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# Occurrence of *Sternaspis scutata* (Polychaeta: Sternaspidae) in the English Channel

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**Abstract:** Several new records are presented that indicate a substantial increase in the U.K. range of the polychaete *Sternaspis scutata* (Ranzani, 1817). Until recently, this conspicuous polychaete was only recorded from a single location (Portland Harbour) but it is now present at a number of sites in South Devon, a westwards extension of approximately 125 km. The new records include an intertidal location on the Dart estuary, which is of particular interest as intertidal records for this species are rare. It is unclear whether the new records are the consequence of a natural range expansion or relate to human activities.

**Résumé :** *Présence de* Sternaspis scutata *(Polychaeta : Sternaspidae) en Manche.* Dans cet article sont présentées de nouvelles données qui montrent une extension importante de la distribution de l'annélide polychète *Sternaspis scutata* (Ranzani, 1817) au Royaume-Uni. Jusqu'à récemment (1987-1994) on n'avait enregistré la présence de ce polychète qu'à un seul endroit – le port de Portland – mais des populations ont été observées depuis, dans plusieurs sites de la partie sud du comté du Devon, un déplacement vers l'Ouest d'environ 125 km. De nouvelles populations ont été découvertes dans la zone intertidale de l'estuaire de la Dart, ce qui présente un intérêt particulier du fait que les données intertidales pour cette espèce sont rares. On n'a pas encore déterminé si ces nouvelles récoltes sont le résultat d'un déplacement naturel de l'espèce ou bien si elles sont liées à l'intervention de l'homme.

*Keywords: Sternaspis scutata* • Range expansion • New record • English Channel

## Introduction

The polychaete genus *Sternaspis* (Otto, 1821) comprises over fifteen species (Petersen, 2000) and is recorded from many parts of the world (Rouse & Pleijel, 2001). Members of the genus are moderately sized (up to 30 mm) with a pair of hard ventral shields and multiple branchiae at the posterior end. The anterior end is retractable, with a mouth and narrow prostomium. The first three segments have rows of stout chaetae and the mid segments have embedded capillary notochaetae and a pair of genital papillae on one segment (Petersen, 2000). Sternaspid worms are typically

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found in mud or sandy mud and are thought to be subsurface deposit feeders (Fauchald & Jumars, 1979) that bury head first into the sediment, leaving their gills exposed (Day, 1967). The only species of *Sternaspis* recorded from British waters (Mackie & Erseus, 1997) is *Sternaspis scutata* (Ranzani, 1817). This species has a preference for fine sediment and is widely tolerant of changes in both salinity and turbidity (Petersen, 2000 and references therein). *Sternaspis scutata* is a squat worm, reaching around 30 mm in length and 15 mm width. It has 20-22 body segments, of which the first three have a lateral row of 12 acicular spines and the first seven comprise an introvert. The ventrocaudal shield of this species is striated, rhomboidal in shape and tan brown in colour. Around the shield are 15-17 long bundles of capillary chaetae (Fig. 1).

Until recently, the only recorded U.K. location for *S. scutata* came from a commercial survey in Portland Harbour, completed by the Oil Pollution Research Unit (Hiscock & Hannam, 1986), which was cited by Sanderson (1996). Subsequent surveys at the same location (Ambios Ltd and Unicomarine Ltd, unpublished report) have confirmed the species' presence (see Table 1). According to Fauvel (1927) the nearest occurrence of *S. scutata* to the U.K. is the Bay of Biscay and the North Sea. Recent records from the Bay of Biscay include an intertidal population found in 2001 at the Ile de Ré (pers. comm. D. Fichet). It is also found in the Mediterranean where it can be an important member of the infaunal community, both numerically and in terms of biomass (Salen-Picard & Arlhac, 2002). Other records of *S. scutata* are from the North Sea, Arctic, Antarctic, South Atlantic and Pacific (Fauvel, 1927; Day, 1967; Martin et al., 2000), however, some may require substantiation. More recently, Dauvin et al. (2003) noted that the presence of *S. scutata* in the English Channel could not be confirmed, despite its occurrence both further north and south. One other species of the same genus, *S. fossor* (Stimpson, 1853), has also been listed for Europe (Bellan, 2001).

## Materials and methods

In 2004 and 2005, sediment was collected during a number of commercial surveys from sites between Portland Harbour and Plymouth Sound (Fig. 2). Collections were made by different organisations using a range of sampling techniques. Material was washed through sieves of different apertures, depending on the survey, and the fauna retained preserved in 5% formalin. After the material was sufficiently fixed, fauna were washed to remove the formalin, and transferred to 70% ethanol prior to identification.

## Results

Specimens of *Sternaspis scutata* were recorded at several of sites at water depths ranging from Low Water Spring

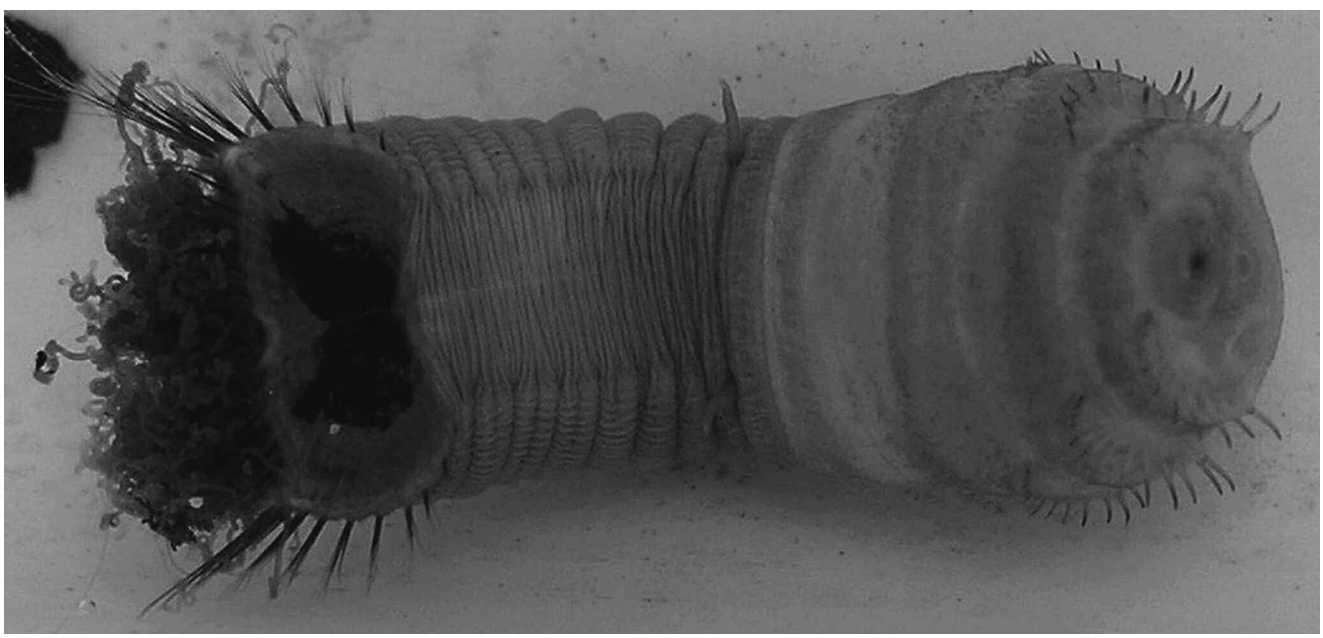

**Figure 1.** A specimen of *Sternaspis scutata*. Pygidium on the left and prostomium on the right. The first seven segments are introverted revealing the acicular spines (Photo courtesy of Alison Miles, Environmental Agency).

**Figure 1.** Un spécimen de *Sternaspis scutata.* Pygidium à gauche et prostomium à droite. Les sept premiers segments sont inversés et révèlent les épines aciculaires (photo prise par Alison Miles, Environmental Agency).

**Table 1.** Recent U.K. records of *Sternaspis scutata.*
**Tableau 1.** Localisation des récoltes récentes de *Sternaspis scutata* au Royaume Uni.

| Date | Location | Water depth (m) | Sediment description | Sampling method | Abundance of *S. scutata* |
|---|---|---|---|---|---|
| **PORTLAND HARBOUR** | | | | | |
| 1987 | 4 sites | 7.5-14 m | Mud-muddy shell gravel | Hunter grab | Present |
| 1994 | Portland Harbour 50°34.9N 002°26.0W | 12 m | Mud and veryfine sand | Day grab | 48 in one grab |
| **PLYMOUTH SOUND** | | | | | |
| August 2004 | Plymouth Sound 50°20.584N, 004°08.600W | 8.6 m | Mud | 1 x 0.1 $m^2$ box core | 3 individuals |
| April 2005 | Plymouth Sound 50°20.956N, 004°07.841W | 10 m | Mud | 5 x 0.1 $m^2$ Day grabs, 1 with *S. scutata* | 1 individual |
| September 2005 | Plymouth Sound 50°20.584N, 004°08.600W | 8.6 m | Mud | 1 x anchor dredge10 x 0.05 $m^2$ van Veen grabs | 22 individuals |
| **DART ESTUARY** | | | | | |
| April 2005 | Kingswear 50°20.930N, 003°34.525W | Intertidal LWS | Mud with woody detritus | 3 x 0.0085 $m^2$ cores | 118 $m^{-2}$ |
| September 2005 | Kingswear 50°20.930N, 003°34.525W | Intertidal LWS | Mud with woody detritus | 6 x 0.0085 $m^2$ cores | 334 $m^{-2}$ |
| **LYME BAY** | | | | | |
| May 2004 | Torbay, 3 stations 50°25.265N, 003°30.551W | 12-15 m | Mud - Sandy mud | 15 x 0.1 $m^2$ Day grabs, all with *S. scutata* | Maximum of 1025 in one grab |
| May 2004 | Off Berry Head, 2 stations 50°22.562N, 003°28.840W | 19-36 m | Sandy mud | 10 x 0.1 $m^2$ Day grabs, 9 with *S. scutata* | Maximum of 11 in one grab |
| April 2005 | Torbay, 18 stations 50°24.458N - 50°26.764N, 003°31.825W - 003°30.186W | 7-15 m | Sandy mud | 30 x 0.1 $m^2$ Day grabs, 22 with *S. scutata* | Maximum of 398 in one grab |
| August 2005 | Brixham Harbour 50°24.343N, 003°30.796W | 9 m | Sandy mud | 16 x 0.05$m^2$ van Veen grabs | Maximum of 126 in one grab |
| September 2005 | Northern Torbay 50°44.293N, 003°52.581W | 12 m | Sandy mud | 1 x 0.1 $m^2$ Smith-McIntyre grab | 55 in one grab |
| May 2004 | Off Otterton Point 50°38.586N, 003°15.863W | 16 m | Sandy mud | 5 x 0.1 $m^2$ Day grabs, all with *S. scutata* | Maximum of 49 in one grab |

(LWS) to approximately 36 m. The records of *S. scutata* are summarized in Table 1 and a specimen is shown Figure 1. Most specimens found conformed well with the descriptions of *S. scutata* given by Petersen (2000). In this paper the new records of *S. scutata* from the English Channel are presented, representing a considerable expansion of the species' range.

## Discussion

In this paper we have assembled recent records of *Sternaspis scutata* from U.K. waters, showing the species to be both more widely distributed (Fig. 2) and more abundant than previous records suggest. In all probability the new information presented here describes an expansion of the species' range: the worm is highly distinctive and hence is unlikely to have been overlooked or mis-identified in previous surveys of the same areas. Some areas such as Plymouth Sound have been sampled regularly for many years. The cause of the expansion is unclear but it comes at a time when other species in Britain are extending their geographical limits and increasing in abundance at sites close to their range edge. Such expansions have been linked to a warming of the marine environment (Stebbing et al., 2002; Beaugrand & Ibanez, 2004; Mieszkowska et al., 2006) but the new records of *S. scutata* do not represent expansion into cooler, more northerly regions. On the contrary, a westward expansion of the species from Portland takes it into more thermally stable water.


**Figure 2.** Map showing the South-West region of the UK and the sites at which *Sternaspis scutata* have been found. Sites: 1. Portland Harbour, 2. Otterton Point, 3. Torbay, 4. Brixham Harbour 5. Kingswear and 6. Plymouth Sound.

**Figure 2.** Carte de la région du Sud Ouest du Royaume Uni et des localités où *Sternaspis scutata* a été trouvéE. 1. Port de Portland, 2. Pointe de Otterton, 3. Torbay, 4. Port de Brixham 5. Kingswear et 6. Détroit de Plymouth.

There are no recent records of *S. scutata* from the coast of Northern France, and the origins of the isolated population at Portland Harbour can only be the subject of speculation. Nevertheless, until 1995 Portland Harbour was a major harbour of the Royal Navy and was a training centre for warships from many countries. The possibility that the population first arrived in a ship's ballast water or on a piece of equipment cannot be overlooked. Recent range expansion is one of the defining criteria of a non-native species (Chapman & Carlton, 1994) and there is currently great concern about the ecological impacts of alien species (Bax et al., 2001; Robinson et al., 2005). If the range of *S. scutata* continues to expand in Britain, close attention should be paid to its interaction with other species. Conversely, if *S. scutata* can be considered to be native, then it must be assumed that it should have some conservation status. It is listed as 'Nationally Rare' by Sanderson (1996). It is evident that more research is required to record and quantify further changes in the distribution and abundance of *S. scutata*, as well as to resolve its native or alien status.

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