

Introduction

Conium maculatum L. is an annual or biennial dicot reaching the height between 0.5-2.5 m. The species is highly toxic. In the area of the Czech Republic, *C. maculatum* is classified as an archaeophyte. Recently its occurrence in the Czech Republic is increasing. It can be found along the roads and on waste places, and it also started to occur in agrophytocoenoses (Kubát, 2002). It grows as an arable weed especially in field margins.

Central Bohemia is a region with a long-term occurrence of *C. maculatum*. It is also an area with increased occurrence of this species. Its presence along the roads can affect water drainage systems, visibility for drivers and pedestrians and its control can increase the costs of roadsides management. When occurring on arable land, *C. maculatum* can lower the crop yields and increase the risk of intoxication of farm animals and humans. For direct control of *C. maculatum* on arable land monitoring of its occurrence is needed.

Aim of the work

1. Mapping of *C. maculatum* occurrence to evaluate its presence along the roads.
2. Monitoring of *C. maculatum* on arable land.
2. Evaluate the possibility of mapping using GPS navigation in moving vehicle.

Materials and Methods

In 2015 the mapping of *C. maculatum* occurrence started in the area between the cities Prague, Kralupy nad Vltavou and Slaný. Both above mentioned systems of monitoring were realised in summer period when *C. maculatum* plants were significantly taller than other vegetation incl. arable crops and they are easy to detect. Localisation along roads was realised using GPS navigation in moving vehicle. The speed of car (30-40 km.h⁻¹) and GPS system used enabled us to put GPS point every 8 m. The roads between two settlements were monitored in both directions. Obtained data were exported to Garmin BaseCamp (ver. 4.4.7., Garmin Ltd., USA) program and consequently maps of *C. maculatum* occurrence were created using Google Earth (ver. 7.1.5.1557, Google Inc., USA) Based on frequency of GPS coordinates the density of the occurrence of *C. maculatum* along the roads was processed in ArcMap (ver. 10.2, ESRI, USA). All the evaluated roads were divided into 20 m sections and for each section number of GPS coordinates was calculated. The mapping will continue in 2016.

Results

Occurrence of *C. maculatum* in selected localities is documented by maps no. 1 and 2. We can see irregular occurrence of the species in monitored area. Graph 1 is showing the density of the occurrence of *C. maculatum* along the road between the villages Velké Přílepy and Tursko, total length 3.24 km and it is also showing possible presentation of the data. On arable land we found *C. maculatum* most frequently in stands of winter oilseed rape, pulses, and sugar beet.

Discussion

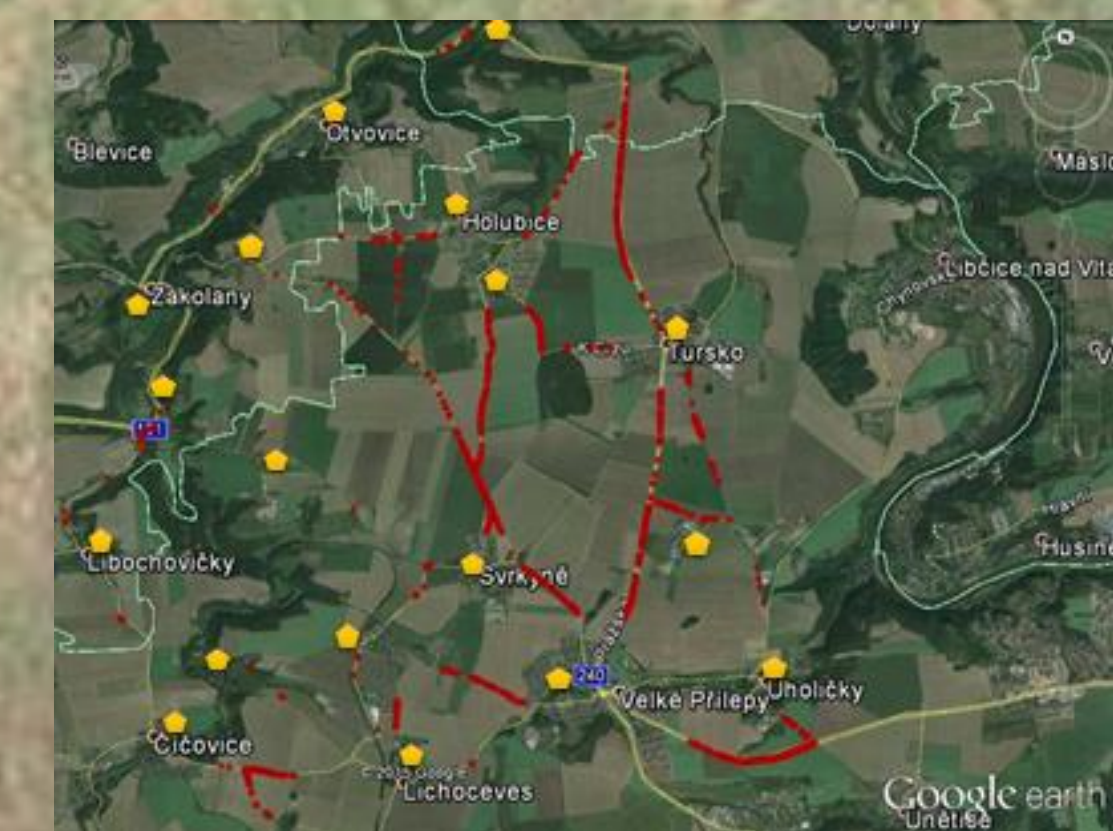
C. maculatum occurred mostly in close proximity of agrophytocoenoses, as pointed out by Vetter (2004) and Brant et al. (2008). Our monitoring also proved its occurrence on arable land (Mitich, 1998 and Brant et al., 2008). Occurrence of *C. maculatum* in agrophytocoenoses was always related to its occurrence in neighbouring communities. The species is spreading from field margins to central part of the fields. Historical data on the occurrence of *C. maculatum* are not available so it is not possible to make comparative study about the trends in its occurrence.

Conclusion

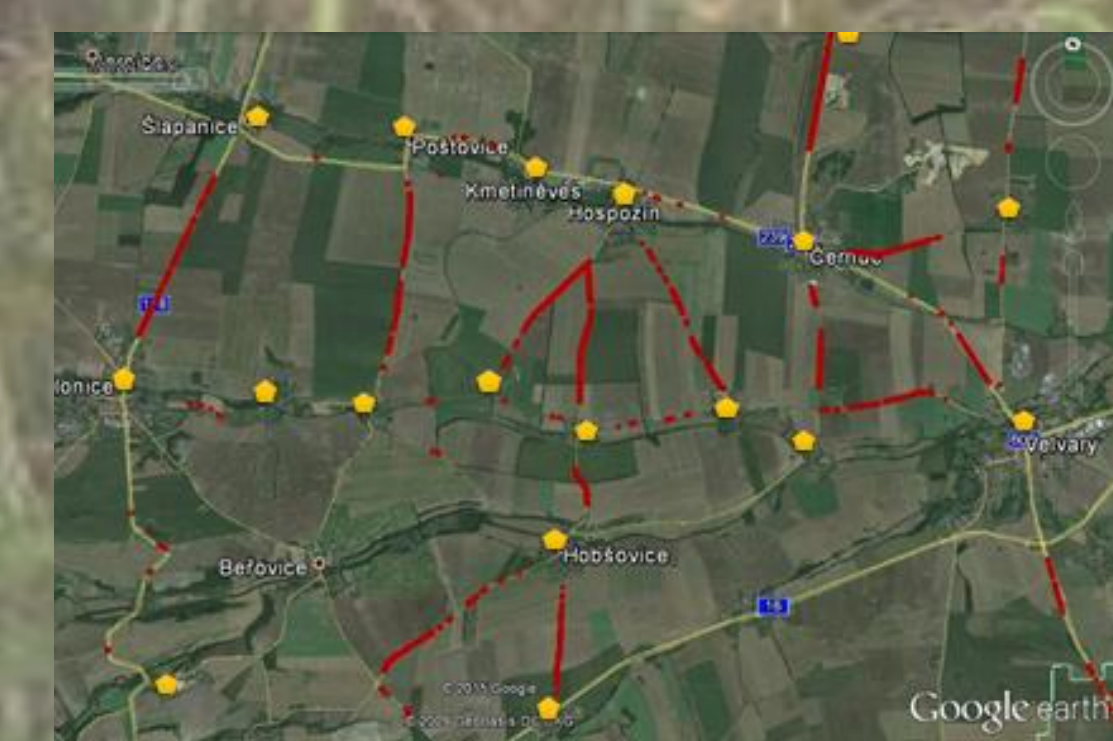
1. In monitored area the presence of *C. maculatum* was proved along the majority of roads mapped.
2. On arable land *C. maculatum* was found most frequently in winter oilseed rape stands.
3. Methods used in this study are suitable for *C. maculatum* mapping and quantifying of the intensity of its occurrence.



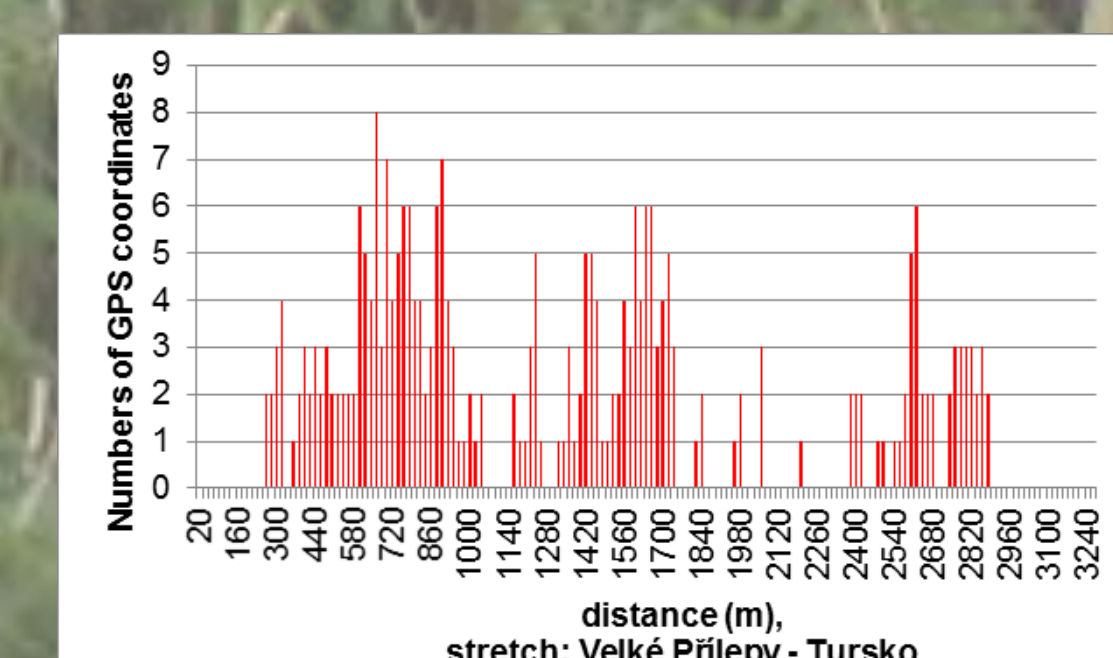
Occurrence of *C. maculatum* in agrophytocoenoses



Map 1: Occurrence of *C. maculatum* in the area between Velké Přílepy, Zákolany, Kralupy nad Vltavou, and Tursko. Red dots document GPS coordinates of *C. maculatum*, yellow pentagons mark towns / villages in mapping area (21.7.2015).



Map 2: Occurrence of *C. maculatum* in the area between Velvary, Hobšovice, Zlonice, and Hospozín. Red dots document GPS coordinates of *C. maculatum*, yellow pentagons mark towns / villages in mapping area (21.7.2015).



Graph 1: Numbers of GPS coordinates for 20 m sections between Velké Přílepy and Tursko