

Assessing the potential impact of the non-native Asian date mussel in the UK using inter-species comparisons of feeding rate

by Kate Dey, University of Portsmouth

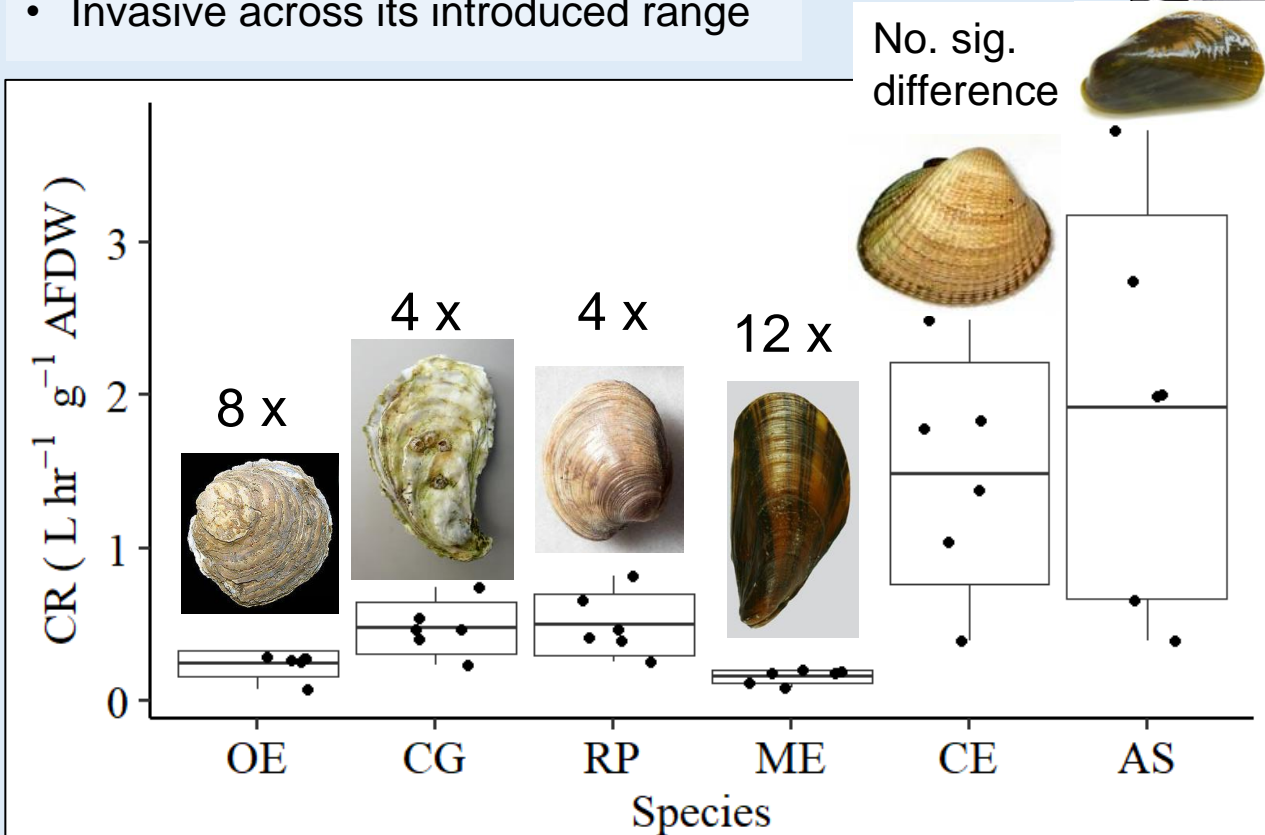
Arcuatula senhousia

- Small marine mussel
- Fast growth rate
- Short-lived
- Forms dense mussel mats
- Invasive across its introduced range

Methods



Fig. 1. Experimental set-up for measuring clearance rate (CR)



Clearance rate / CR (L hr⁻¹ g⁻¹ AFDW) of *A. senhousia* was **4-12 x higher** than that of all species

Fig. 2. Box plot of clearance rate (CR) (L hr⁻¹ g⁻¹ AFDW) of *Ostrea edulis* (OE), *Crassostrea gigas* (CG), *Ruditapes philippinarum* (RP), *Mytilus edulis* (ME), *Cerastoderma edule* (CE) and *Arcuatula senhousia* (AS). AFDW = ash free dry weight. Horizontal line = mean CR, box = 1 standard deviation, dots = CR for each specimen

Comparisons between the CR ($L\ hr^{-1}\ m^{-2}$) of *A. senhousia* and those of other species, when *A. senhousia* are at: **A) mean current density ($2\ ind.\ m^{-2}$) **B)** potential future density ($10,000\ ind.\ m^{-2}$)**

Species	Current mean density (ind. m^{-2})	CR ($L\ hr^{-1}\ m^{-2}$)	How many times higher \uparrow or lower \downarrow CR of species is compared to <i>A. senhousia</i>	
			A	B
<i>Ostrea edulis</i>	0.1	0.02	\downarrow 25	\downarrow 38,400
<i>Crassostrea gigas</i>	13	3	\uparrow 6	\downarrow 256
<i>Ruditapes philippinarum</i>	34	6	\uparrow 12	\downarrow 128
<i>Mytilus edulis</i>	311	33	\uparrow 66	\downarrow 23
<i>Cerastoderma edule</i>	495	59	\uparrow 118	\downarrow 13

Future CR ($L\ hr^{-1}\ m^{-2}$) of *A. senhousia* may be **13-38,400 x higher** than that of all species



A. senhousia mat on the east shore of San Francisco Bay, USA. © Andrew Cohen

Conclusions

High CR means potential:



- competition if densities increase

- impact on commercially important stocks and ecosystem services



- alteration to the abundance and composition of plankton

Next steps: seasonal experiments, assess different food types / concentrations

