HUNTING & SEED SIZE:
A TALE OF EVOLUTION IN THE PRESENT

Some questions that frequently arise in discussions on evolution are — how fast do traits evolve in different organisms? Can we study evolution in the present? Do human actions impact evolution of traits in other organisms? A 2013 study by a group of scientists (Galetti et al.) offers some interesting insights.

Background: South America has rich forests with a vast diversity of fruit-eating birds. In some forests, hunting by humans has led to **defaunation** (the removal of larger-sized animals from the ecosystem). Galetti et al. were interested in investigating if this phenomenon could lead to the selection of a certain fruit size in populations of a bird–dispersed palm species *(Eutrepe edulis)* in forests.

Their hypothesis: Defaunation leads to the removal of large-sized birds, and smaller birds can disperse only small-sized seeds. The small-sized seeds will grow up to produce more small-seeded palms. Therefore, defaunated forests are likely to be dominated by small-seeded palms. In other words, smaller-sized seeds will be more frequently observed in the palms of defaunated forests. How did Galetti et al. test their hypothesis?

The study: The researchers sampled the seed sizes of *E. edulis* in 22 defaunated and intact forests in Brazil. They calculated the frequency of occurrence of different seed sizes. These were compared with the maximum size of a seed that could be eaten and dispersed by small frugivorous (fruit eating) birds (like thrushes) to see if the most seeds dispersed were by smaller or larger frugivorous birds. What did Galetti et al. observe?

The results:

- Smaller-sized seeds (smaller than the maximum size that could be eaten by small birds) were more frequently observed in *E. edulis* populations from defaunated forests.
- Both large- and small-sized seeds were frequently observed in *E. edulis* populations from non-defaunated forests.

Their inference: This led the researchers to conclude that the removal of large-sized frugivorous birds from these forest ecosystems has led to the dispersal, survival, and reproduction of only small–sized seeds in defaunated forests. In other words, small seed size has been selected for in *E. edulis* in defaunatated forests. This is an example of the rapid evolution of a plant trait in the present day.

Reference: Functional Extinction of Birds Drives Rapid Evolutionary Changes in Seed Size. Mauro Galetti, Roger Guevara, Marina C. Côrtes, Rodrigo Fadini, Sandro Von Matter, Abraão B. Leite, Fábio Labecca, Thiago Ribeiro, Carolina S. Carvalho, Rosane G. Collevatti, Mathias M. Pires, Paulo R. Guimarães Jr., Pedro H. Brancalion, Milton C. Ribeiro & Pedro Jordano. *Science*, 31 May 2013: Vol. 340, Issue 6136, pp. 1086-1090. URL: https://www.researchgate.net/publication/236977795_Functional_Extinction_of_Birds_Drives_Rapid_Evolutionary_Changes_in_Seed_Size.

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