

Sardinia (Italy): 2-7 May 2010
Cappadoce (Turkey): 7-11 May 2010

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Primary objectives:

- 1- Collect samples for genetic characterisation of French broom (*Genista monspessulana*)
- 2- Search for biocontrol agents against medusahead (*Taeniatherum caput-medusae*)
- 3- Investigate any other weed and insect targets

Work conditions:

I travelled all trip with Massimo Cristofaro (BBCA); in Turkey, Esther Gerber (Cabi Delémont) joined us. I used BBCA car for moving from Montpellier to Sardinia by ferry, then flew from Rome to Turkey. During all 10-day trip, weather conditions were not really adapted to field surveys, with almost daily sporadic rains, few windows of sun, big variations of temperature (unexpected cold in Turkey). I cancelled the 3rd part of the trip (3d in Erzurum, eastern Turkey), because of bad weather. We drove a total of 1,500 kms.

Field results:

FRENCH BROOM (FB)



1. Genetics: First objective was to find, report and collect samples for genetic analysis (collaborative agreement in prep. with Marie Jasienuk's lab, UC Davis). I firstly found a pop (A) in Corsica during my short connection (ferry to ferry) between France and Sardinia on May 3rd. The pop is in the SouthWest coast of Corsica after the pass of Saint Georges. Massimo and I then collected 3 additional pops in Sardinia covering North and South island. At each site, externally healthy leaf samples from 20 individual plant were collected and stored in silica gel. Material is kept at BBCA until further shipment. For each location, herbarium samples were kept.

2. Natural enemies: arthropod collection was mainly conducted by beating (B).

- A psyllid was found in abundance in south-western Sardinia (presence of all larval stages+adults); they infest green tissues, and seed capsules, from which they take the sap. No particular damage was noticed; Larvae are brown. Material stored in 95 alcohol.
- Several weevils (possibly apions) were found (collected, stored in alcohol for E. Colonelli);
- At least two caterpillars (2 species, one is a Geometridae) were collected, kept alive for being reared out to adults at BBCA.

3. Ecological notes: During the trip, FB elevation range is 400-730mts. Plants are usually on forest edges (C), but they also occur in the open (Photo 1). They are associated with *Erica* sp, *Quercus ilex*, *Rubus* sp. Rocky (granite, volcanic) and well drained soil seems to be suitable growing conditions. On both islands (Corsica & Sardinia), plants were blooming (Photo 2) which is the best time for keying, as high diversity of brooms occurs (5 sp. sometimes found in a single location). Common height ranges 80-150cm.



1. Natural enemies: 3 species of arthropods and 1 fungus were collected in Turkey:

- A curculionid beetle was found for the first time feeding at the base of the spikelets, inserting its mouthparts into seeds; one adult per plant; it's a tiny weevil (2mm); several were collected for further ID. I found it only in Cappadoce at 3 different locations which means it is a common species; no sign of its specificity to Tcm, as one adult was found on

Bromus sterilis. This has to be verified;

- Two flies (D) were collected flying from plant to plant, very active flyers. They are very common; no damage was noticed, and I suspect it was time for egg laying process in immature seeds. They belong to 2 different species; put in alcohol for ID (at Montpellier by Michel martinez, INRA);
- The already known smut fungus, *Ustilago phrygica* (E, blue arrow on an attacked seedling),

that I worked on in the past 5 years, and revealed not to be specific to Tcm was found in every sites surveyed, inducing severe damage, with 100% seed reduction.

2. Ecological notes: Plants were all green (F), occurring as early seedlings to pollinating stage (selfing) both in Sardinia (one site near Dorgali; Plants are sparse), and Cappadoce (high density) in and outside cropping system.

COMMON MULLEIN



1. Natural enemies: No project is actually targeted on mullein, but as it harbours a lot of various insects, I decided to report those found with Massimo.

- In Sardinia, a dominant black tiny (3-4mm) sp. of Curculionidae (G) was commonly found in the heads, with more than 10 adults per plant (H). Dead material will be given to E. Colonelli (Rome Univ.).

- In Sardinia, we found at least 2 species of Lepidoptera at larval stage feeding in the centre of the rosette or on the leaves inducing



severe damage (J).

A 3rd abundant species was found in Turkey (Cappadoce), with spines all over the body (K). Up to 10-20 per plant were noticed at different stages. Larvae were not collected.



2. Ecological notes: Plants are very common in Sardinia and Turkey, but no ID at species level was undertaken. Mullein likes moist sites, is not only a side road weed but occurs naturally in open field too (I). A ID of the most common mullein would help in evaluating specificity of the arthropods found.

Conclusion and perspectives

We got familiar with FB which is not an easy plant to recognize as many species belong to the broom family in the Mediterranean Basin. It turned out that several insect sp. are present on FB, such as the green psyllid, possibly *Arytininis hakani*. Additional surveys in France, Spain will provide more material for genetics, and precise the native natural arthropod fauna on FB.

Central Turkey confirms its status of high plant and insect diversity. Collecting insects on medusahead might lead to new

directions for Biological control. Keying, understanding biology, and Host Specificity Testing of the 3 insect species will be the next



Traditional Cappadocian vineyard growing at ca. 1,000 mts. Local and exotic varieties are used (Merlot, Petit Verdot, etc.)

step. During our stay in Cappadoce, we met with local grapevine growers, with whom we might prepare future agreements for 1/ set up field tests (medusahead, Russian olive, *Onopordum* sp., etc.); 2/ install pheromone traps in vineyards for collecting EGVM, and potentially collect its natural enemies; to my knowledge, this area has never been surveyed; those people are keen to collaborate, and it will be very fruitful for the common projects between EBCL and BBCA. An additional trip to Cappadoce in late May would confirm results and contacts presented here.



Locations of Eurasian collections of French broom (yellow cross), and insect collection on medusahead and common mullein