

# Hawaiian fruit flies had multiple ancestors

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*Scaptomyza pallida*, one of the fruit fly species. Credit: Hokkaido University

A team from Hokkaido University and Ehime University has discovered that Hawaiian drosophilids (fruit flies) had plural ancestors that hailed from continents, refuting the "single Hawaiian origin" hypothesis.

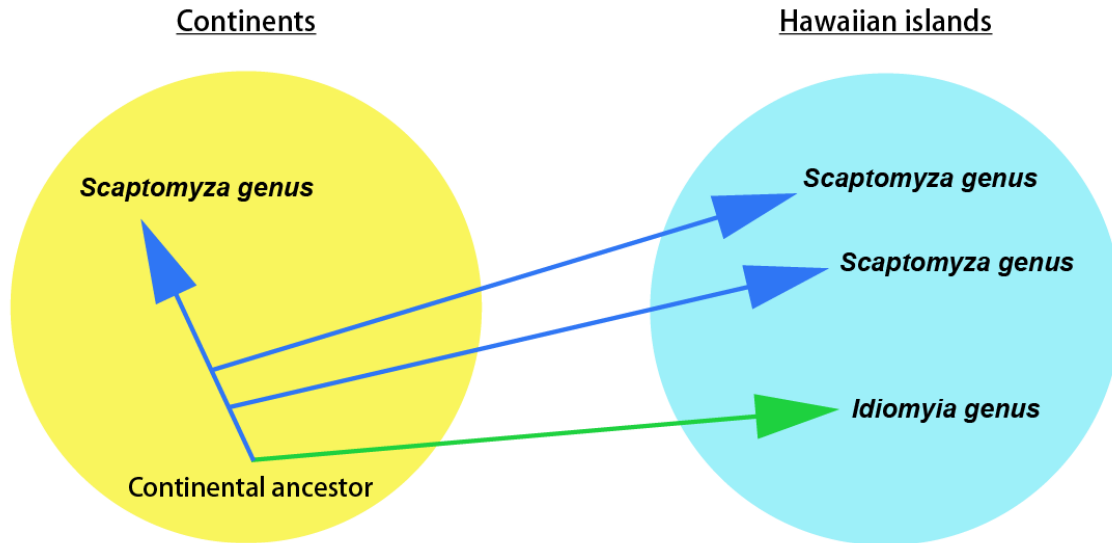
Like African cichlids and the Darwin finches found on the Galapagos

Islands, Hawaiian drosophilids are a striking example of a single lineage diversifying by adapting to a wide variety of environments. The Hawaiian drosophilids are broadly divided into two main groups: the Hawaii-endemic genus *Idiomyia* and the *Scaptomyza* genus. About 60 percent of *Scaptomyza* species are unique to the Hawaiian Islands, with the other 40 percent distributed around the world.

Until now, the "single Hawaiian origin" hypothesis has held sway. This idea proposes that the different Hawaiian drosophilids diverged from a sole common ancestor that once colonized the Hawaiian Islands, then the Hawaiian *Scaptomyza* subsequently moved back to different continents.

However, by newly determining the DNA sequence information of 11 kinds of non-Hawaiian *Scaptomyza* species and analysing it along with existing sequence information, the researchers reconstructed the phylogeny, and estimated ancestral distributions and divergence times. The team thus inferred that the Hawaiian drosophilids had plural continental ancestors that independently migrated to Hawaii at different times.

The exact route taken by the [ancestors](#) of the Hawaiian drosophilids remains unknown, but the research team, led by Assistant Professor Toru Katoh of Hokkaido University's Faculty of Science, hopes to unravel the mystery through further related studies, including research into non-Hawaiian drosophilids endemic to the Pacific Islands.



Hawaiian drosophilids had multiple ancestors that migrated from continents: Phylogenetic analysis of DNA sequences showed that ancestors of the *Idiomya* genus migrated to Hawaii once, while ancestors of the *Scaptomyza* genus migrated twice. Credit: Hokkaido University

**More information:** Toru Katoh et al. Multiple origins of Hawaiian drosophilids: Phylogeography of Hardy (Diptera: Drosophilidae), *Entomological Science* (2016). [DOI: 10.1111/ens.12222](https://doi.org/10.1111/ens.12222)

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