

Supplementary data S2: manganese labelling of the shell of *C. gigas* observed under cathodoluminescence (for more information, see Lartaud et al., 2010, Aquaculture 300: 206-217). This picture of the hinge region of the left valve shows several Mn labels (bright orange) crossing the foliated (dark red areas) and chalky (purple menisci) microstructures. As the labels represent 4 h of mineralization in Mn-enriched water, the continuity of the markings observed in this picture is proof that chalky layers are formed simultaneously with adjacent foliated deposits.

