

# IX Parasitology Summer Course (ParSCo)



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

3-10 June 2023

Organized by



**UNIVERSITÀ  
DEGLI STUDI DI BARI  
ALDO MORO**

A course endorsed by



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Bari, 6 February 2023

*Dear colleagues,*

We are pleased to announce the ninth edition of the Parasitology Summer Course (IX ParSCo) organized by the Parasitology 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 100 attendees from all continents have attended the ParSCo.

(see:

<https://www.youtube.com/watch?v=qpZ6FV9KQVI&feature=youtu.be>)

The ParSCo is 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 includes oral lectures and practical activities on collection, identification and diagnosis of parasites such as *Leishmania infantum*, TBPs, sand flies (e.g., *Phlebotomus perfiliewi*), ticks (e.g., *Ixodes ricinus* and *Rhipicephalus turanicus*), filarioids and eyeworms (*Thelazia callipaeda*). Participants will also attend clinical examinations of cattle and other domestic animals and sample collection from dogs for the diagnosis of arthropod-borne diseases. Attendees will also have the opportunity to participate in tick collection from the environment and clinical examination of dogs, cattle, sheep, goats and reptiles.

The course traditionally takes place in Basilicata, southern Italy, in the heart of the Mediterranean region

<https://www.youtube.com/channel/UCQaKY0wwTxOsz9QiPAqJ0tA>

This region is fairly suitable for an optimal development of arthropods and thus for the life cycles of many parasites including those causing arthropod-borne diseases. A considerable diversity of parasites, inhabiting different microenvironments, can be found in Basilicata. This region has received significant attention from researchers, not only for its outstanding species richness, but also because it represents a potential model for other countries in the Mediterranean area.

We thank Elanco Animal Health, Boehringer Ingelheim, and SoIPa for their financial support.

We look forward to meeting you for an enjoyable IX ParSCo meeting and 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 ([parscobari@gmail.com](mailto:parscobari@gmail.com)).

Videos:

[Promo](#)

[Testimonials](#)

### **SCIENTIFIC ORGANIZERS**

Domenico Otranto  
DVM, PhD, Dip. EVPC, FRES  
Professor of Parasitic Diseases  
Department of Veterinary Medicine  
University of Bari, Italy

Filipe Dantas-Torres  
DVM, MSc, DSc, PhD, Dip. EVPC, FRES  
Principal Researcher  
Department of Immunology  
Aggeu Magalhães Institute  
Recife/PE, Brazil

Jairo Alfonso Mendoza Roldan  
Assistant professor of Parasitic Diseases  
Department of Veterinary Medicine  
University of Bari, Italy

### **SECRETARIAT**

Livia Perles  
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### **VENUE**

La Casa di Caccia, Potenza, Italy.  
Parco Regionale di Gallipoli Cognato, Matera, Italy.

### **APPLICATION**

Course applicants should fill the provided registration form (see below), which should be accompanied by a motivation letter (no more than 500 words) and a recent photo to be sent to [parscobari@gmail.com](mailto:parscobari@gmail.com) within the 21<sup>st</sup> of February.

### **PARTICIPATION FEE**

The total cost for participation is € 1100 (includes accommodation, coffee break, light lunch, and dinner, excluding the second day in Matera), to be paid on-site to the venue.

## **ITALIAN SOCIETY OF PARASITOLOGY YOUNG SCIENTIST GRANT**

The Italian Society of Parasitology (Società Italiana di Parassitologia - SoIPa) will cover the participation fee for a young SoIPa member. 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 relevant scientific activities in the field of parasitology.

The application should be sent to SOIPA secretariat at the following email: [valentina.mangano@unipi.it](mailto:valentina.mangano@unipi.it) within the deadline.

## **ParSCo STUDENT GRANT**

The organizers of ParSCo IX will cover the course fee and the travel costs for a participant applying from a low income country. The commission will be formed by the scientific responsible of the course and the secretary who will select the grant winner, according to the following criteria:

- The candidate must be younger than 40 years at the time of application;
- The candidate must have taken part to relevant scientific activities in the field of parasitology.
- The candidate must not be affiliated to the top high GDP countries.
- Candidate must include a motivation letter, curriculum vitae and nationality proof.

## **OFFICIAL LANGUAGE**

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: 8h from Milan, 5h from Rome, and 4h from Naples).

## **ACCOMODATION**

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

Price: €50 per night (single room)

Via Celso Ulpiani, 11-13

Bari - 70126

Puglia, Italy

Phone+39 0805520805

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

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

Participants may choose other accommodations.

### **La Casa di Caccia**

di Padula Luigi Antonio

Contrada Visciglietta

Pietrapertosa, Potenza - 85010

Basilicata, Italy

Phone: +39 0971 983101

<https://lacasadicaccia.it>

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

**WEATHER**

The area features the general characteristics of the typical Mediterranean climate. In June, 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, but 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 topics:

### **TICKS AND TICK-BORNE DISEASES**

- Tick taxonomy, biology and ecology
- Tick-borne diseases
- Tick collection from hosts and from the environment
- Tick identification
- Tick dissection
- Tick slide mounting

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

- Sand fly species in the Mediterranean area: biology and ecology
- Sand fly collection
- Sand fly slide mounting
- Sand fly identification
- Sampling collection for the diagnosis of leishmaniosis

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

- Thelaziosis in Europe
- *Phortica variegata* collection and identification
- *Thelazia callipaeda* collection and identification

### **CLINICAL PARASITOLOGY**

- Clinical presentation and diagnosis of vector-borne diseases
- Canine filarioid detection and identification

### **OTHERS**

- General pipeline for helminth identification
- Sample collection from wild animals (e.g., reptiles, rodents)

## **GENERAL GOAL**

The main goal of the course is to provide attendees with updated information on the 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 *Phortica variegata*) as well as to diagnose vector-borne infections in dogs and/or cats. Elements of clinical parasitology, presentation and diagnostic procedures of tick-borne diseases and canine leishmaniosis will also be provided.

## **PRE-REQUIRED KNOWLEDGE**

- Basic knowledge of veterinary and/or medical parasitology
- Selected papers will be sent to the attendees one month before the course initiation

## **PEDAGOGICAL APPROACH**

- Oral lectures (30%)
- Practical activities (70%)

## **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, sand flies and fruit flies (*P. variegata*)
- Dissect ticks, sand flies and fruit flies (*P. variegata*)
- Collect samples from dogs for the detection of dermal and blood circulating microfilariae
- Collect and identify *T. callipaeda*
- Collect samples from dogs infected by *L. infantum* and exam in the lab
- Exam slides for the cytological diagnosis of canine vector-borne pathogen infection
- Identify onchocercid nematodes infecting domestic animals

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

Domenico Otranto  
DVM, PhD, Dip. EVPC, FRES  
Unit of Parasitic Diseases, University of Bari, Italy

Filipe Dantas-Torres  
DVM, MSc, DSc, PhD, Dip. EVPC, FRES  
Laboratory of Immunoparasitology, Aggeu Magalhães Institute, Recife, Brazil

Jairo Alfonso Mendoza Roldan  
DVM, MSc, PhD, EVPC resident  
Unit of Parasitic Diseases, University of Bari, Italy

Marcos Bezerra-Santos  
DVM, MSc, PhD, EVPC resident  
Unit of Parasitic Diseases, University of Bari, Italy

Riccardo P. Lia  
DVM, PhD  
Unit of Parasitic Diseases, University of Bari, Italy

Alicia Rojas  
Associate Professor  
Department of Parasitology  
Faculty of Microbiology  
University of Costa Rica

Petr Volf  
RNDr, CSc, PhD  
Department of Parasitology, Faculty of Science, Charles University, Prague, Czech Republic

Guadalupe Mirò  
DVM, PhD, Dipl. EVPC  
School of Veterinary Medicine, Universidad Complutense of Madrid, Spain



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

Ticks are arthropods of medical and veterinary significance. Together with mosquitoes, they act as the main vectors of pathogens to animals and humans worldwide. 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 host availability and climate features. For this reason, ticks can be found throughout the year in urban, suburban, rural, and forested areas. Indeed, some species (e.g., *Ixodes ricinus*) are found even during winter. We have conducted several studies on ticks and tick-borne pathogens in Basilicata. In one of these studies, we collected over 10,000 ticks from the environment and hosts, including humans. *Cercopithifilaria binae*, a poorly studied filarioid presenting dermal microfilariae, has been diagnosed in dogs and ticks. We have also conducted studies on ticks infesting wildlife, including birds. Altogether, these studies have been published in the international literature and provided interesting insights on the ecology of ticks and their transmitted pathogens in southern Europe.

Sand flies 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 leishmaniosis in dogs, cats, and humans. 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. We have studied the species of sand flies occurring in Basilicata, their ecology, and their role as vectors of *L. infantum*. 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 20 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).

Dirofilarioses by *Dirofilaria immitis* and *Dirofilaria repens* are endemic and widespread in southern Europe. In this region we performed many studies on the epidemiology and treatment of these diseases with a focus also to their *Wolbachia* endosymbiont.

The attendees of ParSCo will have the unique opportunity to visit the areas where the abovementioned studies have been carried out and to use the same methodologies presented in the published papers.

## **PREPARATORY WORK AND FINAL EXAMINATION**

- Article reading (selected papers)
- Attendees should prepare in advance a short power point presentation (up to 10 min) about their main activities and field interests.
- Final examination (10 multiple choice questions)
- Course evaluation questionnaire.
- An oral presentation of the ParSCo activities will be delivered at the next EVPC meeting by one of the attendees

## **CANDIDATE SELECTION**

The course is also open to researchers and students from any country of the world with a particular interest in parasitology, including those who intend to apply for an EVPC Alternative Training Program and all peers who would like to delve in an intense week of field parasitology in southern Europe. The course organizers will select the candidates based on motivation letter, CV, application date, and training level. Applicants from low income countries will be prioritized (see also ParSCo student grant).

## **GROUP FORMATION**

- In order to facilitate the activities, attendees may be divided in two or more groups
- Attendees will be allocated to double to five bed rooms according to the availability and personal arrangements.

**IX Parasitology Summer Course  
(ParSCo)**

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

**3-10 June 2023**

**Application form  
(Submission deadline: 21 February 2023)**

To the Organizing committee  
Fax: +39 080/4679839

E-mail: [parscobari@gmail.com](mailto:parscobari@gmail.com)  
Phone: +39 080/4679837

Name: \_\_\_\_\_ Surname: \_\_\_\_\_  
Institution: \_\_\_\_\_  
City: \_\_\_\_\_ Country: \_\_\_\_\_  
Phone: \_\_\_\_\_  
E-mail: \_\_\_\_\_

I will arrive by  Train  Plane

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

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

Signature

## **DETAILED PROGRAM TIMETABLE AND CONTENTS**

### **Saturday 3 June**

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

**18:30-21:30** Welcome to the IX 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 4 June**

**8:30** Departure to Basilicata

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

**13:00-14:30** Lunch

**14:30-15:00** Introduction to the course (D. Otranto and F. Dantas-Torres)

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

**15:00-16:00** Ticks (F. Dantas-Torres)

**Contents:** Oral lecture on tick origin, evolution, taxonomy and more.

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

**16:30-17:30** Tick collection and preservation (F. Dantas-Torres)

**Contents:** Oral lecture on tick collection and preservation.

**17:30-18:00** Refreshing break

**18:00-20:00** 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 the years by a small stream (the Gravina). Known as the Underground City (la Città Sotterranea), Matera is well known for its historical centre 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. Because of its ancient primeval-looking scenery, Matera has been used by many filmmakers as the setting for the ancient Jerusalem. Among the numerous movies filmed in Matera are Mel Gibson's The Passion of the Christ and the most recent Patty Jenkins's Wonder Woman. 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.

**20:00-22:00** Dinner in Matera (not included about 20 Euros)

## **Monday 5 June**

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

**8:30-9:30** Ectoparasites from wild animals and VBDs (J.A. Mendoza Roldan, M. Bezerra Santos, D. Otranto)

**Contents:** Oral lecture on mites and ticks associated to reptiles, rodents and birds in the park.

**9:30-13:00** Ectoparasite collection from the environment and wild hosts (whole team)

**Contents:** Practical activities on ectoparasite collection in the field (Parco Gallipoli Cognato).

**13:00-14:30** Lunch

**14:30-19:00** Tick mounting and identification (F. Dantas-Torres)

**Contents:** Oral lecture and practical activity on tick mounting and identification.

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

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

## Tuesday 6 June

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

**8:30-10:30** Tick and other ectoparasite collection from sheep and cattle (whole team)

**Contents:** Practical activity on tick collection from sheep and cattle in a local subsistence farm.

**10:30-13:00** Phlebotomine sand flies: from the biology to mounting and identification (P. Volf)

**Contents:** Oral lecture on sand flies and their role as vectors of pathogens and practical activity (two groups) on sand fly identification.

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

**14:00-16:00** Xenodiagnosis of *Leishmania* with sand flies (P. Volf, M. Bezerra Santos)

**Contents:** Practical activities on xenodiagnosis with sand flies.

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

**16:30-19:00** Sand fly collection (whole team)

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

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

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

**22:00-22:30** *Team game*: sand fly collection (whole team)

**Contents:** After dinner, practical activity on sand fly collection using mouth aspirators.

## Wednesday 7 June

**7:00-8:30** Early good morning in the field! (R. Lia)

**Contents:** Practical activity on collection of light traps and sticky traps from the field.

**7:30-9:00** Breakfast

**9:00-10:30** Separation of sand flies from non-sand fly insects (P. Volf)

**Contents:** Practical activity on the separation of sand flies from non-sand flies insects collected in the light and sticky traps.

**10:30-13:00** Cytological diagnosis of canine vector-borne diseases (G. Miró)

**Contents:** Oral lecture and wet lab (divided in two groups) on sample collection from sick dogs (e.g., lymph node, blood, skin, and bone marrow) and cytological diagnosis of vector-borne diseases. Practical clinical cases of coinfections and decision making.

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

**14:00-16:00** *Thelazia callipaeda* eyeworm and its vector (D. Otranto)

**Contents:** Oral lecture and practical activity on *T. callipaeda* and its vector. Training on eyeworm collection from dogs and parasite identification.

**16:00-19:00** *Phortica variegata* collection (whole team)

**Contents:** Practical activity on *P. variegata* collection (*Casa Bianca*).

**19:00-20:00** Refreshing break (use this extended break and also for studying)

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

## **Thursday 8 June**

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

**8:30-10:30** Morphological identification of helminth species infecting domestic animals  
(A. Rojas)

**Contents:** Oral lecture on helminth identification.

**10:30-11:00** Coffee break

**11:00-13:00** Morphological identification of helminth species infecting domestic animals  
(A. Rojas)

**Contents:** Practical activity on helminth identification with slide-mounted specimens.

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

**14:00-15:00** Vector-borne diseases: dogs, cats and humans (G. Miró)

**Contents:** Oral lecture on vector-borne diseases of dogs, cats and humans.

**15:00-15:30** Coffee break

**15:30-19:00** Vector-borne diseases: diagnosis and clinical presentation (G. Miró)

**Contents:** Oral lecture and practical activity (divided in two groups) on clinical cases of vector-borne diseases, clinical examination of a sick dog.

**19:00-20:00** Refreshing break (use this extended break and also for studying)

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



## Friday 9 June

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

**8:30-11:00** It's your turn: attendees' talks

**Contents:** Attendees will deliver a short presentation (up to 10 min, including discussion) about their main activities and interests. The idea exchange is to stimulate future collaborations among attendees and the ParSCo team.

**11:00-13:00** Free time for studying

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

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

**14:00-16:00** Final exam

**Contents:** Attendees will sit a final exam (10 multiple-choice questions) on all topics discussed during the course. Attendees will also receive an evaluation questionnaire to give their impressions on the course.

**16:00-18:00** Free time for refreshing and packing

**19:00-20:00** Final results and delivery of certificates

**20:00-22:00** Final dinner

## Saturday 10 June

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

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