

**A MORE RAPID PRESUMPTIVE TEST FOR COLIFORM BACTERIA IN WATER**

The findings of Mallimann and Darby<sup>1</sup> were utilized in devising a rapid test for coliform bacteria in water by Sandholzer and Quimby.<sup>2</sup> For this test a medium of the following composition is recommended:

Tryptose	..	20%
Di-potassium hydrogen phosphate	..	4.0%
Potassium dihydrogen phosphate	..	2.0%
Duponol*	..	0.1%
Potassium nitrate (nitrite free)	..	1.0%

\* Obtainable from Ashe Laboratories, London.

As tryptose was not available in India (or even U. K.) a modification of the above medium was necessitated; it was observed that Stearns peptone could effectively replace tryptose and that it is better not to mix sulphonilic acid with alpha naphthylamine after their preparation in the dark bottle as was recommended by the above workers. Results obtained by this method on two hundred samples of raw, settled, filtered and chlorinated water were compared with those recorded by Macconkey's Bile Salt Neutral Red Lactose broth method of water analysis.<sup>3</sup> The results reveal (see table below) that there is no significant difference between them and those by the above authors. It is therefore obvious that peptone can be conveniently used in place of the more expensive tryptose.

TABLE I

The comparison of nitrate reduction test for coliform bacteria with the standard method and with the results obtained by Sandholzer and Quimby.

No. of samples tested*	Nitrite positive confirmed*	Reaction in Duponol-Peptone Medium Tested after :							No. of samples tested†	Nitrite positive confirmed†
		6 hrs.	8 hrs.	10 hrs.	12 hrs.	14 hrs.	24 hrs.	48 hrs.		
4	4	+	+	+	+	+	+	+	0	0
54	54	-	+	+	+	+	+	+	26	26
27	27	-	-	+	+	+	+	+	13	13
20	20	-	-	-	+	+	+	+	18	12
1	1	-	-	-	-	+	+	+	8	3
26	4	-	-	-	-	+	+	+	7	2
11	1	-	-	-	-	-	-	+	8	1
57	0	-	-	-	-	-	-	-	20	0

\* Tested by the present author on MacConkey's Bile Salt Neutral Red Lactose broth as per standard method, and on Duponol Peptone as a test medium.

† Tested by Sandholzer and Quimby on Brilliant Green Lactose Bile-salt broth method as standard method and on Duponol-Tryptose as test medium.

The author is indebted to the staff and especially to Mr. George Fylinto, B.Sc., of the Public Health Laboratory, Poona, for the co-operation.

Fergusson College,  
Poona 4,  
August 19, 1949.

T. J. BAMAN.

1. Mallimann, W. L., and Darby, C. W., *Am. J. Pub. Health*, 1941, **31**, 127.
2. Sandholzer, L. A., and Quimby, F. H., *Jour. of Bact.* 1945, **50**, 105.
3. Ministry of Health No. 71 (1936).

**A STUDY IN CONTRAST OF THE EFFECTS OF COCOANUT WATER ON THE GROWTH OF IMMATURE EMBRYOS OF CORN (MAIZE) WHEN APPLIED BEFORE AND AFTER GERMINATION OF THE EMBRYO**

IN an exploratory experiment to find out the effect of natural extracts on the growth of a two-week-old corn embryo, it was observed that these extracts exercised some depressing effect upon the germinating embryo; in other words, it took a longer time for the embryo to germinate in the culture medium when in contact with the extract than when it was absent. The natural extracts tried were cocoanut meal extract and young corn ovule extract. A similar depressing effect was observed in the case of cocoanut water (Uttaman,<sup>1</sup> 1949). To examine this phenomenon more critically and, incidentally, to seek an explanation thereof, the following experiment was set up.

Two-week-old corn embryos were used. The treatments consisted of:

1. Cocoanut water applied at the time of placing the embryo in the medium.
2. Cocoanut water applied the next day when the embryo had just started germinating.
3. Control.

Tukey's medium plus active growth promoting ingredients used in culturing very young embryos of corn in a previous experiment (Uttaman,<sup>2</sup> 1949) was used for culturing these embryos. Each treatment was replicated three times and growth measurements for shoot and root were made for the same embryo continuously for five days. The results are entered in the table below. The method of application and the quantity applied, of cocoanut water

was the same as in the previous experiment to find out the effect of coconut water on the embryo growth.

Embryo placed in the medium on 8-9-1947

Replication	Date of measurement	(1)		(2)		(3)	
		Shoot mm.	Root mm.	Shoot mm.	Root mm.	Shoot mm.	Root mm.
		Cocoanut water applied at the time of placing the embryo in the medium		Cocoanut water applied next day when the embryo had just started germinating		Control	
1	9-9-47	Not germinated		2.0	0.5	1.2	1.5
	10-9-47	6.5	1.1	12.9	1.2	13.7	16.8
	11-9-47	13.4	1.1	27.2	1.2	29.5	23.1
	12-9-47	24.4	1.1	36.1	3.0	44.8	31.0
	13-9-47	31.9	1.2	40.2	3.0	46.5	36.2
2	9-9-47	Not germinated		2.2	1.0	1.3	1.3
	10-9-47	5.9	3.5	11.5	1.8	14.3	13.3
	11-9-47	5.9	3.5	26.8	3.0	37.3	30.3
	12-9-47	33.3	3.5	38.6	3.0	59.3	37.6
	13-9-47	35.3	3.6	44.4	3.0	69.2	40.4
3	9-9-47	Not germinated		2.5	0.5	1.1	1.0
	10-9-47	Just germinating	Nil	12.5	1.2	13.0	16.5
	11-9-47	3.4	Nil	31.0	1.2	31.9	29.4
	12-9-47	3.4	Nil	44.4	2.4	46.9	35.5
	13-9-47	3.4	Nil	Fungus attack	54.3	44.5	

From the above results it will be seen that the embryo in treatment 1 failed to germinate on the second day and that the growth of the embryo is more marked when the coconut water is applied after the embryo has germinated than when applied before the germination.

*Discussion.*—The reason for the differential behaviour in the growth of the embryo in the case where coconut water is applied before as compared with after the germination of the embryo might be found in the hypothetical suggestion that by the time the embryo starts to germinate the embryo factors decompose into certain toxic component parts which depress the germinating embryo and that most part of the opportunity to benefit by the embryo factors, is lost to it. That the loss of the embryo factor activity due to heating, chemical treatments, standing, etc., may be due to a release of toxic substances which inhibit the growth of the embryo has been demonstrated in the case of *Datura* by

previous workers (Van Overbeek, 1942; Van Overbeek, Conklin and Blakeslee, 1941).  
Agric. Res. Institute, P. UTTAMAN.  
Coimbatore, July 15, 1949.

1. Uttaman, P., "The effect of coconut water on the growth of immature embryos of corn (maize)," *Curr. Sci.*, July 1949. 2. — "Culturing of pro-embryos of normal diploid corn (maize) aged 3-7 days," *Curr. Sci.*, June 1949. 3. Van Overbeek, J., "Cultivation *in vitro* of small *Datura* embryos," *Am. Jour. Bot.*, 1942, 29, 471. 4. Van Overbeek, J., Marie E. Conklin, and A. F. Blakeslee, "Factors in coconut milk essential for growth development of very young *Datura* embryos," *Sci.*, 1941, 94, 350-51.

### ERGOT ON BAMBOO

In May 1949, several clumps of *Bambusa* sp. near Gudalur (Nilgiris) were found affected by a peculiar disease. From the apices of several shoots whitish to dark brown elongated, curved or twisted sclerotoid bodies up to about an inch in length had formed. These projected out of the sheaths of the topmost leaves. Some of them were covered with a creamy white semisolid mass similar to what appears in the sphaelial stage of *Claviceps*.

Sections of the sclerotoid bodies showed that the core was white made up of a compact mass of hyphal cells. Towards the periphery a dark layer was evident all around the sclerotium. External to this layer the hyphal plexus gave rise to labyrinthine folds and depressions lined by palisade-like cylindrical conidiophores which abstricted conidia one after another. The conidia were elongated, spindle shaped, hyaline, one celled and measured  $7 \times 3 \mu$  ( $4-10 \times 2-4$ ). They germinated when floated on water giving rise to germ tubes mostly laterally.

The hyphae permeate the young tissues of the stem at the tip of the branch. On coming out of the tissues they formed a whitish basic stroma eccentrically placed between the sheaths and the stem on the side where the sheath opened. Originating from this base was the elongated and often twisted sclerotium which was white in the initial stages but developed a dark greenish brown colour on the outside as it became older. Longitudinal fissures were formed in older sclerotia. The sphaelial stage formed a creamy deposit on the surface.