

SOME PROPERTIES OF THE PIGMENT OF BLEPHARISMA

BY ROBERT EMERSON*

(From the Laboratory of General Physiology, Harvard University, Cambridge)

(Accepted for publication, August 17, 1929)

In connection with measurements of the metabolism of *Blepharisma* described in the preceding paper, the writer made certain observations on the red pigment of this organism. The pigment of the intact organism defies extraction with any of the common organic solvents, but it may easily be obtained in solution by macerating fresh cells in clean quartz sand and extracting with 90 per cent ethyl alcohol.

The alcoholic extract behaves like an indicator. When neutral or acid, it is bright red, the color disappearing in alkali. The turning point is quite near neutrality, and only a slight degree of alkalinity is necessary to make the color-change complete. This may be brought about by adding a drop of M/10 sodium bicarbonate solution to 10 cc. of pigment solution. Perceptible changes in depth of color may be caused by merely varying CO₂ tension.

Fig. 1 shows the absorption curve of the extract of 108 mm.³ of cells made up to 10 cc. in ethyl alcohol. The curve was determined on a König-Martens spectrophotometer. ϵ , the extinction coefficient, is plotted against λ , the wave-length in $\mu\mu$. The spectrophotometer readings ϕ_1 and ϕ_2 are shown with their accompanying values of λ and ϵ in Table I.

The curve might be compared with the figure published by E. Ray Lankester in 1873 for the absorption spectrum of the unextracted pigment of *Stentor caeruleus*. Since stentorin is blue and the pigment of *Blepharisma* red, their absorption spectra would not be expected to coincide. But the three maxima shown by the *Blepharisma* pigment in the short-wave-length end of the spectrum might be said to correspond to the three absorption bands of stentorin in the long-wave-length end of the spectrum.

* National Research Council Fellow.

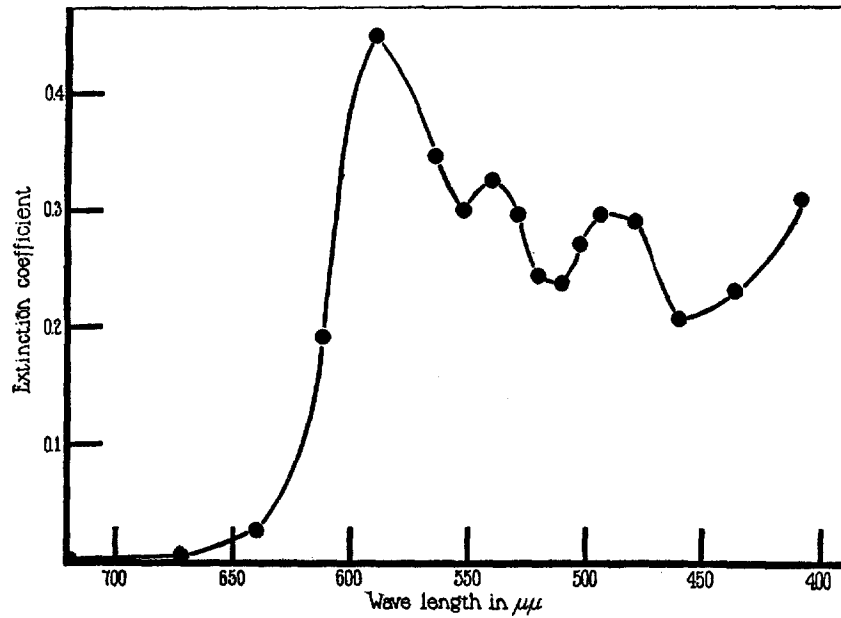


FIG. 1. Curve showing the absorption spectrum of the extracted pigment of *Blepharisma*.

TABLE I

Figures for the Absorption Spectrum of Blepharisma Pigment

λ ($\mu\mu$)	ϕ_1	ϕ_2	ϵ
720	42.0	42.0	0
662	41.2	41.2	0
630	42.5	41.0	0.023
602	48.0	36.0	0.186
579	55.7	28.2	0.457
564	53.1	30.6	0.353
552	51.0	31.8	0.300
540	52.0	31.2	0.325
529	51.0	32.0	0.296
520	49.2	33.4	0.245
510	48.9	33.5	0.238
502	49.9	32.5	0.271
494	51.1	32.0	0.297
479	50.7	32.0	0.291
460	Interpolated from another set of cells		0.208
436			0.232
408			0.308

The pigment fluoresces red in the light of the mercury lamp. This fluorescence is not due to absorption of ultra-violet light, since it appears undiminished when a quinine filter is interposed.

The alcoholic solution of the pigment may be kept for weeks in the refrigerator, but loses its color in a few days at room temperature, even if kept in the dark.

CITATION

Lankester, E. Ray, *Quart. Jour. Micro. Sci.*, 1873, 13, 139.