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THE NEW LOCALITY OF *CHENOPODIUM PUMILIO* R. BR. IN POLAND

Abstract: The clammy goosefoot *Chenopodium pumilio* R. Br. is a rare anthropophyte in the Polish flora. Hitherto, this species was recorded in Gdańsk and Rybnik. The present study describes the newly-discovered locality in Stryków near Łódź (Central Poland), the occurrence of this species in Poland and the general geographical distribution in the world.

Key words: *Chenopodium pumilio*, synanthropic flora, Australian species, alien plants, wool aliens, Poland.

1. INTRODUCTION

In the vicinity of Stryków to the north-east of Łódź, a major transport hub is about to come into existence as the crossing point of A1 and A2 motorways will be located there. The current and predicted changes in the mode of land management in this area provided the incentive for initiation of studies to document the present state of its flora. Already initial floristic exploration brought an unexpected result – the discovery of a site of occurrence of clammy goosefoot *Chenopodium pumilio* R. Br., a synanthropic species rarely recorded in Poland. Correct determination was verified

in the herbarium of the W. Szafer Institute of Botany of the Polish Academy of Sciences in Cracow (KRAM).

Chenopodium pumilio R. Br. (Fig. 1) is an annual plant covered with glandular trichomes; shoots (10-40 cm in length) are reclining and ascending; leaves (1-4 cm in length and 0.5-2 cm in width) sinuously dentate, rhomboid-ovate in shape; flowers in bunches (3-5 mm in diameter), arising in axils of leaves; seeds (0.5-0.8 mm in diameter), reddish-brown in colour, brilliant, laterally flattened (BRENAN 1964; TRZCIŃSKA-TACIK 1992). The study presents the geographical distribution of this species and the location of its new site of occurrence in Poland.

Fig. 1: Habit of *Chenopodium pumilio* R. Br. (after Dostalek *et al.* 1990, modified)

2. GEOGRAPHICAL DISTRIBUTION AND CONDITIONS OF OCCURRENCE

Chenopodium pumilio R. Br. is a native species in Australia and Tasmania. It is most probably an adventive species in New Zealand and New Caledonia. Within

the limits if its natural range it prefers sunny habitats on loam, clay or sand-based soils. It occurs sometimes on salt-containing soils. It grows along shores of rivers and water bodies. It occurs often in synanthropic communities – both ruderal and segetal ones (FLORABASE THE WESTERN AUSTRALIAN FLORA; AELLEN 1960).

As an introduced and partially naturalised species, the clammy goosefoot occurs in Asia (New Zealand, New Caledonia, Papua New Guinea, Korea, China, Japan, Iran), Africa (South Africa, Zimbabwe, Kenya, Ethiopia, Botswana), South America (Argentina), North America (USA) and in numerous European countries (Portugal, Spain, France, England, Scotland, Belgium, Holland, Denmark, Sweden, Norway, Germany, Austria, Czech Republic, Slovakia, Poland, Ukraine, Hungary, Romania) (GLOBAL BIODIVERSITY INFORMATION FACILITY; PROBST 1949; AELLEN 1960; GLEASON & CRONQUIST 1963; BRENAN 1964; HUNZIKER 1965; HEJNÝ & SCHWARZOVÁ 1978; TRZCIŃSKA-TACIK 1992; CHYTRÝ 1993; URBISZ 1996; MOSYAKIN & FEDORONCHUK 1999; HALVORSEN *et. al.* 1998, FERÁKOVÁ 2002; MISIEWICZ & KORCZYŃSKI 2003; RAHIMINEJAD 2004; CHANG-SHAN & SHI-XIN 2006).

Chenopodium pumilio has been introduced to Europe since the late 18th century together with raw wool imported from Australia (PROBST 1949; AELLEN 1960). First records were made in the localities DÖHREN (1889) in Germany (PROBST 1949; AELLEN 1960) and NOSISLAV (1890) in Moravia (HEJNÝ & SCHWARZOVÁ 1978). In Germany, Czech Republic and Slovakia, where it has spread from its initial sites of introduction (wool spinning mills, ports, railway areas) and now occurs in fields, pastures and on river alluvia (AELLEN 1960; LHOTSKA & HEJNY 1979; DOSTALEK *et al.* 1990), it is considered to be a naturalised, but non-invasive species (LHOTSKA & HEJNY 1979; DOSTALEK *et al.* 1990; HAEUPLER & MUER 2000; ROTHMALER 2002; PYŠEK *et. al.* 2002).

The species shows a phytocoenotic optimum in Germany in plant communities from the *Sisymbrion officinalis* and *Chenopodion rubri* alliances (OBERDORFER 1990), while in the Czech Republic its optimum occurs within *Malvion neglectae*, *Polygonion avicularis* and *Sisymbrion officinalis* (DOSTALEK *et al.* 1990).

3. OCCURRENCE IN POLAND

Hitherto, only two localities of *Chenopodium pumilio* had been known:
1) port in Gdańsk – since 1974, the species has persisted along the unloading quay on the depot area and on railway grounds (TRZCIŃSKA-TACIK 1992; MISIEWICZ & KORCZYŃSKI 2003).
2) Rybnik-Piaski – in 1992, 3 individuals were found to occur on a sandy roadside, accompanied by *Polygonum aviculare*, *Plantago major* and *Chenopodium album*. In the subsequent year, the locality was destroyed due to the construction of a concrete sidewalk (URBISZ 1996; ALINA URBISZ personal communication).

A new locality of this species was discovered in 2005 in Stryków, a small town (3000 inhabitants) located ca. 15 km to the north-east of Łódź in ATPOL square DD 67 (ZAJĄC 1978). *Chenopodium pumilio* occurred together with *Digitaria ischaemum* on a strongly trampled strip of land between Stryjkowskiego street and the adjoining sidewalk. The population numbered over a dozen individuals and occupied an area of ca. 1 m^2 (Fig. 2). In 2008, the site of occurrence was partially destroyed when it was buried under a heap of sand used for construction purposes. However, two individuals survived and were able to flower and bear fruit, thus giving hope for preservation of the population of this species in the future. Herbarium documentation of the new locality was deposited in the Herbarium Universitatis Lodziensis (LOD).

4. CONCLUSIONS

It is difficult to unequivocally explain the origin of the *Chenopodium pumilio* population discovered in Stryków. In all probability it is a secondary site of occurrence where the species spread from its initial site of introduction. The strip of ground on which the goosefoot population occurs used to be a lawn in the past. Perhaps, as it was often the case in the past, in the process of its preparation soil was fertilised with wool-cleaning waste material brought from nearby Łódź. However, a doubt is raised by the fact that all wool mills in Łódź ceased their activity already

more than ten years ago and even in their last years of activity the raw material they used was wool previously cleaned elsewhere. It is difficult to presume that the discovered population could have persisted in a locality constantly vulnerable to easy destruction for such a long period of time. Furthermore, occurrence of the clammy goosefoot has never been recorded from Łódź itself despite over 40 years of intensive studies on the urban flora, even though numerous other species customarily introduced with raw wool were found to grow there (WITOSŁAWSKI 2006). Most probably the source of diaspores in this case was different.

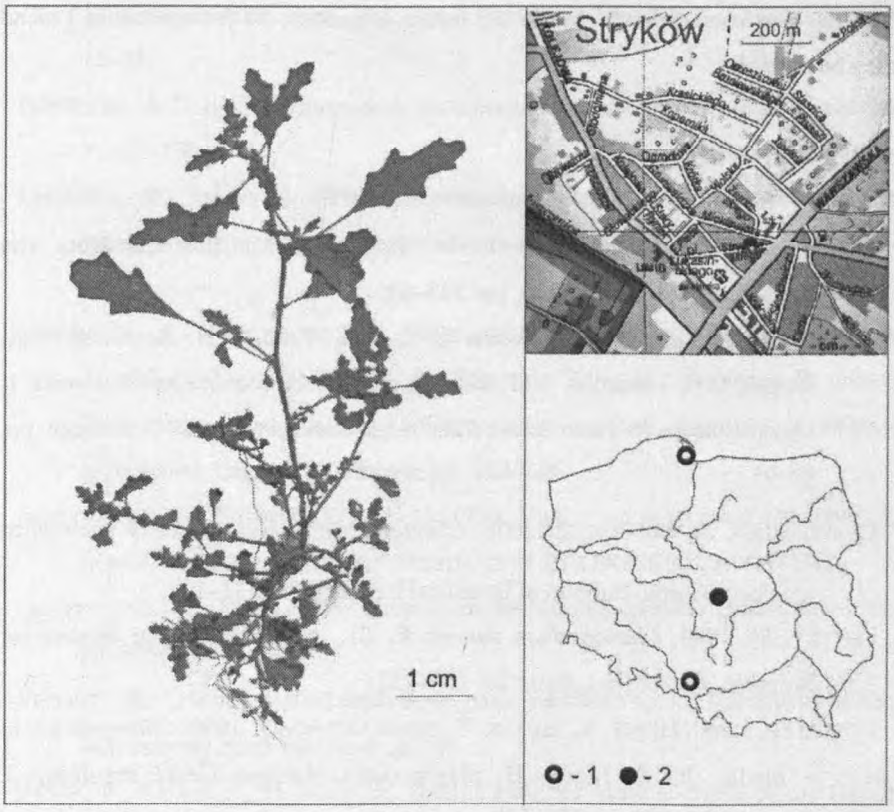

Fig. 2: Herbarium specimen of *Chenopodium pumilio* R. Br. from the locality in Stryków (leg. P. Witosławski, 19 June 2005). Location of the site of (top right) and distribution of the species in Poland (bottom right). 1 – localities known from literature; 2 – new locality of the species

MISIEWICZ and KORCZYŃSKI (2003) suggest that due to its persistent occurrence in Gdańsk *Chenopodium pumilio* should be considered a naturalised species and listed as an epoecophyte. The lack of spreading tendency of this species in Poland is explained by the less propitious climate conditions in comparison to the Czech Republic where the species has undergone expansion for an extended period of time, spreading from industrial centres predominantly along major river valleys (LHOTSKA & HEJNY 1979; TRZCIŃSKA-TACIK 1992).

Naturalisation of *Chenopodium pumilio* in neighbouring countries, its persistent occurrence in Gdańsk and the appearance of secondary sites of occurrence (Rybnik, Stryków) indicate that in the future, expansion of this species in Poland may be possible.

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