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# CERTIFICATE

Presented to

*Roni Koneri*  
(as Speaker)

**BIODIVERSITY AND INTEGRATED PEST MANAGEMENT :**  
Working Together for a Sustainable Future

Manado, North Sulawesi - Indonesia  
July 4 - 7, 2013

Prof. Dr. Donald A. Rumokoy, SH., MH

Rector of Sam Ratulangi University

Dr. R. Muniappan

Director IPM Innovation Lab.  
Virginia Tech

Prof. (Eme.) B. Merle Shepard

Clemson University, SC-USA



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN  
UNIVERSITAS SAM RATULANGI  
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
(F-MIPA)

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**SURAT TUGAS**

Nomor : 533/UN12.10 / LL / 2013

Dekan Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Sam Ratulangi  
mendelegasikan tugas mewakili Fakultas MIPA UNSRAT kepada :

Nama : Dr.Roni Koneri, S.Pd., M.Si  
NIP : 19690313 199803 1 001  
Pangkat/Gol. : Penata / IIIc  
Jabatan : Dosen Biologi Fakultas MIPA UNSRAT

Untuk mengikuti international Conference Biodiversity and Integrated Pest Management  
di Hotel Sintesa Peninsula Manado, tertanggal 4 s/d 5 Juli 2013

Surat tugas ini dibuat untuk dilaksanakan dengan penuh tanggung jawab.



EDWIN DE QUELJOE  
NIP. 19510612 198103 1 006

*International Conference*

# Biodiversity and Integrated Pest Management:

Working Together for a Sustainable Future

Sintesa Peninsula Hotel  
Manado, North Sulawesi - Indonesia  
July 4 - 7, 2013



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# BIODIVERSITY AND INTEGRATED PEST MANAGEMENT:

## Working Together for a Sustainable Future

4-7 July 2013  
Manado, North Sulawesi, Indonesia  
Sintesa Peninsula Hotel  
[www.oired.vt.edu/lpmcrsp/biodivipm2013](http://www.oired.vt.edu/lpmcrsp/biodivipm2013)

Hosted by Sam Ratulangi University (UNSRAT).

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**Integrated Pest Management Innovation Lab**  
[www.oired.vt.edu/lpmcrsp](http://www.oired.vt.edu/lpmcrsp)



**International Association for the Plant Protection Sciences**  
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**U. S. Agency for International Development**  
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**Sam Ratulangi University (UNSRAT)**  
[www.unsrat.ac.id](http://www.unsrat.ac.id)

**Virginia Tech**  
Virginia Tech  
[www.vt.edu](http://www.vt.edu)

**CLEMSON UNIVERSITY**  
Clemson University  
[www.clemson.edu](http://www.clemson.edu)

## At a glance **schedule**

THURSDAY, 4 JULY	FRIDAY, 5 JULY	SATURDAY, 6 JULY	SUNDAY, 7 JULY
<b>08:00–09:00</b> Registration and field trip selection open <b>LOBBY</b>	<b>08:00–09:00</b> Registration and field trip selection open <b>LOBBY</b>	<b>08:00–17:00</b> Field trips with lunch provided to: • Rurukan and Toure agricultural sites • Bunaken park and coral reef	<b>08:00–17:00</b> Field trips with lunch provided to: • Tangkoko Nature Reserve
<b>09:00–10:00</b> Conference inauguration <b>BALLROOM</b>	<b>08:30–10:00</b> Concurrent sessions 3A and 3B <b>BALLROOM AND TULIP ROOM</b>	<b>19:00–21:00</b> Barbeque <b>SINTESA PENINSULA HOTEL</b>	
<b>10:00–10:20</b> Coffee break <b>FOYER</b>	<b>10:00–10:15</b> Coffee break <b>FOYER</b>		
<b>10:20–12:00</b> Keynote addresses <b>BALLROOM</b>	<b>10:15–12:00</b> Concurrent sessions 4A and 4B <b>BALLROOM AND TULIP ROOM</b>		
<b>12:00–13:00</b> Lunch <b>GARDENIA RESTAURANT</b>	<b>12:00–13:00</b> Lunch <b>GARDENIA RESTAURANT</b>		
<b>13:15–15:00</b> Session 1 <b>BALLROOM</b>	<b>13:15–14:45</b> Concurrent sessions 5A and 5B <b>BALLROOM AND TULIP ROOM</b>		
<b>15:00–15:15</b> Break <b>FOYER</b>	<b>14:45–15:00</b> Break <b>FOYER</b>		
<b>15:15–17:00</b> Session 2 <b>BALLROOM</b>	<b>15:00–16:15</b> Session 6 <b>BALLROOM</b>		
<b>19:00–21:00</b> Dinner hosted by the Governor of North Sulawesi <b>GOVERNOR'S RESIDENCE</b>	<b>16:15–17:00</b> Video and conference wrap-up <b>BALLROOM</b>		
	<b>19:00–21:00</b> Dinner hosted by the Rector of Sam Ratulangi University <b>BALLROOM</b>		

# Welcome to Manado

## A message from **Donald A. Rumokoy, Rector of Sam Ratulangi University**

**I**t is a great pleasure for me to welcome participants from overseas and Indonesia to the International Conference on Biodiversity and Integrated Pest Management: Working Together for a Sustainable Future. This conference, jointly organized by Clemson University and Virginia Tech in the United States and Sam Ratulangi University in Indonesia, aims to bring proponents of integrated pest management and biodiversity together as partners to ensure the sustainability of food production and the conservation of biodiversity.

North Sulawesi has long been known for its rich and unique biodiversity. This province is situated on the eastern part of the Wallace Line. The Wallace Line refers to a line which runs through the middle of the Malay Archipelago between Bali and Lombok, and between Borneo and Sulawesi. Alfred Russel Wallace, the famed 19th century British naturalist, spent considerable time in this region, collecting various kinds of insects and birds throughout the island of Sulawesi. He proposed this biogeographic line that identifies the dramatic changes in fauna which have occurred in the middle of the Malay Archipelago. The islands that lie just east of the Wallace line hold a unique mix of Australian and Asian flora and fauna. 2013 represents the 100th anniversary of Dr. Wallace's death.

As rector of Sam Ratulangi University, I am very pleased that this conference will serve as a platform for researchers on biodiversity and IPM from all over the world to discuss the sustainability of food production without compromising the survival of biodiversity. In fact, biodiversity can be utilized in agroecosystems to secure crop protection which in turn improves crop production. In line

with increased interest in internationalization in Indonesia and at Sam Ratulangi University, this is a great opportunity to explore possibilities for future collaboration in research and academic programs among participants from different institutions and countries. North Sulawesi offers a tremendous potential to researchers in biodiversity and IPM. I hope you take advantage of seeing our rich natural resources during the field trips. I hope that this conference brings us a step closer to a working relationship between proponents of biodiversity and practitioners of IPM for sustainable food production. I also hope that more joint research efforts among participating institutions will be developed throughout the conference.

I would like to express my deepest thanks and appreciation to the organizing committee: from Clemson University, Merle Shepard; from Virginia Tech, Rangaswamy Muniappan, Miriam Rich and Melissa Smith; from the University of Nebraska, E. A. "Short" Heinrichs; and from Sam Ratulangi University, Dantje Sembel and Wiske Rotinsulu; as well as other organizers who have worked hard to make this conference happen.

### About **Sam Ratulangi University/ UNSRAT**

Sam Ratulangi University established in 1954, is one of the largest universities in the eastern part of Indonesia. The university was named in honor of Dr. Geringan Saul Samuel Jacob Ratulangi, renowned throughout Indonesia but hailing from Manado, as a leader in the field of education. The main campus is located on 54 hectares around the coast of Manado Bay on the Sulawesi Sea in the city of Manado.

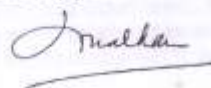
Sam Ratulangi University currently enrolls approximately 23,000 students who come from all parts of Indonesia and are taught by around 1,800 lecturers. At the undergraduate level, the university offers a wide range of study programs under eleven faculties. At the graduate level, it offers twelve master's level study programs, five doctoral programs, and a number of specializations in the field of medicine.

The university's vision is to energetically grow and expand its level of excellence, focusing on the learning process and research with a dedication to community development and related services.

#### Learn more:

[www.unsrat.ac.id](http://www.unsrat.ac.id)  
(in Indonesian)

Finally, I wish you all a fruitful and enjoyable conference.



# Welcome to **Manado**

## A note from the **conference organizers**

**T**he organizing committee for this conference welcomes you! It is particularly fitting to hold this conference in 2013, as it is the 100th anniversary of the death of Alfred Russel Wallace, who spent time studying the flora and fauna of this area and, along with Charles Darwin, provided much to enhance our understanding of natural selection and evolution.

The realization that biological diversity leads to stability in ecological systems is a founding principle of integrated pest management (IPM). Many involved in biodiversity studies attribute the loss of species richness and stability to agricultural production. IPM is an approach to try to bridge the gap between agricultural production and biodiversity preservation. As our understanding of both natural and agricultural systems expands, we will become better at developing and promoting the systems to provide food, clothing and shelter for humankind while minimizing the impact on the environment.

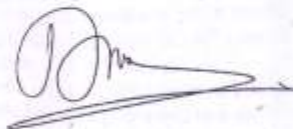
Agricultural systems in developing countries, where farm sizes are relatively small, provide opportunities to reduce the impact of pests and diseases through promotion of more diversity in and around fields. This is particularly true for pollinating species (mostly insects) whose numbers are in serious decline worldwide. Flowering plants (both edible and non-edible) also provide refuge and a food source (nectar) for many naturally-occurring biological control agents, such as predators and parasitoids.

We hope that this conference will stimulate new ideas and approaches for promoting stability in agricultural production systems through the preservation of biodiversity.

We also hope that participants will take the opportunity to network with others to find new ways to work toward the common goal of preserving the natural world and the ecosystem services it provides, while still providing the necessary resources to sustain the human population.

-Short Heinrichs, Muni Muniappan, Dantje Sembel, and Merle Shepard

*Short Heinrichs*



## **Biodiversity and IPM conference organizers**

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# Abstracts

## Information technology and data management tools used in support of United States agricultural safeguarding and pest exclusion activities

Karl Suiter, Yulu Xia

NSF Center for Integrated Pest Management, 1730 Varsity Drive, Venture IV - Suite 110, Raleigh, NC 27606, USA  
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Session 2, 16:15-16:30

The United States Department of Agriculture is tasked with safeguarding US agricultural interests in order to maintain a safe food supply. Prevention, one of the three major tenets of integrated pest management (as defined by the US Environmental Protection Agency) plays a major role in the USDA's pest prevention, exclusion and safeguarding activities. The proactive identification of emergent pest species, the timely dissemination of this information and the creation of recovery and response guidelines for targeted invasive species is a powerful toolset that is used to prevent new pest incursions, protect food production and preserve biodiversity and natural habitats.

The NSF Center for Integrated Pest Management at North Carolina State University has worked closely with the USDA's Center for Plant Health, Science and Technology (CPHST) to create a number of tools used to manage IPM's pest exclusion and prevention activities. An overview of some of these databases and information systems, more specifically the Global Pest and Disease Database (GPDD), the Exotic Plant Pest Monitoring System (PestLens), and New Pest Response Guidelines (NPRG) is presented. We discuss how these systems, used to promote pest exclusion, dovetails nicely with the symposium goals of using IPM to manage species biodiversity.

## Duet call-based sampling to estimate density of spectral tarsier (*Tarsius spectrum*) in farming area

Sareyo Sumarto, Roni Koneki, Trina Tallai

Department of Biology, Faculty of Mathematics and Natural Sciences, University of Sam-Ratulangi, Manado-Indonesia 95115  
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Session 5B, 13:15-13:30

Spectral tarsier (*Tarsius spectrum*) is one of endemic primate species in Sulawesi Island. Tarsiers are very small in size and nocturnal in their habits. In North Sulawesi, they are found in several habitat types, for example: primary and secondary tropical forests, mangrove, scrub, mountain habitat, and farming areas. They are mainly insectivorous animals, so they can play a role in pest control in farming areas. They are considered as beneficial to farmers because of their presence. In a conservation perspective, estimation of their density outside of forests is important to analyse. Therefore, easy and fast sampling techniques are necessary. Duet call is a vocalization released by a pair of adult male and female at every early morning and this behavior can be utilized as the sign for group location for density determination of this species. The technique used was vocalization as group representation and square plots within 100 m in radius. Every early morning, an investigator stays at the center of one plot and counts the total of duet call locations. The average group size was  $4.01 \pm 1.83$  individuals per plot. The formula for counting the density was Tarsier Density = (Total Duet Call  $\times$  4.01) Individual/3.14 Ha.