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Distribution of *Hordelymus europaeus* (L.) Jess. *ex* Harz in forest communities of the Beskid Mały Mountains

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Abstract: The paper presents original and literature data concerning the current distribution of the rare grass *Hordelymus europaeus* (L.) Jess. *ex* Harz in the Beskid Mały Mts. (southern Poland). This study confirms the persistence of *H. europaeus* in Zwalisko (ATPOL DF96). Hitherto, resources of this species have been studied in the eastern part of the range and Suszyce was distinguished as the area of its concentration. New localities on slopes of Suszyce do not change the distribution pattern of the species in the ATPOL 10 km × 10 km grid, because these are in the same square as Zwalisko. Despite that, they should be treated as separate ones. Moreover, extreme localities within Suszyce could also be treated as separate ones, as they represent different squares in the ATPOL subgrid (2 km × 2 km).

Key words: *Hordelymus europaeus,* distribution, new localities, Beskid Mały

Hordelymus europaeus (L.) Jess *ex* Harz (wood barley) is scattered throughout Europe from England and Sweden southwards. It also occurs in southwestern Asia and northwestern Africa (Meusel *et al*. 1965; Hubbard 1968). The species is relatively rare in Poland. It is even regarded as endangered in the Wielkopolska, Kujawy and Ziemia Lubuska regions as well as in the western part of Polish Pomerania (Żukowski & Jackowiak 1995; Piękoś-Mirkowa & Mirek 2002). A significant number of its localities can be found in the northern and the northeastern part of the country, but simultaneously the species is completely absent in central Poland, outside the northeastern limit of the beech range. The highest concentration of its localities is reported from the southern part of the country, i.e. from the Sudetes and Carpathians (Mizianty 2001; Zając & Zając 2001). It was found in the vicinity of the Beskid Mały Mts. by Wilczek (1995) in the area of Bielsko-Biała and Bystra (Silesian Beskid Mts.). The majority of its localities are preserved there within protected areas or in those proposed for protection, e.g. 'Kołowrót', 'Piekielny' (Wilczek 2006).

This species is very rare in the Beskid Mały. It was reported by Myczkowski (1958) from 2 localities in its submontane and lower montane zone. The first locality, confirmed by Żarnowiec *et al*. (1997), was Zasolnica in DF94 (Andrychów Forest District, Zasolnica Forest Range), where it reached 420 m a.s.l. The second, revealed in Zwalisko DF96 (Sucha Forest District, Targoszów Forest Range) at an altitude of 730 m a.s.l., was not confirmed (Kotońska 1991; Mizianty 2001) until the year 2000 (Brzustewicz 2001).

Material for the study was collected during original field research carried out in the Beskid Mały, between 2000 and 2005. It was based upon phytosociological relevés, following the Braun-Blanquet method. The majority of the relevés were made in well-developed, mature (80-120-year-old) forest stands dominated by beech or beech and sycamore, which are subject to forest management. The relevés including *H. europaeus* were compiled into phytosociological tables (Brzustewicz 2001; Barć 2002; Barć & Brzustewicz unpubl.). Syntaxonomic affiliation and nomenclature follows Matuszkiewicz (2001) and the nomenclature of vascular plants follows Mirek *et al*. (2002).

In the paper, the actual distribution of *H. europaeus* localities in the Beskid Mały is shown in the ATPOL grid of 10 km × 10 km squares and subgrid of 2 km × 2 km squares (Zając 1978). The map base (changed) is used after Kotońska (1991). Moreover, the list of new localities with their general characteristics is included. *Hordelymus europaeus* is very rare in the Beskid Mały. In the area of almost 400 km^2 only 3 localities were found: Zasolnica, Zwalisko and Suszyce (Fig. 1).

CHOROLOGY

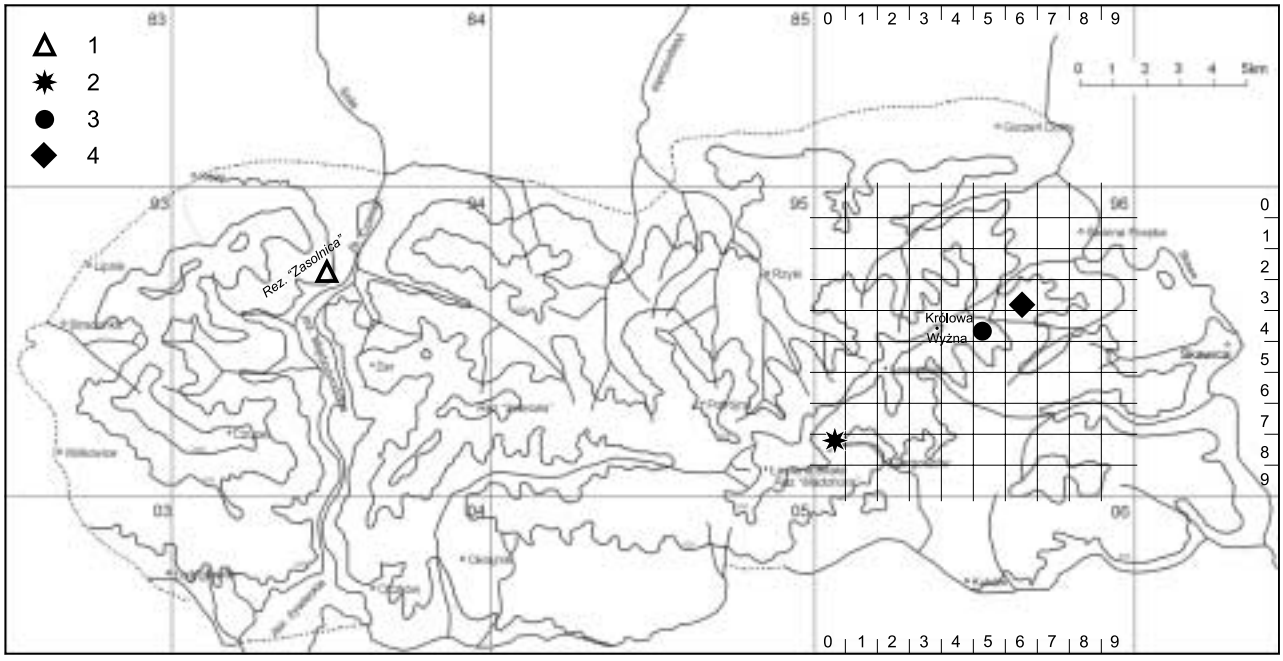

Fig. 1. Distribution of *Hordelymus europaeus* in the ATPOL grid of the Beskid Mały Mountains
Explanations: 1 – Zasolnica; 2 – Zwalisko; 3 – Suszyce, the highest locality; 4 – Suszyce, the lowest locality

The Suszyce localities are new ones for that mountain range and they lie in the DF96 square of the ATPOL grid – the same square as Zwalisko, where it was discovered by Myczkowski (1958) and confirmed by Brzustewicz (2001). The distance between Zwalisko and Suszyce, which is approximately 8000 m in a straight line, allows them to be treated as separate ones. However, this is not enough for the change of the well-known ATPOL pattern of the species distribution in the 10 km × 10 km square grid (Zając & Zając 2001).

Hordelymus europaeus is scattered along the green-marked tourist trail leading from Świnna Poręba village, through Suszyce (561 m a.s.l.) and Królowa Wyżna (817 m a.s.l.) up to Leskowiec (922 m a.s.l.). The highest site of this grass on slopes of Suszyce was situated at 745 m a.s.l. and the lowest one, and actually the easternmost, was at 520 m a.s.l. (see Fig. 1). These 2 localities represent different squares of the 2 km × 2 km ATPOL subgrid, therefore they could be treated as separate ones. Between them, within the distance of approximately 1800 m in a straight line, there are other, more or less spaced connective localities (Table 1).

Hordelymus europaeus occurred in the Beskid Mały in patches of *Dentario glandulosae-Fagetum typicum*

Table 1. The list of *Hordelymus europaeus* localities in the ATPOL grid square DF96 – Zwalisko and Suszyce areas

No.	Forest range	Forest section	Altitude (m a.s.l.)	Exposure	Inclination (°)	Date of relevé	Association/ subassociation	Participation	References
Confirmed locality in the Zwalisko area (Sucha Forest District)									
1	Targ	73a 74b	730	SE	20	7.09.1955	*Fagetum carpaticum*	2.2	Myczkowski 1958
1'	Targ	74b	630	N	10	9.06.2000	*D.g.-F. typ.*	+.2	Brzustewicz 2001
New localities in the Suszyce area (Sucha Forest District)									
1	Mu	46c	745	SSE	10	3.06.2000	*D.g.-F. typ.*	+.2	Barć 2002
2	Mu	46c	740	S	10	27.06.2004	*D.g.-F. typ.*	+.2	Barć & Brzustewicz, unp.
3	Mu	45c	735	S	15	27.06.2004	*D.g.-F. typ.*	+.2	Barć & Brzustewicz, unp.
4	Mu	45c	730	NE	5	26.06.2004	*D.g.-F. typ.*	+.2	Barć & Brzustewicz, unp.
5	Mu	40c	650	NNE	15	27.06.2004	*D.g.-F. typ.*	+.2	Barć & Brzustewicz, unp.
6	Pon	13a	620	NNE	15	27.06.2004	*D.g.-F. typ.*	1.2	Barć & Brzustewicz, unp.
7	Mu	40b	590	SSE	10	3.06.2000	*D.g.-F. lun.*	1.2	Barć 2002
8	Mu	40b	580	NW	ins.	3.06.2000	*D.g.-F. lun.*	+.2	Brzustewicz 2001
9	Pon	11d	550	NNW	15	27.06.2004	*D.g.-F. typ.*	+.2	Barć & Brzustewicz, unp.
10	Pon	11d	530	NNE	20	21.08.2002	*D.g.-F. lun.*	1.2	Brzustewicz, unp.
11	Mu	39a	530	NNE	10	26.06.2004	*D.g.-F. typ.*	1.2	Barć & Brzustewicz, unp.
12	Mu	39a	520	NE	15	26.06.2004	*D.g.-F. typ.*	2.2	Barć & Brzustewicz, unp.

Explanations: Mu – Mucharz, Pon – Ponikiew, Targ – Targoszów; *D.g.-F. typ.* – *Dentario glandulosae-Fagetum typicum*; *D.g.-F. lun.* – *Dentario glandulosae-Fagetum lunarietosum*; ins. – insignificant; unp. – unpublished

rather than in *D.g.-F. lunarietosum*. In both subassociations its participation in the herb layer was relatively low (most frequently up to 1% of the relevé area of 100 m^2). Its scarce participation as well as late flowering – in the end of June, in July and August (Rutkowski 2003) – are some of the possible reasons why it may have been omitted during field studies in beech woods. This also gives rise to the suspicion that its resources still have not been recognized sufficiently.

The strong transformation of the Beskid Mały forest cover has not affected the locality of *Hordelymus europaeus* in Zwalisko, which has persisted at least since 1955. Further studies are needed in order to confirm if Suszyce are truly the area of concentration of the species in the eastern part of this mountain range and if the species' preference for *Dentario glandulosae-Fagetum typicum* is typical for that area.

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