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Factors Affecting Invasive Species Abundance: the Barbary Ground Squirrel on Fuerteventura Island, Spain

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Marta López-Darias and Jorge M. Lobo (2008) Factors affecting invasive species abundance: the Barbary ground squirrel on Fuerteventura Island, Spain. *Zoological Studies* **47**(3): 268-281. We assessed the determinants of habitat selection by the Barbary ground squirrel (*Atlantoxerus getulus*) at Fuerteventura (Canary Is., Spain). We implemented general linear model (GLM) procedures to analyze the relationships between squirrel abundances and 4 kinds of variables related to the biological requirements of the species (environment, food resources, biotic interactions, and refuge/shelter). We performed a variance partitioning analysis between the most explicative categories to explore correlation patterns. The time of year and weather conditions of the census clearly influenced the number of individuals observed. Shelter variables were the best correlates of both the abundance of squirrels and the number of their scat. Although food resources were less important, the presence of certain plant species was correlated with squirrel abundance, while general environmental variables and interactions with other mammals did not affect its distribution. These results improve our understanding of the ecology and the establishment of this highly successful introduced species, providing basic knowledge for use with future management strategies in the Canarian Archipelago.
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Key words: *Atlantoxerus getulus*, Biological invasion, Canary Is., General linear model, Habitat selection.

Much has been written to explain the successful colonization and establishment of marine and terrestrial invasive species. How this colonization and establishment occur is a complicated issue as these processes highly vary among groups. Finding a global theory is difficult since a successful invasion requires a species to pass through different stages, including transport, introduction, and establishment phases (Williamson 1996). Because social and biological mechanisms operating at each stage might differ, the influence of any trait may vary according to the stage at which it is evaluated (Kolar and Lodge 2001, Jeschke and Strayer 2006). Traits affecting the 1st 2 stages (transport and introduction) remain less explored and most likely involve numerous social aspects (see Jeschke and Strayer 2006). However, many features have been described to explain success in the establishment stage. These features can be grouped in 2 main types of factors: i) those related to the attributes of the resident community and ii) those associated with the characteristics of the invader. The attributes of the resident community include species richness, nutrient status, disturbance regime (Crawley 1987, Levine and D'Antonio 1999, Rejmánek 1999, Kneitel and Perrault 2006), competition and facilitation interactions (e.g., Holmgren et al. 1997, Rousset and Lepart 2000), and vegetation structure (e.g., Wiser et al. 1998, Miller et al. 2002). Invader characteristics related to success include the general demographics of the species (e.g.,

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