



SPONTANEOUS OCCURRENCE OF *COTONEASTER LUCIDUS* SCHLTDL. IN THE TOWN OF AUGUSTÓW (NE POLAND)

ARTUR PLISZKO

A. Pliszko, Department of Plant Taxonomy, Phytogeography and Herbarium, Institute of Botany, Jagiellonian University in Cracow, Kopernika 31, 31-501 Kraków, Poland, e-mail: artur.pliszko@uj.edu.pl

(Received: November 15, 2013. Accepted: February 18, 2014)

ABSTRACT. *Cotoneaster lucidus* Schltdl., a potentially invasive alien plant in Poland, is reported from the town of Augustów for the first time (the ATPOL square: FB39). This is the second record of the species occurrence in north-eastern Poland. A new spontaneous population consists of 36 individual shrubs (groups of stems) dispersed on an area of about 0.2 ha, except one dense clump occupying an area of about 20 m². Phytosociological characteristics of the habitat is provided, and the potential threats are discussed.

KEY WORDS: *Cotoneaster lucidus*, alien species, potentially invasive plant, distribution, Poland

INTRODUCTION

Cotoneaster lucidus Schltdl. (Rosaceae), a cold-hardy deciduous shrub, is native to Central and Eastern Asia (the Altai Mountains, Gansu, eastern Siberia) where it occurs on rocky slopes and riversides, mostly in coniferous forests and thickets (LINGDI & BRACH 2003, SLABAUGH & SHAW 2008, SENETA & DOLATOWSKI 2009). It is also a widely cultivated ornamental plant, particularly valued as a formal hedge, screen or small-scale windbreak in Europe and North America (FLINT 1997, SENETA & DOLATOWSKI 2009, SENNIKOV 2011). Interestingly, its fruits are commonly eaten by birds, thereby it easily escapes from gardens and places of original cultivation to nearby located forests and margins of forests. Moreover, in favourable conditions it has an ability to colonise new areas rapidly by root-suckering, causing a strong competition for indigenous species. *Cotoneaster lucidus* has been reported from Eastern, Northern and Central Europe as a casual or established alien with invasive capacity (JOHN and FRANK 2008, ÖÖPIK et al. 2008, SENNIKOV 2009, 2011).

Some taxonomists equate *C. lucidus* with *C. acutifolius* Turcz. (DICKORÉ & KASPEREK 2010) or they accept it as *C. acutifolius* var. *lucidus* (Schltdl.) L.T. Lu which differs from the type variety by its adaxially glabrous leaf blade, usually glabrous hypanthium and bigger fruits (LINGDI & BRACH 2003).

Unfortunately, both taxa are often confused with each other.

In Poland, *C. lucidus*, previously recognised as *C. acutifolius* Lindl. (MIREK et al. 2002), has been under cultivation from the end of 19th century (ABROMEIT et al. 1898). Its spontaneous spread started several decades ago in the Wielkopolska National Park (DANIELEWICZ & MALIŃSKI 2004) and Białowieża Forest (ŁUCZAJ & ADAMOWSKI 1991). This plant was also reported as a rare neophyte from the Eastern Sudety Mountains (KOSIŃSKI & BEDNORZ 2003) and Woźniki-Wieluń Upland (JAKUBOWSKA-GABARA et al. 2012). Nowadays it is regarded as a potentially invasive species occurring especially in disturbed oak-hornbeam forests with *Galio-Carpinetum* association (TOKARSKA-GUZIĆ et al. 2012). A new locality of *C. lucidus* was found in the town of Augustów in NE Poland in 2012.

MATERIAL AND METHODS

Species composition of vegetation impacted by *C. lucidus* was characterised by three phytosociological relevés using standard Braun-Blanquet method. The scientific names of vascular plants follow MIREK et al. (2002), names of mosses follow OCHYRA et al. (2003), names of syntaxa and diagnostic species follow MUCINA (1997). Herbarium voucher specimens consisting of flowering and fruiting shoots of *C. luci-*

lus have been deposited in the Herbarium of Jagiellonian University in Kraków (KRA).

RESULTS AND DISCUSSION

A new station of *C. lucidus* was discovered on 28 August 2012 between Turystyczna Street and the Białe Augustowskie Lake (near the Orzechówka Gulf) in the town of Augustów (Fig. 1). According to the ATPOL cartogram grid (ZAJĄC 1978) the station is situated in FB39 square (10 km × 10 km). First, the fruiting shrub was mistaken with *C. melanocar-*

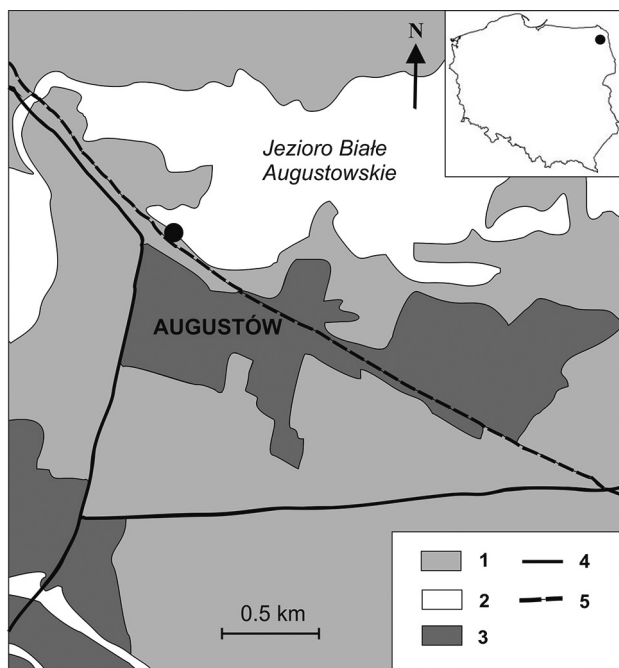


Fig. 1. New locality (●) of spontaneous *Cotoneaster lucidus* Schltl. in the town of Augustów: 1 – forests, 2 – waters, 3 – urban areas, 4 – main roads, 5 – railway track



Fig. 2. Flowering *Cotoneaster lucidus* Schltl. in the town of Augustów (phot. A. Pliszko, 4 June 2013)

pus (Bunge) Loudon which synanthropic sites are known from the Elk Lakeland in NE Poland (ZAJĄC & ZAJĄC 2001). Nevertheless, the final identification of *C. lucidus* was based on flowering specimens collected in spring 2013 (Fig. 2). There are currently 36 individual shrubs of *C. lucidus* (14 vegetative and 22 generative groups of stems) dispersed on an area of about 0.2 ha, except one dense clump occupying an area of about 20 m². The smallest shrub is about 0.6 m tall, the biggest 1.9 m tall. This spontaneous population most likely arose from the plant cultivated as a hedge in the center of the town of Augustów, and its fruits were transported to the outskirts by birds (ornitochory).

Cotoneaster lucidus grows on sandy soil, on sunny and semi-shade slopes covered by plants typical mostly for deciduous mesic and subxerophilous woods and shrub mantle communities of temperate and subboreal Europe (Table 1). The surveyed vegetation was disturbed by the following factors: deforestation, propagation of *Pinus sylvestris* L., building the railway track, and naturalisation of other alien plant species (e.g., *Cerasus mahaleb* (L.) Mill., *Malus domestica* Borkh., and *Quercus rubra* L.). Comparing phytosociological relevés together, the number of species in the herb layer is the lowest, when *C. lucidus* has the highest cover in the shrub layer (Table 1).

There are some published data suggesting that *C. lucidus* can displace indigenous plants, forming the species-poor or monodominant thickets under the trees. In Latvia, significant changes and degradation were observed in urban pine forest vegetation impacted by *C. lucidus* in Riga (STRAUPE et al. 2012). In such communities the proportion of native boreal species and the coverage of mosses are disturbingly low. In Lithuania, in turn, intensive growth of *C. lucidus* is one of the major threats to native stands of rare and endangered *Vicia lathyroides* L. in the Palanga Park (STRAIGYTĖ & BENIŪŠIS 2011). Unfortunately, the town of Augustów is almost surrounded by disturbed coniferous and mixed forests what can make the naturalisation of *C. lucidus* even more successful. Further spread of this plant into the Augustów Primeval Forest and Rospuda River Valley by ornitochory is only a matter of time.

Prohibited plantation, as well as limited introduction of *C. lucidus* in areas adjacent to forests are recommended in Poland, because of the invasive potential of this species (TOKARSKA-GUZIĆ et al. 2012). Preventing the spread of *C. lucidus* from the town of Augustów to the Augustów Primeval Forest and Rospuda River Valley by the removal of the shrubs is extremely important for nature conservation. Some closely located stands of nationally protected and vulnerable *Thesium ebracteatum* Hayne seem to be particularly suitable for *C. lucidus*.

Table 1. Species composition of vegetation impacted by *Cotoneaster lucidus* Schltld. in the town of Augustów

No. of relevé	1	2	3
Date	04.06.2013	04.06.2013	04.06.2013
Area of relevé (m ²)	16	16	16
Latitude (N)	53°51'35,64"	53°51'35.34"	53°51'34.98"
Longitude (E)	23°0'28.86"	23°0'29.70"	23°0'29.58"
Cover of tree layer a (%)	60	-	20
Cover of shrub layer b (%)	90	70	60
Cover of herb layer c (%)	20	30	40
Cover of moss layer d (%)	-	20	-
No. of species	13	24	18
<i>Cotoneaster lucidus</i>	5	2	1
Ch. Vaccinio-Piceetea			
<i>Pinus sylvestris</i> a	4	.	.
Ch. Quercu-Fagetea			
<i>Acer platanoides</i> c/a,b	.	1	1
<i>Moehringia trinervia</i>	.	+	+
<i>Mycelis muralis</i>	.	+	.
<i>Padus avium</i> b	.	1	.
<i>Poa nemoralis</i>	.	2	.
<i>Quercus robur</i> b/c/a	1	+	1
<i>Tilia cordata</i> b/c/a,b	2	1	2
Ch. Rhamno-Prunetea			
<i>Berberis vulgaris</i> b	.	.	3
<i>Rhamnus cathartica</i> b	.	1	.
<i>Rosa canina</i> b/c	1	2	.
Ch. Epilobietea angustifolii			
<i>Calamagrostis epigejos</i>	2	.	2
<i>Fragaria vesca</i>	1	.	.
<i>Rubus idaeus</i>	.	1	.
<i>Sorbus aucuparia</i> b	1	.	+
Ch. Galio-Urticetea			
<i>Chelidonium majus</i>	.	.	+
<i>Galium aparine</i>	+	1	.
<i>Geranium robertianum</i>	.	+	.
<i>Impatiens parviflora</i>	.	1	.
Others			
<i>Achillea millefolium</i>	.	+	+
<i>Artemisia vulgaris</i>	.	+	.
<i>Berteroa incana</i>	.	.	+
<i>Cerasus mahaleb</i> b	.	2	.
<i>Dactylis glomerata</i>	.	.	+
<i>Euphorbia esula</i>	1	.	.
<i>Festuca rubra</i>	.	.	+
<i>Linaria vulgaris</i>	.	+	.
<i>Malus domestica</i> b/c	+	+	.
<i>Melandrium album</i>	+	.	.
<i>Poa pratensis</i>	1	.	2
<i>Polygonatum odoratum</i>	.	+	.
<i>Quercus rubra</i> b	.	.	+
<i>Rhytidadelphus squarrosus</i>	.	2	.
<i>Silene nutans</i> s. str.	.	.	1
<i>Solidago virgaurea</i>	.	1	1
<i>Taraxacum</i> sp.	.	+	.
<i>Veronica chamaedrys</i>	.	+	1

ACKNOWLEDGEMENTS

I would like to thank Prof. Jerzy Zieliński for determining the herbarium voucher specimens of *Cotoneaster lucidus* collected during the field study.

REFERENCES

- ABROMEIT J., NEUHOFF W., STEFFEN H. (1898): Flora von Ost- und Westpreussen. Kommissionsverlag Gräfe und Unzer, Berlin, Königsberg.
- DANIELEWICZ W., MALIŃSKI T. (2004): Naturalization of hedge cotoneaster (*Cotoneaster lucidus* Schltdl.) in the Wielkopolska National Park. *Rocznik Dendrologiczny* 52: 197–214.
- DICKORÉ W.B., KASPEREK G. (2010): Species of *Cotoneaster* (Rosaceae, Maloideae) indigenous to, naturalising or commonly cultivated in Central Europe. *Willdenowia* 40: 13–45.
- FLINT H.L. (1997): Landscape plants for eastern North America: exclusive of Florida and the immediate Gulf Coast. John Wiley and Sons, New York.
- JAKUBOWSKA-GABARA J., KURZAC M., KIEDRZYŃSKI M., KOPEĆ D., KUCHARSKI L., KOŁODZIEJEK J., NIEDZWIEDZKI P., POPKIEWICZ P., WITOSŁAWSKI P., ZIELIŃSKA K. (2012): Nowe stanowiska rzadkich, chronionych i zagrożonych gatunków roślin naczyniowych w Polsce Środkowej. Cz. 2. *Fragmenta Floristica et Geobotanica Polonica* 19(2): 349–359.
- JOHN H., FRANK D. 2008. Verwilderte *Cotoneaster*-Arten in Halle (Saale) und Umgebung. Mitteilungen zur floristischen Kartierung in Sachsen-Anhalt 13: 3–28.
- KOSIŃSKI P., BEDNORZ L. (2003): Trees and shrubs of the Polish part of the Eastern Sudety Mts. *Dendrobiology* 49: 31–42.
- LINGDI L., BRACH A.R. (2003): *Cotoneaster*. In: Z.Y. Wu, P.H. Raven (eds). *Flora of China*. Vol. 9. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis: 85–108.
- ŁUCZAJ Ł., ADAMOWSKI W. (1991): Dziczenie irgi lśniacej (*Cotoneaster lucidus* Schlecht.) w Puszczy Białowieskiej. *Phytocoenosis* 3 (N.S.), *Seminarium Geobotanicum* 1: 269–274.
- MIREK Z., PIĘKOŚ-MIRKOWA H., ZAJĄC A., ZAJĄC M. (2002): Flowering plants and pteridophytes of Poland. A checklist. Vol. 1. Biodiversity of Poland. – Krytyczna lista roślin naczyniowych Polski. T. 1. *Różnorodność biologiczna Polski*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków.
- MUCINA L. (1997): Conspectus of classes of European vegetation. *Folia Geobotanica et Phytotaxonomica* 32(2): 117–172.
- OCHYRA R., ŻARNOWIEC J., BEDNAREK-OCHYRA H. (2003): Census catalogue of Polish mosses. Vol. 3. Biodiversity of Poland. – Katalog mchów Polski. T. 3. *Różnorodność biologiczna Polski*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków.
- ÖÖPIK M., KUKK T., KULL K., KULL T. (2008): The importance of human mediation in species establishment: analysis of the alien flora of Estonia. *Boreal Environment Research* 13: 53–67.
- SENETA W., DOLATOWSKI J. (2009): *Dendrologia*. Wyd. Nauk. PWN, Warszawa.
- SENNIKOV A.N. (2009): *Cotoneaster*. In: A. Kurtto (ed.). *Rosaceae*. Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. <http://ww2.bgbm.org/EuroPlusMed>.
- SENNIKOV A.N. (2011): Atlas Florae Europaeae notes 18. Synonymy and distribution of some native and alien species of *Cotoneaster* (Rosaceae) in eastern Europe and the Caucasus. *Annales Botanici Fennici* 48(4): 325–336.
- SLABAUGH P.E., SHAW N.L. (2008): *Cotoneaster* Medik. In: F.T. Bonner, R.P. Karrfalt (eds). *The woody plant seed manual*. United States Department of Agriculture, Forest Service, Washington, DC.: 442–446.
- STRAIGYTĖ L., BENIUSIS A. (2011): Impact of the invasive shrub spread on spring vetch (*Vicia lathyroides* L.) in Palanga Park. In: *Proceedings of the Biennial International Symposium, Forest and Sustainable Development*, 15–16 October 2010, Braşov, Romania: 295–300.
- STRAUPE I., JANKOVSKA I., RUSINA S., DONIS J. (2012): The impact of recreational pressure on urban pine forest vegetation in Riga city, Latvia. *International Journal of Energy and Environment* 6(4): 406–414.
- TOKARSKA-GUZIĆ B., DAJDOK Z., ZAJĄC M., ZAJĄC A., URBISZ A., DANIELEWICZ W., HOŁDYŃSKI C. (2012): Rośliny obcego pochodzenia w Polsce ze szczególnym uwzględnieniem gatunków inwazyjnych. *Generalna Dyrekcja Ochrony Środowiska*, Warszawa.
- ZAJĄC A. (1978): Atlas of distribution of vascular plants in Poland (ATPOL). *Taxon* 27(5–6): 481–484.
- ZAJĄC A., ZAJĄC M. (2001): Atlas rozmieszczenia roślin naczyniowych w Polsce. *Instytut Botaniki, Uniwersytet Jagielloński*, Kraków.