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A SYSTEM OF PATHOGENIC
LEPTOSPIRAE ISOLATED IN THE U.S.S.R.

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SUMMARY: A proposal of a system of classification of the pathogenic species of the bacterial genus Leptospira based on the standard strains found in the culture collections of Prof. Wolff in Amsterdam and of the Metchnikoff Institute of Vaccines and Sera in Moscow. For the species L. icterohaemorrhagiae one serogroup and four serotypes are listed with names and for L. febris aquatilis five serogroups and twelve serotypes.

The classification of the pathogenic leptospirae is not yet accomplished; the solution of this problem is now in the stage of the systematization of the leptospirae.

In recent years work in this direction has been conducted in a number of countries (Wolff, Broom, Varfolomeeva, Terskih, Baburieri et al.).

Comparison of pathogenic leptospirae isolated in the Soviet Union with foreign standards has been carried out by means of serological methods (agglutination-lysis test, agglutinin-absorption test) and also by use of biological methods.

As a result of these investigations we are proposing a system of leptospiral characteristics and origins for the organisms that are sufficiently known (Table 1).

The sequence listed below consists of four taxonomic categories and designations of standard strains of leptospirae found in the culture collection of Prof. Wolff (Amsterdam) and in that of the Metchnikoff Institute of Vaccines and Sera (Moscow).

1. Genus Leptospira Noguchi, 1917. The fact that pathogenic as well as saprophytic leptospirae are to be included in the genus Leptospira is not questioned.

2. Species of Leptospira. Species of Leptospira exist as an objective reality. However, marked distinctions both in specific and in fermentative properties are as yet not sufficiently investigated, all of which complicates the determination of species in these microorganisms.

Table 1.

Genus	Species	Serogroup	Serotype	Strains
<u>Leptospira</u> (Noguchi, 1917)	<u>L. icterohaemorrhagiae</u> (Inada, Ido, Hoki, Kaneko, Ito, 1916)	<u>icterohaemorrhagiae</u>	<u>L. icterohaemorrhagiae</u> (AB)	Wijnberg Leningradsky-Sudjin Belousov
			<u>L. icterohaemorrhagiae</u> (A)	Kantorowicz Odessa 8-57 Jablochkin
			<u>L. canicola</u>	Utrecht IV Makarov
			<u>L. sorex*</u> (Varfolomeeva and Nikiforova, 1947)	Javanica Poi Sorex
	<u>L. febris aquatilis</u> (nom. nov. Tokarewitch, 1954)	<u>grippotyphosa</u>	<u>L. grippotyphosa</u> (Tarassoff, 1928)	Dmitrovsky Kornilov Vitulina
		<u>pomona</u>	<u>L. pomona</u>	Pomona Manjakow a sucking pig -2
		<u>tarassovi</u>	<u>L. tarassovi</u> (Tarassoff, 1938)	T-384 Mitis Johnson
		<u>bataviae</u>	<u>L. bataviae</u>	van Tienen Micromys minutus 167
		<u>hebdomadis</u>	<u>L. hebdomadis</u>	Akiyami B Terehov
			<u>L. saxkoebing</u>	Mus 24 P-183
				Nero

	<u>L. ussuri</u> (Kraminskaya, 1959)	DW-P
	<u>L. muris</u> (Kraminskaya, 1956)	BM-1
Kazachstanika I	<u>L. kazachstanika</u> I (Krepkogorskaya, 1955)	N ^o 154 N ^o 184
?	<u>L. kazachstanika</u> II** (Krepkogorskaya, 1955)	Kaz II
?	<u>L. erinacei auriti</u> ** (Ananjin, 1951)	<u>Erinacei</u> <u>auriti</u>
?	<u>L. erinacei europaei</u> ** (Ananjin, 1953)	Erinacei N ^o 1 (23)

* The name of the author and the year of isolation are given only for those types of leptospirae which were first established in the Soviet Union.

** These types being quite independent are in the process of further investigations.

In the U. S. S. R., on the basis of the study of the antigenic structure of leptospirae, clinical picture, epidemiology of leptospirosis and also data on their evolution, two concepts as to species in leptospirae have been developed which have come into practical use in scientific and other laboratories (Varfolomeeva, 1947). Improvements in the methods and techniques used for this purpose may involve further changes.

Determination of taxonomic categories in the leptospirae is based on the stability of their antigenic structure. Each species is divided into serogroups and serotypes.

3. Serogroup. A serogroup includes two or more serological types possessing one related antigen and also serotypes having other antigens in addition to this common antigen.

We regard a serogroup not as a replacement of the genus Leptospira but as a certain transitional stage for further delimitation of species in this genus. A species can embrace one or more serological groups.

While dividing leptospirae into serogroups one should attempt to expand them. In our opinion serogroup icterohaemorrhagiae can be enlarged by adding as serotypes L. canicola and L. sorex (see broken lines in the table) or by others closely related as to their antigenic structure.

4. Serological type. In the column of the table under this heading all serological types known so far in the U. S. S. R. are listed. Fourteen of them isolated from human beings have already been investigated. The serotypes are given with their conventional specific binominal names. In the 5th column names of standard foreign and local strains of the leptospirae are indicated.

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