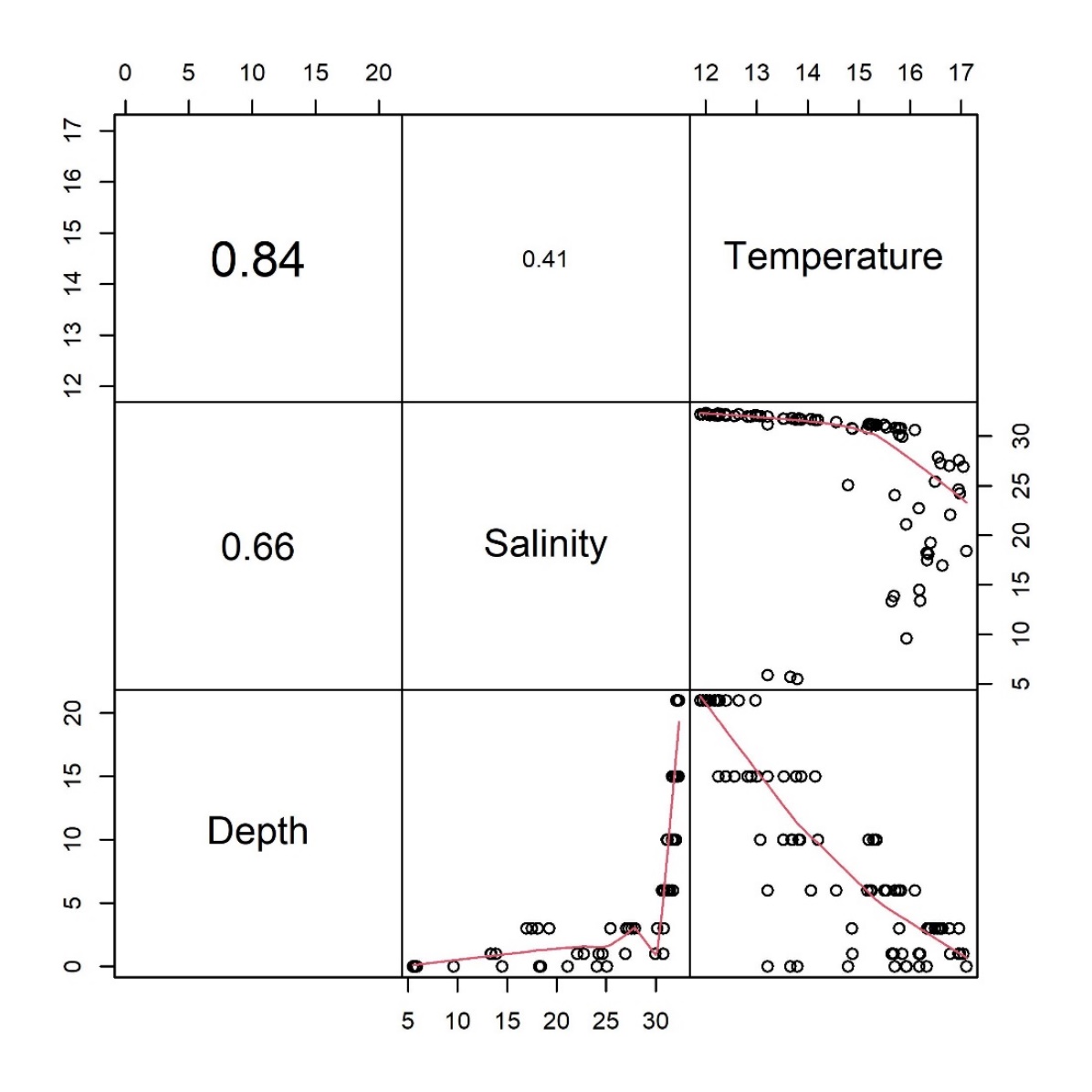
*Supporting information for the manuscript entitled*

**Depth-dependent diversity patterns of rocky subtidal macrobenthic communities along a temperate fjord in Northern Chilean Patagonia**

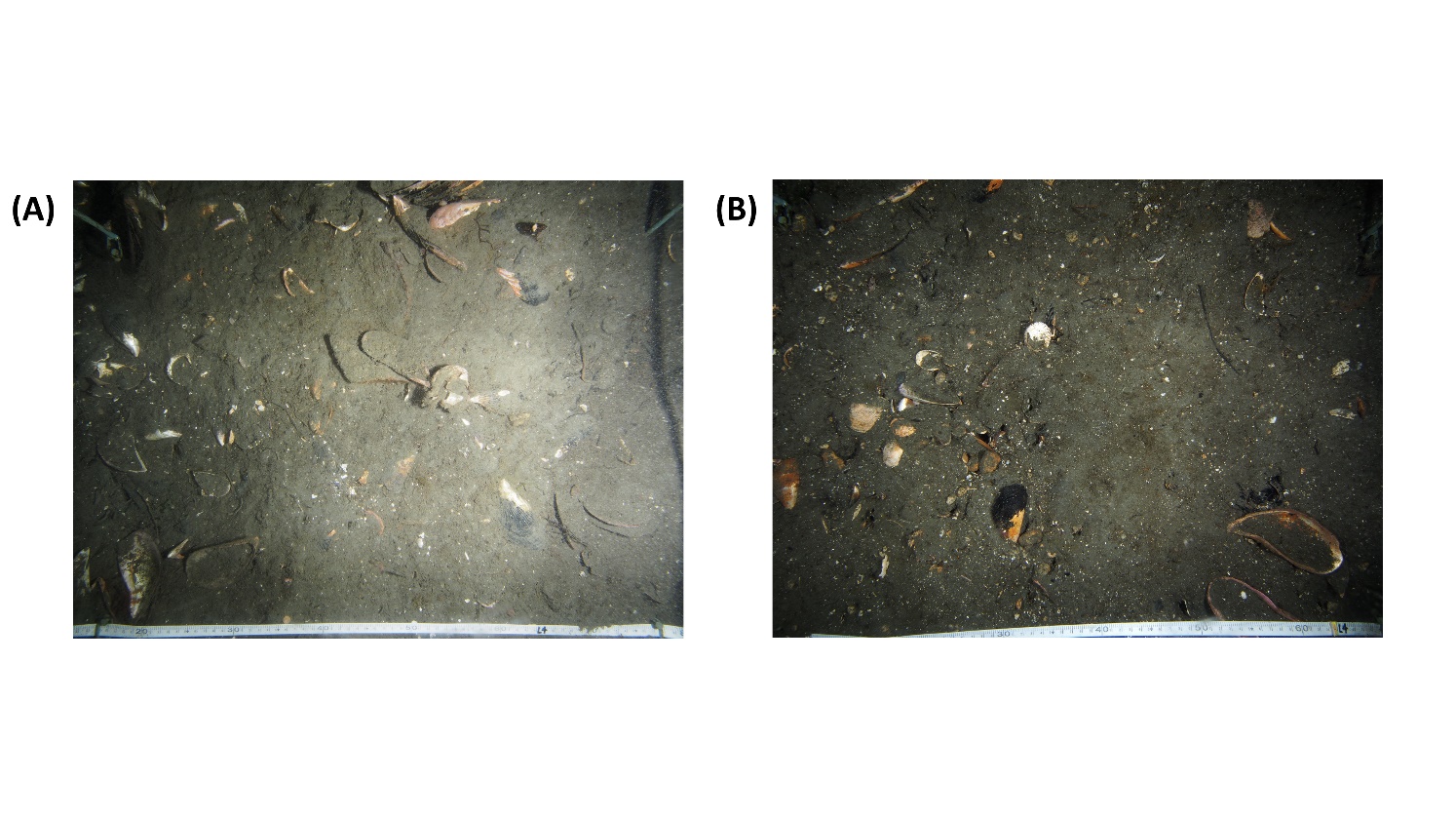
**Supplementary figures**



Supplementary Figure 1. Pearson correlations between environmental variables and depth. Scatterplot showing temperature (C°), salinity (psu) and depth (m) correlations. The axes present respectively “raw” data. To aid visual interpretation a LOWESS smother is added (red lines).



Supplementary Figure 2. Distribution of species richness along depth at three sites for the head sections of Comau fjord. Mean species richness expressed as the total number of taxa in each OUs are shown. The error bars represent the 95% confidence intervals.



Supplementary Figure 3. Representative observational units (28 m2) of the 21-meter stratum at the head section of the Comau fjord. A random chosen replicate of (A) site N°9 and (B) site N°11 are shown.

Supplementary Figure 4. Benthic representatives’ taxa of Comau fjord. Scheme with the subdominant species at each depth range along the fjord sections. Generally, *Lithothamnion* sp. and *Aulacomya* *atra* was the most dominant taxa in all depth-section groups.

**Supplementary tables**

Supplementary Table 1. List of taxonomic identities identified between 0 and 21 m depth range at three sections of Comau fjord, Northern Patagonia. The occurrence of each taxon with its corresponding phylum for each area is shown.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Taxon* | *Phylum* | *Head* | *Middle* | *Mouth* |
| **Rhynchonellata class** |  |  |  |  |
| *Magellania venosa* (Dixon, 1789) | Brachiopoda | X | X | X |
| **Anthozoa class** |  |  |  |  |
| *Swiftia* spp. | Cnidaria | X |  |  |
| *Anthothoe chilensis* (Lesson, 1830) | Cnidaria | X | X | X |
| *Boloceropsis/Bolocera* sp. | Cnidaria |  | X |  |
| *Bunodactis hermafroditica* Carlgren, 1959 | Cnidaria | X |  | X |
| *Caryophyllia huinayensis* Cairns, Häussermann & Försterra, 2005 | Cnidaria | X | X | X |
| *Cereus herpetodes* (McMurrich, 1904) | Cnidaria | X | X | X |
| *Clavulariidae* Hickson, 1894 | Cnidaria | X | X | X |
| *Corynactis* sp. | Cnidaria |  | X | X |
| *Desmophyllum dianthus* (Esper, 1794) | Cnidaria | X | X | X |
| *Epizoanthus fiordicus* Sinniger & Häussermann, 2009 | Cnidaria | X | X | X |
| *Gonactinia prolifera* (Sars, 1983) | Cnidaria | X | X | X |
| *Halcurias pilatus* McMurrich, 1893 | Cnidaria | X | X | X |
| *Hormathia pectinata* (Hertwig, 1882) | Cnidaria | X | X |  |
| *Mesozoanthus fossii* Sinniger & Häussermann, 2009 | Cnidaria |  |  | X |
| *Metridium senile* (Linnaeus, 1761) | Cnidaria | X | X | X |
| *Paranthus niveus* (Lesson, 1830) | Cnidaria |  | X |  |
| *Parazoanthus elongatus* McMurrich, 1904 | Cnidaria |  | X | X |
| *Primnoella chilensis* (Philippi, 1894) | Cnidaria |  | X | X |
| *Swiftia* *comauensis* Breedy, Cairns & Haussermann, 2015 | Cnidaria |  |  | X |
| *Tethocyathus endesa* Cairns, Häussermann & Försterra, 2005 | Cnidaria | X | X |  |
| **Hydrozoa class** |  |  |  |  |
| Unid. hydroid (morpho 1) | Cnidaria | X | X | X |
| Unid. hydroid (morpho 2) | Cnidaria | X | X |  |
| Unid. hydroid (morpho 3) | Cnidaria | X | X | X |
| *Hybocodon chilensis* Hartlaub, 1905 | Cnidaria |  | X | X |
| *Hydractinia pacifica* Hartlaub, 1905 | Cnidaria | X |  | X |
| *Obelia dichotoma* (Linnaeus, 1758) | Cnidaria | X | X | X |
| *Obelia geniculata* (Linnaeus, 1758) | Cnidaria |  | X |  |
| *Plumularia* spp. | Cnidaria | X | X | X |
| *Sertularella* spp. | Cnidaria |  |  | X |
| **Ascidiacea class** |  |  |  |  |
| *Aplidium* spp. | Chordata |  |  | X |
| Unid. ascidian (morpho 1) | Chordata | X |  | X |
| *Corella eumyota* Traustedt, 1882 | Chordata | X |  |  |
| *Didemnum studeri* Hartmeyer, 1911 | Chordata | X | X | X |
| **Polychaeta class** |  |  |  |  |
| *Apomatus* sp. | Annelida |  | X |  |
| *Chaetopterus variopedatus* (Reiner, 1804) | Annelida | X | X | X |
| *Cirratulus* sp. | Annelida |  |  | X |
| *Hypsicomus* sp. | Annelida | X | X | X |
| Unid. polychaete (morpho 1) | Annelida | X | X | X |
| *Spiochaetopterus patagonicus* Kingberg, 1866 | Annelida | X | X | X |
| *Spirorbis* sp. | Annelida | X | X | X |
| **Gymnolaemata class** |  |  |  |  |
| *Adeonella* sp. | Bryozoa |  |  | X |
| *Beania magellanica* (Busk, 1852) | Bryozoa | X | X | X |
| Unid. bryozoan (morpho 1) | Bryozoa | X | X |  |
| Unid. bryozoan (morpho 2) | Bryozoa | X |  | X |
| Unid. bryozoan (morpho 3) | Bryozoa | X | X | X |
| *Cellaria malvinensis* (Busk, 1852) | Bryozoa | X | X | X |
| *Chaperiopsis* sp. | Bryozoa | X | X |  |
| *Fenestrulina* sp. | Bryozoa | X | X |  |
| *Membranipora isabelleana* (d’Orbigny, 1842) | Bryozoa |  | X |  |
| **Gastropoda class** |  |  |  |  |
| *Acanthina* sp. | Mollusca |  | X | X |
| *Crepipatella* spp. | Mollusca | X | X | X |
| *Fissurella oriens* G. B. Sowerby I, 1834 | Mollusca |  | X | X |
| *Fissurella picta* (Gmelin, 1791) | Mollusca |  | X | X |
| *Fissurellidea patagonica* (Strebel, 1907) | Mollusca |  | X | X |
| *Fusitriton magellanicus* (Röding, 1798) | Mollusca | X | X | X |
| *Nacella magellanica* (Gmelin, 1791) | Mollusca | X | X | X |
| *Nassarius gayii* (Kiener, 1834) | Mollusca | X | X | X |
| Unid. nudibranch (morpho 1) | Mollusca |  | X |  |
| Unid. nudibranch (morpho 2) | Mollusca |  |  |  |
| Unid. egg strand (morpho 1) | Mollusca |  | X |  |
| Unid. egg strand (morpho 2) | Mollusca | X |  |  |
| Unid. egg strand (morpho 3) | Mollusca |  |  | X |
| *Tegula atra* (Lesson, 1830) | Mollusca |  | X | X |
| *Tritonia challengeriana* Bergh, 1884 | Mollusca |  | X |  |
| *Trophon* spp. | Mollusca | X | X | X |
| **Bivalvia class** |  |  |  |  |
| *Aulacomya atra* (Molina, 1782) | Mollusca | X | X | X |
| *Ameghinomya antiqua* (P. P. King, 1832) | Mollusca |  |  | X |
| **Polyplacophora class** |  |  |  |  |
| *Chiton* spp. | Mollusca | X | X | X |
| *Tonicia* spp. | Mollusca | X | X | X |
| **Calcarea class** |  |  |  |  |
| *Clathrina fjordica* Azevedo, Hajdu, Willenz & Klautau, 2009 | Porifera | X | X |  |
| *Leucosolenia* sp. | Porifera | X | X | X |
| **Demospongiae class** |  |  |  |  |
| *Amphilectus americanus* (Ridley & Dendy, 1887) | Porifera |  | X | X |
| *Caballeraxine* sp. | Porifera | X | X | X |
| *Cliona chilensis* Thiele, 1905 | Porifera | X |  | X |
| *Crambe chilensis* Esteves, Lôbo-Hajdu & Hajdu, 2007 | Porifera |  |  | X |
| *Desmapsamma* spp. | Porifera |  |  | X |
| Unid. sponge (morpho 1) | Porifera |  | X | X |
| Unid. sponge (morpho 2) | Porifera | X |  | X |
| Unid. sponge (morpho 3) | Porifera | X | X | X |
| Unid. sponge (morpho 4) | Porifera | X | X | X |
| Unid. sponge (morpho 5) | Porifera | X | X | X |
| Haliclona *sp.* | Porifera | X | X | X |
| *Hamigera* sp. | Porifera | X | X | X |
| *Hymenancora* sp. | Porifera | X | X | X |
| *Myxilla (Burtonanchora) araucana* Hajdu, Desqueyroux-Faúndez, Carvalho, Lôbo-Hajdu & Willenz, 2013 | Porifera |  |  | X |
| *Scopalina* sp. | Porifera | X | X | X |
| *Tedania (Tedaniopsis) mucosa* Thiele, 1905 | Porifera |  |  | X |
| *Tethya* spp. | Porifera | X | X | X |
| *Trachytedania spinata* Ridley, 1881 | Porifera | X | X | X |
| **Clase Asteroidea class** |  |  |  |  |
| *Anasterias antarctica* (Lütken, 1857) | Echinodermata | X | X |  |
| *Cosmasterias lurida* (Philippi, 1858) | Echinodermata | X | X | X |
| *Diplodontias singularis* (Müller & Troschel, 1843) | Echinodermata |  | X | X |
| *Henricia* sp. | Echinodermata | X | X | X |
| *Odontaster penicillatus* (Philippi, 1870) | Echinodermata |  |  | X |
| *Poraniopsis echinaster* Perrier, 1891 | Echinodermata |  | X | X |
| **Echinoidea class** |  |  |  |  |
| *Arbacia dufresnii* (Blainville, 1825) | Echinodermata | X | X | X |
| *Loxechinus albus* (Molina, 1782) | Echinodermata | X | X | X |
| **Holothuroidea class** |  |  |  |  |
| *Heterocucumis* spp. | Echinodermata | X | X | X |
| *Heterocucumis godeffroyi* (Semper, 1867) | Echinodermata | X | X | X |
| Unid. holothuroid (morpho 1) | Echinodermata |  | X |  |
| *Pentamera chiloensis* (Ludwig, 1886) | Echinodermata | X | X | X |
| *Psolidium disciformis* (Théel, 1886) | Echinodermata | X | X | X |
| *Psolus* sp. | Echinodermata |  |  | X |
| *Psolus squamatus segregatus* Perrier, 1905 | Echinodermata | X | X | X |
| *Trachythyone lechleri* (Lampert, 1885) | Echinodermata | X |  |  |
| **Ophiuroidea class** |  |  |  |  |
| *Gorgonocephalus chilensis* (Philippi, 1858) | Echinodermata |  |  | X |
| *Ophiocten amitinum* Lyman, 1878 | Echinodermata | X | X |  |
| **Hexanauplia class** |  |  |  |  |
| *Arossia henryae* (Newman, 1982) | Arthropoda | X |  | X |
| *Austromegabalanus psittacus* (Molina, 1788) | Arthropoda |  | X | X |
| Unid. barnacle (morpho 1) | Arthropoda | X | X | X |
| **Malacostraca class** |  |  |  |  |
| Unid. brachyuran (morpho 1) | Arthropoda | X |  |  |
| **Phaeophyceae class** |  |  |  |  |
| *Desmarestia* sp. | Ochrophyta |  | X |  |
| Ectocarpales spp. | Ochrophyta | X | X | X |
| *Ectocarpus* sp. | Ochrophyta | X | X | X |
| *Halopteris* sp. | Ochrophyta |  |  | X |
| *Macrocystis pyrifera* (Linnaeus) C.Agardh, 1820 | Ochrophyta | X | X | X |
| *Ralfsia* sp. | Ochrophyta | X | X | X |
| *Scytosiphon* sp. | Ochrophyta |  | X |  |
| **Florideophyceae class** |  |  |  |  |
| *Ceramiales* sp. | Rhodophyta | X | X | X |
| Unid. coralline (morpho 1) | Rhodophyta | X | X | X |
| Unid. coralline (morpho 2) | Rhodophyta |  | X | X |
| *Delesseriaceae* sp. | Rhodophyta | X |  | X |
| *Hydrolithon* sp. | Rhodophyta | X | X | X |
| *Lithothamnion* sp. | Rhodophyta | X | X | X |
| *Sarcodiotheca* sp. | Rhodophyta | X | X |  |
| **Ulvophyceae class** |  |  |  |  |
| *Acrosiphonia* spp. | Chlorophyta | X | X | X |
| *Chaetomorpha* sp. | Chlorophyta |  |  | X |
| *Ulva* sp. | Chlorophyta | X | X |  |
| Unid. ulvoid (morpho 1) | Chlorophyta | X | X |  |

Supplementary Table 2. Generalized additive mixed models (GAMMs) for the interactive effect of depth, salinity and fjord sections on richness, Shannon’s diversity, and Pielou’s evenness. The between-site variability is shown as the random effect of fjord sites nested in each fjord section. The adjusted R-squared for each individual model are shown. This model was selected as the best model using an information theory-based model selection (See Materials and Methods).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Estimated effect of depth | | | | | | Estimated effect of salinity | | | | | | Estimated interactive effect of depth and salinity | | | | | | Random effect of sites | |
|  | Head | | Middle | | Mouth | | Head | | Middle | | Mouth | | Head | | Middle | | Mouth | |  | |
|  | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* | *edf* | *Ref.df* |
| S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5.5 | 8 | 6.6 | 15 | 7.5 | 14 | 7.2 | 8 |
| H’ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6.5 | 8 | 5 | 15 | 9.2 | 14 | 7.3 | 8 |
| J’ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5.7 | 8 | .9 | 14 | 9.1 | 14 | 7.1 | 8 |

Supplementary Table 3. Summary of PERMANOVA results for benthic community composition trends of Comau fjord measured as Bray-Curtis dissimilarities between pair of observations. The separate and interactive effect of depth ranges, salinity, and fjord sections are shown.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Multivariate test |  |  |  |  |
|  | *df* | *F. Model* | *R-sq.* | *p-value* |
| Depth | 3 | 40.9 | .12 | < .001\*\*\* |
| Section | 2 | 33.1 | .06 | < .001\*\*\* |
| Salinity | 1 | 21 | .02 | < .001\*\*\* |
| Depth : Section | 6 | 7.6 | .04 | < .001\*\*\* |
| Section : Salinity | 2 | 4.5 | .01 | .125 |
| Depth : Section : Salinity | 3 | 6.1 | .03 | < .001\*\*\* |
| Depth ranges | 6 | 5.1 | .12 | < .001\*\*\* |
| Residuals | 715 |  | .69 |  |

‘\*\*\*’ *p* < .001