Fragm. Flor. Geobot. 45(1–2): 513–539, 2000

BOTANICAL NOTES

Veronica peregrina (Scrophulariaceae) in Kraków – rediscovered after a century

In May 2001 the authors spotted two localities of the rare alien plant *Veronica peregrina* L. in Kraków (S Poland). The species has not been reported from the town nor its close vicinity for more than a century.

STATION 1. Kraków-Mydlniki; in masses on the slimy bottom of a temporarily emptied fishpond of the Experimental Fish Breeding Station of the University of Agriculture in Kraków. 50°05′20″N, 19°50′30″E, alt. ca 220 m a.s.l., ATPOL 2 × 2 km grid square: **DF69**10[1], 13 May 2001, *leg. et det. W. Paul* (hb. Paul).

During a second visit to the locality, two weeks later, the pond was already submerged and only a few specimens of *V. peregrina* survived on the shore just above the water level. In the other fishpond, however, still emptied, some hundred specimens in fruit could be found.

STATION 2: Kraków-Wesoła; several specimens on bare soil on the edges of flower beds in various parts of the systematics division of the Botanical Garden of the Jagiellonian University. 50°03′45″N, 19°57′30″E, alt. ca 205 m, 2 × 2 km ATPOL grid square: **DF69**24, 21 May 2001, *leg. et det. J. Guzik & A. Pacyna* (hb. Guzik).

In the Botanical Garden the plant is being eliminated as a weed during cultivation. It is hard to say whether the species is persisting there since it was found at the end of 19th century or has been brought here again only recently.

As for the origin of the species at the first station, we can hypothesize that its seeds were brought with fry and/or fish fodder or transferred from, for example, Kotlina Oświęcimska basin stations by waterfowl, but the date of arrival remains unknown. It may have been transported to the Botanical Garden with garden soil or imported plant species.

Veronica peregrina is a herbaceous annual, usually 10 to 30 cm high, with inconspicuous white or pale blue flowers and obcordate, glabrous capsules with stigma shorter than the fruit's incision, dispersing by small, very numerous (tens per capsule) seeds (Fig. 1A–D).

Veronica peregrina is an example of an originally American species of disjunct distribution. In the southern part of South America it is represented by *V. peregrina* subsp.

[1] For ATPOL basics and numbering conventions see Zając (1978), Zając and Zając (1998).

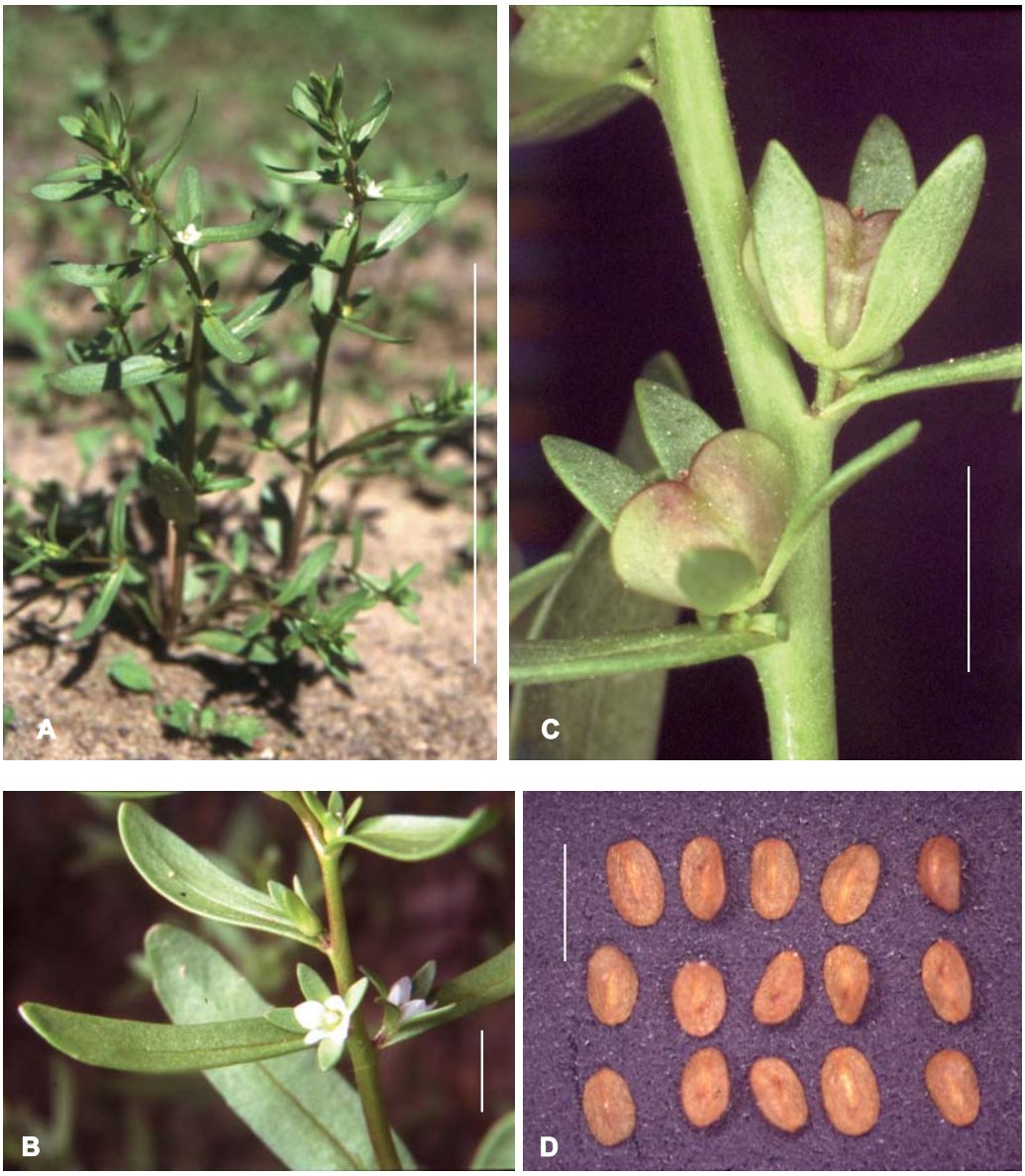

Fig. 1. *Veronica peregrina* L. **A**. Habitus on a dry fishpond bottom in Kraków-Mydlniki; scale bar: 10 cm. **B**. Closeup of flowers in bracteoles' axils; scale bar: 1 cm. **C**. Closeup of fruits; scale bar: 1 cm. **D**. Seeds; scale bar: 1 mm. Phot. W. Paul.

xalapensis (Humb., Boupl. & Kunth) Pennell, and in North America (mostly to the south of the 50^{o}N parallel) by both *V. peregrina.* subsp. *xalapensis* (in the west, north and central part of the continent) and a typical subspecies – *V. peregrina* subsp. *peregrina* (in the eastern part). The plant grows now as a synanthrope in most of Europe, chiefly subsp.

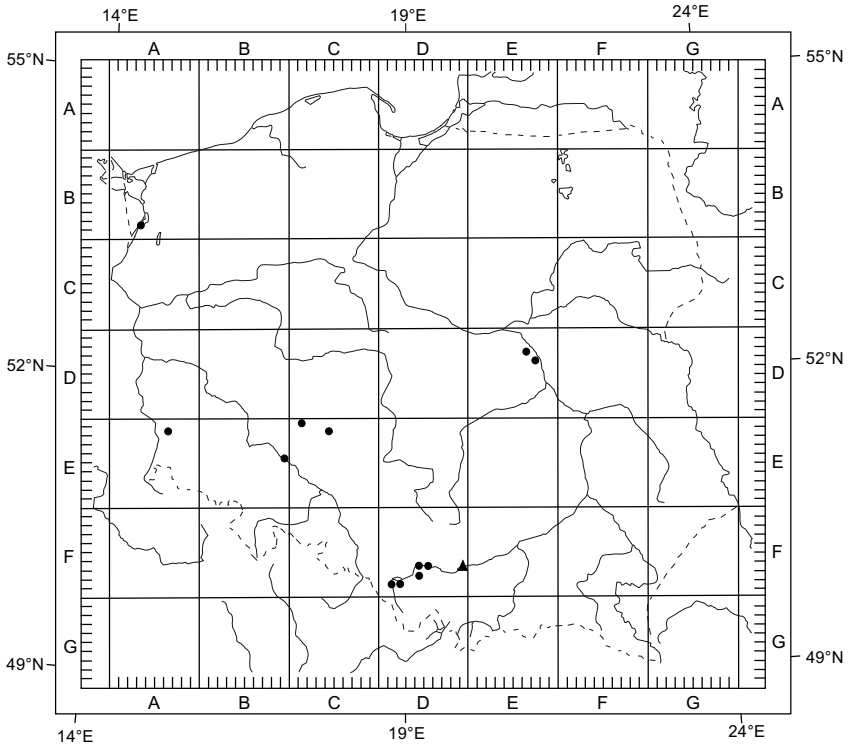

Fig. 2. Stations of *Veronica peregrina* L. in Poland in ATPOL grid square system. Triangle marks square DF 69 of the Kraków stations.

peregrina, to which all the specimens reported to date from Poland also belong (Zając & Zając 1990), as well as in East Asia and South Australia, where mostly subsp. *xalapensis* occurs (Meusel *et al*. 1978; Hultén & Fries 1986). Lately a station new to Africa was reported from Libya (Quaiser 1982).

In Europe *V. peregrina* appeared first at the end of 17th century (England 1680). In many European countries it is regarded as a fully established species showing a tendency towards widening its range. This applies first of all to West European countries, especially along the bigger European river valleys such as the Rhine, Weser and Danube (Hartl 1965; Bangerter 1966; Nilsson 1971; Walters & Webb 1972; Haeupler & Schönfelder 1988; Clement & Foster 1994; Weeda 1987). Further eastward it becomes more scattered and appears mostly only sporadically. However, some new stations of the plant are still being reported, such as from Belarus, Ukraine and Slovakia (Bortnyak 1979; Peniašteková & Feráková 1993; Dzhus & Tret'iakov 1999).

Within the primary range, in the temperate parts of North and South America, *V. peregrina* occurs in marshes, estuaries, moist lake shores, edges of ponds, banks of streams, alluvial soils of valleys, swamps, swales, wet meadows, low moist woodlands, and other damp or wet open places. From these habitats it spreads to lawns, fallow and cultivated

ground, fertile fields and garden plots, often as a difficult to eradicate, aggressive weed. It also may be found along roadsides and railroads as well as in waste places (Deam 1940; Steyermark 1963; Gleason 1968; Fernald 1970; Rousseau 1974; Scoggan 1979; Weeds of the north central states 1981; Rhoads & Klein 1993).

Similarly to the sites within its native parts, within the secondary, European range *V. peregrina* grows mostly in moist, open places, in meadows, lake and pond shores, river and oxbow banks, temporarily submerged dead river branches, as well as on alluvial soils, especially sandy-loamy substrates in river channels. It may be found chiefly in pioneering communities of the *Nanocyperion flavescentis*, *Bidention tripartitae* and *Agropyro-Rumicion crispi* alliances. The plant also occurs along railroads, in gardens, parks, tree and ornamental bush nurseries, on newly prepared lawns and flower beds or in flower containers. Reports on the occurrence of the species in cemeteries are more and more numerous lately – it grows there on gravel lanes and graves (Melzer 1992, 1994; Dörr 1994), where its seeds are transferred probably with garden soil or imported ornamental plants.

The plant is generally regarded as a very rare alien species in the flora of Poland, by some authors as an established one (Zając & Zając 1990; Mirek *et al*. 1995), and by most of the others as an ephemerophyte only (Fiek 1881; Schube 1903; Rostański & Sowa 1988; Trzcińska-Tacik 1979; Sudnik-Wójcikowska 1987; Sudnik-Wójcikowska & Guzik 1998). In adjacent countries it is also a rare species, as indicated in the papers and distribution maps of eastern Germany (Benkert *et al*. 1996), the Czech Republic (Hrouda 2000), Slovakia (Peniašteková & Feráková 1993), Ukraine (Bortnyak 1979), Belarus (Dzhus & Tret'iakov 1999) and Lithuania (Gudžinskas 1998). There *V. peregrina* is most often considered not to be an established plant.

According to Tacik and Trzcińska-Tacikowa (1963), in Kraków it was collected for the first time by Feliks Berdau at Sikornik hill (about 5 km SE of Station 1) in 1854 and determined by the collector as *V. verna*. This specimen is preserved to date in the herbarium of the Institute of Botany of the Jagiellonian University (KRA 172327). Moreover, in the herbarium of the Institute of Botany of the Polish Academy of Sciences there is one sheet of *V. peregrina* by an unknown collector (KRAM 189309), dated 25 June [18]84 with remark: "grows as a very common and stubborn weed on nearly every flower bed in the botanical garden". Although the identity of the garden is not stated explicitly, the information almost surely regards the Botanical Garden of the Jagiellonian University. Since that time no data have been published on the presence of *V. peregrina* in Kraków or its surroundings. The closest stations found so far (see Fig. 2) lie ca 40 km to the west in the Kotlina Oświęcimska basin. Most of the remaining data come from western Poland: Lower Silesia (Wrocław, where the species was regarded by Uechtritz in 1865 as a long-established weed in the Botanical Garden; Tacik & Trzcińska-Tacikowa 1963), Bory Dolnośląskie forest east of the Nysa Łużycka River, Kalisz region, ponds in the vicinity of Milicz, and the mouth of the Odra River area (Szczecin). Apart from these, two stations were given from Warsaw. These make 13 stations altogether, counted as 10×10 km ATPOL grid squares hitherto known from Poland (complete list of localities at the end of the paper).

The question remains whether *V. peregrina* can be regarded as fully established in Poland already. Based on the data on its occurrence obtained so far we do not think this be confirmed definitely yet. Almost all of these data are single observations only, mainly from unstable habitats (such as the temporarily emerging fishpond bottoms). The mass occurrence of the species need not necessarily indicate its full naturalization. The problem may be resolved only after a longer period of observations of the plant's behavior in our country. It is probable that *V. peregrina* is generally overlooked by naturalists due to the overall similarity of its smaller forms to other, more frequent speedwell species (e.g., *V. arvensis*), as well as its short and early life cycle – it flowers in April and May, fruits in May, and by the late May or early June it usually dies and disappears completely. Only sometimes, as may be inferred from the dates of collection of some herbarium specimens, a late summer (second?) generation may also appear.

Localities in Poland

In square brackets [ ] – year of observation/collection; (ATPOL) – data derived directly from (and cited after) ATPOL database.

GRID SQUARE **AB: 83** – Szczecin, in the flower bed [1991], *leg. M. Ciaciura* (KTU, OLSZ, WA – ATPOL);

GRID SQUARE **AE: 16** – between Parowa and Ruszów [1987], *leg. B. Jackowiak & J. Chmiel* (POZ – Zając & Zając 1990);

GRID SQUARE **BE: 49** – Wrocław, weed in botanical garden, regarded by Uechtritz in 1865 as established for long (Tacik & Trzcińska-Tacikowa 1963; Fiek 1881);

GRID SQUARE **CE: 01** – Ruda Milicka [1998], *Z. Dajdok, Z. Kącki*, unpubl. (ATPOL); **14** – Rybin, parish Kobyla Góra, pond in the village [1993] (Popiela 1996);

GRID SQUARE **DF: 64** – Brzezinka near Oświęcim [1986], *leg. M. Zając* (Zając 1989; Zając & Zając 1990); same square **–** Pławy, on the Vistula river [1986], *leg. M. Zając* (Zając 1989; Zając & Zając 1990); **65** – Zagórcze Małe near Libiąż [1988], *L. Olesiński*, unpubl. (ATPOL); **69** – Kraków: Sikornik [1854], *leg. F. Berdau* (as *V. verna*; *rev. T. Tacik* 1961, KRA 172327); **69**10 – Kraków-Mydlniki [2001], *leg. W. Paul* (hb. Paul); **69**24 – Kraków-Wesoła, very common and stubborn weed on nearly every flower bed in the botanical garden [1884], *leg. ?* (KRAM 189309); same locality [2001], *leg. J. Guzik & A. Pacyna* (hb. Guzik); **74**33 – Osiek [1999], *leg. B. Banaś* (hb. Banaś, ATPOL); **81** – Drogomyśl, parish Chybie [1978], *leg. T. Nowak-Fryda* (KTU – Zając 1989, Zając & Zając 1990); same locality, sandy place in the Vistula river valley [1978], *leg. T. Nowak-Fryda* (KRA 138747); **82** – Gołysz near Chybie, muddy bottom of a pond, from which the water has been sluiced away, in the community of therophytes [1970], *leg. A. & J. Kornaś* (KRA 129225); same locality, ponds at the farm of the Polish Academy of Sciences [1986], *leg. M. Zając* (Zając & Zając 1988; Zając 1989; Zając & Zając 1990; same square, Bronów [1987], *leg. M. Zając* (Zając 1989; Zając & Zając 1990);

GRID SQUARE **ED: 26** – Warszawa, waste ground in the Botanical Garden [1962], *leg. M. Zanowa* (WA); **37** – Warszawa-Powsin, waste ground in the Botanical Garden of the Polish Academy of Sciences [1998], *H. Galera, pers. comm.* (Guzik & Sudnik-Wójcikowska 1998).

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References

BANGERTER E. B. 1966. Further notes on *Veronica peregrina* L. – Proc. Bot. Soc. Br. Isl. **6**(3): 215–220.

BENKERT D., FUKAREK F. & KORSCH H. (eds). 1996. Verbreitungsatlas der Farn- und Blütenpflanzen Ostdeutschlands (Mecklenburg-Vorpommern, Brandenburg, Berlin, Sachsen-Anhalt, Sachsen, Thüringen). 615 pp. G. Fischer, Jena.

BORTNYAK M. M. 1979. Novi mistzezrostannya *Veronica peregrina* L. na Ukraini [New habitats of *Veronica peregrina* L. in the Ukraine]. – Ukr. Bot. Zhurn. **36**(6): 598–599 (in Ukrainian with English summary).

CLEMENT E. J. & FOSTER M. C. 1994. Alien plants of the British Isles. xvi + 590 pp. Botanical Society of the British Isles, London.

DEAM CH. 1940. Flora of Indiana. Authorized reprint 1970. 1236 pp. J. Cramer, Lehre.

DÖRR E. 1994. Notizen zur Allgäu Flora aus dem Jahre 1993. – Mitt. Naturwiss. Arbeitskr. Kempten **33**(1): 5–24.

DZHUS M. A. & TRET'IAKOV D. I. 1999. *Veronica peregrina* L. (Scrophulariaceae Juss.) novyj zanosnyj vid vo flore Belarusi [*Veronica peregrina* L. (Scrophulariaceae Juss.) – a new adventive species for Belarusian flora]. – Ukr. Bot. J. **56**(6): 620–623 (in Russian with English summary).

FERNALD M. L. 1970. Gray's manual of botany. Ed. 9. lxiv + 1632 pp. D. Van Nostrand Company, New York – Cincinnati – Toronto – London – Melbourne.

FIEK E. 1881. Flora von Schlesien preussischen und österreichischen Antheils. 164 + 571 pp. J. U. Kern, Breslau.

GLEASON H. A. 1968. The new Britton and Brown illustrated flora of the Northeastern United States and adjacent Canada. **3**. The Sympetalous Dicotyledoneae, Clethraceae to Compositae. iii + 595 pp. Hafner Publishing Company Inc., New York – London.

GUDŽINSKAS Z. 1998. Conspectus of alien species of Lithuania. 6. Lamiaceae and Scrophulariaceae. – Bot. Lithuan. **4**(2): 119–135.

HAEUPLER H. & SCHÖNFELDER P. (eds). 1988. Atlas der Farn- und Blütenpflanzen der Bundesrepublik Deutschland. 768 pp. E. Ulmer, Stuttgart.

HARTL D. 1965. Scrophulariaceae. – In: D. HARTL & G. WAGENITZ (eds), G. Hegi Illustrierte Flora von Mitteleuropa. **6**(1), pp. 146–236. P. Parey, Berlin – Hamburg – München.

HROUDA L. 2000. *Veronica* L. – In: B. SLAVÍK (ed.), Květena Česke republiky [Flora of the Czech Republic]. **6**, pp. 355–397. Academia, Praha (in Czech).

HULTÉN E. & FRIES M. 1986. Atlas of North European vascular plants north of the tropic of Cancer. **2**. xi + 499–968 pp. Koeltz Scientific Books, Königstein.

MELZER H. 1992. Neues zur Flora von Steiermark. 33. – Mitt. Naturwiss. Ver. Steiermark **122**: 123–133.

MELZER H. 1994. *Sporolobus neglectus*, ein neues Gras in der Flora Österreichs und Funde weiterer bemerkenswerter Blütenpflanzen in Kärnten. – Carinthia II **184/104**: 499–513.

MEUSEL H., JÄGER E., RAUSCHERT S. & WEINERT E. 1978. Vergleichende Chorologie der zentraleuropäischen Flora. **2** (Karten). 421 pp. G. Fischer, Jena.

MIREK Z., PIĘKOŚ-MIRKOWA H., ZAJĄC A. & ZAJĄC M. 1995. Vascular plants of Poland: a checklist. – Polish Bot. Stud. Guideb. Ser. **15**: 1–303.

NILSSON Ö. 1971. *Veronica peregrina* L. (Scrophulariaceae) i Skandinavien [*Veronica peregrina* L. (Scrophulariaceae) in Scandinavia]. – Svensk Bot. Tidskr. **65**(4): 393–398 (in Swedish with English abstract).

PENIAŠTEKOVÁ M. & FERÁKOVÁ V. 1993. *Veronica peregrina* L. – neoindigenofyt flóry Slovenska [*Veronica peregrina* L. – the neoindigenophyte of the flora of Slovakia]. – Biológia (Bratislava) **48**(1): 31–35 (in Slovak with English abstract).

POPIELA A. 1996. Zbiorowiska z klasy *Isoëto-Nanojuncetea* na terenie Polski Zachodniej [Communities from the *Isoëto-Nanojuncetea* class in western Poland]. – Fragm. Flor. Geobot. Ser. Polonica **3**: 289–310 (in Polish with English summary).

QUAISER M. 1982. Scrophulariaceae. – In: S. M. H. JAFRI & A. EL-GADI (eds), Flora of Libya. **88**. 70 pp. The National Academy for Scientific Research, Tripoli.

RHOADS A. F. & KLEIN W. M. jr. 1993. The vascular flora of Pennsylvania. Annotated list and atlas. 636 pp. American Philosophical Society, Philadelphia.

ROSTAŃSKI K. & SOWA R. 1986–1987. Alfabetyczny wykaz efemerofitów Polski [Alphabetical list of the ephemerophytes of Poland]. – Fragm. Flor. Geobot. **31/32**(1/2): 151–205 (in Polish with English summary).

ROUSSEAU C. 1974. Géographie floristique du Québec / Labrador. Distribution des principales espèces vasculaires. xiv + 798 pp. Les Presses de L'Université Laval, Québec. Trav. Doc. Centre d'Étud. Nord. 7.

SCHUBE T. 1903. Die Verbreitung der Gefässpflanzen in Schlesien preussischen und österreichischen Anteils. IV + 361 pp. Druck R. Nischkowsky, Breslau.

SCOGGAN H. J. 1979. The flora of Canada. **4**. Dicotyledoneae (Loasaceae to Compositae). 1117–1711 pp. National Museum of Natural Sciences National Museums of Canada, Ottawa.

STEYERMARK J. A. [1963]. Flora of Missouri. lxxiii + 1725 pp. The Iowa State University Press, Ames.

SUDNIK-WÓJCIKOWSKA B. 1987. Flora miasta Warszawy i jej przemiany w ciągu XIX i XX wieku. Część 2 ["Flora of the city of Warsaw and its changes during 19th and 20th century. Part 2"]. 435 pp. Wydawnictwo Uniwersytetu Warszawskiego, Warszawa (in Polish, with English and German summaries).

SUDNIK-WÓJCIKOWSKA B. & GUZIK J. 1998. Flora Warszawy – uzupełnienia. Antropofity ["Flora of Warsaw – supplement. Anthropophytes."] – In: B. SUDNIK-WÓJCIKOWSKA (ed.), Flora miasta Warszawy i jej przemiany w ciągu XIX i XX wieku. Część 3. Dokumentacja 1987–1997 ["Flora of the city of Warsaw and its changes during 19th and 20th century. Part 3. Documentation 1987–1997"]. pp. 21–40. Wydawnictwo Uniwersytetu Warszawskiego, Warszawa (in Polish).

TACIK T. & TRZCIŃSKA-TACIKOWA H. 1963. *Veronica* L. – In: B. PAWŁOWSKI (ed.), Flora Polska. Rośliny naczyniowe Polski i ziem ościennych ["Polish Flora. Vascular plants of Poland and adjoining territories"]. **10,** pp. 280–338. Państwowe Wydawnictwo Naukowe, Warszawa – Kraków (in Polish).

TRZCIŃSKA-TACIK H. 1979. Flora synantropijna Krakowa ["The synanthropic flora of Kraków"]. – Rozpr. Habil. Uniw. Jagiell. **32**: 1–278 (in Polish).

WALTERS S. M. & WEBB D. A. 1972. *Veronica* L. – In: T. G. TUTIN, V. H. HEYWOOD, N. A., BURGES, D. M. MOORE, D. H. VALENTINE, S. M. WALTERS & D. A. WEBB (eds), Flora europaea. **3**. Diapensiaceae to Myoporaceae, pp. 242–251. Cambridge University Press, Cambridge.

WEEDA E. J. 1987. Invasions of vascular plants and mosses into the Netherlands. – Proc. Kon. Nederl. Akad. Wetensch. Ser. C **90**(1): 19–29.

WEEDS OF THE NORTH CENTRAL STATES. 1981. Bull. Univ. Illinois at Urbana-Champaign, College Agricult., Agricult. Exper. Stat. **772**: 1–303.

ZAJĄC A. 1978. Atlas of distribution of vascular plants in Poland (ATPOL). – Taxon **27**(5–6): 481–484.

ZAJĄC M. 1989. Flora południowej części Kotliny Oświęcimskiej i zachodniej części Pogórza Śląskiego [Flora of the southern part of the Oświęcim Basin and Silesian Foothills]. – Zesz. Nauk. Uniw. Jagiell. **952**, Pr. Bot. **19**: 1–199 (in Polish with English summary).

ZAJĄC M. & ZAJĄC A. 1988. Zbiorowiska z klasy *Isoëto-Nanojuncetea* na dnach wysychających stawów w południowej części Kotliny Oświęcimskiej [Communities of the class *Isoëto-Nanojuncetea* on the bottoms of drying-up ponds in the S part of the Oświęcim Basin (Southern Poland)]. – Zesz. Nauk. Uniw. Jagiell. **872**, Prace Bot. **17**: 155–160 + 2 tables (in Polish with English summary).

ZAJĄC M. & ZAJĄC A. 1990. Nowy kenofit w Polsce – *Veronica peregrina* L. [A new kenophyte in Poland – *Veronica peregrina* L.] – Zesz. Nauk. Uniw. Jagiell. **968**, Pr. Bot. **21**: 145–150 (in Polish with English summary).

ZAJĄC M. & ZAJĄC A. (eds). 1998. Atlas rozmieszczenia roślin naczyniowych w woj. krakowskim [Distribution atlas of vascular plants in Kraków Province]. 134 pp. Laboratory of Computer Chorology, Institute of Botany, Jagiellonian University, Kraków.

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New locality of Cerastium brachypetalum (Caryophyllaceae) on the Silesian Upland

Cerastium brachypetalum Pers. is a Subatlantic–Mediterranean species with the eastern border of its geographical limit in Poland (Zając 1975). For most of the Polish localities of this species there is no current confirmation or else the localities are treated as extinct. Only one locality in Dzierżysław near Kietrz (Engler 1869) has been recorded as still existing (Spałek, pers. comm.) (Fig. 1). *C. brachypetalum* is included in the *Red list of threatened vascular plants in Poland* (Zarzycki & Szeląg 1992) because of its rarity and tendency toward extinction.

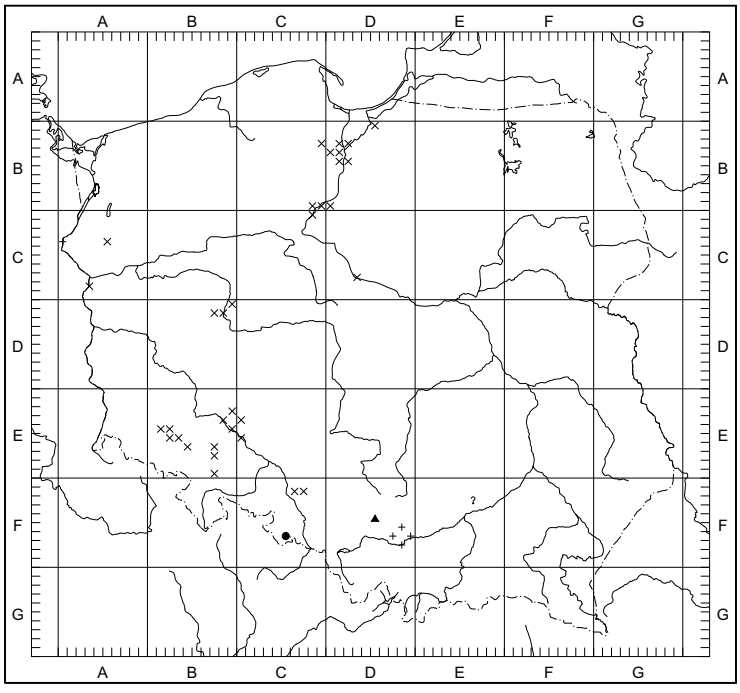

Fig. 1. Distribution of *Cerastium brachypetalum* Pers. in Poland. ● – current locality; ▲ – new locality; + – extinct locality; × – uncertain locality.