



**HAL**  
open science

# On the Protistan Bookplate of Charles Atwood Kofoid

John Dolan

► **To cite this version:**

John Dolan. On the Protistan Bookplate of Charles Atwood Kofoid. *Protist*, 2021, pp.125835. 10.1016/j.protis.2021.125835 . hal-03366352

**HAL Id: hal-03366352**

**<https://hal.sorbonne-universite.fr/hal-03366352>**

Submitted on 5 Oct 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/355014346>

# On the Protistan Bookplate of Charles Atwood Kofoid

Article in *Protist* · October 2021

DOI: 10.1016/j.protis.2021.125835

CITATIONS

0

READS

3

1 author:



**John R Dolan**

Sorbonne Université (formerly Pierre and Marie Curie University - Paris 6)

184 PUBLICATIONS 8,074 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



History of Microscopical Sciences [View project](#)



Tintinnid Ciliates of Antarctica [View project](#)

## **On the Protistan Bookplate of Charles Atwood Kofoid**

John R. Dolan, Sorbonne Université, Laboratoire de Océanographie de Villefranche-sur-Mer, CNRS UMR 7093, Station Zoologique, 06230 Villefranche-sur-Mer, France; john.dolan@imev-mer.fr

**Keywords:** scientific illustration; history of protistology; dinoflagellates; tintinnid ciliates; Beulah Mitchell Clute

### **Introduction**

Charles Atwood Kofoid (1865-1947), who passed most of his career at the University of California, Berkeley (UCB), is well known to protistologists for his wide-ranging work on protists. He published extensively on dinoflagellates and ciliates of the marine plankton, endosymbiotic forms of flagellates and ciliates found in insects and ruminants, and even on the amoebae that infect man (e.g., Dobell 1947; Kirby 1947; Taylor 1999). Less known to protistologists is that Kofoid is renowned among bibliophiles for the very large library he accumulated. His books were labeled on the inside cover with a bookplate, a decorative label to show his ownership. Kofoid is also known among collectors of bookplates for this ornate bookplate, depicting many forms of protists. Exactly how many books were labeled with Kofoid's bookplate is unclear, but we do know that his library consisted of tens of thousands of volumes.

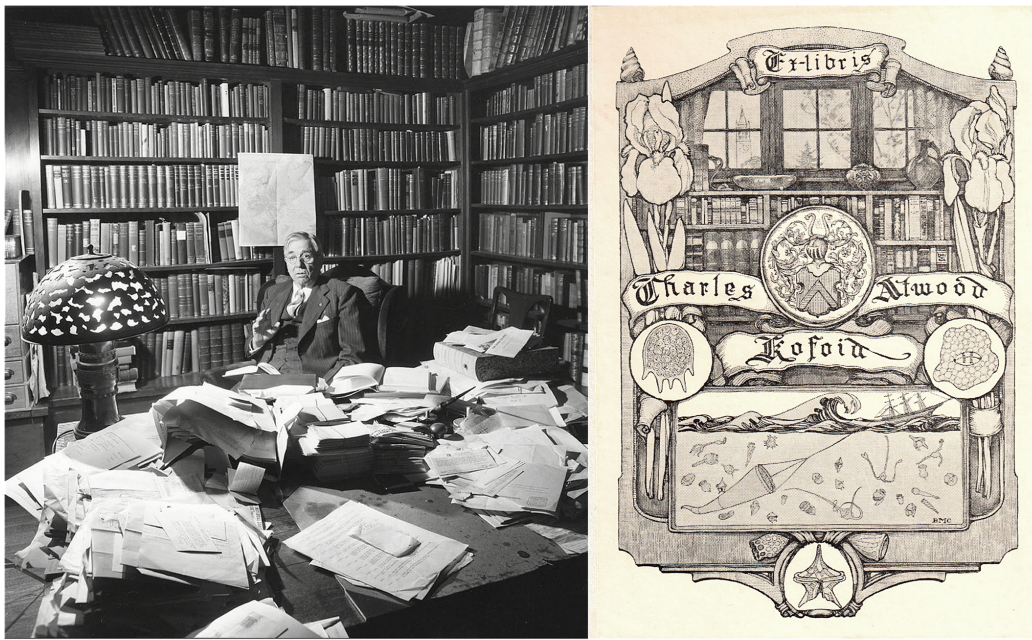
Kofoid's library is estimated to have contained from about 60,000 volumes (Eakens 1957) to over 100,000 volumes and many more reprints (Noble 1935). To place these figures in perspective, consider that the average number of books in a public library in the United States is about 80,000 volumes (National Center for Education Statistics 2021). While he was Chair of the Department of Zoology at UCB, Kofoid is said to have had a secretary whose only work was unwrapping parcels of books and pasting in his bookplate (Goldschmidt 1951; Jackson 2003). Shortly before his death, Kofoid donated his books to the UCB library to form a library of biology and the history of science. The UCB library retained about 30,000 volumes from Kofoid's donation (Stadtman 1967) with the remainder sold by the university. Consequently, books with Kofoid's bookplate were common in the used book trade for many years, but in recent years have become relatively rare (Jackson 2003). Given the number of Kofoid's books made available in the book trade, the protist-rich bookplate is likely among the most widely held modern bookplate by collectors. However, many readers of *Protist* may not know of it. Furthermore, the identities of the protists illustrated may not be obvious, even to protistologists.

Kofoid's bookplate and his book collecting activities have been abundantly commented on by bibliophiles as well as collectors of bookplates (i.e., Anon. 2011; Jackson 2003; Sanders, 2011; Talbot 1936). While these comments and descriptions were not in scientific publications, but rather in publications concerned with book or bookplate collections, they nonetheless included

erroneous descriptions of the protists shown in Kofoid's bookplate. These range from descriptions of them as being bacteria (Talbot 1936), to correctly identifying dinoflagellates as such, but declaring the tintinnid ciliates to be radiolaria (Jackson 2003). To a large extent, the erroneous identifications are understandable since accurate identification requires not only familiarity with protists, but also more importantly a familiarity with the numerous publications of Kofoid, many of which are currently quite obscure. Here the focus will be on his bookplate and the protists shown. It will be dissected, so to speak, and all of the protists illustrated identified, as far as possible. In addition, the apparent sources of the illustrations in Kofoid's publications will be given.

### **Kofoid's Bookplate**

Kofoid the book collector, and his bookplate are shown in Fig. 1. The bookplate is of the type known as a '20th Century Pictorial'. Beulah Mitchell Clute (1873-1958) designed it. A full account of Beulah Clute's life and work as a bookplate designer is given in Dolan (2021). At the time she undertook Kofoid's bookplate, she was the designer at the Three Redwoods Studio in Berkeley. The studio produced bookplates, greeting cards, and illustrations for publications. Beulah Clute was well-known for her designs of bookplates and over the years made bookplates for several notable Berkeley academics other than Kofoid. These included William Frederic Badè, the Dean of the Pacific School of Religion and Oliver Essig, the chair of the Department of Entomology at UCB as well as Robert Legge, a Professor of Hygiene and University Physician at UCB and also Armin Otto Leuschner, the distinguished astronomer and Dean of Graduate Studies at UCB. Kofoid's bookplate was likely created sometime between 1929 (as we will see based on the apparent age of the protists illustrations shown) and 1936, when the bookplate was first mentioned in a publication, *Historic California Bookplates* (Talbot 1936).



**Figure 1.** Left panel, Kofoid at his desk in his office at the University of California Berkeley, courtesy of the Regents of the University of California. It appears to date from about 1936 when he retired after chairing the Department of Zoology for over 25 years. Note the bookshelves extending to the ceiling and the piles of pamphlets, books, and manuscripts on his desk. Right panel, Kofoid's bookplate as it appears, printed on off-white paper using a dark brown ink; actual size 7 x 10 cm (author's copy).

In Kofoid's bookplate, the setting is his office in his Berkeley home. The view from the office window is dominated by the Campanile Tower of UCB. Irises, for which the university campus is well known, adorn the frame and the central crest resembles one of the Berkeley Family arms (Jackson 2003). Three medallions (on the left, the right and at the bottom), show protists clearly in some detail. The bottom third of the bookplate is a depiction of a ship pulling a plankton net through a sea populated by myriad, oddly shaped, tiny organisms. Identifying the protists shown in these minute sketches (actual size of the scene below the ship with the plankton the net and the protists is but 4.5 x 1.5 cm) proved to be challenging, but only a few could not be identified.

### **Dissecting Kofoid's Bookplate**

To aid in the identification of the forms shown in Kofoid's bookplate, it has been enlarged (Fig. 2) and the image was enhanced to improve the definition as much as possible (e.g., sharpened, black added to greys, black reduced from whites, increased contrast, color data discarded). Then, Kofoid's protist publications were examined for illustrations used in the bookplate. These were the protist works (as indicated by the titles) from the comprehensive Kofoid bibliography given in Goldschmidt (1951). The majority of Kofoid's publications on protists were available through the Biodiversity Heritage Library and/or Open Archive. Two of the illustrations of tintinnid ciliates are somewhat problematic as they appeared in two publications; first in the 1929 Kofoid and Campbell monograph on tintinnids (Kofoid & Campbell 1929) and then reproduced, oddly with same

figure numbering, in a 1930 article (Kofoid 1930). It seems likely that Kofoid would have given or lent to Beulah Clute the 1930 article of 39 pages rather than the 1929 monograph of 403 pages. All in all, the illustrations of protists in the bookplate can be found in a pool of only 8 works published between 1899 and 1929 or 1930 (see Table 1). This represents a very small portion of Kofoid's considerable number of publications. The Kofoid bibliography given in Goldschmidt's biographical memoir on Kofoid (Goldschmidt 1951), lists 236 titles published between 1894 and 1948. Of the 236 titles, 156 dealt with protists.



**Figure 2.** Kofoid's bookplate enlarged and enhanced to facilitate identification of the organisms shown. The signature of Beulah Mitchell Clute, BMC, is circled in white at the lower right. The bottom panel is a further enlargement of the plankton net scene below the waves and ship. The uppercase letters A to E mark the larger images of organisms, and the lowercase a to zz, the organisms of the plankton net scene. A key to the labeled organisms is given in Table 1.

**Table 1. Key to the protists shown in Kofoid's bookplate.**

The organism names in the table are those as given in the presumed source publication. Most of the species shown in the bookplate were described as new species of protists by Kofoid as indicated by 'yes' in the column 'Kofoid sp?'; n/d indicates no data. Many are species are not currently recognized as valid first descriptions. The organisms shown cover nearly all of his scientific career beginning in Illinois in the late 1890's when he described *Platydorina* as a new colonial flagellate, the many species shown from his extensive work on dinoflagellates and tintinnids, and the later part of his career when his work focused on endosymbiotic and parasitic protists (i.e., *Endamoeba*). Of the 32 forms shown in the bookplate, 5 could not be matched with any certainty to an illustration in a Kofoid publication.

Label	Organism	Kofoid sp?	Presumed Source
A	<i>Platydorina caudata</i>	yes	Kofoid 1899, plate 38, fig.1
B	<i>Dictyocysta pacifica</i>	no	Kofoid & Campbell 1929, Kofoid 1930, fig. 550
C	<i>Peridinium fatulipes</i>	yes	Kofoid 1906a, plate 5, fig. 30
D	<i>Epiplocylys nervosa</i>	no	Kofoid & Campbell 1929, Kofoid 1930, fig. 318
E	<i>Endamoeba dysenteriae</i>	no	Kofoid & Swezy 1922, fig. 6
a	<i>Gymnodinium puniceum</i>	yes	Kofoid & Swezy 1921, plate 5, fig. 1
b	<i>Amphisolenia quinquecauda</i>	yes	Kofoid 1906a, plate 13, fig. 75
c	tintinnid ciliate	n/d	unknown
d	<i>Erythopsis pavillardi</i>	yes	Kofoid & Swezy 1921, plate 12, fig. 133
e	<i>Peridinium fatulipes</i>	yes	Kofoid 1906a, plate 5, fig. 30
f	<i>Peridinium latissimum</i>	yes	Kofoid 1906a, plate 5, fig. 32
g	<i>Peridinium tenissimum</i>	yes	Kofoid 1906a, plate 5, fig. 34
h	tintinnid ciliate	n/d	unknown
i	<i>Oxytoxum turbo</i>	yes	Kofoid 1906a, plate 10, fig. 60
j	dinoflagellate	n/d	unknown
k	<i>Acanthodinium spinosum</i>	yes	Kofoid 1906a, plate 11, fig. 60
l	tintinnid ciliate	n/d	unknown
m	<i>Histioneis garrettii</i>	yes	Kofoid 1906a, plate 16, fig. 97
n	dinoflagellate	n/d	unknown
o	<i>Peridinium rectum</i>	yes	Kofoid 1907, plate 32, fig. 49
p	<i>Murrayella punctata</i>	yes	Kofoid 1906a, plate 9, fig. 58
q	<i>Ceratium reticulum spirale</i> subsp. nov.	yes	Kofoid 1907, plate 27, fig. 27
r	<i>Histioneis carinata</i>	yes	Kofoid 1906a, plate 16, fig. 98
s	<i>Ceratium claviger</i>	yes	Kofoid 1906a, plate 4, fig. 27
t	<i>Tintinnopsis dadayi</i> divider	yes	Kofoid 1905, plate 26, fig. 4
u	<i>Heterodinium inaequale</i>	yes	Kofoid 1906b, plate 18, fig. 9
v	<i>Ceratium ehrenbergii</i>	yes	Kofoid 1906a, plate 2, fig. 16
w	<i>Tintinnopsis dadayi</i>	yes	Kofoid 1905, plate 26, fig. 3
x	<i>Cyrtarocylys fasciata</i>	yes	Kofoid 1905, plate 26, Fig. 6
y	<i>Cyrtarocylys torta</i>	yes	Kofoid 1905, plate 28, fig.16
z	<i>Triplosolenia ambulatrix</i>	yes	Kofoid 1906a, plate 4, fig 24
zz	dinoflagellate	n/d	unknown



It seems likely that Beulah Clute would have sought Kofoid's wishes as to which illustrations he wanted featured, particularly with regard to the three 'medallions' of his bookplate, the circles at the left and right margins, and the bottom center. These prominent medallions show the colonial volvocine algae *Platydorina caudata* (Fig. 2. A), the dinoflagellate *Peridinium fatulipes* (Fig. 2. C), and a stage of mitosis of the amoeba *Endamoeba dysenteriae* (Fig. 2, E). The presumed source publications for the illustrations are shown in Fig. 3. The three illustrations correspond to three areas of his expertise. *Platydorina caudata* is representative of the part of Kofoid's career in which his studies concerned freshwater plankton. These were carried out when he was Superintendent of the Illinois Biological Station, and published from 1896 to 1908. *Peridinium fatulipes* was described from material Kofoid gathered during the cruise of the *Albatross* to the Eastern Tropical Pacific in 1904-1905. The samples he gathered provided much of the material used in his monographic studies of dinoflagellates and tintinnid ciliates of the marine plankton published from 1907 to 1939. The cruise of the *Albatross* is also represented in the plankton net scene filled with many distinctive species of dinoflagellates and tintinnid ciliates. However it should be noted that the *Albatross* was a two-masted steamer, different from the 3-masted sailing ship shown pulling the plankton net. The illustration of *Endamoeba dysenteriae*, is representative of the latter part of Kofoid's career in which he focused largely on parasitology (1915-1940).

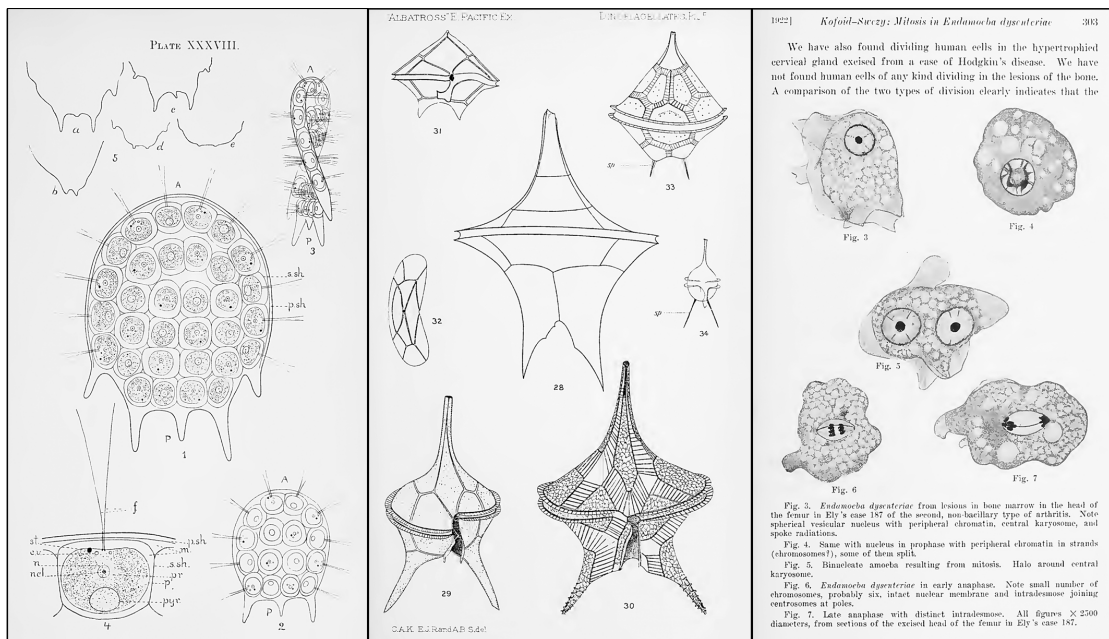


Fig. 3. Examples of published illustrations, presumably used by Beulah Clute as sources for her illustrations of the protists shown in Kofoid's bookplate. The left panel shows the colonial flagellate *Platydorina caudata* (fig. 1, in bookplate labeled A) in Kofoid 1899. Clute omitted the flagella shown in the original. The middle panel shows the dinoflagellate *Peridinium fatulipes* from Kofoid 1906a. Note that in the bookplate Clute included some of the crosshatching used in the original (here fig. 30, in bookplate labeled C) to distinguish the different thecal plates. The right panel shows the illustrations from Kofoid & Swezy 1922. In the bookplate a stage of mitosis in *Endamoeba dysenteriae* (here fig. 6, in bookplate labeled E) is shown.

## Conclusion

A protistological dissection of Kofoid's bookplate shows that it was mostly filled with drawings of protists that he himself had described as new species. Interestingly, the most prominent protist images in his bookplate, while well representing his career, were perhaps not well chosen as they are today fairly obscure. According to Google Scholar, the publication describing *Platydorina caudata* in 1899 has been cited only 8 times and the species has been termed 'rare' in recent years (Coleman 2014). The dinoflagellate Kofoid described as *Peridinium fatulipes* in 1906 was transferred to the genus *Proto-peridinium* by Balech in 1974 (Balech 1974). As *Peridinium fatulipes*, it has been mentioned in only 9 publications and in another 9 publications as *Proto-peridinium fatulipes*. The article in which mitotic stages of *Endamoeba dysteneriae* (now known as *Entamoeba histolytica*), were shown (Kofoid & Swezy 1922), has only been cited twice perhaps in part because of the long-standing confusion of *Endamoeba* and *Entamoeba* and synonyms within each genus (e.g., Kirby 1945). It appears likely that the images of protists showcased in Kofoid's bookplate will remain obscure. However, their artistic value will endure. Kofoid's bookplate will likely endure as the only widely known protist bookplate.

## Acknowledgements

Graham Clarke was of great help in untangling *Endamoeba/Entamoeba*. The efforts of the reviewers and the Monitoring Editor led to significant improvements in the manuscript. However, I retain full responsibility for all errors of fact, omission, and interpretation in this work.

## References

- Anon. (2011) A gift for the ages. *Fiat Lux*, Fall 2011, n° 21: 1-4
- Coleman AW (2014) Lessons from a Volvocaeen jackpot. *Phycologia* 53:423-425
- Balech, E (1974) El genero '*Proto-peridinium*' Bergh, 1881 ('*Peridinium*' Ehrenberg, 1831, partim). *Rev Mus Argent Cienc Nat. Bernardino Rivadavia Inst Nac Invest Cienc Nat*, 4:1-79
- Dobell C (1947) Prof. C.A. Kofoid. *Nature*, 160:115-116
- Dolan JR. (2021) When an artist works for scientists: on Beulah Mitchell Clute and her bookplates for scientists of the University of California at Berkeley. *Arts et Sciences*, vol. 5, doi:10.21494/ISTE.OP.2021.0718
- Eakins RM (1957) History of zoology at the University of California, Berkeley. *Bios*, 27:67-90

- Goldschmidt RB (1951) Charles Atwood Kofoid 1865-1947, a Biographical Memoir. Washington D.C: National Academy of Sciences
- Jackson I (2003) Charles Atwood Kofoid and scientific book -collecting at Berkeley. Bookplate J, 1:39-44
- Kirby H (1945) *Entamoeba coli* versus *Endamoeba coli*. J of Parasitol, 31:177-184
- Kirby H (1947) Charles Atwood Kofoid: 1865-1947. Science, 106:462-463
- Kofoid CA (1899). Plankton Studies III. On *Platydorina*, A New Genus of the Family Volvocidae, from the Plankton of the Illinois River. Ill Nat Hist Survey Bull; v. 005, art. 9, 419-440
- Kofoid CA (1905). Some new Tintinnidae from the plankton of the San Diego region. Univ Calif Publ Zool, 1:287-306
- Kofoid CA (1906a). New species of dinoflagellates. Bull Mus Comp Zool, 50:163-207
- Kofoid CA (1906b). Dinoflagellata of the San Diego region, I: On *Heterodinium*, a new genus of the Peridinidae. Univ Calif Publ Zool, 2 341-368
- Kofoid C.A (1907). Dinoflagellata of the San Diego region, III. descriptions of new species. Univ Calif Publ Zool, 3:299-340
- Kofoid CA (1930) Factors in the evolution of the pelagic ciliata, the Tintinnoinea. in: Contributions to Marine Biology, Stanford University Press, pp. 1-39
- Kofoid CA, Campbell AS (1929) A conspectus of the marine and fresh-water ciliata belonging to the suborder Tintinnoinea, with descriptions of new species principally from the Agassiz expedition to the eastern tropical Pacific, 1904-1905. Univ Calif Publ Zool, 34:1-403
- Kofoid CA, Swezy O (1921) The free-living unarmored Dinoflagellata. Univ Calif Mem, 5:1-562
- Kofoid CA, Swezy O (1922) Mitosis in *Endamoeba dysenteriae* in the bone marrow in arthritis deformans. Univ Calif Publ Zool, 20:301-307
- National Center for Education Statistics 2021. Digest of education statistics: 2019. NCES 2021-009, February 2021.  
<https://nces.ed.gov/programs/digest/d19/index.asp>
- Noble AE (1935) Charles Atwood Kofoid. Bios, 6:243-249
- Sanders K (2011) My Bucket's got a hole in it: a tale of brine shrimp, the lost Kofoid books and a happy ending for the Berkeley library. *Bancroftiana* n° 139:14-15

Stadtman VH (1967) *The centennial record*, the University of California.  
Berkeley: University of California Printing Office

Talbot CR (1936) *Historic California in Bookplates*. Los Angeles: Graphic Press

Taylor FJR (1999) Charles Atwood Kofoed and his dinoflagellate tabulation system: an appraisal and evaluation of the phylogenetic value of tabulation. *Protist*, 150:213-220