

ABSTRAK

MOLASE SEBAGAI SUMBER MIKRO NUTRIEN PADA BUDIDAYA PHYTOPLANKTON *Nannochloropsis* sp., SALAH SATU ALTERNATIF PEMANFAATAN HASIL SAMPING PABRIK GULA

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Nannochloropsis sp. merupakan salah satu mikroalga laut dari jenis alga hijau yang mempunyai kandungan gizi tinggi, mudah tumbuh dalam berbagai kondisi lingkungan dan memiliki manfaat yang sangat besar. Salah satu kendala dalam kultur *Nannochloropsis* sp. adalah penggunaan media tumbuh yang mahal seperti media Guillard dan Conwy sehingga perlu dicari alternatif lain seperti penggunaan hasil samping pabrik gula yaitu molase yang lebih ekonomis karena selain ramah lingkungan, mudah diperoleh, lebih efektif dan efisien untuk media tumbuh tanaman.

Molase mengandung unsur hara, terutama mikro nutrisi dan *chelator agent* yang dibutuhkan untuk pertumbuhan *Nannochloropsis* sp. *Chelator agent* berfungsi untuk mengikat unsur hara sehingga bisa dimanfaatkan oleh *Nannochloropsis* sp. dan sangat berperan penting dalam proses penyerapan, transportasi, dan aktivitas metabolik beberapa kation esensial *trace element*. Sedangkan sumber Makro nutrisi berasal dari Urea dan TSP. Penelitian dilakukan di Laboratorium pakan alami, Balai Besar Pengembangan Budidaya Laut Lampung pada bulan Juli – Nopember 2011, dengan 7 perlakuan dan 4 ulangan. Perlakuan A (Dosis molase 0 ppm), B (3 ppm), C (5 ppm), D (7 ppm), E (10 ppm), F (12 ppm), dan G (Conwy).

Hasil analisis sidik ragam (ANOVA) menunjukkan bahwa jumlah sel populasi tertinggi dicapai oleh perlakuan E dengan kepadatan populasi $8717,25 \times 10^4$ sel/ml dan G sebesar 8205×10^4 sel/ml, Perlakuan B, C, D, dan F berkisar antara $7412,5 \times 10^4$ sel/ml - $7800,75 \times 10^4$ sel/ml. Kepadatan populasi terendah perlakuan A yaitu 6603×10^4 sel/ml. Waktu maksimum yang tercepat diperoleh perlakuan G yaitu 6 hari dan E yaitu 6,25 hari, perlakuan B, C, D dan F tidak berbeda nyata yaitu berkisar 7,25 – 7,50 hari dan terlama perlakuan A yaitu 8,25 hari. Nilai laju pertumbuhan spesifik tertinggi dihasilkan oleh perlakuan E yaitu sebesar 0,5716 sel/ml/hari, dan

terendah perlakuan A yaitu sebesar 0,3644 sel/ml/hari. Perlakuan B, C, D, dan F untuk laju pertumbuhan relatif sama (0,4493 – 0,4579 sel/ml/hari). Waktu generasi tercepat dicapai oleh perlakuan G yaitu mencapai 44,1867 jam dan E sebesar 45,137 jam, setelah itu pada perlakuan B, C, D, dan F relatif sama 51,099 - 52,065 jam dan waktu generasi terlama perlakuan A sebesar 56,442 jam. Kandungan gizi *Nannochloropsis* sp. tertinggi dicapai oleh perlakuan E ; protein 24,221 %, karbohidrat 37,898 % dan Lemak 4,126 % berat kering. Serapan CO₂ biomassa *Nannochloropsis* sp hasil penelitian sebesar 0,1607 mg

Hasil penelitian menunjukkan bahwa pemberian molase dalam media urea dan TSP pada kultur *Nannochloropsis* sp. berpengaruh nyata terhadap kepadatan populasi maksimum, Waktu maksimum, laju pertumbuhan spesifik, waktu penggandaan, dan kandungan gizi. Dosis molase sebanyak 10 ppm merupakan dosis yang paling efektif untuk mendukung pertumbuhan *Nannochloropsis* sp.

Kata Kunci : *Nannochloropsis* sp., Molase, Pertumbuhan, dan Kandungan Gizi

ABSTRACT

MOLASSES AS A SOURCE OF MICRO NUTRIENT ON PHYTOPLANKTON *Nannochloropsis* sp. CULTURE, ALTERNATIVE USE OF SUGAR MILL BY PRODUCT

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Nannochloropsis sp. is one of the marine microalgae species of green algae that have a high nutrient content, easy to grow in a wide range of environmental conditions and has a huge benefit. One of the problems in the culture of *Nannochloropsis* sp. is the use of expensive growth media such as media Guillard and Conwy. So need to look for other alternatives such as the use of the sugar mill byproduct of molasses, which is more economical because in addition to eco-friendly, easily available, more effective and efficient for plant growth media.

Molasses contains nutrients, especially micro-nutrients and chelator agent required for the growth of *Nannochloropsis* sp. Chelator agent serves to bind nutrients that can be used by *Nannochloropsis* sp. and the very important role in the process of absorption, transport, and metabolic activity of some essential trace element cations. While the source of macro nutrients derived from urea and TSP. Laboratory studies were conducted on natural food, Main Center for Marine Aquaculture Development Lampung in July - November 2011, with seven treatments and four replications. The treatment consisted of A (dose of molasses 0 ppm), B (3 ppm), C (5 ppm), D (7 ppm), E (10 ppm), F (12 ppm), and G (Conwy).

Results of analysis of variance (ANOVA) showed that the highest number of cells populations is achieved on treatment E, with a population density of 8717.25×10^4 cells / ml, followed by treatment of G at 8205×10^4 cells / ml, treatment B, C, D , and F ranges between 7412.5×10^4 cells / ml - 7800.75×10^4 cells / ml. The fastest time of the maximum obtained in the treatment of G and E which is 6 days and 6.25 days. Treatments B, C, D and F are not significantly different and it ranged from 7.25 to 7.50 days and the longest time obtained in the treatment of A is 8.25 days. The highest value of specific growth rate resulting in treatment E is equal to 0.5716 cells /

ml / day, and the lowest obtained in the treatment of A is equal to 0.3644 cells / ml / day. Treatment B, C, D, and F has the same relative growth rate (0.4493 to 0.4579 cells / ml / day). The most rapid generation time achieved on treatment G and E which is 44.1867 and 45.137 hours, followed by treatment B, C, D, and F are relatively similar from 51.099 to 52.065 hours and the longest obtained in treatment of A which amounted to 56.442 hours. The highest nutrient content of *Nannochloropsis* sp. is achieved by treatment of E which consists of 24.221% protein, 37.898% carbohydrates and 4.126% fats. CO₂ uptake of *Nannochloropsis* sp biomass in this study amounted to 0.1607 mg.

The results showed that the addition of molasses in urea and TSP medium for *Nannochloropsis* sp. culture significantly affect the maximum population density, the maximum time, specific growth rate, generation time, and nutrient content. Molasses dose of 10 ppm is the most effective dose to support the growth of *Nannochloropsis* sp.

Keywords: *Nannochloropsis* sp., Molasses, Growth, and Nutrition