



ASSOC. PROF. DR. WAHIZATUL AFZAN AZMI

Senior Lecturer (Entomology)

School of Marine and Environmental Sciences
Universiti Malaysia Terengganu, Malaysia



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Academic Qualification

Ph.D [Ecology & Evolutionary Biology (Entomology), University of Adelaide, Australia]

M.Sc (Applied Entomology, USM)

B.Appl.Sc. (Environmental Biology, USM)

Research Areas

- 1) Insect ecology
- 2) Insect pest management
- 3) Insect-plant interaction

Research Interest

My research interests are mainly on the diversity and ecology of insects, pest and disease management and environmental biology. My area of specialization are analyzing and quantifying of biodiversity and community structure of insects, evaluating aquatic insects as bio-indicator of water quality and also insects-plant interactions, especially on Coleopteran pests and stingless bees. My current research involving the development of molecular, systematic and biology of new invasive coconut pest, Red Palm Weevil (*Rhynchophorus ferrugineus*) on coconut palms, and investigation on alternative control strategy of this pest weevil using proteomic profiling of digestive fluid and evaluation of nano-formulated of entomopathogenic fungi as bio-control agent. The key strategy in the research activities is to give a better understanding on the taxonomy, biology and ecology of the new pest weevil on coconut palms, as well as to investigate the potential of indigenous entomopathogenic fungi, which will be the first step to discovery the potential control strategy of the species. The outcomes from this research will provide information for the effective formulation to control this new coconut pest using both biological and chemical pest management, so that the necessary measure can be taken to prevent its further spread.

Current Research Projects

Title : Development of Auto-contamination Device with NanoGreen Bioinsecticide of Entomopathogenic Fungus: A Sustainable Strategy to Control the Red Palm Weevil in Oil Palm and Coconut Plantations

Position: Leader

Grant name & amount received: PRGS RM80,000.00

Project Period: 01/08/17 → 30/07/19

Title : Monitoring, early detection of infestation and control of Red Palm Weevil in Malaysia

Position : Co-researcher

Grant name & amount received: Sime Darby Research Sdn. Bhd. – UKM - UMT RM349,750.00

Project Period: 01/10/17 → 30/09/19

Title : UMT Agro-Trigonpreneur

Position : Leader

Grant name & amount received: IcoE Kluster Pertanian RM50,000.00

Project Period: 01/07/17 → 31/12/17

Title : Lestari Komunii TKPM Peradong, Batu Hampar: Inovasi Pendebungaan Lebah Kelulut Menjana Peningkatan Pengeluaran Melon Manis Terengganu

Position : Leader

Grant name & amount received: UCTC RM32,000.00

Project Period: 01/10/17 → 30/03/17

Title : The Use of Benthic Macroinvertebrates as Indicator of Water Quality in Proposed Geopark Kenyir Regions

Position : Leader

Grant name & amount received: Geopark Kenyir Grant RM32,400.00

Project Period: 01/04/15 → 30/03/17

Title : Evaluation of the entomopathogenic fungi against the invasive coconut pest, red palm weevil (*Rhynchophorus ferrugineus*)

Position: Leader

Grant name & amount received: L'Oréal-UNESCO For Women in Science Fellowships 2014; RM 30,000.00

Project Period: 1/12/14 → 30/11/16

Title : Pollination Effectiveness and Efficiency of the Stingless Bees, *Heterotrigona itama* (Hymenoptera: Apidae) as Alternative Pollinator of Solanaceae and Cucurbitaceae Crops for Future Use in Agriculture

Position: Leader

Grant name & amount received: Fundamental Research Grant Scheme (FRGS); RM 120,000.00

Project Period: 1/07/14 → 30/06/16

Title : Antioxidative Defence Mechanism of Cononut (*Cocos nucifera*) Against the Invasive Coconut Pest, Red Palm Weevil (*Rhynchophorus ferrugineus* Olivier)

Position: Co-researcher

Grant name & amount received: Fundamental Research Grant Scheme (FRGS); RM 112,000.00

Project Period: 1/07/14 → 30/06/16

Title : Differential proteomics approach in elucidating the mechanisms of palm trees (i.e. oil palm and coconut) defences against infestation of the palm pest Red Palm Weevil (*Rhynchophorus ferrugineus*) for crops protection

Position: Co-researcher

Grant name & amount received: Fundamental Research Grant Scheme (FRGS); RM 87,000.00

Project Period: 1/12/13 → 30/11/15

Title : Evaluation of Pheromone Synergists Using Kairomone-releasing Food Baits and Synthetics Palm Ester in Pheromone Mass Trapping System for Management of Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera:Curculionidae) in Coconut Palm Plantations

Position: Leader

Grant name & amount received: Research Acculturation Collaborative Effort (RACE); RM 44,000.00

Project Period: 1/12/12 → 30/05/15

Title : Isolation of virulent isolates of entomopathogenic fungi against the invasive coconut pest, red palm weevil (*Rhynchophorus ferrugineus*; Curculionidae; Coleoptera)

Position: Leader

Grant name & amount received: E-Science Fund; RM 130,650.00

Project Period: 1/11/12 → 30/04/15

Title : Investigation on Alternative Control Strategy of Invasive Red Palm Weevil on Coconut Palms Using Proteomic Profiling of Digestive Fluid from the Larvae of *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae)

Position: Leader

Grant name & amount received: Exploratory Research Grant Scheme (ERGS); RM 88,800.00

Project Period: 1/08/11 → 30/06/14

Title : Molecular and Morphometric Identification and Biology of New Invasive Red Stripe Weevil (Coleoptera: Curculionidae: *Rhynchophorus* spp.) on Coconut Palms

Position: Leader

Grant name & amount received: Fundamental Research Grant Scheme (FRGS); RM 120,000.00

Project Period: 1/01/11 → 30/06/13

Special Interest Group (SIG)

Wetland Ecosystem Conservation (Cluster Marine Sciences & Oceanography)
Kenyir Geopark Research (Cluster Lake Ecosystem and Tropical Biodiversity)
UMT COE for Apis and Meliponine

Professional Membership

Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) – Member
Golden Key International Honour Society – Honorary Member
Malaysian Society of Applied Biology (MSAB) – Executive Committee Member
Malaysian Nature Society (MNS) – Member
Entomological Society of Malaysia (ENTOMA) - Member

Awards

Special Award: SIIF 2017 (Seoul International Invention Fair 2017 - Lebanese Innovation Association)
Silver Medal: PECIPTA 2017 (International Conference & Exposition on Invention of Institutions of Higher Learning 2017)
Gold Medal: ITEX 2017 (International Invention, Innovation & Technology Exhibition 2017)
Anugerah Makalah Terbaik dalam JSSM – MAT 2016 (Majlis Anugerah Tahunan UMT 2016)
Anugerah Perkhidmatan Cemerlang – MAT 2016
Best of the Social Innovation Awards: MYINOVASI UMT 2016
Gold & Silver Awards: MYINOVASI UMT 2016
First Runner Up – CoRIC 2016 (Community Research & Innovation Competition 2016)
Bronze Medal – NRIC 2016 (Novel Research and Innovation Competition 2016)
Best Oral Presenter – The 14th Symposium of Malaysian Society of Applied Biology (MSAB 2016)
Anugerah Kepimpinan Akademik Muda – MAT 2015
Loreal-UNESCO for Women in Science Malaysia Fellowship 2014
Gold Medal – NRIC & CoRIC 2014 (Novel Research and Innovation Competition & Community Research & Innovation Competition 2014)
Anugerah Makalah Terbaik Dalam JSSM - Julangan Bakat 2014
Bronze Award - PECIPTA 2013 (International Conference & Exposition on Invention of Institutions of Higher Learning 2013)
Gold Medal: ITEX 2013 (International Invention, Innovation & Technology Exhibition 2013)
Bronze Medal: MTE 2013 (Malaysia Technology Expo 2013)
Anugerah Perak: 'Terengganu Innovation, Invention & Design 2012 (TIID)'

Publications

2017

Wahizatul Afzan, A., Nurhidayah, S., Muhammad Firdaus, M.H., Roziah, G. and Chuah, T.S. (2017) Effects of stingless bee (*Heterotrigona itama*) Pollination on greenhouse cucumber (*Cucumis sativus*). *Malaysian Applied Biology* 46(1): 51-55.

Grace L.E.L., Jamilah M.S., Mohd. Farid, A. and **Wahizatul Afzan, A.** (2017) Entomopathogenic Fungi isolated from the Soil of Terengganu, Malaysia as Potential Bio-pesticides Against the Red Palm Weevil (*Rhynchophorus ferrugineus*). *Journal of Sustainability Science and Management* 12(2): 71-79.

Wahizatul Afzan, A., Chong, J.L., Hazlina, A.Z., Norhayati, Y., Wan Bayani, W.O., Yong, K.W., Ainatun, N.Z. and Mohd. Haris, H. (2017). The Red Palm Weevil, *Rhynchophorus ferrugineus*: Current Issues and Challenges in Malaysia. *Oil Palm Bulletin* 74: 17-24.

Pong, K.K., Ramle, M., **Wahizatul Afzan, A.**, Norman K. and Siti Ramlah A.A. (2017) Genetic Variation of Entomopathogenic Fungi, *Metarhizium anisopliae* and *Isaria amoenerosea* and Their Pathogenicity Against Subterranean Termite, *Captotermes curvignathus*. *Journal of Oil Palm Research* 29(1): 35-46.

Pong, K.K., **Wahizatul Afzan, A.**, Norman K., Siti Ramlah A.A. and Ramle, M. (2017) The Occurrence of Entomopathogenic Fungi on Mineral and Peat Soils in Peninsular Malaysia. *American Journal of Agricultural and Biological Sciences* 12(1): 1-12.

2016

Wahizatul Afzan, A., Zaidatul Akma, S., Insyirah, I., Pong, K.K., Grace, L.E.L. and Siti Nor Khadijah, A. (2016) Virulence evaluation of entomopathogenic fungi to subterranean termites, *Globitermes sulphures* (Insecta: Isoptera). *Malaysian Journal of Microbiology* 12(6): 492-497.

Wahizatul Afzan, A. and Hoon, A.G. (2016) Aquatic insect communities in relation with water quality of selected tributaries of Tasik Kenyir, Terengganu. *Journal of Sustainability Science and Management* 11(2): 1-10.

Norhayati, Y. **Wahizatul Afzan, A.**, Siti Noor Jannah, S. and Nurul Wahidah, M.R. (2016) Antioxidative Responses of *Cocos nucifera* against Infestation by the Red Palm Weevil, *Rhynchophorus ferrugineus*, a New Invasive Coconut Pest in Malaysia. *Sains Malaysiana*. 45(7): 1035-1040.

Wahizatul Afzan, A., Faridah, M. and Nur Farhah A.S. (2016) Influence of imported horse food on housefly (*Musca domestica* Linnaeus) population densities around horse barns and stables in Terengganu equestrian resort (TER). *Tropical Biomedicine* 33(2): 359-365.

Nur Ain Farhah R.S.K., **Wahizatul Afzan, A.**, Norman K., Siti Ramlah A.A. and Ramle, M. (2016) Replication of *Oryctes* Nudivirus (OrNV) in Insect Cell Line DSIR HA-1179

and Its Infectivity on Neonates of Rhinoceros Beetle, *Oryctes rhinoceros*. *Journal of Oil Palm Research* 28(4): 452-462.

Nur Ain Farhah R.S.K., **Wahizatul Afzan, A.**, Ramle M., Norman K. and Siti Ramlah A.A. (2016) Infectivity of *Oryctes* Nudivirus Produced on Cell Culture DSIR HA-1179 Against Larvae and Its Effects on Feeding of Neonates of Rhinoceros Beetle, *Oryctes rhinoceros*. *Journal of Oil Palm Research* 28(3): 256-265.

Wahizatul Afzan, A., Chuah, T.S. and Nur Suhaili, S. (2016) Pollination efficiency of the stingless bee, *Heterotrigona itama* (Hymenoptera: Apidae) on chilli (*Capsicum annum*) in greenhouse. *Journal of Tropical Plant Physiology* 8: 1-11.

2015

Wahizatul Afzan, A., Nur Syuhadah, Z. and Roziah, G. (2015) Melissopalynology and foraging activity of stingless bees, *Lepido trigona terminata* (Hymenoptera: Apidae) from an apiary in Besut, Terengganu. *Journal of Sustainability Science and Management*. 10(1): 27-35.

Yong K.W., Aisyah A.B. and **Wahizatul Afzan, A.**, (2015) Fecundity, Fertility and Survival of Red Palm Weevil, *Rhynchophorus ferrugineus* Larvae Reared on Sago Palm. *Sains Malaysiana*. 44: 1371-1375.

Hazlina, A. Z., Fahmeeda, M.J. and **Wahizatul Afzan, A.** (2015) Sodium Dodecyl Sulphate-polyacrylamide Gel Protein Profile of Red Palm Weevil and Mechanical-wounded Oil Palm Seedlings. *International Journal of Agriculture, Forestry and Plantation*. 1: 44-48.

Chong, J.L., H'ng, T.M., **Wahizatul Afzan, A.** and Noor Hasmiza, A. (2015) Genetic Variation and Invasion History of the Invasive Red Palm Weevil (*Rhynchophorus ferrugineus*; Olivier) in Terengganu. *International Journal of Agriculture, Forestry and Plantation*. 1: 34-43.

2014

Wahizatul, A.A., Shahrol, N.D, Haris, M.H., Yong, K.W., Zazali, C. and Ahmad, S.S. (2014) Field Trapping of Adult Red Palm Weevil, *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) with Kairomone-Releasing Food Baits and Synthetic Pheromone Lure in a Coconut Plantation. *Philippine Agriculture Scientist*. 97(4): 342-348.

Haris, M.H., Nang, M.L.S., Chuah, T.S. and **Wahizatul, A.A.** (2014) The Efficacy of Synthetic Food Baits in Capturing the Red Palm Weevil, *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) in Campus Area of Universiti Malaysia Terengganu. *Serangga*. 19: 63-81.

2013

Wahizatul, A.A., Ngadin, A., Ng, L.C. and Pong, K.K. (2013). Identification and Characterization of Fungi Associated with the Red Palm Weevil (RPW), *Rhynchophorus ferrugineus*: A Microscopic Study. *Malaysian Journal of Microscopy*. 9: 127-132.

Wahizatul, A.A. and Shasita, R. (2013). A Preliminary Study: Comparative Toxicity of Extracts from *Tinospora tuberculata* Beumee and *Lumnitzera racemosa* Willd on *Aedes aegypti* Linnaeus Larvae (Diptera: Culicidae). *ASEAN Journal on Science & Technology for Development*. 30(1 & 2): 44-49.

Wahizatul Afzan, A., Zazali C., Abdul Rahman, A.R. and Nurul Izzah A.G. (2013). A New Invasive Coconut Pest in Malaysia: the Red Palm Weevil (Curculionidae: *Rhynchophorus ferrugineus*). *The Planter*. 89(1043): 97-110.

Wahizatul Afzan A. and Lim, S.P. (2013) Comparative Study of Dipteran Species Diversity and Their Succession on Rabbit Carrion in Two Different Mangrove Areas of Peninsular Malaysia. *Journal of Insects*. Volume 2013, Article ID 398159, 9 pages.

Wahizatul Afzan, A. and Jennings, J. (2013) The Impact of Management Practices of Exotic Willows (*Salix* spp.) on Aquatic Invertebrate Communities in South Australian Freshwater Streams. *Journal of Sustainability Science and Management*. 8(1): 43-52.

2012

Wahizatul, A.A., Roziah, G., Nor Zalipah, M. (2012). The importance of carpenter bee (*Xylocopa varipuncta*) as pollination agent for mangrove community of Setiu Wetland, Terengganu. *Sains Malaysiana* 41(9): 1057-1062.

Wahizatul, A.A., Abdul Rahman, A.R., Chong, J.L. and Wong, A.S.Y. (2012). Scanning Electron Microscopy of the Red Palm Weevil (RPW), *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae): A new invasive pest of coconut palms in Terengganu. *Malaysian Journal of Microscopy*. 8: 148-152.

Ainatun Nadrah, Z., Hazlina, A.Z. and **Wahizatul, A.A.,** (2012). Preliminary study on the protein profile of Red Palm Weevil (RPW) larvae's foregut (Coleoptera: Curculionidae: *Rhynchophorus ferrugineus*) fed with coconut and sago palms. *Asia-Pacific Journal of molecular Medicine*. Abstract for the 1st Malaysian Proteomics Conference, Vol 2 (Suppl 1): 1 p.

2011

Wahizatul Afzan, A., Long, S.H. and Amirrudin, A. (2011) Composition and Distribution of Aquatic Insect Communities in Relation to Water Quality in Two Freshwater Streams Of Hulu Terengganu, Malaysia. *Journal of Sustainability Science and Management*. 6(1) : 148-155

Wahizatul, A.A. and Jennings, J.T. (2011) Impact of Exotic Willow Roots (*Salix* spp.) as Habitat for Aquatic Invertebrate Communities in South Australian Stream. *Asian Journal of Biological Sciences*. 4(5): 428-444.

2006

Wahizatul Afzan, A., Julia, A. and Amirrudin, A. (2006) Diversity and Distribution of Dragonflies (Insecta: Odonata) in Sekayu Recreational Forest, Terengganu. *Journal of Sustainability Science and Management*. 1(2): 97-106.

2005

Wahizatul Afzan, A. and Che Salmah, M. R. (2005) Adult Dragonfly Communities in Tropical Rivers of the Northern Peninsular Malaysia: Species Composition, Biotope and Host Plant Preferences. *Wetland Science* 3: 167-175.

M. R. Che Salmah, A. Abu Hassan and **A. Wahizatul Afzan**. (2005) Preliminary Study on the Composition and Distribution of Odonata in Perlis State Park. *Malayan Nature Journal*. 57: 317-326.

2004

Che Salmah M. R. and **Wahizatul Afzan, A.** (2004) Distribution of Odonata (Insecta) in Various Ecosystems in Northern Peninsular Malaysia. *Wetland Science*. 2: 184-191.

Academic Supervision

Graduated Students

Master Degree (Microbiology)

Role: Main Supervisor

Name of student: Nur Ain Farhah Ros Saidon Khudri

Project title: Production of *Oryctes rhinoceros* virus on insect cell culture and its effect on mortality of oil palm rhinoceros beetle

Year graduated: 2014 – 2017

E-mail: ainfarhah@mpob.gov.my

Master Degree (Microbiology)

Role: Main Supervisor

Name of student: Pong Kuan Kin

Project title: The Occurrence and Distribution of Entomopathogenic Fungi from the Soil of Oil Palm Plantations in Terengganu

Year graduated: 2014 – 2017

E-mail: kuankin@gmail.com

Master Degree (Biochemistry)

Role: Main Supervisor

Name of student: Ainatun Nadrah Zulkefli

Project title: Investigation on Alternative Control Strategy on Invasive Red Palm Weevil on Coconut Palm Using Proteomic Profiling of Digestive Fluid from the Larvae of *Rhynchophorus ferrugineus* (Coleoptera : Curculionidae).

Year graduated: 2013 – 2016

E-mail: ainatun_nadrah89@yahoo.com

Master Degree (Zoology)

Role: Main Supervisor

Name of student: Yong Kah Wai

Project title: Molecular and Morphometric Identification and Biology of New Invasive Red Stripe Palm Weevil (Coleoptera : Curculionidae : *Rhynchophorus* spp.) on Coconut Palm.

Year graduated: 2013 – 2016

E-mail: alex Yong_100@gmail.com

Master Degree (Ecology)

Role: Main Supervisor

Name of student: Roziah Ghazi

Project title: Melissopalynology and foraging activities of stingless bees (Hymenoptera: Apidae: *Heterotrigona itama*) in Taman Tropika Kenyir

Year graduated: 2012 – 2015

E-mail: mutiara_mujahidah89@gmail.com

Master Degree (Ecology)

Role: Co-Supervisor

Name of student: Muhammad Hafiz Sulaiman

Project title: Investigating the Ecology and Population Structure of the Malayan Pangolin from selected Areas in Peninsular Malaysia

Year graduated: 2012 – 2015

E-mail: -

Postgraduate Under Supervision

PhD (Microbiology)

Role: Main Supervisor

Name of student: Grace Lee Ern Lin

Project title: Isolation of virulent isolates of entomopathogenic fungi against the invasive coconut pest, red palm weevil (*Rhynchophorus ferrugineus*; Curculionidae; Coleoptera

Year graduated: Ongoing (2013 – present)

E-mail: graceernlin@gmail.com

Master Degree (Ecology)

Role: Main Supervisor

Name of student: Muhammad Firdaus Mohd. Hatta

Project title: Pollination Effectiveness and Efficiency of the Stingless Bees, *Heterotrigona itama* (Hymenoptera: Apidae) on Greenhouse Rockmelon

Year graduated: Ongoing (2015 – present)

E-mail: muhammadfirdausumt@yahoo.com

Master Degree (Microbiology)

Role: Main Supervisor

Name of student: Insyirah Ishak

Project title: Mass Production and Evaluation of the Entomopathogenic Fungi *Metarhizium anisopliae* against the Red alm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae).

Year graduated: Ongoing (2016-present)

E-mail: insyirahcatalyst@yahoo.com

Course Taught

Principle of Biology, SBB 2001 / BIO 2000, (Diploma), UMT

Aquatic Ecology 1, SBD 2006, (Diploma), UMT

Biology and Systematic of Insects, BDV 4001, (Undergraduate), UMT

Taxonomy and Systematic of Organisms, BDV 3000, (Undergraduate), UMT

Research Methodologies in Biology, BIO 3801, (Undergraduate), UMT

Evolution and Biodiversity, SBB 3001, (Undergraduate), UMT

Biology of Organisms 2, SBB 3402, (Undergraduate), UMT

Field Ecology, SBD 4801, (Undergraduate), UMT

Final Year Project (Projek Ilmiah Tahun Akhir), SBD 4999, (Undergraduate), UMT

Aquatic Ecology, SBD 3601, (Undergraduate), UMT

Principle of Ecology, BIO 3500, (Undergraduate), UMT

Links

Researchgate : https://www.researchgate.net/profile/Wahizatul_Azmi

Academia : <https://independent.academia.edu/WahizatulAfzanBintiAzmi>

MyBIS : <http://www.mybis.gov.my/exp/322>