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Conference Paper · August 2006

DOI: 10.13140/2.1.5078.9440

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# Synthetic (Toxic) 'honey' in Malaysia

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**Service offered:**

**Purity analysis of local honey using Methods of Test for Honey MS 1531:2002, Department of Standard Malaysia**

This study was financed by honey dealers and consumers via University Malaya Honey Analysis Account No: 103.61115.4231273



## Background

The subject of honey purity is gaining public attention in Malaysia. In fact, the first question asked by anyone interested in honey is : **Is this honey sample pure ?**

- \* This study was conducted to screen honey samples available in Malaysia to ascertain their purity. Only samples claimed to be of Malaysian origin were analysed in this study. The honey samples were analysed over a period of 10 years(1996-2006).
- \* The results of analysis of 40 honey samples are presented here to represent the scenario in Malaysia.

## Our Studies

40 samples (obtained from local beekeepers, honey hunters and dealers ) of honey were analysed for their reducing sugar (fructose, glucose and maltose), non-reducing sugar (sucrose) and hydroxymethylfurfuraldehyde (HMF) contents. Methods of analysis were based on those recommended by International Honey Commission (IHC) and Department of Standards Malaysia, with minor modifications. Both HPLC and GC(White,1978) were used to analyse the major sugars in honey. GC was chosen for routine analysis as the technique is rapid ,accurate and reproducible. There were no significant difference between the results obtained using HPLC and GC. The spectrophotometric assay (White ,1979) was used for HMF determination. All analysis were done in duplicates. Honey supplied by Malaysian Agriculture Department were taken as pure samples. Therefore their results were taken as reference for other samples. The followings were set as reference values:  
Total reducing sugars (Fructose+Glucose+Maltose) = minimum at 60%  
Ratio of Fructose/Glucose = >1.00  
Total Sucrose content = not more than 5 %  
Total HMF = not more than 80mg/Kg Honey (Tropical climates)

## RESULTS

9 samples (photo 1) gave results conforming to IHC accepted values indicating pure honey.  
31 samples showed values indicating that they were either Adulterated (photo 2) or Synthetic (Toxic) honeys ( photos 3 and 4)  
Adulterated honeys were produced by mixing certain portions of pure honey with large proportions of sugar solution (cane sugar) or by feeding bees with sugar solution. Synthetic honeys were made by acid treatment of sugar solutions which leads to the formation of a byproduct, hydroxymethylfurfuraldehyde (HMF) in large quantity (more than 200 mg/Kg, only 80mg/Kg is allowed in honeys from tropical countries).

## DISCUSSION

Our findings clearly indicated that there are 3 types of Honey available in Malaysia : Pure, Adulterated and Synthetic (Toxic). Honeys produced by beekeepers under Malaysian Department of Agriculture conform to values set by The International Honey Commission. They are classified as pure honey. Honeys obtained by honey hunters are also classified as pure honey. Honey samples that have high sucrose content are classified as Adulterated honey. They could be produced by mixing certain portions of pure honey with large proportions of sucrose syrup or by feeding bees with sucrose solution. Honey samples with extremely high HMF content (> 200mg/Kg) are classified as synthetic (Toxic) honey. They are made from High Fructose Syrup.  
**WARNING :** HMF has been shown to be **toxic** to liver cells and a promoter of a type of colon cancer.

## CONCLUSION

Only 23 % of honey samples claimed to be of Malaysian origin are actually pure. The remaining 77 % are either adulterated or synthetic (Toxic).

## References

Kamaruddin MY, Joesima H, and Mohd.Nuruddin A M ( 2006) The Presence of Adulterated and Synthetic Honeys in Malaysia. Proceedings for 1st. International Conference on The Medicinal Uses of Honey, USM, Kota Bharu, Kelantan, 26-28 August 2006.  
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\* Harmonized Methods of the International Honey Commission(1999)  
\* STANDARD MALAYSIA MS 1531 : 2002 (2002)  
METHODS OF TEST FOR HONEY, Copyright Department of Standards Malaysia.



**Toxic honeys at Orang Asli stalls, PLUS Highway, Sungai Perak ( 3 types of toxic honeys)**



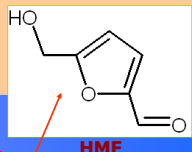
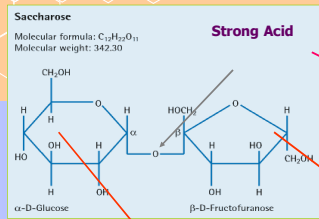
**Photo 3**

**ADULTRATED HONEYS**



**Photo 4**

## SYNTHETIC(TOXIC) HONEYS



**HMF Synthesis**

