## A previously unknown nonmarine ostracod fauna from the Wessex Formation (Early Cretaceous) of the Isle of Wight, southern England, with implications for the origins of hyponeustic feeding in ostracods

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Screening of large quantities of sediment for studies of the plant debris beds of the Wessex Formation (Wealden Group, Barremian) on the Isle of Wight (Fig. 1) and their associated vertebrate and invertebrate fauna (SWEETMAN & INSOLE 2010) has revealed hitherto unknown nonmarine ostracod assemblages.



Fig. 1: Location map; modified after SWEETMAN & INSOLE (2010).

On the Isle of Wight the exposed Wessex Formation of the Wessex Sub-basin is considered to be of Barremian age (Fig. 2) on the basis of palynological, magnetostratigraphic and fossil wood carbon isotope data (KERTH & HAILWOOD 1988; HUGHES & MC-DOUGALL 1990; ROBINSON & HESSELBO 2004) and is equivalent to the lower part of the Upper Weald Clay Formation of the Weald Sub-basin. It represents high sinuosity fluvial, lacustrine and terrestrial deposition on a low relief floodplain. Plant debris beds form a very small proportion of the succession and represent locally derived debris flows, which randomly sampled diverse terrestrial and aquatic floodplain habitats prior to deposition. They are the main source of vertebrate fossils, including dinosaurs and also contain freshwater molluscs and mainly terrestrial plant remains. Several of the beds have yielded nonmarine ostracods, including species of *Cypridea* and *Theriosynoecum*. The ostracod assemblage of one bed, situated a few metres below the Chine Farm Sandstone, is of particular interest. It comprises at least four species of *Cypridea*, a new species of *Pinnocypridea*, and a new genus and species of the cypridoidean Subfamily Notodromadinae; the diversity of *Cypridea* and the absence of taxa requiring permanent waters (such as darwinulids and *Theriosynoecum*) implies derivation from temporary waterbodies.

The occurrence of genus *Pinnocypridea* SHI & Ho, 1963 in England was first noted by LI (1988) who commented that *Mantelliana cyrton* ANDERSON, 1971 from the Purbeck Limestone Group (Berriasian) should be reassigned to *Pinnocypridea*; apart from that, the genus does not seem to have been noticed previously in Europe. First described from the Chentsyanyan Formation of Sichuan Province in China (originally regarded as Late Cretaceous but now considered to be of Early Cretaceous age), the genus is represented by several species in the latest Jurassic to Early Cretaceous of China (e.g., YE 1994; HOU et al. 2002); LUGER & SCHUDACK (2001) have reported it from the early Aptian of Somalia.

Lithostratigraphical divisions Wessex Sub-basin Weald Sub-basin				Stage	Ostracod zonation (Horne, 1995)	
Vectis	dŋ	Γ	///////////////////////////////////////	APTIAN (part)	Cvpridea	
Wessex Formation	Vealden Gro		Upper Weald Clay Formation	BARREMIAN	<i>fasciata</i> Subzone	Theriosynoecum fittoni Zone
		Weald Clay Group	Lower Weald Clay Formation	HAUTERIVIAN	Cypridea pumila Subzone	
					Cypridea dorsispinata Subzone	
		igs Group	Upper Tunbridge Wells Sand Formation Grinstead Clay Formation Tunbridge Wells Sand Formation Wadhurst Clay Formation	VALANGINIAN	Cypridea bispinosa Subzone	Theriosynoecum alleni Zone
		Hasti	Ashdown Formation		Cypridea menevensis Subzone	
				BERRIASIAN (part)	<i>Cypridea</i> propunctata Subzone (part)	<i>Theriosynoecum forbesi</i> Zone (part)

*Fig. 2:* Wealden (Early Cretaceous) stratigraphy of southern England; that of the Wessex Subbasin reflects strata exposed on the Isle of Wight (modified after HORNE 2009).

The Family Notodromadidae today includes the subfamilies Notodromadinae and Cyproidinae; a member of the latter, *Mantelliana phillipsiana* (JONES, 1888), occurs in the Wadhurst Clay Formation of the Hastings Group (Valanginian) and at the base of the Lower Weald Clay Formation (early Hauterivian) (ANDERSON 1985; HORNE & MARTENS 1998). The new Wessex Formation genus is assigned to the Notodromadinae on the basis of the peculiar morphology of its flattened ventral surface, a diagnostic feature of the subfamily, which represents an adaptation allowing the ostracods to attach themselves upside-down to the water surface (e.g., species of *Notodromas* and *Newnhamia*) where they feed on the hyponeuston (DE DECKKER 1979; GEORGE & MARTENS 2003). The Wessex Formation notodromadine ostracod thus constitutes the oldest known evidence of hyponeustic feeding in Ostracoda (and possibly in any crustacean) and has implications for the phylogeny and biogeography of the Notodromadidae.

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