Babür Erdem, PhD

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EDUCATION

PhD, Biology (2024), Middle East Technical University, Department of Biological Sciences, Ankara, Türkiye
Thesis: *Investigation of the Effects of Lithium on Locomotor Activity, Circadian Rhythm, and Learning Using Computational Methods in Honey Bees*
MSc, Biology (2018), Middle East Technical University, Department of Biological Sciences, Ankara, Türkiye
Thesis: *Differences in Learning Performance and Related Behaviors Across Three Honey Bee Subspecies from Turkey*
BSc, Biology (2015), Middle East Technical University, Department of Biological Sciences, Ankara, Türkiye

WORK EXPERIENCE

Visiting Scholar, Michigan State University, Department of Entomology (October 2026 – Ongoing)
Postdoctoral Researcher (Postdoctoral Research Program of the Council of Higher Education of Türkiye), Middle East Technical University, Center for Robotics and Artificial Intelligence (ROMER) (June 2025 – October 2026)
Researcher, Middle East Technical University, Center for Robotics and Artificial Intelligence (ROMER) (December 2021 – June 2025)
Founder & CEO, Vitaliter Natural Sciences and Engineering R&D Ltd. (March 2016 – November 2018)

PUBLICATIONS

PUBLICATIONS in SCI JOURNALS

1. Gultekinoglu, E., **Erdem, B.,** Botasun, A., Arslan, O. C., Sevin, S., Gozen, A. G., Alemdar, H., Sahin, E., & Turgut, A. E. (2026). FloBuzz: a modular feeder system for automated aversive conditioning in bees. *PLOS One, 21*(10), e0361207. https://doi.org/10.1371/journal.pone.0361207 (**Q2**)
2. Tutun, H., Sevin, S., Taş, P., Ozgenc Cinar, O., **Erdem, B.**, Ceylan, A., & Keskin, E. (2026). Chronic oral toxicity of lithium citrate in honeybees (Apis mellifera L.): Impacts on survival, midgut histopathology and gut microbiota. *The Science of Nature, 113*, 132. https://doi.org/10.1007/s00114-026-02179-z (**Q2**)
3. Sevin, S., Tutun, H., **Erdem, B.**, Arslan, O. C., Okuyan, S., Ozgenc Cinar, O., & Ceylan, A. (2026). The effects of infusion of wormwood (Artemisia absinthium) and European red pine (Pinus sylvestris) on honey bee health and against nosemosis. *Apidology, 57*, 59. https://doi.org/10.1007/s13592-026-01295-z (**Q1**)
4. Sevin, S., Tutun, H., Miloudi, S., Arslan, O. C., Skaou, A., **Erdem, B.**, El Mouden, E. H., Vural, N., Abbad, A., Kaymak, S., Alemdar, H., & Aglagane, A. (2026). Efficacy and safety of Moroccan and Turkish essential oils against Varroa destructor: varroacidal potency, locomotor activity impact, and mechanistic insights via molecular docking. *Experimental and Applied Acarology, 96*(3), 40. https://doi.org/10.1007/s10493-026-01134-x (**Q2**)

5. **Erdem, B.**, Fidan, I., Turgut, A. E., Sahin, E., Gozen, A. G., & Alemdar, H. (2026). Specific wavelengths of light modulate honey bee locomotor activity. *Scientific Reports, 16*(1), 9037. https://doi.org/10.1038/s41598-025-34255-1 (**Q1**)
6. **Erdem, B.**, Ince, A., Sevin, S., Arslan, O. C., Gozen, A. G., Giray, T., & Alemdar, H. (2026). Api-TRACE: A system for honey bee tracking in a constrained environment to study bee learning process and the effect of lithium on learning. *Computers and Electronics in Agriculture, 241*(1), 111236. https://doi.org/10.1016/j.compag.2025.111236 (**Q1**)
7. Ulrich, J., Stefanec, M., Rekabi-Bana, F., Fedotoff, L., Roucek, T., Gundeger, B., Saadat, M., Blaha, J., Janota, J., Hofstadler, D., Zampachu, K., Keyvan, E. E., **Erdem, B.**, Sahin, E., Alemdar, H., Turgut, A., Arvin, F., Schmickl, T., & Krajnik, T. (2024). Autonomous tracking of honey bee behaviors over long-term periods with cooperating robots. *Science Robotics, 9*(95), eadn6848. https://doi.org/10.1126/scirobotics.adn6848 (**Q1**)
8. Ekici, S., Bozkaya, O., Sevin, **Erdem, B.**, Arslan, O. C., Cinar, O. O., Bozkaya, E., & Ekici, H. (2024). Investigation of the biological activity and toxicity of bioactive silver nanoparticles synthesized via Vitex agnus-castus seed extract on honey bees. *Veterinary Research Communications, 48*(6), 3813-3821. https://doi.org/10.1007/s11259-024-10550-6 (**Q2**)
9. **Erdem, B.**, Arslan, O. C., Sevin, S., Gozen, A. G., Agosto-Rivera, J. L., Giray, T., & Alemdar, H. (2023). Effects of lithium on locomotor activity and circadian rhythm of honey bees. *Scientific Reports, 13*(1), 19861. https://doi.org/10.1038/s41598-023-46777-7 (**Q1**)
10. Arslan, O. C., **Erdem, B.**, Somel, M., Giray, T., & Kence, M. (2023). Effects of coumaphos on locomotor activities of different honeybee (Apis mellifera L.) subspecies and ecotypes. *Apidologie, 54*(4), 39. https://doi.org/10.1007/s13592-023-01017-9 (**Q1**)
11. Arslan, O. C., Sevin, S., & **Erdem, B.** (2023). Practical protocol for honey bee immobilization for oral administration of drugs and pathogens. *Journal of Apicultural Research, 62*(4), 932-935. https://doi.org/10.1080/00218839.2021.2014645 (**Q2**)
12. Sevin, S., Bommuraj, V., Chen, Y., Afik, O., Zarchin, S., Barel, S., Arslan, O. C., **Erdem, B.**, Tutun, H., & Shimshoni, J. A. (2022). Lithium salts: assessment of their chronic and acute toxicities to honey bees and their anti-Varroa field efficacy. *Pest Management Science 78*(11), 4507-4516. https://doi.org/10.1002/ps.7071 (**Q1**)
13. Kirman, E.A., Asar, N. V., **Erdem, B.**, Turkyılmaz, I. (2022). Effects of abutment length and platform size on the retention of implant-supported CAD/CAM crowns using six different cements. *Journal of Dental Sciences, 17*(1), 601-603. https://doi.org/10.1016/j.jds.2021.04.013 (**Q1**)

PUBLICATIONS in TURKISH-INDEXED JOURNALS

1. **Erdem, B.**, & Özkök, A. (2017). Can food supplement produced from apilarnil be alternative to testosterone replacement therapy? *Hacettepe Journal of Biology and Chemistry, 45*(4), 635 – 638. DOI: 10.15671/HJBC.2018.207

CONFERENCE PAPERS in SCI

1. Botasun, A., **Erdem, B**., Gültekinoğlu, E., Turgut, A.E., & Şahin, E. (2026). A social interaction model for forager task allocation in honey bees. In: Groß, R., *et al.* Swarm Intelligence. ANTS 2026. *Lecture Notes in Computer Science*, vol 16515. Springer, Cham. https://doi.org/10.1007/978-3-032-26123-6_3 (**Q4**, Full text, Oral presentation)

2. Sağlıcan, E., Dönertaş, M., Rohlfs, R., Özkurt, E., Hu, H., Neme, R., **Erdem, B**., Khaitovich, P., & Somel, M. (2017). Mechanisms of convergent testis transcriptome evolution in primates. *American Journal of Physical Anthropology, 162*, 364. https://doi.org/10.1002/ajpa.23210 (**Q1**, Meeting abstract, Oral presentation)

PREPRINTS

1. **Erdem, B.**, Sevin, S., Arslan, O. C., Gozen, A. G., Alemdar, H., Turgut, A. E., Giray, T., & Sahin, E. (2026). Caste-specific proboscis extension responses in honey bees to sucrose and royal jelly stimuli. *bioRxiv*. https://doi.org/10.64898/2026.01.23.701277
2. Yapar, E., Sağlıcan, E., Dönertaş H. M., Özkurt, E., Hu, H., Guo, S., **Erdem, B.**, Rohlfs, R. V., Khaitovich, P., Somel, M. (2021). Convergent evolution of primate testis transcriptomes reflects mating strategy. *bioRxiv.* https://doi.org/10.1101/010553

PATENT

1. **Erdem, B.,** Arslan O. C., & Mulayim M. S. (2018). *Turkish Patent No. TR 2016 14275 B "Separation of apilarnil lipid extract and its use as a testosterone enhancer"* Ankara: Turkish Patent and Trademark Office.

PROJECTS

PROJECT MANAGER

1. *Autopol: Development of Automated Pollen Identification and Flora Tracking System* (September 2026 – Ongoing). Supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under the 1001 program. Project ID: 126R047 (Budget: $ 77,210)
2. *Development of a Biosensor Using Honey Bees for Detection of Explosives and Narcotic Substances* (July 2016 – September 2017). Supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under the 1512 program. Project ID: 2150043 (Budget: $ 51,725)
3. *Effects of Light and Serotonin on Sex Determination in Water Fleas (Daphnia magna)* (September 2013 – September 2014). Supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under the 2209-A program. Project ID: 1919B011301375 (Budget: $ 750)

RESEARCHER

1. *RoboRoyale: ROBOtic Replicants for Optimizing the Yield by Augmenting Living Ecosystems* (December 2021 - Ongoing). Supported by EU Horizon 2020 FET Open. Grant agreement ID: 964492. (Project coordinator: Farshad Arvin, University of Durham. Local project manager: Erol Sahin, METU / Budget: € 3,269,939)
2. *Study of Behavioral Interactions and Nutrition of Queen and Worker Bees to Determine Queen Bee Health and Needs* (June 2021 – June 2022). Supported by METU Scientific Research Projects Coordination Unit. Project ID: BAP-HDESP-312-2021-10868 (Project Manager: Hande Alemdar / Budget: $ 1,175)

CONSULTANT

1. *Museum Research: Cenozoic Stratigraphy and Paleogeography of Türkiye* (January 2026 – December 2026). Supported by Mineral Research and Exploration General Directorate of Türkiye (MTA). Project ID: 2026-08-160-1-(01-1) (Project Manager: Müjde Gürsoy)

AWARD

1. **Erdem, B.** Middle East Technical University Thesis Award, Organized by METU. September 28, 2026, Ankara, Türkiye.
2. **Erdem, B**., Akpolat, M. T., & Arslan, O. C. (Kovan Team) *"Development of a biosensor for detecting explosives and narcotics using honey bees."* Special Prize in the IDEA Category of the "New Ideas New Businesses" Technopreneurship Program, Organized by METU Technopolis and METU. December 5, 2015, Ankara, Türkiye.

SCHOLARSHIP

1. Scientific and Technological Research Council of Türkiye - TÜBİTAK BİDEB 2219 - Postdoctoral Research Fellowship Program Abroad (October 2026 – October 2027)
2. Scientific and Technological Research Council of Türkiye - TÜBİTAK BİDEB 2250 Graduate Performance Scholarship (September 2022 – November 2024)
3. Project assistant. Hive 4.0: Artificial intelligence-based objective approaches in honeybee monitoring. Middle East Technical University, Department of Computer Engineering (May 2022 – November 2024). Supported by TÜBİTAK
4. The Council of Higher Education - YOK 100/2000 Doctoral Fellowship in Bioinformatics – Biostatistics field (2019 – 2021)
5. Project assistant. Investigation of the neural basis of attention in the fruit fly. TOBB Economy and Technology University, Psychology Department (December 2017 – July 2018). Supported by TÜBİTAK

CONFERENCE PRESENTATIONS

INTERNATIONAL CONFERENCE PRESENTATIONS

1. **Erdem, B.**, Arslan, O. C., Sevin, S., Gödelek, O., Gözen A. G., Agosto Rivera, J. L., Giray, T. & Alemdar, H. "*Effect of lithium on locomotor activity, circadian rhythm and social behaviors of honeybees.*" 47th Apimondia International Apicultural Congress. August 24-28, 2022. İstanbul, Türkiye. Abstract Book: p 83 (Oral Presentation) https://zenodo.org/records/14633093
2. Roboroyale Consortium. "*Robotic replicants for improving queen bee health and persistence of the honey bee colony.*" 47th Apimondia International Apicultural Congress. August 24-28, 2022. İstanbul, Türkiye. (Poster Presentation) https://zenodo.org/records/14633093
3. **Erdem, B.**, Arslan, O. C., Kence, M., Somel, M., & Giray, T. "*Determining the differences of learning abilities and behaviors between the three honey bee subspecies."* 45th Apimondia International Apicultural Congress. September 29 – October 4, 2017. İstanbul, Türkiye. Abstract Book: p 205 (Poster Presentation)
4. Parvizi, P., Turan, Z. G., Özkurt, E., Baloğlu, O., **Erdem, B**., Karaca, M., Erbaba, B., Burduroğlu, H. C., Doğru, E., Somel, M. *"Testing the hypothesis that chronic stress accelerates brain aging in a mouse model."* 3rd International Congress of the Molecular Biology Association of Türkiye, organized by İzmir Institute of Technology & Molecular Biology Association of Türkiye. September 10-12, 2014. İzmir, Türkiye. Abstract Book: p 186 (Poster Presentation)

NATIONAL CONFERENCE PRESENTATIONS

1. Karapunar, B., Gursoy, M., **Erdem, B.** "*Permian-Triassic extinction event, Taskent (Konya) geosite proposal*." 77th Geological Congress of Türkiye, organized by Chamber of Geological Engineers of Türkiye, April 14-18, 2025, Ankara, Türkiye. Abstract Book: p 77 (Poster presentation in Turkish)

2. **Erdem, B.** *"Aesthetic perception existing within biological constraints."* Mersin Aesthetics Symposium, organized by Mersin Municipality. February 8-10, 2024. Mersin, Türkiye. Symposium Book: p 167-169 (Oral presentation in Turkish)
3. **Erdem, B**., Mandacı, B. C., Kence, M., Beklioğlu, M. "*The effect of serotonin in hypoxia induced hemoglobin producing pathway in water fleas (Daphnia magna)."* Ecology and Evolutionary Biology Symposium, organized by Ecology and Evolutionary Biology Society of Türkiye & İstanbul Technical University. July 11-13, 2017. İstanbul, Türkiye. Abstract Book: p 40 (Poster Presentation)
4. **Erdem, B**., Usal, K. A., & Hohenberger, A. *"Smell recognition and odor – shape matching."* 4th International Symposium on Brain and Cognitive Science, organized by Hacettepe University. April 30, 2017. Ankara, Türkiye. (Poster Presentation)
5. **Erdem, B**. *"Daphnia: a rising model organism*." Laboratory Animal Science 3rd National Congress, organized by Erciyes University. September 26-28, 2013. Kayseri, Türkiye. Abstract Book: pp 68-69 (Oral presentation in Turkish)
6. **Erdem, B**. *"Biological origins of obesity and food-based regulations for prevention."* Turkish 11th Food Congress, organized by Mustafa Kemal University & The Association of Food Technology. October 11-12, 2012. Hatay, Türkiye. Abstract Book: p 18 (Oral presentation in Turkish)

TRAININGS & CERTIFICATES

1. *T-Jump Entrepreneurship Accelerator Camp*, February 9-19, 2016. METU Technopolis, San Francisco, USA
2. *New Ideas New Businesses Technopreneurship Program*, June – September 2015. METU Technopolis, Ankara, Türkiye
3. *Mt. Erciyes & Sultan Reeds Nature Education Certificate*. August 2010. Erciyes University & TÜBİTAK, Kayseri, Türkiye

LANGUAGE and COMPUTER SKILLS

Turkish, English, Python, R, Matlab, SPSS