REVIEW OF ASAI'S 1934-35 CONTRIBUTIONS TO THE
TAXONOMY OF THE ACETIC ACID BACTERIA

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The contributions of Dr. Asai (published in Japanese during the years 1934 and 1935) on the acetic acid and gluconic acid bacteria constitute the basis for recent proposals that there be accepted two generic names, Acetobacter and Gluconobacter. Asai published in eight issue of the Journal of the Agricultural Chemical Society of Japan successive articles each with the title "Taxonomic studies on acetic acid bacteria and allied oxidative bacteria isolated from fruits—A new classification of the oxidative bacteria." The eight publications technically constitute sections of a single article with eight successive publication dates.

Although there are translations of some sections and parts of sections, there is no translation of the entire series. Nevertheless considerable information from an examination of the original articles may be secured due to the fact that all names of bacterial taxa and the names of individuals are printed in conventional type. A careful translation of the entire article would prove very helpful.

This review is intended to note the nomenclatural and taxonomic significance of each of the eight sections, numbered Section I, 1934 to Section VIII, 1935 inclusive.

SECTION I, 1934, pp. 621-629

An introductory index is given which includes three Latin paragraphs:

"Group I. Acetogluconobacter, Acetogluconobacter dioxycetonicus nov. sp.

"Group II. Gluconoacetobacter, Gluconoacetobacter melanogenum liquefaciens nov. sp.

"Group III. Gluconobacter, Gluconobacter viscosus nov. sp."

These generic and specific names are discussed in detail in Sections VII and VIII. The literature pertinent to a study of the acetic acid bacteria was surveyed and a list of 79 names of species and subspecies given, with numbered

citations to a list of references which appears in Section V. There is also given a list of the names of 19 species and varieties of edible fruits. The juices of these fruits when fermented constituted the sources of a considerable number of strains described.

SECTION II, 1934, pp. 932-941

This includes 8 tables giving characters of the 38 strains isolated from the several fruit juices. In one table the English names proposed by Ridgeway are used to designate the colors of the bacterial pigments.

SECTION III, 1935, pp. 50-60

No Latin names of taxa listed. Additional tables of the characters of the 38 strains from fermented fruit juices are given.

SECTION IV, 1935, pp. 331-345

On page 332 a table apparently summarizes the previous tables. There are additional tables of the characteristics of the 38 strains studied.

SECTION V, 1935, pp. 377-390

Apparently a discussion and review of the various species and varieties of acetic bacteria described in the literature.

SECTION VI, 1935, pp. 499-513

Discussion of species allocated to Group I, under the genus Acetogluconobacter, Asai. Four species are designated as members of the genus Bacterium. One species only is definitely assigned to the genus, namely, Acetogluconobacter dioxycetonicus nov. sp. with one variety and 3 formae speciales.

SECTION VIII, 1935, pp. 674-708

Four new species of Gluconoacetobacter are proposed, G. roseus, G. nonoxygluconicus, G. opacus and G. scleroides. The species assignable to Group III, the genus Gluconobacter are discussed. Two species only are accepted, G. liquefaciens and G. viscosus both named by Asai.

Apparently Dr. Asai never designated a type species for the genus Gluconobacter. Two species only were initially proposed for this genus. Reasons for not recognizing G. liquefaciens were later given by Asai, Iizuki and Komagata (1964, 119).

The International Code of Nomenclature of Bacteria is quite explicit. Rule 9c states "if the genus, when originally published, included more than one species, the type species shall be one of these. However, species doubtfully referred to the genus, species mentioned as in any way exceptional, species which definitely disagree with the generic description (provided others agree) and species which possess characters stated in the generic description as rare or unusual are to be excluded from consideration in selecting the type." Obviously neither of the species Bacterium indus-trium or B. oxydans later placed in the genus are acceptable as types. It would be most helpful if a carefully prepared translation of Asai's original descriptions of G. viscosus and G. liquefaciens could be published to explore the possibility that one or the other of Hennebery's names is a synonym of either of Asai's species.