



# Alien Invaders



## The Current Status of *Platorchestia platensis*

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### Introduction

Alien or invasive species are defined as 'non-indigenous species whose introduction causes or is likely to cause economic or environmental harm, reducing biodiversity' (ISAC 2006). Worldwide, marine invasions are considered the leading cause of marine extinctions and biotic homogenisation (Sala *et al.* 2000; Lockwood & McKinney 2001; Drake & Lodge 2007). One invasive species, *Platorchestia platensis* is found on beaches worldwide outcompeting the native species, reducing biodiversity which results in strandline not being decomposed. Originally recorded in the Thames Estuary, UK by Wildish and Lincoln in 1979, *P. platensis* has never been found in the UK since. The aim of my project was to investigate the status of *P. platensis* in the UK by mapping the abundance and distribution of species present in Kent.

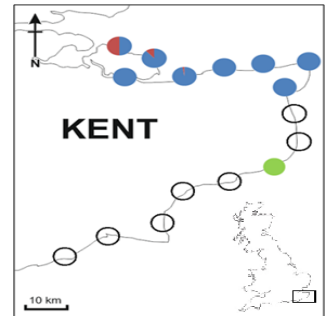


Fig.1. Percentage abundance of amphipod species found: *P. platensis*, *Orchestia gammarellus*, *Chaetogammarus marius*, and other amphipods (empty circles).

### Methodology

- 30 minute surveys at a site every 10km around Kent.
- Amphipods caught by hand and preserved in 70% IMS.
- Identification carried out under low power magnification using Spicer & Janas' (2006) classification system.
- The numbers of segments on antennae 2 in female *P. platensis* counted to explore whether the females had reproduced prior to sampling.
- Compared male gnathopod 2 in Kent *P. platensis* to other published material using scanning electron microscopy to assess whether a distinct sub-species is present.

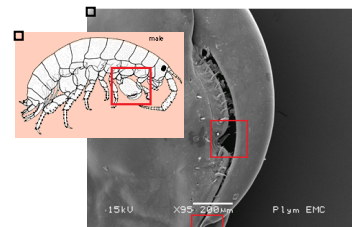


Fig.2. Male gnathopod 2 in Kent *P. platensis* has a distinct notch and a "spike-like" appendage at the end of the dactylus.

### Results

- *P. platensis* is present in north Kent coexisting with the native species *Orchestia gammarellus* (Fig.1).
- Female *P. platensis* sampled were born in March/April and had reproduced prior to sampling. This and the presence of juveniles indicates *P. platensis* is reproducing successfully in the UK.
- It was found that male Kent *P. platensis* have a distinct 'V' shaped notch and a "spike-like" appendage at the end of the dactylus on gnathopod 2 (Fig.2). This is most similar to a Danish species (Fig.3), which may have adapted in geographical isolation to become a

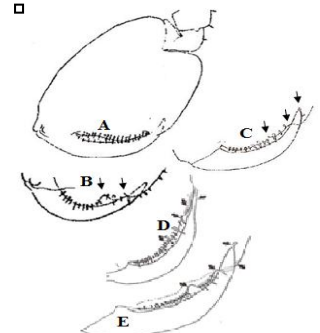


Fig.3. Male gnathopod 2 from: A. *P. japonica*, B. *P. platensis* (Japan) C. *P. platensis* (Poland) D. *P. monodi* (Ascension) E. *P. platensis* (Denmark) Adapted from: A,B,C Iwasa (1939) and D,E from Stock & Beimbaum (1994).

### How could introduction have occurred?

- Initial introduction most likely from ballast water as current transport on seaweed not possible from Denmark (Fig.4).
- Range expansion in Kent through secondary dispersal on wrack or re-introduction by ballast water as amphipods can only move up and down the beach, not along.
- However ballast water transport has only occurred in the last 100 years which is not considered long enough for significant mutation and recombination of genes.

### Conclusion

*P. platensis* is present in the UK coexisting with the native species (Fig.1). Without genetic studies its origin is unclear, however it is most morphologically similar to a Danish *P. platensis* (Fig.3). If this is the case it probably got here via ballast water. Interestingly since this study, three other invasive species have also been found at one of the sites where *P. platensis* was found suggesting ships are not offloading their ballast more than 12 nautical miles offshore as is legally required.

Fig.4. North Sea Currents. From: [www.safetyatsea.se](http://www.safetyatsea.se) (Last accessed: 09/03/12).

## References

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