**Additional online materials**

**Supplemental fatty acid data**

**S1:** Stable isotope composition of carbon (δ13C) and nitrogen (δ15N) (mean ± standard deviation) in *Hilsa kelee*, *Valamugil buchanani* and their potential food sources collected from Pangani estuary

|  |  |  |  |
| --- | --- | --- | --- |
| Functional group | Taxa | Upper estuarine zone | Lower estuarine zone |
| δ13C  | δ15N  | δ13C | δ15N |
| Primary producers  | Seston ≥250 µm (3)  | -27.05 ± 0.42 | 7.14 ± 0.26 | -24.60 ± 0.54 | 7.82 ± 0.70 |
| Seston ≤20 µm (3) | -24.15 ± 0.12 | 6.87 ± 0.16 | -23.74 ± 0.27 | 8.16 ± 0.17 |
| Surface sediment OM (sPOM) (3) | -23.90 ± 0.72 | 6.81 ± 0.19 | -22.90 ± 0.74 | 6.42 ± 0.33 |
| Microphytobenthos (2) | -20.62 | 3.73 | -20.22 | 4.01 |
| Periphyton (3) | -23.38 ± 0.33 |  | -19.91 ± 0.20 | 6.86 ± 0.23 |
| Green filamentous algae (3) | - | - | -21.64 ± 1.42 | 6.11 ± 0.33 |
| Seaweed (3) |  |  | -16.18 ± 0.32 | 2.61 ± 0.42 |
| Sea grass (3) |  |  | -13.71 ± 1.04 | 3.53 ± 0.60 |
| C4 plants (grasses) (5) | -12.90 ± 0.34 | 5.21 ± 1.22 | - | - |
| C3 plants (5) | -28.10 ± 1.31 | 5.11 ± 1.32 | -28.70 ± 0.84 | 3.91 ± 1.93 |
| Invertebrates | Zooplankton (2) | -20.60 | 7.34 | -19.81 | 6.94 |
| Amphipods (2) | - | - | -18.05 | 10.01 |
| Barnacles (3) | -17.69 ± 0.1 | 8.64 ± 0.20 | -16.25 ± 0.22 | 8.61 ± 0.07 |
| Isopods (1) | -20.9 | 8.5 | -18.4 | 7.8 |
| Polichaetes (3) | -22.95 ± 0.93 | 10.35 ± 0.04 | -20.55 ± 0.81 | 8.05 ± 0.24 |
| Fish | Fish larvae (1) | -20.42 | 8.71 | -18.73 | 9.52 |
| *Hilsa kelee* | -17.82 ± 0.60 (19) | 10.80 ± 0.4 (19) | -17.61 ± 0.5 (20) | 10.92 ± 0.50 (20) |
| *Valamugil buchanani* | -23.24 ± 0.72 (20) | 12.96 ± 0.53 (20) | -22.30 ± 0.83 (22) | 12.41 ± 0.82 (22) |

**S2: Fatty acid composition (mean ± SD) in *Valamugil buchanani* and *Hilsa kelee* from Pangani estuary.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fatty acid | Upper estuary |  | Lower estuary |  |
| *H. kelee*(n = 17) | *V. buchanani*(n = 17) | *H. kelee*(n = 18) | *V. buchanani* (n = 18) |
| C14:0 | 6.41 ± 0.99 | 6.55 ± 0.85 | 6.32 ± 1.53 | 6.77 ± 1.30 |
| C15:0 | 1.49 ± 0.79 | 1.40 ± 0.83 | 1.18 ± 0.40 | 1.86 ± 1.05 |
| C16:0 | 30.27 ± 2.28 | 27.0 ± 2.09 | 31.87 ± 2.63 | 27.38 ± 2.73 |
| C16:1 | 5.27 ± 0.86 | 7.78 ± 1.09 | 5.62 ± 1.90 | 7.87 ± 1.86 |
| C16:1(n-7) | 0.17 ± 0.12 | 1.10 ± 0.35 | 0.05 ± 0.19  | 0.03 ± 0.05 |
| C17:0 | 0.79 ± 0.20 | 0.96 ± 0.55 | 0.66 ± 0.15 | 0.95 ± 0.70 |
| C17:1 | 1.36 ± 0.68 | 2.03 ± 1.10 | 1.71 ± 0.86 | 2.27 ± 0.89 |
| C18:0 | 8.24 ± 1.35 | 8.17± 1.22 | 8.35 ± 1.51 | 7.63 ± 1.36 |
| C18:1(n-7) | 2.46 ± 0.86 | 1.87 ± 0.95 | 2.90 ± 0.97 | 2.73 ± 1.03 |
| C18:1(n-9) | 9.55 ± 0.83 | 10.74 ± 1.36 | 9.38 ± 1.11 | 11.19± 2.39 |
| C18:2(n-6) (LIN) | 1.61 ± 0.77 | 2.02 ± 0.87 | 1.07 ± 0.55 | 0.76 ± 0.27 |
| C18:3(n-3) (ALA) | 0.98 ± 0.53 | 1.74 ± 0.92 | 0.76 ± 0.60 | 0.90 ± 0.85 |
| C18:4(n-3) | 0.49 ± 0.30 | 0.76 ± 0.39 | 0.52 ± 0.26 | 1.74 ± 1.03 |
| C20:1(n-9) | 2.19 ± 1.09 | 0.41 ± 0.40 | 1.97 ± 0.98 | 0.88 ± 0.56 |
| C20:4(n-6) (ARA) | 2.08 ± 1.02 | 3.77 ± 1.00 | 1.67 ± 0.89 | 2.29 ± 0.95 |
| C20:5(n-3) (EPA) | 9.29 ± 1.47 | 11.18 ± 1.63 | 9.09 ± 1.61 | 12.19 ± 1.91 |
| C22:1(n-9) | 0.28 ± 0.21 | 0.33 ± 0.19 | 0.30 ± 0.11 | 0.36 ± 0.22 |
| C22:5(n-3)  | 2.84 ± 1.06 | 3.18 ± 0.81 | 2.75 ± 1.34 | 2.83 ± 0.96 |
| C22:6(n-3) (DHA) | 11.56 ± 1.48 | 6.13 ± 1.16 | 11.86 ± 1.83 | 6.56 ± 1.45 |
| C24:0 | 0.31 ± 0.15 | 0.13 ± 0.14 | 0.28 ± 0.14 | 0.23 ± 0.22 |

**SS3: Fatty acids composition (mean ± 1 SD) in primary producers from upper estuarine zone (where sample size is < 3 were presented as average**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Fatty acid | ≤ 20 µm (n = 3) | ≥ 250 µm (n = 3) | sPOM (n = 3)  | Periphyton (n = 3)  | Chlorophytes (n =2) | C4 plant (n= 5) | C3 plant (n = 6) |
|  | (n=3) | (n=3) |  | (n = 3) | (n = 2) | ( n =5) | ( n = 6) |
| C14:0 | 3.6 ± 1.0 | 1.7 ± 0.3 | 4.1 ± 1.4 | 1.0 ± 0.4 | 9.4 | 5.1 ± 0.4 | 3.1 ± 1.1 |
| C15:0 | 0.8 ± 0.0 | - | 3.3 ± 1.2 | 5.6 ± 1.9 | 0.6 | 0.3 ± 0.1 | 0.3 ± 0.2 |
| C16:0 | 18.8 ±3.7 | 21.8 ± 2.8 | 26.3 ± 0.9 | 27.7 ± 3 | 26.4 | 20.5 ± 1.7 | 20.6 ± 2.4 |
| C16:1 | 1.6 ± 0.8 | 2.3 ± 0.4 | 5.0 ± 1.9 | 8.9 ± 3.1 | 6.6 | 4.3 ± 1.0 | 5.4 ± 1.9 |
| C16:1(n-7) | 3.2 ± 1.9 | 1.2 ± 0.9 | 2.9 ± 1.7 | 0.6 ± 0.3 | 1.5 | 1.9 ± 0.3 | 0.8 ± 0.5 |
| C17:0 | 2.4 ± 1.7 | 0.4 ± 0.2 | 2.4 ± 0.4 | 0.7 ± 0.5 | 1 | 0.1 ± 0.1 | 1.1 ± 1.5 |
| C17:1 | 0.1 ± 0.1 | 0.1 ± 0.1 | 0 | 1.0 ± 0.3 | 0.3 | 0.7 ± 0.7 | 1.0 ± 0.4 |
| C18:0 | 5.3 ± 3.0 | 9.1 ± 1.2 | 5.4 ± 1.4 | 3.4 ± 1.1 | 1.6 | 5.7 ± 1.3 | 7.0 ± 1.1 |
| C18:1(n-7) | 3.3 ± 1.5 | 7.7 ± 2.9 | 6.4 ± 0.5 | 2.2 ± 1.3 | 3.6 | - | 0.2 ± 0.2 |
| C18:1(n-9) | 11.8 ± 1.8 | 10.4 ± 3.3 | 8.6 ± 0.9 | 12.7 ± 3.8 | 12.6 | 9.1 ± 1.7 | 10.8 ± 2.2 |
| C18:2(n-6) | 2.0 ± 0.9 | 4.3 ± 1.3 | 2.6 ± 1.2 | 7.6 ± 1.7 | 8.6 | 16.3 ± 2.4 | 12.5 ± 2.4 |
| C18:3(n-3) | 7.9 ± 2.6 | 2.5 ± 0.3 | 3.2 ± 1.4 | 8.4 ± 2.6 | 16.9 | 28.7 ± 3.2 | 30.7 ± 5.3 |
| C18:4n-3 | 1.7 ± 1.1 | 0.7 ± 0.9 | 0 | 0.7 ± 0.7 | 1.4 | 0 | 0 |
| C20:0 | 1.5 ± 0.6 | 0.3 ± 0.3 | 0.4 ± 0.0 | 0.4 ± 0.3 | 0.2 | 2.7 ± 0.9 | 2.1 ± 1.1 |
| C20:1n-9 | 2.4 ± 0.6 | 0.9 ± 0.7 | 0 | 0.7 ± 0.6 | 0 | 0 | 0 |
| C20:4(n-6) | 1.4 ± 0.6 | 4.3 ±1.6 | 3.5 ± 0.2 | 0.4 ± 0.5 | 0.3 | - | - |
| C20:5(n-3) | 4.2 ± 1.2 | 6.0 ± 2.9 | 10.4 ±0.9 | 3.2 ± 0.7 | 2.6 | - | - |
| C22:5(n-3) | 5.0 ± 2.6 | 1.1 ± 0.9 | 2.0 ± 0.8 | 1.1 ± 0.2 | 3 | - | - |
| C22:6(n-3) | 17.7 ± 2.1 | 15.9 ± 2.0 | 0.8 ± 0.7 | 0.5 ± 0.3 | - | - | - |
| C24:0 |  | 1.3 ± 0.7 | 0.2 ± 0.2 | 0 | 0.1 | 0 | 0 |

**SS4: Fatty acids composition (mean ± 1 SD) in primary producers from lower estuarine zone (where sample size (n) < 3 were presented as average**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Fatty acid | ≤ 20 µm (n = 3) | ≥ 250 µm (n = 3) | sPOM (n = 3)  | Periphyton (n = 3)  | Chlorophytes (n =2) | Mangrove (n = 7) |
| C14:0 | 3.6 ± 1.7 | 3.7 ± 1.9 | 4.7 ± 1.6 | 1.8 ± 0.8 | 9.7 ± 3.2 | 6.2 ± 1.8 |
| C15:0 | 0.3 ± 0.2 | 0.2 ± 0.1 | 3.1 ± 1.1 | 3.2 ± 1.4 | 0.9 ± 0.3 | 0.1 ± 0.1 |
| C16:0 | 19.8 ± 3.0 | 19.8 ± 2.6 | 25.6 ± 3.4 | 31.0 ± 3.5 | 28.0 ± 3.8 | 18.5 ± 1.2 |
| C16:1 | 0.2 ± 0.1 | 2.2 ± 0.8 | 4.0 ± 0.3 | 7.8 ± 2.4 | 8.2 ± 2.0 | 1.0 ± 1.7 |
| C16:1(n-7) | 4.4 ± 1.1 | 2.0 ± 1.3 | 1.0 ± 0.6 | 0.8 ± 0.8 | 0.1 ± 0.0 | 1.2 ± 0.5 |
| C17:0 | 1.3 ± 0.3 | 0.3 ± 0.0 | 1.2 ± 0.2 | 1.1 ± 0.4 | 0.6 ± 0.2 | 0.7 ± 0.6 |
| C17:1 | 0.3 ± 0.2 | 0.1 ± 0.1 | 0.5 ± 0.2 | 2.3 ± 1.1 | 0.2 ± 0.2 | 1.8 ± 0.8 |
| C18:0 | 8.4 ± 2.7 | 10.4 ± 2.4 | 5.1 ± 1.6 | 1.8 ± 1.0 | 2.7 ± 0.5 | 5.3 ± 2.0 |
| C18:1(n-7) | 4.9 ± 2.1 | 8.3 ± 2.2 | 5.7 ± 0.9 | 4.3 ± 0.6 | 5.0 ± 2.2 | - |
| C18:1(n-9) | 8.2 ± 3.5 | 12.8 ± 2.2 | 8.2 ± 3.5 | 10.2 ± 1.4 | 9.0 ± 2.4 | 9.8 ± 1.9 |
| C18:2(n-6) | 4.1 ± 1.0 | 1.7 ± 1.2 | 3.1 ± 1.9 | 8.8 ± 2.5 | 6.5 ± 1 | 13.5 ± 2.6 |
| C18:3(n-3) | 7.6 ± 2.4 | 4.8 ± 3.4 | 2.8 ± 0.9 | 9.2 ± 2.0  | 19.7 ± 1.4 | 31.0 ± 2.7 |
| C18:4n-3 | 1.3 ± 0.6 | 2.0 ± 1.8 | 1.0 ± 1.4 | 0.3 ± 0.2 | 1.0 ± 0.2 | 0 |
| C20:0 | 1.4 ± 0.9 | 0.5 ± 0.2 | 1.1 ± 0.5 | 0.1 ± 0.1 | 0.3 ± 0.2 | 2.7 ± 1.0 |
| C20:1n-9 | 0.9 ± 0.6 | 0.3 ± 0.1 | 0 | 0.2 ± 0.0 | 0 |  |
| C20:4(n-6) | 3.7 ± 0.5 | 1.2 ± 0.9 | 2.9 ± 0.7 | 0.6 ± 0.2 | 0.1 ± 0.1 | 0.1 ±0.1 |
| C20:5(n-3) | 6.4 ± 1.7 | 6.0 ± 3.4 | 10.9 ± 2.4 | 6.3 ± 1.5 | 1.9 ± 0.6 | - |
| C22:5(n-3) | 2.1 ± 1.0 | 0.4 ± 0.4 | 1.7 ± 1.4 | 2.5 ± 0.6 | 2.6 ± 1.2 | - |
| C22:6(n-3) | 15.2 ± 2.6 | 16.0 ± 3.6 | 1.5 ± 0.9 | 1.3 ± 0.8 | - | - |
| C24:0 | 0 | 1.3 ± 0.8 | 1.3 ± 1.1 | 0.1 ± 0.1 | 0 | 1.4 ± 0.6 |

**SS5: Fatty acid composition of potential prey of fish from Pangani estuary (samples were presented as range)**

|  |  |  |
| --- | --- | --- |
| FA | Upper estuarine zone | Lower estuarine zone |
|  | Zooplankton (2) | Fish larvae (1) | Polichaetes (2) | Zooplankton (2) | Fish larvae (2) | Polichaete (2) |
| C14:0 | 5.2 - 6.1 | 1.8 | 0.7 - 1.4 | 4.1- 5.4 | 3.6 - 4.5 | 1.0 - 1.7 |
| C15:0 | 0.7 - 0.9 | 0.6 | 2.0 -1.2 | 0.5-0.7 | 1.0 - 2.4 | 1.7 - 2.4 |
| C16:0 | 18.0-19.2 | 20.2 | 21.0-22.9 | 18.5-20.3 | 18.4 - 20.7 | 20.8 - 23.7 |
| C16:1 | 0.7 - 1.1 | 4.4 | 10.2 - 1.0 | 0.6 -1.7 | 0 - 3.2 | 9.5-12.7 |
| C16:1(n-7) | 3.1 - 4.0 | 2.2 | 0.7 - 1.4 | 3.8- 4.7 | 0 - 0.5 | 0.1 - 0.6 |
| C17:0 | 1.9 - 2.0 | 1.9 | 1.4 - 2.1 | 1.5 -2.0 | 0.7 - 2.5 | 0.6 - 4.7 |
| C17:1 | 1.7 - 2.0 | 1 | 2.2 - 2.5 | 0.5 -0.7 | 0.5 - 1.1 | 0.3 - 0.7 |
| C18:0 | 6.7 - 7.1 | 15.7 | 7.6 - 10.1 | 7.7 -8.3 | 15.7-16.2 | 9.2 -11.8 |
| C18:1(n-7) | 6.1 - 6.9 | 2.1 | 7.2 - 8.4 | 4.2- 5.7 | 1.9 - 3.6 | 5.6 - 8.8 |
| C18:1(n-9) | 8.0 - 9.2 | 8.7 | 12.2 -13.2 | 6.8 -8.5 | 7.2-10.4 | 7.0-14.7 |
| C18:2(n-6) | 3.0 - 4.6 | 2.5 | 5.2 - 6.5 | 1.6 -2.4 | 1.5 - 2.2 | 4.8 - 4.9 |
| C18:3(n-3) | 4.4 - 5.0 | 1.1 | 1.1 - 2.3 | 3.0 -4.4 | 0.7 - 1.7 | 1.6 - 2.8 |
| C18:4(n-3) | 0.8 - 1.0 | 1.2 | - | 1.6 -2.0 | 0.6 - 2.6 | 0 |
| C20:0 | 0.3 - 0.5 | 1.4 | 0.4 - 0.6 | 0.2 -0.6 | 0.8 - 1.3 | 0.3 - 1.1 |
| C20:1(n-9) | 1.2 - 2.1 | 1.1 | 1.8 - 2.0 | 3.1 -3.4 | 0.7 - 1.4 | 2.6 - 3.1 |
| C20:4(n-6) | 4.2 - 5.2 | 2.4 | 5.8 - 6.9 | 2.1 -3.1 | 2.3-3.31 | 4.7 - 5.7 |
| C20:5(n-3) | 6.1 - 6.3 | 5.6 | 7.2 - 7.4 | 8.2 -10.4 | 6.7 - 7.8 | 8.2-10.4 |
| C22:5(n-3) | 0.9 - 1.1 | 2.5 | 1.2 - 3.0 | 0.9 -1.2 | 2.2 - 3.0 | 0.0 – 0.1 |
| C22:6(n-3) | 13.2-15.5 | 15.8 | 1.3 - 2.1 | 14.1-16.9 | 16.3-18.4 | 1.3 - 2.9 |
| C24:0 | 0.5 - 0.9 | - | 0.8 - 1.8 | 0.5 -0.7 | 0 - 0.9 | 0.1 - 0.7 |