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## Protozoa of Iowa

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## Protozoa of Iowa

FAE M. SHAWHAN, LELAND P. JOHNSON, AND THEODORE L. JAHN

### *Introduction*

Ten years ago, the authors, while working at the University of Iowa Lakeside Laboratory at Lake Okoboji, compiled a list of Protozoa studied that summer. It was felt such a list could be enlarged upon and become a useful reference for workers in the field of Protozoology.

As Protozoa have been identified we have added species from the vicinities of Lakeside Laboratory, Des Moines and Iowa City. Most of these were free living, but we have also included some parasitic forms.

In addition we have made some attempt to include those mentioned in readily accessible literature, but no attempt has been made to make an exhaustive survey.

We intend to supplement this list with additional forms as they are revealed by an intensive search of published material. We believe that this list is sufficiently complete to be of considerable value in its present form.

### *Protozoa of Iowa*

#### SUB PHYLUM PLASMODROMA

#### CLASS MASTIGOPHOREA

#### SUB CLASS PHYTOMASTIGOPHORIA

#### ORDER 1 CHRYSOMONADIDA

1. *Dinobryon calyciforme*
2. *Dinobryon divergens*
3. *Dinobryon sertularia*
4. *Dinobryon sociale*
5. *Dinobryon stipitatum*
6. *Hyalobryon* sp.
7. *Mallomonas* sp.

#### ORDER 2 CRYPTOMONADIDA

1. *Chilomonas paramecium*
2. *Cryptomonas erosa*
3. *Cryptomonas ovata*
4. *Cyathomonas truncata*
5. *Nephroselmis olivacea*

#### ORDER 3 DINOFLAGELLIDA

1. *Ceratium hirundinella*
2. *Glenodinium uliginosum*
3. *Gymnodinium agile*
4. *Peridinium tabulatum*

ORDER 4 PHYTOMONADIDA

1. *Carteria* sp.
2. *Chlamydomonas anglica*
3. *Chlamydomonas debaryana*
4. *Chlamydomonas dinobryoni*
5. *Chlamydomonas ehrenbergii*
6. *Chlamydomonas globosa*
7. *Chlamydomonas snowii*
8. *Chlamydotryps stellata*
9. *Eudorina elegans*
10. *Gonium pectorale*
11. *Gonium sociale*
12. *Monas vulgaris*
13. *Oikomonas termo*
14. *Pandorina morum*
15. *Parapolytoma satura*
16. *Pleodorina californica*
17. *Pleodorina illinoisensis*
18. *Platydorina caudatum*
19. *Polytomella agilis*
20. *Polytoma uvella*
21. *Synura adamsii*
22. *Synura uvella*
23. *Spondylorum quaternarium*
24. *Volvox aureus*
25. *Volvox globator*
26. *Volvox mononae*

ORDER 5 EUGLENIDA

1. *Anisonema acinus*
2. *Anisonema emarginatum*
3. *Anisonema ludibundum*
4. *Anisonema ovale*
5. *Anisonema pulsillum*
6. *Anisonema solenata*
7. *Anisonema striatum*
8. *Anisonema truncatum*
9. *Astasia curvata*
10. *Astasia dangeardii*
11. *Astasia inflata*
12. *Astasia klebsii*
13. *Astasia ocellata*
14. *Astasia trichophora*
15. *Chloropeltis hispidula*
16. *Chloropeltis ovum*
17. *Cryptoglena pigma*
18. *Distigma proteus*
19. *Entosiphon ovatum*
20. *Entosiphon sulcatum*

21. *Euglena acus*
22. *Euglena acus* var. *angularis*
23. *Euglena acus* var. *rigida*
24. *Euglena acutissima*
25. *Euglena acutissima* var. *longa*
26. *Euglena anabaena* var. *minor*
27. *Euglena antefossa*
28. *Euglena caudata*
29. *Euglena chlamydophora*
30. *Euglena cyclopicola*
31. *Euglena deses*
32. *Euglena deses* var. *tenuis*
33. *Euglena ehrenbergii*
34. *Euglena elongata*
35. *Euglena flava*
36. *Euglena fronsundulata*
37. *Euglena fundoversata*
38. *Euglena gracilis*
39. *Euglena granulata*
40. *Euglena ignobilis*
41. *Euglena intermedia*
42. *Euglena klebsii*
43. *Euglena minima*
44. *Euglena nana*
45. *Euglena oblongata*
46. *Euglena oxyurus*
47. *Euglena pisciformis*
48. *Euglena pisciformis* var. *minor*
49. *Euglena polymorpha*
50. *Euglena proxima*
51. *Euglena pseudospiroides*
52. *Euglena retronata*
53. *Euglena rostrifera*
54. *Euglena rubra*
55. *Euglena sanguinea*
56. *Euglena sociabilis*
57. *Euglena spirogyra*
58. *Euglena spirogyra* var. *abrupte acuminata*
59. *Euglena spirogyra* var. *elegans*
60. *Euglena spirogyra* var. *marchica*
61. *Euglena spirogyra* var. *suprema*
62. *Euglena spiroides*
63. *Euglena splendens*
64. *Euglena terricola*
65. *Euglena torta*
66. *Euglena tripteris*
67. *Euglena tripteris* var. *klebsii*
68. *Euglena trisulcata*
69. *Euglena truncata*

70. *Euglena tuba*
71. *Euglena velata*
72. *Euglena viridis*
73. *Euglena vivida*
74. *Heteronema acus*
75. *Heteronema mutabilis*
76. *Heteronema nebulosum*
77. *Heteronema spirale*
78. *Heteronema tremulum*
79. *Khawkinea halli*
80. *Lepocinclis fusciformis*
81. *Lepocinclis marsonni*
82. *Lepocinclis ovum*
83. *Lepocinclis ovum* var. *globular*
84. *Menoidium falcatum*
85. *Menoidium incurvum*
86. *Menoidium pellucidum*
87. *Menoidium tortuosum*
88. *Notosolenus apocamplus*
89. *Notosolenus orbicularis*
90. *Notosolenus sinuatus*
91. *Peranema trichophorum*
92. *Petalomonas abscisca*
93. *Petalomonas abscisca* var. *convergens*
94. *Petalomonas alata*
95. *Petalomonas angusta*
96. *Petalomonas angusta* var. *pulsilla*
97. *Petalomonas assymetrica*
98. *Petalomonas bicarinata*
99. *Petalomonas carinata*
100. *Petalomonas dorsalis*
101. *Petalomonas inflexa* var. *obliqua*
102. *Petalomonas mediocanellata*
103. *Petalomonas mediocanellata* var. *distomata*
104. *Petalomonas mediocanellata* var. *minor*
105. *Petalomonas mediocanellata* var. *pleurosigma*
106. *Petalomonas quinquemarginata*
107. *Petalomonas septamarginata*
108. *Petalomonas sulcata*
109. *Phacus acumina*
110. *Phacus acumina* var. *iowenesis*
111. *Phacus acuminata*
112. *Phacus agilia skuja* var. *okobojiensis*
113. *Phacus alata*
114. *Phacus anoceolus*
115. *Phacus brevicaudata*
116. *Phacus caudata*
117. *Phacus longicaudus*
118. *Phacus mcnilata*

119. *Phacus oscillans*
120. *Phacus pleuronectes*
121. *Phacus pyrum*
122. *Phacus quinquemarginatus*
123. *Phacus rostafinskii*
124. *Phacus spiralis*
125. *Phacus stokesii*
126. *Phacus suecica*
127. *Phacus torta*
128. *Phacus trimarginatus*
129. *Phacus triqueter*
130. *Phacus warszewiczii*
131. *Scytomonas pulsilla*
132. *Trachelomonas abrupta*
133. *Trachelomonas abrupta* var. *bonnieri*
134. *Trachelomonas affinis*
135. *Trachelomonas affinis* var. *levis*
136. *Trachelomonas allia*
137. *Trachelomonas armata*
138. *Trachelomonas armata* var. *steinii*
139. *Trachelomonas benardi*
140. *Trachelomonas elegans*
141. *Trachelomonas ensifera*
142. *Trachelomonas enclora*
143. *Trachelomonas hispida*
144. *Trachelomonas hispida* var. *coronata*
145. *Trachelomonas hispida* var. *crenulatocollis*
146. *Trachelomonas hispida* var. *punctulatum*
147. *Trachelomonas hispida* var. *subarmata*
148. *Trachelomonas hispida* var. *verrucosa*
149. *Trachelomonas horrida*
150. *Trachelomonas horrida* var. *pauciopina*
151. *Trachelomonas molesta*
152. *Trachelomonas oblongata*
153. *Trachelomonas obovata*
154. *Trachelomonas piscatoris*
155. *Trachelomonas planctonica*
156. *Trachelomonas raciborskii*
157. *Trachelomonas raciborskii* var. *incerta*
158. *Trachelomonas raciborskii* var. *punctata*
159. *Trachelomonas reticulata*
160. *Trachelomonas rugulosa*
161. *Trachelomonas scheviokoffi*
162. *Trachelomonas spinosa*
163. *Trachelomonas superba*
164. *Trachelomonas volvocina*
165. *Trachelomonas westii*

SUB CLASS ZOOMASTIGOPHORIA

ORDER 1 RHIZOMASTIGIDA

1. *Mastigamoeba aspera*
2. *Mastigamoeba butschlii*
3. *Mastigamoeba longifilum*
4. *Mastigamoeba socialis*
5. *Mastigella radricula*
6. *Multicillia lacustris*
7. *Multicillia* sp. (90 $\mu$ )

ORDER 2 PROTOMASTIGIDA (PROTOMANADINA)

1. *Anthophysa vegetans*
2. *Bodo caudatus*
3. *Codosiga botrytus*
4. *Embadomonas phyllophagae*
5. *Monas communis*
6. *Monas elongata*
7. *Monas guttula*
8. *Monas vivipara*
9. *Monosiga steinii*
10. *Oikomonas equi*
11. *Trypanosoma chrysemydis*
12. *Trypanosoma cryptobranchi*
13. *Trypanosoma hixsoni*
14. *Trypanosoma iowensis*
15. *Trypanosoma laverani* var. *toxastomae*

ORDER 3 POLYMASTIGIDA

1. *Callimastix equi*
2. *Eutrichomastix phyllophagae*
3. *Eutrichomastix passali*
4. *Giardia botouri*
5. *Giardia floridae*
6. *Giardia melaspizae*
7. *Giardia ondalrae*
8. *Giardia stunellae*
9. *Hexamita marmotae*
10. *Hexamita inflatus*
11. *Hexamita intestinalis*
12. *Monocercomonas melolonthae*
13. *Polymastix melolonthae*
14. *Polymastix phyllophagae*
15. *Tetramitus pyriformis*
16. *Tetramitus rostratus*
17. *Tetramitus sulcatus*
18. *Tetramitus* sp.
19. *Trepomonas agilis*
20. *Trichomonas augusta*
21. *Trichomonas chordeilis*
22. *Trichomonas equi*

23. *Trichomonas galenae*
24. *Trichomonas iowensis*
25. *Trichomonas pisobiae*
26. *Trichomonas ruminatum*

## CLASS II SARCODINA

## SUB CLASS RHIZOPODA

## ORDER 1 AMOEBA

1. *Amoeba gargonis*
2. *Amoeba limicola*
3. *Amoeba proteus*
4. *Amoeba radiosa*
5. *Amoeba striata*
6. *Amoeba verrucosa*
7. *Amoeba vespertilio*
8. *Dinamoeba mirabilis*
9. *Endamoeba bovis*
10. *Endamoeba gedoelsti*
11. *Pelomyxa villosa*
12. *Vahlkampfia limax*
13. *Vahlkampfia lobospinosa*

## ORDER 2 TESTACIDA

1. *Arcella vulgaris*
2. *Arcella discoides*
3. *Assulina semilinum*
4. *Centropyxis aculeata*
5. *Cochliopodium vestitum*
6. *Cochliopodium bilimbosum*
7. *Diffugia acuminata*
8. *Diffugia circeolata*
9. *Diffugia constricta*
10. *Diffugia corona*
11. *Diffugia cratera*
12. *Diffugia globulosa*
13. *Diffugia lobostoma*
14. *Diffugia oblongata*
15. *Diffugia pyriformis*
16. *Diffugia spiralis*
17. *Diffugia urceolata*
18. *Euglypha alveolata*
19. *Pamphagus mutabilis*
20. *Pyxidicula operculata*
21. *Trinema enchelys*
22. *Cyphoderia ampulla*

## SUB CLASS ACTINOPODIA

## ORDER 1 HELIOZOA

1. *Acanthocystis* sp.
2. *Actinophrys sol*
3. *Actinophrys picta*



4. *Actinosphaerium eichorni*
5. *Clathrulina elegans*
6. *Heterophrys* sp.
7. *Raphidiophrys viridis*
8. *Vampyrella lateritia*

CLASS SPOROZOEIA

ORDER 1 MYXOSPORIDA

1. *Chloromyxum trijugum*
2. *Henneguya exilis*
3. *Henneguya magna*
4. *Myxidium macrocapsularis*
5. *Myxidium melum*
6. *Myxosoma ovalis*
7. *Myxosoma okobojiensis*
8. *Myxosoma multiplicatum*
9. *Myxidium* sp.
10. *Myxobolus bursaria*
11. *Myxobolus discrepans*
12. *Myxobolus iowensis*
13. *Myxobolus okobojiensis*
14. *Myxobolus osburnii*
15. *Myxobolus sparoidia*
16. *Myxobolus symmetricus*
17. *Myxobolus transovalis*

ORDER 2 COCCIDIA

1. *Eimeria americana*
2. *Eimeria chrysemydis*
3. *Eimeria delagei*
4. *Eimeria environ*
5. *Eimeria exigua*
6. *Eimeria irresidua*
7. *Eimeria leporis*
8. *Eimeria magna*
9. *Eimeria major*
10. *Eimeria media*
11. *Eimeria minima*
12. *Eimeria mitrarium*
13. *Eimeria monacis*
14. *Eimeria neoleparis*
15. *Eimeria os*
16. *Eimeria palistana*
17. *Eimeria perforoides*
18. *Eimeria perforans*
19. *Eimeria perforans* var. *groenlandica*
20. *Eimeria pintonensis*
21. *Eimeria robertsoni*
22. *Eimeria sculpta*
23. *Eimeria septentrionalis*

24. *Eimeria silvilagi*
25. *Eimeria stiedae*
26. *Haemogregarina lahillei*
27. *Haemogregarina masoni*
28. *Haemogregarina pituophis*
29. *Haemogregarina stepanowi*

## ORDER 3 HEMOSPORIDIA

1. *Hemoproteus beckeri*
2. *Hemoproteus citelli*
3. *Hemoproteus columbae*

## SUBPHYLUM CILLIOPHORA

## CLASS CILIATEA

## ORDER 1 HOLOTRICHIDA

1. *Actinobolus radians*
2. *Aegyria* sp.
3. *Alloiozona trizona*
4. *Blepharaconus cervicalis*
5. *Blepharaconus benbrooki*
6. *Blepharocorys angusta*
7. *Blepharocorys cardionucleata*
8. *Blepharocorys curvigula*
9. *Blepharocorys jubata*
10. *Blepharocorys uncinata*
11. *Blepharocorys valvata*
12. *Blepharosphaera ellipsoidalis*
13. *Blepharosphaera intestinalis*
14. *Blepharoprosthium pireum*
15. *Bundleia postciliata*
16. *Charon equi*
17. *Chilodon caudatus*
18. *Chilodon fluviatilia*
19. *Chilodonella cucullulus*
20. *Chilodonella dentata*
21. *Cinetochilum margaritaceum*
22. *Coleps bicuspis*
23. *Coleps hirtus*
24. *Coleps octospinus*
25. *Coleps striatus*
26. *Colpidium striatum*
27. *Colpidium campylum*
28. *Colpoda flavicans*
29. *Colpoda helia*
30. *Colpoda inflata*
31. *Colpoda saprophila*
32. *Colpoda steinii*
33. *Ctedoctema acanthocrysta*
34. *Cyclidium chrysalis*
35. *Cyclidium citrullus*

36. *Cyclidium glaucoma*
37. *Cyrotolophosis mucicola*
38. *Dallasia frontata*
39. *Dasytricha ruminantium*
40. *Didesmis ovalis*
41. *Didesmis quadrata*
42. *Didesmis spiralis*
43. *Didinium nasutum*
44. *Dileptus gigas*
45. *Dileptus micronatus*
46. *Dileptus monilatus*
47. *Enchelys truncata*
48. *Enchelyodon farctus*
49. *Frontonia acuminata*
50. *Frontonia atra*
51. *Frontonia leucas*
52. *Glaucoma scintillans*
53. *Glaucoma macrostoma*
54. *Holophyra keselerii*
55. *Isotricha prostoma*
56. *Lembadion bullinum*
57. *Lacrymaria cohirii*
58. *Lacrymaria truncata*
59. *Lacrymaria olor*
60. *Lacrymaria elegans*
61. *Lionotus fascicola*
62. *Lionotus pleurosigma*
63. *Loxocephalus granulosis*
64. *Loxophyllum melaegris*
65. *Loxodes rostrum*
66. *Mesodinium* sp.
67. *Microthorax sulcatus*
68. *Nassula flava*
69. *Nassula aranata*
70. *Nassula rubens*
71. *Ophryoglena grandulosis*
72. *Paraisotricha beckeri*
73. *Paraisotricha colpoidea*
74. *Paraisotricha minuata*
75. *Paramecium aurelia*
76. *Paramecium bursaria*
77. *Paramecium caudatum*
78. *Paramecium multimicronucleatum*
79. *Paramecium trichium*
80. *Polymorpha trizona*
81. *Prorodon edentatis*
82. *Prorodon discolor*
83. *Prorodon morgani*
84. *Prorodon opalescens*

85. *Prorodon ovum*
86. *Prorodon teres*
87. *Spathidium spathula*
88. *Trachelocerca trepida*
89. *Trachelius ovum*
90. *Trachelophyllum tachyblastum*
91. *Urocentrum turbo*
92. *Uronema marinum*
93. *Urotricha platystoma*

## ORDER 2 SPIROTRICHIDA

## SUB ORDER HETEROTRICHINA

1. *Blepharisma bursaria*
2. *Blepharisma clarrissinum*
3. *Blepharisma lateritia*
4. *Blepharisma salinarum*
5. *Bursaria truncatella*
6. *Caenomorpha levanderi*
7. *Climacostomum virens*
8. *Condylostoma* sp.
9. *Gyrocoris oxyura*
10. *Metopoides acuminata*
11. *Metopus bacillatus*
12. *Metopus campanula*
13. *Metopus hyalinus*
14. *Metopus pullus*
15. *Metopus setifer*
16. *Metopus setosus*
17. *Metopus sigmoides*
18. *Metopus spiralis*
19. *Metopus undulans*
20. *Nyctotherus cordiformis*
21. *Spirostomum ambiguum*
22. *Spirostomum intermedium*
23. *Spirostomum teres*
24. *Stentor coeruleus*
25. *Stentor igneus*
26. *Stentor polymorphus*
27. *Stentor pyriformis*
28. *Stentor roeseli*
29. *Peritromus ovalis*

## SUB ORDER OGLIGOTRICHINA

1. *Cycloposthium affinae*
2. *Cycloposthium bipalmatum*
3. *Cycloposthium corrugatum*
4. *Cycloposthium dentiferum*
5. *Cycloposthium edentatum*
6. *Cycloposthium scutigerum*
7. *Cochliatoxum periachtum*

8. *Diplodinium bursa*
9. *Diplodinium clevelandi*
10. *Diplodinium dentatum*
11. *Diplodinium denticulatum*
12. *Diplodinium ecuadatum*
13. *Diplodinium hegneri*
14. *Diplodinium helveri*
15. *Diplodinium magii*
16. *Diplodinium medium*
17. *Ditoxum funinucleum*
18. *Entodidium bicarinatum*
19. *Entodinium bursa*
20. *Entodinium caudatum*
21. *Entodinium furca*
22. *Entodinium minimum*
23. *Halteria grandinella*
24. *Halteria grandinella* var. *chlorelligera*
25. *Halteria grandinella* var. *cirrifera*
26. *Ophryoscolex caudatus*
27. *Ophryoscolex inermis*
28. *Spirodinium equi*
29. *Tetratoxum excavatum*
30. *Tetratoxum parvum*
31. *Tetratoxum unifasiculatum*
32. *Triadinium caudatum*
33. *Triadinium galea*
34. *Triadinium minimum*
35. *Tripalmaria dogieli*

SUB ORDER CTENOSTOMINA

1. *Epalxis mirabilis*

SUB ORDER HYPOTRICHINA

1. *Aspidisca costata*
2. *Aspidisca lynceus*
3. *Aspidisca putrina*
4. *Balladina elongata*
5. *Euplotes carinata*
6. *Euplotes charon*
7. *Euplotes patella*
8. *Gastrostyla steinii*
9. *Histrio steinii*
10. *Onychodromus grandis*
11. *Oxytricha minor*
12. *Oxytricha pellationella*
13. *Oxytricha platystoma*
14. *Pleurotricha lanceolata*
15. *Stichotricha aculeata*
16. *Stichotricha opisthonoides*
17. *Stichotricha secunda*

18. *Stylonychia mytilus*
19. *Stylonychia notophora*
20. *Stylonychia pustulata*
21. *Stylonychia putrina*
22. *Strongylidium californicum*
23. *Uroleptus agilis*
24. *Uroleptus rattulus*
25. *Urosoma caudata*
26. *Urosoma cienkowskii*
27. *Urostyla grandis*

## SUB ORDER PERITRICHINA

1. *Carchesium polypinum*
2. *Cothurnia curva*
3. *Cothurnia imberbis*
4. *Epistylus articularis*
5. *Epistylus chrysemydis*
6. *Epistylus flavians*
7. *Epistylus niagarae*
8. *Epistylus plicatilis*
9. *Epistylus urceolata*
10. *Gerda glans*
11. *Opercularia ramosa*
12. *Scyphidia inclinans*
13. *Vaginicola* sp.
14. *Vorticella alba*
15. *Vorticella campanula*
16. *Vorticella citrina*
17. *Vorticella convallaria*
18. *Vorticella elongata*
19. *Vorticella fluviatilis*
20. *Vorticella longifilum*
21. *Vorticella nebulifera*
22. *Vorticella nutans*
23. *Vorticella perlata*
24. *Vorticella quadrangularis*
25. *Vorticella striata*
26. *Vorticella telescopa*
27. *Zoothamnium* sp.

## CLASS SUCTOREA

1. *Allantosoma brevicoxniger*
2. *Allantosoma dioxniger*
3. *Allantosoma intestinalis*
4. *Anarma brevis*
5. *Anarma multiruga*
6. *Acineta* sp.
7. *Acineta limnetis*
8. *Hallezia buckei*
9. *Multifasiculatum elegans*

10. Podophyra fixa
11. Podophyra okobojiensis
12. Podophyra quadripartita
13. Sphaerophyra magna
14. Squalorophyra macrostyla
15. Tokophyra quadripartita
16. Trichophysea sinuosa

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*Literature Cited*

- Allegre, Charles F. and Jahn, T. L. 1943. A Survey of the Genus Phacus Dujardin (Protozoa; Euglenoidina) Trans. Amer. Micro. Soc. Vol. 62, No. 3.
- Becker, E. R. and Roudabush, Robert L. 1934. Trypanosoma iowensis n. sp. and Babesia citelli, n. sp. from Citellus tridecemlineatus, and Trypanosoma hixsoni n. sp. from Citellus franklini, Iowa State Col. Journ. Sci. Vol. 8: 527-32.
- Becker, E. R. and Talbott, M. The Protozoan Fauna of the Rumen and Reticulum of American Cattle. Iowa State Col. Journ. of Sci. Vol. 1: 345-371.
- Bishop, E. L., Jr., and Jahn, T. L. 1941. Observations on Colonial Peritrichs of the Okoboji Region. Proc. of the Iowa Acad. of Sci. XLVII: 417-21.
- Carvalho, Jose C. M. 1943. The Coccidia of Wild Rabbits of Iowa. Iowa State Col. Journ. Sci. Vol. 18: 103-133.
- Crouch, H. B. 1934. Observations on Hexamita marmotae, n. sp., A Protozoan Flagellate from the Woodchuck (Marmota monax linn.) Iowa State Col. Journ. Sci. Vol. 8: 513-518.
- Crouch, H. B. and Becker, E. R. 1931. Three Species of Coccidia from the Woodchuck (Marmota monax) Iowa State Col. Journ. Sci. Vol. 5: 127-31.
- Deeds, Orville J. and Jahn, T. L. 1939. Coccidian Infections of Western Painted Turtles of the Okoboji Region. Trans. Amer. Micro. Soc. Vol. 58, No. 3.
- Drake, C. J. and Jones, R. M. 1930. The Pigeon Fly and Pigeon Malaria in Iowa. Iowa State Col. Journ. Sci. Vol. 4: 253-62.
- Edmonson, C. H. 1906. The Protozoa of Iowa. Proc. Davenport Acad. Sci. 11: 1-124.
- Gerhardt, C. E. 1940. An Ecological Survey of a Large Kettlehole. Thesis. Univ. of Iowa.
- Goodrich, James P. and Jahn, T. L. 1943. Epizoic Suctorina (Protozoa) from Turtles. Trans. Amer. Micro. Soc. Vol. 62, No. 3.
- Hsuing, Ta-Shih. 1930. A Monograph on the Protozoa of the Large Intestine of the Horse. Iowa State Col. Journ. Sci. Vol. 4: 359-423.
- Jahn, T. L. and Shawhan, Fae M. 1942. Phacus quinquemarginatus (Protozoa Mastigophora, Euglenoidina) Trans. Amer. Micro. Soc. Vol. 59, No. 1.
- Johnson, Leland Parrish. 1944. Euglenae of Iowa. Trans. Amer. Micro. Soc. Vol. 63, No. 2.
- Otto, George R. and Jahn, T. L. 1943. Internal Myxosporidian Infections of Some Fishes of the Okoboji Region. Proc. of the Iowa Acad. of Sci. Vol. 50.
- Prescott, Gerald W. 1931. Iowa Algae. Univ. of Iowa Studies Vol. 13, No. 6.
- Rice, Verne J. and Jahn, T. L. 1943. Myxosporidian Parasites from

- the Gills of Some Fishes of the Okoboji Region. Proc. of the Iowa Acad. of Sci. Vol. 50.
- Roudabush, Robert L. and Coatney, G. Robert. 1937. On Some Blood Protozoa of Reptiles and Amphibians. Trans. Amer. Micro. Soc. Vol. 56, No. 3.
- Travis, Bernard V. 1939. Descriptions of Five New Species of Flagellate Protozoa of the Genus *Giardia*. Journ. of Parasitol. 25 (1) 11-17.
- Travis, Bernard V. and Becker, E. R. 1931. A Preliminary Report on Intestinal Protozoa of the White Grubs (*Phyllophaga* spp-Coleoptera.) Iowa State Col. Journ. of Sci. Vol. 5: 223-35.
- Yakimoff, W. L. and Sokoloff, B. D. 1935. *Eimeria beckeri*, n. sp. A new Coccidian from the Ground Squirrel, *Citellus pygmaeus*. Iowa State Col. Journ. of Sci. Vol. 9: 581-586.
- Travis, Bernard V. and Hamerstrom, F. N. 1934. Three New Trichomonads from Birds. Iowa State Col. Journ. of Sci. Vol. 8, 537-543.