

of organisms like *Proteus morgani*, *Pseudomonas pyocyaneus*, *Bacterium faecolis alkaligenes*, and a few other strains with a typical biochemical or serological reactions were isolated. The possible association of these organisms in the causation of continuous fever required further investigation.

Urine Culture.—During the investigation 50 samples of urine from cases of continuous fever were cultured. Out of these, in two cases the same specimen was examined twice at about a week's interval. The results of analysis of the remaining 48 samples are given in Table II.

Out of clinically definite cases of typhoid, *B. typhosus* was isolated in 6 cases, the paratyphoid group of organisms not being isolated in any of them.

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**THE FATTY OIL FROM THE SEEDS
OF *MALLOTUS PHILIPPINENSIS*,
MUELL. ARG. (NATURAL ORDER
EUPHORBIACEÆ)**

The seeds of *Mallotus philippinensis* (commonly known as *Monkey face tree* in English and *Kamala* in Hindustani) on extraction with benzene yielded a thick, transparent light brown oil of drying character. The physical and chemical constants of this oil, which has not so far been investigated,¹ have been determined with the following results:—

Yield of oil in kernels—48.8 per cent.; Specific gravity at 33° C./33° C.—0.9333; Refractive index at 34° C.—1.5156; Acid value—11.3; Saponification value—207.6; Iodine value—157.3; Acetyl value—46.8; Hehner value—96.1; Unsaponifiable matter—1.9 per cent.

A detailed examination of the constituent acids of this oil is now in progress.

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¹ Brodie, N., *Bull. Indian Ind. Research*, No. 10, *Indian Vegetable Oils*, 1937, p. 33.

CONSTITUTION OF HIBISCETIN

THE hydroxy flavonol, hibiscetin obtained from the flowers of *Hibiscus sabdariffa*, was shown to be 3:5:7:8:3':4':5'-heptahydroxy flavone from a study of its reactions and of the degradation products.¹ This structure has now been confirmed by the synthesis of its methyl ether according to the method of Allan and Robinson.² 2:4-dihydroxy- ω :3:6-trimethoxy acetophenone has been condensed with trimethyl gallic anhydride and anhydrous sodium trimethyl gallate to produce 7-hydroxy-3:5:8:3':4':5'-hexamethoxy flavone, which on subsequent methylation has yielded 3:5:7:8:3':4':5'-heptamethoxy flavone. This methyl ether agrees in all respects with heptamethyl hibiscetin. Experiments on demethylation to yield hibiscetin itself have yet to be carried out.

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August 5, 1942.

¹ Suryaprakasa Rao and Seshalri, *Proc. Ind. Acad. Sci. (A)*, 1942, 15, 148.

² Allan and Robinson, *J.C.S.*, 1924, 2192.

**PHENYLHYDRAZINE ANÆMIA IN
RATS**

IN the search for a simple method for making experimental animals anæmic for the study of the hæmopoietic action of amino-acids, it was decided to investigate the possibility of using phenylhydrazine. This substance has long been known to have a destructive action on the red blood cells, a fact which has found therapeutic application in the treatment of polycythemia vera, a disorder in which the blood contains an abnormally high proportion of erythrocytes. Apart from ascertaining the conditions under which experimental anæmia could be induced in rats by injection of phenylhydrazine it was found necessary to study the blood picture of such animals in some detail as certain authors claim to have observed an increase in blood concentration due to fluid loss in poisoning by hydrazine and its derivatives [cf. Underhill and Karelitz¹ (1923), Bondansky² (1924)]. In careful experiments on rabbits

carried out by Long³ (1925-1926) no such anhydremia was, however, observed.

For experiment, rats weighing about 80 gm. and maintained on a synthetic diet consisting of starch, sugar, casein, butter-fat and salt mixture with supplements of yeast and codliver oil were used. It was found that the animals could be consistently made anæmic by a single intraperitoneal injection of 2 mg. (1 c.c. of a 0.2 per cent. aqueous solution) of phenylhydrazine. Commencing from a control period of three days prior to the injection daily determinations were made of the red cell count, hæmoglobin and of reticulocytes until the blood characteristics returned to normal. In view of the claims regarding anhydremia mentioned in the literature two independent methods were used for hæmoglobin determination, viz., the Iron method of Wong⁴ (1928) and the Acid Hæmetin method as described in Peters and Van Slyke⁵ (1932). The two methods gave results in close agreement. The experiments were repeated on several groups of animals, the results on one set of eight rats being given in the accompanying tables.

The average values obtained with this group were used for the construction of the graph.

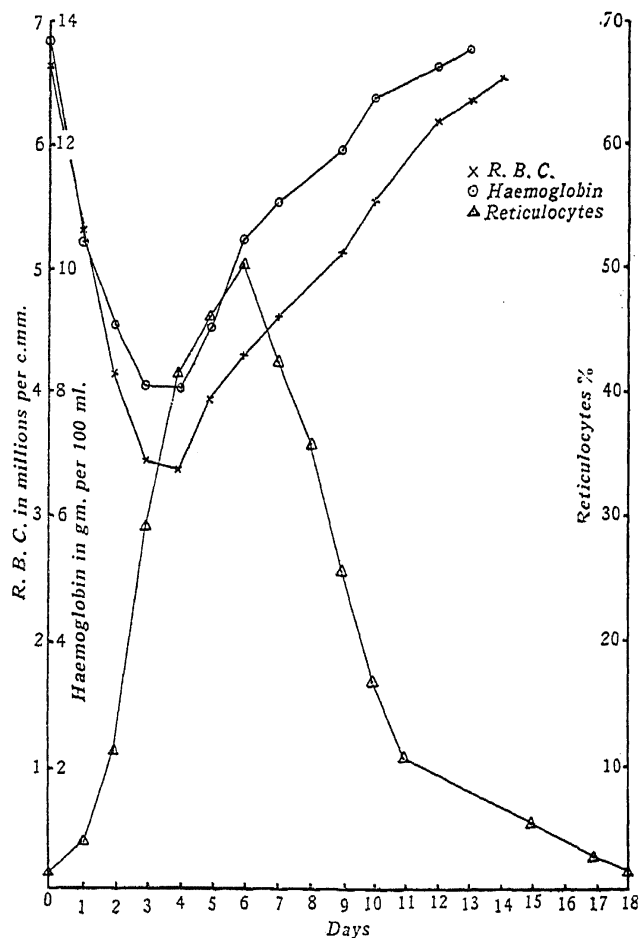


FIG. 1

TABLE I

R.B.C. in million per c.mm.

Rat No.	Days after injection														
	0*	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	6.60	5.33	4.30	3.48	3.40	3.77	4.30	4.60		5.10	5.64		6.38	6.64	6.60
2	6.31	5.51	4.10	3.49	3.48	4.01	4.37	4.71		5.31	5.67		6.20	6.40	6.45
3	6.51	5.60	4.34	4.47	3.46	4.04	4.22	4.51		5.02	5.73		6.21	6.35	6.50
4	6.50	5.31	4.40	3.57	3.43	3.88	4.37	4.80		5.12	5.69		6.30	6.21	6.40
5	6.98	5.10	4.03	3.52	3.50	4.00	4.34	4.70		5.31	5.73		6.45	6.95	6.90
6	6.99	5.01	4.10	3.28	3.03	4.04	4.37	4.50		5.01	5.35		5.95	6.01	6.61
7	6.99	5.25	4.19	3.34	3.41	3.80	4.03	4.20		5.00	5.36		6.01	6.20	6.50
8	6.13	5.01	4.01	3.27	3.29	3.93	4.41	4.76		5.10	5.33		6.00	6.15	6.19
Average Values	6.63	5.30	4.18	3.43	3.38	3.93	4.30	4.60		5.12	5.56		6.19	6.36	6.52

* Averages of 3 days previous to injection.

TABLE II

Gm. Hæmoglobin per 100 c.c. blood (acid hematin method)

Rat No.	Days after injection											
	0*	1	2	3	4	5	6	7	9	10	12	13
1	14.33	10.08	8.93	8.10	8.01	8.80	10.17	11.24	12.22	13.64	13.90	14.10
2	13.28	10.35	8.77	8.28	8.20	9.22	10.70	11.11	12.00	12.64	13.64	13.60
3	14.61	10.91	9.21	8.31	8.10	9.83	11.03	11.19	11.75	12.64	13.50	14.01
4	13.77	11.11	9.88	8.33	8.31	9.43	10.91	11.11	12.00	12.50	13.43	13.50
5	13.53	10.35	8.83	8.21	8.12	8.82	10.70	11.75	12.60	13.64	13.71	13.76
6	13.45	10.76	9.09	7.89	8.00	8.52	9.83	10.53	11.53	11.90	12.50	13.20
7	13.69	10.00	9.14	8.10	7.99	8.82	10.35	10.64	11.53		13.04	13.50
8	12.77	10.17	8.99	7.84	8.00	8.69	10.00	10.71	11.80	12.50	12.40	12.60
Average Values	13.68	10.42	9.11	8.13	8.09	9.02	10.46	11.04	11.93	12.78	13.27	13.53

* Averages of 3 days previous to injection.

TABLE III

Reticulocytes (%)

Rat No.	Days after injection														
	0*	1	2	3	4	5	6	7	8	9	10	11	15	17	18
1	1.15	3.80	10.30	28.60	41.00	45.00	51.40	42.40	34.40	26.00	17.60	10.80	5.30	3.00	1.50
2	.95	3.40	12.00	30.30	41.00	46.00	48.90	43.00	36.10	25.60	16.40	11.00	5.00	2.60	1.20
3	1.00	3.60	10.80	27.80	39.00	46.00	48.80	44.60	36.80	26.00	15.80	10.60	5.80	3.10	1.00
4	1.15	4.00	11.20	29.60	39.90	45.80	49.80	43.80	34.60	25.40	17.60	11.40	6.00	2.20	1.10
5	.95	3.70	10.60	30.40	40.80	46.20	51.40	42.90	35.80	24.10	15.90	10.80	6.10	2.40	1.40
6	.90	4.20	11.00	29.40	42.00	46.40	50.00	40.40	26.80	25.80	15.90	11.10	5.20	2.80	1.80
7	1.05	4.30	11.30	28.80	41.20	45.00	51.40	42.60	38.20	27.00	18.00	10.20	6.30	3.00	1.00
8	1.05	4.60	12.70	30.00	41.40	46.80	52.00	42.00	34.20	26.10	17.20	11.40	6.10	3.10	1.60
Average Values	1.03	3.95	11.25	29.31	41.41	45.90	50.40	42.71	35.86	25.74	16.80	10.91	5.73	2.77	1.32

* Averages of 3 days previous to injection.

It will be seen from Tables I to III and Fig. 1 that the anæmia runs a well-defined and reproducible course in all the animals manifesting itself in a lowered erythrocyte and hæmoglobin content within 24 hours after injection. The decrease in hæmoglobin and R.B.C. follow a parallel course, both reaching their minimal values (about 60 and 50 per cent. of normal respectively) between the third and the fourth day after injection and both being restored to normal on the thirteenth or fourteenth day. With the fall in erythrocytes, there is an increase in the number of reticulocytes which reaches its maximum value of about 50 per cent. on the sixth day. After this there is a gradual fall in their number until the normal value of about 1.1 per cent. is reached at the end of 18 days. During the experimental period the animals maintained their normal health and increase in weight. Nor were any ill-effects discernible if animals after recovery from the anæmia were subjected to a second treatment with phenylhydrazine.

These experiments make it clear that injection of phenylhydrazine provides a simple and convenient method of making experimental animals anæmic for the study of the action of hæmopoietic substances.

The author is very much indebted to Professor M. Damodaran for his valuable advice and help.

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August 21, 1942.

¹ Underhill and Karelitz, *J.B.C.*, 1923, 58, 147-51.

² Bodansky, *J. of Pharmacology*, 1924, 23, 127-33.

³ Long, *J. of Clin. Invest.*, 1925-26, 2, 329.

⁴ Wong, *J.B.C.*, 1928, 77, 409.

⁵ Peters and Van Slyke, *Quantitative Clinical Chemistry*, 1932, 2, 668.

**OLPIDIUM UREDINIS PARASITIC
WITHIN THE UREDIOSPORES OF
HEMILEIA CANTHII BERK. AND
BROOME**

THE genus *Olpidium* founded by Schröter includes many species which are parasitic within the tissues of plants. *Olpidium Brassicæ*

(Woro.) Dang. and *O. Viciæ* Kusano cause diseases of cabbage and *Vicia* respectively, particularly the former causes the damping off disease of the cabbage seedlings. *O. pendulum* Zopf is found parasitic within the pollen of aquatic plants. Other species of *Olpidium* are found parasitic within the mycelium of *Saprolegnia*, algal filaments and others.

Olpidium uredinis (Lagerh.) Fischer is known to be hyperparasitic within the urediospores of many rusts, such as *Uredo airæ*, *Puccinia violæ*, *Puccinia rhamnii*¹ and those of *Puccinia coronata* and *P. levis*.² In the course of the studies on some of the uredinicolous fungi, the writer observed that many of the urediospores of *Hemileia canthii* Berk. and Broome being hyperparasitised by *Olpidium uredinis*. Collection of the material was made near Talakad, Mysore State. The affected spores are without any cell contents and fail to germinate when placed in moist chambers. The sporangium of the hyperparasite is single-celled (Fig. 1), hyaline, ovate or spherical. As many as nine such sporangia have been noticed within a single urediospore. The

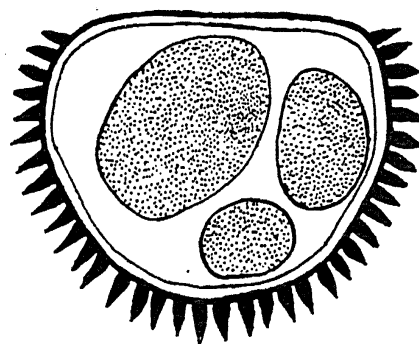


FIG. 1

Urediospore of *Hemileia canthii* parasitised by *Olpidium uredinis*. × 1800.

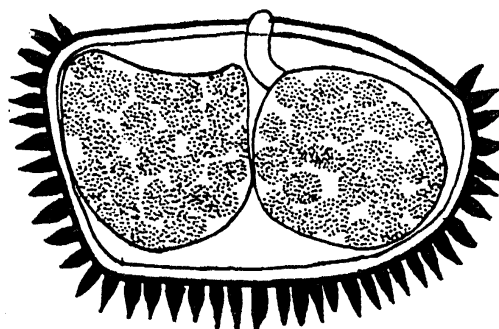


FIG. 2

Formation of zoosporangium, × 1800.