

## **EVALUATION OF THE EFFECT OF POST-CONSUMER WASTE ON THE MECHANICAL PROPERTIES OF PRODUCED POLYETHYLENE-BASED BIOCOMPOSITES**

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There is a growing awareness of the need to manage waste generated in the food and catering industry. According to the Food and Agriculture Organization of the United Nations, billions of tons of post-consumer waste are generated worldwide (approximately 1.3 billion tons/year), which accounts for almost 30% of all food production. Organic waste such as coffee grounds, tea, fruit and vegetable peels, but also food leftovers account for about 50% of the total mass of municipal waste in many countries around the world. When sent to landfills, this waste decomposes, generating methane - a powerful greenhouse gas that further deepens the problem of climate change. The aim of the research was to investigate the potential of tea and coffee waste as fillers in polyethylene-based polymer biocomposites (LDPE, HDPE). Using a screw extruder, biopolymers containing 10 and 25% by weight of coffee and tea grounds, which were post-consumer waste from coffee shops, were produced. The resulting extrudates were crushed and then formed using the compression method with the participation of elevated temperature into samples for preliminary tests.

The density of the resulting materials, their hardness and impact strength were determined. The results of the preliminary tests determine the effect of waste addition on the mechanical properties of the produced biopolymers and may be useful for selecting groups of materials for further tests, such as water absorption or compressive and tensile strength. These results may contribute to reducing the amount of post-consumer waste generated in the food and catering industry, thus supporting sustainable development and a circular economy.