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The Effects Produced in the Rabbit by Feeding Cultures of Monilia psilosis.

DONOVAN C. BROWNE. (Introduced by W. H. Harris.)

From the Department of Pathology of the Tulane University School of Medicine.

From a human case of typical Sprue, cultures of the *Monilia psilosis* were isolated both from the oral lesions and from the stools. These cultures were identical in biological characteristics, and corresponded in every manner to those described by Ashford[1] in his experimental work on Sprue. The organism grows in chains, has a motile body in the vacuole, forms dense mycelia and ferments saccharose, maltose, and levulose. Pure cultures were obtained by plating an emulsion on Sabouraud's medium. Several other forms of yeast were also obtained from foamy stools which do not, however, conform culturally to the true *Monilia psilosis*. These were employed as culture suspensions in feeding experiments upon control animals.

Seventeen full grown rabbits were employed, six of which were used as controls. The *Monilia psilosis* was cultured for 10 days in a 4 per cent dextrose bouillon. Two of the rabbits were injected intravenously with 1.0 cc. of this culture, and one of these was also injected with 0.2 cc. sublingually. Both rabbits died in approximately 24 hours and from each a pure culture of the *Monilia* was recovered from the heart's blood, kidneys and liver. Through this procedure the pathogenicity of the organism for the rabbit was determined.

TABLE I.

Rabbit	Red Blood Count			White Blood Count		
	Initial count			Initial count		
		25th day	29th day		25th day	29th day
1.	6,000,000	4,000,000	3,250,000	15,000	13,750	12,500
		32nd day	38th day		32nd day	38th day
2.	4,750,000	2,750,000	2,750,000	13,500	14,000	14,250
		21st day	54th day		21st day	54th day
3.	5,250,000	5,000,000	5,000,000	10,750	16,000	12,000
			38th day			38th day
4.	4,500,000	5,000,000	4,750,000	8,000	10,500	9,000
		28th day	48th day		28th day	48th day
6.	5,500,000	4,250,000	3,500,000	11,000	14,000	10,000
		50th day	57th day		50th day	57th day
7.	4,750,000	4,000,000	3,750,000	13,000	16,000	18,000

Feeding Experiments: Nine rabbits were fed with the 10 day culture of this same strain of *Monilia* grown in 4 per cent dextrose bouillon. The cultures were administered daily with oats and carrots. Of these 9 rabbits, 6 died between the 31st and 61st day. The three remaining animals continued entirely normal

The blood counts of the six animals which became sick and died are shown in the table.

Rabbit 1: After the 25th day the animal showed loss in weight, became sluggish and refused food, grew weaker and died on the 31st day. Autopsy: Intestines are slightly distended, much mucus is present in the lower colon, the mucous membrane appears normal. The spleen is small and dark red. All other structures appear normal. Abnormal extensive deposits of blood pigment are in the spleen and to less extent in the liver. The bone marrow shows increase in the red portions, but no microscopic change.

Rabbit 2: After 32 days the animal refused food, became droopy and lost weight, until death on the 39th day. Autopsy: the bowel slightly distended with gas, with very small amount of mucus in the colon. The spleen small and dark red color. Marked deposit of blood pigment in spleen and liver.

Rabbit 3: Apparently normal for 3 weeks, then stools became periodically loose, watery, but at no time gave the true buoyant, foamy sprue stool. The appetite became poor, animal lost weight, grew progressively weaker, and died on the 56th day. At autopsy the gross findings were negative. The microscopic study showed acute cholangitis, and a chronic parenchymatous nephritis, with marked evidence of calcium deposit in the epithelial lining of the loops of the Henle. No pigment deposits were noted.

Rabbit 4: Animal normal until 4th week, when it suddenly refused food, lost weight, grew weak, and died on the 41st day. At autopsy the liver was of a light reddish brown, the spleen normal, fatty degeneration of the kidney epithelium marked. Occasional small deposits of blood pigment present in the spleen.

Rabbit 6: Loose stools developed on the 28th and 48th day, but not sprue-like in character, nor did they show fat crystals. A week prior to death, on the 50th day, there was loss of appetite, emaciation and weakness. The autopsy showed bright red spleen, normal, slightly softer in consistency. Massive amounts of blood pigment in the spleen, both intra and extra-cellular and arranged in very large aggregations, scattered throughout the organ. In the liver a lesser amount of pigment appeared both inside and outside of the intralobular sinusoids. The kidney showed cloudy swelling and some fatty degeneration.

Rabbit 7: Died on the 62nd day, having shown signs of loss of weight and appetite from the 50th day on. Microscopic study showed considerable blood pigment deposited in the spleen, none in the liver. In the kidney there was a slight cloudy swelling, and some fatty degeneration. Cultures from the intestinal tract of all six animals at post mortem yielded growths of *Monilia psilosis* while those made from the heart's blood, liver, spleen and kidney were negative.

Controls: Six rabbits were treated in a similar manner as those of the *Monilia* experiments, excepting that bouillon growth of the other saccharomycetes isolated from the stools of the same sprue patient was the culture employed. These animals, although fed over a period of approximately 61 days with these presumably saprophytic cultures remained in every way normal.

The experiments indicated that the *Monilia psilosis* is pathogenic for rabbits when injected intravenously and also when given by feeding. The clinical picture produced in the animals of the feeding experiments is quite constant although no specific syndrome corresponding to clinical sprue occurred. The only manifestations relating to this clinical entity which were produced were loss of weight and some anemia. The striking feature of the stool character and the stomatitis of human sprue were in no instance noted. From the pathological standpoint the almost constant evidences of extensive blood destruction as shown by the marked deposits of blood pigments in the various organs, especially in the spleen, were of striking interest.

[1] Ashford, D. K., *Am. J. Med. Sc.*, 1917, cliv, 157.

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Variations of Blood Inorganic Phosphorus With Exercise.

ARTHUR O. KASTLER. (Introduced by W. Denis.)

From the Department of Biochemistry of the School of Medicine, Tulane University.

With regard to the relationship apparently existing between carbohydrate metabolism and the metabolism of phosphorus, it was proposed to study the behavior of the inorganic and the acid-soluble phosphorus in the blood of dogs whose carbohydrate supply was being rapidly utilized by strenuous exercise. The glycogen reserve of one series of animals was depleted by a preliminary 48 hour starvation.