

7. Deknudt, Gh., Colle, A. and Gerber, G. B., *Mutation Res.*, 1977, 45, 77.
8. Mountschen-Dahmen, J. and Moutschen-Dahmen, M., *Experientia*, 1963, 19, 144.
9. Murthy, D. S. and Vaidyanath, K., *Indian J. Expt., Biol.*, 1974, 12, 474.
10. Muro, L. A. and Goyer, R. A., *Arch. Pathol.*, 1969, 87, 660.
11. Nishioka, H., *Mutation Res.*, 1975, 31, 185.
12. Patten, F. R. and Allison, A. C., *Ibid.*, 1972, 16, 332.
13. Reddy, T. P., Reddy, C. S. and Reddy, G. M., *Ibid.*, 1974, 22, 127.
14. Steffensen, D., *Proc. Natl. Acad. Sci.*, 1955, 41, 155.
15. —, *Intn. Rev. Cytol.*, 1961, 12, 163.
16. Williamson, M. B. and Gulick, A., *J. Cell. Comp. Physiol.*, 1943, 23, 77.
17. Steffensen, D., *Proc. Natl. Acad. Sci.*, 1953, 39, 613.
18. — and Bergeron, J. A., *J. Biophys. Biochem. Cytol.*, 1959, 6, 339.

EFFECT OF ORAL CONTRACEPTIVE ON PLANT CHROMOSOMES

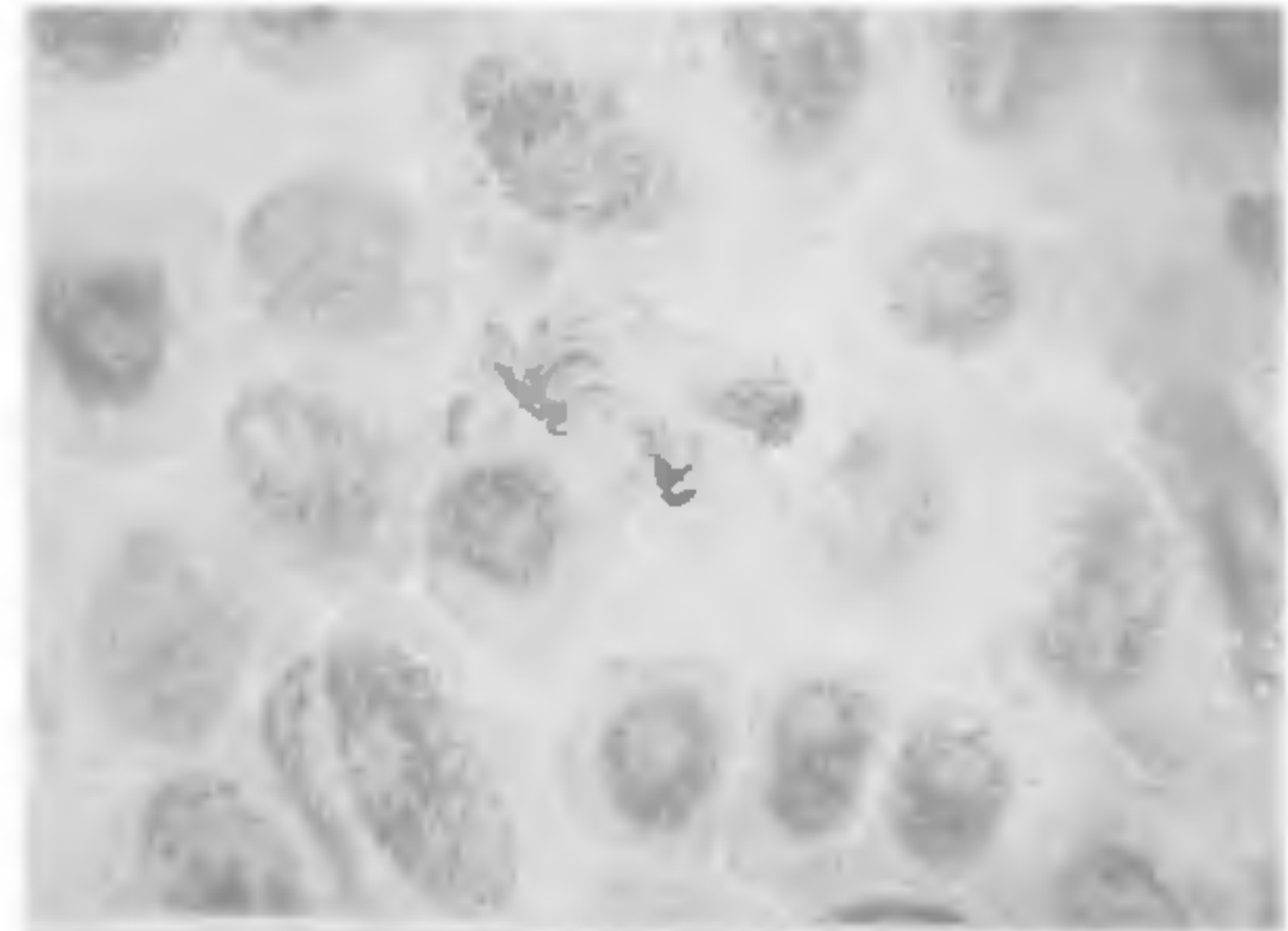
WHILE studying Twinning, it was noted that quite a good number of mothers who took oral pills as a contraceptive measure, gave birth to twins. It was deemed necessary to study the after effects of the drug on plant chromosomes.

The tablets* used as oral contraceptives were obtained from G.R. Medical College, Gwalior. Each tablet containing *Lynestrol* BP (1.0 mg and ethinyloestradiol 0.05 mg) was dissolved in warm distilled water. Trials to dissolve other combinations gave rise to suspended particles and hence discarded. The solution of the present drug was simultaneously administered on actively growing roots of *Allium cepa* (onion) and *Allium sativum* (garlic) for 2, 4 and 6 hours. Controls were maintained in distilled water.

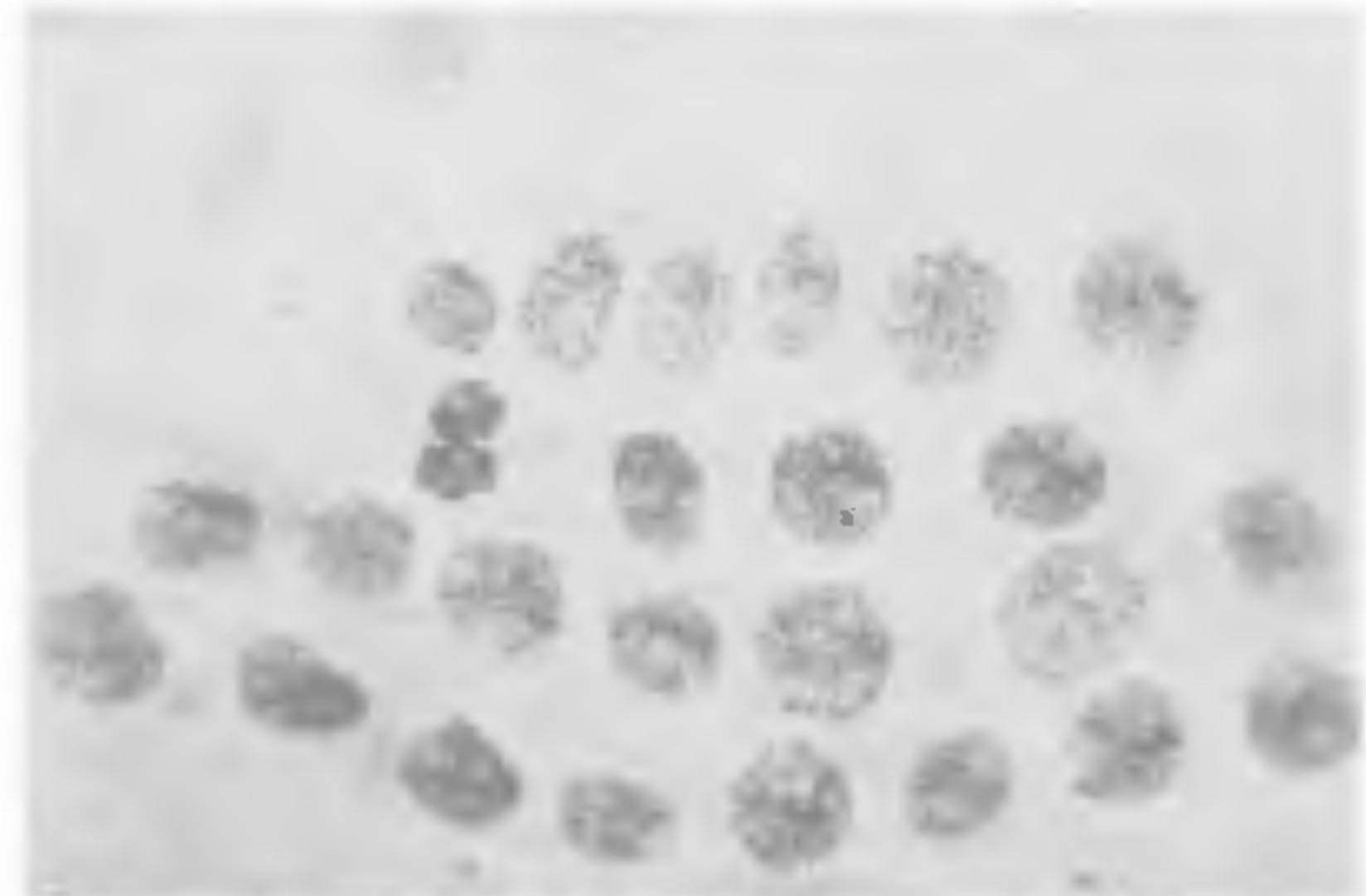
Roots were fixed in equal parts of ethanol and acetic acid and stained by usual acetic-orcein method. Active mitotic rates [computed by adding meta and anaphases and dividing by the total number of cells observed *i.e.*, (M + A)/TC] have been compared in Table I.

The active mitotic rate goes down significantly especially in *Allium sativum*. The number of metaphases was considerably reduced in 6 hours while anaphase frequency was only halved. There were hardly any stages which could either exhibit C-metaphase or atleast the stickiness on the contours of chromosomes. Certain specific aberrations like pseudo-translocations pseudo-Renner complex were also absent. A few cells possessing chromosomal

breaks were observed in garlic ($f=0.005$) but not in onion in 4 h treatment. Multipolar spindle (Fig. 1) and a tendency for the nuclear cleavage (Fig. 2) have been observed, only in garlic roots ($f=0.011$; 0.008 respectively).



1



2

FIGS. 1-2. Fig. 1. *Allium sativum* root showing a tripolar spindle due to the treatment of the drug for 4 hours. Fig. 2. *Allium sativum* root exhibiting a tendency for nuclear cleavage.

Both *Allium cepa* and *A. sativum* have $2n=16$ long chromosomes but *A. sativum* never sets any seed and its strain is regarded as a clone. Since *A. sativum* exclusively reproduces by vegetative propagation, it can be argued that it possesses higher inbreeding level than *Allium cepa* which reproduces by sexual and vegetative means. Observations of multipolar spindle and tendency of nuclear cleavage in *Allium sativum* and their absence in *Allium cepa* may be suggestive of the former's greater susceptibility to the contraceptive hormonal preparations.

That a drug can pass the placental barrier during the period of sensitive organogenesis in human being is well documented by *Thalidomide tragedy* in the German Federal Republic.¹ The drug was found to induce chromosome breakage in plant cells and it was realised that perhaps the *Thalidomide* disaster could have been avoided if its cytotoxic action on plant cells had been assessed earlier.

TABLE I
Effect of oral contraceptive on active mitotic rates of onion and garlic

Observations	Two hour		Four hour		Six hour	
	Onion	Garlic	Onion	Garlic	Onion	Garlic
1. Total No. of cells observed	1800	1790	2000	1800	1750	1840
2. No. of metaphases	52	60	40	28	15	14
3. No. of anaphases	20	24	28	21	12	12
4. (M + A)/TC (active mitotic rate)						
(1) Treatment	0.040	0.046	0.035	0.027	0.014	0.008
(2) Control (2000 cells for each class)	0.065	0.078	0.059	0.049	0.039	0.021

Bulmer² mentioned that the third type of twinning (other than monozygotic) may arise by the mitotic divisions of an egg before fertilization. It would be surprising if a drug administered with a view to interfere with ovulation might stimulate a mitotic division in an ovum as may be guessed from figures presented here.

The author is indebted to Prof. K. V. Wagh, Department of Gynaecology and obstetrics, G.R. Medical College, Gwalior, for providing oral contraceptive tablets and helpful suggestions.

School of Biological Sciences, H. K. GOSWAMI,
Bhopal University, Bhopal,
March 15, 1977.

* *Lyndoil*: Manufactured by Organon (India) Ltd., Calcutta.

1. Degenhardt, K. H., Kerken, H., Knorr, S. and Wiedemann, H. K., "Drug usage and fetal development: Preliminary evaluation of a prospective investigation," In, *Drugs and Fetal Development*, (Eds.), Klingberg, M. A., Abramovici, A. and Chemke, J., Plenum Publishing Corporation, New York, 1972.
2. Bulmer, M. G., *The Biology of Twinning in Man*. Clarendon Press, Oxford, 1970.

BROWN RUST—A THREAT TO GRAPE CULTIVATION

In the present communication we are reporting brown rust disease of grapes caused by *Cephaleuros parasiticus* Karst that seriously hinders viticulture in this part of country. Beauty seedless, Cardinal³ and a few unidentified local varieties were found to be affected by the disease. The disease can be seen throughout the

year but for the months of March, April and May. More than 45% humidity in this part of Uttar Pradesh in all other months may be attributed to the presence of disease almost throughout the year. However, the first symptoms of the disease were observed in the month of August.

Cephaleuros, an air borne alga has been reported as an epiphyte or space parasite on leaves and young stems of higher plants from different parts of the country (Bhargava *et al.*^{1,2}; S'feullah and Govindu⁴; Yadav^{6,7}).

The affected plants of grapevine show small, brown patches (Figs. 1 and 2) in early stage of infection which

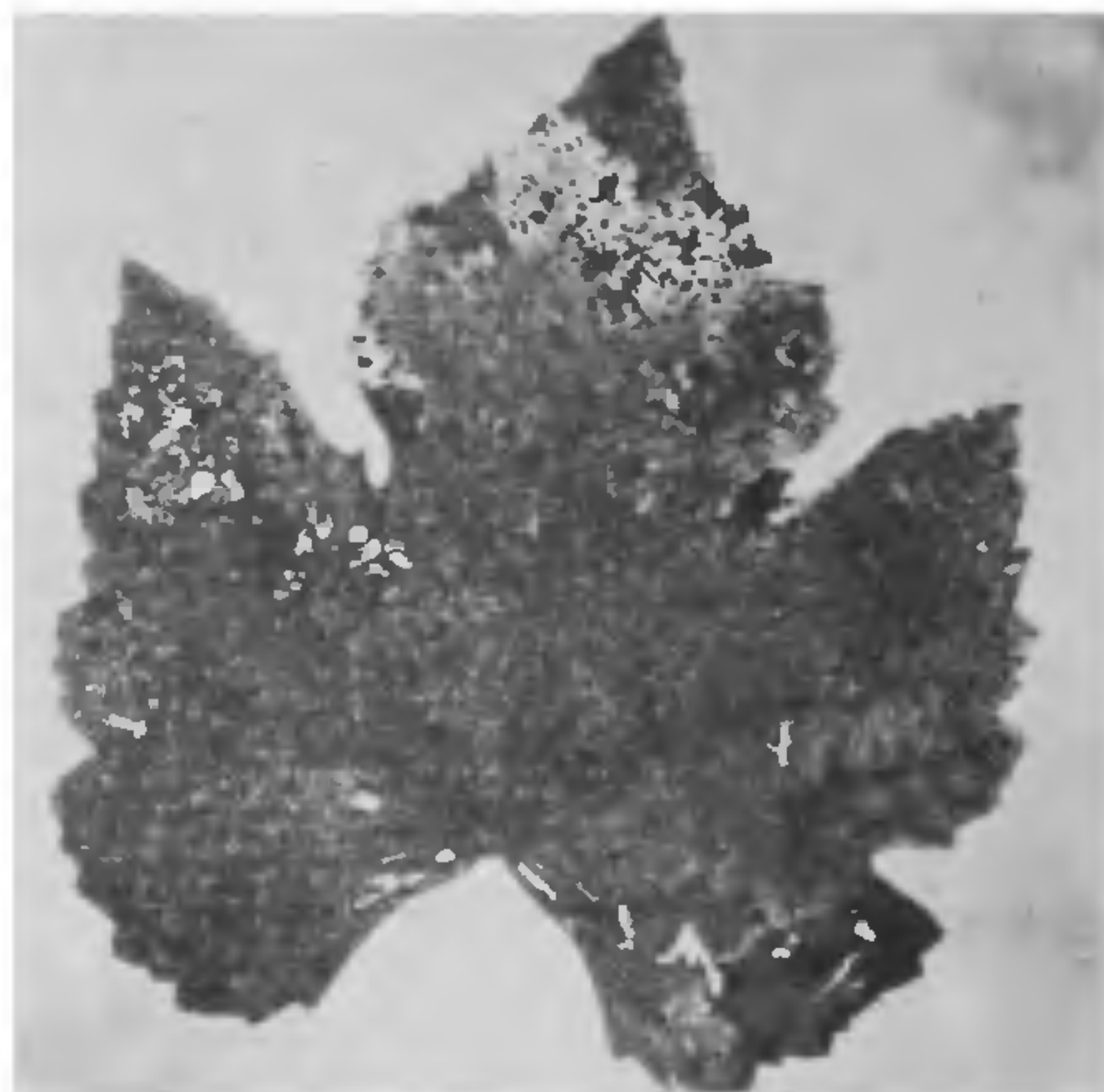


FIG. 1. Infected leaf of grapevine showing numerous small brown patches.