

***Bellardiochloa violacea* and *Festuca versicolor* (Poaceae) in the Bieszczady Mts. (south-eastern Poland)**

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Abstract: Based on the recent field studies and revision of the available herbarium specimens, it was found that *Bellardiochloa violacea* became extinct on Mt. Kopa Bukowska in the Bieszczady Mts. already before 1990, while *Festuca versicolor* still exists at the same locality and its population amounts to a few dozen of individuals.

Keywords: *Bellardiochloa violacea*, Bieszczady Mts., *Festuca versicolor*, Poaceae.

Introduction

Bellardiochloa Chiov. is a genus of five high-mountain species centered in the area of Turkey (CABI et al. 2015), where three endemic species, with a very narrow distribution, are found: *B. argaea* (Boiss. & Bal.) R. R. Mill in central Turkey, *B. carica* R. R. Mill and *B. doganiana* Cabi & Soreng in the south-western part of the country. *Bellardiochloa polychroa* (Trautv.) Roshev. extends from northeast Turkey through Caucasus Mts. to northwest Iran. The most

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widespread species, *Bellardiochloa violacea* (Bellardi) Chiov. [*B. variegata* (Lam.) Kerguélen, *Poa violacea* Bellardij] grows in the mountains of middle and southern Europe from Spain to Greece and the Balkans, extending to northwest Turkey (BRULLO et al. 2013, CABI et al. 2015). *B. violacea* reaches its northern limit in the Polish Carpathians (Tatry Mts., Bieszczady Mts.). In the Carpathians, it is an endangered species included in the Red Books of Poland (MIREK 2014), Slovakia (ŠOLTÉSOVÁ et al. 1999) and Ukraine (<http://redbook-ua.org/item/bellardiochloa-violacea/>). In the Carpathians, it was reported from the Tatry Mts., Bieszczady Mts., Czarnohora Mts. and further southwards (CONERT 1998). In Poland, *B. violacea* was found in Dolina Smytnia Valley and Polana na Stołach in the Tatry Zachodnie Mts., Mt. Turbacz in the Gorce Mts. and on Mt. Kopa Bukowska in the Bieszczady Mts. At the two anthropogenic stands on Polana na Stołach and Mt. Turbacz, the species is extinct (Kruk, pers. observation; MIREK 2001). Even though the species was included in the all three editions of the Polish Red Data Book (MIREK 1999, 2001, 2014), an updated information on its population state in the Bieszczady Mts. was never provided. Therefore, in 2015 – 2016 we undertook field studies on the current state of *B. violacea* in the Bieszczady Mts. and verified the available herbarium materials. Nomenclature of the species was according to MIREK et al. (2002).

Results and discussion

During the current studies, the presence of *B. violacea* on Mt. Kopa Bukowska, the only stand of this species in the Bieszczady Mts. previously reported, was not confirmed. Nevertheless, we found on the summit rocks of Mt. Kopa Bukowska, in the west and south-west slopes, a few dozen of *Festuca versicolor* individuals (Fig. 1), the species whose presence was recently not confirmed in the Bieszczady Mts. (ZEMANEK & WINNICKI 1999). *F. versicolor* (*F. versicolor* subsp. *versicolor*) is a Carpathian subendemic species with the only stands outside the Carpathians located in the Sudety Mts. (Karkonosze) (PIĘKOŚ-MIRKOWA et al. 1996).

In the Bieszczady Mts., *B. violacea* was first identified by JASIEWICZ & ZARZYCKI (1960) on the summit of Bukowska Kopa at 1300-1320 m a. s. l., in rock crevices and in compact grasslands on flat and strongly inclined rocks, in south, south-west and south-east exposition, in association with *Anemone narcissifolia*, *Antennaria dioica*, *Calamagrostis arundinacea*, *Carex ornithopoda*, *C. pallescens*, *C. rupestris*, *Festuca supina*, *Hieracium prenanthoides*, *Homogyne alpina*, *Hypochoeris uniflora*, *Luzula luzuloides*, *Lycopodium selago*, *Polygonum viviparum*, *Potentilla aurea*, *Sesleria coeruleans*, *Solidago alpestris*, *Thymus alpestris* and *Viola biflora*. On the other hand, *F. versicolor* was reported from the same locality by JASIEWICZ (1964). Revision of the herbarium materials revealed that the only authentic specimens of *B. violacea* are those from KRAM collected by J. Rychlewski: 421184, the Western Bieszczady Mts., Mt. Bukowska Kopa (the Small Halicz), grasslands on carbonate rocks at 1300 m a.s.l., July 1956 (Fig. 2); 426840, the Western Bieszczady Mts., Mt. Bukowska Kopa (the Small Halicz), grasslands on rocks at 1300 m a.s.l., August 1956. The other

specimens (407275, the Western Bieszczady Mts., Mt. Bukowska Kopa, on the summit in a rock crevice, ca. 1310 m a.s.l., 17. 07. 1990, leg. L. Nowak & A. Jasiewicz; 407276, the Western Bieszczady Mts., Mt. Bukowska Kopa, rocks on the summit, ca. 1310 m a.s.l., 17. 07. 1990, leg. L. Nowak & A. Jasiewicz), are individuals of *F. versicolor*. Evidently, the latter species was confused with *B. violacea*, as these two species show some similarity in general appearance, for example in the purple tint of spikelets. However, the detailed morphological differences are evident. *B. violacea* has panicle branches with prickles, lemma is hirsute with 2-dented apex, short but distinct awn, ciliate rachilla, especially at the base of florets, and smooth ovary (Fig. 3). On the other hand, *F. versicolor* shows smooth branches, smooth lemma with acute top, without or with a short awn, sparsely hirsute rachilla, hairy ovary (Fig. 3). Moreover, the latter species has characteristic swellings at the base of basal leaves.



Fig. 1. *Festuca versicolor* on summit rocks of Mt. Kopa Bukowska (photo by J. Kruk, June 2015).

During studies on the vascular plants of the Bieszczady National Park plants performed between in the period of 1993 – 1997 (ZEMANEK & WINNICKI 1999), the presence of *B. violacea* on Mt. Kopa Bukowska was claimed, while *F. versicolor* was not confirmed. This indicates, that also in this case, both species were not properly identified.



Fig. 2. Herbarium specimen of *Bellardiochloa violacea* from Kopa Bukowska (KRAM 421184, the Western Bieszczady Mts., 1300 m a.s.l., July 1956, leg. J. Rychlewski).



Fig. 3. Spikelets of *Bellardiochloa violacea* (left) and *Festuca versicolor* (right).

Based on the presented literature data and the herbarium materials it can be concluded that *B. violacea* became extinct in the Bieszczady Mts. already before 1990, most probably in 80's, while *F. versicolor* still exists there and its occurrence in the Bieszczady Mts. was probably not only limited to Mt. Kopa Bukowska. *F. versicolor* was probably also confused with *Festuca picta*, whose doubtful reports were given from different regions of the Bieszczady Mts., i. e. Połonina Caryńska, Połonina Bukowska (JASIEWICZ 1965; ZEMANEK & WINNICKI 1999) and Mt. Kopa Bukowska (GRODZIŃSKA 1958).

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