Tracking flower-foraging insects and their pollen loads in mountain permanent grasslands

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Context of our study

• Flower foraging insects are active pollen vectors

• They play a crucial role on the grassland biodiversity maintaining

• Most studies on pollination process focus on crops due to the importance of this ecosystem service in food supply

• The role and the importance of many insects in pollen transport are still poorly understood in grassland contexts
Objectives of our study

‘Who visits what and.... Who transports what?’

• We set up field observations in mountain grasslands to explore the flower-foraging insect networks

• We test the DNA barcoding method as an alternative tool to enhance our knowledge on those interactions
Materiel and methods

- 100m-transects in 6 permanent grasslands
- 3 periods of 2-3 days
  In May and June 2015 (48 transects)

- Flower-foraging insects, collecting actively pollen and/or nectar

Add alcohol and shake

DNA barcoding

Visual identification
1. Results - Visual observations

‘Who visits’

- The flower foraging insects

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Galliot et al., comm in prep

Photos: © JN Galliot
Empis sp. (Diptera)
1. Results - Visual observations

‘Visit what’

- The visited plants

394 visits on 16 botanical families
1. Results - Visual observations

...‘Who Visits what’

- The flower-foragers network

Insects families

Botanical families
1. Results - Barcoding

‘Who transports what?’

82% of individuals carry pollen

44% carry a mixed pollen load

3% of the insects transport pollens from non-grassland plants such as Betula sp., Quercus sp. and Salix sp.

Only 27% of the insects were identified, most of them being Diptera
Conclusion

• **Diptera** may play an important role in pollination in grasslands especially the Empidae family in our mountain grasslands.

• That result must alert us about the *very little number of taxonomists* who are able to identify species from this key order beyond Syrphideia.

• Our study has also proved the **powerfulness of the DNA barcoding** for pollination study applications but we have also shown that the technique needs to be **improved** to be fully operational.

• DNA barcoding will be a **new tool** in the taxonomists toolbox as well as being an innovative device for ecological studies.

• **Our study continue !** in two different contexts of grasslands in the East and the West of France.
Thank you for your attention

Scatophaga scorcoraria. (Diptera)