

## Detection of adulterated honey by surface plasmon resonance optical sensor

### ABSTRACT

In this study, surface plasmon resonance based on Kretschmann configuration is employed as an alternative method to detect adulteration of pure honey. The adulterated honey was prepared by diluting three types of sugar adulterants (fructose, glucose and sucrose) into pure honey. The concentration of each adulterant is tested from 2% until 10% adulteration with 0% adulteration represents the reference for pure honey. All the resonance angles of adulterated honey demonstrated similar behavior by shifting to smaller angle than pure honey. The measured sensitivities are  $0.1266^{\circ}/\%$ ,  $0.1065^{\circ}/\%$ , and  $0.0988^{\circ}/\%$  for fructose, glucose and sucrose adulterants, respectively. The shift of resonance angle as a function of adulterants concentration in pure honey was plotted with linear regression greater than 0.95 for all samples. The outcome has disclosed a real-time, rapid and non-destructive sensor to be promoted as well-developed honey sensor.

**Keyword:** Adulterated honey; Kretschmann configuration; Surface plasmon resonance; Sensor

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