

## INTISARI

Telah dilakukan isolasi dan identifikasi senyawa antimikroba dari bagian tanaman di atas tanah tumbuhan *Lantana camara* L. Penvarian dilakukan dengan maserasi selama 3 kali 24 jam pada suhu kamar dengan pelarut kloroform ( $\text{CHCl}_3$ ). Sari didapat dengan menguapkan  $\text{CHCl}_3$  menggunakan rotavapor. Setelah semua  $\text{CHCl}_3$  menguap, bahan dimaserasi lagi dengan metanol ( $\text{MeOH}$ ) dengan cara yang sama hingga didapat sari Me01-1. Kedua sari diuji aktivitas antimikrobanya dengan metode dilusi agar. Sari aktif dipisahkan dengan aseton hingga didapat fraksi larut dan talc larut aseton. Kedua fraksi diuji aktivitas antimikrobanya, selanjutnya fraksi aktif difraksinasi laud dengan metanol 80%, dan kedua fraksi yang didapat diuji aktivitas antimikrobanya. Keberhasilan penyarian dan fraksinasi diuji dengan kromatografi lapis tipis (KLT), fraksi aktif selanjutnya difraksinasi dengan kromatografi vakum kolom, eluat dikelompokkan berdasarkan kesamaan bercak kromatogram lapis tipis. Fraksi yang didapat diuji aktivitas antimikrobanya dengan metode dilusi agar dan selanjutnya fraksi aktif diuji aktivitas antimikrobanya dengan metode bioautografi. Bercak aktif diisolasi dengan metode KLT preparatif. Kemudian isolat ( $\text{LC}_{01}$ ) diperiksa dengan KLT. Penetapan harga konsentrasi bunch minimal (KBM) isolat ( $\text{LC}_{01}$ ) dengan metode dilusi agar. Elusidasi struktur ditentukan berdasarkan atas spektra ultra violet (UV), infra merah (IM), spektra massa (SM), resonansi magnetik Millier (RMIP), R.M1/14, *correlation spectroscopy* (COSY) dan *heteronuclear correlation* (HETCOR).

S-Nktm UV isolat  $\text{LC}_{01}$ , menunjukkan puncak serapan pada panjang gelombang ( $\lambda$ ) 241 nm. Spektra IM menunjukkan serapan pada bilangan gelombang ( $\nu$ )  $448\text{ cm}^{-1}$  (OH),  $2918\text{ cm}^{-1}$ ,  $2850\text{ cm}^{-1}$  ( $\text{C-H}$  alifatik),  $1718\text{ cm}^{-1}$  (CO dari COM),  $1701\text{ cm}^{-1}$  (CO ester), dan  $1637\text{ cm}^{-1}$  ( $\text{C=C}$ ). Dari pengionan semprot elektron resolusi tinggi diperoleh  $m/z$  470 ( $\text{C}_{31}\text{H}_{50}\text{O}_4$ ). Spektra Raman  $^{13}\text{C}$  pada 100 MHz menunjukkan adanya 35 puncak serapan (35 C), 178 ppm (COON), 165,5 ppm ( $\text{C=O}$  ester), 157,2 dan 122,7 ppm ( $\text{CH=}$ ), 116,2 ppm ( $\text{C=}$ ), 99 ppm ( $\text{O-C-O}$ ), 75,5 ppm ( $\text{CH-O}$ ), 67,9 ppm ( $\text{C-1,-O}$ ) dan 122,5 ppm, 143 ppm (gugus olefin, kerangka). Berdasarkan atas data UV, IM, MS, dan Raman  $^{13}\text{C}$  di atas, identifikasi isolat  $\text{LC}_{01}$  mengarah pada senyawa triterpena dengan tipe olefin, kerangka dengan rantai samping ester dan karboksilat. Spektra Raman/W.14 pada 400 MHz menunjukkan adanya 8 puncak singlet tajam (8 metil singlet), dan serapan pada 5,56 ppm (atom H pada  $\text{C}_{32}$ ). Berdasarkan atas data spektra di atas dan perbandingan dengan data pustaka, serta diperkuat dengan spektra COSY dan HETCOR, maka dapat ditetapkan bahwa senyawa tersebut adalah asam lantanilat. Hasil uji aktivitas isolat Lem menunjukkan bahwa tumbuhan *Lantana camara* L. mengandung asam lantanilat yang dapat melawan pertumbuhan *Staphylococcus aureus* dengan harga KBM 375  $\mu\text{g/ml}$ .

ABSTRACT



The isolation and identification of antimicrobial compound from the aerial parts of *Lantana cainara* L. plant has been carried out. The isolation was started by 3 days maceration of the the aerial parts of *Lantana cainara* L. plants with chloroform (CHCl<sub>3</sub>), following by evaporation using evaporator to dry. The plant material then remacerated with methanol (MeOH) using the same method with that of CHCl<sub>3</sub>. Both extracts were tested for their antimicrobial activity using agar dilution method. The active extract was then extracted with acetone, resulted in acetone soluble and insoluble fractions, followed by microbial activity test for both fractions. The active fraction was then reextracted with 80% MeOH, followed by microbial activity test for both fractions. The success of extraction and fractionation were tested using thin layer chromatography (TLC). The active fractions were then defractionated using vacuum liquid chromatography (VLC), The eluates were pooled based on the similarity of TLC spots, The fractions were tested for their antimicrobial activity using agar dilution method, followed by bioautography method. Active spot was then isolated using preparative TLC, The purity of isolate (LC<sub>01</sub>), was tested using TLC. The minimal bactericidal concentration (MBC) value of isolate (LC<sub>01</sub>), was determined using agar dilution method. Structure elucidation of active compound was established based on the spectra of ultra violet (UV), infra red (IR), mass spectra (MS), nuclear magnetic resonance (NMR)<sup>13</sup>C, NMR<sup>1</sup>H, correlation spectroscopy (COSY) and heteronuclear correlation (HETCOR).

The IR spectra of isolate (LC<sub>01</sub>), showed the maximum absorbance (X) at 241 nm. The IR spectra showed the wavenumber (ν) at 3448 cm<sup>-1</sup> (OH), 2918 cm<sup>-1</sup>, 2850 cm<sup>-1</sup> (C<sub>13</sub>, C<sub>12</sub> aliphatic), 1718 cm<sup>-1</sup> (CO and COOH), 1701 (CO ester) and 1637 cm<sup>-1</sup> (C=C). High resolution electrospray ionization showed molecular ion m/z 470 (C<sub>31</sub>-14604). The NMR<sup>13</sup>C spectra at 100 MHz showed 35 absorbance (35 C), 178 ppm (C=O ester), 165,5 ppm (C=C ester), 157,2 and 122,7 ppm (C=C), 116,2 ppm (C=C), 99 ppm (O-C-O), 75,5 ppm (CH-O), 67,9 ppm (C=C-O), 122,5 ppm, 143 ppm (the oleanolic Vamirin skeleton), Based on UV, IR, MS, and NMR<sup>13</sup>C, identification of isolate LC<sub>01</sub> seems to be a triterpene compound that have clean type, f-amirin skeleton, with ester of carboxylic acid. The NMR<sup>1</sup>H spectra at 400 MHz showed 8 sharp singlet absorptions (8 methyl singlets), and absorbance at 5,56 ppm (atom H-1 at C<sub>32</sub>), Based on the spectrum and comparison with literature study, and ensure with COSY and HETCOR spectrum, it can be concluded that the active compound is lantanilic acid. Based on the antimicrobial activity test of isolate (LC<sub>01</sub>), *Lantana cainara* L. plant contains lantanilic acid, that be able to kill the growth of *Staphylococcus aureus* at the concentration of 325 µg/ml.