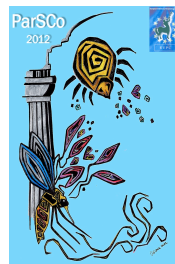


**University of Bari, Italy  
Faculty of Veterinary Medicine  
Department of Veterinary Public Health**

**European Veterinary  
Parasitology College (EVPC)**



## ***I Parasitology Summer Course (ParSCo)***

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

**8<sup>th</sup> – 15<sup>th</sup> September 2012**

**SPONSORSHIP**

*Cari colleghi,*

It is a great pleasure for me to present the Parasitology Resident Course organised by the Parasitology and Mycology Unit of the Faculty of Veterinary Medicine, University of Bari (Italy), together with the European Veterinary Parasitology College (EVPC).

This will be the first of a series of one-week long summer courses on advanced level Veterinary Parasitology that we would like to organise over the next years. It is our intention to give the opportunity to young parasitologists who had never dealt with certain groups of parasites occurring the Mediterranean region, to become more familiar with them. Indeed, aim of these courses is to train people with interest in the field of parasitology mainly on the practical aspects of the discipline, and to give them an overview of the most important arthropod vectors of pathogens.

For its features in terms of climate, fauna, and flora, the Mediterranean region furnishes an optimal environment for the development of arthropods and thus for the spread of many parasites causing arthropod-borne diseases (ABDs). Here an incredible diversity of parasite species, inhabiting different microenvironments, can be found. Indeed, by virtue of its geographical position, southern Italy has historically been an important route of migration for human and animal populations coming from the east (Albania, Greece, Poland, Romania, Russia, etc.), the south (Morocco, Egypt, Algeria), the west (Spain, France) and the north (Scandinavia and Germany). This has led to the blend of cultures, populations, genes, agricultural practices and animals and their associated parasites, which can be seen in this area. Nowadays, southern Italy still represents one of the main routes of migration from northern Africa.

This region deserves attention, not only for its outstanding diversity and richness of parasites and hosts, but also because of the potential 'example' it may represent for central and northern European countries, considering the environmental and climatic modifications they are currently experiencing. Arthropods and their transmitted parasites cannot in fact be defined as exotic anymore, as there are no boundaries, neither well-defined seasons or other constraints that would limit their spreading and circulation.

*Domenico Otranto*  
University of Bari, Italy

## **GENERAL INFORMATION**

For any information you might need, please refer to the secretariat.

### **COURSE DIRECTOR**

D. Otranto  
DVM, PhD, Dip. EVPC, FRES  
Professor of Parasitic Diseases  
Department of Veterinary Public Health  
Faculty of Veterinary Medicine, University of Bari  
Str. prov. per Casamassima km 3  
70010 Valenzano (Bari)  
ITALY  
tel/fax +39 080 4679839  
e.mail: d.otranto@veterinaria.uniba.it  
<http://www.bariparasitology.it/>

### **SCIENTIFIC ORGANIZERS**

D. Otranto  
F. Dantas-Torres  
Unit of Parasitic Diseases, University of Bari  
Department of Veterinary Public Health  
Faculty of Veterinary Medicine, University of Bari

### **SECRETARIAT**

Dr. Viviana Tarallo  
Department of Veterinary Public Health  
Str. Prov. le per Casamassima Km 3 – 70010 Valenzano (Bari), ITALY  
e.mail: v.tarallo@veterinaria.uniba.it  
Phone: +39 080 4679837  
Fax: + 39 080 4679835

### **VENUE**

Parco Regionale di Gallipoli Cognato  
Matera, Basilicata – Italy.

### **PARTECIPATION FEE**

The total cost for participation is € 1000,00

- € 440 is to be paid directly to the Hotel on-site (includes accommodation, meals (coffee break, light lunch, and dinner).
- € 560 is to be paid to the EVPC (includes place of the meeting, teaching and laboratory material, transportation to field sites and others).

Payment is by bank transfer to:

*'European Veterinary Parasitology College'*

*Account nr: 390 0115139 55*

*IBAN-nr: BE31 3900 1151 3955*

*BIC/SWIFT-code: BBRUBEBB*

*Bank address: ING MERELBEKE, Hundelgemsesteenweg 450, 9820 Merelbeke, Belgium*

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

### **DEADLINES**

- Application: 1<sup>st</sup> April 2012
- Communication to the secretariat of inbound/outbound flight timetable 1<sup>st</sup> June 2012.

### **LANGUAGE**

The official language will be English.

### **ATLAS**

#### **By plane**

Bari – Palese Airport

There is an international airport in Bari with daily flights to and from the main European cities and with many domestic flights from main Italian towns.

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

### **ACCOMODATION**

Casa Della Caccia

di Padula Luigi Antonio

Contrada Visciglietta

Pietrapertosa - Potenza (PZ) - 85010

Basilicata

<http://www.casadicacciapadula.com/>

A 25x10m swimming pool surrounded by the greenery of the park is available.

### **WEATHER**

The area features the general characteristics of the typical Mediterranean climate. Mean temperatures in September range from 17°C to 32°C; rain 62mm. A sweater and/or jacket may be useful for the evening but, during the daytime, a swimming suit may be useful (do not forget that there is a swimming pool for the free time).

## **OBJECTIVES**

To provide an overview of the main issues listed here in the following, including practical activities in the field or on animals (PA) and oral lectures (OL):

### **TICKS**

- Tick species in Mediterranean area – Biology and Ecology (OL)
- Tick-borne diseases (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 (PA) (OL)

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

- Sand fly species in Mediterranean area – Biology and Ecology (OL)
- Sand fly-transmitted pathogens (OL)
- Sand fly collection (PA)
- Sand fly mounting on slide (PA) (OL)
- Sand fly identification (PA) (OL)
- Sand fly processing for molecular detection of *Leishmania infantum* (PA) (OL)
- Clinical cases of leishmaniosis (PA)
- Collection of samples for the diagnosis of leishmaniosis (blood withdraw, skin snip, ocular swabs, bone marrow collection, lymph-node ago puncture) (PA)
- Field diagnosis of canine leishmaniosis (cytology and serology) (PA) (OL)

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

- *Phortica variegata* collection and identification (PA) (OL)
- *Thelazia callipaeda* collection from dogs and identification (PA) (OL)

### **OTHER**

- *Cercopithifilaria* collection and identification in hosts and ticks (PA) (OL)

## **GOALS**

- To provide updated information on biology and ecology of ticks, sand flies and other vectors of pathogens in Mediterranean area;
- To instruct students on how to collect and identify ticks and sand flies;
- To instruct students on how to collect and identify *Phortica variegata* (vector of *Thelazia callipaeda*);
- To instruct students on how to collect and identify *Cercopithifilaria* from ticks and dogs;
- To provide an introduction on how to process tick and sand flies for molecular biology;
- To discuss about clinical cases of canine leishmaniosis as well as on sample collection and in-field diagnosis of *L. infantum* in dogs.

## **PRE-REQUIRED KNOWLEDGE**

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

## **PEDAGOGICAL APPROACH**

- Lectures and workshop (30%)
- Field activities (50%)
- In-field laboratory activities (20%)

## **SCIENTIFIC CONTENT**

- Lectures will provide up-to-date information on arthropod vectors and pathogens in the Mediterranean area (detailed content in the course schedule).
- Series of annual courses have been announced in the whole EU as part of the veterinary parasitology specialization within the framework of the EVPC, thereby becoming attractive to a larger number of students.

## **LEARNING OUTCOME**

- 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;
- They will be able to collect samples from ticks and dogs for the diagnosis and identification of *Cercopithifilaria* sp.;
- They will be able to collect and identify *P. variegata* and *T. callipaeda*;
- They will be instructed about canine leishmaniosis, collection of biological samples and diagnosis (cytology and serology) of *L. infantum* in dogs.

**LIST OF LECTURERS**  
**AND TECHNICAL ASSISTANT**

D. Otranto  
DVM, PhD, Dip. EVPC, FRES  
Full Professor, Unit of Parasitic Diseases, University of Bari

F. Dantas-Torres  
DVM, PhD, FRES  
Researcher assistant, Unit of Parasitic Diseases, University of Bari

R. P. Lia  
DVM, PhD  
Researcher, Unit of Parasitic Diseases, University of Bari

V. Tarallo  
DVM, PhD  
Grant Holder, Unit of Parasitic Diseases, University of Bari

S. Latrofa  
DBSci, PhD  
Researcher, Unit of Parasitic Diseases, University of Bari

E. Brianti  
DVM, PhD  
Researcher, Unit of Parasitic Diseases, University of Messina

G. Dipaola (practitioner) DVM

E. Mallia (practitioner and responsible for the Park Veterinary Services) DVM

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

Ticks (Acari: Ixodida) are arthropods of major medical and veterinary significance. Together with mosquitoes, they are the main vectors of disease agents to animals and humans worldwide. Indeed, many emerging pathogens discovered in the past decades, including several *Rickettsia* species, are tick-transmitted. 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 during wintry months. The Parasitology Unit of the Faculty of Veterinary Medicine, University of Bari, has a long tradition concerning 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. This large study will provide interesting insights on the natural history of ticks and their transmitted pathogens in southern Europe.

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 human and canine leishmaniasis. 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, the Parasitology Unit of the Faculty of Veterinary Medicine of Bari has been carrying out research projects in southern Italy to study the species of sand flies occurring in this region, 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 mascitti*, and *Sergentomyia minuta*) accounting for about the 75% of the species diversity of sand fly population in Italy were eventually collected. 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, raising the issue of potential 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 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* sp., a poorly studied filarioid of dogs presenting dermal microfilariae, has been diagnosed here in animals and ticks feeding on them.

### **PREPARATORY WORK:**

- Advance assignment (article reading)
- The attendees prepare ½ page self-reflections on the contents of the course.

### **CANDIDATE SELECTION:**

First-come basis will be used for selection of candidate applications, prioritizing those of EVPC residents.

## **GROUP FORMATION:**

- In order to facilitate the activities the attendees could be divided in two groups (i.e., group A and B) each of 5 persons.
- Attendees will be allocated to double or triple rooms according to the availability and personal arrangements.

**I Parasitology Summer Course  
(ParSCo)**

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

**8<sup>th</sup>-15<sup>th</sup> September 2012**

**Application form  
(To be sent before 1<sup>st</sup> April 2012)**

To the Organizing committee  
Fax: +39 080/4679839

E-mail: v.tarallo@veterinaria.uniba.it  
Phone: +39 080/4679835

Name: \_\_\_\_\_ Surname: \_\_\_\_\_  
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 take out personal accident insurance if you do not already have it.

Date \_\_\_\_\_

**DETAILED PROGRAM  
TIMETABLE AND CONTENTS  
8<sup>th</sup> -15<sup>th</sup> September 2012**

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

Arrival at Bari and accommodation in the Campus Hotel.

**Sunday 9<sup>th</sup> September**

**8.30** Departure to Basilicata

**11.30** Accommodation in the hunting lodge

**12.00** Lunch

**13.30-14.00** Introduction to the residential course (OP)

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

**14.00-16.00** Tick species in the Mediterranean area – Morphology, Biology, and Ecology.

**Contents:** This first lecture will be focussed on the morphology, biology, and ecology of ticks and their role as vectors of pathogens. The lecture will deal with the main tick species found in the study area (OL)

**16.00-23.00** Excursion: Visit to the Parco della Grancia, including attendance at the *Cinespettacolo* (optional. Ticket cost 25 Euro).

**Contents:** The ‘Parco della Grancia’ is the first historical, rural, and environmental park of Italy. It extends over 12 hectares, in the stunning natural scenery of the Grancia State forest, in the territory of Brindisi Montagna (town of Albanian origins overlooking the park with its suggestive ruined tower). *Cinespettacolo* (21.00): the story of the social and political revolt, gives voice to the yearning for social redemption and claim for dignity and freedom of a people, who despised and humiliated, betrayed and disappointed by those that it experiences by time to time as false promises, arises. A story dismissed as phenomenon of banditry, by some, denied, removed, in the spirit of the show. The main character is still Crocco (voiced by Michele Placido).

For more info:

[http://www.parcodellagrancia.com/site/index.php?option=com\\_content&view=article&id=3&Itemid=2&lang=en](http://www.parcodellagrancia.com/site/index.php?option=com_content&view=article&id=3&Itemid=2&lang=en)

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

**7.30-8.30** Breakfast

**8.30-11.00** First session of tick collection from the environment (PA)

**Contents:** Ticks will be collected by dragging and flagging, in an area of the park already monitored for ticks over the previous two years.

**11.00-12.00** Tick preservation (OL, PA)

**Contents:** Attendees will be trained on how to preserve ticks with different purposes.

**12.00-13.30** Lunch

**13.30-16.00 (including two 15' coffee break)** Tick identification (PA)

**Contents:** Morphological key characters for the identification of the most commonly retrieved tick species (1.30h). Each participant will identify collected ticks as well as reference tick specimens (2.00h: activity constantly monitored by the teachers).

**16.00-16.30** Refreshing break

**16.30-20.00** Sand fly collection and field activity (OP, PA)

**Contents:** Oral introductory lecture to sand fly collection.

GROUP A - Sand fly collection with mouth aspirators

GROUP B - Sand fly collection with light traps and sticky traps

**20.00** Dinner

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

**7.00-8.00** GROUP B - an early good morning in the field!

**Contents:** Light traps and sticky traps collection (PA)

**7.30-8.30** Breakfast

**8.30-10.00** Second session of tick collection from the environment (PA)

**Contents:** Ticks will be collected, by dragging and flagging, in an area of the park already monitored for ticks over the previous two years.

**10.00-12.00** Tick-borne diseases (OL)

**Contents:** Lecture on the main TBDs affecting cattle, pets, and humans transmitted by the tick species most commonly retrieved in the Mediterranean area.

**12.00-13.30** Lunch

**13.30-16.00** Tick dissection and tick mounting (PA)

**Contents:** Attendees will be trained to tick dissection for the detection of pathogens in ticks. An introduction to tick mounting will also be presented.

**16.00-16.30** Coffee break

**16.30-20.00** Tick collection from dogs, sheep, cattle (PA)

**Contents:** Tick collection from animals in selected farms and preservation of collected ticks for different purposes (tick identification and/or dissection). The responsible for the veterinary services of the Park will supervise all the activities.

**20.00-21.30** Dinner

**21.30-22.30** Parasitologists in the night

**Contents:** Sand fly collection (PA)

GROUP A - Sand fly collection with light traps and sticky traps

GROUP B - Sand fly collection with mouth aspirators.

## **Wednesday 12<sup>th</sup> September**

**7.00-8.00** GROUP A - an early good morning in the field!

**Contents:** Light traps and sticky traps collection (PA)

**7.30-8.30** Breakfast

**8.30-10.00** Sand fly species in the park (OL)

**Contents:** Sand fly species of the Mediterranean area – Biology and Ecology and their role as vectors of pathogens.

**10.00-10.30** Pause

**10.30-12.00** Sand fly identification and mounting (PA) (OL)

**Contents:** Morphological key characters for the identification of the most commonly sand fly species (1.30h). Each participant will identify the collected sand flies (2.00h: this activity will be monitored by the organisers).

**12.00-13.00** Lunch

**13.00-13.30** Fourth-day: a deserved nap! (subtracted from the lunch!)

**13.30-15.30** Sand fly identification and mounting (PA)

**Contents:** Each participant will identify the collected sand flies (1.30h: this activity will be monitored by the organisers).

**15.30-15.45** Coffee break

**15.45-19.30** *Thelazia callipaeda* eyeworm and its vector (OL, PA)

**Contents:** Participants will attend an introductory lecture on *T. callipaeda* (biology, ecology, and medical and veterinary importance) and its vector (OL: 1h). Eyeworm collection from dogs and identification (PA: 1h).

Afterwards, *Phortica variegata* specimens will be collected from the environment, to be subjected to morphological identification (PA: 1.30h).

**19.30** Dinner

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

**7.30-8.30** Breakfast

**8.30-11.00** Tick and sand fly processing for the molecular detection of pathogens (PA) (OL)

**Contents:** Attendees will be trained on tick preservation, genomic DNA extraction for the detection of pathogens (theoretical and practical aspects)

**11.00-11.15** Coffee break

**11.15-13.00** *Cercopithifilaria* collection and identification in hosts and ticks (PA) (OL)

**Contents:** Attendees will be trained to perform skin sampling and tick collection from infested dogs. Ticks will be then dissected for searching *Cercopithifilaria* sp. larvae.

**13.00-14.00** Lunch

**14.00-19.00** Accompanied visit to the Park and some rural villages in the surroundings.

**19.30-21.30** Dinner

## Friday 14<sup>th</sup> September

**7.30-8.30** Breakfast

**8.30-11.00** Field diagnosis of canine leishmaniosis (cytology and serology) (OL)

**Contents:** An overview of selected tests that can be used for in-field diagnosis of *L. infantum*.

**11.00-11.15** Coffee break

**11.15- 13.00** Clinical cases of canine leishmaniosis & sample collection for the diagnosis of leishmaniosis (OP, PA)

**Contents:** Oral introductory lecture to canine leishmaniosis (mainly focussed on clinical aspects and diagnosis). Attendees will follow a clinical check of dogs naturally infected by *L. infantum*. Collection of biological samples (blood, skin, ocular swabs, bone marrow, lymph node) for the diagnosis of canine leishmaniosis will also be performed.

**13.00-14.00** Lunch

**14.00-15.00** Field diagnosis of canine leishmaniosis (cytology and serology) (PA)

**Contents:** Attendees will be trained on selected tests for in-field diagnosis of *L. infantum*.

**15.00-19.00** Final examination (written exam) of the course

**Contents:** All topics (e.g., biology, ecology, collection, and identification of arthropod vectors) discussed during the course.

**19.30-21.30** Dinner

## Saturday 15<sup>th</sup> September

**7.30-8.30** Breakfast

**9.00** Return to Bari and departure.