Migratory birds disperse seeds long distances

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Some species of plants are capable of colonising new habitats thanks to birds that transport their seeds in their plumage or digestive tract. Until recently, it was known that birds could do this over short distances, but a new study shows that they are also capable of dispersing them over more than 300 kilometres. For researchers, this function could be key in the face of climate change, allowing the survival of many species.

Birds can act as dispersers of seeds and other propagules —buds, bulbs, tubers or spores— over short distances which, in many cases, do not exceed a kilometre and a half. However, it had not been demonstrated whether they were capable of doing so over longer distances.

A team led by scientists at the Doñana Biological Station-CSIC (Spanish Council for Scientific Research) in Seville (Spain) confirmed this hypothesis due to the seeds found in the digestive tract of various species of birds hunted in the Canaries by Eleonora's falcons (Falco eleonorae) during their migration towards Africa.

"This mechanism of long-distance dispersion had not been confirmed until now, mainly due to the difficulty involved in sampling propagules transported by birds during their migratory flight. We were able to analyse it thanks to the hunting behaviour of Eleonora's falcons," Duarte Viana, researcher in the Doñana Biological Station and co-author of the study, explained to SINC.

The data, published in the journal *Proceedings of the Royal Society B*, reveal for the first time that there are species that may be excellent

dispersers of propagules over long distances of more than 300 km. These birds were flying over the sea in an area located between the Canaries and Africa, and scientists found in them seeds that belonged to a plant that was not native to the Canary Islands, which demonstrates that they are capable of promoting colonisation of distant and remote areas.

In total, researchers sampled 408 specimens of 21 species. Five birds from three different species stored 45 seeds inside them: the European pied flycatcher (Ficedula hypoleuca), the common redstart (Phoenicurus phoenicurus) and the common quail (Coturnix coturnix). The first two transported seeds of fleshy fruits (two species of the Rhamnus genus), while the common quail transported up to three different species (Rubus, Genisteae and Persicaria)..

"The best dispersers would be frugivorous birds, which eat fruit; granivorous birds, which eat seeds, such as the quail; and water birds, many of which eat the sediment of ponds. We could be talking about thousands of species of birds around the world, many of which are migratory," said Viana.

According to researchers, faced with a situation of global change, long-distance dispersers will allow many species of plants and organisms to reach new habitats that offer them optimal conditions for their survival.

New territories for plants

The seeds transported by migratory birds are defecated and deposited in the place where the birds arrive. If the new habitat is favourable to germination and the subsequent establishment of a viable population, the species of plant dispersed may successfully colonise this area, grow and reproduce.

The study was focused on three islands to the northeast of the

archipelago of the Canaries: Alegranza -from which a large part of the samples were obtained-, Montaña Clara and Roque del Este, places where Eleonora's falcon nests and towards which the trade winds usually drag the migratory birds that go from Europe to Africa. Here they are hunted, particularly in October, when there is large-scale migration.

After examining the stomach and intestine contents of the prey stored in the falcon nests, the experts demonstrate that most of the species to which the seeds belong grow more than 100 or 200km from the islands studies, and one of them, Persicaria, is not even a Canary Island.

"In the particular case of Alegranza, the likelihood of colonisation is slim since this islet has an extremely arid climate, which is unsuitable for the life of most plant species. However, other islands of the Canary archipelago may have been colonised through seeds that come from further afield, continental Africa or, more likely, the Iberian Peninsula," concluded Viana.

More information: Duarte S. Viana et al. Overseas seed dispersal by migratory birds, *Proceedings of the Royal Society B: Biological Sciences* (2016). DOI: 10.1098/rspb.2015.2406

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