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EFFECT OF WILD GARLIC ADDITION ON THE PHYSICOCHEMICAL AND SENSORY PROPERTIES OF A RED LENTIL SPREAD

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Abstract: *This study evaluated the effect of wild garlic (Allium ursinum) on the quality of a plant-based red lentil (Lens culinaris) spread. A control and two spreads with 30 g and 40 g of fresh wild garlic per 150 g of dry lentils were compared in terms of sensory attributes, moisture, fat, NaCl and pH. The spread with 30 g of wild garlic obtained the highest scores for all attributes (4.60–5.00) and the highest total score (23.8 out of 25). All spreads had a smooth, spreadable consistency and a balanced, slightly spicy flavor, while their high moisture content requires refrigerated storage.*

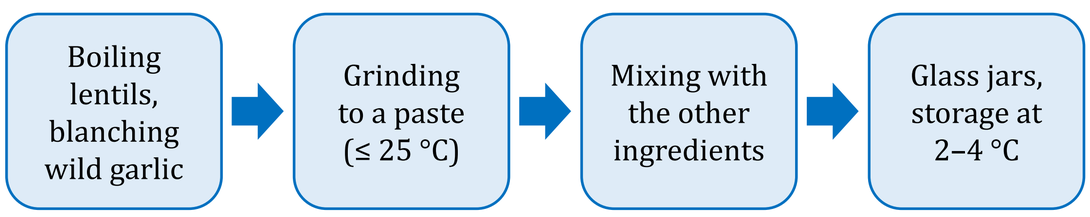
• Introduction

Red lentils (*Lens culinaris*) are a nutrient-dense legume, rich in protein (about 24–30%), dietary fiber, resistant starch and polyphenols, and a valuable source of plant-based protein. Wild garlic (*Allium ursinum* L.) is a perennial plant widespread in Europe and Asia, rich in sulfur compounds, with antimicrobial and antioxidant effects, already used to flavor regional cheeses. Legumes are used as the base of plant-based spreads, whose quality and acceptability depend on the formulation, particularly on the flavoring ingredients.

Aim: to evaluate the effect of wild garlic on the physicochemical and sensory quality of a red lentil spread and to establish the most suitable wild garlic level.

• Material and method

Three spreads were prepared from 150 g of dry decorticated red lentils: P1 – control, without wild garlic; P2 – 30 g of fresh wild garlic (20%); P3 – 40 g of fresh wild garlic (≈27%). The other ingredients were extra-virgin olive oil, smoked chili paste, lemon juice and zest, honey, salt, roasted walnuts and coconut milk.



Sensory evaluation: after 24 h, by five trained assessors, on a 5-point scale (1 = very poor, 5 = very good) for appearance, consistency, color, odor and taste.

Physicochemical analysis (three replicates): moisture by oven drying at 110 °C, fat by the Van Gulik acidobutyrometric method, NaCl by the Mohr method and pH potentiometrically.

• Results and discussions

All spreads obtained mean scores of at least 3.60 for every attribute. P2 (30 g wild garlic) obtained the highest scores for all attributes (4.60–5.00), including the maximum score for color awarded by all assessors, and the highest total score (23.8 out of 25), followed by P3 (21.0) and the control P1 (18.2) (Figure 1). This suggests that above 30 g, the more intense pungent flavor of wild garlic becomes less pleasant for the assessors.

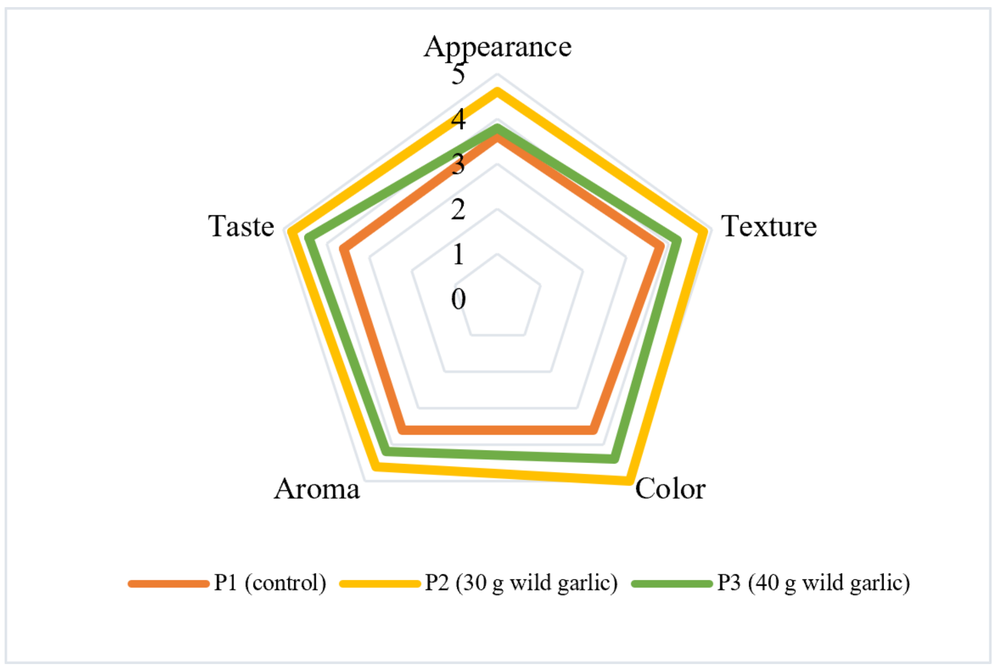


Figure 1. Sensory profiles of the red lentil spreads (mean scores, n = 5)

Table 1. Physicochemical characteristics of the red lentil spreads

Parameter	P1	P2	P3	Mean ± SD
Moisture (%)	63.5 ± 0.2	58.9 ± 0.3	61.2 ± 0.2	61.20 ± 2.30
Fat (%)	21.0 ± 0.2	23.3 ± 0.1	25.1 ± 0.1	23.13 ± 2.06
NaCl (%)	1.39 ± 0.01	1.20 ± 0.10	1.60 ± 0.17	1.40 ± 0.20
pH	5.4 ± 0.2	5.8 ± 0.1	5.6 ± 0.3	5.60 ± 0.20

P1–P3: mean ± SD of three determinations; Mean ± SD: variability among the three formulations.

The spreads had a high moisture content (58.9–63.5%) and a fat content of 21.0–25.1%, provided mainly by olive oil and walnuts. The salt content (1.20–1.60% NaCl) gives a pleasant taste, and the slightly acidic pH (5.4–5.8) favors flavor preservation; as the pH is above 4.6, product safety relies on heat treatment, hygiene and refrigerated storage at 2–4 °C.

• Conclusions

- Wild garlic improved the sensory quality of the red lentil spread.
- The most suitable level was 30 g of wild garlic per 150 g of dry lentils (P2), with the highest scores for all attributes and the highest total score (23.8/25).
- Due to its high moisture content and pH above 4.6, the spread is perishable and requires strict hygiene and refrigerated storage (2–4 °C).
- Red lentils and wild garlic are suitable ingredients for a natural, nutritious, plant-based spread.

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