

SHORT COMMUNICATIONS

FIRST RECORD OF THE AMERICAN JACK KNIFE CLAM *ENSIS DIRECTUS* ON THE FRENCH COAST OF THE NORTH SEA

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Ensis directus (Bivalvia: Solenidae) was noted for the first time along the French coast of the North Sea in June 1991. High numbers of post larvae after a period of northerly winds indicate that settled larvae originated from adult populations in Belgian or Dutch coastal waters. Future dispersal of *Ensis directus* could be used as a biological tracer of coastal water movements between the Southern Bight of the North Sea and the English Channel.

The American jack knife clam, *Ensis directus* (Conrad, 1843), synonym *Ensis americanus* (Binney, 1870) *sensu* van Urk (1964, 1972), was discovered in Europe in the German Bight for the first time in June 1979 (Von Cosel *et al.*, 1982). This species is assumed to have been transported in its larval stage by a ship containing ballast water. Considering the dimensions of the specimens, this probably happened in the first half of 1978 (Von Cosel *et al.*, 1982; Mühlenhardt-Siegel *et al.*, 1983). Since then this species has spread rapidly in the North Sea in subtidal and intertidal areas. Dense populations were found along the German coast within a few years (Von Cosel *et al.*, 1982; Mühlenhardt-Siegel *et al.*, 1983; Swennen *et al.*, 1985). In 1986 *Ensis directus* was reported from the north and east Danish coasts as far as the Belgian coast (Kerkhof & Dumoulin, 1987) (Figure 1). Since then no new records have been reported.

Samples of macrobenthic fauna have been collected on the French coast of the North Sea (mean geographic position: 51°01'N 02°05'E) for a study on mechanisms of recruitment and dynamics of dominant species in the *Abra alba* community (RENORA project).

The first samples, collected on 8 June 1991, revealed an important recruitment of an *Ensis* species (densities up to 30,000 individuals per m²). On 22 June 1991 the mean density was 10,000 m⁻² (SD=8,787). The post-larvae (mean length 3.0 mm) were initially identified as *Ensis arcuatus* (Jeffreys, 1865).

In September 1991 the mean length of the cohort was 35 mm and a new examination of the shells revealed characters of *Ensis directus* (Von Cosel *et al.*, 1982; de Boer, 1984; van Urk, 1987). The length/height ratio was about 6:1 except for specimens smaller than 15 mm (Luczak & Dewarumez, *in press*). This ratio corresponds to the one determined for *Ensis directus* by Essink & Visser (1988).

Ensis directus was found in muddy, fine sand along the French coast of the North Sea at a depth not exceeding 10 m. Recent investigations in February 1992 show that *Ensis directus* occurs in French coastal waters in an area which extends from a point 2°E to the western harbour of Dunkerque (a distance of 10 km).

In view of the large numbers of post-larvae observed, the adult population producing these meroplanktonic larvae must also be dense. Such dense populations are known in Europe only from coastal waters of the German Bight and from the Wadden Sea (Mühlenhardt-Siegel *et al.*,

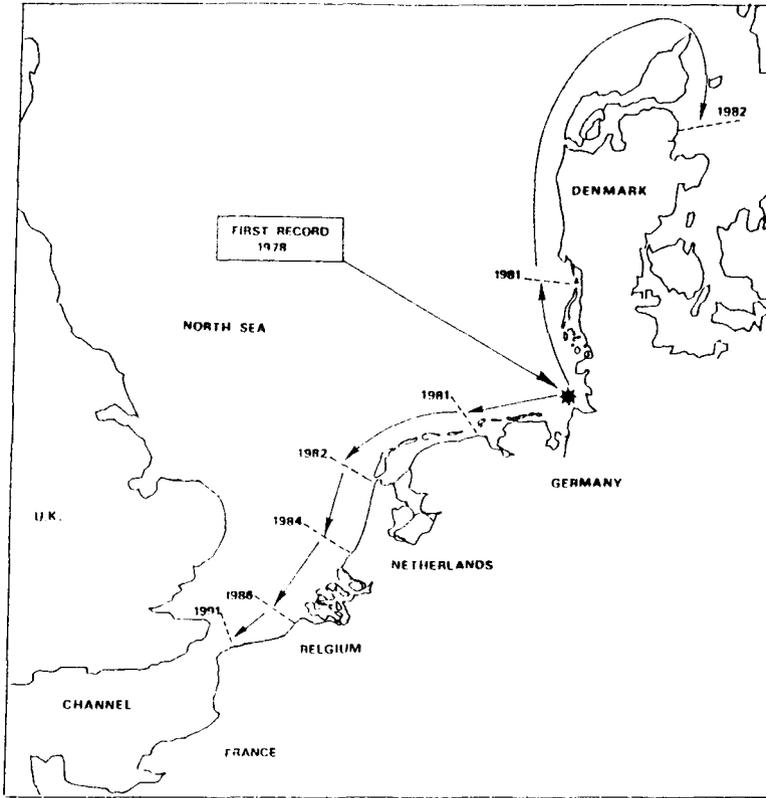


Figure 1. Expansion of the known distribution of *Ensis directus* in north-west Europe.

1983; Essink & Visser, 1988). No information is available from the Belgian coast and the Scheldt Estuary. In any case, the location of the nearest adult population is undoubtedly north-east of Dunkerque as the important recruitment of *Ensis directus* occurred after a period of predominantly northerly winds. These wind conditions explain the transport of pelagic larvae in the opposite direction to the north-easterly residual current (Belgrano *et al.*, 1990). These results are in accordance with Essink's (1985) explanation of the south-westerly dispersal of *Ensis directus* along the German and Dutch coasts. *Ensis directus* can be regarded as a 'biological tracer' of water transport. Future studies on the dispersal of *Ensis directus* will contribute to explaining the complex biological fluxes in the coastal waters between the English Channel and the Southern Bight of the North Sea.

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