ALMONDS INTERCROPPED WITH OTHER CROPS CULTIVATED IN CROATIA: STUDY OF NUTRITIONAL PROPERTIES AND BIOACTIVITIES

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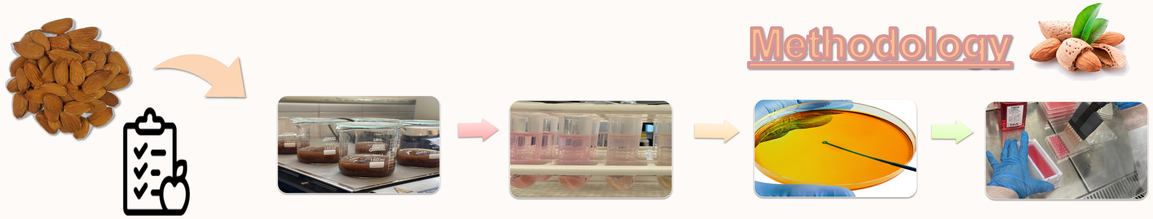
Introduction

In recent years, crop diversification in agroforestry systems has been recognized as a sustainable strategy to improve land use efficiency, restore environmental balance, mitigate climate change, provide economic benefits and ensure food security. Research has shown that practices such as intercropping can significantly enhance soil quality, which in turn increases the quality of almonds. This study aimed to evaluate the nutritional and bioactive aspects of almonds to investigate the benefits resulting from crop interactions, using different almond cultivars.

Methodology



Results

The Texas cultivar had the highest crude fat content, while the AI cultivar had the highest protein content (**Table 1**).

Table 1. Nutritional profile of almonds produced in Croatia.

	Moisture (g/100 g fw)	Crude Fat (g/100 g fw)	Proteins (g/100 g fw)	Ash (g/100 g fw)	Carbohydrates (g/100 g fw)	Energy (Kcal/100g)
ACFD	6±0,2	47±2	12,3±0,02	3,54±0,3	30±0,1	600,5±1
ACFG	4,2±0,1	49±2,3	15±2	3,41±0,1	28±2	621,5±2,3
ACT	4,0±0,2	54±0,2	15±0,1	3,24±0,14	24±1	638±0,2
ACAI	5±0,1	48±0,4	19,2±0,4	3,73±0,1	25±1	605,4±2

ACT – Intercropped almond corresponding to the Texas cultivar **ACAI** – Intercropped almond corresponding to the AI cultivar; **ACFG** - Intercropped almond corresponding to the Ferragnès cultivar; **ACFD** - Intercropped almond corresponding to the Ferraduel cultivar.

The Ferraduel cultivar showed the highest antioxidant activity forTBARS (**Table 2**).

Table 2. Results of lipid peroxidation inhibition assay (TBARS), 2,2- diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity, cytotoxic and anti-inflammatory activity of the almonds.

Antioxidant Activity (IC_{50} values, µg/mL)					
		ACFG	**ACT**	**ACAI**	**ACFD**
TBARS (IC50 values, mg/mL)		0,2±0,01	0,4±0,003	0,2±0,001	0,1±0,003
DPPH (mg/mL)		1±0,01	1,7±0,02	0,4±0,01	1,2±0,04
Cytotoxicity (GI_{50} values; µg/mL)					
		ACFG	**ACT**	**ACAI**	**ACFD**
Tumoral cell lines	Caco2	66±3	>400	29±4	29±4
	MCF_7	93±4	>400	58±3	65,14±3
	AGS	102±3	>400	61,2±2	67,1±2
	HeLa	110,3±3	>400	55±2	62±2
Non-tumor cell line	VERO	161±2	>400	216,2±5	231±5
Anti-inflammatory (IC_{50} values; µg/mL)					
RAW264,7		102±5	>400	82,04±5	95,4±5

Conclusions

Overall, the study shows that interaction with other crops can improve the nutritional profile and health benefits of almonds, underlining the importance of sustainable agricultural practices.

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