



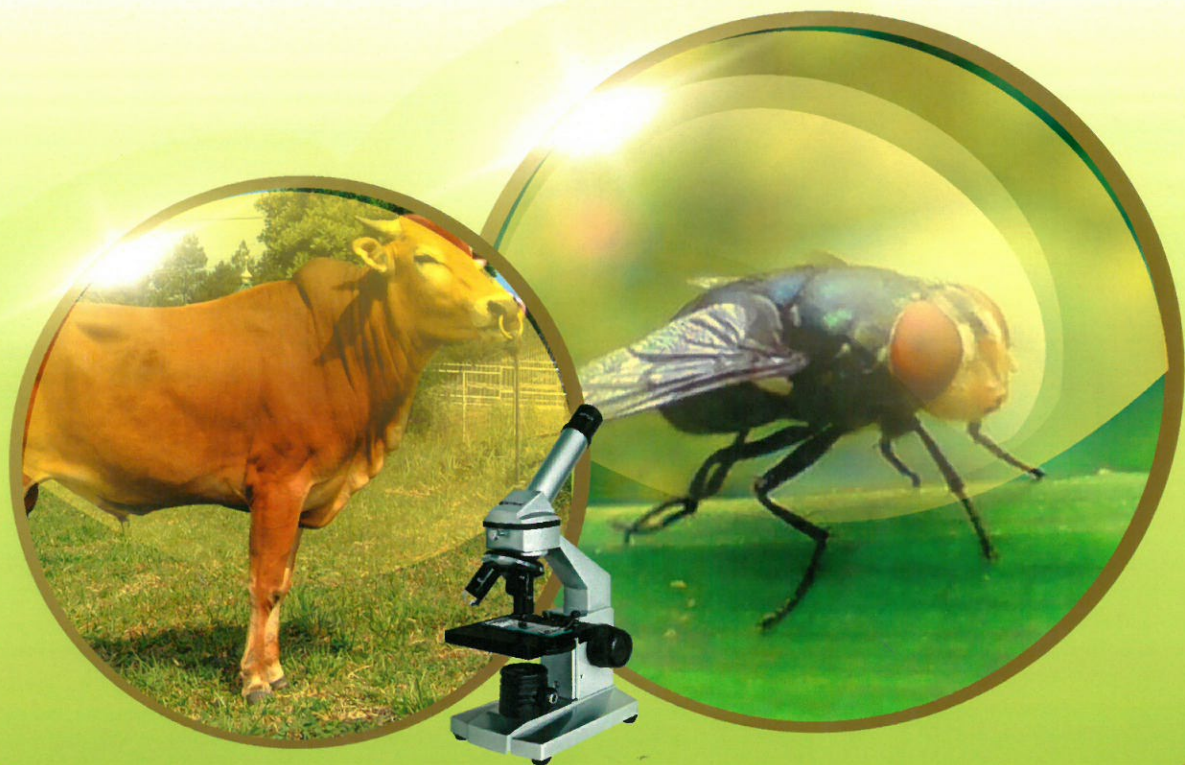
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PROCEEDING

International Seminar And Workshop

BITING FLIES AS VECTORS OF TRYPANOSOMES AND THE ROLE OF ONE HEALTH IN ANIMAL HEALTH

Yogyakarta, May 19th-25th, 2014



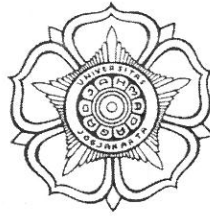
Coordinated by:
Graduate Program - Faculty of Veterinary Medicine
Gadjah Mada University

**International Seminar and workshop on
Biting Flies as vectors of Trypanosomes and
the Role of One Health in Animal Health
Yogyakarta, Indonesia, May 19th - 25th, 2014**

ORGANIZATION

- Patrons :
- : Rector of Gadjah Mada University, Indonesia
 - : Dean of the Faculty of Veterinary Medicine,
Gadjah Mada University, Indonesia
- Scientific Committee :
- Prof. Dr. Sathaporn Jittapalpong (Kasetsart University-Thailand)
 - Dr. Aurielle Binot Herder (CIRAD/GREASE-France)
 - Dr. Marc Desquesnes (CIRAD /IRD/KU- France)
 - Dr. Stephane Herder (CIRAD/IRD/KU-France)
 - Dr. Alan Dargantes (Central Mindanao University – Philippines)
 - Dr. Candrawathani Panchadcharam (VRI – Malaysia)
 - Dr. Jumnonngjit Phasuk (Kasetsart University – Thailand)
 - Dr. Phung Quoc Chuong (NIVR – Vietnam)
 - Dr. Gilles Sain-Martin (CIRAD – France)
 - Prof. Dr. Wayan T. Artama (Gadjah Mada University – Indonesia)
- Organizing Committee :
- Dr. R. Wisnu Nurcahyo, DVM
 - Devita Anggraeni, DVM, MP, Ph.D
 - Prof. Dr. Isrina OS, DVM
 - Prof. Dr. Puji Astuti, DVM, MP

Dr. S. Indarjulianto, DVM
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Dr. Trini Susmiyati, DVM, MP
Yuli Purwandari, DVM., MP
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Muhammad Tauhid Nursalim, DVM, M.Sc.
Oka Sayuthi, DVM, MP
Aven Oematan, DVM
Rika Yuniar S, DVM
Jaka Wisnu, DVM



Opening Remarks
Vice Rector for Research and Community Services
Gadjah Mada University

The Honorable
Speakers of this seminar
And all the participants

Welcome to the international seminar and workshop on Trypanosoma, Vector and The role of One-Health for Animal Health, which will be held from 19th up to 24th (of) May, 2014 in Gadjah Mada University.

I fully support this program, which is initiated by the Faculty of Medicine of Gadjah Mada University as part of the celebration of its 67th Dies Natalis. I fully support all of the efforts in eradicating animal disease and in preventing its spread, particularly parasitic disease. As it is known, Indonesia has approximately 14.000 islands with a wide variety of flora and fauna, the second largest in the world after Brazil. And it makes Indonesia vulnerable to disease spread between animals and humans. This is a challenge for all of us to maintain our good health. That is why the role of One Health to maintain our health is highly required of all parties involved in the cooperation, from multi-disciplines.

Ladies and Gentlemen,

Gadjah Mada University was founded in 1949 in this city of culture and education, Yogyakarta. This is the biggest university in Indonesia, and ranks best in some categories. Since it was first established, Gadjah Mada University has been a great place for students from many different places in Indonesia to study. These students bring with them their own local culture and language. Gradually, along with the

establishment of international programs in this campus, more and more foreign students come to Gadjah Mada University to study. Not only do we offer dual-degree program in corporation with top universities from all over the world, we also offer the foreign students a lot of programs and activities. The presence of both local and international students makes the learning environment in this campus feel "glocal" (global/local).

Gadjah Mada University offers many different programs or disciplines that the students can choose to take. It allows them to enrich their knowledge, experience in doing research, and conduct an interdisciplinary approach for their research. Not only for students, researchers, and lecturers, a number of institutions that work with Gadjah Mada University also find the disciplines offered by this campus complete. In addition, Gadjah Mada University has 230 programs and more than 28 centers of study. Our wide-range of experiences in building the network with educational institutions, research institutions, government, non-government institutions and industries enable us to facilitate an intensive cooperation.

The comfortable situation and the complete facilities in this campus are enhanced by the conducive environment. Located in Yogyakarta which is a student city rich with relic of history and cultural heritage, the students, researchers, and visiting professors can gain not only knowledge but also experience. Except Yogyakarta Palace, the location of this campus is not too far from two famous temples, that is, Borobudur Temple and Prambanan Temple.

In this occasion, I would like to thank all parties for the support that helps succeed this international program. To Prof. Sathaporn from Kasetsart University as the chief of steering committee of GREASE and Dr Marc Desquesnes from CIRAD/IRD, France as the coordinator as well as the speaker for the Workshop, I would like to send all my thanks and gratitude. Also, for Gadjah Mada University, thank you for the total support and help.

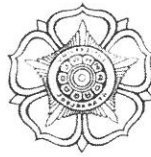
Finally, on behalf of the Rector of Gadjah Mada University, I officially open the International Seminar and Workshop on Trypanosoma, Vector and The role of One Health in Animal Health today.

Thank you.

May God Shower us with his blessings for this program.

Vice rector for Research and Community Service of Gadjah Mada University

Prof. Dr. Suratman, MSc.



Welcome speech from the Chair of Committee
International Seminar and Workshop on Trypanosoma, Vector and the Role of One
Health in Animal Health, Yogyakarta, 19-24 May 2014

The Honorable

Vice Rector for Research and Community Service of Gadjah Mada University

The speakers of this international seminar

The participants of the workshop,

Ladies and gentlemen,

All praise be unto God that has made it possible for us to gather in this international seminar on Trypanosoma, Vector and The role of One-Health for Animal health today, 19th (of) May 2014. The seminar will be followed by a Workshop on Identifying Biting Flies and Trypanosoma Diagnosis on 20th up to 24th (of) May 2014. This program is part of GREASE networking, a cooperation among UGM, Kasetsart University, CIRAD, IRD and a support from French Ministry of Foreign Affairs.

The topic of this international seminar ranges from the variety of parasites, Trypanosoma, Vector up to the Role of One-Health in Animal Health. The seminar will be divided into 2 groups. Group A will talk about Trypanosoma and Vector. Group B will talk about the role of One-Health for Animal Health. The key speakers for these topics are Prof. Sathaporn from Kasetsart University, Dr. Marc Desquesnes from CIRAD, Dr. Stephane Helder from CIRAD/IRD, Dr. Auriele Binot from GREASE, Dr. Jumnonjit Phasuk from Kasetsart University, Dr. Chandra from VRI Malaysia, Dr. Alan Dargantes and Prof. Escarlos from the Philippines, Dr. Phung Quoc Chuong and Dr Do Thi Thu Thuy and NVRI Vietnam. They will explain the importance of trypanosome and vector in ASEAN and the world. Speakers from Indonesia are Dr. April Wardana from Balitvet Bogor, Dr. Fajar Satria, Dr. Umi from IPB Bogor, the representatives from Disease Investigation Center in Medan, Bukittinggi, Lampung, Subang, Wates, Banjarbaru, Maros, Denpasar and Waingapu Department of Livestock Services, Sumba, NTT. They will explain the importance of parasites in world

health for animals and human. Meanwhile, Group B will talk about various topics concerning human and animal within One-Health framework.

Ladies and Gentlemen,

We have invited a number of universities, research institutions, and disease Investigation center from all over Indonesia and the world to join this international seminar and workshop which will be held for one week in Gadjah Mada University. For the workshop on trypanosome and vector, there will be a practicum and field visit to dairy farm in Kaliurang, beef cattle breeding in Pandansimo Bantul to see various biting flies that suck the blood of the cattle and will be continued by identification process at the lab.

In this occasion, I would like to thank UGM for providing the facilities, vehicles, and labs. Also, thanks to GREASE, CIRAD for the shared-funding for accommodation and transportation. Thanks to UIN Yogyakarta for the equipment, Faculty of Agriculture, and Faculty of Biology for the support to this program. Also, thanks to the speakers from Malaysia, the Philippines, Vietnam, Thailand for your participation in this program. To BALITVET and Disease Investigation Center for sending their representatives proving their support to this program.

I would like to thank the Faculty and the committee for making this program possible and for all the support to succeed this. I do apologize if there is any drawback and faults that you may find during the program.

Last but not least, I send my gratitude to the Vice Rector of Gadjah Mada University for attending the opening session of both the international seminar and workshop. And for this, we would welcome Prof. Suratman to officially open the program.

Chair of Committee

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Seminar schedule
Day 1 : May 19th, 2014; Seminar at University Center UC
in Bulaksumur Room (Group A)

| Time | Programme | Lecture/Speaker | duration | |
|--|---|---|----------|---|
| International seminar on Biting Flies and Trypanosomes | | | | |
| 09.00 – 09.05 | Opening remarks from the committee | Dr. Wisnu Nurcahyo (GMU) | 5 min | T |
| 09.05 – 09.15 | Opening Speech from GMU | Prof. Dr. Suratman (Vice Rector Research GMU) | 10 min | T |
| 09.15 – 09.25 | Opening Speech from coordinator of <i>BioZoonoSEA</i> | Prof. Sathaporn Jittapalapong (KU) | 10 min | T |
| 09.25 – 09.30 | Opening Speech from <i>NAHIAT</i> coordinator (<i>CIRAD-IRD</i>) | Dr. Marc Desquesnes (<i>CIRAD / KU</i>) | 5 min | T |
| 09.30 – 09.45 | Coffee break 15 min | | | |
| Morning Session (Moderator Dr. Alan Dargantes) | | | | |
| 09.45 – 10.25 | Lecture 1 : Concept of One Health / EcoHealth | Dr. A Binot | 40 min | T |
| 10.25 – 10.45 | L 2 : Parasitic Zoonoses in Thailand | Pr. S Jittapalapong | 20 min | T |
| 10.45 – 11.05 | L 3 : VRI and zoonoses in Malaysia | Dr C Panchadcharam | 20 min | T |
| 11.05 – 11.25 | L 4 : Atypical Human Trypanosomoses in SEA | Dr S Herder | 20 min | T |
| 11.25 – 11.45 | L 5 : Biting-Insects as mechanical vectors | Dr M Desquesnes | 20 min | T |
| 11.45 – 12.05 | L 6 : Parasitic zoonoses in Indonesia | Dr. WisnuNurcahyo | 20 min | T |
| 12.05 – 12.50 | Lunch Time (45 min) | | | |
| Afternoon Session 1 (Moderator Dr. Marc Desquesnes) | | | | |
| 12.50 – 13.00 | L 7 : National regulation of Animal health in Indonesia | Dr. Pudjiatmoko (Director of Animal Health, Minist. of Agric.) | 15 min | T |
| 13.00 – 13.10 | L 8 : Surra in the Philippines | Dr. A. Dargantes | 15 min | T |
| 13.15 – 13.30 | L 9 : Surra in Malaysia | Dr. C. Panchadcharam | 15 min | T |
| 13.30 – 13.45 | L 10 : Surra in Thailand | Prof. S Jittapalapong | 15 min | T |
| 13.45 – 14.00 | L 11 : Surra in Indonesia | Dr. April Wardana | 15 min | T |
| 14.00 – 14.15 | L 12 : Molecular aspects of surra | Prof. Dr. WayanArtama | 15 min | T |
| 14.15 – 14.30 | L 13: Economic impact of surra | Dr A Dargantes | 15 min | T |
| Regional aspects of Surra in Indonesia (Moderator Dr. Wisnu Nurcahyo) | | | | |
| 14.30 – 14.40 | L 14 : Surra in Banten | Balitvet | 10 min | T |
| 14.40 – 14.50 | L 15 : Surra in Bali | BB Vet Denpasar | 10 min | T |
| 14.50 – 15.00 | L 16 : Surra in Java | BB Vet Wates | 10 min | T |
| 15.00 – 15.10 | L 17 : Surra in Nusa Tenggara | Dispet Waingapu, NTT | 10 min | T |
| 15.10 – 15.20 | L 18 : Surra in North Sumatra | BVet Medan | 10 min | T |
| 15.20 – 15.30 | L 19 : Surra Kalimantan | BVet Banjarbaru | 10 min | T |
| 15.30 – 15.40 | L 20 : Surra in Sulawesi | BBVet Maros | 10 min | T |
| 15.40 – 15.50 | L 21 : Surra in West Sumatra | BVet Bukittinggi | 10 min | T |
| 15.50 – 16.00 | L 22 : Effects of Methanolic Extract of Buah Makasar <i>Brucea Javanica</i> (L) Merr. Leave's on The Parasitemic Level of <i>Trypanosoma</i> <i>Evansi</i> (Steel, 1885) In Mice | Rr. Upiek Ngesti Wibawaning Astuti | 10 min | T |
| 16.00 – 16.10 | L23 : Wild Rats Trypanosomiasis In Surabaya: a Case Report | Lucia Tri Suwanti | 10 min | T |
| 16.10 – 16.30 | Coffee break | | | |
| Open Discussion (Moderator Dr. C. Panchadcharam) | | | | |
| 16.30 – 16.40 | L 22: GREASE network | Dr. A Binot | 10 min | T |
| 16.40 – 17.05 | Open Discussion on One Health Concepts : Biting flies and Trypanosomes | Dr. A Binot Dr. Marc Desquesnes (<i>CIRAD / GREASE</i>) | 25 min | T |
| 17.05 – 17.15 | Closing remarks | Dr. A Binot/ Dr. Marc Desquesnes | 10 min | T |
| 17.15 – 17.20 | Announcement | Dr. Wisnu Nurcahyo | 5 min | T |

Day 1: Parallel session in Wanagama room (Group B)
The Role of One Health in Animal Health

| Time | Tittle | Speakers | Duration | Moderator |
|---------------|---|-------------------------|----------|------------------|
| 09.45 – 09.55 | Lecture 1: Effect of Chinaberry | Rr Upiek NWA | 10 min | Dr. Yudha |
| 09.55 – 10.05 | Lecture 2: Study of Toxoplasmosis | Slamet Raharjo | 10 min | |
| 10.05 – 10.15 | Lecture 3: Clasical Swine Fever | Widi Nugroho | 10 min | |
| 10.15 – 10.25 | Lecture 4: Potensi of Precocious Lines of Eimeria | Yunus, M | 10 min | |
| 10.25 – 10.35 | Lecture 5: The Role of Tamoxifen | Devita Anggraeni | 10 min | Dr. Lucia TS |
| 10.35 – 10.45 | Lecture 6: Preliminary study on porcine | Fajar S. | 10 min | |
| 10.45 – 11.0 | Lecture 7: Hair examination | Soedarmanto, I. | 10 min | |
| 11.00 – 11.10 | Lecture 8: The Effect BCS | Agung B. | 10 min | |
| 11.10 – 11.20 | Discussion | | 10 min | |
| 11.20 – 11.30 | Lecture 9: Cloning of Gene encoding MRP gene 188 bp | Mitra Slipranata | 10 min | Prof. Pujiastuti |
| 11.30 – 11.40 | Lecture 10: The Bed Bugs | Susi Soviana | 10 min | |
| 11.40 – 11.50 | Lecture 11: Detection Of <i>Edwardsiella Tarda</i> From African Catfish | Miftahul Fikar | 10 min | |
| 11.50 – 12.00 | Lecture 12: Effect of Kersen Fruit Extract | Vembriarto Jati Pramono | 10 Min | |
| 12.00 – 12.10 | Discussion | | 10 min | |
| 12.10 – 12.50 | Lunch Time (40 min) | | | |
| 12.50 – 13.00 | Lecture 13: Hemolytic effect of venom | Slamet Raharjo | 10 min | Prof. Aris J |
| 13.00 – 13.10 | Lecture 14: The efficacy of abamectin | Yuriadi | 10 min | |
| 13.10 – 13.20 | Lecture 15 :Red Ginger (<i>Zingiber Officinale Roscoe</i>) As Immunostimulant | Untari, T | 10 min | |
| 13.20 – 13.30 | Discussion | | 10 min | |
| 13.30 – 13.40 | Lecture 16: Hematological Studies On Turi Ducks | Irkham Widiyono | 10 min | Dr. Indar Y |
| 13.40 – 13.50 | Lecture 17: Mapping Of Zoonotic Diseases And Spatial Analysis | Wayan T. Artama | 10 min | |
| 13.50 – 14.00 | Discussion | | 10 min | |
| 14.10 – 14.20 | Lecture 18: Morphology and pathological feature | Bambang Sutrisno | 10 min | Prof. Isrina |
| 14.20 – 14.30 | Lecture 19: The Effect Of Bamboo Leaves Infusion | Widiarso, B. P. | 10 min | |
| 14.30 – 14.40 | Lecture 20: Using GIS technology | M. Tauhid Nursalim | 10 min | |
| 14.40 – 14.50 | Lecture 21: Biological Characterization Of Bovine Herpes Virus | Untari, T | 10 Min | |
| 14.50 – 15.00 | Lecture 22: genetic diversity study of native | Trini Susmiati | 10 Min | |
| 15.00 – 15.10 | Discussion | | 10 min | |
| 15.10 – 15.20 | Lecture 23: <i>Mediorhynchus Gallinarum</i> (Acanthocephala: Gigantorhynchidae) | Joko Prastowo | 10 Min | Dr. Fajar |
| 15.20 – 15.30 | Lecture 24: Upgrading Community | Aris Purwantoro | 10 Min | |
| 15.30 – 15.40 | Lecture 25: <i>Mediorhynchus gallinarum</i> of Layer Poultry | Ana Sahara | 10 Min | |
| 15.40 – 15.50 | Lecture 26: The Effect of Doxycycline | Agustina Dwi Wijayanti | 10 Min | |
| 15.50 – 16.00 | Lecture 27 :Potency of Testosterone Hormone Therapy | Yuli P. Kristianingrum | 10 Min | |
| 16.00 – 16.15 | Discussion | | 15 Min | |
| 16.15 – 16.25 | Lecture 28 : Specific Primers to Confirm Gene of <i>Bacillus anthracis</i> | Max Sanam | 10 Min | Dr. Yudha F |
| 16.25 – 16.35 | Lecture 29 : Modification of Nucleoprotein | Sidna Artanto | 10 Min | |

| | | | | |
|---------------|---|-------------------|--------|---|
| 16.35 – 16.45 | Lecture 30 : Effect of transport on TPP | Sarmin | 10 Min | |
| 16.45 – 17.05 | Discussion | | 15 Min | |
| 17.05 – 17.15 | Closing remarks | Dr. A Binot | 10 min | T |
| 17.15 – 17.20 | Announcement | Dr. WisnuNurcahyo | 5 min | T |
| | | | | |
| | | | | |

**Meeting of Indonesian Society for Veterinary Parasitology
(Time 19.00 – 22.00) at Wanagama Room)**

Presidium : Dr. drh. Wisnu Nurcahyo
Dr. drh. Fajar Satria
Dr. drh. Yudha Fahrimal
drh. Didik Tulus Subekti, MSi
drh. Ketut Mastra

Participants : Universities, Diseases Investigation Center, Veterinary Research Institute, Veterinarian, Biologist etc.

PRELIMINARY STUDY ON PORCINE CYSTICERCOSIS IN SORONG AREA OF WEST PAPUA PROVINCE, INDONESIA

Fadjar Satrija¹, Yuliana Fatie², Sri Murtini¹

¹Department of Animal Infectious Diseases and Veterinary Public Health, ²Undergraduate student, Faculty of Veterinary Medicine, Bogor Agricultural University (IPB), Jl. Agatis Kampus IPBD armaga, Bogor-Indonesia

ABSTRACT

Taeniosis/cysticercosis due to *T. solium* is one of the most important public health problems in Papua (formerly Irian Jaya). This parasitic zoonosis spread in six regencies in Papua, mostly in Papua Province. With exception of Manokwari Regency, the disease has not been reported in other parts of West Papua Province. The preliminary study was designed to elucidate the prevalence of cysticercosis in the Sorong area. This study was done by conducting carcass and visceral inspection, and ELISA test on 30 pigs slaughtered at Remu Market, City of Sorong, during the period of July-September 2013. Of 30 pigs examined and sampled in this study, none of them was positive neither for *T. solium* nor *Taenia hydatigena* cysticercosis. The serological test showed that one out of 30 samples (3.33%) showed a positive reaction in the ELISA test. The positive pig originated from Sorong Manoi District of Sorong City. This indicates the presence of viable cysticercus in the pig from District Sorong Manoi, Sorong. Results of the present serological test should be carefully interpreted. Further studies are needed to elucidate whether the cysticercosis is caused by *Taenia solium* or other *Taenia* species metacestodes as the ELISA is not able to distinguish between the two species. Nevertheless, veterinary and health authorities in the Sorong Area should be aware and working together to prevent the spread of cysticercosis in the area. An important step that must be taken is to set up slaughterhouse facilities for pigs, including establishing a meat inspection system in the slaughterhouse. Community awareness of the disease should be encouraged through community health education programs.

INTRODUCTION

Cysticercosis/taeniosis solium has been found endemic in several areas of Indonesia, including Bali and Papua (Formerly Irian Jaya), and to a lesser extent in East Nusa Tenggara, North Sumatra, Lampung, East Nusa Tenggara, South East Sulawesi, North Sulawesi, Jakarta, West Kalimantan, and East Java (Margono *et al* 2001, Suroso *et al* 2006). Papua is the area with the highest prevalence of cysticercosis/taeniosis in Indonesia, and even is considered to have one of the highest human cysticercosis prevalences in the world (Willingham *et al.* 2010). After the first case of taeniosis/cysticercosis due to *Taenia solium* was reported in Paniai District in early 1970s, the parasite has spread to five other districts in Papua, i.e. Jayawijaya, Pegunungan Bintang, Puncak Jaya, Nabire dan Manokwari, through movements of people and pigs as animals with high socio-cultural values (Wandra *et al* 2013).

Despite extensive researches have been done to elucidate prevalence and transmission of the disease in Papua, less attention has been paid on cysticercosis in pigs as the source of human infection. Survey of porcine cysticercosis in Jayawijaya Regency during 1998-1999 showed a prevalence of 70.4% (Margono *et al.*, 2003). Postmortem examination in pigs slaughtered at the market Jibama in Wamena Jayawijaya Regency revealed a prevalence rate of 77.1% (Maitindom 2008). Recent study showed seroprevalence of porcine cysticercosis in this regency was 40.54% (Assa *et al.* 2012).

Since 2007, Papua Province of Indonesia has been divided into two province namely Papua Province and West Papua Province (Papua Barat). Among the six endemic districts, Manokwari Regency is the only one belong to West Papua Province. There have been no report of *T. solium* infection neither in humans nor pigs in other areas of West Papua Province. Therefore there is of important to conduct surveillance on porcine cysticercosis in

this new province. This survey was designed as a preliminary study to investigate possible occurrence of porcine cysticercosis in Sorong Area of West Papua Province.

MATERIALS AND METHODS

Sample collection

A cross sectional study was carried out by conducting carcass and visceral inspection, and serological test to identify presence of cysticercosis in pigs slaughtered at Remu Market, City of Sorong of West Papua Province-Indonesia during period of July-September 2013 (Figure1). Remu Market is the trading center of Sorong area (Sorong City and Sorong Municipality). Traditionally, local peoples slaughter pigs in the market because no slaughter house is available in this area. A total of 30 pigs were examined during this period. The pigs originated from City of Sorong (Districts Sorong Kota, Sorong Utara, Sorong Timur, Sorong Barat, and Sorong Manoi), and Sorong Regency (Districts of Malaweï, Salawati, Samate and Kalobo). The pigs examined during this study consist of 11 males and 19 females weighed between 30-75 kgs.

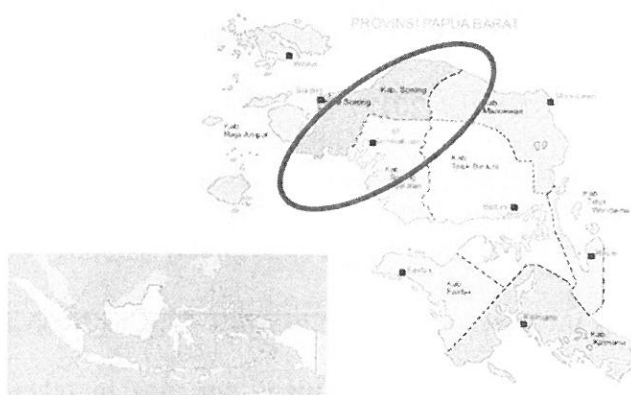


Figure 1. Map of West Papua Province and study area (Red cycle)

Blood samples were taken at slaughter from jugular vein, or the cranial vena cava and collected in disposable plastic cups. The blood samples were then stored in the refrigerator overnight in order to allow serum formation. The serum samples were subsequently dispensed into aliquots and stored in -20°C until serological test was performed. After the slaughtered animals were exviscerated, postmortem inspection of meat and visceral organs were done to find cysticercus.

Serological Test

The serum samples were tested for the presence of circulating parasite antigen using monoclonal antibody-based sandwich enzyme-linked immunosorbent assay (ELISA-Moab) as described by Dorny *et al.* (2004a). The monoclonal antibody for ELISA was kindly donated by Professor thank Prof. Pierre Dorny of Institute for Tropical Medicine, Belgium.

Prior to the test, serum samples and controls were pretreated with trichloroacetic acid (TCA) to break down immune complexes that may bind circulating antigen and reducing cross reaction. All of the wells of plate were then coated with 100 μl of capturing antibody (B158C11A10) (5 $\mu\text{g}/\text{ml}$ coating buffer) except the 2 wells for the substrate control. A hundred micro liters of coating buffer was put into those wells. It was incubated at 37°C while shaking for 30 minutes. Then, it washed once with washing buffer and blocked all wells with 150 μl of blocking buffer. It was incubated for 15 minutes at 37°C while shaking. The step did not wash. A hundred microliters of pre treated samples were put into designate wells. Blocking buffer (100 μl) was filled for substrate and conjugate controls. Then, it incubated for 15 minutes at 37°C while shaking. It also washed 5 times with washing buffer. A hundred microliters of detecting antibody (B60H8A4) (1.25 $\mu\text{g}/\text{ml}$ blocking buffer) was put in all wells, except the 2 wells for the substrate control. Then, 100 μl blocking buffer was put in those wells and incubated for 15 minutes at 37°C while shaking. It was washed 5 times

with washing buffer. This was also the time to take the OPD out of fridge. 100 µl of peroxidase labeled streptavidin (1/10000 in blocking buffer) was put in all wells, except the 2 wells for the substrate control. Put 100 µl of blocking buffer in those wells and incubated for 15 minutes at 37 °C while shaking. It also was washed 5 times with washing buffer. 2.5 µl of H₂O₂ was added before put 100 µl of OPD on the plate. Then, incubated for 15 minutes at 30 °C in the dark and did not shake. The reaction stopped with the addition of 50 µl H₂SO₄ (4N) in each well before the the plate was read at 492 and 655 nm. The optical density of each serum sample was compared with a sample of negative pig serum samples (n= 6) at a probability due to chance P< 0.01 to determine the result of the test.

RESULTS AND DISCUSSION

Carcass and visceral inspection

Results of carcass and visceral inspection are summarized in Table 1. The pigs originated from 5 out of 6 districts in the Sorong City, and 4 out of 14 districts in Sorong Regency. Of 30 pigs examined and sampled in this study, none of them was positive for *T. solium* cysticercosis on carcass and visceral inspection. Examination of the liver and peritoneum also revealed no *Taenia hydatigena* cysticercus (*cysticercus tenuicollis*) found in all animals. This result is somehow similar to Saleh (2010) finding who did not find any cysticercosis infections in slaughter house survey in East Flores Regency where sporadic human taeniosis cases have been reported. In contrast, high prevalence of cysticercosis solium (77.1%) was found among pigs slaughtered at Jibama Market situated in the endemic area of Wamena, Jayawijaya Regency-Papua (Maitindom 2008).

ELISA

The serological test showed that one out of 30 samples (3.33%) showed positive reaction in the ELISA test. The positive pig originated from Sorong Manoi District of Sorong City (Table 1). With the same ELISA test, Assa *et al* (2012) found seroprevalence of porcine cysticercosis as high as 40.54% in seven cysticercosis/taeniosis endemic districts of Jayawijaya Regency, Papua Province. Prevalence in the district level ranged between 5.88% (Wamena Kota) to 92.86% (Asolokobal District). Recent field survey of cysticercosis in Jayawijaya Regency (2012) using ELISA and immunoblotting revealed seroprevalences of cysticercosis in human and pigs were 8.3%, and 19%, respectively (Swastika et al-cited by Wandra et al. 2013).

Table 1. Results of carcass and visceral inspection and ELISA test to detect cysticercosis in pigs slaughtered at Remu Market, Sorong, Province of West Papua

| District of pig origin | No inspected animals | Results of Tests | |
|-------------------------|----------------------|------------------------------|-----------------------|
| | | Positive cyst in carcass (%) | Positive Ag-ELISA (%) |
| Sorong Kota (SC) | 3 | 0 (0) | 0 (0) |
| Sorong Utara(SC) | 5 | 0 (0) | 0 (0) |
| Sorong Barat(SC) | 1 | 0 (0) | 0 (0) |
| Sorong Timur(SC) | 1 | 0 (0) | 0 (0) |
| Sorong Manoi(SC) | 6 | 0 (0) | 1 (16.7) |
| Kalobo (SR) | 2 | 0 (0) | 0 (0) |
| Malawei(SR) | 3 | 0 (0) | 0 (0) |
| Samate(SR) | 7 | 0 (0) | 0 (0) |
| Salawati(SR) | 4 | 0 (0) | 0 (0) |
| Total | 30 | 0 (0.0) | 1 (3.33) |

Remarks: SC- City of Sorong, SR – Sorong Regency

Seropositive reaction in the ELISA indicates presence of viable *Taenia cysticerci* in pig. The monoclonal antibodies used in the test were originally prepared against antigens from *T. saginata*. However, this monoclonal antibody can not only detect viable cysticerci in

bovines, but also cysticerci of *T. solium* in pigs and humans. The cross-reactions between antigens produced by *T. solium* and *T. saginata* metacestodes become an advantage from diagnostic point of view. Unfortunately there are also cross-reactions with antigens from *T. hydatigena* and *T. asiatica* metacestodes (Dorny *et al.*, 2004b). Therefore the later phenomenon restrict the use of ELISA methods in the diagnosis of cysticercosis solium in the areas where these parasites are co-exist.

Result of the present serological test should be carefully interpreted. Yet presence of *T. hydatigena* in Papua has not been reported, this parasite has been identified to infect pigs in East Flores (Saleh 2010) and ruminants in Java (Satrija unpublished data). Further studies are needed to elucidate whether is the cysticercosis is caused by *Taenia solium* or other *Taenia* species metacestodes. Nevertheless veterinary and health authorities in Sorong Area should aware and working together to prevent spread of cysticercosis in the area. Important step that must be taken is to set up slaughterhouse facilities for pigs, including establishing meat inspection system in the slaughter house. Community awareness to the disease should be encouraged through community health education programs.

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BEDBUGS (*Cimex hemipterus*) INFESTATION AT STUDENTS'S DORMITORY

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ABSTRACT

The study was done based on several reports of bedbugs (Cimicidae: *Cimex hemipterus*) nuisance at first level students dormitory. The study was initiated by distribution of questionnaires amongst the dwellers and visual inspections on surfaces of bed , its mattres and others room utensils. The results showed that from 35% of total rooms were had inspected, there were 60% male dormitory's rooms and of 15% of female dormitory rooms have bedbug infestation. Among the positives cases male dormitory rooms, more than 50% were considered high infestation. Therefore urgent control on all rooms and beds were needed at male dormitory. Identification of all bedbug samples showed that only one species existed i.e *Cimex hemipterus* (Hymenoptera: Cimicidae). Collecting and inspecting of some bats which nesting attached the dormitory were also be done to search the possibility of bedbugs transportation.

Keywords: Bedbug, *Cimex hemipterus*, infestation, dormitory

INTRODUCTION

Dormitory accommodation is as one facility in a college has a value of strategic importance for the development of higher education. Dormitories are a coaching point of generation either. Joint Preparation Level (TPB) Dormitoty is a facility of one college in Bogor given to its students, were established since 2002. These dormitory facing bedbug nuisances recently, base on its dwellers reports. Bedbug infestations which mostly found on bed mattresses could develop to be serious problem because dormitory occupants are about 3200 people who change each year and are come from various regions.

Bedbug is human and animal ectoparasite which member of ordo Hemiptera, a group of insect most often known as the true bugs, and referring to the forewings of many species are hardened near the base, but membranous at the ends. As distinct from all of Hemipteran,

bedbug has no wing at all. There are 2 important family of Hemipterans in medical and veterinary interest, Cimicidae and Reduviidae. Two species of bedbug or *Cimex* within member of Cimicidae, which has temperate region distribution known as *C. lectularius*, and *C. hemipterus* in tropical region distribution, include Indonesia.

Bedbug nuisances to host (humans) mainly as a result of its bite as bloodsucking insect, either female or male and host blood to be the only meal for all stages bedbug since the egg hatches. At some people, bedbug bite do not show any symptom, contrary bite reactions followed by local inflammation and itching, so it usually will scratch repeatedly and cause a secondary infection. With nocturnal biting activity, of course ones sleep time and other activities to be disrupted, as well as bedbugs potential to transmit vector borne diseases.

In recent years it has been reported the case of a reemerging infestations of bedbugs in several countries such as USA, Canada, Europe and Australia so that said bedbugs have become a pest settlements important or an important urban pest (Hwang et al . 2005; Gangloff - Kaufmann et al , 2006; Doggett et al . 2007; Potter et al . 2008). Places to stay with frequency alternating occupancy such as hotels, dormitories, apartments, hospitals and others become prone areas for bedbugs infestation. The household utensils (furniture, luggage bags, carpets, etc.) known to be good media for bedbugs spreading.

A variety of control methods applied mainly to consideration of the behavior of bedbugs which occupies almost the entire space and furnished as a residence throughout his life stage and only host approached while eating, as well as survival habitat within long without getting blood. Additional occupant safety factor, especially in public service area into consideration to minimize the use of chemical insecticides. Various factors above make bedbugs control are not easy. This study aims to obtain base data of bedbugs infestation (the bedbug species, degree of infestation, and distribution) in one college dormitory in Bogor,

also to determine the extent of the impact of bedbugs infestation (disruption to occupants, potentially places as a source of breeding bedbugs, and means of reinfestation sources) and make a recommendation to the dorm manager to establish control program which are effective and efficient.

Materials and Methods.

METHODS WERE CONDUCTED AS FOLLOWS:

1. The initial survey conducted by distributing questionnaires directly (interview) to at least 10 % of the dwellers. Interviews were conducted in 2 hours (at 8:00 p.m. to 22:00 pm). Targeted interviews were residents dormitory individuals wherever possible come from different rooms, considering each room occupied by 4 students.
2. Inspections carried out at night, with a frequency of 3 hours (20:00 - 23:00) everyday. Inspection includes a visual inspection and discovery bedbugs throughout all the stages (eggs, nymphs and adults) over the inside dorm (room and common room) , especially on tools that have the potential as a bug breeding place like mattresses , beds , chairs , tables , shelves books, cracks and crevices walls and floors .3. Bedbug samples were collected manually, inserted into a bottle containing 80 % alcohol, then preservation and processing is done for identification purpose (Hadi et al 2008). Identification is done by Smith (1973) and Soulsby et al. (1979).
4. Determination of the degree of infestation of bedbugs by categories namely Secure (not found in either of bedbugs or eggs); Low (found bedbugs 1-5 nymphs and adults , with or without eggs) ; Medium (5-10 bedbugs nymphs and adults , with or without eggs) and high (found more 10 bedbug nymphs and adults , with or without eggs) . When just found eggs bedbugs only, then categorized as Heavy infestations (Hadi & Rush , 2006)
6. Data were analyzed descriptively and then do the mapping bedbug infestation.

RESULT

Successful interview conducted on 353 respondents (200 girls and 153 boys) who inhabit 175 rooms in the female dorms , and 136 rooms in the male dorm. Based on the interviews, there were 72 rooms in male dorm (52 %) face bedbugs problems and only 11 % (20 rooms) in the woman dorms. Interview data is a reference to conduct inspections to rooms which has bedbug's disorders, as well as to examine truth of the interview. In three nights each for 3 hours (20:00 to 23:00 pm) inspection has been successfully carried out on a total of 300 rooms (140 rooms in the male dorm and 160 rooms in female dorm), which means about 35 % of the entire the dorm room. Inspection on 140 rooms in the male dorm found that in the positive chambers infested by bedbugs (about 60%), more than 50 % were already infested with heavy degree infestation. Discovery of eggs in up to 50 % rooms positively infested , showed that the infestation is already prolonged or chronic. Percentage of bedbugs infested room with degrees infestations rise as shown in Figure 1. The spread of bedbugs infestations in the dormitories with various degree of infestation has been mapped.

DISCUSSION

Inspections are conducted mainly on the rooms which complained of bedbug infestation. It aims to proving the existence the bedbug inside the rooms, also to determine whether bedbug infestations has spread to neighboring rooms or directly adjacent the rooms. So the next target is adjacent rooms directly to the infested rooms. Thus it can be said that the inspection is not done purely at random (random sampling), but by specific reason (purposive random sampling). This is done with the consideration that the information regarding incidence of bedbug infestation in the dorm particularly in male dormitory (from informal review to student residents, students reports and so on). So that is more important to know the degree of bedbugs infestation that occurred in the dorm, because the presence of bedbug

infestation in one room but even with heavy degree has become an indication for control action is taken to the entire dorm. Even the use of residual insecticides have been necessary in order to minimize reinfestation especially from and out of rooms with heavy infestations (Todd, 2006). Infestations of bedbugs in one place can be seen visually by the presence of bedbugs either on stage nymphs and adults , eggs , or blackish patches which are usually attached to the fabric surface (bedbug feces) , also of the distinctive smell. In contrast of the mattresses in female dormitory, in the male dorm mattress upholstery in infested rooms in general are seen filled with black splotches that indicate the presence of bedbugs colony. Blackish patches are also visible on the mattress upholstery found in some rooms but not found bedbugs in all stages or even its eggs. This situation is categorized as safe or no bedbugs infestations. Measurement of the degree of infestation of bedbugs in visual inspection performed on some of furniture in the room such as a bed, chairs , tables and cabinets , but it can be said that almost 100 % of infestation bedbugs were obtained from the mattress .

Although the results of the inspection showed that the bedbug infestation (the discovery of bedbugs, eggs, black spots) especially visible from the mattress, but from some rooms in the male dorm also found bedbugs infestations (bedbugs discovery of adult stage and nymphs) inside the crack wall, especially the walls in direct contact with the bed. Even in a room of male dorm, surveyors find a bag which commonly used for student daily activities harboured by adult bedbugs in crevices of the periphery bag. Bags or luggage, clothing and other items such as beds, tables, cabinets, and seats are general goods become a means of transportation for bedbug to infest other environments (Pinto *et al.* , 2007) .

The identification of bedbugs samples showed that only one species of *Cimex hemipterus* (F). Mainly based on morphological identification narrower pronotum, shape and location of the Ribaga organs on abdominal segment , or form of seta (hair structure) on the

pronotum, which are characteristic of the morphology of this species compared to *C. lectularius*. Map the bedbugs spread of infestations showed that the rooms infested with high degree were spread group (clusters). If at the hall found a room with high infestations, then the rooms at surrounding also infested with varies degree. Rooms with heavy infestations become a source of infestation potentially spread to other rooms in a dormitory environment even other, through human or other tools. In this case it seems humans and students tools (bags, clothes, or shoes) could potentially be bedbugs transport to infest another room or environment.

The presence of a particular part of the roof in male dormitory into bat nested were to be concern. Some people in Indonesia believe that the existence of bat indicative of the occurrence of bedbugs infestation in one place, because this animal is considered a source of bedbugs migration from somewhere. This assumption has not been proven, although Using (1966 in Pinto *et al.*, 2007) ever reported the discovery of *C. lectularius* in the bat's body nesting in settlements. Bats are very small chances as carriers of bedbugs that infest human settlements (Pinto *et al.*, 2007) because there never found a change in bedbugs behavior from nocturnal to become diurnal to infest bat that rest during the day. There were no bedbug as results of examination on bats captured from the roof of male dormitory, both visually and using Berlese funnel (Hadi *et al.* 2008).

CONCLUSIONS AND RECOMMENDATIONS

Conclusion:

1. Only one species bedbug which infest the dormitory i.e *Cimex hemipterus* (F).
2. 50% of all room in male dormitory were infested by bedbug dan more than 50% in high degree infestation.
3. Bedbugs infestation in the dorms mainly found in the mattress.

4. Not found bedbugs in bats nesting in partially dormitory.

5. Based on the degree of infestation and the spread of infested rooms bedbugs, male dorm already at the level that needs treatment.

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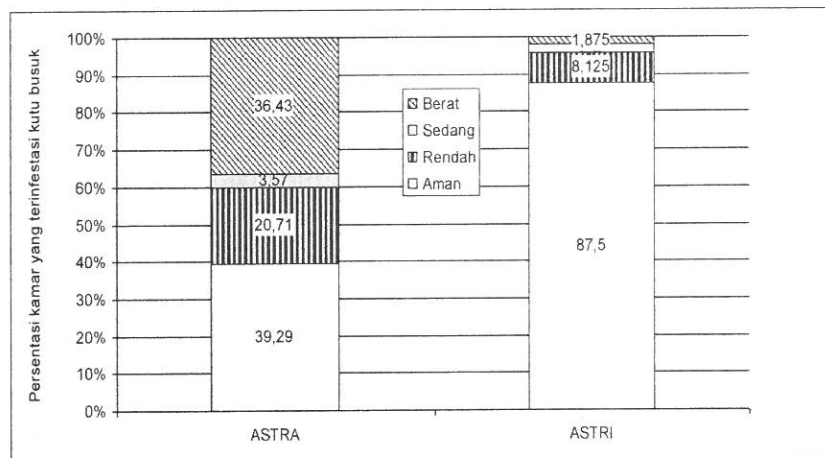


Figure1. Percentage of bedbug infestation room with varies dregree of infestation



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ISBN : 978-979-96104-8-5