

A Table showing certain Cultural Characteristics of some of the Commonest Bacteria found in the Laboratory Tanks at Plymouth.

By

G. Harold Drew.

THE following table is merely intended as a rough classification of eight of the most common species of bacteria found in the Laboratory Tanks. Only the forms which occur free in the water in the greatest numbers have been considered, and the moulds and higher bacteria which can be cultivated from scrapings from the walls of the tanks have not been included.

Until further and more detailed work has been done on the subject, it seemed better to designate the various species by numbers instead of names, since the majority have probably not previously been described.

The culture media employed were similar to those ordinarily used for bacteriological work, with the exception that fish broth (made from dogfish) was substituted for meat broth, and that sea-water was used in place of tap-water. All media were faintly alkaline to Neutral Red.

The medium designated as "Gran's medium," has the following composition:—

Sodium chloride	8.8 grammes.
Potassium nitrate	0.25 "
Sodium phosphate (Na_2HPO_4 , 12 H_2O)	0.125 "
Calcium malate	in excess of its solubility.
Distilled water	250.0 c.c.

and is fully described by H. H. Gran in the *Bergens Museums Aarbog*, No. 3, 1901.

The sample of water, from which the bacteria classified in the table were isolated, was collected from just below the surface of one of the tanks in the upper Laboratory at 5.30 p.m. on December 6th, 1909. 0.1 c.c. of this sample plated on Fish-broth, Peptone Agar at 30° C., gave an average of 130 colonies of all kinds. Samples collected on other occasions show that the eight species described below may be considered as always present and abundant in the tank water.

TABLE SHOWING SOME OF THE DISTINGUISHING CHARACTERS OF THE COMMONEST BACTERIA IN THE AQUARIUM TANKS.

No	Morphological characters of bacteria grown in Fish broth, Peptone medium.	Appearance of superficial colonies on Fish broth, Peptone Agar at 30° C.	Stab cultures on Fish broth, Peptone Gelatin at 15° C.	Stab cultures on Fish broth, Litmus, Lactose, Peptone Agar at 30° C.	Stab cultures on Fish broth, Neutral Red, Glucose, Peptone Gelatin at 15° C.	Denitrification in Gran's medium at 15° C.	Further notes.
1	Actively motile rods with rounded ends, often appearing as diplo-bacilli. Length of rods about $1\frac{1}{2}$ times diameter.	Circular brown colonies, becoming white at edge as growth proceeds. Slow growth. Margin smooth and regular.	Slight superficial growth; very faint growth along stab. No liquefaction.	Slight superficial growth; very faint growth along stab. No colour change.	Slight growth on surface and to within $\frac{1}{4}$ inch below; very faint growth in deeper parts. No colour change.	No growth.	Growth in media containing Lactose or Glucose was slightly though distinctly more rapid than in other media.
2	Actively motile rods and diplo-bacilli. Extremely small.	Circular white colonies, uniform, with denser spot in centre. Margin smooth and regular. Rapid growth.	Free liquefaction on surface. Free growth in deeper parts, but no liquefaction.	Moderate woolly looking growth all along stab. No colour change.	Strong growth all along stab. Liquefaction on surface. Acid formation.	Moderate growth. Nitrite formation recognizable after five days.	
3	Small actively motile vibrio.	Circular cream-coloured colonies, much elevated. Brownish spot in centre. Highly refractive. Margin smooth and regular. Rapid growth.	Uniform growth along stab. No liquefaction.	Uniform growth along stab. No colour change.	Uniform growth along stab. No colour change. No liquefaction.	Moderate growth, but no nitrite formation.	Growth in media containing Lactose or Glucose was more rapid than in other media.
4	Long spirillum, actively motile.	Large white colonies with irregular outline, denser spot in centre. Colonies rapidly spread over surface.	Very slight growth all along stab. No liquefaction.	Very faint growth near surface. No colour change.	Very faint growth near surface. No colour change or liquefaction.	Moderate growth, but no nitrite formation.	Presence of Lactose or Glucose appears to retard growth.

5	Small actively motile vibrio.	Circular white colonies with very granular appearance. Margin finely irregular. Colonies much elevated above surface, and of slow growth.	Free growth. Funnel-shaped area of liquefaction rapidly spreading downwards.	Growth all along stab. No colour change. Woolly appearance.	Free growth. Funnel-shaped liquefaction. No colour change.	No growth.	
6	Minute actively motile rods.	Large white, cloudy-looking colonies, circular with finely irregular outline.	Growth on surface only. No liquefaction.	No growth.	No growth.	Rapid growth, and denitrification apparent in four days.	
7	Small spirillum, non-motile.	White, translucent, highly refractive colonies. Circular. Margin smooth and regular.	Free growth all along stab. No liquefaction at first, but after five days it begins to appear.	Free growth all along stab. No colour change.	Free growth all along stab. No colour change.	No growth.	
8	Small actively motile rods.	Circular white colonies of very rapid growth, showing denser spot in middle. Uniform smooth margin. In old cultures the whole medium becomes of a golden-brown colour.	Rapidly developed funnel-shaped area of liquefaction, soon resulting in the complete liquefaction of all the medium.	Free growth all along stab. Woolly appearance. No colour change beyond slight reduction in deeper parts.	Rapid liquefaction with acid formation.	Rapid growth, and denitrification within four days. Ammonia formation apparent at fifth day.	Further experiments with Litmus Gelatin Peptone media containing Glucose, Lactose, Cane Sugar, Starch, etc., gave results which point to the conclusion that this is the <i>Bacillus repens</i> described in detail by H. Gran.