

EFFECT OF DIFFERENT CONCENTRATION OF
NITROGEN ON PRODUCTION OF OOSPORES OF
PHYTOPHTHORA PARASITICA DASTUR.

BY

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Voluminous literatures have been accumulated on the production of both oospores and sporangia of *Phytophthora* (Harnish and Merz, 1964 ; Hendrix, 1964, 1965 ; Leal, 1964 ; Leal, Friend and Holliday, 1964 ; Ashby, 1929 ; Roncadori, 1965 ; Thomas, Ramakrishnan, Soumini and Balakrishnan, 1947 ; Turner, 1961 ;). Although most of the species of *Phytophthora* are capable of saprophytic growth and can be easily cultured in the laboratory on a variety of natural and synthetic media, the production of oospores or sporangia is often poor or absent. But the formation of oospores and sporangia are very essential for the identification of the species with few exceptions. Under this circumstances, the role of nitrogen source on the growth of *Phytophthora* has been evaluated and it has been demonstrated that different nitrogen source have different effects (Leal and Gomez-Miranda, 1967). In the present investigation, the effect of casein hydrolysate as source of nitrogen, on sexual reproduction is evaluated, as it contains several amino acids.

The organism studied, *Phytophthora parasitica* Dastur., was obtained from the stock cultures of Dr S. N. Banerjee, Department of Botany, Calcutta University.

The solid 2% *Potato-dextrose Agar* medium was used as basal medium. To it, different concentrations of nitrogen was added. The source of nitrogen being casein hydrolysate treated previously with CaCO_3 . The different concentrations used were 5, 10, 15, 20, 25, 30, 35 and 40 mg. of N per litre. The cultures were incubated at 30° C for 4 days after inoculation, initially to obtain good growth and then transferred to 27°C. in darkness for rest of the experimental period. The experiment was conducted for 30 days and observations were taken at the 10, 15, 20, 25 and 30 days stage.

Estimates of frequency of oospores formation were made in the following manner. The numbers were counted in each of five microscopic field of 1 mm. diameter using a Leitz objective (10X). The counts were made from the pre-

pared slides from three different zones (centre of inoculum, margin of growth and middle portion) of the culture. Each treatment were replicated three times.

The results obtained after the 30 days experimental periods, reveals that the fungus differs widely in the behaviour of oospore formation in the presence of different concentrations of nitrogen (Table 1).

Table 1. Data (mean) showing the number of oospore formation of *Phytophthora parasitica* in presence of different concentrations of casein hydrolysate and at the different incubation days.

Conc. of Casein hydrolysate (mg./l)	Numbers of oospore				
	Incubation period (Days)				
	10	15	20	25	30
5	17	28	37	44	52
10	49	56	63	71	78
15	50	58	69	76	81
20	63	72	88	114	130
25	51	59	65	79	93
30	10	23	43	49	55
35	9	14	21	28	32
40	—	—	—	—	—

(‘—’=no reproductive organ)

The results show (Table 1) that nitrogen source is essential for sexual reproduction of *Phytophthora parasitica*. Of the different concentrations used, 20 mg./l. of nitrogen is found to have maximum stimulatory effect on oospore formation followed by 25, 15, 10 mg./l of nitrogen. While 5 and 35 mg./l of nitrogen have but little stimulatory effect on sexual reproduction, 40 mg./l, not a single reproductive organ was found. But it is noticed that the rate of oospore formation decreases as the number of incubation days increases. This is possibly due to loss of required amount of percentage of nitrogen, as the supplied nitrogen is utilized during its incubation periods or due to production of toxic substances produced during deamination of amino acid present in the casein hydrolysate (Leal and Gomez-Miranda, 1967).

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