

ABSTRAK

Diabetes mellitus (DM) merupakan gangguan metabolisme yang ditandai dengan tingginya kadar glukosa darah (*hiperglikemia*) akibat kerusakan sel β pankreas sehingga menyebabkan produksi insulin berkurang atau menurunnya sensitifitas reseptor insulin. *Tithonia diversifolia* merupakan salah satu tumbuhan yang berpotensi menurunkan kadar glukosa darah. Secara anatomi, daun *T. diversifolia* memiliki 2 jenis trikoma yaitu trikoma glandular dan non glandular. trikoma non glandular berfungsi mencegah serangan dari luar dan trikoma glandular menyimpan produk metabolit sekunder seperti terpenoid, tanin, fenol dll. Tujuan: mengetahui perbedaan struktur anatomi daun *T. diversifolia* muda dan dewasa, mengetahui kerapatan trikoma dan stomata pada daun muda dan dewasa, mengetahui senyawa yang terkandung pada ekstrak rebusan daun *T. diversifolia*, mengetahui pengaruh ekstrak rebusan terhadap penurunan glukosa darah dan mengetahui ekstrak rebusan yang paling efektif untuk menurunkan kadar glukosa darah. Pengamatan anatomi dilakukan pada preparat awetan dan preparat segar. Penelitian menggunakan Rancangan Acak Lengkap (RAL). Tikus putih (*Rattus norvegicus*) Berkenhout, 1769) pada penelitian ini sebanyak 16 ekor yang dibagi menjadi 6 kelompok yaitu: (1) Kontrol Normal, (2) Kontrol STZ, (3) Kontrol Perlakuan, (4) Perlakuan I diberi ekstrak rebusan daun muda, (5) Perlakuan II diberi ekstrak campuran rebusan daun muda+dewasa, (6) Perlakuan III diberi ekstrak rebusan daun dewasa. Kelompok tikus Kontrol STZ, Perlakuan I, II dan III diinduksi STZ 65 mg/KgBB. Daun yang digunakan untuk rebusan adalah urutan 1-6 dari pucuk, sedangkan untuk pengamatan anatomi daun urutan 1, 3 dan 5. Analisis kandungan senyawa ekstrak rebusan daun *T. diversifolia* menggunakan spektrofotometer visible (analisis tanin, fenol dan flavonoid) dan GC-MS (analisis terpenoid). Hasil pengamatan anatomi menunjukkan kerapatan trikoma glandular paling tinggi terdapat pada daun muda sedangkan kerapatan trikoma glandular paling tinggi ditemukan pada daun dewasa. Kerapatan stomata paling tinggi ditemukan pada daun muda. Ekstrak rebusan daun mengandung tanin, flavonoid dan fenol, sedangkan terpenoid tidak terdeteksi. Ekstrak rebusan daun berpengaruh terhadap penurunan kadar glukosa darah tikus DM terutama rebusan daun dewasa yang menurunkan kadar glukosa darah mencapai 71,16 %. Daun *T. diversifolia* terbukti mampu menurunkan kadar glukosa darah.

Kata kunci: *Tithonia diversifolia*, Trikoma, Senyawa Biokimia, STZ, DM.

ABSTRACT

Diabetes mellitus (DM) is a metabolism disorder which is indicated by increasing blood glucose levels (*hiperglikemia*) result from the disorder of pancreas cell β so that it causes the insulin product decrease or decline the sensitivity of insulin receptor. *Tithonia diversifolia* is one of plants that can potentially decrease blood glucose levels. Anatomically, *T. diversifolia* leaves have 2 trichome types; glandular and non glandular one. Non glandular trichome has function to prevent the outsider damage and glandular one to store some secondary metabolism such as terpenoid, tanin, fenol, etc. The aims of this research are to know the difference of anatomy structure of young and adult *T. diversifolia* leaves, to identify the density of trichome and stomata in young and adult leaves, to clarify the types of chemical compound of decoction extract of *T. diversifolia* leaves, find out the effect of decoction extract on blood glucose level decrease, and to examine the most effective of the extract decoction to decrease the levels of blood glucose. The anatomy observation was done on the well-preserved and fresh preparat. This research used Rancangan Acak Lengkap (RAL) or Completely Random Design. *Rattus norvegicus* Berkenhout, 1769 used in this research are 16 which are divided into 6 groups. The groups are (1) Normal Control, (2) STZ Control, (3) Treatment Control, (4) Treatment I given young leaves decoction extract, (5) Treatment II given mixed (young and adult leaves) decoction extract, and (6) Treatment III given adult leaves decoction extract. The group of STZ Control mice, treatment I, II and III were induced by STZ 65 mg/Kg weight. The leaves used for decoction were 1st – 6th young ones, whereas for the anatomy observation were 1st, 3rd and 5th. The analysis of chemical compound in the decoction extract of *T. diversifolia* leaves is by using visible spectrophotometer (to analyze tanin, fenol, and flavonoid) and GC-MS (terpenoid analysis). The observation result shows that the density of glandular trichome highest was found in young leaves. On the other side, the density of glandular trichome was found in mostly in adult leaves. The stomata density was mostly found in young leaves. The extract decoction contains tanin, flavonoid and phenol, whereas terpenoid was not identified. The decoction extract gave effect on the decrease of blood glucose levels of DM Mice up to 71.16 %. *T. diversifolia* leaves was proved that they can decrease blood glucose levels.

Keyword: *Tithonia diversifolia*, Trichome, Biochemical compound, STZ, DM.