2025 Nutri COLOSS Workshop

Istituto Zooprofilattico Sperimentale delle Venezie,
IZSVe Padua, February 7th 2025

Short Proceedings

Dear colleagues,

We are pleased to propose you the short proceedings of our Coloss Nutri-Task Force workshop that took place near the nice town of Padua, Italy, February 7th 2025.

Even if we attended our first meeting in Montreal several years ago and we joined each annual Coloss General Assembly, the Padua one was our first in person workshop. We were so happy to interact with each other without screen, finally.

We beneficiated of the warm welcome of the Experimental Zooprophylactic Institute of Venezia thanks to Franco Mutineli and thanks to the constant attention of Michela Bertola. During the week, we shared our works with our collegues of the Coloss B-Rap and Monitoring Groups andwith the new BeeScholar Task Force.
The abstracts of the 7th of february were dedicated to the advances in Bee Nutritions.
We would like to thank all the contributors for the presentation of their works.
In our agenda, we proposed three types of presentation:

- Updates of our different Nutri Task Force projects;
- Scientific presentations from researchers;
- And for the first time, regional focus on bee nutrition covering all the continents, juggling with the time zones.

It designed a very dense workshop with a good participation of the attendees and a huge work of organisation of Alessandra Giacomelli who acted as the chairwoman of the day.

We also spend half a day, the 8th of february, with BeeScholar group, on a practical workshop focused on fat body and hemolymph sampling, beyond *Aethina Tumida* identification: a very interesting experience in the Institute campus.

Please enjoy the abstracts and feel free to contact us to join our Coloss Nutri-TF group, to participate to our present projects or to propose new topics to improve knowledge of the bee nutrition, at the different scales of perception (individual bee, colony, territory)

Michel Bocquet

Co-Chair of the COLOSS Nutri Task Force

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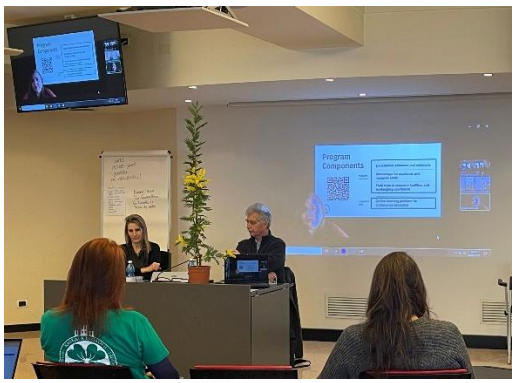
COLOSS Nutri TF Workshop
IZSVe Padua, February 7th 2025
Programm

Morning session
9.00 Registration of the participants
9.15 Introduction of the COLOSS Nutri TF workshop- Simone Tosi (ZOOM)

9.30-10.40 Australia/Asia Regional talks regarding honeybee criticalities and experiences on nutrition (5 presentations)
Ming-Cheng Wu (TAIWAN) 9.30-9.45 (ZOOM)
Rajini Arjun (INDIA) 9.45-10.00 (ZOOM)
Jakkravut Maitip (THAILAND) 10.00-10.15 (ZOOM)
Alireeza Arab (IRAN) 10.15-10.25 (ZOOM)
Damien Fevre (AUSTRALIA) 10.25-10.40 (in presence)
10.40-11.15 Q&A and Discussion Time

11.15-11.30 Coffee break

11.30- 12.30 Africa and America Regional talks regarding honeybee criticalities and experiences on nutrition (4 presentations)
Michell Lattorff (KENYA) 11.30-11.45 (ZOOM)
Beatrice Nganso (9 AFRICAN COUNTRIES) 11.45-12.00 (ZOOM)
Christian Pirk (SOUTH AFRICA) 12.00-12.15 (ZOOM)
Priyadarshini Chakrabarti Basu (US and Canada) 12.15-12.30 (ZOOM)
12.30-1300 Q&A and Discussion Time
13.00 Lunch break



Abstract Title:
Disaccharides in Honey: Overview; Composition; Structure and Health Benefits.

Abstract Authors:
Mohammad Forsi DVM

Authors Affiliations:
Iran Veterinary Organization

Abstract Text:
Scientists have identified at least 16 disaccharides in honey and honeydew (Fuente; 2006; Bogdanov; 2004). These disaccharides are crucial for the survival of honeybees; with trehalose playing a particularly vital role by boosting immunity and providing protection against pathogens. Trehalose also helps bees withstand environmental stresses; including dehydration; extreme cold; and food scarcity. A deficiency in these disaccharides; particularly trehalose; can lead to weakened immunity; colony decline; and increased susceptibility to Nosema disease. In addition to their importance for bees; several of these disaccharides offer significant health benefits for humans. This paper examines the structure; formation pathways; and health effects of common disaccharides in honey; with a particular focus on trehalose; highlighting its essential role in honeybee physiology and resilience to stress.

Abstract Title:

The immune response of honeybees to the pollen of different botanical origins: an insight on the role of the source colony.

Abstract Authors:

Chiara Braglia; Anna Tinti; Cecilia Rudelli; Daniele Alberoni; Gloria Isani; Diana Di Gioia; Alessandra Giacomelli; Michel Boquet; Philippe Bulet

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Abstract Text:

Agricultural practices; pollutants and climate change can influence plant metabolic functions as well as the spatial distribution and abundance of trophic resources for pollinators. Nectar and pollen availability or changes in their dietary profile aremay also occur and lead to nutritional deficit in pollinators; and trigger additional threats to ecosystem stability. The absence of a balanced diet; concerning the pollen source diversity and quantity and quality of protein content; has been proven to be detrimental for honeybee health; gut microbiome fitness and haemolymph protein content. Our research aims at investigating the potential of different trophic sources; i.e. of different botanical origin; on the stimulation of honeybee's immune and proteomic response and modulation of the gut microbiome development. For these objectives; a holistic approach was proposed using MALDI-MS (MALDI BeeTyping) for antimicrobial peptides (AMPs) and SDS-PAGE for vitellogenin detection in haemolymph. Moreover; q-PCR was used for gut microbiome analysis. Newly-emerged caged honeybees were daily fed with a fresh suspension of pollen and sugar syrup (1:1 w/v) for a total of 40 monofloral and 13 polyfloral pollens belonging to 8 botanical families (Cistaceae; Asteraceae; Cornaceae; Boraginaceae; Fagaceae; Leguminosae; Rosaceae and Salicaceae) collected in 5 Italian regions. After 5 days; haemolymph and guts were extracted for the MALDI-BeeTyping; SDS-PAGE; and qPCR analysis after DNA extraction. Our results showed that different pollen sources can affect both AMPs and vitellogenin content in haemolymph but with no significant variations. However; using a genetic algorithm on MALDI BeeTyping spectra; we developed a model able to discriminate various small size proteins correlating with vitellogenin content in the haemolymph. Finally; qPCR results highlighted that all botanical families could influence significantly the gut core microorganisms within the genera Bifidobacterium; Bombilactobacillus; Lactobacillus; Frischella; Bartonella; Gilliamella and Snodgrassella. These results represent a first step in understanding the complex interaction between pollen sources; microbiome and honeybees' health.

Abstract Title:
Quality screening and digestibility of artificial feeding for bees: the perspective of the APISCIBUS project

Abstract Authors:
Soraia I. Falcão [1]; Andreia Tomás [1]; Paulo Russo-Almeida [2]; Miguel Vilas-Boas [2]

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[1] CIMO; LA SusTEC; Instituto Politécnico de Bragança; Campus de Santa Apolónia; 5300-253 Bragança; Portugal. [2] Laboratório Apícola–LabApis; Departamento de Zootecnia; Universidade de Trás-os-Montes e Alto Douro (UTAD); 5300-801 Vila Real; Portugal

Abstract Text:
The nutrition of honeybee; Apis mellifera; relies on nectar for carbohydrates and pollen for proteins; vitamins; and minerals. Artificial supplementation of bee colonies is a growing practice all around the world; inclusively in Portuguese beekeeping. It is employed not only to address food shortages resulting from adverse climatic variations; but also, to ensure optimal nutritional and health conditions for bees during specific production periods. This practice; coupled with limited regulation in the field; has led to the proliferation of commercial products based on carbohydrates; proteins; and other substances of diverse origins and compositions. While these products can help beekeepers mitigate imbalances in colonies caused by adverse conditions or management practices; they also pose potential risks to bee health and the quality of bee-derived products; depending on the raw materials used and the presence of harmful substances. The project APISCIBUS; funded by the Portuguese National Program for Beekeeping; aimed the identification of the artificial feeding practices employed by the beekeepers; the evaluation of the quality and safety of commercial products available on the market; and their nutritional potential and impact on colony development. For that; approximately; 40 commercial feeds; among which artificial carbohydrate and protein supplementation; where evaluated through the nutritional profile (water content; ashes; lipids; proteins; carbohydrates); sugars; free aminoacids; fatty acids; minerals and HMF. The impact of these supplements on the longevity of the bees were assessed with in vitro assays with controlled temperature and humidity. Overall; results showed a clear need for regulation of the artificial bee feeding products due to the existing gaps in available information on composition; mode of application and efficacy of the products; but also, because clear differences were identified between the composition found and product labelled specifications.

Abstract Title:
The impact of heat stress and pesticides on honeybee immune system

Abstract Authors:
Lenka Jerele; Maja Ivana Smodiš Škerl

Authors Affiliations:
Agricultural institute of Slovenia

Abstract Text:
Honeybees are essential for pollination and maintaining biodiversity; yet colony losses have increased dramatically due to multiple stress factors; including pesticides; poor nutrition; pathogens; and climate change. Rising temperatures; altered weather patterns; and diminished forage resources driven by climate change significantly threaten honeybee health. Foraging bees often encounter pesticides through contaminated nectar; pollen; or water; leading to oral and contact exposure. While the effects of individual stressors on honeybee immunity are well-documented; little is known about the combined influence of multiple stressors. This study investigates the combined effects of thermal stress and pesticide exposure on honeybee immunity and physiology. One-day-old bees were kept in controlled cage experiments for 18 days and divided into three groups: untreated controls; those subjected to acute heat stress; and those exposed to both acute heat stress and sublethal pesticide doses. Mechanical immune activation was performed on half of the bees from each group before sampling. Hemolymph was collected on the final day for total and differential hemocyte analysis. Mortality rates and food intake were monitored throughout the experiment. We hypothesized that combined stress from elevated temperatures and pesticide exposure reduces overall hemocyte numbers and alters the distribution of different hemocyte types. Given the intensifying effects of climate change; this research highlights the need to understand how honeybees cope with simultaneous environmental and chemical pressures.

Abstract Title:
Determination of gross energy content of the honey bees fed with different supplementary feed using calorimetry

Abstract Authors:
Ana-Marija Kovač[1]; Ivana Tlak Gajger[1]; Arnold Majoroš[1]; Maja Ivana Smodiš Škerl[2]

Authors Affiliations:
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Abstract Text:
The honey bee (Apis mellifera L.) is a holometabolous insect due to its specific ontogenetic development. Accordingly; no linear relationship between age; body mass; heat production and energy turnover are to be expected; which makes these insects an interesting model for calorimetric research. So far; there is a lack of data on the energy value of individual developmental stages in relation to the different feeding of honey bee colonies. The aim of this study is therefore to investigate the effectiveness of supplementary feeding with protein candies; pollen candies and sugar candies with added spirulina on the development of honey bee colonies using calorimetric analyses. After the last honey extraction in August; 36 experimental honey bee colonies were set up in the apiary under field conditions. The colonies comprised four experimental groups. The first group (9 colonies) was fed with sugar syrup (sugar:water ratio; 1:1); the second group (9 colonies) consisted of colonies fed with commercial protein cake (Medopip PLUS); the third group (9 colonies) was fed with pollen cake (APIGALA standard with added pollen) and the fourth group (9 colonies) was fed with prepared sugar cake with an addition of 2% spirulina. This study investigated the gross energy content variations across three sampling rounds. The first sampling of the adult honey bees (30 bees/sample) took place before the start of supplemental feeding. The second sampling was carried out 22 days and the last sampling 43 days after the start of supplemental feeding. The gross energy content of the honey bees was determined calorimetrically (IKA C6000 global standard; Staufen; Germany). Analysis revealed significant differences between sampling rounds (ANOVA; p < 0.0001; F = 40.8449). The mean gross energy content showed an increasing trend across sampling rounds; from 10.246 ± 0.289 MJ/kg in round 1 to 10.747 ± 0.254 MJ/kg in round 3; with round 2 showing intermediate values (10.374 ± 0.347 MJ/kg). Group-specific analysis revealed varying patterns; with Group 1 showing the highest energy content in round 3 (10.827 ± 0.190 MJ/kg); while other groups demonstrated more moderate variations. These findings suggest temporal dynamics in energy content; with significant variations both between sampling rounds and groups. Considering the lack of studies on honey bees as a model for calorimetry; further studies are needed to collect data on the influence of supplementary feeding on the energy status of honey bees. Key words: Honey bees; supplementary feed; calorimetry

Abstract Title:
Sortiment and evaluation of carbohydrate feed for bees

Abstract Authors:
Robert Chlebo1; Michel Bocquet2; Soraia Falcão3; Maja Ivana Smodiš Škerl4; Alessandra Giacomelli5; Giancarlo Quaglia6

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Abstract Text:
The classic substitute for honey is the sugar solution made by beekeepers. Variety of sucrose or starch based ready-to-use feeds; in liquid or pasty form; which can be given to bee colonies directly without further processing; are offered to beekeepers for decades. However; the composition of these products is variable and sometimes even undefined. Although the market for pre-prepared sugary feeds is growing exponentially; there are very few studies regarding their suitability and impact on bee colony health. We have analyzed 5 liquid feeds produced by various European producers and found that sugar spectrum and HMF content differed significantly. Different ratios of fructose; glucose; sucrose; and maltose depend on the production method. Eight commercial non-fortified candy boards available in European markets were analyzed. The sugar composition and other parameters often didn’t match the product labels. In both liquid or pasty feed types we have noticed samples contained levels of HMF up to 50 mg/kg; due to poor production or storage practices. Feeds made from refined sucrose are preferable to those containing starch hydrolysates or poorly defined sugar mixes; which can include indigestible components harmful to bees. Another challenge is setting up a methodology for monitoring enriched carbohydrate feeds for bees. We identified candy boards on European market with declared addition of pollen or other proteins; vitamins; essential oils and anti-nosema agents. These products claiming a set of actions at the level of brood stimulation; energy supplementation; queen rearing support; reduction of varroa reproduction levels; improvement of the intestinal microflora of bees; nosema prevention; improvement of the health of hives infested by bacterial diseases. Recommendations for policymakers include implementing clearer regulations for honey bee feeds; ensuring safety and consistency across products; developing guidelines for acceptable levels of critical parameters such as HMF; acidity; and sugar types as well as rules regarding the health effect claims on enriched feed labels.

Abstract Title:

Evaluating the nutritional impact of BeeElixir and spirulina on honey bees in a controlled laboratory study

Abstract Authors:

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Abstract Text:

Honey bee nutrition is vital for colony health and survival; particularly during periods of resource scarcity and winter preparation. This study investigated the effects of two nutritional supplements; BeeElixir and Spirulina; on worker bee health and physiology under laboratory conditions. Worker bees were divided into groups: a control group receiving standard sugar syrup (1:1); BeeElixir groups with varying dilutions (1:2; 1:3; 3:1; BeeElixir: water); and a Spirulina group (1 g of dry Spirulina in 100 ml sugar syrup). Survival rates and consumption patterns were monitored throughout the experiment. At the conclusion of the 18-day trial; body and head weights were measured; and hemolymph samples were collected to evaluate the physiological effects of the supplements. The results demonstrated significant differences among the groups. Bees fed sugar syrup or Spirulina exhibited higher survival rates and greater consumption compared to those in the BeeElixir groups. Specifically; BeeElixir (1:3) promoted increased consumption; while BeeElixir (3:1) was associated with elevated mortality. Body and head weight measurements suggested differences in nutrient assimilation and resource allocation; with Spirulina and BeeElixir groups showing more efficient resource utilization. Hemolymph analysis using MALDI (Matrix-Assisted Laser Desorption/Ionization) mass spectrometry provided molecular insights into the physiological impacts of the supplements. The analysis revealed distinct biomolecular profiles and metabolic pathways associated with BeeElixir and Spirulina supplementation; offering a deeper understanding of their roles in honey bee nutrition.

Abstract Title:
Feeding the Colony: New Discoveries and Understanding in Honey Bee Nutrition

Abstract Authors:
Jaber Amin; currently pursuing a Ph.D. at the Honey Bee Research and Application Center; Çukurova University; located in Adana; Turkey

Authors Affiliations:
Honey Bee Research and Application Center; Çukurova University; Adana; Turkey
Department of Animal Sciences and Husbandry; Çukurova University; Adana; Turkey

Abstract Text:
Honey bees; known scientifically as Apis mellifera; are essential for global agriculture because they provide vital pollination services. Unfortunately; their numbers have been declining significantly; largely due to various stressors; especially nutritional shortages caused by habitat loss and changes in the environment. Grasping the nutritional needs of honey bees is crucial for creating effective conservation efforts and promoting sustainable farming methods.

Abstract Title:

Evaluating the Impact of Nutrition on Honeybee Queen Egg-laying: Implications for Colony Performance and Pollination Services

Abstract Authors:
Damien Fevre

Authors Affiliations:
Department of Agriculture, Forest and Food Sciences, University of Turin, Largo Paolo

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Abstract Text:
The egg-laying capacity of the honeybee queen is a cornerstone of colony growth, productivity, and the pollination services provided by honeybees. Queen reproductive output, sustained by worker-collected nutrition, determines both colony population dynamics and resilience, yet the role of diet in shaping egg quantity and quality remains insufficiently understood. In this study, we investigated how the balance of proteins and carbohydrates influences queen fecundity, egg traits, and gene expression. Using nutritional geometry, phenotypic analyses, and RNA-seq, we found that optimal protein-to-carbohydrate ratios enhanced egg number and weight, while imbalanced diets reduced performance and activated stress-related pathways such as autophagy and inflammation. Gene expression profiles further indicated that nutrition modulates key developmental and regulatory pathways; however, queen genotype exerted an even stronger influence, underscoring the role of selective breeding in maintaining colony vitality. By linking diet, genotype, and colony-level outcomes, our results highlight the importance of adequate and diverse floral resources for sustaining honeybee populations and their ecosystemic services. The standardized laboratory framework developed here also provides a basis for evaluating combined stressors (nutrition, pathogens, pesticides, and G×E interactions) on colony productivity and pollination efficiency.

Keywords: Honeybee nutrition, queen reproduction, genotype-by-environment interactions, colony productivity, pollination services

Abstract Title:

Exploring probiotics and feed supplements to increase the physiological resilience of bees

Abstract Authors:

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Abstract Text:

Beekeeping is increasingly challenged by climate change, food scarcity, and disease. This presentation explores the potential of probiotics and feed supplements to bolster bee health and resilience, directly addressing these critical issues. Key research includes the development of a new bee cage platform for enhanced rearing and observation. Nutritional studies reveal age-specific consumption patterns in honey bees (pollen primarily by 1-9 day olds; consistent sugar intake across ages) and identify yeast extract, peptone, and soybean flour as significant upregulators of the nutritional genes *mrjp1* and *vg*. Analysis of Taiwan bee pollens demonstrates diverse nutritional compositions (carbohydrates: 60.4-78.8%; protein: 15.9-32.2%; lipids: 2.0-8.8%), with *Bombax ceiba* pollen exhibiting the highest protein content and *Hylocereus costaricensis* pollen the highest lipid content. Furthermore, *Camellia sinensis* and *Brassica napus* pollens are shown to improve bumblebee reproduction. The probiotic potential of *Aureobasidium melanogenum* CK-CSC (enhancing bee nutrient gene expression) and *Leuconostoc mesenteroides* TBE-8 (improving carbohydrate utilization, stress survival, and boosting nutrition and immunity genes) is investigated. Microbiota analysis of beebread reveals varied bacterial communities dominated by Lactobacillus and Rosenbergiella, and indicates its role in enriching γ-Proteobacteria, Bacteroidetes, and Actinobacteria in the bee gut. Collectively, these findings provide a foundation for developing targeted nutritional and probiotic interventions to enhance bee health and sustainability in the face of growing environmental and biological pressures.

Keywords: Bee health, probiotics, feed supplements, bee nutrition, resilience

Abstract Title:
Beekeeping industry in Iran: Nutritional practices and management strategies

Abstract Authors:
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Abstract Text:
Modern beekeeping in Iran started in the late 1940s.Today, Iran is one of the top ten honey producers in the world with an annual production exceeding 100,000 tons of honey and 91,000 beekeepers managing 10.7 million honey bee colonies organized into more than 200 co-operatives throughout the country.
Despite this substantial growth, colony losses remain systematically high, driven by various factors including climate change, pesticides exposure, honey bee diseases, management practices and natural disasters. Among these, nutritional status- and its interaction with other stressors- plays an important role in colony health. This mini review discusses the current status of beekeeping industry and nutritional practices in Iran based on the standardized questionnaire(COLOSS). A total of 1305 beekeepers, managing 135,000 colonies participated via online,call and face to face interviews in 2022. Results showed 33% of beekeepers experienced a dearth of nectar or pollen, while 18% reported severe shortages of both. These deficiencies significantly impacted colony strength, with over 75% of colonies entering winter with fewer than six frames. The most commonly used supplemental feeds were sugar syrup, fondant, and pollen patties. On average, carbohydrate and protein feed usage per colony was 10.7 kg and 1.3 kg, respectively. Peak consumption of both feed types occurred in early spring (March), while the lowest levels were recorded in July (carbohydrates) and June (proteins). Interestingly, while commercial products were preferred for fondant, pollen patties were often prepared home-made. Additionally, many beekeepers used probiotics, prebiotics, and essential oils as feed additives, frequently without adhering to recommended dosages. These findings highlight the need for improved nutritional management and standardized practices to enhance colony health in Iran.
Keywords: Iran, beekeeping industry, Honey bee, nutrition

Abstract Title:
Dietary supplementation of high polyphenolic substances as protection from pesticide toxicity to honeybees

Abstract Authors:
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Abstract Text:
Research studies have revealed significant levels of pesticide toxicity and the related detrimental consequences for honeybees. The environmental dangers posed by pesticides to honeybees are substantial and need to be mitigated. Deltamethrin (DTM) is a Type II pyrethroid with a broad spectrum of activity that is widely used in professional agriculture, forestry, and hobby farming. However, its use is not without risks to pollinating insects. Deltamethrin disrupts honeybee physiology, causing memory disturbances, hypofertility, hypothermia, alterations in body and intestinal development, as well as changes in normal dances and foraging activity. Several studies have shown that supplementing the honeybee diet with antioxidant compounds can provide protection against the harmful effects of many classes of pesticides. This study aimed to evaluate the protective action of the bergamot polyphenolic fraction (BPF) against toxic doses of DTM. For this study, honeybees were divided into twelve experimental groups, each consisting of 20 individuals. DTM at a dose of 21.6 mg/L was administered orally to honeybees under laboratory conditions for three days. In addition, BPF (1 mg/kg) was added to the aforementioned toxic doses and administered to other experimental groups. Abnormal behaviors (including curved-down abdomen, hyperactivity, apathy, motion coordination issues, and moribundness) and survival rates were evaluated in all experimental groups at 1, 2, and 3 days.
All honeybees in the experimental groups administered DTM at the highest dose (21.6 mg/L) died by the
third day of the study. Conversely, the groups fed BPF in combination with DTM (21.6 mg/mL) had a survival probability of 46% after three days of treatment. Overall, the combination of BPF and DTM resulted in higher survival rates (BPF + DTM: day 1 = 86%, day 2 = 72%) compared to groups that received toxic doses of DTM alone (day 1 = 38%, day 2 = 25%). Moreover, a comparison between the groups intoxicated with DTM alone and those treated with the BPF/DTM combination showed a lower incidence of abnormal behaviors among the latter.
This study demonstrated that the oral administration of BPF reduces the toxic effects of DTM in honey bees. However, despite the observed beneficial effects, further research is required before beekeepers can be advised to include BPF in honeybee diets.

Abstract Title:
COLOSS Nutri Survey Project - 2022 Monitoring Year

Abstract Authors:
Alessandra Giacomelli[1], Damien Pierre Fevre[2], Aygün Schiesser[3], Alireza Arab[4], Bjørn Dahle[5], Christian Pirk[6], Ivana Tlak Gajger[7], Maja Ivana Smodiš Škerl[8], Michael Lattorff[9], Michel Bocquet[10], Mustafa Necati Muz[11], Priyadarshini Chakrabarti[12], Robert Chlebo[13], Simone Tosi[2]

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Abstract Text:

To provide an overview of current feeding practices and the nutritional challenges faced by honey bee colonies the COLOSS Bee Nutrition Task Force, that gathers experts in bee nutrition, implemented a global Nutri survey. The first investigation, regarding the 2022 year, collected data from Asia, Africa, Europe, North America and Australia and monitored more than 215,000 honey bee colonies. Key objectives of the Nutri Survey included assessing the utilization of feeding practices, the perceptions of bee feeds, risks related to malnutrition and starvation, primary nutritional stressors, and potential future directions for honey bee feeding practices.

Keywords: Honey bee nutrition, nutritional stressors, supplemental feeding, malnutrition, monitoring

Abstract Title:
Seasonal and landscape-driven variations in honey bee forage resources: implications for sustainable pollination and colony health in Taita Taveta County, Kenya

Abstract Authors:
Mary Chege, Benjamin W. Mbatha, Kilonzo J. Wambua, Sevgan Subramanian, Beatrice T. Nganso*

Authors Affiliations:
International Centre of Insect Physiology and Ecology (*icipe*), Nairobi, Kenya

Correspondence: Nganso T. Beatrice (bnganso@icipe.org)

Abstract Text:
Seasonality and land-use change are key factors influencing forage availability for managed honey bee colonies, yet knowledge of forage identity and how these factors influence forage availability remains limited in Africa. To address these gaps, we used DNA metabarcoding to identify nectar and pollen plant species supporting honey bee nutrition across different landscapes and seasons in Taita Taveta County, Kenya. We identified 224 forage plant species from 65 families, with Asteraceae, Fabaceae, and Myrtaceae being the top contributors. Forage availability was significantly influenced by landscape and season, with honey bees in the lowlands foraging on fewer and less diverse resources, particularly pollen, than those in the highland and midland, during the short dry season. Nectar plants were generally more diverse than pollen plants. Exotic species dominated (67%) over native species (33%), raising concerns about the long-term sustainability of colony health and native pollination networks. Overall, these findings provide a foundation for future research on the nutritional profiles of both native and exotic plants and how the occurrence of exotic plants may affect local plant-pollination networks, to guide the development of nutrient-rich forage landscapes for honey bees in Taita.

Keywords: Honey bee nutrition, seasonality, landscape variability, DNA metabarcoding, exotic and native plants.

Abstract Title:
Honey bee nutrition perspective from North America

Abstract Authors:
Priyadarshini Chakrabarti Basu

Authors Affiliations:
Department of Entomology, Washington State University

Abstract Text:
The talk focused on understanding the status of honey bee nutrition research in North America. Both United States and Canada are losing honey bee colonies at alarming rates. The importance of healthy well-fed colonies is foremost. As an approach to consolidate information for beekeepers in North America, a supplemental feeding guide was published by Honey Bee Health Coalition which summarized the basics of bee nutrition and supplemental feeding practices for North America. In addition, the presentation also summarized research efforts underway to create two unique databases for North America – the pollen nutrition database and the phenology wheel project – in order to better understand the nutritional habitat for all bee species and the impacts of changing environment on bee nutrition habitat.

COLOSS Nutri TF Workshop
IZSVe Padua, February 8th 2025

We spent half a day in a practical workshop on two topics

- Hemolymph and Fat Body collection on honey bees, as these tissues are more and more studied in experimental designs. Michela Bertola presented differents elements on hemolymph and hemolymph collection and Michel Bocquet Presented the kit used in the frame of the Maldi-BeeTyping experiments to extract hemolymph, and proposed a rapid demonstration of Fat Body dissection. The attendant could practicate during this session.




- Identification of Aethina tumida, as this parasite is only present in italy in Italy in Europe, and may expand in the future in other regions. Franco Mutinelli and Michela Bertola presented the way of identifying this coleoptera, and the could had the opportunity to identify some samples under binocular microscope.

We also enjoyed a presentation of the Institute by our hosts during this day.

Social events and visits of Padova

Popular places to visit in Padua

1. Basilica of Saint Anthony of Padua
2. Scrovegni Chapel
3. University of Padua (Galileo's chair, anatomical theatre)
4. Pedrocchi cafè
5. Prato della Valle
6. Padua cathedral
7. Piazza dei Signori
8. Piazza delle Erbe
9. Botanical garden (internal part)
10. Santa Giustina church

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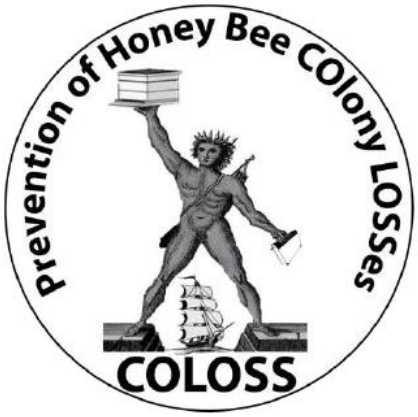

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INVITATION TO ATTEND BEESCHOLARS TF SESSION

Dear all,

we hope this message finds you well. We are pleased to invite you to participate in the upcoming BEESHCOLARS Task Force session, that will take place during the 21st COLOSS Conference, in September 23rd. This meeting will provide a valuable opportunity to discuss BEESCHOLARS achievements in 2025, share insights, and to collaborate all together on key priorities for our young researchers in 2026 activities.

Details:
Date: September 23rd 2025
Time: 11am CEST
Duration: 1 hour

We'll be amazed to welcome you in person (during the 21st COLOSS Conference 2025, Sep. 22-23, Copenhagen, Denmark), but, if you'll prefer to attend via web, please find below all the needed details to join the meeting:

Platform: ZOOM

https://us06web.zoom.us/j/85875633212?pwd=r2jKam1bMMCVQTBYwzGxJQoRGWHqlr.1

ID: 858 7563 3212

Keyword: 313912

Agenda:

1. short introduction of the last year’s activities
2. plans for the next year-webinars,training schools,conference
3. Young researchers session: we'll be there to listen to all your great ideas/suggestions/experiences

If you have specific topics you would like to add to the agenda, feel free to reply to this email with your suggestions.

We look forward to meeting you at the BEESCHOLARS session!

Best regards,

Alessandra and Aygun