

## **Abstract**

This research paper reports on the findings of the first scientific investigation into the various physicochemical properties of the palm civet (Kopi Luwak coffee bean) from Indonesia and their comparison to the first African civet coffee beans collected in Ethiopia in eastern Africa. Examination of the palm civet (Kopi Luwak) and African civet coffee beans indicate that major physical differences exist between them especially with regards to their overall color. All civet coffee beans appear to possess a higher level of red color hue and being overall darker in color than their control counterparts. Scanning electron microscopy revealed that all civet coffee beans possessed surface micro-pitting (as viewed at 10,000× magnification) caused by the action of gastric juices and digestive enzymes during digestion. Large deformation mechanical rheology testing revealed that civet coffee beans were in fact harder and more brittle in nature than their control counterparts indicating that digestive juices were entering into the beans and modifying the micro-structural properties of these beans. SDS-PAGE also supported this observation by revealing that proteolytic enzymes were penetrating into all the civet beans and causing substantial breakdown of storage proteins. Differences were noted in the types of subunits which were most susceptible to proteolysis between civet types and therefore lead to differences in maillard browning products and therefore flavor and aroma profiles. This was confirmed by electronic nose analysis which revealed differences between the palm civet coffee (Kopi Luwak) and African civet coffee aroma profiles. Analytical techniques for the authentication of palm civet (Kopi Luwak) and African civet coffee are also explored. It would appear that SDS-PAGE may serve as the most reasonable and reliable test to help confirm the authenticity of civet coffee. Electronic nose data was able to distinguish both civet coffees from their control counterparts and further indicated that processing through the civets gastrointestinal track substantially modified these coffees.