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ABSTRACT

INTERNATIONAL CONFERENCE ON BIODIVERSITY

SOCIETY FOR INDONESIAN BIODIVERSITY

Yogyakarta, 18-19 March 2017

Mount Merapi; photo by PT. Way 2 East Indonesia

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ABSTRACT

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SOCIETY FOR INDONESIAN BIODIVERSITY

Yogyakarta, 18-19 March 2017

THEME:

How do Volcanoes Affect the Biodiversity and Environment?

SECRETARIAT ADDRESS

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TIME SCHEDULE

International Conference on Biodiversity

Society for Indonesian Biodiversity (SIB)

Yogyakarta, Indonesia, 18-19 March 2017

TIME	ACTIVITIES	PERSON IN CHARGE	SITE
March 18, 2017			
07.30-08.00	Registration	Committee	Lobby
08.00-08.15	Opening ceremony	Chairman of the SIB	R1
08.15-08.30	Photo session and coffee break	Committee	R1, Lobby
08.30-10.00	Panel I **Prof. Dr. Trimurti Habazar** **Dr. Akira Kikuchi**	Moderator	R1
10.00-11.30	Panel II **Prof. Dwikorita Karnawati** **Dr. Syed Ajijur Rahman**	Moderator	R1
11.30-13.00	Rest, prayer, lunch & Poster session	Committee	Lobby
13.00-14.00	Parallel presentation I		
	Group 1: AO-01 to BO-02	Moderator	R1
	Group 2: BO-03 to BO-08	Moderator	R2
	Group 3: BO-09 to BO-14	Moderator	R3
	Group 4: BO-15 to BO-20	Moderator	R4
14.00-15.00	Parallel presentation II		
	Group 5: BO-21 to BO-26	Moderator	R1
	Group 6: BO-27 to BO-32	Moderator	R2
	Group 7: BO-33 to BO-38	Moderator	R3
	Group 8: BO-39 to CO-03	Moderator	R4
15.00-15.15	Coffee break, prayer	Committee	Lobby
15.15-16.15	Group 9: CO-04 to CO-08	Moderator	R1
	Group 10: CO-09 to DO-03	Moderator	R2
	Group 11: DO-04 to EO-04	Moderator	R3
	Group 12: EO-05 to EO-09	Moderator	R4
16.15-16.30	Announcement of the Best Presenters	Chairman of the Board of Assessors	R1
	Closing ceremony & other explanation	Chairman of the Committee	
March 19, 2017			
07.30- ...	City tour [optional]	Committee	Lobby

Upcoming events:

1. April 13-15, 2017 – Palembang, South Sumatra (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/palembang/home.html

2. May 20-21, 2017 – Jatinangor-Sumedang, West Java (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/bandung/home.html

3. July 5-8, 2017 – Derawan, Berau, East Kalimantan (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/berau/home.html

4. August 12-13, 2017 – Palu, Central Sulawesi (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/palu/home.html

5. September 9-10, 2017 – Bogor, West Java (National Seminar)
   http://biodiversitas.mipa.uns.ac.id/S/2017/bogor/home.html

6. October 14-15, 2017 – Pontianak, West Kalimantan (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/pontianak/home.html

7. November 4-5, 2017 – Medan, North Sumatra (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/medan/home.html

8. December 8-10, 2017 – Bali (International Conference on Biodiversity)
   http://biodiversitas.mipa.uns.ac.id/S/2017/bali/home.html

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Society for Indonesian Biodiversity (SIB)

Yogyakarta, Indonesia, 18-19 March 2017

Note: A. Genetic Diversity, B. Diversity of Species, C. Diversity of Ecosystem, D. Ethnobiology, E. Bioscience (Life Science and Technology); O. Oral, P. Poster

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ABSTRACT

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Society for Indonesian Biodiversity (SIB)

Yogyakarta, Indonesia, 18-19 March 2017

Genetic diversity

AO-01

Coat Protein Gene of Peanut Stripe Virus isolate Bm from West Nusa Tenggara, Indonesia

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Isolate Bm of Peanut Stripe Virus (PStV), capable of infecting peanut plant, was collected from West Nusa Tenggara. Coat protein (CP) gene of this virus was determined used RT-PCR methods. Alignment of the nucleotide sequence of PStV isolate Bm CP gene, showed variability compared with some PStV isolates in the GenBank. There were differences in bases at some points on the nucleotide sequence of CP gene. Clustering analyzed showed that similarity of PStV isolate Bm compared with isolates in genebank were 97-99% based on nucleotide sequence. Based on the similarity of nucleotide sequence of CP gene, PStV isolates Bm could be a group with some PStV isolates from Indonesia. m

Coat protein gene, peanut stripe virus, PStV isolate Bm, West Nusa Tenggara

AO-02

Mutation breeding of pummelo using Gamma Rays: Fruit evaluation for seedlessness

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Pummelo is one of the native crops found in South East Asia including Indonesia. It is well known due to its big size and distinct taste compared to other citrus fruits. One of the main breeding objectives for citrus is seedlessness, which could be obtained using mutation breeding. The mutation breeding program in pummelo was started in 2003 using gamma rays and bud woods of Pamelo Nambangan as the plant material. The bud woods were irradiated with 20, 40, and 60 Grays. The buds then grafted to JC rootstocks and maintained properly until the fruits could be observed. After few years of selection and fruit evaluation especially for the seedless character, a mutant plant derived from 20 Gray irradiation treatment was observed showing improved character of the number of seed. Pamelo Nambangan has more than 40 seeds/fruit and the mutant accession has less than five seeds/fruit in average. In the seedless mechanism preliminary study, it was observed that the mutant has embryo sac abortion leading to seedless fruit. The mutant has been released in 2016 as new seedless pummelo variety under the name of 'Pamindo Agrihorti'.

Mutation breeding, pummelo, seedlessness

AO-03

Biodiversity of the Gaga's Chicken (Ayam Ketawa) from Pinrang South Sulawesi based on the bioacoustic analysis and the morphometric study

Pipih Suningsih Effendi♥, Abinawanto

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Gallus gallus domesticus or Gaga's chicken is the local ornamental chicken originated from Pinrang, South Sulawesi, Indonesia. Gaga's chicken which also called "ayam ketawa" has the unique crowing song, like human laughing. Gaga's chicken which has long and fast crowing song is called 'dangdut' type, while the short and slow crowing song chicken is named 'slow' type. The objective of present study is to investigate the biodiversity of Gaga's chicken based on morphometric. Twenty samples of Gaga's chicken have been collected, consisted of eight of 'slow' type and twelve of 'dangdut' type, respectively. Data were analyzed by t-test using SPSS ver. 22. The result showed that 'slow' type was bigger (1787.5 g) than 'dangdut' type (1595.8 g). Morphometric characters could be applied to determine the biodiversity of Gaga's chicken.

Ayam ketawa, crowing song, Gaga's chicken, morphometric

AO-04

Variance analysis of three Banyumas local Salak [Salacca zalacca (Gaertn.) Voss] based on leaf anatomy and genetic diversity

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There are three salak cultivars found in Banyumas District, Central Java, Indonesia. The aim of the study was to know the detailed information of those three salak cultivars based on anatomy and genetic diversity by using RAPD(Random Amplified Polymorphic DNA) technique. Ten primers used were OPA-9, OPA-10, OPA-11, OPA-16, OPA-18, OPC-8, OPD-18, OPM-10, OPW-13, and OPX-17. The result of this study showed that all of those salak cultivars have the same leaf anatomy structure. The only distinction characteristic is the trichomata on cultivars Kedung Paruk and Kalisube per 1 mm^2 unit of leaf area, while the cultivars of Candinegara did not have trichomes.Ten primers could detect 50 polymorphic bands (80.6%) from a total of 62 bands which could be observed clearly. The percentage of polymorphic loci in *S. zalacca* 'Candinegara' were 64%, *S. zalacca* 'Kedung Paruk' 62%, and *S. zalacca* 'Kalisube' 44%. The heterozygosity value of *S. zalacca* 'Candinegara' was 0.1590, *S. zalacca* 'Kedung Paruk' 0.1449, and *S. zalacca* 'Kalisube' 0.1136. The closest genetic distance was shown by *S. zalacca* 'Kalisube' and *S. zalacca* 'Candinegara' (0.0235). Meanwhile, the furthest genetic distance was shown by *S. zalacca* 'Kedung Paruk' and *S. zalacca* 'Candinegara' (0.0704).

Salacca, genetic diversity, leaf anatomy, RAPD

AP-01

The effect of pod maturity to seed viability and vigor of several yam bean accessions (*Pachyrrhizus erosus*)

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Seed germination uniformity and simultaneity of yam bean (*Pachyrrhizus erosus* L. Urban) was related to pod maturity. A total of ten accessions of yam bean from various regions in Indonesia was planted at ILETRI Kendalpayak Research Station, Malang (Indonesia) from May to October 2016. Soil tillage was performed optimally. The seeds were planted using tugal planting system on 6-m-long ridges 0.5 m apart, one seed per hill, and then covered with manure. Yam bean pods of each accession were harvested at three developmental stage, i.e. full-size green pods, yellow pods, and brown/black pods. Pods were dried by the traditional sun drying method, and then the seeds were separated manually. The vigor and viability tests were using media of sterilized sand. The experiment was conducted using a completely randomized factorial design with three replications. The first factor was pod maturity (green, yellow and black) and the second factor was ten accessions of yam bean. Significant interactions between pod maturities with accessions were found on characters of epicotyl length, leaf length, leaf width, root dry weight, maximum growth potential, and germination rate at the 10th days of observation. The pod maturity at yellow stage gave the highest maximum growth potential and germination rate, respectively. The average germination rate of yellow pods was 8.15% per day, higher than those of green pods (3.83% per day) as well as black pods (3.73% per day). Those resulted in more optimal growth of germination derived from the yellow pods compared to those of seeds derived from green as well as black pods. The practical implication of this research is the use of yellow pods as recommended seed source for yam bean cultivation.

Germination rate, maximum growth potential, *Pachyrrhizus erosus*, pod maturity, yam bean

AP-02

Morphological characterization of Indonesian winged beans (*Psophocarpus tetragonolobus*) germplasm

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Winged bean (*Psophocarpus tetragonolobus* (L.) DC.) is a multipurpose legume crop of the tropics that has gained

much attention in recent years due to its nutritional quality. Characterization and evaluation of diversity among winged bean germplasms will provide the necessary information for varietal development. Thirty-eight winged bean accessions from five locations in Indonesia were evaluated for different qualitative and quantitative characters during January to April 2013 at ILETRI's greenhouse. Large variations were recorded for different traits in germplasm accession. Most of the accession had deltoid leaflet shape, green stem color, and greenish calyx color. Purple corolla color dominated the accession. Pod character varied among accessions, whereas the color of the central portion of the pod and the pod wing color were dominated by green. The pod length and the pod width mostly ranged from 20 to 30 cm and from 0.81 cm to 1.20 cm, respectively. Most of the accessions had a range of the number of seed/pod from 10 seed/pod to 16 seed/pod. The seed coat color was dominated by brown-black, followed by brown, tan, and cream. Hilum color was varied, consisted of brown, tan, dark brown, and white. Seed shape consisted of round and oval. Knowledge of the morphological diversity among accessions may play a significant role in the breeding programs and for sustainable conservation and utilization of winged bean germplasm.

Characterization, morphological, *Psophocarpus tetragonolobus*

AP-03

Interstock effect on the growth of Mandarin cv. Batu 55, Tangerine cv. Pontianak and Lime cv. Nimas propagated by grafting

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Japansce Citroen (JC) rootstock is still the main choice for producing citrus seeds due to its availability and high compatibility. Other rootstocks have been used with unsatisfying results. There is a possibility of using rootstock as interstock to stimulate the growth of scion. The research objective was to know the effect of interstock on the growth of Mandarin cv. Batu 55, Tangerine cv. Pontianak and Lime cv. Nimas. The research was done in Screen house of Tlekung Experimental Field of Indonesian Citrus and Subtropical Fruits Research Institute (ICSFRI) in Batu-East Java, located on 950 m asl, from January to April 2016. The research was arranged in a CRD design with four replications and 24 interstock-scion combination treatments. Interstocks used were Carizzo citrange, Citrumello, Poncirus trifoliata, Volkameriana, Rough Lemon, Troyer citrange, Kanci and control (JC) combined with three scions namely Mandarin cv. Batu 55, Tangerine cv. Pontianak and Lime cv. Nimas propagated by grafting. The result showed the percentage of successful grafting ranged between 37.5% to 100% while the percentage of shoot formed on grafted plants was 75%-100%. Poncirus trifoliata as interstock stimulated fastest bud break on Pontianak in 24.75 days while Troyer citrange stimulated shoot growth better on Nimas resulting in the highest shoot around 52.20 cm which was significantly different from other treatments. Meanwhile, Carizzo citrange influenced the plant diameter and number of leave of Nimas but showed the insignificant effect on the growth of its own diameter. The use of interstock showed that it could promote the growth of scion that usually has slow growth if directly grafted on rootstock.

Citrus, grafting, interstock, rootstock

AP-04

Molecular identification of citrus genomes produced by somatic hybrid between Siam Madu and Satsuma Mandarin

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The import volume of fresh citrus fruit is increasing from year to year. In order to encounter continuing import impact, the breeding program should be done to increase Indonesian local citrus quality. One of the promising programs is somatic hybridization which has already been done between Siam Madu and Satsuma Mandarin. To accelerate breeding selection, a novel method such as molecular approach is needed. Simple sequence repeats (SSR) analysis was used to identify the genetic status of 24 Citrus somatic hybrid genotypes from Siam Madu+Satsuma Mandarin and their similarity to the parental lines. Three SSR primer pairs (Nucleus and chloroplast genomes) could amplify polymorphic SSRs from all of these genotypes. Using these primer pairs, the accessions classifications to identify the type of somatic hybrids were obtained by the measurement of DNA bands. Of 24 genotypes, 15 accessions were identified as hybrid type and three accessions as cybrid type.

Identification, markers, somatic hybrid, SSR Siam Madu, Satsuma Mandarin

AP-05

Potential of liquid smoke to suppress the development of *Elsinoe fawcettii* causes scab on Citrus Plant Japansche Citroen (JC)

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Citrus (*Citrus* sp.) is one of the flagship fruit commodities in Indonesia. One of the disorders that resulted in the loss of the results of high enough on the citrus plants are disturbed organisms plants. Special attention will need to be done to the scall infection. The control of the scall has many done with chemical fungicide, but rather as a cause of environmental pollution. The use of natural materials as fungicides that more secure is liquid smoke. The purpose of this researched is to analyzed the ability as well as the most effective concentration of the three types of liquid smoke this is coconut shell, teak wood and sengon in pressing the development of fungi *Elsinoe fawcettii* on citrus plants Japansche Citroen (JC). Method used is the identification and experiment with its phases analysis of phenol compounds contained in three types of liquid smoke coconut shell, teak wood and sengon, testing the nature of it in vitro against the growth of fungal isolates *E. fawcetti*i on the cup petri and in vivo against the level of the attack of the scall on citrus plants JC. Results there is a level of phenol on the liquid smoke coconut shell is 62,747 mL/L, teak of 227,873 mL/L and wood carving of 115,587 mL/L. Each type of liquid smoke has the contain phenol where the different levels of phenol teak wood have a total higher compared with coconut shell and wood sengon. On the broad observation of the colony fungi, 14's HSI ended nearly the highest percentage inhibition is liquid smoke sengon wood concentration of 5%. With the concentration of 5% is able to inhibit the growth of *E. fawcettii* of 77.22% and lowest is coconut shell liquid smoke concentration of 2% with the level of inhibition by 10.14%. The observation of wet and dry weight liquid smoke treatment sengon wood concentration of 5% and 1% have the weight of the wet and dry weight lowest namely 0.867 g and 0.030 g. While on the intensity of observation and extensive disease attacks in vivo treatment liquid smoke coconut shell teak wood and sengon have the level of effectiveness that is almost the same. The conclusion of the research is three types of liquid smoke that are coconut shell, teak wood and sengon have the ability to suppress the growth and development of fungi *E. fawcetti* both in vitro and in vivo with the types of the most effective sengon wood. The most effective concentration in pressing the growth and development of fungi *E. fawcetti* both in vitro and in vivo is 5 percent on all types of liquid smoke.

Citrus, liquid smoke, *Elsinoe fawcettii*, scab diseases

Diversity of Species

BO-01

Taxonomic diversity and longitudinal distribution of freshwater fish in Klawing River, Purbalingga, Central Java, Indonesia

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Abstract. The study of fish diversity was conducted in Klawing River, Purbalingga District of Central Java Province, in June-September 2016. The aims of this study were to collect data about fish species in Klawing River, abundance and its longitudinal distribution. The study was applied survey method with random sampling technique in three area along the river, i.e. upstream, middle stream and downstream. Species diversity was measured as the number of each species, and the longitudinal distribution was measured as fish species in each area. There were 472 individuals of fish, composed by 18 species of 11 families were identified from Klawing River. The 11 families were Cyprinidae, Bagridae, Cichlidae, Anabantidae, Eleotrididae, Belontinidae, Mastacembelidae, Poeciliidae, Channidae, Osphronemidae and Siluridae. Cyprinidae was the family having the highest number of species (6 species), followed by Bagridae (2 species), Cichlidae, (2 species). The remaining families have respective one species. Based on single cluster analysis showed that upstream area has the highest similarity with midstream (78%) compare with midstream and downstream (50%). The richness of species and family was higher in midstream than in upstream and downstream. This longitudinal distributions pattern may because of the difference of environmental conditions and can be recommended that management of land use surrounding the Klawing River is a key factor to conserve freshwater fish.

Distribution, diversity, fish, Klawing, taxonomic

BO-02

Intensity of *Trichodina* sp. protozoon of tawes, nilem, mujaher and gourami cultivated in a polyculture system

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Trichodina sp. protozoon, is one among those parasites which able to infect all freshwater fish such as: gourami, nilem, nila and tawes, cultivated in either mono or polyculture. The occurrence of this infection to the fish fry of up to 80% had ever been reported before. Currently, there are still many Banyumas fish-farmers cultivated their freshwater fish in a polyculture technique and put the Gourami fish together with nilem, tawes and nila. Research which was purposed to note the intensity of *Trichodina* sp.

protozoon on each type of fish like gourami, nilem, nila and tawes cultivated in a polyculture technique. The research was done in a survey with sampling area of fish farmers' ponds of the Purwoksari-Baturraden, Banyumas. Isolation and identification of the protozoon were done in Entomology-Parasitology laboratory of the Faculty of Biology Unsoed-Purwokerto. Data showed the intensities of *Trichodina* sp. varied subsequently in either nilem, nila, tawes or gourami 6.8 ; 5.8 ; 5.2 and2.2. m

Cultivation, gourami, intensity, polyculture, *Trichodina*

BO-03

Screening of bacterial endophyte from healthy root of chili to control bacterial wilt disease of chili (*Ralstonia solanacearum*)

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Bacterial wilt disease on chili caused by *Ralstonia solanaceou*s E.F. Smith can lose crop production up to 100%. This problem also has an economical impact, though controlling this pathogen has been done before. Biological control using endophytic bacteria is one of alternative control methods to support sustainable agriculture program. The objective of these experiments was to obtain the endophytic bacterial isolates from the healthy root of chili, which can control of bacterial wilt disease on chili. In planta technique was used to screening the biocontrol activity of bacterial endophytic isolates against *R. solanacearum*. Bacterial endophytes were isolated from the healthy root;s chili from an endemic area of bacterial wilt diseases (West Sumatra Province, Indonesia). This approach focuses on indirect mechanisms (systemic induced resistance). This technique has the possibility to find the new, easy and cheap biocontrol organisms. Among 16 bacterial endophytic isolates, it was found that 14 isolates could suppress bacterial wilt disease on chili until 0 %, the plants were still healthy and produced fruit. If we compare than control plants died at 22.2 days post inoculation. We have found one bacterial endophytic isolate AGBE.4.1.TL, that have multifunction as a biocontrol of wilt disease and as biofertilizer to increase growth and yield of chili.

Bacterial endophyte, chili, healthy chili root, in planta technique, *Ralstonia solanacearum*

BO-04

Fish community structure and its conservation in Lake Sentani, Papua, Indonesia

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Lake Sentani has high endemism and one of freshwater ecosystem conservation priority in Papua, Indonesia. However, it is facing high threats of human population and their activities, which threats habitat and biota. This research was designed to document fish structure community, threats and its conservation in Lake Sentani. Fish was done in seven locations in Lake Sentani, including Waena, Yahim, Puai, Ayapo, Enandowai, Atamali andYakonde. Three gill nets with three different mesh size, which is 1,5 inches; 2 inches; and 2,5 inches were used to sample fish in three sites of each location in the lake. Fish sampling was replicated three times in each location. Fish data analysis was done by calculating Shannon-Wiener's diversity index (H'), relative abundance (KR), and dominance index (c). Nineteen (19) freshwater fish species in 16 genera and 11 families were recorded from the lake. The fish are including two endemic fish, five native fish, one anadromous species and 10 introduced species. The Shannon-Wiener diversity index shows Lake Sentani's diversity is low (H'=0.76) and dominance value was medium (C=0.68). An introduced species, Amphilopus labiatus, has the highest abundance with relative abundance reach 82% and also the highest dominance fish in the lake. Lake Sentani is facing threats of introduced species and habitat alteration. Therefore, in-situ and ex-situ conservation of Lake Sentani and its biota should be done to conserve it.

Conservation, fish community structure, Lake Sentani, threats

BO-05

Ant (Hymenoptera: Formicidae) diversity as bioindicators of agroecosystem health in northern slope of Mount Slamet, Cental Java, Indonesia

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Ants respond to a variety of disturbances and have served as bioindicators to assess effects of organic agriculture. This research was done at two types of agroecosystems (organic and conventional farming) in northern slope of Mount Slamet, Central Java, Indonesia from the periods of April to August 2015. The aims of the research were to know the diversity of ants assemblages in two different agroecosystems and to evaluate respond of ants diversity

from the different farming system. A total of 359 ants individuals of 17 species, from 5 subfamily were collected. Of the 17 specimens collected, seven species (41%) were found only in organic farming and four species (23%) were found only in conventional farm and six specimens (35%) were found in both habitats. Based on similarity index (Morisita-Horn) showed that species composition between two habitats was low (33%). Organic farming showed higher abundance (287 individuals, 79.94%) than that in conventional farming that only found 72 individuals (20.05%). From the result can be concluded that ants diversity can be use as bioindicators of agroecosystem health.

Agroecosystem, ants diversity, bioindicators, conventional and organic farming

BO-06

Behavior ecology of orangutan reintroduction in Bukit Batikap, Central Kalimantan, Indonesia

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A successful component of adaptation of reintroduced orangutans by BOSF in Bukit Batikap forest, Central Kalimantan, Indonesia to their new habitat was evaluated using vertical and horizontal space occupied, supported by food patch distribution, phenology, and vegetation. This study was done on 16 reintroduced orangutans (8 semi-wild and eight rehabilitated) with the distribution of vegetation analysis overlaid with ranging for ecology effect. Day journey length and home range of orangutans were collected for 18 months (2012-2014) using focal animal sampling. Ranging data was analyzed using ArcMAP GIS 9.3 Kernels program, correlation between ranging and vegetation by Canonical Correspondence Analysis (CCA), diversity and biodiversity vegetation analysis which was then compared to wild orangutans (Sebangau and Tuanan Research Station). We found a significantly high proportion of fruit (0.81) and rattan (0.58) eaten, fruit availability per month was between 1-16% based on phenology, 98% of Sorensen similarity of vegetation and similar diversity for Simpson's, Shannon-Wiener and biodiversity indexes. We also found dominance for vertical space occupied (16-20m), minimum home range for males (619 ha) and females (544 ha), and overlapping area between orangutans (0.09%-77.85%), Based on the correlation between ranging and food distribution by CCA (eigenvalues 1,242), orangutan distribution was found to be concentrated on food resources, and ranging was found to be similar compared to wild orangutans. In conclusion, we found the similarity in adaptation reintroduced orangutans, both semi-wild and rehabilitated, in their new habitat.

Food-patch, orangutan, phenology, ranging, vegetation

BO-07

Distribution and abundance of *Ficus* sp. in Gunung Tilu, Kuningan, West Java, Indonesia

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Ficus trees, which are considered to be critically important components of tropical ecosystems, may be particularly attractive to species disperses and abundance in different location elevation gradient.This research has been done in Gunung Tilu, Kuningan, West Java, Indonesia during August to October 2016 and aims to map distribution and abundance of species of *Ficus* sp. to construct conservation strategy. The result showed that in the study site we found 11 species of *Ficus* and distributed from 500 m asl to 1000 m asl. The highest species richness was found at the elevation 500-700 m asl (10 species), and the lowest was found at more than 1000 m asl (only two species). The abundance showed highest at mid elevation (700 m asl to 1000 m asl) and dropped dramatically at an elevation more than 1000 m asl. Based on our finding can be concluded that *Ficus* sp distributed randomly at different elevations and the abundance at middle elevations, this finding is very important to construct conservation strategy of Gunung Tilu forest remnant in Kuningan

Abundance, distribution, *Ficus*, Gunung Tilu

BO-08

Distinctiveness of termites assemblages at four mount sides in production forest of Slamet Mount, Central Java, Indonesia

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This study compares the termite assemblages at production forest of Slamet Mount, Central Java, Indonesia sampled from south, north, west and east direction, on similar altitude (700, 800,900,1000,1100 and ≥ 1200) m asl, with the view to identify their distinctiveness. To sample the termite at four mount side, the belt transect was used. Termites recorded were put into feeding group based on their taxonomic identity. Data analyzed by Shanon-Wiener Diversity Index. A total 11 species of termites in six genera belonging to three subfamilies and two families were recorded. Four species mostly wood feeder from northern mount side are *Schedorinotermes javanicus, Macrotermes gilvus, Odontotermes javanicus* and *Microtermes insperatus*, while humic feeder termites abundant at western and eastern mount side consist of *Capritermes semarangi, Pericapritermes javanicus, P. dolicocephalus, Procapritermes* spp., *Nasutitermes matangensis, N.matangensiformis* and *Bulbitermes* spp. Species *S. javanicus* is the one and only cosmopolites in all of the altitudes from all of the mount side, Procapritermes spp and *Bulbitermes* spp are species inhabiting in humic habitat under Pinus trees but each specific at southern and western mount side. Also, Climate, rainfall, canopy and degree of human interference appear to contribute to the distinctiveness of termite assemblages at four mount side in production forest of Slamet Mount Central Java.

Altitude, mount-side, production-forest, humic-feeder

BO-09

Preliminary study of population structure and habitat stratification base on daily activity frequency of long tail monkey (*Macaca fascicularis*) in disturbance protected forest in Sabang, Aceh Province, Indonesia

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This research was done through the observation of population structure and habitat stratification base on daily activity frequency of Monkey long tail (*Macaca fascicularis*) in disturbance of Protected Forest in Sabang, Aceh Province. This research was descriptive with quantitative approach. This research was held in the Protected Forest of Iboih, Sabang district. The collective data on population structure observation and grouping size of *M. fascicularis* by using concentration count method and for observing the daily activity of *M. fascicularis*, scan sampling method was used. Based on the research shown that (i) Population structure of *M. fascicularis* on the 1st location was ranged in between 11 and 12 individual. On the 2nd location was ranged in between 20-25 individual and on the 3rd location was ranged in between 10-15 individual. (ii) Habitat stratification which used by *M. fascicularis* was more dominant by using E stratum (0 meter). Dominant activity is dynamic activity with the number of percentages was about 37.05% comparing with other activities. On the other hand, the reproduction activity is more frequent doing in the altitude between 1-5 meter (D stratum) with the percentage is about 1.40% comparing with E stratum (0 meter) which only has the percentage about 0.17%. (iii) The most frequent behavior which was done by the group of *M. fascicularis* is the behavior of moving which has the percentage about 39.50% comparing with other activities. The conclusion of this research is the population structure of *M. fascicularis* will form the inverted pyramid, because the mature individual was more dominant comparing with the young individual. These facts cause the age structure of long tail macaque categorize in the regressive population in disturbance forest

Disturbance, protected forest, population, stratification

BO-10

Identification and screening of white rot fungi in pine woods of East Banyumas Forest, Central Java, Indonesia

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Pinewoods of east Banyumas forest area, Central Java, Indonesia have specific conditions of moist topsoil, humid weather, and rich of lignocellulosic debris materials. This condition support existence of diverse fungal population including that of white rot fungi. This research purposed to identify and screen genera of white rot fungi in Mandirancan pine woods of East Banyumas Forest. The research elaborated survey method with purposive random sampling, obtained 26 genera that 12 of them are positively white rot fungi based on Bavendam's Test, i.e.: *Humicola, Botryotrichum, Periconia, Pythium, Phoma, Chaetomium, Marasmius, Auricularia, Hypholoma, Phytophthora, Mucor,* and *Rigidoporus.*

Bavendam's test, screening, white rot fungi

BO-11

Characterization of *Bifidobacteria* from infant feces with different mode of birth at Purwokerto, Indonesia

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Bifidobacteria belong to the so-called beneficial intestinal flora. Before attempting to raise their intestinal levels to improve the health status of the host, it is of importance to know about physiological variations in the bifidobacterial colonization of the human intestine. The diversity of Bifidobacteria in infant feces was influenced by birth process. The purpose of the research was to isolation, characterization, identification and potential test of *Bifidobacterium* spp. from the result of isolation by different birth infant (normal, caesar and premature) feces. The research was conducted by survey method and data were analyzed by analytic descriptive. The result of this research found that 35 isolates are suspected *Bifidobacterium* group and after API 20 A test showed 17 isolates to make certain genera of Bifidobacterium spp. And all isolates come from infant feces with caesar and premature delivery. This finding is very important for science and medical point of view and could be developed with further research.

Bifidobacterium, birth process, characterization, feces

BO-12

The leave anatomy characters and analysis chlorophyll content on sweet potato cultivars (*Ipomoea batatas*)

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The leave morphology and anatomy characters can be used to identify plant adaptation to the environment. Leaves are one organ that can be used as the growth parameters for easy adaptation to environmental changes. The research was aimed to determine the differentiation anatomical characters of leaf and chlorophyll contents on 10 cultivars sweet potato (*Ipomoea batatas* L.). The method was used survey with purposive random sampling at Purwokerto around. Leaf anatomy was made by using paraffin method and spectrophotometry method was used to determine the content of chlorophyll. The results of this research showed that the cuticle thickness was in Cangkuang cultivar with 4.25 µm. The biggest stomata density in adaxial surface were in Cangkuang and Sukuh with 8 cells/mm2, meanwhile in abaxial surface was in Borobudur with 17 cells/mm2. Trichomes density in adaxial surface ranged from 1 to 2 cell/mm2, meanwhile, the highest density in the abaxial surface was in Beta with 3 cells/mm2. The greatest palisade cell number was in Cilembu with 13 cells out of 4 epidermis cells palisade ratio. The highest chlorophyll content was in Cilembu with 1.44 mg.L-1 for chlorophyll a; 0.725 mg.L^{-1} for chlorophyll b; and 1.787 mg.L^{-1} for total chlorophyll.

Anatomy characters of leaf, chlorophyll, cultivars, *Ipomoea batatas*

BO-13

Diversity characteristics of sugarcane varieties tolerant waterlogging stress

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Sugarcane varieties that are waterlogging tolerant in Indonesia nobody yet releasing. On this research, we present and prove two varieties of sugarcane that will be the potential to be sugarcane varieties that tolerant or adapted to waterlogging. The aim of this research was to obtain the waterlogging stress tolerant sugarcane plant. The research used complete randomized block design (RBD) with two factors and three replications. The first factor was sugarcane varieties consisting of PS 8845, VMC 7616, BL, VMC 86550, PSJK 922 and PS 864. The second factor was the treatment of waterlogging stress for 0, 6, 9, and 12 weeks of waterlogging in a bucket. The results showed that the diversity in the resistance response of several tested sugarcane varieties was indicated in several parameters such as the fresh weight of stem, dry weight of stem, liquid of stem, total sucrose, stem aerenchyma, stomata density, roots, and chlorophyll content. Based on the results of the experiment, we identified that Variety VMC7616 can be grouped as a variety that adapted to stress waterlogging. PS 8845 as long as 12 weeks waterlogging stress had the stable highest sucrose levels, so variety with the best response tolerant to waterlogging stress is PS 8845. Variety with the lowest response resistance indicated by PS 864 due to having the lowest sucrose content.

Adventive roots, aerenchyma, fresh weight, photosynthesis

BO-14

Diversity of mangrove vegetation and carbon sink estimation of Segara Anakan Mangrove Forest Cilacap, Central Java, Indonesia

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Mangrove forest is known as standing stores as sequestered atmospheric carbon. Of these ecosystems, the roles of mangrove forest substantial amount of atmospheric carbon diopside (CO_2) and stored carbon its biomass have been recently understored. The aims research was to estimate vegetation diversity and carbon sink estimation of Segara

Anakan Mangrove Forest Cilacap, Central Java, Indonesia during Augst until December 2012. Vegetations sampling was done by square plots technique. Diversity index was utilized to determine species diversity. Allometric equations were utilized to determine biomass and carbon sinks estimation. This study only calculates aboveground biomass and carbon sinks. The research results showed that mangrove in Segara Anakan composed by 16 species of trees, 15 species of sapling and 18 species of seedling, shrubs, and herbs. The most dominant of tree was Avicennia marina with important value 25.6 %. The most dominant of sapling was Avicennia marina, too with important value 31.1 %. The most dominant of seedling, shrubs, and herbs was Acanthus illicifolius with important value 24.98 %. The total biomass of tree about 43.06 kg/tree or 0.13 ton/ha. Total biomass of sapling was 27.38 kg/tree or 0.32 ton/ha. The carbon sink of tree 0.13 ton/ha and carbon sink of saplings 0.32 ton/ha. Conclusion: total biomass and carbon sinks of trees more than the total biomass and carbon sink of saplings.

Carbon sink, diversity, mangrove forest

BO-15

Species diversity of herpetofauna in the Sekung River Camp of Wehea Protection Forest, Wahau, East Kalimantan, Indonesia

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Wehea protected forest is part of a landscape of the Essential Ecosystem Wehea-Kelay of East Kalimantan, Indonesia. In the Wehea protected forest area, there are several watersheds are a source of water for most of the people in the sub-district of Muara Wahau. Biodiversity in it is not yet known for certain particular species of herpetofauna. Some species of herpetofauna can be an indicator of environmental quality especially the waters of a river that became a source of clean water for the community. For it becomes important to know which type of herpetofauna diversity into a source of wealth of the kind that supports the ecosystem in the region. Research was done by the method of visual encounter surveys. Found 9 order comprising 21 types of reptiles (composition with 38.09%) and amphibians (61.90%). Not found the species common in disturbed areas so as to indicate the resources support neighborhood around the river Sekung is still relatively good mainly for its water source.

Herpetofauna, Sekung River, Wehea Protection Forest

BO-16

Home range of adolescent orangutan (*Pongo pygmaeus wurmbii*) based on fruit availability in degraded peat swamp forest

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Adolescent orangutan becomes a competitor for the mothers with newborn infants. This condition made adolescent orangutan must adapt with other orangutans in order to find fruit. The orangutan's response can be seen from the size of home range and utilization area in home range.The aims of this research are to identify (i) fruiting tree availability of orangutan food, (ii) home range of adolescent orangutan based on fruiting tree availability. These research were conducted from August 2013 to July 2014 in Tuanan Orangutan Research Station, Central Kalimantan. Fruit trail method was used to estimate the abundance of fruiting plant, while focal animal sampling method was used to estimate the home range by tagging a point every 30 minutes in GPS during the following of the orangutan. The research results showed 62 species trees of orangutan food trees and 15 liana species. The highest Period of fruit abundance of orangutan food occurred in November until January. Adolescent orangutan responded to a high fruit availability by increasing their home range size and will decrease it when the fruit availability is low. Adolescent orangutan often used area in their home range which has high and medium abundance of fruit trees. When the number of the tree bearing fruit decreased (low period), adolescent orangutan changed their home range to an area that consisted of medium up to high abundance of liana fruit.

Adolescent orangutan, fruit, home range, liana, tree

BO-17

Diversity and distribution Genus Mystus fish in Cingcingguling, Central Java, Indonesia

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Data about Mystus is not easy to be found in publicity, moreover it hasn't been found yet in Cingcingguling river, Kebumen, Central Java, Indonesia. The goal of the research is to figure out and to reveal the diversity and ecological distribution manner based on the characteristic of the habitat. The survey method is purposive random sampling technique, May-October 2016. The diversity and the abundance are to be analyzed based on the amount and the species of the fish. The species distribution is to be analyzed by correspondence factorial analysis. There have been found three species, they are *Mystus micrachantus* 455 fish (7.6-23.4 cm), Mystus sp. 240 fish (5.2-12.2 cm), *Mystus gulio* 1246 fish (3.4-35.8 cm). The distribution of *Mystus micrachantus* and *Mystus* sp generally has been found in the middle segment and lower course. Mystus gulio can be found in upper course, middle course and lower course. The best habitat for *Mystus micrachantus* and *Mystus* sp. is in muddy slow stream.

Cingcingguling River, distribution, diversity, *Mystus* fish

BO-18

Variation of seaweeds *Sargassum polycystum* thalli from Menganti, Kebumen and Karimunjawa Beaches, Central Java, Indonesia

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Sargassum polycystum C. Agardh is known as one among those of alginate producing seaweeds, a linear copolymer which constructs seaweeds cell's wall, and currently has been being utilized in various industries. The alginate content is strongly affected by activity of the enzymes as well as part of the thalli being extracted for this particular component with a specific encoding gene which its expression is affected by environmental factors where the seaweeds were grown/cultivated. The current study was aimed to know the variation of seaweeds *S. polycystum* thalli grown in Menganti-Kebumen and Karimunjawa-Jepara Beaches. The data showed if the thalli of the *S. polycystum* seaweeds grown in the Karimunjawa had more variation than those of cultivated in the Menganti beach, as obviously seen on its leaves and vesicles. Statistically, there was a relationship between water salinity and pH of the Menganti Beach and the length of the *S. polycystum* seaweeds, with a coefficient correlation of ($r=0.416$ $p<0.05$). On the other hand, water temperature, salinity and pH of the Karimunjawa beach were correlated with the vesicle's colour ($r=0.390$ $p<0.05$); nitrate and phosphate affect leaves, width as well as upper and lower surfaces of the thallus leaf; but phosphate solely affect thallus width and so the thallus edge and vesivle length. Water temperature, salinity, pH, nitrate and phosphate factors in the Menganti beach were significantly affected the *S. polycystum* seaweeds thalli variation (Fcal<Ftable and $p>0.05$); whereas water temperature, salinity and pH in the Karimunjawa beach significantly affected the length, width, edge, upper and lower thallio surfaces of the *S. polycystum* seaweeds. The existence of nitrate and phosphate correlated with length, width, edges, upper and lower surfaces of the thallus leaf. The content of phosphate solely, affect the color of the *S. polycystum* seaweeds vesicles (Fcalc> Ftable $p<0.05$).

Environmental factors, Karimunjawa, Menganti, thalli variations

BO-19

Citrus diversity of West Sumatra based on morphology, ISSR, and its combined analysis

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Citrus species in West Sumatra is very diverse. However, the analysis of diversity based on either morphology or genetic or both combined is limited. The analysis was conducted on 27 cultivars derived from exploration activity in four districts of West Sumatra in October-November 2014 along with four germplasm collections cultivars as the controls. The morphological characterization was done based on IPGRI Descriptor List, while the genetic analysis was done using Inter-Simple Sequence Repeats (ISSR) markers. The data of morphological characters was analyzed first using Principal Component Analysis (PCA), for grouping plants Cluster Analysis was used, and the dendrogram was calculated according to UPGMA SAHN method on NTSys program. The results showed that the plant's diversity based on morphological and genetic are grouped into two and four groups with the degree of similarity are 21-100% and 58%-96%, respectively; while based on its combined analysis, there are two major groups with a degree of similarity ranged between 56-94%. Of all citrus samples from West Sumatra, there are 3 types which could be genetically identified properly, the Siam-1 is similar to Siam Bangkinang, GF-1 is related to Kontrol-4 (G88.1/Grape Fruit) and Keprok-1 is related to the Kontrol-1 (KKO/Kacang Mandarin) with their levels of genetic similarity are 96%, 93.4% and 77.8%, respectively. Meanwhile, based on combined data, there is a 94% degree of similarity between Siam-1 with S. Bangkinang and JC-1 with Limau Kuning. The diversity of West Sumatra Citrus is very high; this is evidenced by some species that composed of several genetically different individuals

Citrus, diversity, genetic, molecular, morphology, West Sumatra

BO-20

Chromosome numbers of some species of *Pteris* (Pteridaceae) in Java, Indonesia

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Pteris L. (Pteridaceae) is a large fern genus consisting of about 250 species distributed predominantly in tropical and subtropical countries. The genus grows in a diversity of ecosystems, either terrestrially or lithophytically (on rocks), although most species occur in the forest. A study of the cytology of *Pteris* in Java is being undertaken in the hope that it may contribute to conceptual understanding of the interrelationships between various fern species in the Malesian region. The aims of our study are: (i) to observe somatic chromosome number of some species of Pteris in Java and to determine their reproduction types; and (ii) to discuss polyploidy in the species in relation to plant morphological variation across their geographical distribution. Chromosome counts for eight species are reported. *Pteris biaurita* is an apogamous diploid species (2n = 58). *Pteris ensiformis* var *ensiformis* has chromosome numbers of 2n = 87 (apogamous triploid) and 2n = 116 (sexual tetraploid), while *P. ensiformis* var. *victoria* has a chromosome number 2n = 58 and is a sexual diploid. Pteris fauriei is an apogamous triploid species (2n = 87). *Pteris longipinnula* has a chromosome number of 2n = 116 (tetraploid). *Pteris multifida* and *P. vittata* are sexual tetraploids (2n=116). *Pteris tripartita* has two ploidy levels (sexual diploid and tetraploid). Another currently unplaced Javanese *Pteris* sp. has 2n = 87 (apogamous triploid).

Chromosome, Java, ploidy, *Pteris*

BO-21

Analysis of growth mindi (*Melia azedarach*) and productivity sorghum (*Sorghum bicolor*) G55 and Bioss-04 Strain in agroforestry systems

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Indonesia's population growth led to an increase in human needs. On the other hand, the land available to meet those needs was decreasing. So it needs a system that maximizes land one of them is agroforestry. Agroforestry will combine mindi tree (*Melia azedarach* L.) were 2 years old with a spacing of 2.5 mx 2.5 m, and agricultural crops is sorghum strain of SEAMEO BIOTROP development results that G55 is a BMR (Brown midrib) strain and BIOSS 04 which belonging in sweet sorghum. The research purpose is to analyze the growth of mindi on agroforestry systems and monoculture and analyze the growth and productivity of sorghum on agroforestry systems and monoculture.The results showed growth of mindi as high tree, diameter of stem, canopy and root diameter larger on agroforestry than monocultures.Growth and productivity of sorghum in the two strains showed lower on agroforestry cropping pattern.Sorghum G55 and BIOSS 04 strains can grow under mindi trees but can not produce optimally.

Agroforestry, *Melia azedarach*, *Sorghum bicolor*, strains

BO-22

Effect of sentang (*Azadirachta excelsa*) and mindi (*Melia azedarach*) extracts on soybean (*Glycine max*) germination

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Azadirachta excelsa Jack and *Melia azedarach* L. are potential trees species to be developed in agroforestry system. Both plants are fast growing species and good for timber use. However, there is an inadequacy on both species due to their allelopathic compound contents. Allelopathic compounds in the plants are distributed from root, stem, leaf, and fruit; which at certain concentrations could inhibit germination, growth, and development of other plants. The objective of this study was to analyze the effects of root, leaf, and twig extracts of *M. azedarach* and *A. excelsa* on the germination of soybean. The result of this study showed that the root, leaf, and twig extracts of *M. azedarach* and *A. excelsa* were able to inhibit the development of soybean. 5 % twig extract of *M. azedarach*, significantly inhibited the germination by 77.75%. Leaf and twig extracts of *A. excelsa* at 1.25% concentration was known to provide a stimulant effect on the germination of soybean.

Agroforestry, allelopathy, extracts, germination, inhibition

BO-23

Comparison study of diversity *Sargassum* on Karimunjawa and Menganti, Kebumen Beach, Central Java, Indonesia

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Sargassum seaweed is Phaeophyta who has the most species diversity in Indonesia. *Sargassum* has a cylindrical shape and leaf-shaped talus, *Sargassum* body dominated by the color brown. The purpose of this study was to determine the types of *Sargassum* and knowing the morphological variations that distinguish *Sargassum* in Karimunjawa beach, Jepara district and Menganti beach, subdistrict Ayah, district of Kebumen, Central Java, Indonesia. The different geographic location and characteristics of Karimunjawa and Menganti affect the biodiversity of the living. This study uses survey method with purposive sampling technique Random Sampling. *Sargassum* obtained from two locations were analyzed using descriptive methods. Morphological variations obtained *Sargassum* be described by observing the morphology of each species. The results showed that in Karimunjawa beach there are eight species of *Sargassum* and in Menganti beach there are nine species of *Sargassum*. Morphological variations that distinguish *Sargassum* in Karimunjawa beach and Menganti beach are shape of leaf thallus, edge of the leaf talus, tip of the leaf thallus, color of the leaf thallus, form of vesicles thallus, length of primary rod thallus and length of secondary rod thallus.

Karimunjawa, Menganti, morphology, *Sargassum*, seaweed

BO-24

Potential development of Citrus cv. Nimas Agrihorti as citrus bio-pharmacy

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Nimas Agrihorti is a suitable citrus variety to develop in Indonesia to fulfill the needs of citrus bio-pharmacy in domestic markets as more people concern about their health. This is based on the potency of high-quality fruits of Nimas Agrihorti as the raw material for bio-pharmacy industry. The objective of this study was to acquire some information on characteristics and potentials of fruits of Nimas Agrihorti as the source of citrus bio-pharmacy. The methodology used was by examination and observation conducted in June 2013-October 2014 at experimental field of Banjarsari, Bateman village, Probolinggo in East Java. Morphological observation of the crop's performance was done based on Descriptor List for Citrus (IPGRI), while the characterization of fruit's chemical substances was done at the Post Harvest Laboratory of Brawijaya University, Malang. The results showed that according to the fruit quality (size, color, and taste), Nimas Agrihorti has potential advantages for development. It has a big-sized fruit of 72-82 gram in weight, yellow skin color, sweet taste, 34.8 mg/100g of vitamin C and low acid content around 0.45%.

Biopharmacy, citrus, development, Nimas Agrihorti, variety

BO-25

Diversity of macroscopic fungi along an elevational gradient in Mount Slamet, Central Java, Indonesia

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Elevational patterns of plant and animal diversity have been studied for centuries; however, the effects of land elevation on macroscopic fungal diversity remains unclear. Mount Slamet is the second largest volcanic mountain in Java, located in the western region of Central Java Province, Indonesia, with an altitude of 3,432 m above sea level, climatic conditions of this region suitable for growing diverse species of fungi or mushrooms. The purpose of this study was to determine the diversity of the mushroom based on of the macroscopic character. Research has been done from December 2013 to June 2014 at Baturaden hiking track from the elevation of 900 m asl to 2400 m asl (above sea level) with total 16 sampling site. During study period we found 75 species from 46 families and showed that the highest species richness was at the elevations of 900-1200 m asl. (28 species) and the lowest was at the elevations of 1800-2100 m asl. Two dominant species were *Mycena* sp. and *Coprinus* sp. that almost found in all elevations. The finding of the result showed that Mount Slamet was very rich in macroscopic mushroom and distributed along the elevational gradient.

Diversity, elevational, gradient, macroscopic fungi, Mount Slamet

BO-26

System dynamics modeling: The relationship between community structure of mangrove with temperature in Coastal Area of Jakarta Bay

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This research was conducted in the Bay of Jakarta, North Jakarta, Indonesia. This research has taken since February 2016 until December 2016. This study aims to make the modeling design of relationship between the community structure of mangrove with the temperature in mangrove

forest that found in coastal areas protected forest Angke Kapuk in the Bay of Jakarta, using software power sim studio 10.0. This modelling is useful to get keys factor in the relationship between them, so that both parameters will be obtained on predictive simulation condition of mangrove forests in the Bay of Jakarta as desired. Stations samples used in this study is divided into five stations spread from Tangerang (Banten Province) Dadap station (Station 1), along with the Bay of Jakarta (Stations 2,3, and 4) located in North Jakarta, and in Bekasi (West Java) that in Muara Bendera (station 5). The results obtained are significant relation between the community structure of mangroves with temperatures pattern in the Bay of Jakarta throughout in year. The dominance of *Avicennia lanata, A. marina, Rhizipora apiculata, Soneratia alba*, can give a picture of the mangrove system in the region. Fluctuating temperatures caused by rainfall and coastal ecosystem that intersect with the construction of the city, causing a significant correlation with the dominance of species in the mangrove forest.

Community structure, mangrove forest, species dominance, system dynamics, temperature

BO-27

Diversity of insect pest in peanut crop treated with bio insecticide *Beauveria bassiana* in different concentration

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Biological control using *Beauveria basiana* fungi can be done to control the pest of peanuts. Applications entomopathogen *B. basiana* as biopesticide has been done to control pests in the peanut crop. The research aims to study the effect of application bioinsecticide *B. basiana* in different concentration on the diversity of insect pests in the peanut crop. The study was conducted in Rambatan, Tanah Datar, West Sumatra Province from February to June 2016. Identification of insects done in the laboratory Bio-Ecology of Insect, Plant Protection Department, Faculty of Agriculture. Research in the field prepared with completely randomized design with four treatments (concentration of 10, 20, 30 and 40 g/L) and four replicates. Direct observations made on plot crop peanut size of 1 x 1 m, with five plant samples. Results obtained in each treatment species richness is highest 6 and the lowest 2. Abundance highest individual occurred at week 8 and nine after planting. Diversity index ranged from 0:33 to 1:50 and evenness index 0.16-0.80. The diversity and evenness of insect pests on peanut crop were applied B. bassiana with several concentrations relative no different.

Bioinsecticide, diversity, insect pest, peanut crop

BO-28

Copper and zinc removal from textile industry effluent using *Acinetobacter* sp. IrC2 in a fixed bed reactor

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Environmental pollution caused by toxic heavy metals from textile effluents have become very important in recent years. Pollutant treatments are part of the human calling to subdue, preserve, and cultivate the earth in bringing goodness for all creatures. Biological methods are the most commonly used for removing heavy metals from the environment because of low cost and high efficiency. The aim of this study was to evaluate the potential of *Acinetobacter* sp. IrC2 for removing copper and zinc using a fixed bed bioreactor. Textile industry effluent containing copper and zinc was added to a bioreactor and *Acinetobacter* sp. IrC2 was inoculated to the bioreactor containing the mixture of molasses and Carbon/Nitrogen/ Phosphor, the mixture of molasses and urea, and without energy sources. The bioreactors were run for 12 days and sampling was done every day for determining heavy metals percentage removal from textile industry effluent using Atomic Absorption Spectrophotometer. The results showed that inoculation treatment enhanced bioreactor application to remove zinc and copper up to 100% and 78% concentration level in effluent industry containing the mixture of molasses and urea with bacterial inoculation, respectively. While, there was no removal of zinc in treatment without inoculation treatment. The finding of this study indicated that *Acinetobacter* sp. IrC2 was potential bacterium for removal of heavy metals using fixed bed bioreactor. Therefore, the bacterial study is a part of human calling in preserving the earth.

Acinetobacter sp. IrC2, copper, fixed bed bioreactor, removal, zinc

BO-29

Distribution and microhabitat characteristic of *Drepanosticta spatulifera*, an endemic Java Damselfly (Odonata: Plastystictidae) in Mount Ungaran, Central Java, Indonesia

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Drepanosticta spatulifera is an endemic damselfly in the Java Island, Indonesia. The last publication mentioned that it species discover in Baturaden, the slope of Mount Slamet, Central Java and it was only 12 males and 14 females (Liefthinck 1954). Based on the Red List Threatened Species, the status of *D. spatulifera* is data deficient due to lack expert sampling of Odonata in Java more than fifty years. As an endemic Java damselfly, updating data about its distribution and microhabitat are needed for conservation activity. Recently, *D. spatulifera* was found in seven areas of Mount Ungaran; there were Citro Arum Waterfall, Tundo Tigo Waterfall, Panglebur Gongso waterfall, Semirang Waterfall, Wana WIsata Gonoharjo, Kalisidi, and Banyuwindu. The altitude of seven locations is around 592-824 m ASL. In 2016, adult stage of *D. spatulifera* first appeared in September. It spent most of time to perch in the twig or leaves near a little stream. Microhabitat of *D. spatulifera* was dominated by Colocasia esculenta with dense canopies. Microhabitat characteristic of *D. spatulifera* in Mount Ungaran had an air temperature around 22-28◦C, humidity 70-90%, Light intensity 30-1350 lux, soil moisture mostly more than 80%, pH of soil 4-5, pH of water around seven, and DO 5-6.5 ppm.

Distribution, *Drepanosticta spatulifera*, microhabitat, Mount Ungaran

BO-30

Isolation and identification of fungi associated with wilt disease of banana plants (*Musa* sp.)

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A dominant devastating disease found in banana plants (*Musa* sp.) in Indonesia is wilt. Microbial pathogens attack the stump and are able to spread on the soil in which the plants grow. In order to obtain and determine the species of fungi associated with wilt disease of banana plants, isolation and identification of microscopic and macroscopic characteristics were carried out to the stump and soil where the plants grow. Furthermore, the cellulose-degrading ability of each isolate was confirmed using carboxymethyl cellulose (CMC) media and continued with antagonist test using *Trichoderma* sp. Totally, there were 13 isolates obtained, consisting of Aspergillus sp. LBKURCC72; *Fusarium* sp. LBKURCC73; *Penicillium* sp. LBKURCC74, 75, 76, 77, 78, 79; and *Trichoderma* sp. LBKURCC80, 81, 82, 83, and 84. Cellulase-degrading abilities were found in *Fusarium* sp. LBKURCC73; *Penicillium* sp. LBKURCC75; and *Penicillium* sp. LBKURCC77, which the largest clear zone was produced by *Penicillium* sp. LBKURCC77 with a ratio of 2,617. Antagonism effect of *Trichoderma* sp. LBKURCC2 successfully performed against *Fusarium* sp. LBKURCC73 with the largest inhibition percentage of 73.32%.

Banana, cellulose, fungi, identification, wilt

BO-31

Changes in floating diatom biodiversity in the Wadaslintang Reservoir, Central Java, Indonesia

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The influence of the increase in organic components, especially nitrogen (N) and phosphate (P) to changes in the composition and community structure of planktonic diatoms have been studied in Reservoir Wadaslintang, Wonosobo, Central Java. The reservoir has undergone enrichment (eutrophication) due to an increase in both human activities in the catchment area, as well as in the water body as a result of the cultivation of floating net activities. Diatoms are phytoplankton potential for fish larvae and other planktonic organisms. Changes in the composition and abundance of phytoplankton will affect water productivity. Results of studies using surveys in the waters of the reservoir Wadaslintang indicate a change in species composition and structure of the diatom community from 2008, 2015, 2016 to 2017.

Biodiversity, diatoms, organic pollution

BO-32

Analysis of insect diversity in the paddy ecosystem in endemic areas of brown planthopper *Nilaparvata lugens* in West Sumatra, Indonesia

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Biodiversity in agricultural ecosystems such as fields may affect the growth and production. Insects as one of the components of biodiversity also have an important role in the food web and the balance of the ecosystem paddy. The research was aimed to determine the diversity of insect and environment quality in paddy ecosystem in endemic areas of brown planthopper, *Nilaparvata lugens*. The research was conducted in Cacang Tinggi, Tanjung Mutiara Sub-District, Agam District of West Sumatra Province, Indonesia, from July to December 2015. The observed land, paddy fields were attacked by brown planthopper. Sampling is paddy ecosystems located on the edge of rice field (ecosystem I), ecosystem located in the middle of rice field (ecosystem II) and ecosystem bordered with irrigation system (ecosystem III). Sampling was done by two methods, (i) method visual (direct observations) which is determined by purposive sampling, (ii) method using nets swinging (sweep net). The diversity of insects was analyzed using diversity index of Shannon-Wiener (H'), evenness index (€) using index of Piellou, community structure between land (IS) using index of Sorensen and index dominance (D) using index of Simpson. The results showed that total insect found was 228 individual insects, consists of 7 orders, 13 families, 15 genera and 16 species. The highest diversity of insects was located of ecosystem II, value of diversity index (H') 2.18, evenness index (€) 0.83and dominance index 0.99. Similarity land index < 70%. The quality of the environment in ecosystem II by community structure was more stable and structure of insect-spread was very stable.

Diversity, insect, endemic, *Nilaparvata lugens*

BO-33

Length-weight relationship and condition factor of naleh fish (*Barbonymus* sp.) from Nagan Raya District, Aceh Province, Indonesia

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Study on length-weight relationship and condition factor of naleh (*Barbonymus* sp.) have been conducted in Nagan River, Nagan Raya, Aceh province, Indonesia. The study was conducted for one year starting in November 2015 to October 2016. This study used an exploratory survey to determine the location based on information from local fishermen. Total fish samples caught during the year amounted to 783 tails, where the minimum number of 50 samples/month. The analysis showed the value of coefficient b highs seen in December (b = 3.82) and the lowest in July (b = 2.52) with a mean value of 2.98 (isometric growth pattern). The value of Fulton's condition factor (K) average of 2.24 and relative weight (Wr) average of 100.68. Based on the value of b, K and Wr can be concluded that the fish balanced growth pattern, sources of food available, low competitors and predators, thus indicating the aquatic environment in a stable condition.

Barbonymus, condition factor, fish

BO-34

Comparison of aquatic insect assemblages between managed and unmanaged artificial lakes

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Aquatic insects are an example of organisms vulnerable to habitat alteration. Several artificial lakes were constructed with different maintenance pattern (managed and unmanaged) in Bekasi, which could impact the development of aquatic insect community differently. Therefore, the present study examined the aquatic insect assemblages between managed and unmanaged artificial lakes in Indonesia from January to June 2016. Additionally, the influences of physicochemical factors on the aquatic insect communities were assessed. The results showed that the abundance of insects was higher in managed (1059 individuals) than unmanaged lakes (426 individuals) ($p<0.05$, T-test). The significance of the difference in species composition between managed and unmanaged lakes was illustrated by the separated groups in nMDS graph ($p<0.001$, One-way ANOSIM). However, the same dominant species (*Orthetrum testaceum*) was found in both lakes. *O. testaceum* and *Desmopachria latissima* have strong correlation with all physicochemical parameters. Different management of artificial lakes significantly changed the aquatic insect assemblages, and unmanaged artificial lake decreased the abundance of aquatic insect.

Artificial, Bekasi, insect, lake, management

BO-35

Distribution of *Tetrastigma* (Vitaceae) in Sumatra, Indonesia

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There are 95 species of *Tetrastigma* in the Old World, primarily in the tropics with a few species in temperate Asia (Wen 2007; Chen et al. 2011a, 2011b). Latiff (1983) recognized 12 species in Malay Peninsula. The latest study found four species in Singapore (Yeo et al. 2012) and Jakes (1989) treated five species in Australia. Sumatra may have served as one of the major routes of dispersal of *Tetrastigma* from Indochina to west Malesia in the early Oligocene before they became widely distributed in east Malesia in the late of middle Miocene (Chen et al. 2011b). Study of distribution of Sumatran *Tetrastigma* was done by an extensive field trip through Sumatra and observing 172 herbarium collections from Herbarium Bogoriense (BO). The western of Bukit Barisan mountains is the main distribution area of *Tetrastigma* in Sumatra. *Tetrastigma* in Sumatra spread at an altitude of 23-2200 m asl. *Tetrastigma* from Sumatra is well-known as the host plants of the charismatic Rafflesiaceae on the island which is attracting many tourists (Wen 2007; Veldkamp 2008). However, *Tetrastigma* distribution types are not always followed by the distribution of *Rafflesia*. *Tetrastigma* has wider ecological distribution.

Distribution, diversity, Sumatra, *Tetrastigma*, Vitaceae

BO-36

Invasive alien plant species invasion after eruption of Mount Merapi, Java, Indonesia

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Mount Merapi is one of the major active volcanoes in Java Island, Indonesia that located side the National Park. Type of eruption is characterized by the collapse of lava dome at the summit generating a huge ”Nuees ardentes”/ pyroclastic flows called "wedhus gembel". The last eruption occurred in 2010 and caused severe damage to the surrounding vegetation in Mt. Merapi National Park MMNP). The purpose of this research is to determine the relationship between Mt. Merapi eruption and the population of invasive alien plant species (IAPS). Vegetation data were collected using transect line laid down on three different sites; one was in Cangkringan and Kemalang that affected by pyroclastic flow and the other in Selo that was not affected. The result showed that in the location that affected by pyroclastic flow (Cangkringan and Kemalang) has high numbers of IAPS than not affected location (Selo). The total number of IAPS was found in Mt. MMNP is 22 (twenty-two species). The important value indexes (IVI) showed that *A. decurrens* is the most dominant IAPS in Cangkringan and Kemalang. The high number of IAPS was indicated that the eruption of Mt. Merapi has decreased the local plant diversity.

Invasive alien plant species, Mount Merapi National Park, plant diversity, volcano eruption

BO-37

Positive feedbacks between volcano eruption and invasive alien plant species of *Acacia decurrens* seed germination

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Invasive alien plant species (IAPS) of *Acacia decurrens* (Wendl.) Wild seed bank has tended to response positively to post-eruption condition such as increased soil temperatures and the light levels. This study is to simulating the effect of pyroclastic flows during the eruption of Mt. Merapi to the germination of *A. decurrens* seed bank. The simulation is using three different temperature treatment such as soaking in smoke water, chemicals soaking using KNO3, and physical heat. The result showed that the germination of *A. decurrens* seed was correlated with the temperature. The high temperature was stimulating the seed germination. Statistical analysis showed all the temperature treatment are correlated with the seed germination. The seed can be germinated in 100o C smoke water and 80o C heat temperature. This simulation was showed that the high density of *A. decurrens* after the eruption was correlated with the seed bank germination after the eruption of Mt. Merapi.

Acacia decurrens, seed germination, temperature, volcano eruption

BO-38

Carbon stock potential of agroforestry system between mindi (*Melia azedarach*) and soybean

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Agroforestry systems are recognized to be a strategy to mitigate global climate change. This system can absorb and store large quantities of carbon (C) through the trees are managed together with crops. Developing allometric

equation of Mindi (*Melia azedarach* L.) plants could help quantifying the C stock in agroforestry system due to the importance of parameterisation of allometric equations with site-specific data. These study not only address to develop biomass equation (above- and below-ground) of *M. azedarach* but also to estimate C stock in its agroforestry system. The allometric equation for above ground biomass (AGB) and below-ground biomass (BGB) were quantified by destructive tree harvesting. AGB and BGB were regressed on diameter at breast height (DBH), height (H), and DBH in combination with H to obtain allometric coefficients for estimating biomass. Allometric equations AGB =-0.066 + 0.139 (DBH)2 and BGB = exp (0.584 + 0.015 DBH2) was found to be the best for predicting total above- and below-ground biomass of *M. azedarach*.The potential carbon stock in agroforestry system is estimated to be 62.998 Mg C ha^{-1} (55.278 Mg C ha^{-1} in soil and 7.720 Mg C ha^{-1} in plant biomass).

Agroforestry, carbon stock, *Glycine max*, *Melia azedarach*, soil carbon

BO-39

Distinctiveness of termite assemblages at four mount side in production forest of Mount Slamet, Central Java, Indonesia

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This study compares the termite assemblages at production forest of Slamet Mount, Central Java, Indonesia sampled from south, north, west and east direction, on similar altitude (700, 800, 900, 1000, 1100 and ≥ 1200) m asl, with view to identifying their distinctiveness. To sample the termite at four mount side, the belt transect was used. Termites recorded were put into feeding group based on their taxonomic identity. Data analyzed by Shanon-Wiener Diversity Index. A total 11 species of termites in six genera belonging to three subfamilies and two families were recorded. Four species mostly wood feeder from northern mount side are *Schedorinotermes javanicus*, *Macrotermes gilvus, Odontotermes javanicus* and *Microtermes insperatus*, while humic feeder termites abundant at western and eastern mount side consist of *Capritermes semarangi*, *Pericapritermes javanicus*, *P. dolicocephalus*, *Procapritermes* spp, *Nasutitermes matangensis, N. matangensiformis* and *Bulbitermes* spp. Species *Schedorinotermes javanicus* is the one and only cosmopolites in all of altitudes from all of mountain side, *Procapritermes* spp and *Bulbitermes* spp are species inhabiting in humic habitat under *Pinus* trees but each specific at southern and western mount side. Also, Climate, rainfall, canopy and degree of human interference appear to contribute to the distinctiveness of termite assemblages at four mount side in production forest of Mount Slamet, Central Java.

Altitude, humic-feeder, mount-side, production-forest

BO-40

Description of a new record of *Cryptolepis sinensis* (Apocynaceae) from Mount Nglanggeran, Yogyakarta, Indonesia

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Cryptolepis sinensis were found at coordinates of S 07o 50 '29.3 "; E 110o 32 '19.6 ", 497 m asl on climbing route of Mount Nglanggeran Gunung Kidul, Yogyakarta, Indonesia. Identification was based on the literature and herbarium specimens. Research was done using exploration and in-situ visitation, morphological and anatomical observation, and specimen collection. The existence of *Cryptolepis sinensis* in Java has not been reported, neither in the book Flora of Java by Backer and Bakhuizen v.d. Brink (1963-1968) nor in other literatures. Cryptolepissinensis is a small liana plant. This paper describes the character of the *Cryptolepis sinensis* found in Nglanggeran including its leaves, stems, and flowers morphology.

Cryoptolepis sinensis, Mount Nglanggeran, Periplocoideae

BP-01

Potential entomopathogenic fungi to control scale insect pest on citrus tangerine (*Citrus suhuiensis*)

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Realizing food self-sufficiency in Indonesia can be done by implementing optimize local potential that had been owned by agribusiness agriculture in Indonesia. One potential locally owned agribusiness commodity horticultural especially citrus is the use of entomopathogenic fungi to improve the productivity of citrus (*Citrus suhuiensis* Tan.) Reported decreased productivity due to pest infestation scale insect. The experiment was conducted at the Laboratory of Integrated Research Institute for Citrus and Subtropical Fruit October 2013 to October 2014. The study begins with a pest infestation survey scale insect on citrus crops in upland agro-climate, medium, and low in the dry and rainy seasons. Taken from a collection of

entomopathogenic fungi associated with scale insect in the field. A collection of fungi isolated from single conidia and its ability to infect selected scale insect. Entomopathogenic fungi pathogenic next on viability and pathogenicity test against scale insect. The results showed that the scale insect attack citrus is kind L beckii and A. aurantii. The highest attack occurred in lowland agro-climate during the dry season by L. beckii with tails and the rising population of 4.2 to 5.5 individuals per 10 cm in the rainy season. The result of selection of entomopathogenic fungi with density 107 conidia/ml with LC 50 within 14 days produced 12 isolates obtained during the dry season and 9 isolates during the rainy season. Viability test results showed that the isolates had viability above 50%, namely SK B4 K, SK D1 K and SB B3 K are respectively 73.6%, 61.6% and 53%, which were collected during the dry season and out of season isolates obtained rain SBW D2 H and SBW D3 BH each with a viability of 77.3% and 78.3%. Pathogenicity test results showed that there were six isolates are known to have a potential for controlling scale insect entomopathogenic fungi namely SBW B2 H, SBW D2 H, SBW D3 BH, SK D1 K, SBW D1 K and SB B3 K pathogenicity which has over 50 % up to 14 days.

Citrus, entomopathogenic fungi, pathogenicity, scale insect, viability

BP-02

Abundance, size distribution, and sex ratio of freshwater crabs *Parathelphusa convexa* in Mengaji River, Central Java, Indonesia

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The river is one of the freshwater crab habitats, the land use changes will affect the abundance and distribution of biota. The study on the abundance, distribution and sex ratio freshwater crab *Parathelphusa convexa* (De Man, 1879) on the Mengaji river, Banyumas, Central Java, Indonesia was conducted in April to June 2015. The method used in the form of surveys using traps, that trap installed in each station observation of as many as 15 pieces of each station. Total crabs caught as many as 117 individual with a sex ratio of male: female = 1: 0.89. Crab carapace length ranging from 13.75 to 41.42 mm for males and 13.48 to 38.78 mm for females. Carapace width ranged from 13.60 to 48.42 for males and 15.65 mm up to 45.50 mm for females. The total weight range of between 1 to 48 grams for males and 0.8 to 31gram for females. The highest abundance was obtained in the downstream areas as many as 62 individuals. The results showed that at the same size, weight, length and width of carapace *P. convexa* caught in the River Mengaji, Banyumas larger than females

Abundance, distribution, *Parathelphusa convexa*

BP-03

Respon of *Nicotiana tabacum* plant to waterlogging stress during vegetative stage

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Tobacco is one of the important commodity in Indonesia. Some varieties of tobacco cultivated in Indonesia, among others varieties Srumpung, Dixie Bright and Somporis. However, some constraints were found in the cultivation of tobacco is increasing the frequency of rain that caused waterlogging. Waterlogging stress can reduce the growth and productivity of plants. Waterlogging stress condition, the plant will try to survive by adapting morphology, anatomy, physiology, and biochemistry. One tobacco plant responses to waterlogging stress are adventitious root formation and closing of stomata. The purpose of this study was to evaluate the response of some varieties of tobacco plants (varieties Srumpung, Dixie Bright and Somporis) to waterlogging stress. The method used is the provision of treatment of stress puddle with a percentage of 100%, 150%, 175%, and 200% in the third test varieties. The observation form adventitious roots number and the number of stomata open and close.

Adventitious roots, *Nicotiana tabacum*, stomata, waterlogging stress

Diversity of Ecosystem

CO-01

Refining the suitability modeling of sea cucumber (*Holothuria scabra*) by using a fully raster-based data

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The research was aimed at refining the suitability modeling of sea cucumber (*Holothuria scabra*) by using a fully

raster-based data in the waters of Kiowa Bay, Kahyapu Village, Sub-District of Enggano, Bengkulu, Indonesia. Using a Geographical Information System, all parameters affecting the suitability of sea cucumber were considered. The available data was converted to raster format to improve compatibility and ease the analysis. The relevant data are all related to sea water such as acidity, depth, current velocity, temperature, salinity, brightness, dissolved oxygen, condition of the sea floor, and coastal protection of the area. These nine parameters were surveyed at 51 stations in the field. Each parameter then was digitized and interpolated to create a continuous raster data set by a Kriging interpolation technique. Correlation analysis was then followed to check the correlation among the parameters. Parameters with a correlation coefficient > 0.75 led to a decision which parameter to be excluded from further analysis since it can be derived from the remaining parameter set. A Principal Component Analysis was then applied to gain the weight of each component. Furthermore, the plot scree technique was employed to choose which principal components are relevant for insertion into the formula of suitability. The final result is then compared to the map of suitability resulting from the analysis performed on vector-based data as reference data set. The research results show that: (i) Parameter of sea brightness can be excluded for further analysis as to their coefficient of correlation with sea salinity reaches > 0.75, while sea salinity is considered the more important parameter to work with; (ii) The final formula for the suitability of sea cucumber is formulated as Suitability = 0.6937 * PC_1 + 0.2544 * PC_2 + 0.0430 * PC_3 + 0.0089 * PC_4; 3) The suitability Map of sea cucumber created from the analysis using fully raster-based data has less uncertainty compared to the map created using vector-based data.

Fully raster-based, GIS, sea cucumber, suitability modeling

CO-02

Breeding behavior of different raptor species in Human Modified Landscape

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Raptors are considered biologically important, environmentally sensitive and indicators of the health of the ecosystem. The breeding period is a critical phase for raptors, that at present are categorized as rare and threatened species. Nest site selection can have important nesting success consequences in raptors. In relation to this, the use of human-modified landscape by raptors has been undertaken to assess the breeding behavior among raptors in Panaruban and Telaga Warna landscape, West Java Indonesia. The aim of the study is to analyze the nest site, nesting period and placement nest by raptors in the human-modified landscape in Panaruban and Telaga Warna. The methods used in the study are the qualitative method by using descriptive analysis and the quantitative one by applying GIS. The study used four circular buffer at distances of 250, 500, 750 and 1000 m around each nest-tree to analyze the relationship among raptor nest occurrence. The four species of raptors are Javan hawk eagle (Spizaetus bartelsi), changeable hawk eagle (*Spizaetus cirrhatus*), crested serpent eagle (*Spilornis cheela*) and Indian black eagle (Ictinaetus malayensis) tend to select a nesting site in different place. Characteristic differences in nest site selection may be due to landscape structure at different scales around the nest. The raptors had a different time for the breading season in the same landscape. The differences of place and time become a strategy to decrease of competition among raptors in human-modified landscape.

Human-modified landscape, nesting site, nesting period, raptor

CO-03

Palm oil water table level management on tropical peatland: How is it altering soil CO_2 respiration?

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Palm oil plantation is a strong driver of economic in Indonesia, however, there are large environment impacts issued. The rapid expansion of peatland land cover changes into large Palm oil plantation in Indonesia raises environmental concerns about deforestation and forest degradation, loss of biodiversity, and largely to greenhouse gas emissions (GHG) impacted from the deforestation. However, less attention was given toward the possible continuous CO_2 emissions affected by the hydrological management in the field. Our previous study on monitoring CO_2 respirations from Palm oil on peatland indicated the large level of peat CO_2 respirations on their daily practices of 60-80cm water table levels which ranged from 85 to 165 ton ha^{-1} $year^{-1}$. This study aims to examine the effects of decreasing water table level to soil CO_2 respiration level on Palm oil plantation on peatland. Water table levels within Palm oil drainage ditches were set up to 60, 50, 40, 30, and 20cm from peat surface by establishing water flow dams that maintaining the maximum water level on each plot. Soil CO_2 respiration, as well as water level fluctuation, were monitored weekly along 8 months involving dry and rainy season of the year 2016. Results show that water level significantly dictating peat CO_2 respirations. The increasing water level from 60 to 20cm under soil surface could reduce about 75% CO_2 fluxes. Other water levels

treatment resulted in the respiration's level in between those two levels. The water levels in peatland affected carbon dynamics through addition/reduction soil aeration which could alter the dynamics of oxygen status for microorganism activities. The water level set up could largely lowered CO_2 emission on peatland yet further investigation should be made on the impacts of the increasing water level on Palm oil growth and production both newly grown and ready stocks Palm oil and on other soil biophysical conditions.

CO_2, palm oil plantation, respiration, tropical peatland, water table levels

CO-04

Development strategy of Community Forest in Nusapati Village, West Kalimantan Province, Indonesia

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The exploitation of forest would cause a negative effect, like degradation and deforestation. Based on this condition, it is necessary to make reforestation. One effort in improving productivity and regaining the function of forest and land which have been degraded is national movement on forest and land rehabilitation (Gerhan). One of these is developing community forest. Research on development strategy on community forest on Nusapati village was conducted, using survey methods. The aim of this research was to arrange a strategy of community forest development which could give both economy and ecology benefits. This research used financial analysis, and SWOT analysis. The result of the analyses indicated that the strategy could be best applied was strength-threat (ST) by increasing the role of farmer organization, conducting agroforestry pattern development to increase land productivity, applying proper regulating area for planting, and assuring the exploitation of the private land.

Agroforestry, community forest, development strategy, ecology, economy

CO-05

Phenology of *Sonneratia alba* in Sembilang National Park, South Sumatra, Indonesia

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Mangrove ecosystem is the largest habitat Sembilang National Park (SNP) Banyuasin, South Sumatra, Indonesia and is the largest mangrove area in Western Indonesia. Mangrove conditions in this region under pressure and degradation from year to year. The main cause of mangrove destruction in the SNP is the cultivation or manufacture of ponds, especially in Banyuasin Peninsula. Research on phenology study Mangrove Restoration Area Sembilang National Park, in particular, is to know the phenology of Sonneratia alba. Observation survey conducted in August 2016-January 2017.This research was conducted in the arboretum area using tagging method. First, set up a label to mark the sample was then affixed to the trunk or branches and given a serial number on each sample of mangrove trunks. The phenology of *Sonneratia alba* in SNP is three months.

Mangrove, phenology, SNP, *Sonneratia alba*

CO-06

Bird diversity on remaining tropical forest patches in West Bandung District, West Java, Indonesia

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The diversity of birds can be conducted Taxocene and Guild. Taxocene is a grouping of birds based on the level of taxa from any species of birds, while the Guild is a species of bird that are connected in the ways the same food resources. Similarity bird character is emphasized in morphology is Taxocene, while Guild emphasized in the functional position of resource utilization. The purpose of this study was to determine the relationship of the diversity of birds in the forest land use and non-forests. This research was conducted from September to November 2013, and February to September 2014 in the remaining tropical forest outside of protected areas of West Bandung District, West Java, Indonesia. The method used is the point count and opportunistic observation. The diversity of birds in the forest remaining Gowek blocks (3.01), Curug Japarana (2.71) and Curug walet (2.77), while the non-forest land uses have lower diversity index. In general, bird guild group showed that the cluster hierarchy bird communities in more complex research sites on the remaining forest patches are more extensive than the more narrow, whereas hierarchical cluster guild in land use around the forest is more complex than in talun garden shrubs and fields. In every land use more guild nectarivorous and frugivorous than carnivorous and granivorous.

Bird diversity, Forest, Guild, Habitat, Resource

CO-07

The effect of single and dual infections of *Citrus tristeza* virus and enation citrus vein virus on two citrus species

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Viral diseases caused by CTV and CVEV induce dwarfing on plants and severe damage and yield loss to the citrus crop. The virus transmitted through infected plant material and by the same vectors, aphid. Problems cited in the field are complex of symptoms of the two diseases that are difficult to distinguish. This study aimed to determine the effect of single and dual infections of CTV and CVEV on purut (*Citrus hystrix*) and lime (*Citrus aurantifolia*). The research was conducted at the screen house and laboratory of Balitjestro, Batu and University of Brawijaya in October 2014 to April 2015. CTV and CVEV isolates used were from Balitjestro's collection. Treatments conducted were single inoculation for CTV and CVEV, three combinations of CTV and CVEV dual inoculations. Each treatment was carried out both on purut and lime. A total of 6 treatments and five replications were arranged in a Randomized Complete Design; each replication comprised if two plants. The results showed that the symptoms on purut appeared faster and more severe than those on lime. Both single and dual infections of CTV and CVEV affected the incubation period of CTV on vein clearing symptoms, cupping and vein enation. A symptom of vein clearing was found the fastest at dual infections treatment of CTV followed by CVEV. Cupping symptom was seen the fastest in the treatment of dual infections of CVEV followed by CTV, and symptom of vein enation was found only in a single infection of CVEV. The highest disease intensity and infection of vein clearing and cupping were observed on dual infections of CVEV followed by CTV while the highest infections of vein clearing and stem pitting were obtained from simultaneous dual infection of CTV and CVEV. The results of serologic testing by DAS ELISA on three observations (44 days after inoculation (dai), 86 dai, and 142 dai) showed that a dual infection showed greater absorbance value than single infection treatment did. Plants growths on dual infections treatment were slower than those on single infection.

Citrus histrix, *Citrus aurantifolia*, Citrus Tristeza Virus, Citrus Vein Enation Virus

CO-08

The effect of La Nina on fruits production of three citrus varieties in highland

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In tropical climates, citrus flowering is controlled primarily by the availability of water (wet-dry). Therefore, the phenomenon of La Nina in 2016 which led to changes in rainfall will definitely affect flowering and fruits production in 2017. The aim of this research was to study the effect of La Nina in 2016 on the production of three varieties of citrus in 2017. This activity was conducted from January 2016 to February 2017 in the experimental field of Kliran, Balitjestro, located on 950 meters above sea level. Plants used in this study were three varieties of mandarin (Citrus reticulata) namely Keprok Batu 55, Keprok Madura, and Keprok Terigas planted in dry land Inceptisol in January 2014. The results showed that wet months that occurred during the year 2016 (La Nina) inhibited flowering of Keprok Batu 55 and Keprok Madura varieties which causing the plants failed to produce fruits in 2017. On the other hand, Terigas variety could bloom several times a year and the number of fruit/tree was high. This phenomenon showed that Terigas is more resilient to La Nina than the other varieties observed.

Keprok Batu 55, Keprok Madura, Keprok Terigas, La Nina, Production

CO-09

Adding potassium and magnesium elements to enhance sweetness degree of mandarin cv. Batu 55 (*Citrus reticulata*)

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The objective of this research was to increase the degree of sweetness of mandarin cv. Batu 55 (*Citrus reticulata* Blanco) by adding potassium and magnesium elements based on the ratio of K/Mg from different sources of magnesium through fertilization. The study was conducted in September 2012 until September 2013 at farmer's orchard in Selorejo village of Dau district, Malang District, East Java. Experiments were arranged in a Randomized Block Design (RBD) factorial repeated 3 times with the first factor was the source of Magnesium (M) consisting of 2 types, dolomite (M1) and kieserite (M2); and the second factor was the ratio of K/Mg (K) consisting of 5 treatments, K1 (K/Mg 1:0), K2 (K/Mg 1:1), K3 (K/Mg 2:1), K4 (K/Mg 1:1.5), K5 (K/Mg 1: 2) and farmer treatment as control.

Hence, there were 11 treatments. The results indicated that adding magnesium element from the ratio of K/Mg of 1: 2 and 1: 1, potentially improved the degree of sweetness of mandarin cv. Batu 55. Magnesium generated from kieserite fertilizer was more effective in increasing the degree of sweetness without increasing total acid.

Magnesium, mandarin cv. Batu 55, potassium, sweetness degrees

CO-10

Modeling of space-time seasonal Generalized Autoregressive (SGSTAR) (Case Study: Rice Production)

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Generalized Space Time Autoregressive (GSTAR) model is more flexible as a generalization of Space Time Autoregressive (STAR) model which be able to express the linear relationship of time and location. The purpose of this study is to construct GSTAR model for forecasting the rice plant production in the three districts of Central Java. The data which used to construct the model is quarterly data of rice plant production in central java. According to the empirical study result using GSTAR model with uniform weight, binary weight, inverse distance wight, and normalized cross correlation weight, GSTAR (31)-I(1)3 with uniform weight is the optimal model. The model shows that every location is influenced by the location itself.

GSTAR, production, Space Time, Rice

Ethnobiology & Socioeconomis

DO-01

Local Ecological Knowledge of Sukasari People, Sumedang District, West Java, Indonesia on tobacco (*Nicotiana tabacum*)

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Tobacco (*Nicotiana tabacum* L) is an original crop of Cuba, Latin America, discovered by Christoper Clumber in 1492 and introduced to Europe. Moreover, it was distributed to Asia countries, including Indonesia. Local people of Sukari village, Sukasari sub-district, Sumedang district, West Java, Indonesia has cultivated the tobacco for a long time, since the Dutch colonial, based on local ecological knowledge transmitted by intergeneration. As a result, local people of Sukasari village have rich knowledge on the tobacco. Nowadays, however, since the agricultural lands as well as tobacco farmers have decreased, the local ecological knowledge of the Sukasari people have eroded. This paper elucidates the local ecological knowledge of Sukasari people, Sumedang District of West Java on landraces, cultivation, process, and local trading of tobacco. The method used in this study is by qualitative with descriptive analysis which the ethnoecological approach was applied. The result of the study shows that the Sukasari people have predominantly cultivated four landraces of the tobacco. The cultivation of tobacco include the selecting of seeds, nursery, preparing land, planting, look after, harvesting and processing of tobacco products require diligent effort and high skill. Today, the cultivation of tobacco has many constraints, such as climate anomalies, decrease of agricultural lands, and the lack of finance; consequently, the tobacco farmers have less enthusiasm to cultivate the tobacco. Indeed, the local ecological knowledge of the Sukasari people has eroded and may extinct in the near future

Local ecological knowledge, Sumedang, tobacco

DO-02

Cost-benefit analysis of tangerine cv madu rehabilitation due to volcanic ash: Case study of Mount Sinabung Eruption, North Sumatra, Indonesia

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Indonesia's tangerine/mandarin plants which have diverse varieties possess the adaptability from lowland to highlands that have a tropical climate. Some area that supports tangerine/mandarin orange center (Karo, Mandailing Natal and Dairi district, also Malang, Batu, Bali) were located in the volcano path which is prone to eruption (along with the ring of fire: Sumatra-Jawa-Bali-Nusa Tenggara-Sulawesi-Banda-Maluku-Papua). The eruption of Mount Sinabung in 2013 and 2014 has caused damage to tangerine cv Madu crops which estimated to reach Rp476.109.849.600,-with an area of 7.202,89 ha and predicted to be one of the factors that cause the decline of North Sumatra contribution on tangerine production. Therefore this paper try: (i) to analyze the financial feasibility of tangerine cv Madu rehabilitation from volcanic ash, which includes zone 1 (radius of 7-10 km) and zone 2 (radius of 5-6.9 km, (ii)

considering the option of opening new land. The results showed that the B/C ratio for the immediate rehabilitation is 1.45 so it is feasible to be implemented and can reduce the damage and losses suffered by farmers. In the other side, the opening of new land still takes approximately three years to produce, with B/C ratio within that period is still in the range of 0.66.

Cost benefit analysis, Tangerine cv Madu rehabilitation, volcanic ash

DO-03

The threat facing local wisdom in preventing the declining biodiversity of fish at Rangau river, Riau Province, Indonesia

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This descriptive research was conducted at Rantau Kopar village, Rokan Hilir District, Riau Province, Indonesia from January to February 2017. It is aimed the threats facing the local wisdom in preventing the decreasing of fish biodiversity at Rangau river. The employed sampling technique was snowball technic sampling which involved 30 respondents. The primary data were obtained using observation and interview; the secondary data (documents). Data consist of community composition, livelihood, community participation in preserving the local wisdom, the synergy between the local wisdom and the policies of the local administration. The data were computed in percentage and were analyzed descriptively. The findings (1998) demonstrated that the local wisdom was compiled by the local community whose livelihood as fishermen. Conversely, In 2017, the local people did not comply with both sanction and the local customary law, there had been careless exploitation of the water across the watershed to be oil palm plantation area and the increasing number of palm oil farmers. This study concludes that the main threat facing the local wisdom is that the policies of local administration are not synergic with the local wisdom as stipulated in the regulations and conservation of the area across the watershed of Rangau

Fish biodiversity, Indonesia, local wisdom, Rangau River

DO-04

Ethnobotanical classification and nomenclature of the Marori, Papua, Indonesia: A preliminary report

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The Marori is a small indigenous community inhabits Wasur villages in the Wasur National Park, Merauke, Papua, Indonesia. This indigenous community still depends directly on forest products in their traditional territories. A study of ethnobotany was conducted on this tribe to document ethno-taxonomy aspects of their botanical knowledge refers to principles of ethnobiological classification proposed by Berlin. Field surveys were conducted with key informants to record all the species that are recognized or not recognized. For recognized species, the species name in Marori language, the meaning of the name, and cultural significance are noted. Identification of plant species is assisted by taxonomist of the Wasur National Park. All species that found in the field trips were collected for the further identification and validation of the scientific names. A total of 194 generic names in the Marori language were documented and a preliminary analysis of the relationship between their ethno-taxonomy with the scientific taxonomy based on identified species is explained.

Biocultural diversity, ethnobotany, ethno-taxonomy, Marori, Wasur

DP-01

Backpropagation Neural Network (BPNN) and Genetic Algorithm (GA) for forecasting robusta coffee prices

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Modeling time series is often associated with the process forecasts a certain characteristic in the next period. One of the method forecasts that developed nowadays is using artificial neural network or more popularly known as a neural network. Use neural network in forecasts time series can be a good solution, but the problem is network architecture and the training method in the right direction. One of the choices that might be using the genetic algorithm. Genetic algorithm is a search algorithm stochastic resonance based on how it works by the mechanisms of natural selection and genetic variation that aims to find a solution to a problem. This algorithm can be used as teaching methods in train models are sent back propagation neural network. The application genetic algorithm and neural network for divination time series aim to get the weight optimum. From the training and testing on

the data robusta prices obtained by the RMSE training 1.1057 and RMSE testing 2.442 The weight or parameters that produced has reached an optimum level in second-generation 1000 with the best fitness 0.022539. BPNN-GA is good to be used to give a prediction that is quite accurate information that is shown by the close target with the output.

Algorithm, BPNN, coffee, genetic, robusta

DP-02

Local people's perception of the existence and the potency of mangrove forest in Kuala Langsa, Aceh, Indonesia

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This research aimed to analyze the local people's perception of the existence and the potency of mangrove forests in Kuala Langsa Village. This was a qualitative descriptive research done on November 2016 until February 2017 in Kuala Langsa Village, Sub-District of West Langsa, Langsa City, Aceh, Indonesia. The data was collected by the questionnaires and in-depth interviews towards the villagers as respondents, that most of their daily livelihoods depend on mangrove forest ecosystems in Kuala Langsa, and the local government. Respondents were selected by purposive random sampling based on Slovin's method. Furthermore, the obtained data were analyzed descriptively to determine: mean, standard deviation along with minimum and maximum value of data, and regression analysis was used to determine the influence of dependent and independent variables. The analysis result showed that the people perception of the existence and the potency of mangrove forests was very good. The factor of age, education background and/or job did not significantly affect people's perception. They were already aware the importance to protect mangrove forests because of its ecosystem function as land protection and their dependency on the natural resources potential of mangrove ecosystems, such as oysters, clams, crabs, and shrimps for market purpose or private consumption.

Kuala Langsa, mangrove, natural resources, perception, potency

Bioscience

EO-01

The degree of parasitemia in various blood of animal test infected by *Plasmodium falciparum* in vitro

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Malaria is a disease caused by *Plasmodium* sp. and transmitted by *Anopheles* sp. female. Infection of *Plasmodium* sp. starts when the sporozoit from the salivary gland of mosquitos enter the human body by biting of an infected mosquito. The red blood cell infecting of *Plasmodium* sp. can be used to detect the degree of parasitemia. *P. falciparum* is the most pathogenic human parasite that causes an acute infection. *P. falciparum* has similar morphology with *P. knowlesi* that infects long-tailed macaque and zoonotic. Based on the similarity of morphology, the research conducted by the formulating problem are how the degree of parasitemia on various blood animal tested, is the *P. falciparum* potential as zoonotic, and how the development of *P. falciparum* in fected blood test in vitro. The purpose of this research is to determine the degree of parasitemia on the various blood of animals tested, potential zoonotic of *P. falciparum*, and development of *P. falciparum* in the red blood cell in vitro test. Research carried out by experimentally, with the random block design. The red blood cell used are human blood as a control, long-tailed macaque, cow, and mice treatment were repeated seven times. Parameters observed are the number of red blood cell infect by *P. falciparum*, zoonotic potential of *P. falciparum*, and the development of *P. falciparum* inside the red blood cell. The degree of parasitemia was done by counting the number of erythrocytes infected with *P. falciparum* per 1000 erythrocytes in a thin blood smear. The result showed that the degree of parasitemia in human blood is higher than the red blood cell of animal tested *P. falciparum* is not a potential cause zoonoses, subsequently, *P. falciparum* is developing normally (stage tropozoit, schizonts, merozoites, and tropozoid) during 24 hours occurs in cultured human blood.

In vitro, malaria, parasitemia, zoonoses

EO-02

Modeling chili price Indonesia using GSTAR SUR

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Increased demand curly red chili makes the selling price of basic commodities is raised in marketing. In this study, selected four research sites; Jakarta, Bandung, Semarang and Yogyakarta, the conclusion that GSTAR best to price data of red pepper curly fresh at these locations is GSTAR (21) I (1) that uses weights the inverse for fulfilling the assumption of white noise and multivariate normal with an average lowest value of RMSE and MAPE. GSTAR best to explain that the price data of red pepper curly fresh in Jakarta, Bandung and Semarang influence each other, but in the area of Yogyakarta, the price of red pepper curly fresh only influenced by previous times and not affected by the prices in other cities,

Chili, GSTAR, Spatial

EO-03

Differentiation of tropical eel (*Anguilla bicolor*) gonads based on body length

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The objective of the present study was to provide reproductive biological information on the gonadal development of the short-finned eel, *Anguilla bicolor* Mclelland based on body length, inhabiting the coastal waters of southern coastal of Central Java from September 2015 until December 2016. The gonads from 282 specimens were subjected to histological analysis and specimen were grouping based on body length. The result showed that gonads differentiate into four groups based on body length i.e., not differentiate in body length 9-28 cm, intersex gonads in body length 20-40.5 cm, female gonads in body length 27-47.8 cm and finally male with body length 28.5-81 cm. Based on the result can be concluded that gonads differentiated of tropical eel based on the body length, this information very important to develop for further research.

Body length, differentiation, gonads, tropical eel

EO-04

In vitro callus induction of *Vanda* sp. leaf explants that stimulated by 2.4-D

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Abstract The addition of growth regulators is one of the critical success factors in vitro cultures. Plant growth regulators 2.4-D in media can stimulate cell division and enlargement of the explants and promotes the formation and growth of callus. The purpose of this study was to determine the time of the formation of callus from leaf explants of *Vanda* sp. and to determine the best concentration of 2.4-D in inducing growth of callus from leaf explants of *Vanda* sp. This research was conducted an experiment with completely randomized design (CRD), which consists of six treatments concentration of 2,4-D e.i: 0 ppm; 1 ppm; 1.5 ppm; 2 ppm; 2.5 ppm; and 3 ppm. All the treatments were repeated three times. The parameters observed were: percentage of callus formation and form of callus from *Vanda* sp leaf explants. Data were analyzed by using analysis of variance (ANOVA). If there is a significant effect, continued by LSD test. The results showed that 2.4-D treatment gives significant effect ($P < 0.05$) on time to grow callus and its percentage. Application of 2 ppm 2.4-D was the best concentration for stimulating callus growth (14.3 days after planting) and percentage callus formation (83.3%). Most of the callus type was proliferative callus (36.11%) and senescence callus (11.11%). Based on the result can be concluded that 2.4-D growth regulators act as an important component for callus induction of *Vanda* sp.

Callus, leaf explant, inductions, 2,4-D

EO-05

The effect of dilution rate and phosphate concentration in culture medium using tapioca waste on the growth microalgae *Navicula* sp.

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Tapioca liquid waste can be used as a medium for microalgae culture because they contain some nutrients that support microalgae's life, one of those nutrients is phosphate that can affects on cell division, carbohydrate preparation process and fat formation. Tapioca liquid waste is still very concentrated, so the waste has to be diluted first to increase light intensity that comes into the microalgae growth medium. The aim of this research was to determine an effect of interaction between the degree of dilution and concentration of phosphate into the density of *Navicula* sp. that being cultured in tapioca liquid waste medium. This research used the experimental method with Completely Randomized Design with factorial design. The first factor was the degree of dilution tapioca liquid waste which were 0%, 10%, 20% and 30%; the second factor was the concentration of phosphate which was 0 ppm, 10 ppm, 20

ppm and 30 ppm. Results of variance test indicated that the interaction between the degree of phosphate dilution and concentration gave effect in increasing the density of *Navicula* sp. Duncan test results indicated that the best treatment that produces maximum density of *Navicula* sp. for the medium was with 20% dilution rate without phosphate addition.

Dilution, tapioca liquid waste, *Navicula*, phosphate

EO-06

Isolation of IgY anti-idiotype HPV 16 L2 from egg yolk for HPV vaccine

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A potential strategy for the production of safe protective vaccines for HPV infection is to utilize anti-ids. The present study was about the isolation of specific IgY for anti-idiotype HPV 16 L2 from egg yolk as an immunogen for HPV vaccine. Antibody anti-idiotype was derived from egg yolk, produced by chicken that had been immunized by HPV 16 L2 antibody. Then a diagnostic kit was used to purify the immunized chicken egg yolk. The next step was to electrophoresis them by SDS-PAGE method to determine the molecular weight of IgY. The amount of IgY protein concentration was determined by fluorometer method; and to confirm the existence of specific IgY, the ELISA method was used. Results of this study: IgY was detected by SDS-PAGE; it wast revealed that the IgY preparation dissociated into three major protein bands, with molecular weights of 180; 65; and 25 kD respectively. The IgY and IgY-specific concentration in egg yolk increased during the immunization period until week-8. After week-8 the levels decreased gradually. Samples derived from immunized chicken showed significantly higher concentrations of IgY and IgY-specific compared to control samples ($p<0.05$). Conclusions, this study showed that: chicken IgY could be a practical strategy in large-scale production of specific antibody anti-idiotype HPV 16 L2 for HPV Vaccine.

Anti-idiotype, egg yolk, HPV 16 L2, isolation

EO-07

Performance of Rabbit Skin Tissue (*Oryctolagus cuniculus*) after Supplementation of *Aloe vera* and *Spirulina fusiformis*

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Research on performance of rabbit skin tissue (*Oryctolagus cuniculus* L.) after supplementation of *Aloe vera* L. and *Spirulina fusiformis* Vor. has been done. This study was carried out to find the effective formulation based supplement *A. vera* and *S. fusiformis* as a natural supplement that can provide the best performance of rabbit skin tissue. The method used in this research was single Complete Random Design (CRD)against 16 weeks of 28 male rabbit New Zealand White strains. Treatment phase were divided into seven with four repetitions, P0 (negative control), P1(positive control, vitamin C 19 mg/kg bw), P2 (*A. vera* 74 mg/kg bw), P3 (*S. fusiformis* 296 mg/kg bw), P4 (*A. vera*: *S. fusiformis*, 74: 148 mg/kg bw), P5 (*A. vera*: *S. fusiformis*, 74: 296 mg/kg bw), and P6 (*A. vera*: *S. fusiformis*, 74: 593 mg/kg bw). Parameters observed were production aspect (hair texture, slaughter weight, wide skin, and skin weight percentage) and histological aspect (thickness of skin tissue and the amount of hair follicle). All of the data was analyzed using ANOVA test ($\alpha=0.05$) and Duncan test. The result showed that giving of supplement based from the formulation *A. vera* 74 mg/kg bw and *S. fusiformis* 296 mg/kg bw effective in giving the best performance of rabbit skin tissue

Aloe vera, performance skin tissue, rabbit, rabbit, *Spirulina fusiformis*

EO-08

Analysis of estradiol and progesterone hormone levels against various cell culture in TCM-199 medium for cattle in vitro

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This research was aimed to obtained database of the hormones estradiol and progesterone levels in various cell cultures. Culture cells used are cells fallopian tubes, ampulla, isthmus and follicle cells, whereas the culture period used were 0, 2 and 4 days. Analysis of the hormones estradiol and progesterone levels in various cell culture used ELISA method. Data results obtained are the estradiol hormone levels in various cell cultures and periods of

different cultures in TCM-199 medium ie cell treatment Fallopian tubes in culture period 0, 2 and 4 days (9.07; 13.14; 9.00 pg/ml), cell culture period ampulla at 0, 2 and 4 days (9.00; 9.29; 14.39 pg/ml), cell isthmus (9.00; 12.08; 9.00 pg/ml) whereas follicular cells in culture period 0, 2 and 4 days (415.04; 476.67; 376.93 pg/ml). Progesterone levels obtained in the treatment of Fallopian tube cells in culture period 0. 2 and 4 days (24.107; 24.644; 24.474 ng/ml), cell culture period ampulla at 0, 2 and 4 days (24.187; 23.753; 24.254 ng/ml), cell isthmus (24.071; 24.083; 24.034 ng/ml) whereas follicular cells in culture period 0, 2 and 4 days (26.671; 27.610; 24.034 ng/ml).

Estradiol, hormones, progesterone, Cell Culture and TCM-199 Medium

EO-09

Physiological responses of some local varieties of cowpea in Maluku Barat Daya to drought stress

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The aim of this study was to analyze the physiological responses of some cowpea local MBD varieties to drought stress. The physiological responses were analyzed by measuring plant height, number of leaves, relative water content (RWC), chlorophyll a content, chlorophyll b content, and total chlorophyll content using ANOVA test and were continued with Duncan test at 5% significance level. Results of this research showed that the varieties and drought stress in the form of interval length of water provision to give effect to all variables except plant height. Physiological responses show that at 10 days watering of period, the crimson varieties gives the highest plant height (33.85 cm), the brown varieties gives the highest number of leaves (30 pieces), the dark brown varieties have the highest RWC (88.675%), and the highest content of chlorophyll a (0.5088 mg/L), chlorophyll b (1.595 mg/L), and total chlorophyll (1.5095 mg/L) found in white varieties. The supply of water 10 days is the optimum time of drought stress in cowpea. Further research will be needed on the response of the other variables for screening drought tolerant varieties for the development of cowpea plant breeding and germplasm conservation.

Cowpea, drought stress, physiological responses

EP-01

Optimize the genetic yield potential of soybean in Indonesia by exploring the Genotype × Environment Interaction (GEI) Patterns

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Indonesia's soybean breeding program has been actively involved in improving the genetic yield potential to meet the needs of farmers in different parts of the country. This study was conducted in eight soybeans (*Glycine max* (L.) Merr.) production centers in Indonesia, to identify high yielding and stable lines, the ideal testing environment and to determine the presence of soybean production mega-environments in the country. The results indicated that the yield performance of soybean was highly influenced by GEI effects. Based on the GGE visual assessment, Indonesia can be divided into at least three putative mega-environments for soybean production. The genotype of G8 and G2 were the best yielding genotype in the most discriminating environment but adapted to specific environment, thus it is highly recommended for release for specific locations. E6 and E8 are the most discriminating sites and are therefore recommended as primary testing centers for new soybean genotypes.

Environment, GEI, genotype, *Glycine max*, yield potential

EP-02

Immunomodulatory effects of probiotics bacteria *Lactobacillus acidophilus* and *Streptococcus thermophilus* as a fermenter in soyghurt

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Probiotics commonly are produced from Lactic Acid Bacteria (LAB). *Lactobacillus acidophilus* and *Streptococcus thermophilus* are known can grow well in soy milk media. Probiotics conferred many benefits, the one is as a immunomodulator. Many studies have shown that probiotics can stimulate the immune system, such enhanced specific or non-specific immune responses, such as increasing the activity of macrophage phagocytosis and antibody titers. This study aimed to examine the effects of immunomodulatory *L. acidophillus* and *S. thermophillus* as bacteria fermenter in soyghurt. Twenty-four of mice were divided in four groups: control negative, mice that treated the soyghurt *L. acidophillus*, mice that treated the soyghurt *S. thermophillus*, and mice that treated the combination soyghurt. Mice were given the soyghurt in 10 days and

induced *E. coli* on days 9. The mice immune response was measured by observing the activity of phagocytosis and antibody titer. The study did not show the activity of phagocytosis. The result of the study occurred the increase of monocyte numbers in peritoneum liquid. It indicated the enhancement of immune response in mice. There was a significant difference between control group and treated group ($p \leq 0.05$) but no significant difference ($p \geq 0.05$) among the treated groups. There are significant differences in antibody titres by treating soyghurt *L. acidophilus* ($p = 0.028$) and soyghurt combination ($p = 0.029$) compared to the control group. The mice group treated S. thermophilus yield an increase in antibody titer but not significant ($p \geq 0.05$) compared with the control group.

Macrophage phagocytosis activity, *Lactobacillus acidophilus*, soyghurt, *Streptococcus thermophilus*, titer antibody

EP-03

Addition of Chromium (Cr+3) in diets containing the fermented yellow corn meal for Jelawat, *Leptobarbus hoevenii*

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This experiment aimed to find the optimal level of Cr+3 in the diets contained fermented yellow corn meal to increase carbohydrate metabolism and growth on jelawat (*Leptobarbus hoevenii* Blkr.). The triplicate fully randomized experiment had five levels of Cr+3, and they were A0 (0.52), A1 (1.55), A2 (3.03), A3 (4.52) and A4 (6.04) mg kg^{-1} in the diet. The source of Cr+3 was CrCl3 6(H2O) fermented by Saccharomyces cerevisiae. The results showed Cr^{+3} in diets could the activated insulin and regulated the blood glucose. The Cr+3 1,55 mg kg-1 in diet could increase the blood glucose fast, five hours post prandial. The liver and tissues glycogen, protein and lipid body, protein and lipid retentions, daily growth rate, and feed efficiency were significant ($P<0.05$). The Cr+3 1.55 mg kg-1 in the diet was the highest one for liver glycogen, protein and lipid body, protein and lipid retention, daily growth rate, and feed efficiency, but the lipid body, protein and lipid retention, and daily growth rate were not significant ($P>0.05$) with Cr+3 3.11 mg kg-1. The Cr+3 1.55 mg kg^{-1} in the diet contained 30% fermented yellow corn meal and 42.79% total carbohydrate was the best one for growth and feed efficiency on jelawat.

Chromium, fermentation, *Leptobarbus hoevenii*, yellow corn

EP-04

Effectiveness of Huanglongbing Vector (*Diaphorina citri* Kuw.) control citrus grower group based in District of Sambas, West Kalimantan, Indonesia

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The purpose of this study was to determine the effectiveness of Huanglongbing vector (*Diaphorina citri* Kuw.) control recommendation Citrus Grower Group based. Studies have been carried out in 2010 in Tebas, District of Sambas, West Kalimantan, Indonesia. The tangerine grove that been used are, one grower's orchard as a demonstration plot in a particular citrus grower group (orchard I); five other citrus orchards with different ownership at the same citrus grower Group (orchard II), as well as five other citrus orchard with different ownership which each of them spreads over five different citrus grower groups outside the farm demonstration plots (orchard III). The recommendation technology for controlling huanglongbing vector which applied in this experiment included bark painting by systemic insecticide of imidacloprid for two each 1.5-month and spray using contact insecticide with dimethoate to the plant crown which application time been alternated after bark painting application. The effectiveness of technology implementation is measured by a decrease psyllid intervals every two weeks during the flushing to the 14th week after the first treatment. The results showed if the recommended treatment technology were absolutely proven to reduce huanglongbing vector population in significant, namely in the orchard I, II, and III respectively at 95.3%, 84.7%, and 72% for stage imago; 97.3 %, 80%, and 100% for stage nymphs; and 98.5%, 100% and 100% for the egg stage.

Citrus, Citrus Grower Groups, control, *Diaphorina citri* Kuw, Huanglongbing

EP-05

The accumulation of mercury in plant *Davalia denticulata* at Bone River, Gorontalo Province, Indonesia

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Davalia denticulata is one species of ferns. This plant has a high adaptability so that they can grow well in the area along the river even in the gold mining region. This study aims to determine the accumulation of mercury (Hg) in plants *D. denticulata* in a Bone river of Gorontalo province, Indonesia. This research is quantitative descriptive survey method. Data collection was performed by using purposive random sampling on four point location, namely the one in the Upper River Station located in the village of Tulabolo, Station 2. River Plate Bone contained in Bonadaa Village, Village Duano station 3, and 4 stations located at the mouth of the River Bone, in the village of Timbuolo. Examination of mercury in plants nails done by using Atomic Absorption Spectrophotometry (AAS). The results showed that the plant *D. denticulata* in riverbanks Bone metallic mercury can accumulate. Average mercury content found in plants *D. denticulata* successively: the roots (5.42 ppm), stem (3.38 ppm), and in leaves (2.09 ppm). Furthermore, the accumulation of mercury by these plants at the station located at the headwaters of 8.1 ppm, station 2 amounted to 13.41 ppm, station 3 by 12, 37 ppm and in the locations contained in the estuary of the Bone of 9.61 ppm.

Accumulation, *Davalia denticulata*, fern, mercury

EP-06

Leaf flavonoids and phenolic content of adaptive functional citrus in Indonesia

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This study aimed to identify and determine the concentration of the active compound of secondary metabolites, the flavonoids and phenol, from leaves of 11 accessions of functional citrus which were Monte Hondu M, Monte Hondu B, Lemo swangi, Ganesha Aceh, Purut, Mexican Lime, Sambal, Grape fruit, Tening Mandarin, Citromello, Japansche citroen, which grown in a screen-house. The research was carried out in Integrated Laboratory of ICSFRI and laboratory of CDAST Jember University in April 2015. The methods used for flavonoid and phenol identification were AlCl3 and Folin Cicalteau, respectively. The identification results showed that the content of flavonoids and phenol varied on 11 accessions. Total flavonoids were found highest on Lemo swangi about 9.362 mg QE/g dry weight, while the total phenolic content was highest in Japansche citroen about 9.883 mg GAE/g dry weight. On the other hand, both the lowest flavonoid and phenolic content were found in Purut, 2.755 mg QE/g dry weight and 5.721 mg GAE/g dry weight, respectively. There was a relationship between total flavonoids and phenolic content with genetic similarity showing that Hondu M, Sambal, and Ganesha Aceh were grouped in cluster 1, Monte Hondu, Purut and Lemo swangi were grouped in cluster 2. Lastly, Keprok Tening and JC were put in different clusters, clusters 3 and 4 accordingly.

Functional, flavonoids, genetic similarity, phenolic

EP-07

The effect of munghurt *Lactobacillus acidophilus* on blood glucose levels in alloxan-induced diabetic rats

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This study aims to determine the effect of Munghurt *Lactobacillus acidophilus* on blood glucose levels in diabetic rats induced alloxan. Munghurt is a probiotic made from green beans. Green beans contain low levels fat suitable to grow *L. acidophilus.* The laboratory experimental study using 25 male Wistar rats were divided into five groups consisting of: (i) positive control group; (ii) negative control group; (iii) glibenclamide-treated group; (iv) munghurt *L. acidophilus* treated group; and (v) a combination of glibenclamide and munghurt *L. acidophilus* treated group. Treatments were conducted for 4 weeks. Blood samplings were performed before and after treatments. The results were analyzed with Kruskall Wallis and Man Whitney tests. There were significant influences before and after treatment in the group given munghurt *L. acidophilus* ($p < 0.05$). Besides that, this study also showed that the group treated with munghurt L. acidophillus combined with glibenclamide best results at lowering blood glucose in diabetic rats ($p < 0.016$). Conclusions, this study showed that: munghurt *L. acidophilus* had the effect of the decreasing blood glucose levels, and there is a complementary mechanism between munghurt *L. acidophilus* and glibenclamide in lowering blood glucose level in alloxan-induced diabetic rats.

Diabetic rats, glucose levels, *Lactobacillus acidophillus*, Munghurt

EP-08

In vitro growth of swingle citrumelo (*Citrus paradisi* Macfaden x *Poncirus trifoliata* (L.) Raf) plantlets on several types and concentrations of carbon source

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Swinge citrumelo is one of citrus rootstocks which is tolerant to biotic and abiotic stresses. Generally, it is difficult to induce its fruit in Indonesia, so in vitro technique is suitable for conservation and seedling production. The carbon source is one of the important medium components for in vitro plant growth. This study aimed to get type and concentration of carbon source for in vitro conservation and in vitro seedling production of Swingle citrumelo. Node explants of Swingle citrumelo cultured in MS medium enriched with several types and concentrations of carbon source. Type of carbon sources used was Sucrose, Glucose-Mannitol, Glucose-Sorbitol, Lactose and Maltose at a concentration of 10, 20 and 30 $g.L^{-1}$. Fresh weight, leaf number, shoot number and shoot height of the explants observed every three-week for three months. The results showed that 20 $g.L^{-1}$ maltose or 30 $g.L^{-1}$ sucrose were the best carbon source for increasing all parameters observed but 30 $g.L^{-1}$ glucose-mannitol was the worst one. So, application of 20 $g.L^{-1}$ maltose or 30 $g.L^{-1}$ sucrose in the medium were suitable for plantlet proliferation and seedling production and 30 $g.L^{-1}$ glucose-mannitol was suitable for conservation.

Carbon source, conservation, in vitro, Swingle Citrumelo

EP-09

Managing biodiversity in a small town in developing countries: A case study of Surakarta (Solo City), Central Java, Indonesia

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Biodiversity needs more space to grow, flourish and sustainably. Conservation of biological diversity in urban areas is an exciting challenge because of their limited land and high human activity. This research is a long-term study conducted in the last 15 years since 2002, with the aim to identify sites that host the biodiversity in Surakarta, Central Java, Indonesia, and conservation issues. The results showed that the green area in Surakarta does not reach 30% as mandated by law, but some areas can be storage sites of biodiversity. Include, (i) water bodies and the surrounding area, such as riparian ecosystems and tributaries of the Bengawan Solo River, Lake Balekambang, etc., (ii). Closed specific purpose areas, such as Campus UNS Kentingan and Keraton Surakarta, (iii) the Green line and city parks, such as green belt along the Slamet Riyadi road as well as Sriwedari Park, (iv). Parks with a special purpose, such as Taman Wisata Satwa Taru Jurug (zoo), (v) The housing and settlements. In addition to the wildlife, some markets in the city have become a source of biodiversity presence, namely Pasar Satwa Depok (birds, fishes, etc.), Pasar Tanaman Hias Nongko (ornamental plants), etc. Besides, the limited land greener, low awareness of citizens in maintaining wildlife and environmental sanitation are the main problems that threaten biodiversity in the city. The residential areas have the potential to save biodiversities such as ornamental plants and pets, but sustainability is relatively low.

Biodiversity, small town, Surakarta