

# 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

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 - Ongoing)  
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

- Sevin, S., Tutun, H., **Erdem, B.**, Arslan, O. C., Okuyan, S., Ozgenc Cinar, O., Ceylan, A. (Accepted). The effects of infusion of wormwood (*Artemisia absinthium*) and European red pine (*Pinus sylvestris*) on honey bee health and against noseimos. *Apidology* (Q1)
- 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)
- 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)
- 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)
- 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., & Krajník, 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)

6. 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)
7. **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)
8. 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)
9. 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)
10. 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)
11. Kirman, E.A., Asar, N. V., **Erdem, B.**, Turkyilmaz, 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

#### BOOK CHAPTER

1. Botasun, A., **Erdem, B.**, Gültekinoglu, 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](https://doi.org/10.1007/978-3-032-26123-6_3)

#### CONFERENCE PAPERS in SCI

1. Sağlıcan, E., Dönertaş, M., Rohlf, 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. 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. *bioRxiv*. <https://doi.org/10.64898/2026.02.08.704633>

2. **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>
3. Yapar, E., Sağlıcan, E., Dönertaş H. M., Özkurt, E., Hu, H., Guo, S., **Erdem, B.**, Rohlf, 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. *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)
2. *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)

## SCHOLARSHIP

1. Scientific and Technological Research Council of Türkiye - TÜBİTAK BİDEB 2250 Graduate Performance Scholarship (September 2022 – November 2024)
2. 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
3. The Council of Higher Education - YOK 100/2000 Doctoral Fellowship in Bioinformatics – Biostatistics field (2019 – 2021)

4. 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

## AWARD

**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.

## 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.*" 47<sup>th</sup> 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.*" 47<sup>th</sup> 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.*" 45<sup>th</sup> 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., Burduloğlu, H. C., Doğru, E., Somel, M. "*Testing the hypothesis that chronic stress accelerates brain aging in a mouse model.*" 3<sup>rd</sup> 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. Karapınar, B., Gursöy, M., **Erdem, B.** "*Permian-Triassic extinction event, Taskent (Konya) geosite proposal.*" 77<sup>th</sup> 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.**, 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)
3. **Erdem, B.**, Usal, K. A., & Hohenberger, A. "*Smell recognition and odor – shape matching.*" 4<sup>th</sup> International Symposium on Brain and Cognitive Science, organized by Hacettepe University. April 30, 2017. Ankara, Türkiye. (Poster Presentation)
4. **Erdem, B.** "*Daphnia: a rising model organism.*" Laboratory Animal Science 3<sup>rd</sup> National Congress, organized by Erciyes University. September 26-28, 2013. Kayseri, Türkiye. Abstract Book: pp 68-69 (Oral presentation in Turkish)

5. **Erdem, B.** “*Biological origins of obesity and food-based regulations for prevention.*” Turkish 11<sup>th</sup> 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