

Observations on the Effect of Various Drugs on the Activity of the Preoral Cilia of the Prosobranch Veliger, *Conus californicus* Hinds

BY

ALGIRDAS G. VILKAS

New York Ocean Science Laboratory, Montauk, New York, 11954

VELIGERS OF *Conus californicus* Hinds, 1844 were obtained from egg capsules that hatched in the laboratory. The veligers were transferred to a 250 ml capacity beaker of filtered (0.45 μ m) sea water with a capillary pipette. The water was changed every 3 days and a few drops of a cell suspension of *Phaeodactylum tricornutum* were introduced as food.

Acetylcholine chloride, Flexadil (a curare-like substance) and 5-HT creatine sulfate (serotonin) were tested for their effect on the preoral cilia. Dilutions of the individual drugs were prepared and in each experiment the solution was added to a petri dish, 60 mm in diameter, containing sea water and 10 veligers. The veligers were transferred to a depression slide by pipette and observed under a compound microscope at 35 \times and 100 \times magnification for preoral ciliary activity. Concurrently, veligers were pipetted out into a depression slide without the drug to serve as control. The pH of the solution was determined with pH paper and was in the range 7.0 to 7.5.

Table 1 lists the results of the effects of various drugs on ciliary activity.

Table 1

Drug	conc. g/ml	Response of preoral cilia
Acetylcholine	10 ⁻³	—
	10 ⁻⁵	+
Flexadil	10 ⁻³	—
	10 ⁻⁵	+
	10 ⁻⁵	+

+ = increased activity; — = decreased activity

CARTER (1926, 1928) found that in nudibranchs the cilia do not beat continuously and are under control of nerves in the velum. It is possible that the activity of the preoral cilia is controlled by a chemical transmitter similar to that which has been suggested for cilia of *Myti-*

lus edulis gills (BÜLBRING, BURN & SHELLY, 1953). These investigators found that acetylcholine at low concentrations, 10⁻⁵ g/ml and 10⁻⁶ g/ml, increased ciliary activity and that at high concentrations, 10⁻³ g/ml, decreased activity. LAGERSPETZ, LANSIMIES, IMPIVAARA & SENIUS (1970) found similar effects for high and low concentrations of acetylcholine on gill filament cilia of *Anodonta cygnea*. The results show that the activity of the preoral cilia of *Conus californicus* was inhibited with acetylcholine at 10⁻³ g/ml and stimulated at 10⁻⁵ g/ml. BÜLBRING, BURN & SHELLY (1953) also found that d-tubocurarine reduced ciliary activity. A curare-like substance, Flexadil, was tested on the veligers and it did depress the activity of the preoral cilia.

The veligers were observed feeding when acetylcholine was used. However, when serotonin was added, feeding was not evident. The cilia were beating rapidly and rejection currents may have been set up which prevented the algal cells from reaching the food groove (FRETTER & MONTGOMERY, 1968).

Further studies need to be performed to determine what chemical transmitter controls the preoral cilia.

ACKNOWLEDGMENT

I wish to thank Dr. Vera Fretter of the University of Reading, England, for her criticism and guidance throughout the experiment.

Literature Cited

- BÜLBRING, E., J. BURN & H. SHELLY
1953. Acetylcholine and ciliary movement in the gill plates of *Mytilus edulis*. Proc. Roy. Soc. Biol. 141: 445-466
- CARTER, G. S.
1926. On the nervous control of the velar cilia of the nudibranch veliger. Brit. Journ. exp. Biol. 4 (1): 1-26
1928. On the structure of cells bearing the velar cilia of the nudibranch veliger. Brit. Journ. exp. Biol. 6: 97-109
- FRETTER, VERA & MARGARET C. MONTGOMERY
1968. The treatment of food by prosobranch veligers. Journ. mar. biol. Assoc. U. K. 48: 499-520; 4 figs.
- LAGERSPETZ, K., H. LANSIMIES, H. IMPIVAARA & K. SENIUS
1970. Control of the ciliary activity in the gills of *Anodonta* by acetylcholine. Journ. Comp. gen. Pharmacol. 1: 152-154



Vilkas, Algirdas G. 1974. "OBSERVATIONS ON THE EFFECT OF VARIOUS DRUGS ON THE ACTIVITY OF THE PREORAL CILIA OF THE PROSOBRANCH VELIGER CONUS-CALIFORNICUS." *The veliger* 16, 289–289.

View This Item Online: <https://www.biodiversitylibrary.org/item/134247>

Permalink: <https://www.biodiversitylibrary.org/partpdf/93994>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: In Copyright. Digitized with the permission of the rights holder.

Rights Holder: California Malacozoological Society

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.