SKRINING SENYAWA METABOLIT SEKUNDER EKSTRAK RUMPUT MUTIARA (*Hedyotis Corymbosa* (L.) Lamk.) DENGAN METODE GC-MS

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ABSTRACT

The research was conducted aimed at exploring the potential of plant secondary metabolites "Mutiara" grass (*Hedyotis corymbosa* (L.) Lamk.) extracts. This study is expected to provide more complete information on the potential use of the plant as a traditional medicine. Identify the components of secondary metabolites was conducted using Gas Chromatograph Mass Spectrometri (GCMS). GCMS results showed that 20 compounds derived from the group of flavanols, monoterpenes, triterpenes, cycloterpenes, sesquiterpenes, phenolics, organic acids, flavones. Compounds that identified were: catechol, camphene, limonene, myrcene, pinene, camphor, cineole, geraniol, citronellol, gallic acid, ascorbic acid, β caryophyllene, β elemene, β farnesene, β selinene, apigenin, kaempferol, luteolin, catechin, betulinic acid. Some of the important functions of compounds were antioxidant, antibacterial, antiinflammatory, anticancer, antitumor, antileukemic, hepatoprotector, antiallergic, expectorant, hypoglycemia, hipocholesterolemic, antitussive, analgesic, chemoprotective agent.

Key words: extract, "mutiara grass", GCMS, secondary metabolite

PENDAHULUAN

Rumput mutiara (*Hedyotis corymbosa* (L.) Lamk.) merupakan salah satu tanaman berkhasiat obat. Tanaman ini digunakan untuk mengobati penyakit kanker di daerah Cina, India, dan wilayah Asia Tenggara. Rumput mutiara di Cina dikenal dengan sebutan *shui xian cao*, penggunaannya sebagai obat penyakit kanker limfosarcoma, lambung, nasophar, cervix, kanker payudara, rektum dan *fibrosarcoma*. Rumput mutiara disamping juga sebagai antiradang diuretik, menghilangkan demam, antitoksin, mengaktifkan sirkulasi darah dan memperlancar sumbatan sperma serta meningkatkan daya fagositosis sel darah putih, imunitas hormonal, hepatitis, cholecytitis, radang panggul dan infeksi saluran kemih, tekanan darah tinggi, tonsilis, bronchitis dan radang usus buntu (Sirait, 2014). Bagian tanaman yang digunakan adalah seluruh tanaman, yaitu bagian daun, batang dan juga akar.

Hedyotis corymbosa memiliki sinonim yaitu *Oldenlandia corymbosa*. Beberapa nama daerah dari rumput mutiara adalah rumput siku-siku, lidah ular, bunga telor belungkas (Indonesia), daun mutiara, rumput mutiara (Jakarta), katepan, urek-urek polo (Jawa), pengka (Makasar), pucuk pulung (Kalimantan Barat), *shui xian cao* (Cina) (Wijayakusuma *et al*., 1992; Depkes RI, 1995; Andriani, 2012). Tanaman ini termasuk kelas *Magnoliopsida*, famili *Rubiaceae*, tergolong terna, tumbuh rindang berserakan dan mempunyai banyak percabangan, batang bersegi, agak lemah, tinggi tanaman sekitar 15 – 50 cm. Daun relatif kecil silang berhadapan, tangkai daun pendek/hampir duduk. Bentuk daun lanset, panjang daun sekitar 2-5 cm, warna hijau muda, ujung daun runcing berambut pendek, pangkal menyempit, tepi rata, tulang daun satu di tengah. Bunganya majemuk 2-5, keluar dari ketiak daun, bentuk bunga seperti payung berwarna putih, tangkai bunga induk keras seperti kawat, dan panjang 5-10 mm. akarnya merupakan akar tunggang dengan garis tengah rata-rata 1 mm dengan akar cabang berbentuk benang. Buahnya bulat kecil-kecil jika telah cukup tua bijinya berwarna cokelat dengan ujung pecah-pecah

(Wijayakusuma *et al*, 1992).

Penelitian yang berkaitan dengan pemanfaatan rumput mutiara (*Hedyotus corymbosa*) dalam bidang farmasi dan kesehatan telah banyak dilakukan diantaranya, uji total flavonoid (Lumbessy, 2013), uji toksisitas (Tholib, 2006; Ruwaida, 2010), aktivitas sitotoksik (Churiyah *et al*, 2011), aktivitas antioksidan (Endrini, 2011; Churiyah *et al*, 2011), aktivitas antibakteri (Mukmilah dkk, 2012), efek antiartritis (Andriani, 2012), efek antikarsinogenik (Febia, dkk., 2005; Sukamdi dkk., 2010; Endrini, 2011; Sirait, 2014), serta aktivitas fagositosis makrofag mencit (Azenda , 2006).

Namun demikian informasi yang berkaitan dengan kandungan senyawa metabolit sekunder yang terdapat pada tanaman rumput mutiara belum tersedia. Berdasarkan latar belakang tersebut, penelitian ini bertujuan untuk mengetahui, mengidentifikasi dan mengklasifikasi jenis-jenis senyawa metabolit sekunder yang terkandung pada rumput mutiara (*H. corymbosa*) dengan menggunakan metode *Gas Chromatograph – Mass Spectrometry* (GCMS).

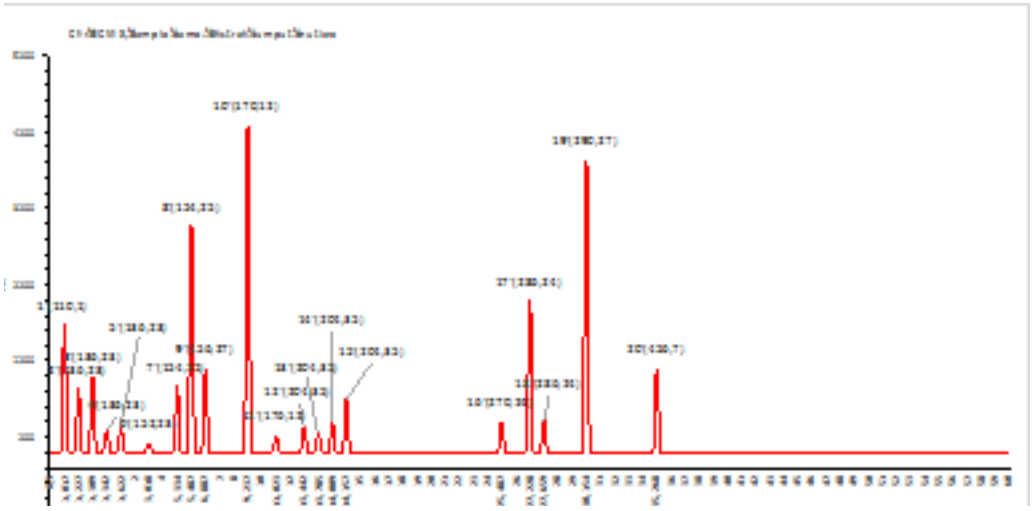
METODE

Penelitian dilakukan pada bulan Nopember sampai dengan Desember 2016.

Sampel tanaman diambil dari kebun milik Balai Materia Medica Batu dalam bentuk segar. Setelah dibersihkan, sampel tanaman diproses ekstraksi untuk mendapatkan ekstrak pekat. Selanjutnya dilarutkan dengan heksana untuk didapatkan fase heksana. Setelah dilakukan proses penguapan heksana, maka dilanjutkan dengan injeksi pada GCMS. Sebanyak 1 µl sampel diinjeksikan pada alat GCMS Shimadzu GCMS QP 2010 SE dengan kolom ZB-AAA Phenomenex Inc, dengan gas helium, suhu 110 sampai dengan 320°C, tekanan konstan pada 15 kPa, mode scan, waktu 60 menit, laju aliran 0,6 ml/menit. Pemindai bobot molekul kisaran 45-600 (m/z). Hasil analisis berupa grafik yang berisi titik puncak tiap senyawa yang ditentukan dengan bobot jenis dan perpustakaan dari GCMS.

HASIL DAN PEMBAHASAN

Hasil identifikasi senyawa metabolit sekunder yang terkandung dalam ekstrak rumput mutiara dengan GCMS tersaji dalam grafik (Gambar 1). Grafik GCMS terlihat bahwa terdapat 20 senyawa yang terdeteksi sampel ekstrak rumput mutiara, sedangkan resume hasil GCMS sampel ekstrak rumput mutiara ditampilkan pada Tabel 1.



Gambar 1. Grafik GCMS Identifikasi Senyawa Metabolit Sekunder pada Ekstrak Rumput

Tabel 1. Resume Hasil GCMS Sampel Ekstrak Rumput Mutiara

No Titik Puncak	Komposisi (%)	Bobot Molekul	Rumus Molekul	Nama Senyawa
1	7,239	110,1	$C_6H_6O_2$	Catechol
2	3,559	136,23	$C_{10}H_{16}$	Camphene
3	4,319	136,23	$C_{10}H_{16}$	Limonene
4	1,247	136,23	$C_{10}H_{16}$	Myrcene
5	1,425	136,24	$C_{10}H_{16}$	Pinene
6	0,474	152,23	$C_{10}H_{16}O$	Camphor
7	3,755	154,25	$C_{10}H_{18}O$	Cineole
8	12,876	154,25	$C_{10}H_{28}O$	*Geraniol*
9	4,719	156,27	$C_{10}H_{20}O$	Citronellol
10	18,583	170,12	$C_7H_6O_5$	*Gallic* acid
11	0,910	176,12	$C_6H_8O_6$	Ascorbic acid
12	1,428	204,35	$C_{15}H_{24}$	β Caryophyllene
13	1,203	204,35	$C_{15}H_{24}$	β Elemene
14	1,731	204,35	$C_{15}H_{24}$	β Farnesene
15	3,030	204,35	$C_{15}H_{24}$	α Selinene
16	1,726	270,24	$C_{15}H_{10}O_5$	*Apigenin*
17	8,620	286,24	$C_{15}H_{10}O_6$	*Kaempferol*
18	1,778	286,24	$C_{15}H_{10}O_6$	*Luteolin*
19	16,616	290,27	$C_{15}H_{14}O_6$	*Catechin*
20	4,761	456,7	$C_{30}H_{48}O_3$	*Betulinic acid*

Tabel 1 menunjukkan bahwa dari ke-20 senyawa yang terdeteksi, tiga senyawa dengan komposisi tertinggi secara berturut-turut adalah adalah *gallic acid* 18,583%, *catechin* 16,616% dan *geraniol* 12,876%. Sedangkan tiga senyawa dengan komposisi terendah adalah β *elemene* 1,203%, *ascorbic acid* 0,910% dan *camphor*, yakni 0,474%. Berdasarkan kajian literatur yang dilakukan, didapatkan beberapa fungsi penting senyawa-senyawa yang terkandung pada ekstrak rumput mutiara (Tabel 2). Tanaman rumput mutiara dalam bentuk sediaan ekstrak mempunyai khasiat yang cukup banyak dan penting dalam bidang farmasi. Hal tersebut menunjukkan bahwa rumput mutiara mempunyai potensi yang besar untuk dikembangkan menjadi obat herbal yang bermanfaat dan dalam produksi yang lebih maju.

Tabel 2. Fungsi Penting Senyawa Metabolit Sekunder Ekstrak Rumput Mutiara

No Titik Puncak	Nama Senyawa	Golongan	Fungsi
1	Catechol	Flavanol	Antikanker (Nair, *et al*, 2009), Antioksidan (Justino, *et al*, 2006), Antitumor (Nair, *et al*, 2009),
2	Camphene	Monoterpena	Antioksidan (Tiwari, *et al*, 2009), Hipokolesterolmia (Vallianou, *et al*, 2011)
3	Limonene	Sikloterpena	Antiasetilkolinesterase (Aazza, *et al*, 2011) Antiasma (Tanaka dan Takahashi, 2013), Antibakteri (Bevilacqua, 2010), Anti kanker (Gould, 1997), Antiinflamasi (d'Alessio, *et al*, 2013), Imunomodulator (Astani, *et al*, 2014)

4	Myrcene	Monoterpena	Antibakteri (Gonzaga, *et al*, 2003), Antinosiseptif (Rao, *et al*, 1990), Kemopreventif (Esmaelli, *et al*, 2011), Analgesik (Lorenzett, *et al*, 1991), Antikonvulsan (Viana, *et al*, 2000), Antioksidan (Ciftci, *et al*, 2011)
5	Pinene	Monoterpena	Ekspektoran (Schmitt, *et al*, 2009), Antibakteri (Silva, *et al*, 2012)
6	Camphor	Monoterpena	Analgesik (Xu, *et al*, 2005), Antidiare (Hamidpour, *et al*, 2014), Dekongestan (Xu, *et al*, 2005), Ekspektoran (Zuccarini, *et al*, 2009)
7	Cineole	Monoterpena	Anastesi (Zalachoras, *et al*, 2010), Antitusif (Laude, *et al*, 1994), Anti helmintikum (Taur, *et al*, 2010), Dekongestan (Takaishi, *et al*, 2012)
8	Geraniol	Monoterpena	Antitumor (Tiwari, *et al*, 2009), Antibakteri (Pattnaik, *et al*, 1997), Anti TBC (Soto, *et al*, 2014)
9	Citronellol	Monoterpena	Antibakteri (Pattnaik, *et al*, 1996)
10	Gallic acid	Fenolat	Antialergi (Liu, *et al*, 2013), Antibakteri (Borges, *et al*, 2013), Antikanker (Faried, *et al*, 2007), Antiinflamasi (Kou, *et al*, 2008), Insulin-sparing (Doan, *et al*, 2015), Analgesik (Krogh, *et al*, 2000), Antiasma (Dorsch, *et al*, 1992), Antibronkitis (Ow, *et al*, 2003) , Antihepatotoksik (Hoffman, *et al*, 1992), Antioksidan (Kim, 2007)
11	Ascorbic acid	Asam organik	Analgesik (Zeraati, *et al*, 2014), Antipenuaan dini (Fitzpatrick, *et al*, 2002), Antialergi (Gonzalez, *et al*, 1979), Antiartritik (Singh, *et al*, 2011), Antibakteri (Myvrik dan Volk, 1954), Antikatarak (Fujiwara, *et al*, 1991), Antidepresan (Binfare, *et al*, 2009), Antidiabetes (Alper, *et al*, 2006), Antihepatitis (Tepe, 2008), Antihistamin (Johnston, *et al*, 1992), Antiinflamasi (Sorice, *et al*, 2014), Antiobesitas (Adumosu, *et al*, 1979), Antioksidan (Pdayatty, *et al*, 2003), Antirematik (Massell, *et al*, 1950), Antitumor (Chuang, *et al*, 2007), Kardioprotektor (Swamy, *et al*, 2011), Hipokolesterolmia (Ginter, *et al*, 1978), Hipoglikemia (Ceriello, *et al*, 2013),
12	β Caryophyllene	Seskuiterpena	Antioksidan (Dahham, *et al*, 2015), Antibakteri (Dahham, *et al*, 2015), Antiinfamasi, Antitumor (Dahham, *et al*, 2015), Antiulcer (Legault, *et al*, 2007), Pelindung saluran pencernaan (Soheil, *et al*, 2009)
13	β Elemene	Seskuiterpena	Antikanker (Li, *et al*, 2013)
14	β Farnesene	Seskuiterpena	Antioksidan (Turkez, H, *et al*, 2014)
15	α Selinene	Seskuiterpena	Ekspektoran (Khokra, *et al*, 2008)
16	Apigenin	Flavon	Antibakteri (Nayaka, *et al*, 2014), Antiherpes (Lyu, *et al*, 2005), Antileukimia (Budhraja, *et al*, 2012), Antimetastatic, Antitumor (Budhraja, *et al*, 2012; Lefort, *et al*, 2011), Apoptosis (Budhraja, *et al*, 2012) Antialergen, Antiinflamasi (Lee, *et al*, 2007) ,
17	Kaempferol	Flavonol	Anticancer (Kim, *et al*, 2013), Antiinflamasi (Goel, *et al*, 1988, Mediavilla, *et al*, 2007), Antiulcer (Goel, *et al*, 1988), Hepatoprotective (Shakya, *et al*, 2014),
18	Luteolin	Flavon	Antileukimia (Chiang, *et al*, 2003), Antiinflamasi (Chen, *et al*, 2014), Antitumor (Lu, *et al*, 2015), Kemoprotektor (Manju, *et al*, 2005)
19	*Catechin*	Flavanol	Antiendotoksik (Hingdon, *et al*, 2003), Antihistamin (Hodnett, *et al*, 1972), Antiinflamasi (Hingdon, *et al*, 2003), Antioksidan (Hingdon, *et al*, 2003), Antihepatitis (Hingdon, *et al*, 2003), Antihiperlipidemia (Choi, *et al*, 1991), Antileukimia (Chiang, *et al*, 2003, Papiez, *et al*, 2010), Antiulcer (Hamaishi, *et al*, 2006),
20	Betulinic acid	Triterpena	Antibakteri (Fontanay, *et al*, 2008), Antikanker (Mullauer, *et al*, 2010), Antiinflamasi (Costa, *et al*, 2014), Antileukimia (Chiang, *et al*, 2003, Kumar, *et al*, 2010)

Terdapat tiga senyawa pada rumput mutiara dengan komposisi tertinggi secara berturut-turut yaitu *Gallic Acid* 18,583%; *Catechin* 16,616% dan *Geraniol* 12,876%. Berdasarkan hasil GC-MS senyawa *Gallic Acid* terdapat pada no titik puncak 10, dengan bobot molekul 170,12 dan memiliki rumus molekul C7H6O5 serta terklasifikasi pada golongan Fenolat. Menurut kajian referensi, golongan ini memiliki beberapa fungsi yaitu antialergi (Liu, *et al*., 2013), antibakteri (Borges, *et al*., 2013), antikanker (Faried, *et al*., 2007), antiinflamasi (Kou, *et al*., 2008), insulin-sparing (Doan, *et al*., 2015), analgesik (Krogh, *et al*., 2000), antiasma (Dorsch, *et al*., 1992), antibronkitis (Ow and Stupans, 2003), antihepatotoksik (Hoffmann-bohm, *et al*., 1992), dan antioksidan (Kim, 2007). Senyawa dengan komposisi tertinggi kedua adalah *Catechin* yang terdapat pada no titik puncak 19. Bobot molekul *Catechin* yaitu 290,27 dengan rumus molekul C15H14O6 dan terklasifikasi pada golongan Flavanol. Fungsi golongan ini adalah antihistamin (Johnston, *et al*., 1992), antiinflamasi (Mediavilla, *et al*., 2007), antioksidan (Higdon and Frei, 2003), antihepatitis (Shakya, *et al*., 2014), antihiperlipidemia (Choi, *et al*., 1991), antileukimia (Chiang, *et al*., 2003), (Papiez, *et al*., 2010), dan antiulcer (Hamaishi, *et al*., 2006).

Selanjutnya *Geraniol* merupakan senyawa dengan urutan ketiga yang terdapat pada no titik puncak 8, bobot molekul 154,25, rumus molekul C10H28O dan terklasifikasi pada golongan Monoterpena. Hasil kajian referensi menunjukkan bahwa golongan Monoterpena memiliki beberapa fungsi yaitu antitumor)Tiwari and Kakkar, 2009), antibakteri (Pattnaik *et al*., 1997), dan anti TBC (Soto, *et al*., 2014). Banyaknya fungsi pada masing-masing golongan senyawa metabolit sekunder yang teridentifikasi, menunjukkan bahwa rumput mutiara memiliki potensi yang sangat besar untuk menjadi tanaman yang berkhasiat obat secara herbal.

KESIMPULAN

Berdasarkan hasil penelitian yang telah dilakukan dapat disimpulkan bahwa tanaman rumput mutiara (*Hedyotis Corymbosa*) dalam bentuk sediaan ekstrak pekat, secara GCMS (*Gas Chromatograph Mass Spectrometry*) terdeteksi mengandung 20 senyawa metabolit sekunder, yaitu *catechol, camphene, limonene*, *myrcene, pinene, camphor, cineole, geraniol, citronellol, gallic acid, ascorbic acid, β caryophyllene, β elemene, β farnesene, β selinene, apigenin, kaempferol, luteolin, catechin,* dan *betulinic acid.* Senyawa metabolit sekunder yang terdeteksi tersebut memiliki fungsi pengobatan yang luas dan penting. Hal ini menunjukkan bahwa tanaman rumput mutiara memiliki potensi yang sangat besar sebagai tanaman obat.

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