

**List of leptospira strains kept in the WHO/FAO
Leptospira Reference Laboratory in Rome**

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Two years ago, in a report published in these Annals and illustrating a 15 years' activity of the WHO/FAO Leptospira Reference Laboratory in Rome, we gave a list of the leptospira strains kept in the Laboratory collection.

We have deemed it advisable, after two years, to re-publish this list to complete some data missing in the previous one, to add the new strains of pathogenic leptospira that have enriched the collection and the new serotypes we have recently described and, above all, to report the systematics of water leptospires, which we elaborated during the last two years, and which allowed us to give a precise classification of most of the leptospires of the « biflexa » complex comprised in our collection.

Besides, we added to the list an enumeration of the mutants obtained experimentally.

The collection that two years ago comprised 480 strains, 403 of which had been classified, now comprises 933 strains, 846 of which have been classified. In the complex of pathogenic leptospires we passed from the previous 17 serogroups and 143 serotypes to the present 18 serogroups and 149 serotypes. In the « biflexa » complex we have passed from 11 serogroups and 22 serotypes to the present 33 serogroups and 55 serotypes.

List of the leptospira strains

Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Ictero N. 1	man
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Asakawa	man
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Kagoshima dog	dog
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Vittoria	<i>Rattus decum.</i>
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Mino R 2	rat
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae	Canova	man
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae A	Policlinico	man
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae A	Zavka	rat
ICTERO-HAEMORRHAGIAE	icterohaemorrhagiae B	Verdun	man
ICTERO-HAEMORRHAGIAE	icteroides	R.G.A.	man
ICTERO-HAEMORRHAGIAE	icteroides	Bianchi 1	man
ICTERO-HAEMORRHAGIAE	icteroides	Konings	man
ICTERO-HAEMORRHAGIAE	icteroides	Visentin	man
ICTERO-HAEMORRHAGIAE	icteroides	Fiumicino 7	rat
ICTERO-HAEMORRHAGIAE	icteroides	Mino R 3	rat
ICTERO-HAEMORRHAGIAE	icteroides	Raf	dog
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 58	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 59	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 60	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 63	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 64	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 65	rat
ICTERO-HAEMORRHAGIAE	icteroides	Ratto 66	rat
ICTERO-HAEMORRHAGIAE	icteroides	Gemo	man
ICTERO-HAEMORRHAGIAE	icteroides	Scollo	man
ICTERO-HAEMORRHAGIAE	icteroides	Roma 1	rat
ICTERO-HAEMORRHAGIAE	icteroides	Valeria	<i>Rattus decum.</i>
ICTERO-HAEMORRHAGIAE	icteroides	Vinicia	<i>Rattus decum.</i>
ICTERO-HAEMORRHAGIAE	icteroides	Laura	rat
ICTERO-HAEMORRHAGIAE	icteroides	Barbieri R.	man
ICTERO-HAEMORRHAGIAE	icteroides	Rossetti O.	man

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Japan	1914	Inada, Ido and coll . .	Yamamoto	1965
Japan (Ibaraki)	1933	Numata	Yamamoto	1968
Japan (Kagoshima) . .	1954	Yamamoto	Yamamoto	1968
Italy (Roma)	1941	Babudieri	Babudieri	1941
Italy (Vercelli)	1937	Mino	Mino	1938
Italy (Padova)	1949	Austoni	Austoni	1949
Italy (Roma)	1965	Babudieri	Babudieri	1963
Italy (Perugia)	1963	Zavka	Zavka	1963
France	1916	Martin & Petit	Borg Petersen	1949
Germany	1915	Uhlenhuth & Fromme .	Ist. R. Koch	1940
Italy (Pavia)	1937	Bianchi	Bianchi	1938
Netherlands (Rotterdam)	1937	Wolff	Schueffner	1938
Italy (Mortara)	1939	Babudieri	Babudieri	1939
Italy (Fiumicino) . . .	1939	Babudieri	Babudieri	1939
Italy (Vercelli)	1937	Mino	Mino	1938
Italy (Bologna)	1941	Castagnoli	Castagnoli	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Mortara)	1939	Babudieri	Babudieri	1939
Italy	1940	Babudieri	Babudieri	1940
Italy (Roma)	1935	Marchesi	Marchesi	1935
Italy (Roma)	1941	Babudieri	Babudieri	1941
Italy (Roma)	1941	Babudieri	Babudieri	1941
Italy (Lazio)	1952	Addamiano	Addamiano	1952
Italy	1955	Bussinello and coll. . .	Bussinello and coll. . .	1955
Italy	1955	Bussinello and coll. . .	Bussinello and coll. . .	1955

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Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
ICTERO-HAEMORRHAGIAE	icteroides	Borsari A.	man
ICTERO-HAEMORRHAGIAE	icteroides	Uchida	man
ICTERO-HAEMORRHAGIAE	icteroides	Wissmar	man
ICTERO-HAEMORRHAGIAE	icteroides	RA - 79.	dog
ICTERO-HAEMORRHAGIAE	icteroides	Santos Echevarria .	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	M 20	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Wijnberg	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Zaan	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Fiumicino 6	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Dellatte	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Ratto 52	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Dell'Unto	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	I.h. Camarles. . . .	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Bonariensis S. R. .	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	I.h. Valencia	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Maccarese R 7 . . .	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Barros Luco	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Cane Farina	dog
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Cane 475	dog
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Lola	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	CF 1	dog
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Belousov	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Bisagno	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Messina R 4	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Messina R 5	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Castoro 4	<i>Myocastor coypus</i>
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Monica	rat
ICTERO-HAEMORRHAGIAE	copenhageni . . .	C 13 - 1	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	C 13 - 33	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	F 17 - 5	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	F 17 - 10	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Riccio 4	<i>Erinaceus europ.</i>
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Riccio 24	<i>Erinaceus europ.</i>

kept in the Laboratory
strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Italy (Modena)	1953	Bussinello	Bussinello	1953
Japan	1931	Inada and coll.	Yamamoto	1965
Germany (Berlin)	1935	Schlossberger	—	—
Italy (Sicily)	1965	Joli	Joli	1965
Perù	1966	J. L. de Hidalgo	J. L. de Hidalgo	1971
Demmark	1938	Borg Petersen	Borg Petersen	1956
Netherlands	1926	Gispén & Schueffner	Schueffner	1938
Netherlands	1924	Schueffner	Borg Petersen	1950
Italy (Fiumicino)	1939	Babudieri	Babudieri	1939
Italy (Roma)	1940	Babudieri	Babudieri	1940
Italy (Roma)	1941	Enrico	Enrico	1941
Italy (Roma)	1939	Babudieri	Babudieri	1939
Spain	1952	Covaleda & Pumarola	Pumarola	—
Argentine (B. Aires)	1944	Savino & Remella	Savino	1950
Spain (Valencia)	1953	Altava	Altava	1953
Italy (Lazio)	1951	Babudieri	Babudieri	1951
Cile (Santiago)	1957	Castelli	Castelli	1957
Italy (Pisa)	1955	Farina	Farina	1955
Italy (Pisa)	1955	Farina	Farina	1955
Spain (Castellón)	1953	Babudieri	Babudieri	1953
Puertorico	1950	Alexander	Starnes	1957
URSS (Krasnodar)	1949	Kovalskii & Ribnikwa	Scirvinskaia	1956
Italy (Pavia)	1954	Bianchi	Bianchi	1955
Italy (Sicily)	1962	Joli	Joli	1962
Italy (Sicily)	1962	Joli	Joli	1962
Italy	1964	Farina	Farina	1964
Italy (Roma)	1967	—	—	1967
Brazil (Bahia)	1964	Silva	Silva	1969
Brazil (Bahia)	1964	Silva	Silva	1969
Brazil (Bahia)	1964	Silva	Silva	1969
Brazil (Bahia)	1964	Silva	Silva	1969
Italy (Tuscania)	1963	Farina	Farina	1963
Italy (Tuscania)	1963	Farina	Farina	1963

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
ICTERO-HAEMORRHAGIAE	copenhageni . . .	R 10	<i>Zygodontomys lasiurus</i>
ICTERO-HAEMORRHAGIAE	copenhageni . . .	R 154	<i>Rattus r. frugivorus</i>
ICTERO-HAEMORRHAGIAE	copenhageni . . .	R 410	<i>Rattus norvegicus</i>
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Bonifacio H. Carmahuaco	man
ICTERO-HAEMORRHAGIAE	copenhageni . . .	Felipe Mogollón Atocha	man
ICTERO-HAEMORRHAGIAE	—	Ratto 67	rat
ICTERO-HAEMORRHAGIAE	mankarso	Mankarso	man
ICTERO-HAEMORRHAGIAE	naam	Naam	man
ICTERO-HAEMORRHAGIAE	mwogolo	Mwogolo	man
ICTERO-HAEMORRHAGIAE	dakota	Grand-River	water
ICTERO-HAEMORRHAGIAE	sarmin	Sarmin	man
ICTERO-HAEMORRHAGIAE	birkini	Birkini	man
ICTERO-HAEMORRHAGIAE	smithi	Smith	man
ICTERO-HAEMORRHAGIAE	ndambari	Ndambari	man
ICTERO-HAEMORRHAGIAE	ndambari	21-543	man
ICTERO-HAEMORRHAGIAE	ndahambukuje	Ndahambukuje	man
ICTERO-HAEMORRHAGIAE	budapest	PV 1	white rat
ICTERO-HAEMORRHAGIAE	weaveri	CZ 390 U	man
ICTERO-HAEMORRHAGIAE	hualien	LT 1131	man
ICTERO-HAEMORRHAGIAE	gem	LT 16-67	man
ICTERO-HAEMORRHAGIAE	monymusk	LT 75-68	rat
ICTERO-HAEMORRHAGIAE	tonkini	LT 96-68	man
ICTERO-HAEMORRHAGIAE	hog-vere	LT 60-69	rat
ICTERO-HAEMORRHAGIAE	waskurin	Waskurin (LT 63-68)	bandicoot
JAVANICA	javanica	Veldrat-Batavia 46	<i>Rattus brevicaud.</i>
JAVANICA	javanica	C.R. 90	rat
JAVANICA	javanica	C.R. 91	rat
JAVANICA	javanica	D.K. 380	dog
JAVANICA	poi	Poi	man
JAVANICA	poi	Bugnolo	man
JAVANICA	poi	Granzieri	man
JAVANICA	poi	Tamiazzo	man

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Brazil	1969	Silva	Silva	1971
Brazil	1969	Silva	Silva	1971
Perù	1958	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1967	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1971
Italy (Roma)	1941	Enrico	Enrico	1941
Sumatra	1938	Wolff	—	—
Sumatra	1936	Wolff	Borg Petersen	1947
Congo	1938	Van Riel	Van Riel	1951
U.S.A	1958	Alexander	Galton	1965
Sumatra (Kotaradja)	1939	Kotter	Borg Petersen	1947
Malaya	—	—	M. B. Starnes	1957
Malaya	1957	Alexander and coll	M. B. Starnes	1957
Congo	1946	Van Riel	Van Riel	—
Congo	1938	Van Riel	Wolff	1962
Congo	1938	Van Riel	Wolff	1962
Hungary (Budapest)	1961	Fuzi-Czoka	—	—
U.S.A. (Canal Zone)	1961	Alexander	Alexander	1965
Taiwan	1965	Namru 2 team	Sulzer	1970
Ceylon	1967	Nityananda	Sulzer	1970
Jamaica	1968	Jamaica taems	Sulzer	1970
South Viet-Nam	1968	Namru 2 team	Sulzer	1970
Jamaica	1969	Jamaica teams	Sulzer	1970
Papua	1968	Morahan	Morahan	1968
Java	1938	Esseveld-Mochtar	Borg-Petersen	—
Ceylon	1971	Nityananda	Nityananda	1971
Ceylon	1971	Nityananda	Nityananda	1971
Ceylon	1971	Nityananda	Nityananda	1971
Italy (Vercelli)	1941	Mino	Wolff	1949
Italy	1955	Bussinello and coll	Bussinello and coll.	1955
Italy	1955	Bussinello and coll.	Bussinello and coll.	1955
Italy	1954	Bussinello and coll.	Bussinello and coll.	1954

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
JAVANICA	poi	Sorex 1	<i>Sorex araneus</i>
JAVANICA	sorex jalna	Sorex Jalna	<i>Sorex araneus</i>
JAVANICA	coxi	Cox	man
JAVANICA	sofia	Sofia 874	man
JAVANICA	ceylonica	Piyasena	man
CELLEDONI	celledoni	Celledoni	man
CELLEDONI	celledoni	Reilly	man
CELLEDONI	celledoni	Band 102	—
CELLEDONI	withcombi	Withcombi	man
CANICOLA	canicola	Hond Utrecht IV.	dog
CANICOLA	canicola	Alarik	dog
CANICOLA	canicola	Gaachtgens	dog
CANICOLA	canicola	M 468	dog
CANICOLA	canicola	Nettuno 33	dog
CANICOLA	canicola	Nettuno 45	dog
CANICOLA	canicola	Nettuno 51	dog
CANICOLA	canicola	Nettuno 57	dog
CANICOLA	canicola	Nettuno 947	dog
CANICOLA	canicola	Nettuno 988	dog
CANICOLA	canicola	Moulton	dog
CANICOLA	canicola	Venado Tuerto 2	dog
CANICOLA	canicola	Longhi	man
CANICOLA	canicola	Bavio	cattle
CANICOLA	bafani	Bafani	man
CANICOLA	kamituga	Kamituga	man
CANICOLA	jonsis	Jones	man
CANICOLA	sumneri	Sumner	man
CANICOLA	broomi	Patane	man
CANICOLA	bindjei	Bindjei	man
CANICOLA	schueffneri	Vleermuis 90 C	<i>Cynopterus sp.</i>
CANICOLA	benjamin	Benjamin	man
CANICOLA	malaya	H 6	man
CANICOLA	kahendo	Kahendo	man
CANICOLA	portland-vere ja- maica	LT 63-69	man

kept in the Laboratory
strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
U.S.S.R. (Moscow) . . .	1947	Vorfolomeeva & Nicoforova	Scirvinkaia	1956
Czechoslovakia	1955	Kmety	Kmety	—
Malaya	1957	Alexander and coll. . .	Starnes	1957
Bulgaria (Sofia)	—	Mateew	Mateew	1956
Ceylon	—	Knitgonda	—	—
Australia	1954	Smith, Brown, Torge . .	Broom	1955
Malaya	1954	Mc Crumb	Starnes	1958
—	—	—	—	—
Malaya	1957	Alexander	Starnes	1957
Netherlands	1931	Klarenbeek-Schueffner . .	Walch-Sorgdrager . . .	1938
Netherlands	1932-33	Klarenbeek-Schueffner . .	Walch-Sorgdrager . . .	1938
Germany (Hambourg) . .	—	—	Jakob	1948
Germany	—	—	Jakob	1948
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
Italy (Roma)	1958	Babudieri & Castagnoli	Babudieri & Castagnoli	1958
U.S.A.	—	—	—	—
Argentina	—	Cacchione	Cacchione	1961
Italy	—	Bianchi	Bianchi	1963
Argentina (La Plata) . .	1967	Aguirre, Gallo and coll.	Aguirre	1968
Congo	1946	Van Riel	Wolff	1962
Congo	1938	Van Riel	Wolff	1962
Malaya	1957	Alexander	Starnes	1957
Malaya	1957	Alexander	Starnes	1957
Australia	1954	Smith	—	—
Indonesia	1938	Sardjito	Sardjito	1938
Indonesia	1938	Collier & Esseveld . . .	Borg Petersen	1940
Sumatra	1937	Wolff	Borg Petersen	1947
Malaya	1957	Alexander	Starnes	1957
Congo	—	Van Riel	Wolff	1962
Jamaica	1969	Jamaica teams	Sulzer	1970

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Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
BALLUM	ballum	Mus 127	<i>Mus musculus spic.</i>
BALLUM	ballum	Rata 112	rat
BALLUM	ballum	M.m. 2 ball.	<i>Mus musculus brev.</i>
BALLUM	ballum	M.m. 60	<i>Mus musculus brev.</i>
BALLUM	castellonis	Castellón 3	<i>Apodemus sylv.</i>
BALLUM	castellonis	Castellón 1	<i>Apodemus sylv.</i>
BALLUM	castellonis	Castellón 2	<i>Apodemus sylv.</i>
BALLUM	castellonis	Castellón 4	<i>Apodemus sylv.</i>
BALLUM	castellonis	Rocamora	sheep
BALLUM	castellonis	Ballum Camarles	rat
BALLUM	arboreae	Arborea	<i>Apodemus sylv.</i>
BALLUM	arboreae	Mus 29	—
BALLUM	arboreae	Ballum S 102	mouse
BALLUM	arboreae	Weisse Maus	white mouse
BALLUM	arboreae	Farina R. 35	rat
BALLUM	arboreae	LT 2	black rat
BALLUM	arboreae	LT 18	<i>Mus musculus</i>
BALLUM	arboreae	LT 51	opossum
BALLUM	arboreae	Ba A 52	man
BALLUM	arboreae	Ar A 52	man
BALLUM	arboreae	Ball. Frankfurt	man
BALLUM	arboreae	Riccio 7	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 21	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 23	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 31	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 69	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 88	<i>Erinaceus europ.</i>
BALLUM	arboreae	Riccio 116	<i>Erinaceus europ.</i>
BALLUM	arboreae	Ratto 42 B	<i>R. norvegicus</i>
BALLUM	arboreae	Ratto 43 B	<i>R. norvegicus</i>
PYROGENES	pyrogenes	Salinem	man
PYROGENES	pyrogenes	Okinawa	rat
PYROGENES	pyrogenes	Juanes.	dog

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Denmark	1943	Borg Petersen	Borg Petersen	1950
Portugal	1951	Fraga de Azevedo	Fraga de Azevedo	1951
Brazil	1970	Cordeiro	Cordeiro	1970
Brazil	1970	Cordeiro	Cordeiro	1970
Spain	1953	Babudieri	Babudieri	1953
Spain	1953	Babudieri	Babudieri	1953
Spain	1953	Babudieri	Babudieri	1953
Spain	1955	Babudieri	Babudieri	1955
Argentina	—	Cacchione	Cacchione	1961
Spain	1952	Covaleda & Pumarola	Covaleda & Pumarola	1954
Italy (Sardinia)	1954	Babudieri & Moscovici	Babudieri	1954
—	—	—	—	—
Netherlands	1941	Schueffner	Wolff	1954
Czechoslovakia	1955	Kmety	Kmety	—
Italy (Pisa)	1956	Farina	Farina	1956
U.S.A. (Georgia)	1954	Galton	Galton	1954
U.S.A. (Georgia)	1954	Galton	Galton	1955
U.S.A. (Georgia)	—	Galton	Galton	1956
France	1952	Picard, Eysseric, Trouche	Kolochine Erber	1954
France	1952	Picard, Eysseric, Trouche	Kolochine Erber	1954
Germany	—	Kleinschmidt	Hygiene Inst. Univ. Frankfurt	1958
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Sumatra - Deli	1924	Baermann	Wolff	1946
Japan (Okinawa)	1951	Kitaoka	—	—
Argentina (La Plata)	1968	Aguirre	Aguirre	1968

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Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
PYROGENES	pyrogenes	B 1295	man
PYROGENES	zanoni	Zanoni	man
PYROGENES	zanoni	Jaconi	man
PYROGENES	zanoni	Biolechini	man
PYROGENES	myocastoris	LSU 1551	<i>Myocastor coypus</i>
PYROGENES	abramis	Abraham	man
PYROGENES	biggis	Biggs	man
PYROGENES	hamptoni	Hampton	man
PYROGENES	alexi	HL 565	man
PYROGENES	robinsoni	Robinson	man
PYROGENES	manilae	LT 398	rat
PYROGENES	varela	LT 992	—
PYROGENES	camlo	LT 64-67	man
CYNOPTERI	cynopteri	3522 C	bat
CYNOPTERI	cynopteri	3868 C	bat
CYNOPTERI	canalzonae	CZ 188 K	<i>Proechimys sp.</i>
CYNOPTERI	butembo	Butembo	man
AUTUMNALIS	autumnalis	Akiyami A	man
AUTUMNALIS	autumnalis	E 700	man
AUTUMNALIS	rachmati	Rachmat	man
AUTUMNALIS	rachmati	Jow Jit	man
AUTUMNALIS	rachmati	Weil Russo	—
AUTUMNALIS	fort-bragg	Fort-Bragg	man
AUTUMNALIS	sumatrana	Sapulette	man
AUTUMNALIS	bulgarica	Nikolaevo	man
AUTUMNALIS	bulgarica	Benkowski	man
AUTUMNALIS	bangkinang	Bangkinang I	man
AUTUMNALIS	bangkinang	Bangkinang II	man
AUTUMNALIS	hankinang	B 2088	man
AUTUMNALIS	erinacei auriti	Erinaceus aur. N. 1	<i>Erinaceus auritus</i>
AUTUMNALIS	erinacei auriti	Erinacei aur. 670	<i>Erinaceus auritus</i>
AUTUMNALIS	mooris	Moores	man
AUTUMNALIS	sentot	Sentot	man

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Ceylon	1971	Nityananda	Nityananda	1971
Australia	1937	Lumley	Rimpau	—
Italy	1953	Bussinello and coll. . .	Bussinello and coll. . .	1953
Italy	1953	Bussinello and coll. . .	Bussinello and coll. . .	1953
U.S.A.	1964	—	Galton	1955
Malaya	1957	Alexander and coll. . .	Starnes	1957
Malaya	1957	Alexander and coll. . .	Starnes	1957
Malaya	1957	Alexander and coll. . .	Starnes	1957
Puertorico	—	Alexander	Starnes	1951
Australia	1951	Smith and coll.	Broom	1955
Philippines	1958	—	Galton	1965
Nicaragua	—	L. G. Clark	Sulzer	1970
South Viet-Nam	1967	Namru 2 team	Sulzer	1970
Indonesia	1939	Collier-Mochtar	Kitaoka	1960
Indonesia	1939	Collier-Mochtar	—	—
U.S.A.	1962	Alexander	Alexander	1965
Congo	1946	Van Riel	Wolff	—
Japan	1922	Koshima	Alexander	1957
Sumatra	1933	Wolff	Wolff	1946
Indonesia	1923	Baerman	Borg Petersen	1950
—	—	—	Alexander	1957
Indonesia	—	Slot e V. d. Walle . . .	Schueffner	1939
—	—	—	—	—
U.S.A.	1942	Alexander	Starnes	1957
Sumatra	1938	Kotter	Bohlander	1967
Bulgaria	1951	Jankow	Matecw	1957
Bulgaria	1951	Jankow	—	—
Sumatra (Bangkinang) .	1929	Slot e V. d. Walle . . .	Sardjito	1939
Sumatra (Bangkinang) .	1929	Slot e V. d. Walle . . .	Kitaoka	1960
Sumatra (Bangkinang) .	1929	Slot e V. d. Walle . . .	Sardjito	1939
Ceylon	1971	Nityananda	Nityananda	1971
U.S.S.R.	1951	Ananjn	Ananjn	1965
U.S.S.R. (Stavropolsk) .	1949	Ananjn	Ananjn	1965
Malaya	1957	Alexander and coll. . .	Starnes	1957
Java	1937	Wolff	Borg Petersen	1947
			Walter Reed Hosp. . . .	1963

List of the leptospira strains

Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
AUTUMNALIS	louisiana	LSU 1945	<i>Dasytus novemc.</i>
AUTUMNALIS	orleans	LSU 2580	<i>Myocastor coypus</i>
AUTUMNALIS	djasiman	Djasiman	man
AUTUMNALIS	djasiman	L.C. 235	<i>Citellus citellus</i>
AUTUMNALIS	gurungi	Gurung	man
AUTUMNALIS	alice	Alice	man
AUTUMNALIS	weerasinghe	Weerasinghe	—
AUTUMNALIS	lanka	LT 25-67	man
AUTUMNALIS	mujunkum	Yez 237	<i>Erinaceus aurit.</i>
AUSTRALIS	australis	Ballico	man
AUSTRALIS	australis	Hebdomadis C	—
AUSTRALIS	australis	Saigon 1952	man
AUSTRALIS	lora	Lora	man
AUSTRALIS	lora	And 11	<i>Erinaceus europ.</i>
AUSTRALIS	lora	Arcaini	man
AUSTRALIS	lora	Bodini	man
AUSTRALIS	lora	Gastaldi	man
AUSTRALIS	lora	Riccio 33	<i>Erinaceus europ.</i>
AUSTRALIS	lora	Riccio 37	<i>Erinaceus europ.</i>
AUSTRALIS	lora	Riccio 38	<i>Erinaceus europ.</i>
AUSTRALIS	lora	Riccio 41	<i>Erinaceus europ.</i>
AUSTRALIS	lora	Ukkel	<i>Erinaceus europ.</i>
AUSTRALIS	lora	And 1	<i>Erinaceus europ.</i>
AUSTRALIS	lora	And 4	<i>Erinaceus europ.</i>
AUSTRALIS	lora	And 5	<i>Erinaceus europ.</i>
AUSTRALIS	lora	And 6	<i>Erinaceus europ.</i>
AUSTRALIS	muenchen	Muenchen C 90	man
AUSTRALIS	jalna	Jalna	mouse
AUSTRALIS	bratislava	Jež Bratislava	<i>Erinaceus sp.</i>
AUSTRALIS	bratislava	1/23 Yozh	—
AUSTRALIS	bratislava	Esposito	man
AUSTRALIS	bratislava	Riccio 2	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 16	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 20	<i>Erinaceus europ.</i>

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
U.S.A.	1964	Roth and coll.	Galton	1965
—	1964	Roth and coll.	Galton	1965
Sumatra (Atjeh)	1939	Kotter	Wolff	1946
Turkey	1969	Fazly	Walter Reed Hosp. . . .	1963
Malaya	1957	Alexander and coll. . . .	Fazly	1969
Ceylon	1966	—	Starnes	1957
—	—	—	Ananjn	1968
Ceylon	1967	K. Nityananda	—	—
U.S.S.R.	1966	Chernuka	Sulzer/	1970
Australia	1937	Lumley	Chernuka	1972
—	—	—	Wolff	1956
Vietnam (Saigon)	1952	Fassari	—	—
Italy	1941	Mino	Kolochine-Erber	1955
Belgium	1965	Ghysels	Bohlander	1967
Italy	1955	Bussinello and coll. . . .	Ghysels	1965
Italy	1955	Bussinello and coll. . . .	Bussinello and coll. . . .	1955
Italy	1956	Bussinello and coll. . . .	Bussinello and coll. . . .	1955
Italy	1963	Farina	Bussinello and coll. . . .	1956
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Italy	1963	Farina	Farina	1963
Belgium	1965	Ghysels	Farina	1963
Belgium	1965	Ghysels	Farina	1963
Belgium	1965	Ghysels	Ghysels	1965
Belgium	1965	Ghysels	Ghysels	1965
Belgium	1965	Ghysels	Ghysels	1965
Belgium	1965	Ghysels	Ghysels	1965
Germany	1942	Rimpau	Ghysels	1965
Czechoslovakia	1953	Kmety	Wolff	1956
Czechoslovakia	1953	Kmety	Kmety	—
U.S.S.R.	1951	Ananjn	—	—
Australia (Queensland) . .	1954	Smith & Brown	Ananjn	1966
Italy (Pisa)	1963	Farina	Broom	1957
Italy (Pisa)	1963	Farina	Farina	1963
Italy (Pisa)	1963	Farina	Farina	1963
Italy (Pisa)	1963	Farina	Farina	1963

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
AUSTRALIS	bratislava	Riccio 25	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 39	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 51	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 57	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 59	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 60	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 61	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 62	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 63	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 66	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 67	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 72	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 91	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 93	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 99	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 110	<i>Erinaceus europ.</i>
AUSTRALIS	bratislava	Riccio 135	<i>Erinaceus europ.</i>
AUSTRALIS	fugis	Fudge	man
AUSTRALIS	bangkok	D 92	dog
AUSTRALIS	peruviana	LT 911	cattle
AUSTRALIS	pina	LT 932	<i>Didelphis mars.</i>
AUSTRALIS	pina	Dog 5 (Wewak) (LT 66-68)	dog
AUSTRALIS	pina	Oman	bandicoot
AUSTRALIS	hawaii	Hawaii (LT 62-68)	bandicoot
POMONA	pomona	Pomona	man
POMONA	pomona	Mezzano I	water
POMONA	pomona	Mezzano II	water
POMONA	pomona	Mezzano III	rat
POMONA	pomona	Waldkirch	—
POMONA	pomona	Suis S.R.	pig
POMONA	pomona	Pomona Austoni	man
POMONA	pomona	New-Jersey C 164	cattle
POMONA	pomona	Reggiolo T 11	<i>Mus musc. brevit.</i>

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
POMONA	pomona	Reggiolo T 13	<i>Mus musc. brevir.</i>
POMONA	pomona	Sofia 4 Jansk	—
POMONA	pomona	Simon	—
POMONA	pomona	Pomona S 91	pig
POMONA	pomona	Kalipetrovo	—
POMONA	pomona	Marcos Juarez	cattle
POMONA	pomona	Wickard	cattle
POMONA	pomona	Valencia	water
POMONA	pomona	Nueva Valencia	water
POMONA	monjakov	Monjakov DVB	man
POMONA	monjakov	Porocenko	pig
POMONA	monjakov	PK 412	pig
POMONA	mozdok	5621	<i>Microtus arv.</i>
POMONA	tropica	CZ 299 U	<i>Proechimys sp.</i>
POMONA	kennewicki	LT 1026	cattle
POMONA	proechimys	LT 796	<i>Proechimys semisp.</i>
POMONA	cornelli	C B	cattle
GRIPPO-TYPHOSA	grippto-typhosa	Moskva V	man
GRIPPO-TYPHOSA	grippto-typhosa	Mallersdorf	man
GRIPPO-TYPHOSA	grippto-typhosa	Nzirandukula	man
GRIPPO-TYPHOSA	grippto-typhosa	Vitulina	cattle
GRIPPO-TYPHOSA	grippto-typhosa	Kornilov	man
GRIPPO-TYPHOSA	grippto-typhosa	Kizilchaman	sheep
GRIPPO-TYPHOSA	grippto-typhosa	Duyster	man
GRIPPO-TYPHOSA	grippto-typhosa	Bovis Bernkopf.	cattle
GRIPPO-TYPHOSA	grippto-typhosa	R.M. 2	<i>Rattus mulleri</i>
GRIPPO-TYPHOSA	grippto-typhosa	Vertingen	—
GRIPPO-TYPHOSA	grippto-typhosa	Karakabay	cattle
GRIPPO-TYPHOSA	grippto-typhosa	Kabaaskal	goat
GRIPPO-TYPHOSA	grippto-typhosa	Imrahor	cattle
GRIPPO-TYPHOSA	grippto-typhosa	R 28	<i>Zygodontomys la-</i> <i>siurus</i>
GRIPPO-TYPHOSA	grippto-typhosa	R 49	<i>Zygodontomys la-</i> <i>siurus</i>

kept in the Laboratory
strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Italy	1953	Bussinello and coll. . . .	Bussinello and coll. . . .	1953
—	—	—	—	—
—	—	—	—	—
U.S.A.	1951	Gochenour	Alexander	—
—	—	—	—	—
Argentina	1959	Cacchione	Cacchione	1961
U.S.A. (Wisconsin)	1953	Erskine V. Morse	Erskine V. Morse	1969
Argentina	1970	Mazzonelli	Mazzonelli	1970
Argentina	1970	Mazzonelli	Mazzonelli	1970
U.S.S.R.	1937	Terskih	Scirvinskaia	1956
U.S.S.R.(Orekovo-Zuevo)	1940	Terskih	Scirvinskaia	1956
Ceylon	1971	Nityananda	Nityananda	1971
U.S.S.R.	1965	Semenova	Ananjn	1965
Panama (Canal Zone)	1962	Alexander	Alexander	1965
U.S.A.	1964	Nelson	Sulzer	—
Panama (Canal Zone)	1961	Jale	Alexander	1967
U.S.A.	1957	Alexander and coll. . . .	Starnes	1957
U.R.S.S. (Moscow)	1928	Tarassoff	Schlossberger	1938
Germany	—	Schlossberger	Inst. R. Koch	1938
Congo	1939	Van Riel	Van Riel	1952
U.S.S.R. (Rostov)	1938	Terskih	Scirvinskaia	1956
U.S.S.R.	1949	Varfolomeeva	Scirvinskaia	1956
Turkey (Ankara)	1969	Vardar	Vardar	1969
Netherlands(Amsterdam)	1942	Wolff	Wolff	1958
Israel	1947	Bernkopf	Olitzki	—
Malaya	1955	Alexander and coll. . . .	Starnes	1957
—	—	—	Rimpau	1949
Turkey	1968	Vardar	Vardar	1968
Turkey	1969	Hartley	Hartley	1969
Turkey	1969	Ozsoy	Ozsoy	1969
Brazil (Bahia)	1964	Silva	Silva	1968
Brazil (Bahia)	1964	Silva	Silva	1968

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
GRIPPO-TYPHOSA	grippto-typhosa	Valbuzzi	man
GRIPPO-TYPHOSA	ratnapura	Wamalasema	man
GRIPPO-TYPHOSA	vanderhoedeni	LT 1116	hedge hog
HEBDOMADIS	hebdomadis	Hebdomadis I. Pasteur	—
HEBDOMADIS	hebdomadis	Hebdomadis H. . . .	man
HEBDOMADIS	hebdomadis	Lister I.	man
HEBDOMADIS	nona	Nona	man
HEBDOMADIS	kambale	Kambale	man
HEBDOMADIS	kremastos	Kremastos	man
HEBDOMADIS	worsfoldi	Worsfold	man
HEBDOMADIS	jules	Jules	man
HEBDOMADIS	maru	CZ 285 B	water
HEBDOMADIS	horincana	HS 622	man
HEBDOMADIS	kabura	Kabura	man
HEBDOMADIS	mini	Sari	man
HEBDOMADIS	mini	Ghidorsi	man
HEBDOMADIS	mini	Pretto L.	man
HEBDOMADIS	mini	Plovdiv 814	man
HEBDOMADIS	mini	Plovdiv 943	man
HEBDOMADIS	szwajizak	Szwajizak	man
HEBDOMADIS	georgia	LT 117	<i>Didelphis marsup.</i>
HEBDOMADIS	perameles	Bandicoot 343	<i>Perameles nasuta</i>
HEBDOMADIS	hardjo	Hardjoprajitno	man
HEBDOMADIS	hardjo	Farina C 715.	cattle
HEBDOMADIS	hardjo	Farina C 717.	cattle
HEBDOMADIS	hardjo	Farina C 731 733	cattle
HEBDOMADIS	hardjo	D.V.P. (Ussuri)	—
HEBDOMADIS	medanensis	Hond H. C.	dog
HEBDOMADIS	wolffi	3705.	man
HEBDOMADIS	wolffi	H 7	man
HEBDOMADIS	wolffi	D.A.M.	man
HEBDOMADIS	wolffi	Rodent 3799	mouse
HEBDOMADIS	wolffi	Rodent 3835	mouse

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Australia	1955	Smith & Brown	—	1957
Ceylon	1966	—	Ananjan	1968
Israel	—	Van der Hoeden	Torten	1970
—	—	—	Kolochine Erber	1938
Japan	1918	—	—	—
—	—	—	Inst. Lister	1938
Congo	1955-56	Van Riel	—	—
Congo	1956	Van Riel	—	—
Australia (Queensland)	1952	Smith and coll.	Broom	1955
Malaya	1957	Alexander and coll.	Starnes	1957
Congo	1952	Van Riel	Wolff	—
U.S.A. (Canal Zone)	1962	Alexander	Alexander	1965
Puertorico	1955	Alexander and coll.	Galton	1965
Congo	1946	Van Riel	Wolff	1962
Italy (Vercelli)	1941	Mino	Borg Petersen	1949
Italy	1955	Bussinello and coll.	Bussinello and coll.	1955
Italy	1956	Bussinello and coll.	Bussinello and coll.	1956
Bulgaria	1955	Adjarow	Mateew	1965
Bulgaria	1956	Kalaydiew & Mateew	Mateew	1957
Australia (N. Queensl.)	1954	Smith, Brown, Torge	Brown	1955
U.S.A.	1952	Galton	Galton	1961
Australia	1958	Emanuel	—	—
Sumatra	1938	Wolff	Kitaoka	1960
Italy	—	Farina	Farina	—
Italy	—	Farina	Farina	—
Italy	—	Farina	Farina	—
U.S.S.R.	1964	—	Acad. Med. a. Sc. Moscow	1965
Sumatra	1929	Kouwenaer & Wolff	Wolff	1956
Sumatra	1937	Wolff	Wolff	1946
Malaya	1955	Alexander and coll.	Starnes	1957
Brazil (S. Paulo)	1965	Correa	Correa	1965
Brazil (S. Paulo)	1965	Correa	Correa	1965
Brazil (S. Paulo)	1965	Correa	Correa	1965

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
HEBDOMADIS	sejroe	M 81	man
HEBDOMADIS	sejroe	M 809	mouse
HEBDOMADIS	sejroe	Topino 1	<i>Apodemus sylv.</i>
HEBDOMADIS	sejroe	Reggiolo T 2	<i>Mus musc. brev.</i>
HEBDOMADIS	sejroe	Reggiolo T 22	<i>Mus musc. brev.</i>
HEBDOMADIS	sejroe	L. mauri- BM 1	white mouse
HEBDOMADIS	sejroe	Sofia 956	—
HEBDOMADIS	sejroe	Beltrami W.	man
HEBDOMADIS	sejroe	Paglia M.	man
HEBDOMADIS	sejroe	Callegarini	man
HEBDOMADIS	sejroe	Reggiolo T 3	<i>Mus musc. brev.</i>
HEBDOMADIS	balcanica	1627 Burgas	man
HEBDOMADIS	polonica	Poland 493	<i>Erinaceus rouman.</i>
HEBDOMADIS	geyawera	Geyawera	man
HEBDOMADIS	saxkoebing	Mus 24	<i>Apodemus flavicol.</i>
HEBDOMADIS	saxkoebing	Riccio 6	<i>Erinaceus europ.</i>
HEBDOMADIS	nero	Gamsulin	man
HEBDOMADIS	haemolytica	Marsh	man
HEBDOMADIS	ricardi	Richardson	man
HEBDOMADIS	reereo	LT 957	<i>Philander opossum.</i>
HEBDOMADIS	trinidad	LT 1098	man
HEBDOMADIS	guaicurus	LT 45-69	cattle
BATAVIAE	bataviae	Van Tienen	man
BATAVIAE	bataviae	Swart	man
BATAVIAE	bataviae	Pavia I	man
BATAVIAE	bataviae	Calligaris	man
BATAVIAE	bataviae	Boschimi	man
BATAVIAE	bataviae	Sofia 939	—
BATAVIAE	bataviae	Mycromis	<i>Mycromis</i>
BATAVIAE	bataviae	Gal. fegato	bird
BATAVIAE	bataviae	Tar. Intestino	bird
BATAVIAE	bataviae	Mignattino 1	bird
BATAVIAE	bataviae	Mignattino 2	bird
BATAVIAE	bataviae	Uccello 3	<i>Ardeetta minuta</i>

kept in the Laboratory
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LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Denmark	1937	Borg Petersen	Borg Petersen	1940
Denmark	1948	Borg Petersen	Borg Petersen	1949
Italy (Lazio)	1951	Babudieri	Babudieri	1951
Italy	1953	Bussinello and coll.	Bussinello and coll.	1953
Italy	1953	Bussinello and coll.	Bussinello and coll.	1953
U.R.S.S.	1955	Kraminski - Eskon	—	—
—	—	—	—	—
Italy	1956	Bussinello and coll.	Bussinello and coll.	1956
Italy	1956	Bussinello and coll.	Bussinello and coll.	1956
Italy	1956	Bussinello and coll.	Bussinello and coll.	1956
Italy	1953	Bussinello and coll.	Bussinello and coll.	1953
Bulgaria (Burgas)	1958	Janew	Mateew	1958
Poland (Lublin)	1957	Lazuga	Parnas	1958
Ceylon	1966	—	Ananjn	1968
Denmark	1942	Borg Petersen	Borg Petersen	1949
Italy	1963	Farina	Farina	1963
U.S.S.R.	1950	Ananjn	Scirvinskaia	1956
Malaya	1957	Alexander and coll.	Starnes	1957
Malaya	1957	Alexander and coll.	Starnes	1957
Nicaragua	1962	Clark	Alexander	1967
Trinidad	1965	Spence	Alexander	1967
Brazil	1969	Santa Rosa	Sulzer	1970
Java	1932	Dinger	Schueffner	1939
Java (Batavia)	1926	v. Walch	Sardjito	1939
Italy (Pavia)	1938	Babudieri	Babudieri	1938
Italy	—	Babudieri	Babudieri	—
Italy	—	Babudieri	Babudieri	—
—	—	—	—	—
U.R.S.S.	—	—	—	—
Italy (Vercelli)	1958	Babudieri and coll.	Babudieri	1958
Italy (Vercelli)	1958	Babudieri and coll.	Babudieri	1958
Italy (Vercelli)	1958	Babudieri and coll.	Babudieri	1958
Italy (Vercelli)	1958	Babudieri and coll.	Babudieri	1958
Italy (Vercelli)	1958	Bussinello	Bussinello	1958

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SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
BATAVIAE	bataviae	Periovizza V	man
BATAVIAE	paidjan	Paidjan	man
BATAVIAE	djatzi	HS 26	man
BATAVIAE	kobbe	CZ 320 K	<i>Proechimys semisp.</i>
BATAVIAE	balboa	LT 761	<i>Proechimys semisp.</i>
BATAVIAE	claytoni	LT 818	<i>Proechimys semisp.</i>
BATAVIAE	brasiliensis	LT 966	<i>Didelphis marsup.</i>
BATAVIAE	los banós	LT 101-69	rat
TARASSOVI	tarassovi	PerepelicinDVAT 384	cattle
TARASSOVI	tarassovi	Mitis Johnson	man
TARASSOVI	tarassovi	Hyos S.R.	pig
TARASSOVI	tarassovi	Scrofa 4	pig
TARASSOVI	tarassovi	T. 82	<i>Philander opossum</i>
TARASSOVI	tarassovi	Scrofa 6467	pig
TARASSOVI	vietnam	D.R.V.	pig
TARASSOVI	bakeri	LT 79	<i>Philander opossum</i>
TARASSOVI	guidae	RP 29	pig
TARASSOVI	atlantae	LT 81	<i>Didelphis marsup.</i>
TARASSOVI	kisuba	Kisuba	man
TARASSOVI	kisuba	Kaup (LT 64-68)	bandicoot
TARASSOVI	kisuba	Sepik	bandicoot
TARASSOVI	bravo	Bravo	man
TARASSOVI	atchafalaya	LSU 1013	<i>Didelphis marsup.</i>
TARASSOVI	chagres	LT 924	man
TARASSOVI	rama	LT 955	<i>Philander opossum</i>
TARASSOVI	gatuni	LT 839	<i>Didelphis marsup.</i>
TARASSOVI	langati	LT 59-67	<i>Rattus rajah</i>
TARASSOVI	darien	LT 739	<i>Proechimys semisp.</i>
TARASSOVI	vu-ghia	LT 89-68	man
TARASSOVI	moldavia	114-2	pig
PANAMA	panama	CZ 214 K	<i>Didelphis marsup.</i>
SHERMANI	shermani	LT 821	<i>Didelphis marsup.</i>
RANARUM	ranarum	I.C.F.	frog
BUFONIS	carlos	3-C	toad

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LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Italy (Vercelli)	1958	Bussinello	Bussinello	1958
Sumatra	1939	Wolff	Inst. v. Trop. Hyg.	1956
Puertorico	1950	Alexander	Starnes	1957
Panama (Canal Zone)	1962	Alexander	Alexander	1965
Panama (Canal Zone)	1965	Gale	Alexander	1967
Panama (Canal Zone)	1962	Gale	Alexander	1967
Brazil	1962	Santarosa	Alexander	1967
Philippines	1969	Carlos	Sulzer	1970
U.S.S.R. (Orekoovo-Zuevo)	1940	Terskih	Scirvinskaia	1956
Australia	1948	Johnson	Wiesmann	1948
Argentine (B. Aires)	1944	Savino & Rennella,	Savino & Rennella,	1949
Italy (Pisa)	—	Farina	Farina	—
U.S.A. (Georgia)	1955	Galton	Galton	1957
Italy	—	Farina	Farina	—
Vietnam (Hanoi)	1965	—	Ananjn	1968
U.S.A. (Georgia)	1964	Galton	Galton	1965
Brazil	1949	Guida	Galton	1965
U.S.A.	1955	Galton and coll.	Galton	1965
Congo	1956	Van Riel	Wolff	1961
Papua	1968	Morahan	Morahan	1968
Papua	1968	Morahan	Morahan	1968
Panama (Canal Zone)	1961	Alexander	Alexander	1965
U.S.A.	1964	—	Galton	1965
Panama (Canal Zone)	1965	Gale	Alexander	1967
Nicaragua	1962	Clark	Alexander	1967
Panama (Canal Zone)	1962	Gale	Alexander	1967
Malaya	—	Turner	Sulzer	1970
Panama (Canal Zone)	1962	Gale	Sulzer	1970
South Viet-Nam	1968	Namru 2 team	Sulzer	1970
U.S.S.R. (Moldavia)	1966	Chernuka	Chernuka	1972
Panama (Canal Zone)	1962	Alexander	Alexander	1965
Panama (Canal Zone)	1962	Gale	Alexander	1967
U.S.A.	1964	Diesch and coll.	Inst. Agric. Med. Univ. Jowa	1969
Philippines	1970	Carlos	Carlos	1970

List of the leptospira strains

Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
SEMARANGA	semaranga	Veldrat S. 173	<i>R. rattus brev.</i>
SEMARANGA	semaranga	Madida	ice
SEMARANGA	semaranga	B Sh	ice
SEMARANGA	patoc	Patoc 1	water
SEMARANGA	patoc	Lublin	man
SEMARANGA	são Paulo	São Paulo	tap water
SEMARANGA	monte Valerio	Monte Valerio	water
ANDAMANA	andamana	CH 11	man
ANDAMANA	andamana	Andamana S. Paulo	man
ANDAMANA	bovedo	Bovedo	water
CAU	cau	Cau	water
CAU	cau	Percedol 2	water
DOBERDO'	doberdò	Doberdò 1	water
DOBERDO'	doberdò	Percedol 3	water
DOBERDO'	rupino	RPE	water
DOBERDO'	isolasacra	Isola Sacra 1	water
PERCEDOL	percedol	Percedol 1	water
BASOVIZZA	basovizza	Basovizza	water
BASOVIZZA	basovizza	Sevilla agua	water
BASOVIZZA	san Giusto	San Giusto	water
BASOVIZZA	san Giusto	Caspian Sea	salt water
BASOVIZZA	san Giusto	Castellón agua	water
BASOVIZZA	san Giusto	Bulgaria No. 12	water
BASOVIZZA	san Giusto	Friuli 8	water
BASOVIZZA	san Giusto	Friuli 35	water
AURISINA	aurisina	Aurisina	water
AURISINA	aurisina	Zaan A	water
AURISINA	aurisina	Wa Gent	water
AURISINA	farneti	Farneti	water
AURISINA	farneti	Czekalowski	man
BOTANICA	botanica	Botanica	water
BOTANICA	botanica	Monte Fiascone 1	water
BOTANICA	monfiascone	Monte Fiascone 2	water

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
<i>« biflexa »</i>				
Java	1937	Sardjito Mochtar & Wirasmo	Sardjito	1938
U.S.S.R.	1931	Terskih	Sturdza	1957
U.S.S.R. (Moscow)	1930	Terskih	—	—
Italy (Trieste)	1942	Babudieri	Babudieri	1942
Poland	1948	Chrominski	Dymowska	1960
Brazil	1951	Babudieri	Babudieri	1951
Italy (Trieste)	1967	Cinco & Petelin	Cinco & Petelin	1967
Andaman Islands	1933	Taylor & Goyle	Wolff	1958
Brazil	1964	Correa	Correa	1965
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Roma)	1942	Archetti	Archetti	1942
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Spain	1953	Babudieri	Babudieri	1953
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Iran (Caspian Sea)	1968	Babudieri	Babudieri	1968
Spain	1953	Babudieri	Babudieri	1953
Bulgaria	1969	Ivanov	Ivanov	1970
Italy (Friuli)	1970	Faidutti	Cinco	1971
Italy (Friuli)	1970	Faidutti	Cinco	1971
Italy (Trieste)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Archetti	Archetti	1942
Belgium	—	—	Wolff	1946
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
U. K. (Leed)	—	Czekalowski	Broom	1955
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968

List of the leptospira strains

Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
BOTANICA	monfiascone	Doberdò 2	water
BOTANICA	monfiascone	Peschiera 1	water
BOTANICA	monfiascone	Peschiera 2	water
BOTANICA	monfiascone	Peschiera 3	water
BOTANICA	monfiascone	Ocho Rios	water
KHOSHAMIAN	khoshamian	Khoshamian	water
KHOSHAMIAN	khoshamian	Bulgaria No. 5	water
KHOSHAMIAN	khoshamian	Bulgaria No. 7	water
HOLLAND	holland	WaZ Holland	water
HOLLAND	roma	AM 6	tap water
HOLLAND	roma	AR 14.	water
HOLLAND	tredecì	AM 13	tap water
HOLLAND	muggia	Muggia	sea water
HOLLAND	timavo	8 m	sea water
HOLLAND	panzano	11 m	sea water
HOLLAND	acquamarzia.	AM 20	tap water
HOLLAND	lucaia	Lucaia	water
HOLLAND	piatan	Piatan	water
TEVERE	tevere	AR 18.	water
MARITZA	maritza	Bulgaria No. 16	water
MARITZA	valderio.	Friuli 37	water
THRACIA	thracia	Bulgaria No. 4	water
PULPUDEVA.	pulpudeva	Bulgaria No. 6	water
PULPUDEVA.	pulpudeva	Valencia agua	water
PULPUDEVA.	pulpudeva	Tiburtino 2	water
PULPUDEVA.	fons	Fons	water
PULPUDEVA.	jequitaia	Jehuitaia	water
PULPUDEVA.	canela	Canela	water
ORVENCO	orvenco	Friuli 44	water
UDINE.	udine	Friuli 48	water
LAZIO	lazio	AM 8	tap water
LAZIO	lazio	AM 12	tap water
LAZIO	lazio	AM 21	tap water
CODICE	CDC	Biflexa CDC	water

kept in the Laboratory

strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Italy (Trieste)	1968	Cinco & Petelin	Cinco & Petelin	1968
Italy (Peschiera)	1942	Babudieri	Babudieri	1942
Italy (Peschiera)	1942	Babudieri	Babudieri	1942
Italy (Peschiera)	1942	Babudieri	Babudieri	1942
Jamaica	1970	Babudieri	Babudieri	1970
Iran	1968	Babudieri	Babudieri	1968
Bulgaria	1969	Ivanov	Ivanov	1969
Bulgaria	1969	Ivanov	Ivanov	1970
Netherlands	1926	Mochtar	Inst. R. Koch	1940
Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Trieste)	1968	Castelli and coll.	Castelli	1968
Italy (Trieste)	1968	Castelli and coll.	Castelli	1968
Italy (Trieste)	1968	Castelli and coll.	Castelli	1968
Italy (Roma)	1942	Babudieri	Babudieri	1942
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Italy (Roma)	1942	Babudieri	Babudieri	1942
Bulgaria	1969	Ivanov	Ivanov	1970
Italy (Friuli)	1970	Faidutti	Cinco	1971
Bulgaria	1969	Ivanov	Ivanov	1969
Bulgaria	1969	Ivanov	Ivanov	1970
Spain	1953	Babudieri	Babudieri	1953
Italy (Roma)	1942	Archetti	Archetti	1942
Italy (Roma)	1942	Archetti	Archetti	1942
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Italy (Friuli)	1970	Faidutti	Cinco	1971
Italy (Friuli)	1970	Faidutti	Cinco	1971
Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
—	—	—	Starnes	1958

List of the leptospira strains

Classified

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
CODICE	piraja	Piraja	water
PARAPATAN	parapatan	Parapatan	water
BESSEMANS	bessemans	M. Bessemans	water
NOMENTANO	nomentano	Nomentano	water
ANCONA	ancona	Ancona porto	sea water
DINDIO	dindio	Dindio	water
KAZACKSTANIKA 1	kazackstanika 1	No. 184	—
KAZACKSTANIKA 2	kazackstanika 2	Kazackstanika 2	—
VINZENT	vinzent	Vinzent	water
IRAN	piraja	Iran 1	water
ABAETÉ	abaeté	Abaeté	water
GARCIA	garcia	Garcia	water
ONDINA	ondina	Ondina	water
NAZARÉ	nazaré	Nazaré	water
SOBRADINHO	rabradinho	Sobradino	water
TORORO	tororo	Tororo	water

kept in the Laboratory
strains

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Brazil (Bahia)	1969	Silva	Silva	1971
Java	—	—	Inst. R. Koch	1940
Belgium (Gand)	—	Bessemans	Bessemans	1947
Italy (Roma)	1942	Archetti	Archetti	1942
Italy (Ancona)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
U.S.S.R. (Kazackstan)	1940	Krepkogorskaya	Ananjn	1965
U.S.S.R. (Kazackstan)	1953	Krepkogorskaya	Ananjn	1965
France	—	—	Kolochine-Erber	1938
Iran	1968	Sohrabi	Sohrabi	1968
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971
Brazil (Bahia)	1969	Silva	Silva	1971

List of the leptospira strains

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
			<i>Parasitic</i>
		E. Cerda niño	man
		Firsova	man
		153 B	rat
		22.	<i>Mustorius p.</i>
		18.	<i>Mustorius p.</i>
		Topino 6	mouse
		Topino 8	mouse
		56 B	rat
		Komoba	—
		Dania K 1	—
		HB	—
		Kaschirski	—
		Kasman	—
		Stefanopulo	—
		Icteroides 200	—
		CH 11 Lister.	—
	an-hoa	LT 90-68	man
POMONA		M. m. 2. pom	<i>Mus musculus brev.</i>
POMONA		M. m. 51.	<i>Mus musculus brev.</i>
		P. K. 434	pig
		D. K. 361	dog
		P. K. 462	pig
		Vins 10	cow
		Vins 15	cow
		Vins 44	cow
		Vins 45	cow
		C T 1	pig
		V T 28	—
		V T 7	—

not yet classified

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
<i>strains</i>				
Argentina	—	Cacchione	Cacchione	1962
U.S.S.R.	1949	Karimova	Chernukha	1966
Italy	1968	Farina	Farina	1968
Italy	1968	Farina	Farina	1968
Italy	1968	Farina	Farina	1968
Italy	1968	Farina	Farina	1968
Italy	1968	Farina	Farina	1968
Italy	1968	Farina	Farina	1968
—	—	—	—	—
—	—	—	Sulzer	1970
—	—	—	—	—
—	—	—	Sulzer	1970
—	—	—	—	—
—	—	—	Stefanopulo	1942
—	—	—	Lister I.	—
—	—	—	Lister I.	—
South Viet-Nam	1968	Morahan	Sulzer	1970
Brazil	1970	Cordeiro	Cordeiro	1970
Brazil	1970	Cordeiro	Cordeiro	1970
Ceylon	1971	Nityananda	Nityananda	1972
Ceylon	1971	Nityananda	Nityananda	1972
Ceylon	1971	Nityananda	Nityananda	1972
Perù	1969	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1969	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1969	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1969	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1971
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972

List of the leptospira strains

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
			<i>Parasitic</i>
		CT 63	—
		Añuye / 4	—
		Añuye / 3	—
		Añuye / 6	—
		Riccio 141	<i>Erinaceus europ.</i>
		Riccio 145	<i>Erinaceus europ.</i>
		Riccio 158	<i>Erinaceus europ.</i>
		Riccio 164	<i>Erinaceus europ.</i>
		Riccio 165	<i>Erinaceus europ.</i>
		Riccio 167	<i>Erinaceus europ.</i>
		Riccio 168	<i>Erinaceus europ.</i>
		Riccio 176	<i>Erinaceus europ.</i>
		Riccio 188	<i>Erinaceus europ.</i>
		Riccio 193	<i>Erinaceus europ.</i>
		Riccio 194	<i>Erinaceus europ.</i>
		Riccio 196	<i>Erinaceus europ.</i>
		Riccio 181	<i>Erinaceus europ.</i>
		Riccio 186	<i>Erinaceus europ.</i>
		Volpe 40.	fox
		c 718	cow
		Vitello LI/2	calf
		1 MD	<i>Mustella nivalis</i>
		1 RD	<i>Rattus norvegicus</i>
		4 RD	<i>Rattus norvegicus</i>
		4 AR	<i>Apodemus sylvaticus</i>
		6 MR	<i>Cricetus cricetus</i>
		6Aa D	<i>Apodemus agrarius</i>
		9Ar D	<i>Arvicola terrestris</i>
		12 BD	<i>Mus m. spicilegus</i>
		23 CR	<i>Microtus arvalis</i>

not yet classified

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
<i>strains</i>				
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972
Perù	1971	J. L. de Hidalgo	J. L. de Hidalgo	1972
Italy (Pisa)	1971	Farina	Farina	1972
Italy (Pisa)	1964	Farina	Farina	1972
Italy (Pisa)	1968	Farina	Farina	1972
Italy (Pisa)	1968	Farina	Farina	1972
Italy (Pisa)	1968	Farina	Farina	1972
Italy (Pisa)	1968	Farina	Farina	1972
Italy (Pisa)	1968	Farina	Farina	1972
Italy (Pisa)	1969	Farina	Farina	1972
Italy (Pisa)	1969	Farina	Farina	1972
Italy (Pisa)	1970	Farina	Farina	1972
Italy (Pisa)	1970	Farina	Farina	1972
Italy (Pisa)	1970	Farina	Farina	1972
Italy (Pisa)	1970	Farina	Farina	1972
Italy (Pisa)	1969	Farina	Farina	1972
Italy (Pisa)	1969	Farina	Farina	1972
Italy (Pisa)	1971	Farina	Farina	1972
Italy (Pisa)	1967	Farina	Farina	1972
Italy (Pisa)	1971	Farina	Farina	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972

List of the leptospira strains

SEROGROUP	SEROTYPE	STRAIN	ISOLATED FROM
		24 CR	<i>Microtus arvalis</i>
		35 BV	<i>Mus m. spicilegus</i>
		49 BP	<i>Mus m. spicilegus</i>
		83 BR	<i>Mus m. spicilegus</i>
		145 CD	<i>Microtus arvalis</i>
		270 CD	<i>Microtus arvalis</i>
		273 CD	<i>Microtus arvalis</i>
AUSTRALIS		R 116	<i>Cavia a. aperea</i>
AUSTRALIS		R 93	<i>Zygodontomys lasiurus</i>
GRIPPO-TYPHOSA		R 54	<i>Zygodontomys lasiurus</i>
GRIPPO-TYPHOSA		R 61	<i>Zygodontomys lasiurus</i>
			<i>Saprophytic</i>
		AM 3	tap water
		AR 17.	tap water
		Buenos Aires	water
		Biflexa Pasteur . . .	water
		Ruseti	water
		Lublin Voda	tap water
		Sewage water	water
		Manila 11	water
		11 d	salt water
		Fregene 1	water
		Fregene 2	water
		Bulgaria No. 19 . . .	water
		Rufino	water
		Tapalqué	water
		83.	water
		43.	water
		B 16	water

not yet classified

LOCALITY	YEAR	ISOLATED BY	SENT BY	YEAR
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Romania	1972	Bercovici	Bercovici	1972
Brazil	1969	Silva	Silva	1971
Brazil	1969	Silva	Silva	1971
Brazil	1969	Silva	Silva	1971
Brazil	1969	Silva	Silva	1971

strains

Italy (Roma)	1942	Babudieri	Babudieri	1942
Italy (Roma)	1942	Babudieri	Babudieri	1942
Argentine	1951	Babudieri	Babudieri	1951
—	—	—	Kolochine Erber	1938
—	—	—	Inst. Cantacuzino	1958
Poland (Lublin)	—	Babudieri	Babudieri	—
Brazil (S. Paulo)	1965	Correa	Correa	1965
Philippines	1970	Babudieri	Babudieri	1970
Italy (Trieste)	1968	Castelli and coll.	Castelli	1968
Italy (Roma)	1969	Babudieri	Babudieri	1969
Italy (Roma)	1969	Babudieri	Babudieri	1969
Bulgaria	1969	Ivanov	Ivanov	1971
Argentine	1971	Cacchione	Cacchione	1972
Argentine	1971	Cacchione	Cacchione	1972
Australia (Melbourne)	—	Prahan	Prahan	1972
Australia (Melbourne)	—	Prahan	Prahan	1972
Australia (Melbourne)	—	Prahan	Prahan	1972

LIST OF THE EXPERIMENTALLY OBTAINED MUTANTS

Patoc 1, mut. A	antigenic mutant	Literature (1)
Patoc 1, mut. B	antigenic mutant	Literature (1)
Patoc 1, mut. C	antigenic mutant	Literature (1)
Alarik, mut.	antigenic mutant	Literature (1)
Basovizza strept. res. mut.	streptomycine resistant mutant	Literature (2)
Wijnberg strept. res. mut.	streptomycine resistant mutant	Literature (2)
Basovizza morph. mut.	morphologic mutant (straight-ended)	Literature (2)

Received May 5, 1972.

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- (2) USCO, P. In press.