Sub-alpine syrphid communities analysed with the Syrph-the-Net database

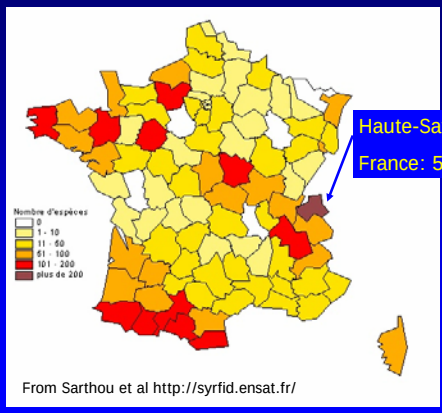
Emmanuel Castella
& Martin C.D. Speight

Context

- Alpine / sub-alpine zones prioritized in the study of climate changes and their consequences on ecosystem functions and biodiversity
- Lack of background data about syrphid communities in alpine / sub-alpine habitats

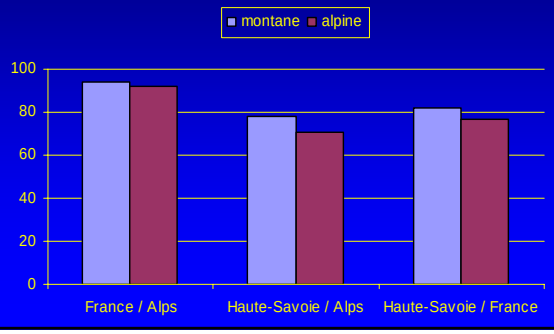
Context

- Nature reserve authorities in Haute-Savoie (Northern French Alps) wanting to:
  - Increase basic knowledge about various taxonomic groups
  - Assess the "quality" of sites recognized of interest on the basis of their plant communities
- Haute-Savoie : largest syrphid species list for a French "département"



From Sarthou et al http://syrfid.ensat.fr/

Representation of centr.European syrphids associated with unimproved grasslands



Objectives

- To assess the quality of three sub-alpine sites in Haute-Savoie: i.e. ability to maintain the local syrphid fauna
- To use the Syrph-the-Net database and its predictive "capability" to carry out this assessment

Presentation given at the 3rd Syrphidae Symposium,
Leiden, The Netherlands, 2nd to 5th September, 2005



End June – mid September 2004

Sixt
1700 – 1800 m
(calcareous)

Passy
1950 – 2000 m
(calcareous / silicaceous)

Carla
2100 – 2200 m
(silicaceous)


Sixt

Hab1: calcareous, montane/subalpine, unimproved grassland (*Caricion ferrugineae*) with flushes (*Caricion davallianae*),

Hab2: alpine heath (*Rhododendron/Vaccinium*) with flushes,

Hab3: montane/subalpine tall herb communities (*Adenostylion*),

Hab4: alpine *Alnus viridis* scrub with open, grassy areas,

Passy


Hab1: calcareous, alpine, unimproved grassland (*Seslerion*),

Hab2: acidophilous, alpine, unimproved grassland (*Nardion strictii*)/alpine heath (*Loiseleurion*) mosaic,

Hab3: calcareous moraine and scree

Carla


Hab 1: acidophilous, alpine, unimproved grassland (*Caricion curvulae*),

Hab 2: alpine heath (with *Azalea/Vaccinium*)

Community prediction

On-site macrohabitats

Syrphid sampling

MACROHABITAT DATABASE

MICROHAB. DATABASE

Observed sp

1

2

3

Predicted sp

EVALUATION

Results

- 59 species collected
- 18 sp (30%) represented by only 1 individual
- 979 individuals for 910 trap-days
  - 1.08 individual / trap / day

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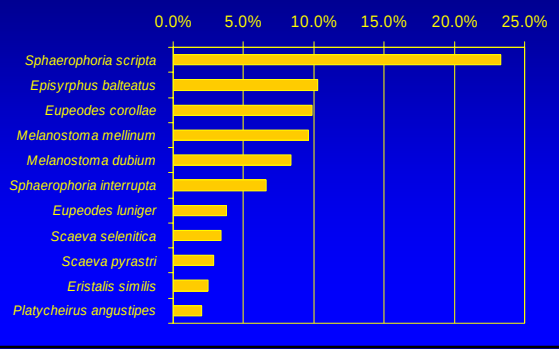
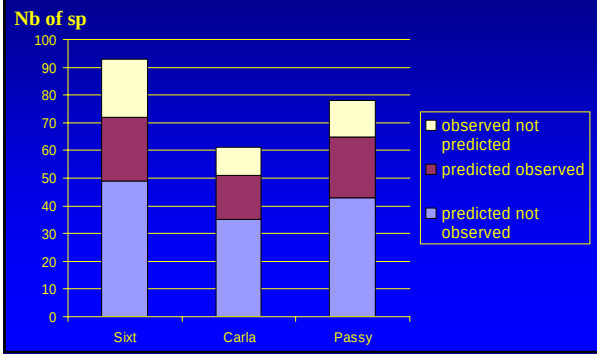
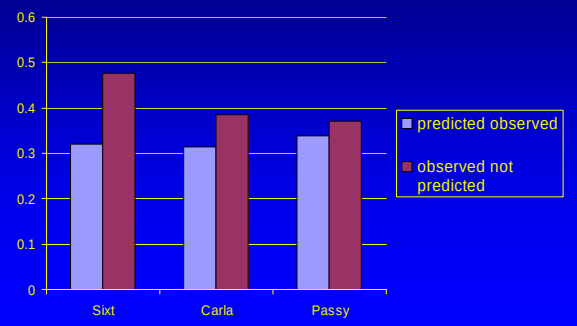
Results: most abundant sp.



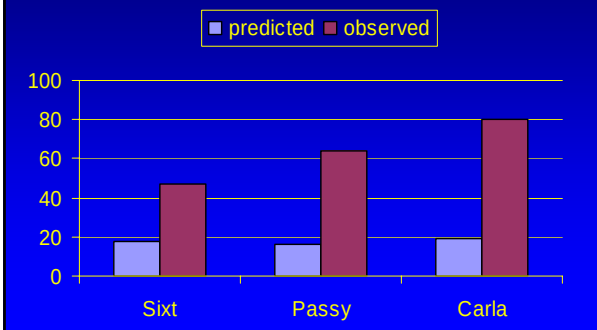
Results: predicted / observed sp.



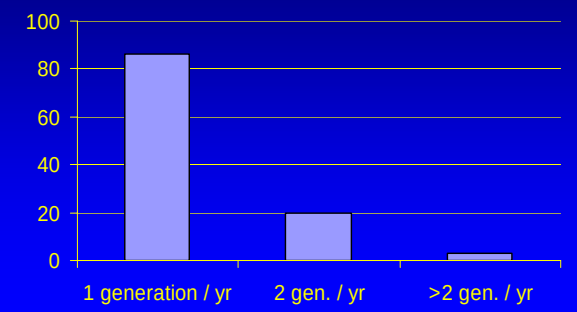
Results: predicted / observed sp.



Results: % migrant sp.



Results: voltinism of the "missing" grassland sp.



Results: Sixt site / macrohabitat level

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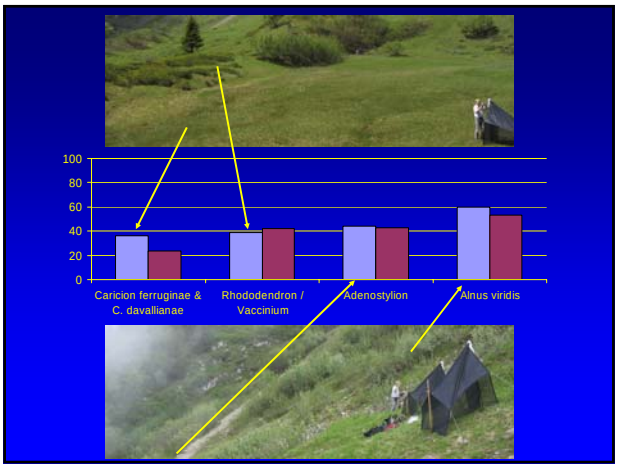
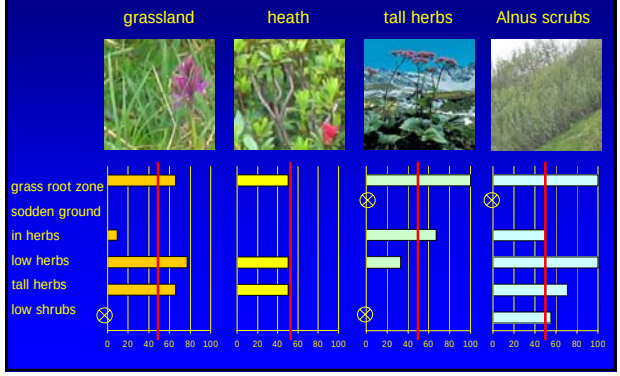


Results: Sixt site / microhabitat level



Conclusion / Discussion

- High proportion of unpredicted species observed (37 – 48%)
  - Migrant species (29-62 % of the unpredicted observed)
  - Species associated with *Picea* and *Fagus* habitats at lower altitudes (50-72% of the non-migrant unpredicted observed)

Conclusion / Discussion

- Low proportion of predicted species observed (31 – 34%)
  - None of the sites of national / international importance for syrphidae
  - Extremely low representation of sp with plant-feeding larvae living in herb-layer plants (less than 10% in Carla site)

Conclusion / Discussion

- Few (no?) data available for comparison
  - Aubert et al 1976. 1 Malaise 1962-73: 63% representation of plant-feeding grassland sp
  - Similar results obtained in a nearby site but with an incomplete season and in 2003 (exceptional summer)

Conclusion / Discussion

- Few (no?) data available for comparison
  - But: a butterfly survey (2002) also revealed the absence of threatened sp, of predicted sp and small numbers of individuals observed.

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Conclusion / Discussion

- Reasons for the under-representation of plant-feeding sp ?
  - Not a sampling / analytical artifact : higher representation of such sp in other habitats (tall herbs)
  - Hypothesis: impact of long-term sheep grazing

Conclusion / Discussion

- Impact of the exceptional dry / hot summer 2003 ?
  - Adults available in 2004 underwent larval development during 2003
  - Could explain the over-representation of polyvoltine sp
  - Could explain the the over-representation of migrant species

Conclusion / Discussion

- Sub-alpine vegetation types attracting protection measures under the Habitat Directive BUT they seem to accommodate a very poor syrphid fauna
- Complex interactions between the grazing history of the sites and the impact of climate changes / fluctuations
- Need for longer term monitoring and comparison with other alpine sites / insect groups

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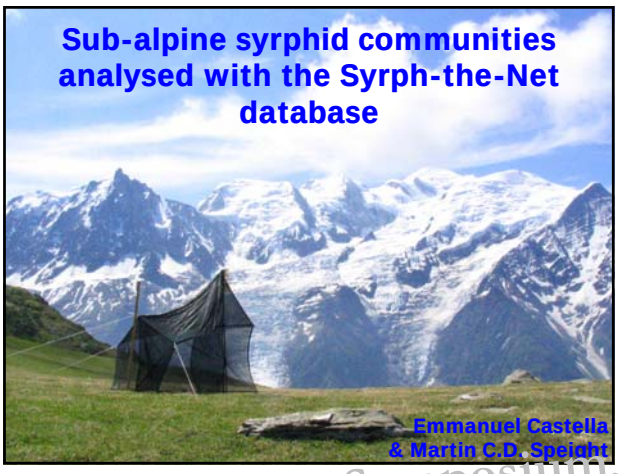

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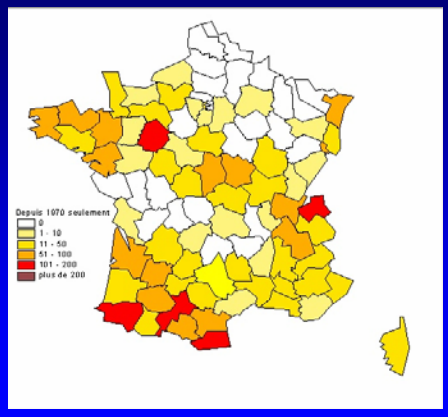
Remerciements

- ASTERS
- Tous les gardes qui ont participé au montage, démontage et au suivi / entretien des pièges
- Mr Gourreau (photos de syrphes)
- Mr Siffointe (collections de syrphes)



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