



Effects of drying methods on the nutrients and anti-nutrients composition of African nightshade



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INTRODUCTION

Africa nightshade (ANS) is among African indigenous leafy vegetables, contributing substantially to food, nutritional, and medicinal benefits. The commonly consumed ANS species in East Africa are *Solanum scabrum*, *Solanum villosum*, and *Solanum nigrum*. They grow naturally and are also cultivated in gardens/farms. Leaves and young ANS shoots are mainly eaten for food; however, other parts such as roots and fruits are also utilized for other purposes. Due to the high perishability of ANS, proper postharvest handling is highly needed for improving shelf life. The study aimed at improving diversification, livelihood, break seasonality, increase utilization, improve food and nutritional security, and reduce postharvest losses.

MATERIALS AND METHODS

Two ANS species, *Solanum scabrum*, and *Solanum villosum* were dried using open sun, mixed solar, and indirect solar drying techniques.



Open sun drying

Indirect solar drying

Mixed solar drying

Results

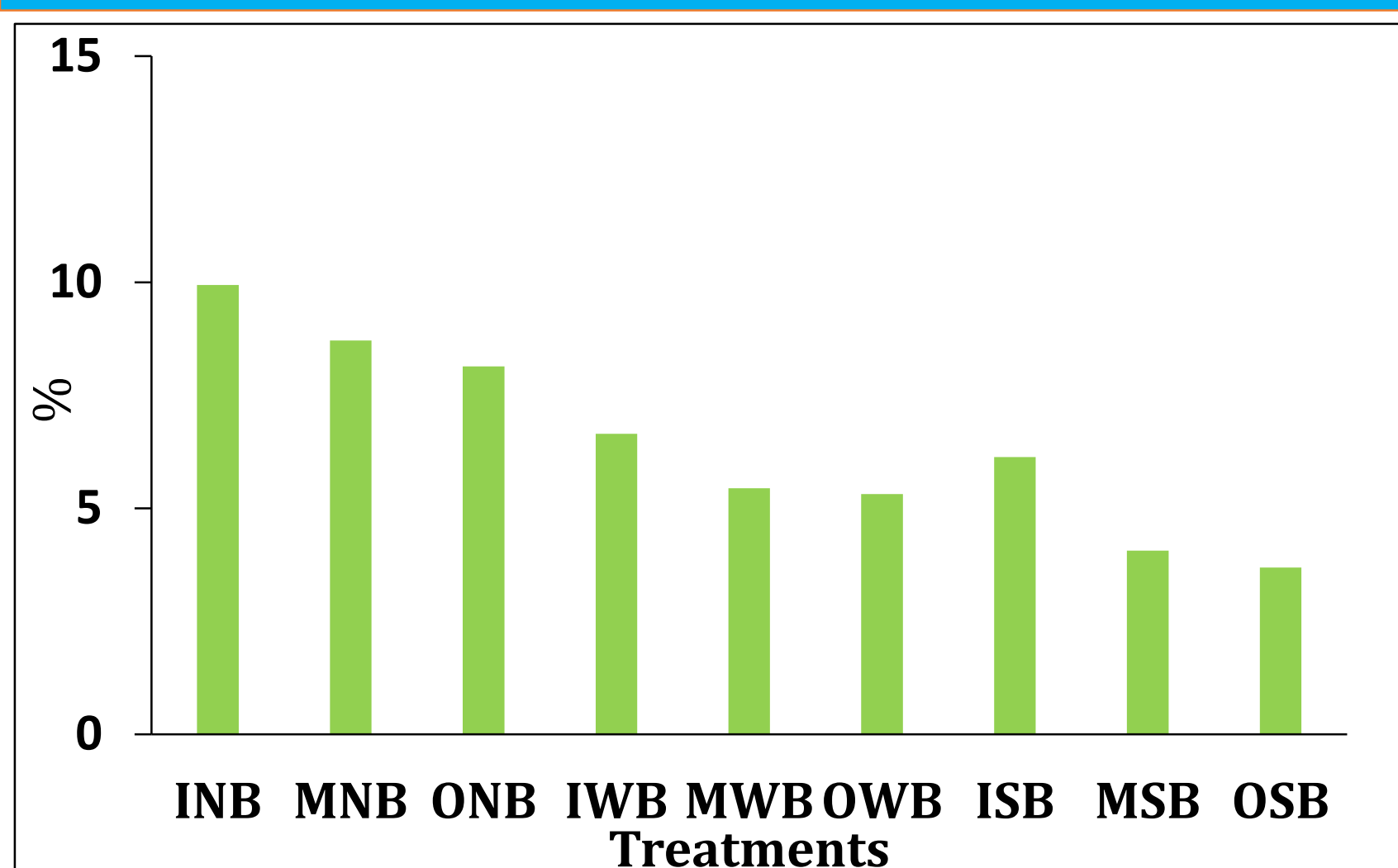


Fig. 1. Percentage Retention of vitamin C in *S. scabrum*

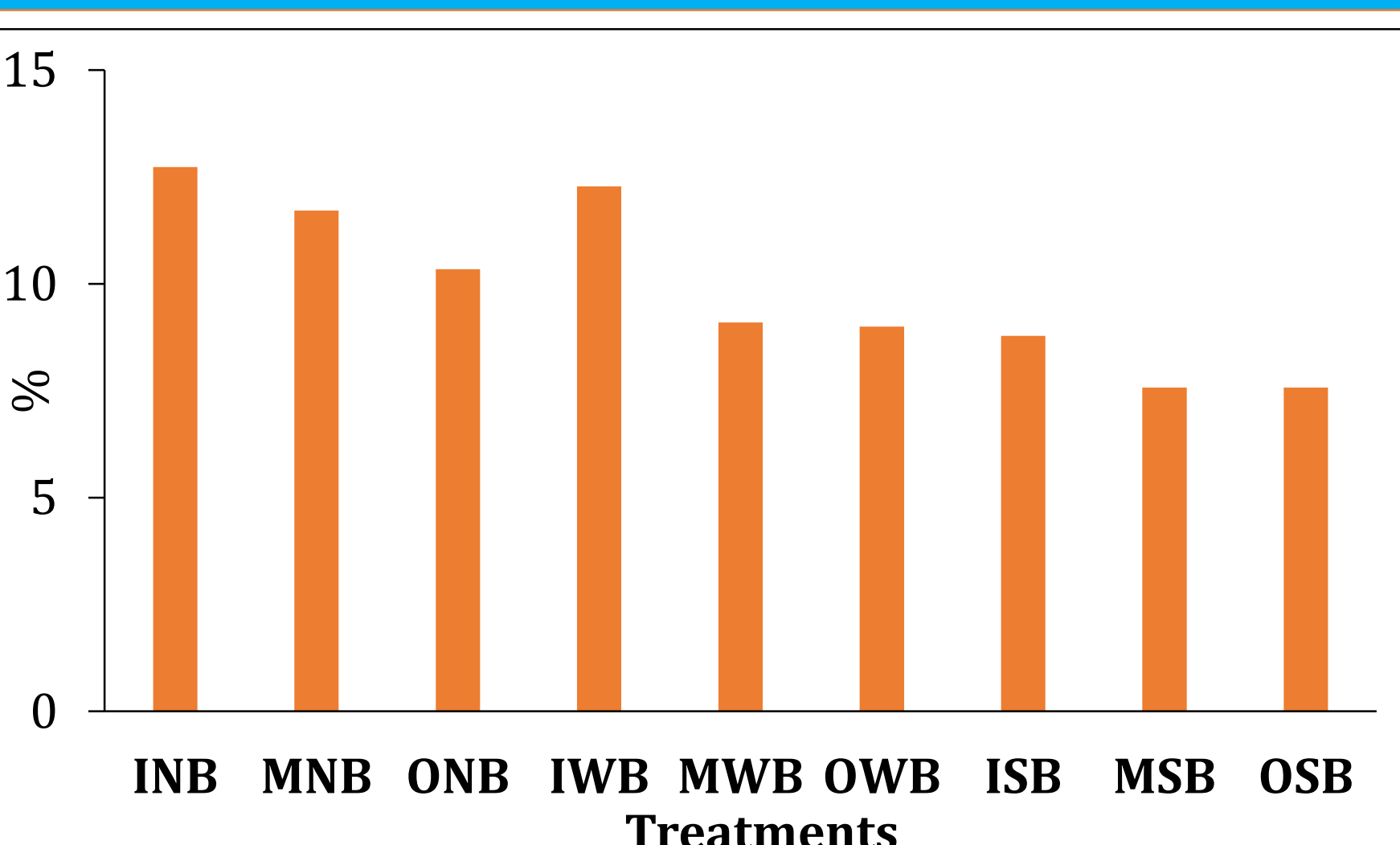


Fig. 2. Percentage retention of Vitamin C in *S. villosum*

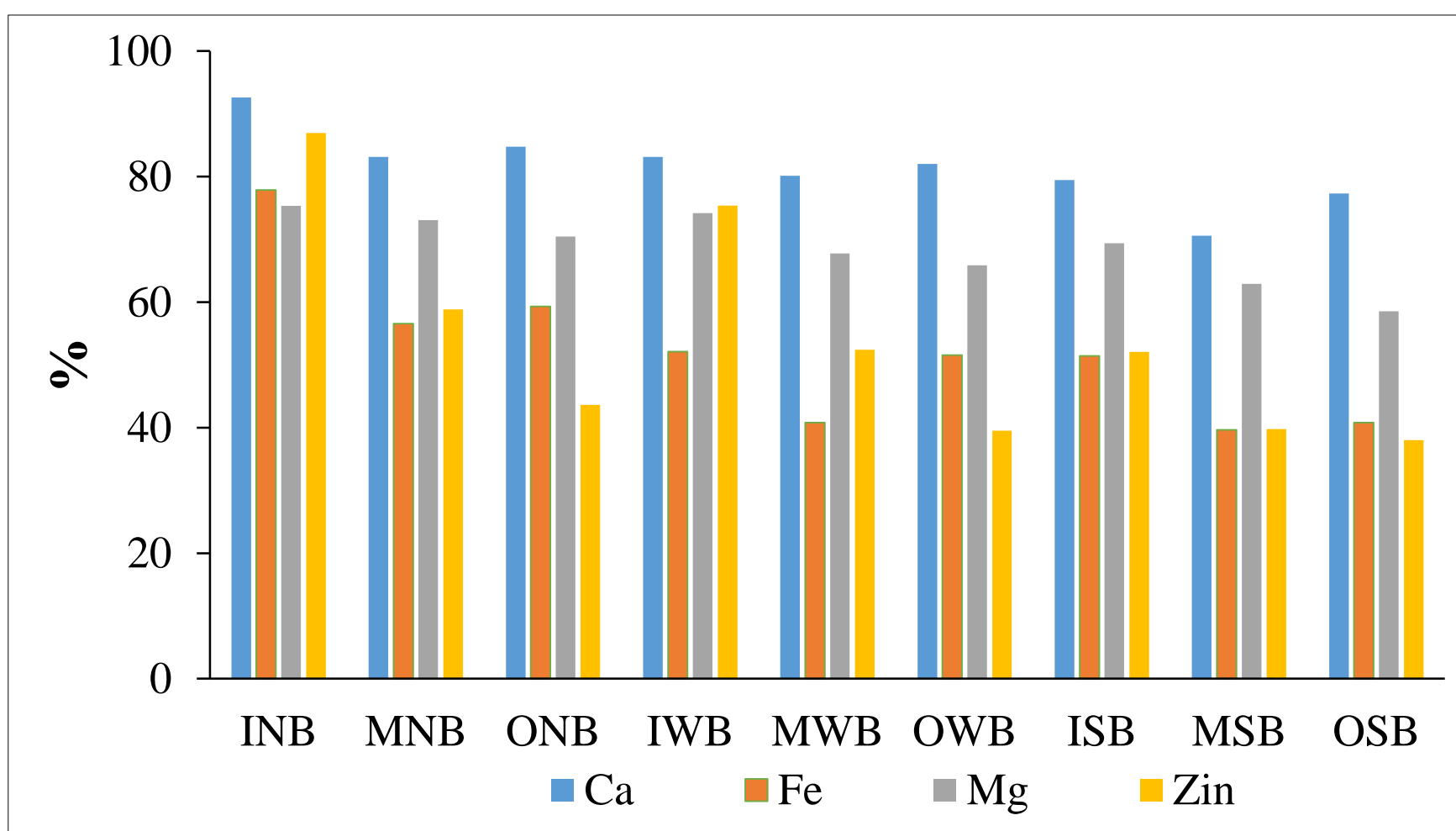


Fig. 3. Percentage Retention of minerals in *S. scabrum*

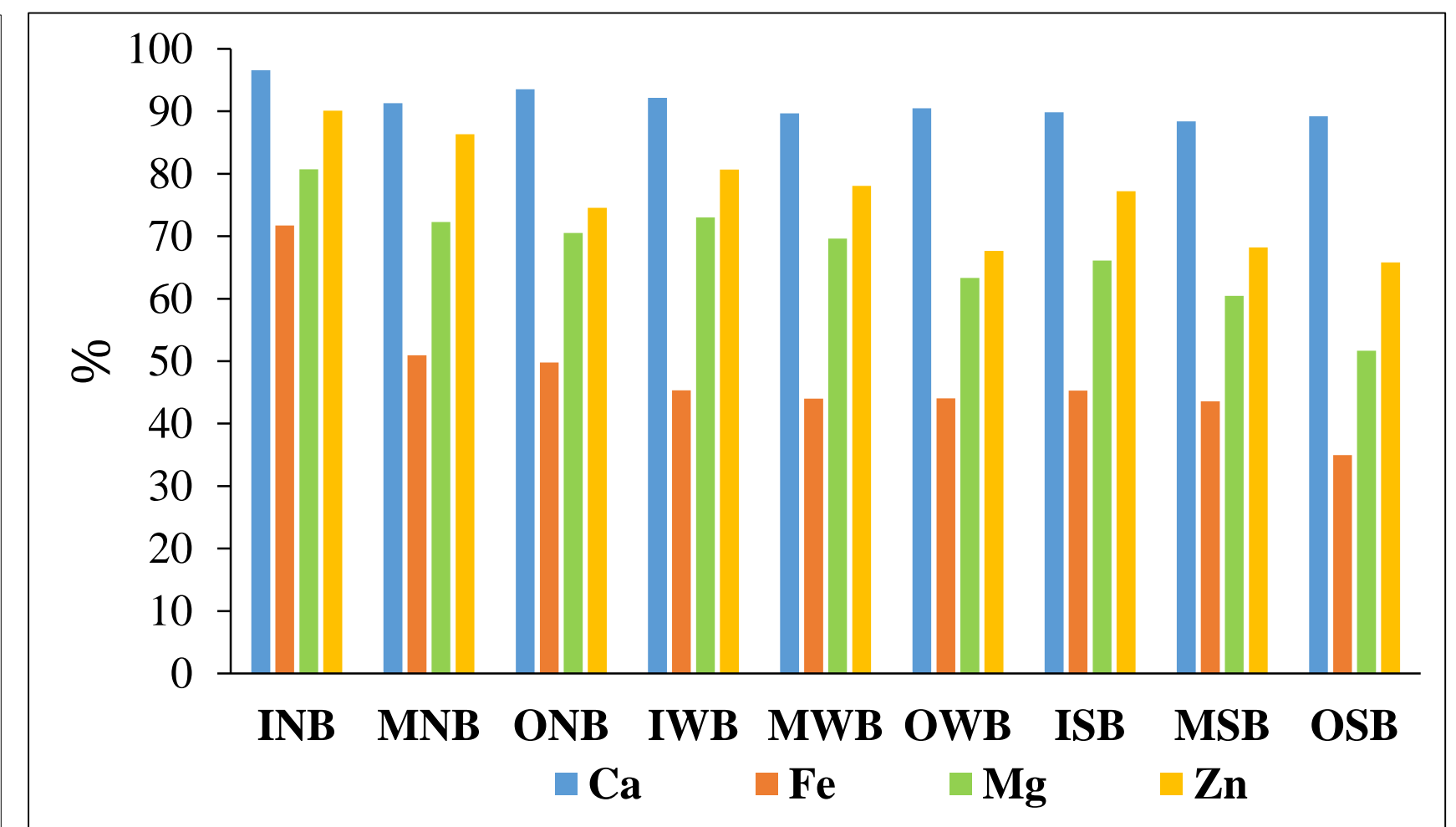


Fig. 4. Percentage Retention of minerals in *S. villosum*

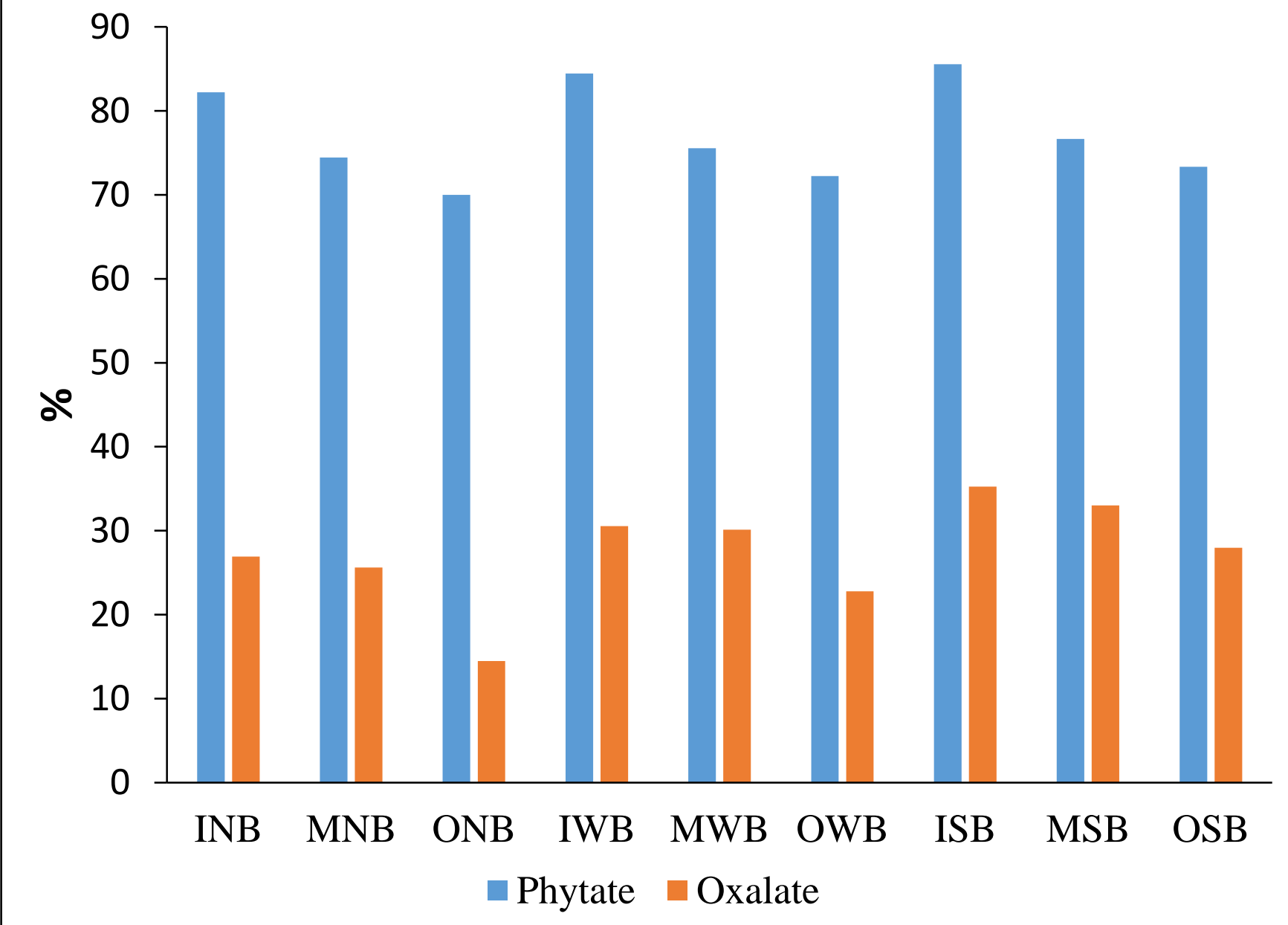


Fig. 5. Percentage Retention of anti-nutritional factors (Oxalate and Phytate) in *S. scabrum*

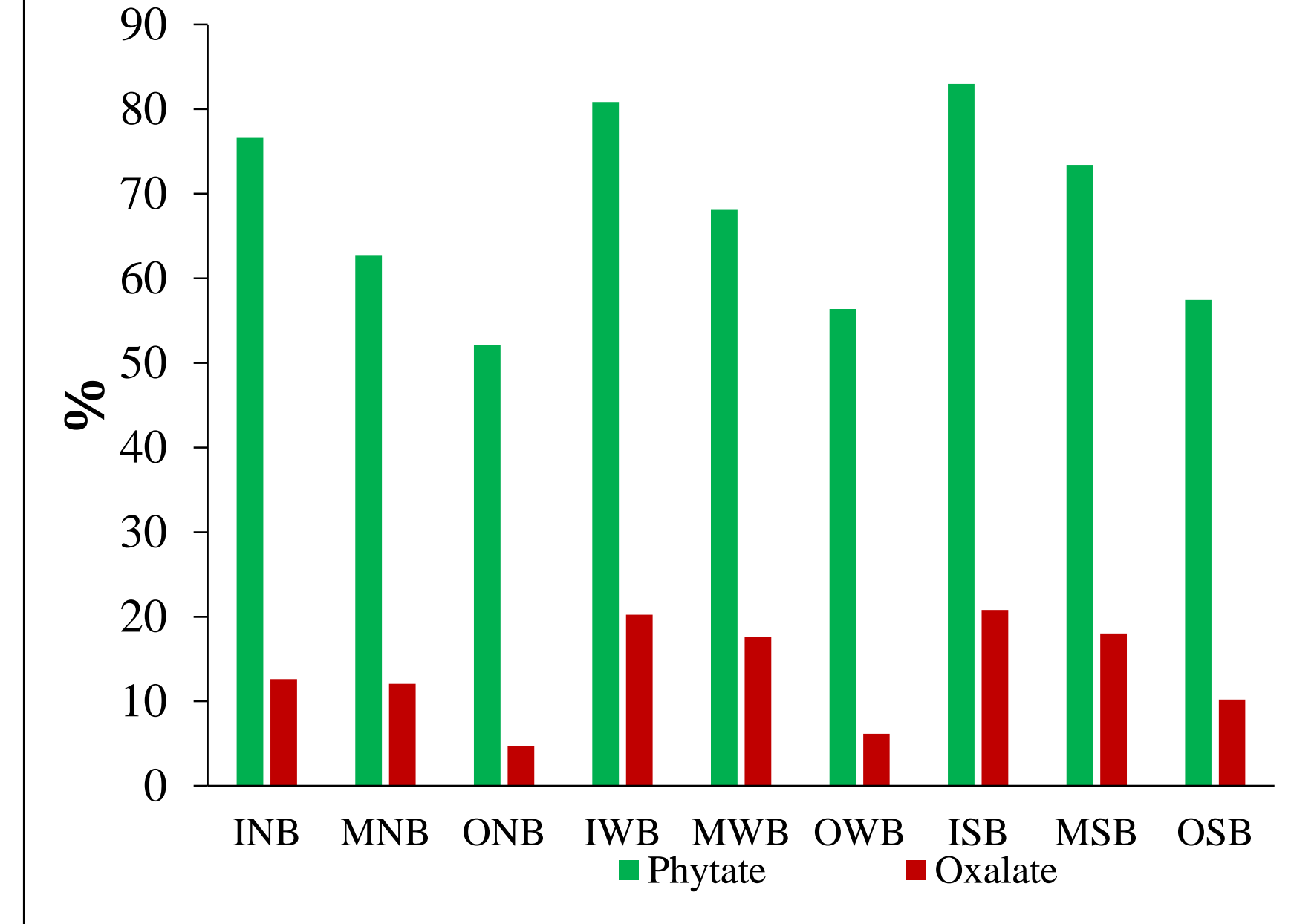


Fig. 6. Percentage Retention of anti-nutritional factors (Oxalate and Phytate) in *S. villosum*

Key:

- ❑ Indirect solar drying technique (INB-Non blanched; IWB-Water blanched; ISB-Salt blanched)
- ❑ Mixed solar drying technique (MNB-Non blanched; MWB- Water blanched; MSB- Salt blanched)
- ❑ Open sun drying techniques (ONB-Non blanched; OWB-Water blanched; OSB- Salt blanched)



Dried ANS products

DISCUSSION

- ❖ The study found higher minerals content, especially calcium, iron, magnesium, and zinc, in raw and dried ANS.
- ❖ Indirect solar drying technique (ISDT) retained higher content of minerals compared to other techniques.
- ❖ Drying techniques significantly reduced vitamin C, although higher vitamin C retention was observed using the indirect solar drying technique.
- ❖ Higher retention of vitamin C in ISDT is attributed to low drying temperature and less penetration of sunlight.
- ❖ Blanching was observed to have a significant reduction of vitamin C and minerals.
- ❖ ISDT reduced significantly amount of anti-nutritional factors such as oxalate and Phytate.

CONCLUSION AND FUTURE PLAN

The indirect solar drying method was observed to be the best drying technique for preserving ANS compared to the drying methods used. The finding in this study will be disseminated to households, women groups, and small-scale farmers. Consequently, the study is anticipated to improve food and nutrition security.

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