

Study of Arabica Coffee Bean characteristics (*Coffea arabica* L. cv. Catimor) in 5 province of the upland of Thailand

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Introduction

In Thailand, Arabica coffee area in the North has rapidly increased due to high demand of specialty coffee. Arabica coffee plantation (harvested area) increase from 8,600 ha in 2014 to 13,945 ha in 2020 [1], accounted for almost 62%. So, have to study of Arabica Coffee Bean characteristics aim to develop the value and identity of Arabica Catimor for use as a basis for registering geographic indications.

Materials/Methods

By studying the geographical characteristics, physical characteristics and chemical composition of Catimor Arabica coffee in 29 plots grown in different altitude of 839-1499 meters above sea level in 5 province as follow (1) Chiang Mai province (Mae Wang district, Mae Chaem district, Omkoi district, Fang District, Doi Saket District), (2) Chiang Rai province (Mae Suai district, Mueang district, Mae Fah Luang district, Mae Sai District), (3) Nan province (Bo Kluea district, Tha Wang Pha district) (4) Mae Hong Son province (Mueang district, Mae La Noi district) and (5) Phayao province (Chiang Kham District). All sample divide in 4 processing for get green bean of coffee.

Results/Discussion

All plot has difference in geographical characteristics as follow (1) intercropping (2) shade plants (3) planting systems (4) slopes of area (5) cultural practices and (6) soil characteristics and climatic conditions which has physical characteristics as follow (1) size of parchment (2) size of green bean (3) weight of 1000 of green bean (4) number of green beans per 100 g. Chemical composition by cup testing, the average score was 79.61 ± 1.69 and different area and variety has different aroma as macadamia, chocolate, dried flower, roasted coffee, cinnamon, nutty, peach, apricot, plum Hazelnut, ripe banana, gingerbread, caramel, butter, apple, jasmine, honey, lime, camphor, cocoa, spice, cereal and roasted fruit. Physical properties has pH 5.2 ± 0.15 , Total acid content 1.99 ± 1.21 , Ash Alkalinity $4.37 \pm 0.32\%$, Sugar content $4.1 \pm 1.7\%$, Nitrogen content $14.29 \pm 0.85\%$, Total soluble solids 5.61 ± 3.42 Brix, Tartaric acid $0.02 \pm 0.01\%$, Oil content $13.19 \pm 1.96\%$, ash content $4.69 \pm 0.38\%$. Chemical properties has Furans content 215.68 ± 44.71 mg./l, pyridine 607.67 ± 211.27 mg./l, Caffeine $17,230 \pm 2,283.91$ mg./l, Quinic Acid $6,384 \pm 1,645.89$ mg./l, Chlorogenic Acid 121.17 ± 26.15 mg./l, Trigonelline $5,176.67 \pm 2,326.99$ mg./l, Pyrene 3.93 ± 1.17 µg./kg and Ochratoxin A 2.05 ± 0.66 ppb unit, Cafestol 0.56 ± 0.07 mg./l, Kahweol 1.09 ± 0.14 mg./l and Cafestol: Kahweol ratio was 0.51 ± 0.01 . Aroma analysis has aroma of Garden Peas $45.5 \pm 13.28\%$, blackcurrant $22.5 \pm 6.92\%$, butter $24.17 \pm 6.83\%$, caramel $23.83 \pm 4.49\%$, roasted peanuts $26.67 \pm 4.97\%$ and roasted coffee $31.83 \pm 6.23\%$. Arabica Coffee Bean characteristics cv. Catimor "Chiang Mai 80" which released by Department of Agriculture, Thailand was found that there were no statistical differences in the width, length and thick of parchment and thick of green bean but there was statistical differences in weight and number of green beans, percentage of grade A, percentage of pea berry, There were statistical differences in the sensory properties of the cup tasting, with an 79.72 ± 0.97 scores, but no statistical difference in 4 process. And there are various aroma in each area and different process such as macadamia, cereal, bread, butter, caramel, honey, flower, fruit, chocolate, herbs and spices.

Conclusion/Perspectives

Arabica Coffee Bean characteristics cv. Catimor in 5 province (Chiang Mai, Chiang Rai, Nan, Mae Hong Son and Phayao) had different in shape, size, chemical composition and cup taste which depend on planting area, cultural practice, geographical characteristics. For more information, have to analysis of the nutrient content of coffee beans. This can be a good indicator for identifying the origin of coffee beans.

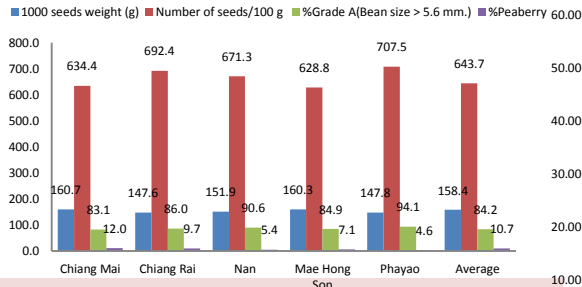


Figure 1: Physical analysis of cv. Catimor in 5 province

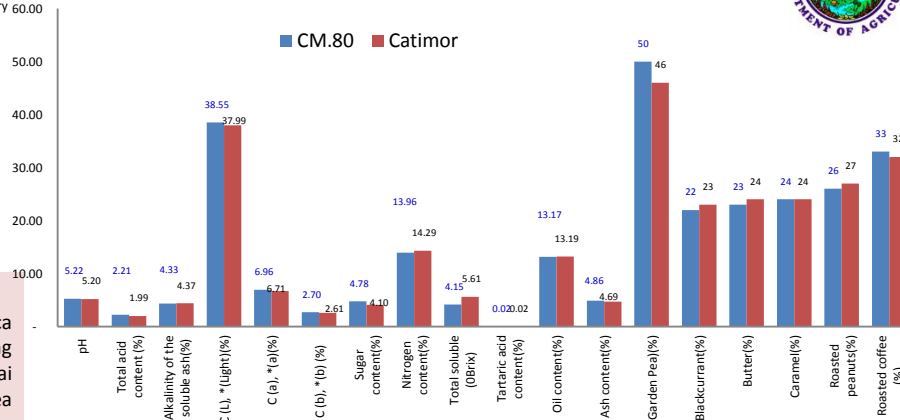


Figure 2: Chemical composition between cv. Catimor and C.M.80