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# The Science Behind Luwak Coffee

*An analysis of the world's rarest and most expensive coffee*

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*[EDITOR'S NOTE: Kopi Luwak (sometimes spelled Kopi Luak) is a rare and prized variety of coffee. It was the subject of the 1995 Ig Nobel Prize in the field of Nutrition. Professor Marcone's work, described here, advances our understanding of Kopi Luwak. Professor Marcone will talk about this at the Ig Informal Lectures at MIT, on Saturday, October 2.]*

No coffee is perhaps in shorter supply and has a more distinct flavor and history than “Kopi Luwak” from Indonesia. With an annual production of less than 500 pounds and a price tag of 500-600 dollars (Canadian) per pound, it commands the undisputed reputation of being the rarest and most expensive coffee in the world. This is indeed a unique coffee, as it is

processed through the digestive system of a palm civet (*Paradoxurus hermaphroditus*). This three-to-ten pound arboreal animal uses its keen sense of eyesight during the night to smell and seek out only the ripest reddish coffee cherries to eat. The coffee cherry fruit is completely digested by the civet, whereas the actual coffee beans are excreted in their feces, being deposited in civetries. These are ultimately collected and washed by local coffee collectors. The internal fermentation and action by different digestive enzymes add a unique flavor to the beans. This flavor has been described as earthy, musty, syrupy, smooth, and rich with both jungle and chocolate undertones.



The author displays some coffee beans.

Curiously, Kopi Luwak is not the first nor the only food that -- prior to human consumption -- makes a passage through the entire, or partial, digestive tract of an animal.

In fact humanity's oldest known sweetener, honey, is produced in part from nectar that bees have swallowed, transported, and regurgitated.

Bird's-nest soup is another such food. Often referred to as the “Caviar from the East,” it is produced from the saliva of a swiftlet (a small bird native to Southeast Asia). Bird's-nest soup is consumed in many parts of the world, with the United States being one of the biggest importers.

Yet another is Argan oil from Morocco, which is produced from the nuts eaten by goats that have climbed into acacia-like trees during their herding. The locals remove the pits from the feces, and grind these carefully harvested nuts to extract their oil. This unusual and expensive oil is used in cooking and also in massaging. It is reputed to be an aphrodisiac.

Recently, I published a study entitled “Composition and Properties of Indonesian Palm Civet Coffee (Kopi Luwak) and

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Ethiopian Civet Coffee.” (The study appears in the journal *Food Research International*, vol. 37, no. 9, 2004, pp. 901-12.) It describes an exploration in Eastern Africa -- specifically, Ethiopia -- which ultimately culminated in my finding a new potential source and type of Kopi Luwak. This particular African coffee has properties similar, but not identical, to those of the prized Kopi Luwak from Indonesia.

The paper also documents a series of newly developed analytical methods that can be used to determine the authenticity of this coffee, both for coffee beans that are green and for those that have been roasted.

Armed with these analytical methods, I tested a series of coffees purporting to be authentic Kopi Luwak (obtained in the United States and directly from Indonesia). The results of the preliminary test show that 41% of coffees tested either were not Kopi Luwak or were adulterated with other non-Kopi Luwak type coffee beans. My study, even though it is not extensive, is a first indication that further monitoring may be needed to protect individuals throughout the supply chain. Such monitoring is especially needed to protect the consumer who wishes to count him or herself among the elite few who have consumed the rarest and most expensive beverage in the world.



The author and an Ethiopian coffee plant.