

BIO-CHEMICAL COMPOSITION OF DIFFERENT ONION LANDRACES FROM GREECE



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Introduction

Onion (*Allium cepa* L.), an important vegetable crop, is widely consumed not only for culinary but also for medicinal purposes due to its various biological properties, which are linked to the bioactive substances it contains. The aim of this study was to assess the bio-chemical composition of dry bulbs of four Greek onion landraces (On4, On5, On6 e On9) compared to a commercial variety (On7).

Materials and Methods

AOAC procedures, chromatography techniques and *in vitro* assays were used to determine nutritional, chemical and bioactive properties.

Results and Discussion

The landraces stood out in terms of macronutrients (**Figure 1**), thereby presenting higher energy value (between 389.2 to 390.64 Kcal/100g dw for landraces and 383.7 Kcal/100g dw for commercial variety).

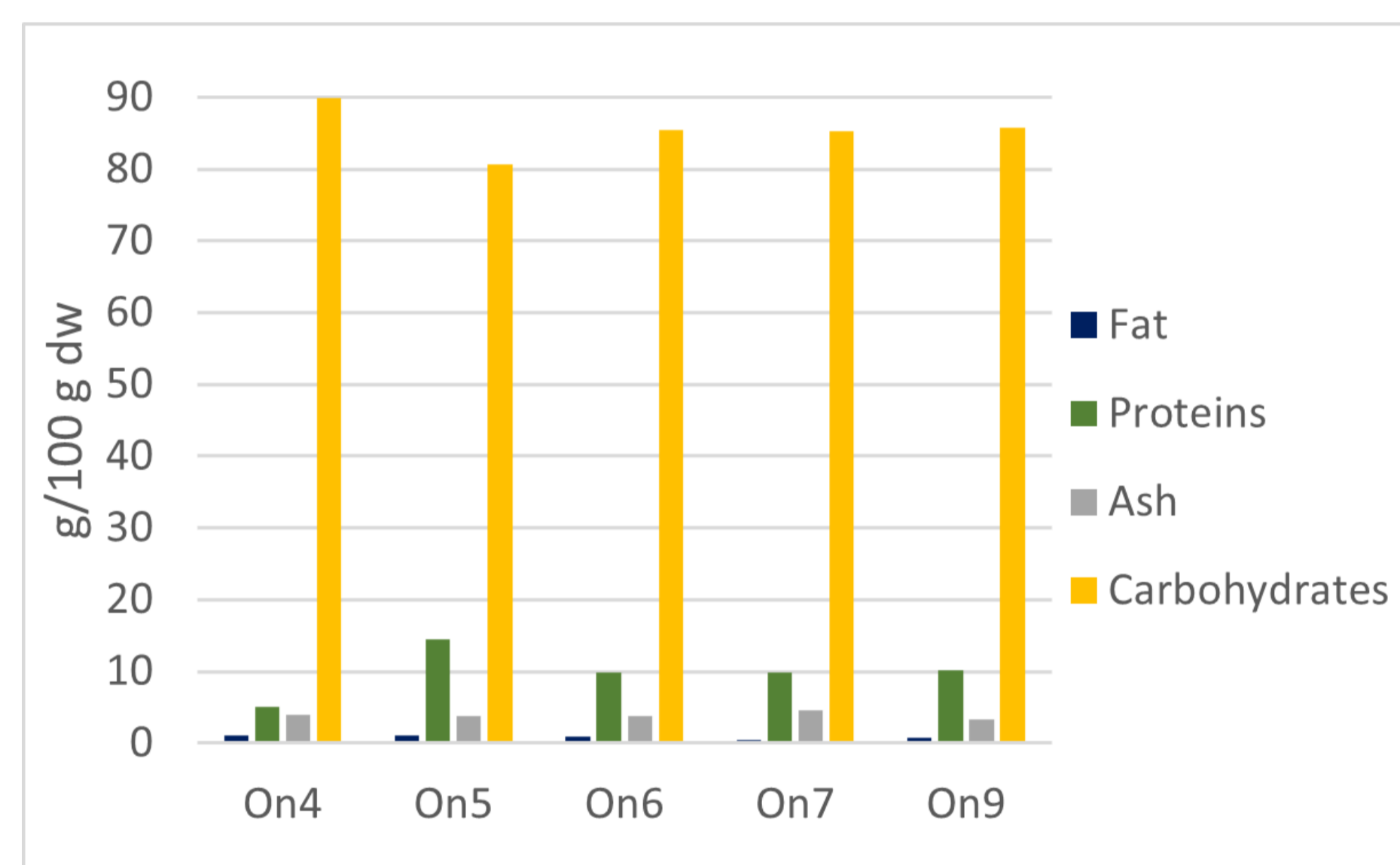


Figure 1 - Nutritional value of the studied onion samples

Fructose, glucose, and sucrose were found in all samples, in greater amounts in the commercial genotype, while a sugar non-identified so far was more prevalent in landraces (**Figure 2**).

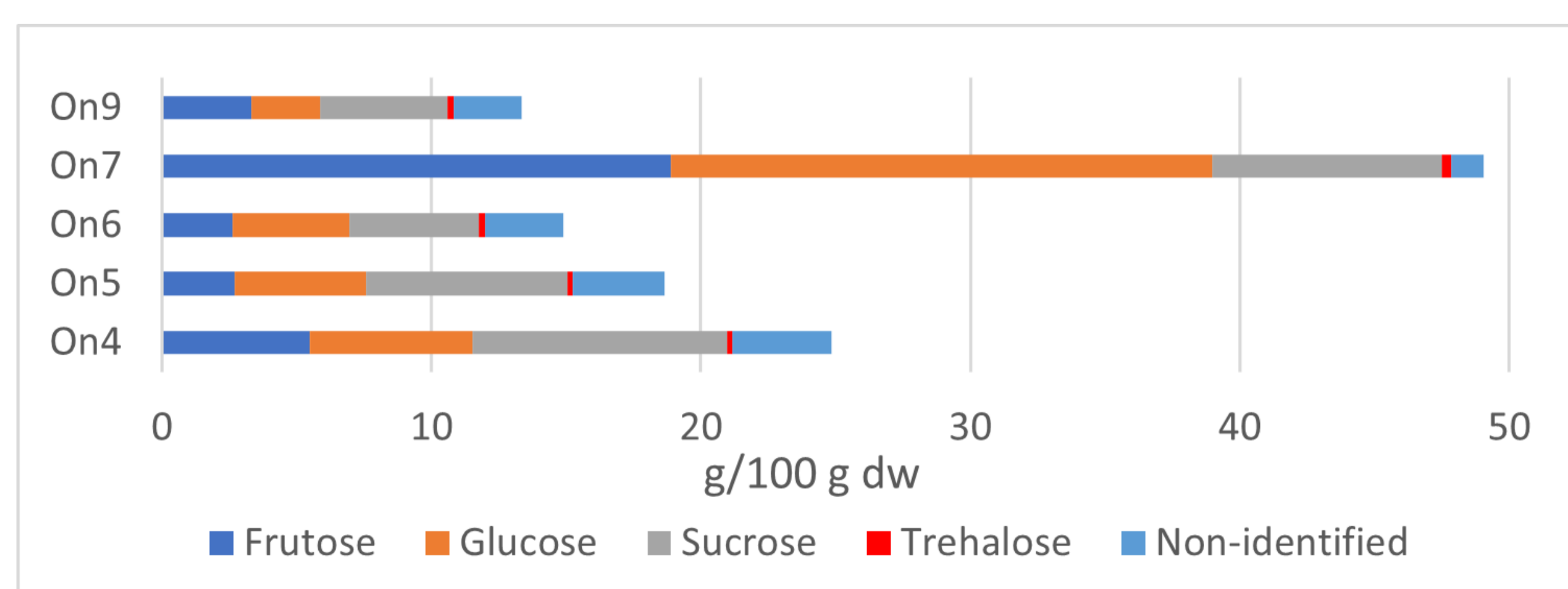


Figure 2 - Free sugars present in the studied onion samples

Polyunsaturated fatty acids predominated in all samples, followed by monounsaturated and saturated ones. Five organic acids were identified, being oxalic and succinic acids most prevalent in cultivated genotypes, while landraces showed higher amounts of citric acid (**Table 1**). The landraces showed higher contents of α -tocopherol (**Table 1**), present in all samples, and demonstrated better antioxidant potential, assessed by TBARS assay, and antimicrobial activity against *S. aureus*, *L. monocytogenes*, and *Y. enterocolitica* (**Table 2**).

Table 1 - Lipophilic compounds of the studied onion samples

	Landraces	Commercial Variety
Fatty acids	Relative percentage (%)	
SFA	22.6 – 25.04	28.29
MUFA	25.7 – 29.7	28.50
PUFA	46.5 – 49.4	43.2
Tocopherols	(mg/100g dw)	
α -Tocopherol	0.082 – 0.149	0.104

Table 2 - Antioxidant and antibacterial activity of the studied onions hydroethanolic extracts

	Landraces	Commercial Variety
Antioxidant activity	EC₅₀ (mg/mL)	
TBARS	0.092 – 1.27	0.114
Antibacterial activity	MIC (mg/mL)	
<i>E. coli</i>	5.0 - >10	2.5
<i>S. enterocolitica</i>	5.0 - >10	2.5
<i>Y. enterocolitica</i>	2,5 - >10	10
<i>L. monocytogenes</i>	5	>10
<i>S. aureus</i>	1.25 - >10	2.5

Conclusion

In conclusion, the local landraces showed interesting results, considering their promising composition and biological properties, which demonstrates that these genotypes could be considered as nutraceutical food since they can promote health benefits for consumers.

Acknowledgment

The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to CIMO (UIDB/00690/2020); national funding by FCT, P.I., through the institutional scientific employment program-contract for A.F. and L.B. contracts.