Supplementary Material

Northward movement of the tropical dinoflagellate *Ornithocercus* and *Triposolenia* genera in Korean coastal waters is strongly associated with the inflow of the Jeju Warm Current

Bora Lee1, Jong Kyu Kim1, Miran Kim2, Byoung-Ju Choi3, Kwang Young Kim3, Myung Gil Park3\*

1Research Institute for Basic Science, Chonnam National University, Gwangju 61186, Republic of Korea

2Honam National Institute of Biological Resources, Mokpo-si, Jeollanam-do 58762, Republic of Korea

3Department of Oceanography, Chonnam National University, Gwangju 61186, Republic of Korea

**\* Correspondence:** Corresponding Author: [mpark@chonnam.ac.kr](mailto:mpark@chonnam.ac.kr)

**Supplementary Table S1.** Summary of sampling sites, dates, locations, average temperature (0 – 30m), and salinity during this study. nd: no data. Italic fonts are the simulated temperatures and salinity.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stn | Latitude | Longitude | Tem/Sal (2017) | | | | Tem/Sal (2018) | | | | Tem/Sal (2019) | | | |
| Mar  (28th) | Jun  (20th) | Sep  (6th) | Nov  (21th) | Mar  (26th) | Jun  (26th) | Sep  (13th) | Nov  (27th) | Mar  (25th) | Jun  (24th) | Sep  (17th) | Nov  (29th) |
| W01 | 34°14.91′N | 126°48.45′E | 11.0/34.0 | 15.5/33.5 | 22.5/32.3 | 14.3/33.1 | 11.2/34.1 | 19.3/33.8 | 21.0/32.7 | 14.7/33.3 | 11.0/33.6 | 17.5/33.6 | 21.1/31.9 | 14.4/33.2 |
| *10.7/33.6* | *15.6/33.4* | *21.7/32.8* | *14.6/32.6* | *10.7/33.7* | *18.5/33.6* | *20.5/32.9* | *14.0/33.0* | *10.8/33.5* | *16.9/33.5* | *21.6/32.2* | *14.9/32.8* |
| W02 | 34°9.81′N | 126°48.45′E | 11.4/34.1 | 14.2/33.4 | 22.7/32.2 | 14.2/33.0 | 10.7/34.0 | 17.5/33.8 | 21.0/33.0 | 14.6/33.3 | 11.1/33.6 | 16.1/33.5 | 20.6/32.0 | 15.2/33.4 |
| *11.0/33.8* | *15.2/33.5* | *19.9/32.7* | *15.1/32.8* | *11.0/33.9* | *17.5/33.8* | *19.8/33.0* | *14.3/32.9* | *11.2/33.6* | *15.9/33.7* | *20.1/32.3* | *15.2/33.0* |
| W03 | 34°5.40′N | 126°47.94′E | 13.2/34.5 | 14.7/33.3 | 22.8/32.3 | 14.0/33.1 | 12.2/34.3 | 18.4/33.8 | 21.7/32.8 | 15.6/33.5 | 13.5/34.2 | 15.9/33.6 | 19.6/32.1 | 15.9/33.6 |
| *12.2/34.1* | *15.6/33.3* | *20.0/32.3* | *15.9/33.1* | *11.3/34.0* | *17.4/33.7* | *19.0/33.0* | *15.4/33.2* | *12.7/34.0* | *16.2/33.4* | *19.4/32.4* | *15.7/33.0* |
| W04 | 34°59.61′N | 126°48.45′E | 13.8/34.6 | 16.5/33.1 | 24.4/31.4 | 14.2/33.1 | 12.4/34.3 | 18.0/33.6 | 19.8/33.0 | 16.1/33.5 | 13.2/34.1 | 16.2/33.4 | 20.5/31.7 | 16.3/33.8 |
| *13.1/34.4* | *16.6/33.2* | *20.7/32.0* | *15.4/32.7* | *11.7/34.1* | *18.6/33.5* | *19.3/32.9* | *16.5/33.5* | *13.7/34.1* | *18.2/33.0* | *20.2/32.1* | *16.3/33.2* |
| W05 | 33°54.51′N | 126°48.45′E | 13.8/34.5 | 17.6/33.2 | 21.9/31.7 | 15.1/33.3 | 13.2/34.4 | 19.5/33.0 | 22.4/33.4 | 16.5/33.5 | 13.7/34.2 | 17.9/33.1 | 23.5/31.0 | 17.1/34.0 |
| *13.0/34.3* | *17.0/33.1* | *21.4/31.9* | *17.4/33.0* | *13.0/34.3* | *19.5/33.2* | *23.0/33.4* | *18.1/33.7* | *13.1/34.1* | *18.4/32.2* | *22.7/31.8* | *19.7/34.1* |
| W06 | 33°49.41′N | 126°48.45′E | 14.1/34.5 | 17.6/33.2 | 22.2/32.3 | 18.6/33.8 | 13.6/34.4 | 21.0/33.0 | 22.0/33.4 | 18.8/33.8 | 14.5/34.3 | 19.6/33.1 | 24.2/31.3 | 18.5/34.1 |
| *13.8/34.5* | *17.8/33.1* | *23.4/32.3* | *19.4/33.8* | *13.5/34.3* | *20.0/33.0* | *24.7/33.8* | *19.4/34.3* | *14.4/34.2* | *18.8/31.9* | *24.3/31.4* | *19.7/34.1* |
| W07 | 33°44.31′N | 126°48.45′E | 14.2/34.5 | 19.4/33.4 | 24.8/31.8 | 19.0/33.9 | 13.7/34.4 | 19.9/33.2 | 23.0/33.5 | 19.4/34.1 | 14.4/34.3 | 19.9/33.4 | 24.3/31.4 | 18.5/34.0 |
| *14.0/34.6* | *19.0/33.4* | *25.8/33.1* | *19.4/33.8* | *14.0/34.4* | *20.0/32.7* | *24.7/33.9* | *19.7/34.4* | *15.5/34.3* | *19.1/31.6* | *24.5/31.2* | *19.6/34.1* |
| W08 | 33°39.21′N | 126°48.45′E | 14.5/34.6 | nd | 25.6/31.7 | 20.2/34.2 | 14.4/34.4 | 21.0/33.1 | 22.6/33.7 | 18.8/33.8 | 14.4/34.3 | 18.5/33.7 | 24.5/31.4 | 18.5/33.9 |
| *14.0/34.6* | *18.9/33.5* | *26.6/33.2* | *19.6/33.7* | *14.3/34.4* | *20.0/32.8* | *24.7/33.8* | *19.8/34.4* | *15.4/34.3* | *18.8/31.6* | *25.1/31.3* | *19.7/34.2* |
| W09 | 33°35.01′N | 126°48.45′Es | nd | nd | Nd | 19.4/34.2 | 14.5/34.4 | 19.3/33.4 | 21.6/33.5 | 18.9/33.9 | 14.2/34.3 | 18.0/33.8 | 24.2/31.5 | 18.2/34.1 |
| *13.8/34.5* | *19.0/33.7* | *26.1/33.0* | *19.3/33.8* | *14.4/34.4* | *20.5/33.0* | *24.2/34.0* | *19.3/34.3* | *15.5/34.3* | *19.1/32.1* | *24.7/31.7* | *19.3/34.1* |