



WOAH Collaborative Centre Reports Activities 2024

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CENTRE INFORMATION

*Title of WOAHCollaborating Centre	Good Beekeeping Management Practices and Biosecurity Measures in the Apiculture Sector
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*Name of the writer:	Dr. Marco Pietropaoli

TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOAHC

Category	Title of activity	Scope
		Horizon Europe Project. Thematic Network

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Training, capacity building (true)	Coordination of the Horizon Europe Project B-THENET	on "BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING" - Acronym: BTHENET
Animal welfare (true)	National Research project IZS LT 08/22 RC	National Research project IZS LT 08/22 RC. Title: "Assessment of welfare in Apis mellifera and development of operational protocols in relation to biosecurity and environmental context measures"
Diagnosis, biotechnology and laboratory (true)	Accreditation	The Istituto Zooprofilattico Sperimentale del Lazio e della Toscana has implemented the customer-oriented Quality Policy in compliance with the ISO 9000 and UNI CEI ISO/IEC 17025 standards. This is to grant qualified laboratory results and services, officially acknowledged by EU and by third countries. IZSLT is a multisites laboratory accredited in 1998 (SINAL n. 201 accreditation) according to the UNI CEI EN 45001 directive, and now by Accredia (the Italian accreditation body) according to the UNI CEI ISO/IEC 17025 standard, "General requirements for the competence of testing and calibration laboratories"
Food security (true)	Partner in the National Research project IZS PLV 06/24 RC	Partner in the National Research project IZS PLV 06/24 RC. Title: "Investigation of the quality and safety of imported honey through multidisciplinary approaches"
Training, capacity building (true)	Partner in the Horizon Europe Project BETTER-B	Horizon Europe Project. Project name: Improving Bees' Resilience to Stressors by Restoring Harmony and Balance. Project acronym: BETTER-B. Call: HORIZON-CL6-2022- BIODIV-02-two-stage. Partner activities during 2023: WP6 coordination, PCR development for SHB detection in bee hive debris, development of an on-line tool for beekeepers
Environmental monitoring (true)	Tender EU N° 09.200200/2021/864096/SER/ENV.D.2	Preparatory action for monitoring of environmental pollution using honey bees. Tender EU N° 09.200200/2021/864096/SER/ENV.D.2
Training, capacity building (true)	FAO Letter of Agreement	Letter of Agreement (Loa) GF NSAHD RY20300000000, PO Number 357176 "Development Of Infographics On Varroa Mite And Compendium On Biosecurity

		Measures For Bombus Spp”
Diagnostic activities (true)	Diagnostic activities in beekeeping	<p>The following laboratory analysis according to WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals have been performed: 17 Varroa destructor infestation level assessment, 12 Nosema spp. microscopy, 5 American and European foulbrood cultural method, 2 American foulbrood PCR end-point analyses, 1 European foulbrood PCR end-point analyses, 24 Aethina tumida identification, 5 Nosema apis PCR end-point analyses, 5 Nosema ceranae PCR end-point analyses. Moreover, the following laboratory analysis have been performed: 26 Inspections of affected samples, 149 Morphometrical identification of Apis species, 8 Deformed Wing Virus PCR end-point analyses, 8 Israeli Acute Paralysis Virus PCR end-point analyses, 8 Kashmir Bee Virus PCR end-point analyses, 8 Chronic Bee Paralysis Virus PCR end-point analyses, 8 Acute Bee Paralysis Virus PCR end-point analyses, 8 Black Queen Cell Virus PCR end-point analyses, 8 Sac Brood Virus PCR end-point analyses, 82 Analysis on honey and pollen (melissopalinalogical, palynological and humidity), 3000 Antibiotic susceptibility testing performed according to the current legislation, the relevant International Standards, and the protocols developed by the EURL-AR. Results are interpreted according to the Annex A of the Dec. 2020/1729/EU and to the “Manual for reporting 2021 antimicrobial resistance data within the framework of Directive 2003/99/EC and Decision 2020/1729/EU”</p>
Training, capacity building (true)	Ring tests	<p>The Collaborating Centre is successfully participating to the following international ring tests: - melissopalinalogical analysis proposed by IHC (International Honey Commission); - royal jelly characterization proposed by IHC (International Honey Commission); - melissopalinalogical analysis proposed by BIPEA (https://www.bipea.org/); - honey humidity proposed by BIPEA (https://www.bipea.org/); - morphometrical</p>

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		analysis proposed by CREA-API (Bologna, Italy); - melissopalynological analysis proposed by CREA-API (Bologna, Italy); - Aethina tumida identification (adults and larvae) proposed by the Italian National Reference Laboratory for Apiculture (IZSVe).
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TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable Area
PCR for Tropilaelaps spp. from hive debris	Development of PCR protocols for Tropilaelaps spp. from the selected regions of mitochondrial Cytochrome Oxidase I (COI) of the four Tropilaelaps species (T. mercedesae, T. clareae, T. thaii, T. koenigerum).	Laboratory Expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAHP?

No

4. Did your Collaborating Centre maintain a network with other WOAHP Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same speciality, to coordinate scientific and technical studies?

Yes

Name of WOAHP CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
WOAHP CC "Bee Health in Africa"	-	África	Participation in the SHB_SNSF project "Evolution of polyandry and reproduction underlying success and impact of an invasive beetle pest" Participation to the International Symposium on Biosecurity Measures in Beekeeping organized by IZSLT
WOAHP – SHB Reference Centre and National Reference Laboratory for Bee Diseases "Friedrich Loeffler-Institut"	-	Europa	SHB control methods in Italy: evaluate new control strategies for monitoring and

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Federal Research Institute for Animal Health" – Germany (Dr. Marc O. Schäfer)			control <i>A. tumida</i> in baited traps with acetamiprid
WOAH Reference Laboratory for American Foulbrood: Dr Adriana M. Alippi	-	América	Studies on bacteriophages

TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHO Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHO CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Food and Agriculture Organization of the UN (FAO)	Rome	Africa Americas Asia and Pacific Europe Middle East	Letter of Agreement (Loa) GF NSAHD RY20300000000, PO Number 357176 "Development Of Infographics On Varroa Mite And Compendium On Biosecurity Measures For <i>Bombus Spp</i> "
FAO AMR Working Group http://www.fao.org/antimicrobial-resistance/background/who-we-are/en/	Rome	Africa Americas Asia and Pacific Europe Middle East	Participation to the AMR Working Group meetings and definition of the AMR PMP in beekeeping.
COLOSS	Bern	Africa Americas Asia and Pacific Europe Middle East	Participation in the Varroa Control Task Force: to share expertise and perform field trials to develop monitoring and control methods. Participation to SHB Task Force: to compare methods for surveillance and control of <i>Aethina tumida</i> .
		Africa	

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International Federation of beekeepers' associations (APIMONDIA)	Rome	Americas Asia and Pacific Europe Middle East	Participation in the Scientific Commission "Bee Health"
European Professional Beekeepers Association	-	Europe	Vice-president of the Bee Health Scientific Commission
Italian Agency for the Promotion of Scientific Research, International Federation of Beekeepers' Associations, Loba Customer Experience Design, Swedish University of Agricultural Sciences, Bee Life European Beekeeping Coordination, Danish Beekeepers Association, Slovenian Beekeepers' Association, Complutense University of Madrid, Hellenic Agricultural Organization DIMITRA, Faculty of Veterinary Medicine of University of Zagreb, Poland National Institute of Horticultural Research, University of Veterinary Medicine and Pharmacy in Košice, Honeybee Valley, Ghent University, State Institute of Bee Research University of Hohenheim, Latvia University of Life Sciences and Technologies, University of Graz, University of Veterinary Medicine in Budapest	-	Europe	B-THENET Thematic Network. Project coordination.
Istituto Zooprofilattico Sperimentale delle Venezie (National Reference Centre for beekeeping and the National Reference Laboratory for honey bee health)	-	Europe	SHB ring test

TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?H?

No

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

No

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA, to personnel from WOA Members?

No

TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?

Yes

National/International	Title of event	Co-organiser	Date	Location	No. Participants
Nationally	"Aggiornamenti in Apicoltura"	Viterbo Veterinary Services, Apituscia Association	2024-02-16	Rocca dei Papi – Montefiascone (VT)	80
Nationally	"Attività di tutela, conservazione e valorizzazione dell'Apis mellifera ligustica del Lazio – primo evento"	-	2024-10-06	Rome, IZSLT headquarter	20
Nationally	"Attività di tutela, conservazione e valorizzazione dell'Apis mellifera ligustica del Lazio – secondo evento"	-	2024-11-24	Rome, IZSLT headquarter	20
Internationally	3rd International Event "Bee Health towards Sustainable Apiculture"	WOAH and FAO	2024-05-16	Rome	800

TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA that may be useful to Members of WOA

a) Articles published in peer-reviewed journals:

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1. Mascarello, G., Pinto, A., Crovato, S., Tiozzo Pezzoli, B., Pietropaoli, M., Bertola, M., ... & Formato, G. (2024). Consumers' Perceptions and

- Behaviors Regarding Honey Purchases and Expectations on Traceability and Sustainability in Italy. Sustainability, 16(20), 8846.*
2. Mosca, M., Gyorffy, A., Pietropaoli, M., Giannetti, L., Cersini, A., Fortugno, L., & Formato, G. (2024). IPM Strategy to Control EFB in *Apis mellifera*: Oxytetracycline Treatment Combined with Partial Shook Swarm and Queen Caging. *Veterinary Sciences, 11(1), 28.*
 3. Lukic, B., Raguz, N., Kovačić, M., Curik, I., Obšteter, J., Prešern, J., ... & Puškadija, Z. (2024). Genomic diversity and population structure of Carniolan honey bee in its native habitat. *BMC genomics, 25(1), 849.*
 4. De Carolis, A., Newmark, A. J., Kim, J., Song, J., Pietropaoli, M., Manara, V., ... & Formato, G. (2024). A Comprehensive Analysis of Beekeeping Risks and Validation of Biosecurity Measures against Major Infectious Diseases in *Apis mellifera* in Europe. *Agriculture, 14(3), 393.*
 5. Bubnič, J., Prešern, J., Pietropaoli, M., Cersini, A., Moškrič, A., Formato, G., ... & Smodiš Škerl, M. I. (2024). Integrated Pest Management Strategies to Control *Varroa* Mites and Their Effect on Viral Loads in Honey Bee Colonies. *Insects, 15(2), 115.*
 6. Leti Maggio, E., Tofani, S., Granato, A., Formato, G., Pietrella, G., Conti, R., ... & Scicluna, M. T. (2024). First Description of the Occurrence of Slow Bee Paralysis Virus-1 and Deformed Wing Virus B in *Apis mellifera ligustica* Honeybee in Italy. *Applied Sciences, 14(2), 626.*
 7. Formato, G., Giannottu, E., Lorenzi, V., Roncoroni, C., Pietropaoli, M., Pedrelli, C., ... & Palomba, S. (2024). Definition and Identification of Honey Bee Welfare Practices Within the Five Domains Framework for Sustainable Beekeeping. *Applied Sciences, 14(24), 11902.*
 8. Marcoccia, D., Tzanetou, E. N., Pietropaoli, M., Roessink, I., van der Steen, J., Cuva, C., ... & Kasiotis, K. M. (2024). Biomonitoring of particulate matter and volatile organic compounds using honey bees and their products. A contemporary overview. *Science of The Total Environment, 956, 177391.*
 9. Quaresma, A., Ankenbrand, M. J., Garcia, C. A. Y., Rufino, J., Honrado, M., Amaral, J., ... & Keller, A. (2024). Semi-automated sequence curation for reliable reference datasets in ITS2 vascular plant DNA (meta-) barcoding. *Scientific Data, 11(1), 129.*

b) International conferences:

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- 10th EURBEE Congress 2024. 16th – 19th September 2024.
- Podcast Be Tuned, 14th August 2024. AFB and EFB.
- APIMONDIA Bee Health Symposium, 15th – 16th June 2024, Universidad Complutense de Madrid.
- University of Liège, Belgium / 17-19 April 2024, "Horizon scanning in veterinary epidemiology".
- Slovenia, Ljubljana, 22nd – 23rd May 2024, Honey Bee health and disease prevention. FAO International Forum for action on Sustainable Beekeeping and Pollination.

c) National conferences:

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- XXXIII National Congress of the SOCIETÀ ITALIANA DI PARASSITOLOGIA (SOIPA), Padova, 18 – 21 June 2024.

d) Other (Provide website address or link to appropriate information):

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

Our activities have been oriented to promote globally and to adapt to the specific geographical context:

- high standards of Good Beekeeping Practices (GBPs);
- high standards of Biosecurity Measures in Beekeeping (BMBs);
- proper measures to prevent and mitigate the impact of Antimicrobial Resistance (AMR);
- guidelines, training and checklists for risk assessment concerning bee health and welfare;
- new diagnostic procedures for veterinarians concerning honey bee diseases;
- guidelines for the biosecurity measures for Bumble bees.



12. Additional comments regarding your report: