



ASSOC. PROF. DR. WAHIZATUL AFZAN AZMI

Senior Lecturer
Faculty of Science and Marine Environment
Universiti Malaysia Terengganu



wahizatul@umt.edu.my



+609 668 3751 / +6013 9145457



+609 668 3193

QUALIFICATIONS

- Doctor of Philosophy (Ecology & Evolutionary Biology - Entomology), University of Adelaide
- Master of Science (Applied Entomology), Universiti Sains Malaysia
- Bachelor of Science (Environmental Biology), Universiti Sains Malaysia

FIELD OF RESEARCH

- Insect ecology
- Insect pest management
- 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 is analyzing and quantifying of biodiversity and community structure of insects, evaluating aquatic insects as bio-indicator of water quality and insects-plant interactions, especially on Coleopteran pests and stingless bees. My current research involving the development of alternative control strategy of invasive coconut pest, Red Palm Weevil (*Rhynchophorus ferrugineus*) using nano-formulated of entomopathogenic fungi as bio-control agent. The key strategy in the research activities is to give a better understanding on the biology and ecological aspects of this pest, as well as to investigate the potential of indigenous entomopathogenic fungi, which will be the first step to discovery the potential biocontrol strategy of the species. Besides that, I am also investigating on the optimization of in-vitro rearing of Indo-Malayan stingless bee queen *Heterotrigona itama*, one of the most domesticated stingless bee species in Malaysia. The aim of this project is to develop an alternative technique to mass produce queen through *in vitro* rearing on a large scale. Outcomes from this study could be helpful for increasing the number of colonies as well as conserving the native species of stingless bees.

RESEARCH PROJECTS / GRANTS

- Title : Aggregation Pheromone and Synergist Lure for *Rhynchophorus ferrugineus* and *R. vulneratus*
Position: Leader
Grant name & amount received: Behn Meyer Agricare (M) Sdn. Bhd.; RM 30,000.00
Status: Ongoing
Project Period: 01/06/20→ 31/05/22
- Title : Elucidating the Bio-efficacy of Coastal Halophytes Rhizobacteria in Promoting Rice Plant Health, Growth and Productivity on Saline Soil
Position: Co-researcher
Grant name & amount received: FRGS; RM 123,000.00
Status: Ongoing
Project Period: 01/11/20→ 31/10/23
- Title : Elucidating the potential of liverworts as biopesticides in activation of chili plant defence upon infestation with pest insects
Position: Co-researcher
Grant name & amount received: FRGS; RM 84,200.00
Status: Ongoing
Project Period: 01/11/20→ 31/10/22
- Title : FREMEEBEE: French Malaysian Initiative for Intelligent Beehive Health Monitoring
Position: Co-researcher
Grant name & amount received: MyPAIR-PHC-Hibiscus; RM 66,000.00
Status: Ongoing
Project Period: 01/05/20→ 30/04/22
- Title : Integrated Vector Management: Managing Aedes mosquito resistance populations, vectors of Zika and dengue using fungal infection
Position: Co-researcher
Grant name & amount received: FRGS; RM 116,800.00
Status: Ongoing
Project Period: 01/01/19→ 31/12/21
- Title : Beehive Fence Using Honeybees (*Apis cerana* and *Apis mellifera*) as Natural Deterrent of Asian Elephant (*Elephas maximus*) in TDMP Oil Palm Plantations
Position: Co-researcher
Grant name & amount received: TDM Plantation Sdn. Bhd.; RM 295,104.00
Status: Ongoing
Project Period: 01/04/18→ 31/03/21

- Title : Optimization of In-Vitro Rearing of Indo-Malaya Stingless Bee Queen: A Strategy to Improve the Management and Conservation of Insect Pollinator in Tropical Landscapes
Position: Leader
Grant name & amount received: FRGS; RM84,200.00
Status: Ongoing
Project Period: 01/01/19→ 31/12/20
- 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
Status: Completed
Project Period: 01/08/17→ 30/01/20
- 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.; RM70,000.00
Status: Completed
Project Period: 01/10/17→ 30/09/19
- 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; RM 32,400.00
Status: Completed
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
Status: Completed
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: FRGS; RM 120,000.00
Status: Completed
Project Period: 1/07/14 → 30/06/16

- Title : Antioxidative Defence Mechanism of Coconut (*Cocos nucifera*) Against the Invasive Coconut Pest, Red Palm Weevil (*Rhynchophorus ferrugineus* Olivier) Position: Co-researcher
Grant name & amount received: FRGS; RM 112,000.00
Status: Completed
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: FRGS; RM 87,000.00
Status: Completed
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: RACE; RM 44,000.00
Status: Completed
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
Status: Completed
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: ERGS; RM 88,800.00
Status: Completed
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: FRGS; RM 120,000.00
Status: Completed
Project Period: 1/01/11 → 30/06/13

EXPERT LINKAGES

- DEPARTMENT OF AGRICULTURE MALAYSIA, MINISTRY OF AGRICULTURE & FOOD INDUSTRIES
- MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE (MARDI)
- MALAYSIAN PALM OIL BOARD (MPOB)
- INSTITUTE OF MEDICAL RESEARCH (IMR)
- SIME DARBY RESEARCH SDN. BHD.
- AMCO NIAGA SDN. BHD.
- BIG BEE HONEY SDN. BHD.

PROFFESIONAL MEMBERSHIP

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

AWARDS

- Gold & Silver Awards: MPI (Minggu Inovasi & Penyelidikan) 2020
- Best Oral Presentation Award – The 4th Virtual International Symposium of Insects (ISOI 2020)
- Silver Medal: ITEX 2019 (International Invention, Innovation & Technology Exhibition 2019)
- Gold & Silver Awards: MPI (Minggu Inovasi & Penyelidikan) 2019
- Best Oral Presenter – 2nd Seminar on Biological Security and Sustainability (BIOSES 2019)
- Silver Medal: ITEX 2018 (International Invention, Innovation & Technology Exhibition 2018)
- Gold & Silver Awards: MPI (Minggu Inovasi & Penyelidikan) 2018
- 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

Journal Article

1. Najihah, A.H., Jalinas, J., Azlina, Z., Samsudin, A., Zazali, C., Idris, A.B., and **Wahizatul, A.A.** (2021). Effects of nutrient additives and incubation period on sporulation and viability of the entomopathogenic fungus, *Metarhizium anisopliae* (Hypocreales: Clavicipitaceae). *Malaysian Journal of Microbiology*. 17(1): 97 – 102.
2. Nazmi, H.F., Haris-Hussain, M., Idris, A.G., Azlina, Z., Samsudin, A., Zamri, Z., **Wahizatul, A.A.**, Jalinas, J. and Hassan, M. (2020). Physical and Physiological Monitoring on Red Palm Weevil-Infested Oil Palms. *Insects*. 11: 407; doi:10.3390/insects11070407
3. Pallanisamay, P., Addis, S.N.K., Ros Saidon Khudri, N.A.F., Ramle, M. and **Wahizatul, A.A.** Detection of *Oryctes rhinoceros* Nudivirus (ORNV) from *Oryctes rhinoceros* (Coleoptera: Scarabaeidae) Beetles in Oil Palm Plantations of East Coast Peninsular Malaysia. *Journal of International Society for Southeast Asian Agricultural Sciences*. 26: 99 – 107.
4. Ishak, I., Ng, L.C., Haris-Hussain, M., Jalinas, J., Idris, A.B., Azlina, Z., Samsudin, A. and **Wahizatul, A.A.** (2020) Pathogenicity of an Indigenous Strain of the Entomopathogenic Fungus *Metarhizium anisopliae* (Hypocreales: Clavicipitaceae) (MET-GRA4 Strain) as a Potential Biological Control Agent Against the Red Palm Weevil (Coleoptera: Dryophthoridae). *Journal of Economic Entomology*. 113(1): 43 – 49.
5. Haris-Hussain, M., Kamarudin, N., and **Wahizatul, A.A.** (2020). Efficacy of Baits for Red Palm Weevil (RPW), *Rhynchophorus ferrugineus* Olivier Under Constant Laboratory Condition. *Journal of Oil Palm Research*. 32(2): 355 – 364.
6. Natasya, A.T., Hashim, N.A., Tahir, A.M. and **Wahizatul, A.A.** (2020) Pests and Diseases Incidence at Different Growth Stages of Melon Manis Terengganu (*Cucumis melo* var. *Inodorus* cv. Melon Manis Terengganu). *Serangga*. 25(1): 1 – 14.

7. Wan Bayani, W. O., **Wahizatul, A.A.**, Shamsul Bahri, A.R., Nur Suliyana, M., Nurul Suhadah, A.A.R. and Nur Khalilah, A. (2020) A Study on the Genetic Variability of Stingless bees in Terengganu by Using Random Amplified Polymorphic DNA (RAPD) Markers: A Preliminary Assessment. *Serangga*. 25(3): 35 – 44.
8. Cheong, J.L. and **Wahizatul, A.A.** (2020). Dataset on the influence of relative humidity on the pathogenicity of *Metarhizium anisopliae* isolates from Thailand and Malaysia against red palm weevil (*Rhynchophorus ferrugineus*, Olivier) adult. *Data in Brief*. 30(2020): 105482.
9. Muhammad Firdaus, M.H., Chuah, T.S. and **Wahizatul, A.A.** (2020). Synergistic Effect of Synthetic Pheromone and Kairomone Releasing Food Baits in Mass Trapping System of Red Palm Weevil, *Rhynchophorus ferrugineus*. *IOP Conf. Series: Earth and Environmental Science*. 494 (2020): 012015 doi:10.1088/1755-1315/494/1/012015
10. **Wahizatul, A.A.**, Wan Zaliha, W.S., Norhayati, Y., Muhammad Firdaus, M.H., Ahmad Faeizian, S., Muhammad Azzeeruf, H.H. and Sarah, N.R. (2019) Effects of pollination by the Indo-Malaya stingless bee, *Heterotrigona itama* (Hymenoptera: Apidae) on the quality of greenhouse produced rockmelon. *Journal of Economic Entomology*. 112(1): 20-24.
11. Tay, K.Y, Asari, A., Abdullah, S., Ismail, M. and **Wahizatul, A.A.** (2019). The dataset for antifeedant activity of eugenol derived compounds against red palm weevil (*Rhynchophorus ferrugineus*, Olivier) larvae. *Data in Brief*. 25(2019): 104227.
12. **Wahizatul, A.A.**, Mohd. Fazlin, M.S., Mohamad Haris, H. and Muhammad Firdaus M.H. (2019). A Survey on Diversity of Insects in Pulau Sibul, Johor. *Malayan Nature Journal*. 71(3): 349-359.
13. Ainatun, Z.N., Hazlina, A.A. and **Wahizatul Afzan, A.** (2018) Food Consumption, Developmental Time and Protein Profile of the Digestive System of the Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Dryophthoridae) Larvae Reared on Different Food Diets. *Journal of Insect Science*. 18(5): 1-7.
14. Fong J.H., Siti Nor Khadijah A. and **Wahizatul A.A.** (2018) Virulence evaluation of entomopathogenic fungi against the Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Dryophthoridae). *Malaysian Applied Biology Journal*. 47(5): 25-30
15. **Wahizatul A.A.**, Nur Hidayah Hussin and Nakisah M.A. Monitoring of Water Quality using Aquatic Insects as Biological Indicators in Three Streams of Terengganu. *Journal of Sustainability Science and Management* 13(1):67-76.
16. Norhayati, Y., Nur Nassihah M.N., **Wahizatul Afzan, A.**, and Hazlina, A.Z. (2018) Antioxidative Activities in Coconut Cultivars against Infestation by the Red Palm Weevil, *Rhynchophorus ferrugienus*. *Pertanika Tropical Agricultural Science Journal*. 41(1): 349-364.
17. Muhammad Hafiz, S., **Wahizatul Afzan, A.**, Marina, H. and Chong, J.L. (2018) Current updates on the morphological measurement of the Malayan pangolin, *Manis javanica*. *Folia Zoologica*. 66(4): 262-266.
18. **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.
19. 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 ferrugienus*). *Journal of Sustainability Science and Management* 12(2): 71-79.
20. **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 ferrugienus*: Current Issues and Challenges in Malaysia. *Oil Palm Bulletin* 74: 17-24.
 21. 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.
 22. 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.
 23. **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.
 24. **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.
 25. 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 ferrugienus*, a New Invasive Coconut Pest in Malaysia. *Sains Malaysiana*. 45(7): 1035-1040.
 26. **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.
 27. 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.
 28. 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.
 29. **Wahizatul Afzan, A.**, Chuah, T.S. and NurSuhaili, 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.
 30. **Wahizatul Afzan, A.**, NurSyuhadah, Z. and Roziah, G. (2015) Melissopalynology and foraging activity of stingless bees, *Lepidotrigona terminate* (Hymenoptera: Apidae) from an apiary in Besut, Terengganu. *Journal of Sustainability Science and Management*. 10(1): 27-35.
 31. Yong K.W., Aisyah A.B. and **Wahizatul Afzan, A.**, (2015) Fecundity, Fertility and Survival of Red Palm Weevil, *Rhynchophorus ferrugienus* Larvae Reared on Sago Palm. *Sains Malaysiana*. 44: 1371-1375.

32. 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.
33. 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.
34. **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.
35. 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.
36. **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.
37. **Wahizatul, A.A.** and Shasita, R. (2013). A Preliminary Study: Comparative Toxicity of Extracts from *Tinospora tuberculata* Beumee and *Lumnitzera racemose* Willd on *Aedesa egypti* Linnaeus Larvae (Diptera: Culicidae). *ASEAN Journal on Science & Technology for Development*. 30(1 & 2):44-49.
38. **Wahizatul Afzan, A.**, Zazali C., Abdul Rahman, A.R. and Nurullzzah A.G. (2013). A New Invasive Coconut Pest in Malaysia: the Red Palm Weevil (Curculionidae: *Rhynchophorus ferrugineus*). *The Planter*. 89(1043): 97-110.
39. **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.
40. **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.
41. **Wahizatul, A.A.**, Roziah, G., NorZalipah, 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.
42. **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.
43. **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.

44. **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.
45. **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.
46. **Wahizatul Afzan, A.** and CheSalmah, 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.
47. Che Salmah, M.R., 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.
48. CheSalmah M. R. and **Wahizatul Afzan, A.** (2004) Distribution of Odonata (Insecta) in Various Ecosystems in Northern Peninsular Malaysia. *Wetland Science*. 2: 184-191.

Conference Publication

1. Muhammad Firdaus, M.H., Chuah, T.S. and **Wahizatul, A.A.** (2020). Synergistic Effect of Synthetic Pheromone and Kairomone Releasing Food Baits in Mass Trapping System of Red Palm Weevil, *Rhynchophorus ferrugineus*. *IOP Conf. Series: Earth and Environmental Science*. 494 (2020): 012015 doi:10.1088/1755-1315/494/1/012015
2. Wan Mohd Afiq, W.M.K. and **Wahizatul, A.A.** (2020). Editorial: Sustainable Development Through Science, Technology and Innovation. *Journal of Sustainability Science and Management (UMTAS Special Issue)*. 15 (4): 1 – 1.

Other Outputs

[Thesis, manuscript, books, reports, etc.]

1. **Wahizatul Afzan A.**, Roziah G. and Ilyia S.H. (2019). Morphological, Nest Architecture and Colony Characteristics of Stingless Bees (Hymenoptera; Apidae; Meliponini) from Tasik Kenyir, Terengganu. Greater Kenyir Landscape: From Ridge to Reef. Springer Nature Switzerland. Pp 111-121.
2. Roziah G., Nur Syuhadah Z. and **Wahizatul Afzan A.** (2018). Melittopalynological Studies of Stingless Bees from the East Coast of Peninsular Malaysia. Pot-Pollen in Stingless Bee Melittology. Springer International Publishing. Pp 77-89.
3. **Wahizatul Afzan Azmi** and Hoon Ai Geok. (2015) Aquatic insect communities in Setiu River, Terengganu. Setiu Wetlands: Species, Ecosystems and Livelihoods. Penerbit UMT. Pp 19-25.
4. Wan Bayani Wan Omar, Abdulmula Abdul Magid Hamza, **Wahizatul Afzan Azmi**, Faridah Mohamad and Nurul Eizzati Ibrahim. (2015). A Preliminary Survey on Diversity and Abundance of Freshwater Gastropod in Tasik Berombak, Setiu. Setiu Wetlands: Species, Ecosystems and Livelihoods. Penerbit UMT.
5. **Wahizatul Afzan Azmi**, Alesa Zainuddin and Muhammad Razali Salam. (2015) Notes on the firefly, *Pteroptyx tener* (Coleoptera: Lampyridae) in mangrove forest of Setiu,

- Terengganu. Setiu Wetlands: Species, Ecosystems and Livelihoods. Penerbit UMT. Pp 67-72.
6. Amirrudin B. Ahmad, **Wahizatul Afzan Azmi**, Johari M. Nor, Nurul Nadia Rahim and Siti Aminah Mohd Suyud. (2011) Dragonfly of Jambu Bongkok Forest Reserve, Terengganu, Peninsular Malaysia. A Biological Assessment of Jambu Bongkok Forest Reserve, Terengganu and Nearby Ecosystem. Penerbit UMT. Pp 59-67.

SUPERVISION

Doctor of Philosophy Degree

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

Student Name : Grace Lee Ern Lin

Role : Main Supervisor

Status : Completed (2013-2020)

Master Degree

Thesis Title : Antifeedant Activity of Eugenol and Thymol Derivatives Toward Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae) Larvae

Student Name : Tay Karh Yan

Role : Main Supervisor

Status : Completed (2017-2019)

Thesis Title : Mass Production and Evaluation of the Entomopathogenic Fungi *Metarhizium anisopliae* against the Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae).

Student Name : Insyirah Ishak

Role : Main Supervisor

Status : Completed (2016-2018)

Thesis Title : The populations of the Red Palm Weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae) and *Oryctes rhinoceros* beetle and their coexistence aspects in selected oil palm plantations

Student Name : Mohamad Haris Hussain

Role : Main Supervisor

Status : Completed (2014-2018)

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

Student Name : Nur Ain Farhah Ros Saidon Khudri

Role : Main Supervisor

Status : Completed (2014-2017)

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

Student Name : Pong Kuan Kin

Role : Main Supervisor

Status : Completed (2014-2017)

Thesis 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: Curculinidae).

Student Name : Ainatun Nadrah Zulkefli

Role : Main Supervisor

Status : Completed (2013-2016)

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

Student Name : Yong Kah Wai

Role : Main Supervisor

Status : Completed (2013-2016)

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

Student Name : Roziah Ghazi

Role : Main Supervisor

Status : Completed (2012-2015)

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

Student Name : Muhammad Hafiz Sulaiman

Role : Co-supervisor

Status : Completed (2012-2015)

COURSE TAUGHT

- Biology and Systematic of Insects, BDV 4001 (2+1), (Undergraduate)
- Taxonomy and Systematic of Organisms, BDV 3000 (2+1), (Undergraduate)
- Research Methodologies in Biology, BIO 3801 (3+0), (Undergraduate)
- Principle of Ecology, BIO 3500 (2+1), (Undergraduate)
- Field Ecology, SBD 4801 (0+3), (Undergraduate)
- Evolution and Biodiversity, SBB 3001 (2+1), (Undergraduate)
- Aquatic Ecology, SBD 3601 (2+1), (Undergraduate)
- Biology of Organisms 2, SBB 3402 (2+1), (Undergraduate)
- Projek Ilmiah Tahun Akhir), SBD 4999, (Undergraduate)
- Aquatic Ecology 1, SBD 2006 (2+1), (Diploma)
- Principle of Biology, SBB 2001 / BIO 2000 (2+1), (Diploma)

LINKS

- SCOPUS: <https://www.scopus.com/authid/detail.uri?authorId=55349512200>
- WoS
- Researchgate: https://www.researchgate.net/profile/Wahizatul_Azmi
- Academia.edu: <https://independent.academia.edu/WahizatulAfzanBintiAzmi>
- LinkedIn
- LiveDNA
- ORCID: <https://orcid.org/0000-0003-2713-815X>
- Google Scholar: <https://scholar.google.com/citations?user=FEdi-eAAAAAJ&hl=en>
- Facebook