**SUPPLEMENTARY MATERIAL**

**Comparative phylogeography in a marine biodiversity hotspot provides novel insights into evolutionary processes across the Atlantic-Indian Ocean transition**



Figure S1 : Pearson’s correlation between environmental predictors, shown for Sea Surface Temperature (SST) and Sea Surface Salinity (SSS), for the present day (\*\_cont), Mid-Holocene (\*\_MH) and Last Glacial Maximum (\*\_LGM).

Table S1: List of species, with the number of sites and samples (individuals) taken in each bioregions, their distribution range, their preferred habitat and average values of haplotype and nucleotide diversity.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **# of sites (# samples)** | **Western range limit** | **Eastern range limit** | **Habitat** | **Mean *h*** | **Mean π** | **References** |
|   | **CT** | **SW** | **WT** | **ST** | **Total** |
| *Acanthochiton garnoti* (Aga) | 6 (105) | 4 (70) | 5(51) | 1(22) | 16(248) | Port Nolloth  | Port St Johns | Hard substrate | 0.947 | 0.008 | (Wright et al., 2015) |
| *Afrolittorina africana* (Aaf) |  - |  - | 3(91) | 8(96) | 11(187) | False Bay | Southern Mozambique | Hard substrate | 0.360 | 0.001 | [(Matumba et al., 2020)](https://f1000research.com/articles/9-339) |
| *Afrolittorina knysnaensis* (Akn) | 7(181) | 2(17) | 7(71) | 4(43) | 20(312) | Namibia | Port St Johns  | Hard substrate | 0.299 | 0.001 | (Matumba et al., 2020) |
| *Bullia rhodostoma* (Brh) | 2(39)  | 2(39) | 4(59) | 2(45) | 10(182) | Cape Point | Port St Johns | Soft substrate | 0.828 | 0.076 | (Muteveri et al., 2015) |
| *Caffrogobius caffer* (Cca) | 3(69) | 3(69) | 6(148) | 1(21) | 13(307) | Port Nolloth  | Haga Haga | Hard substrate | 0.961 | 0.010 | (Neethling et al., 2008) |
| *Chrysoblephus puniceus* (Chu) |  - |  - | 6(116) | 3(112) | 9(228) | Cape Point | East London | Hard substrate | 0.970 |  0.012 | (Duncan et al., 2015) |
| *Cyclograpsus punctatus* (Cpu) | 4(57) | 3(44) | 4(61) | 2(27) | 13(189) | Jacobs Bay | Ponta de Ouro | Hard substrate | 0.758 | 0.009 | (Wright et al., 2015) |
| *Jasus lalandii* (Jla) | 6(195) | 2(67) |  - | 1(10) | 9(272) | southern Namibia | Algoa Bay | Hard substrate | 0.603 | 0.002 | (Matthee et al., 2007) |
| *Lithognathus lithognathus* (Lli) | 2(55) | 1(55) | 4(91) | 2(65) | 9(266) | northern Namibia | Mozambique | Soft substrate | 0.986 | 0.012 | (Bennett et al., 2017) |
| *Nassarius kraussianus* (Nkr) | 3(29) | 1(10) | 3(30) | 4(40) | 11(109) | Namibia | Mozambique | Soft substrate | 0.685 | 0.002 | (Teske et al., 2007a) |
| *Oxystele tigrina* (Oti) | 10(253) | 2(39) | 6(126) | 1(24) | 19(442) | Port Nolloth | Port St Johns | Hard substrate | 0.919 | 0.006 | (Wright et al., 2015; Mertens et al., 2018) |
| *Oxystele antoni* (Ova) | 4(71) | 1(9) | 4(77) | 1(15) | 10(172) | Namibia | Port St Johns | Hard substrate | 0.675 | 0.003 | (Wright et al., 2015) |
| *Palaemon peringueyi* (Ppa) | 5(52) | 2(20) | 10(76) | 3(27) | 20(175) | Walvis Bay (Namibia) | Kosi Bay | Soft substrate | 0.824 | 0.007 | [(Teske et al. 2007)](https://www.tandfonline.com/doi/abs/10.2989/AJMS.2007.29.2.9.192)  |
| *Parechinus angulosus* (Pan) | 10(294) | 4(126) | 5(103) | 2(62) | 21(585) | Luderitz | Durban | Hard substrate | 0.909 | 0.008 | (Muller et al., 2012) |
| *Perna perna* (Ppe) | 2(91) | 2(91) | 4(218) | 4(110) | 12(510) | Angola | Mozambique | Hard substrate | 0.770 | 0.004 | (Teske et al., 2013) + unpublished data |
| *Siphonaria capensis* (Sca) |  - |  - | 2(83) | 3(42) | 5(125) | Namibia | Mozambique  | Hard substrate | 0.810 | 0.004 | (Teske et al., 2011a, 2013) |
| *Siphonaria serrata* (Sse) |  - |  - | 2(92) | 9(205) | 11(297) | Cape Point | Tongati | Hard substrate | 0.556 | 0.003 | (Teske et al., 2013) |

Table S2. List of species in which within-bioregion ΦST values were calculated, with number (#) of sites used to calculate values, along with the significance of the values at p<0.05. The ΦST values are shown per species, per bioregion.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Species** | **Cool temperate (CT)** | **South-West (SW)** | **Warm Temperate (WT)** | **Subtropical (ST)** |
| ***Acanthochiton garnoti*** |  |  |  |  |
| # sites |  | 4 | 5 |  |
| within-region ΦST |  | 0.08169 | 0.04394 |  |
| p-value |  | 0.00000+-0.00000 | 0.00489+-0.00203 |  |
| ***Afrolittorina africana*** |  |  |  |  |
| # sites |  |  | 4 | 10 |
| within-region ΦST |  |  | 0.12402 | 0.03524 |
| p-value |  |  | 0.07625+-0.00842 | 0.04106+-0.00517 |
| ***Afrolittorina knysnaensis*** |  |  |  |  |
| # sites | 5 |  | 8 | 4 |
| within-region ΦST | 0 |  | 0 | 0.00637 |
| p-value | 0.89932+-0.00988 |  | 0.53275+-0.01021 | 0.35386+-0.01358 |
| ***Excirolana latipes*** |  |  |  |  |
| # sites | 4 | 4 |  |  |
| within-region ΦST | 0.45979 | 0.31052 |  |  |
| p-value | 0.00000+-0.00000 | 0.00098+-0.00098 |  |  |
| ***Nassarius kraussianus*** |  |  |  |  |
| # sites |  |  | 3 | 4 |
| within-region ΦST |  |  | 0.01645 | 0.13978 |
| p-value |  |  | 0.33333+-0.01225 | 0.00391+-0.00185 |
| ***Oxystele antoni***  |  |  |  |  |
| # sites | 3 | 4 |  |  |
| within-region ΦST | 0.00309 | 0.00827 |  |  |
| p-value | 0.48485+-0.01552 | 0.22385+-0.01095 |  |  |
| ***Parechinus angulosus*** |  |  |  |  |
| # sites | 6 | 4 | 5 |  |
| within-region ΦST | 0.28265 | 0.00597 | 0.08235 |  |
| p-value | 0.00000+-0.00000 | 0.20528+-0.01538 | 0.00000+-0.00000 |  |
| ***Tetraclita serrata*** |  |  |  |  |
| # sites | 4 | 4 | 7 |  |
| within-region ΦST | 0.07692 | 0.16186 | 0.00219 |  |
| p-value | 0.00000+-0.00000 | 0.00000+-0.00000 | 0.33333+-0.01419 |  |
| **Total sites** | **22** | **20** | **32** | **18** |
| **Total species** | **5** | **5** | **6** | **3** |

Figure S2 : boxplot of the haplotype and nucleotide diversity per species.

Figure S3 : boxplot of the haplotype and nucleotide diversity per species and bioregion.