Thesis Title	Chemical Constituents and Biological Activities from Rutaceae Plants: *Atalantia monophylla*, *Clausena excavata*, *Feroniella lucida*, *Glycosmis pentaphylla* and *Glycosmis cochinchinensis*
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ABSTRACT

Phytochemical investigation and biological activities study from Rutaceae plants including *Atalantia monophylla*, *Clausena excavata*, *Feroniella lucida*, *Glycosmis pentaphylla* and *G. cochinchinensis* led to the isolation and structure elucidation of 119 compounds.

The chemical investigation of the acetone extract of *A. monophylla* roots led to isolation of 15 known compounds including eight acridone alkaloids (**AM1**-**AM8**), six coumarins (**AM9-AM14**) and a limonoid (**AM15**). All compounds, except **AM6** and **AM11** were evaluated for their antibacterial activity. Compound **AM2** exhibited strong antibacterial activity against methicillin-resistant *Straphylococcus aureus* SK1 (MRSA) and *S. aureus* with MIC values of 2 and 4 µg/mL, respectively.

Phytochemical investigation of *C. excavata* led to isolation and identification of 43 compounds. A new coumarin (**CE1**) together with two known coumarins (**CE3** and **CE4**), a known benzene derivative (**CE34**), a known monoterpene (**CE36**) and a

known steroid (**CE38**) were isolated from the hexanes-CH_2Cl_2 extract of fruits whereas a new carbazole alkaloid (**CE22**), along with 18 compounds (**CE2**, **CE5**, **CE8**, **CE11-CE16**, **CE18-CE22**, **CE23**, **CE32**, **CE33**, **CE35** and **CE37**) were isolated from the EtOAc extract of stems. The remaining 18 known compounds (**CE3**, **CE6-CE10**, **CE13**, **CE16**, **CE17** and **CE24-CE32**) were isolated from the acetone extract of roots. Some of isolated compounds were further evaluated for their cytotoxicity against KB, MCF-7 and NCI-H187 human cell lines. Compounds **CE20**, **CE21** and **CE23** showed the highest cytotoxicity against KB, NCI-H187 and MCF-7 human cell lines with IC_{50} values of 4.63, 1.07 and 0.78 µg/mL, respectively.

Thirty-six compounds were isolated and identified from *F. lucida*. Seven known compounds (**FL14**, **FL16**, **FL17**, **FL21**, **FL23**, **FL29** and **FL30**) were isolated from the acetone extract of fruits while a new furanocoumarin (**FL8**) together with 17 known compounds (**FL1**, **FL3-FL7**, **FL11**, **FL12, FL14**, **FL15**, **FL18-FL22**, **FL24** and **FL25**) were isolated from the acetone extract of roots. The remaining two new furanocoumarins (**FL9** and **FL10**) along with 9 compounds (**FL2**, **FL7**, **FL11-FL13**, **FL16** and **FL26-FL28**) were isolated from the acetone extracts of twigs. Some of the isolates were evaluated for their biological activities, including cytotoxic, antimalarial and anti-TB activities. Compound **FL25** showed strong cytotoxicity against KB (IC_{50} = 0.637 µg/mL) and NCI-H187 (IC_{50} = 0.094 µg/mL) human cancer cell lines, antimalarial activity against *Plasmodium falciparum* (IC_{50} = 0.336 µg/mL), and antituberculosis activity against *Mycobacterium tuberculosis* (MIC = 6.25 µg/mL).

A new hydroperoxyquinolone alkaloid (**GP1**) along with nine known compounds (**GP2–GP10**) were isolated from the CH_2Cl_2-MeOH extract of *G. pentaphylla* fruits. All isolates exhibited weak or inactive antibacterial activity against Gram-negative bacteria (*Escherichia coli* and *Salmonella typhimurium*) as well as Gram-positive bacteria (*Staphylococcus aureus* and MRSA).

A phytochemical investigation of the acetone extract of *G. cochinchinensis* twigs led to the isolation and identification of a new acridone alkaloid (**GC1**) and a new indole alkaloid (**GC10**), together with 13 known compounds (**GC2-GC9** and **GC11-GC15**). Some of the isolates were evaluated for their antibacterial activity. Only compound **GC8** exhibited moderate antibacterial activity against MRSA with a MIC value of 16 μg/mL.

Keywords: Rutaceae/*Atalantia monophylla*/*Clausena excavata*/*Feroniella lucida*/*Glycosmis pentaphylla*/*Glycosmis cochinchinensis*/Cytotoxicity/Antimalaria/Antibacteria/Antituberculosis Activity