A PROPOSED NEW GENUS OF
GRAM-NEGATIVE COCCI: GEMELLA

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SUMMARY: Gemella gen. nov. is proposed as the name of a new monotypic genus, with type species Gemella haemolysans (Thjötta and Bøe 1938) Berger (basionym Neisseria haemolysans Thjötta and Bøe 1938). The genus Neisseria includes the aerobic, oxidase-positive species, Gemella the aerobic, oxidase-negative species and Veillonella the anaerobic, oxidase-negative species.

Neisseria haemolysans is a relatively new species of gram-negative, hemolyzing, aerobic diplococci which has been described, classified and named by Thjötta and Bøe (1) and recognized by Branham, Pelczar and Murray (2) in Bergey's Manual (7th ed.).

The original strain (1) has recently been re-investigated and compared with five freshly isolated strains (3)(4). It could be shown that, in contrast to the other species of this genus, N. haemolysans does not possess either cytochrome-oxidase, or catalase, or peroxidase. Its respiration system is resistant to cyanide. On catalase-free media minute amounts of hydrogen peroxide are formed, and the organisms are only moderately sensitive to this compound. The action on carbohydrates is fermentative (5). On the basis of these properties, N. haemolysans resembles far less Neisseria than e.g. the streptococci.

On the basis of these results, it was felt that N. haemolysans deviates to such an extent from Neisseria as defined in Bergey's Manual (2) that it can not be retained in this genus. Since it differs also widely from the generally catalase-positive Veillonella (6)(7)(8) we propose a new genus to which the generic name Gemella (gemellus = diminutive of geminus = twin) was given (4). It contains as yet one single species: Gemella haemolysans.

By this procedure, Neisseria would include the aerobic,

oxidase-positive species, Gemella the aerobic, oxidase-negative species, and Veillonella the anaerobic, oxidase-negative species.

The proposed definitions of the genera Neisseria and Gemella with a description of G. haemolysans are given in the following:

FAMILY VIII. NEISSERIACEAE

Genus I. Neisseria

Cocci occurring in pairs with the adjacent sides flattened. Gram negative. Growth on non-enriched media may be poor. Some species produce yellowish or tan pigments. Biochemical activities are limited. Few carbohydrates are utilized; action on carbohydrates, if any, is generally oxidative. From sucrose a starch-like polysaccharide is synthesized by some species. Indol not produced. Nitrates not reduced. Cytochrome-oxidase, catalase and peroxidase are produced. Aerobic. Hemolytic strains occur in some species. Parasites of man and animals.

The type species is Neisseria gonorrhoeae Trevisan.

Genus II. Gemella nov. gen.

Cocci occurring in pairs with the adjacent sides flattened. Gram-negative. Growth on non-enriched media is poor. Pigments are not produced. Action on carbohydrates is fermentative. No starch-like polysaccharide is synthesized from sucrose. Indol not produced. Nitrates not reduced. Lacks cytochrome-oxidase, catalase and peroxidase. Respiration system is resistant to cyanide. Facultatively aerobic. Hemolytic. Parasites of man.

The type species is Gemella haemolysans (Thjötta and Böe) comb. nov.

1. Gemella haemolysans.

Spheres, 0.6 to 1.0 microns or more in diameter, occurring singly and in pairs with adjacent sides flattened. Type strain shows some very large cells. Gram-negative.

Blood agar colonies: Smooth, non-chromogenic, surrounded by a zone of clear hemolysis by the second day on rabbit blood agar; no hemolysis on sheep blood agar. Growth slow and delicate.

BACTERIOLOGICAL NOMENCLATURE AND TAXONOMY

On nutrient agar growth is poor.

Excellent growth in thioglycollate broth with serum added.

Poor growth under strictly anaerobic conditions.

No growth on 5 per cent bile agar.

Acid from glucose, fructose, maltose, sucrose, dextrin, starch and glycogen; by some strains, weak acid production from arabinose, mannitol, sorbitol and inulin.

Methyl-red test positive.

Voges-Proskauer test delayed positive.

Gelatin and coagulated serum not liquefied.

Indol and hydrogen sulfide not produced.

Urea and esculin not hydrolyzed.

Nitrites not produced from nitrates.

Tributylin hydrolyzed; fat not hydrolyzed.

Not pathogenic for white mice (nor with mucin or egg-yolk added).

Source: Human oral cavity.

Habitat: Human mucous membrane of the upper respiratory tract.

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