Observations on the Size of the ciliate Dileptus anser

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The purpose of this paper is to present data concerning the variability of size in normal, active populations of *Dileptus anser*. Relatively few analyses of measurements of living protozoa have been made (Wichterman, 1953), and the description of new species is sometimes made using measurements from fixed specimens. Published figures for the size of *D. anser* range from 100 microns in rapidly dividing populations (Hayes, 1938), to a maximum of 900 microns (Kahl, 1931), the usual size being from 250-400 microns.

Methods

The *Dileptus* used in this study were obtained from the Carolina Biological Supply Company and were identified as *D. anser*. These animals were maintained in cultures in 2-inch micro-diffusion dishes and were fed small protozoa and rotifers. Individuals were isolated and measured with an ocular micrometer under a compound microscope with a 10X objective. A total of 107 individuals were measured for total length, length of proboscis, width, and length of tail. Frequency polygons were constructed by plotting the measurement values against the number of individuals. Means and standard deviations were calculated for each distribution and each was fitted to the normal curve, goodness-of-fit being determined by the Chi-square method.

Results and Discussion

The results of measurement and analysis of data are shown in Table I. The goodness-of-fit probabilities indicate that total length and proboscis length are distributed normally. It is far less likely, however, that width and tail length are distributed normally; therefore, the frequency data for these dimensions are shown in Table II.

The plotted frequencies (Table II) tend to form a plateau, with few, if any, measurements in the "tails" of the distribution. The normally distributed total length and proboscis length, however, show a gradual tapering off of frequencies toward the extreme values. These data can then be interpreted as follows: The total length variation occurs mainly in the trunk and to a lesser degree in the proboscis; therefore, growth must occur by lengthening of the trunk and proboscis. Width measurements do not vary much considering the size of the animal, therefore, the animal must tend to reach a maximum width soon after cell division. The tail length also tends not to change as the animal grows, an observation which might be expected since the tail is composed entirely of ectoplasm and is posterior to the cytopyge. In general, these data agree with published sizes for the animal but indicate that since width and tail length do not vary greatly perhaps more weight should be placed on these measurements as specific characters. Recent descriptions of *Dileptus anser* do not mention width

TABLE I. MEASUREMENTS OF *Dileptus anser*. VALUES IN MICRONS.

Dimension	Limits	Mean	Standard deviation	goodness-of-fit probability
total length	272-612	430	58	0.70 -0.80
proboscis	68-204	130	25	0.40 -0.50
tail	0-41	27	7	0.05 -0.10
width	27-54	41	6	0.025-0.05

TABLE II. MEASUREMENT VALUES IN MICRONS

Measurement value	Frequencies: Length of tail	Frequencies: Widths
0	1	0
7	0	0
14	3	0
20	29	0
27	36	0
34	34	28
41	4	48
48	0	26
54	0	5
61	0	0
Sum	107	107

or tail length (Hayes, 1938; Jones, 1951; Kahl, 1931). This measurement analysis should become more valuable as similar analyses are made for other species of *Dileptus*, particularly those described in the future.

Summary

1. Data were collected by measuring living specimens of *Dileptus anser*.
2. Analysis of data indicates that total length and proboscis length are distributed normally while width and tail length tend to be constant, considering the size of the animal; therefore, growth must occur by an increase in the length of the proboscis and trunk.

LITERATURE CITED

Hayes, M. L. 1938. Cytological studies on *Dileptus anser*. Trans. Am. Micr. Soc., 57(1):11-25.

Jones, E. E. 1951. Encystment, excystment, and the nuclear cycle in the ciliate *Dileptus anser*. J. Elisha Mitchell Sci. Soc., 67(2):205-217.

Kahl, A. 1931. In: F. Dahl's "Die Tierwelt Deutschlands", Teil 21:205-209.

Wichterman, R. 1953. The biology of *Paramecium*. The Blakiston Co., New York, N. Y.