INTERNATIONAL COMMITTEE ON NOMENCLATURE OF
BACTERIA SUBCOMMITTEE ON TAXONOMY OF
ACTINOMYCETES

Reports on the "Round Table Conference on Actinomycetes"
held at the IX International Congress for Microbiology
Moscow, 24th - 31st July, 1966

The first meeting was held at the Institute of New Antibiotics of the Academy of Medical Sciences USSR (Professor Gause) on 23rd July, 1966.

GOTTLIEB (USA) opened the meeting and introduced Krasil'nikov (USSR) as Chairman.

1. KWAPINSKI (Australia) read a paper on "Serological relationships among the Actinomycetales" (see appended summary p. 143). By the use of various serological methods good results have been obtained in distinguishing between A. bovis and A. israeli. Nocardia and Streptomyces show a wide serological spectrum with a possible separation into "groups." The standardization of methods used is an essential postulate for comparative studies. The use of selective antisera is recommended for the differentiation of serological types of the genera in question.

In the discussion which followed SOLOVYEVA (USSR) mentioned the methods mainly used in her serological studies: agglutination and immunoprecipitation in agar (see also Antibiotiki 1961, No. 8, p. 671). TSYGANOV (USSR) recommended the use of cytoplasmatic antigens.

As other characters, serological properties in particular, are subject to variability in Streptomyces species. PREOBRASHENSKAJA (USSR) agreed on the difficulties mentioned and suggested the extension of research work on techniques and methods. In examining 58 Streptomyces species by agar precipitation she obtained good results with sonic rupture of cells. Where serological methods can be applied in the taxonomy of actinomycetes, the studies should begin with typical and well-known cultures.

2. RAUTENSTEIN (USSR) dealt in detail with "The use of actinophages for the classification of Actinomycetes" (see p. 157). He considered lytic properties to be characteristic and stable; mutations occur at this point very rarely and are limited. Lysogenic cultures are the most suitable sources of phages; phages isolated from soils are not as useful.

In the discussion WELSCH (Belgium) confirmed that mutations are no problem for studies with specific phages. He also recommends the use of lysogenic cultures. Together with other criteria the examination of phages can be a help in taxonomic studies on actinomycetes (see p. 150). In some cases phage specificity is so narrow that only one species is involved.

KUTZNETSOV (USSR) showed some experimental data obtained from studies which have been carried out with strains from different collections in comparison with A. levoris.

3. JOHANIDES (Jugoslavia) gave a good review on "The implication of genetic recombination on the taxonomy and phylogeny of Streptomyces."

4. SLACK (USA) reported on the results of a cooperative work on "Microaerophilic Actinomycetes." Twelve cultures (species of Actinomyces, Odontomyces, and Nocardia) have been examined by members of the Subgroup on the Taxonomy of Microaerophilic Actinomycetes. Comparative experiments have been carried out on morphology, microcolony morphology, oxygen tolerance, and various common biochemical tests. Special studies on cell-wall composition, DNA-base ratio, pathogenicity, antigenicity, and fermentation end products were included. As a consequence a detailed description of each strain was presented.

In reply to questions by KRASIL'NIKOV (USSR) it was stated that the presence or absence of catalase is only one of the criteria for differentiation between aerobic and anaerobic organisms; other tests have to be applied. The antibiotic activity of the strains in question has not been examined. Data on the formation of antibiotic substances are not known and unavailable.

PRAUSER (Germany) asked about the composition of amino acids, particularly on the occurrence of lysine and diaminopimelic acid (DAP). Lysine was reported to have been found in A. propionicus, DAP has not been examined. Another question concerned the motility of microaerophilic Actinomycetes, which has never been observed.

KALAKOUTSKII (USSR) asked if Lactobacillus bifidus, corynebacteria, and anaerobic micromonosporae have been or will be included in the comparative studies. A. parabifidus has been examined, corynebacteria will be studied in future, anaerobic micromonosporae have not been considered. Relationships obviously exist between Lactobacillus bifidus and A. acne.

5. GOTTLIEB (USA) reported on the work and results of the "International Streptomyces Project" (ISP). The first experiment with 140 cultures has been completed. A second and third experiment with another set of 120 and 45 species respectively is in progress and in preparation. There exist a number of species for which no authentic holotypes are available and for which neotypes should be proposed and created. New neotypes will not change the author's name previously given to the species. It is hoped to publish the descriptions of Streptomyces species which resulted from the ISP work. This book will not be a key and will only contain the descriptions without any phylogenetic ideas. KWAPINSKI (Australia) asked about the serological examination of the ISP strains. It was suggested that he and two other colleagues should carry out such experiments.

6. KRASIL'NIKOV (USSR) closed the meeting, stressing again the importance of Actinomycetes for agriculture, veterinary medicine, and medicine.

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A second meeting was held at the Faculty of Soil Biology, Lomonosov Moscow State University (Professor Krasil'nikov) on 28th July, 1966.

GOTTLIEB (USA) was in the chair and introduced the speakers who contributed to the problem of taxonomy of actinomycetes from various aspects. It was unfortunately impossible to spend much time for discussion.

TESIC (Yugoslavia) explained his view on a practical and rational system of classification of actinomycetes. He suggested that the names of genera, sections, series, and even species should indicate the main criteria by which the respective taxon is characterized, e.g. colour, manner of spore formation and others. He showed a new classification key which he believes will contribute to a better and more satisfying understanding and use of the different taxa of actinomycetes.

KUTZNETSOV (USSR) proposed in his comments (see p. 154) to add a list of valid species including homonyms and synonyms as well as that of rejected names to the Code of Nomenclature of Bacteria. It seems also to be desirable to re-examine and revise the common features used for the description of Streptomyces species before proposing including them in the Code as a rule for the description of new species.

WILLIAMS (England) showed electron micrographs of spores of various genera of actinomycetes which he obtained

by the use of a stereoscopic electron microscope (Stereoscan). He explained the methods of preparation, the technique, and advantages of this new method.

TSYGANOV (USSR) reported on his studies on the DNA composition in various genera of Actinomycetes (see also Mikrobiologiya 35:92, 1966) and concluded that the DNA specificity quotients are a criterion not only for the identification of Streptomyces but also of other genera.

LOCCI (Italy) described in detail the genus Streptovercillium. He explained its characteristic morphology and considered a typical verticil to be a sporophore structure comprising a main axis with sets of three or more side branches arising from the same level and each bearing chains of spores. This structure must not be confused with the arrangement of subsequent branching, which is an umbel rather than a verticil, and should be clearly distinguished from pseudo-verticils and -umbels. The distinction between mono- and biverticillate forms seems to be not correct (see also Giorn. Microbiol. 14:33, 1966).

KONEV (USSR) examined a great number of verticillate actinomycetes and generally confirmed Baldacci's definition of Streptovercillium. In addition he observed occasionally cross walls at the branching point with some verticillate strains for which he proposed the generic name Pseudovercillium.

KALAKOUTSKII (USSR) demonstrated another particular and new type of spore formation within a culture which he calls Intrasporangium vulgaris. It is distinguished by the formation of intercalary sporangia besides the normal terminal ones. The sporangiospores are nonmotile.

ASEM (USSR) stressed again the importance of the composition of the medium for the examination of streptomycetes and their classification. This is particularly true of pigment formation. A good example is A. (S.) rubro-cyaneus (see also Trans. Inst. Microbiol. Acad. Sci. USSR 1965, p. 133), which produces a chemically different blue or red pigment when cultivated on different media.

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