*The following supplement accompanies the article*

# Decoding fingerprints: elemental composition of vertebrae correlates to age-related habitat use in two morphologically similar sharks

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## **Supplement 1.** Vertebral microchemistry of bull (*Carcharhinus leucas*) and pig-eye (*C. amboinensis*) sharks through ontogeny

Table S1. Sampling details for fishery independent surveys (species combined). Location, sample size (sex ratio), species, average total length (TL) ± standard deviation (mm), date (months / years).

| Location | Sample size (sex ratio) | Species | Average TL (± st dev) (mm) | Date |
|---|---|---|---|---|
| Darwin harbour | 4 (2 male, 2 female) | *C. amboinensis* | 753.75 (43.28) | March 2008 |
| Fitzroy R | 16 (8 male, 8 female) | *C. leucas* | 994.18 (295.36) | June 2003 |
| Daly R | 15 (9 male, 6 female) | *C. leucas* | 862.53 (99.77) | July / August 2007 |
| Liverpool R | 7 (5 male, 2 female) | *C. leucas* | 904 (96.87) | June 2002 |
| East Alligator R | 14 (7 male, 7 female) | *C. leucas* | 767.62 (26.87) | April 2008 |
| Roper R | 11 (5 male, 6 female) | *C. leucas* | 836.18 (47.5) | July 2002 |
| Towns R | 11 (5 male, 6 female) | *C. leucas* | 1092.92 (130.85) | July 2002 |

Table S2. Average percent composition of calcium in shark vertebrae from the regions scanned in Fig. S1.

| Sample | Species | % composition Calcium ( ± St Dev) |
|---|---|---|
| PE168 | *Carcharhinus amboinensis* | 35.16 (0.76) |
| PE169 | *Carcharhinus amboinensis* | 35.41 (0.74) |
| B201 | *Carcharhinus leucas* | 34.63 (0.84) |
| B229 | *Carcharhinus leucas* | 35.81 (0.73) |

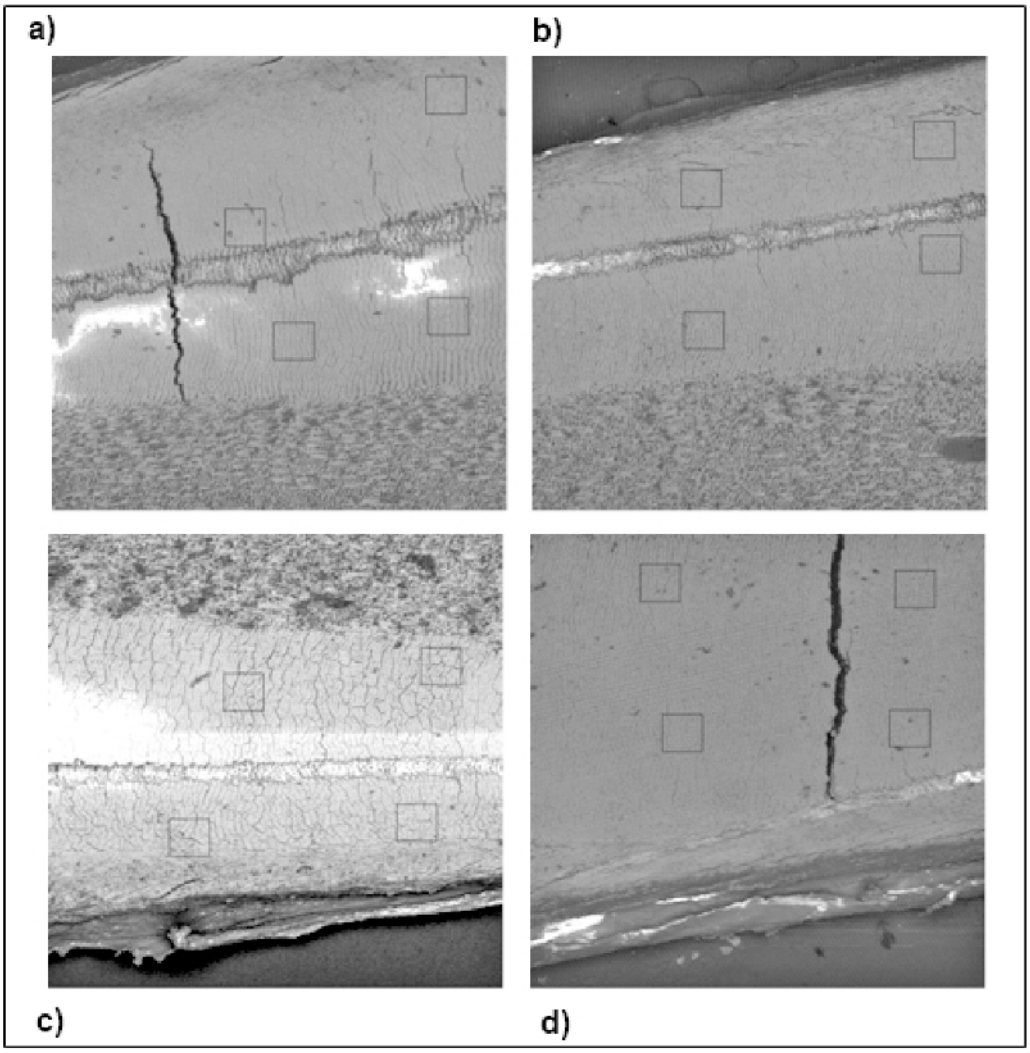
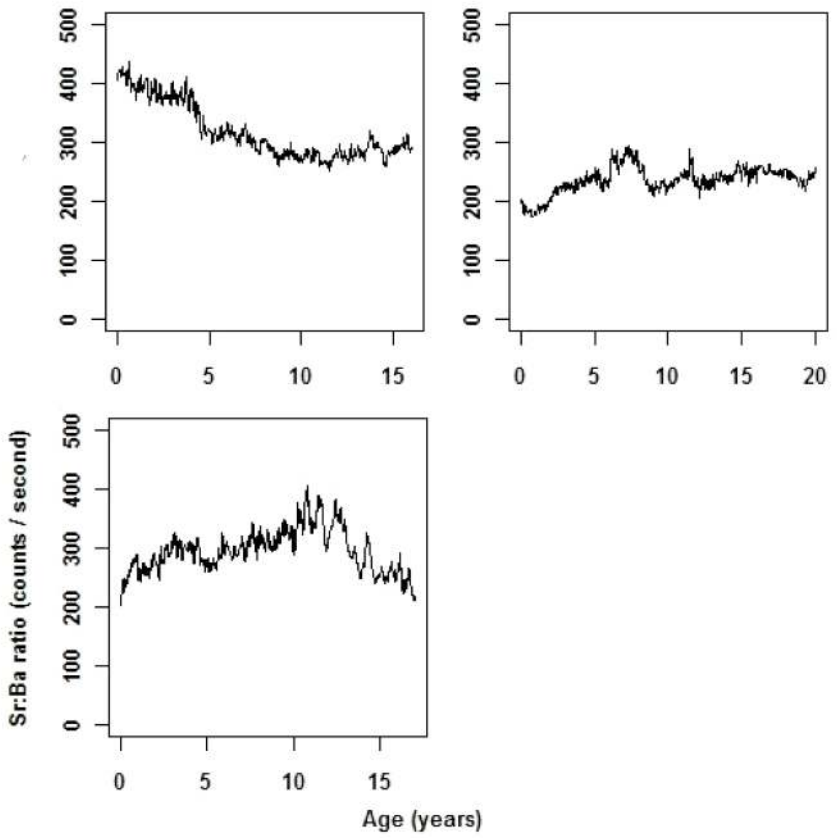



Fig. S1. Scanning electron microscopy of sagitally sectioned ablated shark vertebrae. Boxes represent areas in the corpus calcareum which elemental compostion were quantified and compared (1 mm x 1 mm). (a) sample PE168 (*Carcharhinus amboinensis*); (b) sample PE169 (*Carcharhinus amboinesis*); (c) sample B201 (*Carcharhinus leucas*); (d) sample B229 (*Carcharhinus leucas*).

a)




b)

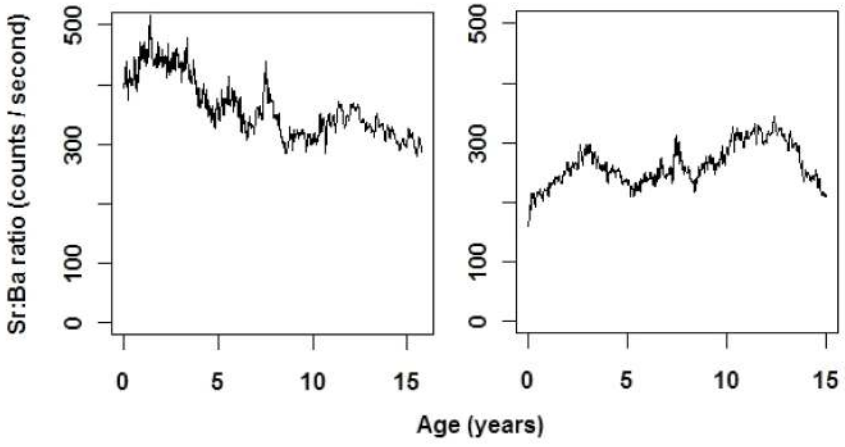
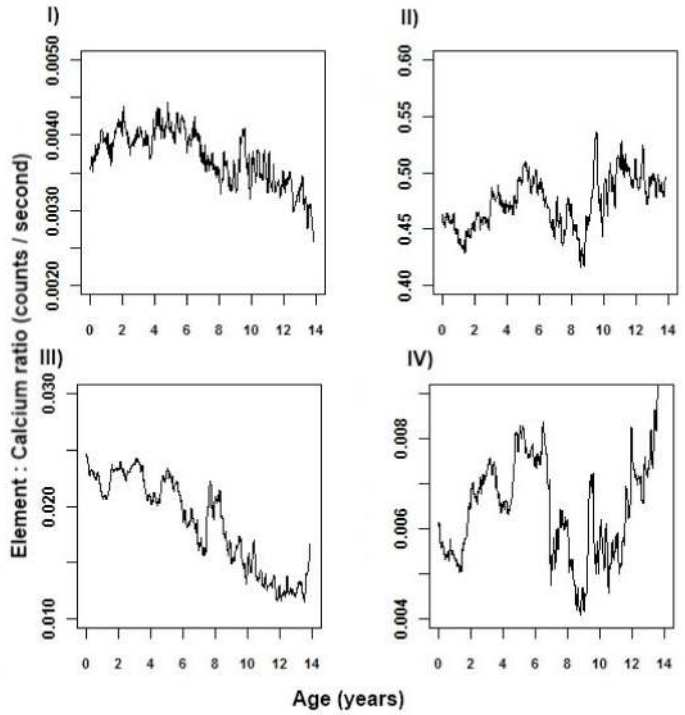



Fig. S2. Typical Sr:Ba net cps ratios (counts per second) with age (years) of pig-eye sharks; total $n = 39$. (a) Female patterns, $n = 18$; (b) Male patterns, $n = 21$

a)




b)

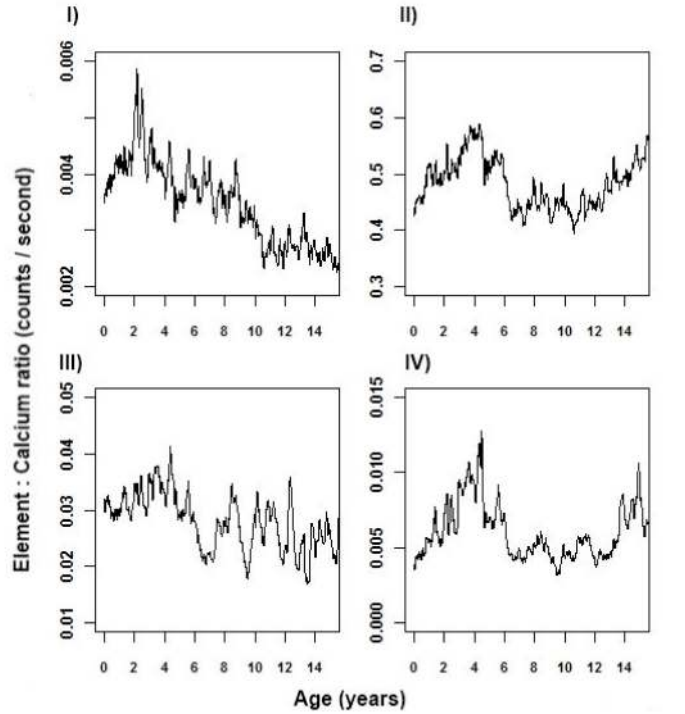



Fig. S3. Typical element:Ca net cps ratios (counts per second) with age (years) of pig-eye sharks; total $n$ = 39. (I) Lithium; (II) Magnesium; (III) Manganese; (IV) Zinc. (a) Female patterns, $n$ = 18; (b) Male patterns, $n$ = 21.

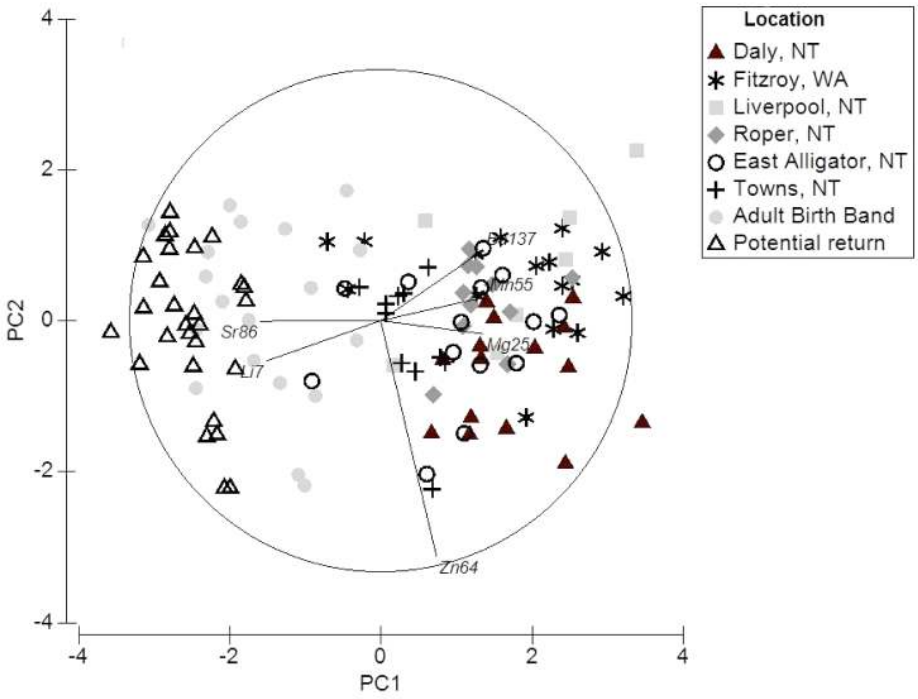



Fig. S4. Principal component analysis of bull shark nurseries identified from juvenile vertebrae; adults birthbands and return periods. Variation explained by the first 2 principal components is represented. Fitzroy River $n$ = 16, Daly River $n$ = 15, Liverpool River $n$ = 7, East Alligator River $n$ = 14, Roper River $n$ = 11, Towns River $n$ = 11, adult $n$ = 18, adult returns $n$ = 28; total $n$ = 120.