

Jaroslava Švarc-Gajić, Tanja Brezo-Borjan, Lana Kisić, Kristina Čupić, Dostanić Milica

University of Novi sad, Faculty of Technology, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

**Agri-food Waste Management
for Sustainable bio-economy
through Higher Education
curricula and upskilling**



AGRIMA

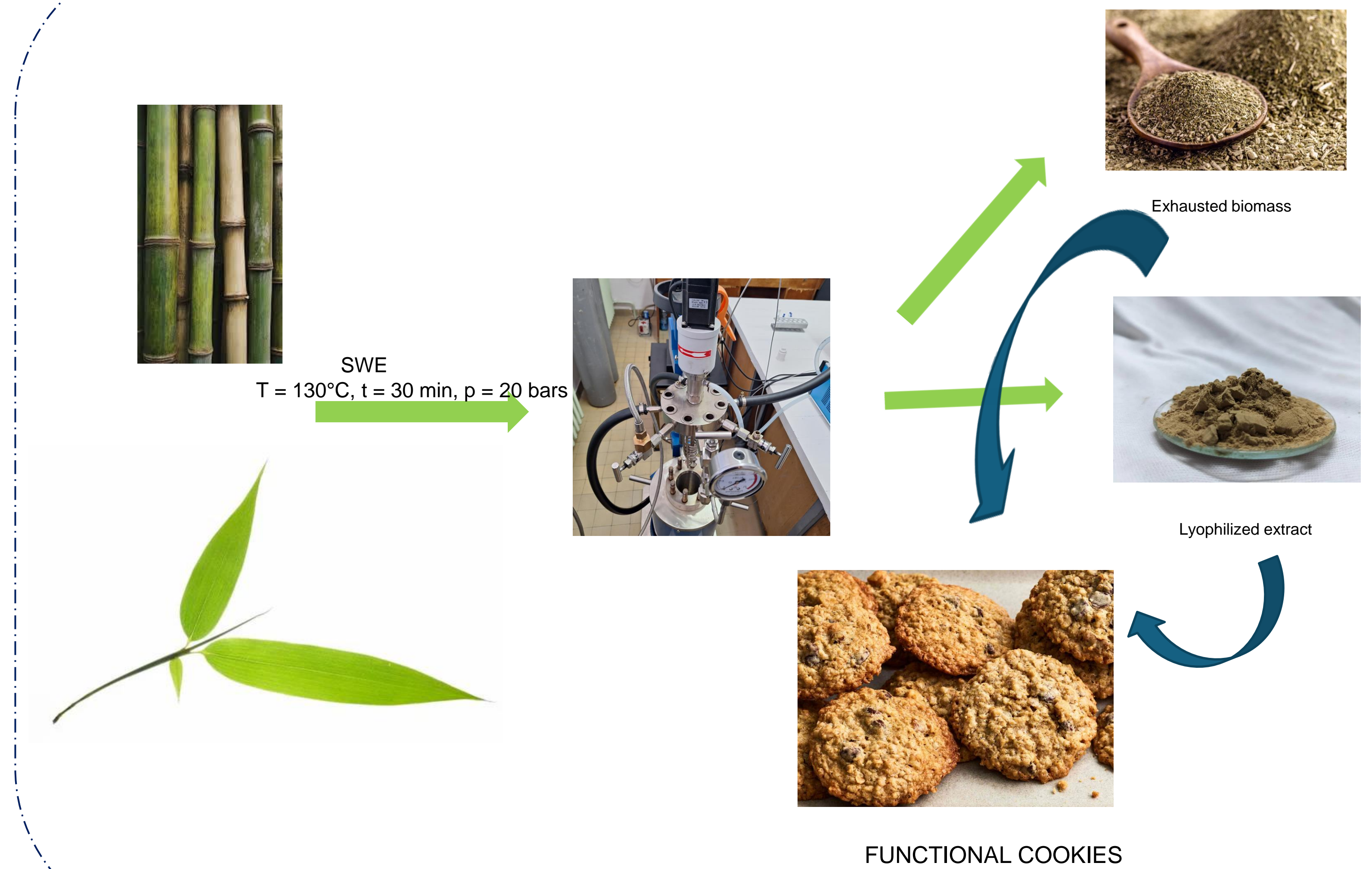
Development of wellness biscuits with prebiotic properties with exhausted bamboo biomass and extracts

INTRODUCTION

Bamboo is fast growing plant, having significant environmental contributions. Different parts of the plant, such as stalks, leaves and shoots, have different chemical composition. Phytonutrients from leaves and shoots are rich in phenolic acids, flavonoids, vitamin B2, and ascorbic acid, and exhibit anti-inflammatory and anti-microbial properties. Bamboo stalks are primarily composed of cellulose, hemicellulose, and lignin, with minor components being tannins, pigments, fats, and proteins.

Different parts of this fast growing plant can be used for different purposes. In this research bamboo stalk and leaves were treated with subcritical water (SWE) to extract bioactive compounds and to partially decompose matrix biopolymers. Cellulose and hemicellulose from stalk were partially hydrolysed, owing to high water reactivity in the subcritical state, yielding in more digestible dietary fibers with prebiotic properties. Partially hydrolysed biomass, exhausted by extraction, was used as an ingredient to formulate functional cookies, that were additionally enriched with bamboo leaves extracts, contributing to nutritional profile of the cookies.

MATERIALS & METHODS



RESULTS & DISCUSSION

Developed cookies included exhausted bamboo biomass, in which partial cellulose and hemicellulose hydrolysis took place, confirmed by total sugars analysis (14.77 ± 1.06 g/100 g dw). Cellulose hydrolysates, particularly cello-oligosaccharides, have gained attention for their potential as prebiotics. The hydrolysates obtained by subcritical water treatment, derived from bamboo stalk cellulose, can be used as a source of prebiotic fibers, benefiting gut health. Both stalk and leaves extracts exhibited good antioxidant and antiradical properties, with stalk extract (1554.17 ± 7.22 mg AAE/l) being more potent in comparison to leaves extract (712.5 ± 24.8 mg AAE/l). Cookies were formulated without sugar addition for wellness and health concept.

CONCLUSIONS

Prepared and baked cookies containing bamboo stalk biomass and bamboo extract were evaluated in respect to their sensory properties and likeliness to consumers.

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