


## Medis pel manteniment d'èssers vius



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Medi de cultiu de Chilomonas paramecium

1 g d'acetat de sodi (trihidrat)

1 g peptona seca

1.000 cm<sup>3</sup> d'aigua dest.

2

Cal disoldre la peptona en calent i remenant.

Esterilitzat a 1,1 atm durant 20 min (30 + 20 min).

Medi de cultiu de Chlamydomonas reinhardi

0,5 g	de	SO Mg
1 g	de	PO <sub>4</sub> H <sub>2</sub> K (fosfat monopotàsic)
1 g	de	SO <sub>4</sub> (NH <sub>4</sub> ) <sub>2</sub> (sulfat amònic)
traces	de	SO <sub>4</sub> Fe

en 1.000 cm<sup>3</sup> d'aigua dest.

esterilitzar 20 min a 1,1 atm (30 + 20).

## CULTIU D'ARTEMIES

Alternatives: a) Feu aigua de mar artificial:

NaCl	24.70 g
KCL	0.70 g
CaCl <sub>2</sub>	1.00 g
MgSO <sub>4</sub>	4.20 g
NaHCO <sub>3</sub>	0.18 g
H <sub>2</sub> O dest.	1 litre (destil.lador de vidre)

b) el mateix, però a partir de les sals marines artificials "Artificial Sea Salts" (M81005/4).

c) o semblantment, posant una cullerada de les de tè de sal de cuina en 100 ml d'aigua.

Poseu una petita quantitat d'artèmia en un flascó que contingui 100 cm<sup>3</sup> d'"aigua de mar". Deixeu que s'airegi a la temperatura de l'habitació i al cap de dos dies hi haurà larves d'artèmia. Les temperatures baixes i la manca d'aireació originaran collites pobres. Abans d'omprar les artèmies cal filtrar es i treure-les del seu medi.

Medi de cultiu de protozoous

-Medi núm 1 (Paramecium, Colpidium, Stentor, Spirostomum)

35 m m<sup>3</sup> de blat integral (1 mesura rasa) en  
1.000 cm<sup>3</sup> d'aigua dest.

bullir 5 min i colar (eliminar el blat)

esterilitzar 20 min a 1,1 atm. (un cop posat ja en els tubs  
viats de cultiu). (Temps total 30 + 20 min)

abans de sembrar, ja en fred, posar 3 o 4 grans d'arròs int.  
si es tracta d'un flascó de cultiu (de 350 cm) o només un gra  
és un tub de mostra.

-Medi núm 2 (Paramecium, Colpidium, Stentor, Spirostomum)

(és alternatiu del medi núm 1).

col.locar en un pot twist dels grans (de galó o similar)

100 cm<sup>3</sup> de terra de jardí (de reacció bàsica)

1.000 cm<sup>3</sup> d'aigua dest.

tapar i esterilitzar durant 1 hora a 1,1 atm. (temps total 30 + 60 min)  
Precaució: cal assegurar-se que l'olla conté suficient aigua per a  
bullir durant 90 min.

deixa reposar i al cap de 24 h tornar a esterilitzar 60 min (30 +  
deixa reposar 24 h, filtrar i esterilitzar en pots de cultiu).

en fred, abans de sembrar afeigir 3 o 4 grans d'arros integral (per  
als pots de cultiu de 350 cm) o un gra en els tubs de mostra.



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science and  
education

# product information

## protozoa and algae

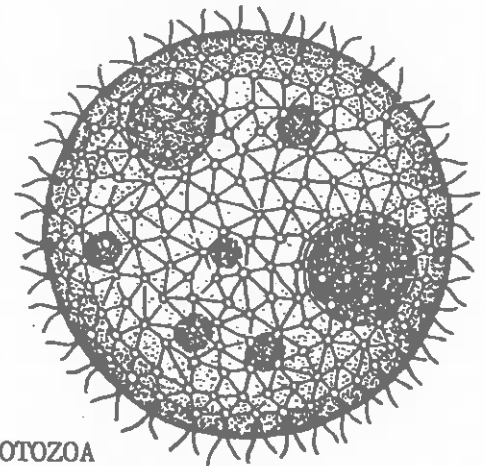
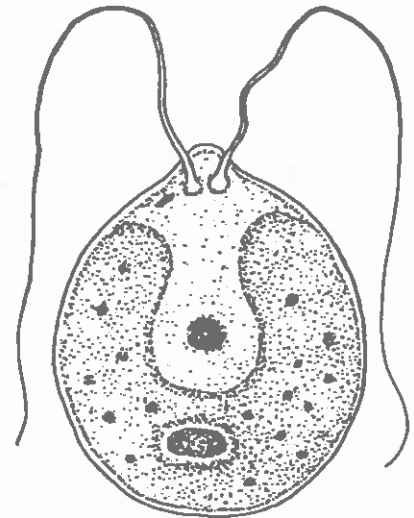
The Culture Centre of Algae and Protozoa, Cambridge, have helped us to select and establish stocks of their most popular cultures. These are listed below. Strain numbers can be supplied on request.

All are pure laboratory cultures of the named organisms. Bacteria or other food organisms may also be added.

All cultures are for 50 students, at £6.55 each.

### ALGAE

ZDC-100-T	Chlamydomonas
ZDC-115-F	Chlamydomonas +
ZDC-130-V	Chlamydomonas -
ZDC-145-H	Eudorina
ZDC-160-A	Gonium
ZDC-175-J	Pandorina
ZDC-190-C	Haematococcus
ZDC-205-E	Volvox
ZDC-220-U	Scenedesmus
ZDC-235-G	Chlorella
ZDC-250-W	Pediastrum
ZDC-265-Y	Ulothrix
ZDC-280-B	Stigeoclonium
ZDC-295-K	Spirogyra
ZDC-310-T	Micrasterias
ZDC-325-F	Cosmarium
ZDC-360-H	Spirulina
ZDC-365-A	Dunaliella
ZDC-370-A	Synura
ZDC-385-J	Cryptomonas
ZDC-400-S	Peridinium
ZDC-430-U	Euglena gracilis
ZDC-445-G	Euglena spirogyra
ZDC-460-W	Phacus
ZDC-475-Y	Tribonema
ZDC-490-B	Vaucheria
ZDC-505-D	Anabena cylindrica
ZDC-520-T	Nostoc
ZDC-535-F	Oscillatoria
ZDC-550-V	Chroococcus
ZDC-565-H	Tolypothrix



### PROTOZOA

ZDC-580-A	Blepharisma
ZDC-595-J	Discophrya
ZDC-610-S	Paramecium bursaria +
ZDC-625-E	Paramecium bursaria -
ZDC-640-U	Paramecium caudatum
ZDC-655-G	Spirostomum
ZDC-670-W	Stentor
ZDC-685-Y	Stylonychia
ZDC-700-R	Tetrahymena
ZDC-715-D	Vorticella
ZDC-730-T	Amoeba proteus
ZDC-775-H	Actinosphaerium




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THE CULTURE COLLECTION OF ALGAE AND PROTOZOA

PUBLICATIONS - 2

CCAP

CRYOPRESERVATION - AN INTRODUCTION TO CRYOPRESERVATION IN CULTURE COLLECTIONS by G.J. Morris

~~£2.00~~

Storage under liquid nitrogen at  $-196^{\circ}\text{C}$  has become a standard method for long-term maintenance of a large variety of cell types and tissues. This book investigates the freezing and thawing processes, the effects of low temperatures on biological membranes, cellular viability following freezing and thawing, and freezing injury.

CCAP

MARINE GYMNAMOEBAE by F.C. Page

~~£5.00~~

This publication is intended as a source book for the investigation of naked lobose amoebae in the marine environment. It aims to encourage the inclusion of these organisms in ecological studies and, through information on culture, to make them available for experimental work.

CCAP

PARASITIC PROTOZOA IN BRITISH WILD ANIMALS by J.R. Baker

~~£1.70~~

In addition to the myriad protozoa living in the soil and water, many species inhabit the bodies of other plants and animals, obtaining nourishment from their (usually unwilling) hosts and sometimes causing the latter considerable damage. This booklet illustrates the extent of parasitic protozoa in the British wild fauna.

CCAP

THE CULTURE AND USE OF FREE-LIVING PROTOZOA IN TEACHING by F.C. Page

~~£2.10~~

The primary purpose of this book is to make possible the maintenance of small collections of protozoa for educational use, particularly in schools and colleges whose circumstances make it impractical to order cultures as needed. To encourage such use of protozoa, this book shows how they can serve for illustrating biological principles and for experimental material.

CCAP

AN ILLUSTRATED GUIDE TO RIVER PHYTOPLANKTON by H. Belcher & E. Swale

~~£1.50~~

The purpose of this guide is to enable a non-specialist to identify most of the algae occurring in the plankton of rivers. In addition it will be found helpful in identifying algae in canals, broads and lowland pools, the plankton of which contains many of the same organisms.

CCAP

A BEGINNER'S GUIDE TO FRESHWATER ALGAE by H. Belcher & E. Swale

~~£0.85~~

The purpose of this booklet is to enable those who would like to learn to recognise some of the algae of freshwater to make a start. From the large number of different genera, 110 of those most likely to be found have been selected and one species belonging to each has been illustrated.

# Instructions

## CARE OF LIVING CULTURES OF PROTOZOA, HYDRA AND ALGAE

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1-2ml of the Amoeba culture which should include some Chilomonas to act as a food source. Leave undisturbed in a cool place (17-19°C) for approximately 3 weeks.

#### Prescott & James solution

- a) Calcium chloride - 3.27g  
Potassium chloride - 1.62g  
Distilled water - 100ml
- b) di-Potassium hydrogen orthophosphate - 5.12g  
Distilled water - 100ml
- c) Magnesium sulphate - 2.8g  
Distilled Water - 100ml

Final solution - 0.1ml each of a, b, c. 999.7ml distilled water.

#### Spirostomum

Place 5mm of soil into a clean 250ml jar. Add a knife point of green meal and two untreated wheat grains. Fill to the shoulders with tap water and steam for 30 minutes. Stand for 2-3 days and adjust pH 7.0-7.2 before inoculating with the Spirostomum. Cover loosely and keep at approximately 19°C for about two weeks. For the best results it may be necessary to try several different types of soil.

#### Stetnor

Bring to the boil 1 litre of spring water, filtered pond water or prepared "Instant Pond". Pour 100ml into each of 10 dishes approximately 12cm in diameter. Add 2 grains of previously boiled wheat to each dish. Inoculate with some Chilomonas as a food source, cover loosely to exclude dust but not air, and leave for 2-3 days before inoculating with the Stentor. Keep at room temperature away from bright sunlight for 2-4 weeks.

#### Euglena

Bring to the boil 1 litre of distilled water and add 40 wheat grains and 35 rice grains; continue boiling for 5 minutes. Leave for 2-3 days before inoculating with the Euglena. Cover loosely and keep in a cool well-lit area but not in direct sunlight. Leave approximately four weeks.

#### Hydra

Fill some large culture dishes with filtered spring or pond water or prepared "Instant Pond". Do not use distilled or tap water for Hydra. Carefully transfer about a dozen Hydra to each dish. At least one-third of the water should be changed daily and it is most important that any dead or uneaten food be removed after 30 minutes. Hydra should be fed regularly on living Daphnia or Brine Shrimps.

## Algae

### Knop's Solution

#### solution A

Magnesium sulphate  
Potassium nitrate  
di-Potassium hydrogen orthophosphate

1g  
1g  
1g

#### solution B

Distilled water  
Calcium nitrate  
Distilled water

1,000ml  
4g  
1,000ml

Add solution A to B just before use. Adjust to pH7. Better results may sometimes be obtained by diluting solution B two, three or four times. Keep the cultures in a cool well-lit area.

#### Chlorella

Ammonium nitrate  
Potassium dihydrogen orthophosphate  
Magnesium sulphate  
Potassium chloride  
Ferric chloride  
Distilled water

1g  
0.2g  
0.2g  
0.2g  
trace  
1,000ml

Adjust to pH7. Inoculate with Chlorella and keep in a well-lit area.

### Living Cultures available from Gerrard Biological Centre

#### Protozoa

ZBA-180-010C  
ZBA-180-030T  
ZBA-260-010Y  
ZBA-260-030C  
ZBA-300-010T  
ZBA-300-030N  
ZBA-320-Y  
ZBA-380-010J  
ZBA-380-030D  
ZBA-460-010P  
ZBA-460-030J  
ZBA-500-010D  
ZBA-500-030U  
ZBA-540-B

Amoeba proteus, culture  
Amoeba proteus, culture  
Euglena gracilis, culture  
Euglena gracilis, culture  
Euglena spirogyra, culture  
Euglena spirogyra, culture  
Chilomonas culture  
Paramecium caudatum, culture  
Paramecium caudatum, culture  
Stentor sp., culture  
Stentor sp., culture  
Spirostomum sp., culture  
Spirostomum sp., culture  
Blepharisma

Class of 10 pack  
Class of 50 pack  
Class of 10 pack  
Class of 50 pack  
Class of 10 pack  
Class of 50 pack  
Class of 10 pack  
Class of 10 pack  
Class of 10 pack  
Class of 50 pack  
Class of 10 pack  
Class of 50 pack  
Class of 10 pack



## Coelenterata

ZBA-600-V Hydra vulgaris (brown) Pack of 10  
ZBA-640-Q Hydra viridissima (green) Pack of 10

## Freshwater Algae

ZEC-120-010X Chlorella Class of 10 pack  
ZEC-120-030Y Chlorella Class of 50 pack  
ZEC-142-010L Chlamydomonas sp. Class of 10 pack  
ZEC-142-030F Chlamydomonas sp. Class of 50 pack  
ZEC-160-010J Volvox sp. Class of 10 pack  
ZEC-160-030D Volvox sp. Class of 50 pack  
ZEC-210-010N Spirogyra sp. vegetative Class of 10 pack  
ZEC-210-030H Spirogyra sp. vegetative Class of 50 pack

Further cultures of Algae and Protozoa, also Bacteria, Fungi, Drosophila, etc., are available - full details will be found in our catalogue.

## Sets and Materials

ZBA-140-K Vitalchrome Protokit. A kit containing mixed living protozoa and equipment for staining them and observing their structure and behaviour.  
ZBA-200-H Amoeba Proteus culture set  
ZBA-400-X Paramaecium bursaria, mating strains set  
ZBD-110-B Daphnia (Water Flea and other cladocerans), living  
ZBD-310-Y Brine Shrimp viable eggs, 60ml bottle  
ZBW-500-Q Brine Shrimp egg hatcher kit  
ZGV-170-A GERRARD Instant Pond  
ZBW-350-U Green meal, 500g  
PMK-290-030S Pasteur pipettes, 145mm for transferring microscopic organisms, pack of 250  
119-061-010T Ammonium nitrate, 500g  
153-061-010M Calcium chloride, 500g  
155-041-010G Calcium nitrate, 500g  
214-080-010D Ferric Chloride, 250g  
232-051-010Q Magnesium sulphate, 1kg  
276-041-010Y Potassium chloride, 500g  
277-085-020M Potassium dihydrogen orthophosphate, 500g  
279-048-020C di-Potassium hydrogen orthophosphate, 500g  
281-081-010T Potassium nitrate, 500g

medi de cultiu per a Drosophila melanogaster

	FLASCONS					
	10	24	32	40	50	
agar-agar	5,6	13,5	18,0	22,5	28,1	grams
sucre	1	2,5	3	4	5	cull.
aigua	375	900	1200	1500	1875	cm <sup>3</sup>
<hr/>						
farina de blat de moro	91,0	218,3	291,0	364,0	454,2	grams
aigua	187,5	450	600	750	937,5	cm <sup>3</sup>
nipagin	0,9	2,2	3,0	3,7	4,7	grams
alcohol etílic	10,3	24,7	33,0	41,2	51,5	cm <sup>3</sup>

N<sup>o</sup> 21

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## CULTIU D'HIDRES.

Hom suministra les hidres en un medi de cultiu especial (vegeu-ne la fórmula més avall).

En rebre-les, cal descargolar el tap i deixar el cultiu en un lloc fresc. El animals us poden seguir vivint encara uns quants dies en el vial o en aigua de bassa filtrada, però si voleu que visquin un temps més llarg, cal cultivar-les en el medi per a Hidres i alimentar-les amb regularitat: l'hidra verda unes dues vegades per setmana i la hidra fosca cada dia.

L'hidra necessita il.luminació -mijançant una finestra encarada al nord o un tub fluorescent- durant 8-10 hores al dia com a mínim.

## ALIMENTACIO

Filtreu les artèmies -criades com direm més endavant- amb un sedàs de malla de niló (n'hi ha prou amb un colador de plàstic com els de tè de malla fina). Vesseu una petita quantitat de medi per a hidres o de aigua destil.lada (destil.lador de vidre) per sobre de les artèmies retingudes al sedàs, a fi d'eliminar l'aigua salada residual; afegiu, llavors, les artèmies rentades a la càpsula de les hidres. Passats uns 30 minuts, cal netejar les hidres i retirar les artèmies mortes i els productes residuals.

## NETEJA

Desenganxeu les hidres de la càpsula amb un pincellet i aboqueu hidres i artèmies a un sedàs de malla adequada per a retenir les hidres tot deixant passar les artèmies. Les hidres poden llavors conservar-se en una càpsula amb medi (la profunditat del medi ha d'ésser d'aproximadament 1 cm).

## MEDI PER A HIDRES

(Medi ja preparat, referència M45009/8)

## MEDI PER A HIDRES - Preparació.

Solució A:    KCl                    3.75 g  
              NaHCO<sub>3</sub>                42.00 g  
              NH<sub>2</sub>.C(CH<sub>2</sub>OH)<sub>3</sub>    60.57 g    (esmortuïdor Tris)  
              H<sub>2</sub>O dest.            1 litre    (destil.lador de vidre)

Solució B:    CaCl<sub>2</sub>                    41.60 g  
              MgCl<sub>2</sub>·6H<sub>2</sub>O            10.20 g  
              H<sub>2</sub>O dest.            1 litre    (destil.lador de vidre)

Per a fer 1 litre de medi, preneu 2 cm<sup>3</sup> de la Solució A i 2 cm<sup>3</sup> de la Solució B per a 1 litre d'aigua destil.lada. Ajusteu el pH a 7.5-7.8 afegint-hi HCl M (normalment calen uns 0.9 cm<sup>3</sup> de HCl M).

## CULTIU D'ARTEMIES

Alternatives: a) Feu aigua de mar artificial:

NaCl	24.70 g
KCl	0.70 g
CaCl <sub>2</sub>	1.00 g
MgSO <sub>4</sub>	4.20 g
NaHCO <sub>3</sub>	0.18 g
H <sub>2</sub> O dest.	1 litre (destil.lador de vidre)

b) el mateix, però a partir de les sals marines artificials "Artificial Sea Salts" (M81005/4).

c) o semblantment, posant una cullerada de les de tè de sal de cuina en 100 ml d'aigua.

Poseu una petita quantitat d'artèmia en un flascó que contingui 100 cm<sup>3</sup> d'"aigua de mar". Deixeu que s'airegi a la temperatura de l'habitació i al cap de dos dos dies hi haurà larves d'artèmia. Les temperatures baixes i la manca d'aireació originaran collites pobres. Abans d'empurar les artèmies cal filtrar es i treure-les del seu medi.

# Culturing Hydra

Hydra are supplied in a special culture medium (see formula below). On receipt, the cap should be loosened and the culture allowed to stand in a cool place. The animals will live for several days in the container or in filtered pond water, but to keep them for any longer period of time, they must be cultured in Hydra medium and fed regularly: green Hydra about twice a week and brown Hydra every day. Green Hydra also need illumination from a north-facing window or fluorescent tube for at least 8-10 hours per day.

## FEEDING

Artemia hatched according to the instructions below are strained through a fine nylon mesh sieve (a plastic tea strainer of fine mesh is suitable). A small quantity of Hydra medium or glass-distilled water is then poured over the Artemia retained in the sieve, to wash away residual sea water and then the washed Artemia are added to the Hydra dish. After a period of 30 minutes, the Hydra must be cleaned and all dead Artemia and waste products removed.

## CLEANING

Dislodge the Hydra from the dish with a fine paintbrush and then pour the Hydra and Artemia through a sieve of suitable mesh to retain the Hydra but not the Artemia. The Hydra can then be kept in a dish containing about 1cm depth of medium.

## HYDRA MEDIUM

(Available ready-made, M45009/8)

### Solution A:

KCl	3.75g
NaHCO <sub>3</sub>	42.00g
NH <sub>2</sub> .C(CH <sub>2</sub> OH) <sub>3</sub> (Tris buffer)	60.57g
Glass-distilled H <sub>2</sub> O	1 litre

### Solution B:

CaCl <sub>2</sub>	41.60g
MgCl <sub>2</sub> ·6H <sub>2</sub> O	10.20g
Glass-distilled H <sub>2</sub> O	1 litre

To make up 1 litre of medium, take 2cm<sup>3</sup> Solution A plus 2cm<sup>3</sup> Solution B to 1 litre distilled water. Adjust the pH to 7.5-7.8 by addition of M HCl (normally requires about 0.9cm<sup>3</sup> M HCl).

## CULTURING ARTEMIA (Brine shrimps)

Either make up artificial sea water:

NaCl	24.70g
KCl	0.70g
CaCl <sub>2</sub>	1.00g
MgSO <sub>4</sub>	4.20g
NaHCO <sub>3</sub>	0.18g
Glass-distilled H <sub>2</sub> O	1 litre

or obtain Artificial Sea Salts (M81005/4). Alternatively, use 1 teaspoonful of cooking salt in 100ml of water.

Sprinkle a small amount of Artemia into a bottle containing 100cm<sup>3</sup> 'sea water'. Aerate at room temperature and Artemia larvae will be present after 2 days. Lower temperature and poor aeration will give smaller hatchlings. The shrimps are then strained from the solution before use.

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