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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*.
- Lack of proper postharvest handling methods for ANS leads to high postharvest losses.
- Due to its high perishability, proper handling is highly needed for improving shelf-life.
- This study aimed to break seasonality, increase utilization, improve product diversification, food and nutritional security, as well as reducing postharvest losses of ANS.

MATERIAL AND METHODS

Solanum scabrum, and *Solanum villosum* were dried using **open sun, mixed solar, and indirect solar driers**.



Fig. 1. Open sun, Indirect solar and Mixed solar driers



Fig. 8. Dried African nightshade product/s

RESULTS

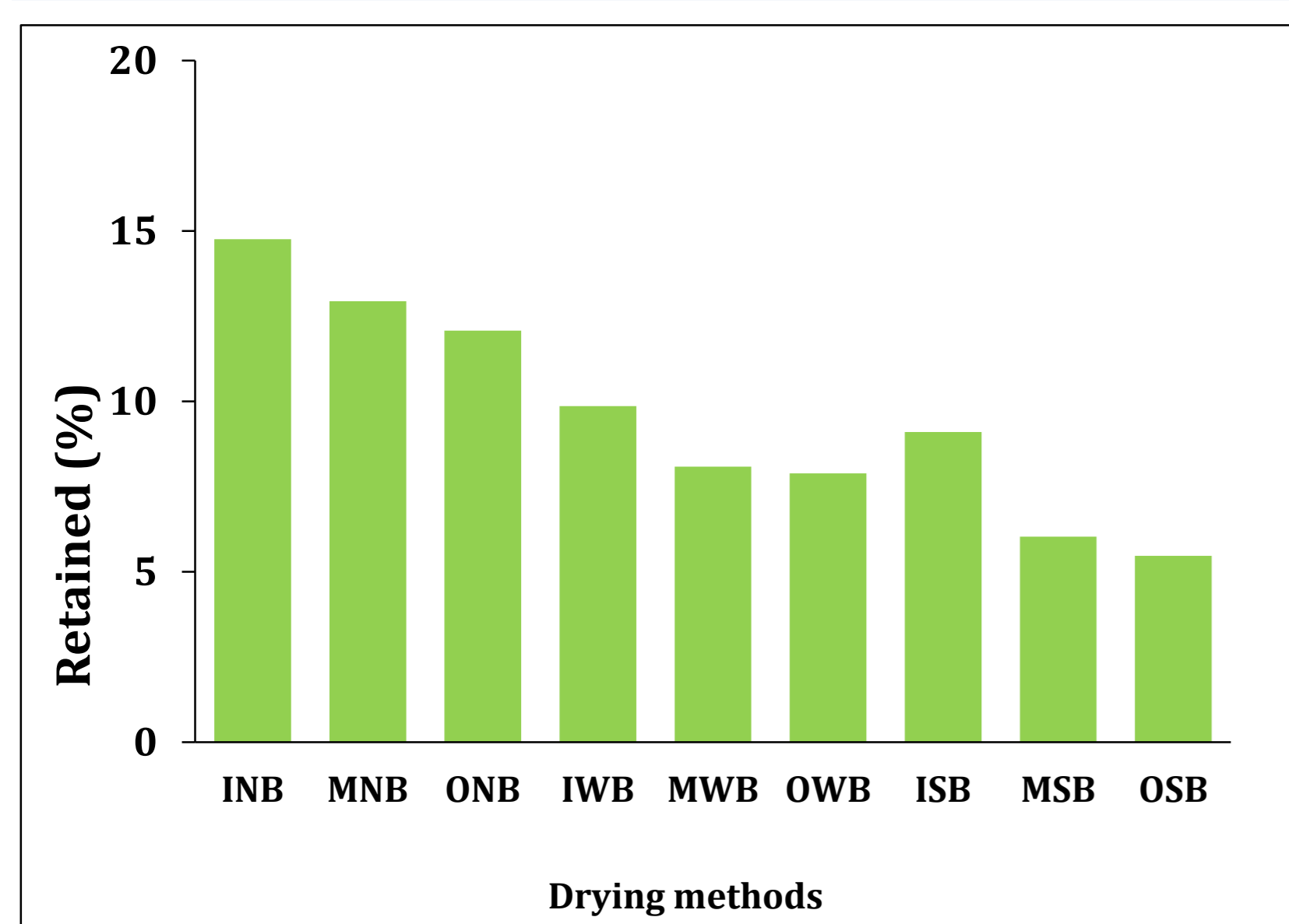


Fig. 2. Vitamin C retention in *S. scabrum*

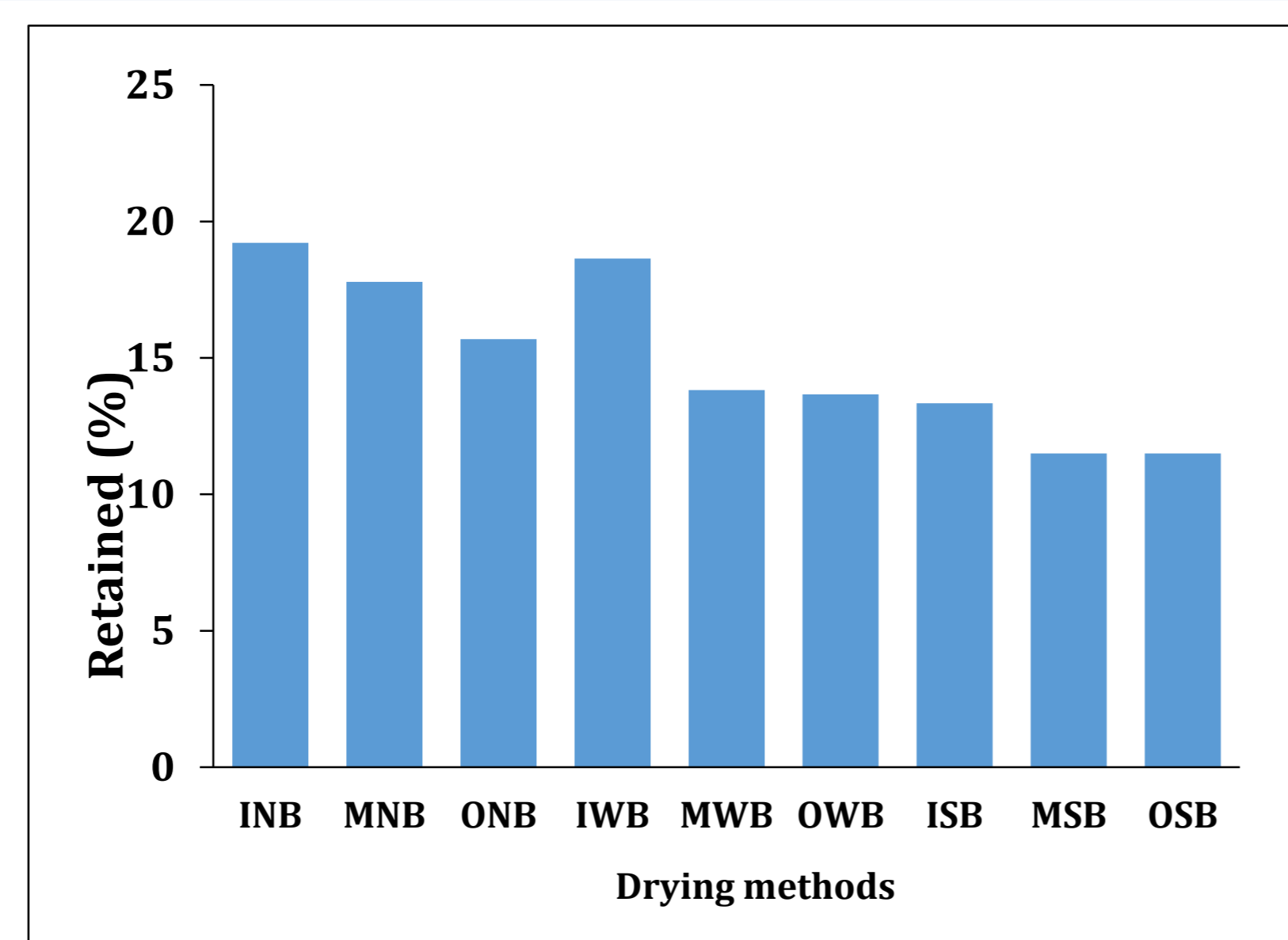


Fig. 3. Vitamin C retention in *S. villosum*

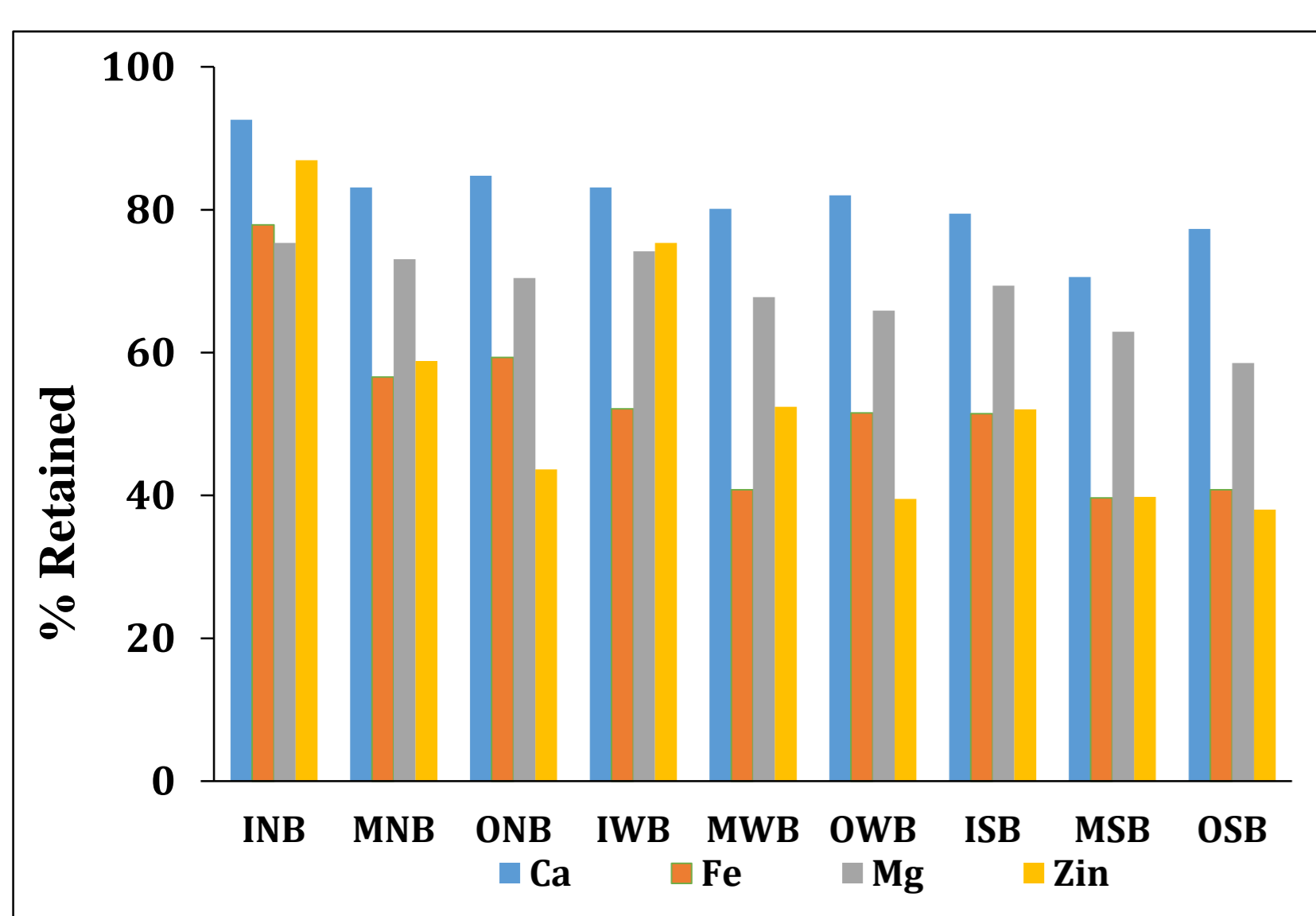


Fig. 4. Percentage retention of minerals in *S. scabrum*

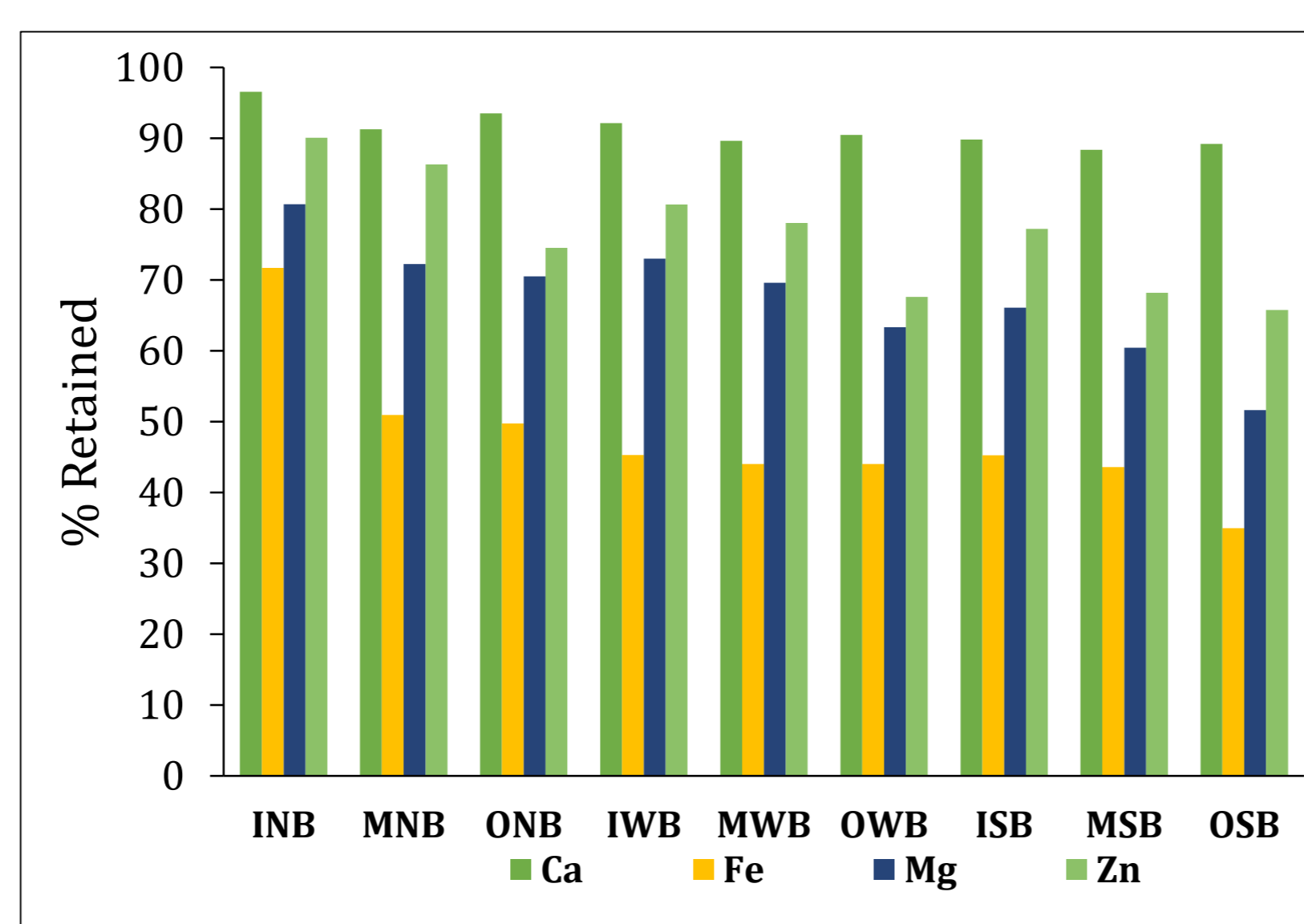


Fig. 5. Percentage retention of minerals in *S. villosum*

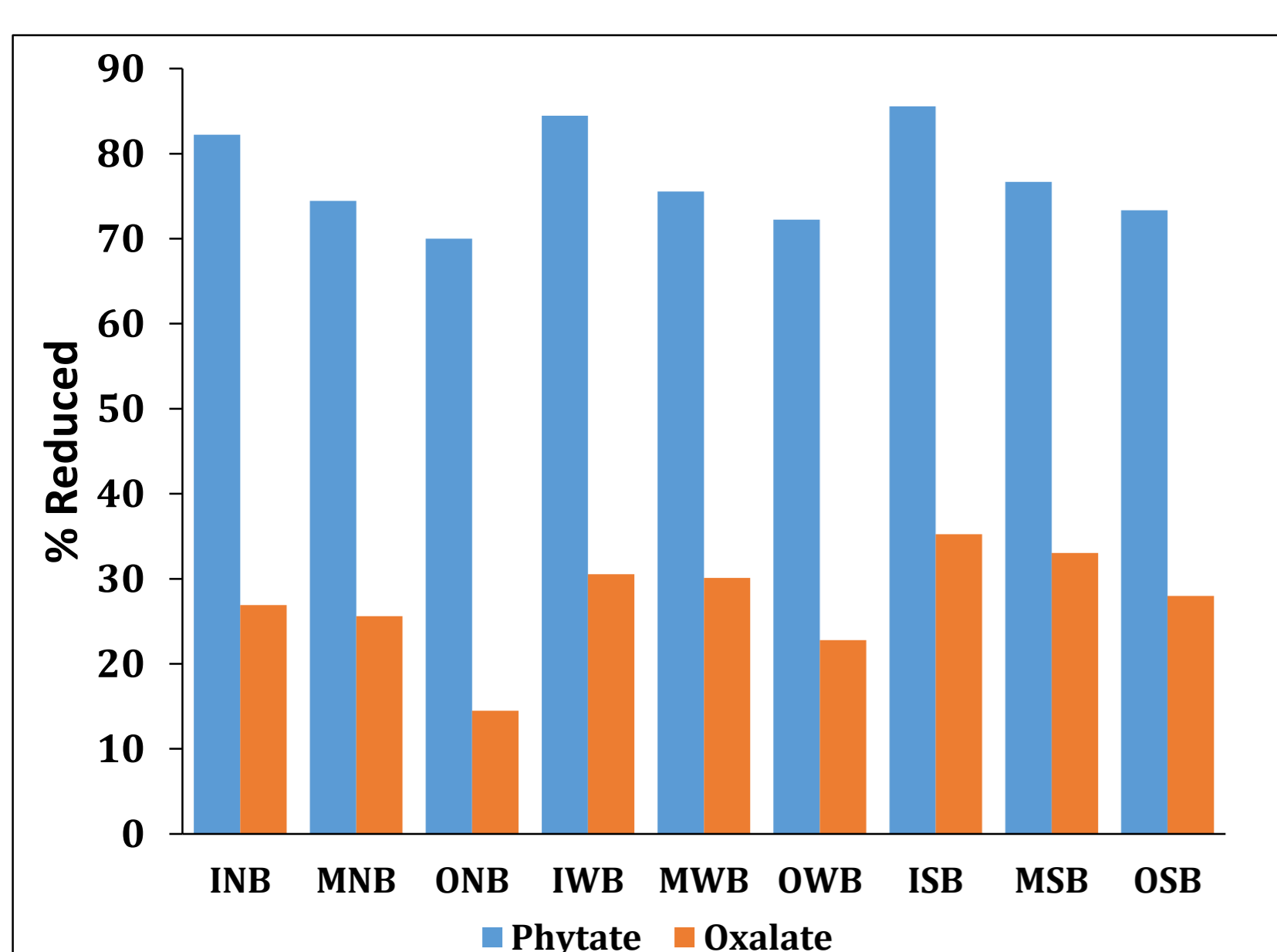


Fig. 6. Percentage reduced of oxalate and phytate in *S. scabrum*

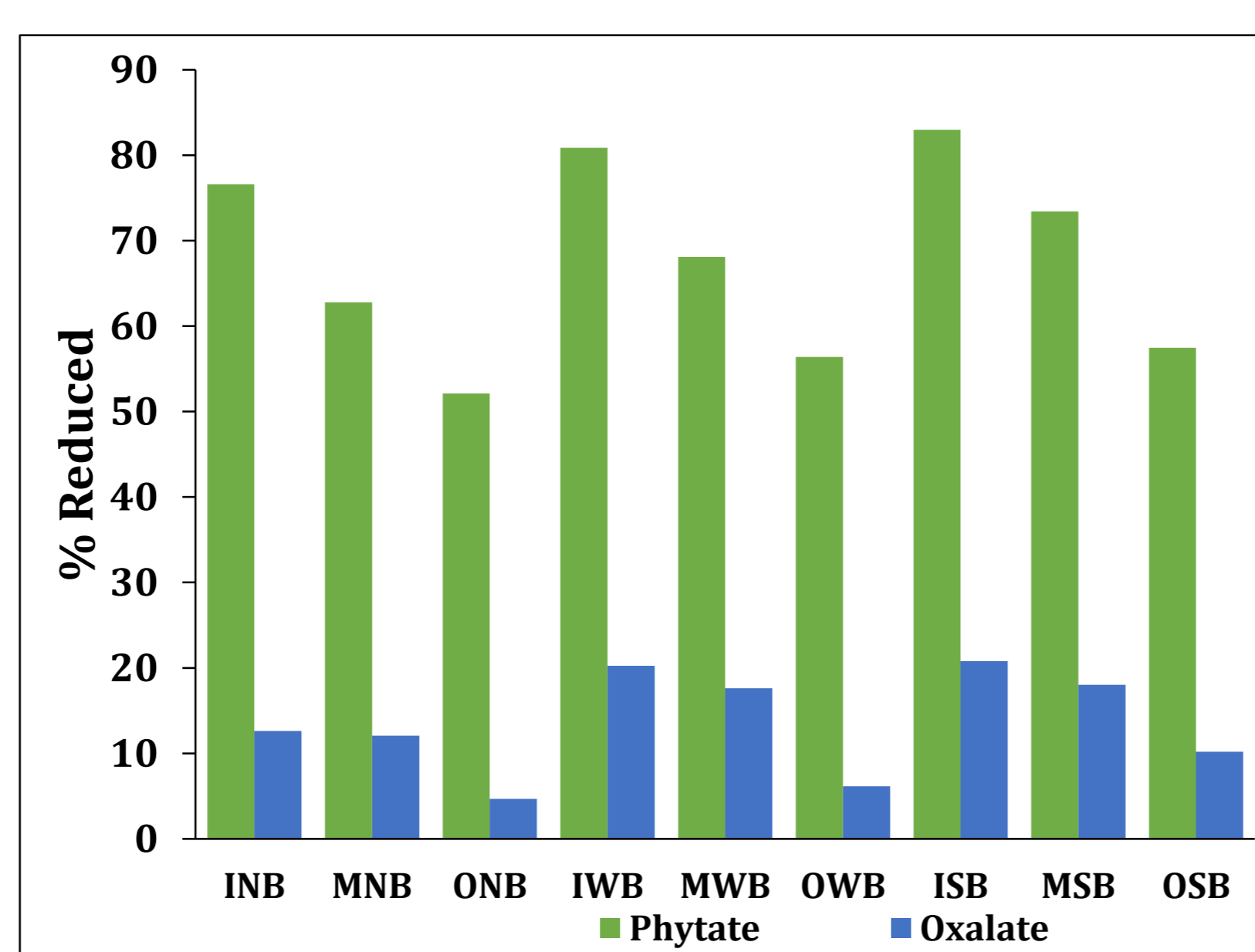


Fig. 7. Percentage reduced of oxalate and phytate in *S. villosum*

- 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)

DISCUSSION

- ❖ The ANS is a rich source of minerals, especially calcium, iron, magnesium, and zinc.
- ❖ Indirect solar drying technique retained higher content of minerals compared to other techniques.
- ❖ All 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 Indirect solar drying technique was attributed to low drying temperature and less sunlight penetration.
- ❖ Blanching had a significant effect in reduction of vitamin C and minerals.
- ❖ Indirect solar drying technique significantly reduced the anti-nutrients i.e., oxalate and phytate.

CONCLUSION

- ❖ Indirect solar drying method can be recommended as the best drying technique for preserving nutritional quality of ANS compared to other drying methods.
- ❖ The findings in this study was disseminated to households, women groups, and small-scale farmers in ANS growing areas. Consequently, the study anticipated to improve food and nutrition security.

REFERENCES

- Danso, J., Alemawor, F., Boateng, R., Barimah, J. & Kumah, D.B. (2019). Effect of drying on the nutrient and anti-nutrient composition of *Bombax buonopozense* sepals. *African Journal of Food Science*, 13(1), 21-29.
- Kamga, R. T., Kouamé, C., Atangana, A. R., Chagomoka, T., & Ndango, R. (2013). Nutritional Evaluation of Five African Indigenous Vegetables. *Journal of Horticultural Research*, 21(1), 99-106.
- Mohammed, M.I & Sharif, N. (2011). Mineral Composition of Some Leafy Vegetables Consumed in Kano, Nigeria. *Nigerian Journal of Basic and Applied Science*, 19(2):208-212.
- Traoré, K., Parkouda, C., Savadogo, A., BaHama, F., Kamga, R., & Traoré, Y. (2017). Effect of processing methods on the nutritional content of three traditional vegetables leaves: Amaranth, black nightshade and jute mallow. *Food Science & Nutrition*, 5(6), 1139-1144.