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Unmasking the invader: genetic identity of invasive wild boar from three minor islands off Sardinia (Italy)

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Abstract

Introduced invasive species such as the wild boar (*Sus scrofa*) represent a huge threat to the biodiversity of small islands, in that they may lead to ecological disequilibria and taxa extinctions. Additionally, if introduced populations with an alien or admixed genetic origin disperse from islands, they may jeopardize the endemic genetic diversity of mainland conspecifics through introgressive hybridization.

Despite past hybridization with local domestic pigs and introduced continental wild boar, the wild boar population of Sardinia (Italy) maintained a significant amount of genomic diversity and was thus classified as a distinct subspecies (*Sus scrofa meridionalis*) as it clustered separately from all other European *S. scrofa*. In the past few decades, however, wild boar populations of uncertain origin have appeared on three islands off the Sardinian coast.

We accordingly investigated the genetic composition of these three island wild boar populations by using a panel of 16 autosomal microsatellites and a reference dataset including domestic pig and wild boar populations from Sardinia, mainland Italy and other European regions, in order to reconstruct the history of each colonization and the possible origin of colonizers.

The genetic make-up of the three populations was found to diverge from that of Sardinia to such an extent that they could not be classified as Sardinian wild boar. In fact, their genome bore traces of multiple introductions from different source populations, as well as introgression from the domestic pig, followed by the effects of relative isolation and genetic drift. Thus, besides impacting on island biodiversity and human activities, these admixed populations can represent a threat to the endemic subspecies (*S. s. meridionalis*) inhabiting the major island on account of their proximity to the Sardinian coasts. We thereby argue for a strict control of these populations or, whereby feasible, their eradication.

Keywords: Island populations, *Sus scrofa meridionalis*, Wildlife introductions, Hybridization, Wild boar