



MEDREONET: "Surveillance network of Reoviruses, Bluetongue and African Horse Sickness, in the Mediterranean Basin and Europe"

WP 2: Regional surveillance of vectors.



WP2 Leaders: Miguel Miranda & Matthew Baylis

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Istituto Zooprofilattico Sperimentale "G. Caporale" **IZS A&M**

Universidad Complutense de Madrid **UCM**

University of the Balearic Islands **UIB** (University of Zaragoza **UZ**,
Centre se Recerca en Sanitat Animal **CRESA**)

Institute of Animal Health **IAH**

University of Liverpool. **U Liv.**

Onderstepoort veterinary Institute. **OVI**

Friedrich- Loeffler Institute. Deutsches Entomologisches Institut. **FLI/DEI**

Institute of Tropical Medicine. **ITMA**

Institute of Parasitology. University of Zürich.

Objectives

General:

Strengthening Culicoides entomological surveillance in Europe and neighbouring countries.

Specific:

Evaluation and harmonisation of (1) surveillance protocols and (2) available tools for trapping,

Identification of vectors and modelling of vector habitat

D2.1 - Recommendation of the optimal trap design for sampling *Culicoides*

D2.2 - Guide to the identification of *Culicoides* vectors and potential vectors present in the Mediterranean basin, including molecular methods.

D2.3 - Assessment of the relationship between *Culicoides* vector density and BT and AHS 'risk'

D2.4 - Evaluation of the role played in Europe by novel (non- *C. imicola*) vector species

D2.5 - Standardised protocols for detection of presence/absence and estimation of abundance of *Culicoides*.

D2.6 - Evaluation of available models of suitable vector (larval and adult) habitat

D2.7 - Recommendations on optimal surveillance protocols for *Culicoides*, according to the needs of the country (to confirm vector absence; to demarcate areas of low or zero risk; to monitor vector spread)

D2.8 - A reference collection of *C. imicola* specimens from across the region for future DNA analysis

D2.1 - Recommendation of the optimal trap design for sampling *Culicoides*

Palma of Majorca meeting 2007:

- 4 traps: CDC, OVI, Riebt, UK
- Data presented: UIB.

Teramo meeting 2008:

- 5 traps: CDC, German, OVI, Riebt, UK.
- Data from UIB and OVI. Under processing by CIRAD

Lisbon meeting 2009:

- Data from OVI. Published? Others: CIRAD; FLI/DEI?
- A final recommendation in regards to the optimal trap design will be then developed.

TRAP COMPARISONS



D2.1 - Recommendation of the optimal trap design for sampling *Culicoides*

STABLING



Palma of Majorca meeting 2007:

- U. Liv.: In early summer, animal presence increased catch by 2x, and trapping inside decreased catch by 7x. In late autumn, trapping inside had very little effect, except on warm, windless nights when outdoors catches were high.

Teramo meeting 2008:

- U. Liv.: in May/June, the presence of cattle increased catches of *C. obsoletus* and outside traps caught more than inside traps. Similar patterns were apparent in October, but the difference between inside and outside catches was reduced. The risk of biting is reduced by housing, but the benefit would be greatest on warm nights.

Lisbon meeting 2009:

No new data

D2.1 - Recommendation of the optimal trap design for sampling *Culicoides*

COLLABORATIVE TEST FOR INSECTICIDES

Palma of Majorca meeting 2007: CIRAD: to develop a general protocol.

Teramo meeting 2008: CIRAD: Organization of a multi-focus laboratory test for insecticide assessment.

Strasbourg meeting 2009: WHO protocol for insecticide testing was adopted and a general protocol was discussed.

Lisbon meeting 2009: Updating of the current activity.

D2.2 - Guide to the identification of Culicoides vectors and potential vectors present in the Mediterranean basin, including molecular methods.

MOLECULAR TAXONOMY

Palma of Majorca meeting 2007:

- Ring-trial of molecular methods organised by CIRAD.

Teramo meeting 2008:

- Presentation of the results of the ring trial. Subgenus *Avaritia*. Mol. Markers ITS1, ITS2, COI. 11 participants: CIRAD, IBABSA, CRESA, CITA, IZS, UK-Aberdeen, FLI, DEI, IAH, ITMA, CRESA.

Lisbon meeting 2009:

- Results of the second ring trial will be presented and discussed.

D2.2 - Guide to the identification of *Culicoides* vectors and potential vectors present in the Mediterranean basin, including molecular methods.

MORPHOLOGICAL TAXONOMY

Palma of Majorca meeting 2007: To produce template for computer-assisted key for identification of *Culicoides*. Basic identification of european vectors to be included in Medreonet Webpage.

Teramo meeting 2008: Towards an online key for morphological identification of Palearctic *Culicoides* species. CIRAD

Strasbourg meeting 2009: the draft of the web based key was successfully presented and discussed. The first international meeting on *Culicoides* taxonomy in Strasbourg in April 2010 was announced.

•**Lisbon meeting 2009:** and update of the web based key will be presented.

D2.3 - Assessment of the relationship between *Culicoides* vector density and BT and AHS 'risk'

Palma of Majorca meeting 2007: Switzerland have set up surveillance system to help define 'vector-free' periods or places. South Africa have investigated *Culicoides* density, seasonality and vector-competence in traditional AHSV-free area of Western Cape

Teramo meeting 2008: AHSV outbreaks in SA (OVI); Spatial variation in Wales (U. Liv.); Introduction by Wind (UCM). Results from last EFSA report: period of low risk; vector activity threshold.

ACTIONS: *Analysis of available data at local/ national level in regards to BTV and AHS outbreaks as well as Culicoides vector distributions. The data is needed to be integrated in a GIS context. The following institutions will participate in this action: CIRAD, IZS, UIB, OVI and ITMA. The action will be coordinated by Dr. Baylis.*

Lisbon meeting 2009: to discuss about already available data and feasibility of the analysis.

D2.4 - Evaluation of the role played in Europe by novel (non-*C. imicola*) vector species.

Palma of Majorca meeting 2007: No updates in regards to this issue. *C. obsoletus* identified as a vector by using PCR analysis. Few vector competence/oral susceptibility studies.

Teramo meeting 2008: Review published on the last EFSA report. Studies about vector O.S. conducted in IAH and OVI.

ACTIONS: *The participants agreed to develop a common protocol for evaluating vector competence. A preliminary trial will be proposed to be conducted in the second half of the next year. The following institutions will participate in this action: CIRAD, IZS, UIB, IAH, OVI and FLI/ DEI. The action will be coordinated by Dr. Carpenter.*

•**Lisbon meeting 2009:** vector competence studies presented by IAH, OVI and UIB.

D2.5 - Standardised protocols for detection of presence/absence and estimation of abundance of *Culicoides*.

Palma of Majorca meeting 2007: No updates.

Teramo meeting 2008: Data in regards to trap comparison under low population level and definition of seasonal vector free period. UIB.

ACTIONS: The participants agreed to develop a protocol based on D2.1 and the available data. The institutions that will participate in this action are the same mentioned in D2.1. This action will be coordinated by Drs. Baylis and Miranda.

Lisbon meeting 2009: to discuss about already available data and feasibility of the analysis.

D2.6 - Evaluation of available models of suitable vector (larval and adult) habitat

Palma of Majorca meeting 2007: Breeding sites for *C. imicola* and *C. obsoletus* (UIB); Landscape parameters for *C. imicola* adults in Corsica (CIRAD); parasites on larvae and adult (CRESA); nocturnal activity of adults (UIB)

Teramo meeting 2008: Oviposition preferences of *C. imicola* (OVI).

ACTIONS: The participants agreed to conduct a review of the available models across Europe. The institutions that will participate in this action are CIRAD, IZS, UCM, UIB, IAH and U. Liv. The action will be coordinated by Drs. Baylis and Conte.

Lisbon meeting 2009: to discuss about already available data and feasibility of the analysis.

D2.7 - Recommendations on optimal surveillance protocols for *Culicoides*, according to the needs of the country (to confirm vector absence; to demarcate areas of low or zero risk; to monitor vector spread).

Palma of Majorca meeting 2007: No actions.

Teramo meeting 2008:

ACTIONS: *The participants agreed to link this deliverable with D2.5. Standardised protocols for detection of presence/absence and estimation of abundance of *Culicoides* and consequently with D2.1. Recommendation of the optimal trap design for sampling *Culicoides**

The institutions that will participate and the coordinators will be the same as D2.1 and D2.5.

Lisbon meeting 2009: to discuss about already available data and feasibility of the analysis.

D2.8 - A reference collection of *C. imicola* specimens from across the region for future DNA analysis

Palma of Majorca meeting 2007: Specimens of *C. imicola*, *C. dewulfi*, *C. obsoletus* and *C. pulicaris* grps – frozen at -20 or -80. Male and female. Spain/Portugal/Switzerland/Italy/[greece][turkey]/France

Teramo meeting 2008:

ACTIONS: *Samples has been collected and stored in several laboratories. During 2009, Drs. Baylis and Miranda will coordinate the procedure for the establishment of the reference collection.*

Lisbon meeting 2009: to develop an specific protocol for sampling preservation and labelling according to the project needs.

Summary of presentations in Lisbon 2009.

| Deliverable | Topic | Oral Presentation | Poster presentation |
|-------------|------------------------|-------------------|---------------------|
| D2.1 | Traps | 4 | |
| D2.2 | Identification | 3 | 1 |
| D2.3 | Vector density | 5 | 1 |
| D2.4 | Vector competence | 5 | 1 |
| D2.5 | Presence/absence | | |
| D2.6 | Models | | |
| D2.7 | Surveillance protocols | 1 | |
| D2.8 | Reference collection | | |

Total oral: 18**Total poster: 3**