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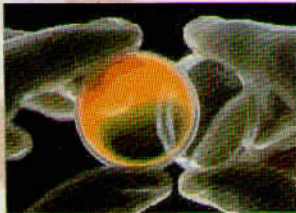
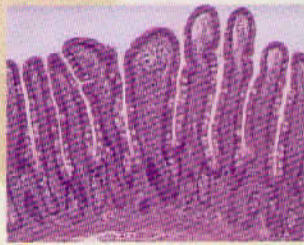
# PROCEEDINGS

The First Congress of

# SEAVSA

(South East Asia Veterinary School Association)

Animal Health & Production  
for Better ASEAN Quality of Life  
Challenge of Veterinary Education



IPB International Convention Centre  
Bogor, Indonesia July 20 - 22, 2010



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Contact Address:

Secretariat of SEAVSA 2010

Wing 2, Second Floor, Faculty of Veterinary Medicine, Bogor Agricultural University (IPB)

Jl. Agatis Kampus IPB Dramaga Bogor 16680, Indonesia.

Phone: +62-251-8628080/Fax: +62-251-8628181

E-mail: [conferenceipb2010@gmail.com](mailto:conferenceipb2010@gmail.com)

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OAEA 14	Reproductive Potency and Effort to Increase Spotted Buffalo Population in Tana Toraja <i>Yulnawati, Herdis, Hera Maheswari, M. Rizal, Arief Boediono</i>	127
OAEA 15	Repair of Spiral Fracture of the Left Femur in an Ettawa Goat Using Combination Medullary, Transsegmental Pinning and Wiring <i>Dhirgo Adji</i>	129
OAEA 16	The Value Of Quality Problem Orientated Veterinary Records In Teaching Veterinary Hospitals – A Case Of Cervical Spondylopathy In A Doberman Dog <i>Rashid Ibrahim</i>	131
OAEA 17	Oligodendroglioma of the Interthalamic: Pathomorphology in a French Mastiff Dog <i>E. Handharyani, Hernomoadi Huminto, Adi Winarto, K. Ochiai</i>	134

**POSTER PRESENTATION**

		<b>Page</b>
P 1	Identification of Bacterias That was Isolated from Origin Goat's Milk in Turi, Sleman, Yogyakarta <i>Agnesia Endang Tri Hastuti Wahyuni, Tri Untari, Franky, Satria Pinanditiya</i>	139
P 2	Three in One Anti Diarrhea and Avian Influenza Egg: Production and Efficacy <i>Agustin Indrawati</i>	141
P 3	The Potency of Ketamine as an Alternative Anaestheticum in Transportation of Catfish <i>Andriyanto, A. Sutisna, R. Hidayat, K. Suanda, S. Valinata, L. Andini, W. Manalu</i>	143
P 4	The Effect of Ethanolic Extract of Zedoary Rhizome ( <i>Curcuma zedoaria</i> (Berg.) Roscoe) Administration on Leucocytes Profile of Rabbits Which was Induced by Tumour and Treated by Combination with Surgery <i>Anita Esfandiari, Gunanti, Ietje Wintarsih, Ros Sumarny, Ridlayanti Maulida</i>	145
P 5	Sensitivity Analysis of Non Radioactive-labeled Jembrana disease Virus DNA Probe Through Chromogenic Reaction <i>Asmarani Kusumawati, Penny Humaidah Hamid</i>	147
P 6	Antihyperglycaemic Effect of <i>Azadirachta indica</i> J Extract on Alloxan – Induced Diabetic Rat <i>Bayu Febram Prasetyo, Bambang Pontjo Priosoeryanto, Ietje Wintarsih, Rini Madyastuti</i>	149
P 7	Risk Factors Related to Cutaneous Anthrax Disease Occurrence in Inhabitant of Bogor District <i>C. Basri, NM Kiptiyah</i>	151



## THE EFFECT OF ETHANOLIC EXTRACT OF ZEDOARY RHIZOME (*CURCUMA ZEDOARIA* (BERG.) ROSCOE) ADMINISTRATION ON LEUCOCYTES PROFILE OF RABBITS WHICH WAS INDUCED BY TUMOUR AND TREATED BY COMBINATION WITH SURGERY

Anita Esfandiari<sup>2</sup>, Gunanti<sup>1</sup>, Ietje Wientarsih<sup>3</sup>, Ros Sumarny<sup>4</sup>, Ridlayanti Maulida<sup>5</sup>

<sup>1</sup>Division of Surgery and Radiology, Faculty of Veterinary Medicine, Bogor Agricultural University

<sup>2</sup>Division of Internal Medicine, Faculty of Veterinary Medicine, Bogor Agricultural University

<sup>3</sup>Division of Pharmacy, Faculty of Veterinary Medicine, Bogor Agricultural University

<sup>4</sup>Division of Pharmacology, Faculty of Pharmacy, Pancasila University

### Introduction

Tumor is a tissue swelling that can be caused by an inflammation (Sumarny 2006). Generally, tumor can be divided into benign tumor and malignant tumor (Wijayakusuma 2005 and Sumarny 2006). One of susceptible body tissue can be a tumor is mammary gland tissue and often found in pet animal, especially dog and cat (Stone 2000 and Fossum 2002). Conventionally, tumor can be healed by a surgical operation, radiation and chemotherapy, but these measures have some weakness (Kintzios 2004). Historically, one of Indonesian's plant is zedoary (temu putih) was supposed as antitumor. Gunanti *et al.* (2004) declared that either single or combination of nusa indah, blustru and zedoary extract have a tumor inhibition activity in vitro. Sumarny (2006) declared that zedoary has antibacterial, antiinflammation, analgesic, hepatoprotector, antioxidant and antitumor activity in vitro and in vivo. The effectiveness of tumor inhibition by ethanol extract of zedoary can be evaluated by leucocyte profile include amount and differentiation of leucocyte.

### Materials and Methods

Rabbits were used divided into seven group, each group consist of three rabbits. Tumor induction was done in mammary gland on both sides (intra mammary), three times in the first, second and third week (B-G group) using n-methyl-n-nitrosourea (MNU). MNU doses was used 50µg/kg body weight. Ethanol extract of zedoary was dissolved in propylene glycol. Ethanol extract of zedoary and curcumin given orally by stomach tube. It was given every day during treatment (four weeks). Zedoary was given on dose 250mg/kg body weight (Murwanti *et al.* 2004), while curcumin was given on dose 60mg/kg body weight. Tumor growth was observed by amount and differentiation of leucocyte. Surgical operation (ovariohysterectomy and mastectomy) was done in fifth week (B, D, E, F and G group).

Table 1 Grouping of experiment rabbits

Group	Treatment in week								
	1	2	3	4	5	6	7	8	9
A									
B	IT/CC	IT/CC	IT/CC	CC	OP	CC	CC	CC	CC
C	IT	IT	IT						
D	IT	IT	IT		OP				
E	IT/TM	IT/TM	IT/TM	TM	OP				
F	IT/TM	IT/TM	IT/TM	TM	OP	TM	TM	TM	TM
G	IT	IT	IT		OP	TM	TM	TM	TM

Note: IT=tumor induction; CC=treatment by curcumin; OP=surgical operation;  
TM=treatment by zedoary extract

### Result and Discussion

#### Amount of Total Leucocyte

Generally, amount of total leucocyte before operation in tumor group increase in a normal range and decrease after operation. This increase may be happened by an inflammation. The decrease may be happened by tumor removal and treatment of zedoary (F, G group). Zedoary has antiinflammation activity (Sumarny 2006). In B group, amount of total leucocyte didn't show a significant decrease may be happened by treatment of curcumin. Curcumin has antioxidant, antiinflammation and antitumor activity (Anderson 2005). Curcumin is one of many substances in zedoary.

#### Differentiation of Leucocyte

##### Total Neutrophil (Heterophil)

According to amount of total leucocyte, average of total heterophil, eosinophil, basophil, lymphocyte and monocyte in each group was increased before operation and decreased after operation. In B group, total heterophil was increased in normal range because of their physiological respon. Generally, increase of total neutrophil happened in second to fourth day after operation (Magdalena



2000). Increase of total monocyte was associated with total heterophil because they cooperate in bacterial elimination in body tissue. In B, D and G group, total eosinophil and basophil was increase significantly before operation because of allergic reaction to MNU. Eosinophil and basophil have a role in allergic reaction and anaphylactic hypersensitivity (Vansteenhuse 2006). In F group, total eosinophil and basophil didn't show significant increase. This fact indicate that zedoary inhibit tumor growth and decrease allergic reaction to MNU.

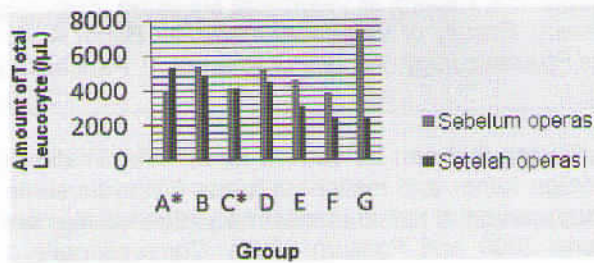


Figure 1 Ratio of amount of total leucocyte before and after operation.

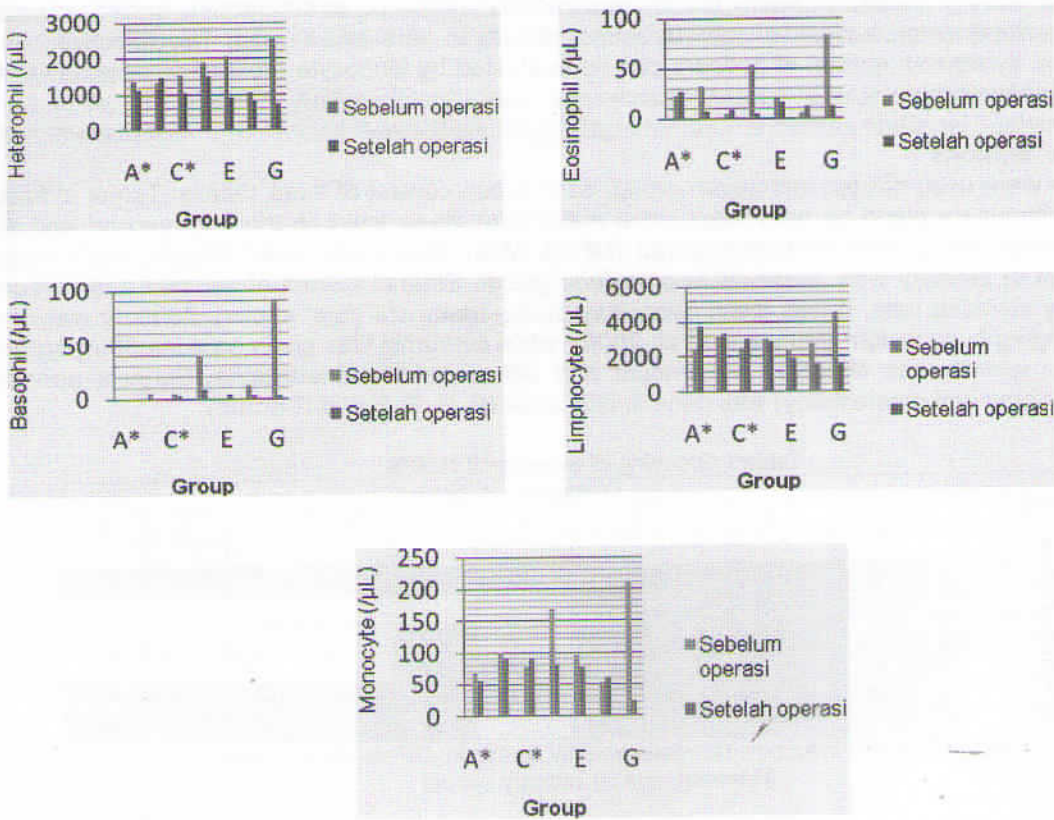


Figure 2 Ratio of each differentiated leucocyte before and after operation.

### Conclusion

Inducing tumor in mammary gland with MNU can make allergic reaction, while zedoary can decrease allergic reaction. Treatment of tumor with surgical operation and zedoary can decrease amount of total leucocyte, heterophil and lymphocyte, but influence total monocyte slightly.

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