

# One ordinary day on the meadow

## The life of the anthers

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### Situation

Export of pollen from anthers is impossible during wet weather.

Activity of pollinators is also strongly influenced by weather.

### Our questions

In which time are anthers active?

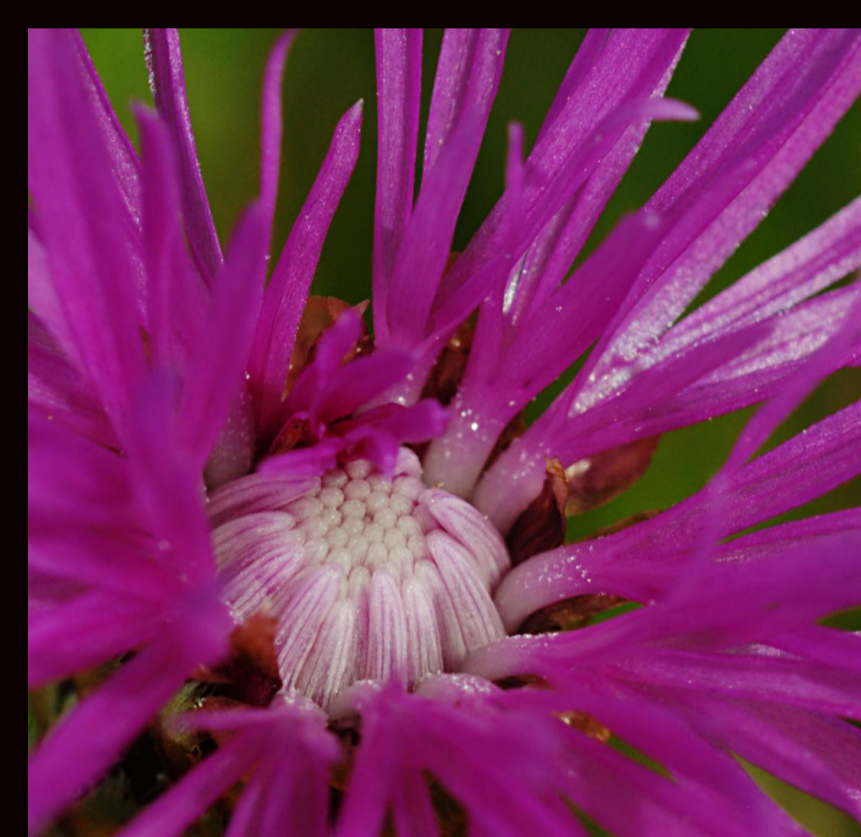
How is their activity influenced by weather?

Is correlated activity of anthers and pollinators?



both closed and senescent anthers

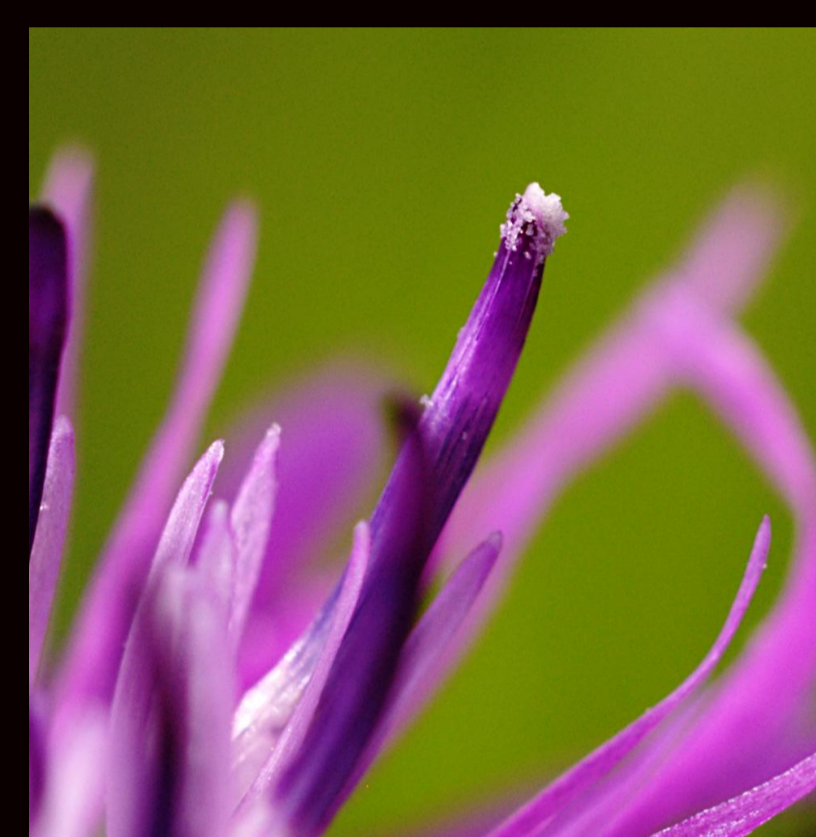
*Succisa pratensis*



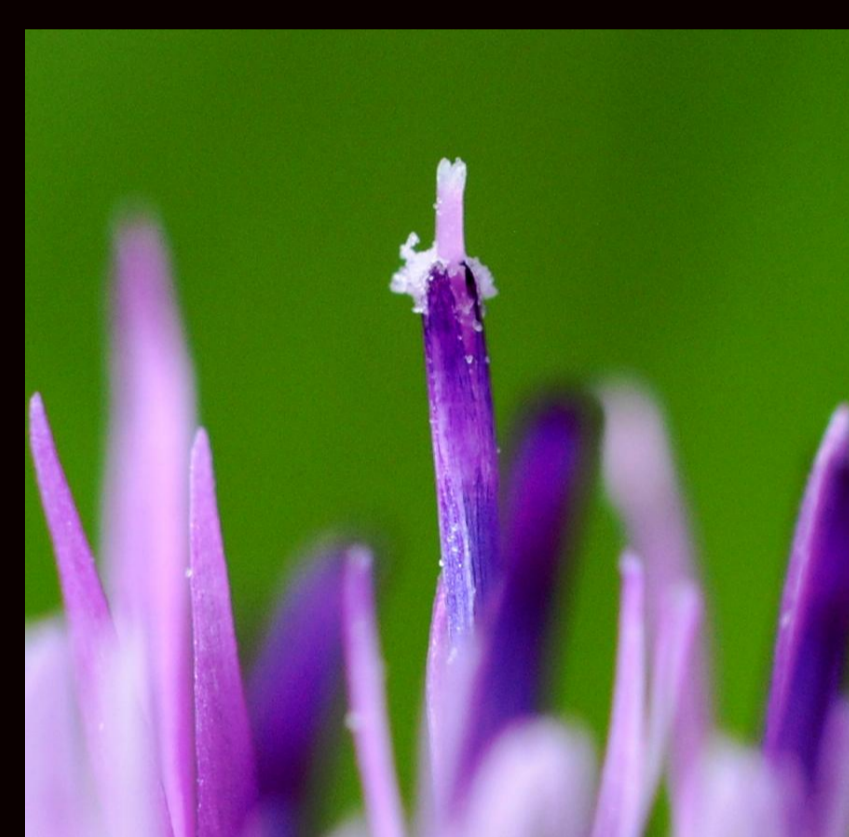
evening  
budding  
of flower



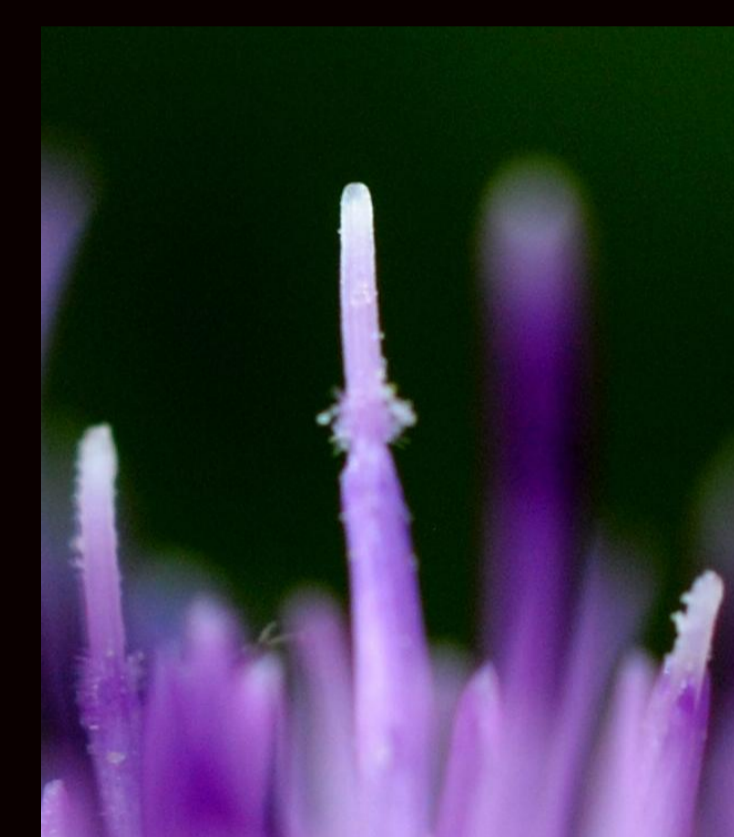
morning  
budding  
of anthers



afternoon  
dehiscence



evening  
growing  
of style



next morning  
development  
finished

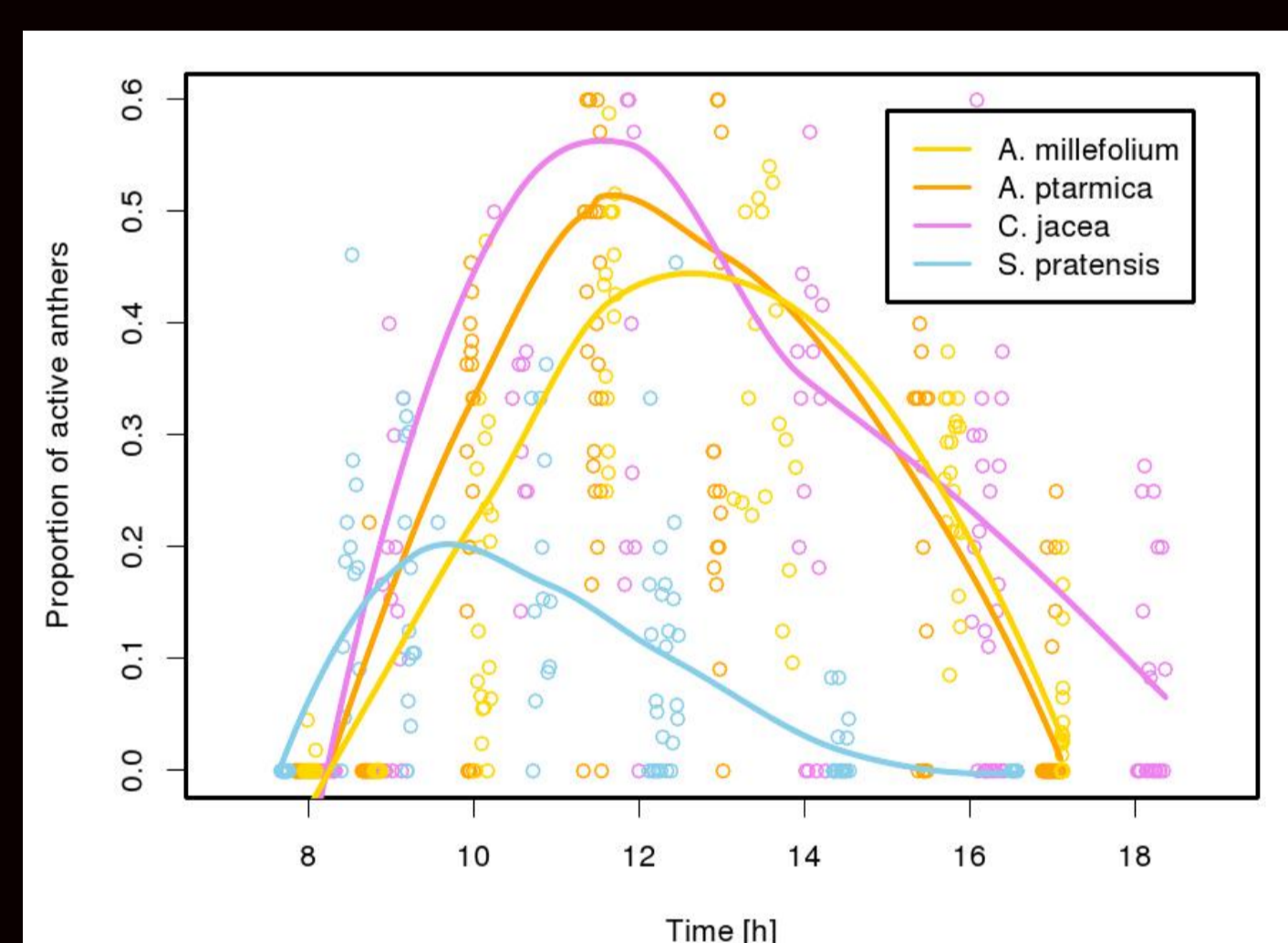


a) closed floral bud  
b) pollen export from anther  
c) growing of style  
d) opening of stigma

*Centaurea jacea*

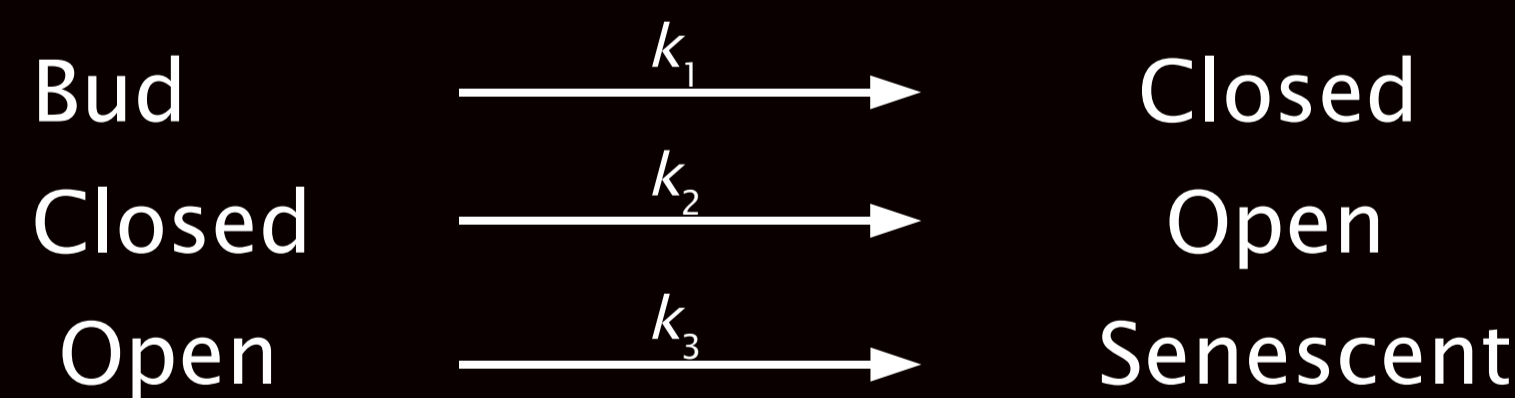
*Achillea ptarmica*

*Achillea millefolium*



Proportion of pollen exporting anthers  $f_{open}$  during sunny day

### Kinetics of anther life



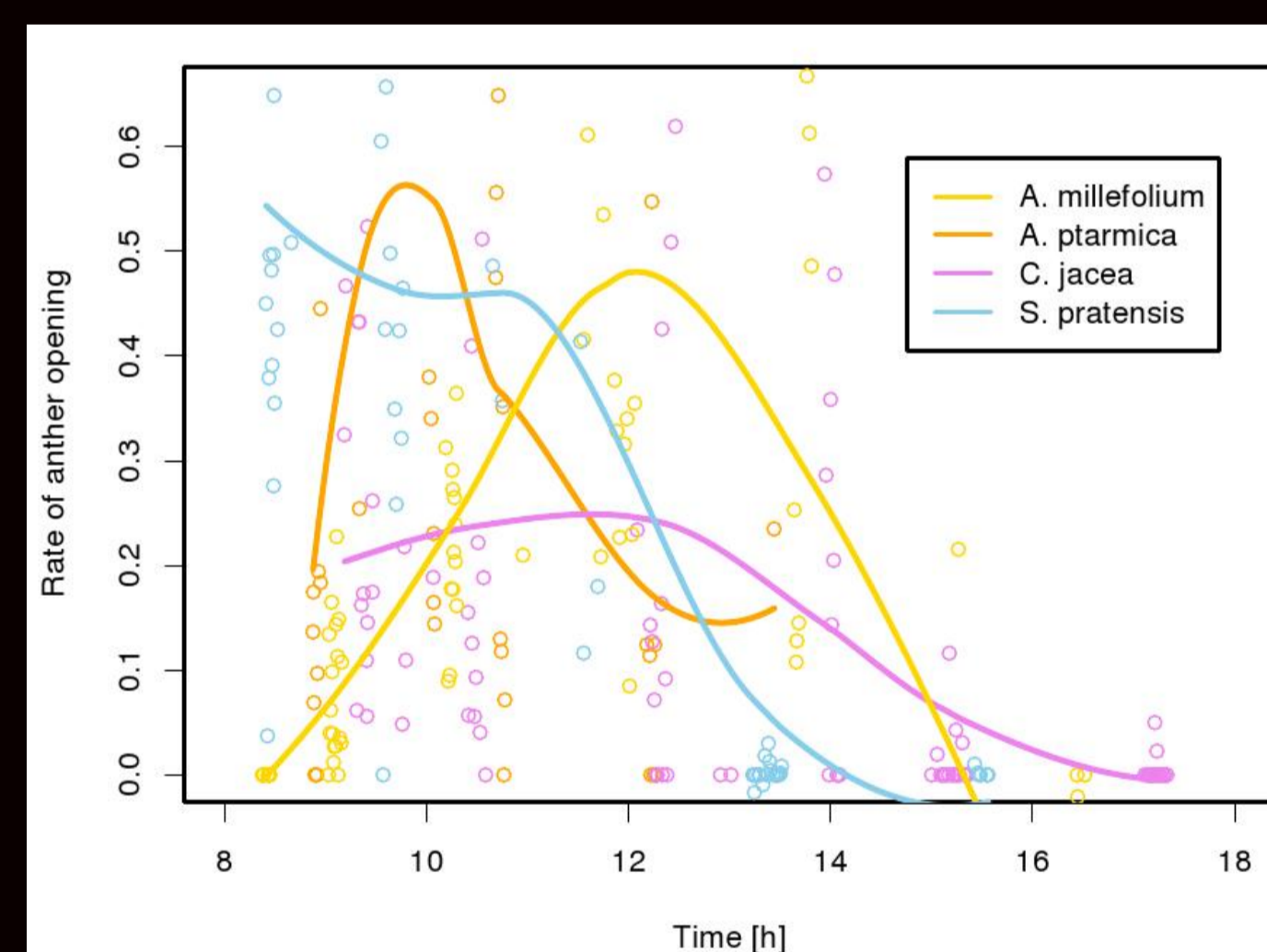
$$df_{bud}/dt = -k_1 f_{bud}$$

$$df_{closed}/dt = k_1 f_{bud} - k_2 f_{closed}$$

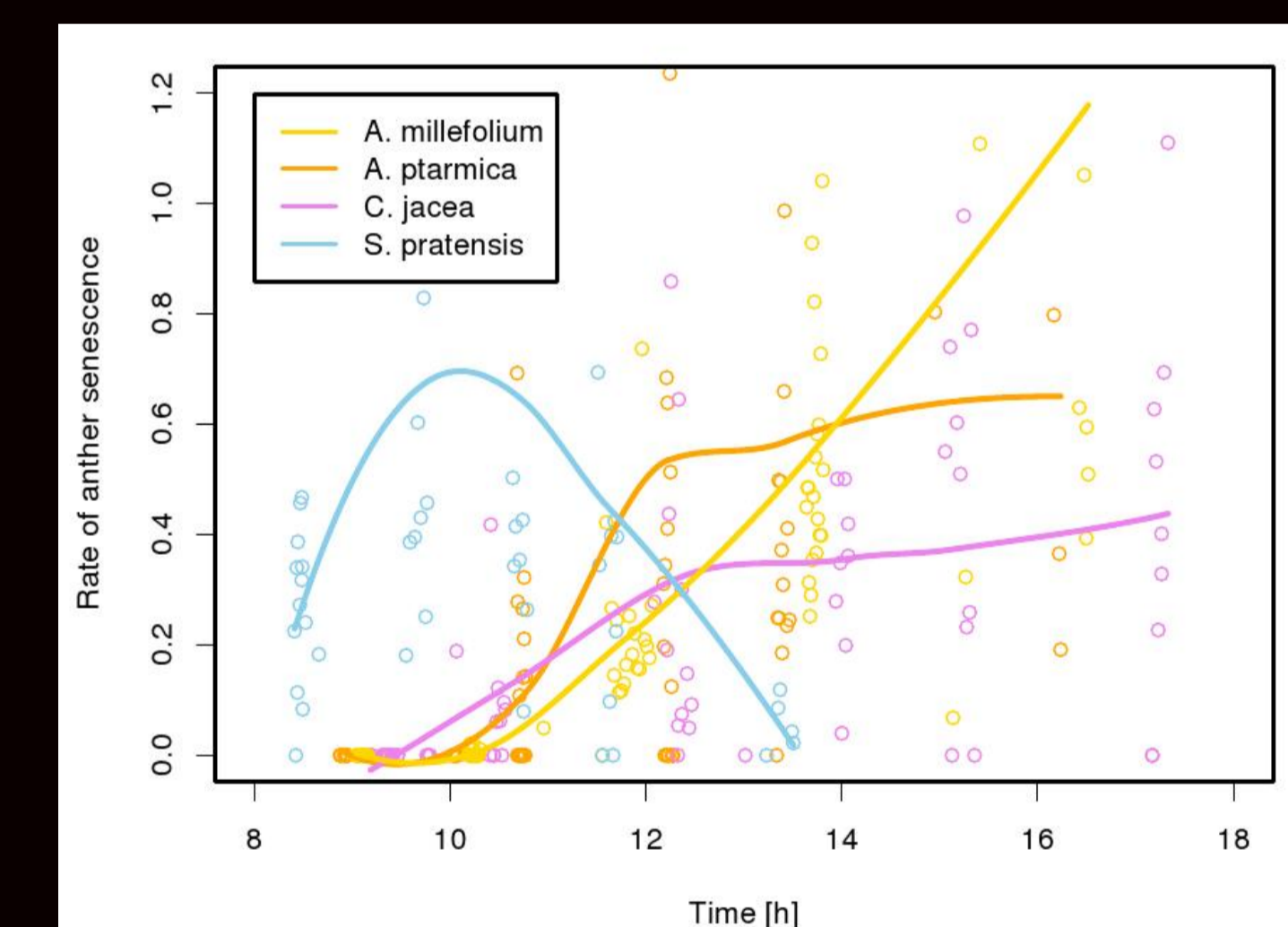
$$df_{open}/dt = k_2 f_{closed} - k_3 f_{open}$$

$$df_{senescent}/dt = k_3 f_{open}$$

where  $f$  is proportion of each developmental phase

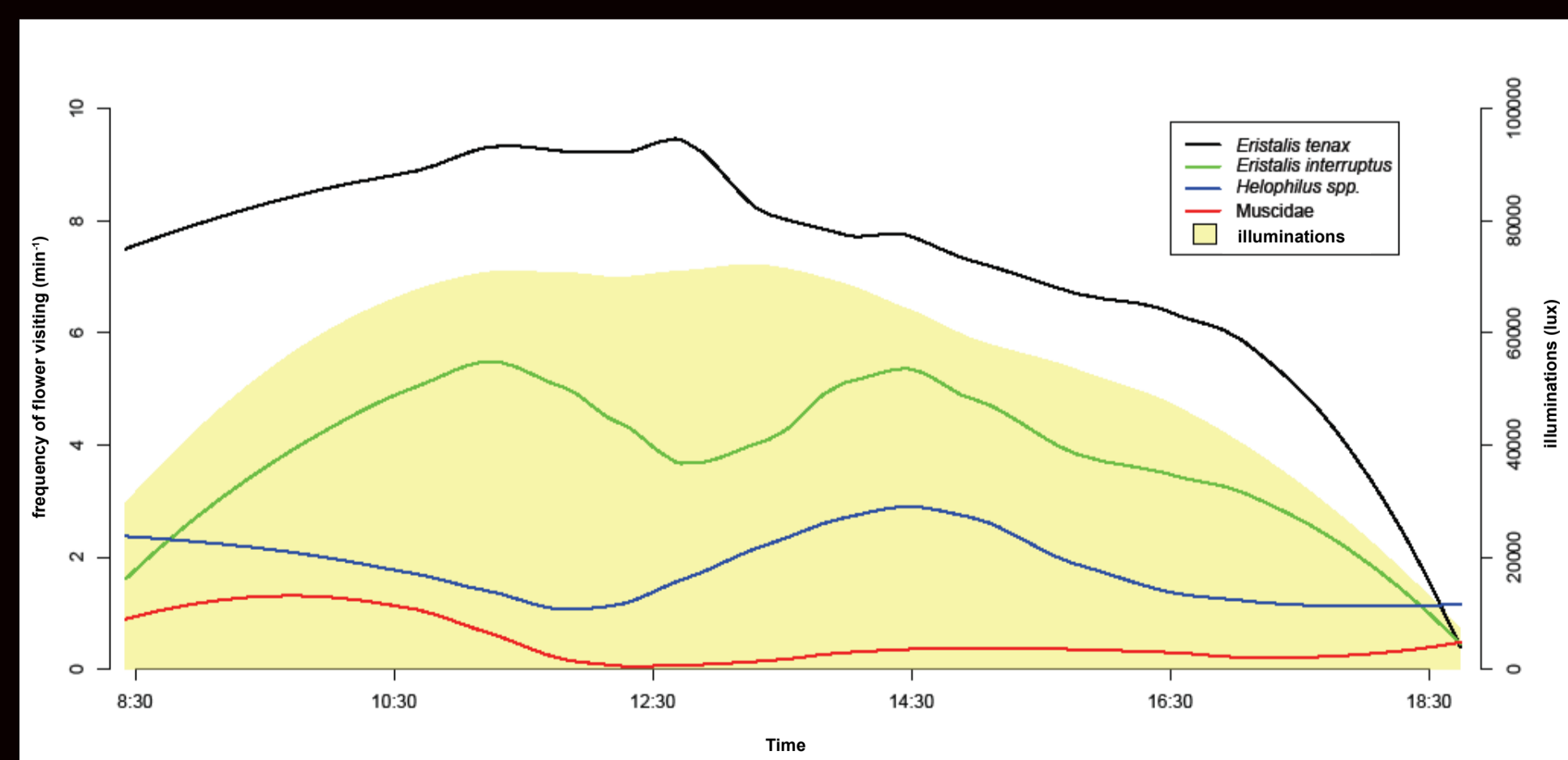


Rate of anther opening as  $k_2 f_{closed}$  during one sunny day



Rate of anther senescence as  $k_3 f_{open}$  during one sunny day

### Visiting of *Succisa* by insect



Frequency of flower visiting on flower head of *Succisa pratensis* during five sunny days

### Conclusions

Activities of anthers of studied species are very different, plants from family *Asteraceae* have significantly longer male activity during a day than *Succisa pratensis*.

Life-time of anthers is very short (several hours) and pollen grains are rapidly removed by pollinators.

Opening of anthers occurred only after drying of dew or rain, in rainy weather anthers are aborted.

Pollinators are visiting all flowers for the whole day.

**Acknowledgment** GAČR P505/11/1589, Kamil Vrzal from Community Center of St. Giles in Uhlířské Janovice for accommodation and Union for Transport and Signaling of Plants for complete support.