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A Preliminary Study of the Fresh Water Protozoan Fauna of Mount Desert Island

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Although Procter (Biological Survey of the Mount Desert Region 1933) has described the occurrence of the Foraminifera in waters about Mount Desert Island and Unger (Bull. M.D.I.B.L. 1941) has reported on the fresh water protozoa found in Beaver Lake, apparently no records are in existence concerning the general nature of the protozoan fauna in the several fresh water lakes and ponds on the island. During the month of June, 1954, protozoa were identified in samples of water collected from fresh water bodies on the island. It was the intention to determine, generally, what protozoan forms were present and their approximate distribution.

Following is the list of collection points.

1. Mount Sargent Pond - East edge
2. Jordan Pond - north end at entrance of Deer Brook
3. Jordan Pond - south end
4. Long Pond - south end near road
5. Upper Hadlock Pond - south end above creek draining to (6)
6. Lower Hadlock Pond - north end below creek entrance
7. Asticou Pond - south end near road
8. Bubble Pond - north end above creek draining to (9)
9. Eagle Lake - north end
10. Breakneck Pond (South) - north end above drain to (11)
11. Breakneck Pond (North) - east edge
12. Halfmoon Pond - south edge
13. Witch Hole Pond - north end
14. Lake Wood - north end
15. Aunt Betty Pond - east edge
16. The Tarn - north end
17. The Bowl - east edge
18. Round Pond - south end above stream flowing to (19)
19. Great Pond - north end below stream from (18)
20. Ripple Pond - north end above stream flowing to (21)
21. Somes Pond - south end below stream from (20)
22. Little Round Pond - east edge
23. Echo Lake - east edge
24. Hodgdon Pond - south end above stream flowing to (25)
25. Seal Cove Pond - north end below stream from (24)

The genera and species observed (arranged alphabetically by classes) are listed below. Numbers indicate points from which the forms were observed.

ACADIA NATIONAL PARK
RESOURCE MANAGEMENT DIVISION

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MASTIGOPHORA

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|---|--|
| Astasia klebseii 19, 22 | Gymnodinium palustre 5, 20 |
| Bodo edax 13 | Heteronema acus 22 |
| Chilomonas paramecium 1, 3, 12, 16, 20 | Mallanomonas sp. 21 |
| Chrysidella schaudinni 5, 10 | Mastigosphaera gobii 14 |
| Chrysocapsa paludosa 10 | Monas socialis 2 |
| Clamydomonas globosa 11 | Ochromonas ludibunda 16, 21 |
| Cryptochrysis communata 4, 5, 22 | Oikomonas termo 2, 3, 20 |
| Cryptoglana pigra 6, 17 | Peranema trichophorum 11 |
| Cryptomonas ovata 2, 4, 9, 10, 11, 13, 14, 15, 16, 18, 19, 25 | Peridinium sp. 2, 3, 6, 8, 9, 11, 12, 13, 14, 15, 18, 20, 24, 25 |
| Dinobryon sertularia 7, 16 | Peridinium divergens 15 |
| Distigma proteus 22 | Peridinium wisconsinense 12 |
| Eudorina elegans 10, 13, 17 | Phacus acuminata 17 |
| Euglena agilis 22, 24 | Phacus pleuronectes 2 |
| Euglena gracilis 10 | Streptomonas cordata 17 |
| Euglena phacoides 15 | Syncrepta volvox 14 |
| Euglena viridis 2 | Synura adamsi 4, 5, 7, 13, 24, 25 |
| Glenodinium sp. 8, 9, 10, 17, 20, 21 | Synura uvella 2, 3, 4, 5, 6, 7, 12, 13, 14, 16, 18, 24, 25 |
| Gleomonas ovalis 13 | Trachelomonas hispida 5 |
| Gonium pectorale 16 | Trachelomonas varians 19 |
| Gymnodinium sp. 10, 16, 17, 18 | Uroglena volvox 7 |
| Gymnodinium aeruginosum 14 | Volvox aureus 4, 17 |
| Gymnodinium fuscum 16, 18, 24 | Volvox globator 4, 7, 10, 11, 12, 15, 16 |

SARCODINA

- | | |
|---|--------------------------------|
| Acanthocystis aculeata 5 | Diffugia urceolata 25 |
| Actinosphaerium eichorni 12 | Elaeorhanus cinta 23 |
| Arcella discoides 13, 14, 15, 16, 18, 22 | Euglypha sp. 12, 22 |
| Arcella mitrata 22 | Heleopera sp. 12, 22 |
| Arcella vulgaris 15 | Heterophrys glabrescens 14 |
| Centropyxis aculeata 3, 11, 17, 22, 25 | Heterophrys miriopoda 2, 4, 20 |
| Corycia coronata 13, 15 | Nebela sp. 14 |
| Cyphoderia ampulla 18 | Parmulina cyathus 3 |
| Diffugia constricta 18 | Phryganella sp. 1 |
| Diffugia oblonga 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 16, 17, 18, 19, 20, 24, 25 | Raphidocystis tubifera 13, 20 |
| | Sphenoderia lenta 18 |

CILIATA

- | | |
|----------------------------------|--------------------------------|
| Amphileptus claparedei 13 | Cyclogramma trichocystis 25 |
| Balladyna elongata 13 | Dileptus americanus 1, 18 |
| Blepharisma lateritum 25 | Dileptus anser 10, 13, 15, 24 |
| Bresslaia vorax 5, 12 | Disematostoma butschlii 15, 20 |
| Chiliophrya labiata 1 | Enchelydium fusidens 14, 24 |
| Coleps bicuspidis 15 | Frontonia sp. 15 |
| Coleps octospinus 13, 16, 20, 22 | Frontonia leucas 2, 7, 14, 16 |
| Colpidium campylum 22 | Glaucoma scintillans 7 |

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Gonostomum sternuum 20
 Halteria grandinella 1, 11, 15, 16, 18, 21, 24
 Kalia acrobates 1
 Lacrymaria olor 20
 Lagnyophrya simplex 17
 Loxocephalus sp. 24
 Malacophrys rotans 4
 Monochilium frontatum 8, 10, 20
 Ophrydium ectatum 17
 Oxytricha bifaria 1, 4, 14
 Oxytricha fallax 20
 Oxytricha setigera 5, 8, 19, 24, 25
 Paramecium aurelia 7
 Paramecium bursaria 13, 16, 17, 20, 24
 Paramecium caudatum 7
 Paramecium multimicronucleatum 9
 Paramecium trichium 2, 3
 Paranassula microstoma 18
 Penardiella crassa 13
 Pithothorax ovatus 2, 19
 Plagiopyla nasuta 2, 20
 Platynematum sociale 9
 Pseudoprionodon farctus 21
 Psilotricha sp. 7, 10
 Saprophilus agitated 17
 Spastosome viride 2, 5
 Spirostomum ambiguum 6, 7, 11, 13, 21
 Spirostomum filium 12
 Stentor coerules 13, 18
 Stentor igneus 1, 15
 Stentor niger 17
 Stentor polymorphus 13, 17
 Stongylidium sp. 20
 Trachelius ovum 7
 Trichodina sp. 14
 Uroleptus sp. 12
 Urotricha agilis 3, 9, 23, 25
 Vaginicola amorphia 14
 Vorticella campanula 1, 5, 6, 14, 23, 25
 Vorticella convallaria 4, 11, 24
 Vorticella microstoma 14, 22

Adrenalin Diuresis in the Spiny Dogfish, *Squalus acanthias*

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 Marquette University and Yale University

Clarke (Bull., M. D. I. B. L., 1932, 1936) demonstrated that Adrenalin causes a diuresis in *Squalus acanthias*, which is characterized by a marked increase in urea clearance and urea U/P ratio with no change in the sucrose clearance. The nature of this diuresis was re-examined using inulin as a measure of glomerular filtration rate, and freezing point depression as a measure of osmotic pressure. Male dogfish were catheterized and injected intramuscularly with 600 mg. inulin. Urine was collected in a rubber balloon tied to the catheter and blood by percutaneous tail puncture. After two control periods, 1 mg. of Adrenalin chloride (Parke, Davis and Co.) was injected into the tail muscles. Urine and plasma were collected for 2 to 5 periods.

Data from 6 fish showed that:

- 1) Urine volume increased in 5 fish 1-4 fold over control values.
- 2) Filtration rate rose in 3 of 5 fish in which it was measured.
- 3) Osmotic clearance increased in all fish tested, the maximal increase being 3-fold.

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- 4) Urea clearance increased consistently, by as much as 8-fold.
 - 5) The duration of diuresis was 2 to 4 hours.
 - 6) A second dose of Adrenalin 2 to 4 hours later evoked a second diuretic response.
 - 7) Sodium and potassium clearances increased in one fish in which they were measured.
 - 8) No significant change occurred in plasma osmolarity.
- It is concluded that Adrenalin increases osmotic diuresis, but the osmotic components in the urine are not fully known.

Comparative Histochemistry of Esterases and Mucopolysaccharides

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Tissues from the following species were used in this study.

Strongylocentrotus droehbachensis	Halicystus
Cuccummarai frondosa	Buccinum undatum
Patella vulgata	Mytilus edulis
Metridium dianthus	Mya arenaria
Eutaenia sirtalis	Anodonta cygnea
Pseudopleuronectes americanus	Balanus balanus
Lophius piscatorius	Triton rubiculus
Ameiurus nebulosus	Pagurus bernhardus
Triturus viridescens	Asterias vulgaris

It was proposed to make a comparative study of the non-specific esterases and their association with mucopolysaccharides and mucoproteins. Phosphatase, 5-nucleotidase, and some other enzymes were studied incidentally. A single method of fixation and embedding was employed (cold neutral formalin fixation, cold acetone dehydration, paraffin embedding) which affords excellent histological preservation together with adequate preservation of alkaline phosphatase, lipase and non-specific esterases. Many of the tissues were also studied as frozen sections after cold formalin fixation. Some estimate was thus obtained of the losses of enzymes due to dehydration, clearing and embedding.

Coupling azo dye methods were used to demonstrate alkaline phosphatase and non-specific esterase and an indoxyl method for lipase and non-specific esterases. A standard Ca-CoS method was used for 5-nucleotidase. Polysaccharides and mucopolysaccharides were revealed by the PAS method (McManus - Hotchkiss); Alcian blue and toluidine blue studies of metachromasia were used to define the acid mucopolysaccharides. The whole of the material is now being subjected to a much wider spectrum of histochemical investigation.