

The Sensory Quality of Sprouts Obtained from the Selected Species of Legume Seeds

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Abstract: Sensory characteristics (evaluated by quantitative descriptive analysis and as the hedonic ratings) of sprouts obtained from lentil, Mung bean, pea and soybean sprouts were assessed. It was found that the palatability of sprouts was negatively correlated with bitterness and astringency of these products. However, the statistically significant correlation between the content of total phenolic compounds and negative sensory attributes (bitterness and astringency) was not found.

Keywords: legumes; sprouts; sensory quality; phenolic compounds

INTRODUCTION

Sprouts of legume seeds are the rich source of bioactive compounds (including polyphenols) revealing valuable wholesome properties. Current literature provides data on content of these compounds in the sprouts [1–3] but the information about their sensory quality is still fragmentary. The aim of the presented study was to evaluate sensory quality of sprouts, different in terms of phenolic content, obtained from the selected species of legume seeds: pea (*Pisum sativum* L.), lentil (*Lens culinaris*), Mung bean (*Vigna radiata* L.) and soybean (*Glycine hirsuta* Max).

EXPERIMENTAL

Samples. The seeds used for the germination were purchased in so called “healthy food” shop in Olsztyn, Poland.

Seeds germination. Seeds were soaked in distilled water at room temperature for three hours. Next they were transferred to an incubator (Cliambic Cabinet, model Economics Deluxe EC00-065, Snijders Scientific b.v, the Netherlands). Germination of seeds was conducted at a temperature of 25°C without light. After 3 days of germination, when the sprouts were ready for the consumption were subjected to sensory evaluation and determined

the total phenolic compounds (sprouts with cotyledons and without cotyledons).

Sensory evaluation. The tests were applied to characterise the sensory properties of sprouts by means of a quantitative descriptive analysis and also by consumers preference test (as hedonic ratings). The panel of 8 subjects, previously trained in intensity scaling, was used for testing. First they evaluated the general palatability of the sprouts and next sensory profiling was performed by the methods of scaling [4, 5]. Unstructured 10-unit linear scale ranged from “none” to “very intensive” was used. The samples were individually coded and presented in a random order to the panellists. A computerised system was used for experimental setting and data collection. The correlation between some sensory attributes and the palatability was calculated.

Total phenolics determination. The content of total phenolic compounds in the lyophilised samples was estimated using the *Folin-Ciocalteu's* reagent. (+)-Catechin was used as a standard in this work [6].

RESULTS AND DISCUSSION

The study showed that among the four kinds of sprouts of legume seeds the best sensory quality and the most palatable were Mung bean sprouts

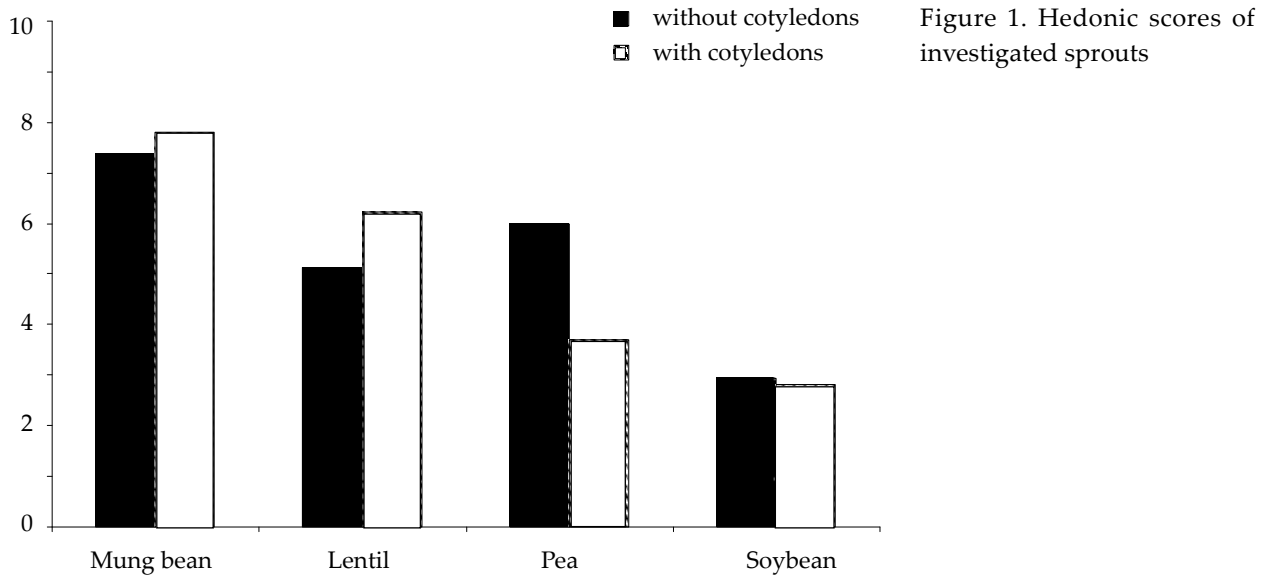


Figure 1. Hedonic scores of investigated sprouts

whereas the soybean sprouts (both with and without cotyledons) obtained the lowest marks. The sensory quality of pea and lentil sprouts was determined by the fact whether they were with or without cotyledons (Figure 1).

The removal of the cotyledons significantly affected the raise of sensory quality of pea sprouts

whereas the sprouts of lentil with the cotyledon were higher evaluated. To find the dominant attributes which influenced the consumer's preference of sprouts quantitative descriptive analysis was used. Seventeen sensory attributes of the analysed products were chosen and the intensity of them was evaluated by scaling. The results showed that

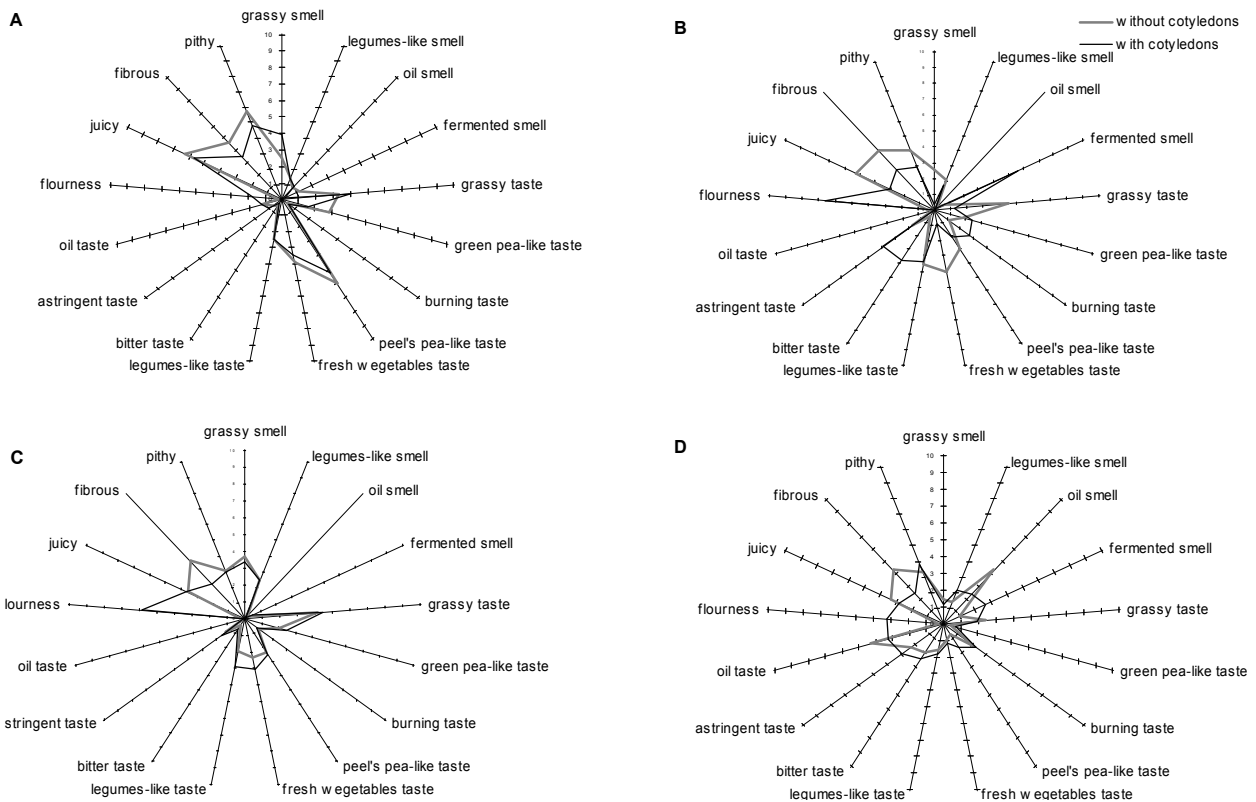


Figure 2. The sensory profile of sprouts: A – Mung bean, B – pea, C – lentil, D – soybean

Table 1. Content of total phenolics in seeds and sprouts

| Material | Total phenolics [mg of (\pm) catechin/g d.m.] | | |
|-----------|---|-------------------------|----------------------------|
| | seeds | sprouts with cotyledons | sprouts without cotyledons |
| Mung bean | 48.15 \pm 1.09 | 19.67 \pm 1.11 | 11.78 \pm 0.31 |
| Lentil | 99.86 \pm 6.09 | 12.32 \pm 0.20 | 15.57 \pm 1.14 |
| Pea | 6.79 \pm 1.70 | 13.09 \pm 0.89 | 11.85 \pm 1.10 |
| Soybean | 19.64 \pm 0.29 | 19.67 \pm 1.85 | 25.97 \pm 0.70 |

the sensory profiles of evaluated sprouts were very differentiated (Figure 2A, B, C, D). However, the dominating attributes differentiating soybean sprouts (with and without cotyledons) from the other products were taste and odour of oil. These soybean sprouts indicated also more intensive bitterness and astringency than other product (except pea sprouts with cotyledons) which had clearly negative effect on their palatability. The analysis of relations showed a statistically significant correlation between the palatability of sprouts and the intensity of bitterness sensation and bitter taste ($r = -0.845$ and -0.715 , respectively, $P \leq 0.05$).

Due to the fact that bitterness and astringency may be caused by the phenolic compounds [7, 8], their content in the samples was determined. It was found that the quantity of these compounds in the sprouts was from 11.79 mg/g d.m. (sprouts of Mung bean without cotyledons) to 25 mg/g d.m. (sprouts of soybean without cotyledons) (Table 1). However, no statistically significant correlation was found between the total phenolics and astringency and bitterness. It suggests that the negative sensory

attributes may be caused by other (non phenolic) compounds. That issue is the objective of the next research of the authors.

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