EXTERNAL QUALITY ASSESSMENT ON MOSQUITO IDENTIFICATION #2

The MediLabSecure network organized an External quality assessment (EQA) on mosquito identification[1]. This method allows for comparison of a laboratory's testing to a source outside the laboratory. The purpose of this testing is to assess the efficiency and accuracy of mosquito identification by all the medical entomology laboratories of the MediLabSecure network.

One mosquito box of 12 specimens was distributed to the laboratories that are members of the MediLabSecure entomology network, including 8 adult mosquito specimens and 4 larvae mosquito specimens to be identified at genus and species levels. Eight laboratories from the Mediterranean and Black Sea countries participated in the EQA study #2.

As general results, the rate of correct answers is 83% for the genus identification and 78% for the species identification, adult and larva combined. More precisely for the species identification, 6 laboratories have more than 75% correct answers and 2 laboratories have between 40% and 50% correct answers.

The results show that the participating labs have quite good and homogeneous identification skills. Significant augmentation of capacities is demonstrated for labs which had few, if any, skills on mosquito identification at the beginning of the MediLabSecure project.

Because mosquito identification is an important step in entomological surveillance, a regular practice, apart from routine activities, is highly recommended. It was in this sense that the EQA has been implemented. It is indeed a good exercise as it confronts labs with species that country does not necessarily face with.

MATERIALS AND METHODS

CALL FOR PARTICIPATION

A total of 9 laboratories involved in the medical entomology MediLabSecure network were invited to participate in this test, in the continuity of the previous MediLabSecure on-site training sessions. This study was designed and coordinated by the WP4 MediLabSecure team.

This exercise was intended primarily for the two people who followed the MediLabSecure training in medical entomology, but also for the whole laboratory. This exercise could be carried out by one or several people.

This species identification could be done by using all the tools they wanted (dichotomical keys, interactive key for mosquito species such as MosKeyTool, molecular methods…).
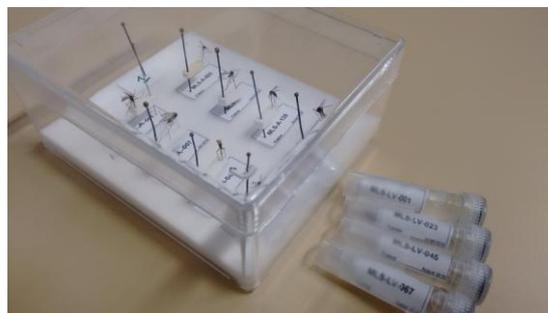
SPECIMEN PREPARATION

The mosquito box was composed of:

- 7 or 8 mounting adult mosquito specimens

-    4 larva mosquito specimens in alcohol.

Each specimen had an associated code (*e.g*. MLS-A-001)

All the specimens were fresh; they have been collected the previous few months. Despite the precautions regarding the materials, some specimen could have been damaged during the transportation (especially specimens at adult stage). This option has been considered and it has been admit that the challenging determination of poor preserved specimen relies within the area of the medical entomology expertise. Participants have been invited to take this challenge and to manage it the best they can.

VALIDATION AND DISPATCH OF THE SPECIMEN BOX

The specimens have been collected and conditioned by a senior medical entomologist. The labelings and identifications have been double-checked.

The mosquito boxes were distributed by hand to participants during the MediLabSecure regional meeting in Tunis with full instructions. They were asked to report their results and any problem encountered using a common online formulary.

RESULTS

We obtained a response from 8 labs in 7 countries (Middle-East and North Africa):

-    Algeria / Pasteur Institute of Algeria, Eco-épidemiologie Parasitaire et Génétique des Populations
-    Jordan / Ministry of Health, Parasitic and Zoonotic Diseases Department
-    Lebanon / Lebanese University, Laboratory of Immunology
-    Libya / National Center for Disease Control, Laboratory of parasitology and vector borne diseases
-    Morocco / Institut National d'Hygiène, Laboratoire d'Entomologie Médicale
-    Morocco / Institut Pasteur du Maroc, Laboratoire des Maladies Vectorielles
-    Palestine / Ministry of Health, Public Health Lab
-    Tunisia / Pasteur Institute of Tunis, Medical Entomology Laboratory

Unfortunately, we did not receive the results for Egypt (Ain Shams University, Entomology Department and the Research and Training Center on Vectors of Diseases) despite several reminders.

All the laboratories performed the exercise by morphological identification, using dichotomical key (50%) or interactive and online key (87,5%).

Results of the EQA - Rate of correct answers by type of specimen

Specimen	% right answers	
	Genus	Species
Adult	81%	77%
Larva	97%	88%
All	89%	82%

Results of the EQA - Rate of correct answers by species (adult mosquitoes)

Species (adult)	Nb specimens to identify	Genus		Species	
		Right	%	Right	%
Aedes albopictus	8	8	100%	8	100%
Aedes vexans	8	5	63%	5	63%
Aedes vittatus	8	7	88%	7	88%
Culex hortensis	5	5	100%	4	80%
Culex pipiens	8	5	63%	5	63%
Culiseta longiareolata	8	5	63%	5	63%
Orthopodomyia pulcripalpis	8	8	100%	7	88%
Total	**53**	**43**	**81%**	**41**	**77%**

Results of the EQA - Rate of correct answers by species (larva mosquitoes)

Species (larva)	Nb specimens to identify	Genus		Species	
		Right	%	Right	%
Aedes vittatus	8	7	88%	5	63%
Aedes (Ochlerotatus) detritus	8	8	100%	7	88%
Culiseta longiareolata	8	8	100%	8	100%
Orthopodomyia pulcripalpis	8	8	100%	8	100%
Total	**32**	**31**	**97%**	**28**	**88%**