

## First record of the pelagic fish species blue whiting *Micromesistius poutassou* in the Belgian part of the North Sea

Karl Van Ginderdeuren<sup>1,2\*</sup>, Stefan Hoffman<sup>1</sup>, Sofie Vandendriessche<sup>1</sup>, Magda Vincx<sup>2</sup> and Kris Hostens<sup>1</sup>

<sup>1</sup> Institute for Agricultural and Fisheries Research, Animal Science Unit – Fisheries, Ankerstraat 1 8400 Oostende, Belgium

<sup>2</sup> Ghent University (UGent), Biology Department, Marine Biology Section, Sterre Campus, Krijgslaan 281-S8 9000 Gent, Belgium

\* Corresponding author: Karl Van Ginderdeuren: karl.vanginderdeuren@ilvo.vlaanderen.be

KEY WORDS: blue whiting, *Micromesistius poutassou*, Belgian part of the North Sea, Belgium.

The blue whiting *Micromesistius poutassou* (Risso, 1827) 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 (1). It reaches lengths up to 50 cm and can weigh up to 830 g (1, 2). Blue whittings are bathypelagic oceanodromous fish that occupy depth ranges from 150-3000 m, but are mostly found at 300-400 m (3, 4).

These fish prey on small crustaceans but large individuals also forage on small fish and cephalopods. Blue whiting stocks are the target of the largest fishery in the Atlantic (5); the meat is sold both fresh and frozen, and is also processed as oil and fishmeal (1). Annual European landings fluctuate around 500, 000 tonnes (6).

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 4\*2 m diameter opening was dragged over the seabed for 30min at 3-4 mph.

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* (LINNAEUS, 1758) in its stomach, indicating that it had been feeding recently.

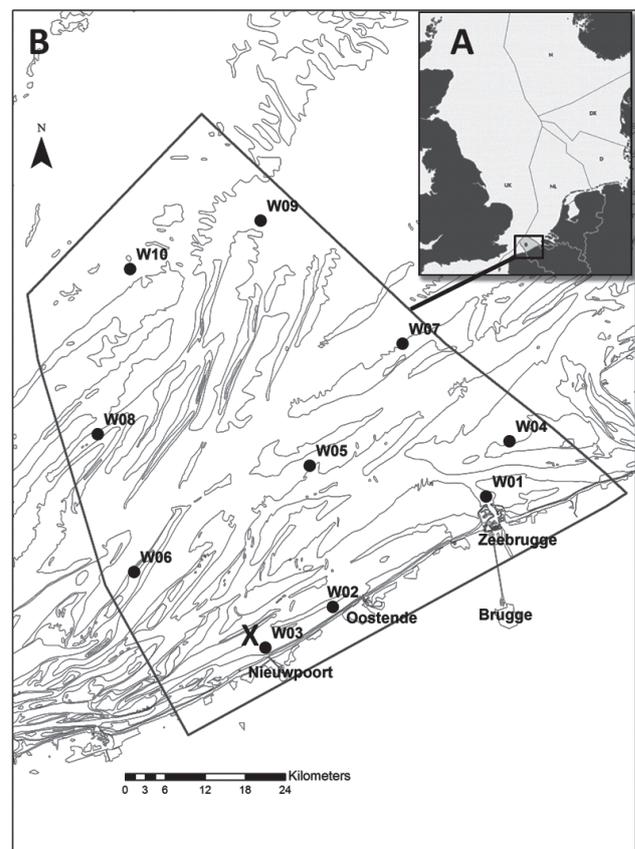


Fig. 1. – (A): North sea exclusive economic zones. (B): Belgian part of the North Sea (BPNS) with ten sampling stations sampled monthly in 2009 and 2010 for pelagic fish. The cross (X) indicates where the blue whiting was caught.

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 (6, 7). PAWSON (8) states that a blue whiting measuring 22cm is most likely three 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 (8).

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 (TANGCRAANAGRAARTAYCAYT CNGG). Amplified PCR products were sequenced on a capillary sequencer (ABI 3730XL). Subsequently, fragment analysis (364bp) 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 (9). 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 (9). 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 (9). 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 (10). DE GROOT (11) reports a blue whiting caught in the Dutch part of the North Sea and BLACKER (12) 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. MULLER (13) as well mentions blue whiting being caught in the Channel, at Wimereux (northern France). PERRY et al. (14) 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.



Fig. 2. – blue whiting, caught at station W03 (Nieuwpoort) on 16/7/2010.



Fig. 3. – 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).

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

## REFERENCES

1. COHEN DM, INADA T, IWAMOTO T & SCIALABBA N (1990). FAO Species Catalogue. Vol. 10. Gadiform fishes of the world (Order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. FAO Fisheries Synopsis, 10 (125). 442 p.
2. IGFA (2001). Database of IGFA angling records until 2001, made available to FishBase. IGFA, Fort Lauderdale, USA.
3. RIEDE K (2004). Global register of migratory species - from global to regional scales. Final Report of the R&D-Project 808 05 081. Federal Agency for Nature Conservation, Bonn, Germany. 329 pp.
4. SVETOVIDOV AN (1986). Gadidae. p. 680-710. In: WHITEHEAD PJP, BAUCHOT ML, HUREAU JC, NIELSEN J & TORTONESE E (Eds.). Fishes of the north-eastern Atlantic and the Mediterranean. UNESCO, Paris. vol. 2.
5. ICES (2004). ICES Advisory Committee on Fishery Management (ACFM), Report of the Northern Pelagic and Blue Whiting Fisheries Working Group (ICES CM 2004/ ACFM:24, ICES, Copenhagen).
6. MUUS BJ & NIELSEN JG (1999). Sea fish. Scandinavian Fishing Year Book, Hedehusene, Denmark. 340 pp.
7. RUSSELL FS (1976). The eggs and planktonic stages of British marine fishes, Academic Press: London. ISBN 0-12-604050-8. 524 pp.
8. PAWSON MG (1979). Laboratory leaflet No. 45, Ministry of Agriculture Fisheries and Food Directorate of Fisheries Research, Lowestoft. 17 pp.
9. VANDEPITTE L, DECOCK W & MEES J (Eds.) (2010). Belgian Register of Marine Species, compiled and validated by the VLIZ Belgian Marine Species Consortium. VLIZ Special Publication, 46. Vlaams Instituut voor de Zee (VLIZ): Oostende. ISBN 978-90-812900-8-1. 78 pp. Online available at <http://www.marinespecies.org/berms/> (accessed on July 18, 2011).
10. SOUTHWARD AJ & MATTACOLA AD (1980). Occurrence of Norway pout, *Trisopterus esmarckii* and blue whiting, *Micromesistius poutassou* (Risso), in the Western English Channel off Plymouth. Journal of the marine

- biological association of the United Kingdom 60 (1): 39-44.
11. DE GROOT SJ (1973). Dutch observations on rare fish in 1971. *Annales biologiques*, 28: 223-223.
12. BLACKER RW (1981). Recent occurrences of blue whiting, *Micromesistius poutassou*, and Norway pout, *Trisopterus esmarkii*, in the English channel and southern North Sea. *Journal of the marine biological association of the United Kingdom*, 61 (2): 307-313.
13. MULLER Y (2004). Faune et flore du littoral du Nord, du Pas-de-Calais et de la Belgique: inventaire. Commission Régionale de Biologie Région Nord Pas-de-Calais: France. 307 pp.
14. PERRY AL, LOW PJ, ELLIS JR & REYNOLDS JD (2005). Climate change and distribution shifts in marine fishes. *Science*, 308: 5730.

*Received: August 10th, 2011*

*Accepted: December 20th, 2011*

*Branch editor: De Troch Marleen*