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A giant *Nucella lapillus* (Linnaeus, 1758) (Muricidae) from the Holocene of the Outer Thames Estuary

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Abstract: A giant shell of *Nucella lapillus* (Linnaeus, 1758) was found among other shells and normal-sized specimens of the same species in gravel dredged on the edge of the Outer Thames Estuary offshore the British coast and deposited at the Belgian coast.

Introduction: Sand, grit and pebbles dredged far offshore may be an interesting source for additional specimens for a shell collection. Such shells are often damaged or eroded, but occasionally fine specimens are found. The correct locality of the dredgings may be difficult to find out, usually remaining a rough guess, but occasionally good data are obtained from the crew of the ship or from the company. During one such occasion the second author was allowed to collect shells from a closed yard near Oostende, where a pile of pebbles and shells was waiting to be dispatched. One large shell, at first sight looking like a faded *Neptunea antiqua* (Linnaeus, 1758), caught his eye. After picking up the badly damaged shell, it was clear that this shell belonged to *Nucella lapillus* (Linnaeus, 1758), a very common species among the shells in the pile. The size, however, is remarkably big: a giant of 94 mm long and 54 mm wide.

Systematics:
MURICIDAE Rafinesque, 1815
Genus *Nucella* Röding, 1798. Type species: *Buccinum filosum* Gmelin, 1791 = *Buccinum lapillus* Linnaeus, 1758)

Nucella lapillus (Linnaeus, 1758)
= *Buccinum lapillus* Linnaeus, 1758
Figs 1-6

Remarks: *Nucella lapillus* is easily recognisable by the heavy shell, the semi-oval shape with a medium to moderately short spire, the shape of the columella with a weak convex parietal area (where a thin callus is covering the preceding whorl) and a deep abapical concavity (resulting in a semi-oval aperture) and a strongly twisted transition to the siphonal canal. The surface is usually quite rough.

The species is briefly discussed in most publications that deal with the Belgian coast and in papers that deal with the recent recovery of the species along our coast and the presence of reproducing populations. All shells reported in those papers are of normal size. The species is reported on in paleontological studies dealing with Red Crag and Corraline Crag specimens, but no detailed information about offshore sand and gravel dredging is known to us.

The giant specimen we record in the present paper is badly eroded and no characteristics are visible on the surface anymore. The shape of the spire is much higher because the last whorl is strongly stretched with the aperture situated more abapically along the base and siphonal canal of the penultimate whorl. As a result, the shape of the columella is quite deformed with a shorter, but deeper concavity.

Among the many synonyms and forms that we could trace in literature and on the web, one particular name may well fit for the giant specimen we discus in the present paper: *Purpura lapillus* var. *major* Jeffreys, 1867. The shell is described as “Var. 2. Major. Larger and having a long spire. L. 2.5. B. 1.25.” (after: Jeffreys, 1867: 277). The size of 2.5 inch is 63.5 mm, very large indeed. The large shells that were ones common along

the coast of Tholen (Netherlands) are smaller (up to 41 mm). Jeffreys did not illustrate a specimen nor give a detailed locality, but we may assume that it was a Recent specimen rather than a fossil or a so-called subfossil shell. Our giant specimen is clearly of Late Pleistocene or Early Holocene origin, as most samples of the dredged gravel offshore the Thames, Essex and East Anglia are.

The company that dredged the gravel was so kind as to procure the exact locality: 52°05.3044'N, 01°98.3709'E at the NE edge of the Thames Estuary, far offshore Orford. This is at an unnamed bank (Allen et al 2010: 51, 57), situated N-NE of the Inner Gabbard and just east of the North Inner Gabbard prospecting license area.

This giant shell was found among normal-sized specimens of *Nucella lapillus* and plenty of valves of *Aequipecten opercularis* (Linnaeus, 1758), **Pectinidae**. It has an identical appearance in shell material and erosion as the normal sized specimens. We therefore have no indication that it may be a replaced specimen during ancient times (before the sandbeds were formed) or in recent time (during dredgings). We assume this shell was a member of the main population that became included in the layers of sand rather than an ecophenotype that originates from a nearby, yet distinct fauna.

We have not found any information about other giant specimens of *N. lapillus*, apart from the known World Record Size that is listed as 50.1 mm (Quiquandon et al, 2015) and from an additional giant specimen (55.4 mm, coll. Vanleke) collected from the same source.

N. lapillus specimens have increased by 22.6 % in size between 1915-1922 and 2007 (Fisher et al, 2009: 5209-5211) along the coast of Maine (USA). This study was reported in Science Daily, 31 march 2009. The reason for the increasing size is still an unanswered question. Possibilities are sought among lower predation (crabs, fish), nutrient-enrichment and/or surface water temperature and it will be an interesting subject for further study.

Comparison: *Neptunea antiqua* differs by the more convex whorls, the gently curved columella (without convex parietal) and the longer, straight siphonal canal. Moreover, the *N. antiqua* specimens dredged offshore the Thames and the adjacent SE coast of England belong to the 'Channel form' and are brown in colour (see Fraussen & Terryn, 2007: 81, pl. 51, fig. 1-3), a colour still traceable even in the Holocene shell deposits.

Nucella lamellosa (Gmelin, 1791) from the northern Pacific Ocean may grow up to 86 mm (Dall, 1915: 564), but differs by the more oval aperture without convex parietal area and the angular shape of the whorls. The range of this species (the northern Pacific) is far away from the North Sea and we may assume with some certainty that no specimens had the occasion to become introduced during Late Pleistocene or Early Holocene times.

Nucella lamellosa f. *neptunea* Dall, 1915 from Cook Inlet, Alaska, has a shape much similar to our giant *N. lapillus*, with much weaker angulated whorls indeed, but differs by the presence of spiral sculpture. The holotype (USNM 31134) is figured by Kosuge (1972: pl. 9, fig. 6) and a picture of the holotype in colour is available at http://n2t.net/ark:/65665/328b9856c-484d-42bd-943f-41abe1feae4b**.**

References

Allen, V., Lee, N & Murphy, K., 2010. Marine Aggregate Regional Environmental Assessment of the outer Thames Estuary. *Thames Estuary Dredging Association* (TEDA) *main report*. Oxford, 347 pp.

Dall, W. H., 1915. Notes on the species of the molluscan subgenus *Nucella* inhabiting the northwest coast of America and adjacent regions. *Proceedings of the United States National Museum*, 49(2124): 557-572. Available online at: http://www.biodiversitylibrary.org/item/53483#page/729/mode/1up

Fischer, J. A. D., Rhile, E. C., Liu, H. & Petraitis, P. S., 2009. An intertidal snail shows a dramatic size increase over the past century. *Proceedings of the National Academy of Sciences*, 106(13): 5209-5212. DOI: 10.1073/pnas.0812137106

Fraussen, K. & Terryn, Y., 2007. The Family Buccinidae: Genus *Neptunea*. *In*: G. T. Poppe & K. Groh, *A conchological iconography*. ConchBooks, Hackenheim. 166 pp. 154 pl.

Jeffreys, J. G., 1867. *British Conchology, or an account of The Mollusca which now inhabit the British Isles and the surrounding seas. Vol. 4. Marine Shells, is continuation of the Gastropoda as far as the Bullia family*. John Van Voorst, London. 496 pp. 8 pl.

Kosuge, S., 1972. Illustrations of Type Specimens of Molluscs Described by William Healey Dall (North – Western Pacific Gastropods). 29 pl.

Linnaeus, C., 1758. *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. *Editio decima*, reformata. Laurentius Salvius: Holmiae. ii, 824 pp., available online at http://www.biodiversitylibrary.org/item/10277#page/3/mode/1up

Queens's University, 2009. Atlantic Snails Are Increasing Dramatically In Size. *ScienceDaily*. 2009, March 31. available online at www.sciencedaily.com/releases/2009/03/090324171604.htm

Quiquandon, P., Barbier, J.-P. & Brunella, A., 2015. *Registry of world record size shells*. Shell's Passion & Topseashells. Ed. 12

Plate

1-6: ***Nucella lapillus*** (Linnaeus, 1758)
England, sand winning dredgings at 52°05.3044'N, 01°98.3709'E, an unnamed bank at the NE edge of the Thames Estuary, Coll. Clint Vanleke.
1-3: 94 mm,
4-5: 55.6 mm,
6: 18-37 mm

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