

Hybridization can give rise to different genome combinations

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Researchers have for the first time determined that hybridization between two bird species can give rise to several novel and fully functional hybrid genomic combinations. This could potentially be because hybrid species emerged through independent hybridisation events between the same parent species on different islands.

Swedish and Norwegian researchers have studied island populations of a hybrid species, the Italian sparrow (*Passer italiae*) from Crete, Corsica, Sicily and Malta. The researchers find that Italian sparrow populations from different islands probably result from independent hybridization events between their parent species, the house sparrow and Spanish sparrow.

"The populations on the islands have very different genetic compositions. This is consistent with independent hybridisation events between the parent species. We have demonstrated that hybridisation between the same parent species can lead to great variation within a new [hybrid species](#)", says Anna Runemark, biologist at Lund University in Sweden.

The researchers have also discovered limitations to which genetic combinations that work together. The Italian sparrow always inherits certain genes from the house sparrow, regardless of whether the house or Spanish sparrow contributes the majority of genes to the hybrid. These house sparrow genes are likely required to form a functional hybrid. Among the genes that Italian sparrows always inherit from the house

sparrow are those that repair DNA. These gene classes are likely to give rise to reproductive isolation between species, and may thus be important when new species are formed.

"Genes that are always inherited from the [house sparrow](#) are probably important in order for the hybrid to survive and reproduce. Our discovery shows that there are limitations to which combinations of genes work together", says Anna Runemark, continuing:

"In practice, it means that we have identified [genes](#) that are important for speciation."

Understanding the potential outcomes of hybridization helps predict possible consequences when species move to new geographic areas where they meet and mate with close relatives; for example, when [species](#) move increasingly farther north due to a warmer climate.

More information: Anna Runemark et al. Variation and constraints in hybrid genome formation, *Nature Ecology & Evolution* (2018). [DOI: 10.1038/s41559-017-0437-7](#)

Provided by Lund University

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