ISBN: 978-602-0860-13-8

Proceedings of 3rd International Wildlife Symposium

October 18-20, 2016

"Conserving Sumatran Wildlife Heritage for Sustainable Livelihood"

Institute for Research and Community Service
University of Lampung

LIST OF CONTENTS

		Pages
	WELCOMING SPEECH FROM CHAIR PERSON OF THE ORGANIZING COMMITTEE	iii
	OPENING REMARKS FROM THE HEAD OF RESEARCH INSTITUTION AND COMMUNITY SERVICE, UNIVERSITY OF LAMPUNG	v
	KEYNOTE SPEAKER: MINISTER OF ENVIRONMENT AND FORESTRY REPUBLIC OF INDONESIA	vi
	SAFE SYSTEMS: HWC Safe Systems Approach and the HWC Rapid Assessment tool (Ashley Brooks, Ph.D.)	x
	PROMOTING MULTI-STAKEHOLDER INTERNATIONAL COLLABORATIONS FOR ENDANGERED SPECIES RECOVERY (Barney Long)	xiv
	INTEGRATING PLANTS INTO WILDLIFE CONSERVATION PROGRAMS (Siti Nur Hidayati, Ph.D.)	xvii
1.	PREVENTION MODELS TOWARDS HUMAN - TIGER CONFLICT (HTC) IN BUKIT BARISAN SELATAN NATIONAL PARK (BBSNP), LAMPUNG (Firdaus Rahman Affandi, Tugiyono, G. Nugroho Susanto, Elly Lestari Rustiaty) ...	1 -- 10
2.	IMPACT OF ANIMAL HOUSING TOWARDS WORMS INFECTION IN LOCAL BEEF CATTLE FARMS IN DUKUHBADAG VILLAGE, CIBINGBING, KUNINGAN, WEST JAVA, INDONESIA: AN ANALYSIS (Retno Widyani, Fitri Dian Perwitasari, Mus Nilamcaya, Ida Herawati)	11 -- 17
3.	ESTABLISHING BASELINE DATA ON FISHERMAN AND FISH CAUGHT ON THE SERKAP RIVER, KAMPAR PENINSULA, RIAU (Sidiq Purwanto)	18--24
4.	WALKING THROUGH CONVERSION: A MONITORING OF ELEPHANT MOVEMENT IN DEGRADED FOREST OF TESSO NILO LANDSCAPE (Febri Anggriawan Widodo, Wishnu Sukmantoro, Heri Irawan, Eka Septayuda, Yansen Gultom, Samsuardi, Sunarto, Nurchalis Fadhli)	25--29
5.	EVALUATING THE INTERVENTION METHODS TO REDUCE HUMAN-ELEPHANT CONFLICT AROUND WAY KAMBAS NATIONAL PARK (Sugiyo, Ardiantiono, Agus Santo, William Marthy, Fahrul Amama)	30--36
6.	JAVAN RHINO (*RHINOCEROS SONDAICUS*), BANTENG (*BOS JAVANICUS*) & OTHER MAMMALS COEXISTENCE IN UJUNG KULON NATIONAL PARK: SPATIAL AND TEMPORAL OVERLAP (Mahmud R, Rahmaningsih MD, Sunarto, Daryan, Firdaus AY, Muhtarom A, Setiawan R)	37--49
7.	FILLING THE KNOWLEDGE GAP ON THE ENDANGERED ASIAN TAPIRS IN SOUTHERN PART OF TROPICAL RAINFOREST HERITAGE OF SUMATRA (Ardiantiono, Fahrudin Surahmat, Tri Sugiharti, Wulan Pusparini)	50--57
8.	PEKON MUARA TEMBULIH, NGAMBUR, PESISIR BARAT: PRELIMINARY STUDY ON THE CHARACTERISTICS OF TURTLE HABITAT (Brina Wanda Pratiwi, Sugeng P. Harianto, Elly Lestari Rustiati)	58--65
9.	SUMATRAN ELEPHANT (*ELEPHAS MAXIMUS SUMATRANUS* T) FOOD COMPOSITION AND ITS PREFERENCE IN TESSO NILO NATIONAL PARK (Defri Yoza and Yuliantony)	66--77
10.	DIVERSITY AND ABUNDANCE OF AVIAN COMMUNITY AT COASTAL LAGOONS IN BUKIT BARISAN SELATAN NATIONAL PARK, INDONESIA: WHY WATERBIRD IS LACKING? (Ani Mardiastuti, Yeni A. Mulyani, Lina K. Dewi)	78--85

11. HUMAN ELEPHANT CONFLICT STUDY BASED ON THE COMMUNITY INFORMATION IN RIAU – INDONESIA (Wishnu Sukmantoro, Yansen Gultom, Heri Irawan) 86--90

12. STUDY ONHEALTH CARE MANAGEMENT SYSTEM OF CAPTIVE SUMATRAN ELEPHANT (*Elephas maximus sumateranus*) IN Prof. Dr. Ir. M. RUBINI ATMAWIDJAJA ELEPHANT HOSPITAL, WAY KAMBAS NATIONAL PARK (Firda Nur Islami, Dedi Candra, Diah Esti A, Priyambodo) 91--93

13. A PRELIMINARY STUDY ON POPULATION ESTIMATION TECHNIQUE OF SIAMANG (*Sympalangus syndactilus)* in WAY CANGUK RESEARCH STATION, BUKIT BARISAN SELATAN NATIONAL PARK (Nafila Izazaya Idrus, Ryan Setiono, Fahrudin Surahmat) ..... 94—98

14. HELMINTHES PARASITIC (*PARAMPHISTOMUM SP*) INFECTION ON THE SUMATRAN ELEPHANTS IN ELEPHANT TRAINING CENTER WAY KAMBAS NATIONAL PARK LAMPUNG (Dedi Candra, Diah Esti, Elisabeth Devi, Catur Marsudi) 99--101

15. TRAPPING FRUIT EATING BATS IN WAY CANGUK RESEARCH STATION, BUKIT BARISAN SELATAN NATIONAL PARK: MIST NET VS HARP TRAP (M. Khairul Ikhwan, Eka S. Ariyanti, Fahrudin Surahman, Janjiyanto) 102--105

16. RESCUE SUMATRAN ELEPHANT BABY WITHOUT TRUNK IN WAY KAMBAS NATIONAL PARK LAMPUNG (Elisabeth Devi K, Dedi Candra, Diah Esti Anggraini, Nazarudin, Mahfud Handoko) 106--108

17. THE TABANID FLY BIODIVERSITY AND ITS POTENCY AS TRANSMISSION VECTOR OF TRYPANOSOMIASIS TO THE JAVAN RHINO POPULATION WITHIN THE UJUNG KULON NATIONAL PARK (Gita Alvernita, Kurnia O. Khairani, Dariyan, Dyah Lukitaningsih, Supriyono, Dedy S. Pahlawan, Zaenal Gesit Kalbuadi, Upik Kesumawati Hadi) 109--113

18. ELEPHANT ENDOTHELIOTROPIC HERPESVIRUS (EEHV) MANAGEMENT IN ELEPHANT CONSERVATION CENTER WAY KAMBAS NATIONAL PARK LAMPUNG (Diah Esti, Dedi Candra, Anhar Lubis, M. Wahyu, Elisabeth Devi) 114--116

19. AN EXPERT SYSTEM TO DIAGNOSE CHICKEN DISEASES WITH CERTAINTY FACTOR BASED ON ANDROID (Aristoteles, Kusuma Adhianto, Puja Putri A) 117--126

20. COMPARISON EFFECTIVENESS OF ANTIOXIDANT ACTIVITY EXTRACT HERBAL MIXTURE OF SOURSOP LEAF *(Annona muricata),* BAY LEAF *(Syzygium polyanthum)* AND PEGAGAN LEAF *(Centella asiatica)* (Khairun Nisa Berawi, Liana Shidarti, Samsu U. Nurdin) 127--132

21. THE UTILIZATION OF ISOLATE *Bacillus thuringiensis* TO GRAYAK LARVAE PEST *(Spodoptera litura* Fab.) ON CABBAGE (*Brassica oleraceae* var. capitata Linn.) (Wibowo Nugroho Jati, Felicia Zahida, Sara Puspareni Prayitno) 133--137

22. LEG AMPUTATION OF TIMOR DEER (Hastono, S.D) 138--140

23. IDENTIFICATION OF THE SUMATRAN RHINO FOOD PLANTS IN WAY KAMBAS NATIONAL PARK LAMPUNG (Dedi Candra, Sumadi Hasmaran, Lamijo, Supriyono) 141--146

24. SURVEILLANCE ANTHRAX (*Bacillus anthracis)* IN SURROUNDING WAY KAMBAS NATIONAL PARK LAMPUNG INDONESIA (Dedi Candra, Arie Khoiriyah, Diah Esti Anggraini, Joko Siswanto) 147--151

25. GENOMIC DNA ISOLATION OFGAJAH SUMATERA *(Elephas maximus sumatrensis)* IN ELEPHANT TRAINING CENTER, WAY KAMBAS NATIONAL PARK, EAST LAMPUNG (Elly L. Rustiati, Priyambodo) 152--155

26. INDUCE RESISTANCE OF *SPATHOGLOTTIS PLICATA* BL. TOWARD TO 156--158

*FUSARIUM OXYSPORUM (*Endang Nurcahyani, Rochmah Agustrina, Erdi Suroso) .....

27. THE EFFECTS OF A HEXANE FRACTION OF RED BETEL LEAF (*Piper cricatum*) ON LEARNING AND MEMORY IN MICE (Pratika Viogenta, Lilik Koernia Wahidah, Yudha Erlangga) 159--163

28. THE LOCAL KNOWLEDGE OF COASTAL ETHNIC COMMUNITIES OF PLANTS THAT EFFICACIOUS AS MEDICINE IN 5 DISTRICTS OF SOUTH LAMPUNG REGENCY (Arum Asterini, Yulianty, Tundjung Tripeni Handayani) .. 164--169

29. PHYTOTELMATA SPECIES AND ITS DISTRIBUTION IN SOUTH PRINGSEWU, LAMPUNG (Putri Minggar Oktaviani, Emantis Rosa, Yulianty) ... 170--174

30. THETOXICITY OF PURIFIED ISOLATE OF POLAR EXTRACT POWDER LEAFS *GLIRICIDIA MACULATA* HBR. TO CACAO MEALYBUG (*PLANOCOCCUS MINOR* MASKELL) (Ratih Andriyani, Nismah Nukmal, Emantis Rosa) 175--181

31. SOCIAL BEHAVIOR OF SPOTTED DEER *(Axis axis)* IN GUNUNG MADU PLANTATIONS INC.SANCTUARY LAMPUNG TENGAH LAMPUNG PROVINCE INDONESIA (Rita Gusmalinda, Bainah Sari Dewi, Niskan Walid Masruri) 182--188

32. THE COMPARISON OF TOXICITY PURIFIED ISOLATE OF WATER AND METHANOL EXTRACTS OF PAWDER LEAF *GLIRICIDIA MACULATA* ON MORTALITY SOURSOP MEALYBUG *PSEUDOCOCCUS CRYPTUS (*Fahrul Aksah, Nismah Nukmal, Emantis Rosa) 189--196

33. DEVELOPMENT OF BOTANICAL INSECTICIDE FROM FLAVONOID OF COMPOUND LEAF EXTRACT *GLIRICIDIA MACULATA* TO CONTROL COFFEE MEALYBUG *PLANACOCCUS CITRI (*Apriliyani, Nismah Nukmal, Emantis Rosa) 197--204

3rd INTERNATIONAL WILDLIFE SYMPOSIUM

"Conserving Sumatran Wildlife Heritage for Sustainable Livelihood"

PROCEEDING

ISBN: 978-602-0860-13-8

Organized by:

RESEARCH AND DEVELOPMENT CENTER OF ENVIRONMENT
INSTITUTE FOR RESEARCH AND COMMUNITY SERVICE
UNIVERSITY OF LAMPUNG
2016

PROCEEDING IWS 2016

Person in charge:

Warsono, Ph.D.

Steering Committee:

Dr. Hartoyo, M.Si.

Organizing Commettee:

Dr. Erdi Suroso, M.T.A.

Editors:
Dr. Endang Nurcahyani, M.Si.
Dr. Ir. Sumaryo Gs, M.Si.

Published by:
Research and Development Center of Environment
Institute for Research and Community Service
University of Lampung
Jl. Sumantri Brojonegoro No. 1, Bandar Lampung 35145
Phone: +62-721-705173, Fax. +621-721-773798
E-mail: lppm@kpa.unila.ac.id

ISBN: 978-602-0860-13-8

All right reserved (including those of translation into other languages). No part of this book may be reproduced in any form – by photoprinting, microfilm, or any other means – nor transmitted or translated into a machine language without written permission from the publishers. Registered names, trademarks, etc. Used in this book, even when not specially marked as such, are nor to be considered unpropected by law.

INDUCE RESISTANCE OF *SPATHOGLOTTIS PLICATA* BL. TOWARD TO *FUSARIUM OXYSPORUM*

Endang Nurcahyani[1], Rochmah Agustrina[1], Erdi Suroso[2]

[1]Dept. of Biology, Faculty of Mathematics and Natural of Science, University of Lampung, Bandar Lampung, Indonesia
[2]Dept. of Agricultural Technology, Faculty of Agriculture, University of Lampung, Bandar Lampung, Indonesia
E-mail: endang_nurcahyani@yahoo.com, erdisuroso@gmail.com

ABSTRACT

Spathoglottis plicata attracts many people as an ornamental plant for parks, offices and housing complexes in urban areas. The most production constrain on Ground Orchid (*Spathoglottis plicata* Bl.) plantation recently has been caused by fusarium wilt caused by *Fusarium oxysporum* and until now still can not be solved effectively. In general, Indonesian farmers cope with fusarium wilt disease by using pesticides that often cause environmental pollution, while orchids are always physically close to the fans. Therefore, it should be an effective and environmentally friendly alternative. One of the most secure and efficient alternative diseases control for environment is by using resistant varieties. Ground orchid plantlets that are resistant to *Fo* have been selected by in vitro selection on Vacin & Went (VW) medium containing fusaric acid (FA) at different concentrations. The objectives of this research was to determine: Resistance criteria of *S. plicata* plantlet that was induced by fusaric acid on *F. oxysporum* infection through in vitro selection. This research was conducted at In Vitro Laboratory of Dept. of Biology, Faculty of Mathematics and Natural of Science, University of Lampung, Bandar Lampung, Indonesia. The research was compiled by using Completely Randomized Design (CRD) with one factor that is FA consisting of 5 levels: 0 ppm, 10 ppm, 20 ppm, 30 ppm, and 40 ppm on WV medium. Data analysis used ANOVA (analysis of varian) at significance level 5% and a further test with LSD (Least Significant Difference) at the significance level 5%. The result showed that: The resistance criteria of *S. plicata* plantlet on day 28 (0 ppm) was control and 10 ppm was susceptible. At 20 ppm and 30 ppm, its resistance criteria were moderate. At concentration of 40 ppm, its resistance criteria was resistant.

Keywords: *Spathoglottis plicata*, *Fusarium oxysporum*, Induced Resistance, Fusarium wilt, Fusaric Acid

I. INTRODUCTION

Orchid is a flowering plant that has economic value is high enough and the price is relatively stable. Ground orchid (*Spathoglottis plicata* Bl.) is one of orchids is much preferred. One of the obstacles encountered in the cultivation of *S. plicata* is the presence of pathogenic fungi which can attack several parts of plants such as stems, leaves or roots (Djatnika, 2012). Fusarium wilt caused by the fungus *Fusarium oxysporum* is an important disease and one of the obstacles in the quality and production of *S. plicata* (Palmer, 2011).

One alternative way to control the disease that is safe, efficient and effective, and safe for the environment, among others, using varieties that are resistant. The development of *S. plicata* resistant cultivars can be done by in vitro selection method that is explants form of tissue or organ in a medium containing fusaric acid (FA) that selective concentration (Bouizgarne et al., 2006). Use of FA as a selective agent in vitro selection may produce mutant cell or tissue which is insensitive to FA, so that after being regenerated into plants can produce resistant strains of pathogen infection (Arai and Takeuchi, 1993).

II. MATERIALS AND METHODS

Materials used are plantlets of *Spathoglottis plicata* Bl. aged 6 months were obtained from the personal collection of Dr. Endang Nurcahyani, pure Fusaric Acid manufactured by *Sigma chemical Co*. {Fusaric acid (5-butylpicolinic acid) from Giberella fujikuroi}, 70% alcohol, distilled water,

Benzine Amino Purine (BAP), indole-3-Acetic Acid (IAA), sucrose, Potassium Hydroxide (KOH), acid chloride (HCl) and chemicals medium Vacin & Went (VW) solid.

Research compiled by using a completely randomized design (CRD) with one factor: FA concentration which consists of 5 levels: 0 ppm, 10 ppm, 20 ppm, 30 ppm and 40 ppm. Each concentration was repeated 5 times and each replication consisted of three explants *S. plicata* in each culture bottle. Then testing the resilience of plantlets of *S. plicata* against *F. oxysporum.*

Medium VW on a sterilized bottle culture coupled with a concentration corresponding FA treatment. Fusaric acid before use, diluted with distilled water to obtain the concentrations specified, then filtered using a syringe filter having a diameter of 0.45 µm, was done 2 times and filter diameter of 0.22 µm was done one time. Filtering is done in a sterile room in the Laminar Air Flow (LAF) Cabinet. Furthermore, FA is added to VW medium. Before use, the medium was incubated for 7 days at room temperature (25 °C) to ensure that FA has been pre-screened. If within 7 days of no contamination on the medium, the medium can be used.

S. plicata plantlets are planted in the VW medium in the Laminar Air Flow (LAF) Cabinet. Plantlets from culture bottle issued with a sterile scalpel and one by one placed on a petridish, diameter of 10 cm, then plantlets sorted one by one, after it is planted on each bottle culture medium. Each concentration is done five replications and each replication consisted of three explants of *S. plicata* in each culture bottle. Selection plantlets carried out for 30 days At the end of the 4th week, were evaluated to determine the concentration of FA are tolerant to the selection of *S. plicata* plantlets in vitro.

Fusarium oxysporum inoculation was performed directly on the plantlets in the culture bottles (Hadisutrisno, 1995). Mikrokonidium fungus *F. oxysporum* with a density of 1.7 x 104 spores per ml is dripped onto the plantlets 1-2 drops, then incubated at room temperature (25˚C) for 24 hours. Observations were made starting on day 3rd after inoculation for four weeks by observing and counting the number of leaves that show symptoms of wilting index by He et al (2002). Disease Intensity (IP) is calculated according to the formula of Wibowo (2002).

$$DI = \frac{\Sigma(n \times v)}{N \times Z} \times 100\%$$

The level of plant resistance is determined by scoring with reference to the provisions of Wibowo (2002).

DI (%)	Criteria of Resistance
≤ 25	Resistant
25 < DI ≤ 50	Moderate
>50 or die	Susceptible

Information : DI = Disease Intensity

III. RESULT AND DISCUSSION

Fusarium wilt disease caused by *F. oxysporum* is an important disease that is one of the obstacles to the growth of orchids (Palmer, 2012). In orchids, fusarium wilt caused the death of more than 50% of the number of plants grown orchid (Wedge & Elmer, 2008).

Observation of wilting symptoms on the leaves of plantlets which is done every day for 4 weeks showed symptoms of wilting on *S. plicata* orchid plantlets in the culture bottle. Furthermore, based on the scoring of the symptoms that appear wilted or yellow can be determined intensity of the disease (DI) and the criteria for each treatment resistance.

Criteria of resistance on treatment outcome plantlets control and the provision of 10 ppm produced plantlets resistance that criteria are susceptible to the disease intensity at 91% and 83%, the highest disease intensity shown by the control that is 91%. Induced resistance to FA at concentrations of 20 and 30 ppm produces plantlets that have the disease intensity reaches 33%, so the durability criteria

was moderate. In the treatment of 40 ppm FA there are no symptoms of the disease that is resistant durability criteria.

Based on data from the disease intensity and endurance above it can be seen that FA treatment of 40 ppm able to induce the most good resistance so as to reduce the intensity of the disease up to 0% and raising the criteria become resistant. The above shows that FA is able to induce resistance orchid plantlets of *S. plicata* against fusarium wilt. The results of this study supported the opinion of Arai and Takeuchi (1993) which describes the correlation between plant resistance to the toxin with disease resistance, so that pure toxin FA can be used as a component selection.

This result is in line with research conducted by Nurcahyani *et al.* (2012) which states that Induced resistant of vanilla against fusarium wilt can reduce the intensity of the disease reached 25% at 110 ppm treatment. The results also support the statement Agrios (2005) which states that the expression of induced resistance is by decreasing the intensity of the disease.

IV. CONCLUSION

Based on the results of research and discussion above, it can be concluded that the criteria for resistance plantlets of *S. plicata* on day 28 (controls) and 10 ppm is vulnerable. At 20 ppm and 30 ppm which is a moderate resistance criteria. At a concentration of 40 ppm resistance criteria are resistant to disease intensity to 0%.

REFERENCES

Agrios, G.N. 2005. *Plant Pathology*. 5th *ed.* Elsevuer Academic Press, California.

Arai M dan Takeuchi M. 1993. Influence of Fusarium Wilt toxin(s) on Carnation cell. *Plant Cells, Tissue and Organ Culture* (34): 287 – 293.

Bouizgarne B, Bouteau H.E.M, Frankart C, Reboutier D, Madiona K, Pennarun A.M, Monestiez M, Trouverie J, Amiar Z, Briand J, Brault M, Rona J.P, Ouhdouch Y, and Hadramu E.I. 2006. *Early Physiological Responses of Arabidopsis thaliana Cells to Fusaric Acid* : Toxic and Signallling Effects. *New Phytologist* 169 : 209 - 218

Djatnika, I. 2012. Seleksi Bakteri Antagonis untuk Mengendalikan Layu Fusarium pada Tanaman *Phalaenopsis. J. Hort*. 22 (3) 276-284.

Hadisutrisno, B. 1995. *Taktik dan Strategi Perlindungan Tanaman Menghadapi Gangguan Penyakit Layu Fusarium*. Makalah Simposium Nasional I di Purwokerto, 2-3 Maret.

He CY, Hsiang T, & Wolyn DJ. 2002. Induction of Systemic Disease Resistance and Pathogen Defence Responses in *Asparagus officinalis* Inoculated with Pathogenic Strains of *Fusarium oxysporum*. *Plant Pathology* 51: 225-230.

Nurcahyani E, Sumardi I, Hadisutrisno B, & Suharyanto E. 2012. Supression of Development of Vanilla Foot Rot Disease (*Fusarium oxysporum* f. sp. *vanillae*) Throught In Vitro Fusaric Acid Selection. *Journal of Tropical Plant Pests and Diseases.* Acreditation of DIKTI No.110/DIKTI/Kep/2009. ISSN: 1411-7525. Vol. 12 /No. 1: 12-22.

Wedge, D.E and Elmer, W.H. 2008. Fusarium Wilt of Orchids. *ICOGO Bull*. 2 (3): 161-168.

Wibowo A. 2002. Pengendalian Penyakit Layu Fusarium pada Pisang dengan Menggunakan Isolat Nonpatogenik *Fusarium* sp. *Jurnal Fitopatologi Indonesia* 6: 65-70.

Palmer, G.D. 2011. *The control of orchids*. http://www.ebow.com/info_8525784_control-fusarium-wilt-orchids html. Di akses pada tanggal 20 January 2015