PENGARUH *Arthrospira maxima* Setchell et Gardner DAN *Chlorella vulgaris* Beijerinck TERHADAP PROFIL LIPID DAN INDEKS LEMAK VISERAL TIKUS (*Rattus norvegicus* Berkenhout, 1769) GALUR WISTAR HIPERGLIKEMIA

Aprilia Rahmawati
15/381845/BI/09484
Dosen Pembimbing : Dra. Mulyati, M.Si.

ABSTRAK

Bebarapa tahun terakhir, mikroalga semakin diminati di bidang farmasetikal. *Arthrospira maxima* dan *Chlorella vulgaris* memiliki kandungan protein, karbohidrat, vitamin, antioksidan, asam lemak omega-3, dan beberapa mikronutrien lainnya. Kedua mikroalga ini memiliki potensi sebagai antidiabetik dan hipolipidemik. Penelitian ini bertujuan untuk mengevaluasi efek dari pemberian A. *maxima* dan C. *vulgaris* terhadap perubahan berat badan, profil ipid serum, kadar glukosa serum, dan indeks lemak viseral tikus pada induksi sindrom metabolik hiperglikemia. Dua puluh ekor tikus jantan dibagi menjadi 5 kelompok yaitu kontrol negatif (KN), kontrol positif hiperglikemia (KP), obat metformin (M), A. *maxima* (AR), dan C. *vulgaris* (CH). Seluruh kelompok, kecuali KN diinduksi hiperglikemia menggunakan STZ dosis rendah tunggal (30 mg/kg bb.) secara intraperitoneal. Administrasi mikroalga (2500 mg/kg bb.) dan metformin (10 mg/kg bb.) secara *oral gavage* selama 30 hari. Berat badan, kadar glukosa serum, dan indeks lemak viseral diukur dan dianalisis. Kadar kolesterol total, HDL, LDL, dan trigliserida diukur menggunakan metode enzimatik fotometrik. Pada akhir periode perlakuan, berat badan, kadar kolesterol total dan HDL pada kelompok mikroalga meningkat, tidak berbeda signifikan dengan kelompok kontrol. Kadar LDL meningkat signifikan dari H0, tidak berbeda signifikan antar kelompok. Kadar trigliserida dan glukosa serum kelompok mikroalga turun, tidak berbeda signifikan dengan kelompok kontrol. Indeks lemak viseral kelompok mikroalga lebih rendah daripada kontrol dan berbeda signifikan. Kesimpulan dari penelitian ini, pemberian mikroalga A. *maxima* dan C. *vulgaris* selama 30 hari cukup efektif untuk menurunkan kadar glukosa darah dan indeks lemak viseral, serta menjaga berat badan. Mikroalga juga berpotensi untuk memperbaiki profil lipid pada tikus hiperglikemia dengan meningkatkan kadar HDL dan menurunkan kadar trigliserida.

Kata kunci : *Arthrospira maxima, Chlorella vulgaris,* profil lipid, metformin, STZ, kadar glukosa serum, indeks lemak viseral

EFFECTS OF *Arthrospira maxima* Setchell et Gardner AND *Chlorella vulgaris* Beijerinck ON THE LIPID PROFILE AND VISCERAL FAT INDEX OF HYPERGLYCEMIA RATS (*Rattus norvegicus* Berkenhout, 1769) WISTAR STRAIN

Aprilia Rahmawati
15/381845/BI/09484
Supervisor : Dra. Mulyati, M.Si.

ABSTRACT

Recent years, demand of microalgae in pharmaceutical are increase. *Arthrospira maxima* and *Chlorella vulgaris* contain protein, carbohydrates, antioxidants, omega-3 fatty acids, and other micronutrients. Both of them have antidiabetic and hypolipidemic potentials. This study aimed to evaluate the effect of A. *maxima* and C. *vulgaris* administration to body weight, serum lipid profile, serum glucose levels, and visceral fat index alteration in hyperglycemic rats. Twenty male rats were divided into 5 groups i.e. negative control (NC), hyperglycemic control (HC), metformin (M), A. *maxima* (AR), and C. *vulgaris* (CH). All groups were induced by single low dose of streptozotocin (30 mg/kg b.w.) intraperitoneally, except NC group. Microalgae (2500 mg/kg b.w.) and metformin (10 mg/kg b.w.) were administrated orally for 30 days. Body weight, serum glucose level, and visceral fat index were measured and analyzed. Total cholesterol, HDL-C, LDL-C, and triglyceride levels were measured using the photometric enzymatic method. At the end of treatment period, body weight, total cholesterol and HDL levels in microalgae groups increased, not significantly different to control group. LDL levels increased significantly from day 0, not significantly different between groups. The triglyceride and glucose serum levels of microalgae groups decreased and not significantly dirrefent to control groups. The visceral fat index of NC group was higher than the microalgae group and significantly different. In conclusion, the administration of microalgae A. *maxima* and C. *vulgaris* for 30 days are effective enough to reduce blood glucose levels, visceral far index, and maintain body weight. Microalgae also has the potential to improves lipid profile of hyperglycemic rats by increasing HDL-C levels, decreasing triglyceride

Keywords: *Arthrospira maxima*, *Chlorella vulgaris*, lipid profile, metformin, streptozotocin, serum glucose levels, visceral fat index.