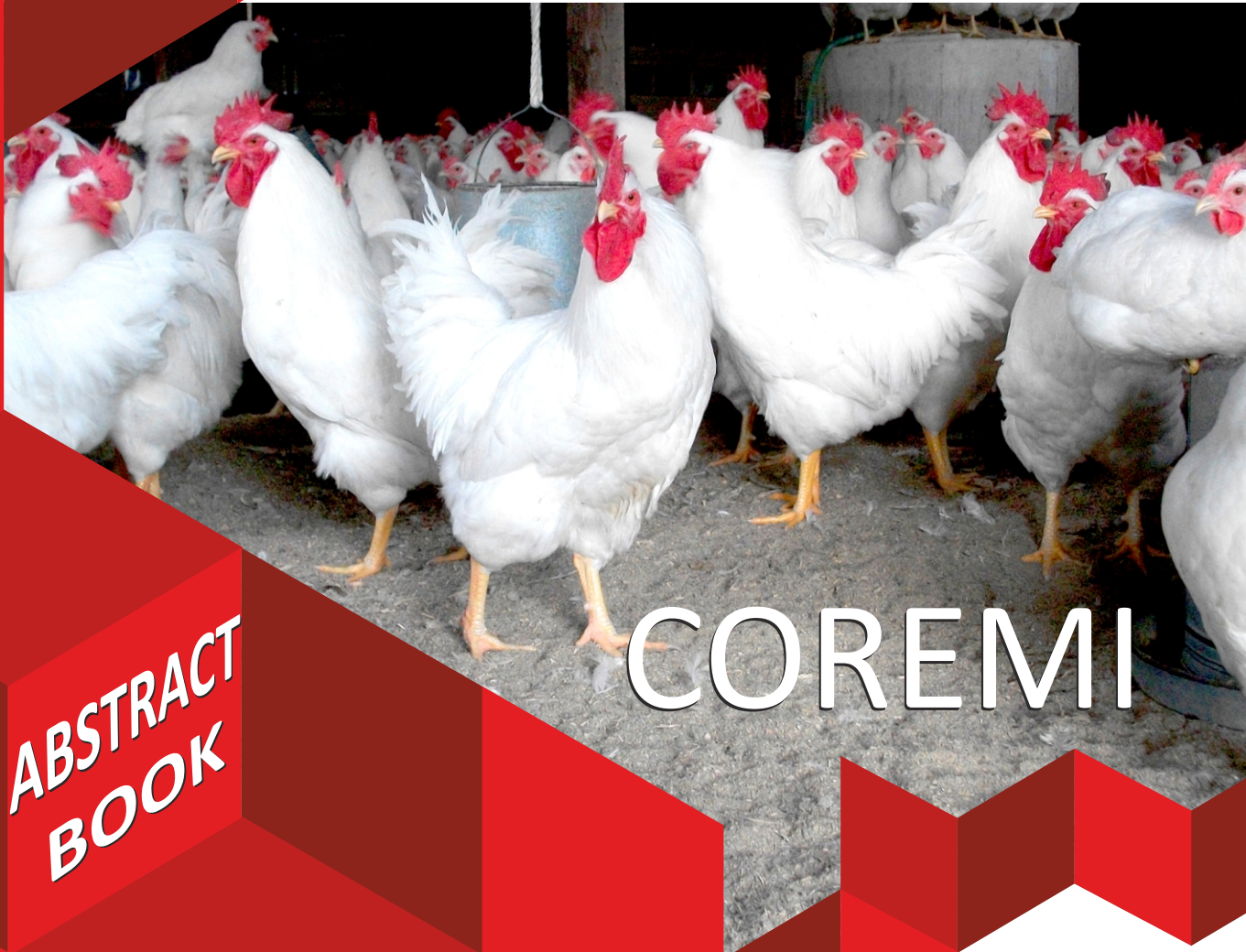


# 3<sup>rd</sup> COST CONFERENCE

20, 21 September 2017  
Oeiras, PORTUGAL



ABSTRACT  
BOOK

COREMI

PROGRAM



National Institute for  
Agrarian and Veterinary  
Research



Instituto Nacional de  
Investigação Agrária e  
Veterinária, I.P.



## **3<sup>rd</sup> COST CONFERENCE**

**20-21 September, 2017**

### **MANAGEMENT COMMITTEE (MC) MEETING**

**22 September, 2017**

**Oeiras, Portugal**

**COST ACTION FA1404**

## **Improving current understanding and research for sustainable control of the poultry red mite *Dermanyssus gallinae* (COREMI)**



### **FINAL PROGRAM AND ABSTRACTS**

## **SCIENTIFIC COMMITTEE AND CORE GROUP MEMBERS**

Olivier Sparagano (Chair) UK  
Fiona Tomley (Vice-Chair) UK  
Robert Finn (WG1) UK  
Mul Monique (WG2) NL  
Lise Roy (WG3) FR  
Danijela Horvatek Tomic (WG4) HR  
Annunziata Giangaspero (STSM) IT  
Julia Stew (GH) UK

## **ORGANIZING COMMITTEE**

Helga Waap  
Jacinto Gomes  
Graça Camacho  
Eduardo Chan  
Susana Pires  
Ana Paula Alves  
Cristina Ferreira  
Julia Stew  
Olivier Sparagano  
Fiona Tomley  
Annunziata Giangaspero

***For information please contact:  
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## **WGs SUBJECTS**

<b>Working group/leader</b>	<b>Subject</b>
<b>WG 1 - Robert Finn</b>	Developing alternative control measures
<b>WG 2 - Monique Mul</b>	End users (One Health) - interdisciplinary approach
<b>WG 3 - Lise Roy</b>	Genetic structure in a changing world
<b>WG 4 - Danijela Horvatek Tomic</b>	Epidemiology, pathology, geographical mapping and surveillance tools

## WELCOME ADDRESS

*Dear Colleagues,*

The Committee members and of the COST Action FA1404 are pleased to welcome you in Oeiras at the 3rd COST CONFERENCE MANAGEMENT and COMMITTEE MEETING on Improving current understanding and research for sustainable control of the poultry red mite *Dermanyssus gallinae* (COREMI).

The overall aim of COREMI is to generate a synergic/holistic approach to improving the health, welfare and productivity of the 350 million laying hens, through more effective prevention and control of *Dermanyssus gallinae*, the Poultry Red Mite (PRM). This will be achieved by cooperation and multidisciplinary networking between scientists and other stakeholders from the different member states and from different disciplines, thus making the European poultry industry more competitive with other leading countries. COREMI plans to consolidate the existing expertise and knowledge in order to gain better understanding of PRM and its economic and social impacts, and to use this information to implement more efficient and sustainable control methods.

The Conference is open to all world scientists interested in this topic and will take place in the heart of the scientific Institution, the *National Institute for Agrarian and Veterinary Research (INIAV)-Oeiras, Portugal*.

**We wish you a nice stay in Oeiras!**

***Olivier E. Sparagano***

*Coventry University, UK*

*COREMI Cost Action Chair*



# PROGRAMME

## Tuesday September 19th, 2017

*Location: National Institute for Agrarian and Veterinary Research (INIAV)-Oeiras*

18:00 Welcome cocktail

## Wednesday September 20th, 2017

*Location: National Institute for Agrarian and Veterinary Research (INIAV)-Oeiras*

8:00 – 9:00 Registration of participants

9:00 – 9:30 Opening ceremony:

Professor Doutor Nuno Canada (INIAV President)

Professor Fernando Bernardo (Directorate-General of Food and Veterinary Medicine [DGAV]– General Director)

Dr. Fernando Moreira (Portuguese Association of Avian Sciences [APCA] – President)

Professor Olivier Sparagano (COREMI Chair)

## SESSION 1

**Chair:** Fiona Tomley and José Francisco Lima Barbero

9:30 -10:00 Key note lecture 1

**An overview of the history, biology and control of bedbugs: what have we learned that could be applied to the poultry red mite?**

Richard A. Naylor

10:00-11:00 Effective and perceived epidemiology of PRM

Oral presentations (15 min each plus discussion)

**Internationalisation of research publications on *Dermanyssus*: myth or reality?**

Olivier Sparagano, Fiona Tomley, Robert Finn, Monique Mul, Lise Roy, Danijela Horvatek Tomić, Annunziata Giangaspero

**A survey on *Dermanyssus gallinae* in intensive poultry units in Portugal**

Helga Waap, Telmo Nunes, Jacinto Gomes, Paulo Leite

**Farmers' perceptions about poultry red mite in Macedonia – findings from the Coremi questionnaire**

Miroslav Radeski, Aleksandar Dodovski

11:00-11:30 Coffee break

**SESSION 2**

**Chair:** Annunziata Giangaspero and Miroslav Radeski

11:30-12:00 Key note lecture 2

**The 'other' poultry mite, *Ornithonyssus sylvarium***

Bradley A Mullens, Amy C Murillo, Alec C Gerry

12:00-13:20 Biology, ecology, physiology, mite-host relationship

Oral presentations (15 min each plus discussion)

**General knowledge of *Dermanyssus gallinae* reproduction after feeding**

Ivan Pavlovic, Aleksandar Pavlicevic, JongUng Yoon, Milica Dotlic

**Development of a poultry red mite on-hen feeding device: a potential tool for mite control evaluation and vectorial studies**

Kathryn Bartley, Frank Turnbull, Fran Nunn, Harry Wright, Alasdair Nisbet

**Characterization of mite communities in wild bird nests from south-central Spain**

José Francisco Lima-Barbero, Marta Sánchez, Monica Young, Maria L. Moraza, Shira Gal, Ursula Höfle, Eric Palevsky

**An integrative pilot study to assess the feasibility of conservation biological control of the poultry red mite in barn layer farms**

Lise Roy, Marine El Adouzi, Maria Lourdes Moraza, Geoffrey Chiron, Etienne Villeneuve de Janti, Guérolé Le Peutrec, Olivier Bonato

13:20-14:30 Lunch

## SESSION 3

**Chair:** Elias Papadopoulos and Martina Lichovnikova

14:30-15:50 Available and future control methods - towards better treatments?

Oral presentations (15 min each plus discussion)

**Efficacy of a novel neem oil formulation (RP03™) to control the poultry red mite *Dermanyssus gallinae***

Annunziata Giangaspero, Nicola Pugliese, Antonio Bevilacqua, Elena Circella, Marianna Marangi, Luigi Gradoni, David George, Olivier Sparagano, Antonio Camarda

**Comparative in vitro susceptibility of *Dermanyssus gallinae* field isolates to fluralaner, phoxim, spinosad, deltamethrin and propoxur**

Emmanuel Thomas, Hartmut Zoller, Gabriele Liebisch, Annie Flochlay-Sigognault

**Field safety and efficacy of fluralaner in drinking water for the treatment of poultry red mite (*Dermanyssus gallinae*) infestations in commercial flocks in Europe**

Emmanuel Thomas, Annie Flochlay-Sigognault

**Introduction of Exzolt (fluralaner 10 mg/ml solution)—A new product for treatment of poultry red mite infestation in chickens**

Roser Dolz

15:50-16:30 Poster session and extended coffee break

**Biological control of the chicken red mite in layer farms in Europe: state of the art and perspectives**

Damien Morel, Tom Groot

**Control of red poultry mite (*Dermanyssus gallinae*) by mechanical effect: chosen current improvements of formulations, application and concept**

Aleksandar Pavlicevic, JongUng Yoon, Ivan Pavlovic

**An integrative approach to the molecular and morphological identification of mites associated with the red poultry mite**

Shira Gal, Eric Palevsky, Eitan Recht, Yuval Gottlieb, Efrat Gavish, Lise Roy, María L. Moraza, Eddie Ueckermann Monica Young

**Description of proteomes for different fed and unfed stages of the poultry red mite (*Dermanyssus gallinae*)**

José Francisco Lima-Barbero, Olivier Sparagano, Robert D. Finn, Lourdes Mateos-Hernández, Mariana Boadella, Ursula Höfle, José de la Fuente, Margarita Villar



***In vitro* effect of plant essential oils as acaricides against *Dermanyssus gallinae***

Monika Roczeń-Karczmarz, Marta Demkowska-Kutrzepa, Jolanta Zdybel, Krzysztof Tomczuk, Maria Studzińska, Tomasz Cencek, Magdalena Włodarczyk-Ramus

***In vitro* evaluation of the effectiveness of commercially available acaricides against the populations of red mites (*Dermanyssus gallinae*) occurring in Poland**

Tomasz Cencek, Jolanta Zdybel, Magdalena Włodarczyk-Ramus, Jacek Karamon, Marta Dempkowska-Kutrzepa, Monika Roczeń-Karczmarz

***Dermanyssus gallinae* status in Iran: an emerging problem**

Shayan Rahimian, Olivier A. E. Sparagano

**The residue depletions of spinosad and abamectin in eggs of laying hens**

Veli Yilgor Cirak, Cengiz Gokbulut, Mehmet Ozuicli, Levent Aydin

**Results of a pilot study regarding *Dermanyssus gallinae* in the greek laying hen industry**

Konstantinos Arsenopoulos, Athanasios Angelou, Elias

16:30-18:00 WG2 individual session:

**Chair:** Monique Mul

WG2: End users (One Health) – an interdisciplinary approach

19:00- Social dinner “A PASTORINHA”

*Location:* Avenida Marginal, Praia de Carcavelos

Thursday September 21st, 2017

Location: National Institute for Agrarian and Veterinary Research (INIAV)-Oeiras

## SESSION 4

Chair: Katherina Tiligada and Igor Stojanov

9:00 -9:30 Key note lecture 3

**Fipronil in eggs, hens and in laying hen facilities**

Guillaume Counotte and Ruth Bouwstra

9:30-10:50 Available and future control option: IPM strategies

Oral presentations (15 min each plus discussion)

**A practical elaboration of integrated pest management for *Dermanyssus gallinae*; a farmer-science co-creation**

Monique Mul, Alex Visch, Dirk Lagerweij, Linda van Lith

**Mite monitoring can improve hen welfare**

José Francisco Lima-Barbero, Ursula Höfle, Mariana Boadella, Xavier Manteca, Monique Mül, Deborah Temple

**A model forecasting the *Dermanyssus gallinae* population in laying hen houses using monitoring data, housing temperature and dates of treatment.**

Monique Mul, Johan van Riel, David George, Marcel Dicke, Bastiaan Meerburg, Johan Zoons, Lise Roy, Simon van Mourik, Peter Groot Koerkamp

**The potential of an integrated PRM strategy in practice**

Nathalie Sleenckx, Ine Kempen, Johan Zoons

10:50-11:20 Coffee break

## SESSION 5

Chair: Robert Finn and Marta Demkowska-Kutrzepa

11:20-11:50 Key note lecture 4

**Tropical and emerging diseases: new developments for tackling insecticide resistance**

Mark Paine

11:50-12:30 Resistance of mites and associated pathogenic microorganisms

Oral presentations (15 min each plus discussion)

**Preliminary results towards the molecular characterization of voltage gene sodium channel in *Dermanyssus gallinae* isolates**

Marianna Marangi, Harry Wright, Alasdair Nisbet, Annunziata Giangaspero, Lise Roy, Kathryn Bartley

**The bacterial flora of *Dermanyssus gallinae* and its antimicrobial resistance**

Igor Stojanov<sup>1</sup>, Danijela Horvatek Tomić, Ivan Pušić<sup>1</sup>, Ivan Pavlović, Dalibor Todorović

12:30-13:40 Lunch

## SESSION 6

**Chair:** Alasdair Nisbet and Marianna Marangi

13:40-14:40 Control: Protective antigens and immune responses to PRM

Oral presentations (15 min each plus discussion)

**Understanding population genetic and antigenic diversity of the poultry red mite to improve prospects for successful vaccine development**

Eleanor Karp-Tatham, Tatiana Küster, Alasdair Nisbet, Øivind Øines, Fiona Tomley, Damer Blake

**Enhanced delivery of a prototype poultry red mite vaccine**

Tatiana Küster, Dan Price, Alasdair Nisbet, Oivind Oines, Damer Blake, Fiona Tomley

**Identification of gut antigens in *Dermanyssus gallinae***

James Pritchard, Tatiana Küster, Rob Noad, Dominic Kurian, Olivier Sparagano, Fiona Tomley

## WG3 and WG4 individual sessions

14:40-15:50 WG3: Genetic structure in a changing world

**Chair:** Lise Roy and Øivind Øines

15:50-17:00 WG4: Epidemiology, pathology, geographical mapping and surveillance tools

**Chair:** Danijela Horvatek Tomić and Olivier Sparagano

17:00-17:15 Closing ceremony

17:15 - City tour

## Friday September 22nd, 2017 MC Members only

*Location:* National Institute for Agrarian and Veterinary Research (INIAV)-Oeiras

9:00 -13:00	MC Members meeting (including a coffee break) Report from previous Training Schools (Israel and Greece) and London workshop Report from previous STSM activities Financial Report Membership expansion Plans for WBP4 (Year 4) Future dissemination activities
13:00-14:00	Lunch
14:00-15:00	Final remarks
15:00-	Farewell

# **ABSTRACTS**

## **Lectures and Oral Presentations**

## EFFICACY OF A NOVEL NEEM OIL FORMULATION (RP03<sup>TM</sup>) TO CONTROL THE POULTRY RED MITE *DERMANYSSUS GALLINAE*

Annunziata Giangaspero<sup>1</sup>, Nicola Pugliese<sup>2</sup>, Antonio Bevilacqua<sup>1</sup>, Elena Circella<sup>2</sup>, Marianna Marangi<sup>1</sup>, Luigi Gradoni<sup>3</sup>, David George<sup>4</sup>, Olivier Sparagano<sup>5</sup>, Antonio Camarda<sup>2</sup>

<sup>1</sup>Department of Science of Agriculture, Food and Environment, University of Foggia, Foggia, Italy;

<sup>2</sup>Department of Veterinary Medicine, University of Bari, Valenzano, Italy; <sup>3</sup>Istituto Superiore di Sanità, Roma, Italy; <sup>4</sup>Stockbridge Technology Centre, North Yorkshire, UK; <sup>5</sup>Centre for Agriculture and Water Resilience (CAWR), Coventry University, Coventry, UK

The poultry red mite (PRM) *Dermanyssus gallinae* is of major concern for the poultry industry. Several chemicals are effective against PRM, but acaricide resistance, the limited number of active ingredients, and the risk of residues create a demand for alternative products, such as plant-derived acaricides.

We investigated the efficacy of neem oil against *D. gallinae* on a commercial laying egg farm with a high infestation level. The farm building was arranged in four blocks of cages, each consisting of two adjacent lines arranged over four tiers. A novel formulation of 20% neem oil dilution from a 2,400 ppm azadirachtin-concentrated stock (RP03<sup>TM</sup>) was administered by nebulization three times, at three day intervals.

Using corrugated cardboard traps, mite density was monitored before, during and after treatment. Following trap removal, mites were frozen and their amount was estimated as total weight. The results were analyzed through multi-factorial ANOVA with trap position and time as criteria predictors. Mite populations in the treated block showed a 94.65%, 99.64% and 99.80% reduction after the first, second and third administration, respectively.

A reduction in mite population was observed also in buffer (59.93%, 75.68% and 83.68%) and control blocks (63.24%, 80.02% and 82.27%). Trap position was the most significant variable according to the analysis run, as well as the interactive term 'time/trap position'. Trap position showed a mean mite log-reduction of ca. 2.2-2.4 for the treated block, while in the control and buffer areas the mean reduction was 0.8 and 1.3, respectively.

The reduction rate of the mite population was significantly higher for treated block ( $p < 0.001$ ) compared to the buffer and control blocks. Nevertheless, it was also possible to observe a reduction in the population of the latter two blocks. It is postulated that forced ventilation may have spread the product, affecting mite density in the buffer and control block.

This result was independent from the effect of time and it suggests strong bioactivity of neem, and more specifically the patented neem-based RP03<sup>TM</sup>, against *D. gallinae*. The treatment was most effective in the 10 days following the first application, and its effects persisted for over two months.

Further studies will aim to reduce the treatment schedule and neem concentration to overcome unwanted effects of treatment recorded on equipment and eggs, as related to the oily consistence and smell of the product.

This paper was supported by Farmaneem SRL (Italy) and by the European Cooperation in Science and Technology (COST Action (FA1404 – COREMI - “Improving current understanding and research for sustainable control of the poultry red mite *Dermanyssus gallinae*”).