

A detailed description of the apparatus will appear elsewhere.

B. N. SINGH.
P. B. MATHUR.

Laboratories for Plant Physiology,
Institute of Agricultural Research,
Benares Hindu University.

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¹ Carpenter, *Carnegie Inst. Wash. Pub.*, 1915, 216, 76.

Uric Acid Crystals in the Blood Plasma of a Fowl suffering from Pyo-nephrosis consequent on Vitamin A Deficiency.

AN investigation is being undertaken on the growth of embryonic tissues in vitro on plasma taken from vitamin A deficient fowls and rats. In the course of the investigation blood was taken from a fowl which had been fed for 12 weeks on the following diet:—

| | | | |
|--|----|----|-----------|
| Milled Rice | .. | .. | 65 parts. |
| Ground Whole Rice | .. | .. | 15 " |
| Casein | .. | .. | 12 " |
| NaCl | .. | .. | 1 " |
| CaCO ₃ | .. | .. | 1 " |
| Ca ₂ H ₂ (PO ₄) ₂ | .. | .. | 1 " |
| Dried Yeast | .. | .. | 5 " |

Under light ether anæsthesia blood was drawn from the carotid artery. Directly after centrifuging the plasma appeared quite clear. In spite, however, of the fact that the blood was drawn through an ice-cold paraffined canula into a paraffined centrifuge tube and kept in ice packing until centrifu-



Microphotograph of crystals. × 103.

ging, clotting occurred within a few minutes of centrifuging. The plasma of a normal fowl, collected and treated in this manner, can be kept in cold storage for months without clotting. In the present instance it was observed that the serum exuding from the clot was turbid and under the microscope it was found to contain a mass of needle-shaped crystals (see accompanying microphotograph, magnification × 103). A

post-mortem examination of the fowl revealed that the kidneys were completely disorganised, being practically "bags of pus". The comb showed dryness and keratinisation, and, in places, ulceration. The liver was found to be devoid of vitamin A by the arsenic trichloride test.

The condition of the kidneys suggested that crystals in the blood might be uric acid. Under the microscope it was observed that they dissolved completely in dilute potassium hydroxide, but were insoluble in dilute acetic acid and in distilled water. A quantitative estimate of uric acid content was made by Benedict's method. For purposes of comparison, similar tests were carried out on the plasma of 2 fowls, with apparently normal kidneys, fed respectively on the mixed stock diet and on a "control" diet similar to the one described above except that it contained 3 per cent. of cod liver oil. Results were as follows:—

| | | |
|-------------------------|-----------------------|--------|
| | Uric acid in plasma | |
| | (mgrms. per 100 c.c.) | |
| Fowl on stock diet | .. | 12.50 |
| " "control" diet | .. | 8.34 |
| " vit. A deficient diet | | 375.00 |

There seems no doubt that the crystals were uric acid. A uric acid plasma content about 30 times greater than values obtained from two fowls with normal kidneys, seemed sufficiently interesting to report. The presence of excessive uric acid in the blood was not, of course, directly due to vitamin A deficiency, but was caused by a pyo-nephrosis consequent on vitamin A deficiency. It need hardly be said that the plasma from the deficient bird, choked with uric acid crystals, could not be used for tissue-culture experiments.

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G. SANKARAN.

Nutrition Research Laboratories,

I. R. F. A., Coonoor,

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Fusarium Wilt in Sann Hemp.

IN his recent work¹ Mitra brought forth evidence that under the conditions at Pusa wilts in *Crotalaria juncea* and in *Cajanus indicus* are caused by similar physiologic strains of *Fusarium vasinfectum*. Although the isolates from these two hosts were able to cross inoculate each other, they always failed to infect cotton and *vice versa*.

In their study of the Fusarium wilt in sann hemp, the results of which will be published separately, the present writers had obtained evidence that *Fusarium vasinfectum* was a highly specialised species and in no case did the form on sann hemp pass to pigeon pea, and *vice versa*. These results were contrary to those reported by Mitra, and it was therefore decided to test the correctness of Mitra's conclusions by a series of well-designed experiments. Cultures of *Fusarium vasinfectum* from sann hemp and pigeon pea grown in Pusa and in its neighbourhood were secured through the kindness of Dr. Mitra, and were compared with similar cultures obtained locally. The seeds of a wilt-resistant type, T. 80, and of a susceptible type, T. 5, of pigeon pea were also secured from Pusa.

Cross inoculation experiments were made in soil temperature tanks of Wisconsin type at 28° C., the optimum temperature for the development of wilt. In all cases seeds of sann hemp and pigeon pea were surface-disinfected before sowing in pots. In these experiments cultures of *Fusarium vasinfectum* from sann hemp did not infect pigeon pea and *vice versa*, although control plants in all cases gave a high percentage of deaths.

These results will be reported in detail separately.

B. N. UPPAL.

N. T. KULKARNI.

College of Agriculture,
Poona,
November 6, 1935.

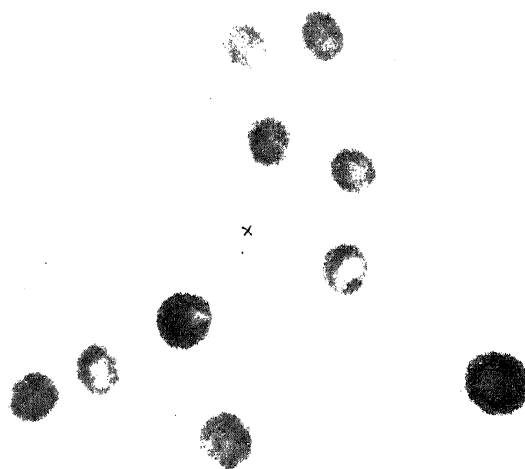
¹ Mitra, M., *Ind. Jour. Agric. Sci.*, 1934, 4, 701-714.

Dummy Pollen.

IN the course of the examination of innumerable pollen grains in many varieties of *Sorghum* since 1931, a peculiar kind of pollen was met with. An examination of pollen grains under the microscope shows constantly a few grains devoid of solid contents (see Figure). In size they are comparatively small (31μ to 34μ). Due to the pressure of the sap inside, they are not shrivelled but retain normal shape. They do not germinate and usually plasmolyse in the culture medium. Pollen studies have not, so far as we are aware, recorded non-germinating pollen of this peculiar type. Similar pollen has been met with in the allied wild grasses, *Andropogon annulatus* and *Andropogon pertusus*, L. In the eight different

varieties of *Sorghum* examined, the incidence of this pollen ranged from 2.3 to 13.5 per cent. In the day flowering *S. margaritifera* it was only 0.4 per cent. The higher types of cultivated *Sorghum* had a lower percentage of this Dummy Pollen. Dummy Pollen is slightly less in the anthers at the base of the earhead.

In the other millets this pollen is met with in *Pennisetum typhoides*, Stapf and Hubbard (also a millet of African origin), which like



× Dummy pollen in *Sorghum*. × 150.

Sorghum has both hermaphrodite and antheriferous flowers. Instances have been met with in both *Sorghum* and *Pennisetum* in which a non-dehiscence of anthers proved to be due to an extreme paucity of this Dummy Pollen, it being under one per cent. in the non-dehiscenced ones, and over seven per cent. in the dehiscenced ones. This points to the probable rôle of this Dummy Pollen as a specialisation ensuring dehiscence in these predominantly night-flowering millets. An experience has been met with in which this poverty of Dummy Pollen and the attendant non-dehiscence of anthers proved a simple recessive to the presence of the normal proportion of such pollen and the consequent dehiscence of anthers. A fuller account of this experience is being published elsewhere shortly.

G. N. RANGASWAMI AYYANGAR.

V. PANDURANGA RAO.

Millets Breeding Station,
Coimbatore,
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