ON CLASSIFICATION AND TAXONOMY
OF DYSENTERY BACTERIA

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SUMMARY: Here are listed the reasons determining the Soviet classification of the dysentery bacteria and the major differences from the International Schema of the International Subcommittee on Enterobacteriaceae. The Soviet arrangement is based on typospecific antigens irrespective of group variations of antigens.

Резюме.

В статье приведены обоснования, положенные в основу советской классификации дизентерийных бактерий. Проводится сопоставление международной и временной советской схемы. Вносится предложение об установлении эталонов типовых культур по типоспецифическому антигену, независимо от вариаций групповых антигенов, а также о совместной проработке принципиальных установок для построения классификационных схем.

It has been pointed out by W. H. Ewing et al. (1959) that the comprehension of publications on dysentery microbes by soviet students is impeded by the discrepancies in the nomenclature. This is due to some divergencies of the soviet classification schemes of Shigellae from the international one.

According to Soviet classification, the genus of dysentery microbes (Shigella) is divided into 4 species:

- S. grigoriowa-Shigae
- S. stutzeri-schmitzii
- S. flexneri
- S. sonnei

This classification is based on biochemical, enzymatic and serological differences between the species. Some of these species contain certain varieties which are grouped into subspecies and types. Thus, bacteria of the Grigorieva-Shigae species include varieties (subspecies) discovered by Novgorodskaya and Semenova. These students had no opportunity to compare their strains with the foreign ones. It is well known at the present that the Novgorodskaya-Semenova strains are identical to those of Large-Sachs.

The first and second species of the soviet classification are included in the subgroup A of the classification of the International Shigella Center. The numeration suggested by this classification, from 1 to 10, includes in the same series both the independent Grigorieva-Shiga or the Stutzer-Schmitz species and the Large-Sachs varieties (or Novgorodskaya-Semenova). While the former have apparently stabilized during evolution and have fairly constant clear cut characteristics, the Large-Sachs varieties are not at all as constant and their number is by no means confined to those already described. While it is possible and advisable to conceive the Grigorieva-Shiga and Stutzer-Schmitz bacteria as independent species there are no grounds to consider the various serological types of Large-Sachs bacteria as individual species. Hence, in the soviet nomenclature the subgroup A corresponds to two species of dysentery bacteria, viz. Shigella grigoriewa-shiga and S. stutzeri-schmitzii and by the variants described by Large, Sachs, and in the Soviet Union by Novgorodskaya and Semenova which are regarded as varieties of S. grigoriewa-shigae.

The S. flexneri species of the soviet classification has 3 subspecies, viz. the correct Flexner, Newcastle and Boyd-Novgorodskaya names. According to the international classification they correspond to the B and C subgroups. As pointed out by Ewing previously in 1949, these microbes have biological characters in common and are probably variants of bacteria of the S. flexneri species. However due to their antigenic and immunological heterogeneity they have to be isolated into several subspecies, two of which—proper Flexner and Boyd-Novgorodskaya—are divided into types which are cross related within the subspecies but mostly have a marked type-specific antigen. It does not seem expedient to produce an unlimited number of standard types by introducing numerous variants which have lost or restores some

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group antigen. One should dispose of standards according to the type-specific antigen, that is to say the type should be represented by strain 3b as the most complete one or by 4b or 1a, etc. If we accept such a relatively constant set of type cultures as standards we shall be able to compare the types of the soviet nomenclature with those of the International Center. It appears from a comparison of the evidence obtained by Novgorodskaya (1959) and W.H. Ewing et al. (1959) that a comparative study by different workers does not show identity throughout all types. This is due to excessive details of the antigenic composition and high variability of the group antigens. It seems necessary to establish for the type strains of S. flexneri a correspondence of type-specific antigens as the criterion for identification.

Our opinion is corroborated by the case of the Boyd-Novgorodskaya subspecies (S. boydii) in which the less differentiated antigenic structure enables one to demonstrate the coincidence of standard cultures in a greater number of cases.

One may agree completely with the division in the B and C subgroups (S. flexneri and S. boydii respectively) as assumed in the international classification. Yet, there exists a not less isolated subgroup of bacteria included in the international classification under the title of Type 6 (S. newcastle) which however is a biochemically heterogeneous set of types whose antigenic and immunological properties are largely obscure.

This is reflected by the Soviet classification in which every subgroup occupies the position of a subspecies.

Subgroup D of the international classification corresponds to S. sonnei species of the Soviet classification.

Within S. flexneri and S. boydii subspecies one should accept the designation of the types by arabic figures as suggested by the international classification. This will facilitate mutual understanding in the analysis of studies from various countries.

The above considerations require further collaboration for treating some general fundamental principles which are necessary for the construction of uniform classification schemes.

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