Determination of fat and fatty acids profile in coffee pulp *Coffea arabica*

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Coffee cherry pulp is a by-product obtained during green coffee beans production. The coffee cherry pulp contains considerable amounts of bioactive chemical compounds. This research aimed to determine the chemical parameters (polyunsaturated fatty acids, monounsaturated fatty acids, saturated fatty acids, ratio Σn3/Σn6, ratio Σn6/Σn3 and fat) in samples of Coffee cherries *Coffea arabica* from Columbia (sample A1) Panama (sample B1) Costa Rica (sample C1). All samples were post-harvest processing by dry method. The altitude analyzed samples were in the range of 1100 - 1760 mamsl. Fat was extracted from the lyophilized samples using Soxhlet extraction with petroleum ether. The PUFA, MUFA, SFA, ratio Σn3/Σn6, ratio Σn6/Σn3, and fat content were expressed as % of dry matter. Obtained data were analyzed using the XLSTAT. ANOVA analysis with Duncan and REGWQ tests were used. The results of this study show that was observed significant differences in parameters PUFA, MUFA, ratio Σn3/Σn6, ratio Σn6/Σn3, and fat. The ratios of Σn3/Σn6 and Σn6/Σn3 are discussed concerning their significance for human health, suggesting that coffee cherry pulp could potentially contribute to a balanced diet and improved nutrition. A significant amount of ratio Σn3/Σn6 was observed in sample A1 (0,845) and on the other hand lowest values were observed in sample B1 (0,471). The next group is the ratio of Σn6/Σn3 which is significant for sample C1 (2,577). The lowest value of fat was determined in sample C1 (0,645) from Costa Rica on the other hand highest value was determined in sample A1 (0,914). The sample from Columbia (A1) had the highest value of MUFA (17,942) and SFA (41,864) but a significant amount of PUFA was observed in sample C1 from Costa Rica in the amount of 50,191. Based on our results we can say that Coffee Cherry and her incorporation, after adjustment, into the global diet may contribute to nutrition security, the sustainability of the coffee sector, and human health. This study and its results bring information on the potential health benefits and sustainability implications of incorporating coffee cherry pulp into the diet.

ID	PUFA	MUFA	SFA	Σn3/Σn6	Σn6/Σn3	Fat
A1	40,206 b	17,942 a	41,864 a	0,845 a	1,193 c	0,914 a
C1	50,191 a	10,302 b	39,240 a	0,386 b	2,577 a	0,645 b
B1	46,516 ab	7,323 c	39,494 a	0,471 b	1,928 b	0,419 c
Pr > F(Model)	0,038	<0,0001	0,475	0,002	0,001	<0,0001
Significant	Yes	Yes	No	Yes	Yes	Yes

Fig.1. ANOVA

CONCLUSION

The research investigated the chemical parameters of coffee cherry pulp from different origins, emphasizing its potential health benefits and sustainability implications. Significant variations were found in polyunsaturated fatty acids (PUFA), monounsaturated fatty acids (MUFA), saturated fatty acids (SFA), and fat content among samples from Colombia, Panama, and Costa Rica. The ratios of Σn3/Σn6 and Σn6/Σn3 were highlighted for their significance in human health, with sample A1 showing the highest Σn3/Σn6 ratio and sample C1 demonstrating the highest Σn6/Σn3 ratio. Moreover, sample C1 exhibited a notable amount of PUFA. These findings suggest that incorporating coffee cherry pulp into the diet could contribute to balanced nutrition and health improvement. Additionally, such utilization may enhance the sustainability of the coffee sector while ensuring nutrition security.

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