

Produksi Mikoprotein *Ganoderma* sp. dan *Auricularia* sp. Menggunakan Medium *Whey* Kedelai Secara *Liquid State Fermentation*

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INTISARI

Mikoprotein merupakan sumber protein alternatif bergizi tinggi yang dihasilkan dari jamur. *Whey* kedelai, sebagai produk sampingan dari industri pengolahan kedelai, mengandung nutrisi penting seperti karbohidrat, protein, lemak, dan mineral, sehingga potensial sebagai medium untuk pertumbuhan jamur. Penelitian ini bertujuan untuk mengeksplorasi potensi *whey* kedelai sebagai medium dalam produksi mikoprotein melalui proses *liquid state fermentation* dan mengkarakterisasi sifat fisikokimia, nutrisi, dan mikrobiologis. *Ganoderma* sp. dan *Auricularia* sp. dipilih karena merupakan *edible mushrooms* dengan kandungan protein tinggi dan bernilai ekonomis tinggi di pasar global. Identifikasi molekuler pada wilayah rDNA menggunakan primer ITS1 dan ITS4. Mikoprotein diproduksi melalui fermentasi 100 mL medium *whey* kedelai dengan penambahan 10 mL prakultur jamur dari stok PDA, dan diinkubasi selama 7 hari pada 24°C dengan agitasi 120 rpm. Biomassa dipanen dan dipisahkan dengan fraksi cair, dianalisis untuk kadar protein total (metode Bradford) dan profil asam amino menggunakan HPLC, analisis mikrobiologis menggunakan metode *Total Plate Count* (TPC) dan keberadaan bakteri koliform. Hasil penelitian menunjukkan bahwa *Ganoderma* sp. berkerabat dekat dengan *G. lucidum* dan *Auricularia* sp. dengan *A. polytricha*. Produksi biomassa oleh *Ganoderma* sp. (2,26 g/L) dan *Auricularia* (8,31 g/L) menunjukkan pertumbuhan jamur selama proses fermentasi. Kadar protein total menunjukkan kandungan protein *Ganoderma* sp. biomassa ($708,27 \pm 38,61 \mu\text{g/mL}$) dan fraksi cair ($243,23 \pm 8,19 \mu\text{g/mL}$), *Auricularia* sp. biomassa ($801,43 \pm 46,14 \mu\text{g/mL}$) dan fraksi cair ($258,88 \pm 7,35 \mu\text{g/mL}$). Profil asam amino esensial tertinggi yaitu Leucine pada biomassa *Ganoderma* sp. ($3386,25 \pm 164,40 \text{ mg/L}$) dan *Auricularia* sp. ($3377,50 \pm 3,52 \text{ mg/L}$), pada fraksi cair dengan kadar peningkatan tertinggi yaitu Lycine pada *Ganoderma* sp. ($1787,38 \pm 15,02^{\text{a}} \text{ mg/L}$), dan *Auricularia* sp. ($854,13 \pm 16,08^{\text{c}}$). Total koloni mikroba dibawah Log 6,00 dan tidak ditemukan kontaminasi mikrobiologis dari kelompok koliform selama fermentasi mendukung keamanan mikrobiologis mikoprotein.

Kata Kunci: Mikoprotein, *Whey* Kedelai, *Ganoderma*, *Auricularia*, *Liquid State Fermentation*

Production of Mycoproteins of *Ganoderma* sp. and *Auricularia* sp. Using Soybean Whey Medium by *Liquid State Fermentation*

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ABSTRACT

Mycoprotein is a high-nutritional-value alternative protein source derived from fungi. Soy whey, a by-product of the soybean processing industry, contains essential nutrients such as carbohydrates, proteins, fats, and minerals, making it a potential medium for fungal growth. This study aimed to explore the potential of soy whey as a medium for mycoprotein production through liquid-state fermentation and to characterize its physicochemical, nutritional, and microbiological properties. *Ganoderma* sp. and *Auricularia* sp. were selected as representatives of edible mushrooms with high protein content and significant economic value in the global market. Molecular identification was performed on the rDNA region using ITS1 and ITS4 primers. Mycoprotein was produced by fermenting 100 mL of soy whey medium with the addition of 10 mL of fungal pre-culture from PDA stock and incubated for 7 days at 24°C with agitation at 120 rpm. The biomass was harvested and separated from the liquid fraction, then analyzed for total protein content (Bradford method), amino acid profile using HPLC, microbiological quality using the Total Plate Count (TPC) method, and the presence of coliform bacteria. The results showed that *Ganoderma* sp. is closely related to *G. lucidum* and *Auricularia* sp. to *A. polytricha*. Biomass production by *Ganoderma* sp. (2.26 g/L) and *Auricularia* sp. (8.31 g/L) indicated fungal growth during the fermentation process. Total protein content was observed in *Ganoderma* sp. biomass (708.2 µg/mL) and its liquid fraction (246.5 µg/mL), and in *Auricularia* sp. biomass (801.8 µg/mL) and its liquid fraction (157.2 µg/mL). The highest essential amino acid identified was leucine in the biomass of *Ganoderma* sp. (3386,25 ± 164,40 mg/L) and *Auricularia* sp. (3377,50 ± 3,52 mg/L). In the liquid fraction, the highest increase was found in lysine for *Ganoderma* sp. (1787,38 ± 15,02a mg/L) and *Auricularia* sp. (854,13 ± 16,08c). The total microbial colony count was below Log 6.00, and no coliform contamination was detected during fermentation, supporting the microbiological safety of the mycoprotein.

Keywords: Mycoprotein, Soy Whey, *Ganoderma*, *Auricularia*, *Liquid State Fermentation*