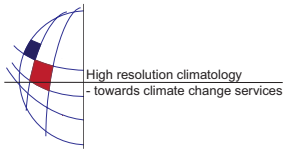
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-446, 2010
10th EMS / 8th ECAC



Phenological response of five wild plant shrubs and assessment its sums of effective units in region of the Czech Republic during 1961-2010

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Presented study is focused on 50 years of phenological observations (1961-2010) of five wild plant shrubs and its phenological phases that create a continuous phenological sequence covering the whole spring aspect of floodplain forest. The phases were observed for Cornelian cherry (Cornus mas), English hawthorn (Crataegus oxyacantha), Midland hawthorn (Crataegus laevigata), Blackthorn (Prunus spinosa) and Common dogwood (Cornus sanguinea). The study was conducted at nature reserve at Vranovice (170 m a.s.l., 48°56′ N, 16°35′ E) with additional data available from three observational sites in the region (15-60 km apart). For each shrub the date of first flower and the date of full flowering were determined. The collected phenological data were analysed together with local meteorological observations for trends and periodicity by software AnClim and PhenoClim developed by Czech Hydrometeorological Institute and Mendel University respectively. For each shrub and its phenological phases the sum of effective units above the given threshold were calculate by means of PhenoClim. The values of sum of effective units for weather variables parameters (e. g. mean temperature, maximum temperature) and above given threshold (e. g. range of baseline mean temperature values from 1 to 10°C with step of 0.1°C) were assess.
Observations of these five wild plant shrubs have been since season 2009 modernized by extremely detail air temperature measurements and phenocameras (taking multiple series of 12 photos during a single day) for three individuals of Common dogwood at three different habitats (insolated, shaded and half-shaded habitat) at plot Vranovice. This detailed observation provide unusual level of detail about the role of particular location of the given species within the particular site and provides a method allowing for precise determination of the individual phenological stages.
The mean annual temperature showed a significant increase of 0.33°C per decade, with almost the same magnitude of change during spring. These changes of temperature profound influence on the length of phenological changes which advanced by almost 14 days during the whole period of observations. The start of phenophases of three individuals of Common dogwood differ significantly despite their proximity (less than 200m in completely flat terrain).

Key words: phenology, Cornus sp, Crataegus sp., Prunus sp., sum of effective units, temperature

Acknowledgements: We gratefully acknowledge the support of research plan MSM6215648905 “Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change”; and the KONTAKT OC187 (linked to COST 734).