

---

**Ecology, physiology and behaviour**

---

**Evidence of density dependence on wild boar reproduction in Mediterranean populations**Colomer, Joana<sup>1,2,3\*</sup>; Rodríguez-Teijeiro, José Domingo<sup>2,3</sup>; Rosell, Carme<sup>1,2</sup>; Massei, Giovanna<sup>4,5</sup><sup>1</sup> Minuartia, Barcelona, Spain<sup>2</sup> University of Barcelona, Faculty of Biology, Department of Evolutionary Biology, Ecology and Environmental Sciences, Barcelona, Spain<sup>3</sup> University of Barcelona, Institut de Recerca de la Biodiversitat, Barcelona, Spain<sup>4</sup> Botstiber Institute for Wildlife Fertility Control Europe, York, UK<sup>5</sup> University of York, Department of Environment and Geography, York, UK

\* jcolomer@minuartia.com

DOI: 10.20315/evmc.2025.011

Understanding factors affecting the reproductive dynamics of wild boar populations is essential for developing effective population management. Previous studies have demonstrated density dependence in wild boar population growth but the mechanisms driving this relationship remain poorly understood. This study examines key reproductive parameters—ovulation rate, litter size, intrauterine mortality, and breeding probability—and their relationship with density across five Mediterranean sites over three years (2021-2023), using data from 575 female wild boar. Generalized linear mixed models (GLMMs) assessed the effects of population density on reproductive parameters, while structural equation models (SEMs) explored density-dependent mechanisms. A long-term dataset spanning 23 years was used to further explore the relationship between density and female body mass.

Results show that higher densities are associated with lower breeding probability, while ovulation rate, litter size, and intrauterine mortality were unaffected, suggesting that the primary reproductive adjustment to varying population densities lies in whether or not a wild boar female becomes pregnant, rather than the number of offspring produced. Female body mass influenced all reproductive parameters except intrauterine mortality. SEM analyses of the three years dataset did not reveal any effect of density on female body mass. Conversely, the long-term dataset demonstrated that higher population density is associated with reduced female body mass. This highlights the importance of long-term datasets in identifying processes that short-term studies might overlook. SEM also revealed a direct effect of density on breeding probability, independent of female body mass. This effect may reflect density-dependent changes in factors such as physiology, behaviour, or social structure, which ultimately influence reproduction. Our findings highlight the complex relationship between population density and reproductive success in wild boar and offer valuable information for understanding population dynamics and informing adaptive population management.