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HAY THERAPY (*FENUM*) IN PHYTOBALNEOTHERAPY WITH THE USE OF *MOLINION CAERULAE* ALLIANCE FROM THE OPOLE PLAIN (SW POLAND)

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ABSTRACT: A new role exists for Polish health resorts and spas, mainly connected with physio-prevention. Their treatments need to be broadened with new standardized forms of therapy. One such example would be phytobalneotherapeutic treatment with hay (*fenum*) used as supplementation in baths, compresses and wrappings. To date, only the general medical properties of hay have been taken into consideration, without respect to the syntaxonomical differentiation of vegetation. However, depending on the share of medicinal species in a given alliance, its hay has specific medical qualities which have not yet been studied in detail. In this study a meadow community was studied following the methods of the Zurich-Montpellier School of Phytosociology. On the Opole Plain, meadow communities from the *Molinion caerulae* alliance are a habitat for more than dominant 11 species which may be used in balneotherapy and other health resort treatments. The properties of the examined alliance indicate that hay from Polish meadow alliances can be appropriate for balneotherapy and spa resort treatment. Knowledge of these meadows is helpful in the usage of these hays in the prevention as well as therapy of many diseases. Hay from meadows belonging to the *Molinietum medioeuropaeum* alliance in the Opole Plain has antibacterial, anti-inflammatory, protozoonicidal, antifungal, antiviral, congestive, antiseptic, anti-rheumatic, antispasmodic,

and antioxidant properties, and is soothing to inflammations of wounds, ulcers and inflammations of the skin. Hay from meadows belonging to the *Junco-Molinietum* alliance in the Opole Plain inhibits autoimmune reactions, and has antibacterial, anti-inflammatory and astringent properties.

KEY WORDS: hay therapy, *fenum*, phytobalneotherapy, meadow community, *Molinion caerulae* alliance, Opole Plain, Poland

Introduction

Nowadays health resorts in Poland are undergoing considerable changes. Forms of healing which are based on pathogenesis are being supplemented by other holistic methods based on salutogenesis, such as the Sebastian Kneipp method (Lindström and Kriksson 2006). In Poland this system is increasingly important as a preventive measure, especially for civilization diseases (Trzewikowska 2003a). This provides a new role for Polish health resorts, mainly connected with physio-prevention, where treatments need to be broadened with new and standardized forms of therapy (Trzewikowska 2003b; Spałek and Trzewikowska 2007; Spałek et al. 2010, 2011). One example would be phytobalneotherapeutic treatment with hay (*fenum*) (Brinkhaus et al. 2009) used as supplementation in baths, compresses and wrappings. Despite the common usage of this method in health resorts, there are not many scientific contributions regarding this subject. The aim of this work is to prompt further clinical research on hay therapy usage showing dependencies on the original meadow community. Hay belonging to special Polish meadow alliances is appropriate for balneotherapy and spa resort treatment, where knowledge of these meadows is helpful in the usage of these hays in the prevention as well as therapy of many diseases (Spałek and Trzewikowska 2011; Spałek et al. 2011).

In Europe, meadows belong to the class *Molinio-Arrhenatheretea*, including mainly semi-natural and anthropogenic turf communities of meadows and pastures (Oberdorfer 1994; Pott 1995; Schubert et al. 1995; Ellenberg 1996; Matuszkiewicz 2007). meadow communities are widespread across the whole Euro-Siberian region, on lowlands, highlands and foothills. In many regions of Poland they belong to the group of the most important vegetation structures defining the physiognomy of a landscape (Ellenberg 1996; Matuszkiewicz 2007). Despite their great economical importance and undeniable cognitive-educational values, hay is still insufficiently examined when it comes to its importance in phytotherapy and in balneology. To date only the general medical properties of hay have been taken into consideration, without respect to the syntaxonomical differentiation of vegetation. However, depending on the participation of medicinal species in a given alliance, hay has specific medical qualities which have not yet been studied in detail.

In Poland, meadow communities belong to two orders: *Molinietalia caeruleae*, with five alliances, and *Arrhenatheretalia*, with three alliances (Matuszkiewicz 2007). The order *Molinietalia caeruleae* includes moist mesothropic and euthropic harvestable meadows, as well as riverside herbs which are permanently or periodically moist and common among lowlands and highlands (Ellenberg 1996; Matuszkiewicz 2007).

The Opole Plain is a large mesoregion covering 2582 km^2 belonging to the Silesian Lowland macroregion (Kondracki 1998) in south-western Poland (Fig. 1). It is located on the western part of the Odra River basin. In terms of geobotanical division by Szafer (1977), the studied area lies within the Odra District belonging to the Silesian Basin.

Methods

The communities were characterized on the basis of phytosociological records following the method of the Zurich-Montpellier School of Phytosociology (Braun-Blanquet 1964; Dzwonko 2007) for the determination of the preservation and directions of transformation of communities. Phytosociological records concerned selected uniform patches, representative for phytocenoses with larger areas. The phytosociological nomenclature and the syntaxonomical nomenclature are based on Oberdorfer (1994) and Matuszkiewicz (2007). The species names of vascular plants are given according to Mirek et al. (2002). Healing properties of herbs were given after Strzelecka and Kowalski (2000).

Results

Medicinal species found in Molinion caerulae alliances

Meadows from the *Molinion caerulae* alliance that have been mowed once and never fertilized, have moist changeable meadows on mineral grounds, and are currently disappearing and are no longer common in Europe. This alliance has developed over a specific period when the main aim of farmers was to obtain meadows and hay for domesticated animals. This type of meadow was mowed yearly or sometimes every second year, usually quite late in September or at the beginning of October. This type of long-term exploitation led to the formation of meadows with a characteristic seasonal rhythm and composition, in which, apart from the dominating *Molinion caerulae*, an important role was played by large and often colorful blooming perennial plants (Ellenberg 1996; Matuszkiewicz 2007). *Molinion caerulae* meadows which are left without mowing for a very long time often transform into a alliance *Filipendulion ulmariae*, from which they historically emerged. Meadows that are utilized in a more intensive way, transform into an *Calthion palustris* alliance. In Poland, these types of meadows are common over the entire country, although usually in small areas and rarely in a classical form (Matuszkiewicz 2007). The *Molinion caerulae* alliance on the Opole Plain includes two communities: *Molinietum medioeuropaeum* and *Junco-Molinietum*.

Molinietum medioeuropaeum Koch 1926

Phytocenoses of *Molinietum medioeuropaeum* are among the most endangered plant communities both in Poland and Europe (Denisiuk et al. 1995). This community is also found on the Opole Plain and is very rare, and every year its area is diminishing. The most common examples are plots that are floristically very poor, with a dominance of *Molinia caerulea*. The most developed *Molinietum medioeuropaeum* patches are found in the vicinity of Zawadzkie, Krasiejów, Kotórz Wielki, Falmirowice, Dyrdy, on the Groszowickie Meadows between Przywory and Kosorowice, and in Staniszcze Małe. They inhabit wet locations where they most often occur close to *Cirsietum rivularis*, *Caricetum gracilis* and meadow communities consisting of *Molinion* and *Calthion* alliances.

The most characteristic species include *Molinia caerulea* and *Gentiana pneumonanthe*, and much less frequently *Dianthus superbus* and *Silaum silaus*. An occurrence of *Iris sibirica* was found in phytocenoses near Dyrdy. Phytocenoses of *Molinietum medioeuropaeum* in the study area, similar to other parts of the country (e.g. Denisiuk 1967, 1976; Pender 1990; Oświt 1991; Kącki et al. 1998; Kącki 2007), often show a significant depletion of especially characteristic species of flora, likely due to intensification of agriculture and control of water flow, and a change in the use of meadows.

Among dominant species in the plots of this alliance on the Opole Plain, medicinal properties are exhibited by *Lysimachia vulgaris*, *Succisa pratensis*, *Lychnis flos-cuculi*, *Sanguisorba officinalis*, *Ranunculus acris*, *Centaurea jacea*, *Rumex acetosa* and *Achillea millefolium* (Tab. 1, 3).

Junco-Molinietum Prsg 1951

Phytocenoses *Junco-Molinietum* are quite rare on the Opole Plain. Their largest areas are found in the vicinity of Brynica, Tworóg, Radomierowice and Falmirowice. They occur in humid locations, often neighbouring communities of *Scheuchzerio-Caricetea nigrae*, and are not usually used for agricultural purposes. Patches of this alliance are characterized by flora depletion. They are dominated by *Molinia caerulea* and to a lesser extent by *Juncus effusus*.

In Poland, this community used to be common and widespread and was considered to be the worst type of meadows, hence its gradual disappearance in many pasture meadow complexes in river valleys (Matuszkiewicz 2007). Among dominant species in the patches of this alliance on the Opole Plain, medicinal properties are exhibited by *Juncus effusus*, *Lysimachia vulgaris*, *Caltha palustris* subsp. *palustris*, *Rumex acetosa* and *Potentilla erecta* (Tab. 2, 4).

Discussion

On the Opole Plain, meadow communities of the *Molinion caerulae* alliance are habitat for more than 11 medicinal plant species, dominant in this meadow, which can be used in balneotherapy and in health resort treatment (tab. 3, 4). Hay, which belongs to the special Polish meadow alliance, is appropriate for balneotherapy and spa resort treatment. Knowledge of these meadows is helpful in the usage of the hay in the prevention as well as therapy of many diseases.

Hay from meadows belonging to the *Molinietum medioeuropaeum* alliance in the Opole Plain has antibacterial, anti-inflammatory, protozoonicidal, antifungal, antiviral, congestive, antiseptic, anti-rheumatic, antispasmodic, and antioxidant properties, and is soothing to inflammations of wounds, ulcers and inflammations of the skin.

Hay from meadows belonging to the *Junco-Molinietum* alliance in the Opole Plain inhibits autoimmune reactions and has antibacterial, anti-inflammatory and astringent properties.

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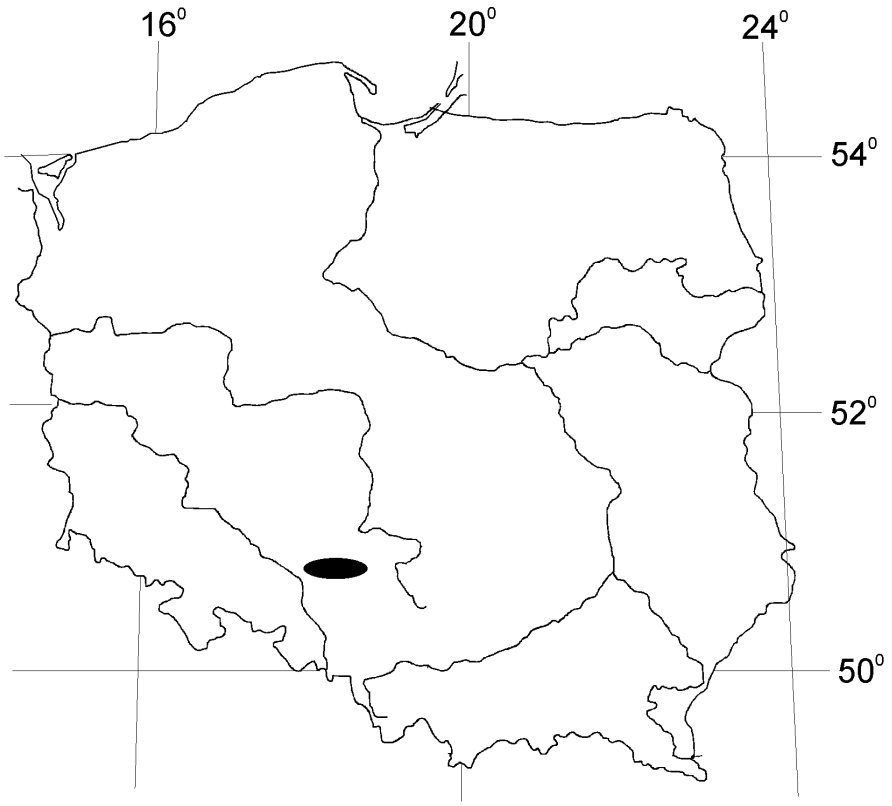

Fig 1. Localization of the Opole Plain.