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Measuring the extent of the encroaching into Europe of African species due to climate change

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The recent modification of species distributions in response to a warmer climate constitutes a major and generalized biogeographic change. One of the main drivers of the change in species distribution is the disequilibrium of the species ranges with their climatic favorability. The various approaches to the species distribution modelling assume an equilibrium of the distribution with the environment, and this hinders their applicability to the analysis of this change. Using fuzzy set theory we have studied the response to climate change of 10 African bird species in the context of the Strait of Gibraltar, where a short-distance expansion of the species' range towards the north means a major step in biogeographical terms, since the Strait is an important barrier separating North African and European fauna. All studied species have already been observed during the last decade in Spain, in some cases sporadically, in others regularly and in some others, it has even been possible to confirm the reproduction of the species in Europe; some examples of the latter case are the Long-legged Buzzard, the Little Swift and the Common Bulbul. We have also identified those areas of Southern Europe that are climatically favorable for the breeding of the set of selected African species for the period 2041-2060, which shows that southern Spain is a potential focal point for the colonization of Europe by African species. If our climate continues to warm, further arrivals of potential colonist African bird species to southern Europe are to be expected.