

CHAPTER 4 ANNEX I

FIRST RECORD OF THE PELAGIC FISH SPECIES BLUE WHITING

MICROMESISTIUS POUTASSOU IN THE BELGIAN PART OF THE NORTH SEA

Adapted from:

*Van Ginderdeuren K, Hoffman S, Vandendriessche S, Vincx M, Hostens K (2012) First record of the pelagic fish species blue whiting *Micromesistius poutassou* in the Belgian part of the North Sea. Belgian Journal of Zoology 142: 93-96.*

During fish sampling campaigns in the Belgian part of the North Sea in 2009 and 2010, several rare fish species were trawled. Rare catches included sardine *Sardina pilchardus*, anchovy *Engraulis encrasicolus*, twait shad *Alosa fallax*, smelt *Osmerus eperlanus* and several species of sandeels: *Ammodytes tobianus*, *Ammodytes marinus*, *Hyperoplus lanceolatus* and *Hyperoplus immaculatus*. These species are all known to occur in the BPNS, which could not be said about the blue whiting *Micromesistius poutassou* we caught in July 2010.

The blue whiting is a member of the cod family (Gadidae) and occurs in the western Mediterranean Sea and in the North Atlantic, ranging from Morocco to Spitsbergen in the east, and from Maine (US) towards southern Greenland in the west (Cohen *et al.* 1990). It reaches lengths up to 50 cm and can weigh up to 830 g (Cohen *et al.* 1990, IGFA 2001). Blue whittings are bathypelagic oceanodromous fish that occupy depth ranges from 150-3000 m, but are mostly found at 300-400 m (Svetovidov 1986, Riede 2004).

These fish prey on small crustaceans but large individuals also forage on smallest fish and cephalopods. Blue whiting stocks are the target of the largest fishery in the Atlantic (ICES 2004); the meat is sold both fresh and frozen, and is also processed as oil and fishmeal (Cohen *et al.* 1990). Annual European landings fluctuate around 50×10^4 tonnes (Muus and Nielsen 1999).

In 2009 and 2010, monthly fish tracks using an otter trawl were carried out at ten monitoring stations (Fig. 1) in the Belgian part of the North Sea (BPNS). The trawl net with a 3*1m diameter opening was dragged over the seabed for 30 min at 3-4 knots.

On 16/7/2010 a whiting measuring 22 cm was caught near Nieuwpoort at station W03 (N 51°10'10", E 2°42'50") in very shallow waters (7 m depth). The fish had a partly digested adult brown shrimp *Crangon crangon* in its stomach, indicating that it had been feeding recently (Van Ginderdeuren *et al.* 2012c).

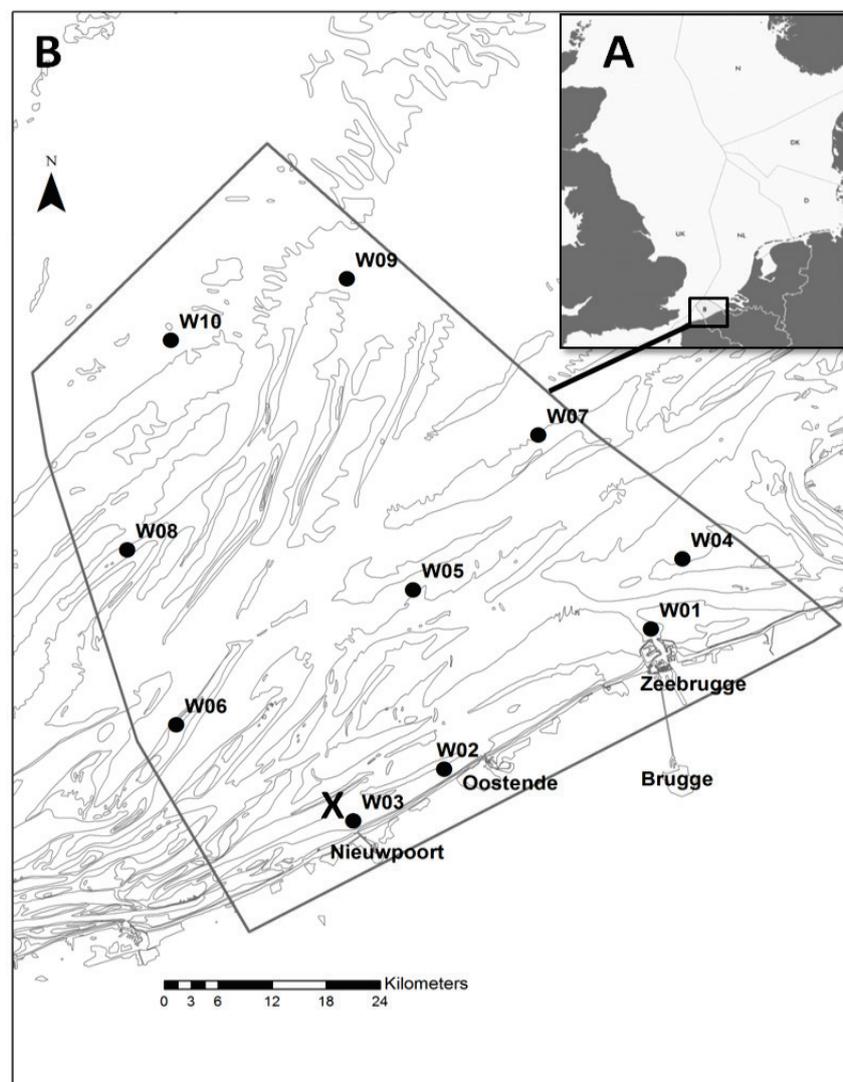


Figure 1: A) North sea exclusive economic zones; B) Belgian part of the North Sea (BPNS) with ten sampling stations sampled monthly in 2009 and 2010 for pelagic fish. The cross (X) indicates where the blue whiting was caught.

Photographs 1 and 2 of this individual show that the three dorsal fins are widely spaced and that the interspace between the second and third fin is larger than the base length of the first dorsal fin. Also obvious is that the mouth and gill cavities are black and that the lower

jaw is somewhat protruding. The eyes are very big. These morphological features are characteristic for the blue whiting (Russell 1976, Muus and Nielsen 1999). Pawson (1979) states that a blue whiting measuring 22 cm is most likely 3 years old. Some blue whiting reach maturity in their third year, but recruitment to the breeding stock is not complete until most fish are 7-8 years old (Pawson 1979).



Photograph 1: blue whiting, caught at station W03 (Nieuwpoort) on 16/7/2010.



Photograph 2: blue whiting dorsal fins are widely separated and the interspace between the second and third dorsal fin (2) is bigger than the base of the first dorsal fin (1).

In order to validate the morphological identification, part of the caudal fin was cut for DNA analysis. This DNA was used as a template for the amplification of part of the mitochondrial cytochrome b gene in a PCR reaction with two in-house-developed primers UCYTB152BF (GGSGCWACTGTNATYACWAA) and UCYTB271BR (TANGCRAANAGRAARTAYCAYTCNGG). Amplified PCR

products were sequenced on a capillary sequencer (ABI 3730XL). Subsequently, fragment analysis (364 bp) was conducted. Positions showing two peaks were coded as degenerated. Sequence identity was evaluated performing an NCBI-BLASTN search against the GenBank database.

The sequence of the caught specimen showed a best hit with a similarity and maximum identification of 98-100 % and a query coverage of 100 % with 18 specimens of blue whiting present in the GenBank.

There are currently 121 fish species known to be present in the BPNS, of which 18 are considered vagrants. Six more species have probably gone extinct in Belgian marine waters (Vandepitte *et al.* 2010). The last new fish species to be added was the Atlantic croaker *Micropogonias undulatus* (Linnaeus, 1766), a non-indigenous species that was first observed in the BPNS in 1998. It probably reached our waters by ballast water transport (Vandepitte *et al.* 2010). The Belgian Register of Marine Species BERMS (consultation date 18/7/2011) states that there are no registered sightings of blue whiting in the BPNS (Vandepitte *et al.* 2010). This makes sense: blue whittings usually live in much deeper waters and were long considered rare in the shallow southern North Sea and English Channel (Southward and Mattacola 1980). De Groot (1973) reports a blue whiting caught in the Dutch part of the North Sea and Blacker (1981) described an influx of *M. poutassou* in the English Channel towards the southern North Sea in 1979-1980, which he attributed to an unusual intrusion of water from the south and west. On 27/1/1980 he caught a blue whiting in the close vicinity of the BPNS. Müller (1994) as well mentions blue whiting being caught in the English Channel, at Wimereux (northern France). Perry *et al.* (2005) report that the southern boundary of the blue whiting distribution in the North Sea has shifted north by 816 km between 1978 and 2001. The authors state that this pelagic fish may retract completely from the North Sea by 2050.

These sightings indicate that blue whittings have wandered close to Belgian waters in the past and that a warming climate is likely to push blue whiting stocks further north.

Consequently, this manuscript describes the first reported sighting of blue whiting in Belgian waters, thereby adding this species to the Belgian marine species list.