I. INTRODUCTION

1.1 Background

Indonesia and Thailand are the two major global producers of durian, with 1.35 and 1.11 million tonnes produced in 2021, respectively (Pibul & Jawjit, 2021; Statistics Indonesia, 2021). Despite major production and export volumes, studies have reported 67 to 70% agricultural waste from durian cultivation and consumption, with 20 to 25% of waste coming from the seeds and 30 to 40% being the husk (Kumoro et al., 2020). Studies have shown potential transformation of durian seeds into low glycemic index (GI) flour for Type 2 Diabetes Mellitus individuals (Ningsih et al., 2020; Tanyawangrat et al., 2022), filler ingredient in meatballs (Malini et al., 2016), or as a low-cost hydrocolloid (Amid & Mirhosseini, 2012).

Durian seeds, nevertheless, have been poorly utilized as an ingredient, given that direct consumption is avoided due to the presence of harmful cyclopropane fatty acids namely malvalic acid, dihydrosterculic acid, and sterculic acid (Djaeni & Prasetyaningrum, 2010; Kumoro & Hidayat, 2018). However, appropriate processing methods such as boiling has permitted a great starting point for a safe production of valuable ingredients from the seeds with great economic value (Ismail et al., 2010, as cited in Purnama et al., 2022). Starch and mucilage are two primary components that account for the primary components of durian seeds, therefore deeming durian seeds as a good source of starch (Tanyawangrat et al., 2022).

The extraction of starch from durian seeds, nonetheless, has not been widely carried out due to a relatively low starch extraction yield (<10%) attributed to an extensive absorption of water by the gums present in the seeds, resulting in a viscous suspension entrapping starch granules and hindering their release (Amid &

Mirhosseini, 2012; Tongdang, 2008). Pre-cooking durian seeds, therefore, facilitates a modification in the functional properties and stability of the seeds once transformed into a paste and eventually into powdered starch (Tanyawangrat et al., 2022). However, lack of studies reported the functional properties of treated durian seeds, including pasting properties, gelatinization temperature, swelling power and solubility, and the degree of syneresis. Therefore, this study aims to evaluate the functional properties and proximate composition of uncooked and precooked durian starches.

1.2 Research Objectives

The study aims to (1) evaluate the extraction yield of starch from uncooked and pre-cooked durian seed flour and (2) analyze the functional properties and proximate composition of the extracted durian seed starch from uncooked and pre-cooked durian seed flour.

1.3 Research Scope

In this study, durian seeds were processed into durian seed flour to facilitate the extraction of the starch components as a new source of unconventional starch. To do so, the study first divided raw durian seeds into two groups of uncooked and pre-cooked seeds prior to transforming the seeds into uncooked and pre-cooked seed flour. Starch was then extracted from both flours using the alkaline-steeping method. Given the expected differences in the properties of the starches extracted from the two types of flour, functional properties and proximate composition analysis were performed.

1.4 Research Hypothesis

H_0: The extraction yield of durian seed starch extracted from pre-cooked durian seed flour does not differ from that of the starch extracted from uncooked durian seed flour.

H_1: The extraction yield of durian seed starch extracted from pre-cooked durian seed flour differs from that of the starch extracted from uncooked durian seed flour.

H_0: The functional properties and proximate composition of durian seed starch extracted from pre-cooked durian seed flour does not differ from that of the starch extracted from uncooked durian seed flour.

H_1: The functional properties and proximate composition of durian seed starch extracted from pre-cooked durian seed flour differs from that of the starch extracted from uncooked durian seed flour.