

OIE Collaborating Centres Reports Activities

Activities in 2021

This report has been submitted : 2022-01-31 11:26:38

Title of collaborating centre:	Good Beekeeping Management and Biosecurity in Apiculture
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Name (including Title and Position) of Head of the Collaborating Centre (formally OIE Contact Point):	Dr. Giovanni Formato (Head of Apiculture Laboratory)
Name of writer:	Dr. Giovanni Formato and Dr. Marco Pietropaoli Researcher at Apiculture, Honey Bee Productions and Diseases Laboratory

ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories

ToR: To identify and maintain existing expertise, in particular within its region

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

Disease control	
Title of activity	Scope
N. 4 National Research Projects	<p>IZS LT 06/17 RC "Implementation of surveillance activities and development of new methods for the control of Aethina tumida in Italy"</p> <p>IZS LT 14/16 RC "Antibiotics in beekeeping: state of the art, use and potential risks"</p> <p>IZS LT 07/18 RC "Emerging pathogens in beekeeping: Lotmaria passim and Crithidia mellificae - Study on diffusion in the Italian territory and evaluation of the impact on hives mortality"</p> <p>IZS ME 15/20 RC "Development of new diagnostic techniques for SHB control activities in Italy"</p>
Training, capacity building	
Title of activity	Scope
<p>Proposal submission:</p> <p>Call: HORIZON-CL6-2021-GOVERNANCE-01</p>	<p>Thematic Network on "BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING" - Proposal acronym: B-THENET</p> <p>(Project coordinator)</p>

Proposal submission: COST ACTION https://www.cost.eu/	"Network for improvement and integration of beekeeping extension, using extension science principles" (Project Partner)
Diagnosis, biotechnology and laboratory	
Title of activity	Scope
Diagnostic activity (laboratory analysis)	The following laboratory analysis ACCORDING TO OIE MANUAL of Diagnostic Tests and Vaccines for Terrestrial Animals have been performed: 72 Varroa destructor infestation level assessment 110 Nosema spp. microscopy 178 American and European Foulbrood 2 Acarapis woodi PCR end-point analyses 8 Aethina tumida PCR end-point analyses 72 Nosema apis PCR end-point analyses 72 Nosema ceranae PCR end-point analyses Moreover, the following laboratory analysis have been performed the laboratory: 40 inspections of affected combs 262 morphometrical identification of Apis species 75 Lotmaria passim PCR end-point analyses 75 Crithidia spp. PCR end-point analyses 100 Deformed Wing Virus PCR end-point analyses 100 Israeli Acute Paralysis Virus PCR end-point analyses 100 Kashmir Bee Virus PCR end-point analyses 105 Chronic Bee Paralysis Virus PCR end-point analyses 100 Acute Bee Paralysis Virus PCR end-point analyses 100 Black Queen Cell Virus PCR end-point analyses 100 Sac Brood Virus PCR end-point analyses 215 analysis on honey and pollen (melissopalynological, palynological and humidity)
On field diagnosis	20 Cinical inspections of hives and samplings

<p>Development of N. 3 diagnostic methods for SHB published in scientific papers</p>	<p>N. 3 papers in collaboration with other Italian Official Laboratories (Istituto Zooprofilattico delle Venezie - NRL for Bee health; Istituto Zooprofilattico Sperimentale del Mezzogiorno):</p> <p>1. Definition of a Protocol to Manage and Officially Confirm SHB Presence in Sentinel Honeybee Colonies https://doi.org/10.3390/app11178260</p> <p>2. Updates on the Mobile Divider and Its Use in Calabria Region to Monitor and Control Aethina tumida Infestation https://doi.org/10.3390/app112210637</p> <p>3. New Matrixes to Diagnose Aethina tumida Presence at Apiary Level https://doi.org/10.2478/jas-2021-0015</p>
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ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal welfare

Proposal title	Scope/Content	Applicable area
<p>Guidelines on sustainable management of honey bee diseases in Europe</p>	<p>Definition and a list of the most relevant management practices (Good Beekeeping Practices - GBPs) and Biosecurity Measures in Beekeeping (BMBs), harmonized within Europe</p>	<p><input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input checked="" type="checkbox"/> Animal welfare</p>
<p>Good beekeeping practices for sustainable apiculture.</p>	<p>FAO, IZSLT, Apimondia and CAAS. 2021. FAO Animal Production and Health Guidelines No. 25. Rome. https://doi.org/10.4060/cb5353en</p>	<p><input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input checked="" type="checkbox"/> Animal welfare</p>
<p>Responsible use of antimicrobials in beekeeping.</p>	<p>FAO and IZSLT. 2021. FAO Animal Production and Health Guidelines No. 26. Rome, FAO. https://doi.org/10.4060/cb6918en</p>	<p><input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input checked="" type="checkbox"/> Animal welfare</p>

Visual manual on good beekeeping practices for small-scale beekeepers in Africa	FAO, Apimondia, IZSLT. 2021. TECA - Technologies and practices for small agricultural producers, 2. Rome. https://doi.org/10.4060/cb4576en	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input checked="" type="checkbox"/> Animal welfare
Varroa monitoring techniques	Scientific international paper: Identify the best technique for Varroa destructor monitoring at apiary level. Paper published https://doi.org/10.3390/app11104458	<input checked="" type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input checked="" type="checkbox"/> Animal welfare

ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines

ToR: To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations

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

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
OIE RL "Infestation with <i>Aethina tumida</i> "	Germany	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	Develop new tools for <i>Aethina tumida</i> diagnosis and control.
OIE CC "Bee Health in Africa"	Kenya	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Participation in the SHB_SNSF project "Evolution of polyandry and reproduction underlying success and impact of an invasive beetle pest"

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

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
COLOSS coloss.org	Berna (Switzerland)	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East	CSI Varroa project: a Citizen Scientist Initiative to understand Varroa damage thresholds SHB Task Force: to compare methods for surveillance and control of Aethina tumida.
FAO	Rome	<input checked="" type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input checked="" type="checkbox"/> Middle East	<p>Letter of Agreement (LoA) GF CJWZD RA20102000000/GF CJWZD RA50201080000, GRMS Supplier Number 53870, PO Number 351806. "Development and dissemination of Progressive Management Pathway for AMR (PMP-AMR) in beekeeping and launching AMR/AMU/GBPs/BMBs surveys among beekeepers"</p> <p>Letter of Agreement (LoA) GF AGAHD RA30102000000, PO number 340550 con Food and Agriculture Organization (FAO) per la collaborazione nel progetto "Development of Guidelines on Good Beekeeping Practices allowing to obtain high quality products with a focus on small-scale farmers and beekeepers"</p> <p>Letter of Agreement (LoA) GF AGAHD RA50101000000, PO number 342982 con Food and Agriculture Organization (FAO) per la collaborazione nel progetto "Experts consultation meeting on mainstreaming sustainable beekeeping into FAO animal production and health programme"</p> <p>Letter of Agreement (LoA) GF AGAHDRA30102000000, PO Number 340550 con Food and Agriculture Organisation (FAO) per la collaborazione nel progetto "Online Publication of Guidelines and a practical manual for Good Beekeeping Practices"</p> <p>FAO Event "Launch of the Guidelines for the responsible use of antimicrobials in beekeeping"</p> <p>(during the World Antimicrobial Awareness Week 2021: 18-24 November 2021)</p>

ToR: To place expert consultants at the disposal of the OIE.

5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?

No

ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries

6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?

Yes

- a) Technical visits: 0
- b) Seminars: 1
- c) Hands-on training courses: 0
- d) Internships (>1 month): 0

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
b	International OIE Virtual regional workshop on honey bee diseases in Asia and the Pacific, 24 August 2021 - Japan	Japan	50

ToR: To organise and participate in scientific meetings and other activities on behalf of the OIE

7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?

No

ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty

8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE

- a) Articles published in peer-reviewed journals: 13
 Di Ruggiero, C.; Mezher, Z.; Mutinelli, F.; De Carolis, A.; Pocci, N.; Formato, G. Updates on the Mobile Divider and Its Use in Calabria Region to Monitor and Control Aethina tumida Infestation. Appl. Sci. 2021, 11, 10637.
<https://doi.org/10.3390/app112210637>

Cersini, Antonella, Pietropaoli, Marco, Pietrella, Gabriele, Rivera-Gomis, Jorge, Federico, Giovanni, Tofani, Silvia, Conti, Raffaella, Rubino, Roberta C., Di Ruggiero, Camilla and Formato, Giovanni. "New Matrixes to Diagnose Presence at Apiary Level" *Journal of Apicultural Science*, vol.0, no.0, 2021, pp.-
<https://doi.org/10.2478/jas-2021-0015>

Tlak Gajger, I., A. M. Mañes, G. Formato, M. Mortarino, J. Toporcak: Veterinarians and beekeeping: What roles, expectations and future perspectives? - a review paper. *Vet. arhiv* 91, 437-443, 2021. DOI:
10.24099/vet.arhiv.1444

Smodiš Škerl, M.I.; Rivera-Gomis, J.; Tlak Gajger, I.; Bubnič, J.; Talakić, G.; Formato, G.; Baggio, A.; Mutinelli, F.; Tollenaers, W.; Laget, D.; Malagnini, V.; Zanotelli, L.; Pietropaoli, M. Efficacy and Toxicity of VarroMed® Used for Controlling Varroa destructor Infestation in Different Seasons and Geographical Areas. *Appl. Sci.* 2021, 11, 8564.
<https://doi.org/10.3390/app11188564>

Formato, G.; Federico, G.; Di Ruggiero, C.; Pietropaoli, M.; Milito, M.; Mutinelli, F. Definition of a Protocol to Manage and Officially Confirm SHB Presence in Sentinel Honeybee Colonies. *Appl. Sci.* 2021, 11, 8260.
<https://doi.org/10.3390/app11178260>

Mezher, Z.; Bubnic, J.; Condoleo, R.; Jannoni-Sebastianini, F.; Leto, A.; Proscia, F.; Formato, G. Conducting an International, Exploratory Survey to Collect Data on Honey Bee Disease Management and Control. *Appl. Sci.* 2021, 11, 7311. <https://doi.org/10.3390/app11167311>

Pietropaoli, M.; Tlak Gajger, I.; Costa, C.; Gerula, D.; Wilde, J.; Adjlane, N.; Aldea-Sánchez, P.; Smodiš Škerl, M.I.; Bubnič, J.; Formato, G. Evaluation of Two Commonly Used Field Tests to Assess Varroa destructor Infestation on Honey Bee (*Apis mellifera*) Colonies. *Appl. Sci.* 2021, 11, 4458. <https://doi.org/10.3390/app11104458>

Pietropaoli, M., & Formato, G.(2021) Formic acid combined with oxalic acid to boost the acaricide efficacy against Varroa destructor in *Apis mellifera*. *Journal of Apicultural Research*, 1-9.
<https://doi.org/10.1080/00218839.2021.1972634>

M., Pietropaoli; A., Ribarits; R., Moosbeckhofer; H., Köglberger; O., Alber; A., Gregorc; M., I., Smodis Skerl; J., Presern; J., Bubnic; M., Necati Muz; G., Formato. Biosecurity measures in European beekeeping. *Revue Scientifique et Technique (International Office of Epizootics)*, 39,3,2021. <https://doi.org/10.20506/rst.39.3.3174>

Bubnič, J., Moosbeckhofer, R., Prešern, J., Moškrič, A., Formato, G., Pietropaoli, M., ... & Škerl, M. I. S. (2021). Three pillars of Varroa control. *Apidologie*, 1-29. <https://doi.org/10.1007/s13592-021-00903-4>

FAO, IZSLT, Apimondia and CAAS. 2021. Good beekeeping practices for sustainable apiculture. *FAO Animal Production and Health Guidelines No. 25*. Rome. <https://doi.org/10.4060/cb5353en>

FAO and IZSLT. 2021. Responsible use of antimicrobials in beekeeping. *FAO Animal Production and Health Guidelines No. 26*. Rome, FAO. <https://doi.org/10.4060/cb6918en>

FAO, Apimondia, IZSLT. 2021. Visual manual on good beekeeping practices for small-scale beekeepers in Africa. *TECA – Technologies and practices for small agricultural producers, 2*. Rome. <https://doi.org/10.4060/cb4576en>

b) International conferences: 2

International OIE Virtual regional workshop on honey bee diseases in Asia and the Pacific, 24 August 2021 - Japan

COLOSS Varroa Task Force Webinar 1-2 March 2021

c) National conferences: 37

Annual Meeting of the Scientific Veterinary Society in Apiculture – Webinar 18 December 2021

Honey bee health – Webinar organized by the National Reference Laboratory for Apiculture (IZSVe) 15 December 2021

Teaching to beekeepers associations: participation to a total of 35 events at Beekeepers' Associations as speakers (Giovanni Formato, Marco Pietropaoli)

d) Other

(Provide website address or link to appropriate information): 0

9. Additional comments regarding your report: