

The Asian Clam *Corbicula fluminea* (Müller, 1774) (Veneroidea, Cyrenidae) at Nafford Island, Birlingham, Worcestershire with comments on the shell bed

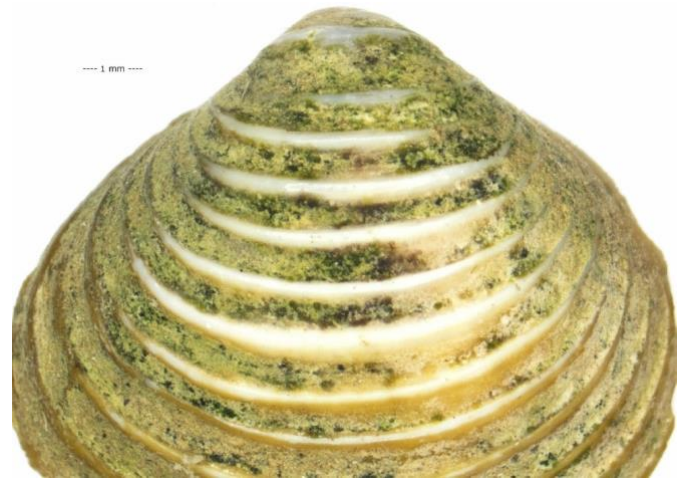
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Introduction

The thermophilous Asian Clam *Corbicula fluminea* (Müller, 1774) has spread rapidly in Europe since 1980 and relatively widely in the British Isles since its appearance in eastern England in 1998 (Minchin, 2014). It has a very high passive dispersal ability and is apparently native to southern and eastern Asia, Australia, north Africa and south-east Russia. Its true status in the Worcestershire River Avon remains unknown but it is suggested that it is not presently burgeoning.

Discussion

In the Worcestershire River Avon *C. fluminea* has been recorded very occasionally since 2014 in the lower reaches near Tewkesbury but up to now is evidently unrecorded further upstream. Its equally climatically-sensitive congener *C. fluminalis* (Müller, 1774) is known only from one fossil occurrence in the protovalley of the River Avon (Whitehead, 1989; 2015); shells of *C. fluminea* can be distinguished readily by their combination of regular elevated concentric growth ridges (01) and trapezoidal shape when fully developed. Adult shells can attain a width of 25 mm. On 10 September 2018 valves of an adult and an immature *C. fluminea* (Fig. 01) were found in a shell bed at Nafford Island (SO9441 13 m altitude Fig. 02) created following high floods during April 2018.



01. Right valve of immature *Corbicula fluminea*, Nafford Island, Birlingham, Worcestershire, 10 September 2018. P. F. Whitehead
 The smoothing of the ridges and absence of periostracum suggests that this shell has been derived in the river for some time.

Farmer & Farmer (2014) drew attention to shell beds at Nafford Island and mentioned the abundance of the fluvial gastropod *Viviparus viviparus* (L., 1758). This is usually lithicolous (Pfleger & Chatfield, 1988) so that in the lowland rivers of central England any populations achieving dominance must be culture-favoured. This is precisely the situation at Nafford Island where the construction of the weir was linked to bankside stabilisation processes using large boulders and walling producing abundant algal mats.



02. Shell bed almost one metre deep at Nafford Island, Birlingham, Worcestershire, 10 April 2018. P. F. Whitehead

The population of *V. viviparus* on these engineered features must be astonishing. During April 2018 the Nafford Island shell bed (02) was originally more than 90 cms thick in places and was thought to

contain almost one million shells of *V. viviparus* as the dominant species. It seems that from time to time shells of *V. viviparus* are scoured by floods and winnowed into beds on the inside of the

channel curve. These are largely fresh shells (earlier shell beds are often destroyed by trampling) which brings with it the implication that these populations of *V. viviparus* are subject to mass mortality perhaps through normal (possibly flood-induced) cyclical processes. Most of the shells of *V. viviparus* assembled at Nafford Island are relatively small. Elsewhere in the River Avon *V. viviparus* frequently occurs as larger shells at low densities e.g. at Pensham on 30 March 1984 a shell with 5.75 whorls was 40 mm high and 28 mm wide. On 1 April 2016 a single shell at Bridgewater Bay, Somerset with six whorls was 44 mm high and 32 mm wide.

Conclusion

It is of some interest that in a shell bed containing millions of shells only two valves of *C. fluminea* were observed during September 2018. This suggests that up to now in the lower valley of the Worcestershire River Avon *C. fluminea* is not reproducing in the kinds of numbers seen in some of the major European rivers. However, on 30 November 2018 it was observed that changed flow rates at Nafford had resorted the river channel bed sediments and winnowed about 70 immature shell valves of *C. fluminea* to one spot. This might suggest that the bivalve is now starting to proliferate but with varying success.

On the Slovakian Danube at Mužla (47°45'N 18°37'E) during June 2015 the author found that *C. fluminea* shells were often dominant in fluvial shell drifts, although the bed sedimentology in that location differs from that of the River Avon at Nafford. It is stressed also that care is required when interpreting shell bed taphonomy due to differential shell transportation and buoyancy between species.

References

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Images

01. Right valve of immature *Corbicula fluminea*, Nafford Island, Worcestershire, 10 September 2018. P. F. Whitehead
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