IOCAG 2025 Conference
The 3rd International Online Conference on Agriculture
22–24 October 2025 | Online
MDPI

Evaluation of the Yield Component and Phytochemical Compositions of Liberica Beans from West Java that Applied Various Harvesting Stages and Soaking Durations

Yudithia Maxiselly 1, Abdillah Azzam Wahyudin 1, Haris Maulana 2
1 Department of Agronomy, Agriculture Faculty, Universitas Padjadjaran, Indonesia
2 National Research and Innovation Agency, Indonesia

INTRODUCTION & AIM

High-quality coffee beans are a key factor in Liberica coffee cultivation. The quality coffee beans is evaluated based on yield components and phytochemical compositions. These parameters influenced by ripening stage of coffee cherries and post-harvest treatment, such as soaking time of wet method (Ahmad et al. 2023; Firdaus et al. 2023). The aim of this study is evaluated Liberica beans for various harvesting stages and soaking times following scientific approach.

METHOD

Eight treatments were examined, including the combination of soaking times (+0 = 0 h, +1 = 12 h, +2 = 24 h, and +3 = 36 h) and harvesting stages (Figure 1). This study was examined with a randomize complete design with four replications. The main observations were bean parameters and phytochemical compositions. Bean parameters were investigated before (0) and after drying (1), such as bean size (L/length, W/width, T/thickness), colour (L*, a*, b*), moisture (M), bean weight (SW), and yield (Y). Meanwhile, phytochemical composition was examined; total phenolic content (TPC), caffeine content (CC), and Antioxidant activity (AA). The data's analyzed using Principal Component Analysis (PCA). Data were also presented as a Biplot graph to better visualize the main observation. The flowchart of this study is presented in Figure 2.

Figure 1. The difference of harvesting stage treatments; **A** (Only ripe stage) B (Mixed ripening stage)

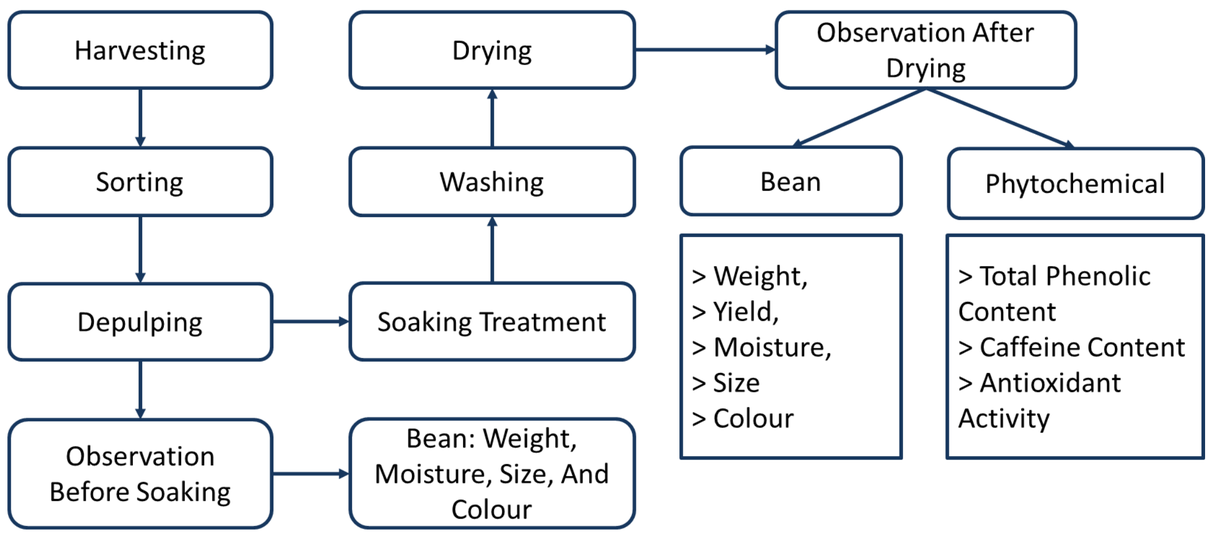

Figure 2. Research Procedure Schematic

RESULTS & DISCUSSION

Table 1. Eigenvalue, variation (%), total % and factor loading of 2 PCs

	F1	F2
Eigenvalue	8.46	3.97
Variation (%)	42.28	19.86
Total %	42.28	62.14
Variables		
SW0	**0.81**	0.41
SW1	**0.61**	-0.63
L0	-0.30	-0.12
W0	-0.16	0.17
T0	0.17	-0.17
L1	**0.89**	0.27
W1	**0.63**	0.20
T1	**0.59**	-0.68
YIELD	-0.69	-0.52

	F1	F2
Variables		
M0	**0.86**	-0.31
M1	-0.33	-0.47
L*0	**0.67**	-0.63
a*0	-0.57	**0.69**
b*0	-0.60	**0.76**
L*1	-0.79	-0.13
a*1	**0.90**	0.12
b*1	**0.92**	0.32
TPC	**0.66**	0.40
CC	0.01	-0.45
AA	**0.79**	0.46

Note: Factor loading in bold >0.5 have significantly correlate (Prayoga et al. 2022)

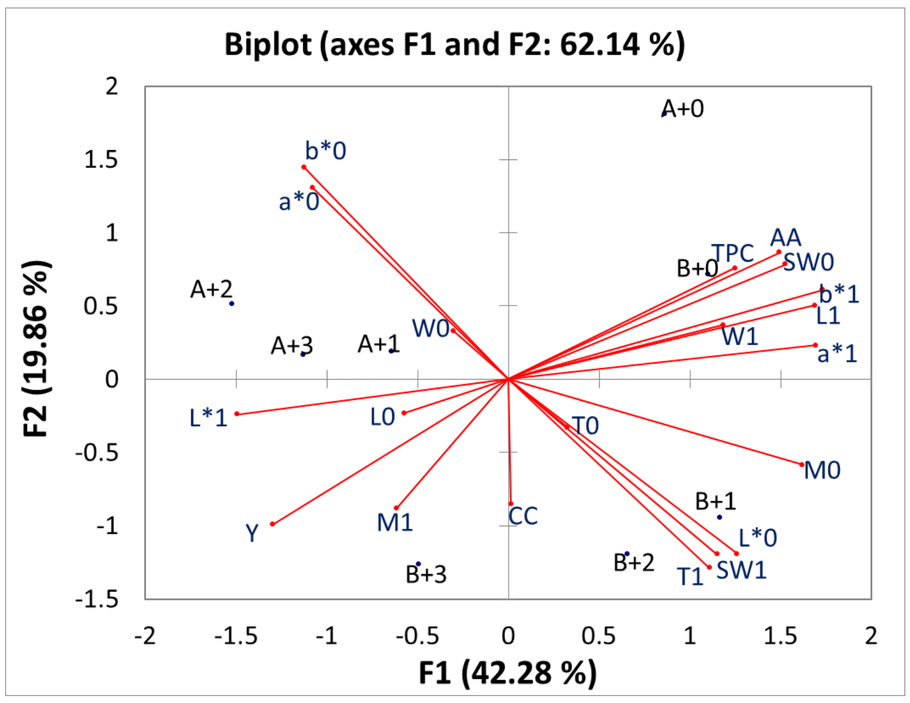

Figure 3. Biplot of PCA among 20 parameters of 8 treatments

CONCLUSION

The combination treatment of ripening stages and soaking durations influenced the yield components and phytochemical composition. The quality of Liberica coffee beans will be enhanced by the most effective combination of treatments.

REFERENCES

Ahmad, U., Sa'diyah, K., & Sathivel, S. (2023). Analysis and technical optimization of processing condition for better quality of robusta coffee production. *Coffee Science-ISSN 1984-3909*, *18*, e182080-e182080.

Firdaus, N. K., Aunillah, A., Pranowo, D., Listyati, D., & Herman, M. (2023). The effect of various harvesting techniques and drying methods on the yield and quality of Liberoid coffee. IOP Conf Ser: Earth and Environ Sci 1246: 012046.

Prayoga M. K., Syahrian H., Rahadi V. P., Atmaja M. I. P, Maulana H, & Anas. (2022). Quality diversity of 35 tea clones (Camellia sinensis var. sinensis) processed for green tea. Biodiversitas 23 (2): 810-816.