



9th National Congress of Indonesian Society for Clinical Microbiology (PAMKI)
and
10th National Symposium of Indonesia Antimicrobial Resistance Watch (IARW)
(9th NC PAMKI and 10th NS-IARW) 2015

MANAGEMENT OF INFECTION IN THE ERA OF ANTIMICROBIAL RESISTANCE

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Medical Faculty University of Sumatera Utara
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MANAGEMENT OF INFECTION IN THE ERA OF ANTIMICROBIAL RESISTANCE

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“Management of Infection in the era of Antimicrobial Resistance”

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CONTENTS

WELCOME MESSAGE	i
COMMITTEE	ii
SCHEDULE HIGHLIGHT	iii
DAILY SCIENTIFIC SCHEDULE	iv
CONTENTS	vii
 SCIENTIFIC SYMPOSIUM	
1.1 Role of Microbiology Laboratory for Diagnosis and Management of Asymptomatic Bacteriuria in Pregnant Woman Dr.dr. Yeva Rosana, SpMK(K)	1
1.2 How to Treat UTI during Pregnancy Dr.dr.Dwiana Ocviyanti, SpOG(K)	2
2.1 Challenges on Laboratory Diagnostic of MDR Tuberculosis Prof. dr. Nasrum Massi, MSc, PhD	3
2.2 Management MDR-tuberculosis Dr. Parluhutan, SpP(K)	4
2.3 Development of TB Vaccine Andriansyah Rukmana, SSI, PhD, M.Biomed	5
3.1 HIV/AIDS and opportunistic infection dr. Tambar Kembaren, SpPD, KPTI	6
3.2 HIV diagnostic and Resistance to ARV dr. Fera Ibrahim, PhD SpMK(K)	7
4.1 Microbiology Aspect of Invasive Candidiasis in Critically Ill Patient Dr. dr. Mardiasuti HW, MSc, SpMK(K)	8
4.2 How to Treat Invasive Candidiasis in Critically Ill Patient? dr. Hasanul Arifin, SpAn-KIC	9
5.1 Use of Carbapenem : Based on Microbiology Data dr. Anis Karuniawati, PhD, SpMK(K)	10
5.2 Antimicrobial Stewardship Impact on Clinical outcomes, Quality Indicators and Medication dr. Josia Ginting, SpPD-KPTI	11
6.1 Trends of Antimicrobial Resistance in <i>Neisseria gonorrhoe</i> Prof. Monica Lahra (Australia)	12
6.2 Clinical Aspect of <i>Neisseria gonorrhoe</i> infection Dr. Richard Hutapea, SpKK(K)	13

“Management of Infection in the era of Antimicrobial Resistance”

LUNCH SYMPOSIUM

1.1	Microbiology Diagnostic and Epidemiology of MDRO infection Juliette Severin, MD, PHD.	14
1.2	Management and controlling of MDRO infection Prof. Henri Verbrugh, MD, Ph.D	15
2.1	Microbial Aspect of Wound Infection DR. Dr. Yeva Rosana, SpMK(K)	16
2.2	Comprehensive Management of Burn Wound Infection dr. Frank B. Buchari, SpBP-RE	17

POSTER

P 001	Antibiotics Resistance Mapping at Various Tertiary-care Hospitals in Northern Central Java Ridha Wahyutomo, Andreas Christian Wijaya, Arif Lianto Lie, Agus Riyanto	18
P 002	A Rare Case of Acid-Fast Bacilli in Pleural Effusion YUSFI RYDOKA, RIDHA WAHYUTOMO	19
P 003	Improved ICU Design Reduces Spreading of <i>Acinetobacter baumannii</i> Multi Drugs Resistant at Mardi Rahayu Hospital ARIF LIANTO LIE, RIDHA WAHYUTOMO	20
P 004	Spread and Resistance Patterns of <i>Acinetobacter spp.</i> from Clinical Specimens in Dr. Soetomo General Hospital SILVIA SUTANDHIO, AGUNG DWI WAHYU WIDODO, EDDY BAGUS WASITO	21
P 005	Pattern of Environmental Bacteria in ICU And Bacteria Caused HCAI in ICU Dr. Soetomo Hospital Koendhori EB, Mertaniasih NM	22
P 006	MRSA (Methicillin Resistant <i>Staphylococcus aureus</i>) Surveillance among Clinical Isolates during 2010-2014 in dr. Saiful Anwar General Hospital Malang, Indonesia DEWI ERIKAWATI, DEWI SANTOSANINGSIH, SANARTO SANTOSO	23
P 007	Risk Factors of Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) Carriage among Patients at Admission to Surgical Wards in a Limited Resources Hospital in Indonesia DEWI SANTOSANINGSIH, SANARTO SANTOSO, JULIETTE SEVERIN, HENRI VERBRUGH	24
P 008	The Risk Factor on Leptospirosis Case in Yogyakarta City LILIS SURYANI, HENNY PRAMOEDYO, SRI ANDARINI, SUDARTO	25
P 009	The Profile of Rotavirus and Non Rotavirus Infection Among Children with Acute Diarrhea in Pekanbaru FAUZIA ANDRINI DJOJOSUGITO, MAYA SAVIRA, DEWI ANGGRAINI, RITA ENDRIANI, ANDANI EKA PUTRA	26
P 010	Antifungal Susceptibility Profile of Candida Isolated from Urine Samples from Januari 2015 - May 2015 in Kariadi Hospital NIA KRISNIAWATI, V. RIZKE CIPTANINGTYAS, SUBAKIR, IVA PUSPITASARI	27
P 011	Isolation of <i>Cryptococcus neoformans</i> from Cerebrospinal Fluid with BacT/Alertsystem® on HIV-Infected Patient: a Case Report ENTY TJOA, DANIEL EDBERT, ALFREDO BAMBANG, OTTO TANUJAYA, ELISABETH SUSIANIWATI, LISYE KONNY, R. R. JOSEPHINE RETNO W	28
P 012	First Line Antiretroviral Therapy Effectiveness in Adult Patients with HIV / AIDS in VCT-CST Clinics part of Prof. Dr. W. Z. Johanes Hospital, Kupang , NTT in the Period of 2010 - 2013 VERONICA NUNUK KARTIKA DEWI, MARIA GORETI EBONG HUREK	29



"Management of Infection in the era of Antimicrobial Resistance"

P 013	Trends in Frequency, Distribution and Antimicrobial Sensitivity Pattern of <i>Enterococcus faecalis</i> between 2014 and 2015 TITIEK SULISTYOWATI, AGUNG DWI WAHYU WIDODO, NI MADE MERTANIASIH	30
P 014	<i>In Vivo</i> Study, Effect Combination of <i>Lactobacillus spp</i> and Doxycyclin to Eliminate of <i>Vibrio cholerae</i> EKA NONENG NAWANGSIH, DIN'YAR SUPIADI WIDJAYA, RACHMAYANTI NUR	31
P 015	Susceptibility Pattern and Empirical Antibiotic Treatment on Ventilator-Associated Pneumonia in PKU Muhammadiyah Hospital Yogyakarta in 2011-2014 INAYATI, BIMA NOVERENTIKA	32
P 016	Incidence Rate Of Multidrug Resistant Pathogens From Intensive Care Unit in Arifin Achmad General Hospital, Riau Province, Indonesia In 2014 DEWI ANGGRAINI	33
P 017	Correlation Between Knowledge and Attitudes of Mothers Against Acute Diarrhea Children Under Five Years in The Provincial Hospital Arifin Achmad Riau Province and Work-area of Local Government Clinic Pekanbaru. MAYA SAVIRA, DHITA, FAUZIA ANDRINI, DEWI ANGGRAINI, RITA ENDRIANI	34
P 018	Characteristic of Carbapenem-resistant Enterobacteriaceae Infected Patients in Mataram EUSTACHIUS HAGNI WARDOYO	35
P 019	Changing of <i>Burkholderia cepacia</i> Sensitivity Pattern toward Suggested Antimicrobial Agents in Saiful Anwar General Hospital. Malang, Indonesia SIWIPENI IRMAWANTI RAHAYU, NOORHAMDANI, SANARTO SANTOSO	36
P 020	Comparison of ESBL <i>Escherichia coli</i> from Urine Culture at Saiful Anwar General Hospital from 2011 to 2014 ANDREW WILLIAM TULLE, SANARTO SANTOSO	37
P 021	Profile of Gene Expert Assay among TB/HIV Patients at Dr Soetomo Teaching Hospital DEBY KUSUMANINGRUM, NI MADE MERTANIASIH, EKO BUDI , SOEDARSONO, ERWIN A TRIYONO	38
P 022	Disseminated Tuberculosis in a Patient with Systemic Lupus Erythematosus PREPTI DEWI, DESVITA SARI, SUBAKIR	39
P 023	Isolation of <i>Staphylococcus aureus</i> from Clinical Clerkship Student in Teaching Hospital and Its Sensitivity to Methicillin and Vancomycin DIAN WIDIYANTI, TITIEK DJANNATUN, PRATAMI ADITYANINGSARI, JEKTI T. ROCHANI	40
P 024	Prevalence and Antimicrobial Susceptibility Pattern of <i>Staphylococcus aureus</i> with <i>mecA</i> -Mediated Resistance Isolated from Clinical Specimen at Atma Jaya Hospital, Jakarta AGUS SUGIHARTO, ENTY TJOA, YOHANNA ANGELINA, YULIA TANTI NARWATI, KUNADI TANZIL, ALFREDO BAMBANG, CHRISTIAN ARDIANTO, PETER ALISON.	41
P 025	Microscopic Observation Drug Susceptibility Culture Technique in Screening for Tuberculosis in Diabetes Mellitus Patients in Hasan Sadikin Hospital Bandung, 2014-2015 RASPATI C. KOESOEMADINATA, LIDYA CHAIDIR, BACHTI ALISJAHBANA	42
P 026	Bacteremia Cases due to <i>Burkholderia gladioli</i> in ICU Sanglah General Hospital January-July 2015 I WAYAN AGUS GEDE MANIK SAPUTRA, NI NENGGAH DWI FATMAWATI, NI NYOMAN SRI BUDAYANTI, NI MADE ADITARINI	43
P 027	Antibacterial Activity Comparison between the Fraction of Ethyl Acetate, Chloroform, and Methanol of Red Betel Vine (<i>Piper crocatum</i>) Leaves Ethanol Extract toward <i>Salmonella typhi</i> FARIDA JULIANTINA RACHMAWATY, HADY ANSHORY TAMHID, RIDHO HIDAYAH	44

“Management of Infection in the era of Antimicrobial Resistance”

P 028	Mutation of Structural Gene for Diphtheria Toxin in Java Island Isolates, Indonesia (Interim Report) YUANITA MULYASTUTI, SIWIPENI IRMAWANTI, SUNARNO, SANARTO SANTOSO, EDDY BAGUS WASITO	45
P 029	Antibiotic Susceptibility of Bacteria Isolated from Hand Swabs of Elementary School Students at The Area of Pekapuran River in Banjarmasin LIA YULIA BUDIARTI, RAHMIATI, LAILY KHARIYATI, MUNAWAROH PASARIBU	46
P 030	Antimicrobial Susceptibility Pattern of Extended-Spectrum β -Lactamase Producing <i>Klebsiella pneumoniae</i> from Bloodstream Infections in Dr. Soetomo Hospital Indonesia FIRMAN SETIAWAN, NI MADE MERTANIASIH, EDDY BAGUS WASITO	47
P 031	The Bacteria and Antimicrobial Susceptibility Patterns on The Pus Specimen of Patients with Colon Perforation in Surgery Ward RSUD Dr. Soetomo Surabaya NARITHA VERMASARI, DEWI KLARITA FURTUNA, EDDY BAGUS WASITO	48
P 032	Bacteriological Profile and Antibiotics Resistance Patterns of Isolates in Intensive Care Unit at Columbia Asia Hospital Medan January 2013 – June 2015 EDHIE DJOHAN UTAMA	49
P 033	Antibiotic Susceptibility Pattern of <i>Salmonella</i> spp. Isolated From Clinical Specimens in Sanglah General Hospital Denpasar during January 2012 - June 2015 Mayura IPB, Yuliandari P, Fatmawati NND, Tarini NMA, Budayanti NNS	50
P 034	Gomori Methenamine Silver and Periodic Acid-Schiff Staining in Diagnosing Fungal Infection of the Nasal Cavity- A Case Report LIDYA IMELDA LAKSMI, BETTY, JESSY CHRESTELLA, SRI AMELIA	51
P 035	Detection Glutamate-Dehydrogenase Gene of <i>Streptococcus suis</i> Clinical Isolates in Sanglah Hospital Bali Tarini NMA, Mayura IPB, Yuliandari, Fatmawati NND, Budayanti NNS	52
P 036	The Validity of Direct Gram Stain Scoring on sputum and Bacterial Pattern among Patients with Suspected Lower Respiratory Tract Infection in Dr. Soetomo Hospital, Surabaya PRIYO BUDI PURWONO, PEPY DWI ENDRASWARI	53
P 037	Hospital-based Surveillance of Rotavirus Diarrhea in Children with Acute Diarrhea in Four Teaching Hospitals in Indonesia, year 2011-2012 HERA NIRWATI, ABU THOLIB AMAN, ABDUL WAHAB, IESTJE MARTIZA, SOETJININGSIH, WAYAN SUKARDI, YATI SOENARTO	54
P 038	Syphilis Infection among HIV Patients in High Risk Population in Jakarta, Indonesia IDA EFFENDI, YEVA ROSANA, WRESTI INDRIATMI, ANDI YASMON	55
P 039	Cervical Tuberculosis - A Case Report of Pap Smear Cytology BETTY, LIDYA IMELDA LAKSMI, JESSY CHRESTELLA	56
P 040	Candidemia in Adult Patients at Cipto Mangunkusumo Hospital Jakarta MURSINAH, ISA BELLA, FERA IBRAHIM, MARDIASTUTI WAHID	57
P 041	Prevalence of AmpC-beta lactamase (AmpC) and Extended Spectrum Beta Lactamase (ESBL) Producing Enterobacteriaceae in Intensive Care Unit Dr. Cipto Mangunkusumo Hospital, Jakarta from April to September 2015 T. ROBERTUS, LUCKY H. MOEHARIO, DELLY C. LESTARI, RUDYANTO SOEDONO, ANIS KARUNIAWATI	58
P 042	A Case Report of Two Siblings with Diphtheria Why Does it Still Occur? RATNA WULAN FEBRIYANTI, HELMIA FARIDA, PURNOMO HADI	59



“Management of Infection in the era of Antimicrobial Resistance”

- P 043 Leptospiremic Phase with Multiorgan Involvement
HANNA F PATTIPEILUHU, BAMBANG ISBANDRIO, IVA PUSPITASARI
- P 044 Assessing the Level of Knowledge on Biosafety in Laboratory Workers of Faculty of Medicine and Health Sciences UIN Syarif Hidayatullah Jakarta
ERIKE ANGGRAINI SUWARSONO, AHMAD AZWAR HABIBI
- P 045 *Quaternary Ammonium Compound* Disinfectant (Caviwipes)[®] Efficacy Test in Hospital Acquired Infection Prevention in Dr. Cipto Mangunkusumo Hospital
HINDRA IRAWAN SATARI, ANGKY BUDIANTI, DIMAS SETO PRASETYO, ANIS KARUNIAWATI
- P 046 Prevalence and Antimicrobial Susceptibility Pattern of *Enterococcus spp.* Isolated from Urine Specimens in Rumah Sakit Umum Pusat H. Adam Malik Medan
EVITA MAYASARI, CHERRY SIREGAR, RINA YUNITA
- P 047 Profile and Antibacterial Susceptibility Pattern of *Enterobacteriaceae* with Carbapenemase Activity in Rumah Sakit Umum Pusat H. Adam Malik Medan
CHERRY SIREGAR, EVITA MAYASARI, RINA YUNITA
- P 048 Profile of Multidrug Resistant Pathogens Isolated from Blood Cultures in Rumah Sakit Umum Pusat H Adam Malik Medan
DIAN DWI WAHYUNI, Cherry Siregar
- P 049 Profile of Anaerobic Bacteria Isolated from Clinical Specimen in H.Adam Malik Hospital Medan
RINA YUNITA, TETTY AMAN NASUTION, CHERRY SIREGAR

DENAH

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PARTICIPANTS & SPEAKERS

NOTES

Antibacterial Activity Comparison between the Fraction of Ethyl Acetate, Chloroform, and Methanol of Red Betel Vine (*Piper crocatum*) Leaves Ethanol Extract toward *Salmonella typhi*

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Background: *Salmonella typhi* is the cause of typhoid fever disease. This bacteria was reported to have resistance towards antibiotics at several areas in Indonesia. As an effort to overcome this resistance, it is necessary to find a new drug. Rachmawaty (2009) reported that ethanol red betel leaves extract has antibacterial activity towards *Staphylococcus aureus* and *Escherichia coli*. This research aims to compare antibacterial activity of ethanol red betel vine leaves extract fractions to *Salmonella typhi*. **Method :** The extract was made with maceration method using 70% solvent. It is fractionated with column vacuum chromatography method in sequence with n-hexane, ethyl acetate, chloroform, and methanol solvent. The antibacterial activity is performed by serial dilution method and inoculates in Mac Conkey medium. The tested serial concentration was 50%, 25%, 12.5%, and 6.25%. The antibacterial activity of each fraction was compared and the best fraction was identified using Thin Layer Chromatography and phytochemistry screening. **Result :** This study found that red betel vine leaves extract fraction with the best antibacterial activity was methanol. It had 25% b/v Minimum Bactericidal Concentration (MBC). The identification result showed that methanol fraction contained saponin and flavonoid. **Conclusion :** The best antibacterial activity toward *Salmonella typhi* is found in methanol fraction from the ethanol extract of red betel vine leaves. The compounds obtained in the fraction were flavonoid and saponin.

Keyword : Red betel vine (*Piper crocatum*), *Salmonella typhi*, methanol fraction



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Antibacterial Activity Comparison between the Fraction of Ethyl Acetate, Chloroform, and Methanol of Red Betel Vine (*Piper crocatum*) Leaves Ethanol Extract toward *Salmonella typhi*

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Background: *Salmonella typhi* is the cause of typhoid fever disease. Bacteria were reported to have resistance towards antibiotics at several areas in Indonesia (Suswati & Juniarti, 2009). As an effort to overcome this resistance, it is necessary to find a new drug. Rachmawaty (2009) reported that ethanol red betel leaves extract has antibacterial activity towards *Staphylococcus aureus* and *Escherichia coli*.

Objective research: To compare antibacterial activity of ethanol red betel vine leaves extract fractions to *Salmonella typhi* and to identify the type of compound contained in the most active fraction.

Method: The extract was made with maceration method using 70% ethanol solvent. It is fractionated with column vacuum chromatography method in sequence with n-hexane, ethyl acetate, chloroform, and methanol solvent for mobile phase. The stationary phase is silica gel 60 GF254 powder.

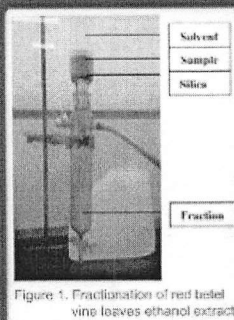


Figure 1. Fractionation of red betel vine leaves ethanol extract

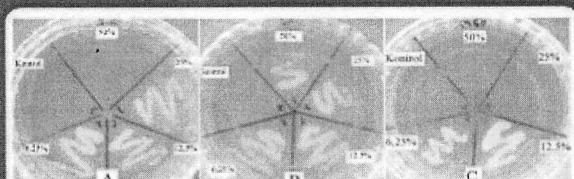


Figure 2. Result of serial dilution in Mac Conkey agar medium. A. Chloroform fraction: concentration of 50% (-), 25% (+), 12.5% (+), 6.25% (+) and control fraction (-). B. ethyl acetate fraction: all concentration (+), while control fraction (-). C. methanol fraction: concentration of 50% (-), 25% (-), 12.5% (+), 6.25% (+) and control fraction (-). Remarks: (+) show the growth of the bacteria, (-) showed no growth of the bacteria.

The antibacterial activity is performed by serial dilution method and inoculates in Mac Conkey medium. The tested serial concentration was 50%, 25%, 12.5%, and 6.25%. The antibacterial activity of each fraction was compared and the best fraction was identified using Thin Layer Chromatography and phytochemistry screening.

Results: This study found that red betel vine leaves extract fraction with the best antibacterial activity was methanol. It had 25% b/v Minimum Bactericidal Concentration (MBC).

Table 1. Result of Inoculation on Mac Conkey Agar Medium

No	Concentration	Sample			
		Chloroform Fraction	Ethyl Acetate Fraction	Methanol Fraction	Ethanol Extract
1	50%	-	+	-	-
2	25%	+	+	-	+
3	12.5%	+	+	+	+
4	6.25%	+	+	+	+
5	Fraction control	-	-	-	-
6	Media control	-	-	-	-
7	Antibiotic control	-	-	-	-
8	Solvent control	+	+	+	+
9	Bacteria control	+	+	+	+

Note: (-): Bacteria did not grow
(+): Bacteria grew

Table 2. Identification result of group compound of methanol fraction

No	Value	Before in spray				After sprayed				Compound group
		Rf	visible	UV ₂₅₄	UV ₃₆₆	Dragendorff	Anisaldehyde H ₂ SO ₄	FeCl ₃	AlCl ₃	
1	0,81	-	-	old brown	-	-	-	-	yellowish green	flavonoid
2	0,6	-	-	old brown	-	-	-	-	yellowish green	flavonoid
3	0,5	-	-	old brown	-	-	-	-	yellowish green	flavonoid

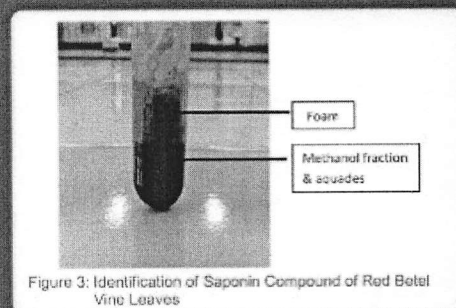


Figure 3. Identification of Saponin Compound of Red Betel Vine Leaves

Research finding showed that active compound was methanol fraction, and then the fraction was used to identify contents of the compounds. The identification result showed that methanol fraction contained saponin and flavonoid (Table 2). Flavonoid and saponin have antibacterial activity (Soetan et al. 2006; Shohaib et al., 2011).

Conclusions: The best antibacterial activity toward *Salmonella typhi* is found in methanol fraction from the ethanol extract of red betel vine leaves. The compounds obtained in the fraction were flavonoid and saponin.

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