

# Comparative Analysis of Functional Properties in Coriander Seed Extracts Using Various Extraction Methods

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## INTRODUCTION

An annual herb used as a spice from ancient times (Yu et al., 2023)

In many countries, coriander is mixed with boiled water and portable water and consumed as a drink

**Coriander seed**  
(*Coriandrum sativum*)

**Nutrients:** crude protein, fat, dietary fiber, vitamin, mineral, polyphenols, flavonoids (Coskuner & Karababa, 2007)

**Functional properties:** Antioxidant, anticancer, neuroprotective, antimicrobial, anti-diabetes, anti-inflammatory, and digestive agent (Thakur et al., 2021)

- Coriander is consumed as a beverage in several ways, but no comparison or clear study regarding their functional properties has been carried out
- The present investigation was conducted using eight methods of coriander seed extraction

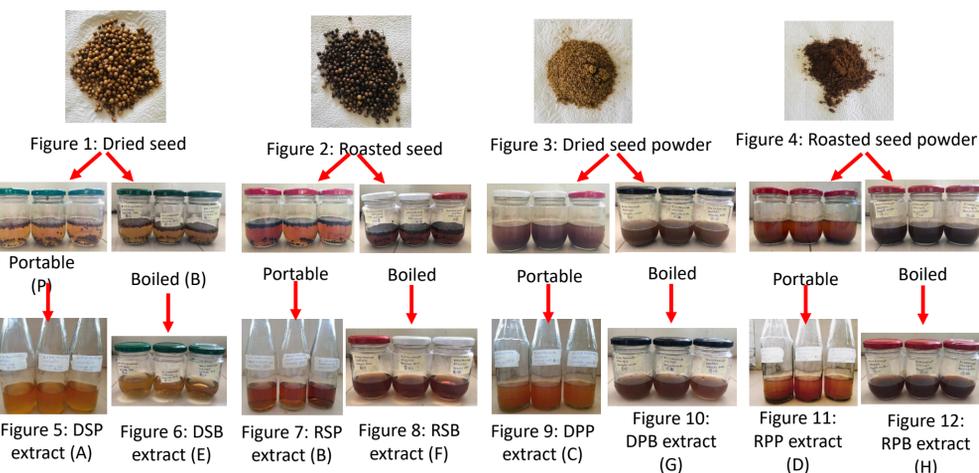
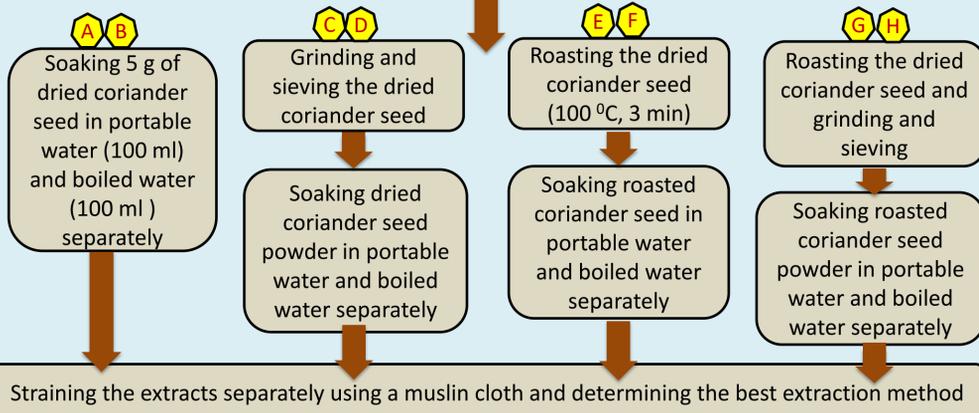
## OBJECTIVES

- To evaluate the pH variation, total phenolic content (TPC), antioxidant activity, and antimicrobial properties of various coriander seed extracts
- To determine the optimal extraction method for coriander seeds based on their functional and physicochemical properties

## METHOD

### Preparation of various extraction methods

Taking dried coriander seed, cleaning, and washing



## RESULTS & DISCUSSION

### Antimicrobial Properties (AP) - Agar well diffusion method

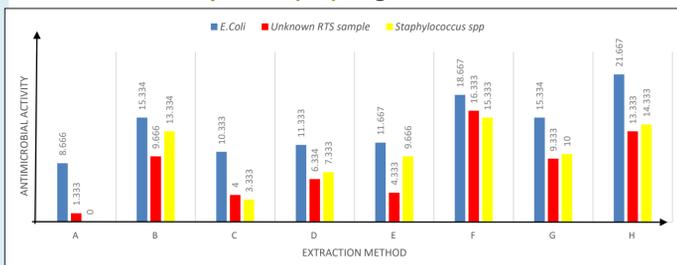


Figure 13: Antimicrobial activity of various coriander seed extract methods

- Consider highest AP,  
H: For *E. coli* bacteria  
F: For *Staphylococcus aureus* bacteria and unknown RTS sample

## RESULTS & DISCUSSION

### pH Variation

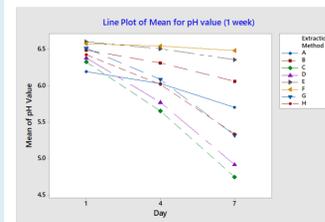


Figure 14. Variation in pH value of different extraction methods

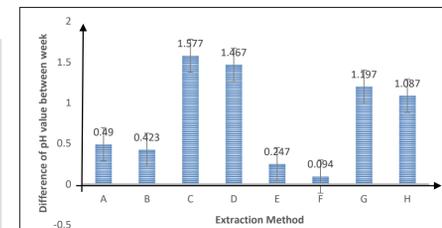


Figure 15. Variation in decrease of pH with storage time of different coriander extraction methods

- F shown,  
• Least pH difference (0.094)
- Low microbial activity
- Longest shelf life

### Total Phenolic Content (TPC) - Folin-ciocalteu reagent method (763 nm)

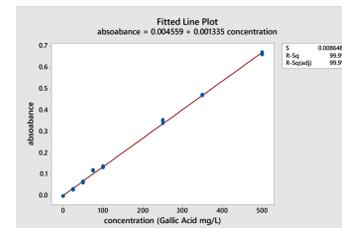


Figure 16. Linear regressions for standard curve

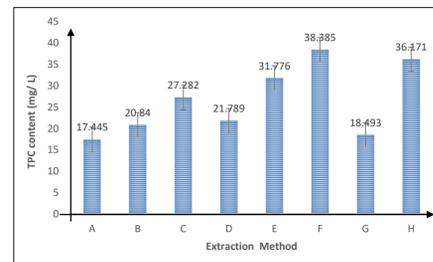


Figure 17. Variation of TPC of different coriander extraction methods

Table 1. TPC for the different coriander extraction methods

Extraction method	Absorbance	Total phenolic content in the diluted solution (GAE mg/L)	Dilution factor	Total phenolic content (GAE mg/L) (ppm)
A	0.121± 0.004	1.439± 0.056	10	14.39
B	0.143± 0.004	1.719± 0.051	10	17.19
C	0.186± 0.006	2.250± 0.080	10	22.50
D	0.150± 0.003	1.797± 0.044	10	17.97
E	0.216± 0.001	2.621± 0.018	10	26.21
F	0.261± 0.003	3.166± 0.020	10	31.66
G	0.128± 0.004	1.525± 0.049	10	15.25
H	0.246± 0.006	2.984± 0.081	10	29.84

The F extraction method has the highest total phenolic content (31.66 GAE mg/L)

### Antioxidant Activity – DPPH assay method (517 nm)

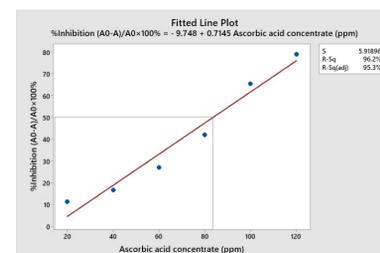


Figure 18. Linear regressions for standard curves for ascorbic acid series

$$y = 0.7145x - 9.748 \quad (R^2 = 95.3\%)$$

IC<sub>50</sub> value = 83.62 ppm

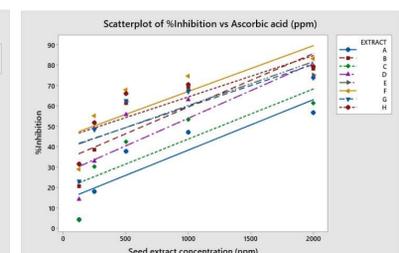


Figure 19. Antioxidant activity of various coriander seed extract methods

- F had a higher inhibition capacity than other extraction methods, because IC<sub>50</sub> value of F method was lower than other methods

## CONCLUSION

- The F extraction method (RSH) is the most suitable for coriander seed extraction due to its superior antioxidant, phenolic, and antimicrobial activities

## FUTURE WORK

- Analyze other bioactive compounds in coriander seeds, such as flavonoids, to expand knowledge of their health benefits
- Test best coriander seed extracts (F) in food preservation and pharmaceuticals to assess their practical applications

## REFERENCES

- Coşkuner, Y. and Karababa, E. (2007). Physical properties of coriander seeds (*Coriandrum sativum* L.). *Journal of Food Engineering*, 80(2), pp. 408–416.
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- Yu, Y., Cheng, Y. and Chong, W. (2023). Inhibitory effect of coriander (*Coriandrum sativum* L.) extract marinades on the formation of polycyclic aromatic hydrocarbons in roasted duck wings. *Food Science and Human Wellness*, 12(4), pp. 1128–1135.