

INTISARI

ISOLASI SENYAWA METABOLIT SEKUNDER ANTIHIPERGLIKEMIK DARI BIJI MAHONI (*Swietenia macrophylla*, King)

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Biji mahoni secara empiris digunakan untuk pengobatan tradisional antara lain sebagai obat kencing manis. Beberapa penelitian menyebutkan bahwa biji mahoni efektif sebagai antihiperglikemik. Berdasarkan penelusuran literatur dan jumlah publikasi yang ada, ternyata belum ada penelitian yang menyebutkan senyawa yang memiliki aktivitas antihiperglikemik dari biji mahoni. Kenyataan tersebut mendorong peneliti melakukan penelitian tentang senyawa yang bertanggung jawab terhadap sifat antihiperglikemik tersebut. Penelitian ini bertujuan melakukan kajian fitokimia biji mahoni (*Swietenia macrophylla*, King) dan menentukan aktivitas antihiperglikemik dari senyawa yang berhasil diisolasi.

Kajian fitokimia terhadap biji mahoni dilakukan dengan cara mengisolasi senyawa metabolit sekunder. Sebanyak 3000 g serbuk biji mahoni dimaserasi menggunakan pelarut *n*-heksana selama 3 x 24 jam. Ekstrak *n*-heksana kemudian dievaporasi menggunakan evaporator Buchii sampai pelarut hilang dan diperoleh minyak biji mahoni. Ampas biji mahoni bebas minyak dimaserasi dengan metanol selama 3 x 24 jam. Ekstrak kering metanol diidentifikasi kandungan senyawanya dan dilakukan pemisahan dengan cara kromatografi vakum cair dan kromatografi kolom gravitasi. Elusidasi struktur dilakukan menggunakan spectrometer IR, UV, dan GC. Uji aktivitas senyawa hasil isolasi terhadap penurunan kadar glukosa darah tikus putih (*Rattus novvergicus*) menggunakan metode pembebanan glukosa. Sebagai kontrol negatif dengan pemberian aquades, dan kontrol positif dengan pemberian glibenklamida.

Hasil identifikasi kualitatif menunjukkan bahwa ekstrak metanol mengandung senyawa flavonoid, alkaloid, dan saponin. Berdasarkan elusidasi struktur, ekstrak metanol diduga mengandung satu senyawa flavonoid yaitu 7-hidroksi-2-(4-hidroksi-3-metoksi-fenil)-kroman-4-on), tiga buah senyawa alkaloid yaitu 3,6,7-trimetoksi-4-metil-1,2,3,4-tetrahidro-isoquinolin; 3,4,5,6,7-pentaetil-1-metoksi-1*H*-indazol, dan 5-etil-6-metoksimetil-2-metil-1,2-dihidro-piridin; serta satu senyawa saponin yaitu 1,4-Bis-(3,4,5-trimetoksi-fenil)-tetrahidro-furo(3,4-c)furan. Hasil penelitian secara keseluruhan menunjukkan bahwa flavonoid, alkaloid, dan saponin dari biji mahoni memiliki aktivitas antihiperglikemik.

Kata kunci: biji mahoni, metabolit sekunder, antihiperglikemik

ABSTRACT

ISOLATION OF ANTIHYPERGLYCEMIC SECONDARY METABOLITE COMPOUNDS FROM MAHAGONY SEED ((*Swietenia macrophylla*, King)

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Mahagony seeds (*Swietenia macrophylla*, King) empirically have been used for traditional medicine as such as diabetes mellitus. The extraction of mahagony seeds is essential to isolate the antihyperglycemic active compounds such as alkaloids, flavonoids, and saponins. This research aimed to study phytochemical screening of isolated compounds of mahagony seeds extract and further evaluation of its antihyperglycemic activity.

Phytochemical studies on the mahagony seeds was done by macerated a total of 3000 g of mahagony seeds powder by using *n*-hexane followed by methanol each for three days. Each fraction was evaporated and gained dry mahagony extracts. The dry extracts were screened to identify the physical, optical and phytochemical activities for the presence of alkaloids, flavonoids, saponins, terpenoids, and steroids, and separation by liquid vacuum chromatography and column chromatography. The structure elucidation of the extracts were performed by FTIR, UV-Vis spectrometer and GC-MS. The glucose tolerance test was used to know the activity of isolated compounds to decreased blood glucose levels in white male Wistar rats (*Rattus novergicus*). Glibenclamide was used for the positive control and distilled water was used for negative control. Blood samples were taken at 30, 60, 90, 120 and 150 minutes after the injection of the substances. Data collection was performed by measuring the UV absorption at λ 630 nm against blood serum test animals before and after glucose loading.

Methanol extract was obtained as 355 g of brown solid with 207 °C of melting point. Phytochemical screening for methanol extract was tested and shown positive result for alkaloids, flavonoids, and saponins. Structure elucidation of methanol extract identified the presence of flavonoids: 7-hydroxy-2-(4-hydroxy-3-methoxy-phenyl)-chromen-4-one), three alkaloids: 3,6,7-trimethoxy-4-methyl-1,2,3,4-tetrahydro-isoquinoline; 3,4,5,6,7-pentaethyl-1-methoxy-1H-indazole; 5-ethyl-6-methoxymethyl-2-methyl-1,2-dihydro-pyridine and saponin : 1,4-Bis-(3,4,5-trimethoxyphenyl)-tetrahydro-furo(3,4-c)furan. The overall study results showed that the flavonoid, alkaloid, and saponin have the antihyperglycemic activity.

Keywords: mahagony seeds, secondary metabolite, antihyperglycemic