

VBORNET

"European Network for Arthropod Vector
Surveillance for Human Public Health"

AGM Riga 2012

Work Package 2.2

Activities for VBORNET period 4 2012/2013

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Objectives WP 2.2 for 2012

- Provide ad-hoc technical support as required by VBORNET and ECDC



- Deliverables:

- Factsheets on ecology & biology of four Anopheline species considered to be important for malaria transmission in Europe
- Factsheet on survey techniques/surveillance for Phlebotomine vectors
- Factsheet on driving forces for change in distribution of Phlebotomine vectors

Ecology & Biology of Anophelines -Factsheets

- *An. labranchiae* & *An. sacharovi*
– deadline 31 May 2012
- *An. atroparvus* & *An. plumbeus*
– deadline 30 Jun 2012
- Seeking expert opinion

Ecology & Biology of Anophelines

-Factsheets

- Single source of information
- Aimed at the public and policy makers
- Information accessible (once approved by VBORNET) via ECDC website

| VBORNET FACTSHEET IMPORTANT ANOPHELINE MOSQUITOES OF EUROPE <i>Anopheles labranchiae</i> | |
|--|--|
| HAZARDS ASSOCIATED WITH SPECIES | |
| <u>Geographical spread:</u> | |
| <u>Ecological plasticity:</u> | |
| <u>Biting/disease risk:</u> | |
| GEOGRAPHICAL DISTRIBUTION | |
| <u>Current spread:</u> | |
| <u>Possible future expansion:</u> | |
| <u>Driving forces for change in distribution:</u> | |
| ENTOMOLOGY | |
| <u>Species name/classification:</u> | |
| <u>Common name/synonyms:</u> | |
| <u>Morphological characteristics/similar species:</u> | |
| <u>Life History: diapausing tendencies, seasonal abundance, flight range, voltinism etc</u> | |
| <u>Host preferences:</u> | |
| <u>Aquatic/terrestrial habitat:</u> | |
| <u>Resting habitat:</u> | |
| <u>Biting behaviour:</u> | |
| <u>Environmental thresholds/constraints:</u> | |
| EPIDEMIOLOGY & TRANSMISSION OF PATHOGENS | |
| <u>Known vector status:</u> | |
| <u>Outbreaks associated with species: including historical, current, airport</u> | |
| <u>Forces driving disease transmission:</u> | |

Ecology & Biology of Anophelinae

-Overview

• Examples

- *An. labranchiae* – control sometimes difficult, utilise vast range of breeding habitats, opportunistic feeder but aggressive human biter, vector of *P. vivax* and possibly African *P. falciparum*
- *An. atroparvus* – opportunist feeder, sometimes found looking for blood meal during the day (indoors), suggested to be most important malaria vector in Europe
- *An. sacharovi* – control sometimes difficult, highly plastic (both adults and juvenile stages), mostly feed at night but also found biting during the day
- *An. plumbeus* – utilising septic tanks (potential increased human-vector contact), vector competence for *P. falciparum* demonstrated and increase in nuisance biting reported

Ecology & Biology of Anophelines -Geography

- Current geographical distribution

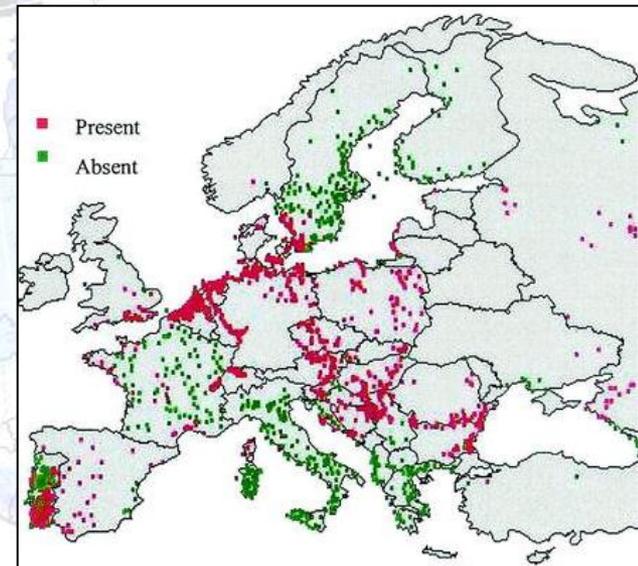
- *An. atroparvus* present northern and western Europe, Spain, Portugal and Northern Italy.
- *An. sacharovi* present eastern coast of Italy, Russia, the Balkans and across Turkey to the Middle East.

- Future expansion

- Re-colonisation of previous territory

- Driving forces for change

- Wetland expansion
- Biodiversity goals
- Agriculture
- Climate change/extremes events



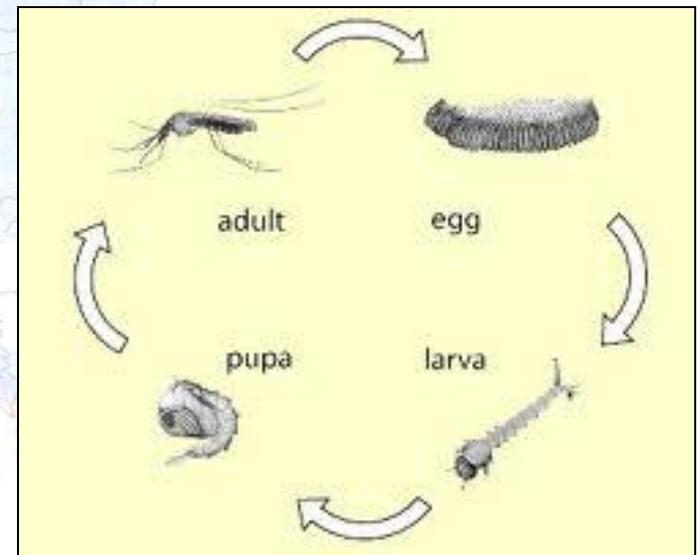
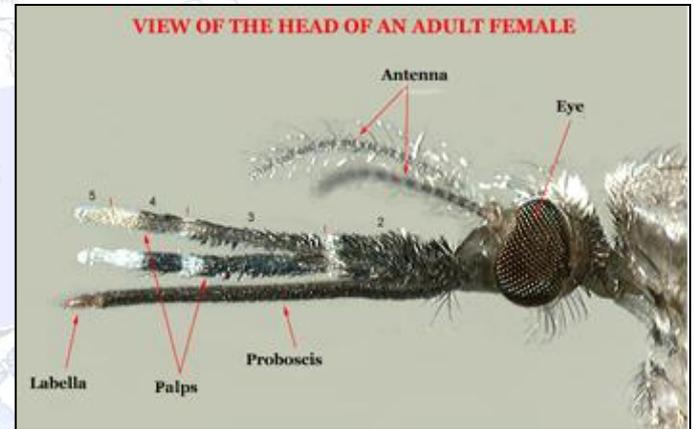
Presence/absence *An. atroparvus* in Europe -
 Kuhn *et al.*, 2002 *Journal of Medical Entomology* 39(4):621-630.

Ecology & Biology of Anophelinae -Entomology

- Synonyms
- Morphology/similar species

- Life cycle
 - Egg laying habits
 - Oviposition site selection
 - Larval development

- Phenology
 - Voltinism
 - Seasonality
 - Diapausing tendencies



Ecology & Biology of Anophelines

-Entomology cont.

- Host preference
 - *An. labranchiae* – opportunist, wide range of hosts, aggressively attacks humans
- Aquatic/terrestrial habitat
 - *An. atroparvus* – fresh/brackish such as canals, ditches, river margins, even used tyres (only a few)
- Resting habitat/biting behaviour
 - *An. sacharovi* – biting habits dependant on host availability
- Environmental thresholds/constraints



Ecology & Biology of Anophelines

-Epidemiology & disease transmission

- Vector status/biting nuisance
- Outbreaks (historical overview and recent significant outbreaks, “airport malaria”)
- Forces driving disease transmission
 - Vector-human contact
 - Growing resistance in *Plasmodium sp.*
 - International travel
 - Migration

Ecology & Biology of Anophelinae

-Surveillance/Control

- Surveillance schemes currently in place
 - Species specific sampling strategies
 - CDC light traps, mosquito magnets, larval dipping, battery powered aspirators, human landing catches



- Species specific control measures
 - Larval habitat reduction, IRS, *Bacillus thurisiensis israeliensis*, larvarous fish etc
- PH interventions

Achievements so far

- Factsheet structure/content
- Extensive literature search (English literature only)
 -  PubMed
 - Google scholar
 -  ScienceDirect
- ~40/100 papers assessed and noted ready for inclusion in factsheet

Keywords:

An. labranchiae

An. sacharovi

An. atroparvus

An. plumbeus

(all above & habitat, ecology, biology, biting behaviour, control, distribution)

Additional searches:

Malaria vector & Europe

Malaria transmission &

Europe

Autochthonous malaria &

Europe

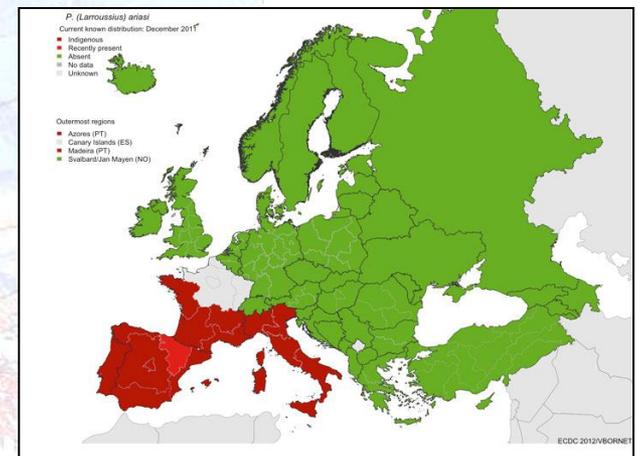
We need your expert opinion

- Factsheets need to be up-to-date
- Need help identifying local/unpublished information or literature
- Particularly information on the **ecology/biology** of each species

Phlebotomine sampling and drivers for change – Factsheets

- **Sampling strategies** – flight traps, light traps, animal-baited overnight trapping etc
 - *Phlebotomus ariasi*, *neglectus*, *papatasi*, *perfiliewi*
 - Outline to be completed Jun 2012
 - Final to be completed Dec 2012

- **Drivers for change**
 - Focus of vectors of *Leishmania* and sandfly fever
 - Outline to be completed Jun 2012
 - Final to be completed Dec 2012



Summary

- Literature review for is underway
- Expert opinion on ecology & biology is needed
- Completed *An.* factsheets by end of Jun 2012
- Literature review of Phlebotomines Jul 2012
- Expert opinion on sampling strategies and driving forces will be sought Jul 2012
- Completed *Ph.* Factsheets Dec 2012

Please remember to share your expertise

- Contacts for WP 2

- Work package leader Jolyon Medlock

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- Scientific support Kayleigh Hansford

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Thank you