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Mucoid Bacterium Coli in Feces of Normal Subject.

LELAND W. PARR.

From the Department of Bacteriology, Hygiene and Preventive Medicine, School of Medicine, George Washington University, Washington, D. C.

Theobald Smith[1] was first to call attention to colon bacilli so similar in colony form to *B. aerogenes* as to be indistinguishable morphologically. Smith's culture "29" derived from a sample of spring water. Mucoid forms of colon bacilli have since been reported under a variety of conditions. Kuwaraba[2] reported a capsulated organism from panophthalmitis at first identified as Friedländer's bacillus, but later as *B. coli.* Revis[3] contaminated soil with feces and after several months obtained mucoid colon bacilli which at 20°C. produced slimy colonies as much as half an inch in diameter. These forms reverted readily to typical colon bacilli. Bordet and Ciuca[4] obtained mucoid "modified *B. coli*" by the action on the colon bacillus of a guinea pig peritoneal exudate produced by injecting *B. coli.* Gratia[5] confirmed the work of Bordet and Ciuca. He also produced non-mucoid variants by aging a normal culture. Gory[6] obtained mucoid coli by the bacteriophagic action of filtered sewage. Theobald Smith and associates[7] in work on pathogenic *B. coli* from bovine sources (scours) dealt with mucoid forms and derivatives therefrom. Parr and Caldwell[8] recovered mucoid forms of various members of the colon-aerogenes group, including coli, from water samples from pumps near bored latrines. Lawson[9] reports the recovery of mucoid colon bacilli from diarrheal stools of infants. Dominick[10] encountered mucoid coli in well water regularly receiving chlorine. Furthermore the colon bacillus is ordinarily unencapsulated except by special technique, Churchman and Emelianoff.[11]

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[1] Smith, T., *Am. J. Med. Sci.*, 1895, **110**, 283.

[2] Kuwaraba, T., *Arch. f. Augenheilk.*, 1908, **60**, 323.

[3] Revis, C., *Centralbl. f. Bakt.*, II Abt., 1910, **26**, 161.

[4] Bordet, J., and Ciuca, M., *Compt. rend. Soc. Biol.*, 1920, **83**, 1293.

[5] Gratia, A., *J. Exp. Med.*, 1921, **34**, 115; 1922, **35**, 287.

[6] Gory, M., *Compt. rend. Soc. Biol.*, 1923, **88**, 49.

[7] Smith, T., *et al., J. Exp. Med.*, 1927, **46**, 123, 133, 141, 155, 549.

[8] Parr, L. W., and Caldwell, E. L., unpublished data from the Research Laboratory, Alabama State Board of Health, Andalusia, Alabama.

[9] Lawson, G. M., 1933, personal communication, Louisville, Ky.

[10] Dominick, J. F., 1933, personal communication, Washington, D. C.

[11] Churchman, J. W., and Emelianoff, N. V., PROC. SOC. EXP. BIOL. AND MED., **1931, 29**, 515.

We here report the occurrence of encapsulated *B. coli,* giving rise to large, moist mucoid colonies on plate culture, derived from the feces of a normal, adult male. During 1932-33, 156 strains were isolated on Endo's agar from 16 fresh fecal suspensions in sterile saline in a preliminary attempt to determine the relative percentages of the different members of the colon-aerogenes group appearing on a medium on which all such members grow well. Unexpectedly it was found that on most platings all colonies were devoid of metallic sheen and were larger, more raised and more moist than the classical colon bacilli. A few times these mucoids were mixed on the plates with typical forms and once no mucoid types were encountered. Of the 156 isolations, 91% were *B. coli.* The mucoid colonies were made up of very short, encapsulated Gram negative bacilli which did not liquefy gelatin nor ferment saccharose, but which in all cases fermented dextrose and lactose with production of gas as well as acid were methyl-red positive, produced indol and failed to grow on citrate agar. No H_2S was produced. Motility was negative in 24 hr. broth cultures. Flagellar stains have not yet been made. Milk was on first isolation only acidified but on sub-culture coagulated. Broth suspensions remained homogenous. Serological investigations have not yet been undertaken. These forms have thus far maintained their mucoid nature despite manipulation designed to revert them to a non-encapsulated state.

The significance of these findings in a perfectly normal subject on an average mixed diet is manifold. Mucoid forms of most members of the colon-typhoid group are commonly considered variant strains produced only under unusual conditions and then rarely and temporarily. Further investigation may show them to be more common than is supposed. The close relationship of the Encapsulatus group to colon-aerogenes organisms is again emphasized from a new angle. From the work of Bordet and Ciuca, of Gratia, of Gory and of the Smith group such forms also relate to the problems of lysis, of the appearance of new races, of the inheritance of acquired characteristics and of virulence. And from the point of view of water bacteriology it must be said that if relatively stable mucoid forms of the colon bacilli may contaminate water all tests designed to hasten water analysis through colony differentiation of *B. coli* and *B. aerogenes* by differential plating procedures are to be questioned.