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Differences in Susceptibility to Ultraviolet Radiation of Paramecium Caudatum and P. Bursaria.

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I. In our previous paper[1] we were able to show that the influence of ultraviolet radiation on *P. caudatum* can be expressed by the Arndt-Schultze's law. Since the body of *P. bursaria* is full of green symbiotic algae, it seems worth while to compare the susceptibility of 2 species of Infusoria, differing in body coloration and hence in absorption of radiation.

TABLE I.
Averages and Probable Errors of the Numbers of Offspring of Infusoria in the First Series of Experiments.

Duration of radiation sec.	*Paramecium caudatum*	*Paramecium bursaria*
Control	100.2 ± 1.77	97.6 ± 2.00
40	85.6 ± 1.67	110.4 ± 3.39
80	69.0 ± 1.70	98.4 ± 1.18
160	45.8 ± 1.47	74.0 ± 2.61

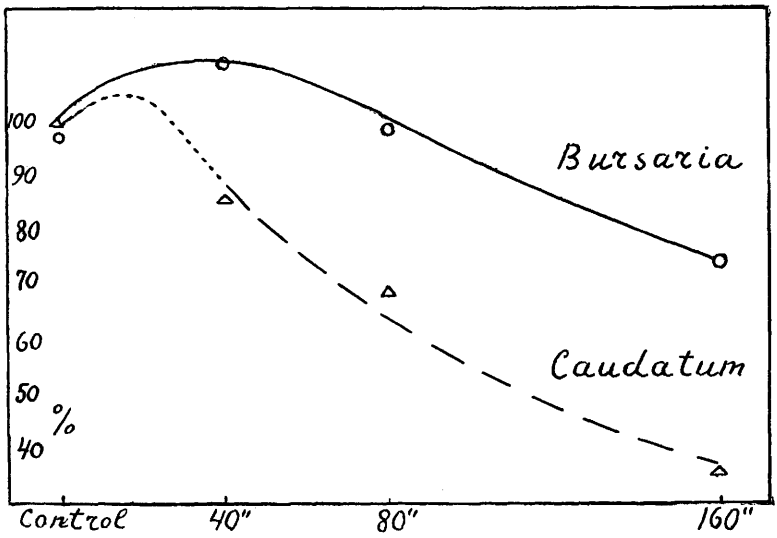

FIG. 1.
Curves showing the relationship between the division rate and the doses of the ultraviolet radiation. The dotted part of the curve for *P. caudatum* is founded on the data of our preceding paper (1933).

[1] Alpatov, W. W., and Nastjukova, O. K., *Protoplasma*, **18**, No. 2.

2. As a source of light was taken a quartz mercury vapour burner of Hereus Hanau, 110 volts of alternating current and 6-7 amp. at a distance of 35 cm. from the animals under quartz Petri dishes filled with water 0.5 cm. deep. The control animals were put under glass dishes to absorb the ultraviolet part of the spectrum. An oatmeal medium containing *Bacillus subtilis* was used. The first series consisted of 5 separate experiments of about 160 specimens each. After keeping them for 24 hours at a temperature of 25°C. on slides with hollows their progeny were counted. The second series of experiments consisted in submitting the same cultures to repeated radiations on consecutive days, keeping the number of parental animals equal to 192. The number of the progeny of each specimen in the first series was expressed in per cent of the average number of the progeny of the control of the corresponding experiment.

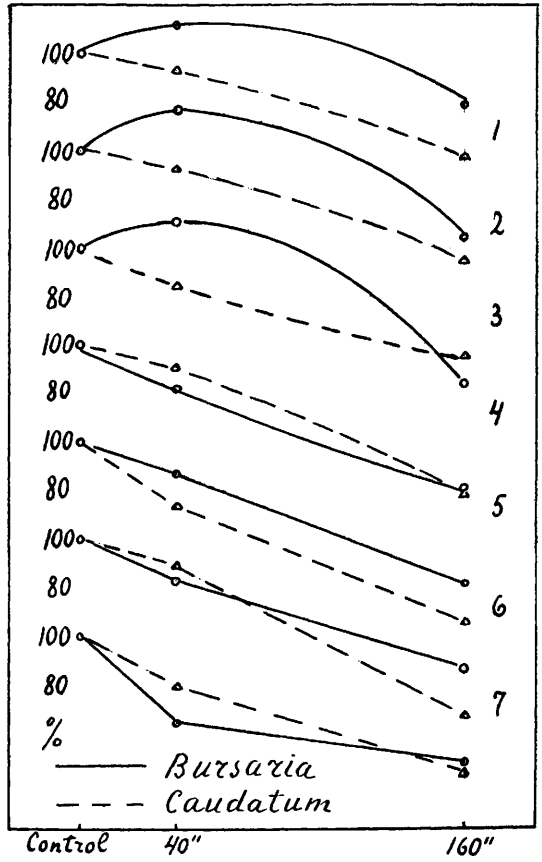

FIG. 2.
Curves showing the results of radiations repeated on 7 consecutive days.

These data show that a radiation of 40 seconds produces in *P. caudatum* a depression of the division rate and the zone of stimulative action is therefore located between 0 and 25 seconds. The curve for *P. bursaria* goes above that of *P. caudatum* and correspondingly the zone of stimulation is extended more to the right somewhere between 0 and 80 seconds. On the whole *P. caudatum* is about 2 times more susceptible to the stimulative and depressive action of the ultraviolet radiation as compared with *P. bursaria.*

The second series of experiments during the first 3 days confirms these conclusions.

Beginning with the fourth day the susceptibility of *P. bursaria* turned out to be practically the same as that of *P. caudatum.* The explanation is as follows: During the whole period of experimentation the cultures were kept in darkness and microscopical observation has shown that *P. bursaria* has lost almost completely the green color of the symbiotic algae. It seems therefore that the presence of pigmented algae is the cause of a greater resistance of *P. bursaria* against the influence of the ultraviolet radiation.

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Oestrus in Hypophysectomised Rats Parabiotically Connected with Castrates.*

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It is known that unoperated female rats, when united in parabiosis with castrates, first pass through a period of irregular oestral and anoestral activity and later go into a condition of constant oestrus. Hill[1] has reported that during this second period the ovaries always contain large numbers of mature follicles but no corpora lutea. On the contrary in the first period the ovaries are crowded with corpora lutea which, especially during prolonged anoestral phases, are increased in number far beyond anything observed under normal conditions. Cryptorchid males (Martins[2]) as

* This investigation was supported by grants from the Committee for Research in Problems of Sex of the National Research Council.

[1] Hill, R. T., *Endocrinol.*, 1933, **17**, 414.

[2] Martins, Th., *Compt. Rend. Soc. de Biol.*, 1930, **105**, 789.