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Fibrinolysis by Streptococci of Human and Animal Origin.*

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The discovery by Tillett and Garner[1] of an antihuman fibrinolytic function in *S. hemolyticus* isolated from human cases and the absence of this enzyme from apparently identical streptococci isolated from the environment or from lower animals, is of suggestive epidemiologic interest. We have, therefore, attempted to confirm their findings.

To do this, 193 cultures of typical hemolytic streptococci were kindly furnished by various clinics and veterinary institutions of Northern California. Antihuman fibrinolytic tests were made by the Tillett-Garner technic, each test being repeated 3 times with different samples of normal human blood. Control tests were made with stock cultures of known lytic powers.

For convenience in recording our data, the 193 cultures were divided into 3 groups: (a) 32 cultures originally isolated from internal human tissues, representing such diseases as pneumonia, septicemia, empyemia, endocarditis, osteomyelitis, and meningitis; (b)

TABLE I.

Lysis of Normal Human Plasma-Clot by 24 Hour Broth Cultures.

Composite readings from 3 tests with different samples of normal human blood; ++++, complete liquefaction of plasma-clot by the end of 60 minutes; +++, complete liquefaction by end of 2 hours; ++, practically complete lysis in from 6 to 24 hours; +, partial lysis by end of 24 hours. Cultures were considered negative which gave no demonstrable softening of the clot by the end of 24 hours.

S. hemolyticus isolated from:	No. of cultures tested	No. giving fibrinolysis				No. not fibrinolytic	Lytic %
		++++	+++	++	+		
(a) Internal human tissues	32	14	7	8	1	2*	94
(b) Superficial human tissues	123	6†	7†	7	1	102	17
(c) Veterinary tissues	38	0	0	0	3‡	35	7

*One of these negative strains was from a right mastoiditis; left mastoiditis, same patient, 10 days later + + + lysis. The other negative strain was from acute meningitis.

†This includes 5 erysipelas strains, all of which were strongly lytic.

‡The 3 slightly positive strains were from hog, dog, and deer.

* Supported by CWA. (Discontinued April 1, 1934.)

1 Tillett, W. S., and Garner, R. L., *J. Exp. Med.*, 1933, **58**, 485.

123 typical hemolytic strains originally isolated from superficial human tissues, representing such diseases as erysipelas, furunculosis, and fistula, septic sore throat, sinusitis, and acute gastric disturbance; and (c) 38 cultures of veterinary origin, representing such animals as cow, horse, hog, dog, deer, and rabbit. The lytic tests thus grouped are recorded in Table I.

Groups I and III are in practical accord with the Tillett-Garner data. Group II, however, suggests a much less sharp differentiation between antihuman and antiveterinary streptococci than their data indicate. The low percentage of fibrinolytic hemolytic streptococci in this group suggests that a fibrinolytic typing of superficial human infections might be of clinical interest.

Thirty-three strains of *S. viridans* were tested in connection with this work. All were non-fibrinolytic.

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Lactose Degraded Colon-Aerogenes Organisms in Normal Feces.

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The type of degradation of lactose-fermentation here considered is that in which bacterial growth in lactose broth produces no fermentation the first few days of incubation. After 2 to 14 days, acidity and gas production may appear. In other strains it is only after repeated subculture on lactose that this sugar is fermented. As a result of lactose-fermenting deficiency, degraded organisms are entirely missed in water analysis. Since dextrose fermentation is normal, degraded strains grow on Endo and Russell's medium like paratyphoids and complicate the examination of suspect material for members of the Salmonella group. Many, but not all, strains ferment saccharose promptly. This led Krumwiede[1] to add saccharose to Russell's medium to exclude these degraded forms designated in Park and Williams as "paratyphoid-like intermediates". Kennedy *et al.*[2] have presented data for 22 strains of colon bacilli showing delayed lactose fermentation, in urine, stools and water.

We have been interested in the *Escherichia-Citrobacter-Aerobac-*

[1] Krumwiede, Charles, and Kohn, L. A., *J. Med. Res.*, 1917, N. S. **32**, 225.

[2] Kennedy, J. A., *et al.*, *J. Infect. Dis.*, 1932, **50**, 333.