

The Conservation and Genetics of the Fen Raft Spider, *Dolomedes plantarius* (Clerk)

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Abstract

The Fen Raft Spider, *Dolomedes plantarius* (Clerk), is one of the UK's largest and rarest spiders. There are 3 populations of *D. plantarius* in the UK, the most threatened of which is the Redgrave & Lopham Fen population. Here a novel, non-invasive method of extracting DNA from skins shed by spiders during moulting is described. The skins were collected in the field between 1992 and 2008 and usable mtDNA sequences were produced from all the years. The 231 base pair mtDNA sequences were combined with sequences from Marija Vugdelić's study (2006) of the genetics of this population and used to investigate how the genetic diversity of the Redgrave & Lopham Fen population has changed between 1990 and 2008.

An AMOVA, a parsimonious network, and haplotype and nucleotide indices demonstrated that the level of genetic diversity had declined, and a sharp drop was observed between 2001 and 2002/03, coinciding with a drop in the population size of one of the sub-populations (Middle Fen) between 2000 and 2001. Alternative theories for the decrease in diversity are the effects of genetic drift on the small population or bacterial driven selective sweep.

DNA from skins was also screened for 4 endosymbiont genera (*Wolbachia*, *Rickettsia*, *Spiroplasma*, and *Cardinium*), although produced no results. Vugdelić's DNA samples were also screened and significant differences were found between the Redgrave & Lopham Fen and Pevensey Levels populations. Additionally, 2 primer pairs (Wsp and FtsZ) were used to screen for *Wolbachia* yet only 1 worked, indicating the presence of different strains and highlighting the importance of using both primer pairs.

The implications of the skin extraction, mtDNA and endosymbiont data were discussed from a conservation perspective.