ABSTRAK

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PURIFIKASI PARSIAL ENZIM PAPAIN DALAM PEMBUATAN HIDROLISAT PROTEIN TEMPE KEDELAI HITAM SEBAGAI PENYEDAP RASA
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(xvi + 91 halaman, 25 gambar, 14 tabel, 16 lampiran)

Tempe yang dibuat dari kedelai hitam Mallika dapat difermentasi hingga 4 hari yang disebut sebagai tempe semangit sehingga memiliki kandungan asam glutamat yang tinggi. Enzim papain yang dipurifikasi parsial dapat ditambahkan pada hidrolisat tempe kedelai hitam untuk mendegradasi protein menjadi peptida rantai pendek maupun asam amino bebas khususnya yang memiliki atribut sensoris rasa umami. Tujuan dari penelitian adalah untuk menentukan fraksinasi ekstrak enzim papain kasar dari daun pepaya california terbaik, menentukan karakteristik fisikokimia hidrolisat protein tempe kedelai hitam terbaik, dan membandingkan secara sensoris dengan penyedap rasa MSG komersial. Penambahan amonium sulfat yang digunakan adalah 0%, 20%, 40%, 60%, dan 80%; waktu fermentasi 2, 3, dan 4 hari; serta konsentrasi penambahan enzim papain purifikasi parsial sebesar 0%, 0,5%, 1%, dan 1,5%. Hasil penelitian menunjukkan konsentrasi fraksinasi amonium sulfat 40% memberikan nilai aktivitas protease tertinggi (0,98 ± 0,04 U/mL). Hidrolisat protein tempe kedelai hitam dengan lama fermentasi 4 hari dan konsentrasi penambahan enzim papain purifikasi parsial 1% memberikan nilai kadar air basis kering (17,97 ± 0,46%), kadar asam glutamat (171,58 ± 5,72 mg/g), kadar protein terlarut (470,66 ± 19,50 mg/g), derajat hidrolisis (43,64 ± 1,99%), *lightness* (46,02 ± 0,97), dan berat molekul 13 kDa. Asam amino pemberi rasa umami memiliki kandungan yang tinggi seperti asam glutamat dan aspartat (59,89 ± 0,31 mg/g dan 26,47 ± 0,09 mg/g) serta asam amino esensial leusin (24,81 ± 0,05 mg/g). Karakteristik sensoris hidrolisat yang diuji pada 12 panelis terpilih menunjukkan nilai ambang batas *absolute threshold* (0,02%), *recognition threshold* (0,19%), dan *best estimation threshold* (0,11%). Penyedap rasa hidrolisat protein tempe kedelai hitam memiliki intensitas rasa umami dan pahit yang sama dengan MSG komersial sehingga dapat dimanfaatkan sebagai alternatif pengganti MSG komersial.

Kata Kunci : enzim papain, purifikasi, tempe, hidrolisat protein, penyedap rasa

Referensi : 77 (2005-2022)

ABSTRACT

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UTILIZATION OF PARTIALLY PURIFIED PAPAIN ENZYME IN BLACK SOYBEAN TEMPEH HYDROLYSATE AS UMAMI SEASONING POWDER

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Tempeh made from Mallika black soybean can be fermented for up to 4 days which is called “tempe semangit” so it has a high glutamic acid content. Partially purified papain enzyme can be added to the hydrolysates to degrade protein into short chain peptides and free amino acids which contribute to umami tastes sensory attributes. The aims of study were to determine the best ammonium sulphate fractionation of crude papain enzyme extracted from the leaf of papaya california variety, to determine the best physicochemical characteristics of black soybean tempeh protein hydrolysate, and to compare sensorically with commercial MSG flavorings. The addition of ammonium sulphate fractionation used were 0%, 20%, 40%, 60%, and 80%; fermentation time 2, 3, and 4 days; and the concentration of partially purified papain enzyme added were 0%, 0,5%, 1%, and 1,5%. The result showed that the 40% fractioned papain enzyme gave the highest protease activity value (0.98 ± 0.04 U/mL). The black soybean tempeh hydrolysates with 4 days fermentation and 1% partially purified papain enzyme added gave the value of dry basis moisture content (17.97 ± 0.46%), glutamic acid content (171.58 ± 5.72 mg/g), dissolved protein content (470.66 ± 19.50 mg/g), degree of hydrolysis (43.64 ± 1.99%), lightness (46.02 ± 0.97), and molecular weight (13 kDa). The umami flavoring amino acids are high in content such as glutamic and aspartic acids (59.89 ± 0.31 mg/g and 26.47 ± 0.09 mg/g) and the essential amino acid leucine (24.81 ± 0.05 mg/g). The sensory characteristics of the hydrolysate tested on 12 selected panels showed absolute threshold values (0.02%), recognition threshold (0.19%), and best estimation threshold (0.11%). The flavoring of black soybean tempeh protein hydrolysate has the same umami and bitter taste intensity as commercial MSG so that it can be used as an alternative to commercial MSG.

Keywords : papain enzyme, purification, tempeh, protein hydrolysate, umami seasoning

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