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Summits**

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Honey Bee Diseases in Africa

Overview of honey bee health challenges
across the African continent.

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Introduction

In this talk, we will explore:

- The importance of honey bees in Africa's agricultural and ecological systems.
- The major honey bee diseases and pests present on the continent.
- How these diseases spread and the factors influencing bee health.
- Strategies for disease management and future research directions.



Importance of Honey Bees in Africa

- Vital pollinators for crops and wild plants
- Support rural livelihoods through honey and beeswax
- Indigenous subspecies adapted to local ecosystems

Two species are important for bee keeping – the western honey bee *Apis mellifera*, and the eastern honey bee *A. cerana*. The Western honey bee is native to the continents of Europe and Africa and is the largest of the cavity-nesting honey bees.

The **East African lowland honey bee** (*Apis mellifera scutellata*) is a [subspecies](#) of the [western honey bee](#). It is native to central, southern and eastern Africa, though at the southern extreme it is replaced by the [Cape honey bee](#) (*Apis mellifera capensis*)



Overview of Honey Bee Diseases and Pests in Africa

- * *Infectious diseases of bees*
Honey bees are susceptible to diseases caused by parasites, fungi, bacteria and viruses
- * *Non-infectious diseases of bees*
- * *Pests in the hive and enemies of bees*
- * *Bee poisoning by plant protection agents (pesticides)*



Bacterial Diseases

- American Foulbrood (*Paenibacillus larvae*)
- European Foulbrood (*Melissococcus plutonius*)
- Impact on brood and colony health



Fungal Diseases

- Chalkbrood (*Ascosphaera apis*)
- Nosemosis (*Nosema apis*, *Nosema ceranae*)
- Effects on larvae and adult bees



Parasitic Mites

- Varroa destructor – main threat globally, spreads viruses
- Tropilaelaps mites – risk of introduction



Viral Diseases

Viruses are often vectored by Varroa mites, creating a “double burden” on colonies. Important viruses in African bees include:

- Deformed Wing Virus (DWV)
- Acute Bee Paralysis Virus (ABPV)
- Black Queen Cell Virus (BQCV)
- Sacbrood Virus (SBV)



Viral Diseases

Colony Collapse Disorder (CCD) is a term used to describe the death and disappearance of bee colonies. There are numerous contributing factors to the collapse, but no single factor has been identified. Several viruses, including the *Israeli acute paralysis virus*, have been associated with the syndrome, but the presence of pesticides in the environment has also been confirmed.



Other Pests and Threats

1. Coleoptera (Beetles)

- Small Hive Beetle (*Aethina tumida*)
- Large Hive Beetles

2. Diptera (Flies)

- Tachinid Fly (*Rondanioestrus apivorus*)
- Bee Conopid (*Physocephala* spp.)
- Bee Louse (*Braula* spp.)

3. Lepidoptera (Moths)

- Wax Moths (*Galleria mellonella* and *Achroia grisella*)
- Death's Head Hawkmoth (*Acherontia atropos*)

4. Hymenoptera (Ants, Wasps, and Honeybees)

- Ants
- Wasps
- Termites



Honeybees and Associated Challenges

- *Apis mellifera capensis* as a Social Parasite
- Dwarf Honeybee (*Apis florea*)
- Bee Pseudoscorpions (*Ellingsenius* spp.)
- Birds and Mammals

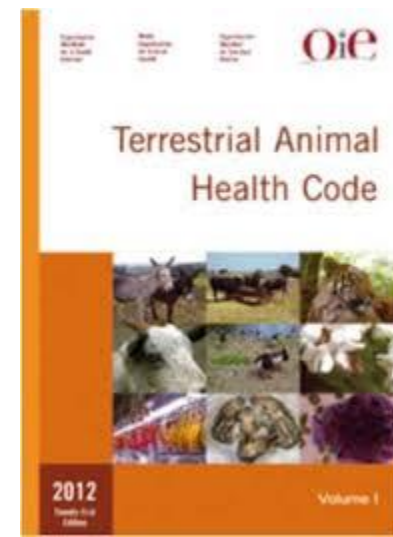


Non-Infectious Diseases of Bees

Factor	Examples	Main Effects	Prevention
Nutrition	Pollen/nectar shortage	Weak brood, low immunity	Supplemental feeding
Environment	Temperature extremes, poor ventilation	Brood death, stress	Insulation, ventilation
Chemicals	Pesticides, miticides, pollutants	Mass deaths, queen loss	Safe location, careful use
Genetics	Poor queens, inbreeding	Weak colonies	Genetic diversity
Management	Rough handling, bad timing	Stress, lower productivity	Good practices

WOAH *Terrestrial Animal Health Code*

- Chapter 9.1. **Acarapisosis** - Infestation of honey bees with *Acarapis woodi*
- Chapter 9.2. **American foulbrood** - Infection of honey bees with *Paenibacillus larvae*
- Chapter 9.3. **European foulbrood** - Infection of honey bees with *Melissococcus plutonius*
- Chapter 9.4. Infestation with *Aethina tumida* (Small hive beetle)
- Chapter 9.5. Infestation of honey bees with *Tropilaelaps* spp.
- Chapter 9.6. **Varroosis** - Infestation of honey bees with *Varroa* spp.



Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, thirteenth edition 2024

Section 3.2 Apinae

- Chapter 3.2.1. **Acarapisosis** - Infestation of honey bees with *Acarapis woodi*
- Chapter 3.2.2. **American foulbrood** - Infection of honey bees with *Paenibacillus larvae*
- Chapter 3.2.3. **European foulbrood** - Infection of honey bees with *Melissococcus plutonius*
- Chapter 3.2.4. Infestation with *Aethina tumida* (Small hive beetle)
- Chapter 3.2.5. Infestation of honey bees with *Tropilaelaps* spp.
- Chapter 3.2.6. **Varroosis** - Infestation of honey bees with *Varroa* spp.



Diagnostic

Microscopy

Bacterial isolation

Antigen detection

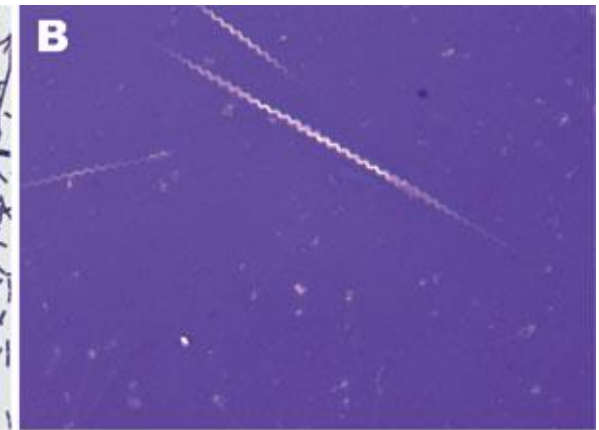
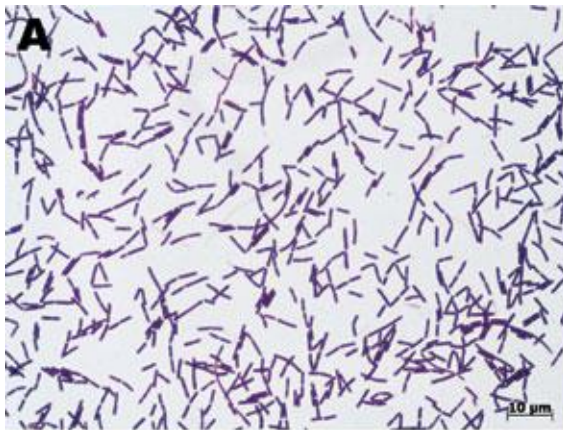
Conventional PCR

Real-time PCR

Mass spectrophotometry

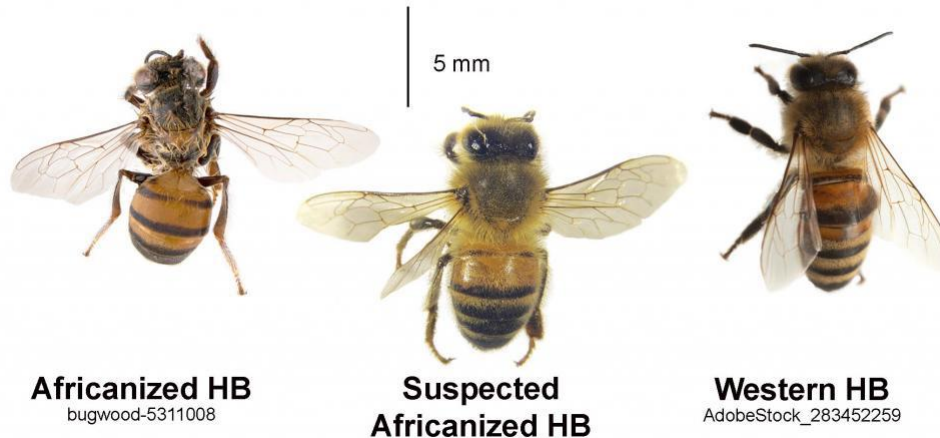
Morphology of parasites

Parasite detection (*debris from live and dead bees, examination of bees and capped brood*)



Factors Influencing Honey Bee Disease Dynamics in Africa

- Genetic diversity of African bees
- Climate and habitat change
- Agricultural practices and pesticide use
- Beekeeping practices and globalization



Myths and facts -
Africanized honey bees.

Authors

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Disease Management Strategies

- Monitoring and surveillance
- Breeding and conservation
- Good beekeeping practices (GBPs)
- Integrated Pest Management (IPM)
- Training and capacity building
- Policy and cross-border collaboration



Preventive Measures

- **Regular Inspection:** Early detection of abnormal brood, mites, or beetles.
- **Good Hygiene:** Clean tools and equipment, manage waste.
- **Strong Colonies:** Healthy colonies resist diseases better.
- **Quarantine New Bees:** Isolate new packages before integration.
- **Integrated Pest Management (IPM):** Combine cultural, mechanical, biological, and chemical methods.

Future Research and Innovation

- **Improved diagnostic tools**
- **Understanding bee immunity and microbiomes**
- **Region-specific IPM programs**
- **Citizen science and mobile tech**



Conclusion

- Honey bees vital for Africa's ecosystems and food security
- Facing diseases and pests
- Need combined action in science, practice, and policy
- Protecting honey bees = protecting sustainability and development

Thank you for your attention!



References:
Available on request