ABSTRACT

MYCOPROTEIN BIOMASS PRODUCTION WITH *Rhizopus oligosporus* FUNGI ON WASTEWATER OF TEMPEH INDUSTRY

By:

DANIEL REINHART TANUGRAHA

18/431478/TP/12334

Protein is one of the macronutrients which generally come from animal sources. However, animal proteins are considered to have an issue with health and environmental risk. Therefore, mycoprotein is produced as a new protein source that is expected to substitute animal-based protein products. Therefore, tempeh industrial wastewater is considered an alternative substrate that can be used to grow mycoprotein biomass as it is known that there are dissolved organic contents from the soaked and boiled soybean in the wastewater. The experiment was carried out by determining the best media to produce most biomass by growing *Rhizopus oligosporus* fungi 100 mL of first and second soaking and first soybean-soaking and second soybean-boiling based on the tempeh industry methods, then determining the best composition between the addition of yeast extract, minerals, a combination of yeast extract and mineral, and urea, and determining the most optimum condition of pH (4; 4,5; 5) and agitation speed (100 and 125 rpm). The result showed that the first soybean-boiling-based media produced the highest biomass production, as well as the highest sugar reduction and protein content, combined with yeast extract and mineral addition. It had the most optimum condition on pH 4 and agitation speed at 125 rpm.

Keywords: Biomass, mycoprotein, *Rhizopus oligosporus*, yeast extract, mineral, pH, agitation speed

INTISARI

PRODUKSI BIOMASSA MIKOPROTEIN DENGAN JAMUR *Rhizopus oligosporus* PADA MEDIA LIMBAH CAIR INDUSTRI TEMPE

Oleh:

DANIEL REINHART TANUGRAHA

18/431478/TP/12334

Protein merupakan salah satu makronutrien utama yang umumnya berasal dari sumber hewani. Namun, konsumen beralih dari protein hewani dengan mempertimbangkan faktor kesehatan dan lingkungan dihasilkan. Oleh karena itu, mikoprotein diproduksi sebagai sumber protein baru yang diharapkan dapat digunakan untuk mensubstitusi produk protein hewani. Oleh karena itu, limbah cair industri tempe dipertimbangkan sebagai substrat pertumbuhan mikoprotein karena diketahui terdapat kandungan organik yang terlarut dari proses perendaman dan perebusan kedelai. Percobaan ini dilakukan dengan menentukan tipe media terbaik dengan menumbuhkan jamur *Rhizopus oligosporus* ke dalam masing-masing 100 mL media air sisa perendaman pertama dan kedua serta air sisa perebusan kedelai pertama dan kedua sebagaiman dilakukan pada industri tempe, kemudian menentukan formulasi media terbaik di antara *yeast extract*, mineral, campuran *yeast extract* dan mineral, dan urea pada media air sisa proses produksi tempe terbaik, dan menentukan kondisi optimum yaitu di antara pH (4; 4,5; 5) dan kecepatan agitasi (110 dan 125 rpm). Diketahui dari percobaan ini bahwa media air sisa perebusan pertama menunjukkan jumlah biomassa, kadar protein, dan kadar gula tertinggi, ditambahkan dengan komposisi *yeast extract* dan mineral, dan kondisi pH 4 dan kecepatan agitasi 125 rpm.

Kata Kunci: Biomassa, mikoprotein, *Rhizopus oligosporus*, *yeast extract*, mineral, pH, kecepatan agitasi