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(Department of Entomology, National Chung Hsing University)



Work History

- Feb 2020-
Present **Assistant professor (Tenues-track)**
Department of Entomology, National Chung Hsing University, Taiwan
- Feb 2019-
Jan 2020 **Project assistant professor**
Department of Entomology, National Chung Hsing University, Taiwan
- Feb 2018-
Jan 2019 **Postdoctoral fellow**
Honey bee and biotechnological products development center, National Ilan University, Taiwan
- Feb 2018-
Jan 2019 **Adjunct Assistance Professor**
Department of Biotechnology and Animal Science, National Ilan University, Taiwan
- Feb 2015-
Jan 2018 **Project assistant professor**
Department of Biotechnology and Animal Science, National Ilan University, Taiwan
- Mar 2017-
Jan 2018 **Chief**
Center for Teaching & Learning, National Ilan University, Taiwan
- Feb 2014-
Jan 2015 **Research assistant professor**
Department of Agricultural Biology, Chonbuk National University, South Korea
- Development of AtMT for *Beauveria bassiana*
 - Promoter strength assay in *B. bassiana*
 - Transcriptome analysis of fungal infected bean bugs
 - Identify novel RNA virus in fungal infected bean bugs
- Jan 2013-
Jan 2014 **Postdoctoral Fellow**
Genomics Research Center, Academia Sinica, Taiwan
- Development of next generation sequencing technology (make paired technology)
 - Establishment of T-Oligo Primed PCR technology (TOP-PCR)
- Aug 2012-
Jan 2013 **Adjunct Assistance Professor**
Department of Earth and Life Science, University of Taipei, Taiwan
- Teaching for genetics and genetic laboratory
- Oct 2011-
July 2012 **Postdoctoral Fellow**
Institute of Zoology, National Taiwan University, Taiwan
- Research on the characterization of aquatic microsporidia (*Triwangia caridina*)
- Feb 2010-
July 2010 **Postdoctoral Fellow**
Institute of Zoology, National Taiwan University, Taiwan
- Research on the differentially gene expression of microsporidia (*Nosema ceranae*) infected with honey bees

Education

2006-2009 **Ph.D. degree**

Department of Entomology, National Taiwan University, Taiwan

Thesis: Genomic Analyses of LyxyMNPV and the Characterization of an LdMNPV-like Virus

2004-2006 **M.S. degree**

Department of Entomology, National Taiwan University, Taiwan

2000-2004 **B. S. degree**

Department of Entomology, National Chung Hsing University, Taiwan

Certificate

- 2019
 - Taiwan Apicultural Society issued, 5th member of council (NO.: 007)
- 2017
 - Taiwan Apicultural Society issued, 4th member of council (NO.: 007)
- 2017
 - National Ilan University issued, Chief, Center for Teaching & Learning Development (NO.: 010)
- 2015
 - Taiwan Apicultural Society issued, 3rd member of council (NO.: 016)
- 2015
 - Minister of Education issued, Academic Teaching Rank Accreditation Certificate Assistant Professor (REG.NO.:140790)

Honor Received

- Sep 2014
 - Best Paper Award. The 58th Conference of the Korean Society of Sericultural Science. (Oral Presentation)



Patent Issued

- Sep 2019
 - **United States, 10407720.** Kuo, P. C. and **Nai, Y. S.**
Methods for full-length amplification of double-stranded linear nucleic acids of unknown sequences.
- Jan 2017
 - **Taiwan, I564393.** Kuo, P. C. and **Nai, Y. S.**
Methods for full-length amplification of double-stranded linear nucleic acids of unknown sequences.
- Apr 2015
 - **Taiwan, I481618.** Lo, C. F., Wang, C. H. and **Nai, Y. S.** *Molecular Markers for nosema infection.*

Project Funded

- Aug 2020-Jul 2023
 - The mechanisms of the phytoegenic for anti-microsporidiosis on honey bee (*Apis mellifera*) and its applications. Grant NO.: MOST 109-2313-B-005 -048 -MY3
Supported by the Ministry of Science and Technology (MOST), Taiwan
- Aug 2020-Jul 2021
 - Control Forcipomyia taiwana by using Muti-Sites Blocking Strategy in Its Life Cycle. Grant NO.: MOST 109-2327-B-020 -001 - **(Co-PI)**
Supported by the Ministry of Science and Technology (MOST), Taiwan
- Apr 2019-Dec 2020
 - Analysis of insecticidal microbials against red palm weevil. Grant NO. in NCHU: 108C140. **(International cooperative project with CBNU in Korea) (Co-PI)**
Supported by the Rural Development Administration, RDA, Korea
- Aug 2018-Jan 2021
 - Monitoring and study of sacbrood disease in Asian honey bee (*Apis cerana*) in Taiwan. Grant NO.: MOST 107-2313-B-197 -004 -MY3 **(Co-PI)**
Supported by the Ministry of Science and Technology (MOST), Taiwan
- Jan 2016-Dec 2016
 - Development and improvement of storage technigues for polyhedral inclusion body (PIB). Grant NO.: 105AS-13.2.3-BQ-B1.
Supported by the Bureau of Animal and Plant Health Inspection and Quarantine, the Council of Agriculture, Executive Yuan, Taiwan

Teaching Experience

- 2008-2009,
2012-2013,
2015-2018
 - Entomology
 - Genetics
 - Genetic Lab
 - Graduate Seminar
 - Microbiology
 - General Chemistry Lab
 - Animal Physiology Lab
 - Honey bee products
 - Teaching Assistant of Life Sciences and Society in Taipei National University of the Arts
- 2019
 - Advanced Insect Pathology
 - Genetics
 - Insect Microbial Control
 - Genetic Lab

Book Chapter

2017

- **Nai, Y. S.**, Huang, Y. F., Chen, T. H., Chiu, K. P. Wang, C. H. Determination of nucleopolyhedrovirus' taxonomic position. In: *Biological Control of Pest and Vector Insects*. Chapter 8: p169-p200. InTech publisher, ISBN 978-953-51-3035-2



Publication

1. **Nai, Y. S.**, T. C. Wang, Y. R. Chen, C. F. Lo, and C. H. Wang. **2009**. A new nucleopolyhedrovirus strain (LdMNPV-like virus) with a defective *fp25* gene from *Lymantria xylyna* (Lepidoptera: Lymantriidae) in Taiwan. *J. Invertebr. Pathol.* 102: 110-119. (SCI) (IF=2.5) (First author).
2. Wang, C. H., Lo, C. F., **Nai, Y. S.**, Wang, C. Y., Chen, Y. R., Huang, W. F., Chien, T. Y. and Wu, C.Y. **2009**. Honey Bee Colony Collapse Disorder. *Formosan Entomol.* 29: 119-138.
3. **Nai, Y. S.**, C. Y. Wu, T. C. Wang, Y. R. Chen, W. H. Lau, C. F. Lo, M. F. Tsai, and C. H. Wang. **2010**. Genomic sequencing and analyses of *Lymantria xylyna* multiple nucleopolyhedrovirus. *BMC genomics* 11: 116. (SCI) (IF=3.73) (First author).
4. Wang, T. C., **Nai, Y. S.***, Wang, C. Y., Solter, L. F., Chen, Y. W., Wang, C. H. and Lo, C. F. **2013**. A new microsporidium, *Triwangia caridinae* gen. nov., sp. nov. parasitizing fresh water shrimp, *Caridina formosae* (Decapoda: Atyidae) in Taiwan. *J. Invertebr. Pathol.* 112(3): 281-293. (SCI) (IF=2.5) (*Co-first author).
5. **Nai, Y. S.**, Su, P. Y., Hsu, Y. H., Chiang, C. H., Kim, J. S., Chen, Y. W. and Wang, C. H. **2014**. A new spiroplasma isolate from the field cricket (*Gryllus bimaculatus*) in Taiwan. *J. Invertebr. Pathol.* 120: 4-8. (SCI) (IF=2.5) (First author) (Cover photo).
6. Lee, S. J., Kim, S. H., **Nai, Y. S.**, Je, Y. H., Parker, B. L. and Kim, J. S. **2014**. Management of Entomopathogenic Fungi in Cultures of *Tenebrio molitor* (Coleoptera: Tenebrionidae). *Entomol. Res.* 44(6): 236-243 (SCI) (IF=0.5).
7. Lee, S. J., Yu, J. S., **Nai, Y. S.**, Parker, B. L., Skinner, M. and Kim, J. S. **2014**. *Beauveria bassiana* granules for management of brown planthopper, *Nilaparvata lugens* (Stål) (Hemiptera: Delphacidae) in rice. *BioControl.* 60: 263-270. (SCI) (IF=1.9).
8. Lee, S. J., Kim, S. H., Yu, J. S., **Nai, Y. S.***, and Kim, J. S.* **2015**. Biological control of Asian tiger mosquito, *Aedes albopictus* (Diptera: Culicidae) using *Metarhizium anisopliae* JEF-003 millet grain. *J. Asia-Pac. Entomol.* 18: 217-221. (SCI) (IF=0.88) (*Corresponding author).
9. **Nai, Y. S.**, Lee, S. J., Kim, S. H., Ju, H. J., Je, Y. H. and Kim, J. S. **2015**. Expression of egfp gene based on *Agrobacterium tumefaciens*-mediated transformation in *Beauveria bassiana* sensu lato ERL836. *J. Asia-Pac. Entomol.* 18(4): 677-681. (SCI) (IF=0.88) (First author).
10. Choi, S. W., Lim, J.R., Moon, H. C., Kim, J. H., Song, Y. J. **Nai, Y. S.***, and Kim J. S.* **2016**. *Aedia leucomelas* (Lepidoptera: Noctuidae)-Pathogenic *Entomophaga aulicae* (Zygomycetes: Entomophthorales) in Sweet Potato Fields. *J. Asia-Pac. Entomol.* 19(1): 71-79. (SCI) (IF=0.88) (*Corresponding author).
11. **Nai, Y. S.**, Yang, Y. T., Kim, J. S., Chen, C. Y., Wu, C. Y., Chen, Y. W.,* Wang, C. H.* **2016**. Baculoviral IAP2 and IAP3 encoded by *Lymantria xylyna* multiple nucleopolyhedrovirus (LyxyMNPV) suppress insect cell apoptosis in a transient expression assay. *Appl. Entomol. Zool.* 51(2): 305-316. (SCI) (IF=0.86) (First author).

12. Chen, Y. W., Wu, P. S., Yang, E. C., **Nai, Y. S.***, Huang, Z. Y.* **2016**. The impact of pyriproxyfen on the development of honey bee (*Apis mellifera* L.) colony in field. *J. Asia-Pac. Entomol.* 19(3): 589-594. (SCI) (IF=0.88) (***Corresponding author**).
13. Yang, Y. T., Lee, S. J., **Nai, Y. S.**, Kim, J. S.* **2016**. Up-regulation of carbon metabolism-related glyoxylate cycle and toxin production *Beauveria bassiana* JEF-007 during infection of bean bug, *Riptortus pedestris* (Hemiptera: Alydidae). *Fungal biol.* 120(10):1236-48. (SCI) (IF=2.6).
14. Kim, S. H., Lee, S. J., **Nai, Y. S.**, Yu, J. S., Lee, M. R., Yang, Y. T., Kim, J. S. **2016**. Characterization of T-DNA insertion mutants with decreased virulence in the entomopathogenic fungus *Beauveria bassiana* JEF-007. *Appl. Microbiol. Biotechnol.* 100(20): 8889-8900. (SCI) (IF=3.3)
15. Yang, Y. T., **Nai, Y. S.**, Lee, S. J., Kim, S. H., Kim, J. S.* **2016**. A novel picorna-like virus, *Riptortus pedestris* virus-1 (RiPV-1), found in the bean bug, *R. pedestris*, after fungal infection. *J. Invertebr. Pathol.* 141: 57-65. (SCI) (IF=2.5) (**Co-first author**).
16. **Nai, Y. S.**, Chen, T. H., Huang, Y. F., Midha, M. K., Shiau, H. C., Shen, C. Y., Chen, C. J., Yu, A. L., Chiu, K. P. **2017**. T Oligo-primed polymerase chain reaction (TOP-PCR): A robust method for the amplification of minute DNA fragments in body fluids. *Scientific Reports* 7 (SCI) (IF=4.2) (**First author**).
17. Ko, C. Y., Chen, Y. W.*, **Nai, Y. S.*** **2017**. Evaluating the Effect of Environmental Chemicals on Honey Bee Development from the Individual to Colony Level. . *J. Vis. Exp. (JoVE)* (122): e55296, doi:10.3791/55296. (SCI) (IF=1.2) (***Corresponding author**).
18. Yang, Y. T., Lee, M. R., Lee, S. J., Kim, S. H., **Nai, Y. S.** and Kim, J. S. **2017**. *Tenebrio molitor* Gram-negative-binding protein 3 (TmGNBP3) is essential for inducing downstream antifungal Tenecin 1 gene expression against infection with *Beauveria bassiana* JEF-007. *Insect Science*: 1-9. doi: 10.1111/1744-7917.12482.(SCI) (IF=2.0).
19. **Nai, Y. S.**, Chen, T. Y., Chen, Y. C., Chen, C. T., Chen, B. Y. and Chen, Y. W. **2017**. Revealing pesticide residues under high pesticide stress in Taiwan's agricultural environment probed by fresh honey bee pollen. *J. Econ. Entomol.*: 1-12. (SCI) (IF= 1.9) (**First author**).
20. **Nai, Y. S.**, Kim, S. H., Lee, M. R., Lee, S. J., Yang, Y. T., and Kim, J. S. **2017**. Relationship between expression level of hygromycin B resistant gene and *Agrobacterium tumefaciens*-mediated transformation efficiency in *Beauveria bassiana* JEF-007. *J. Appl. Microbiol.*: 724-731. (SCI) (IF= 2.2) (**First author**).
21. Kim, J. C., Lee, M. R., Kim, S. H., Lee, S. J., Park, S. E., **Nai, Y. S.**, Shin, T. Y., Lee, G. S. and Kim, J. S. **2018**. *Tenebrio molitor*-mediated entomopathogenic fungal library construction for pest management. *J. Asia-Pac. Entomol.* 21(1): 196-204. (SCI) (IF=0.88).
22. Chang, J. C., Lee, S. J., Kim, J. S., Wang, C. H.* and **Nai, Y. S.*** **2018**. Transient expression of foreign genes in insect cells (sf9) for protein function assay. *J. Vis. Exp. (JoVE)* 132:e56693, doi:10.3791/56693 (SCI) (IF=1.2) (***Corresponding author**).
23. **Nai, Y. S.**, Ko, C. Y., Hsu, P. S., Tsai, W. S., Chen, Y. W., Hsu, M. H., Sung, I. H. **2018**. The seasonal detection of AcSBV (*Apis cerana* sacbrood virus) prevalence in Taiwan. *J. Asia-Pac. Entomol.* 21(1): 417-422. (SCI) (IF=0.88) (**First author**).
24. Chang, J. C., Chang, Z. T., Huang, Y. F., Lee, S. J., Kim, J. S. and **Nai, Y. S.*** **2018**. Characterization and functional assay of alysiin (Lyxy-105) from *Lymantria xylyna* multiple nucleopolyhedrovirus (LyxyMNPV) *Virus Genes* 54(4): 578-586. (SCI) (IF=1.5)(***Corresponding author**).

Publication

25. Lee, S. J., Lee, M. R., Kim, S., Kim, J. C., Park, S. E., Li, D., Shin T. Y., **Nai, Y. S** and Kim, J. S.* **2018**. Genomic Analysis of the Insect-Killing Fungus *Beauveria bassiana* JEF-007 as a Biopesticide **Scientific Reports** 8 (SCI) (IF= 4.12)
26. Chen, C. T., Chen, B. Y., **Nai, Y. S.**, Chang, Y. M., Chen, K. H., and Chen, Y. W.* **2019**. Novel inspection of sugar residue and origin in honey based on the ¹³C/¹²C isotopic ratio and protein content **J. Food Drug Anal.** 27: 175-183 (SCI) (IF= 2.85)
27. Lee, S. J., Yang, Y. T., Kim, S., Lee, M. R., Kim, J. C., Park, S. E., Hossain, M. S., Shin T. Y., **Nai, Y. S.*** and Kim, J. S.* **2019**. Transcriptional response of bean bug (*Riptortus pedestris*) upon infection with entomopathogenic fungus, *Beauveria bassiana* JEF-007. **Pest Manag Sci.** 75(2): 333-345 (SCI) (IF= 3.3) (*Corresponding author)
28. Song, M. H., Yu, J. S., Kim, S. Lee, S. J., Kim, J. C., **Nai, Y. S.**, Shin T. Y.* and Kim, J. S.* **2019**. Downstream processing of *Beauveria bassiana* and *Metarhizium anisopliae*-based fungal biopesticides against *Riptortus pedestris*: Solid culture and delivery of conidia. **Biocontrol Sci. Technol.** 29(6): 1-19 (SCI) (IF= 1.22)
29. Hsieh, C. Y., Li, L. H., Rao, Y. K., Ju, T. C., **Nai, Y. S.**, Chen, Y. W.* and Hua, K. F.* **2019**. Mechanistic insight into 1 the attenuation of gouty inflammation by Taiwanese green propolis via inhibition of the NLRP3 inflammasome. **J. Cell.Physiol.** 234(4): 4081-4094 (SCI) (IF= 3.92)
30. Huang, Y. F., Chen, T. H., Chang, Z. T., Lee, S. J., Kim, J. C., Kim, J. S., Chiu, K. P. and **Nai, Y. S.*** **2019**. Genomic sequencing of *Troides aeacus* nucleopolyhedrovirus (TraeNPV) from golden birdwing larvae (*Troides aeacus formosanus*) revealing a defective *Autographa californica* NPV genomic features. **BMC Genomics (In Press)** (SCI) (IF= 3.73) (*Corresponding author).
31. Wu, C. Y.^{1*}, Huang, C. W.¹, **Nai, Y. S.¹**, Chu, P. Y., Wang, C. H.* and Ding S. T.* **2019**. A newly designed EGFP-2A peptide monocistronic baculoviral vector for concatenating the expression of recombinant proteins in insect cells. **Processes**, 7(5): 291. (Co-first author).
32. Ko, C. Y., Chiang, Z. L., Liao, R. J., Kuo, T. Y., Chen, Y. W.* and **Nai, Y. S.*** **2019**. Dynamics of *Apis cerana* sacbrood virus (AcSBV) prevalence in *A. cerana* in Northern Taiwan and demonstration of its infection in *A. mellifera*. **J. Econ. Entomol.**, 112(5):2055-2066. (SCI)(IF= 1.93) (*Corresponding author).
33. Chang, Z. T., Ko, C. Y., Yen, M. R., Chen, Y. W., **Nai, Y. S.*** **2020**. Screening of Differentially Expressed Microsporidia Genes from *Nosema ceranae* Infected Honey Bees by Suppression Subtractive Hybridization. **Insects**, 11(199), doi:10.3390/insects11030199 (SCI)(IF= 1.93) (*Corresponding author).
34. Yang, Y. T., Lee, S. J., **Nai, Y. S.***, and Kim, J. S.* **2020**. Complete genome sequence of *Riptortus pedestris* virus-2, a novel Putative RNA virus of the bean bug, *R. pedestris*. **Microbiology Resource Announcements**, 9(21), e01584-19. (Other) (*Corresponding author).
35. **Nai, Y. S.*** and Lo, C. M. **2020**. Persistent PnV (*Perina nuda* virus) infection in a heterologous *Lymantria xylyna* cell line, NTU-LY. **Biocontrol Sci. Technol.** <https://doi.org/10.1080/09583157.2020.1774043>. (SCI)(IF= 1.22) (*Corresponding author).
36. Li, Y. H., Huang, Y. F., Chen, T. H., Wu, S. S., Tang, H. C., Hsiao, C. Y., Huang, L. C., Chang, J. C., Chiu, K. P., and **Nai, Y. S.*** **2020**. Comparison of gut microbiota of healthy and unhealthy walking sticks, *Phasmotaenia lanyuhensis*. **Arch. Insect Biochem. Physiol.**, 105:e21749. (IF= 1.56; 38/101= 37.62%) (*Corresponding author).
37. Lin, C.Y., Lee, C.C., **Nai, Y. S.**, Hsu, H. W., Lee, C. Y., Tsuji K. and Yang, C. C. S. **2020**. Deformed Wing Virus in Two Widespread Invasive Ants: Geographical Distribution, Prevalence, and Phylogeny. **Viruses**, 12, 1309; doi:10.3390/v12111309 (IF=3.82; 12/37= 32.43%).

Publication

38. Chang, J. C., Chang, Z. T., Ko, C. Y., Chen, Y. W.* and Nai, Y. S.* 2021. Genomic sequencing and analysis of sacbrood viruses from *Apis cerana* and *Apis mellifera* in Taiwan. *Pathogens*, 10(1) 10(1), 14; <https://doi.org/10.3390/pathogens10010014> (IF=3.02; 65/135= 48.15%) (Co-Corresponding author).
39. Nai, Y. S., Huang, Y. C., Yen, M. R., Hsieh, C. J. and Chen, P. Y. 2021. Diversity of fungal DNA methyltransferases and their association with DNA methylation patterns. *Front. Microbiol.*, 11:616922. doi: 10.3389/fmicb.2020.616922 (IF= 4.24; 34/136= 25%) (Co-First author).
40. Chang, J. C., Wu, S. S., Yang, Y. H., Tsai, Y. F., Li, Y. H., Tseng, C. T., Tang L. C. and Nai, Y. S.* 2021. Construction of entomopathogenic fungal library from soil samples for primary evaluation of pest management potentials (Accepted). (*Corresponding author).