







Fatty acid profiles of more than 470 marine species from the Southern Hemisphere

Peter D. Nichols^{1,2}  | **Heidi R. Pethybridge**¹  | **Bowen Zhang**^{1,2} |
Patti Virtue^{1,2} | **Lauren Meyer**³  | **Zahirah Dhurmeea**^{1,4,5} | **Lara Marcus**^{2,6} |
Jessica A. Ericson^{1,2,7} | **Nicole Hellessey**^{1,2,8}  | **Sharon Every**^{9,10} |
Kathryn Wheatley^{2,11} | **Christopher C. Parrish**¹² | **Pascale Eisenmann**¹³ |
Alastair M. M. Baylis¹⁴  | **Corey J. A. Bradshaw**¹⁵  | **Stacy L. Bierwagen**¹⁶ |
Jock W. Young¹ | **Lydie I. E. Couturier**¹⁷ | **Christoph A. Rohner**¹⁸ |
Jasmin Groß¹³ | **Courtney Waugh**¹⁹ | **Charles F. Phleger**¹ |
Christine Jackson^{2,20} | **George Jackson**²⁰ | **Charlie Huvneers**³ |
Susan Bengtson Nash¹³ | **Mina Brock**¹ | **Peter Mansour**¹

¹CSIRO Oceans and Atmosphere, Hobart, Tasmania, Australia

²IMAS, University of Tasmania, Hobart, Tasmania, Australia

³Southern Shark Ecology Group, Flinders University, Adelaide, South Australia, Australia

⁴Department of Biosciences and Ocean Studies, Faculty of Science, University of Mauritius, Réduit, Mauritius

⁵IRD – Research Unit Marine Biodiversity, Exploitation & Conservation (MARBEC), Plouzané, France

⁶Department of Zoology, Faculty of Natural and Oceanographic Sciences, University of Concepción, Concepción, Chile

⁷Cawthron Institute, Nelson, New Zealand

⁸School of Biology, Georgia Institute of Technology, Atlanta, Georgia, USA

⁹Research Institute for the Environment and Livelihoods, Charles Darwin University, Darwin, Northern Territory, Australia

¹⁰Research School of Biology, The Australian National University, Canberra, Australian Capital Territory, Australia

¹¹Marine Environmental Consultant, Melbourne, Victoria, Australia

¹²Department of Ocean Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, Canada

¹³Southern Ocean Persistent Organic Pollutants Program, Centre for Planetary Health and Food Security, Griffith University, Brisbane, Queensland, Australia

¹⁴South Atlantic Environmental Research Institute, Stanley, FIQQ1ZZ, Falkland Islands

¹⁵Global Ecology (Partuyarta Ngadluki Wardli Kuu), College of Science and Engineering, Flinders University, Adelaide, South Australia, Australia

¹⁶Australian Institute of Marine Science, Townsville, Queensland, Australia

¹⁷Environmental Intégration Program, France Energies Marines, Plouzané, France

¹⁸Marine Megafauna Foundation, West Palm Beach, Florida, USA

¹⁹Faculty of Biosciences and Aquaculture, Nord University, Steinkjer, Norway

²⁰Earth and Biological Sciences, Loma Linda University, Loma Linda, California, USA

Peter D. Nichols and Heidi R. Pethybridge contributed equally to this work.

Correspondence

Heidi R. Pethybridge

Email: heidi.pethybridge@csiro.au**Handling Editor:** William K. Michener**Abstract**

Lipid and fatty acid datasets are commonly used to assess the nutritional composition of organisms, trophic ecology, and ecosystem dynamics. Lipids and their fatty acid constituents are essential nutrients to all forms of life because they contribute to biological processes such as energy flow and metabolism. Assessment of total lipids in tissues of organisms provides information on energy allocation and life-history strategies and can be an indicator of nutritional condition. The analysis of an organism's fatty acids is a widely used technique for assessing nutrient and energy transfer, and dietary interactions in food webs. Although there have been many published regional studies that assessed lipid and fatty acid compositions, many only report the mean values of the most abundant fatty acids. There are limited individual records available for wider use in intercomparison or macro-scale studies. This dataset consists of 4856 records of individual and pooled samples of at least 470 different marine consumer species sampled from tropical, temperate, and polar regions around Australia and in the Southern, Indian, and Pacific Oceans from 1989 to 2018. This includes data for a diverse range of taxa (zooplankton, fish, cephalopods, chondrichthyans, and marine mammals), size ranges (0.02 cm to ~13 m), and that cover a broad range of trophic positions (2.0–4.6). When known, we provide a record of species name, date of sampling, sampling location, body size, relative (%) measurements of tissue-specific total lipid content and abundant fatty acids, and absolute content ($\text{mg } 100 \text{ g}^{-1} \text{ tissue}$) of eicosapentaenoic acid (EPA, 20:5n3) and docosahexaenoic acid (DHA, 22:6n3) as important long-chain ($\geq \text{C}_{20}$) polyunsaturated omega-3 fatty acids. These records form a solid basis for comparative studies that will facilitate a broad understanding of the spatial and temporal distribution of marine lipids globally. The dataset also provides reference data for future dietary assessments of marine predators and model assessments of potential impacts of climate change on the availability of marine lipids and fatty acids. There are 480 data records within our data file for which the providers have requested that permission for reuse be granted, with the likely condition that they are included as a coauthor on the reporting of the dataset. Records with this condition are indicated by a “yes” under “Conditions_of_data_use” in Data S1: Marineconsumer_FAdata.csv (see Table 2 in Metadata S1 for more details). For all other data records marked as “No” under “Conditions_of_data_use,” there are no copyright restrictions for research and/or teaching purposes. We request that users acknowledge use of the data in publications, research proposals, websites, and other outlets via formal citation of this work and original data sources as applicable.

KEYWORDS

crustaceans, ecology, fish, food web, lipids, marine consumers, nutritional composition, seafood, squid, trophodynamics

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The complete data set is available as Supporting Information (Data S1). Data are also available from the CSIRO Data Portal at <https://doi.org/10.25919/pdxr-cf66>.

ORCID

Peter D. Nichols  <https://orcid.org/0000-0003-2445-5504>

Heidi R. Pethybridge  <https://orcid.org/0000-0002-7291-5766>

Lauren Meyer  <https://orcid.org/0000-0003-0374-9941>

Nicole Hellessey  <https://orcid.org/0000-0002-3053-8720>

Alastair M. M. Baylis  <https://orcid.org/0000-0002-5167-0472>

Corey J. A. Bradshaw  <https://orcid.org/0000-0002-5328-7741>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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