



University of Bari, Italy  
Department of Veterinary Medicine



European Veterinary  
Parasitology College

## V Parasitology Summer Course (ParSCo)



### Residency Course on ARTHROPOD VECTORS AND TRANSMITTED PATHOGENS IN THE MEDITERRANEAN AREA

8<sup>th</sup>- 15<sup>th</sup> July 2017

#### SPONSORSHIP

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and with the participation of



*Cari colleghi,*

Following four consecutive successful years, we are pleased to announce the fifth edition of the Parasitology Summer Course (V ParSCo) organized by the Parasitology and Mycology Unit of the Department of Veterinary Medicine, University of Bari (Italy), with the support of the European Veterinary Parasitology College (EVPC) and of *Parasites & Vectors*. Over the last years, more than 60 post-graduate, doctoral and research fellows from all continents in the world have enjoyed attending the ParSCo.

Also this year the ParSCo will be an intense, one-week long course for parasitologists and post-graduate students working in the field of veterinary parasitology. This course is mostly focused on practical activities, with theoretical lectures making up less than 40% of the whole program. The program traditionally includes oral lectures and practical activities on collection, identification and management of parasites such as *Leishmania infantum*, sand flies (e.g., *Phlebotomus perfiliewi*), ticks (e.g., *Ixodes ricinus* and *Rhipicephalus turanicus*), and the eyeworms (*Thelazia callipaeda*). Participants will also attend clinical examinations of cattle and other domestic animals and sample collection (lymph node and skin tissues, blood) from dogs for the diagnosis of the most prevalent vector borne diseases. Attendees will also have the opportunity to participate in bird trapping sessions and tick collection from birds as well as necropsies of wild cats for the detection of lungworms (*Aelurostrongylus abstrusus* and *Troglostrongylus* spp.).

The course traditionally takes place in Basilicata, southern Italy, in the heart of the Mediterranean. This region is fairly suitable for an optimal development of arthropods and thus for the life cycles of many parasites causing arthropod-borne diseases. A considerable diversity of parasite species, inhabiting different microenvironments, can be found in Basilicata. This region has received considerable attention from researchers, not only for its outstanding species richness, but also because it represents a potential model for other areas in the Mediterranean countries, given the environmental and climatic changes that are currently occurring in this region.

We look forward to meeting you for a successful V ParSCo meeting and to sharing with you our experience in the field of parasitology!

*Domenico Otranto  
Filipe Dantas-Torres  
University of Bari, Italy*

## **GENERAL INFORMATION**

For any information, please refer to the secretariat (dedonno.cinzia@gmail.com).

### **SCIENTIFIC ORGANIZERS**

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### **SECRETARIAT**

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### **VENUE**

Parco Regionale di Gallipoli Cognato, Matera, Basilicata, Italy.

### **PARTECIPATION FEE**

The total cost for participation is € 1000

- € 500 is to be paid directly to the Hotel on-site (includes accommodation, coffee break, light lunch, and dinner). Cash payment is preferred.
- € 500 is to be paid to the EVPC (includes place of the meeting, teaching and laboratory material, transportation to field sites and others).

Payment to the EVPC has to be issued by bank transfer to:

*'European Veterinary Parasitology College'*

*Bank name: KeytradeBank*

**IBAN: BE50651157306118**

**BIC/SWIFT-code: KEYTBEBB**

*Account Holder/Name: Thomas Geurden*

Please add as Reason for payment: Attendance to the V Parasitology Summer Course (8-15 July 2017, Italy).

The organizers guarantee only for the travel arrangements in the program (from Bari to hunting lodge and from hunting lodge to Bari). Other personal arrangements, different from those in the program, cannot be guaranteed since the location of the meeting is in a remote area of Basilicata not very well connected and they should be avoided.

Course applicants should fill the provided registration form, which should be accompanied by a motivation letter and a recent photo.

#### ***Italian Society of Parasitology young scientist grant***

The Italian Society of Parasitology (Società Italiana di Parassitologia - SOIPA) will cover the entire costs (travel and accommodation) for a young SOIPA fellow. A commission nominated by the SOIPA executive board will select the grant winner, according to the following criteria:

- The candidate must be younger than 35 years at the time of application;
- The candidate must have authored publications in international peer-reviewed journals and taken part to other relevant scientific activities in the field of parasitology.

#### **DEADLINES**

- Application: 18<sup>th</sup> February 2017 (closed).
- Communication to the secretariat regarding flight schedules: 18<sup>th</sup> February 2017.

#### **LANGUAGE**

The official language will be English.

#### **ATLAS**

##### **By plane**

The Bari International Airport (Aeroporto di Bari "Karol Wojtyła") runs daily flights to and from the main European cities and many domestic flights from main Italian cities.

##### **By train**

Bari can also be reached from any Italian city by train (Ferrovie dello Stato: 8 h from Milan, 5 h from Rome, and 4 h from Naples).

#### **ACCOMODATION**

##### **1<sup>st</sup> night – Campus Hotel**

Via Celso Ulpiani, 11-13

Bari (BA) – 70126

Puglia

Phone+39 0805520805

Email: [info@campushotel.it](mailto:info@campushotel.it)

[www.campushotel.it/](http://www.campushotel.it/)

**Casa Della Caccia**

di Padula Luigi Antonio

Contrada Visciglietta

Pietrapertosa - Potenza (PZ) - 85010

Basilicata

Phone: +39 0971 983101

**<http://www.lacasadicacciapadula.com>**

A 25x10 m swimming pool surrounded by the greenery of the park is available.

€ 40 will be paid directly to the Campus Hotel and € 460 to Casa Della Caccia.

**WEATHER**

The area features the general characteristics of the typical Mediterranean climate. In July, temperatures range from 20°C to 32°C, with rainfall of 0.3 mm. A sweater and/or jacket may be useful for the evening but, over the daytime, a swimming suit may be more suitable (do not forget that there is a swimming pool for the free time only).

## **OBJECTIVES AND CONTENTS**

The main objective of the course is to provide, by means of oral lectures (OL) and practical activities (PA), an overview about the following issues:

### **TICKS**

- Tick species in Mediterranean area – biology and ecology (OL)
- Tick-borne diseases – TBDs (OL)
- Tick collection from dogs, sheep, cattle (PA)
- Tick collection from the environment (PA)
- Tick identification (PA)
- Tick dissection and detection of pathogens (PA)
- Tick mounting on slide (PA)
- Tick processing for molecular biology (OL/PA)

### **SAND FLIES AND CANINE LEISHMANIOSIS**

- Sand fly species in Mediterranean area: biology and ecology (OL)
- Sand fly collection (PA)
- Sand fly mounting on slide (PA)
- Sand fly identification (PA)
- Sand fly processing for molecular detection of *Leishmania infantum* (OL/PA)
- Sampling collection for the diagnosis of leishmaniosis (PA)

### **PHORTICA VARIEGATA AND THELAZIA CALLIPAEDA**

- Thelaziosis emergence in Europe (OL)
- *Phortica variegata* collection and identification (PA)
- *Thelazia callipaeda* collection from dogs and identification (PA)

### **CLINICAL PARASITOLGOGY**

- Clinical presentation and diagnostic procedures of TBDs and CanL (OL/PA)

### **MOLECULAR BIOLOGY**

- Sample processing for molecular techniques (OL)
- Genomics and transcriptomics of parasites (OL)
- High-throughput sequencing and bioinformatics (OL)

### **OTHER**

- *Cercopithifilaria baina* collection and identification (OL/PA)
- *Troglostrongylus* spp. collection and identification (OL/PA)
- Wild bird trapping and tick collection (PA)

## **GENERAL GOAL**

The main goal of the course is to provide attendees with updated information on biology and ecology of ticks, sand flies and other vectors of pathogens in the Mediterranean area. At the end of the course, they should be able to collect and identify important arthropod vectors (i.e., ticks, sand flies, and *P. variegata*) as well as to diagnose *Cercopithifilaria bainae* and *Troglostrongylus* spp. infestation and *L. infantum* infection in dogs. Elements of clinical parasitology, presentation and diagnostic procedures of TBDs and CanL will also be provided.

## **PRE-REQUIRED KNOWLEDGE**

- DVM/MSc level knowledge of veterinary parasitology.
- Assignments and selected papers will be sent out to the students 1 month before the start of the course.

## **PEDAGOGICAL APPROACH**

- Oral lectures (35.3%)
- Practical activities (64.7%)

## **LEARNING OUTCOMES**

The attendees will be updated on the biology and ecology of the main arthropod vectors and pathogens in Mediterranean area. They will be able to:

- Collect and identify ticks and sand flies from hosts and from the environment;
- Dissect ticks, fleas and fruit flies (*P. variegata*);
- Collect samples from dogs for the diagnosis of *Cercopithifilaria* infection;
- Collect and identify *P. variegata* and *T. callipaeda*;
- Collect samples from cats for the diagnosis of lungworm infection.
- Clinical examination of and sample collection from dogs infected by *L. infantum*.
- Cytological diagnosis of CanL and TBDs.



## **LIST OF LECTURERS AND TECHNICAL ASSISTANTS**

Domenico Otranto  
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Full Professor  
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Molecular Biology, Immunology, Parasitology  
| Department of Veterinary Medicine University of Sassari, Italy

Giancarlo Di Paola  
DVM  
Practitioner

Egidio Mallia  
DVM  
Practitioner and manager of the Park Veterinary Services  
Parco Regionale di Gallipoli Cognato, Matera, Basilicata, Italy

## **SCIENTIFIC CONTEXT IN THE SPECIFIC AREA OF THE COURSE**

Ticks (Acari: Ixodida) are arthropods of medical and veterinary significance. Together with mosquitoes, they act as the main vectors of pathogens to animals and humans worldwide. Indeed, ticks transmit many emerging pathogens that have been discovered over the past decades, including several *Rickettsia* species. The Mediterranean region is particularly suitable for ticks in terms of climate and host availability. For this reason, ticks can be found throughout the year in urban, suburban, rural, and forested areas. Some species (e.g., *Ixodes ricinus*) are indeed commonly found even over winter. The Parasitology Unit of the Department of Veterinary Medicine, University of Bari, has a long tradition of studies on ticks and tick-borne diseases in Italy. The most recent study was carried out in the Basilicata region, with over 10,000 ticks collected from the environment and hosts, including humans. We have also conducted studies on ticks infesting wildlife, including birds. These studies have provided interesting insights on the natural history of ticks and their transmitted pathogens in southern Europe. Migratory birds have been studied as carriers and spreaders of ticks and their role in the ecology of ticks and TBD causing pathogens is of increasing concern.

Sand flies (Diptera: Psychodidae) are vectors of several zoonotic pathogens including viruses, bacteria and protozoa. In the Mediterranean area they are the main vectors of *Leishmania infantum*, the causative agent of leishmaniasis in humans, dogs, and cats. The study of the ecology of these insects can provide useful information about the spread of this infection as well as other viral agents in a given area. Over the last four years, we have studied the species of sand flies occurring in Basilicata, their ecology, and their role as vectors of *L. infantum*. Over the last two years, the richness of sand fly species has been specifically investigated in different localities near the forest of Gallipoli Cognato, a protected area located in the Basilicata region, southern Italy. Nearly 9,000 sand flies belonging to six species (*Phlebotomus papatasi*, *Phlebotomus perniciosus*, *Phlebotomus perfiliewi*, *Phlebotomus neglectus*, *Phlebotomus mascittii*, and *Sergentomyia minuta*) were collected, accounting for about 75% of the species diversity of sand fly population in Italy. These findings confirmed that sand flies are well adapted to the environment of the study area, where they find suitable conditions in terms of microclimate and host availability, for their perpetuation. Of particular interest, *P. perfiliewi* and *P. perniciosus* were the most abundant species, highlighting the risk for *L. infantum* transmission in the region.

Thelaziosis by *Thelazia callipaeda* (eyeworm) is common in wild and domestic carnivores in this area. Over the past 15 years, several studies on the biology of this nematode – both in the definitive host and in its vector (*Phortica variegata*) – have been carried out in the natural park of Gallipoli Cognato. These studies have allowed us to predict suitable environments for the occurrence and development of *P. variegata* across Italy and Europe using a desktop implementation of the Genetic Algorithm for Rule-Set Prediction (GARP).

Recently, *Cercopithifilaria bainaе*, a poorly studied filarioid of dogs presenting dermal microfilariae, has been diagnosed here in animals and ticks feeding on them.

## **PREPARATORY WORK AND FINAL EXAMINATION**

- Advance assignment (article reading)
- The attendees will prepare ½ page self-reflections on the contents of the course.
- A 20' presentation of the ParSCo activities will be delivered at the next EVPC meeting.
- At the end of the course, attendees will take a Final examination (MCQ) on all topics discussed.

## **CANDIDATE SELECTION**

First-come basis will be used for selection of candidate applications, prioritizing those of EVPC residents. However, the course is also open to researchers and students from any country of the world with a particular interest in parasitology (veterinarians, physicians, biologists), including those who intend to apply for an EVPC Alternative Training Program and all peers who would like to immerse themselves in an intense week of field parasitology in southern Europe. The average daily workload is 13hrs.

## **GROUP FORMATION**

- In order to facilitate the activities the attendees could be divided in two groups (i.e., group A and B).
- Attendees will be allocated to double or triple rooms according to the availability and personal arrangements.

**V Parasitology Summer Course  
(ParSCo)**

**Residency Course on:  
ARTHROPOD VECTORS AND TRANSMITTED PATHOGENS  
IN THE MEDITERRANEAN AREA**

**July 2017**

**Application form  
(To be sent before 18<sup>th</sup> February 2017)**

To the Organizing committee  
Fax: +39 080/4679839

E-mail: dedonno.cinzia@gmail.com  
Phone: +39 080/4679837

|                            |
|----------------------------|
| Name: _____ Surname: _____ |
| Gender: _____              |
| Institution: _____         |
| City: _____ Country: _____ |
| Phone: _____ Fax: _____    |
| E-mail : _____             |

I will arrive by  train  plane

Arrival date: \_\_\_\_\_

Time \_\_\_\_\_

Acceptance of terms and conditions

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

Date \_\_\_\_\_

**DETAILED PROGRAM  
TIMETABLE AND CONTENTS  
July 2017**

**Saturday 8<sup>st</sup> July**

Arrival at the Bari International Airport and check-in at the Campus Hotel.

**18:30-21:30** Welcome to the ParSCo!

Welcome dinner (optional participation) in Torre a Mare, Bari. This is a welcome dinner offered by the course organizers. Meeting at the Campus Hotel at 18.30 for the departure (20' driving by car).

## **Sunday 9<sup>th</sup> July**

**8:30** Departure to Basilicata

**11:30** Check-in at the hunting lodge

**12:00** Lunch

**13:30-14:00** Introduction to the course

**Contents:** Presentation of the course location, organization, learning material for attendees (i.e., slides, selected articles, tick and sand fly identification keys). Welcome by the responsible for the Park veterinary services.

**14:00-16:00** Introduction to the Ixodidae (OL)

**Contents:** Lecture on general aspects of tick biology and ecology.

**16:00-23:00** Visit to Matera.

**Contents:** Matera is a city in the region of Basilicata lying in a small canyon, which has been eroded in the course of years by a small stream (the Gravina). Known as the Underground City (la Città Sotterranea), Matera is well known for its historical center called "Sassi", considered World Heritage Site by UNESCO since 1993, along with the Park of the Rupestrian Churches. On October 17, 2014, Matera was declared Italian host of European Capital of Culture for 2019.

The area of what is now Matera has been settled since the Palaeolithic. Romans allegedly founded the city in the 3rd century BC. In AD 664 Matera was conquered by the Lombards and became part of the Duchy of Benevento. In the 7th and 8th centuries the nearby grottos were colonized by both Benedictine and Basilian monastic institutions. The 9th and 10th centuries were characterized by the struggle between the Byzantines and the German emperors, including Louis II, who partially destroyed the city. After the settlement of the Normans in Apulia, William Iron-Arm ruled Matera from 1043.

## **Monday 10<sup>th</sup> July**

**7:30-8:30** Breakfast

**8:30-10:30** Tick collection from the environment (OL, PA)

**Contents:** Training on tick collection by dragging and flagging in a meadow habitat

**11:00-12:00** Tick preservation and mounting (PA)

**Contents:** Training on how to preserve ticks for different purposes.

**12:00-13:30** Lunch

**13:30-16:30** Tick identification and tick dissection (OL, PA)

**Contents:** Training on morphological identification of ticks and on tick dissection.

**16:30- 17:00** Coffee break

**17:00-19:00** Sand fly collection (OP, PA)

**Contents:** Training on sand fly collection methods (*Casa di Caccia*).

**19:30-20:00** Refreshing break

**20:00** Dinner

**22:00-22:30** *A team game:* sand fly collection (leisure)

**Contents:** Sand fly collection using mouth aspirators.



## **Tuesday 11<sup>th</sup> July**

**7:30-8:30** Breakfast

**8:30-10:00** Tick collection from sheep and cattle at a local, subsistence farm (PA)

**Contents:** Tick collection from domestic animals and discussion on the most common parasites of farm animals.

**10:00-11:00** Phlebotomine sand flies in the Mediterranean region (OL)

**Contents:** Lecture on sand fly species of the Mediterranean region and their role as vectors of pathogens.

**11:00-13:00** Sand fly identification and mounting (OL, PA)

**Contents:** Training on morphological identification of sand fly species.

**13:00-14:00** Lunch

**14:00-15:30** Diagnosis of vector-borne diseases (OL)

**Contents:** Overview on tests that can be used for diagnosing vector-borne diseases in dogs and cats.

**15:30-18:30** Clinical cases of vector-borne diseases (PA)

**Contents:** Presentation of clinical cases and training on collection of biological samples for the diagnosis of vector-borne diseases in dogs and cats.

**18:30-19:30** Refreshing break

**19:30** Dinner

## Wednesday 12<sup>th</sup> July

**7:30-8:30** Breakfast

**8.30-11:30** Cytological diagnosis of canine vector-borne diseases (OL, PA)

**Contents:** Training on sample collection from dogs (e.g., lymph node, blood and bone marrow) and cytological diagnosis of vector-borne diseases.

**11:30-13:00** Sample processing for molecular biology techniques (OL)

**Contents:** Methods of sample preparation, nucleic acids extraction and quality check.

**13:00-14:00** Lunch

**14:00-15:30** Canine zootic cestodes in southern Europe: updates on epidemiology, diagnosis and control (OL, PA)

**Contents:** Lecture on recent advances on sequencing techniques to understand parasite biology, diagnosis and control.

**15:30-16:30** *Thelazia callipaeda* eyeworm and its vector (OL, PA)

**Contents:** Lecture on *T. callipaeda* and its vector. Training on eyeworm collection and identification from dogs.

**16:30-18:00** *Phortica variegata* collection (PA)

**Contents:** Training on *Phortica variegata* collection from the environment (*Casa Bianca*).

**18:00-19:00** Sand fly collection (PA)

**Contents:** Training on sand fly collection using light traps and sticky traps (*Pizzaiolo*).

**19:00-20:30** Refreshing break

**20:30-22:00** Dinner

## **Thursday 13<sup>th</sup> July**

**7:00-8:00** An early good morning in the field! (PA)

**Contents:** Collection of light traps and sticky traps from the field.

**8:00-8:30** Breakfast

**8:30-10:30** Lungworms of wild and domestic cats: *Troglostrongylus* spp. (OL, PA)

**Contents:** Lecture on *Troglostrongylus* spp. lungworms infesting wild and domestic cats and training on nematode collection (necropsy of wild felids) and identification.

**10:30-11:30** *Onchocerca lupi*: recent studies on a neglected filarioid (OL)

**Contents:** Lecture on *Onchocerca lupi*, an emerging, neglected zoonotic parasite.

**11:30-12:30** *Cercopithifilaria* collection and identification (OL, PA)

**Contents:** Training on skin sampling and tick collection from infested dogs as well as on tick dissection for detection of *Cercopithifilaria* larvae.

**13:00-14:00** Lunch

**14:00-16:00** Free time for studying

**Contents:** The course organizers and collaborators at the attendees' disposal to respond to any query or to solve doubts about the content of the past lectures.

**16:00-20:00** Visit to the Park and some rural villages in the surroundings.

**20:00** Dinner

## **Friday 14<sup>th</sup> July**

**7:30-8:30** Breakfast

**8:30-11:00** Tick collection from birds (PA)

**Contents:** Training on wild bird trapping and tick collection from birds.

**12:00-13:00** Lunch

**13:00-15:30** Free time for studying

**Contents:** The course organizers and collaborators at the attendees' disposal to respond to any query or to solve doubts about the content of the past lectures. Attendees will have free access to stereomicroscopes and microscopes for doing practical activities during this free time.

**15:30-17:30** Final examination of the course

**Contents:** Final examination (MCQ) on all topics discussed during the course.

**17:30-20:00** Time for refreshing and packing

**20:00** Final dinner

**Saturday 15<sup>th</sup> July**

**7:30-8:30** Breakfast

**9:00** Checkout and return to Bari (back to reality!).