

KING'S QUAY

OS Grid Reference: SZ538941–SZ556934

Highlights

The latest Eocene Osborne Beds, on the Isle of Wight in Hampshire, contain fresh- and brackish-water fish fossils, unique in British Tertiary stratigraphy. Abundant specimens of the small teleost *Vectichthys vectensis* (Newton), both as complete fishes and crushed partial bodies, occur in a discrete bed, perhaps recording sudden mortality by asphyxiation.

Introduction

King's Quay in the Fishbourne area of the north-eastern Isle of Wight is famous for the lenticular bone-bed horizons that crop out on the foreshore, and occur within the Osborne Beds at the top of the Upper Eocene. The bone beds are within a series of blue and grey, hard, laminated clays (Osborne facies) and yield exceptionally preserved, three-dimensional fossil fishes. The fish fauna is unusual in the context of the British Eocene, as it developed within a freshwater or brackish palaeoenvironment, with limited access to the open ocean.

Excavations at several points along this coastline yielded three fish species to Gaudant and Quayle (1988), including a new genus.

Description

Well-preserved small fishes here attracted local collectors in the late 19th century, one of the more active being G.W. Colenutt, who found these fossils 'near Ryde House and in the cliff section east of King's Quay' (Colenutt, 1888, p. 358; 1903, p. 99). The section given below and drawn up by Clement Reid and G.W. Colenutt was recorded by H.J. Osborne White (1921). Colenutt (1903) had traced the productive bed from the vicinity of Ryde House westwards to King's Quay and east to Sea View.

	Thickness (m)
Section east of King's Quay	
<i>Bembridge Limestone</i> Red and mottled clay (only seen in landslips)	12.0
Green clay, with scattered fish bones Scales and vertebrae of <i>Lepidosteus</i> abundant, <i>Alligator</i> , <i>Emys</i> [<i>Ocadia?</i>], <i>Trionyx</i> , and <i>Chelone</i> , <i>Theridomys</i> and snake vertebra	1.2
[Fish Bed] Hard grey shaley clay, full of fish bones, and whole fish (<i>Vectichthys</i> (<i>Clupea</i>) <i>vectensis</i>)	0.6
Similar clay with grass-like leaves and lenticular masses of cement stones	0.9
Blue clay, with abundance of mollusca <i>Paludina lenta</i> (<i>Viviparus</i>), <i>Melanopsis carinata</i> etc.	1.8
Unfossiliferous green clay, to low water	16.5

White reported (1921) that the best exposures were on the shore to the west of the mouth of Wootton Creek, where the fish bed (Chapelcorner Fish Bed) crops out just below high water mark as a rib projecting through the beach. Fish preserved in the strata above are incomplete (White, 1921), as are the tetrapod remains.

Insole and Daley (1985) have proposed a lithostratigraphical nomenclature for this part of the Hampshire Basin succession. The fish bed occurs in the Fishbourne Member of the Headon Hill Formation, Solent Group.

Fauna

Osteichthyes: Actinopterygii: Neopterygii: Teleostei

Amia (?) sp. *Potamoschistus* (?) cf. *bleicheri* (Sauvage, 1883) *Vectichthys vectensis* (Newton, 1889)

Osteichthyes: Actinopterygii: Ginglymodi

Lepisosteus sp.

Interpretation

The Headon Beds, Osborne Beds and Hamstead Beds all contain fresh- and brackish-water fossil assemblages (Figure 14.16) where these facies are interspersed with deltaic clastics. Lacustrine deposits tend to occur as fine, laminated, clay-grade clastics, containing well-preserved fossil fishes. The Osborne Beds are about 50 m of clays and marls with hard bands of limestone. Freshwater molluscs (*Limnaea*, *Viviparus*, etc.) are common.

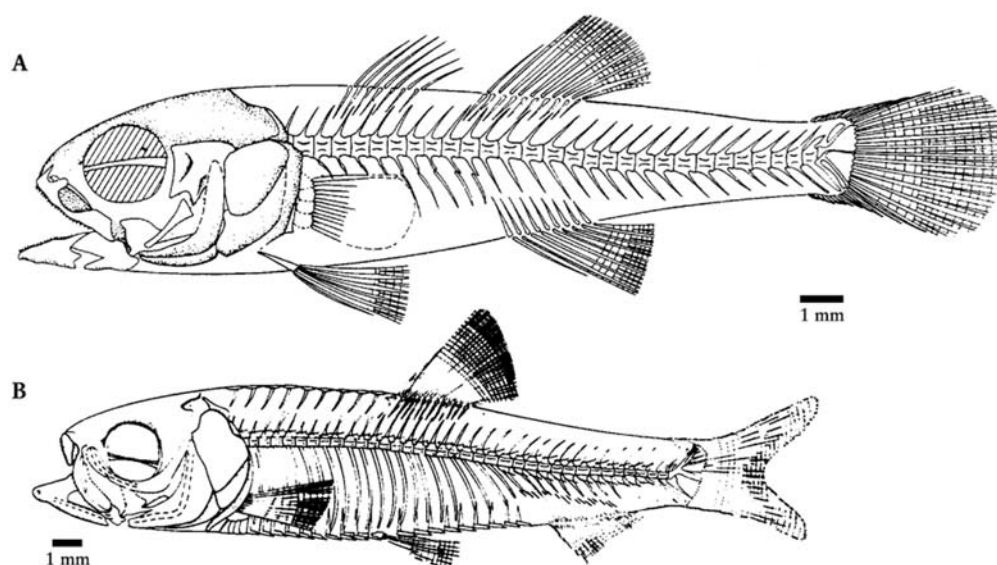


Figure 14.16: Fossils from the Osborne Beds at King's Quay, Isle of Wight (after Gaudant and Quayle, 1988, © The Natural History Museum, London): (A) reconstruction of *Potamoschistus* (?) cf. *bleicheri* (Sauvage); (B) reconstruction of *Vectichthys vectensis* (Newton).

The succession seems to record a phase of shallow sedimentation under quiet brackish or freshwater conditions, which culminated in the formation of the Bembridge Limestone. The presence of plant remains and tetrapod bones indicates the proximity of a vegetated land surface. The environment about the water mass was low, contributing only clay-grade sediment, probably via sluggish small streams and under subtropical conditions (see Gaudant and Quayle, 1988). A truly freshwater regime was established before the appearance of the fishes, *vide* the molluscs *Paludina* and *Melanopsis*. Whether or not the fishes normally inhabited these waters or were introduced as floating corpses from elsewhere is not certain. The completeness of many of the bodies and the gaping mouths suggest sudden asphyxiation and burial without much transport. The death of the fishes was not violent, and may have been induced by sudden oxygen depletion of the waters where they swam or by their entry into a lower stagnant water level. The green clay with scattered tetrapod bones and *Lepisosteus* may represent an episode of influx of terrestrial organic debris. No fishes are recorded from the Bembridge Limestone, which may have thus originated in an aquatic environment without fishes.

Comparison with other localities

The preservational style and faunal composition of the King's Quay fish bed is similar to that of some parts of the Early to Middle Eocene Green River Formation shales of Wyoming, USA. No other comparable localities have been found in Britain. In the Paris Basin the Montmartre gypsum beds are thought to be equivalent to the Bembridge Limestone, but no direct connection existed.

Conclusions

The succession near King's Quay has yielded abundant remains of the small teleost *Vectichthys* from a series of pale clays, hard marls and concretions of brackish-water-freshwater origin. The conservation value of the site is derived from its fish fauna and unique stratigraphical position within British Tertiary stratigraphy.

Reference list

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