Supplementary Table 1. Location and environmental parameters for each station of the cruise. All the parameters are averaged from 5 to 200 m depth. LT is location time. The parameter $\Omega_{ar}$ is calculated. Values with an * are from station 18.

<table>
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<th>Station name</th>
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<th>Time (LT)</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Volume (m³)</th>
<th>Temperature (°C)</th>
<th>Salinity PSU</th>
<th>Fluorescense (μg L⁻¹)</th>
<th>pH</th>
<th>$\Omega_{ar}$</th>
<th>NO₃</th>
<th>PO₄</th>
<th>$O₂$</th>
<th>$ρCO₂$</th>
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Supplementary Table 2. Relative and absolute abundance of pteropods collected from BONGO nets. Western stations are 1-7a, 19-22 and Eastern stations are 9-'16-18’.

**Absolute abundance (individuals m⁻²)**

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<th>Station</th>
<th>Station</th>
<th>H. inflata</th>
<th>L. trochiformis</th>
<th>L. bulimoides</th>
<th>Other Limaciniidae</th>
<th>C. inflexa</th>
<th>Other Cavoliniidae</th>
<th>C. acicula</th>
<th>C. conica</th>
<th>S. subula</th>
<th>Other Creseidae</th>
<th>Total</th>
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**Relative abundance (%)**

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<th>Other Cavoliniidae</th>
<th>C. acicula</th>
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Notes:
- SLT: Salinity (in practical salinity units)
- ‘Str.’: Strait
- ‘Basin’: Basin
- ‘Delta’: Delta
**Supplementary Table 3.** Loadings of the environmental parameters of the PCA and Pearson’s correlation coefficients for the relationships between the environmental parameters and PCA factors as well as correlation coefficients for total abundance and the abundances of each species with the environment parameters and PCA factors. The binary logistic regression model uses two groups (low abundance and high abundance) to predict the odds of a station having low abundance (Exp[B]) with 90% confidence. Kruskal-Wallis Test indicates significant differences in total and individual species abundance between western and eastern stations. OTMC = Omnibus test for model coefficients. Nagelkerk R-square is used. ^ indicates significance at the 0.1 level, * at the 0.05 level and ** 0.01 level.

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Environmental Factors

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**Kruskal-Wallis test**

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Supplementary Figure 1. PCA graphs of environmental factors overlaid with absolute abundance values on station scores of **A** *L. inflata*, **B** *L. trochiformis*, **C** *L. bulimoides*, **D** *C. inflexa*, **E** *C. acicula*, **F** *C. conica* and **G** *S. subula*. Stations in blue indicate western Mediterranean stations (1-7a and 19-22) and stations in red indicate eastern stations (9-16-18).