List of marine algal steroids used in zooplankton metabolic, growth and reproduction experiments

Website: https://www.bco-dmo.org/dataset/643054
Data Type: experimental
Version:
Version Date: 2016-04-14

Project
» Collaborative Research: Effects of Marine Algal Sterols on Zooplankton Growth and Reproduction (PhytosterolsZooplank)

Contributors	Affiliation	Role
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Methods & Sampling

Marine algal sterols used in metabolic studies with Artemia and Acartia tonsa

Id#	Sterol	Natural occurrence
1	cholesterol	common
2	24-methylenecholesterol	common
3	24-methylcholesterol	common
4	24-ethylidenecholesterol	common
5	24-ethylcholesterol	common
6	24-propylidenecholesterol	brown tide
7	27-norbrassicasterol	variant of brevesterol
8	brassicasterol	common
9	23-methylbrassicasterol	diatoms
10	24,25-methylenecholesterol	sponges and fungi
11	Δ^0 4a-methylcholestanol	variant of dinosterol
12	$\Delta^{8(14)}$4a-methylcholestanol	variant of brevesterol
13	brevesterol	Karenia
14	gymnodynosterol	Karenia
15	gorgosterol	Alexandrium
16	24-epibrassicasterol	common
18	24-methylpavloval	Pavlova
19	pfiesterol	Pfiesteria

Marine algal sterols used in studies of effects on growth and reproduction of Artemia, Eurytemora affinis, and Acartia tonsa

Id#	Sterol	Natural occurrence
2	24-methylenecholesterol	common
3	24-methylcholesterol	common
6	24-propylidenecholesterol	brown tide
7	27-norbrassicasterol	variant of brevesterol
9	23-methylbrassicasterol	common
10	24,25-methylenecholesterol	sponges and fungi
13	brevesterol	Karenia
15	gorgosterol	Alexandrium
20	24-methyl-androsterone	derived from pfiesterol
21	24 methylpavlovol	Pavlova
22	dinosterol	dinoflagellates
23	cholesta-pavlovol	Pavlova
24	4-methylenecholestanol	?
25	petrosterol	sponges and fungi

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Data Files

File
sterols_zoop.csv (Comma Separated Values (.csv), 2.58 KB) MD5:aa0a8cfd8d3e206e2ea2e55f52336f6a Primary data file for dataset ID 643054

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Parameters

Parameter	Description	Units
expt_type	type of experiment using marine algal sterols	unitless
species	species tested	unitless
sterol_id	sterol identification number	unitless
sterol_name	chemical name	unitless
natural_occurrence	where sterol is found in nature	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Camera
Dataset-specific Description	Nikon CoolPix950 digital camera
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

Dataset-specific Instrument Name	
Generic Instrument Name	In-situ incubator
Dataset-specific Description	Sanyo MIR252 incubator
Generic Instrument Description	A device on a ship or in the laboratory that holds water samples under controlled conditions of temperature and possibly illumination.

Dataset-specific Instrument Name	
Generic Instrument Name	Microscope - Optical
Dataset-specific Description	Olympus SZH30 stereo microscope
Generic Instrument Description	Instruments that generate enlarged images of samples using the phenomena of reflection and absorption of visible light. Includes conventional and inverted instruments. Also called a "light microscope".

Dataset-specific Instrument Name	
Generic Instrument Name	scale or balance
Dataset-specific Description	Mettler AE analytical balance
Generic Instrument Description	Devices that determine the mass or weight of a sample.

Dataset-specific Instrument Name	
Generic Instrument Name	Shaker
Dataset-specific Description	LabGenius Digital Orbital Shaker
Generic Instrument Description	A Shaker is a piece of lab equipment used to mix, blend, or to agitate substances in tube(s) or flask(s) by shaking them, which is mainly used in the fields of chemistry and biology. A shaker contains an oscillating board which is used to place the flasks, beakers, test tubes, etc.

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Project Information

Collaborative Research: Effects of Marine Algal Sterols on Zooplankton Growth and Reproduction (PhytosterolsZooplank)

Description from NSF award abstract:
Autotroph-herbivore interactions in marine food webs are important to fisheries, the global carbon cycle, and, because of harmful algal blooms, human health. The recent hypothesis that harmful algae interfere with the growth and reproduction of zooplankton because of specific structural modifications of the algal sterols will be tested in research on the roles of nutritional factors in planktonic food webs. The effects of marine algal sterols on herbivorous crustaceans will be investigated in three calanoid copepods, *Acartia hudsonica*, *Eurytemora affinis*, and *Calanus finmarchicus*, and brine shrimp, *Artemia salina*. In this project, studies will be carried out to determine whether marine algal sterols can be metabolized to cholesterol by zooplankton and the relative efficiency of this process. This information is critical for assessing the nutritional value of different algal diets. Using the metabolic studies as a foundation, further experiments will seek to determine whether selected sterols, some of which have structural similarities to steroid hormones, have an inhibitory impact on the growth and reproduction of crustaceans. The analytical techniques used in these experiments will be high-field 13C-nuclear magnetic resonance spectrometry (NMR) and gas chromatography-high resolution mass spectrometry (GC-HRMS). Test sterols for these experiments will be labeled with stable isotopes (13C and 2H) in specific positions by chemical synthesis.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1061973

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