from glucose in the absence and presence of 100 μg DSM per ml at about the same rate as the parent strain, but they fermented pyruvate very slowly. Although the parent strain produced approximately 9 μM CO₂ from 10 μM pyruvate in 60 minutes, the variants produced less than 3 μM in the same time. DSM in a concentration of 100 μg per ml had no appreciable effect on the CO₂ production by the mutant strains.

Experiments on the growth of the parent strain E. coli demonstrated that, although DSM did not inhibit the anaerobic CO₂ production from glucose to any extent, the cells could not grow anaerobically in glucose synthetic medium in the presence of DSM. The dependent variant did not require DSM for the anaerobic dissimilation of glucose, but required the drug for growth in glucose synthetic medium. Viable counts of the resistant strain showed that it grows equally well with and without DSM in glucose synthetic medium.

It appears that DSM inhibits some terminal step in both aerobic and anaerobic carbohydrate dissimilation, but no conclusions can be made at present as to the primary inhibitory effect of DSM.

THE POSITION OF BACILLUS KANDIENSIS VAR. KANDIENSOIDES (CASTELLANI)

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In the last edition of Bergey's Manual a number of organisms are listed as belonging to the former genus Eberthella, which is no longer regarded as a valid genus. It might therefore be of interest to the taxonomist to compare organisms of this group in order to determine their position in the system of classification now being used in various parts of the world.

Recently, through the courtesy of Prof. A. Castellani, Instituto de Medicina Tropical, Lisbon, the writer obtained an authentic strain of Bacillus kandiensis var. kandiensoides (Castellani) from Prof. Castellani's culture collection in London. The organism was considered a variant of B. kandiensis, isolated from cases of diarrhea in Ceylon by Castellani in 1912 and named after Kandy, the place of the first isolation (Zentr. Bakt. Parasitenk., I, Orig., 65, 262, 1912). The species later was placed in the genus Eberthella (Castellani and Chalmers: Manual of tropical medicine, 3d ed., 1919).

The culture obtained revealed the following cultural and biochemical characteristics. After plating on Endo's medium two kinds of colonies were seen: (a) colorless, round, glistening colonies, 1.5 to 2 mm in diameter, turning pinkish after prolonged incubation at room temperature; and (b) more reddish

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colonies of the same size and appearance, which became deep red within 2 days
at 22 C. No change of the color of the surrounding medium occurred with this
time of incubation. Subcultures of the two types of colonies revealed no differ-
ences in the fermentation reactions. Good growth of colorless colonies with a
central yellowish node was observed on Leifson's medium after 24 hours at 37 C.
One per cent solutions of the following carbohydrates in beef infusion peptone
broth with brom cresol purple as indicator were acidified without production of
visible amounts of gas: glucose, mannitol, rhamnose, adonitol, fructose, and
galactose. Sucrose was attacked after 4 to 5 days' incubation. No fermentation
was found with lactose, dulcitol, salicin, sorbitol, xylose, maltose, and arabinose,
even when the observation was continued for 35 days. Indole was produced in
tryp tic digest broth. No evidence of H2S production was seen in lead acetate
agar or in beef infusion peptone broth with the lead acetate paper test. On a
medium enriched with cystine, small amounts of hydrogen sulfide were formed
after 4 to 5 days' incubation at 22 C, indicated by some blackening of the lead
acetate paper. The culture grew well on Simmons' citrate agar at 22 C; at 37 C
growth was delayed. Nitrites were produced on 1 per cent nitrate agar. Urea
was hydrolyzed strongly on Christensen's medium. Gelatin was not liquefied
after 28 days at 22 and 37 C. Motility was proved by hanging drop preparations,
in 0.4 per cent agar, and by swarming on fresh agar media at room temperature.
At 37 C motility was sluggish.

These reactions make B. kandiensis var. kandiensoi des (Castellani) indistin-
guishable from cultures thought to be a new type of Shigella (Cope and Kilander: A m. J. Pub. Health, 32, 352, 1942), designated as Proteus entericus by Rustigian
and Stuart (J. Bact., 45, 198, 1943), and classified as Proteus rettgeri by Hadley,

Since Proteus rettgeri is serologically heterogeneous (Rustigian and Stuart: J.
classification of B. kandiensis var. kandiensoi des (Castellani) was attempted at
this time.

The kandiensoi des variety differs from the original description of B. kandiensis
(Castellani, 1912) mainly by its production of indole and by its ability to reduce
nitrate to nitrite. It may be remembered that in Bergey's Manual, third edition, the
same reactions are given for Shigella rettgeri. In the series of 11 strains of
Proteus rettgeri examined by Cook (J. Path. Bact., 60, 171, 1948) one culture
was indole-negative. In our experience, the indole production of Proteus rettgeri
is usually positive; nevertheless, indole-negative strains have been isolated at
this laboratory several times.

Castellani has pointed out that B. kandiensis may be considered as a possible
etiological agent in cases of human diarrheal disease. This fact has been stressed
recently by Cope and Kilander, Rustigian and Stuart, and Cope and Kasper
in several publications. In Germany, strains biochemically identical with Proteus
rettgeri have been isolated rather frequently by the writer from cases of diarrhea
and cystitis, from healthy persons, and from flies. No definite conclusion as to
the pathogenicity of the strains could be reached. In several instances in which
the organisms were first thought to be the causative organism of pathological conditions, finally organisms of known pathogenicity such as *Shigella* or *Salmonella* were cultured.

From the foregoing observations, it is deduced that *B. kandiensis* var. *kandiensoides* (Castellani), and possibly *B. kandiensis*, formerly assigned to the genus *Eberthella*, are culturally and biochemically identical with *Proteus rettgeri* (Hadley *et al.*).