EVIDENCE FOR THE DISPLACEMENT OF GAMMARUS DUEBENII BY GAMMARUS PULEX (AMPHIPODA) IN A FRESHWATER SITE IN BRITTANY, FRANCE

BY

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Populations of Gammarus duebenii Liljeborg, 1852 have been reported from fresh water in a number of sites in Britain and Western France (Hynes, 1954; Pinkster et al., 1970). However, G. duebenii is rarely present in sympatry with Gammarus pulex (Linnaeus, 1758) and it has been suggested that G. duebenii is displaced by G. pulex in fresh water localities. It has been proposed that G. duebenii is displaced due to competition with G. pulex for resources (Kinne, 1959; Pinkster et al., 1970) and the superior reproductive rate of G. pulex (cf. Hynes, 1955); and that G. duebenii is driven extinct due to predation by G. pulex upon recently moulted congeners (Dick et al., 1993). Here I present evidence that G. duebenii has been displaced by G. pulex in a freshwater site in Brittany.

Pinkster et al. (1970) studied the distribution of G. duebenii and G. pulex in 364 sites in Brittany and found that G. duebenii was predominant in Western Brittany, but that G. pulex predominated further East. A narrow zone of overlap was recorded. In this zone G. duebenii had been forced back by G. pulex and was confined to the upper reaches of the streams. In only four (1%) sites were both G. duebenii and G. pulex found in sympatry. In two of these sites only G. duebenii

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Crustaceana 68 (7)
The composition of samples of gammarids made in 1993 and 1994 from two freshwater sites in Brittany: Brasparts and Loperec. Sex ratio in brackets

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<tr>
<td><em>G. duebenii</em></td>
<td>0</td>
<td>0</td>
<td>149 (0.64)</td>
<td>146 (0.56)</td>
</tr>
<tr>
<td><em>G. pulex</em></td>
<td>89 (0.72)</td>
<td>200 (0.57)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><em>E. berillonii</em></td>
<td>45 (0.54)</td>
<td>5 (0.6)</td>
<td>25 (0.6)</td>
<td>27 (0.52)</td>
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and *G. pulex* were recorded; in the other two *Echinogammarus berillonii* (Catta, 1878) was also present. It was suggested that *G. pulex* was eliminating *G. duebenii* from freshwater and that the distribution of *G. duebenii* in Brittany was being pushed West due to displacement by *G. pulex* (cf. Pinkster et al., 1970). In contrast, *G. duebenii* and *E. berillonii* coexisted in a number of sites and competition between these species was less severe (Pinkster et al., 1970).

In 1993 and 1994, during a study of parasitism in *G. duebenii*, I visited two of the sites which Pinkster et al. (1970) had studied. Both streams form tributaries of the River Douffine. In the first, near Loperec, *G. duebenii* and *E. berillonii* were present in the 1969 study (Pinkster et al., 1970). In the second, near Brasparts, *G. pulex*, *G. duebenii* and *E. berillonii* were recorded in 1969 (Pinkster et al., 1970) and Bulnheim (1978) confirmed the presence of *G. duebenii* at this site. In 1993 and 1994 I visited these sites and made collections of Gammarids by kick sampling. I recorded the species and sex of the adult animals collected using the key in Gledhill et al. (1993).

The composition of my collections is recorded in table I. At the site near Loperec, there was no change in the species composition from 1969 to 1994. However, samples collected Brasparts in 1993 and 1994 contained only *G. pulex* and *E. berillonii*. I found no *G. duebenii* at this site in either year.

These data suggest that *G. duebenii* is now extinct from the site in Brasparts where previously it was found in coexistence with *G. pulex*. The study supports the hypothesis that *G. pulex* is eliminating and replacing *G. duebenii* in freshwater and is spreading through Brittany driving the distribution of *G. duebenii* further West (Pinkster et al., 1970).

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REFERENCES

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