



Timing and duration of autumn leaf development in Sweden

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The growing season is changing in both ends and autumn phases seem to be responding in more diverse ways than spring events. Indeed, we know little about autumn leaf phenological strategies and how they are correlated with fitness components or ecosystem properties, and how they vary between species and over bioclimatic gradients. In this study more than 10 000 students were involved in observing autumn leaf development at 378 sites all over Sweden (55-68°N). They followed an image based observation protocol classifying autumn leaf development into five levels, from summer green (level 0) to 100% autumn leaf colored (level 4) canopy. In total, they submitted almost 12 000 observations between August 9 and November 15. 75% of the observations were made on the common species of *Populus tremula*, *Betula pendula/pubescens* and *Sorbus aucuparia*. The expected (negative) correlation between latitude and start of leaf senescence (level 2) was found in *Populus* and *Betula*, but not in *Sorbus*. The duration of the leaf senescence period, defined as the period between 1/3 (level 2) and 100% (level 4) of the canopy autumn leaf colored, was negatively correlated with latitude in *Populus* and *Betula*, but not in *Sorbus*. There was also a strong (negative) correlation of the start (level 2) and the duration of the leaf senescence in the early senescing *Sorbus* and *Betula*, while this effect was weaker in the late senescing *Populus*.