

**INFORMATION ON VARIOUS SPS MATTERS**

Communication from Zambia

The following communication, received on 20 March 2008, is being circulated at the request of the Delegation of Zambia.

A. REPORT ON THE FRUIT FLY SITUATION

1. Zambia conducted fruit fly trapping using traps and lures in two provinces, one central and a western province. The trapping scheme was more efficient in its fly catches than what was done before. The surveillance was done with the assistance of the USDA APHIS International Service staff based in Pretoria. The traps and lures were generously provided by the USDA APHIS, to whom Zambia is grateful.

2. From the trap catches in the Lusaka province, the following were identified and confirmed:

- *Ceratitidis capitata*
- *Ceratitidis fasciventris*
- *Ceratitidis* sp.
- *Dacus* sp.

3. Only one specimen of the *Ceratitidis* sp. and six of the *Dacus* sp. were found and more catches are needed for further identification.

4. In Kaoma, Western province, similar fly trapping was conducted and the following fruit flies were identified:

- *Ceratitidis capatata*
- *Ceratitidis fasciventris*
- *Ceratitidis cosyra*
- *Dacus* sp.

5. Of interest was the presence of the *Bactrocera invadens* in one of the traps that had six specimens. A surveillance protocol has been set up and a monitoring program to include the communities in Kaoma has been developed.

6. The trapping program is continuing and will be extended to other parts of the country. This should determine the routes of entry and possible management options for the fruit flies.

7. Acknowledgements are given to Dr. Mervyn Mansell, Dr. Jeffrey Austin and Mr. Mathews Matimelo who did the surveillance, and to Dr. Mare De Meyer of the Royal Museum for Central Africa, Tervuren, Belgium, who did the confirmations.

Map of Zambia



## B. SURVEY OF *PAENIBACILLUS LARVAE* SUBSP. *LARVAE* SPORES IN HONEY SAMPLES

### Summary

8. American foulbrood (AFB) is a severe bacterial disease affecting larvae of the honey bee *Apis mellifera* and is caused by *Paenibacillus larvae* subsp. *larvae*. The disease is present worldwide and cases have been reported in almost all beekeeping regions of the five continents.

9. Seventeen (17) samples were collected from individual hives and twelve (12) samples from retail outlets were collected and these were cultured for *Paenibacillus larvae* subsp. *larvae*. No *Paenibacillus larvae* subsp. *larvae* spores were found in any of the organic honey produced in Zambia. The results are in line with previous observations and can contribute to the determination of disease-free areas.

## Introduction

10. The American Foulbrood (AFB) pathogen is the spore-forming bacillus *Paenibacillus larvae* subsp. *larvae*, whose spores are exceptionally resistant to heat, chemical and environmental conditions (Hansen and Brodsgaard 1999).

11. Serious effects are associated with AFB such as the decrease of honeybee population and honey production, causing significant damage to beekeeping industries.

12. Due of the severity of the disease, its control is often regulated by law and many countries require the destruction of infected colonies if found. An alternative measure to limit the spread of the disease is to irradiate honey produced from infected areas (OIE, 2005).

13. Honey bees have been introduced to sub-Saharan Africa from regions infected with American Foulbrood and the continuous importation of honey from such regions is likely to introduce the pathogen (Hansen, 1984). Due to restrictions in market access for Zambian organic honey, this survey was initiated to determine the pest-free areas for the pest in Zambia.

14. The paper describes the detection and identification of *Paenibacillus larvae* subsp. *larvae* in honey samples collected directly from hives, co-operatives and retail outlets from Western, North-Western, Copperbelt, Central and Lusaka Provinces, the high honey-producing and exporting areas of Zambia.

## Places visited

15. Twenty-nine honey samples originating from North-Western, Copperbelt, Central and Lusaka Provinces were randomly collected by the survey team in October 2007. The number of samples from each location is presented in Table 1.

16. Honey samples were kept at room temperature for a few days before they were submitted to the Agricultural Research Council – Plant Protection Research Institute (ARC-PPRI) laboratory in South Africa for analysis of *Paenibacillus larvae* subsp. *larvae*.

**Table 1. Details of honey samples collected in Zambia**

Origin of samples	Type of samples	Number of samples
Mwinilunga-North Western Province	Individual hives-Field	17
Kitwe-Copperbelt Province	Composite-Retail	2
Kapiri Mposhi - Central Province	Composite-Retail	2
Chisamba -Central Province	Local production-Retail	2
Lusaka - Lusaka Province	Composite-Retail	6

## Results

17. Bacteria were isolated from all 29 samples. Table 2 gives preliminary biochemical tests on typical bacteria species found in honey samples from Zambia. Representative suspect colonies grown on J-agar plates were examined for the presence of the pest.

**Table 2. Results of preliminary biochemical tests on 8 bacterial colonies isolated from the Zambian organic honey**

Test	<i>P.larvae</i> subsp. <i>larvae</i>	<i>P.larvae</i> subsp. <i>pulvefaciens</i>	N°1	N°3	N°5	N°6	N°7	N°25	N°27	N°29
Colonies on J-agar	White small smooth	White or orange small smooth	Dark yellow huge	White big rough	Yellow very slimy	Dirty white very slimy	White big rough	White big rough	White big rough	White big rough
Growth at 20°C	-	+	-	-	-	-	-	-	-	-
Catalase	-	-	+	-	+	-	+	-	-	-
Gram stain	Gram + rods	Gram + rods	Gram + cocci	Gram + rods	Gram + rods	Gram + rods	Gram + rods	Gram + rods	Gram + rods	Gram + rods
Starch hydrolysis	-	-	+	-	+	-	+	-	-	-
Milk hydrolysis	+	+	+	-	+	-	-	-	-	-
Acid from										
D-glucose	+	+	+	-	+	-	+	-	-	-
Mannitol	-	+	+	+	+	+	+	+	+	+
Salicin	+	-	+	-	-	-	-	-	-	-

18. In addition to bacteria, fungi were also growing on the J-agar plates. No further identification was performed with bacteria and fungi except for *Paenibacillus larvae* subsp. *larvae*, the causative agent of American Foulbrood *Paenibacillus larvae* subsp. *larvae*, was not isolated from any of the samples.

### Acknowledgment

19. Special acknowledgement goes to Dr. Teresa Goszczynska of ARC-PPRI for technical assistance in analyzing the submitted honey samples. The surveillance study had financial support from the World Bank under the ADSP for Zambia to the Ministry of Agriculture and Co-operatives, specifically, the Plant Quarantine and Phytosanitary Service (PQPS). Messieurs Nguz Kabwit, Jack Chipili, Chiluba Mwape and Mathews Matimelo did the surveillance.

### C. WTO ENQUIRY POINT

20. Zambia has made strides in the formation and establishment of a dedicated office for the Enquiry Point. This is in line with the WTO requirements to be transparent and Zambia followed the WTO workshop on transparency held in November 2007. The Enquiry Point is making strides to acquire the necessary equipment and documentation facilitation to make it more operational (Figure 1 below).

21. The WTO Enquiry Point was set up with support from the JITAP project that provides a computer and accessories, photocopier and scanner, including soft ware. Through other funding from the International Institute for Communication and Development, a V-sat connectivity was made to the Research Station. The Zambia Threshold Project (ZTP, a USAID-funded project) facilitated the connectivity to the main system, hence the Enquiry Point is now fully connected.

22. The staff are now finalizing a documentation system by implementing ISO 9000 to enhance the filing and retrieval system.

Figure 1: The PQPS Editor Mr. Ivor Mukuka in the PQPS Resource Centre



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