

Konstituen Kimia Tumbuhan Tingkat Rendah *Plagiochila sandei* Dozy dan Tumbuhan Tingkat Tinggi *Beilschmiedia brevipes* Ridl., *B. glauca* Lee dan *Cryptocarya kurzii* Hk(f) serta Uji Sitotoksik dan Apoptosis Sel Alkaloid Aporfin dan Oxoaporfin pada Sel KB

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Abstrak

ABSTRAK

Telah dilakukan penelitian pada tumbuhan tingkat rendah lumut hati *P. sandei* Dozy dan tumbuhan tingkat tinggi famili Lauraceae yaitu *Beilschmiedia brevipes* Ridl., *B. glauca* Lee dan *Cryptocarya kurzii* Hk.f. Ekstraksi *P. sandei* Dozy dilakukan dengan cara maserasi dengan pelarut berturut-turut n-heksana, kloroform dan metanol, sedangkan ekstraksi pada tumbuhan tingkat tinggi famili Lauraceae menggunakan ekstraksi asam basa untuk memperoleh alkaloid total. Isolasi *P. sandei* Dozy dilakukan dengan kromatografi kolom menggunakan fasa diam silika gel, Sephadex LH-20 dan Cosmosil RP-75 serta eluen n-heksana-etilasetat, n-heksana-aseton dan kloroform-metanol, sedangkan isolasi alkaloid digunakan fasa diam silika gel dan eluen diklorometana-metanol. Penentuan struktur molekul dilakukan dengan UV, FTIR, ¹H-NMR, ¹³C-NMR, NMR-2D, ESI-MS, FAB-MS, GC-MS dan HR-MS. Dari hasil tumbuhan tingkat rendah *P. sandei* Dozy diperoleh 6 senyawa yaitu 2 seskuiterpen, spathulenol (A-1) dan 10-oksodaudan-5,8-dien-11-asetat (A-3) yang merupakan senyawa baru, 2 macam sterol yaitu stigmasterol (A-2) dan silosterol (A-4), turunan gliserol 1',2'-[(3~etoksi)-heksa vinil] gliserol (A-5) juga merupakan senyawa baru dan etil p-metoksi sinamat (A-6), sedangkan dari tumbuhan tingkat tinggi famili Lauraceae diperoleh 7 alkaloid bensilisokuinolin dari *B. brevipes* Ridl., yaitu 7-O,4'-O-dimetiloklaurin (B-1), papaveraldin (B-2), velucryptin (B-3), papaverine (B-4) adalah bahan alam baru, amepavin (B-5), 4-metilpapaveraldin (B-6) merupakan senyawa baru dan noramepavin (B-7). Enam alkaloid aporfin yaitu norisoturberin (C-1), norisocoridin (C-2), N-metilhemagin (C-3), isocoridin (C-4), hemagin (C-6), catalpivolin (C-7) dan 1 oksoaporin, 7-oksohemagin (C-5) dari *B. glauca* Lee dan 4 alkaloid oksoaporin, O-metilmoschatolin (D-1), subseilin (D-2), aihierolin (D-3), dioentrinon (D-4) dan sinamida (D-5) dari *C. kurzii* Hk.f. Uji aktivitas sitotoksik alkaloid disentrinon pada sel KB menunjukkan harga LC₅₀ 9,03 ppm, sedangkan pada konsentrasi 10 ppm disentrinon dapat menginduksi apoptosis sebesar 46,30%, dan menyebabkan nekrosis 20,28%. Disentrinon menginduksi apoptosis jauh lebih tinggi dibanding dengan aporfin atau oksoaporfin lain, tetapi sedikit lebih rendah daripada vinkristin sebagai kontrol positif.

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Abstract

The research of the isolation and structure determination of the chemical constituents of the liverwort of *Plagiochila sandei* Dozy and Lauraceae, namely *Beilschmiedia brevipes* Ridl., *Beilschmiedia glauca* Lee and *Cryptocarya kurzii* Hk.f. have been performed. The extraction of *P. sandei* was carried out using n-hexane, CHCl₃ and MeOH, subsequently, while for the Lauraceae the acid base extraction was performed to get the crude alkaloid extracts. *P. sandei* Dozy was

purified by column chromatography using silica gel, Sephadex LH-20 dan Cosmosil RP-75 as stationary phase and n-hexane-ethyl-acetate, n-hexane-acetone and chloroform-methanol as mobile phase, respectively. The crude alkaloids mixture was subjected to column chromatography over silica gel and dichloromethane - methanol as mobile phase. The molecular structure of the compounds were determined by spectroscopic methods, such as UV, FTIR, ¹H-NMR, ¹³C-NMR, NMR-2D, ESI-MS, FAB-MS, GC-MS and HR-MS. From the liverwort *P. sandei* Dozy, 6 compounds as chemical constituents of were obtained: 2 sesquiterpenes, spathulenol (A-1) and 10 oxodaucane-5,8-diene-11-acetate (A-3) as a new compound, 2 sterols: stigmasterol (A-2) and sitosterol (A-4), 1',2'-dimethyl-[(3-ethoxy)-hexavinyl] glycerol. a new compound of a derivative of glycerol (A-5) and ediy p-melhoxy cinnamate (A-6). Nineteen alkaloids were isolated from *Lauraeae*, 7 benzyloquinoline from *B. brevipes* Ridl.: 7-O,4'-O-dimethylcoclaurine (B-1), papaveraldine (B-2), veluoriptine (B-3), papaverinol (B-4) as new natural product compound, arnepavine (35). 4-methylpapaveraldine (B-6) as new compound and noramrepavine (B-7). Six aporphine alkaloids were obtained: norisoturberine (C-1), norisocorydine (C-2), N-methylhemagine (C-3), isocorydine (C-4). hemagine (C-6), catalpivoline (C-7) and one oxoaporphine called 7-oxohemagine (C-5). Four oxoaporphine alkaloids were isolated from *B. glauca* Lee: 0#methyimoschatoline (D-1), subessiline (D-2), atheroline (D-3), dicentrinone (D-4) and a 'proto' alkaloid cinamide (D-5) from *C. kurzii* Hk.f. The cytotoxic activity test of the aporphine and oxoaporphine alkaloids to the KB cell line showed that dicentrinone - an oxoaporphine had LC50 9,03 ppm, while at 10 ppm, dicentrinone induced apoptosis 46.30% and 20,28% necrosis. This activity was much higher than aporphines and other oxoaporphines, but it was slightly lower than vincristine as positive control.