herbarium Chiosi (foil 0039, FI!): “Monte della Perticara, *Sesleria nitida* Ten. var. *brevidentata* Hack. f. *intermedia* Pamp. R. Chiosi 24 aprile 1930”. For the Republic of San Marino samples by Pampanini in FI!, all labelled by Ujhelyi as *Sesleria italica*: “*Sesleria nitida* Ten. var. *tenoreana* f. *macrostachya* Pamp., Borgo l. d. Ornella, 2 maggio 1912” (typus formae designated by UJHELYI, 1959); “*Sesleria nitida* Ten. var. *Visianii* Pamp., M. Titano vers. or., 4 Maggio 1912”; “*Sesleria nitida* Ten. var. *brevidentata* Hack. f. *intermedia* (Beck), M. Titano vers. or., 24 Maggio 1912”.

For central Apennines: several materials from Mount Nerone (Marche), collected by Ubaldi; Mount Catria (Marche and Umbria), mainly a large collection realized by F. Barbadoro in the localities of Rocca Baiarda and La Forchetta; two foils in FI! by Brillì-Cattarini and Gubellini, one from Mount Catria, sub *Sesleria nitida*, and another one from the nearby locality of Pergola, sub *Sesleria italica*; “Roccabajarda (Mount Catria), Piccinini, *Sesleria caerulea*” FI!, reported as *Sesleria italica* by UJHELYI (1959); Herbarium Paolucci online, “*Sesleria coerulea* Linn., in herbidis montanis, Junii, in M. Catria, leg. frater Piccinini”, labeled *Sesleria nitida* by Paradisi; a collection from Mount Vettore (Marche and Umbria) by Ubaldi; “*Sesleria caerulea* Ard., legi in Apennino Umbro ad Subasio et in Ap. Piceno a Frondosa, Gennari”, in FI!, labeled *Sesleria italica* by Ujhelyi, on the same foil also a specimen from Furlo collected by Narducci; “Acquasanta Trisungo, 1836, Parlatore, *Sesleria nitida* Ten.”, FI!, labeled *Sesleria italica* by Ujhelyi; Santo Stefano di Sessanio (Gran Sasso range, Abruzzo), a collection by F. Semprini; “Abruzzo, TE, da Prati di Incodara a Colle Andreole, F. Conti and F. Bartolucci, 26/5/2010”, det. *Sesleria nitida* by F. Conti, but labeled *Sesleria italica* by R. Di Pietro; “Abruzzo, Montagna dei Fiori (Teramo), leg. G. Aldobrandi, G. Padovani, E. Tosi, 27/5/ 1987, det. *Sesleria italica* by E. Tosi (1988)”, in FI!; Mount Terminillo (Lazio), Ubaldi’s collection.

For the analysis of the materials, we have examined the main morphological features reported by the major scholars of the genus *Sesleria*, e.g. DEYL (1946, 1978) and UJHELYI (1959, 1959a), i. e. plant stature, size of the leaves, length of the upper leaf, number of caulinar leaves, size and shape of panicle and spikelets (glumes and lemma). As far as possible, our observations are based on samples collected in field by ourselves, because direct collection of a fair amount of material is fundamental to assess the variability of the species and the habitat. Obviously

this is commonly unfeasible in institutional herbaria, which however can suggest places in which to collect more study material.

Results

The samples examined from locations of the Central Apennines are all determinable as *Sesleria nitida*, except for the sample from the Montagna dei Fiori (Abruzzo), which is close to *Sesleria pulchella* of the Northern Apennines. Also the samples by Barbadoro from the locality La Forchetta and by Narducci from the Furlo are close to another species (see below *Sesleria feretrana*).

With the sole exception of the sample from Mount Vettore (Marche-Umbria), the specimens of *Sesleria nitida* differ from the literature descriptions for the low length of the lemma awn, which attains much lower values than those considered canonical for this species, i.e. 0.5-1.8(2) mm vs. 1-2 or 2-2.5 mm according to the authors. The awn of the glumes, a usually neglected feature, measures 0.5-2 mm, while it is 1.5 - 3 mm in our samples from Southern Italy mentioned in the Introduction. In addition the glumes are ovate-lanceolate and not long-lanceolate as in the plants of Southern Italy. These plants of the Central Apennines are also distinguished by the larger number of cauline leaves, 3-4 vs. 2(3), the latter number being similar to that reported by BRULLO & GIUSSO DEL GALDO (2006) for *Sesleria nitida*, all three subspecies. Our samples are also characterized by a greater height of the culm, leaves almost always flat, wider and longer, contrary to what is observed on samples of the Southern Apennines. We can assume that our collections from Central Apennines can be referred to *Sesleria nitida* subsp. *nitida*, in comparison to the type of the species below mentioned, while there may be some doubt about the plants so named by BRULLO & GIUSSO DEL GALDO (cit.).

Sesleria nitida was described by TENORE (1815). BRULLO & GIUSSO DEL GALDO (2006) established as neotype the table of Tenore published in the Flora Napolitana (1824-1829; Fl. Nap. 3, Tav. CII, f. 1), and as epitype a sample collected on Mount Cervialto (Campania). Tenore's figure is consistent with our samples from the Central Apennines, with respect to the wide leaves and number of cauline leaves in particular. The typus sample of Mount Cervialto chosen by DI PIETRO et al. (2017) is also similar. Curiously enough, in Tenore's table two extra glumes are highlighted for the spikelet, a recurrent feature in *Sesleria nitida* both in Central and Southern Apennines, more rare in Northern one. This feature was reported by UBALDI (2016) for Southern Apennines material.

The samples seen by UBALDI (cit.) for the extreme South of Italy refer to a form of *Sesleria nitida* having longer awns in agreement with UJHELYI (cit.), PIGNATTI (cit.) and BRULLO & GIUSSO DEL GALDO (cit.), but also shorter and often conduplicate leaves and a modest plant stature. These characteristics would lead to *Sesleria nitida* subsp. *aprutia* Brullo & Giusso. Our sample from Mount Vettore definitely

approaches this morphology, as our samples from Southern Apennines also do, but subsp. *aprutia* is reported only for the central Apennines. This problem remains to be explored.

Beginning with UJHELYI (1959), the Tuscan-Romagna Apennines were considered by all authors as the centre of distribution of *Sesleria italica* (Pamp.) Ujhelyi. This name is derived from *Sesleria coerulea* (L.) Ard. var. *italica* Pamp. PAMPANINI (1917a) left a homogeneous sample of specimens collected near Galeata (Forlì-Cesena province) in central Romagna. This same sample was later chosen by UJHELYI (cit.) as *typus* of his new combination and new species. It is preserved in FI! (FI007054) and is also visible on the website of the Museo di Storia Naturale of the University of Florence. The *typus* includes seven clumps of plants of modest stature (20-25 cm) in the flowering phase, collected on April 12, 1917. Pampanini states in the protologue that the leaves are green (actually slightly glaucescent), (2.5)3 - 4(5) mm wide, very rough especially near the apex, mucronate, culms smooth, up to 30 cm high, weak and curved-flexuous (this is scarcely detectable on the *typus*), panicle ovate-cylindrical (we would say short-cylindrical), intensely shimmering, cerulean, 8-10 mm wide and 2-2.5 cm long, the paleas 5 mm long. We can add that the upper cauline leaf is about 5-6 cm long, the spikelets about 6 mm including awns of various lengths (0.5-1.8 mm). In our opinion this sample falls within the variability of *Sesleria nitida*, matching the most common forms so widely spread in the Central Apennines. As a consequence, the name *Sesleria italica* falls into synonymy with *Sesleria nitida*.

The presence of *Sesleria nitida* in localities of the Tuscan-Romagna Apennines, before Ujhelyi decreed their assignment to *Sesleria italica*, was affirmed by PAMPANINI (1917b, 1927, 1930) for the Republic of San Marino and by DEYL (1946) for Mugello. This latter author subsequently supported the name *Sesleria italica* at the rank of a subspecies of *Sesleria insularis* Sommier (DEYL, 1978, 1980), a conclusion that remains difficult to understand, the more so since the material seen was not reported.

The plants forming the *typus* of *Sesleria italica* are rather similar to typical *Sesleria nitida*. We have seen such forms in other localities of central Romagna (samples collected by F. Semprini) and in Montefeltro, at Castello di Montecopiolo and Pietrarubbia (Marche: Pesaro and Urbino province), the latter two on hard calcareous or conglomerate substrates. The *typus* of *Sesleria italica* was found on a stone wall. Similar specimens can also be found on Mount Catria (Central Apennine), for example in Herbarium Paolucci. Among samples collected by PAMPANINI (cit.) on Mount Titano (Republic of San Marino), the specimen labelled as *Sesleria nitida* Ten. var. *brevidentata* Hack. f. *intermedia* (Beck) is clearly attributable to a typical *S. nitida* in reason of the robust panicle of 9 x 30 mm and fairly broad leaves, while the tiny length of the awns falls within the variability of the species in the Northern and Central Apennines. The name reported by Pampanini

for this sample is found in HALÁCSY (1904) as a variety of *Sesleria nitida* spread in southern Greece, probably referred to the current *Sesleria taygetea* Hayek. On the other hand, the sample named *Sesleria nitida* f. *macrostachya* Pamp. stands out for its “giant” panicle of 12-15 x 37-54 mm and leaves up to 7 mm wide, matching the description of *Sesleria nitida* by UJHELYI (1959), (who, however, considers all Pampanini’s samples as *Sesleria italica*). As to the sample “*Sesleria nitida* var. *Visianii* Pamp.”, again reported by Pampanini for Mount Titano, and also labelled *Sesleria italica* by Ujhelyi, this plant shows a narrow panicle of 6 mm width, a feature considered by this author and by PIGNATTI (cit.) as distinctive of *Sesleria italica* with respect to *S. nitida*. No other differences are detectable on this specimen, however, and it would be out of place to hypothesize a species other than *S. nitida* only based on this feature. This sample can be compared to *Sesleria italica* subsp. *mariculensis* (UBALDI, 2016), which we now think is a form of *Sesleria nitida*. Such plants with elongated and narrow panicles are a tough problem since they do not seem to form a homogeneous assemblage.

Contrary to what reported by UJHELYI (1959), in *Sesleria nitida* of the Northern and Central Apennines (samples just mentioned above), the surface of the panicle is usually smooth with densely juxtaposed spikelets, especially at the young age. The panicle can be cerulean or straw-colored, mainly brilliant, or softly opaque in the case of specimens having hairy lemma and palea. A bristly aspect due to protruding tips is characteristic of panicles with longer awns and divergent spikelets, what we have met with in the Central Apennines. In any case, Ujhelyi’s report about the rough appearance of the panicle surface is not to be generalized. A particular morph for panicle and vegetative habitus was observed in samples from Mount Canda in Mugello, which we propose to be a new variety of *Sesleria nitida*. As we will say, these specimens are similar to other samples from the same area we have checked in FI.

Not all of our samples from the Tuscan-Romagna Apennines are attributable to a specific form of *Sesleria nitida*. In Montefeltro and contiguous eastern Tuscany a morph often found on clay and marl is apparently intermediate between *Sesleria nitida* and *S. pulchella* (the infrequent stations of the latter being located here). We will describe this morph as a new species, distinct from both possible parental species.

***Sesleria feretrana* Ubaldi sp. nova**

Holotypus hic designatus (Fig. 4): “Lungo la strada da Novafeltria a Talamello (provincia Rimini, regione Emilia-Romagna) in pratelli aridi a Bromus erectus, 6 settembre 1987”. Registered in FI.

Diagnosis

Differt a *Sesleria pulchella* (Chiosi) Ubaldi in UBALDI (2017) statura, longitudine

foliorum et spica maioribus, plerumque longiore arista glumarum et lemmatis, foliis rectis et planis (non arcuatis duplicatis), sine furfuribus.

Statura in *Sesleria pulchella* circa 10 - 12 cm, folia 2 - 8(12) cm longa, conduplicata, 1.5 - 2.5 mm lata, spica 5-7 x 10-17 mm, glumarum arista 0.2-1.0 mm, lemmatis arista 0.4-0.8 mm (Ubaldi, 2017).

Differt a *Sesleria nitida* Ten. (typus): statura inferiore (40 - 60 cm contra 50 - 80 cm, in senectute); foliis brevioribus (usque ad 15 - 25 cm contra 30 - 35 cm) et strictioribus (caulis 1.5 - 2.5 mm latis contra 2.5 - 3.5 mm, usque ad 5 mm basilaribus contra 6 - 7(8) mm); folio superiore usque ad 3.5(4) cm longo contra 9 - 11 cm sicut mensura maxima; foliis caulinis 2(3) contra 4-5, in numero; spica strictiore, 4-8(9) mm contra 10-12(15) mm, parum caerulea contra cyanea, glumis et lemmate aliquando solum 4-4.5 mm longis, aristis inclusis, contra 6-7 mm (Fig. 1).

Description

This plant reaches 20 - 30 cm at ripening and 40 - 60 cm at senescence. Leaves all or mostly flat, cauline leaves only 2-3 of number, 1 - 2.5(3) mm wide, the uppermost one (1)2.5 - 3.5(4) cm long, situated at half of the culm or below at maturity; basal leaves up to 4(5) mm wide and 15-25 cm long. Panicle approximately cylindrical, straight or slightly arched at the top, 4 - 8(9) x 11 - 25 mm, rarely up to 45 mm, and usually slightly cerulean. Spikelets loosely crowded, green on the proximal part, cerulean on the distal one. Glumes ovate-lanceolate, hairless, rough on the veins, 4-6 mm long, awn included, the lower usually a little shorter, awn 0.5 - 1.5 mm. Lemma glabrescent, rough on midrib, sometimes hirsute on the veins and margins in the distal part (the same the palea), 4.5 - 6 mm long including the central awn of 0.5 - 1.5 mm, accompanied by two teeth on both side, usually only the external well mucronate (Fig. 1).

Etymology

The name pertains to Montefeltro (latin: *Mons Feretri* or *Mons Feretranus*) the historical region between Romagna and Marche, also extending to a part of eastern Tuscany and to the Republic of San Marino, in the sense of the homonymous diocese. This territory represents the centre of distribution of the taxon.

Habitat

Eroded slopes on clay and marly detritic substrate and similar road escarpments, on which this species can form dense xero-thermophilous grass communities of Festuco-Brometea class, widespread from hilly to montane places, up to 1200 m in sunny places. This species is less alticolous and more thermophilous than *Sesleria nitida*. It grows also at forest margins and in open shrublands.

Materials

Localities for *Sesleria feretrana* are known for Montefeltro, eastern Tuscany and also in the high valleys of rivers Metauro and Candigliano (Marche): “Along the road between Novafeltria and Talamello”, type sample locality (province of Rimini, Romagna); Gattara di Castel delci (id.); Mount of Perticara (id.): sample 0039 from the Herbarium Chiosi in FI; Mount Carpegna, road from Cippo to the summit (province of Pesaro and Urbino, Marche); Ponte Conca di Montecopiolo (id.); Fonte Abeti di Borgo Pace (id.); between Pieve dei Graticcioli and San Martino del Piano (id.); between Belforte all’Isauro and Sant’Angelo in Vado (id.); San Cristoforo Pass and Motolano (province of Arezzo, Tuscany); Mount Serra di Battiroli (id.); along the road between Parchiule (province of Pesaro e Urbino, Marche) and Montelabreve (province of Arezzo, Tuscany). UBALDI (2016) reported *Sesleria italica* for the Gorgo a Cerbara gorge and Fossombrone, in the calcareous Central Apennines in province of Pesaro and Urbino (Marche). These samples are similar to *Sesleria feretrana* and so too ones from the same area mentioned in materials for the localities La Forchetta and Furlo.

Herbarium samples from southern Tuscany, attributed to *Sesleria italica* (FRIGNANI et al., 2007; SELVI, 2010, UBALDI, 2016), should be checked in relation to this taxon: “Sarteano, tenuta di Spineto (province of Siena), F. Selvi sub *Sesleria italica* (Pamp.) Ujhelyi”; “Seggiano - Pian di Bugnano (province of Grosseto), F. Selvi sub *Sesleria italica* (Pamp.) Ujhelyi”. To be checked also the reports of *Sesleria italica* by ANZALONE et al. (2010) for some localities of northern Lazio at the border of Tuscany.

Note

A possible hybridization between *Sesleria feretrana* and *Sesleria pulchella* is suggested by the finding of a specimen of *S. feretrana* with arcuate and duplicate leaves like in the other species. Found in northern Umbria near Bocca Trabaria (Trabaria Pass) in the Tiber valley, not far from a station of *S. pulchella* in the high valley of Metauro.

***Sesleria nitida* Ten. var. *candae* Ubaldi & Garavaglia var. nova**

Holotypus hic designatus (Fig. 5): “Monte Canda, 21 aprile 2015, leg. Carla Garavaglia”. Registered in FI.

Diagnosis

Differt a *Sesleria nitida* Ten. subsp. *nitida*, foliis manifeste glaucis et supra pruinosis, culmo in parte superiore plus minusve compresso ad latera et gracile, spiculis minoribus (glumis et lemmatibus solum 4 - 5(6) mm longis, arista inclusa).

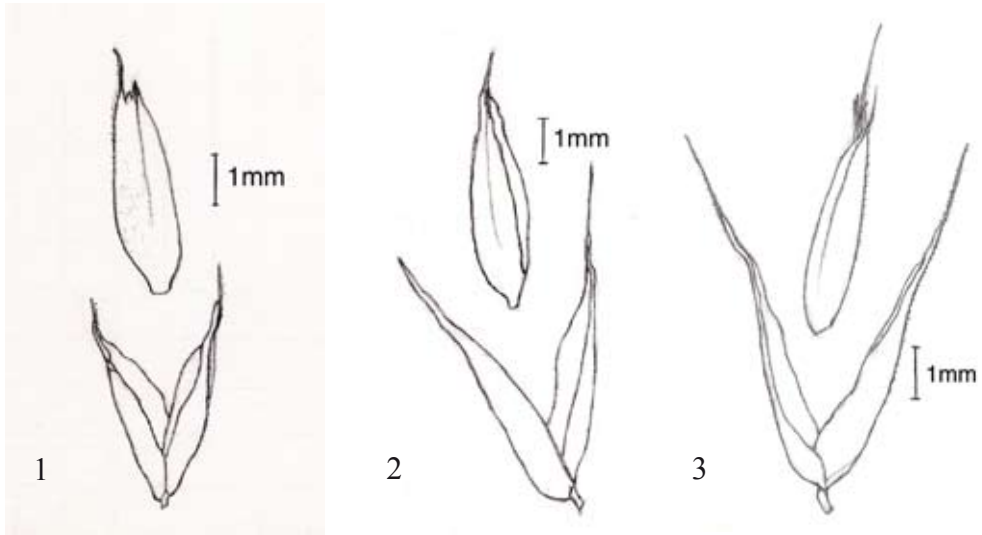


Fig. 1 - Glumes and lemma of *Sesleria feretrana* (by UBALDI, 2016, sub *Sesleria italica*).
 Fig. 2 - Glumes and lemma of *Sesleria nitida* from Romagna and central Apennines. Note a glume without awn, a feature not rare in this species, sometimes affecting all two glumes.
 Fig. 3 - Glumes and lemma of *Sesleria nitida* from South Italy (by UBALDI, 2016).

Description

Plants fairly robust, 25 - 32 cm high just after full bloom (not observed at senescence), upper culm tapering-compressed to 0.3 - 0.4 mm; cauline leaves 2 - 5, flat or incompletely duplicate, straight, stiff, prickly at the apex, glaucous, pruinose and sparsely hairy on upper blade, 2 - 4 mm wide, 10-24 cm long, uppermost leaf 28 - 98 mm; ground dry leaves only 1 - 3, 4 - 6 mm wide, 30 cm long; basal sheaths continuous, light brownish; panicle dense, deep-bluish, sometimes massive brief cylindrical (10 - 11 x 25 mm), or ovate-elongate, or long cylindrical (8 - 9 x 22 - 35 mm). Spikelets small: glumes ovate-lanceolate, glabrous between the veins, hirsute on midrib, 4 - 6 mm long, including awn of 1 - 1.5(2) mm; lemma glabrescent (and so also the palea), hirsute on the veins and margins, 4-5 mm long including middle awn of 0.5 - 1.2 mm, this last accompanied by two lateral teeth 0.5 mm long on each side, both awned.

Etymology and habitat

The name derives from Mount Canda (1158 m), located in the Mugello, subregion of Tuscany, province of Florence, from which the collection by C. Garavaglia originates. This plant forms dense semi-arid meadows on limestone.

Materials

In addition to the above, other mentioned samples in materials can be also attributed to this taxon: Madonna dei Tre Fiumi, Giogo di Scarperia, Ronta.

Discussion

The central point of this study is the recognition of *Sesleria nitida* as a widespread species also in the Tuscan-Romagna Apennines and the conclusion that the name *Sesleria italica* is a synonym. *Sesleria nitida* is present in the Tuscan-Romagna area with forms similar to those found in Central Apennines, i.e. characterized by the middle awn shorter than in populations from the extreme South of Italy reported by UBALDI (2016), as well as from Sicily (subsp. *sicula* Brullo & Giusso), and also distinguished by ovate-lanceolate glumes and lemma (Fig. 2), not long-lanceolate (Fig. 3).

According to DEYL (1946) *Sesleria nitida* is closely related to species of the Balkan Peninsula, in particular *Sesleria sillingeri* Deyl (later renamed *Sesleria insularis* Sommier subsp. *sillingeri* (Deyl) Deyl) and *Sesleria vaginalis* Boiss. & Orph. The ancestors of *Sesleria nitida* may have colonized Italy through a bridge over the Adriatic Sea (Deyl probably refers to the Adria, a collapsed bridge of which the islands of lower Adriatic Sea are the remains). The ancestors would then evolve into *Sesleria nitida* by hybridization with *Sesleria argentea* in the lack of other species with which to hybridize, so Deyl writes, bringing in support of his theory the close resemblance of the “turma nitida” with the “turma argentea”. Deyl does not much worry of the likely obstacle to hybridization resulting from the different phenologies of the two species: *Sesleria argentea* is late flowering, whereas *Sesleria nitida* and its closest Balkan relatives are early bloomers, and so possibly their Balkan ancestors too.

Nowadays we may also take into account the probable genetic interference of the Tyrrhenian group of *Sesleria insularis*, a phenomenon that seems to have a bearing on the origin of some Apennine taxa. FOGGI et al. (2006) have considered this possibility for their *Sesleria pichiana*, whose karyotype of 56 chromosomes would derive from ancestors of *Sesleria insularis* ($2n = 28$) and *Sesleria italica* ($2n = 28$). Hybridization and polyploidy are frequent in the evolution of *Sesleria* species (LYSAK & DOLEZEL, 1998; DI PIETRO, 2010; LAZAREVIĆ et al., 2015; KUZMANOVIĆ et al., 2017). A similar origin is also likely for *Sesleria pulchella*, which is reminiscent of *Sesleria insularis* subsp. *morisina* Arrigoni for its small size and very short awns. Hybridizations and introgressions may have occurred in several other cases. Even *Sesleria feretrana* might be a hybrid between *Sesleria nitida* and *S. pulchella* and, in turn, it would seem that it can hybridize with *S. pulchella* (sample mentioned for Trabaria Pass).

Some light on the intricate history of the Apennine taxa may also be shed from the finding of possible relics. As such can we interpret *Sesleria pulchella*, not



Fig. 4 - Holotypus of *Sesleria feretrana*.



Fig. 5 - Holotypus of *Sesleria nitida* var. *candae*.

only because of its rarity but also because a very similar biotype (perhaps only a variety of the same species) is located at a great distance, the Montagna dei Fiori in Abruzzo (see Materials). As in *Sesleria pulchella*, the latter plants also feature a small size and glumes and lemmas with very short awns. Even the presence of *Sesleria nitida* populations with short awns in Northern and Central Apennines could be due to breeding events with western lineages, which failed of course to affect populations of extreme Southern Apennines and Sicily, and apparently also certain high-montane populations of Central Apennines (*Sesleria nitida* subsp. *aprutia* Brullo & Giusso).

It is surprising that all the taxa we have listed (*Sesleria nitida*, *S. pulchella* and *S. feretrana*) can keep on in Montefeltro and surrounding areas, considering that all have the same phenology of spring plants and possibly the same chromosomal number. According to UJHELYI (1960) the chromosomal number of *Sesleria italica* (to be read *S. nitida* or *Sesleria feretrana* as already explained) is $2n = 28$, without indication on the origin of the sample, and the same number is reported by FOGGI et al. (2007) for a sample (also referable to *S. nitida* or *S. feretrana*) collected at Mount Titano (Republic of San Marino). There are no karyological investigations of *Sesleria pulchella* and *Sesleria feretrana*.

Acknowledgments

Thanks are due to prof. Paolo Pupillo for reading the manuscript. Many thanks to all persons mentioned in the article, who have sent us materials, particularly to dr. Fabio Semprini for his key samples. Thanks to the kind Curator of Museo di Storia Naturale dell'Università di Firenze dr. Chiara Nepi and dr. Egildo Luccioli; drs. Annalisa Managlia and Rosa Ranalli of Orto Botanico ed Erbario of the University of Bologna. Finally, we express our gratitude to dr. Lucia Cecchetti of the Biblioteca di Stato of the Republic of San Marino for sending a paper by Pampanini. Thanks to dr. Fabrizio Buldrini for the technical help regarding the preparation of this article for printing.

References

- ANZALONE B., IBERITE M. & LATTANZI E., 2010 - La Flora vascolare del Lazio. *Informatore Botanico Italiano*, 42(1): 187-317.
- ARRIGONI P.V., 1983 - Le piante endemiche della Sardegna. *Boll. Soc. Sarda Sci. Nat.*, 22: 259-316.
- BRULLO S. & GIUSSO DEL GALDO G. P., 2006 - Taxonomic remarks on *Sesleria nitida* Ten. (Poaceae), an orophyte endemic to Sicily and the central-southern Apennines. *Plant. Biosystems*, 140(1): 43-49.
- CHIOSI R., 1930 - La "Sesleria nitida" Ten. del Montefeltro e dell'Alpe della Luna. *Nuovo Giornale Botanico Italiano*, n.s., Vol. 37, N. 3: 631-637.

- CONTI F., ABBATE S., ALESSANDRINI A. & BLASI C., 2005 - An annotated check-list of the Italian Flora. *Ministero per l'Ambiente. Roma*, 420 pp.
- DEYL M., 1946 - Study of the genus *Sesleria*. *Op. Bot. Čech.*, 3: 1-257.
- DEYL M., 1978 - *Sesleria* Scop. - In Heywood V. H. (Ed.), *Flora Europaea Notulae systematicae ad Floram Europaeam spectantes*, 20. *Botanical Journal of the Linnean Society*, 76: 364.
- DEYL M., 1980 - *Sesleria* Scop. - In: Tutin T.G., Heywood V.H., Burges N.A., Valentine D.H., Walters S.M. & Webb D.A. (Eds.), *Flora Europaea*, 5: 173-177. Cambridge.
- DI PIETRO R., 2010 - Phytosociological features of *Sesleria calabrica* (Poaceae), an endemic species to Pollino-Orsomarso mountains (southern Italy). *Acta Botanica Gallica*, 157 (3): 539-554.
- DI PIETRO R., KUZMANOVIĆ N., IAMONICO D. & LAKUŠIĆ D., 2017 - Nomenclatural and taxonomic notes on *Sesleria* sect. *Argenteae* (Poaceae). *Phytotaxa*, Vol. 309, No 2.
- FOGGI B., ROSSI G., PIGNOTTI L., 2007 - *Sesleria pichiana* (Poaceae), a new species from north-west Italian peninsula. *Webbia*, 62 (1): 1-10.
- FRIGNANI F., ANGIOLINI C., LANDI M., RICCUCCI C. & BONCOMPAGNI, G., 2007 - Flora vascolare dell'Oasi WWF "Bosco Rocconi" (Grosseto, Toscana Meridionale). *Informatore Botanico Italiano*, 39 (1): 65-86.
- HALÁCSY (DE) E., 1904 - *Conspectus Florae Graecae*. Volumen III, Lipsiae. Sumptibus Guilelmi Engelmann, 520 pp.
- KUZMANOVIĆ N., LAKUŠIĆ D., FRAJMAN B., ALEGRO A., SCHÖNSWETTER P., 2017 - Phylogenetic relationships in *Seslerieae* (Poaceae) including resurrection of *Psilathera* and *Sesleriella*, two monotypic genera endemic to Alps. *Taxon*, Vol. 66, N. 6, pp. 1349 - 1370 (22).
- LAZAREVIĆ M., KUZMANOVIĆ N., LAKUŠIĆ D., ALEGRO A., SCHÖNSWETTER P., FRAJMAN B., 2015 - Patterns of cytotype distribution and genome size variation in the genus *Sesleria* Scop. (Poaceae). *Botanical Journal of the Linnean Society*, 179: 126-143.
- LYSAK M.A. & DOLEZEL J., 1998 - Estimation of nuclear DNA content in *Sesleria* (Poaceae). *Caryologia*, vol. 51, n. 2: 123 - 132.
- PAMPANINI R., 1917a - *Arundo plinii*, *Sesleria coerulea* var. *italica* e *Chamaebuxus alpester* var. *grandiflorus* nella Romagna. *Bull. Soc. Bot. Ital.* n. 4-5 (aprile-maggio), 46-50.
- PAMPANINI R., 1917b - Piante nuove della Repubblica di San Marino. *Museum a. I*, n. 2 (aprile-giugno), 140-142.
- PAMPANINI R., 1927 - La "*Sesleria nitida* Ten." del M. Titano (Repubblica di S. Marino). *N. Giorn. Bot. Ital.*, n.s. 34, 328-332.
- PAMPANINI R., 1930 - Flora della Repubblica di San Marino. *F. Della Balda*, 228 p.
- PIGNATTI S., 1982 - Flora d'Italia. *Ed. Edagricole*. 3° vol.
- PIGNATTI S., 2017 - Flora d'Italia. *Ed. Edagricole*. 1° vol.
- SELVI F., 2010 - A critical checklist of the vascular flora of Tuscan Maremma (Grosseto province, Italy). *Fl. Medit.* 20: 47-139. 2010. — ISSN 1120-4052.

- TENORE M., 1815 - Synopsis novarum plantarum quae in Prodomo Florae Neapolitanae, anno 1811–1813 edito, describuntur. In: Tenore, M. (ed.), Ad Catalogum plantarum horti regii Neapolitani anno 1813 editum Appendix I. *Tipografia Amuliana*, Napoli.
- UBALDI D., 2016 - Taxonomic remarks on *Sesleria italica* (Pamp.) Ujhelyi (Monocotyledones Poaceae). *Quad. Studi Nat. Romagna*, 43: 117-131.
- UBALDI D., 2017 - *Sesleria pulchella*, a new species from a limited area between northern and central Apennines (Italy). *Quad. Studi Nat. Romagna*, 45: 39-52 (giugno 2017).
- UJHELYI J., 1959a - Species Sesleriae generis novae. *Feddes Repertorium*, 62(1): 59-70.
- UJHELYI J., 1959 - Révision des espèces du genre “Sesleria” en Italie. *Webbia*, 14(2): 597-614.
- UJHELYI J., 1960 - Weitere zytotaxonomische Beiträge zur Kenntnis der Gattung Sesleria. *Botanikai Közlem.* 48: 278-280.
- ZANGHERI P., 1976 - Flora italica. *Cedam*, Padova, 1636 pp.

Address of the authors:

Davide Ubaldi
via Mascarella, 77/7°, 40126 Bologna (Italy)
e-mail: davide.ubaldi@unibo.it

Carla Garavaglia
Department DIFA, University of Bologna, viale Berti Pichat, 6/2, 40127 Bologna (Italy).
e-mail: carla.garavaglia@unibo.it