

Isolasi dan penentuan senyawa kimia serta uji aktivitas biologi dari daun buah tanaman *Garcinia dulcis* kurz dan kulit batang serta akar tanaman *Garcinia picrorrhiza* miq

Atiek Soemiati, author

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Abstrak

Garcinia picrorrhiza Miq. dan *Garcinia dulcis* Kurz termasuk famili Clusiaceae banyak tumbuh di daerah Asia tenggara termasuk Indonesia. Dari beberapa hasil penelitian diketahui, bahwa famili Guttiferae merupakan sumber senyawa xanton, isoprenilbenzophenon, flavonoid, deksidon dan anthron, beberapa di antaranya mempunyai aktivitas biologi seperti antibakteri, antifungi, antioksidan, anti-HIV, dan sitotoksik. Berdasarkan hal tersebut di atas, telah dilakukan penelitian yang bertujuan untuk mempelajari lebih lanjut tentang keanekaragaman struktur metabolit sekunder yang dihasilkan oleh beberapa species dari familia Guttiferae dan mengungkapkan aktivitas biologi senyawa tersebut.

Pada penelitian ini telah diselidiki senyawa bioaktif kulit batang *G. picrorrhiza* Miq. dan buah *G. dulcis* Kun. Bahan tanaman diperoleh dari sekitar Bogor. Selanjutnya masing-masing bahan diekstraksi dengan pelarut n-heksana dan diklorometan. Ekstrak yang diperoleh difraksinasi dengan teknik kromatografi dan pemurnian. Senyawa yang murni kemudian ditentukan strukturnya dengan metoda spektroskopi UV, IR, ¹H-NMR, ¹³C-NMR, HMQC, HMBC dan COSY. Aktivitas biologi senyawa-senyawa yang diperoleh ditetapkan dengan uji antioksidan terhadap radikal DPPH dan uji sitotoksitas terhadap sel kanker L1210. Dari isolasi *G. dulcis* Kurz telah ditemukan 3 senyawa caged poliprenilasi xanton, yaitu senyawa (1) desoksimorellin, senyawa (2) asam morellat dan senyawa (3) morellin; hasil uji sitotoksitas terhadap sel kanker L1210 berturut-turut menunjukkan IC₅₀ = 25,56 g/mL, 20,82 g/mL dan 26,67 g/mL dan uji antioksidan terhadap radikal bebas berturut-turut IC₅₀ = 22,42 g/mL; 30,91 g/ 1249,93 g/mL. Dari hasil isolasi ekstrak n-heksana kulit batang *G. picrorrhiza* Miq., ditemukan senyawa baru garcinopicrobenzofenon, senyawa (4) uji toksisitas terhadap sel kanker L1210 menunjukkan IC₅₀ = 53,05 g/mL dan uji antioksidan terhadap radikal bebas DPPH menunjukkan IC₅₀ = 27,67 g/mL. Ditemukan senyawa (5) asam lanosta 3-oxo-7, 24-dien-27-oat, ditemukan senyawa (6) asam lanosta 3-hidroksi-7,24-dien-oat, dan senyawa (9) asam 3- hidroksi-isonikotinat. Dari isolasi ekstrak n-heksana akar *G. picrorrhiza* ditemukan senyawa baru (8) garcinopicrobenzofenonon, uji toksisitas terhadap sel kanker murine L1210 menunjukkan IC₅₀ sebesar 40,37 g/mL, ujiaktivitas antioksidan menunjukkan IC₅₀ sebesar 83,88 g/mL dan senyawa (7) (23E)- eupha-7-oxo-8,23-dien-27-oat.

.....*Garcinia dulcis* Kurz and *Garcinia picrorrhiza* Miq. (Clusiaceae) is group of plants grown in Indonesian tropical forest which has been reported to be rich in chemicals substances. Extensive phytochemical screening have shown that *Garcinia* species are rich in a variety of oxygenated and prenylated xanthone. Some of these exhibit a wide range of biological and pharmacological activities as cytotoxic, antimicrobial, antifungal, antioxidant, antimalarial, and HIV-1 protease inhibitory activities. Based on these data, this research work aims to further study the structure molecule variety of their secondary metabolite especially their bioactive constituents.

In this research work, the bioactive constituents of *G. dulcis* Kurz and *G. picrorrhiza* Miq. was collected from surrounding Bogor, have been evaluated. The selected plant materials were the bark and roots of *G.*

picrorrhiza Miq and fruits of *G. dulcis* Kurz. Extraction, fractionation and bioactive compound isolation-purification were conducted using various organic solvents and chromatographic techniques. The isolated compounds were elucidated based on their physical and spectral data, such UV, IR, ¹H- and ¹³C-NMR, MS, HMBC, HMQC and COSY. The biological activity evaluations, namely, in vitro cytotoxicity using murine L1210 cell line, and antioxidant activity under DPPH (1,1-diphenyl-2-picrylhydrazyl) Radical Scavenging Activity Methode.

Chromatographic separation of the n-hexane extract of dried *G. dulcis* fruits furnished three prenylated pyranoxanthonoids, identified as desoxymorelline (1), morellic acid (2), and morellin (3). The isolated compounds found exhibit cytotoxicity against L1210 cancer cell line. The IC₅₀ values were 26,6; 20,8, and 25,5 g/mL, respectively. Under DPPH Radical Scavenging Activity Methode the compounds to exhibit antioxidant activity. The IC₅₀ value for desoxymorelline, morellic acid and morellin are 22,42 g/mL; 30,91 g/mL and 1249,93 g/mL. Chromatographic separation on the n-hexane extract from bark of *G. picrorrhiza* Miq. furnish new compounds garcinopicrobenzophenon (4) to exhibit cytotoxicity against L1210 cell line, with the IC₅₀ value 53,05 g/mL and antioxidant activity with IC₅₀ value 27,67 g/mL and known lanosta-3-oxo-7,24-dien-27oic acid (5); lanosta 3-hydroxy-7,24-dien-oic-acid (6), and 3-hydroxy-isonicotinic acid (9). Chromatographic separation of the dichloromethane extract from roots of *G. picrorrhiza* furnish new compound garcinopicrobenzophenonon (8) to exhibit cytotoxicity against L1210 cell line. The IC₅₀ value was 40,37 g/mL, and antioxidant activity 83,88 g/mL; and (23E)-eupha-7oxo-8,23-dien-27oic (7)