
LEE-ON-SOLENT

OS Grid Reference: SU552014–SU563002

Highlights

This site offers a range of chondrichthyan taxa comparable to that described immediately above. It has a very good range of teleost otoliths, in addition to the abundant selachian teeth and other remains.

Introduction

A diverse vertebrate fauna has been recovered from several levels within the uppermost beds of the Bracklesham Group on the lower foreshore at Lee-on-Solent. The fauna is particularly rich in shark teeth and the site has yielded over 30 species of selachians. Chimaeroids, which are poorly known elsewhere in the Middle Eocene, are represented at Lee by five species, including the type of *Elasmodus kemp* Ward, 1976. Teleost otoliths are extremely well represented in the fossiliferous beds.

Description

The vertebrate-bearing beds occur within the uppermost part of the Bracklesham Group, the Selsey and Huntingbridge Divisions of Fisher (1862). The vertebrate fauna is composed of mammals, reptiles, birds and fishes, in association with a diverse invertebrate fauna in which crustacea and molluscs predominate.

Fauna

Marsh Farm Formation

Chondrichthyes: Elasmobranchii: Neoselachii: Squalomorphii

Heterodontus vincenti (Leriche, 1905)

H. woodwardi Casier, 1946

Isistius trituratorus (Winkler, 1874)

Notorhynchus kemp Ward, 1979

Squalus minor (Leriche, 1902)

Chondrichthyes: Elasmobranchii: Neoselachii: Squatinomorphii

Squatina prima (Winkler, 1873)

Chondrichthyes: Elasmobranchii: Neoselachii: Galeomorphii *Alopias leeensis* Ward, 1978

Carcharias hopei (Agassiz, 1843)

Carcharinus sp.

Carcharocles auriculatus (de Blainville, 1818)

Eostegostoma angusta (Nolf and Taverne *in* Herman, 1977)

Galeocerdo latidens Agassiz, 1843

Galeorhinus minor (Agassiz, 1835)

G. recticonus (Winkler, 1874)

G. cf. ypresiensis (Casier, 1946)

Hemiscyllium bruxelliensis (Herman, 1977)

Isurus praecursor (Leriche, 1904)

Isurolamna affinis (Casier, 1946)

Jaekelotodus trigonalis (Jaekel, 1895)

'*Lamna lerichei* Casier, 1946

Nebrius thielensi (Winkler, 1873)

Odontaspis winkleri (Leriche, 1905)

Physogaleus secundus (Winkler, 1874)

P. tertius (Winkler, 1874)

Scyliorhinus gilberti Casier, 1946

S. pattersoni Cappetta, 1977

Scyliorhinus spp.

'*Scyliorhinus*' *minutissimus* (Winkler, 1873)

'*S.*' *biauriculatus* Casier, 1950

'*Scyliorhinus*' sp.

Synodontaspis macrotus (Agassiz, 1843)

S. acutissima (Agassiz, 1843)

S. striatus (Winkler, 1874)

Chondrichthyes: Elasmobranchii: Neoselachii: Batomorphii

Aetobatus irregularis Agassiz, 1843

Aetobatus sp.

Burnhamia davesi (Woodward, 1889)

Dasyatis duponii (Winkler, 1847)

D. jaekeli (Leriche, 1905)

Dasyatis sp.

Myliobatis dixonii Agassiz, 1843

M. latidens Woodward, 1888

M. nzadinensis (Dartevelle and Casier, 1943)

M. striatus Buckland, 1837

M. toliapicus Agassiz, 1843

Myliobatis sp.

Pristis lathami (Galeotti, 1837)

Pristis sp.

Propristis schweinfurthi Dames, 1883

Rhinobatos bruxelliensis (Jaekel, 1894)

Rhinoptera sherbourn White, 1926

Rhynchobatus vincenti (Jaekel, 1894)

Chondrichthyes: Holocephali: Chimaeriformes

Amylodon venablesae (Casier, 1966)

Callorhynchus newton Ward, 1973

Edaphodon bucklandi (Agassiz, 1843)

E. leptognathus Agassiz, 1843

Elasmodus kemp Ward, 1976

Huntingbridge Division

Chondrichthyes: Elasmobranchii: Neoselachii: Squalomorphii

Heterodontus vincenti (Leriche, 1905)

H. woodwardi Casier, 1946

Notorhynchus kemp Ward, 1979

Squalus minor (Leriche, 1902)

Isistius trituratorus (Winkler, 1874)

Chondrichthyes: Elasmobranchii: Neoselachii: Squatinomorphii

Squatina prima (Winkler, 1873)

Chondrichthyes: Elasmobranchii: Neoselachii: Galeomorphii **Carcharias hopei** (Agassiz, 1843)

Galeocerdo latidens Agassiz, 1843

Galeorhinus minor (Agassiz, 1835)

G. recticonus (Winkler, 1874)

G. cf. ypresiensis (Casier, 1946)

Hemiscyllium bruxelliensis (Herman, 1977)

Isurus praecursor (Leriche, 1904)

Isurolamna affinis (Casier, 1946)

Jaekelotodus trigonalis (Jaekel, 1895)

'*Lamna*' *lerichei* Casier, 1946

Odontaspis winkleri (Leriche, 1905)

Physogaleus secundus (Winkler, 1874)

P. tertius (Winkler, 1874)

Scyliorhinus gilberti Casier, 1946

S. pattersoni Cappetta, 1977

Scyliorhinus spp.

'*Scyliorhinus*' *minutissimus* (Winkler, 1873)

'*S.*' *biauriculatus* Casier, 1950

'*Scyliorhinus*' sp.

Synodontaspis macrotus (Agassiz, 1843)

S. acutissima (Agassiz, 1843)

S. striatus (Winkler, 1874)

Chondrichthyes: Elasmobranchii: Neoselachii: Batomorphii

Archaeomanta melenhorsti Herman, 1979

Aetobatus sp.

Burnhamia davesi (Woodward, 1889)

Dasyatis duponti (Winkler, 1847)

D. jaekeli (Leriche, 1905)

D. tricuspidata Casier, 1946

D. wochadunensis Ward, 1979

Myliobatis dixonii Agassiz, 1843

M. latidens Woodward, 1888

M. cf. *toliapicus* Agassiz, 1843

Myliobatis sp.

?*Myripristis* sp.

Pristis lathamii (Galeotti, 1837)

Pristis sp.

Rhinobatos bruxelliensis (Jaekel, 1894)

Rhynchobatus vincenti (Jaekel, 1894)

Chondrichthyes: Holocephali: Chimaeriformes

Edaphodon bucklandi (Agassiz, 1843)

E. leptognathus Agassiz, 1843

Bracklesham Group, undifferentiated Indeterminate selachian dermal denticles, vertebrae, tail spines and coprolites

Osteichthyes: Actinopterygii: Acipenseroidei

Acipenser sp.

Osteichthyes: Neopterygii: Amiiformes

Amia sp.

Osteichthyes: Teleostei: Osteoglossiformes

Brychaetes sp.

Osteichthyes: Neopterygii: Pycnodontiformes

Pycnodus sp.

Osteichthyes: Acanthopterygii: Scombroidei

Cybium proosti (Storms, 1876)

Cylindracanthus rectus (Dixon, 1850)

Sphyraenodus cf. *antiquus* Casier, 1966

Trichuroides sagittidens (Winkler, 1874)

T. winkeri Casier, 1944

T. gulincki Casier, 1967

Xiphiorhynchus sp.

Osteichthyes: Acanthopterygii: Perciformes

Platylaemus cole Dixon, 1850 *Platylaemus* sp. *Sparcus* sp.

?*Lutianus concavus* (Priem, 1912)

Osteichthyes: Elopomorpha: Anguilliformes

Conger sp.

Osteichthyes: Euteleostei: Tetradontiformes

Eotrigodon serratus (Gervais, 1852)

Interpretation

The uppermost Bracklesham Beds at Lee-on-Solent were deposited under conditions very similar to those that prevailed at Bracklesham Bay (q.v.), and the faunal list is correspondingly similar. Its richness in neoselachians and chimaeriforms is especially conspicuous and in part suggests a rich supply of food at upper and midwater levels i.e. nekton and larger plankton.

The number of chondrichthyan species is large, with batomorphs and galeomorphs predominating, as elsewhere. Nevertheless there is an appreciable teleost element present, plus *Acipenser* and *Amia*. The scombroid teleosts and perciforms represent a fauna of active, small- to middle-sized fishes. Some genera such as *Conger*, *Acipenser* and *Amia* (which reach larger sizes) may have been somewhat migratory in habit, but it is difficult to impute such behaviour to these fossil forms.

Since most of the taxa are based on teeth, it is unlikely that taphonomic data will ever be significant. Selective sedimentation of hard parts cannot be ruled out, so that concentration of fossils may have occurred. On the other hand, there is no reliable evidence of mass mortality,

nor of periodic influx of dead fish from other environments. The simplest interpretation of the fossils is that they accrued from large and flourishing fish populations.

Comparison with other localities

Comparison with the fossil yield at Bracklesham Bay (q.v.) is obvious, and similar depositional conditions and habitats are indicated. No other localities are as productive of fossil fishes at this level.

Conclusions

The conservation value of this site lies in its exceptionally rich fauna of fossil shark remains. The population of such predatory fishes would have depended upon a large mass of prey. The latter may have included other fishes as well as pelagic invertebrates and bottom-dwelling molluscs. However, the disarticulated remains and lack of taphonomic information precludes speculation about the rates and causes of mortality.

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