



Character of phenological records regarding to climate variability in Latvia

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The study examines long-term time-series of phenological records to assess the impact of climate change on Latvian nature. Records were obtained for 1971-2000 from eight observation points for the beginning of leaf development, colouring of leaves, leaves fall for eight species (alder *Alnus incana*, aspen *Populus tremula*, red currant *Ribes rubrum*, maple *Acer platanoides*, dandelion *Taraxacum officinale*, ash *Fraxinus excelsior*, rowan *Sorbus aucuparia*, lilac *Syringa vulgaris*). The beginnings of spring and summer phases are shifted by 4 days earlier over the last 30 years. The most recent changes were observed for early spring phases. The beginning of flowering of the alder *Alnus incana* is advanced by 1.1 days/year (33 days during 1971 – 2000). For red currant *Ribes rubrum*, the beginning of leaf unfolding advanced by 5.6 days/decade, ripening by 3.5 days/decade. The lengths of the growing season for birch *Betula pendula* and maple *Acer platanoides* increased during the past 30 years on average 14 days. The autumn phases in Latvia started earlier by 2.8 days/decade, in difference to Europe, where autumn phases have tendency to start later. The variability temperature and precipitation was considered in order to evaluate relationships between climatic data and phenological observations. In general, long-term air temperature trends in Latvia are rather similar to the trends in the other regions around the Baltic Sea. Air temperature observations have shown progressive warming over the territory of Latvia and the greatest increases in average air temperature have been recorded in the spring and the early winter. Concerning changes of precipitation it is found, that the most significant increase has taken place in January and March. In our study a strict correlations between phases and air temperature of the previous month were found. An increase in mean air temperature in April by 1°C, it associated with earlier flowering of

red current *Ribes rubrum* in May by 2.6 days, and flowering of dandelion *Taraxacum officinale* by 3.4 days. Linear regression analyses showed a strong negative correlation for earlier spring phase. For autumn phases the higher air temperature leads to a later autumn. Overall founded correlation coefficients for autumn phases and temperature are weaker. Also rather weak relationship was obtained among precipitation and phenological phases, which indicated that precipitation in total is not a limiting factor for beginning of phenological phases in Latvia.