

Isolation, Structure Elucidation, and Biological Evaluation of Secondary Metabolites from Indonesian Plants

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学 位 論 文 概 要

(Dissertation Summary)

学位論文題名(Title of Dissertation)

Isolation, Structure Elucidation, and Biological Evaluation of Secondary Metabolites from Indonesian Plants

邦題(Title in Japanese)

インドネシア産植物由来新規天然物の探索と生理活性評価

専攻(Division) : Pharmaceutical Sciences

研究室(Laboratory) : Molecular Pharmacognosy

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学位論文概要(Dissertation Summary)

Indonesia located in tropical area is the next mega-biodiversity country after Brazil. The endemic plants inhabited a certain area in Indonesia, such as Sulawesi Island, have a great potential for discovery of structurally and biologically unique chemical constituents, since many of them have not been well-investigated phytochemically.

In this study, two Indonesian medicinal plants, *Kleinhovia hospita* and *Melochia umbellata*, were selected for the isolation, structure elucidation, and biological evaluation of their secondary metabolites.

The MeOH extracts of *K. hospita* and *M. umbellata* were partitioned and fractionated by a combination of various chromatographic methods. The structures of isolated compounds were elucidated based on extensive spectroscopic analyses.

Phytochemical studies of *K. hospita* led to the isolation of seven novel cycloartanes **12–18**, along with four known compounds **8–11**. The kleinhospitine E (**12**) is the first unusual cycloartane alkaloid characterized by γ -lactam with an oxopropylidene side chain. The study of *M. umbellata* resulted in the isolation of seven novel quinolone and a quinoline alkaloid, **26–32** along with eighteen known compounds **21, 24, and 33–47**.

The isolated compounds were evaluated for antiproliferative and anti-HIV activities. Among all, cycloartanes **8, 13, and 15**, as well as a quinolone **33** displayed greater antiproliferative activity against MDR than non-MDR cell lines. Cycloartanes **8, 9, 12, and 15**, as well as quinolones, **21, 24, 29, and 33** significantly inhibited some of tumor cell growth. Meanwhile, cycloartanes **14 and 17** showed potent anti-HIV activity.