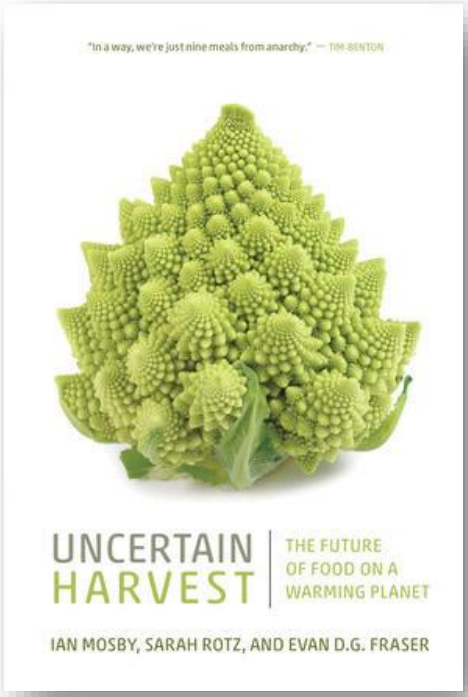
NEWS

Congratulations to KC Galang, a master's student in the Zayed Lab! KC's talk titled "*The molecular basis of altruistic and selfish aggression in honey bees*" won the Entomological Society of Canada's President Prize for best student talk in the area of Social Insects.

ESC-ESO 2021

Monday, November 15 to Thursday, November 18, 2021



Dr. Sarah Rotz, a BEEc Faculty Associate, has recently coauthored a book on the future of food on a warming planet…

"A menu for an edible future.

In a world expected to reach a staggering population of 10 billion by 2050, and with global temperatures rising fast, humanity must fundamentally change the way it grows and consumes food. Uncertain Harvest brings together scientists, chefs, activists, entrepreneurs, farmers, philosophers, and engineers working on the global future of food to answer questions on how to make a more equitable, safe, sustainable, and plentiful food future.

Navigating cutting-edge research on the science, culture, and economics of food, Ian Mosby, Sarah Rotz, and Evan D. G. Fraser present a roadmap for a global food policy, while examining eight foods that could save us: algae, caribou, kale, millet, tuna, crickets, milk, and rice."

OPPORTUNITIES

Would you like to focus on your research? BEEc is here to help you! If you would like support with your next grant application, including budget creation, application editing, project management, knowledge mobilization, etc., please reach out to Carolyn (daviesca@yorku.ca) with your request!

Pollinator Partnership's 2022 Honey Bee Health Improvement Project Grant Cycle is now open! Priority areas include pathogens/pests shared between bee species, nutrition effects on health, pesticides, genetics, environmental variables, and the development of diagnostics. Several awards of a maximum of $10,000 each are anticipated. Applications due January 21, 2022!

Weston Family Awards in Northern Research 2022 competition is open! Awards amounts and duration vary by program (Masters, PhD, Post-Doc) from $15,000-$100,000 over two years. All applications should be submitted through the Scholarship Partners Canada (SPC) online portal. Applications due January 27, 2022 – so get out there and find some northern bees!

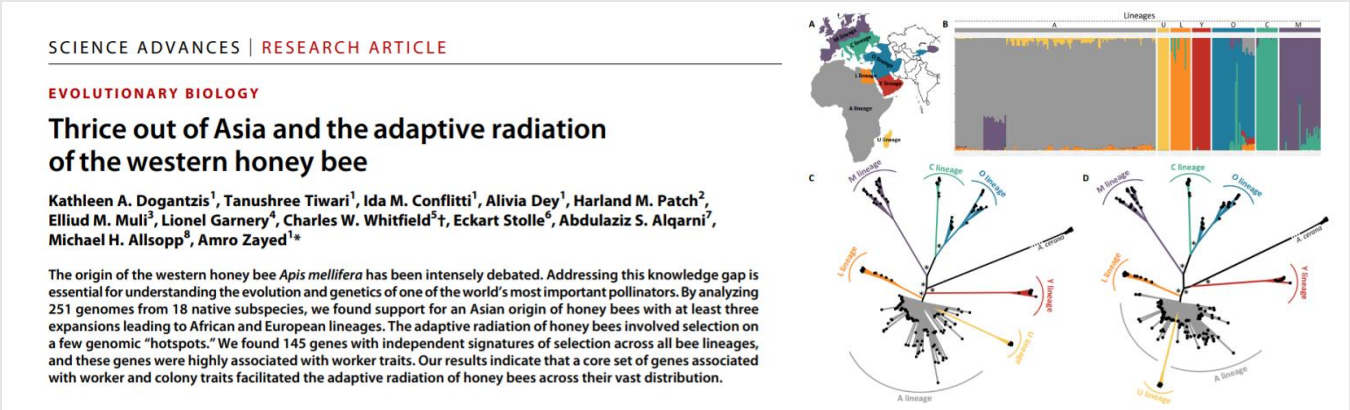
Genome Canada: Genomic Applications Partnership Program (GAPP) funds downstream research and development (R&D) projects that address real world opportunities and challenges defined by "Receptor" organizations such as industry, government, or not-for-profit entities. Award is valued at $300K-$6M over 3 years. Round 23 Draft EOI due to Ontario Genomics Feb 8, 2022.

ASSOCIATE PUBLICATIONS

Bixby, M. E. F., Polinsky, M., Scarlett, R., Higo, H., Common, J., Hoover, S. E., Foster, L. J., **Zayed, A.,** Cunningham, M., Guarna, M. M. (2021). Impacts of COVID-19 on Canadian Beekeeping: Survey Results and a Profitability Analysis. *Journal of Economic Entomology*, 114 (6), 2245–2254. https://doi.org/10.1093/jee/toab180

Conrad, K. M., Peters, V. E., & **Rehan, S. M**. (2021). Tropical bee species abundance differs within a narrow elevational gradient. *Scientific Reports*, 11(1), 23368. https://doi.org/10.1038/s41598-021-02727-9

Dogantzis, K. A., **Tiwari, T., Conflitti, I. M**., Dey, A., Patch, H. M., Muli, E. M., Garnery, L., Whitfield, C. W., Stolle, E., Alqarni, A. S., Allsopp, M. H., & **Zayed, A**. (2021). Thrice out of Asia and the adaptive radiation of the western honey bee. *Science Advances*, 7(49), eabj2151. https://doi.org/10.1126/sciadv.abj2151



SCIENCE ADVANCES | RESEARCH ARTICLE

EVOLUTIONARY BIOLOGY

Thrice out of Asia and the adaptive radiation of the western honey bee

Kathleen A. Dogantzis[1], Tanushree Tiwari[1], Ida M. Conflitti[1], Alivia Dey[1], Harland M. Patch[2], Elliud M. Muli[3], Lionel Garnery[4], Charles W. Whitfield[5]†, Eckart Stolle[6], Abdulaziz S. Alqarni[7], Michael H. Allsopp[8], Amro Zayed[1]*

The origin of the western honey bee *Apis mellifera* has been intensely debated. Addressing this knowledge gap is essential for understanding the evolution and genetics of one of the world's most important pollinators. By analyzing 251 genomes from 18 native subspecies, we found support for an Asian origin of honey bees with at least three expansions leading to African and European lineages. The adaptive radiation of honey bees involved selection on a few genomic "hotspots." We found 145 genes with independent signatures of selection across all bee lineages, and these genes were highly associated with worker traits. Our results indicate that a core set of genes associated with worker and colony traits facilitated the adaptive radiation of honey bees across their vast distribution.