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# Poxwell, Dorset

[SY 740 835]

## Introduction

Poxwell, north-east of Weymouth, Dorset, is one of a network of sites (see also GCR site reports for Durlston Bay, Dinton and Teffont Evias) that has provided a diversity of fossil insect beds. The Poxwell site straddles the Jurassic–Cretaceous boundary (Tithonian/Berriasian, c. 145 Ma) and is currently one of the most productive sites for the latest Jurassic (latest Tithonian) insects in Britain and Europe.

## Description

The Poxwell site consists of a small exposure in a disused quarry at the western end of the Purbeck Hills (Figure 4.40) and the east-west striking outcrop of the Purbeck Limestone Formation. Here, the Purbeck Limestone Formation straddles the Jurassic–Cretaceous boundary with the lowest part of the Purbeck Limestone generally considered to be of latest Jurassic (Tithonian) age. Much of the Lower Purbeck and all the Middle and Upper Purbecks are Early Cretaceous (Berriasian) in age. The fossil insects are preserved in a soft white micrite (limestone) with pseudomorphs after halite and gypsum assigned to the Lower Insect Bed (Barton, 1978, (Figure 4.41) and (Figure 4.42)).

## Fauna

Some 50 species of terrestrial and aquatic insects have been found so far in the Lower Purbeck strata exposed at Poxwell and include forms not previously known from any other Purbeck localities. Overall, the entomofauna includes fossil cockroaches (blattodeans), dragonflies (odonatans), bugs (hemipterans), beetles (coleopterans), true flies (dipterans), wasps (hymenopterans), 'grasshoppers' (orthopterans), lacewings (neuropterans) and caddisflies (trichopterans). Species found here include a unique species of caddisfly (*Pteromixanum poxwellense* Sukatsheva and Jarzembowski, 2001), an extinct false crane fly (*Brodilka mitchelli* Lukashevich, Jarzembowski and Coram, 1997; (Figure 4.44)), an enigmatic Purbeck whitefly-like larva Oarzembowski and Coram, 1997, fig. 6) and the unique, bush cricket-like *?Cyrtophyllites cretaceus* Gorochoy, Jarzembowski and Coram (2006) (Figure 4.43).

## Interpretation

The evaporites in the Insect Bed recorded by Barton (1978; pseudomorphs after gypsum and halite) suggest hypersalinity during or subsequent to deposition of the bed. The absence of molluscs and infrequency of ostracods suggests a stressful environment, probably due to fluctuating salinities. This is supported by a restricted aquatic insect fauna dominated by a single species of water bug (*Nepidium stolones* Westwood). This fauna also suggests brackish rather than freshwater conditions. So, the insects are probably preserved due to brackish, stressful and even hypersaline conditions limiting the infauna and inhibiting organic decay. The water body was subject to varying degrees of salinity and therefore varying marine influence, suggesting a lagoonal environment.

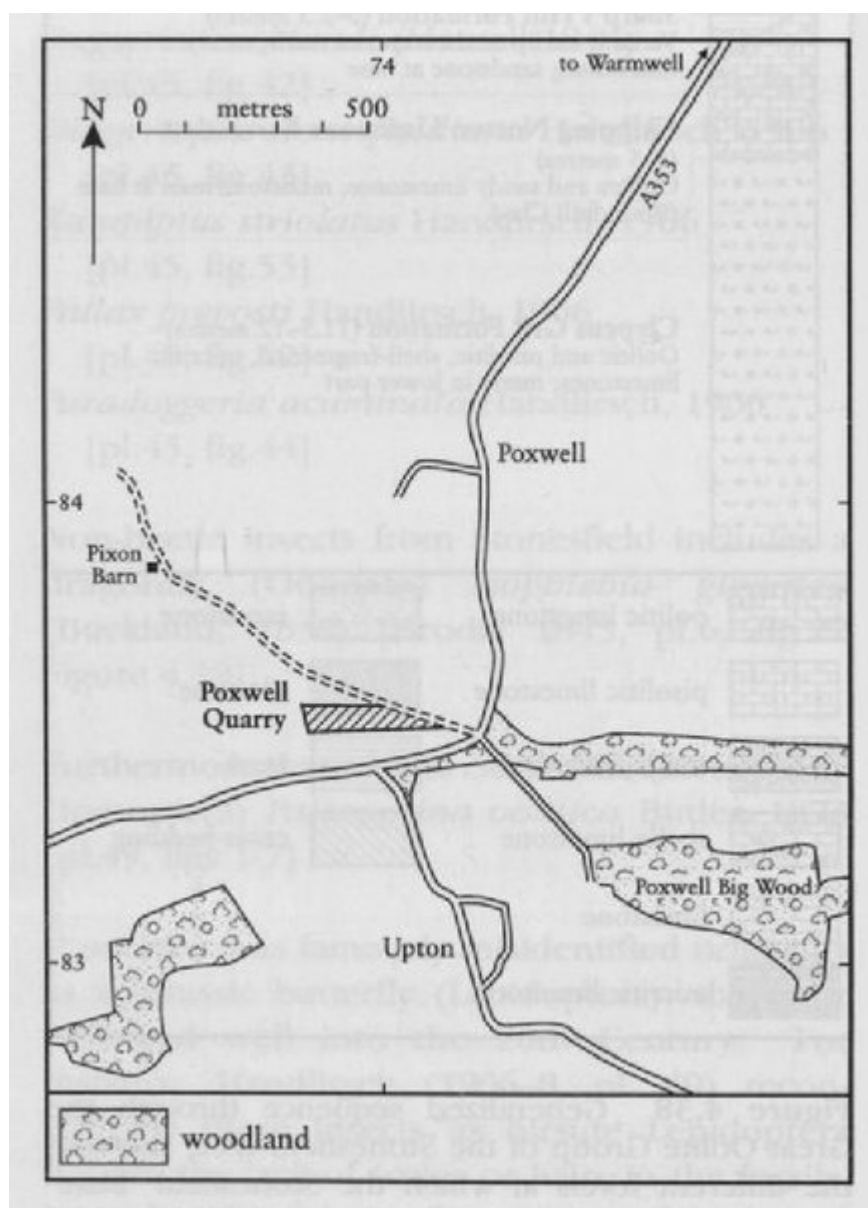
## Comparison with other localities

This small field outcrop is the finest inland exposure of the historically important Lower Insect Bed (Lulworth Formation), first recognized in the Weymouth area by Fisher (1856). The only other equivalent horizon in Durlston Bay has been degraded by modern coastal defence works, so it supplements the bay which is the type section of the Purbeck Limestone Formation.

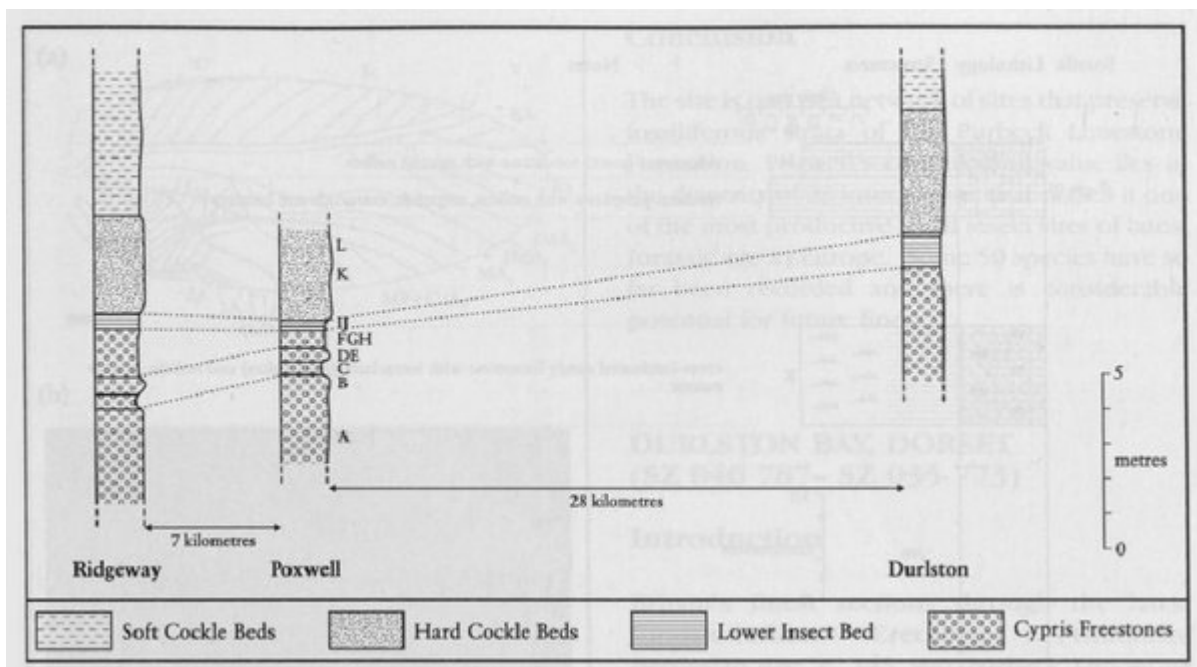
## Conclusion

The site is part of a network of sites that preserve fossiliferous strata of the Purbeck Limestone Formation. Poxwell's conservation value lies in the diversity of its insect fauna that makes it one of the most productive fossil insect sites of latest Jurassic age in Europe. Some 50 species have so far been recorded and there is considerable potential for future finds.

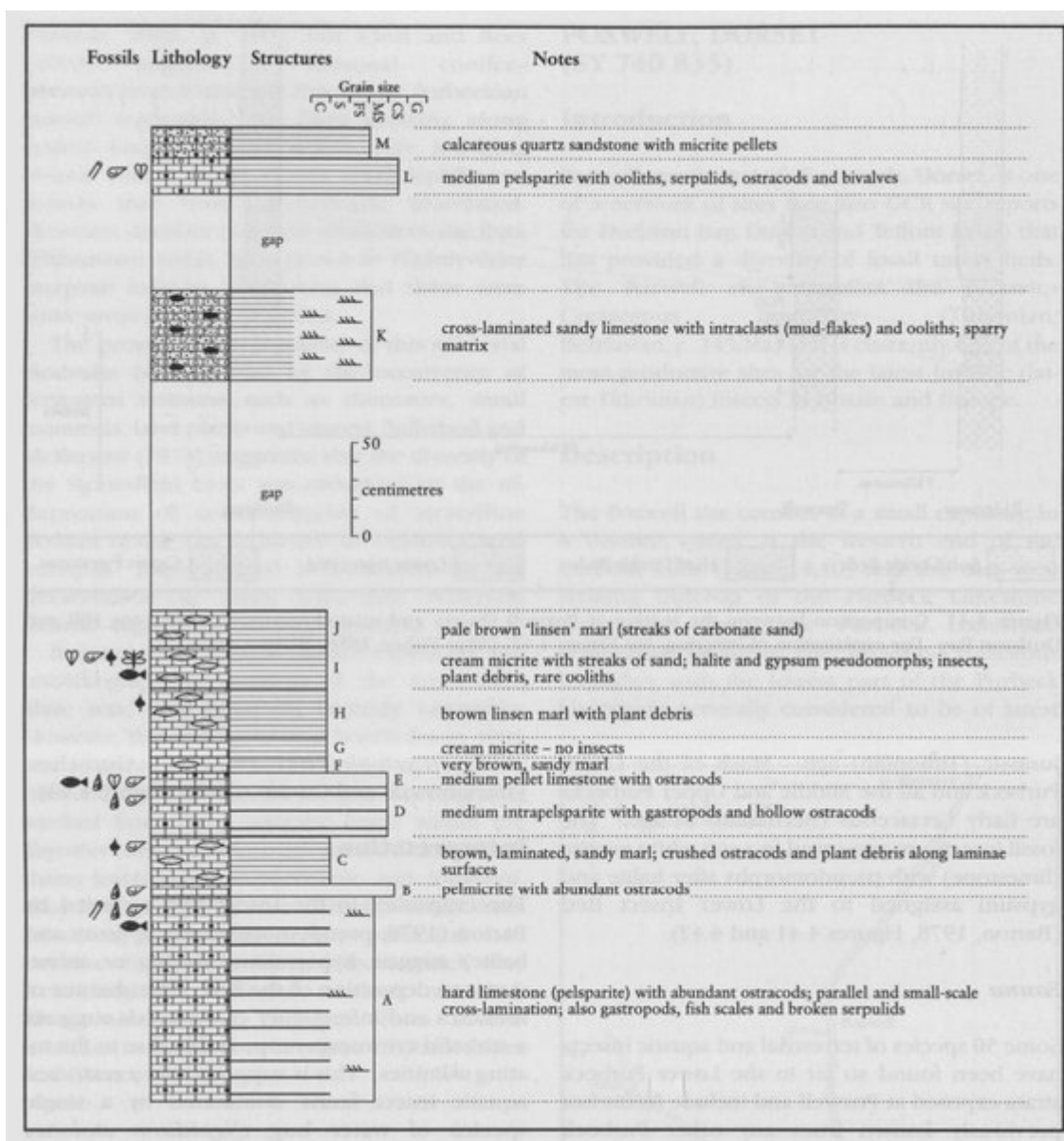
## References



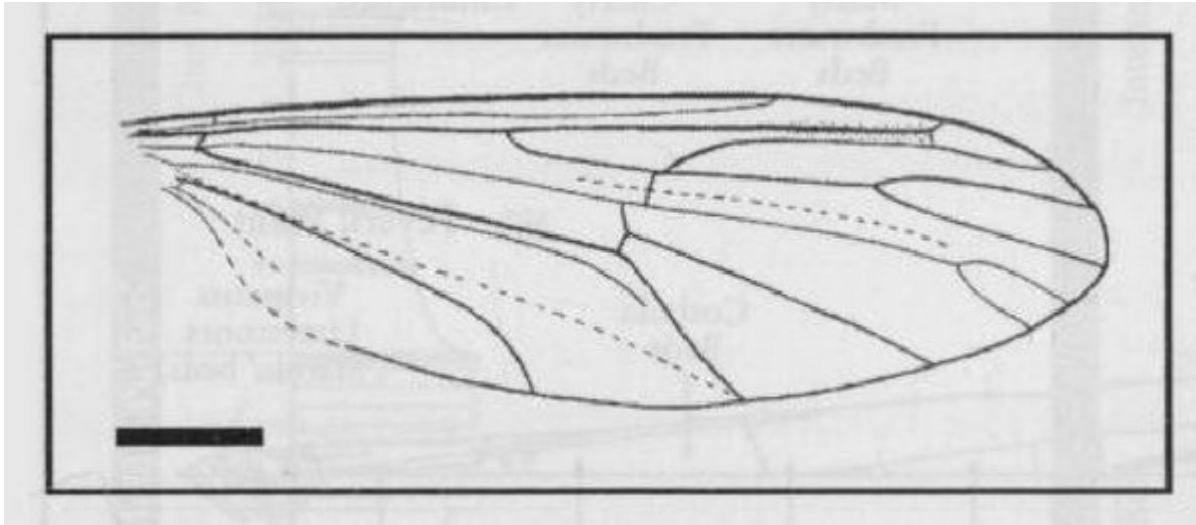
(Figure 4.40) Location map for Poxwell Quarry GCR site.



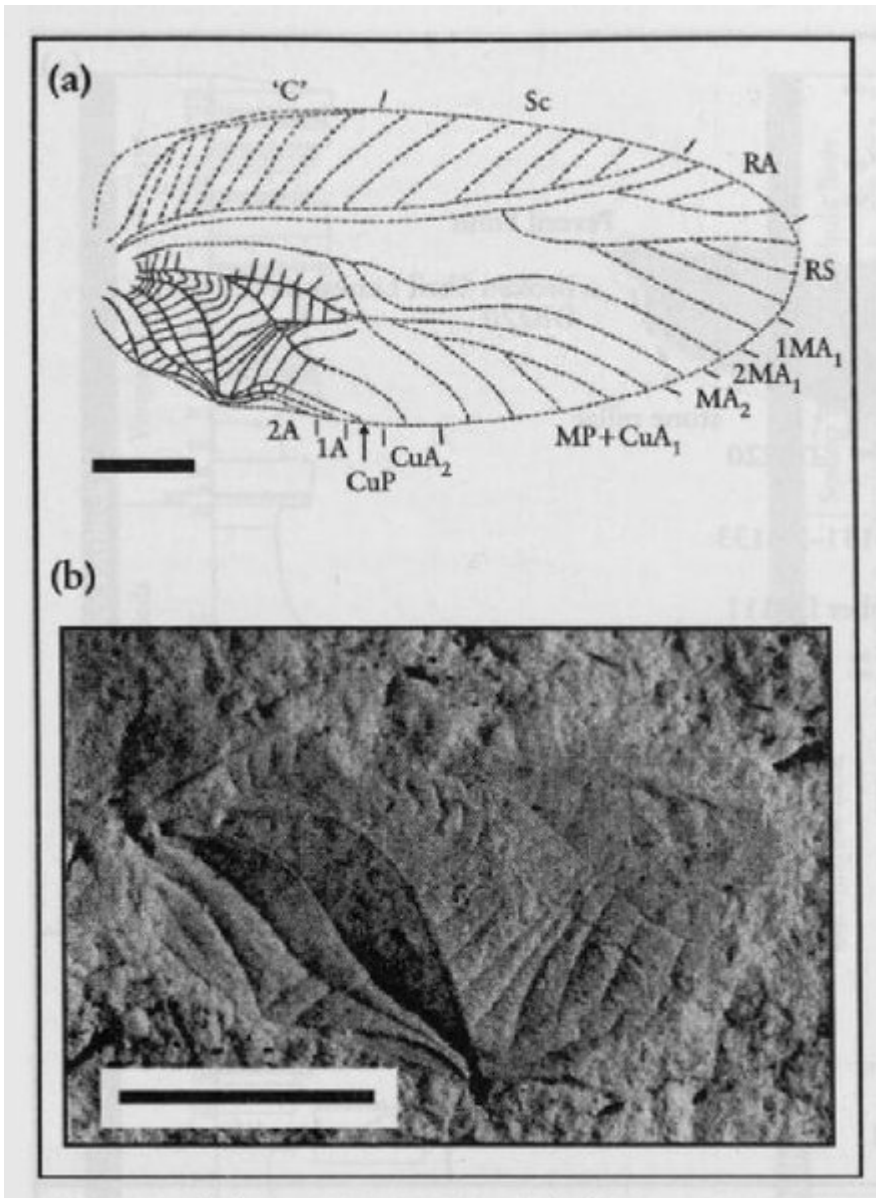
(Figure 4.41) Comparison between the section at Poxwell Quarry and related sections at Ridgeway Hill and Durlston Bay. For explanation of lettering, see (Figure 4.42). (After Fisher, 1856; Barton, 1978.)



(Figure 4.42) Graphic log of the Poxwell 'Insect Quarry'. For lithology: C, clay; CS, coarse sand; FS, fine sand; G, gravel; MS, medium sand. The horizons where various types of fossils are found are shown by symbols for gastropods, fish, plants, insects, ostracods, serpulids and bivalves. (After Barton, 1978.)



(Figure 4.44) *Brodilka mitchelli* Lukasevich et al 2001, holotype MNEMG 2000.50; Poxwell, Dorset; Upper Tithonian.



(Figure 4.43) (a,b) ?*Cyrtophyllites cretaceous* Gorochov et al, 2006, male forewing (holotype). Bar 5 mm. For venation abbreviations see (Figure 4.23). (From Gorochov et al., 2006.)