

# Entomology Summer Course

*'Hands on' Course on Arthropods  
of Medical and Veterinary Significance:  
A global perspective, from theory to practice*

**26 - 30 August, 2019**

National Veterinary School of Toulouse, France

Continuing education in Medical and Veterinary Entomology



## SPONSORSHIP

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The Parasitology and Entomology team at the National Veterinary School of Toulouse, France, organizes an entomology course which will be held from the 26<sup>th</sup> to 30<sup>th</sup> of August 2019. The course will highlight topics such as arthropod-borne diseases, resistance in arthropod populations, control tools, principles of laboratory rearing and morphological identification of arthropods of medical and veterinary importance.

The course will encompass several arthropod groups, namely sand flies, mosquitoes, midges (*Culicoides* spp.), Tabanidae, Muscidae, fleas, bedbugs, ticks and mites (Dermanyssidae and Sarcoptidae.) Lectures will generally take place in the morning, while the afternoon will be dedicated to laboratory and field work.

## Preliminary program at a glance

	Monday, 26 <sup>th</sup> August	Tuesday, 27 <sup>th</sup> August	Wednesday, 28 <sup>th</sup> August	Thursday, 29 <sup>th</sup> August	Friday, 30 <sup>th</sup> August
<b>MORNING</b> (08h30 am – 12h30 pm)	Introduction to medical and veterinary entomology <i>Prof Richard Wall, University of Bristol, United Kingdom</i>	Mosquito-borne diseases: a One Health perspective <i>Dr Anna-Bella Failloux, Institut Pasteur de Paris, France</i>	<i>Glossina</i> spp.: bio-ecology and African Trypanosomiasis <i>Prof Steve Torr, Tropical Liverpool School, United Kingdom</i>	Fleas and flea-borne pathogens <i>Dr Emilie Bouhsira, ENVT, France</i>	Ticks and tick-borne diseases in companion animals and wildlife <i>Dr Magalie René-Martellet, Dr Gilles Bourgoin, VetAgro Sup, France</i>
	<i>Phlebotomus</i> spp.: bio-ecology and pathogenic roles: human and animal leishmaniosis <i>Prof Jérôme Depaquit, Université de Reims, France</i>	Mosquito control and public health <i>Dr Fabrice Chandre, IRD, France</i>	<i>Stomoxys calcitrans</i> : bio-ecology and pathogenic role <i>Dr Emmanuel Liénard, ENVT, France</i>	Bedbugs: bio-ecology, pathogenic role and principle of laboratory rearing <i>Jean-Michel Bérenger, LDI, France</i>	<i>Dermanyssus gallinae</i> : bio-ecology, pathogenic role and control <i>Prof Lionel Zenner, VetAgro Sup, France</i>
	<i>Culicoides</i> spp.: bio-ecology and transmitted diseases <i>Dr Claire Garros, CIRAD, France</i>	Mechanisms of insecticide resistance <i>Dr Sylvie Cornélie, IRD, France</i>	Principles of alternative control tools against stable flies and tabanids <i>Prof Philippe Jacquet, ENVT, France</i>	<i>Principles of evaluation of the efficacy of an ectoparasiticide</i> <i>Prof Michel Franc, ENVT, France</i>	Sarcoptidae mites: bio-ecology and pathogenic role in human and animals <i>Prof Jacques Guillot, Dr Charlotte Bernigaud, ENVA, France</i>
<b>AFTERNOON</b> (1.30 – 6 pm)	Sand flies and midges: principles of morphological identification (+ trapping) <i>Prof Jérôme Depaquit, Dr Claire Garros</i>	Mosquitoes: principles of morphological identification Initiation to « <i>MoskeyTool</i> » <i>Nil Rahola, IRD, France</i>	Field work in the vicinity of Toulouse: principles of stable fly and tabanid trapping	Stable flies and tabanids: principles of morphological identification <i>Prof Gérard Duvallat, Université de Montpellier, France</i>	Ticks and tick-borne pathogens in livestock: a One Health perspective Principles of tick morphological identification <i>Dr Vincenzo Lorusso, University of Salford, UK Vetoquinol, France</i>
		Principles of mosquito laboratory rearing <i>Dr Emilie Bouhsira, ENVT, France</i>		Principles of stable fly laboratory rearing <i>Dr Shukri Sharif, ENVT, France</i>	

# General information

**Course Organizers:** Emilie Bouhsira and Michel Franc

Dr Emilie Bouhsira (Programme Leader)  
DVM, MSc, PhD, Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Toulouse  
23 chemin des Capelles, 31076 Toulouse, France  
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Prof Michel Franc  
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Tel : +33 (0) 5 61 19 38 873  
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**Scientific committee :** Dr Emilie Bouhsira, Prof Michel Franc, Prof Philippe Jacquet, Dr Emmanuel Liénard

Dr Emmanuel Liénard  
DVM, MSc, PhD, Dip. EVPC  
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Prof Philippe Jacquet  
DVM, PhD, HDR, Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Toulouse  
23 chemin des Capelles, 31076 Toulouse, France  
Tel : +33 (0) 5 61 19 39 67  
E-mail : [p.jacquet@envt.fr](mailto:p.jacquet@envt.fr)

**Course venue:** National Veterinary School of Toulouse, 23 chemin des Capelles, 31076 Toulouse, France

**Fees:** 450 euros for students and EVPC residents, 950 euros for other participants.

Fees include teaching and laboratory materials, transportation for field work, coffee and lunch breaks and public transport pass.

Transport to and from Toulouse, accommodation and breakfast, and evening meals (except for welcome and gala dinners) are not included in the fees.

**Application:** please send a CV, a motivation letter, the name of two referees and the application form filled in with your details to Emilie Bouhsira: [e.bouhsira@envt.fr](mailto:e.bouhsira@envt.fr)

**Deadline for application:** 31<sup>st</sup> of March 2019

**Language:** The official language of the course will be English

**Number of participants:** maximum 12

**Target participants:** EVPC residents and diplomates, postgraduate (MSc, PhD) students, Post-Doc scientists, research fellows, entomologists, laboratory staff.

## How to get to Toulouse

By plane: Toulouse-Blagnac international airport features direct flights to 74 destinations mostly in Europe and Northern Africa with a few additional seasonal long-haul connections.

Many domestic flights from main French cities also run daily.

From the airport to Toulouse downtown:

- **Tram**: the tram line T2 connects Toulouse centre with the airport and back, running every 15 minutes. The tram connects with metro Line A at the stop 'Arènes' and metro Line B at the stop 'Palais de Justice'.
- **Bus and coach**: Shuttle buses to Toulouse city centre, run from the airport, outside Hall B, every 20 minutes. Faster than the journey by tram, it takes approximately 20 minutes to reach the city centre by bus, stopping at 'Compans Caffarelli' or 'Jeanne d'Arc' (both on Metro Line B), or 'Jean Jaurès' (Metro Lines A and B) or 'Toulouse-Matabiau' railway station.

- **By train:** Toulouse can be reached by train from other French cities (Toulouse-Matabiau railway station).
- **By car:** Toulouse can be reached by car using existing major highways (National road tax). Within the city, however, the parking is extremely limited and very expensive. The vet school has however a large car park where you can leave your car.

### **Accommodation**

The vet school is located in a residential neighborhood with limited public transportation, especially in the evening.

We recommend the **Residhome Occitania**, particularly for its location in-between the city center [public transportation (tram (Lines T1 and T2) and metro (Line A)) are at 5 minutes-walking distance] and the vet school (direct access with bus n°46). It is also directly reachable from the airport using the tramway.

The hotel is equipped with a swimming pool, which could be a great way to relax after a whole day of science! The weather in Toulouse is indeed usually very warm at the end of August.

Location : 93, avenue de Lombez - 31300 Toulouse

Tel. : +33 (0)5 61 44 08 34

E-mail : [toulouse.occitania@residhome.com](mailto:toulouse.occitania@residhome.com)

<https://www.residhome.com/residence-hoteliere-aparthotel-toulouse-185.html>

**Studio:** approximately 61 euros/night (room with double-bed or two single beds and equipped kitchen)

**One-bed room apartment:** approximately 73 euros/night (in addition to the studio equipment, a leaving room with convertible sofa)

A booking code will be given to the participants to get these specific discounts.

Other options, closer to the vet school but further away from the city center:

<https://www.campanile.com/fr/hotels/campanile-toulouse-ouest-purpan>

<https://www.appartcity.com/fr/destinations/midi-pyrenees/toulouse/toulouse-purpan-aeroport.html>

<https://www.hotel-bb.com/fr/hotels/toulouse-purpan.html>



<https://www.accorhotels.com/fr/hotel-0445-novotel-toulouse-purpan-aeroport/index.shtml>

<https://www.residhome.com/residence-hoteliere-aparthotel-toulouse-199.html>

And also: <https://www.airbnb.fr>

To help your search, the neighborhood of the vet school is called "Lardenne".

## List of lecturers

Richard Wall, B.Sc., M.B.A., Ph.D.

University of Bristol, United Kingdom

Jérôme Depaquit, Pharm. D., Ph.D.

University of Champagne-Ardenne, France

Claire Garros, M.Sc., Ph.D.

Centre of agricultural research for development (CIRAD), Montpellier, France

Anna-Bella Failloux, M.Sc., Ph.D.

Institut Pasteur of Paris, France

Fabrice Chandre, DVM, HDR, Ph.D.

Institute of Research for Development (IRD), Montpellier, France

Sylvie Cornélie, M.Sc., Ph.D.

Institute of Research for Development (IRD), Montpellier, France

Nil Rahola

Institute of Research for Development (IRD), Montpellier, France

Steve Torr, B.Sc., M.Sc., Ph.D.

Liverpool School of Tropical Medicine, Liverpool, United Kingdom

Emmanuel Liénard, DMV, M.Sc., Ph.D., Dip. EVPC

EBVS® European Veterinary Specialist in Parasitology

National Veterinary School of Toulouse (ENVT), Toulouse, France

Philippe Jacquiet, DVM, HDR, Ph.D., Dip. EVPC

EBVS® European Veterinary Specialist in Parasitology

National Veterinary School of Toulouse (ENVT), Toulouse, France

Gérard Duvallet, M.Sc., Ph.D.

University of Montpellier, France

Emilie Bouhsira, DMV, M.Sc., Ph.D., Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Toulouse (ENVT), Toulouse, France

Jean-Michel Bérenger, M.Sc.  
Laboratory of Insect and Diagnostic (LDI)  
Research Unity on Tropical Infectious Emerging Diseases (URMITE), Marseille, France

Michel Franc, DVM, HDR, Ph.D., Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Toulouse (ENVT), Toulouse, France

Shukri Sharif, BSc, Ph.D.  
National Veterinary School of Toulouse (ENVT), Toulouse, France

Magalie René-Martellet, DVM, Ph.D.  
National Veterinary School of Lyon (VetAgro Sup), Lyon, France

Gilles Bourgoïn, DVM, Ph.D.  
National Veterinary School of Lyon (VetAgro Sup), Lyon, France

Lionel Zenner, DVM, Ph.D., Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Lyon (VetAgro Sup), Lyon, France

Jacques Guillot, DVM, HDR, Ph.D., Dip. EVPC  
EBVS® European Veterinary Specialist in Parasitology  
National Veterinary School of Maisons-Alfort (ENVA), Maisons-Alfort, France

Vincenzo Lorusso, DVM, Ph.D., Dip. EVPC, Dip. ACVM  
EBVS® and ACVM® European and American Specialist in Veterinary Parasitology  
Vetoquinol, Paris, France  
University of Salford, Manchester, United Kingdom

## **Preparatory work and final examination**

The attendees will receive a selection of papers covering the topics that will be developed during the course at least one month prior to the beginning of the summer school.

The final examination will be made of 10 multiple choice questions and short answering questions.

A course feedback questionnaire will be sent to each participant via email to be filled at the end of the summer course.

## Detailed program

### Sunday 25<sup>th</sup> of August

Arrival of participants

**20h00:** Welcome dinner

### Monday 26<sup>th</sup> of August

**08h00:** Welcome coffee

08h15-12h30: Lectures

**08h15-10h15:** Introduction to medical and veterinary entomology, Prof Richard Wall

**10h15-10h30:** Coffee break

**10h30-11h30:** Bio-ecology and pathogenic role of sandflies, Prof Jérôme Depaquit

**11h30-12h30:** Bio-ecology and pathogenic role of *Culicoides* spp., Dr Claire Garros

**12h30-13h30:** Lunch break

13h30- 18h30: Practical work

**13h30- 16h00:** Principles of morphological identification of sandflies, Prof Jérôme Depaquit

**16h00-16h15:** Coffee break

**16h15- 18h00:** Principles of morphological identification of *Culicoides* spp., Dr Claire Garros

**18h00-18h30:** How to set up a trap for *Culicoides* in the vet school facilities (large animal hospital)

**Free evening**

## **Tuesday 27<sup>th</sup> of August**

08h15-12h30: Lectures

**08h15-10h15: Mosquito-borne diseases: a one health perspective**, Dr Anna-Bella Failloux

**10h15-10h30: Coffee break**

**10h30-11h30: Mosquito control and public health**, Dr Fabrice Chandre

**11h30-12h30: Mechanisms of insecticide resistance in mosquitoes**, Dr Sylvie Cornélie

**12h30-13h30: Lunch break**

13h30-17h30: Practical work

**13h30-17h00: Principles of morphological identification of mosquitoes**, Nil Rahola

**Training on the recognition of the main European mosquito species of medical and veterinary significance.**

Participants need to bring their laptop with them so as to install the software “MoskeyTool”, and will be taught how to use it.

Principles of mosquito mounting will also be addressed.

**17h00-17h30: Principles of mosquito laboratory rearing**, Dr Emilie Bouhsira

**19H00: Welcome cocktail at the Toulouse town hall and welcome speech by a council member.**

**20H00: Dinner all together in Toulouse downtown**

## Wednesday 28<sup>th</sup> of August

08h15-12h30: Lectures

**08h15-10h15: Bio-ecology of *Glossina* spp. and African trypanosomiasis**, Prof Steve Torr

**10h15-10h30: Coffee break**

**10h30-11h30: Bio-ecology and pathogenic roles of stable flies**, Dr Emmanuel Liénard

**11h30-12h30: Principle of alternative control tools against stable flies and tabanids**, Prof Philippe Jacquet

**12h30-13h30: Lunch break**

14h00-18h30: Field work

**14h00: Departure**

**Field work in a farm in the vicinity of Toulouse to learn the principles of trappings of stable flies and tabanids**

**18h30/19h00: Back to Toulouse**

**Free evening**

## Thursday 29<sup>th</sup> of August

08h15-11h30: Lectures

11h30-12h30: Practical work

**08h15-09h15: Fleas and flea-borne pathogens**, Dr Emilie Bouhsira

**09h30-10h15: Bio-ecology and pathogenic role of bedbugs and principle of laboratory rearing**, Jean-Michel Bérenger

**10h15-10h30: Coffee break**

**10h30-11h30: Principles of the evaluation of the efficacy of an ectoparasiticide**

**11h30-12h30: Assessment of the efficacy of an ectoparasiticide against sandflies in laboratory condition - *Practical work***- Dr Emilie Bouhsira, Prof Michel Franc

**12h30-13h30: Lunch break**

13h30-17h30: Practical work

**13h30-17h00: Principles of morphological identification of sandflies and tabanids**, Prof Gérard Duvallet

**17h00-17h30: Principle of stable fly laboratory rearing**, Dr Shukri Sharif

**18h30-19h30/20h00: Guided visit of Toulouse town centre**

**Free evening**

## **Friday 30<sup>th</sup> of August 2019**

08h15-12h30: Lectures

**08h15-09h15: Ticks and tick-borne diseases in companion animals**, Dr René-Martellet

**09h15-10h15: Ticks and tick-borne diseases in wildlife**, Dr Gilles Bourgoïn

**10h15-10h30: Coffee break**

**10h30-11h30: Bio-ecology and pathogenic roles of *Dermanyssus gallinae***, Prof Lionel Zenner

**11h30-12h30: Sarcoptidae: bio-ecology and pathogenic roles in human and animals**, Prof Jacques Guillot and Dr Charlotte Bernigaud

**12h30-13h30: Lunch break**

13h30-18h30: Lecture and Practical work

**13h30-14h30: Ticks and tick-borne pathogens in cattle: a one-health perspective**,  
Dr Vincenzo Lorusso

**14h30-17h30: Principles of tick morphological identification**, Dr Vincenzo Lorusso

**18h00-19h00: Final examination of the course**

**20h30: Gala dinner in the centre of Toulouse**



## REGISTRATION FORM

**Entomology Summer Course**

**26 - 30<sup>th</sup> of August 2019**

**Ecole Nationale Vétérinaire de Toulouse**

To the organizing Committee: Dr Emilie Bouhsira and Prof Michel Franc

E-mail: [e.bouhsira@envt.fr](mailto:e.bouhsira@envt.fr)

To be sent with the CV and motivation letter

Name..... Surname.....

Institution.....

Address.....

City..... Country.....

Phone..... E-mail.....

Date of arrival:....., Date of departure: .....

Specific dietary intolerance/allergy/requirement.....

Acceptance of terms and conditions

Please be aware that the course organizers are not responsible for any damage or injury in any way arising through transport, field and laboratory activities during participation of the course. We strongly suggest you to take out personal accident insurance if you do not already have it.

Place and date ..... Signature.....