

## from unroasted coffee aged via water heating without roasting

Motohiko Sugiura<sup>1</sup> (m\_sugiura@tacr.co.jp), Mari Nakai<sup>1</sup>, Shihori Ishizuka<sup>1</sup>, Kazuhiko Futami<sup>1</sup>, Takao Myoda<sup>2</sup>

<sup>1</sup> Tokyo Allied Coffee Roasters Co.,LTD, Tokyo, Japan; <sup>2</sup> Tokyo University of Agriculture, Tokyo, Japan



### Introduction

Green coffee is considerably aromatized by roasting, and based on its origin, it has a characteristic aromas. Green coffee has many components that are precursors of the aromas, and they are generated by heating. This study was undertaken to create a new aromatic beverage from green coffee via heating it in water, which results in the generation of aromas.

### Materials/Methods

Origins of green-coffee samples from all over the world including Arabica and Robusta varieties were treated by the washed and natural in post-harvest processes. A sealed container, such as a can, was filled with a solid-liquid mixture obtained by adding water to whole green coffee or ground green coffee. The container was placed into boiling water, and the heating time considered was up to approximately 12 hrs. Additionally, whole or ground green coffee with a water ratio of 5-15 times was immersed at 85° C to 100° C for 30 min to 60 min. This extract was filled in the container, and it was placed in to boiling water. After heating and cooling, the containers were opened and the residues were separated. The flavor of the liquor was evaluated, and the pH and chlorogenic-acids contents were analyzed.

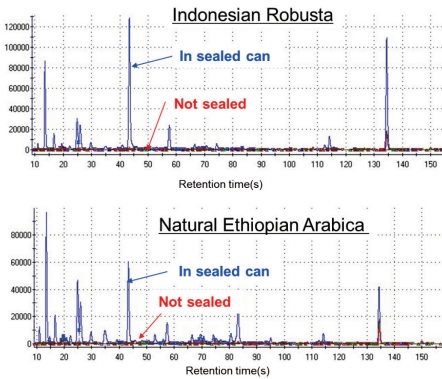


Figure 1 : Rapid gas Chromatography chromatogram of heating green coffee in boiling water.

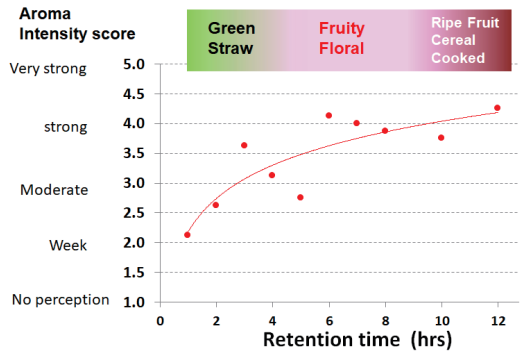


Figure 2 : Aroma qualitative change of Natural Ethiopian Arabica in boiling water.

### Results/Discussion

In both the mixed state of green coffee with water and the extracts obtained from green coffee and hot water, some origins produced fruity or a black tea-like aroma in boiling water at 100° C for ≥5 hrs. Preferred origins of coffee beans were Natural Ethiopian Arabica and Robusta that were obtained from countries such as Indonesia. The washed beans, which typically demonstrated good aromas after adequate roasting, did not demonstrate good aromas. Moreover, when the temperature exceeded 120° C, cereal odor and the stuffy heat odor were observed that were not preferable with acidity. Furthermore, when the

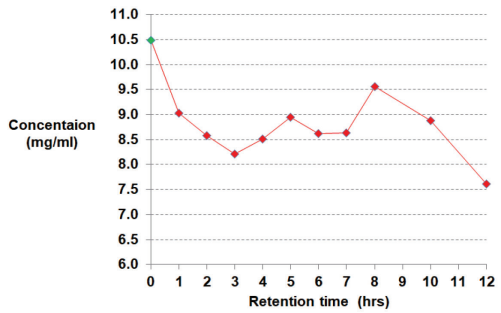


Figure 3 : Chlorogenic acids change of Indonesian Robusta in boiling water.

sealed container was not used, the volatile aroma components generated during the heat treatment were scattered. Although the chlorogenic acids content considerably decreased after roasting, the heated green coffee liquor retained approximately 80% of the original green coffee.

### Conclusion/Perspectives

A preferable quality extract could be obtained from coffee beans without roasting. This extract has potential applications as a new beverage, a natural fragrance, among others. Study conducted in the future will focus on how to scale-up production.