Hybrid of *Rumex patientia* × *Rumex tianschanicus* (*Rumex* OK-2) as a potentially new invasive weed in Central Europe

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Abstract

Since 2001 a hybrid of docks *Rumex patientia* × *Rumex tianschanicus* (*Rumex* OK-2) has been grown as a new energy crop in the Czech Republic. It was originally bred as a forage crop plant in Ukraine and then introduced for the same reason to the Czech Republic. In the past five years a successive spreading in the surroundings of the fields of the original plantation was observed. This paper evaluates the results of the two monitoring years (2011 and 2012) at the eastern edge of Prague where *Rumex* OK-2 was established on arable land. In 2011 each plant of the *Rumex* OK-2 was located by geodetic GPS equipment in the study area. In 2012, the presence of *Rumex* OK-2 plants was verified and some newly discovered plants were recorded. By comparison of the two successive years, we have shown successive spreading of *Rumex* OK-2, mainly in man-made habitats. It seems that *Rumex* OK-2 could have an invasive potential. Further detailed study of its biology and ecology is needed.

Keywords: energy crop, weed, spreading, *Rumex* OK-2

Introduction

Many broad-leaved *Rumex* species are considered to be the most difficult weeds in grasslands and arable land worldwide (Zaller, 2004). A new forage and energy crop hybrid *R. patienta* × *R. tianschanicus* registered as cv. *Rumex* OK-2 (hereafter referred as *Rumex* OK-2) also known as Uteush (after the breeder Prof. Uteush from Ukraine) was introduced to the Czech Republic about ten years ago (Usťak, 2007). This taxon has, moreover, recently been introduced into other European Countries (Bulgaria, Germany, Norway). It can potentially become a new invasive weed species, because the escape of *Rumex* OK-2 plants from cultivation into surrounding grassland has been recorded (Hujerová, 2010).
Rumex OK-2 is described as a perennial (up to 10 years) stress-tolerant plant, characterized by high ecological plasticity, with cold and winter hardiness, tolerance to salt stress and increased humidity (Kosakivska *et al*., 2008). Although *Rumex* OK-2 has been planted for ten years in the Czech Republic, its detailed ecological requirements, spatial distribution, possibility to hybridize with native species, and its potential to become a new weedy species has never been investigated.
In this study we present preliminary results of *Rumex* OK-2 spreading within two monitoring years in the vicinity of the former field where *Rumex* OK-2 was grown experimentally. In particular, we consider whether the taxon is able to spontaneously spread in the countryside.

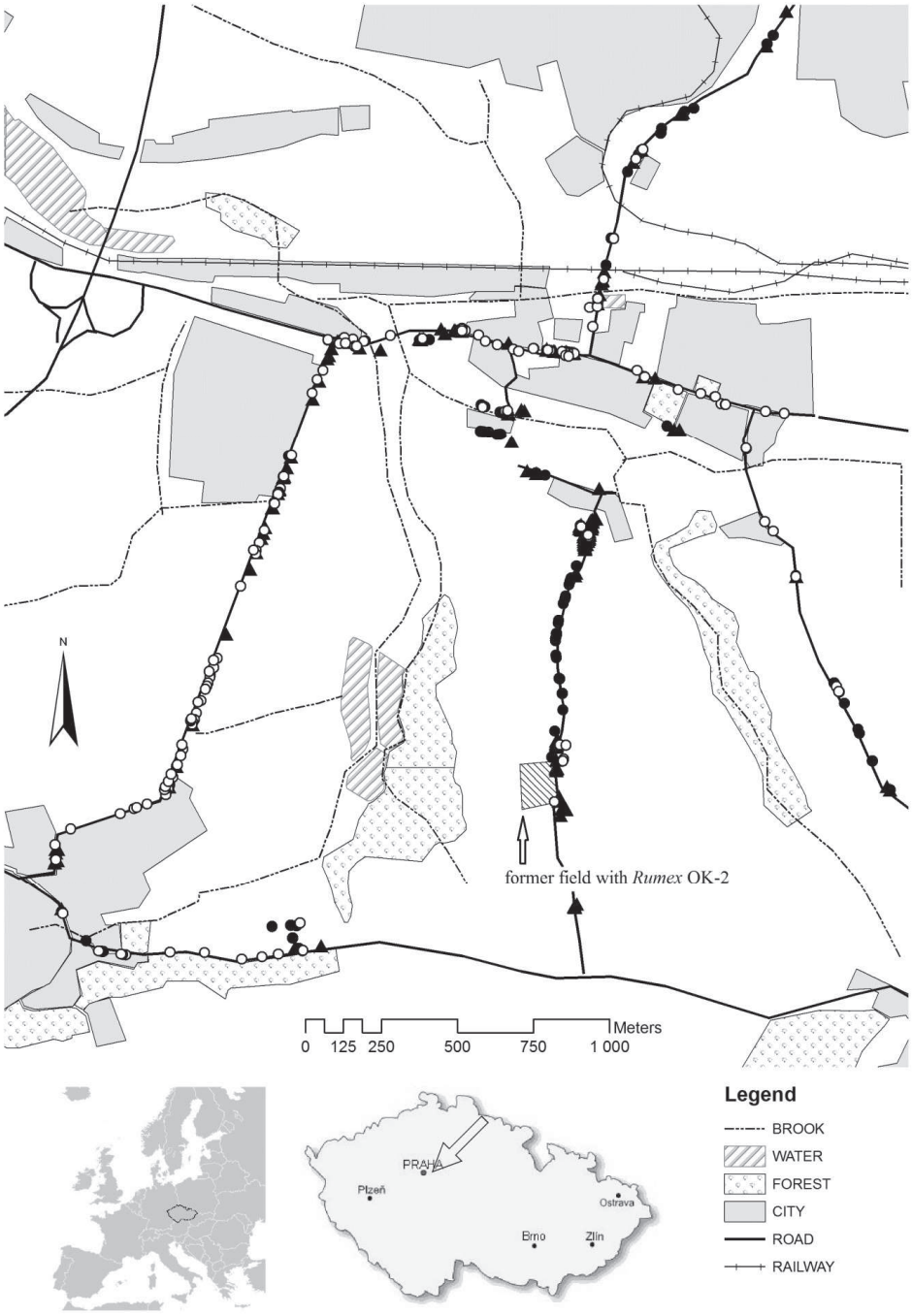

Figure 1. Map showing the distribution of *Rumex* OK-2 in the vicinity of Prague where a experimental field of the *Rumex* OK-2 was established about ten years ago. ▲ plants recorded in 2011 and 2012, ● plants recorded only in 2011, ○ plants recorded only in 2012.

Materials and methods

Monitoring was conducted over the years 2011 and 2012 in the eastern margin of Prague where *Rumex* OK-2 was experimentally grown about ten years ago. The ditches along both sides of the roads (± 3 m) were monitored, in total length about 20 km (Figure 1). Each plant of *Rumex* OK-2 was located (± 3 cm) using geodetic GPS equipment ProMark 200 and its distribution was recorded in a special map.

Results and discussion

In the first monitoring year (2011) 375 plants were found in the study area. In 2012, the second monitoring year, 264 plants (70.4%) were verified again. Furthermore, 275 additional plants were discovered. By comparing the two successive years we have shown successive spreading of *Rumex* OK-2 in the study area (Figure 1). The majority of recorded plants were present on the edges of fields and in grasslands along the roads. Although Usťak (2007) characterized *Rumex* OK-2 as a competitively weak plant that disappears from grassland vegetation after 2-3 years, our previous monitoring (Hujerová, 2010) showed that it is able to persist in grassland for a much longer time.

Conclusion

The preliminary results of two monitoring years (2011-2012) showed the expansive spreading of the *Rumex* OK-2 from the former field especially along roadside ditches. It seems that *Rumex* OK-2 could have an invasive potential and that further detailed study of its biology, ecology and distribution strategy in the landscape is needed.

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