



erma safitri &lt;erma-s@fkh.unair.ac.id&gt;

---

**[IJTID] Submission Acknowledgement**

1 message

---

**Dr. Prihartini Widiyanti**, <ijtid@itd.unair.ac.id>  
To: Erma - Safitri <erma-s@fkh.unair.ac.id>

Wed, Jan 10, 2018 at 10:45 PM

Erma - Safitri:

Thank you for submitting the manuscript, "EFFECTIVENESS OF MENIRAN (PHYLLANTHUS NIRURI LINN) AS ANTIBACTERIAL FOR RESISTANCE ANTIBIOTICS PREVENTION OF ENTEROTOXIN ESCHERICHIA COLI" to Indonesian Journal of Tropical and Infectious Disease.

Editor would check the appropriateness with the aim and scope of manuscript first.

And would send the Accepted Letter whether this manuscript could be further proceed.

With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Manuscript URL: <https://e-journal.unair.ac.id/IJTID/author/submission/7328>

Username: 1erma\_safitri2

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Dr. Prihartini Widiyanti,  
Indonesian Journal of Tropical and Infectious Disease

---

p-ISSN 2085-1103

e-ISSN 2356-0991

Indonesian Journal of Tropical and Infectious Disease

Kampus C Jln. Mulyorejo Surabaya 60115

Telp. 62-31-5992445-46 fax. 62-31-5992445

Website: <http://e-journal.unair.ac.id/index.php/IJTID>

Email: [ijtid@journal.unair.ac.id](mailto:ijtid@journal.unair.ac.id)



erma safitri &lt;erma-s@fkh.unair.ac.id&gt;

---

**[IJTID] Editor Decision**

1 message

**Prihartini Widiyanti** <drwidiyantidrg@gmail.com>

Mon, Feb 12, 2018 at 4:19 PM

To: Erma - Safitri &lt;erma-s@fkh.unair.ac.id&gt;

Cc: Sri Hidanah &lt;s\_hidanah@yahoo.com&gt;, Emy Koestanti Sabdoningrum &lt;emykoestanti@yahoo.co.id&gt;, Retno Sri Wahyuni &lt;wahjuniretno@yahoo.com&gt;

 boxbe Prihartini Widiyanti ([drwidiyantidrg@gmail.com](mailto:drwidiyantidrg@gmail.com)) is not on your [Guest List](#) | [Approve sender](#) | [Approve domain](#)

Dear Erma - Safitri:

We have reached a decision regarding your submission to Indonesian Journal of Tropical and Infectious Disease, "EFFECTIVENESS OF MENIRAN (PHYLLANTHUS NIRURI LINN) AS ANTIBACTERIAL FOR RESISTANCE ANTIBIOTICS PREVENTION OF ENTEROTOXIN ESCHERICHIA COLI".

Our decision is to: Revision required until February 19th, 2018  
Thank you

Prihartini Widiyanti  
Universitas Airlangga  
Phone +6285850871975  
Fax +62315678798  
[drwidiyantidrg@gmail.com](mailto:drwidiyantidrg@gmail.com)

---

p-ISSN 2085-1103

e-ISSN 2356-0991

Indonesian Journal of Tropical and Infectious Disease

Kampus C Jln. Mulyorejo Surabaya 60115

Telp. 62-31-5992445-46 fax. 62-31-5992445

Website: <http://e-journal.unair.ac.id/index.php/IJTID>Email: [ijtid@journal.unair.ac.id](mailto:ijtid@journal.unair.ac.id)



erma safitri &lt;erma-s@fkh.unair.ac.id&gt;

**[IJTID] New Issue Published**

1 message

**Prihartini Widiyanti** <drwidiyantidrg@gmail.com>  
To: Erma - Safitri <erma-s@fkh.unair.ac.id>

Wed, Feb 14, 2018 at 2:44 PM

**boxbe** Prihartini Widiyanti (drwidiyantidrg@gmail.com) is not on your [Guest List](#) | [Approve sender](#) | [Approve domain](#)

Dear Readers:

Indonesian Journal of Tropical and Infectious Disease has just published its latest issue at <https://e-journal.unair.ac.id/IJTID>. We invite you to review the Table of Contents here and then visit our web site to review articles and items of interest.

Thanks for the continuing interest in our work,  
Prihartini Widiyanti  
Universitas Airlangga  
Phone +6285850871975  
Fax +62315678798  
[drwidiyantidrg@gmail.com](mailto:drwidiyantidrg@gmail.com)

Indonesian Journal of Tropical and Infectious Disease  
Vol 6, No 6 (2017)  
Table of Contents  
<https://e-journal.unair.ac.id/IJTID/issue/view/652>

Articles

-----  
A REVIEW ON THE CHEMISTRY AND PHARMACOLOGY OF *Rennellia elliptica* Korth (131-140)

Che Puteh Osman, Nor Hadiani Ismail

INHIBITORY ACTIVITY OF COBALT(II) "MORIN COMPLEX AGAINST THE REPLICATION OF DENGUE VIRUS TYPE 2 (141-144)

Teguh Hari Sucipto, Siti Churrotin, Harsasi Setyawati Setyawati, Kris Cahyo Mulyatno, Ilham Harlan Amarullah, Shuhai Ueda, Tomohiro Kotaki, Sri Sumarsih, Puspa Wardhani, Sri Subekti Bendryman, Aryati Aryati, Soegeng Soegijanto, Masanori Kameoka

LOW CD4 LYMPHOCYTE COUNT RELATED RISK TO *Pneumocystis jiroveci* PNEUMONIA IN HIV/AIDS PATIENTS FROM BRONCHOALVEOLAR LAVAGE SPECIMENS USING REAL TIME PCR DETECTION (145-149)

Alicia Margareta Widya, Ni Made Mertaniasih, Arthur Pohan

Kawilarang, Isnin Anang Marhana  
MOLECULAR IDENTIFICATION OF *SARCOPTES SCABIEI* VAR. *CUNICULI* FROM SURABAYA AND MALANG REGIONS OF EAST JAVA (150-153)

Kurnia Desiandura, Nunuk Dyah Retno Lastuti, Lucia Tri Suwanti, Didik

Handijatno  
PREVALENCE OF HELMINTH EGGS IN CAT FECES CONTAMINATING PUBLIC AREAS IN SURABAYA (154-159)

Nurul Tri Wahyudi, Lucia Tri Suwanti, Kusnoto Kusnoto, Sri Mumpuni, Ira Sari Yudaniyanti, Maslichah Mafruchati

Editorial Articles

-----  
FRONT MATTER

BACK MATTER

p-ISSN 2085-1103

e-ISSN 2356-0991

Indonesian Journal of Tropical and Infectious Disease

Kampus C Jln. Mulyorejo Surabaya 60115

Telp. 62-31-5992445-46 fax. 62-31-5992445

Website: <http://e-journal.unair.ac.id/index.php/IJTID>

Email: [ijtid@journal.unair.ac.id](mailto:ijtid@journal.unair.ac.id)



erma safitri &lt;erma-s@fkh.unair.ac.id&gt;

---

**[IJTID] Editor Decision**

1 message


---

**Prihartini Widiyanti** <drwidiyantidrg@gmail.com>

Mon, Feb 19, 2018 at 10:43 AM

To: Erma - Safitri &lt;erma-s@fkh.unair.ac.id&gt;

Cc: Sri Hidanah &lt;s\_hidanah@yahoo.com&gt;, Emy Koestanti Sabdoningrum &lt;emykoestanti@yahoo.co.id&gt;, Retno Sri Wahyuni &lt;wahjuniretno@yahoo.com&gt;

 Prihartini Widiyanti ([drwidiyantidrg@gmail.com](mailto:drwidiyantidrg@gmail.com)) is not on your [Guest List](#) | [Approve sender](#) | [Approve domain](#)

Dear Erma - Safitri:

We have reached a decision regarding your submission to Indonesian Journal of Tropical and Infectious Disease, "EFFECTIVENESS OF MENIRAN (PHYLLANTHUS NIRURI LINN) AS ANTIBACTERIAL FOR RESISTANCE ANTIBIOTICS PREVENTION OF ENTEROTOXIN ESCHERICHIA COLI".

Our decision is to: Revision required until February 26th, 2018.  
Thank you

Prihartini Widiyanti  
Universitas Airlangga  
Phone +6285850871975  
Fax +62315678798  
[drwidiyantidrg@gmail.com](mailto:drwidiyantidrg@gmail.com)

---

p-ISSN 2085-1103

e-ISSN 2356-0991

Indonesian Journal of Tropical and Infectious Disease

Kampus C Jln. Mulyorejo Surabaya 60115

Telp. 62-31-5992445-46 fax. 62-31-5992445

Website: <http://e-journal.unair.ac.id/index.php/IJTID>Email: [ijtid@journal.unair.ac.id](mailto:ijtid@journal.unair.ac.id)



erma safitri <erma-s@fkh.unair.ac.id>

---

## Jurnal IJTID

2 messages

---

**sri hidanah** <s\_hidanah@yahoo.com>

Sat, Jan 12, 2019 at 8:38 PM

To: Safitri Erma <rma\_fispro@yahoo.com>, Erma Safitri <erma-s@fkh.unair.ac.id>



Virus-free. [www.avg.com](http://www.avg.com)



**8840-28861-1-SM.pdf**

1417K

---

**sri hidanah** <s\_hidanah@yahoo.com>

Sat, Jan 12, 2019 at 9:46 PM

To: Erma Safitri <erma-s@fkh.unair.ac.id>, Safitri Erma <rma\_fispro@yahoo.com>



**45. IJTID Vol 7 No 2 2018.pdf**

539K

# Indonesian Journal of Tropical and Infectious Disease

Vol. 7 No. 2 May–August 2018

Research Report

## EFFECTIVENESS OF MENIRAN (*PHYLLANTHUS NIRURI* LINN) AS ANTIBACTERIAL FOR ANTIBIOTICS RESISTANCE ENTEROTOXIGENIC *ESCHERICHIA COLI*

Sri Hidanah<sup>1</sup>, Emy Koestanti Sabdoningrum<sup>1</sup>, Retno Sri Wahyuni<sup>2</sup>, Arini Rahmi Dewi<sup>3</sup>, Erma Safitri<sup>3a</sup>

<sup>1</sup> Department of Animal Husbandry, Faculty of Veterinary Medicine, Universitas Airlangga

<sup>2</sup> Department of Basic Medicine Veterinary, Faculty of Veterinary Medicine, Universitas Airlangga

<sup>3</sup> Student of Faculty of Veterinary Medicine, Universitas Airlangga

<sup>4</sup> Departemen of Reproduction Veteriner, Faculty of Veterinary Medicine, Universitas Airlangga

<sup>a</sup> Corresponding author: erma-s@fkh.unair.ac.id

### ABSTRACT

*Escherichia coli* (*E. coli*) can be isolated from the environment both inside and outside the hospes body. There were 89 serotypes in which showed 21% resistance to various antibiotics, such as enterotoxigenic *E. coli*. Alternative efforts are needed to overcome this, one of them through the use of medicinal plants, such as meniran (*Phyllanthus niruri* Linn). Meniran plant is an immunomodulator that serves to repair the immune system of the body. The aim of research is the research was done through several stages: isolation and identification of enterotoxigenic *E. coli* from several broiler farms in East Java using the polymerase chain reaction (PCR) method, *E. coli* resistance test against some antibiotics, making meniran extract and activation test against enterotoxigenic *E. coli* n The study was divided into five treatments: T0+ (group of chickens were infected by enterotoxigenic *E. coli* T0- (control group, not infected), T1 (infected by enterotoxigenic *E. coli* + 20% meniran extract), T2 (infected by enterotoxigenic *E. coli* + 25% extract meniran), T3 (infected by enterotoxigenic *E. coli* + 30% extract meniran). Data were analyzed by ANOVA (Analysis of Variance). The results show that all of *E. coli* DNA isolates which tested by the PCR method show positive reactions at 600 bp. The next stage, the enterotoxigenic *E. coli* are resistant to some antibiotics, such as amoxicillin, ampicillin, erythromycin, cephalosporins, tetracycline, cloxacillin and gentamicin. Furthermore, the 30% *Phyllanthus niruri* Linn extract is effective as an antibacterial for antibiotic resistance enterotoxigenic *E. coli*. next necessary to write that: The 30% meniran extract is potential for kill of enterotoxigenic *E. coli*

**Keywords:** *Phyllanthus niruri* Linn, enterotoxigenic *E. coli*, antibiotic resistance, medicinal plants, immunomodulator

### ABSTRAK

*Escherichia coli* (*E. coli*) dapat diisolasi dari lingkungan baik di dalam maupun di luar tubuh inang. Ditemukan 89 serotipe dimana 21% menunjukkan resistensi terhadap berbagai antibiotik, seperti *E. coli* enterotoxigenic. Diperlukan upaya alternative sebagai pengganti antibiotik, salah satunya melalui pemanfaatan tanaman obat, seperti meniran (*Phyllanthus niruri* Linn). Tanaman meniran merupakan imunomodulator yang berfungsi memperbaiki sistem imun tubuh. Penelitian ini melalui beberapa tahap yaitu: isolasi dan identifikasi *E. coli* enterotoxigenic dari beberapa peternakan ayam pedaging di Jawa Timur menggunakan metode polymerase chain reaction (PCR), uji resistensi *E. coli* terhadap beberapa antibiotik, pembuatan ekstrak meniran dan uji aktivasi meniran terhadap *E. coli* enterotoxigenic. Penelitian ini dibagi menjadi lima perlakuan: T0+ (kelompok ayam yang terinfeksi oleh *E. coli* enterotoxigenic), T0- (kelompok kontrol, ayam tidak terinfeksi enterotoksigenic *E. coli*, T1 (kelompok ayam yang terinfeksi oleh *E. coli* enterotoxigenic + ekstrak meniran dosis 20%), T2 (ayam terinfeksi oleh *E. coli* enterotoxigenic + ekstrak meniran dosis 25%), T3 (ayam terinfeksi *E. coli* enterotoxigenic + ekstrak meniran dosis 30%). Data dianalisis dengan ANOVA (Analisis Varians). Hasil penelitian menunjukkan semua isolat DNA *E. coli* yang diuji melalui metode PCR menunjukkan reaksi positif berada pada posisi 600 bp. Pada tahap penelitian berikutnya ditemukan bahwa *E. coli* enterotoksigenic resisten terhadap beberapa antibiotik, seperti: amoxicillin, ampicillin, eritromisin, cephalosporins, tetracycline, cloxacilin dan gentamicin. Selanjutnya 30% ekstrak meniran (*Phyllanthus niruri* Linn) 30% efektif sebagai

*antibakteri untuk pencegahan resisten antibiotik dari E. coli enterotoxigenic. Kesimpulan dari penelitian ini, 30% meniran extract efektif untuk membunuh E. coli enterotoksigenic*

**Kata kunci:** *Phyllanthus niruri* Linn, *E. coli* enterotoxigenic, resisten antibiotik, tanaman obat, imunomodulator

## INTRODUCTION

The poultry, especially chickens are farm animals which particularly vulnerable to diseases. This condition leads to decrease in productivity and causes major losses if the treatment is not successful.<sup>1</sup> One of the diseases that are common and detrimental to farmers is a bacterial infection such as *E. coli*.<sup>2</sup> *E. coli* especially due to enterotoxigenic from *E. coli* was commonly cause diarrheal disease in chickens, is called Colibacillosis.<sup>3</sup> The losses due to diseases such as colibacillosis is high chicken mortality which can reach 30%. Colibacillosis disease attacks young chickens until harvesting on the age around of 25-35 days old broiler and 40-50 days old layer.<sup>4</sup>

Incorrect diagnosis, treatment and control of *E. coli* infections often cause resistance to antibiotics.<sup>5</sup> There are 89 serotypes *E. coli* can be isolated from the host and 21% exhibit resistance to various antibiotics, because *E. coli* contains plasmids.<sup>6</sup>

Use of antibiotics should be re-evaluated, as well as against the enterotoxigenic and virulence factors of *E. coli*. The meniran (*Phyllanthus niruri* Linn) is a plant that can be used as an alternative prevention and treatment of diseases which caused by *E. coli*.<sup>7</sup> The chemicals contain in meniran are flavonoids and tannins.<sup>8</sup> The flavonoids action of *Phyllanthus niruri* Linn is an immunomodulator whose role is to boost the immune system and improve dysfunctional of the immune system.<sup>9</sup> Immune dysfunctional is caused a decrease in number of immune cells such as T-CD5+, CD4+, CD8a+, CD8b+ in the lamina propria and intraepithelial villi intestine.<sup>10</sup>

The immune dysfunctional, which can lead to infection by bacterial or parasites with symptoms of chronic diarrhea and that, will increase mortality. From previous studies, the animal laboratory were conditioned immune dysfunctional in addition to obtain high expression of Hsp70, low expression of prostaglandin E2, expression of immunoglobulin A, histologically visible damage of intestinal mucosa epithelium and is showed villus atrophy, which will lead to decrease in the absorption function. The impact is as reduced nutritional intake and organs damage, including liver damage.<sup>11</sup> This will reduce the reproductive rate of both male<sup>12</sup> and female,<sup>13,14</sup> which in turn decreases productivity for livestock, especially poultry.

Tannins efficacious as an antibacterial (prevents bacterial growth) and hemostatic (bleeding stopped).<sup>15</sup> Phenolic compounds may be bactericidal or bacteriostatic depending on the concentration used. Antibacterial substances have various ways in inhibiting bacterial growth.<sup>16</sup> Damage to one of the structures of the bacterial

cell can cause changes in the structure and action of bacteria. This can lead become stunted bacterial growth and even lead to cell death.<sup>17</sup> Cytoplasmic membrane is the outer part of the cytoplasm which is located under the cell wall, composed of proteins, lipids and carbohydrates. This membrane plays a role to regulate the incoming of matter such as water and mineral salts needed by the cell. The parts of the cell in the cytoplasm are ribosomes, nuclei, granules and mesosomes. Ribosomes are small follicles composed of proteins and ribonucleic acid (RNA), which their function were act in protein synthesis. The nucleus contains deoxyribonucleic acid (DNA) as a carrier of genetic information. Granules are chemical substances that can functionate as food reserves for cells. The mesosome is the fold of the cytoplasmic membrane into the cytoplasm. In connection with this, the damage to cell membranes by antibacterial substances can lead stunted cell growth and even result in the death of bacterial cells.<sup>16</sup>

The meniran plant as the composition of feed as well as a single oramixture of food ingredients, processed or unprocessed, which is given for animal's survival, production and breed.<sup>18</sup> The research purposes is isolation and identification of enterotoxigenic *E. coli* was antibiotic-resistant as the causative agent of loss and death of broilers. Furthermore, applying meniran (*Phyllanthus niruri* Linn) as antibacterial for the prevention enterotoxigenic *E. coli* of antibiotic-resistant in broiler.

## MATERIAL AND METHOD

The research was done through several stages:

**First stage.** Isolation and identification of *enterotoxigenic E. coli* from several broiler farms in East Java (Mojokerto and Tuban). The identification using the polymerase chain reaction (PCR) method<sup>19</sup> with primer: Forward (5'-TAGAGAAATTATCAAGTTAGTTCC-3') Reverse: (5'-ATAGTTATGAACATCTTGTGGTTAGC-3') (17).

**The second stage.** *E. coli* resistance test against some antibiotics were used dilution method, namely *Minimum Inhibitory Concentration* (MIC)<sup>20</sup> and *Minimum Bactericide Concentration* (MBC). The test were done through several antibiotics: amoxicillin, ampicillin, erythromycin, cephalosporins, tetracycline, cloxacilin and gentamicin.

**The third stage.** The synthesis of meniran extract with ethanol solven. Ried Meniran plants have been milled to obtain powder. Pollen meniran 1 kg extracted using maceration method by immersion in a solution of ethanol 96% as much as five liters for 3 x 24 hours. Stirring is



done twice, morning and afternoon. Maceration process is performed three times. The marinade filtrate is then filtered to evaporate using a rotary evaporator which will yield a concentrated plant extracts meniran<sup>21</sup> and then, meniran extract was already for application to broiler chicken.

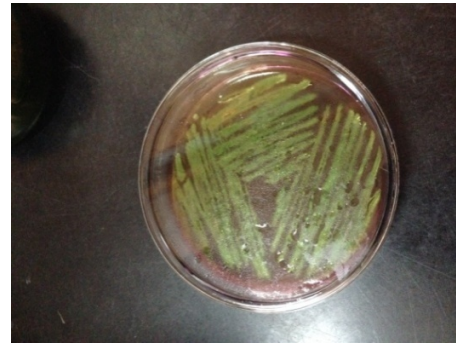
**The fourth stage.** Activation test of the meniran extract against enterotoxigenic *E. coli* were applied to 25 broiler chicken aged 19 days, with treatment as follow: *E. coli* infected T0+: broiler chickens infected with *E. coli* at 28 days of age with a concentration of 10<sup>6</sup> CFU/ml/chicken orally without meniran plant extract (control positive); T0-: broiler chickens at 28 days without any treatment (control negative); *E. coli* infected T1: broiler chickens 28 days of age with a concentration of 10<sup>6</sup> CFU/ml/chicken orally and then given the extract of meniran plants with a dose of concentration of 20% /ml/chicken orally; *E. coli* infected T2: broiler chickens 28 days of age with a concentration of 10<sup>6</sup> CFU/ml/chicken orally and then given the extract of meniran plants with a dose of concentration of 25%/ml/chicken orally; *E. coli* infected T3: broiler chickens at 28 days of age with a concentration of 10<sup>6</sup> CFU/ml/ chicken orally and they had been given the extract of meniran plants with a dose of concentration of 30%/ml/chicken orally.

Sampling for the calculation of the number of *E. coli* bacteria was done by killing the broiler chickens in each treatment to take 1 g of broiler chicken liver sample and inserted into a venoject tube containing 9 ml of physiological NaCl solution and labeled treatment for each sample. All samples that have been taken are saved into the coolbox.

Data on the number of *E. coli* with *Most Probable Number* (MPN) were analyzed by ANOVA (Analysis of Variance). The data was analysed using SPSS version 20. *p* value at the level of < 0,05 was refer to significant.

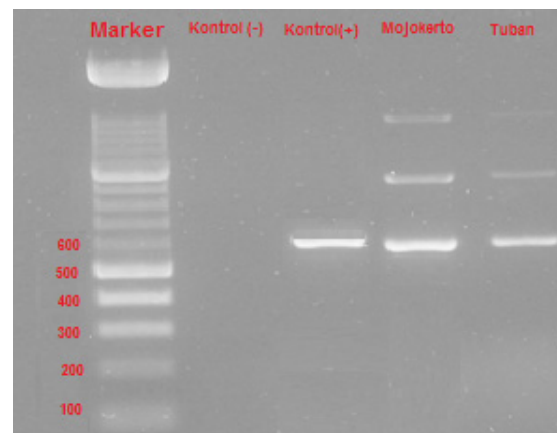
## RESULT AND DISCUSION

The isolation and identification of Escherichia coli bacteria results on broiler chicken liver samples from broiler farms in Tuban and Mojokerto, where showed of *E. coli* infected typical symptoms such as diarrhea and sepsis. The body was bluish, *E. coli* isolated bacteria was identified on hepar. 29 samples including 17 samples from Tuban and 12 samples from Mojokerto, were showed positive for *E.coli* in 20 samples consist of 12 samples from Tuban and 8 samples from Mojokerto. The results of *E.coli* isolation on EMBA media were showed metallic green colonies (Figure 1). Biochemical test results are as follows TSIA (+), Indole (+), Urea Agar (-) and SCA (-).



**Figure 1.** *E. coli* isolation in EMBA media.

The identification of enterotoxigenic *E. coli* DNA from several broiler farms in East Java (Mojokerto and Tuban) using the polymerase chain reaction (PCR) method was showed a positive reaction for all isolates tested the PCR fragments which was located position at 600 bp (Figure 2).



**Figure 2.** Gene analysis coding enterotoxigenic *E. coli* DNA with PCR electrophoresis was visualized on 2% agarose gel ethidium bromide staining. The results show a 600 bp cDNA string on all samples from chicken farms in Mojokerto and Tuban.

Enterotoxigenic *E. coli* DNA detection by PCR was showed a positive reaction for all isolates tested the PCR fragments which was located at position 600 bp. The used of primer has a great prospect when used in the early detection of enterotoxigenic *E. coli* strain enterohemorrhagic for local (Indonesian) because it has a fairly high specificity.<sup>2</sup>

Furthermore, enterotoxigenic *E. coli* resistance to some antibiotics such as amoxicillin, ampicillin, erythromycin, cephalosporins, tetracycline, cloxacilin and gentamicin. The using of antibiotics is widely used in the livestock

industry to prevent infection of *E. coli*.<sup>22</sup> because *E. coli* is a commensal bacterium that has a live strain not only in the gastrointestinal tract but also in various internal organs.<sup>23</sup> Bacteria become resistant to antibiotic agents due to mutations, transformations, transduction or conjugation.<sup>24</sup> The mechanism of resistance can be through various means, among others: drug activation, altering the structure of enzymes or bacterial membranes, decreasing the accumulation of drugs by cells, the presence of variations in metabolic pathways as well as increased metabolic concentration.<sup>25</sup>

Enterotoxigenic *E. coli* resistance to some antibiotics is showed resistant to amoxicillin, ampicillin, erythromycin, cephalosporins, tetracycline, cloxacilin and gentamicin. The ability of meniran (*Phyllanthus niruri* Linn) extract in inhibiting the growth of bacteria due to the chemicals contains found in plant meniran (*Phyllanthus niruri* Linn) extracts namely flavonoids, tannins and saponins.

Plant phenolic compounds and phenol compounds in general is a class of materials that has the ability to kill and inhibit the growth of bacteria. Damage to one of the constituent structures of bacterial cells can cause changes in the structure and working of bacteria.<sup>22</sup>

After meniran extract already for application to broiler chicken, further observations were made on the activation test from the meniran extract against enterotoxigenic. The meniran extract potential for enterotoxigenic *E. coli* was showed the power to kill the enterotoxigenic *E. coli* at concentrations of 30% (Table 1).

**Table 1.** Mean and Standard Deviation (SD) Number of *E. coli* (MPN) in Broiler Chickens with Various Treatment

Treatments	Mean ± SD
T0 - (control group, not infected)	0.7593 <sup>a</sup> ± 0,32578
T3 (infected by enterotoxigenic <i>E. coli</i> + 30% extract meniran)	1.1799 <sup>a</sup> ± 0,81489
T2 (infected by enterotoxigenic <i>E. coli</i> + 25% extract meniran)	1.4210 <sup>ab</sup> ± 0,32792
T1 (infected by enterotoxigenic <i>E. coli</i> + 20% meniran extract)	2.3181 <sup>bc</sup> ± 0, 83574
T0 + (group of chickens were infected by enterotoxigenic <i>E. coli</i> )	2.7732 <sup>c</sup> ± 0.53645

<sup>a, b</sup> Superscript different in the same column indicate significant differences ( $p < 0.05$ )

The analysis of data that has been done using Anova showed significant result between T0 + and T0-. While T0 + and T1 showed insignificant results, significant results were also seen between T0 + and T2. T0 + and T3 were significantly different, significant results were also seen between T0- and T1, and T1 and T3. Between T0- and T2 are not significant. While in T0- and T3 the results are significant. The concentration of 30% is a concentration that can kill the bacteria *E. coli* according to the result.

The cytoplasmic membrane is the outermost part cytoplasm that lies beneath the cell wall, composed

of protein compounds, lipids and carbohydrates. This membrane acts to regulate the materials out of cells such as water and mineral salts needed cells. Parts of the cell in the cytoplasm include the ribosomes, nuclei, granules and mesosom. Ribosomes shaped small particles consisting of protein and ribonucleic acid (RNA), which functions as a protein synthesis. The tannin compound which is a component of meniran has a working mechanism that inhibits and kills the growth of bacteria by reacting with membrane cells as well as the destruction or inactivation of the function of the genetic material.<sup>16</sup> Tanin is also toxic and the nature of astrigensia works against bacterial cell membranes, by inhibiting certain enzymes.<sup>24,25</sup>

Other antibacterial compounds are saponins. Saponins can increase the permeability of bacterial cell membranes in order to alter membrane structure and function, causing membrane protein denaturation so that cell membranes will be damaged and lysis.<sup>16</sup> Saponins can increase the permeability of the intestinal wall, improve nutrient absorption and also inhibit the activity of the urease enzyme.<sup>17</sup>

Meniran plants also contain alkaloids that are toxic to microbes, so effectively kill gram-negative and gram-positive bacteria. Alkaloids act as antibacterial by destroying the peptidoglycan component in bacterial cells, so that the cell wall layer is not fully formed and causes the cell death.<sup>26</sup>

## CONCLUSION

*Enterotoxigenic E. coli* DNA was showed a positive reaction for all isolates tested the PCR fragments which was is located at position 600 bp. The enterotoxigenic *E. coli* are resistance to some antibiotics, such as amoxicillin, ampicillin, erythromycin, cephalosporins, tetracycline, cloxacillin and gentamicin. 30% concentration *Phyllanthus niruri* Linn extract effective as an antibacterial for the prevention of antibiotic resistance from enterotoxigenic *E. coli* of broilers.

## ACKNOWLEDGEMENT

We thank to Directorate General of Higher Education for funding through scheme *Program Penelitian Unggulan Perguruan Tinggi (PUPT) Universitas Airlangga, 2016.*

## REFERENCES

1. Review M. Salmonellosis - a Potential Threat To Poultry: J Cell Tissue Res. 2015;15(3):5209–13.
2. He X, Qi W, Quiñones B, McMahon S, Cooley M, and Mandrell RE. Comparison of the Specificities and Efficacies of Primers for Aromatic Dioxygenase Gene Analysis of Environmental Samples. Appl Env Microbiol. 2011;77(11):3551–3557.
3. Bergeron CR, Prussing C, Boerlin P, Daignault D, Dutil L, Reid-smith RJ, et al. Chicken as Reservoir for Extraintestinal Pathogenic Escherichia coli in Humans, Canada. 2012;18(3):415–21.

4. Matin MA, Islam MA, Khatun MM. Prevalence of colibacillosis in chickens in greater Mymensingh district of Bangladesh. *Vet World*. 2017 Jan;10(1):29–33.
5. Beckson D. B BBL Prepared Tubed Medium for Detection of Fecal Coliform Bacteria. 2011;8806881.
6. Trivedi RN, Akhtar P, Meade J, Bartlow P, Ataii MM, Khan SA, et al. High-Level Production of Plasmid DNA by *Escherichia coli* DH5 $\alpha$   $\Omega$  sacB by Introducing *inc* Mutations. Parales RE, editor. *Appl Environ Microbiol*. 2014 Dec 1;80(23):7154–60.
7. Yuniati Y, Rollando R. Isolation of antibacterial compounds from endophyte fungal of fusarium Isolation of antibacterial compounds from endophyte fungal of fusarium sp. In *Phyllanthus niruri* linn. Leaves. 2018;(March).
8. Permata DA, Murtius WS, August J. Research Journal of Pharmaceutical, Biological and Chemical Sciences Alpha Amylase Inhibition and Antioxidant Activity of *Phyllanthus niruri* Powder Drink. 7(656):656–62.
9. Aldi Y, Rasyadi Y, Handayani D. Immunomodulatory Activity of Meniran Extracts (*Phyllanthus niruri* Linn.) on Broiler Chickens. *J Sains Farm Klin*. 2014;1(1):20–6.
10. Prasetyo RH, Safitri E. Effects of honey to mobilize endogenous stem cells in efforts intestinal and ovarian tissue regeneration in rats with protein energy malnutrition. *Asian Pacific J Reprod*. 2016 May;5(3):198–203.
11. Prasetyo RH, Hestianah EP. Honey can repairing damage of liver tissue due to protein energy malnutrition through induction of endogenous stem cells. *Vet world*. 2017 Jun;10(6):711–5.
12. Safitri E, Utama S, Widiyatno TV, Sandhika W, Prasetyo RH. Auto-regeneration of mice testicle seminiferous tubules due to malnutrition based on stem cells mobilization using honey. *Asian Pacific J Reprod*. 2016 Mar;5(1):31–5.
13. Safitri E, Widiyatno TV., Prasetyo RH. Honeybee product therapeutic as stem cells homing for ovary failure. *Vet World*. 2016 Nov;9(11):1324–30.
14. Samik A, Safitri E. Mycotoxin binders potential on histological of ovary mice exposed by zearalenone. *Vet World*. 2017 Mar;10(3):353–7.
15. Dandjesso C, Klotoé JR, Dougnon TV, Sègbo J, Atègbo JM, Gbaguidi F, et al. Phytochemistry and hemostatic properties of some medicinal plants sold as anti-hemorrhagic in Cotonou Markets (Benin). *Indian J Sci Technol*. 2012;5(8):3105–9.
16. Maddox CE, Laur LM, Tian L. Antibacterial Activity of Phenolic Compounds Against the Phytopathogen *Xylella fastidiosa*. *Curr Microbiol*. 2010 Jan 8;60(1):53–8.
17. Jawetz, Melnick and A. *Medical Microbiology*. 6<sup>th</sup> Ed. New York: A LANGE medical book; 2013.
18. Samik A, Safitri E. Potency of mycotoxin binders on MDA level, expressions of caspase 9 and caspase 3 in the uterus of mice exposed to zearalenone. *Iraqi J Vet Sci*. 2017;31(1):29–33.
19. Lluque A, Mercado E, Riveros M, Alvarado L, Carlos E., Colichón A, Salazar E, Ochoa T. Comparison of enteropathogenic *Escherichia coli* (EPEC) diagnosis by serology and by polymerase chain reaction (PCR). *Rev Gastroenterol Peru*. 2010;30(2):121–5.
20. Lara VM, Carregaro AB, Santurio DF, Sá MF de, Santurio JM, Alves SH. Antimicrobial Susceptibility of *Escherichia coli* Strains Isolated from *Alouatta* spp. Feces to Essential Oils. *Evidence-Based Complement Altern Med*. 2016;2016:1–4.
21. Rumagit BI, Banne Y, Dilampudi Y. Preparation of ulcer ointment from meniran (*Phyllanthus niruri* L.) herb extract. *J STIFA Makassar*. 2015;1(1):15–9.
22. Landers TF. A Review of Antibiotic Use in Food Animals: Perspective, Policy, and Potential. 127(February 2012).
23. Katouli M. Population structure of gut *Escherichia coli* and its role in development of extra-intestinal infections. 2010;2(2):59–72.
24. Willey JM, Sherwood LM, Woolverten CJ. *Prescott's Principle of Microbiology*. New York: McGraw-Hill Higher Education; 2009. 532–567 p.
25. Munita JM, Arias CA, Unit AR, Santiago A De. HHS Public Access. 2016;4(2):1–37.
26. Cushnie TPT, Cushnie B, Lamb AJ. International Journal of Antimicrobial Agents Alkaloids: An overview of their antibacterial, antibiotic-enhancing and antivirulence activities. *Int J Antimicrob Agents*. 2014;44(5):377–86.

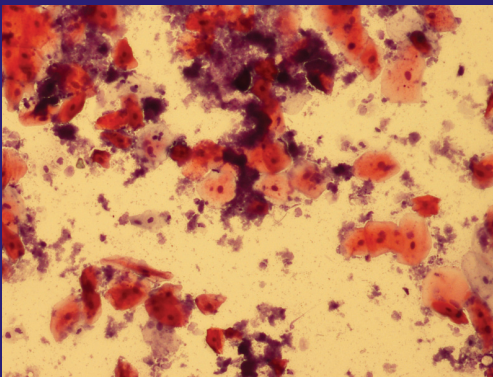
e ISSN 2356-0991  
p ISSN 2085-1103



9 772085 111006 6



# Indonesian Journal of Tropical and Infectious Disease



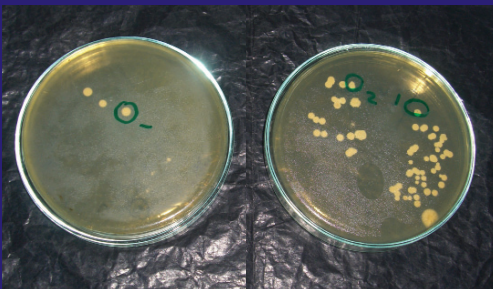
Soil-Transmitted Helminth Infection and Eosinophil Level Among Waste Collectors in Banda Aceh

Effectiveness of Meniran (*Phyllanthus Niruri* Linn) as Antibacterial for Antibiotics Resistance Enterotoxigenic *Escherichia Coli*

Factor Related to Anti-Tuberculosis Drug Resistency on Pulmonary Tuberculosis Patients in Labuang Baji Hospital Makassar

Onychomycosis Finger Nail by *Cryptococcus Laurentii*, *Trychophyton Spp*

The Effectiveness of Herbal Mosquito Coils “Morizena” Against *Aedes Aegypti* Death



[e-journal.unair.ac.id/index.php/IJTID](http://e-journal.unair.ac.id/index.php/IJTID)

Vol. 7 • No. 2 May–August 2018

# IJTID

Indexed by:



# *Indonesian Journal of* Tropical and Infectious Disease

---

## **EDITORIAL TEAM OF INDONESIAN JOURNAL OF TROPICAL AND INFECTIOUS DISEASE**

### **EDITOR IN CHIEF**

Prihartini Widiyanti, Indonesia

### **EDITORIAL BOARD**

Mark Alan Graber, United States  
Kazufumi Shimizu, Japan  
Masanori Kameoka, Japan  
Hak Hotta, Japan  
Fumihiko Kawamoto, Japan  
Nasronudin Nasronudin, Indonesia  
Maria Inge Lusida, Indonesia  
Puruhito Puruhito, Indonesia  
Indropo Agusni, Indonesia  
Retno Handajani, Indonesia  
Kuntaman Kuntaman, Indonesia  
Soengeng Soegijanto, Indonesia  
Bambang Prajogo, Indonesia  
Ni Nyoman Sri Budayanti, Indonesia  
Achmad Fuad Hafid, Indonesia  
Tri Wibawa, Indonesia  
Irwanto Irwanto, Indonesia  
Marcellino Rudyanto, Indonesia  
Yulis Setiya Dewi, Indonesia  
Laura Navika Yamani, Indonesia

### **SECRETARIAT**

Zakaria Pamoengkas  
Firda Fatma Hamzah

### *Secretariat Office*

Publishing Unit of Indonesian Journal of Tropical and Infectious Disease, Institute of Tropical Disease Universitas Airlangga  
Kampus C, Jalan Mulyorejo Surabaya 60115, Jawa Timur – Indonesia. Phone 62-31-5992445-46 Faximile 62-31-5992445  
E-mail: [ijtid@itd.unair.ac.id](mailto:ijtid@itd.unair.ac.id) Homepage: [e-journal.unair.ac.id/index.php/IJTID](http://e-journal.unair.ac.id/index.php/IJTID)

# Indonesian Journal of Tropical and Infectious Disease

---

## CONTENTS

	<i>Page</i>
1. Soil-Transmitted Helminth Infection and Eosinophil Level among Waste Collectors in Banda Aceh <b>Teuku Romi Imansyah Putra, Ricke Loesnihari, Merina Panggabean</b> .....	27–34
2. Effectiveness of Meniran ( <i>Phyllanthus Niruri</i> Linn) as Antibacterial for Antibiotics Resistance Enterotoxigenic <i>Escherichia Coli</i> <b>Sri Hidanah, Emy Koestanti Sabdoningrum, Retno Sri Wahyuni, Arini Rahmi Dewi, Erma Safitri</b> .....	35–39
3. Factor Related to Anti-Tuberculosis Drug Resistency on Pulmonary Tuberculosis Patients in Labuang Baji Hospital Makassar <b>Sapriadi, Syahridha</b> .....	40–44
4. Onychomycosis Finger Nail by <i>Cryptococcus Laurentii</i> , <i>Trychophyton Spp</i> <b>Dhelya Widasmara, Diane Tantia Sari</b> .....	45–49
5. The Effectiveness of Herbal Mosquito Coils “Morizena” against <i>Aedes Aegypti</i> Death <b>Rina Priastini Susilowati, Win Darmanto, Nanik Siti Aminah</b> .....	50–55