



**World Health
Organization**



Institut Pasteur

**WHO Collaborating Centre for Reference
and Research on *Salmonella***

**ANTIGENIC FORMULAE OF THE
SALMONELLA SEROVARS**

2007

9th edition

Patrick A.D. Grimont & François-Xavier Weill

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WHO COLLABORATING CENTRE FOR REFERENCE AND RESEARCH
ON *SALMONELLA*

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Role of the WHO Collaborating Centre for Reference and Research on *Salmonella* (WHOCC-Salm)

WHOCC-Salm is expected to provide the following service :

- Updating the *Salmonella* serotyping scheme (antigenic factors and serovar nomenclature)
- Technical support for *Salmonella* National Reference Centres (unusual antigenic structures or biochemical features)
- Updating protocols for the production of antisera
- Research activities on *Salmonella* (molecular methods for the identification of serovars)
- Contribution to the WHO surveillance program (recommendations, training, participation to Global Salm-Surv)

The historical role of WHOCC-Salm has been to maintain the comprehensive list of known *Salmonella* serovars. Since the creation of the *Salmonella* International Centre by Thorwald Madsen, Chairman of the Hygiene Committee of the League of Nations, the following scientists were in charge :

- F. Kauffmann (Statens Serum Institut, Copenhagen, Denmark) : 1934-1965
- L. Le Minor (Institut Pasteur, Paris) : 1965-1989
- M.Y. Popoff (Institut Pasteur, Paris) : 1989-2003
- P.A.D. Grimont and F.-X. Weill (Institut Pasteur, Paris) : 2003-2007

The first publication of the Kauffmann-White scheme (*Salmonella* Subcommittee, 1934, J. Hyg. 34 :333-350) listed 44 serovars. When F. Kauffmann retired (1964), the scheme contained 958 serovars. L. Le Minor published an annual supplement in the *Annales de l'Institut Pasteur* which became *Research in Microbiology*. When L. Le Minor retired, there were 2267 serovars and when M.Y. Popoff left, there were 2555 serovars.

Since L. Le Minor described most of the presently known serovars, we propose to designate the list of antigenic formulae (formerly known as “Kauffmann-White scheme”) as White-Kauffmann-Le Minor scheme.

Validation of new serovars is done at WHOCC-Salm (Institut Pasteur) in collaboration with laboratories in Hamburg (Institut für Hygiene und Umwelt, J. Bockemühl, S. Aleksic, and P. Roggentin) and Atlanta (Centers for Disease Control, F.W. Brenner, L. Gheesling, P. Fields, and M. Mikoleit). Serovars are homologated when these three laboratories agree on their validation.

This scheme which summarizes antigenic formulae of all known *Salmonella* serovars, is intended for National Reference Centres and other laboratories where all agglutinating sera are available. It is a reference document. Beware of non-authorized copies or translations with a modified content.

We recommend that National Reference Centres make available to local laboratories a simplified scheme limited to the most prevalent serovars in their countries. About 30 serovars may account for more than 90% of *Salmonella* isolates in a given country.

Acknowledgements

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Taxonomy and nomenclature of the genus *Salmonella*

Molecular methods have shown that the genus *Salmonella* consists of only two species (*Int. J. Syst. Bacteriol.*, 1987, **37**, 465-468; *J. Clin. Microbiol.*, 1989, **27**, 313-320). The following nomenclature is in accordance with present taxonomic knowledge (*Int. J. Syst. Evol. Microbiol.*, 2005, **55**, 521-524). The two species in the genus *Salmonella* are *S. enterica* and *S. bongori*. The species called *S. subterranea* (*Appl. Environ. Microbiol.*, 2004, **70**, 2959-2965) does not belong in the genus *Salmonella* (unpublished data). *Salmonella enterica* is divided into the following six subspecies: *S. enterica* subsp. *enterica*, *S. enterica* subsp. *salamae*, *S. enterica* subsp. *arizonae*, *S. enterica* subsp. *diarizonae*, *S. enterica* subsp. *houtenae* and *S. enterica* subsp. *indica*.

These species and subspecies can be distinguished on the basis of differential characters (table below).

Before the taxonomy of the genus *Salmonella* was established on scientific basis, *S. enterica* subspecies were considered as subgenera and serovars were treated as species. Thus, there were subgenera I (*S. enterica* subsp. *enterica*), II (*S. enterica* subsp. *salamae*), III (former genus *Arizona*; subdivided in IIIa, *S. enterica* subsp. *arizonae*, and IIIb, *S. enterica* subsp. *diarizonae*), IV (*S. enterica* subsp. *houtenae*), V (*S. bongori*), and VI (*S. enterica* subsp. *indica*).

The way serovars were designated evolved with time. Some serovar names denoted syndrome (*S. typhi*) or relationship (*S. paratyphi* A, B, C). Other names were correlated with syndrome and host specificity which was right in some cases (*S. abortus-ovis*, *S. abortus-equi*) or wrong in other cases (*S. typhi-murium*, *S. cholerae-suis*). To avoid possible sources of confusion, names indicating geographical origin of the first strain of a new serovar (*S. london*, *S. panama*, *S. tel-el-kebir*) were then used. At the International Congress of Microbiology held in Moscow (*Int. J. Syst. Bacteriol.*, 1968., **18**, 191-196), it was decided that compound names would be hereafter condensed in simple names (*S. typhimurium*, *S. choleraesuis*, *S. tel-el-kebir*). These names, wrongly considered as species names, were for this reason italicized. They are in fact without taxonomic status, used to name bacteria frequently isolated in human or veterinary medicine. In other bacterial species (*Escherichia coli*, for example) names have not been given to serovars which are only designated by their antigenic formula. However, names of the most frequently encountered *Salmonella* serovars are so familiar that it would be unrealistic to suppress these names and to substitute their antigenic formula. Names were maintained only for subspecies *enterica* serovars which account for more than 99.5% of isolated *Salmonella* strains. These names must no longer be italicized. The first letter is a capital letter. In practice, for *S. enterica* subsp. *enterica*, the subspecies name (subsp. *enterica*) does not need to be indicated as only serovars of this subspecies bear a name. Serovars of other subspecies of *S. enterica* and those of *S. bongori* are designated only by their antigenic formula. Therefore, the following examples are correct: *S. enterica* subsp. *enterica* serovar Typhimurium, or *S. enterica* serovar Typhimurium, or *Salmonella* ser. Typhimurium. Designations such as *S. Typhimurium* or S.I, S.II, S.IIIa, S.IIIb, S.IV, S.VI should be limited to laboratory notebooks since abbreviation (*S.*) of a genus name (*Salmonella*) cannot stand alone without being followed by a specific epithet (*S. enterica*).

Differential characters of *Salmonella* species and subspecies

Species	<i>S. enterica</i>						<i>S. bongori</i>
	<i>enterica</i>	<i>salamae</i>	<i>arizonae</i>	<i>diarizonae</i>	<i>houtenae</i>	<i>indica</i>	
Characters							
Dulcitol	+	+	-	-	-	d	+
ONPG (2 h)	-	-	+	+	-	d	+
Malonate	-	+	+	+	-	-	-
Gelatinase	-	+	+	+	+	+	-
Sorbitol	+	+	+	+	+	-	+
Growth with KCN	-	-	-	-	+	-	+
L(+)-tartrate ^(a)	+	-	-	-	-	-	-
Galacturonate	-	+	-	+	+	+	+
γ -glutamyltransferase	+(*)	+	-	+	+	+	+
β -glucuronidase	d	d	-	+	-	d	-
Mucate	+	+	+	-(70%)	-	+	+
Salicine	-	-	-	-	+	-	-
Lactose	-	-	-(75%)	+(75%)	-	d	-
Lysed by phage O1	+	+	-	+	-	+	d
Usual habitat	Warm-blooded animals		Cold-blooded animals and environment				

(a) = *d*-tartrate.

(*) = Typhimurium d, Dublin -.

+ = 90 % or more positive reactions.

- = 90 % or more negative reactions.

d = different reactions given by different serovars.

L. Le Minor, M. Véron, M. Popoff. *Ann. Microbiol. (Inst. Pasteur)*, 1982, **133 B**, 223-243 and 245-254.

L. Le Minor, M.Y. Popoff, B. Laurent, D. Hermant. *Ann. Inst. Pasteur/Microbiol.*, 1986, **137 B**, 211-217.

Changes in serovar nomenclature

Some names appearing in previous editions of the scheme were deleted:

- those given to variants converted by lysogenization: *e.g.*, Newhaw is now called Muenster var. 15₊, Arkansas is now called Muenster var. 15₊,34₊ as they correspond to variants of serovar Muenster converted by phage ϵ_{15} or by phages $\epsilon_{15}+\epsilon_{34}$, respectively. The position of these converted variants is essentially the same as the position of group O:4 (B) strains which express after conversion, factor 1 and for which no new name had been proposed.
- those given before 1966 to serovars later found not to belong to subspecies *enterica*.

These names, suppressed from the scheme, are listed in appendix II. These names have only a historic interest. This appendix also lists the names of serovars which have been combined with serovars kept in the scheme. For example, Pullorum is considered as one among the biovars of serovar Gallinarum (identical 1,9,12:-:- formula).

Designation of the O groups.

Historically, O groups were first designated by letters. Since there were not enough letters, it was necessary to continue with numbers 51 to 67. It is now more logical to designate each O group using the characteristic O factor. Letters are provisionally kept into brackets. Ex. O:4 (B); O:18 (K). It is advisable to abandon designation-by-letter which is unnecessary.

Old and new designations :

Old	New	Old	New	Old	New
A	2	G ₁ -G ₂	13	Q	39
B	4	H	6,14	R	40
C ₁ -C ₄	6,7	I	16	S	41
C ₂ -C ₃	8	J	17	T	42
D ₁	9	K	18	U	43
D ₂	9,46	L	21	V	44
D ₃	9,46,27	M	28	W	45
E ₁ -E ₂ -E ₃	3,10	N	30	X	47
E ₄	1,3,19	O	35	Y	48
F	11	P	38	Z	50

Case of factor O:27 in group O:4

Production of factor O:27 in group O:4 was thought to be determined by a converting phage. Therefore, in 1983, several pairs of serovars differing only by the presence of factor O:27 were combined into single serovars. Reeves and coworkers (*J Bacteriol.* 2002. 184 :1669-1677) showed that production of factor O:27 is in fact due to gene *wzy*_{α(1-6)} located within the major O-antigen cluster on the bacterial chromosome. To take this into account, we suppressed underlining for this factor and provisionally print factor O :27 into brackets – [27] – to indicate variability when a named serotype includes both formulae (with and without O :27). Population genetic methods will be used before any further revision of the antigenic formula nomenclature associated with factor O:27.

Case of group O:54

Heterogenous group O:54 is provisionally kept. It has been demonstrated that O factor 54 is plasmid-determined in 8 serovars. If the plasmid is lost, factor O:54 is no longer expressed (*Ann. Inst. Pasteur*, 1985, **136 B**, 169-179). The serovars listed below may be considered:

Tonev	as a variant	54+	of Minnesota
Winnipeg	as a variant	54+	of Ferruch
Poeseldorf	as a variant	54+	of Kentucky
Ochsenwerder	as a variant	54+	of Thompson
Steinwerder	as a variant	54+	of Orion var. <u>15+</u>
Canton	as a variant	54+	of Hadar
Barry	as a variant	54+	of Mbandaka
Newholland	as a variant	54+	of Banana

Otherwise the formula of Uccle (3,54:g,s,t:-) corresponds to the formula of an undescribed serovar 3...:g,s,t:-. As Orion var 15₊, Steinwerder can express both factors 34 and 12₂ after conversion by phage ε₃₄.

Flagellar (H) antigens of the e,n,x/e,n,z₁₅ complex

Composition of H antigens e,n,x and e,n,z₁₅

<i>Salmonella</i>	H formula in scheme	Actual H factors	Factor x present
<i>S. enterica</i> subsp. <i>enterica</i>	e,n,x	e,n,x,z ₁₆	+
	e,n,x	e,n,x,z ₁₇ (very rare)	+
	e,n,z ₁₅	e,n,z ₁₅ ,z ₁₇	-
	e,n,x,z ₁₅	e,n,z ₁₅ ,z ₁₆	-
<i>S. enterica</i> subsp. <i>salamae</i>	e,n,x	e,n,z ₁₆	-
	e,n,z ₁₅	e,n,z ₁₅ ,z ₁₇	-
	e,n,x,z ₁₅	e,n,z ₁₅ ,z ₁₆	-
<i>S. enterica</i> subsp. <i>diarizonae</i>	e,n,x	e,n,z ₁₆	-
	e,n,x,z ₁₅	e,n,z ₁₅ ,z ₁₆	-
<i>S. enterica</i> subsp. <i>houtenae</i>	e,n,x	e,n,x,z ₁₇	+
<i>S. enterica</i> subsp. <i>indica</i>	e,n,x	e,n,x,z ₁₇	+
<i>S. bongori</i>	e,n,z ₁₅	e,n,z ₁₅ ,z ₁₇	-

Most e,n,x phases of *S. enterica* subsp. *enterica* (subspecies I) strains contain both factors x and z₁₆, and their formula is in fact e,n,x,z₁₆. Exceptionnally, e,n,x phases can occur without z₁₆ and with z₁₇. In contrast, factor x never occurs in strains of subspecies *salamae* (II) and *diarizonae* (IIIb) even if the WKLM scheme indicates e,n,x or e,n,x,z₁₅. The so-called factor x in their formula is in fact z₁₆.

All e,n,z₁₅ phases have, in addition, factor z₁₇. Factor z₁₇ never occurs with e,n,x,z₁₅ (which is in fact, e,n,z₁₅,z₁₆).

Differential characters of serovars having the same global antigenic formula

Historically, different names have been given to serovars having the same antigenic formula and differing by either biochemical characters, pathogenicity, or habitat.

• **Differentiation of serovars with formula 6,7:c:1,5 (Table below)**

	Dulcitol	H ₂ S	Mucate	Agglutination of H:c in sera		
				S1	S2	S3
Paratyphi C (Vi ⁺ or Vi ⁻)	+	+	-	-	-	+
Choleraesuis	-	-	-	-	+	-
Choleraesuis var. Kunzendorf	-	+	-	-	+	+
Choleraesuis var. Decatur	+	+	+	+	+	+
Typhisuis	-	-	-	-	+	+

S1 = Serum anti-Choleraesuis var. Decatur absorbed with Choleraesuis var. Kunzendorf.

S2 = Serum anti-Choleraesuis var. Decatur absorbed with Paratyphi C.

S3 = Serum anti-Choleraesuis var. Decatur absorbed with Choleraesuis.

Typhisuis is a serovar adapted to pigs. Colonies are small. Dulcitol, L(= *d*)tartrate negative in contrast to the four other serovars.

Le Minor L. et al. *Ann Inst. Pasteur/Microbiol.*, 1985, **136 B**, 225-234.

• **Differentiation of serovars with formula 1,9,12:a:1,5**

Serovars Miami and Sendai are both kept in this scheme because they might be different. Biochemical characters formerly used for their differentiation (xylose, arabinose, rhamnose, H₂S) can only be used to define biovars. The differentiation is now based on an essential character : Sendai, which is adapted to man, is auxotrophic, i.e. does not grow on a minimal medium with glucose or on Simmons's citrate agar. On the contrary, Miami, which is ubiquitous, is prototrophic, i.e. grows on such minimal media.

• **Differentiation of serovars with formula 4,12 :a :1,5**

Serovars Hessarek (4,12,[27] :a :1,5) and Fulica (4,[5],12 :a :[1,5]), which formula could be similar, are not combined because they differ by biochemical characters. Rhamnose, gas production from glucose, dulcitol, trehalose, Simmons citrate, L(+) tartrate (= *d*-tartrate), mucate, H₂S, and tetrathionate-reductase are positive for Hessarek and negative for Fulica. This latter serovar is very rare.

Presentation of the scheme. Symbols

In the first column of the table, are reported:

- the name of the serovar for *S. enterica* subsp. *enterica*;
- for other subspecies of *S. enterica*, the subspecies to which belongs the serovar is indicated by the following symbol:
 - II for serovar of *S. enterica* subsp. *salamae*
 - IIIa for serovar of *S. enterica* subsp. *arizonae*
 - IIIb for serovar of *S. enterica* subsp. *diarizonae*
 - IV for serovar of *S. enterica* subsp. *houtenae*
 - VI for serovar of *S. enterica* subsp. *indica*
- for serovars of *S. bongori*, symbol “V” was retained to avoid confusion with serovar names of *S. enterica* subsp. *enterica*.

The subfactors of O factors 40, 47, 48 and 50 are no longer mentioned as their identification is unnecessary in current practice. O and H factors having the same symbol in the White-Kauffmann-Le Minor scheme are always related, but not always identical in different serovars. This table of antigenic formulae is a scheme designed for identification purposes. Details that are unnecessary for the identification of serovars are not given in this scheme.

 = Underlined O factors are determined by phage conversion (e.g. 6,14,18). They are present only if the culture is lysogenized by the corresponding converting phage. These factors are added to the factors present in non-converted strain (for example 6,7 → 6,7,14) except in group O :3,10 (see below). These underlined factors are mentioned in the table for serovars in which they were found. It is probable that this situation may be encountered for all serovars in the same O group.

{ } = O-factors indicated in curly brackets are exclusive. In a given serovar, factors in curly brackets cannot coexist with other factors in curly brackets. Some factors may be phage-determined (underlined). In group O:3,10, factors O:15 or O:15,34, when present, replace O:10. To indicate this fact, the following symbols are used, O :3,{10},{15},{15,34}.

[] = O (not underlined) or H factor that may be present or absent without relation to phage conversion. Example : factor [5] of group O:4 (B). When H factors are in square brackets, this means that they are exceptionally found in wild strains. For example, most strains of Paratyphi A possess a monophasic antigen phase 1 (a). In rare cases, diphasic strains with phase 2 H:1,5 may be isolated. For this reason, [1,5] is mentioned in square brackets in the formula of this serovar.

() = O or H factor weakly agglutinable. H factor k, in *S. enterica* subsp. *arizonae*, is weakly agglutinable by the standard k serum (prepared against *S. enterica* subsp. *enterica*), but is normally agglutinable by polyvalent k serum (see "Guidelines for the preparation of *Salmonella* antisera").

Groups formerly called C₄ (O:6,7,14), E₂ (O:3,15), and E₃ (O:3,15,34) contained respectively serovars of group C₁ lysogenized by phage 14 (O:6,7 → O:6,7,14), and serovars of groups E₁

lysogenized by phage ϵ_{15} (O:3,10 \rightarrow O:3,15), or by phages ϵ_{15} and ϵ_{34} (O:3,10 \rightarrow O:3,15,34). Serovars of these groups are included in group O:7 (C₁) and O:3,10 (E₁).

Presence or absence of accessory O factors (underlined or in square brackets) does not interfere with serovar identification. These factors are only interesting as epidemiological markers within a given serovar.

Lower case letter "l" and number "1" are difficult to distinguish in print. Associated with another letter, it is letter "ell" (e.g. l,w). When associated with a number, it is number "one" (ex. 1,2).

Designation of "R phases" of H antigens.

These "abnormal" specificities of H antigens described by Kauffmann and first reported by him for Typhi (*Z. Hyg.*, 1936, **119**, 103) were designated by R followed by the factor symbol, e.g. R_j for Typhi, R_{Z₅₀} for Muenchen. The genetic basis of these « R phases » is only known in a few cases. Factor j is the product of gene *fliC-j* which is Typhi *fliC-d* with a 261-nucleotide deletion. Factor z₆₆ of Typhi is an additional phase (coded by neither *fliC* nor *fljB*) the gene of which is on a plasmid (Baker, S. et al., 2007, PLoS Pathogens, 3 :e59). In the scheme, three columns are now devoted to H antigens, and R phases and third phases are given in the third column. Since many R phases are agglutinable by anti-1,2 - 1,5 - 1,6 - 1,7 sera but not by anti-2 - 5 - 6 - 7 sera, these are now all designated by R1. The subdivision R1,10 - R1,11 ... is no longer used, being of little interest.

"R phases" of H antigens are uncommon. Their identification is usually done only by Reference Centres. However, corresponding antisera are useful for phase inversion.

Information and references concerning the first isolation of each serovar.

They were collected in two books by E. Kelterborn:

- *Salmonella*-species. S. Hirzel, Leipzig, GDR, 1967.
- Catalogue of *Salmonella* first isolation 1965-1984. Gustav Fisher, Iena. GDR, 1987.

Present number of serovars in each species and subspecies

<i>S. enterica</i>	2 557
<i>S. enterica</i> subsp. <i>enterica</i>	1 531
<i>S. enterica</i> subsp. <i>salamae</i>	505
<i>S. enterica</i> subsp. <i>arizonae</i>	99
<i>S. enterica</i> subsp. <i>diarizonae</i>	336
<i>S. enterica</i> subsp. <i>houtenae</i>	73
<i>S. enterica</i> subsp. <i>indica</i>	13
<i>S. bongori</i>	22
Total (genus <i>Salmonella</i>)	2 579

WHITE-KAUFFMANN-LE MINOR SCHEME

ANTIGENIC FORMULAE

VALIDATED AS OF JANUARY 1st, 2007

Group O:2 (A)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Paratyphi A	<u>1</u> ,2,12	a	[1,5]	
Nitra	2,12	g,m	–	
Kiel	<u>1</u> ,2,12	g,p	–	
Koessen	2,12	l,v	1,5	

Group O:4 (B)

Presentation of factor O:27 was modified. See page 8.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Kisangani	<u>1</u> ,4,[5],12	a	1,2	
Hessarek ¹	4,12,[27]	a	1,5	
Fulica ¹	4,[5],12	a	[1,5]	
Arechavaleta	4,[5],12	a	1,7	
Bispebjerg	<u>1</u> ,4,[5],12	a	e,n,x	
Tinda	<u>1</u> ,4,12,27	a	e,n,z ₁₅	
II	<u>1</u> ,4,[5],12,[27]	a	e,n,x	
Huettwilen	<u>1</u> ,4,12	a	l,w	
Nakuru	<u>1</u> ,4,12,27	a	z ₆	
II	<u>1</u> ,4,12,[27]	a	z ₃₉	
Paratyphi B ²	<u>1</u> ,4,[5],12	b	1,2	[z ₅],[z ₃₃]
Limete	<u>1</u> ,4,12,[27]	b	1,5	
II	4,12	b	1,5	
Canada	4,12,[27]	b	1,6	
Uppsala	<u>1</u> ,4,12,27	b	1,7	
Abony	<u>1</u> ,4,[5],12,[27]	b	e,n,x	
II	<u>1</u> ,4,[5],12,[27]	b	[e,n,x]	
Wagenia	<u>1</u> ,4,12,27	b	e,n,z ₁₅	
Wien	<u>1</u> ,4,12,[27]	b	l,w	
Tripoli	<u>1</u> ,4,12,27	b	z ₆	
Schleissheim ³	4,12,27	b	–	
Legon	<u>1</u> ,4,12,[27]	c	1,5	
Abortusovis	4,12	c	1,6	
Altendorf	4,12,[27]	c	1,7	
Bissau	4,12	c	e,n,x	
Jericho	<u>1</u> ,4,12,27	c	e,n,z ₁₅	
Hallfold	<u>1</u> ,4,12,27	c	l,w	
Bury	4,12,27	c	z ₆	
Stanley	<u>1</u> ,4,[5],12,[27]	d	1,2	
Eppendorf	<u>1</u> ,4,12,[27]	d	1,5	
Brezany	<u>1</u> ,4,12,27	d	1,6	

Schwarzengrund	<u>1</u> ,4,12,27	d	1,7	
II	4,12	d	e,n,x	
Sarajane	<u>1</u> ,4,[5],12,[27]	d	e,n,x	
Duisburg	<u>1</u> ,4,12,[27]	d	e,n,z ₁₅	[e,h]
Mons	<u>1</u> ,4,12,27	d	l,w	
Ayinde	<u>1</u> ,4,12,27	d	z ₆	
Chennai	4,12	d	z ₃₅	
Saintpaul	<u>1</u> ,4,[5],12	e,h	1,2	
Reading ⁴	<u>1</u> ,4,[5],12	e,h	1,5	[R1...]
Eko	4,12	e,h	1,6	
Kaapstad	4,12	e,h	1,7	
Chester	<u>1</u> ,4,[5],12	e,h	e,n,x	
Sandiego	<u>1</u> ,4,[5],12	e,h	e,n,z ₁₅	
Chartres	<u>1</u> ,4,12	e,h	l,w	
II	4,12	e,n,x	1,2,7	
II	<u>1</u> ,4,12,[27]	e,n,x	1,[5],7	
Derby	<u>1</u> ,4,[5],12	f,g	[1,2]	
Agona	<u>1</u> ,4,[5],12	f,g,s	[1,2]	[z ₂₇],[z ₄₅]
II	<u>1</u> ,4,[5],12	f,g,t	z ₆	z ₄₂
Essen	4,12	g,m	–	
Hato	<u>1</u> ,4,[5],12	g,m,s	[1,2]	
II	<u>1</u> ,4,12,[27]	g,[m],[s],t	e,n,x	
II	<u>1</u> ,4,12,[27]	g,[m],t	[1,5]	
II	4,12	g,m,t	z ₃₉	
California	4,12	g,m,t	[z ₆₇]	
Kingston	<u>1</u> ,4,[5],12,[27]	g,s,t	[1,2]	[z ₄₃]
Budapest	<u>1</u> ,4,12,[27]	g,t	–	
Travis	4,[5],12	g,z ₅₁	1,7	
Tennyson	4,[5],12	g,z ₅₁	e,n,z ₁₅	
II	4,12	g,z ₆₂	–	
Banana	<u>1</u> ,4,[5],12	m,t	[1,5]	
Madras	4,[5],12	m,t	e,n,z ₁₅	
Typhimurium	<u>1</u> ,4,[5],12	i	1,2	
Lagos	<u>1</u> ,4,[5],12	i	1,5	
Agama	4,12	i	1,6	
Farsta	4,12	i	e,n,x	
Tsevie	<u>1</u> ,4,12	i	e,n,z ₁₅	
Gloucester	<u>1</u> ,4,12,27	i	l,w	
Tumodi	<u>1</u> ,4,12	i	z ₆	
II	4,12,27	i	z ₃₅	
Massenya	<u>1</u> ,4,12,27	k	1,5	

Neumuenster	<u>1</u> ,4,12,27	k	1,6	
II	<u>1</u> ,4,12,27	k	1,6	
Ljubljana	4,12,27	k	e,n,x	
Texas	4,[5],12	k	e,n,z ₁₅	
Fyris	4,[5],12	l,v	1,2	
Azteca	4,[5],12,[27]	l,v	1,5	
Clackamas	4,12	l,v	1,6	
Bredeney	<u>1</u> ,4,12,27	l,v	1,7	[z ₄₀]
Kimuenza	<u>1</u> ,4,12,27	l,v	e,n,x	
II	<u>1</u> ,4,12,27	l,v	e,n,x	
Brandenburg	4,[5],12	l,v	e,n,z ₁₅	
II	<u>1</u> ,4,12,27	l,v	z ₃₉	
Mono	4,12	l,w	1,5	
Togo	4,12	l,w	1,6	
II	4,12	l,w	e,n,x	
Blancmesnil	4,12	l,w	e,n,z ₁₅	
Ayton	<u>1</u> ,4,12,27	l,w	z ₆	
Kunduchi	<u>1</u> ,4,[5],12,[27]	l,[z ₁₃],[z ₂₈]	1,2	
Tyresoe	<u>1</u> ,4,12,[27]	l,[z ₁₃],z ₂₈	1,5	
Haduna	4,12	l,z ₁₃ ,[z ₂₈]	1,6	
Kubacha	<u>1</u> ,4,12,27	l,z ₁₃ ,z ₂₈	1,7	
Kano	<u>1</u> ,4,12,27	l,z ₁₃ ,z ₂₈	e,n,x	
Vom	<u>1</u> ,4,12,27	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Reinickendorf	4,12	l,z ₂₈	e,n,x	
II	<u>1</u> ,4,12	l,z ₂₈	[e,n,x]	
Heidelberg	<u>1</u> ,4,[5],12	r	1,2	
Bradford	4,12,[27]	r	1,5	
Winneba	4,12	r	1,6	
Remo	<u>1</u> ,4,12,27	r	1,7	
Bochum	<u>1</u> ,4,[5],12	r	l,w	
Southampton	4,12,27	r	z ₆	
Drogana	<u>1</u> ,4,12,27	r,[i]	e,n,z ₁₅	
Africana	4,12	r,i	l,w	
Coeln	<u>1</u> ,4,[5],12	y	1,2	
Trachau	4,12,27	y	1,5	
Finaghy	4,12	y	1,6	
Teddington	<u>1</u> ,4,12,27	y	1,7	
Ball	<u>1</u> ,4,[5],12,[27]	y	e,n,x	
Jos	<u>1</u> ,4,12,27	y	e,n,z ₁₅	
Kamoru	<u>1</u> ,4,12,27	y	z ₆	
Shubra	4,[5],12	z	1,2	

Kiambu	<u>1</u> ,4,12	Z	1,5
II	<u>1</u> ,4,12,27	Z	1,5
Loubomo	4,12	Z	1,6
Indiana	<u>1</u> ,4,12	Z	1,7
II	4,12	Z	1,7
Neftenbach	4,12	Z	e,n,x
II	<u>1</u> ,4,12,27	Z	e,n,x
Koenigstuhl	<u>1</u> ,4,[5],12	Z	e,n,Z ₁₅
Preston	<u>1</u> ,4,12	Z	l,w
Entebbe	<u>1</u> ,4,12,27	Z	Z ₆
II	4,12	Z	Z ₃₉
Stanleyville	<u>1</u> ,4,[5],12,[27]	Z ₄ ,Z ₂₃	[1,2]
Vuadens	4,12,27	Z ₄ ,Z ₂₃	Z ₆
Kalamu	<u>1</u> ,4,[5],12	Z ₄ ,Z ₂₄	[1,5]
Haifa	<u>1</u> ,4,[5],12	Z ₁₀	1,2
Ituri	<u>1</u> ,4,12	Z ₁₀	1,5
Tudu	4,12	Z ₁₀	1,6
Albert	4,12	Z ₁₀	e,n,x
Tokoin	4,12	Z ₁₀	e,n,Z ₁₅
Mura	<u>1</u> ,4,12	Z ₁₀	l,w
Fortune	<u>1</u> ,4,12,[27]	Z ₁₀	Z ₆
Vellore	<u>1</u> ,4,12,27	Z ₁₀	Z ₃₅
Brancaster	<u>1</u> ,4,12,27	Z ₂₉	–
II	<u>1</u> ,4,12	Z ₂₉	e,n,x
Pasing	4,12	Z ₃₅	1,5
Tafo	<u>1</u> ,4,12,27	Z ₃₅	1,7
Sloterdijk	<u>1</u> ,4,12,27	Z ₃₅	Z ₆
Yaounde	<u>1</u> ,4,12,27	Z ₃₅	e,n,Z ₁₅
Tejas	4,12	Z ₃₆	–
Wilhelmsburg	<u>1</u> ,4,[5],12,[27]	Z ₃₈	[e,n,Z ₁₅]
II	<u>1</u> ,4,12,[27]	Z ₃₉	1,[5],7
Thayngen	<u>1</u> ,4,12,27	Z ₄₁	1,(2),5
Maska	<u>1</u> ,4,12,27	Z ₄₁	e,n,Z ₁₅
Abortusequi	4,12	–	e,n,x
Mygdal	4,12	Z ₉₁	–

- 1 Rhamnose, gas from glucose, dulcitol, trehalose, Simmons citrate, L(+) tartrate (= d-tartrate), mucate, H₂S, and tetrathionate-reductase : + for Hessarek, – for Fulica. This latter serovar is very rare.
- 2 L(+) tartrate (= d-tartrate) positive variant is often referred to as var. Java.
- 3 Gelatinase +, dulcitol –.
- 4 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:7 (C₁)

Strains in this group can be lysogenized by phage 14 (O:6,7 → O:6,7,14, former group C₄).

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Sanjuan	6,7	a	1,5	
II	6,7, <u>14</u>	a	1,5	
Umhlali	6,7	a	1,6	
Austin	6,7	a	1,7	
Oslo	6,7, <u>14</u>	a	e,n,x	
Denver	6,7	a	e,n,z ₁₅	
Coleypark	6,7, <u>14</u>	a	l,w	
Damman	6,7, <u>14</u>	a	z ₆	
II	6,7	a	z ₆	
II	6,7	a	z ₄₂	
Brazzaville	6,7	b	1,2	
Edinburg	6,7, <u>14</u>	b	1,5	
Adime	6,7	b	1,6	
Koumra	6,7	b	1,7	
Lockleaze	6,7, <u>14</u>	b	e,n,x	
Georgia	6,7	b	e,n,z ₁₅	
II	6,7	b	[e,n,x]	z ₄₂
Ohio	6,7, <u>14</u>	b	l,w	[z ₅₉]
Leopoldville	6,7, <u>14</u>	b	z ₆	
Kotte	6,7	b	z ₃₅	
II	6,7	b	z ₃₉	
Hissar	6,7, <u>14</u>	c	1,2	
Paratyphi C ¹	6,7,[Vi]	c	1,5	
Choleraesuis ¹	6,7	c	1,5	
Typhisuis ¹	6,7	c	1,5	
Birkenhead	6,7	c	1,6	
Schwabach	6,7	c	1,7	
Cotonou	6,7	c	z ₆	
Namibia	6,7	c	e,n,x	
Kaduna	6,7, <u>14</u>	c	e,n,z ₁₅	
Kisii	6,7	d	1,2	
Isangi	6,7, <u>14</u>	d	1,5	

Kivu	6,7	d	1,6	
Kambole	6,7	d	1,[2],7	
Amersfoort	6,7, <u>14</u>	d	e,n,x	
Gombe	6,7, <u>14</u>	d	e,n,z ₁₅	
Livingstone	6,7, <u>14</u>	d	l,w	
Wil	6,7	d	l,z ₁₃ ,z ₂₈	
Nieukerk	6,7, <u>14</u>	d	z ₆	
II	6,7	d	z ₄₂	
Larochelle	6,7	e,h	1,2	
Lomita	6,7	e,h	1,5	
Norwich	6,7	e,h	1,6	
Nola	6,7	e,h	1,7	
Braenderup	6,7, <u>14</u>	e,h	e,n,z ₁₅	
II	6,7	e,n,x	1,6	z ₄₂
Kastrup	6,7	e,n,z ₁₅	1,6	
Rissen	6,7, <u>14</u>	f,g	–	
Eingedi	6,7	f,g,t	1,2,7	
Afula	6,7	f,g,t	e,n,x	
Montevideo ²	6,7, <u>14</u>	g,m,[p],s	[1,2,7]	
II	6,7	g,m,[s],t	e,n,x	
II	6,7	(g),m,[s],t	1,5	
II	6,7	g,m,s,t	z ₃₉	
II	6,7	g,[m],s,t	[z ₄₂]	
Othmarschen	6,7, <u>14</u>	g,m,[t]	–	
Plumaugat	6,7	g,s,q	–	
Menston	6,7	g,s,[t]	[1,6]	
II	6,7	g,t	[e,n,x]	z ₄₂
Riggil	6,7	g,(t)	–	
Alamo	6,7	g,z ₅₁	1,5	
Larose	6,7	g,z ₅₁	e,n,z ₁₅	
IV	6,7	g,z ₅₁	–	
Haelsingborg	6,7	m,p,t,[u]	–	
Winston	6,7	m,t	1,6	
Oakey	6,7	m,t	z ₆₄	
II	6,7	m,t	–	
Oranienburg	6,7, <u>14</u>	m,t	[z ₅₇]	
Augustenborg	6,7, <u>14</u>	i	1,2	
Oritamerin	6,7	i	1,5	
Garoli	6,7	i	1,6	
Lika	6,7	i	1,7	
Athinai	6,7	i	e,n,z ₁₅	

Norton	6,7	i	l,w	
Stuttgart	6,7,14	i	z ₆	
Galiema	6,7,14	k	1,2	
Thompson ³	6,7,14	k	1,5	[R1...]
Daytona	6,7	k	1,6	
Baiboukoum	6,7	k	1,7	
Singapore	6,7	k	e,n,x	
Escanaba	6,7	k	e,n,z ₁₅	
IIIb	6,7	(k)	z	[z ₅₅]
II	6,7	k	[z ₆]	
Concord	6,7	l,v	1,2	
Irumu	6,7	l,v	1,5	
IIIb	6,7	l,v	1,5,7	
Mkamba	6,7	l,v	1,6	
Kortrijk	6,7	l,v	1,7	
Bonn	6,7	l,v	e,n,x	
Potsdam	6,7,14	l,v	e,n,z ₁₅	
Gdansk	6,7,14	l,v	z ₆	
Coromandel	6,7	l,v	z ₃₅	
IIIb	6,7	l,v	z ₅₃	
Gabon	6,7	l,w	1,2	
Colorado	6,7	l,w	1,5	
II	6,7	l,w	1,5,7	
Langeveld	6,7	l,w	e,n,z ₁₅	
II	6,7	l,w	z ₄₂	
Nessziona	6,7	l,z ₁₃	1,5	
Kenya	6,7	l,z ₁₃	e,n,x	
Neukoelln	6,7	l,z ₁₃ ,[z ₂₈]	e,n,z ₁₅	
Makiso	6,7	l,z ₁₃ ,z ₂₈	z ₆	
Strathcona	6,7	l,z ₁₃ ,z ₂₈	1,7	
II	6,7	l,z ₂₈	1,5	[z ₄₂]
II	6,7	l,z ₂₈	e,n,x	
II	6,7	l,z ₂₈	z ₆	
Virchow	6,7,14	r	1,2	
Infantis ³	6,7,14	r	1,5	[R1...],[z ₃₇],[z ₄₅],[z ₄₉]
Nigeria	6,7	r	1,6	
Colindale	6,7	r	1,7	
Papua	6,7	r	e,n,z ₁₅	
Grampian	6,7	r	l,w	
Richmond	6,7	y	1,2	
Bareilly	6,7,14	y	1,5	

Oyonnax	6,7	y	1,6	
Gatow	6,7	y	1,7	
Hartford	6,7	y	e,n,x	[z ₆₇]
Mikawasima	6,7,14	y	e,n,z ₁₅	[z ₄₇],[z ₅₀]
Chile	6,7	z	1,2	
Poitiers	6,7	z	1,5	
II	6,7	z	1,5	
Oakland	6,7	z	1,6,[7]	
Cayar	6,7	z	e,n,x	
II	6,7	z	e,n,x	
Businga	6,7	z	e,n,z ₁₅	
Bruck	6,7	z	l,w	
II	6,7	z	z ₆	
II	6,7	z	z ₃₉	
II	6,7	z	z ₄₂	
Obogu	6,7	z ₄ ,z ₂₃	1,5	
Planckendael	6,7	z ₄ ,z ₂₃	1,6	
Aequatoria	6,7	z ₄ ,z ₂₃	e,n,z ₁₅	
Goma	6,7	z ₄ ,z ₂₃	z ₆	
II	6,7	z ₄ ,z ₂₃	–	
IV	6,7	z ₄ ,z ₂₃	–	
II	6,7	z ₄ ,z ₂₄	z ₄₂	
Somone	6,7	z ₄ ,z ₂₄	–	
IV	6,7	z ₄ ,z ₂₄	–	
II	6,7	z ₆	1,7	
Menden	6,7	z ₁₀	1,2	
Inganda	6,7	z ₁₀	1,5	
Eschweiler	6,7	z ₁₀	1,6	
Ngili	6,7	z ₁₀	1,7	
Djugu	6,7	z ₁₀	e,n,x	
Mbandaka	6,7,14	z ₁₀	e,n,z ₁₅	[z ₃₇],[z ₄₅]
Jerusalem	6,7,14	z ₁₀	l,w	
Redba	6,7	z ₁₀	z ₆	
Omuna	6,7	z ₁₀	z ₃₅	
Tennessee	6,7,14	z ₂₉	[1,2,7]	
II	6,7	z ₂₉	[z ₄₂]	
Tienba	6,7	z ₃₅	1,6	
Palime	6,7	z ₃₅	e,n,z ₁₅	
Tampico	6,7	z ₃₆	e,n,z ₁₅	
II	6,7	z ₃₆	z ₄₂	
IV	6,7	z ₃₆	–	

Rumford	6,7	Z ₃₈	1,2	[Z ₈₂]
Lille	6,7, <u>14</u>	Z ₃₈	—	[Z ₈₂]
IIIb	6,7, <u>14</u>	Z ₃₉	1,2	
II	6,7	Z ₃₉	1,5,7	
VI	6,7	Z ₄₁	1,7	
Hillsborough	6,7	Z ₄₁	1,w	
Tamilnadu	6,7	Z ₄₁	Z ₃₅	
II	6,7	Z ₄₂	1,[5],7	
Bulovka	6,7	Z ₄₄	—	
II	6,7	—	1,6	

- 1 See table "Differential characters of serovars having the same global antigenic formula" (chapter Taxonomy and nomenclature of the genus *Salmonella*).
- 2 Plasmid-controlled factor O:54 may occur and mask factors O:6,7,14
- 3 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:8 (C₂-C₃)

Groups O:6,8 (C₂) and O:8 (C₃) which differed only by the presence or absence of factor O:6, were lumped together in a single group O:8.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Be	8, <u>20</u>	a	[z ₆]	
Valdosta	6,8	a	1,2	
Doncaster	6,8	a	1,5	
Curacao	6,8	a	1,6	
Nordufer	6,8	a	1,7	
Narashino	6,8	a	e,n,x	
II	6,8	a	e,n,x	
Leith	6,8	a	e,n,z ₁₅	
II	6,8	a	z ₃₉	
II	6,8	a	z ₅₂	
Djelfa	8	b	1,2	
Skansen	6,8	b	1,2	
Korbol	8, <u>20</u>	b	1,5	
Nagoya	6,8	b	1,5	
II	6,8	b	1,5	
Stourbridge	6,8	b	1,6	
Sanga	8	b	1,7	
Eboko	6,8	b	1,7	
Konstanz	8	b	e,n,x	
Gatuni	6,8	b	e,n,x	
Shiple	8, <u>20</u>	b	e,n,z ₁₅	
Presov	6,8	b	e,n,z ₁₅	
Bukuru	6,8	b	1,w	
Heistopdenberg	8, <u>20</u>	b	1,w	
Tounouma	8, <u>20</u>	b	z ₆	
Banalia	6,8	b	z ₆	
Wingrove	6,8	c	1,2	
Gaillac	8, <u>20</u>	c	1,5	
Utah	6,8	c	1,5	
Bronx	6,8	c	1,6	
Belfast	6,8	c	1,7	

Alexanderpolder	8	c	l,w	
Santiago	8, <u>20</u>	c	e,n,x	
Belem	6,8	c	e,n,x	
Quiniela	6,8	c	e,n,z ₁₅	
Tado	8, <u>20</u>	c	z ₆	
Virginia	8	d	1,2	
Muenchen	6,8	d	1,2	[z ₆₇]
Yovokome	8, <u>20</u>	d	1,5	
Manhattan	6,8	d	1,5	[z ₅₈]
Portanigra	8, <u>20</u>	d	1,7	
Dunkwa	6,8	d	1,7	
Sterrenbos	6,8	d	e,n,x	
Herston	6,8	d	e,n,z ₁₅	
Labadi	8, <u>20</u>	d	z ₆	
II	6,8	d	z ₆	z ₄₂
Bardo	8	e,h	1,2	
Newport	6,8, <u>20</u>	e,h	1,2	[z ₆₇], [z ₇₈]
Ferruch	8	e,h	1,5	
Kottbus	6,8	e,h	1,5	
Cremieu ¹	6,8	e,h	1,6	[R1...]
Atakpame	8, <u>20</u>	e,h	1,7	
Fillmore	6,8	e,h	e,n,x	
Tshiongwe	6,8	e,h	e,n,z ₁₅	
Rechovot	8, <u>20</u>	e,h	z ₆	
Sadow	6,8	f,g	e,n,z ₁₅	
II	6,8	f,g,m,t	[e,n,x]	
Emek	8, <u>20</u>	g,m,s	–	
Chincol	6,8	g,m,[s]	[e,n,x]	
II	6,8	g,m,t	1,7	
Reubeuss	8, <u>20</u>	g,m,t	–	
Alminko	8, <u>20</u>	g,s,t	–	
Nanergou	6,8	g,s,t	–	
Yokoe	8, <u>20</u>	m,t	–	
II	6,8	m,t	1,5	
II	6,8	m,t	e,n,x	
Bassa	6,8	m,t	–	
Lindenbug	6,8	i	1,2	
Bargny	8, <u>20</u>	i	1,5	
Takoradi	6,8	i	1,5	
Warnow	6,8	i	1,6	
Malmoe	6,8	i	1,7	

Bonariensis	6,8	i	e,n,x	
Aba	6,8	i	e,n,z ₁₅	
Magherafelt	8, <u>20</u>	i	l,w	
Cyprus	6,8	i	l,w	
Kentucky	8, <u>20</u>	i	z ₆	
Kallo	6,8	k	1,2	
Haardt	8	k	1,5	
Blockley	6,8	k	1,5	[z ₅₈]
Schwerin	6,8	k	e,n,x	
Charlottenburg	6,8	k	e,n,z ₁₅	
IIIb	8	(k)	z ₃₅	
Pakistan	8	l,v	1,2	
Litchfield	6,8	l,v	1,2	
Loanda	6,8	l,v	1,5	
Amherstiana	8	l,v	1,6	
Manchester	6,8	l,v	1,7	
Holcomb	6,8	l,v	e,n,x	
II	6,8	l,v	e,n,x	
Edmonton	6,8	l,v	e,n,z ₁₅	
Lund	6,8	l,v	z ₆	
Fayed	6,8	l,w	1,2	
II	6,8	l,w	z ₆	z ₄₂
Hiduddify	6,8	l,z ₁₃ ,z ₂₈	1,5	
Breukelen	6,8	l,z ₁₃ ,[z ₂₈]	e,n,z ₁₅	
II	6,8	l,z ₂₈	e,n,x	
Bsilla	6,8	r	1,2	
Hindmarsh	8, <u>20</u>	r	1,5	
Bovismorbificans ¹	6,8, <u>20</u>	r,[i]	1,5	[R1...]
Noya	8	r	1,7	
Akanji	6,8	r	1,7	
Cocody	8, <u>20</u>	r,i	e,n,z ₁₅	
Hidalgo	6,8	r,[i]	e,n,z ₁₅	
Brikama	8, <u>20</u>	r,[i]	l,w	
Goldcoast	6,8	r	l,w	
IIIb	8	r	z	
Altona	8, <u>20</u>	r,[i]	z ₆	
Giza	8, <u>20</u>	y	1,2	
Lamphun	6,8	y	1,2	
Brunei	8, <u>20</u>	y	1,5	
Tananarive	6,8	y	1,5	
Bulgaria	6,8	y	1,6	

II	6,8	y	1,6	Z ₄₂
Alagbon	8, <u>20</u>	y	1,7	
Inchpark	6,8	y	1,7	
Sunnycove	8	y	e,n,x	
Daarle	6,8	y	e,n,x	
Praha	6,8	y	e,n,Z ₁₅	
Kralingen	8, <u>20</u>	y	Z ₆	
Benue	6,8	y	l,w	
Sindelfingen	8, <u>20</u>	y	l,w	
Mowanjum	6,8	z	1,5	
II	6,8	z	1,5	
Marmande	6,8	z	1,7	
Phaliron	8	z	e,n,Z ₁₅	
Kalumburu	6,8	z	e,n,Z ₁₅	
Kuru	6,8	z	l,w	
Daula	8, <u>20</u>	z	Z ₆	
Bellevue	8	Z ₄ ,Z ₂₃	1,7	
Lezennes	6,8	Z ₄ ,Z ₂₃	1,7	
Breda	6,8	Z ₄ ,Z ₂₃	e,n,x	
Chailey	6,8	Z ₄ ,Z ₂₃	[e,n,Z ₁₅]	
Dabou	8, <u>20</u>	Z ₄ ,Z ₂₃	l,w	
Corvallis	8, <u>20</u>	Z ₄ ,Z ₂₃	[Z ₆]	
Albany	8, <u>20</u>	Z ₄ ,Z ₂₄	–	[Z ₄₅]
Duesseldorf	6,8	Z ₄ ,Z ₂₄	–	
Tallahassee	6,8	Z ₄ ,Z ₃₂	–	
Bazenheid	8, <u>20</u>	Z ₁₀	1,2	
Zerifin	6,8	Z ₁₀	1,2	
Paris	8, <u>20</u>	Z ₁₀	1,5	
Mapo	6,8	Z ₁₀	1,5	
Cleveland	6,8	Z ₁₀	1,7	
Istanbul	8	Z ₁₀	e,n,x	
Hadar	6,8	Z ₁₀	e,n,x	
Chomedey	8, <u>20</u>	Z ₁₀	e,n,Z ₁₅	
Glostrup	6,8	Z ₁₀	e,n,Z ₁₅	
Remiremont	8, <u>20</u>	Z ₁₀	l,w	
Molade	8, <u>20</u>	Z ₁₀	Z ₆	
Wippra	6,8	Z ₁₀	Z ₆	
II	6,8	Z ₂₉	1,5	
II	6,8	Z ₂₉	e,n,x	Z ₄₂
Tamale	8, <u>20</u>	Z ₂₉	[e,n,Z ₁₅]	
Uno	6,8	Z ₂₉	[e,n,Z ₁₅]	

II	6,8	Z ₂₉	e,n,x
Kolda	8, <u>20</u>	Z ₃₅	1,2
Yarm	6,8	Z ₃₅	1,2
Angers	8, <u>20</u>	Z ₃₅	Z ₆
Apeyeme	8, <u>20</u>	Z ₃₈	—
Diogoye	8, <u>20</u>	Z ₄₁	Z ₆
Aesch	6,8	Z ₆₀	1,2

1 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:9 (D₁)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Sendai ¹	<u>1</u> ,9,12	a	1,5	
Miami ¹	<u>1</u> ,9,12	a	1,5	
II	9,12	a	1,5	
Os	9,12	a	1,6	
Saarbruecken	<u>1</u> ,9,12	a	1,7	
Lomalinda	<u>1</u> ,9,12	a	e,n,x	
II	<u>1</u> ,9,12	a	e,n,x	
Durban	<u>1</u> ,9,12	a	e,n,Z ₁₅	
II	9,12	a	Z ₃₉	
II	<u>1</u> ,9,12	a	Z ₄₂	
Onarimon	<u>1</u> ,9,12	b	1,2	
Frintrop	<u>1</u> ,9,12	b	1,5	
Bata	9,12	b	1,7	
II	<u>1</u> ,9,12	b	e,n,x	
Mana	9,12	b	e,n,Z ₁₅	
II	<u>1</u> ,9,12	b	Z ₆	
II	<u>1</u> ,9,12	b	Z ₃₉	
Goeteborg	9,12	c	1,5	
Ipeko	9,12	c	1,6	
Elokate	9,12	c	1,7	
Alabama	9,12	c	e,n,Z ₁₅	
Ridge	9,12	c	Z ₆	
Ndolo	<u>1</u> ,9,12	d	1,5	
Tarshyne	9,12	d	1,6	
Eschberg	9,12	d	1,7	
II	<u>1</u> ,9,12	d	e,n,x	
Bangui	9,12	d	e,n,Z ₁₅	
Zega	9,12	d	Z ₆	
Jaffna	<u>1</u> ,9,12	d	Z ₃₅	
II	9,12	d	Z ₃₉	
Typhi ²	9,12[Vi]	d	–	[Z ₆₆]
Bournemouth	9,12	e,h	1,2	
Eastbourne	<u>1</u> ,9,12	e,h	1,5	

Westafrica	9,12	e,h	1,7	
Israel	9,12	e,h	e,n,z ₁₅	
II	9,12	e,n,x	1,[5],7	
II	9,12	e,n,x	1,6	
Berta	<u>1</u> ,9,12	[f],g,[t]	–	
Enteritidis ³	<u>1</u> ,9,12	g,m	–	
Gueuletapee	9,12	g,m,s	–	
Blegdam	9,12	g,m,q	–	
II	<u>1</u> ,9,12	g,m,[s],t	[1,5,7]	[z ₄₂]
II	<u>1</u> ,9,12	g,m,s,t	e,n,x	
Dublin	<u>1</u> ,9,12[Vi]	g,p	–	
Naestved	<u>1</u> ,9,12	g,p,s	–	
Rostock	<u>1</u> ,9,12	g,p,u	–	
Moscow	<u>1</u> ,9,12	g,q	–	
II	9,12	g,s,t	e,n,x	
Newmexico	9,12	g,z ₅₁	1,5	
II	<u>1</u> ,9,12	g,z ₆₂	[e,n,x]	
Antarctica	9,12	g,z ₆₃	–	
Rosenberg	9,12	g,z ₈₅	–	
II	9,12	m,t	e,n,x	
Pensacola	<u>1</u> ,9,12	m,t	[1,2]	
II	<u>1</u> ,9,12	m,t	1,5	
II	<u>1</u> ,9,12	m,t	z ₃₉	
Seremban	9,12	i	1,5	
Claibornei	<u>1</u> ,9,12	k	1,5	
Goverdhan	9,12	k	1,6	
Mendoza	9,12	l,v	1,2	
Panama ⁴	<u>1</u> ,9,12	l,v	1,5	[R1...]
Houston	9,12	l,v	1,5	d
Kapemba	9,12	l,v	1,7	[z ₄₀]
Zaiman	9,12	l,v	e,n,x	
II	9,12	l,v	e,n,x	
Goettingen	9,12	l,v	e,n,z ₁₅	
II	9,12	l,v	z ₃₉	
Victoria	<u>1</u> ,9,12	l,w	1,5	
II	<u>1</u> ,9,12	l,w	e,n,x	
Itami	9,12	l,z ₁₃	1,5	
Miyazaki	9,12	l,z ₁₃	1,7	
Napoli	<u>1</u> ,9,12	l,z ₁₃	e,n,x	
Javiana ⁴	<u>1</u> ,9,12	l,z ₂₈	1,5	[R1...]
Kotu	9,12	l,z ₂₈	1,6	

II	9,12	1,Z ₂₈	1,5	Z ₄₂
II	9,12	1,Z ₂₈	e,n,x	
York	9,12	1,Z ₂₈	e,n,Z ₁₅	
Jamaica	9,12	r	1,5	
Camberwell	9,12	r	1,7	
Yellowknife	9,12	r	e,n,x	
Campinense	9,12	r	e,n,Z ₁₅	
Lome	9,12	r	Z ₆	
Powell	9,12	y	1,7	
II	<u>1</u> ,9,12	y	Z ₃₉	
Mulhouse	<u>1</u> ,9,12	z	1,2	
Lawndale	<u>1</u> ,9,12	z	1,5	
Kimpese	9,12	z	1,6	
II	<u>1</u> ,9,12	z	1,7	
Aurelianis	9,12	z	e,n,Z ₁₅	
II	<u>1</u> ,9,12	z	Z ₆	
II	9,12	z	Z ₃₉	
Wangata	<u>1</u> ,9,12	Z ₄ ,Z ₂₃	[1,7]	
Natal	9,12	Z ₄ ,Z ₂₄	—	
Franken ⁴	9,12	Z ₆	Z ₆₇	[R1...]
Portland	9,12	Z ₁₀	1,5	
Treguier	9,12	Z ₁₀	Z ₆	
Ruanda	9,12	Z ₁₀	e,n,Z ₁₅	
II	9,12	Z ₂₉	1,5	
II	<u>1</u> ,9,12	Z ₂₉	e,n,x	
Penarth	9,12	Z ₃₅	Z ₆	
Elomrane	<u>1</u> ,9,12	Z ₃₈	—	
II	<u>1</u> ,9,12	Z ₃₉	1,7	
Ottawa	<u>1</u> ,9,12	Z ₄₁	1,5	
II	<u>1</u> ,9,12	Z ₄₂	1,[5],7	
Gallinarum	<u>1</u> ,9,12	—	—	

- 1 Sendai (adapted to man) is auxotrophic, Miami is prototrophic.
- 2 Rare strains can have, as phase 1, H :j instead of H :d (261-nucleotide deletion in gene *fliC*). Independently, rare strains can have an additional phase H :z66 determined by a plasmid-borne gene.
- 3 In addition to factors H:g,m, some strains may have factor H:p or H:f or H:t. Exceptional strains can have antigen H:1,7 as second phase.
- 4 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:9,46 (D₂)

In this group, strains also have factors O:3 and (O:10), the latter being weak. They can be lysogenized by phages ϵ_{15} and ϵ_{34} . When doubly lysogenized, they become strongly agglutinable (like group E strains) by sera O:34 and O:12₂.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Detmold	9,46	a	1,2	
Baildon	9,46	a	e,n,x	
Doba	9,46	a	e,n,z ₁₅	
Montaigu	9,46	b	1,2	
Cheltenham	9,46	b	1,5	
Zadar	9,46	b	1,6	
Worb	9,46	b	e,n,x	
II	9,46	b	e,n,x	
Bamboye	9,46	b	l,w	
Linguere	9,46	b	z ₆	
Kolar	9,46	b	z ₃₅	
Argenteuil	<u>1</u> ,9,46	c	1,7	
Itutaba	9,46	c	z ₆	
Ontario	9,46	d	1,5	
Quentin	9,46	d	1,6	
Strasbourg	9,46	d	1,7	
Olten	9,46	d	e,n,z ₁₅	
Plymouth	9,46	d	z ₆	
Sontheim	9,46	d	z ₃₅	
Bergedorf	9,46	e,h	1,2	
Waedenswil	9,46	e,h	1,5	
Guerin	9,46	e,h	z ₆	
II	9,46	e,n,x	1,5,7	
Wernigerode	9,46	f,g	–	
Hillingdon	9,46	g,m	–	
Macclesfield	9,46	g,m,s	1,2,7	
II	9,46	g,[m],[s],t	[e,n,x]	
Gateshead	9,46	g,s,t	–	
II	9,46	g,z ₆₂	–	

II	9,46	m,t	e,n,x	
Sangkalam	9,46	m,t	–	
Mathura	9,46	i	e,n,Z ₁₅	
Potto	9,46	i	Z ₆	
Marylebone	9,46	k	1,2	
Cochin	9,46	k	1,5	
Clontarf	9,46	k	1,6	
Ceyco	9,46	k	Z ₃₅	
India	9,46	l,v	1,5	
Geraldton	9,46	l,v	1,6	
Toronto	9,46	l,v	e,n,x	
Ackwepe	9,46	l,w	–	
Nordrhein	9,46	l,Z ₁₃ ,Z ₂₈	e,n,Z ₁₅	
Deckstein	9,46	r	1,7	
Shoreditch	9,46	r	e,n,Z ₁₅	
Sokode	9,46	r	Z ₆	
Benin	9,46	y	1,7	
Irchel	9,46	y	e,n,x	
Nantes	9,46	y	l,w	
Mayday	9,46	y	Z ₆	
II	9,46	z	1,5	
II	9,46	z	e,n,x	
Bambylor	9,46	z	e,n,Z ₁₅	
II	9,46	z	Z ₃₉	
Ekotedo	9,46	Z ₄ ,Z ₂₃	–	
II	9,46	Z ₄ ,Z ₂₄	Z ₃₉	Z ₄₂
Ngaparou	9,46	Z ₄ ,Z ₂₄	–	
Lishabi	9,46	Z ₁₀	1,7	
Inglis	9,46	Z ₁₀	e,n,x	
Mahina	9,46	Z ₁₀	e,n,Z ₁₅	
Louisiana	9,46	Z ₁₀	Z ₆	
II	9,46	Z ₁₀	Z ₆	
II	9,46	Z ₁₀	Z ₃₉	
Ouakam	9,46	Z ₂₉	–	[Z ₄₅]
Hillegersberg	9,46	Z ₃₅	1,5	
Basingstoke	9,46	Z ₃₅	e,n,Z ₁₅	
Trimdon	9,46	Z ₃₅	Z ₆	
Fresno	9,46	Z ₃₈	–	
II	9,46	Z ₃₉	1,7	
Wuppertal	9,46	Z ₄₁	–	

Group O:9,46,27 (D₃)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	1,9,12,46,27	a	Z ₆	
II	1,9,12,46,27	c	Z ₃₉	
II	9,12,46,27	g,t	e,n,x	
II	1,9,12,46,27	l,Z ₁₃ ,Z ₂₈	Z ₃₉	
II	1,9,12,46,27	y	Z ₃₉	
II	1,9,12,46,27	Z ₄ ,Z ₂₄	1,5	
II	1,9,12,46,27	Z ₁₀	1,5	
II	1,9,12,46,27	Z ₁₀	e,n,x	
II	1,9,12,46,27	Z ₁₀	Z ₃₉	

Group O:3,10 (E₁)

In this group, strains can be lysogenized by phage ϵ_{15} (O:3,10 \rightarrow O:3,15, former group E₂) then by phage ϵ_{34} (O:3,15 \rightarrow O:3,15,34, former group E₃). **In these cases, factors O:15 or O:15,34 replace factor O:10 which is no more detected.** Factors O:10, O:15 and O:15,34 are given in curly brackets {} to indicate exclusivity. Factors O:15 and O:15,34 are given in the scheme when occurring naturally.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Aminatu	3,10	a	1,2	
Goelzau	3,{10}{ <u>15</u> }	a	1,5	
Oxford	3,{10}{ <u>15</u> }{ <u>15,34</u> }	a	1,7	
Masembe	3,10	a	e,n,x	
II	3,10	a	e,n,x	
Galil	3,10	a	e,n,Z ₁₅	
II	3,10	a	l,v	
II	3,10	a	Z ₃₉	
Kalina	3,10	b	1,2	
Butantan	3,{10}{ <u>15</u> }{ <u>15,34</u> }	b	1,5	
Allerton	3,10	b	1,6	
Huvudsta	3,{10}{ <u>15,34</u> }	b	1,7	
Benfica	3,10	b	e,n,x	
II	3,10	b	e,n,x	
Yaba	3,{10}{ <u>15</u> }	b	e,n,Z ₁₅	
Epicrates	3,10	b	l,w	
Wilmington	3,10	b	Z ₆	
Westminster	3,{10}{ <u>15</u> }	b	Z ₃₅	
II	3,10	b	Z ₃₉	
Asylanta	3,10	c	1,2	
Gbadago	3,{10}{ <u>15</u> }	c	1,5	
Ikayi	3,{10}{ <u>15</u> }	c	1,6	
Pramiso	3,10	c	1,7	
Agege	3,10	c	e,n,Z ₁₅	
Anderlecht	3,10	c	l,w	
Okefoko	3,10	c	Z ₆	

Stormont	3,10	d	1,2	
Shangani	3,{10}{15}	d	1,5	
Lekke	3,10	d	1,6	
Onireke	3,10	d	1,7	
Souza	3,{10}{15}	d	e,n,x	
II	3,10	d	e,n,x	
Madjorio	3,10	d	e,n,z ₁₅	
Birmingham	3,{10}{15}	d	l,w	
Weybridge	3,10	d	z ₆	
Maron	3,10	d	z ₃₅	
Vejle	3,{10}{15}	e,h	1,2	[z ₂₇]
Muenster	3,{10}{15}{15,34}	e,h	1,5	[z ₄₈]
Anatum	3,{10}{15}{15,34}	e,h	1,6	[z ₆₄]
Nyborg	3,{10}{15}	e,h	1,7	
Newlands	3,{10}{15,34}	e,h	e,n,x	
Lamberhurst	3,10	e,h	e,n,z ₁₅	
Meleagridis	3,{10}{15}{15,34}	e,h	l,w	
Sekondi	3,10	e,h	z ₆	
II	3,10	e,n,x	1,7	
Regent	3,10	f,g,[s]	[1,6]	
Alfort	3,10	f,g	e,n,x	
Suberu	3,10	g,m	–	
Amsterdam	3,{10}{15}{15,34}	g,m,s	–	
II	3,{10}{15}	g,m,s,t	[1,5]	
Westhampton	3,{10}{15}{15,34}	g,s,t	–	[z ₃₇]
Bloomsbury	3,10	g,t	1,5	
II	3,10	g,t	–	
II	3,10	m,t	1,5	
Southbank	3,{10}{15}{15,34}	m,t	[1,6]	
II	3,10	m,t	e,n,x	
Cuckmere	3,10	i	1,2	
Amounderness	3,10	i	1,5	
Tibati	3,10	i	1,6	
Truro	3,10	i	1,7	
Bessi	3,10	i	e,n,x	
Falkensee	3,{10}{15}	i	e,n,z ₁₅	
Hoboken	3,10	i	l,w	
Yeerongpilly	3,10	i	z ₆	
Wimborne	3,10	k	1,2	
Zanzibar	3,{10}{15}	k	1,5	
Serrekunda	3,10	k	1,7	

Yundum	3,10	k	e,n,x	
Marienthal	3,10	k	e,n,z ₁₅	
Newrochelle	3,10	k	l,w	
Nchanga	3,{10}{15}	l,v	1,2	
Sinstorf	3,10	l,v	1,5	
London	3,{10}{15}	l,v	1,6	
Give	3,{10}{15}{15,34}	l,v	1,7	[d],[z ₇₇]
II	3,10	l,v	e,n,x	
Ruzizi	3,10	l,v	e,n,z ₁₅	
II	3,10	l,v	z ₆	
Sinchew	3,10	l,v	z ₃₅	
Assinie	3,10	l,w	z ₆	[z ₄₅]
Freiburg	3,10	l,z ₁₃	1,2	
Uganda	3,{10}{15}	l,z ₁₃	1,5	
Fallowfield	3,10	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Hoghton	3,10	l,z ₁₃ ,z ₂₈	z ₆	
II	3,10	l,z ₂₈	1,5	
Joal	3,10	l,z ₂₈	1,7	
Lamin	3,10	l,z ₂₈	e,n,x	
II	3,10	l,z ₂₈	e,n,x	
II	3,10	l,z ₂₈	z ₃₉	
Ughelli	3,10	r	1,5	
Elisabethville	3,{10}{15}	r	1,7	
Simi	3,10	r	e,n,z ₁₅	
Weltevreden	3,{10}{15}	r	z ₆	
Seegefeld	3,10	r,i	1,2	
Dumfries	3,10	r,i	1,6	
Amager	3,{10}{15}	y	1,2	[z ₄₅]
Orion	3,{10}{15}{15,34}	y	1,5	
Mokola	3,10	y	1,7	
Ohlstedt	3,{10}{15}	y	e,n,x	
Bolton	3,10	y	e,n,z ₁₅	
Langensalza	3,10	y	l,w	
Stockholm	3,{10}{15}	y	z ₆	
Fufu	3,10	z	1,5	
II	3,10	z	1,5	
Harleystreet	3,10	z	1,6	
Huddinge	3,10	z	1,7	
II	3,10	z	e,n,x	
Clerkenwell	3,10	z	l,w	
Landwasser	3,10	z	z ₆	

II	3,10	Z	Z ₃₉	
Adabraka	3,10	Z ₄ ,Z ₂₃	[1,7]	
Wagadugu	3,10	Z ₄ ,Z ₂₃	Z ₆	
Florian	3,{10}{ <u>15</u> }	Z ₄ ,Z ₂₄	–	
II	3,10	Z ₄ ,Z ₂₄	–	
Okerara	3,10	Z ₁₀	1,2	
Lexington	3,{10}{ <u>15</u> }{ <u>15,34</u> }	Z ₁₀	1,5	[Z ₄₉]
Harrisonburg	3,{10}{ <u>15</u> }{ <u>15,34</u> }	Z ₁₀	1,6	
Coquilhatville	3,10	Z ₁₀	1,7	
Podiensis	3,10	Z ₁₀	e,n,x	
Kristianstad	3,10	Z ₁₀	e,n,Z ₁₅	
Biafra	3,10	Z ₁₀	Z ₆	
Everleigh	3,10	Z ₂₉	e,n,x	
II	3,10	Z ₂₉	[e,n,x]	
Jedburgh	3,{10}{ <u>15</u> }	Z ₂₉	–	
Ratchaburi	3,10	Z ₃₅	1,6	
Zongo	3,10	Z ₃₅	1,7	
II	3,10	Z ₃₅	e,n,x,Z ₁₅	
Shannon	3,10	Z ₃₅	l,w	
Cairina	3,10	Z ₃₅	Z ₆	
Macallen	3,10	Z ₃₆	–	
Sandaga	3,10	Z ₃₈	1,2	
Albertslund	3,10	Z ₃₈	1,6	
Bolombo	3,10	Z ₃₈	[Z ₆]	
II	3,10	Z ₃₈	Z ₄₂	
II	3,10	Z ₃₉	1,[5],7	
Dortmund	3,10	Z ₄₁	1,[2],5	
Pietersburg	3,{10}{ <u>15,34</u> }	Z ₆₉	1,7	

Group O:1,3,19 (E₄)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Niumi	1,3,19	a	1,5	
Juba	1,3,19	a	1,7	
Gwoza	1,3,19	a	e,n,z ₁₅	
Alkmaar	1,3,19	a	l,w	
Gnesta	1,3,19	b	1,5	[z ₃₇]
Visby	1,3,19	b	1,6	
Tambacounda	1,3,19	b	e,n,x	
Kande	1,3,19	b	e,n,z ₁₅	
Broughton	1,3,19	b	l,w	
Accra	1,3,19	b	z ₆	
Eastglam	1,3,19	c	1,5	
Bida	1,3,19	c	1,6	
Madiago	1,3,19	c	1,7	
Umbadah	1,3,19	d	1,2	
Ahmadi	1,3,19	d	1,5	
Wanatah	1,3,19	d	1,7	
Liverpool	1,3,19	d	e,n,z ₁₅	
Tilburg	1,3,19	d	l,w	[z ₄₉]
Niloese	1,3,19	d	z ₆	
Vilvoorde	1,3,19	e,h	1,5	
Hayindogo	1,3,19	e,h	1,6	
Sanktmarx	1,3,19	e,h	1,7	
Sao	1,3,19	e,h	e,n,z ₁₅	
Calabar	1,3,19	e,h	l,w	
Rideau	1,3,19	f,g	–	
Petahtikve	1,3,19	f,g,t	1,7	
Maiduguri	1,3,19	f,g,t	e,n,z ₁₅	
Kouka	1,3,19	g,m,[t]	–	
Senftenberg	1,3,19	g,[s],t	–	[z ₂₇],[z ₃₄],[z ₃₇],[z ₄₃], [z ₄₅],[z ₄₆],[z ₈₂]
Cannstatt	1,3,19	m,t	–	
Stratford	1,3,19	i	1,2	

Ouagadougou	1,3,19	i	1,5	
Chichester	1,3,19	i	1,6	
Machaga	1,3,19	i	e,n,x	
Avonmouth	1,3,19	i	e,n,z ₁₅	
Zuilen	1,3,19	i	l,w	
Taksony	1,3,19	i	z ₆	
Oesterbro	1,3,19	k	1,5	
Bethune	1,3,19	k	1,7	
Ngor	1,3,19	l,v	1,5	
Parkroyal	1,3,19	l,v	1,7	
Svedvi	1,3,19	l,v	e,n,z ₁₅	
Fulda	1,3,19	l,w	1,5	
Westerstede	1,3,19	l,z ₁₃	1,2	
Winterthur	1,3,19	l,z ₁₃	1,6	
Lokstedt	1,3,19	l,z ₁₃ ,z ₂₈	1,2	
Stuivenberg	1,3,19	l,[z ₁₃],z ₂₈	1,5	
Bedford	1,3,19	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Tomelilla	1,3,19	l,z ₂₈	1,7	
Kindia	1,3,19	l,z ₂₈	e,n,x	
Yalding	1,3,19	r	e,n,z ₁₅	
Fareham	1,3,19	r,i	l,w	
Gatineau	1,3,19	y	1,5	
Thies	1,3,19	y	1,7	
Slade	1,3,19	y	e,n,z ₁₅	
Kinson	1,3,19	y	e,n,x	
Krefeld	1,3,19	y	l,w	
Korlebu	1,3,19	z	1,5	
Kainji	1,3,19	z	1,6	
Lerum	1,3,19	z	1,7	
Schoeneberg	1,3,19	z	e,n,z ₁₅	
Carno	1,3,19	z	l,w	
Hongkong	1,3,19	z	z ₆	
Sambre	1,3,19	z ₄ ,z ₂₄	–	
Yenne	1,3,19	z ₁₀	1,5	
Dallgow	1,3,19	z ₁₀	e,n,z ₁₅	
Llandoff	1,3,19	z ₂₉	[z ₆]	[z ₃₇]
Catumagos	1,3,19	z ₃₅	1,5	
Ochiogu	1,3,19	z ₃₈	[e,n,z ₁₅]	
Chittagong	1,3,10,19	b	z ₃₅	
Bilu	1,3,10,19	f,g,t	1,(2),7	
Ilugun	1,3,10,19	z ₄ ,z ₂₃	z ₆	

Dessau	1,3, <u>15</u> ,19	g,s,t	-
Cannonhill	1,3,{10}{ <u>15</u> },19	y	e,n,x

Group O:11 (F)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Gallen	11	a	1,2	
Marseille	11	a	1,5	
VI	11	a	1,5	
Massilia	11	a	1,6	
Toowong	11	a	1,7	
Luciana	11	a	e,n,Z ₁₅	
II	11	a	e,n,Z ₁₅	d
Epinay	11	a	l,Z ₁₃ ,Z ₂₈	
II	11	a	Z ₆	Z ₄₂
Atento	11	b	1,2	
Leeuwarden	11	b	1,5	
Wohlen	11	b	1,6	
VI	11	b	1,7	
VI	11	b	e,n,x	
Pharr	11	b	e,n,Z ₁₅	
Erfurt	11	b	Z ₆	
Chiredzi	11	c	1,5	
Brindisi	11	c	1,6	
II	11	c	e,n,Z ₁₅	
Woodinville	11	c	e,n,x	
Ati	11	d	1,2	
Gustavia	11	d	1,5	
Chandans	11	d	[e,n,x]	[r]
Findorff	11	d	Z ₆	
Chingola	11	e,h	1,2	
Adamstua	11	e,h	1,6	
Redhill	11	e,h	l,Z ₁₃ ,Z ₂₈	
Abuja	11	g,m	1,5	
Missouri	11	g,s,t	–	
II	11	g,[m],s,t	Z ₃₉	
IV	11	g,Z ₅₁	–	
Moers	11	m,t	–	
II	11	m,t	e,n,x	

Aberdeen	11	i	1,2	
Brijbhumi	11	i	1,5	
Heerlen	11	i	1,6	
Veneziana	11	i	e,n,x	
Pretoria	11	k	1,2	
Abaetetuba	11	k	1,5	
Sharon	11	k	1,6	
Colobane	11	k	1,7	
Kisarawe	11	k	e,n,x,[z ₁₅]	
Mannheim	11	k	l,w	
Amba	11	k	l,z ₁₃ ,z ₂₈	
IIIb	11	k	z ₅₃	
Stendal	11	l,v	1,2	
Maracaibo	11	l,v	1,5	
Fann	11	l,v	e,n,x	
Bullbay	11	l,v	e,n,z ₁₅	
IIIb	11	l,v	z	[z ₅₆]
IIIb	11	l,v	z ₅₃	
Glidji	11	l,w	1,5	
Tours	11	l,z ₁₃	1,2	
Connecticut	11	l,z ₁₃ ,z ₂₈	1,5	
Osnabrueck	11	l,z ₁₃ ,z ₂₈	e,n,x	
II	11	l,z ₂₈	e,n,x	
Senegal	11	r	1,5	
Rubislaw	11	r	e,n,x	
Clanvillian	11	r	e,n,z ₁₅	
Euston	11	r,i	e,n,x,z ₁₅	
Volta	11	r	l,z ₁₃ ,z ₂₈	
Solt	11	y	1,5	
Jalisco	11	y	1,7	
Herzliya	11	y	e,n,x	
Woumbou	11	y	e,n,x,z ₁₅	
Crewe	11	z	1,5	
Maroua	11	z	1,7	
II	11	z	e,n,x	
Nyanza	11	z	z ₆	[z ₈₃]
II	11	z	z ₃₉	
Remete	11	z ₄ ,z ₂₃	1,6	
Etterbeek	11	z ₄ ,z ₂₃	e,n,z ₁₅	
IIIa	11	z ₄ ,z ₂₃	–	
IV	11	z ₄ ,z ₂₃	–	

Yehuda	11	Z_4, Z_{24}	–
IV	11	Z_4, Z_{32}	–
Wentworth	11	Z_{10}	1,2
Straengnaes	11	Z_{10}	1,5
Telhashomer	11	Z_{10}	e,n,x
Lene	11	Z_{38}	–
Maastricht	11	Z_{41}	1,2
II	11	–	1,5

Group O:13 (G)

Groups formerly designated O:13,22 (G₁) and O:13,23 (G₂) were lumped together in a group which characteristic factor is O:13.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Chagoua	<u>1</u> ,13,23	a	1,5	
II	<u>1</u> ,13,23	a	1,5	
Mim	13,22	a	1,6	
II	13,22	a	e,n,x	
Wyldegreen	<u>1</u> ,13,23	a	1,w	
Marshall	13,22	a	1,Z ₁₃ ,Z ₂₈	
II	<u>1</u> ,13,23	a	Z ₄₂	
Ibadan	13,22	b	1,5	
Mississippi	<u>1</u> ,13,23	b	1,5	
Oudwijk	13,22	b	1,6	
II	<u>1</u> ,13,23	b	[1,5]	Z ₄₂
Bracknell	13,23	b	1,6	
Rottnest	<u>1</u> ,13,22	b	1,7	
Vaertan	13,22	b	e,n,x	
Ullevi	<u>1</u> ,13,23	b	e,n,x	
Bahati	13,22	b	e,n,Z ₁₅	
Durham	13,23	b	e,n,Z ₁₅	
Sanktjohann	13,23	b	1,w	
II	<u>1</u> ,13,22	b	Z ₄₂	
Haouaria	13,22	c	e,n,x,Z ₁₅	
Handen	<u>1</u> ,13,23	d	1,2	
II	13,22	d	1,5	
Mishmarhaemek	<u>1</u> ,13,23	d	1,5	
Friedenau	13,22	d	1,6	
Wichita	<u>1</u> ,13,23	d	1,6	[Z ₃₇]
Grumpensis	<u>1</u> ,13,23	d	1,7	
II	13,23	d	e,n,x	
Diguel	<u>1</u> ,13,22	d	e,n,Z ₁₅	

Telekebir	13,23	d	e,n,z ₁₅	
Putten	13,23	d	l,w	
Isuge	13,23	d	z ₆	
Tschangu	<u>1</u> ,13,23	e,h	1,5	
Willemstad	<u>1</u> ,13,22	e,h	1,6	
Vridi	<u>1</u> ,13,23	e,h	l,w	
II	<u>1</u> ,13,23	e,n,x	1,[5],7	
Raus	13,22	f,g	e,n,x	
Havana	<u>1</u> ,13,23	f,g,[s]	–	[z ₇₉]
Bron	13,22	g,m	[e,n,z ₁₅]	
IIIb	13,22	g,m,s	z	
Agbeni	<u>1</u> ,13,23	g,m,[s],[t]	–	
II	<u>1</u> ,13,22	g,m,t	[1,5]	
II	<u>1</u> ,13,23	g,m,s,t	1,5	
II	<u>1</u> ,13,23	g,m,[s],t	[e,n,x]	
II	<u>1</u> ,13,23	g,m,s,t	z ₄₂	
Newyork	13,22	g,s,t	–	
Okatie	13,23	g,[s],t	–	
II	<u>1</u> ,13,22	g,t	[1,5]	
II	13,22	g,t	z ₆	
II	<u>1</u> ,13,23	g,t	1,5	
II	13,23	g,t	e,n,x	
II	<u>1</u> ,13,23	g,[s],t	z ₄₂	
IIIa	<u>1</u> ,13,23	g,z ₅₁	–	
Washington	13,22	m,t	–	
II	<u>1</u> ,13,23	m,t	1,5	
II	<u>1</u> ,13,23	m,t	e,n,x	
II	13,22	m,t	z ₄₂	z ₃₉
II	<u>1</u> ,13,23	m,t	z ₄₂	
Kintambo	<u>1</u> ,13,23	m,t	–	
V	<u>1</u> ,13,22	i	–	
Idikan	<u>1</u> ,13,23	i	1,5	
Myrria	13,23	i	1,7	
Jukestown	13,23	i	e,n,z ₁₅	
Kedougou	<u>1</u> ,13,23	i	l,w	
II	13,22	k	1,5	z ₄₂
Marburg	13,23	k	–	
II	13,23	k	z ₄₁	
Lovelace	13,22	l,v	1,5	
IIIb	13,22	l,v	1,5,7	
Borbeck	13,22	l,v	1,6	

Nanga	<u>1</u> ,13,23	l,v	e,n,z ₁₅	
II	13,23	l,w	e,n,x	
Taiping	13,22	l,z ₁₃	e,n,z ₁₅	
II	13,22	l,z ₂₈	1,5	
II	13,23	l,z ₂₈	1,5	
II	13,23	l,z ₂₈	z ₆	
II	<u>1</u> ,13,23	l,z ₂₈	z ₄₂	
V	13,22	r	–	
Adjame	13,23	r	1,6	
Linton	13,23	r	e,n,z ₁₅	
Tanger	<u>1</u> ,13,22	y	1,6	
Yarrabah	13,23	y	1,7	
Ordonez	<u>1</u> ,13,23	y	l,w	
Tunis	<u>1</u> ,13,23	y	z ₆	
Winslow	13,22	z	1,5	
II	<u>1</u> ,13,23	z	1,5	
IIIb	13,23	z	1,5	
Poona	<u>1</u> ,13,22	z	1,6	[z ₄₄],[z ₅₉]
Farmsen	13,23	z	1,6	
Bristol	13,22	z	1,7	
Ivryurseine	<u>1</u> ,13,23	z	z ₆	
Tanzania	<u>1</u> ,13,22	z	e,n,z ₁₅	
Worthington	<u>1</u> ,13,23	z	l,w	[z ₄₃]
II	<u>1</u> ,13,23	z	z ₄₂	
II	13,22	z	–	
Ried	<u>1</u> ,13,22	z ₄ ,z ₂₃	[e,n,z ₁₅]	
IIIa	13,22	z ₄ ,z ₂₃	–	
Ajiobo	13,23	z ₄ ,z ₂₃	–	
IIIa	13,23	z ₄ ,z ₂₃ ,[z ₃₂]	–	
Romanby	<u>1</u> ,13,23	z ₄ ,z ₂₄	–	
IIIa	13,23	z ₄ ,z ₂₄	–	
Roodepoort	<u>1</u> ,13,22	z ₁₀	1,5	
II	<u>1</u> ,13,22	z ₁₀	z ₆	
Sapele	13,23	z ₁₀	e,n,z ₁₅	
Demerara	13,23	z ₁₀	l,w	
II	13,22	z ₂₉	1,5	
II	13,22	z ₂₉	e,n,x	
II	<u>1</u> ,13,23	z ₂₉	1,5	
II	<u>1</u> ,13,23	z ₂₉	e,n,x	
Agoueve	13,22	z ₂₉	–	
Cubana	<u>1</u> ,13,23	z ₂₉	–	[z ₃₇],[z ₄₃]

Mampong	13,22	Z_{35}	1,6
Nimes	13,22	Z_{35}	e,n, Z_{15}
Picpus	13,23	Z_{35}	1,6
Anna	13,23	Z_{35}	e,n, Z_{15}
Leiden	13,22	Z_{38}	—
Fanti	13,23	Z_{38}	—
V	13,22	Z_{39}	—
II	13,22	Z_{39}	1,7
II	<u>1</u> ,13,23	Z_{39}	1,5,7
II	<u>1</u> ,13,23	$[Z_{42}]$	1,[5],7
II	13,23	—	1,6

Group O:6,14 (H)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Garba	1,6,14,25	a	1,5	
VI	[1],6,14	a	1,5	
VI	[1],6,14,[25]	a	e,n,x	
Banjul	1,6,14,25	a	e,n,z ₁₅	
Ndjamena	1,6,14,25	b	1,2	
Kuntair	1,6,14,25	b	1,5	
Tucson	[1],6,14,[25]	b	1,7	
IIIb	(6),14	b	e,n,x	
Blijdorp	1,6,14,25	c	1,5	
Kassberg	1,6,14,25	c	1,6	
Runby	1,6,14,25	c	e,n,x	
Minna	1,6,14,25	c	l,w	
Martonos	6,14,24	d	1,5	
Finkenwerder	[1],6,14,[25]	d	1,5	
Woodhull	1,6,14,25	d	1,6	
Midway	6,14,24	d	1,7	
Florida	[1],6,14,[25]	d	1,7	
Lindern	6,14,[24]	d	e,n,x	
Charity	[1],6,14,[25]	d	e,n,x	
Teko	[1],6,14,[25]	d	e,n,z ₁₅	
Encino	1,6,14,25	d	l,z ₁₃ ,z ₂₈	
Albuquerque	1,6,14,24	d	z ₆	
Bahrenfeld	6,14,[24]	e,h	1,5	
Onderstepoort	1,6,14,[25]	e,h	1,5	
Magumeri	1,6,14,25	e,h	1,6	
Beaudesert	[1],6,14,[25]	e,h	1,7	
V	6,14	e,n,z ₁₅	–	
Warragul	[1],6,14,[25]	g,m	–	
Caracas	[1],6,14,[25]	g,m,s	–	
Sylvania	[1],6,14,[25]	g,p	–	
Catanzaro	6,14	g,s,t	–	
II	1,6,14	m,t	1,5	
II	6,14	m,t	e,n,x	

Kaitaan	1,6,14,25	m,t	–	
Mampeza	1,6,14,25	i	1,5	
Buzu	[1],6,14,[25]	i	1,7	
Schalkwijk	6,14,[24]	i	e,n,z ₁₅	
Moussoro	1,6,14,25	i	e,n,z ₁₅	
Harburg	[1],6,14,[25]	k	1,5	
II	6,14,[24]	k	1,6	
II	6,14	k	e,n,x	
IIIb	(6),14	k	z	
II	1,6,14	k	z ₆	z ₄₂
IIIb	(6),14	k	z ₅₃	
Amberg	6,14,24	l,v	1,7	
Boecker	[1],6,14,[25]	l,v	1,7	
Horsham	1,6,14,[25]	l,v	e,n,x	
Alpenquai	6,14	l,v	e,n,z ₁₅	
IIIb	(6),14	l,v	z	
IIIb	(6),14	l,v	z ₃₅	
IIIb	(6),14	l,v	z ₅₃	
VI	6,14	l,v	z ₈₈	
Aflao	1,6,14,25	l,z ₂₈	e,n,x	
Istoria	1,6,14,25	r,i	1,5	
IIIb	(6),14	r	z	
Surat	[1],6,14,[25]	r,[i]	e,n,z ₁₅	
Carrau	6,14,[24]	y	1,7	
Madelia	1,6,14,25	y	1,7	
Fischerkietz	1,6,14,25	y	e,n,x	
Mornington	1,6,14,25	y	e,n,z ₁₅	
Homosassa	1,6,14,25	z	1,5	
Kanifing	1,6,14,25	z	1,6	
Soahanina	6,14,24	z	e,n,x	
Sundsvall	[1],6,14,[25]	z	e,n,x	
Royan	1,6,14,25	z	e,n,z ₁₅	
Poano	[1],6,14,[25]	z	l,z ₁₃ ,z ₂₈	
Arapahoe	6,14	z ₄ ,z ₂₃	1,5	
Boussou	1,6,14,25	z ₄ ,z ₂₃	[e,n,z ₁₅]	
IV	6,14	z ₄ ,z ₂₃	–	
Chichiri	6,14,24	z ₄ ,z ₂₄	–	
Uzaramo	1,6,14,25	z ₄ ,z ₂₄	–	
Nessa	1,6,14,25	z ₁₀	1,2	
VI	1,6,14,25	z ₁₀	1,(2),7	

II	1,6,14	Z ₁₀	1,5	
Laredo	1,6,14,25	Z ₁₀	1,6	
IIIb	(6),14	Z ₁₀	e,n,x,Z ₁₅	
IIIb	(6),14	Z ₁₀	z	[z ₅₆],[z ₉₀]
II	1,6,14	Z ₁₀	z ₆	z ₄₂
IIIb	6,14	Z ₁₀	z ₅₃	
Potosi	6,14	Z ₃₆	1,5	
II	6,14	Z ₃₆	–	
Sara	1,6,14,25	Z ₃₈	[e,n,x]	
II	1,6,14	Z ₄₂	1,6	
IIIb	6,14	Z ₅₂	e,n,x,Z ₁₅	
IIIb	[1],6,14,[25]	Z ₅₂	Z ₃₅	

Group O:16 (I)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Hannover	16	a	1,2	
Brazil	16	a	1,5	
Amunigun	16	a	1,6	
Nyeko	16	a	1,7	
Togba	16	a	e,n,x	
Fischerhuetten	16	a	e,n,Z ₁₅	
Heron	16	a	Z ₆	
Hull	16	b	1,2	
Melaka	16	b	1,2,5	
Wa	16	b	1,5	
Glasgow	16	b	1,6	
Hvittingfoss	16	b	e,n,x	
II	16	b	e,n,x	
Sangera	16	b	e,n,Z ₁₅	
Vegesack	16	b	l,w	
Malstatt	16	b	Z ₆	
II	16	b	Z ₃₉	
II	16	b	Z ₄₂	
Vancouver	16	c	1,5	
Gafsa	16	c	1,6	
Shamba	16	c	e,n,x	
Hithergreen	16	c	e,n,Z ₁₅	
Yoruba	16	c	l,w	
Oldenburg	16	d	1,2	
Sculcoates	16	d	1,5	
II	16	d	1,5	
Sherbrooke	16	d	1,6	
Gaminara	16	d	1,7	
Barranquilla	16	d	e,n,x	
II	16	d	e,n,x	
Nottingham	16	d	e,n,Z ₁₅	
Caen	16	d	l,w	[Z ₈₂]
Barmbek	16	d	Z ₆	

Malakal	16	e,h	1,2	
Saboya	16	e,h	1,5	
Astridplein	16	e,h	1,6	
Rhydyfelin	16	e,h	e,n,x	
Moabit	16	e,h	l,w	
Weston	16	e,h	z ₆	
II	16	e,n,x	1,(5),7	
II	16	e,n,x	1,6	z ₄₂
Tees	16	f,g	–	[z ₃₇]
Adeoyo	16	g,m,[t]	–	
Nikolaifleet	16	g,m,s	–	
II	16	g,[m],[s],t	[1,5]	[z ₄₂]
II	16	g,[m],[s],t	[e,n,x]	
Cardoner	16	g,s,t	–	
II	16	m,t	e,n,x	
Morbihan	16	m,t	e,n,z ₁₅	
II	16	m,t	[z ₄₂]	
Mpouto	16	m,t	–	
Amina	16	i	1,5	
Agbara	16	i	1,6	
Wisbech	16	i	1,7	
Frankfurt	16	i	e,n,z ₁₅	
Pisa	16	i	l,w	
Abobo	16	i	z ₆	
IIIb	16	i	z ₃₅	
Szentes	16	k	1,2	
Maumee	16	k	1,6	
Nuatja	16	k	e,n,x	
Orientalis	16	k	e,n,z ₁₅	
IIIb	16	(k)	e,n,x,z ₁₅	
IIIb	16	k	z	
IIIb	16	(k)	z ₃₅	
IIIb	16	k	z ₅₃	
IIIb	16	l,v	1,5,7	
Shanghai	16	l,v	1,6	[z ₄₅]
Welikade	16	l,v	1,7	
Salford	16	l,v	e,n,x	
Burgas	16	l,v	e,n,z ₁₅	
IIIb	16	l,v	z	[z ₆₁]
Losangeles	16	l,v	z ₆	
IIIb	16	l,v	z ₃₅	

IIIb	16	l,v	z_{53}
Zigong	16	l,w	1,5
Westeinde	16	l,w	1,6
Brooklyn	16	l,w	e,n,x
Lomnava	16	l,w	e,n, z_{15}
Essingen	16	l,w	z_6
II	16	l,w	z_6
Mandera	16	l, z_{13}	e,n, z_{15}
Enugu	16	l,[z_{13}], z_{28}	[1,5]
Battle	16	l, z_{13} , z_{28}	1,6
Ablogame	16	l, z_{13} , z_{28}	z_6
Koblenz	16	l, z_{13} , z_{28}	e,n,x
II	16	l, z_{28}	z_{42}
Rovaniemi	16	r,i	1,5
Ivory	16	r	1,6
Brunflo	16	r	1,7
Lehrte	16	r	z_6
Annedal	16	r,i	e,n,x
Zwickau	16	r,i	e,n, z_{15}
Saphra	16	y	1,5
Akuafo	16	y	1,6
Kikoma	16	y	e,n,x
Avignon	16	y	e,n, z_{15}
Gerland	16	z	1,5
Fortlamy	16	z	1,6
Lingwala	16	z	1,7
Kassel	16	z	e,n,x
II	16	z	e,n,x
Brevik	16	z	e,n,[x], z_{15}
Bouake	16	z	z_6
II	16	z	z_{42}
Kibi	16	z_4 , z_{23}	[1,6]
Axim	16	z_4 , z_{23}	z_6
II	16	z_4 , z_{23}	—
IV	16	z_4 , z_{23}	—
Kaevlinge	16	z_4 , z_{24}	—
II	16	z_4 , z_{24}	—
IV	16	z_4 , z_{24}	—
IV	16	z_4 , z_{32}	—
II	16	z_6	1,6
Badagry	16	z_{10}	1,5

IIIb	16	Z ₁₀	1,7
Lisboa	16	Z ₁₀	1,6
IIIb	16	Z ₁₀	e,n,x,Z ₁₅
Redlands	16	Z ₁₀	e,n,Z ₁₅
Angouleme	16	Z ₁₀	Z ₆
Saloniki	16	Z ₂₉	–
II	16	Z ₂₉	1,5
II	16	Z ₂₉	e,n,x
Trier	16	Z ₃₅	1,6
Dakota	16	Z ₃₅	e,n,Z ₁₅
II	16	Z ₃₅	e,n,x
IV	16	Z ₃₆	–
II	16	Z ₃₆	e,n,Z ₁₅
Naware	16	Z ₃₈	–
Grancanaria	16	Z ₃₉	[1,6]
II	16	Z ₄₂	1,(5),7
II	16	Z ₄₂	1,6
IIIb	16	Z ₅₂	Z ₃₅

Group O:17 (J)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Bonames	17	a	1,2	
Jangwani	17	a	1,5	
Kinondoni	17	a	e,n,x	
Kirkee	17	b	1,2	
Dahra	17	b	1,5	
Mattenhof	17	b	e,n,x	
II	17	b	e,n,x,Z ₁₅	
Bignona	17	b	e,n,Z ₁₅	
II	17	b	Z ₆	
Luedinghausen	17	c	1,5	
Victoriaborg	17	c	1,6	
II	17	c	Z ₃₉	
Berlin	17	d	1,5	
Karlshamn	17	d	e,n,Z ₁₅	
Niamey	17	d	l,w	
Jubilee	17	e,h	1,2	
II	17	e,n,x,Z ₁₅	1,6	
II	17	e,n,x,Z ₁₅	1,[5],7	
II	17	g,m,s,t	–	
Lowestoft	17	g,s,t	–	
II	17	g,t	[e,n,x,Z ₁₅]	
II	17	g,t	Z ₃₉	
Bama	17	m,t	–	
II	17	m,t	–	
Ahanou	17	i	1,7	
IIIb	17	i	Z ₃₅	
Irenea	17	k	1,5	
Bandim	17	k	1,6	
Warri	17	k	1,7	
Matadi	17	k	e,n,x	
Zaria	17	k	e,n,Z ₁₅	
IIIb	17	k	Z	

II	17	k	–	
Morotai	17	l,v	1,2	
Michigan	17	l,v	1,5	
Lancaster	17	l,v	1,7	
Carmel	17	l,v	e,n,x	
IIIb	17	l,v	e,n,x,z ₁₅	
IIIb	17	l,v	z ₃₅	
Granlo	17	l,z ₂₈	e,n,x	
Lode	17	r	1,2	
IIIb	17	r	z	
II	17	y	–	
Tendeba	17	y	e,n,x	
Hadejia	17	y	e,n,z ₁₅	
Lokomo	17	y	l,w	
Gori	17	z	1,2	
Warengo	17	z	1,5	
Dingiri	17	z	1,6	
II	17	z	1,7	
Tchamba	17	z	e,n,z ₁₅	
II	17	z	l,w	z ₄₂
IIIa	17	z ₄ ,z ₂₃	–	
IIIa	17	z ₄ ,z ₂₃ ,z ₃₂	–	
IIIa	17	z ₄ ,z ₂₄	–	
IIIa	17	z ₄ ,z ₃₂	–	
Djibouti	17	z ₁₀	e,n,x	
IIIb	17	z ₁₀	e,n,x,z ₁₅	[z ₅₆]
IIIb	17	z ₁₀	z	
II	17	z ₁₀	–	
Kandla	17	z ₂₉	–	
IIIa	17	z ₂₉	–	
IV	17	z ₂₉	–	
Aachen	17	z ₃₅	1,6	
IIIa	17	z ₃₆	–	
IV	17	z ₃₆	–	

Group O:18 (K)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Brazos	<u>6,14,18</u>	a	e,n,Z ₁₅	
Fluntern	<u>6,14,18</u>	b	1,5	
Cochise	18	b	1,7	
Rawash	<u>6,14,18</u>	c	e,n,x	
Groenekan	18	d	1,5	
Usumbura	<u>6,14,18</u>	d	1,7	
Pontypridd	18	g,m	–	
Eaubonne	18	g,s,t	–	
IIIa	18	g,Z ₅₁	–	
IV	18	g,Z ₅₁	–	
II	18	m,t	1,5	
Langenhorn	18	m,t	–	
Memphis	18	k	1,5	
IIIb	18	(k)	Z ₅₃	
IIIb	18	(k)	Z ₅₄	
IIIb	18	l,v	e,n,x,Z ₁₅	
Orlando	18	l,v	e,n,Z ₁₅	
IIIb	18	l,v	z	[Z ₅₀]
IIIb	18	l,v	Z ₅₃	
Toulon	18	l,w	e,n,Z ₁₅	
Tennenlohe	18	r	1,5	
IIIb	18	r	z	
Troy	18	y	1,7	
II	18	y	e,n,x,Z ₁₅	
Potengi	18	z	–	
Cerro	<u>6,14,18</u>	Z ₄ ,Z ₂₃	[1,5]	[Z ₄₅],[Z ₈₂]
Aarhus	18	Z ₄ ,Z ₂₃	Z ₆₄	
II	18	Z ₄ ,Z ₂₃	–	
IIIa	18	Z ₄ ,Z ₂₃	–	
Blukwa	<u>6,14,18</u>	Z ₄ ,Z ₂₄	–	
II	18	Z ₄ ,Z ₂₄	–	
IIIa	18	Z ₄ ,Z ₃₂	–	

IIIb	18	Z ₁₀	e,n,x,Z ₁₅
Leer	18	Z ₁₀	1,5
Carnac	18	Z ₁₀	Z ₆
II	18	Z ₁₀	Z ₆
II	18	Z ₃₆	–
IV	18	Z ₃₆ ,Z ₃₈	–
Sinthia	18	Z ₃₈	–
Delmenhorst	18	Z ₇₁	–
Cotia	18	–	1,6

Group O:21 (L)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Assen	21	a	[1,5]	
II	21	b	1,5	
Ghana	21	b	1,6	
Minnesota	21	b	e,n,x	[z ₃₃],[z ₄₉]
Hydra	21	c	1,6	
Rhone	21	c	e,n,x	
II	21	c	e,n,x	
IIIb	21	c	e,n,x,z ₁₅	
Spartel	21	d	1,5	
Magwa	21	d	e,n,x	
Madison	21	d	z ₆	
Good	21	f,g	e,n,x	
II	21	g,[m],[s],t	–	
IIIa	21	g,z ₅₁	–	
IV	21	g,z ₅₁	–	
II	21	m,t	–	
IV	21	m,t	–	
Diourbel	21	i	1,2	
IIIb	21	i	1,5,7	
IIIb	21	i	e,n,x,z ₁₅	
IIIb	21	k	e,n,x,z ₁₅	
IIIb	21	k	z	
Surrey	21	k	1,(2),5	
IIIb	21	l,v	z	
IIIb	21	l,v	z ₅₇	
Keve	21	l,w	–	
Jambur	21	l,z ₂₈	e,n,z ₁₅	
Mountmagnet	21	r	–	
IIIb	21	r	z	
Ibaragi	21	y	1,2	
Ruiru	21	y	e,n,x	
II	21	z	–	
Baguida	21	z ₄ ,z ₂₃	–	
IIIa	21	z ₄ ,z ₂₃	–	

IV	21	Z_4, Z_{23}	—
II	21	Z_4, Z_{24}	—
IIIa	21	Z_4, Z_{24}	—
IV	21	Z_4, Z_{32}	—
IIIb	21	Z_{10}	e, n, x, Z_{15}
IIIb	21	Z_{10}	Z
II	21	Z_{10}	$[Z_6]$
IIIb	21	Z_{10}	Z_{53}
IIIa	21	Z_{29}	—
Gambaga	21	Z_{35}	e, n, Z_{15}
IIIa	21	Z_{36}	—
IV	21	Z_{36}	—
IIIb	21	Z_{65}	e, n, x, Z_{15}

Group O:28 (M)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Solna	28	a	1,5	
Dakar	28	a	1,6	
Bakau	28	a	1,7	
Seattle	28	a	e,n,x	
II	28	a	e,n,x	
Honelis	28	a	e,n,Z ₁₅	
Dibra	28	a	Z ₆	
Moero	28	b	1,5	
Ashanti	28	b	1,6	
Bokanjac	28	b	1,7	
Soumbedioune	28	b	e,n,x	
II	28	b	e,n,x	
Langford	28	b	e,n,Z ₁₅	
Freefalls	28	b	l,w	
II	28	b	Z ₆	
Hermannswerder	28	c	1,5	
Eberswalde	28	c	1,6	
Halle	28	c	1,7	
Dresden	28	c	e,n,x	
Wedding	28	c	e,n,Z ₁₅	
Tchimani	28	c	Z ₆	
Amoutive	28	d	1,5	
Hatfield	28	d	1,6	
Mundonobo	28	d	1,7	
Mocamedes	28	d	e,n,x	
Patience	28	d	e,n,Z ₁₅	
Cullingworth	28	d	l,w	
Korkeasaari	28	e,h	1,5	
Kpeme	28	e,h	1,7	
Gozo	28	e,h	e,n,Z ₁₅	
II	28	e,n,x	1,7	
II	28	e,n,Z ₁₅	Z ₈₇	
Friedrichsfelde	28	f,g	—	

Yardley	28	g,m	1,6
Abadina	28	g,m	[e,n,z ₁₅]
II	28	g,(m),[s],t	1,5
Croft	28	g,m,s	[e,n,z ₁₅]
II	28	g,m,t	e,n,x
II	28	g,m,t	z ₃₉
II	28	g,s,t	e,n,x
Ona	28	g,s,t	–
II	28	m,t	[e,n,x]
Vinohrady	28	m,t	[e,n,z ₁₅]
II	28	m,t	z ₃₉
Morillons	28	m,t	1,6
Doorn	28	i	1,2
Cotham	28	i	1,5
Volkmarsdorf	28	i	1,6
Dieuppeul	28	i	1,7
Warnemuende	28	i	e,n,x
Kuessel	28	i	e,n,z ₁₅
Douala	28	i	l,w
Guildford	28	k	1,2
Ilala	28	k	1,5
Adamstown	28	k	1,6
Ikeja	28	k	1,7
IIIb	28	k	1,7
Taunton	28	k	e,n,x
Ank	28	k	e,n,z ₁₅
Leoben	28	l,v	1,5
Vitkin	28	l,v	e,n,x
Nashua	28	l,v	e,n,z ₁₅
Ramsey	28	l,w	1,6
Catalunia	28	l,z ₁₃ ,z ₂₈	1,5
Penilla	28	l,z ₁₃ ,z ₂₈	e,n,z ₁₅
II	28	l,z ₂₈	1,5
Fajara	28	l,z ₂₈	e,n,x
II	28	l,z ₂₈	e,n,x
Bassadji	28	r	1,6
Kibusi	28	r	e,n,x
II	28	r	e,n,z ₁₅
Fairfield	28	r	l,w
Chicago	28	r,[i]	1,5
Banco	28	r,i	1,7

Sanktgeorg	28	r,[i]	e,n,z ₁₅	
Oskarshamn	28	y	1,2	
Nima	28	y	1,5	
Pomona	28	y	1,7	[z ₈₀],[z ₉₀]
Kitenge	28	y	e,n,x	
Telaviv	28	y	e,n,z ₁₅	
Shomolu	28	y	l,w	
Selby	28	y	z ₆	
Vanier	28	z	1,5	
II	28	z	1,5	
Doel	28	z	1,6	
Ezra	28	z	1,7	
Brisbane	28	z	e,n,z ₁₅	
II	28	z	z ₃₉	
Cannobio	28	z ₄ ,z ₂₃	1,5	
Teltow	28	z ₄ ,z ₂₃	1,6	
Babelsberg	28	z ₄ ,z ₂₃	[e,n,z ₁₅]	
Kethiabarny	28	z ₄ ,z ₂₄	–	
Rogy	28	z ₁₀	1,2	
Farakan	28	z ₁₀	1,5	
Libreville	28	z ₁₀	1,6	
Malaysia	28	z ₁₀	1,7	
Umbilo	28	z ₁₀	e,n,x	
Luckenwalde	28	z ₁₀	e,n,z ₁₅	
Moroto	28	z ₁₀	l,w	
IIIb	28	z ₁₀	z	
Djermaia	28	z ₂₉	–	
II	28	z ₂₉	1,5	
II	28	z ₂₉	e,n,x	
Konolfingen	28	z ₃₅	1,6	
Babili	28	z ₃₅	1,7	
Santander	28	z ₃₅	e,n,z ₁₅	
Aderike	28	z ₃₈	e,n,z ₁₅	

Group O:30 (N)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Overvecht	30	a	1,2	
Zehlendorf	30	a	1,5	
Guarapiranga	30	a	e,n,x	
Doulassame	30	a	e,n,z ₁₅	
II	30	a	z ₃₉	
Louga	30	b	1,2	
Aschersleben	30	b	1,5	
Tempe	30	b	1,7	[z ₃₃]
Urbana	30	b	e,n,x	
Neudorf	30	b	e,n,z ₁₅	
II	30	b	z ₆	
Zaire	30	c	1,7	
Morningside	30	c	e,n,z ₁₅	
II	30	c	z ₃₉	
Messina	30	d	1,5	
Livulu	30	e,h	1,2	
Torhout	30	e,h	1,5	
Godesberg	30	g,m,[t]	–	
II	30	g,m,s	e,n,x	
Giessen	30	g,m,s	–	
Sternschanze	30	g,s,t	–	[z ₅₉]
II	30	g,t	–	
Wayne	30	g,z ₅₁	–	
II	30	m,t	–	
Landau	30	i	1,2	
Morehead	30	i	1,5	
Mjordan	30	i	e,n,z ₁₅	
Soerenga	30	i	l,w	
Hilversum	30	k	1,2	
Ramatgan	30	k	1,5	
Aqua	30	k	1,6	
Angoda	30	k	e,n,x	

Odozi	30	k	e,n,[x],z ₁₅
II	30	k	e,n,x,z ₁₅
Scarborough	30	k	l,z ₁₃ ,z ₂₈
Ligeo	30	l,v	1,2
Donna	30	l,v	1,5
Ockenheim	30	l,z ₁₃ ,z ₂₈	1,6
Morocco	30	l,z ₁₃ ,z ₂₈	e,n,z ₁₅
II	30	l,z ₂₈	z ₆
Grandhaven	30	r	1,2
Gege	30	r	1,5
Quincy	30	r	1,6
Matopeni	30	y	1,2
Bietri	30	y	1,5
Steinplatz	30	y	1,6
Baguirmi	30	y	e,n,x
Nijmegen	30	y	e,n,z ₁₅
Hohentwiel	30	z	e,n,x,z ₁₅
Stoneferry	30	z ₄ ,z ₂₃	–
Bodjonegoro	30	z ₄ ,z ₂₄	–
II	30	z ₆	1,6
Sada	30	z ₁₀	1,2
Senneville	30	z ₁₀	1,5
Kumasi	30	z ₁₀	e,n,z ₁₅
II	30	z ₁₀	e,n,x,z ₁₅
Aragua	30	z ₂₉	–
Kokoli	30	z ₃₅	1,6
Wuiti	30	z ₃₅	e,n,z ₁₅
Ago	30	z ₃₈	–
II	30	z ₃₉	1,7

Group O:35 (O)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Umhlatazana	35	a	e,n,Z ₁₅	
Tchad	35	b	–	
Keurmassar	35	c	1,2	
Gouloumbo	35	c	1,5	
Yolo	35	c	[e,n,Z ₁₅]	
II	35	d	1,5	
Dembe	35	d	l,w	[Z ₅₈]
Gassi	35	e,h	Z ₆	
Adelaide	35	f,g	–	[Z ₂₇]
Ealing	35	g,m,s	–	
II	35	g,m,s,t	–	
Ebrie	35	g,m,t	–	
Anecho	35	g,s,t	–	
II	35	g,t	1,5	
II	35	g,t	Z ₄₂	
Agodi	35	g,t	–	
IIIa	35	g,Z ₅₁	–	
Monschaui	35	m,t	–	
II	35	m,t	–	
IIIb	35	i	e,n,x,Z ₁₅	
Gambia	35	i	e,n,Z ₁₅	
Bandia	35	i	l,w	
IIIb	35	i	Z	
Evry	35	i	Z ₆	
IIIb	35	i	Z ₃₅	
IIIb	35	i	Z ₅₃	
IIIb	35	k	e,n,x,Z ₁₅	
IIIb	35	k	Z	
IIIb	35	(k)	Z ₃₅	
IIIb	35	k	Z ₅₃	[Z ₅₀]
IIIb	35	l,v	1,5,7	
IIIb	35	l,v	e,n,x,Z ₁₅	[Z ₅₀]
IIIb	35	l,v	Z ₃₅	[Z ₆₇]

II	35	l,z ₂₈	–	
IIIb	35	r	e,n,x,z ₁₅	
Massakory	35	r	l,w	
IIIb	35	r	z	
IIIb	35	r	z ₃₅	
IIIb	35	r	z ₆₁	
Alachua	35	z ₄ ,z ₂₃	–	[z ₃₇],[z ₄₅]
IIIa	35	z ₄ ,z ₂₃	–	
Westphalia	35	z ₄ ,z ₂₄	–	
IIIa	35	z ₄ ,z ₂₄	–	
IIIa	35	z ₄ ,z ₃₂	–	
Camberene	35	z ₁₀	1,5	
Enschede	35	z ₁₀	l,w	
Ligna	35	z ₁₀	z ₆	
IIIb	35	z ₁₀	z ₃₅	
II	35	z ₂₉	e,n,x	
Widemarsh	35	z ₂₉	–	
IIIa	35	z ₂₉	–	
IIIa	35	z ₃₆	–	
Haga	35	z ₃₈	–	
IIIb	35	z ₅₂	1,5,7	
IIIb	35	z ₅₂	e,n,x,z ₁₅	
IIIb	35	z ₅₂	z	
IIIb	35	z ₅₂	z ₃₅	

Group O:38 (P)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Oran	38	a	e,n,Z ₁₅	
II	38	b	1,2	
Rittersbach	38	b	e,n,Z ₁₅	
Sheffield	38	c	1,5	
Kidderminster	38	c	1,6	[Z ₅₈]
Willamette	38	d	1,5	
II	38	d	[1,5]	
II	38	d	Z ₃₉	
Thiaroye	38	e,h	1,2	
Kasenyi	38	e,h	1,5	
Korovi	38	g,m,[s]	–	
II	38	g,t	–	
IIIa	38	g,Z ₅₁	–	
IV	38	g,Z ₅₁	–	
Rothenburgsort	38	m,t	–	
Mgulani	38	i	1,2	
Lansing	38	i	1,5	
IIIb	38	i	Z	
IIIb	38	i	Z ₅₃	
Echa	38	k	1,2	
Mango	38	k	1,5	
Inverness	38	k	1,6	
Njala	38	k	e,n,x	
IIIb	38	k	e,n,x,Z ₁₅	
IIIb	38	k	Z	
IIIb	38	k	Z ₅₃	
IIIb	38	(k)	1,5,7	
IIIb	38	(k)	Z ₃₅	[Z ₅₆]
IIIb	38	(k)	–	
IIIb	38	(k)	Z ₅₅	
Alger	38	l,v	1,2	
Kimberley	38	l,v	1,5	

Taylor	38	l,v	e,n,z ₁₅	
Roan	38	l,v	e,n,x	
IIIb	38	l,v	z	
IIIb	38	l,v	z ₃₅	
IIIb	38	l,v	[z ₅₃]	[z ₅₄]
Lindi	38	r	1,5	
IIIb	38	r	1,5,7	
Emmastad	38	r	1,6	
IIIb	38	r	e,n,x,z ₁₅	
IIIb	38	r	z	[z ₅₇]
IIIb	38	r	z ₃₅	
Freetown	38	y	1,5	
Colombo	38	y	1,6	
Perth	38	y	e,n,x	
Stachus	38	z	–	
Yoff	38	z ₄ ,z ₂₃	1,2	
IIIa	38	z ₄ ,z ₂₃	–	
IV	38	z ₄ ,z ₂₃	–	
Bangkok	38	z ₄ ,z ₂₄	–	
Neunkirchen	38	z ₁₀	[1,5]	
IIIb	38	z ₁₀	z	
IIIb	38	z ₁₀	z ₅₃	
Carpentras	38	z ₃₅	e,n,z ₁₅	
Klouto	38	z ₃₈	–	
IIIb	38	z ₅₂	z ₃₅	
IIIb	38	z ₅₂	z ₅₃	
IIIb	38	z ₅₃	–	[z ₄₇],[z ₅₀],[z ₇₆]
IIIb	38	z ₆₁	[z ₅₃]	

Group O:39 (Q)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	39	a	Z ₃₉	
Wandsworth	39	b	1,2	
Abidjan	39	b	1,w	
II	39	c	e,n,x	
Logone	39	d	1,5	
Bruebach	39	e,h	1,2	
Mara	39	e,h	1,5	
II	39	e,n,x	1,7	
Dietrichsdorf	39	m,t	–	
II	39	[g],m,t	[e,n,x]	
Hofit	39	i	1,5	
Cumberland	39	i	e,n,x	
Alma	39	i	e,n,Z ₁₅	
Champaign	39	k	1,5	[Z ₄₈]
Newjersey	39	k	e,n,x	
II	39	l,v	1,5	
Kokomlemle	39	l,v	e,n,x	
Oerlikon	39	l,v	e,n,Z ₁₅	
II	39	l,Z ₂₈	e,n,x	
II	39	l,Z ₂₈	Z ₃₉	
Anfo	39	y	1,2	
Windermere	39	y	1,5	
Delan	39	y	e,n,Z ₁₅	
Namur	39	Z ₄ ,Z ₂₃	–	
Hegau	39	Z ₁₀	–	
II	39	Z ₁₀	Z ₆	
II	39	–	1,7	

Group O:40 (R)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Shikmonah	40	a	1,5	
Salinas	40	a	1,7	
Greiz	40	a	Z ₆	
II	40	a	Z ₃₉	
Riogrande	40	b	1,5	
Saugus	40	b	1,7	
Johannesburg	<u>1,40</u>	b	e,n,x	
Duval	<u>1,40</u>	b	e,n,Z ₁₅	
Benguella	40	b	Z ₆	
II	40	b	—	
II	<u>1,40</u>	c	e,n,x,Z ₁₅	
II	40	c	Z ₆	
II	<u>1,40</u>	c	Z ₃₉	
Driffield	<u>1,40</u>	d	1,5	
II	40	d	—	
Tilene	<u>1,40</u>	e,h	1,2	
II	<u>1,40</u>	e,n,x	1,[5],7	
II	<u>1,40</u>	e,n,x,Z ₁₅	1,6	
Bijlmer	<u>1,40</u>	g,m	—	
Athens	<u>1,40</u>	g,m,s	e,n,x	
II	<u>1,40</u>	g,[m],[s],[t]	e,n,x	
II	<u>1,40</u>	g,[m],[s],t	[1,5]	
II	<u>1,40</u>	g,t	e,n,x,Z ₁₅	
II	40	g,t	Z ₃₉	
IV	<u>1,40</u>	g,t	—	
II	<u>1,40</u>	g,[m],[s],t	Z ₄₂	
IIIa	40	g,Z ₅₁	—	
IIIb	40	g,Z ₅₁	e,n,x,Z ₁₅	
IV	<u>1,40</u>	g,Z ₅₁	—	
II	40	m,t	e,n,x	
II	40	m,t	Z ₃₉	
II	<u>1,40</u>	m,t	Z ₄₂	
IV	40	m,t	—	
IIIb	40	i	1,5,7	

Goulfey	<u>1,40</u>	k	1,5	
Allandale	<u>1,40</u>	k	1,6	
Hann	40	k	e,n,x	
II	<u>1,40</u>	k	e,n,x,Z ₁₅	
IIIb	40	k	z	Z ₅₇
II	40	k	Z ₆	
IIIb	40	k	Z ₅₃	
Millesi	<u>1,40</u>	l,v	1,2	
Canary	40	l,v	1,6	
II	40	l,v	e,n,x	
IIIb	40	l,v	z	
IIIb	<u>1,40</u>	l,v	Z ₅₃	
Overchurch	<u>1,40</u>	l,w	[1,2]	
II	40	l,Z ₂₈	e,n,x	
Tiko	<u>1,40</u>	l,Z ₁₃ ,Z ₂₈	1,2	
Bukavu	<u>1,40</u>	l,Z ₂₈	1,5	
II	<u>1,40</u>	l,Z ₂₈	1,5	Z ₄₂
Santhiaba	40	l,Z ₂₈	1,6	
II	<u>1,40</u>	l,Z ₂₈	Z ₃₉	
IIIb	40	r	Z ₅₃	
Odiene	40	y	1,5	
II	<u>1,40</u>	z	1,5	
Casamance	40	z	e,n,x	
Nowawes	40	z	Z ₆	
II	<u>1,40</u>	z	Z ₆	
II	<u>1,40</u>	z	Z ₃₉	
II	40	z	Z ₄₂	
IIIa	40	Z ₄ ,Z ₂₃	—	
IV	<u>1,40</u>	Z ₄ ,Z ₂₃	—	
II	40	Z ₄ ,Z ₂₄	Z ₃₉	
IIIa	40	Z ₄ ,Z ₂₄	—	
IV	<u>1,40</u>	Z ₄ ,Z ₂₄	—	
IIIa	40	Z ₄ ,Z ₃₂	—	
IV	<u>1,40</u>	Z ₄ ,Z ₃₂	—	
II	<u>1,40</u>	Z ₆	1,5	
Trotha	40	Z ₁₀	Z ₆	
II	40	Z ₁₀	e,n,x	
IIIb	40	Z ₁₀	Z ₃₅	
Omifisan	<u>1,40</u>	Z ₂₉	—	
IIIa	40	Z ₂₉	—	
II	<u>1,40</u>	Z ₃₅	e,n,x,Z ₁₅	

Yekepa	<u>1,40</u>	Z ₃₅	e,n,Z ₁₅	
V	<u>1,40</u>	Z ₃₅	—	
IIIa	40	Z ₃₆	—	
II	<u>1,40</u>	Z ₃₉	1,5	Z ₄₂
II	<u>1,40</u>	Z ₃₉	1,6	
IIIb	40	Z ₃₉	1,6	
II	40	Z ₃₉	1,7	
Karamoja	<u>1,40</u>	Z ₄₁	1,2	
II	<u>1,40</u>	Z ₄₂	1,6	
II	<u>1,40</u>	[Z ₄₂]	1,(5),7	
II	<u>1,40</u>	Z ₈₁	Z ₆	
V	<u>1,40</u>	Z ₈₁	—	

Group O:41 (S)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Burundi	41	a	—	
II	41	b	1,5	
Vaugirard	41	b	1,6	
VI	41	b	1,7	
Vietnam	41	b	Z ₆	
Sica	41	b	e,n,Z ₁₅	
Lonestar	41	c	—	
IIIb	41	c	e,n,x,Z ₁₅	
II	41	c	Z ₆	
Egusi	41	d	1,5	
II	41	d	Z ₆	
II	41	g,m,s,t	Z ₆	
II	41	g,t	—	
IIIa	41	g,Z ₅₁	—	
Leatherhead	41	m,t	1,6	
Samaru	41	i	1,5	
Verona	41	i	1,6	
Ferlo	41	k	1,6	
II	41	k	1,6	
II	41	k	Z ₆	
IIIb	41	(k)	Z ₃₅	
II	41	l,Z ₁₃ ,Z ₂₈	e,n,x,Z ₁₅	
Lubumbashi	41	r	1,5	
Konongo	41	r	1,7	
II	41	z	1,5	
Sally	41	z	1,6	
Bofflens	41	Z ₄ ,Z ₂₃	1,7	
Waycross	41	Z ₄ ,Z ₂₃	[e,n,Z ₁₅]	
IIIa	41	Z ₄ ,Z ₂₃	—	
IV	41	Z ₄ ,Z ₂₃	—	
IIIa	41	Z ₄ ,Z ₂₃ ,Z ₃₂	—	
Ipswich	41	Z ₄ ,Z ₂₄	1,5	
IIIa	41	Z ₄ ,Z ₂₄	—	

IIIa	41	Z ₄ ,Z ₃₂	–
II	41	Z ₁₀	1,2
Leipzig	41	Z ₁₀	1,5
Landala	41	Z ₁₀	1,6
Inpraw	41	Z ₁₀	e,n,x
II	41	Z ₁₀	e,n,x,Z ₁₅
II	41	Z ₁₀	Z ₆
Lodz	41	Z ₂₉	–
IIIa	41	Z ₂₉	–
IV	41	Z ₂₉	–
Ahoutoue	41	Z ₃₅	1,6
IIIa	41	Z ₃₆	–
IV	41	Z ₃₆	–
Offa	41	Z ₃₈	–
IV	41	Z ₅₂	–
II	41	–	1,6

Group O:42 (T)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Faji	<u>1</u> ,42	a	e,n,Z ₁₅	
II	42	b	1,5	
Orbe	42	b	1,6	
II	42	b	e,n,x,Z ₁₅	
Tomegbe	<u>1</u> ,42	b	e,n,Z ₁₅	
Frederiksberg	<u>1</u> ,42	b	l,w	
Egusitoo	<u>1</u> ,42	b	Z ₆	
II	42	b	Z ₆	
Antwerpen	<u>1</u> ,42	c	e,n,Z ₁₅	
Kampala	<u>1</u> ,42	c	Z ₆	
II	42	d	Z ₆	
II	42	e,n,x	1,6	
II	42	g,t	–	
Maricopa	<u>1</u> ,42	g,Z ₅₁	1,5	
IIIa	42	g,Z ₅₁	–	
IV	<u>1</u> ,42	g,Z ₅₁	–	
II	42	m,t	[e,n,x,Z ₁₅]	
Waral	<u>1</u> ,42	m,t	–	
Kaneshie	<u>1</u> ,42	i	l,w	
Borromea	42	i	1,6	
Middlesbrough	<u>1</u> ,42	i	Z ₆	
Haferbreite	42	k	1,6	
IIIb	42	k	e,n,x,Z ₁₅	
IIIb	42	k	Z	
Gwale	<u>1</u> ,42	k	Z ₆	
IIIb	42	(k)	Z ₃₅	
IIIb	42	l,v	1,5,7	[Z ₇₆]
II	42	l,v	e,n,x,Z ₁₅	
IIIb	42	l,v	e,n,x,Z ₁₅	
Coogee	42	l,v	e,n,Z ₁₅	
IIIb	42	l,v	Z	
IIIb	42	l,v	Z ₅₃	
II	<u>1</u> ,42	l,w	e,n,x	
Parakou	<u>1</u> ,42	l,w	Z ₃₅	

II	<u>1,42</u>	1,[z ₁₃],z ₂₈	[z ₆]	
Sipane	<u>1,42</u>	r	e,n,z ₁₅	
Brive	<u>1,42</u>	r	l,w	
IIIb	42	r	z	
IIIb	42	r	z ₅₃	
II	42	r	–	
IIIb	42	r	–	[z ₅₀]
Spalantor	<u>1,42</u>	y	e,n,z ₁₅	
Harvestehude	<u>1,42</u>	y	z ₆	
II	42	z	1,5	
Ursenbach	<u>1,42</u>	z	1,6	
II	42	z	e,n,x,z ₁₅	
Melbourne	42	z	e,n,z ₁₅	
II	42	z	z ₆	
Gera	<u>1,42</u>	z ₄ ,z ₂₃	1,6	
Broc	42	z ₄ ,z ₂₃	e,n,z ₁₅	
IIIa	42	z ₄ ,z ₂₃	–	
Toricada	<u>1,42</u>	z ₄ ,z ₂₄	–	
IIIa	42	z ₄ ,z ₂₄	–	
IV	<u>1,42</u>	z ₄ ,z ₂₄	–	
II	42	z ₆	1,6	
II	42	z ₁₀	1,2	
II	42	z ₁₀	e,n,x,z ₁₅	
IIIb	42	z ₁₀	e,n,x,z ₁₅	[z ₆₀]
IIIb	42	z ₁₀	z	
Loenga	<u>1,42</u>	z ₁₀	z ₆	
II	42	z ₁₀	z ₆	
IIIb	42	z ₁₀	z ₃₅	
IIIb	42	z ₁₀	z ₆₇	
Djama	<u>1,42</u>	z ₂₉	[1,5]	
II	42	z ₂₉	–	
Kahla	<u>1,42</u>	z ₃₅	1,6	
Hennekamp	42	z ₃₅	e,n,z ₁₅	
Tema	<u>1,42</u>	z ₃₅	z ₆	
Weslaco	42	z ₃₆	–	
IV	42	z ₃₆	–	
Vogan	<u>1,42</u>	z ₃₈	z ₆	
Taset	<u>1,42</u>	z ₄₁	–	
IIIb	42	z ₅₂	z	
IIIb	42	z ₅₇	1,5	

Group O:43 (U)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Graz	43	a	1,2	
Berkeley	43	a	1,5	
II	43	a	1,5	
II	43	a	Z ₆	
Niederoderwitz	43	b	–	
Ede	43	b	e,n,Z ₁₅	
II	43	b	Z ₄₂	
Montreal	43	c	1,5	
Orleans	43	d	1,5	
II	43	d	e,n,x,Z ₁₅	
II	43	d	Z ₃₉	
II	43	d	Z ₄₂	
II	43	e,n,x,Z ₁₅	1,(5),7	
II	43	e,n,x,Z ₁₅	1,6	
Milwaukee	43	f,g,[t]	–	
II	43	g,m,[s],t	[Z ₄₂]	
II	43	g,t	[1,5]	
IIIb	43	g,t	–	
IIIa	43	g,Z ₅₁	–	
IV	43	g,Z ₅₁	–	
II	43	g,Z ₆₂	e,n,x	
Mbao	43	i	1,2	
Voulte	43	i	e,n,x	
Thetford	43	k	1,2	
Ahuza	43	k	1,5	
IIIb	43	k	Z	
IIIb	43	l,v	Z ₅₃	[Z ₅₆]
Epalinges	43	l,w	[Z ₄₄]	
Sudan	43	l,Z ₁₃	–	
II	43	l,Z ₁₃ ,Z ₂₈	1,5	
IIIb	43	r	e,n,x,Z ₁₅	
IIIb	43	r	Z	

IIIb	43	r	Z ₅₃
Farcha	43	y	1,2
Kingabwa	43	y	1,5
Ogbete	43	z	1,5
II	43	z	1,5
Arusha	43	z	e,n,z ₁₅
Farmingdale	43	Z ₄ ,Z ₂₃	[1,2]
II	43	Z ₄ ,Z ₂₃	—
IIIa	43	Z ₄ ,Z ₂₃	—
IV	43	Z ₄ ,Z ₂₃	—
IIIa	43	Z ₄ ,Z ₂₄	—
IV	43	Z ₄ ,Z ₂₄	—
IV	43	Z ₄ ,Z ₃₂	—
Adana	43	Z ₁₀	1,5
II	43	Z ₂₉	e,n,x
II	43	Z ₂₉	Z ₄₂
Makiling	43	Z ₂₉	—
IIIa	43	Z ₂₉	—
IV	43	Z ₂₉	—
Ahepe	43	Z ₃₅	1,6
IIIa	43	Z ₃₆	—
IV	43	Z ₃₆ ,Z ₃₈	—
Irigny	43	Z ₃₈	—
II	43	Z ₄₂	[1,5,7]
IIIb	43	Z ₅₂	Z ₅₃

Group O:44 (V)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IV	44	a	–	
Niakhar	44	a	1,5	
Tiergarten	44	a	e,n,x	
Niarembe	44	a	l,w	
Shahalam	44	b	1,6	
Elbeuf	44	b	e,n,x	
Sedgwick	44	b	e,n,z ₁₅	
Madigan	44	c	1,5	
Quebec	44	c	e,n,z ₁₅	
Bobo	44	d	1,5	
Kermel	44	d	e,n,x	
Fischerstrasse	44	d	e,n,z ₁₅	
Palamaner	<u>1</u> ,44	d	z ₃₅	
II	<u>1</u> ,44	e,n,x	1,6	
Vleuten	44	f,g	–	
Gamaba	<u>1</u> ,44	g,m,[s]	[1,6]	
Splott	44	g,s,t	[1,7]	
II	44	g,t	z ₄₂	
IIIb	<u>1</u> ,44	g,t	1,5	z ₄₂
Carswell	44	g,z ₅₁	–	
IV	44	g,z ₅₁	–	
Muguga	44	m,t	–	
II	<u>1</u> ,44	m,t	z ₄₂	
Maritzburg	<u>1</u> ,44	i	e,n,z ₁₅	
Lawra	44	k	e,n,z ₁₅	
Malika	44	l,z ₂₈	1,5	
Albertbanjul	44	r	1,5	
Brefet	44	r	e,n,z ₁₅	
V	44	r	–	
Brackenridge	44	z	1,5	
Uhlenhorst	44	z	l,w	
Bolama	44	z	e,n,x	

Kua	44	Z_4, Z_{23}	—	
Ploufragan	<u>1</u> ,44	Z_4, Z_{23}	e,n , Z_{15}	
II	44	Z_4, Z_{23}	—	
IIIa	44	Z_4, Z_{23}	—	
IV	44	Z_4, Z_{23}	—	
IIIa	44	Z_4, Z_{23}, Z_{32}	—	
Christiansborg	44	Z_4, Z_{24}	—	
IIIa	44	Z_4, Z_{24}	—	
IV	44	Z_4, Z_{24}	—	
IIIa	44	Z_4, Z_{32}	—	
IV	<u>1</u> ,44	Z_4, Z_{32}	—	
Guinea	<u>1</u> ,44	Z_{10}	1,7	
Llobregat	<u>1</u> ,44	Z_{10}	e,n,x	
II	44	Z_{29}	e,n,x	Z_{42}
Zinder	44	Z_{29}	—	
IV	44	Z_{29}	—	
IV	44	$Z_{36}, [Z_{38}]$	—	
Koketime	44	Z_{38}	—	
II	<u>1</u> ,44	Z_{39}	e,n,x , Z_{15}	
V	44	Z_{39}	—	

Group O:45 (W)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
VI	45	a	e,n,x	
Meekatharra	45	a	e,n,Z ₁₅	
II	45	a	Z ₁₀	
Riverside	45	b	1,5	
Fomeco	45	b	e,n,Z ₁₅	
Deversoir	45	c	e,n,x	
Dugbe	45	d	1,6	
Karachi	45	d	e,n,x	
Warmesen	45	d	e,n,Z ₁₅	
Suellendorf	45	f,g	–	
Tornow	45	g,m,[s],[t]	–	
II	45	g,m,s,t	1,5	
II	45	g,m,s,t	e,n,x	
II	45	g,m,t	e,n,x,Z ₁₅	
Binningen	45	g,s,t	–	
IIIa	45	g,Z ₅₁	–	
IV	45	g,Z ₅₁	–	
II	45	m,t	1,5	
Apapa	45	m,t	–	
Verviers	45	k	1,5	
Casablanca	45	k	1,7	
Cairns	45	k	e,n,Z ₁₅	
Imo	45	l,v	[e,n,Z ₁₅]	
Kofandoka	45	r	e,n,Z ₁₅	
II	45	z	1,5	
Yopougon	45	z	e,n,Z ₁₅	
II	45	z	Z ₃₉	
IIIa	45	Z ₄ ,Z ₂₃	–	
IV	45	Z ₄ ,Z ₂₃	–	
Transvaal	45	Z ₄ ,Z ₂₄	–	
IIIa	45	Z ₄ ,Z ₂₄	–	
IIIa	45	Z ₄ ,Z ₃₂	–	

Aprad	45	Z ₁₀	–	
Jodhpur	45	Z ₂₉	–	[Z ₄₅]
II	45	Z ₂₉	1,5	
II	45	Z ₂₉	e,n,x	
II	45	Z ₂₉	Z ₄₂	
IIIa	45	Z ₂₉	–	
Lattenkamp	45	Z ₃₅	1,5	
Balcones	45	Z ₃₆	–	
IIIa	45	Z ₃₆	–	
IV	45	Z ₃₆ ,Z ₃₈	–	

Group O:47 (X)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	47	a	1,5	
II	47	a	e,n,x,Z ₁₅	
Wenatchee	47	b	1,2	
II	47	b	1,5	
II	47	b	e,n,x,Z ₁₅	
Sya	47	b	Z ₆	
II	47	b	Z ₆	
IIIb	47	c	1,5,7	
Kodjovi	47	c	1,6	[Z ₇₈]
IIIb	47	c	e,n,x,Z ₁₅	[Z ₅₇]
IIIb	47	c	Z	
IIIb	47	c	Z ₃₅	
II	47	d	1,5	
Stellingen	47	d	e,n,x	[Z ₅₈]
II	47	d	e,n,x,Z ₁₅	
II	47	d	Z ₃₉	
II	47	e,n,x,Z ₁₅	1,6	
Sljeme	1,47	f,g	–	
Luke	1,47	g,m	–	
II	47	[g,t]	e,n,x	
IIIa	47	g,Z ₅₁	–	
Mesbit	47	m,t	e,n,Z ₁₅	
IIIb	47	i	e,n,x,Z ₁₅	[Z ₅₀]
Bergen	47	i	e,n,Z ₁₅	
IIIb	47	i	Z	
IIIb	47	i	Z ₃₅	
IIIb	47	i	Z ₅₃	[Z ₅₇],[Z ₈₄]
Staoueli	47	k	1,2	
Bootle	47	k	1,5	
IIIb	47	k	1,5,7	
Dahomey	47	k	1,6	[Z ₅₈]
IIIb	47	k	e,n,x,Z ₁₅	
Lyon	47	k	e,n,Z ₁₅	
IIIb	47	k	Z	

IIIb	47	k	Z ₃₅	
IIIb	47	k	Z ₅₃	[Z ₈₄]
IIIb	47	l,v	1,[5],7	[Z ₅₀]
Drac	47	l,v	e,n,x	
IIIb	47	l,v	e,n,x,Z ₁₅	
IIIb	47	l,v	Z	
IIIb	47	l,v	Z ₃₅	
IIIb	47	l,v	Z ₅₃	
IIIb	47	l,v	Z ₅₇	
IV	47	l,v	—	
Teshie	<u>1</u> ,47	l,Z ₁₃ ,Z ₂₈	e,n,Z ₁₅	
IIIb	47	r	e,n,x,Z ₁₅	
Dapango	47	r	1,2	
IIIb	47	r	1,5,7	
IIIb	47	r	Z	
IIIb	47	r,[i]	Z ₃₅	
IIIb	47	r	Z ₅₃	[Z ₇₀],[Z ₇₄],[Z ₇₇],[Z ₉₀]
Moualine	47	y	1,6	
Blitta	47	y	e,n,x	
Mountpleasant	47	Z	1,5	
Kaolack	47	Z	1,6	
II	47	Z	e,n,x,Z ₁₅	
II	47	Z	Z ₆	
Tabligbo	47	Z ₄ ,Z ₂₃	e,n,Z ₁₅	
Fehrbellin	47	Z ₄ ,Z ₂₃	1,6	
Bere	47	Z ₄ ,Z ₂₃	Z ₆	[Z ₄₅],[Z ₅₈]
Binche	47	Z ₄ ,Z ₂₃	l,w	
IIIa	47	Z ₄ ,Z ₂₃	—	
Tamberma	47	Z ₄ ,Z ₂₄	—	
II	47	Z ₆	1,6	
IIIb	47	Z ₁₀	1,5,7	
Namoda	47	Z ₁₀	e,n,Z ₁₅	
IIIb	47	Z ₁₀	Z	
IIIb	47	Z ₁₀	Z ₃₅	
II	47	Z ₂₉	e,n,x,Z ₁₅	
Ekpoui	47	Z ₂₉	—	
IIIa	47	Z ₂₉	—	
Yombesali	47	Z ₃₅	Z ₆	
Bingerville	47	Z ₃₅	e,n,Z ₁₅	
IV	47	Z ₃₆	—	

Alexanderplatz	47	Z ₃₈	–	
Quinhon	47	Z ₄₄	–	
IIIb	47	Z ₅₂	1,5	Z ₅₄
IIIb	47	Z ₅₂	1,5,7	
IIIb	47	Z ₅₂	e,n,x,Z ₁₅	
IIIb	47	Z ₅₂	Z	
IIIb	47	Z ₅₂	Z ₃₅	
IIIb	47	Z ₅₃	–	[Z ₉₀]

Group O:48 (Y)

Former group **O:64** was included in group **O:48**. Factor O :64 was found identical to subfactor O:48₄. Winkle, I., *Ann. Microbiol. (Inst. Pasteur)*, 1976, **127 B**, 463-472.

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Hisingen	48	a	1,5,7	
II	48	a	Z ₆	
II	48	a	Z ₃₉	
II	48	b	Z ₆	
II	48	b	e,n,x,Z ₁₅	
V	48	b	—	
IIIb	48	c	Z	
II	48	d	1,2	
II	48	d	Z ₆	
Buckeye	48	d	—	[Z ₅₈]
Fitzroy	48	e,h	1,5	
II	48	e,n,x,Z ₁₅	Z ₆	
II	48	g,m,t	—	
IIIa	48	g,Z ₅₁	—	
IV	48	g,Z ₅₁	—	
IIIb	48	i	Z	[Z ₇₂]
IIIb	48	i	Z ₃₅	[Z ₅₇]
IIIb	48	i	Z ₅₃	
IIIb	48	i	Z ₆₁	
V	48	i	—	
IIIb	48	k	1,5,(7)	
II	48	k	e,n,x,Z ₁₅	
IIIb	48	k	e,n,x,Z ₁₅	
Dahlem	48	k	e,n,Z ₁₅	
IIIb	48	k	Z	
IIIb	48	k	Z ₃₅	[Z ₇₅]
II	48	k	Z ₃₉	
IIIb	48	k	Z ₅₃	
Australia	48	l,v	1,5	
IIIb	48	l,v	1,5,(7)	[Z ₄₇],[Z ₅₀],[Z ₈₉]
IIIb	48	l,v	Z	

IIIb	48	l,w	1,5,7	[Z ₅₀]
IIIb	48	r	e,n,x,Z ₁₅	
IIIb	48	r	z	
Toucra	48	z	1,5	[Z ₅₈]
II	48	z	1,5	
IIIb	48	z	1,5,7	
IIIa	48	Z ₄ ,Z ₂₃	—	
IV	48	Z ₄ ,Z ₂₃	—	
IIIa	48	Z ₄ ,Z ₂₃ ,Z ₃₂	—	
Djakarta	48	Z ₄ ,Z ₂₄	—	
IIIa	48	Z ₄ ,Z ₂₄	—	
IIIb	48	Z ₄ ,Z ₂₄	—	
IIIa	48	Z ₄ ,Z ₃₂	—	
IV	48	Z ₄ ,Z ₃₂	—	
II	48	Z ₁₀	[1,5]	
VI	48	Z ₁₀	1,5	
II	48	Z ₁₀	1,6	
Isaszeg	48	Z ₁₀	e,n,x	
IIIb	48	Z ₁₀	e,n,x,Z ₁₅	
IIIb	48	Z ₁₀	z	
II	48	Z ₂₉	—	
IIIa	48	Z ₂₉	—	
IV	48	Z ₂₉	—	
IIIb	48	Z ₃₅	Z ₅₂	
V	48	Z ₃₅	—	
IIIa	48	Z ₃₆	—	
IV	48	Z ₃₆ ,[Z ₃₈]	—	
II	48	Z ₃₉	Z ₈₁	
V	48	Z ₃₉	—	
V	48	Z ₄₁	—	
IIIb	48	Z ₅₂	e,n,x,Z ₁₅	
IIIb	48	Z ₅₂	z	
V	48	Z ₆₅	—	
V	48	Z ₈₁	—	

Group O:50 (Z)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IV	50	a	–	
Rochdale	50	b	e,n,x	
II	50	b	z ₆	
IV	50	b	–	
Hemingford	50	d	1,5	[z ₈₂]
IV	50	d	–	
II	50	e,n,x	1,7	
II	50	g,[m],s,t	[1,5]	
IIIa	50	g,z ₅₁	–	
IV	50	g,z ₅₁	–	
II	50	g,z ₆₂	e,n,x	
II	50	m,t	z ₆	z ₄₂
IIIb	50	i	1,5,7	
IIIb	50	i	e,n,x,z ₁₅	
IIIb	50	i	z	
IIIb	50	i	z ₅₃	
IIIb	50	k	1,5,7	
II	50	k	e,n,x	z ₄₂
IIIb	50	k	e,n,x,z ₁₅	
IIIb	50	k	z	[z ₅₀],[z ₅₇],[z ₆₈],[z ₈₆]
II	50	k	z ₆	
IIIb	50	k	z ₃₅	
IIIb	50	k	z ₅₃	
Fass	50	l,v	1,2	
IIIb	50	l,v	e,n,x,z ₁₅	
IIIb	50	l,v	z	
IIIb	50	l,v	z ₃₅	
IIIb	50	l,v	z ₅₇	
VI	50	l,v	z ₆₇	
II	50	l,w	e,n,x,z ₁₅	z ₄₂
II	50	l,z ₂₈	z ₄₂	
IIIb	50	r	1,5,(7)	

IIIb	50	r	e,n,x,Z ₁₅	
IIIb	50	r	z	[Z ₆₇]
IIIb	50	r	Z ₃₅	[Z ₅₈]
IIIb	50	r	Z ₅₃	
Dougi	50	y	1,6	
II	50	z	e,n,x	
IIIb	50	z	Z ₅₂	
IIIa	50	Z ₄ ,Z ₂₃	—	
IV	50	Z ₄ ,Z ₂₃	—	
IIIa	50	Z ₄ ,Z ₂₃ ,Z ₃₂	—	
IIIa	50	Z ₄ ,Z ₂₄	—	
IV	50	Z ₄ ,Z ₂₄	—	
IIIa	50	Z ₄ ,Z ₃₂	—	
IV	50	Z ₄ ,Z ₃₂	—	
IIIb	50	Z ₁₀	z	[Z ₅₆]
II	50	Z ₁₀	Z ₆	Z ₄₂
IIIb	50	Z ₁₀	Z ₅₃	
Ivorycoast	50	Z ₂₉	—	
IIIa	50	Z ₂₉	—	
IIIa	50	Z ₃₆	—	
II	50	Z ₄₂	1,7	
IIIb	50	Z ₅₂	1,5,7	
IIIb	50	Z ₅₂	Z ₃₅	
IIIb	50	Z ₅₂	Z ₅₃	

Group O:51

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IV	51	a	–	
Windsheim	51	a	1,2	
Tione	51	a	e,n,x	
Karaya	51	b	1,5	
IV	51	b	–	
II	51	c	–	
Gokul	<u>1</u> ,51	d	1,5	
Meskin	51	e,h	1,2	
II	51	g,s,t	e,n,x	
IIIa	51	g,z ₅₁	–	
Djinten	51	m,t	–	
Kabete	51	i	1,5	
Dan	51	k	e,n,z ₁₅	
IIIb	51	k	z ₃₅	
Harcourt	51	l,v	1,2	
Overschie	51	l,v	1,5	
Dadzie	51	l,v	e,n,x	
IIIb	51	l,v	z	
Moundou	51	l,z ₂₈	1,5	
II	51	l,z ₂₈	z ₆	
II	51	l,z ₂₈	z ₃₉	
Lutetia	51	r,i	l,z ₁₃ ,z ₂₈	
Antsalova	51	z	1,5	
Treforest	<u>1</u> ,51	z	1,6	
Lechler	51	z	e,n,z ₁₅	
IIIa	51	z ₄ ,z ₂₃	–	
IV	51	z ₄ ,z ₂₃	–	
IIIa	51	z ₄ ,z ₂₄	–	
IIIa	51	z ₄ ,z ₃₂	–	
Bergues	51	z ₁₀	1,5	
II	51	z ₂₉	e,n,x,z ₁₅	
II	51	–	1,7	

Group O:52

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Uithof	52	a	1,5	
Ord	52	a	e,n,Z ₁₅	
Molesey	52	b	1,5	
Flottbek	52	b	e,n,x	
II	52	c	k	
Utrecht	52	d	1,5	
II	52	d	e,n,x,Z ₁₅	
II	52	d	Z ₃₉	
Butare	52	e,h	1,6	
Derkle	52	e,h	1,7	
Saintemarie	52	g,t	–	
II	52	g,t	–	
Bordeaux	52	k	1,5	
IIIb	52	k	e,n,x,Z ₁₅	
IIIb	52	k	Z ₃₅	
IIIb	52	k	Z ₅₃	
IIIb	52	l,v	Z ₅₃	
Marsabit	52	l,w	1,5	
II	52	z	Z ₃₉	
IIIb	52	z	Z ₅₂	
II	52	Z ₃₉	1,5,7	
II	52	Z ₄₄	1,5,7	

Group O:53

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II ¹	53	c	1,5	[R1...]
II	53	d	1,5	
II	<u>1</u> ,53	d	Z ₃₉	
II	53	d	Z ₄₂	
IIIa	53	g,Z ₅₁	—	
IV	<u>1</u> ,53	g,Z ₅₁	—	
IIIb	53	i	Z	
IIIb	53	k	e,n,x,Z ₁₅	
IIIb	53	k	Z	
IIIb	53	(k)	Z ₃₅	
IIIb	53	k	Z ₅₃	
IIIb	53	l,v	e,n,x,Z ₁₅	
IIIb	53	l,v	Z	
IIIb	53	l,v	Z ₃₅	
II	53	l,Z ₂₈	e,n,x	
II	53	l,Z ₂₈	Z ₆	
II	53	l,Z ₂₈	Z ₃₉	
IIIb	53	r	Z	
IIIb	53	r	Z ₃₅	
IIIb	53	r	Z ₆₈	
II	53	z	1,5	
IIIb	53	z	1,5,(7)	
II	53	Z	Z ₆	
IIIa	53	Z ₄ ,Z ₂₃	—	
IV	53	Z ₄ ,Z ₂₃	—	
IIIa	53	Z ₄ ,Z ₂₃ ,Z ₃₂	—	
II	53	Z ₄ ,Z ₂₄	—	
IIIa	53	Z ₄ ,Z ₂₄	—	
IIIb	53	Z ₁₀	Z	
IIIb	53	Z ₁₀	Z ₃₅	
IIIa	53	Z ₂₉	—	
IV	<u>1</u> ,53	Z ₃₆ ,Z ₃₈	—	
IIIb	53	Z ₅₂	Z ₃₅	

IIIb	53	Z ₅₂	Z ₅₃
Leda	53	–	1,6

1 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:54

This classification is provisional (see page 8).

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Tonev	21,54	b	e,n,x	
Winnipeg	54	e,h	1,5	
Rossleben	3,54	e,h	1,6	
Borreze	54	f,g,s	–	
Uccle	3,54	g,s,t	–	
Newholland	4,12,54	m,t	–	
Poeseldorf	8,20,54	i	Z ₆	
Ochsenwerder	6,7,54	k	1,5	
Montevideo ¹	{6,7,14}{54}	g,m,s	–	
Czernyring	54	r	1,5	
Steinwerder	3,15,54	y	1,5	
Yerba	54	Z ₄ ,Z ₂₃	–	
Canton	54	Z ₁₀	e,n,x	
Barry	54	Z ₁₀	e,n,Z ₁₅	
Mundubbera	54	Z ₂₉	–	

1 Factor O:54 is plasmid-controlled. In serovar Montevideo, factors O:6,7,14 are expressed in the absence of O:54.

Group O:55

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	55	k	Z ₃₉	

Group O:56

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	56	b	[1,5]	
II	56	d	–	
II	56	e,n,x	1,7	
II	56	l,v	Z ₃₉	
II	56	l,Z ₂₈	–	
II	56	z	Z ₆	
IIIa	56	Z ₄ ,Z ₂₃	–	
IIIa	56	Z ₄ ,Z ₂₃ ,Z ₃₂	–	
II	56	Z ₁₀	e,n,x	
IIIa	56	Z ₂₉	–	

Group O:57

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Antonio	57	a	Z ₆	
II	57	a	Z ₄₂	
Maryland	57	b	1,7	
Batonrouge	57	b	e,n,Z ₁₅	
IIIb	57	c	e,n,x,Z ₁₅	
IIIb	57	c	Z	[Z ₇₀],[Z ₉₀]
II	57	d	1,5	
II	57	g,[m],s,t	Z ₄₂	
II	57	g,t	—	
IIIb	57	i	e,n,x,Z ₁₅	
IIIb	57	i	Z	
IIIb	57	k	e,n,x,Z ₁₅	
IV	57	Z ₄ ,Z ₂₃	—	
IIIb	57	Z ₁₀	Z	
II	57	Z ₂₉	Z ₄₂	
II	57	Z ₃₉	e,n,x,Z ₁₅	
II	57	Z ₄₂	1,6	Z ₅₃

Group O:58

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II	58	a	Z ₆	
II	58	b	1,5	
II	58	c	Z ₆	
II	58	d	Z ₆	
IIIb	58	i	e,n,x,Z ₁₅	
IIIb	58	i	Z ₅₃	
IIIb	58	k	Z	
IIIb	58	l,v	e,n,x,Z ₁₅	
IIIb	58	l,v	Z ₃₅	
II	58	l,Z ₁₃ ,Z ₂₈	1,5	
II	58	l,Z ₁₃ ,Z ₂₈	Z ₆	
IIIb	58	r	e,n,x,Z ₁₅	
IIIb	58	r	Z	
IIIb	58	r	Z ₅₃	[Z ₄₇], [Z ₅₇],[Z ₇₀],[Z ₇₃]
II	58	Z ₆	1,6	
II	58	Z ₁₀	1,6	
IIIb	58	Z ₁₀	e,n,x,Z ₁₅	
II	58	Z ₁₀	Z ₆	
IIIb	58	Z ₁₀	Z ₅₃	[Z ₅₀]
II	58	Z ₃₉	e,n,x,Z ₁₅	
IIIb	58	Z ₅₂	Z	
IIIb	58	Z ₅₂	Z ₃₅	

Group O:59

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IIIb	59	c	e,n,x,Z ₁₅	
IIIb	59	i	e,n,x,Z ₁₅	
IIIb	59	i	z	
IIIb	59	i	Z ₃₅	[Z ₈₄]
IIIb	59	(k)	e,n,x,Z ₁₅	
II	59	k	Z ₆₅	
IIIb	59	(k)	z	
IIIb	59	(k)	Z ₃₅	
IIIb	59	k	Z ₅₃	
IIIb	59	l,v	z	
IIIb	59	l,v	Z ₅₃	
IIIb	59	r	Z ₃₅	
II	1,59	z	Z ₆	
IIIa	59	Z ₄ ,Z ₂₃	—	
IIIb	59	Z ₁₀	Z ₅₃	
IIIb	59	Z ₁₀	Z ₅₇	
IIIa	59	Z ₂₉	—	
IIIa	59	Z ₃₆	—	
VI	59	Z ₃₆	—	
IIIb	59	Z ₅₂	Z ₅₃	

Group O:60

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
II ¹	60	b	–	[R1...]
II	60	g,m,t	Z ₆	
IIIb	60	i	[e,n,x,Z ₁₅]	[Z ₅₀]
IIIb	60	i	[Z]	[Z ₅₀]
IIIb	60	i	[Z ₃₅]	[Z ₅₀]
IIIb	60	k	Z	
IIIb	60	k	Z ₃₅	
IIIb	60	(k)	Z ₅₃	
IIIb	60	l,v	Z	
IIIb	60	r	e,n,x,Z ₁₅	
IIIb	60	r	Z	
IIIb	60	r	Z ₃₅	
IIIb	60	r	Z ₅₃	
II	60	Z	e,n,x	
IIIb	60	Z ₁₀	Z	
IIIb	60	Z ₁₀	Z ₃₅	
IIIb	60	Z ₁₀	Z ₅₃	
II	60	Z ₂₉	e,n,x	
V	60	Z ₄₁	–	
IIIb	60	Z ₅₂	1,5,[7]	
IIIb	60	Z ₅₂	Z	
IIIb	60	Z ₅₂	Z ₃₅	
IIIb	60	Z ₅₂	Z ₅₃	

1 R1... : R phases agglutinated by anti-1,2 - 1,5 - 1,6 - 1,7 sera and not by anti-2 - 5 - 6 - 7 sera.

Group O:61

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IIIb	61	c	1,5,(7)	
IIIb	61	c	Z ₃₅	
IIIb	61	i	e,n,x,Z ₁₅	
IIIb	61	i	Z	
IIIb	61	i	Z ₃₅	
IIIb	61	i	Z ₅₃	
IIIb	61	k	1,5,(7)	
IIIb	61	k	Z ₃₅	
IIIb	61	(k)	Z ₅₃	
IIIb	61	l,v	1,5,7	[Z ₅₇]
IIIb	61	l,v	Z	
IIIb	61	l,v	Z ₃₅	
IIIb	61	r	1,5,7	
IIIb	61	r	Z	
IIIb	61	r	Z ₃₅	
IIIb	61	r	Z ₅₃	[Z ₄₇],[Z ₅₀]
IIIb	61	Z ₁₀	Z ₃₅	
V	61	Z ₃₅	—	
IIIb	61	Z ₅₂	1,5,7	
IIIb	61	Z ₅₂	Z	
IIIb	61	Z ₅₂	Z ₃₅	
IIIb	61	Z ₅₂	Z ₅₃	

Group O:62

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IIIa	62	g,Z ₅₁	—	
IIIa	62	Z ₄ ,Z ₂₃	—	
IIIa	62	Z ₄ ,Z ₃₂	—	
IIIa	62	Z ₂₉	—	
IIIa	62	Z ₃₆	—	

Group O:63

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IIIa	63	g,Z ₅₁	—	
IIIb	63	(k)	Z	
IIIa	63	Z ₄ ,Z ₂₃	—	
IIIa	63	Z ₄ ,Z ₃₂	—	
IIIa	63	Z ₃₆	—	

Group O:65

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
IIIb	65	c	1,5,7	
IIIb	65	c	Z	
IIIb	65	c	Z ₅₃	
II	65	g,t	—	
IIIb	65	i	e,n,x,Z ₁₅	
IIIb	65	i	Z	
IIIb	65	(k)	Z	
IIIb	65	(k)	Z ₃₅	
IIIb	65	(k)	Z ₅₃	
IIIb	65	l,v	e,n,x,Z ₁₅	
IIIb	65	l,v	Z	
IIIb	65	l,v	Z ₃₅	
IIIb	65	l,v	Z ₅₃	
IIIb	65	r	Z ₃₅	
IIIb	65	Z ₁₀	e,n,x,Z ₁₅	
IIIb	65	Z ₁₀	Z	
IIIb	65	Z ₅₂	e,n,x,Z ₁₅	
IIIb	65	Z ₅₂	Z	
IIIb	65	Z ₅₂	Z ₃₅	
IIIb	65	Z ₅₂	Z ₅₃	
II	65	—	1,6	

Group O:66

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
V	66	Z ₃₅	—	
V	66	Z ₃₉	—	
V	66	Z ₄₁	—	
V	66	Z ₆₅	—	
V	66	Z ₈₁	—	

Group O:67

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Crossness	67	r	1,2	

**ALPHABETIC LIST OF NAMES GIVEN TO SEROVARS OF
S. ENTERICA SUBSPECIES *ENTERICA*
WITH THEIR ANTIGENIC FORMULAE**

A

Aachen	17	z_{35}	1,6	
Aarhus	18	z_4, z_{23}	z_{64}	
Aba	6,8	i	e,n, z_{15}	
Abadina	28	g,m	[e,n, z_{15}]	
Abaetetuba	11	k	1,5	
Aberdeen	11	i	1,2	
Abidjan	39	b	l,w	
Ablogame	16	l, z_{13}, z_{28}	z_6	
Abobo	16	i	z_6	
Abony	<u>1</u> ,4,[5],12,[27]	b	e,n,x	
Abortusequi	4,12	–	e,n,x	
Abortusovis	4,12	c	1,6	
Abuja	11	g,m	1,5	
Accra	1,3,19	b	z_6	
Ackwepe	9,46	l,w	–	
Adabraka	3,10	z_4, z_{23}	[1,7]	
Adamstown	28	k	1,6	
Adamstua	11	e,h	1,6	
Adana	43	z_{10}	1,5	
Adelaide	35	f,g	–	[z_{27}]
Adeoyo	16	g,m,[t]	–	
Aderike	28	z_{38}	e,n, z_{15}	
Adime	6,7	b	1,6	
Adjame	13,23	r	1,6	
Aequatoria	6,7	z_4, z_{23}	e,n, z_{15}	
Aesch	6,8	z_{60}	1,2	
Aflao	1,6,14,25	l, z_{28}	e,n,x	
Africana	4,12	r,i	l,w	
Afula	6,7	f,g,t	e,n,x	
Agama	4,12	i	1,6	
Agbara	16	i	1,6	
Agbeni	<u>1</u> ,13,23	g,m,[s],[t]	–	
Agege	3,10	c	e,n, z_{15}	
Ago	30	z_{38}	–	
Agodi	35	g,t	–	
Agona	<u>1</u> ,4,[5],12	f,g,s	[1,2]	[z_{27}],[z_{45}]

Agoueve	13,22	z_{29}	–	
Ahanou	17	i	1,7	
Ahepe	43	z_{35}	1,6	
Ahmadi	1,3,19	d	1,5	
Ahoutoue	41	z_{35}	1,6	
Ahuza	43	k	1,5	
Ajiobo	13,23	z_4, z_{23}	–	
Akanji	6,8	r	1,7	
Akuafo	16	y	1,6	
Alabama	9,12	c	e,n, z_{15}	
Alachua	35	z_4, z_{23}	–	[z_{37}],[z_{45}]
Alagbon	8, <u>20</u>	y	1,7	
Alamo	6,7	g, z_{51}	1,5	
Albany	8, <u>20</u>	z_4, z_{24}	–	[z_{45}]
Albert	4,12	z_{10}	e,n,x	
Albertbanjul	44	r	1,5	
Albertslund	3,10	z_{38}	1,6	
Albuquerque	1,6,14,24	d	z_6	
Alexanderplatz	47	z_{38}	–	
Alexanderpolder	8	c	l,w	
Alfort	3,10	f,g	e,n,x	
Alger	38	l,v	1,2	
Alkmaar	1,3,19	a	l,w	
Allandale	<u>1</u> ,40	k	1,6	
Allerton	3,10	b	1,6	
Alma	39	i	e,n, z_{15}	
Alminko	8, <u>20</u>	g,s,t	–	
Alpenquai	6,14	l,v	e,n, z_{15}	
Altendorf	4,12,[27]	c	1,7	
Altona	8, <u>20</u>	r,[i]	z_6	
Amager	3,{10}{ <u>15</u> }	y	1,2	[z_{45}]
Amba	11	k	l, z_{13}, z_{28}	
Amberg	6,14,24	l,v	1,7	
Amersfoort	6,7, <u>14</u>	d	e,n,x	
Amherstiana	8	l,v	1,6	
Amina	16	i	1,5	
Aminatu	3,10	a	1,2	
Amounderness	3,10	i	1,5	
Amoutive	28	d	1,5	
Amsterdam	3,{10}{ <u>15</u> }{ <u>15,34</u> }	g,m,s	–	
Amunigun	16	a	1,6	

Anatum	3,{10}{15}{15,34}	e,h	1,6	[z ₆₄]
Anderlecht	3,10	c	1,w	
Anecho	35	g,s,t	–	
Anfo	39	y	1,2	
Angers	8,20	z ₃₅	z ₆	
Angoda	30	k	e,n,x	
Angouleme	16	z ₁₀	z ₆	
Ank	28	k	e,n,z ₁₅	
Anna	13,23	z ₃₅	e,n,z ₁₅	
Annedal	16	r,i	e,n,x	
Antarctica	9,12	g,z ₆₃	–	
Antonio	57	a	z ₆	
Antsalova	51	z	1,5	
Antwerpen	1,42	c	e,n,z ₁₅	
Apapa	45	m,t	–	
Apeyeme	8,20	z ₃₈	–	
Aprad	45	z ₁₀	–	
Aqua	30	k	1,6	
Aragua	30	z ₂₉	–	
Arapahoe	6,14	z ₄ ,z ₂₃	1,5	
Arechavaleta	4,[5],12	a	1,7	
Argenteuil	1,9,46	c	1,7	
Arusha	43	z	e,n,z ₁₅	
Aschersleben	30	b	1,5	
Ashanti	28	b	1,6	
Assen	21	a	[1,5]	
Assinie	3,10	l,w	z ₆	[z ₄₅]
Astridplein	16	e,h	1,6	
Asylanta	3,10	c	1,2	
Atakpame	8,20	e,h	1,7	
Atento	11	b	1,2	
Athens	1,40	g,m,s	e,n,x	
Athinai	6,7	i	e,n,z ₁₅	
Ati	11	d	1,2	
Augustenborg	6,7,14	i	1,2	
Aurelianis	9,12	z	e,n,z ₁₅	
Austin	6,7	a	1,7	
Australia	48	l,v	1,5	
Avignon	16	y	e,n,z ₁₅	
Avonmouth	1,3,19	i	e,n,z ₁₅	
Axim	16	z ₄ ,z ₂₃	z ₆	

Ayinde	<u>1</u> ,4,12,27	d	z_6
Ayton	<u>1</u> ,4,12,27	l,w	z_6
Azteca	4,[5],12,[27]	l,v	1,5

B

Babelsberg	28	z_4, z_{23}	[e,n, z_{15}]
Babili	28	z_{35}	1,7
Badagry	16	z_{10}	1,5
Baguida	21	z_4, z_{23}	–
Baguirmi	30	y	e,n,x
Bahati	13,22	b	e,n, z_{15}
Bahrenfeld	6,14,[24]	e,h	1,5
Baiboukoum	6,7	k	1,7
Baildon	9,46	a	e,n,x
Bakau	28	a	1,7
Balcones	45	z_{36}	–
Ball	<u>1</u> ,4,[5],12,[27]	y	e,n,x
Bama	17	m,t	–
Bamboye	9,46	b	l,w
Bambylor	9,46	z	e,n, z_{15}
Banalia	6,8	b	z_6
Banana	<u>1</u> ,4,[5],12	m,t	[1,5]
Banco	28	r,i	1,7
Bandia	35	i	l,w
Bandim	17	k	1,6
Bangkok	38	z_4, z_{24}	–
Bangui	9,12	d	e,n, z_{15}
Banjul	1,6,14,25	a	e,n, z_{15}
Bardo	8	e,h	1,2
Bareilly	6,7, <u>14</u>	y	1,5
Bargny	8, <u>20</u>	i	1,5
Barmbek	16	d	z_6
Barranquilla	16	d	e,n,x
Barry	54	z_{10}	e,n, z_{15}

Basingstoke	9,46	z ₃₅	e,n,z ₁₅	
Bassa	6,8	m,t	–	
Bassadji	28	r	1,6	
Bata	9,12	b	1,7	
Batonrouge	57	b	e,n,z ₁₅	
Battle	16	l,z ₁₃ ,z ₂₈	1,6	
Bazenheid	8, <u>20</u>	z ₁₀	1,2	
Be	8, <u>20</u>	a	[z ₆]	
Beaudesert	[1],6,14,[25]	e,h	1,7	
Bedford	1,3,19	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Belem	6,8	c	e,n,x	
Belfast	6,8	c	1,7	
Bellevue	8	z ₄ ,z ₂₃	1,7	
Benfica	3,10	b	e,n,x	
Benguella	40	b	z ₆	
Benin	9,46	y	1,7	
Benue	6,8	y	l,w	
Bere	47	z ₄ ,z ₂₃	z ₆	[z ₄₅],[z ₅₈]
Bergedorf	9,46	e,h	1,2	
Bergen	47	i	e,n,z ₁₅	
Bergues	51	z ₁₀	1,5	
Berkeley	43	a	1,5	
Berlin	17	d	1,5	
Berta	<u>1</u> ,9,12	[f],g,[t]	–	
Bessi	3,10	i	e,n,x	
Bethune	1,3,19	k	1,7	
Biafra	3,10	z ₁₀	z ₆	
Bida	1,3,19	c	1,6	
Bietri	30	y	1,5	
Bignona	17	b	e,n,z ₁₅	
Bijlmer	<u>1</u> ,40	g,m	–	
Bilu	1,3,10,19	f,g,t	1,(2),7	
Binche	47	z ₄ ,z ₂₃	l,w	
Bingerville	47	z ₃₅	e,n,z ₁₅	
Binningen	45	g,s,t	–	
Birkenhead	6,7	c	1,6	
Birmingham	3,{10}{ <u>15</u> }	d	l,w	
Bispebjerg	<u>1</u> ,4,[5],12	a	e,n,x	
Bissau	4,12	c	e,n,x	
Blancmesnil	4,12	l,w	e,n,z ₁₅	
Blegdam	9,12	g,m,q	–	

Blijdorp	1,6,14,25	c	1,5	
Blitta	47	y	e,n,x	
Blockley	6,8	k	1,5	[z ₅₈]
Bloomsbury	3,10	g,t	1,5	
Blukwa	<u>6,14,18</u>	z ₄ ,z ₂₄	–	
Bobo	44	d	1,5	
Bochum	<u>1,4</u> ,[5],12	r	l,w	
Bodjonegoro	30	z ₄ ,z ₂₄	–	
Boecker	[1],6,14,[25]	l,v	1,7	
Bofflens	41	z ₄ ,z ₂₃	1,7	
Bokanjac	28	b	1,7	
Bolama	44	z	e,n,x	
Bolombo	3,10	z ₃₈	[z ₆]	
Bolton	3,10	y	e,n,z ₁₅	
Bonames	17	a	1,2	
Bonariensis	6,8	i	e,n,x	
Bonn	6,7	l,v	e,n,x	
Bootle	47	k	1,5	
Borbeck	13,22	l,v	1,6	
Bordeaux	52	k	1,5	
Borreze	54	f,g,s	–	
Borromea	42	i	1,6	
Bouake	16	z	z ₆	
Bournemouth	9,12	e,h	1,2	
Bouso	1,6,14,25	z ₄ ,z ₂₃	[e,n,z ₁₅]	
Bovismorbificans	6,8, <u>20</u>	r,[i]	1,5	[R1...]
Brackenridge	44	z	1,5	
Bracknell	13,23	b	1,6	
Bradford	4,12,[27]	r	1,5	
Braenderup	6,7, <u>14</u>	e,h	e,n,z ₁₅	
Brancaster	<u>1,4,12,27</u>	z ₂₉	–	
Brandenburg	4,[5],12	l,v	e,n,z ₁₅	
Brazil	16	a	1,5	
Brazos	<u>6,14,18</u>	a	e,n,z ₁₅	
Brazzaville	6,7	b	1,2	
Breda	6,8	z ₄ ,z ₂₃	e,n,x	
Bredeney	<u>1,4,12,27</u>	l,v	1,7	[z ₄₀]
Brefet	44	r	e,n,z ₁₅	
Breukelen	6,8	l,z ₁₃ ,[z ₂₈]	e,n,z ₁₅	
Brevik	16	z	e,n,[x],z ₁₅	
Brezany	<u>1,4,12,27</u>	d	1,6	

Brijbhumi	11	i	1,5	
Brikama	8, <u>20</u>	r,[i]	1,w	
Brindisi	11	c	1,6	
Brisbane	28	z	e,n,z ₁₅	
Bristol	13,22	z	1,7	
Brive	<u>1</u> ,42	r	1,w	
Broc	42	z ₄ ,z ₂₃	e,n,z ₁₅	
Bron	13,22	g,m	[e,n,z ₁₅]	
Bronx	6,8	c	1,6	
Brooklyn	16	l,w	e,n,x	
Broughton	1,3,19	b	1,w	
Bruck	6,7	z	1,w	
Bruebach	39	e,h	1,2	
Brunei	8, <u>20</u>	y	1,5	
Brunflo	16	r	1,7	
Bsilla	6,8	r	1,2	
Buckeye	48	d	–	[z ₅₈]
Budapest	<u>1</u> ,4,12,[27]	g,t	–	
Bukavu	<u>1</u> ,40	l,z ₂₈	1,5	
Bukuru	6,8	b	1,w	
Bulgaria	6,8	y	1,6	
Bullbay	11	l,v	e,n,z ₁₅	
Bulovka	6,7	z ₄₄	–	
Burgas	16	l,v	e,n,z ₁₅	
Burundi	41	a	–	
Bury	4,12,27	c	z ₆	
Businga	6,7	z	e,n,z ₁₅	
Butantan	3,{10}{ <u>15</u> }{ <u>15</u> ,34}	b	1,5	
Butare	52	e,h	1,6	
Buzu	[1],6,14,[25]	i	1,7	

C

Caen	16	d	1,w	[z ₈₂]
Cairina	3,10	z ₃₅	z ₆	

Cairns	45	k	e,n,z ₁₅	
Calabar	1,3,19	e,h	l,w	
California	4,12	g,m,t	[z ₆₇]	
Camberene	35	z ₁₀	1,5	
Camberwell	9,12	r	1,7	
Campinense	9,12	r	e,n,z ₁₅	
Canada	4,12,[27]	b	1,6	
Canary	40	l,v	1,6	
Cannobio	28	z ₄ ,z ₂₃	1,5	
Cannonhill	1,3,{10},{15},19	y	e,n,x	
Cannstatt	1,3,19	m,t	–	
Canton	54	z ₁₀	e,n,x	
Caracas	[1],6,14,[25]	g,m,s	–	
Cardoner	16	g,s,t	–	
Carmel	17	l,v	e,n,x	
Carnac	18	z ₁₀	z ₆	
Carno	1,3,19	z	l,w	
Carpentras	38	z ₃₅	e,n,z ₁₅	
Carrau	6,14,[24]	y	1,7	
Carswell	44	g,z ₅₁	–	
Casablanca	45	k	1,7	
Casamance	40	z	e,n,x	
Catalunia	28	l,z ₁₃ ,z ₂₈	1,5	
Catanzaro	6,14	g,s,t	–	
Catumagos	1,3,19	z ₃₅	1,5	
Cayar	6,7	z	e,n,x	
Cerro	6,14,18	z ₄ ,z ₂₃	[1,5]	[z ₄₅],[z ₈₂]
Ceyco	9,46	k	z ₃₅	
Chagoua	1,13,23	a	1,5	
Chailey	6,8	z ₄ ,z ₂₃	[e,n,z ₁₅]	
Champaign	39	k	1,5	[z ₄₈]
Chandans	11	d	[e,n,x]	[r]
Charity	[1],6,14,[25]	d	e,n,x	
Charlottenburg	6,8	k	e,n,z ₁₅	
Chartres	1,4,12	e,h	l,w	
Cheltenham	9,46	b	1,5	
Chennai	4,12	d	z ₃₅	
Chester	1,4,[5],12	e,h	e,n,x	
Chicago	28	r,[i]	1,5	
Chichester	1,3,19	i	1,6	
Chichiri	6,14,24	z ₄ ,z ₂₄	–	

Chile	6,7	z	1,2	
Chincol	6,8	g,m,[s]	[e,n,x]	
Chingola	11	e,h	1,2	
Chiredzi	11	c	1,5	
Chittagong	1,3,10,19	b	z ₃₅	
Choleraesuis	6,7	c	1,5	
Chomedey	8, <u>20</u>	z ₁₀	e,n,z ₁₅	
Christiansborg	44	z ₄ ,z ₂₄	–	
Clackamas	4,12	l,v	1,6	
Claibornei	<u>1</u> ,9,12	k	1,5	
Clanvillian	11	r	e,n,z ₁₅	
Clerkenwell	3,10	z	l,w	
Cleveland	6,8	z ₁₀	1,7	
Clontarf	9,46	k	1,6	
Cochin	9,46	k	1,5	
Cochise	18	b	1,7	
Cocody	8, <u>20</u>	r,i	e,n,z ₁₅	
Coeln	<u>1</u> ,4,[5],12	y	1,2	
Coleypark	6,7, <u>14</u>	a	l,w	
Colindale	6,7	r	1,7	
Colobane	11	k	1,7	
Colombo	38	y	1,6	
Colorado	6,7	l,w	1,5	
Concord	6,7	l,v	1,2	
Connecticut	11	l,z ₁₃ ,z ₂₈	1,5	
Coogee	42	l,v	e,n,z ₁₅	
Coquilhatville	3,10	z ₁₀	1,7	
Coromandel	6,7	l,v	z ₃₅	
Corvallis	8, <u>20</u>	z ₄ ,z ₂₃	[z ₆]	
Cotham	28	i	1,5	
Cotia	18	–	1,6	
Cotonou	6,7	c	z ₆	
Cremieu	6,8	e,h	1,6	[R1...]
Crewe	11	z	1,5	
Croft	28	g,m,s	[e,n,z ₁₅]	
Crossness	67	r	1,2	
Cubana	<u>1</u> ,13,23	z ₂₉	–	[z ₃₇],[z ₄₃]
Cuckmere	3,10	i	1,2	
Cullingworth	28	d	l,w	
Cumberland	39	i	e,n,x	
Curacao	6,8	a	1,6	

Cyprus	6,8	i	l,w
Czernyring	54	r	1,5

D

Daarle	6,8	y	e,n,x	
Dabou	8, <u>20</u>	z ₄ ,z ₂₃	l,w	
Dadzie	51	l,v	e,n,x	
Dahlem	48	k	e,n,z ₁₅	
Dahomey	47	k	1,6	[z ₅₈]
Dahra	17	b	1,5	
Dakar	28	a	1,6	
Dakota	16	z ₃₅	e,n,z ₁₅	
Dallgow	1,3,19	z ₁₀	e,n,z ₁₅	
Damman	6,7, <u>14</u>	a	z ₆	
Dan	51	k	e,n,z ₁₅	
Dapango	47	r	1,2	
Daula	8, <u>20</u>	z	z ₆	
Daytona	6,7	k	1,6	
Deckstein	9,46	r	1,7	
Delan	39	y	e,n,z ₁₅	
Delmenhorst	18	z ₇₁	–	
Dembe	35	d	l,w	[z ₅₈]
Demerara	13,23	z ₁₀	l,w	
Denver	6,7	a	e,n,z ₁₅	
Derby	<u>1,4</u> ,[5],12	f,g	[1,2]	
Derkle	52	e,h	1,7	
Dessau	1,3, <u>15</u> ,19	g,s,t	–	
Detmold	9,46	a	1,2	
Deversoir	45	c	e,n,x	
Dibra	28	a	z ₆	
Dietrichsdorf	39	m,t	–	
Dieuppeul	28	i	1,7	
Diguel	<u>1</u> ,13,22	d	e,n,z ₁₅	
Dingiri	17	z	1,6	

Diogoye	8, <u>20</u>	z ₄₁	z ₆	
Diourbel	21	i	1,2	
Djakarta	48	z ₄ ,z ₂₄	–	
Djama	<u>1</u> ,42	z ₂₉	[1,5]	
Djelfa	8	b	1,2	
Djermaia	28	z ₂₉	–	
Djibouti	17	z ₁₀	e,n,x	
Djinten	51	m,t	–	
Djugu	6,7	z ₁₀	e,n,x	
Doba	9,46	a	e,n,z ₁₅	
Doel	28	z	1,6	
Doncaster	6,8	a	1,5	
Donna	30	l,v	1,5	
Doorn	28	i	1,2	
Dortmund	3,10	z ₄₁	1,[2],5	
Douala	28	i	l,w	
Dougi	50	y	1,6	
Doulassame	30	a	e,n,z ₁₅	
Drac	47	l,v	e,n,x	
Dresden	28	c	e,n,x	
Driffield	<u>1</u> ,40	d	1,5	
Drogana	<u>1</u> ,4,12,27	r,[i]	e,n,z ₁₅	
Dublin	<u>1</u> ,9,12[Vi]	g,p	–	
Duesseldorf	6,8	z ₄ ,z ₂₄	–	
Dugbe	45	d	1,6	
Duisburg	<u>1</u> ,4,12,[27]	d	e,n,z ₁₅	[e,h]
Dumfries	3,10	r,i	1,6	
Dunkwa	6,8	d	1,7	
Durban	<u>1</u> ,9,12	a	e,n,z ₁₅	
Durham	13,23	b	e,n,z ₁₅	
Duval	<u>1</u> ,40	b	e,n,z ₁₅	

E

Ealing	35	g,m,s	–
Eastbourne	<u>1</u> ,9,12	e,h	1,5
Eastglam	1,3,19	c	1,5
Eaubonne	18	g,s,t	–
Eberswalde	28	c	1,6
Eboko	6,8	b	1,7
Ebrie	35	g,m,t	–
Echa	38	k	1,2
Ede	43	b	e,n,z ₁₅
Edinburg	6,7,14	b	1,5
Edmonton	6,8	l,v	e,n,z ₁₅
Egusi	41	d	1,5
Egusitoo	<u>1</u> ,42	b	z ₆
Eingedi	6,7	f,g,t	1,2,7
Eko	4,12	e,h	1,6
Ekotedo	9,46	z ₄ ,z ₂₃	–
Ekpoui	47	z ₂₉	–
Elbeuf	44	b	e,n,x
Elisabethville	3,{10}{ <u>15</u> }	r	1,7
Elokate	9,12	c	1,7
Elomrane	<u>1</u> ,9,12	z ₃₈	–
Emek	8, <u>20</u>	g,m,s	–
Emmastad	38	r	1,6
Encino	1,6,14,25	d	l,z ₁₃ ,z ₂₈
Enschede	35	z ₁₀	l,w
Entebbe	<u>1</u> ,4,12,27	z	z ₆
Enteritidis	<u>1</u> ,9,12	g,m	–
Enugu	16	l,[z ₁₃],z ₂₈	[1,5]
Epalinges	43	l,w	[z ₄₄]
Epicrates	3,10	b	l,w
Epinay	11	a	l,z ₁₃ ,z ₂₈
Eppendorf	<u>1</u> ,4,12,[27]	d	1,5
Erfurt	11	b	z ₆
Escanaba	6,7	k	e,n,z ₁₅

Eschberg	9,12	d	1,7
Eschweiler	6,7	z ₁₀	1,6
Essen	4,12	g,m	–
Essingen	16	l,w	z ₆
Etterbeek	11	z ₄ ,z ₂₃	e,n,z ₁₅
Euston	11	r,i	e,n,x,z ₁₅
Everleigh	3,10	z ₂₉	e,n,x
Evry	35	i	z ₆
Ezra	28	z	1,7

F

Fairfield	28	r	l,w
Fajara	28	l,z ₂₈	e,n,x
Faji	<u>1</u> ,42	a	e,n,z ₁₅
Falkensee	3,{10}{ <u>15</u> }	i	e,n,z ₁₅
Fallowfield	3,10	l,z ₁₃ ,z ₂₈	e,n,z ₁₅
Fann	11	l,v	e,n,x
Fanti	13,23	z ₃₈	–
Farakan	28	z ₁₀	1,5
Farcha	43	y	1,2
Fareham	1,3,19	r,i	l,w
Farmingdale	43	z ₄ ,z ₂₃	[1,2]
Farmsen	13,23	z	1,6
Farsta	4,12	i	e,n,x
Fass	50	l,v	1,2
Fayed	6,8	l,w	1,2
Fehrbellin	47	z ₄ ,z ₂₃	1,6
Ferlo	41	k	1,6
Ferruch	8	e,h	1,5
Fillmore	6,8	e,h	e,n,x
Finaghy	4,12	y	1,6
Findorff	11	d	z ₆
Finkenwerder	[1],6,14,[25]	d	1,5
Fischerhuetten	16	a	e,n,z ₁₅

Fischerkietz	1,6,14,25	y	e,n,x
Fischerstrasse	44	d	e,n,z ₁₅
Fitzroy	48	e,h	1,5
Florian	3,{10}{ <u>15</u> }	z ₄ ,z ₂₄	–
Florida	[1],6,14,[25]	d	1,7
Flottbek	52	b	e,n,x
Fluntern	<u>6</u> ,14,18	b	1,5
Fomeco	45	b	e,n,z ₁₅
Fortlamy	16	z	1,6
Fortune	<u>1</u> ,4,12,[27]	z ₁₀	z ₆
Franken	9,12	z ₆	z ₆₇
Frankfurt	16	i	e,n,z ₁₅
Frederiksberg	<u>1</u> ,42	b	l,w
Freefalls	28	b	l,w
Freetown	38	y	1,5
Freiburg	3,10	l,z ₁₃	1,2
Fresno	9,46	z ₃₈	–
Friedenau	13,22	d	1,6
Friedrichsfelde	28	f,g	–
Frintrop	<u>1</u> ,9,12	b	1,5
Fufu	3,10	z	1,5
Fulda	1,3,19	l,w	1,5
Fulica	4,[5],12	a	–
Fyris	4,[5],12	l,v	1,2

G

Gabon	6,7	l,w	1,2
Gafsa	16	c	1,6
Gaillac	8, <u>20</u>	c	1,5
Galiema	6,7, <u>14</u>	k	1,2
Galil	3,10	a	e,n,z ₁₅
Gallen	11	a	1,2
Gallinarum	<u>1</u> ,9,12	–	–
Gamaba	<u>1</u> ,44	g,m,[s]	[1,6]

Gambaga	21	z_{35}	e,n,z_{15}	
Gambia	35	i	e,n,z_{15}	
Gaminara	16	d	1,7	
Garba	1,6,14,25	a	1,5	
Garoli	6,7	i	1,6	
Gassi	35	e,h	z_6	
Gateshead	9,46	g,s,t	–	
Gatineau	1,3,19	y	1,5	
Gatow	6,7	y	1,7	
Gatuni	6,8	b	e,n,x	
Gbadago	$3,\{10\}\{15\}$	c	1,5	
Gdansk	6,7,14	l,v	z_6	
Gege	30	r	1,5	
Georgia	6,7	b	e,n,z_{15}	
Gera	1,42	z_4,z_{23}	1,6	
Geraldton	9,46	l,v	1,6	
Gerland	16	z	1,5	
Ghana	21	b	1,6	
Giessen	30	g,m,s	–	
Give	$3,\{10\}\{15\}\{15,34\}$	l,v	1,7	[d]
Giza	8,20	y	1,2	
Glasgow	16	b	1,6	
Glidji	11	l,w	1,5	
Glostrup	6,8	z_{10}	e,n,z_{15}	
Gloucester	1,4,12,27	i	l,w	
Gnesta	1,3,19	b	1,5	[z_{37}]
Godesberg	30	g,m,[t]	–	
Goelzau	$3,\{10\}\{15\}$	a	1,5	
Goeteborg	9,12	c	1,5	
Goettingen	9,12	l,v	e,n,z_{15}	
Gokul	1,51	d	1,5	
Goldcoast	6,8	r	l,w	
Goma	6,7	z_4,z_{23}	z_6	
Gombe	6,7,14	d	e,n,z_{15}	
Good	21	f,g	e,n,x	
Gori	17	z	1,2	
Goulfey	1,40	k	1,5	
Gouloumbo	35	c	1,5	
Goverdhan	9,12	k	1,6	
Gozo	28	e,h	e,n,z_{15}	
Grampian	6,7	r	l,w	

Grancanaria	16	z_{39}	[1,6]
Grandhaven	30	r	1,2
Granlo	17	l, z_{28}	e,n,x
Graz	43	a	1,2
Greiz	40	a	z_6
Groenekan	18	d	1,5
Grumpensis	<u>1</u> ,13,23	d	1,7
Guarapiranga	30	a	e,n,x
Guerin	9,46	e,h	z_6
Gueuletapee	9,12	g,m,s	–
Guildford	28	k	1,2
Guinea	<u>1</u> ,44	z_{10}	1,7
Gustavia	11	d	1,5
Gwale	<u>1</u> ,42	k	z_6
Gwoza	1,3,19	a	e,n, z_{15}

H

Haardt	8	k	1,5
Hadar	6,8	z_{10}	e,n,x
Hadejia	17	y	e,n, z_{15}
Haduna	4,12	l, z_{13} ,[z_{28}]	1,6
Haelsingborg	6,7	m,p,t,[u]	–
Haferbreite	42	k	1,6
Haga	35	z_{38}	–
Haifa	<u>1</u> ,4,[5],12	z_{10}	1,2
Halle	28	c	1,7
Hallfold	<u>1</u> ,4,12,27	c	l,w
Handen	<u>1</u> ,13,23	d	1,2
Hann	40	k	e,n,x
Hannover	16	a	1,2
Haouaria	13,22	c	e,n,x, z_{15}
Harburg	[1],6,14,[25]	k	1,5
Harcourt	51	l,v	1,2
Harleystreet	3,10	z	1,6

Harrisonburg	3,{10}{15}{15,34}	z_{10}	1,6	
Hartford	6,7	y	e,n,x	[Z ₆₇]
Harvestehude	1,42	y	z_6	
Hatfield	28	d	1,6	
Hato	1,4,[5],12	g,m,s	[1,2]	
Havana	1,13,23	f,g,[s]	–	[Z ₇₉]
Hayindogo	1,3,19	e,h	1,6	
Heerlen	11	i	1,6	
Hegau	39	z_{10}	–	
Heidelberg	1,4,[5],12	r	1,2	
Heistopdenberg	8,20	b	l,w	
Hemingford	50	d	1,5	[Z ₈₂]
Hennekamp	42	z_{35}	e,n, z_{15}	
Hermannswerder	28	c	1,5	
Heron	16	a	z_6	
Herston	6,8	d	e,n, z_{15}	
Herzliya	11	y	e,n,x	
Hessarek	4,12,[27]	a	1,5	
Hidalgo	6,8	r,[i]	e,n, z_{15}	
Hiduddify	6,8	l, z_{13} , z_{28}	1,5	
Hillegersberg	9,46	z_{35}	1,5	
Hillingdon	9,46	g,m	–	
Hillsborough	6,7	z_{41}	l,w	
Hilversum	30	k	1,2	
Hindmarsh	8,20	r	1,5	
Hisingen	48	a	1,5,7	
Hissar	6,7,14	c	1,2	
Hithergreen	16	c	e,n, z_{15}	
Hoboken	3,10	i	l,w	
Hofit	39	i	1,5	
Hoghton	3,10	l, z_{13} , z_{28}	z_6	
Hohentwiel	30	z	e,n,x, z_{15}	
Holcomb	6,8	l,v	e,n,x	
Homosassa	1,6,14,25	z	1,5	
Honelis	28	a	e,n, z_{15}	
Hongkong	1,3,19	z	z_6	
Horsham	1,6,14,[25]	l,v	e,n,x	
Houston	9,12	l,v	1,5	d
Huddinge	3,10	z	1,7	
Huettwilen	1,4,12	a	l,w	
Hull	16	b	1,2	

Huvudsta	3,{10}{ <u>15</u> ,34}	b	1,7
Hvittingfoss	16	b	e,n,x
Hydra	21	c	1,6

I

Ibadan	13,22	b	1,5
Ibaragi	21	y	1,2
Idikan	<u>1</u> ,13,23	i	1,5
Ikayi	3,{10}{ <u>15</u> }	c	1,6
Ikeja	28	k	1,7
Ilala	28	k	1,5
Ilugun	1,3,10,19	z_4, z_{23}	z_6
Imo	45	l,v	[e,n, z_{15}]
Inchpark	6,8	y	1,7
India	9,46	l,v	1,5
Indiana	<u>1</u> ,4,12	z	1,7
Infantis	6,7, <u>14</u>	r	1,5
Inganda	6,7	z_{10}	1,5
Inglis	9,46	z_{10}	e,n,x
Inpraw	41	z_{10}	e,n,x
Inverness	38	k	1,6
Ipeko	9,12	c	1,6
Ipswich	41	z_4, z_{24}	1,5
Irchel	9,46	y	e,n,x
Irenea	17	k	1,5
Irigny	43	z_{38}	—
Irumu	6,7	l,v	1,5
Isangi	6,7, <u>14</u>	d	1,5
Isaszeg	48	z_{10}	e,n,x
Israel	9,12	e,h	e,n, z_{15}
Istanbul	8	z_{10}	e,n,x
Istoria	1,6,14,25	r,i	1,5
Isuge	13,23	d	z_6
Itami	9,12	l, z_{13}	1,5

[R1...],[z_{37}],[z_{45}],[z_{49}]

Ituri	<u>1</u> ,4,12	z ₁₀	1,5
Itutaba	9,46	c	z ₆
Ivory	16	r	1,6
Ivorycoast	50	z ₂₉	–
Ivrysurseine	<u>1</u> ,13,23	z	z ₆

J

Jaffna	<u>1</u> ,9,12	d	z ₃₅	
Jalisco	11	y	1,7	
Jamaica	9,12	r	1,5	
Jambur	21	l,z ₂₈	e,n,z ₁₅	
Jangwani	17	a	1,5	
Javiana	<u>1</u> ,9,12	l,z ₂₈	1,5	[R1...]
Jedburgh	3,{10}{ <u>15</u> }	z ₂₉	–	
Jericho	<u>1</u> ,4,12,27	c	e,n,z ₁₅	
Jerusalem	6,7, <u>14</u>	z ₁₀	l,w	
Joal	3,10	l,z ₂₈	1,7	
Jodhpur	45	z ₂₉	–	[z ₄₅]
Johannesburg	<u>1</u> ,40	b	e,n,x	
Jos	<u>1</u> ,4,12,27	y	e,n,z ₁₅	
Juba	1,3,19	a	1,7	
Jubilee	17	e,h	1,2	
Jukestown	13,23	i	e,n,z ₁₅	

K

Kaapstad	4,12	e,h	1,7
Kabete	51	i	1,5
Kaduna	6,7, <u>14</u>	c	e,n,z ₁₅

Kaevlinge	16	z_4, z_{24}	–	
Kahla	<u>1,42</u>	z_{35}	1,6	
Kainji	1,3,19	z	1,6	
Kaitaan	1,6,14,25	m,t	–	
Kalamu	<u>1,4,[5],12</u>	z_4, z_{24}	[1,5]	
Kalina	3,10	b	1,2	
Kallo	6,8	k	1,2	
Kalumburu	6,8	z	e,n, z_{15}	
Kambole	6,7	d	1,[2],7	
Kamoru	<u>1,4,12,27</u>	y	z_6	
Kampala	<u>1,42</u>	c	z_6	
Kande	1,3,19	b	e,n, z_{15}	
Kandla	17	z_{29}	–	
Kaneshie	<u>1,42</u>	i	l,w	
Kanifing	1,6,14,25	z	1,6	
Kano	<u>1,4,12,27</u>	l, z_{13}, z_{28}	e,n,x	
Kaolack	47	z	1,6	
Kapemba	9,12	l,v	1,7	[z_{40}]
Karachi	45	d	e,n,x	
Karamoja	<u>1,40</u>	z_{41}	1,2	
Karaya	51	b	1,5	
Karlshamn	17	d	e,n, z_{15}	
Kasenyi	38	e,h	1,5	
Kassberg	1,6,14,25	c	1,6	
Kassel	16	z	e,n,x	
Kastrup	6,7	e,n, z_{15}	1,6	
Kedougou	<u>1,13,23</u>	i	l,w	
Kentucky	<u>8,20</u>	i	z_6	
Kenya	6,7	l, z_{13}	e,n,x	
Kermel	44	d	e,n,x	
Kethiabarny	28	z_4, z_{24}	–	
Keurmassar	35	c	1,2	
Keve	21	l,w	–	
Kiambu	<u>1,4,12</u>	z	1,5	
Kibi	16	z_4, z_{23}	[1,6]	
Kibusi	28	r	e,n,x	
Kidderminster	38	c	1,6	[z_{58}]
Kiel	<u>1,2,12</u>	g,p	–	
Kikoma	16	y	e,n,x	
Kimberley	38	l,v	1,5	
Kimpese	9,12	z	1,6	

Kimuenza	<u>1</u> ,4,12,27	l,v	e,n,x	
Kindia	1,3,19	l,z ₂₈	e,n,x	
Kingabwa	43	y	1,5	
Kingston	<u>1</u> ,4,[5],12,[27]	g,s,t	[1,2]	[z ₄₃]
Kinondoni	17	a	e,n,x	
Kinson	1,3,19	y	e,n,x	
Kintambo	<u>1</u> ,13,23	m,t	–	
Kirkee	17	b	1,2	
Kisangani	<u>1</u> ,4,[5],12	a	1,2	
Kisarawe	11	k	e,n,x,[z ₁₅]	
Kisii	6,7	d	1,2	
Kitenge	28	y	e,n,x	
Kivu	6,7	d	1,6	
Klouto	38	z ₃₈	–	
Koblenz	16	l,z ₁₃ ,z ₂₈	e,n,x	
Kodjovi	47	c	1,6	[z ₇₈]
Koenigstuhl	<u>1</u> ,4,[5],12	z	e,n,z ₁₅	
Koessen	2,12	l,v	1,5	
Kofandoka	45	r	e,n,z ₁₅	
Koketime	44	z ₃₈	–	
Kokoli	30	z ₃₅	1,6	
Kokomlemle	39	l,v	e,n,x	
Kolar	9,46	b	z ₃₅	
Kolda	8, <u>20</u>	z ₃₅	1,2	
Konolfingen	28	z ₃₅	1,6	
Konongo	41	r	1,7	
Konstanz	8	b	e,n,x	
Korbol	8, <u>20</u>	b	1,5	
Korkeasaari	28	e,h	1,5	
Korlebu	1,3,19	z	1,5	
Korovi	38	g,m,[s]	–	
Kortrijk	6,7	l,v	1,7	
Kottbus	6,8	e,h	1,5	
Kotte	6,7	b	z ₃₅	
Kotu	9,12	l,z ₂₈	1,6	
Kouka	1,3,19	g,m,[t]	–	
Koumra	6,7	b	1,7	
Kpeme	28	e,h	1,7	
Kralingen	8, <u>20</u>	y	z ₆	
Krefeld	1,3,19	y	l,w	
Kristianstad	3,10	z ₁₀	e,n,z ₁₅	

Kua	44	z_4, z_{23}	–
Kubacha	<u>1</u> ,4,12,27	l, z_{13}, z_{28}	1,7
Kuessel	28	i	e,n, z_{15}
Kumasi	30	z_{10}	e,n, z_{15}
Kunduchi	<u>1</u> ,4,[5],12,[27]	l,[z_{13}],[z_{28}]	1,2
Kuntair	1,6,14,25	b	1,5
Kuru	6,8	z	l,w

L

Labadi	8, <u>20</u>	d	z_6
Lagos	<u>1</u> ,4,[5],12	i	1,5
Lamberhurst	3,10	e,h	e,n, z_{15}
Lamin	3,10	l, z_{28}	e,n,x
Lamphun	6,8	y	1,2
Lancaster	17	l,v	1,7
Landala	41	z_{10}	1,6
Landau	30	i	1,2
Landwasser	3,10	z	z_6
Langenhorn	18	m,t	–
Langensalza	3,10	y	l,w
Langeveld	6,7	l,w	e,n, z_{15}
Langford	28	b	e,n, z_{15}
Lansing	38	i	1,5
Laredo	1,6,14,25	z_{10}	1,6
Larochelle	6,7	e,h	1,2
Larose	6,7	g, z_{51}	e,n, z_{15}
Lattenkamp	45	z_{35}	1,5
Lawndale	<u>1</u> ,9,12	z	1,5
Lawra	44	k	e,n, z_{15}
Leatherhead	41	m,t	1,6
Lechler	51	z	e,n, z_{15}
Leda	53	–	1,6
Leer	18	z_{10}	1,5
Leeuwarden	11	b	1,5

Legon	<u>1</u> ,4,12,[27]	c	1,5	
Lehrte	16	r	z ₆	
Leiden	13,22	z ₃₈	–	
Leipzig	41	z ₁₀	1,5	
Leith	6,8	a	e,n,z ₁₅	
Lekke	3,10	d	1,6	
Lene	11	z ₃₈	–	
Leoben	28	l,v	1,5	
Leopoldville	6,7, <u>14</u>	b	z ₆	
Lerum	1,3,19	z	1,7	
Lexington	3,{10}{ <u>15</u> }{ <u>15,34</u> }	z ₁₀	1,5	[z ₄₉]
Lezennes	6,8	z ₄ ,z ₂₃	1,7	
Libreville	28	z ₁₀	1,6	
Ligeo	30	l,v	1,2	
Ligna	35	z ₁₀	z ₆	
Lika	6,7	i	1,7	
Lille	6,7, <u>14</u>	z ₃₈	–	[z ₈₂]
Limete	<u>1</u> ,4,12,[27]	b	1,5	
Lindenburg	6,8	i	1,2	
Lindern	6,14,[24]	d	e,n,x	
Lindi	38	r	1,5	
Linguere	9,46	b	z ₆	
Lingwala	16	z	1,7	
Linton	13,23	r	e,n,z ₁₅	
Lisboa	16	z ₁₀	1,6	
Lishabi	9,46	z ₁₀	1,7	
Litchfield	6,8	l,v	1,2	
Liverpool	1,3,19	d	e,n,z ₁₅	
Livingstone	6,7, <u>14</u>	d	l,w	
Livulu	30	e,h	1,2	
Ljubljana	4,12,27	k	e,n,x	
Llandoff	1,3,19	z ₂₉	[z ₆]	[z ₃₇]
Llobregat	<u>1</u> ,44	z ₁₀	e,n,x	
Loanda	6,8	l,v	1,5	
Lockleaze	6,7, <u>14</u>	b	e,n,x	
Lode	17	r	1,2	
Lodz	41	z ₂₉	–	
Loenga	<u>1</u> ,42	z ₁₀	z ₆	
Logone	39	d	1,5	
Lokomo	17	y	l,w	
Lokstedt	1,3,19	l,z ₁₃ ,z ₂₈	1,2	

Lomalinda	<u>1</u> ,9,12	a	e,n,x
Lome	9,12	r	z ₆
Lomita	6,7	e,h	1,5
Lomnava	16	l,w	e,n,z ₁₅
London	3,{10}{ <u>15</u> }	l,v	1,6
Lonestar	41	c	–
Losangeles	16	l,v	z ₆
Loubomo	4,12	z	1,6
Louga	30	b	1,2
Louisiana	9,46	z ₁₀	z ₆
Lovelace	13,22	l,v	1,5
Lowestoft	17	g,s,t	–
Lubumbashi	41	r	1,5
Luciana	11	a	e,n,z ₁₅
Luckenwalde	28	z ₁₀	e,n,z ₁₅
Luedinghausen	17	c	1,5
Luke	<u>1</u> ,47	g,m	–
Lund	6,8	l,v	z ₆
Lutetia	51	r,i	l,z ₁₃ ,z ₂₈
Lyon	47	k	e,n,z ₁₅

M

Maastricht	11	z ₄₁	1,2
Macallen	3,10	z ₃₆	–
Macclesfield	9,46	g,m,s	1,2,7
Machaga	1,3,19	i	e,n,x
Madelia	1,6,14,25	y	1,7
Madiago	1,3,19	c	1,7
Madigan	44	c	1,5
Madison	21	d	z ₆
Madjorio	3,10	d	e,n,z ₁₅
Madras	4,[5],12	m,t	e,n,z ₁₅
Magherafelt	8, <u>20</u>	i	l,w
Magumeri	1,6,14,25	e,h	1,6

Magwa	21	d	e,n,x	
Mahina	9,46	z ₁₀	e,n,z ₁₅	
Maiduguri	1,3,19	f,g,t	e,n,z ₁₅	
Makiling	43	z ₂₉	–	
Makiso	6,7	l,z ₁₃ ,z ₂₈	z ₆	
Malakal	16	e,h	1,2	
Malaysia	28	z ₁₀	1,7	
Malika	44	l,z ₂₈	1,5	
Malmoe	6,8	i	1,7	
Malstatt	16	b	z ₆	
Mampeza	1,6,14,25	i	1,5	
Mampong	13,22	z ₃₅	1,6	
Mana	9,12	b	e,n,z ₁₅	
Manchester	6,8	l,v	1,7	
Mandera	16	l,z ₁₃	e,n,z ₁₅	
Mango	38	k	1,5	
Manhattan	6,8	d	1,5	[z ₅₈]
Mannheim	11	k	l,w	
Mapo	6,8	z ₁₀	1,5	
Mara	39	e,h	1,5	
Maracaibo	11	l,v	1,5	
Marburg	13,23	k	–	
Maricopa	1,42	g,z ₅₁	1,5	
Marienthal	3,10	k	e,n,z ₁₅	
Maritzburg	1,44	i	e,n,z ₁₅	
Marmande	6,8	z	1,7	
Maron	3,10	d	z ₃₅	
Maroua	11	z	1,7	
Marsabit	52	l,w	1,5	
Marseille	11	a	1,5	
Marshall	13,22	a	l,z ₁₃ ,z ₂₈	
Martonos	6,14,24	d	1,5	
Maryland	57	b	1,7	
Marylebone	9,46	k	1,2	
Masembe	3,10	a	e,n,x	
Maska	1,4,12,27	z ₄₁	e,n,z ₁₅	
Massakory	35	r	l,w	
Massenya	1,4,12,27	k	1,5	
Massilia	11	a	1,6	
Matadi	17	k	e,n,x	
Mathura	9,46	i	e,n,z ₁₅	

Matopeni	30	y	1,2	
Mattenhof	17	b	e,n,x	
Maumee	16	k	1,6	
Mayday	9,46	y	z ₆	
Mbandaka	6,7, <u>14</u>	z ₁₀	e,n,z ₁₅	[z ₃₇],[z ₄₅]
Mbao	43	i	1,2	
Meekatharra	45	a	e,n,z ₁₅	
Melaka	16	b	1,2,5	
Melbourne	42	z	e,n,z ₁₅	
Meleagridis	3,{10}{15}{15,34}	e,h	l,w	
Memphis	18	k	1,5	
Menden	6,7	z ₁₀	1,2	
Mendoza	9,12	l,v	1,2	
Menston	6,7	g,s,[t]	[1,6]	
Mesbit	47	m,t	e,n,z ₁₅	
Meskin	51	e,h	1,2	
Messina	30	d	1,5	
Mgulani	38	i	1,2	
Miami	<u>1</u> ,9,12	a	1,5	
Michigan	17	l,v	1,5	
Middlesbrough	<u>1</u> ,42	i	z ₆	
Midway	6,14,24	d	1,7	
Mikawasima	6,7, <u>14</u>	y	e,n,z ₁₅	[z ₄₇],[z ₅₀]
Millesi	<u>1</u> ,40	l,v	1,2	
Milwaukee	43	f,g,[t]	–	
Mim	13,22	a	1,6	
Minna	1,6,14,25	c	l,w	
Minnesota	21	b	e,n,x	[z ₃₃],[z ₄₉]
Mishmarhaemek	<u>1</u> ,13,23	d	1,5	
Mississippi	<u>1</u> ,13,23	b	1,5	
Missouri	11	g,s,t	–	
Miyazaki	9,12	l,z ₁₃	1,7	
Mjordan	30	i	e,n,z ₁₅	
Mkamba	6,7	l,v	1,6	
Moabit	16	e,h	l,w	
Mocamedes	28	d	e,n,x	
Moero	28	b	1,5	
Moers	11	m,t	–	
Mokola	3,10	y	1,7	
Molade	8, <u>20</u>	z ₁₀	z ₆	
Molesey	52	b	1,5	

Mono	4,12	l,w	1,5	
Mons	<u>1</u> ,12,27	d	1,w	
Monschau	35	m,t	–	
Montaigu	9,46	b	1,2	
Montevideo	6,7, <u>14</u> ,[54]	g,m,[p],s	[1,2,7]	
Montreal	43	c	1,5	
Morbihan	16	m,t	e,n,z ₁₅	
Morehead	30	i	1,5	
Morillons	28	m,t	1,6	
Morningside	30	c	e,n,z ₁₅	
Mornington	1,6,14,25	y	e,n,z ₁₅	
Morocco	30	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Morotai	17	l,v	1,2	
Moroto	28	z ₁₀	1,w	
Moscow	<u>1</u> ,9,12	g,q	–	
Moualine	47	y	1,6	
Moundou	51	l,z ₂₈	1,5	
Mountmagnet	21	r	–	
Mountpleasant	47	z	1,5	
Moussoro	1,6,14,25	i	e,n,z ₁₅	
Mowanjum	6,8	z	1,5	
Mpouto	16	m,t	–	
Muenchen	6,8	d	1,2	[z ₆₇]
Muenster	3,{10}{15}{ <u>15</u> ,34}	e,h	1,5	[z ₄₈]
Muguga	44	m,t	–	
Mulhouse	<u>1</u> ,9,12	z	1,2	
Mundonobo	28	d	1,7	
Mundubbera	54	z ₂₉	–	
Mura	<u>1</u> ,4,12	z ₁₀	1,w	
Mygdal	4,12	z ₉₁	–	
Myrria	13,23	i	1,7	

N

Naestved	<u>1</u> ,9,12	g,p,s	–	
Nagoya	6,8	b	1,5	
Nakuru	<u>1</u> ,4,12,27	a	z_6	
Namibia	6,7	c	e,n,x	
Namoda	47	z_{10}	e,n, z_{15}	
Namur	39	z_4, z_{23}	–	
Nanergou	6,8	g,s,t	–	
Nanga	<u>1</u> ,13,23	l,v	e,n, z_{15}	
Nantes	9,46	y	l,w	
Napoli	<u>1</u> ,9,12	l, z_{13}	e,n,x	
Narashino	6,8	a	e,n,x	
Nashua	28	l,v	e,n, z_{15}	
Natal	9,12	z_4, z_{24}	–	
Naware	16	z_{38}	–	
Nchanga	3,{ <u>10</u> }{ <u>15</u> }	l,v	1,2	
Ndjamena	1,6,14,25	b	1,2	
Ndolo	<u>1</u> ,9,12	d	1,5	
Neftenbach	4,12	z	e,n,x	
Nessa	1,6,14,25	z_{10}	1,2	
Nessziona	6,7	l, z_{13}	1,5	
Neudorf	30	b	e,n, z_{15}	
Neukoelln	6,7	l, $z_{13}, [z_{28}]$	e,n, z_{15}	
Neumuenster	<u>1</u> ,4,12,27	k	1,6	
Neunkirchen	38	z_{10}	[1,5]	
Newholland	4,12,54	m,t	–	
Newjersey	39	k	e,n,x	
Newlands	3,{ <u>10</u> }{ <u>15,34</u> }	e,h	e,n,x	
Newmexico	9,12	g, z_{51}	1,5	
Newport	6,8, <u>20</u>	e,h	1,2	[z_{67}],[z_{78}]
Newrochelle	3,10	k	l,w	
Newyork	13,22	g,s,t	–	
Ngaparou	9,46	z_4, z_{24}	–	
Ngili	6,7	z_{10}	1,7	
Ngor	1,3,19	l,v	1,5	

Niakhar	44	a	1,5	
Niamey	17	d	1,w	
Niarembe	44	a	1,w	
Niederoderwitz	43	b	–	
Nieukerk	6,7, <u>14</u>	d	z ₆	
Nigeria	6,7	r	1,6	
Nijmegen	30	y	e,n,z ₁₅	
Nikolaifleet	16	g,m,s	–	
Niloese	1,3,19	d	z ₆	
Nima	28	y	1,5	
Nimes	13,22	z ₃₅	e,n,z ₁₅	
Nitra	2,12	g,m	–	
Niumi	1,3,19	a	1,5	
Njala	38	k	e,n,x	
Nola	6,7	e,h	1,7	
Nordrhein	9,46	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Nordufer	6,8	a	1,7	
Norton	6,7	i	1,w	
Norwich	6,7	e,h	1,6	
Nottingham	16	d	e,n,z ₁₅	
Nowawes	40	z	z ₆	
Noya	8	r	1,7	
Nuatja	16	k	e,n,x	
Nyanza	11	z	z ₆	[z ₈₃]
Nyborg	3,{10}{ <u>15</u> }	e,h	1,7	
Nyeko	16	a	1,7	

O

Oakey	6,7	m,t	z ₆₄	
Oakland	6,7	z	1,6,[7]	
Obogu	6,7	z ₄ ,z ₂₃	1,5	
Ochiogu	1,3,19	z ₃₈	[e,n,z ₁₅]	
Ochsenwerder	6,7,54	k	1,5	
Ockenheim	30	l,z ₁₃ ,z ₂₈	1,6	

Odienne	40	y	1,5	
Odozi	30	k	e,n,[x],z ₁₅	
Oerlikon	39	l,v	e,n,z ₁₅	
Oesterbro	1,3,19	k	1,5	
Offa	41	z ₃₈	–	
Ogbete	43	z	1,5	
Ohio	6,7,14	b	l,w	[z ₅₉]
Ohlstedt	3,{10}{15}	y	e,n,x	
Okatie	13,23	g,[s],t	–	
Okefoko	3,10	c	z ₆	
Okerara	3,10	z ₁₀	1,2	
Oldenburg	16	d	1,2	
Olten	9,46	d	e,n,z ₁₅	
Omifisan	1,40	z ₂₉	–	
Omuna	6,7	z ₁₀	z ₃₅	
Ona	28	g,s,t	–	
Onarimon	1,9,12	b	1,2	
Onderstepoort	1,6,14,[25]	e,h	1,5	
Onireke	3,10	d	1,7	
Ontario	9,46	d	1,5	
Oran	38	a	e,n,z ₁₅	
Oranienburg	6,7,14	m,t	[z ₅₇]	
Orbe	42	b	1,6	
Ord	52	a	e,n,z ₁₅	
Ordonez	1,13,23	y	l,w	
Orientalis	16	k	e,n,z ₁₅	
Orion	3,{10}{15}{15,34}	y	1,5	
Oritamerin	6,7	i	1,5	
Orlando	18	l,v	e,n,z ₁₅	
Orleans	43	d	1,5	
Os	9,12	a	1,6	
Oskarshamn	28	y	1,2	
Oslo	6,7,14	a	e,n,x	
Osnabrueck	11	l,z ₁₃ ,z ₂₈	e,n,x	
Othmarschen	6,7,14	g,m,[t]	–	
Ottawa	1,9,12	z ₄₁	1,5	
Ouagadougou	1,3,19	i	1,5	
Ouakam	9,46	z ₂₉	–	[z ₄₅]
Oudwijk	13,22	b	1,6	
Overchurch	1,40	l,w	[1,2]	
Overschie	51	l,v	1,5	

Overvecht	30	a	1,2
Oxford	3,{10}{15}{15,34}	a	1,7
Oyonnax	6,7	y	1,6

P

Pakistan	8	l,v	1,2	
Palamaner	<u>1</u> ,44	d	z ₃₅	
Palime	6,7	z ₃₅	e,n,z ₁₅	
Panama	<u>1</u> ,9,12	l,v	1,5	[R1...]
Papua	6,7	r	e,n,z ₁₅	
Parakou	<u>1</u> ,42	l,w	z ₃₅	
Paratyphi A	<u>1</u> ,2,12	a	[1,5]	
Paratyphi B	<u>1</u> ,4,[5],12	b	1,2	[z ₅],[z ₃₃]
Paratyphi C	6,7,[Vi]	c	1,5	
Paris	8, <u>20</u>	z ₁₀	1,5	
Parkroyal	1,3,19	l,v	1,7	
Pasing	4,12	z ₃₅	1,5	
Patience	28	d	e,n,z ₁₅	
Penarth	9,12	z ₃₅	z ₆	
Penilla	28	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Pensacola	<u>1</u> ,9,12	m,t	[1,2]	
Perth	38	y	e,n,x	
Petahtikve	1,3,19	f,g,t	1,7	
Phaliron	8	z	e,n,z ₁₅	
Pharr	11	b	e,n,z ₁₅	
Picpus	13,23	z ₃₅	1,6	
Pietersburg	3,{10}{15,34}	z ₆₉	1,7	
Pisa	16	i	l,w	
Planckendael	6,7	z ₄ ,z ₂₃	1,6	
Ploufragan	<u>1</u> ,44	z ₄ ,z ₂₃	e,n,z ₁₅	
Plumaugat	6,7	g,s,q	–	
Plymouth	9,46	d	z ₆	
Poano	[1],6,14,[25]	z	l,z ₁₃ ,z ₂₈	
Podiensis	3,10	z ₁₀	e,n,x	

Poeseldorf	8, <u>20</u> ,54
Poitiers	6,7
Pomona	28
Pontypridd	18
Poona	<u>1</u> ,13,22
Portanigra	8, <u>20</u>
Portland	9,12
Potengi	18
Potosi	6,14
Potsdam	6,7, <u>14</u>
Potto	9,46
Powell	9,12
Praha	6,8
Pramiso	3,10
Presov	6,8
Preston	<u>1</u> ,4,12
Pretoria	11
Putten	13,23

i	z ₆	
z	1,5	
y	1,7	[z ₈₀],[z ₉₀]
g,m	–	
z	1,6	[z ₄₄],[z ₅₉]
d	1,7	
z ₁₀	1,5	
z	–	
z ₃₆	1,5	
l,v	e,n,z ₁₅	
i	z ₆	
y	1,7	
y	e,n,z ₁₅	
c	1,7	
b	e,n,z ₁₅	
z	1,w	
k	1,2	
d	1,w	

Q

Quebec	44
Quentin	9,46
Quincy	30
Quinhon	47
Quiniela	6,8

c	e,n,z ₁₅
d	1,6
r	1,6
z ₄₄	–
c	e,n,z ₁₅

R

Ramatgan	30	k	1,5	
Ramsey	28	l,w	1,6	
Ratchaburi	3,10	z ₃₅	1,6	
Raus	13,22	f,g	e,n,x	
Rawash	<u>6,14</u> ,18	c	e,n,x	
Reading	<u>1,4</u> ,[5],12	e,h	1,5	[R1...]
Rehovot	8, <u>20</u>	e,h	z ₆	
Redba	6,7	z ₁₀	z ₆	
Redhill	11	e,h	l,z ₁₃ ,z ₂₈	
Redlands	16	z ₁₀	e,n,z ₁₅	
Regent	3,10	f,g,[s]	[1,6]	
Reinickendorf	4,12	l,z ₂₈	e,n,x	
Remete	11	z ₄ ,z ₂₃	1,6	
Remiremont	8, <u>20</u>	z ₁₀	l,w	
Remo	<u>1,4</u> ,12,27	r	1,7	
Reubeuss	8, <u>20</u>	g,m,t	–	
Rhone	21	c	e,n,x	
Rhydyfelin	16	e,h	e,n,x	
Richmond	6,7	y	1,2	
Rideau	1,3,19	f,g	–	
Ridge	9,12	c	z ₆	
Ried	<u>1,13</u> ,22	z ₄ ,z ₂₃	[e,n,z ₁₅]	
Riggil	6,7	g,(t)	–	
Riogrande	40	b	1,5	
Rissen	6,7, <u>14</u>	f,g	–	
Rittersbach	38	b	e,n,z ₁₅	
Riverside	45	b	1,5	
Roan	38	l,v	e,n,x	
Rochdale	50	b	e,n,x	
Rogy	28	z ₁₀	1,2	
Romanby	<u>1,13</u> ,23	z ₄ ,z ₂₄	–	
Roodepoort	<u>1,13</u> ,22	z ₁₀	1,5	
Rosenberg	9,12	g,z ₈₅	–	
Rossleben	3,54	e,h	1,6	

Rostock	<u>1</u> ,9,12	g,p,u	–	
Rothenburgsort	38	m,t	–	
Rottnest	<u>1</u> ,13,22	b	1,7	
Rovaniemi	16	r,i	1,5	
Royan	1,6,14,25	z	e,n,z ₁₅	
Ruanda	9,12	z ₁₀	e,n,z ₁₅	
Rubislaw	11	r	e,n,x	
Ruiru	21	y	e,n,x	
Rumford	6,7	z ₃₈	1,2	[z ₈₂]
Runby	1,6,14,25	c	e,n,x	
Ruzizi	3,10	l,v	e,n,z ₁₅	

S

Saarbruecken	<u>1</u> ,9,12	a	1,7	
Saboya	16	e,h	1,5	
Sada	30	z ₁₀	1,2	
Saintemarie	52	g,t	–	
Saintpaul	<u>1</u> ,4,[5],12	e,h	1,2	
Salford	16	l,v	e,n,x	
Salinas	40	a	1,7	
Sally	41	z	1,6	
Saloniki	16	z ₂₉	–	
Samaru	41	i	1,5	
Sambre	1,3,19	z ₄ ,z ₂₄	–	
Sandaga	3,10	z ₃₈	1,2	
Sandiego	<u>1</u> ,4,[5],12	e,h	e,n,z ₁₅	
Sadow	6,8	f,g	e,n,z ₁₅	
Sanga	8	b	1,7	
Sangalkam	9,46	m,t	–	
Sangera	16	b	e,n,z ₁₅	
Sanjuan	6,7	a	1,5	
Sanktgeorg	28	r,[i]	e,n,z ₁₅	
Sanktjohann	13,23	b	l,w	
Sanktmarx	1,3,19	e,h	1,7	

Santander	28	z_{35}	e,n,z_{15}	
Santhiaba	40	l,z_{28}	1,6	
Santiago	8, <u>20</u>	c	e,n,x	
Sao	1,3,19	e,h	e,n,z_{15}	
Sapele	13,23	z_{10}	e,n,z_{15}	
Saphra	16	y	1,5	
Sara	1,6,14,25	z_{38}	$[e,n,x]$	
Sarajane	<u>1</u> ,4,[5],12,[27]	d	e,n,x	
Saugus	40	b	1,7	
Scarborough	30	k	l,z_{13},z_{28}	
Schalkwijk	6,14,[24]	i	e,n,z_{15}	
Schleissheim	4,12,27	b	–	
Schoeneberg	1,3,19	z	e,n,z_{15}	
Schwabach	6,7	c	1,7	
Schwarzengrund	<u>1</u> ,4,12,27	d	1,7	
Schwerin	6,8	k	e,n,x	
Sculcoates	16	d	1,5	
Seattle	28	a	e,n,x	
Sedgwick	44	b	e,n,z_{15}	
Seegefeld	3,10	r,i	1,2	
Sekondi	3,10	e,h	z_6	
Selby	28	y	z_6	
Sendai	<u>1</u> ,9,12	a	1,5	
Senegal	11	r	1,5	
Senftenberg	1,3,19	$g,[s],t$	–	$[z_{27}], [z_{34}], [z_{37}], [z_{43}], [z_{45}], [z_{46}], [z_{82}]$
Senneville	30	z_{10}	1,5	
Seremban	9,12	i	1,5	
Serrekunda	3,10	k	1,7	
Shahalam	44	b	1,6	
Shamba	16	c	e,n,x	
Shangani	3,{10}{ <u>15</u> }	d	1,5	
Shanghai	16	l,v	1,6	$[z_{45}]$
Shannon	3,10	z_{35}	l,w	
Sharon	11	k	1,6	
Sheffield	38	c	1,5	
Sherbrooke	16	d	1,6	
Shikmonah	40	a	1,5	
Shiplea	8, <u>20</u>	b	e,n,z_{15}	
Shomolu	28	y	l,w	
Shoreditch	9,46	r	e,n,z_{15}	

Shubra	4,[5],12	z	1,2	
Sica	41	b	e,n,z ₁₅	
Simi	3,10	r	e,n,z ₁₅	
Sinchew	3,10	l,v	z ₃₅	
Sindelfingen	8, <u>20</u>	y	l,w	
Singapore	6,7	k	e,n,x	
Sinstorf	3,10	l,v	1,5	
Sinthia	18	z ₃₈	–	
Sipane	<u>1</u> ,42	r	e,n,z ₁₅	
Skansen	6,8	b	1,2	
Slade	1,3,19	y	e,n,z ₁₅	
Sljeme	<u>1</u> ,47	f,g	–	
Sloterdijk	<u>1</u> ,4,12,27	z ₃₅	z ₆	
Soahanina	6,14,24	z	e,n,x	
Soerenga	30	i	l,w	
Sokode	9,46	r	z ₆	
Solna	28	a	1,5	
Solt	11	y	1,5	
Somone	6,7	z ₄ ,z ₂₄	–	
Sontheim	9,46	d	z ₃₅	
Soumbedioune	28	b	e,n,x	
Southampton	4,12,27	r	z ₆	
Southbank	3,{10}{ <u>15</u> }{ <u>15</u> ,34}	m,t	[1,6]	
Souza	3,{10}{ <u>15</u> }	d	e,n,x	
Spalentor	<u>1</u> ,42	y	e,n,z ₁₅	
Spartel	21	d	1,5	
Splott	44	g,s,t	[1,7]	
Stachus	38	z	–	
Stanley	<u>1</u> ,4,[5],12,[27]	d	1,2	
Stanleyville	<u>1</u> ,4,[5],12,[27]	z ₄ ,z ₂₃	[1,2]	
Staoueli	47	k	1,2	
Steinplatz	30	y	1,6	
Steinwerder	3, <u>15</u> ,54	y	1,5	
Stellingen	47	d	e,n,x	[z ₅₈]
Stendal	11	l,v	1,2	
Sternschanze	30	g,s,t	–	[z ₅₉]
Sterrenbos	6,8	d	e,n,x	
Stockholm	3,{10}{ <u>15</u> }	y	z ₆	
Stoneferry	30	z ₄ ,z ₂₃	–	
Stormont	3,10	d	1,2	
Stourbridge	6,8	b	1,6	

Straengnaes	11	z ₁₀	1,5
Strasbourg	9,46	d	1,7
Stratford	1,3,19	i	1,2
Strathcona	6,7	l,z ₁₃ ,z ₂₈	1,7
Stuivenberg	1,3,19	l,[z ₁₃],z ₂₈	1,5
Stuttgart	6,7, <u>14</u>	i	z ₆
Suberu	3,10	g,m	–
Sudan	43	l,z ₁₃	–
Suelldorf	45	f,g	–
Sundsvall	[1],6,14,[25]	z	e,n,x
Sunnycove	8	y	e,n,x
Surat	[1],6,14,[25]	r,[i]	e,n,z ₁₅
Surrey	21	k	1,(2),5
Svedvi	1,3,19	l,v	e,n,z ₁₅
Sya	47	b	z ₆
Sylvania	[1],6,14,[25]	g,p	–
Szentes	16	k	1,2

T

Tabligbo	47	z ₄ ,z ₂₃	e,n,z ₁₅
Tado	8, <u>20</u>	c	z ₆
Tafo	<u>1</u> ,4,12,27	z ₃₅	1,7
Taiping	13,22	l,z ₁₃	e,n,z ₁₅
Takoradi	6,8	i	1,5
Taksony	1,3,19	i	z ₆
Tallahassee	6,8	z ₄ ,z ₃₂	–
Tamale	8, <u>20</u>	z ₂₉	[e,n,z ₁₅]
Tambacounda	1,3,19	b	e,n,x
Tamberma	47	z ₄ ,z ₂₄	–
Tamilnadu	6,7	z ₄₁	z ₃₅
Tampico	6,7	z ₃₆	e,n,z ₁₅
Tananarive	6,8	y	1,5
Tanger	<u>1</u> ,13,22	y	1,6
Tanzania	<u>1</u> ,13,22	z	e,n,z ₁₅

Tarshyne	9,12	d	1,6	
Taset	<u>1,42</u>	z ₄₁	–	
Taunton	28	k	e,n,x	
Taylor	38	l,v	e,n,z ₁₅	
Tchad	35	b	–	
Tchamba	17	z	e,n,z ₁₅	
Techimani	28	c	z ₆	
Teddington	<u>1,4,12,27</u>	y	1,7	
Tees	16	f,g	–	[z ₃₇]
Tejas	4,12	z ₃₆	–	
Teko	[1],6,14,[25]	d	e,n,z ₁₅	
Telaviv	28	y	e,n,z ₁₅	
Telelkebir	13,23	d	e,n,z ₁₅	
Telhashomer	11	z ₁₀	e,n,x	
Teltow	28	z ₄ ,z ₂₃	1,6	
Tema	<u>1,42</u>	z ₃₅	z ₆	
Tempe	30	b	1,7	[z ₃₃]
Tendeba	17	y	e,n,x	
Tennenlohe	18	r	1,5	
Tennessee	6,7, <u>14</u>	z ₂₉	[1,2,7]	
Tennyson	4,[5],12	g,z ₅₁	e,n,z ₁₅	
Teshie	<u>1,47</u>	l,z ₁₃ ,z ₂₈	e,n,z ₁₅	
Texas	4,[5],12	k	e,n,z ₁₅	
Thayngen	<u>1,4,12,27</u>	z ₄₁	1,(2),5	
Thetford	43	k	1,2	
Thiaroye	38	e,h	1,2	
Thies	1,3,19	y	1,7	
Thompson	6,7, <u>14</u>	k	1,5	[R1...]
Tibati	3,10	i	1,6	
Tienba	6,7	z ₃₅	1,6	
Tiergarten	44	a	e,n,x	
Tiko	<u>1,40</u>	l,z ₁₃ ,z ₂₈	1,2	
Tilburg	1,3,19	d	l,w	[z ₄₉]
Tilene	<u>1,40</u>	e,h	1,2	
Tinda	<u>1,4,12,27</u>	a	e,n,z ₁₅	
Tione	51	a	e,n,x	
Togba	16	a	e,n,x	
Togo	4,12	l,w	1,6	
Tokoin	4,12	z ₁₀	e,n,z ₁₅	
Tomegbe	<u>1,42</u>	b	e,n,z ₁₅	
Tomelilla	1,3,19	l,z ₂₈	1,7	

Tonev	21,54	b	e,n,x	
Toowong	11	a	1,7	
Torhout	30	e,h	1,5	
Toricada	<u>1</u> ,42	z ₄ ,z ₂₄	–	
Tornow	45	g,m,[s],[t]	–	
Toronto	9,46	l,v	e,n,x	
Toucra	48	z	1,5	[z ₅₈]
Toulon	18	l,w	e,n,z ₁₅	
Tounouma	8, <u>20</u>	b	z ₆	
Tours	11	l,z ₁₃	1,2	
Trachau	4,12,27	y	1,5	
Transvaal	45	z ₄ ,z ₂₄	–	
Travis	4,[5],12	g,z ₅₁	1,7	
Treforest	<u>1</u> ,51	z	1,6	
Treguier	9,12	z ₁₀	z ₆	
Trier	16	z ₃₅	1,6	
Trimdon	9,46	z ₃₅	z ₆	
Tripoli	<u>1</u> ,4,12,27	b	z ₆	
Trotha	40	z ₁₀	z ₆	
Troy	18	y	1,7	
Truro	3,10	i	1,7	
Tschangu	<u>1</u> ,13,23	e,h	1,5	
Tsevie	<u>1</u> ,4,12	i	e,n,z ₁₅	
Tshiongwe	6,8	e,h	e,n,z ₁₅	
Tucson	[1],6,14,[25]	b	1,7	
Tudu	4,12	z ₁₀	1,6	
Tumodi	<u>1</u> ,4,12	i	z ₆	
Tunis	<u>1</u> ,13,23	y	z ₆	
Typhi	9,12[Vi]	d	–	[j],[z ₆₆]
Typhimurium	<u>1</u> ,4,[5],12	i	1,2	
Typhisuis	6,7	c	1,5	
Tyresoe	<u>1</u> ,4,12,[27]	l,[z ₁₃],z ₂₈	1,5	

U

Uccle	3,54	g,s,t	–
Uganda	3,{10}{15}	l,z ₁₃	1,5
Ughelli	3,10	r	1,5
Uhlenhorst	44	z	l,w
Uithof	52	a	1,5
Ullevi	1,13,23	b	e,n,x
Umbadah	1,3,19	d	1,2
Umbilo	28	z ₁₀	e,n,x
Umhlali	6,7	a	1,6
Umhlatazana	35	a	e,n,z ₁₅
Uno	6,8	z ₂₉	[e,n,z ₁₅]
Uppsala	1,4,12,27	b	1,7
Urbana	30	b	e,n,x
Ursenbach	1,42	z	1,6
Usumbura	6,14,18	d	1,7
Utah	6,8	c	1,5
Utrecht	52	d	1,5
Uzaramo	1,6,14,25	z ₄ ,z ₂₄	–

V

Vaertan	13,22	b	e,n,x
Valdosta	6,8	a	1,2
Vancouver	16	c	1,5
Vanier	28	z	1,5
Vaugirard	41	b	1,6
Vegesack	16	b	l,w
Vejle	3,{10}{15}	e,h	1,2
Vellore	1,4,12,27	z ₁₀	z ₃₅

[z₂₇]

Veneziana	11	i	e,n,x
Verona	41	i	1,6
Verviers	45	k	1,5
Victoria	<u>1</u> ,9,12	l,w	1,5
Victoriaborg	17	c	1,6
Vietnam	41	b	z ₆
Vilvoorde	1,3,19	e,h	1,5
Vinohrady	28	m,t	[e,n,z ₁₅]
Virchow	6,7, <u>14</u>	r	1,2
Virginia	8	d	1,2
Visby	1,3,19	b	1,6
Vitkin	28	l,v	e,n,x
Vleuten	44	f,g	–
Vogan	<u>1</u> ,42	z ₃₈	z ₆
Volkmarsdorf	28	i	1,6
Volta	11	r	l,z ₁₃ ,z ₂₈
Vom	<u>1</u> ,4,12,27	l,z ₁₃ ,z ₂₈	e,n,z ₁₅
Voulte	43	i	e,n,x
Vridi	<u>1</u> ,13,23	e,h	l,w
Vuadens	4,12,27	z ₄ ,z ₂₃	z ₆

W

Wa	16	b	1,5
Waedenswil	9,46	e,h	1,5
Wagadugu	3,10	z ₄ ,z ₂₃	z ₆
Wagenia	<u>1</u> ,4,12,27	b	e,n,z ₁₅
Wanatah	1,3,19	d	1,7
Wandsworth	39	b	1,2
Wangata	<u>1</u> ,9,12	z ₄ ,z ₂₃	[1,7]
Waral	<u>1</u> ,42	m,t	–
Warengo	17	z	1,5
Warmesen	45	d	e,n,z ₁₅
Warnemuende	28	i	e,n,x

Warnow	6,8	i	1,6	
Warragul	[1],6,14,[25]	g,m	–	
Warri	17	k	1,7	
Washington	13,22	m,t	–	
Waycross	41	z_4, z_{23}	[e,n, z_{15}]	
Wayne	30	g, z_{51}	–	
Wedding	28	c	e,n, z_{15}	
Welikade	16	l,v	1,7	
Weltevreden	$3, \{10\} \{15\}$	r	z_6	
Wenatchee	47	b	1,2	
Wentworth	11	z_{10}	1,2	
Wernigerode	9,46	f,g	–	
Weslaco	42	z_{36}	–	
Westafrica	9,12	e,h	1,7	
Westeinde	16	l,w	1,6	
Westerstede	1,3,19	l, z_{13}	1,2	
Westhampton	$3, \{10\} \{15\} \{15,34\}$	g,s,t	–	[z_{37}]
Westminster	$3, \{10\} \{15\}$	b	z_{35}	
Weston	16	e,h	z_6	
Westphalia	35	z_4, z_{24}	–	
Weybridge	3,10	d	z_6	
Wichita	<u>1</u> ,13,23	d	1,6	[z_{37}]
Widemarsh	35	z_{29}	–	
Wien	<u>1</u> ,4,12,[27]	b	l,w	
Wil	6,7	d	l, z_{13}, z_{28}	
Wilhelmsburg	<u>1</u> ,4,[5],12,[27]	z_{38}	[e,n, z_{15}]	
Willamette	38	d	1,5	
Willemstad	<u>1</u> ,13,22	e,h	1,6	
Wilmington	3,10	b	z_6	
Wimborne	3,10	k	1,2	
Windermere	39	y	1,5	
Windsheim	51	a	1,2	
Wingrove	6,8	c	1,2	
Winneba	4,12	r	1,6	
Winnipeg	54	e,h	1,5	
Winslow	13,22	z	1,5	
Winston	6,7	m,t	1,6	
Winterthur	1,3,19	l, z_{13}	1,6	
Wippra	6,8	z_{10}	z_6	
Wisbech	16	i	1,7	
Wohlen	11	b	1,6	

Woodhull	1,6,14,25	d	1,6	
Woodinville	11	c	e,n,x	
Worb	9,46	b	e,n,x	
Worthington	<u>1</u> ,13,23	z	l,w	[z ₄₃]
Woumbou	11	y	e,n,x,z ₁₅	
Wuiti	30	z ₃₅	e,n,z ₁₅	
Wuppertal	9,46	z ₄₁	–	
Wyldegreen	<u>1</u> ,13,23	a	l,w	

Y

Yaba	3,{10}{ <u>15</u> }	b	e,n,z ₁₅
Yalding	1,3,19	r	e,n,z ₁₅
Yaounde	<u>1</u> ,4,12,27	z ₃₅	e,n,z ₁₅
Yardley	28	g,m	1,6
Yarm	6,8	z ₃₅	1,2
Yarrabah	13,23	y	1,7
Yeerongpilly	3,10	i	z ₆
Yehuda	11	z ₄ ,z ₂₄	–
Yekepa	<u>1</u> ,40	z ₃₅	e,n,z ₁₅
Yellowknife	9,12	r	e,n,x
Yenne	1,3,19	z ₁₀	1,5
Yerba	54	z ₄ ,z ₂₃	–
Yoff	38	z ₄ ,z ₂₃	1,2
Yokoe	8, <u>20</u>	m,t	–
Yolo	35	c	[e,n,z ₁₅]
Yombesali	47	z ₃₅	z ₆
Yopougon	45	z	e,n,z ₁₅
York	9,12	l,z ₂₈	e,n,z ₁₅
Yoruba	16	c	l,w
Yovokome	8, <u>20</u>	d	1,5
Yundum	3,10	k	e,n,x

Z

Zadar	9,46	b	1,6
Zaiman	9,12	l,v	e,n,x
Zaire	30	c	1,7
Zanzibar	3,{10}{15}	k	1,5
Zaria	17	k	e,n,z ₁₅
Zega	9,12	d	z ₆
Zehlendorf	30	a	1,5
Zerifin	6,8	z ₁₀	1,2
Zigong	16	l,w	1,5
Zinder	44	z ₂₉	–
Zongo	3,10	z ₃₅	1,7
Zuilen	1,3,19	i	l,w
Zwickau	16	r,i	e,n,z ₁₅

**ALPHABETIC LIST OF SEROVAR NAMES WITHDRAWN FROM THE
SCHEME**

(Symbols : =, identical to ... ; =>, combined with ...)

Abortusbovis	=>	Abony
Abortuscanis	=>	Paratyphi B
II Acres	=	II <u>1</u> ,13,23:b:[1,5]:z ₄₂
II Alexander	=	II 3,10:z:1,5
II Alsterdorf	=	II <u>1</u> ,40:g,[m],[s],t:[1,5]
II Angola	=	II <u>1</u> ,9,12:z:z ₆
Anie	=>	Mesbit
Ardwick	=	Rissen var. 14 ⁺
IV Argentina	=	IV 6,7:z ₃₆ :-
Arkansas	=	Muenster var. 15 ⁺ ,34 ⁺
II Artis	=	II 56:b:[1,5]
II Askraal	=	II 51:l,z ₂₈ :z ₆
Atherton	=	Waycross
Atlanta	=>	Mississippi
II Atra	=	II 50:m,t:z ₆ :z ₄₂
II Bacongo	=	II 6,7:z ₃₆ :z ₄₂
V Balboa	=	V 48:z ₄₁ :-
Bambesa	=>	Miami
Bantam	=	Meleagridis
II Baragwanath	=	II 6,8:m,t:1,5
II Basel	=	II 58:l,z ₁₃ ,z ₂₈ :1,5
Batavia	=	Lexington
II Bechuana	=	<u>1</u> ,4,12,[27]:g,[m],t:[1,5]
II Bellville	=	II 16:e,n,x:1,(5),7
II Beloha	=	II 18:z ₃₆ :-
IV Bern	=	IV 40:z ₄ ,z ₃₂ :-
II Betioky	=	II 59:k:z ₆₅
II Bilthoven	=	II 47:a:1,5
Binza	=	Orion var. 15 ⁺
II Blankenese	=	II <u>1</u> ,9,12:b:z ₆

II Bleadon	=	II 17:g,t:[e,n,x,z ₁₅]
II Bloemfontein	=	II 6,7:b:e,n,x:z ₄₂
IV Bockenheim	=	IV 1,53:z ₃₆ ,z ₃₈ :-
II Boksburg	=	II 40:g,m,s,t:e,n,x
IV Bonaire	=	IV 50:z ₄ ,z ₃₂ :-
V Bongor	=	V 48:z ₃₅ :-
VI Bornheim	=	VI 1,6,14,25:z ₁₀ :1,(2),7
Bornum	=	Lille var. 14 ⁺
II Boulders	=	II 1,13,23:m,t:z ₄₂
II Bremen	=	II 45:g,m,s,t:e,n,x
V Brookfield	=	V 66:z ₄₁ :-
Broxbourne	=	Wien
Buenosaires	=	Bonariensis
II Bulawayo	=	II 1,40:z:1,5
II Bunnik	=	II 43:z ₄₂ :1,5,7
Cairo	=>	Stanley
II Caledon	=	II 1,4,12,[27]:g,[m],[s],t:e,n,x
II Calvinia	=	II 6,7:a:z ₄₂
Cambridge	=	Meleagris var. 15 ⁺
V Camdeni	=	V 44:r:-
II Canastel	=	II 9,12:z ₂₉ :1,5
Canoga	=	Westhampton var. 15 ⁺ ,34 ⁺
II Cape	=	II 6,7:z ₆ :1,7
Cardiff	=>	Thompson
II Carletonville	=	II 38:d:[1,5]
II Ceres	=	II 28:z:z ₃₉
IV Chameleon	=	IV 16:z ₄ ,z ₃₂ :-
II Chersina	=	II 47:z:z ₆
II Chinovum	=	II 42:b:1,5
II Chudleigh	=	II 3,10:e,n,x:1,7
Clichy	=	Goelzau var. 15 ⁺
II Clifton	=	II 13,22:z ₂₉ :1,5

II Clovelly	=	II 1,44:z ₃₉ :e,n,x,z ₁₅
Congo	=>	Agbeni
II Constantia	=	II 17:z:l,w:z ₄₂
Cook	=>	Champaign
Dalat	=>	Ball
II Daressalaam	=	II 1,9,12:l,w:e,n,x
Decatur	=>	Choleraesuis
II Degania	=	II 40:z ₄ ,z ₂₄ :z ₃₉
II Detroit	=	II 42:z:1,5
Drypool	=	Amsterdam var. 15 ⁺
II Dubrovnik	=	II 41:z:1,5
II Duivenhoks	=	II 9,46:g,[m],[s],t:[e,n,x]
II Durbanville	=	II 1,4,12,[27]:z ₃₉ :1,[5],7
II Eilbek	=	IIIb 61:i:z
Eimsbuettel	=	Livingstone var. 14 ⁺
II Ejeda	=	II 45:a:z ₁₀
II Elsie Rivier	=	II 16:z ₄₂ :1,6
II Emmerich	=	II 6,14:m,t:e,n,x
II Epping	=	II 1,13,23:e,n,x:1,[5],7
II Erlangen	=	II 48:g,m,t:-
Eschersheim	=	Souza var. 15 ⁺
II Etosha	=	II 48:d:1,2
II Fandran	=	II 1,40:z ₃₅ :e,n,x,z ₁₅
II Faure	=	II 50:z ₄₂ :1,7
Ferlac	=	VI 1,6,14,25:a:e,n,x
II Finchley	=	II 3,10:z:e,n,x
IV Flint	=	IV 50:z ₄ ,z ₂₃ :-
II Foulpointe	=	II 38:g,t:-
II Fremantle	=	II 42:g,t:-
II Fuhlsbuettel	=	II 3,10:l,v:z ₆
Gelsenkirchen	=	Gdansk var. 14 ⁺
II Germiston	=	II 6,8:m,t:e,n,x

II Gilbert	=	II 6,7:z ₃₉ :1,5,7
II Glencairn	=	II 11:a:z ₆ :z ₄₂
Goerlitz	=	Vejle var. 15 ⁺
II Gojenberg	=	II 1,13,23:g,t:1,5
II Goodwood	=	II 13,22:z ₂₉ :e,n,x
II Grabouw	=	II 11:g,[m],s,t:z ₃₉
II Greenside	=	II 50:z:e,n,x
II Grunty	=	II 1,40:z ₃₉ :1,6
II Gwaai	=	II 21:z ₄ ,z ₂₄ :-
II Haarlem	=	II 9,46:z:e,n,x
II Haddon	=	II 16:z ₄ ,z ₂₃ :-
II Hagenbeck	=	II 48:d:z ₆
Halmstad	=	Westhampton var. 15 ⁺
II Hamburg	=>	II 1,9,12:g,m,[s],t:[1,5,7]:[z ₄₂]
Hamilton	=	Vejle var. 15 ⁺ ,[Rz ₂₇]
II Hammonia	=	II 48:e,n,x,z ₁₅ :z ₆
IV Harmelen	=	IV 51:z ₄ ,z ₂₃ :-
II Heilbron	=	II 6,7:1,z ₂₈ :1,5:[z ₄₂]
II Helsinki	=	II 1,4,12:z ₂₉ :e,n,x
Heves	=	6,14,[24]:d:1,5
II Hillbrow	=	II 17:b:e,n,x,z ₁₅
Hirschfield	=	Paratyphi C
II Hooggraven	=	II 50:z ₁₀ :z ₆ :z ₄₂
IV Houten	=	IV 43:z ₄ ,z ₂₃ :-
II Hueningen	=	II 9,12:z:z ₃₉
II Huila	=	II 11:l,z ₂₈ :e,n,x
II Humber	=	II 53:z ₄ ,z ₂₄ :-
Illinois	=	Lexington var. 15 ⁺ ,34 ⁺
II Islington	=	II 3,10:g,t:-
Italiana	=>	Panama
Iwojima	=	Kentucky
II Jacksonville	=	II 16:z ₂₉ :e,n,x

Jaja	=	Stanleyville var. 27 ⁺
Java	=	Paratyphi B var. L(+) tartrate (= d-tartrate)+
Joenkoeping	=>	Kingston
II Kaltenhausen	=	II 28:b:z ₆
Kanda	=	Meleagridis
Kaposvar	=>	Reading
II Katesgrove	=	II <u>1</u> ,13,23,m,t:1,5
II Khami	=	II 47:b:e,n,x,z ₁₅
Khartoum	=	Oxford var. 15 ⁺ ,34 ⁺
II Kilwa	=	II 4,12:l,w:e,n,x
Kinshasa	=	Uganda var. 15 ⁺
II Klapmuts	=	II 45:z:z ₃₉
II Kluetjenfelde	=	II 4,12:d:e,n,x
II Kommetje	=	II 43:b:z ₄₂
II Kraaifontein	=>	II <u>1</u> ,13,23:g,m,[s],t:[e,n,x]
IV Kralendyk	=	IV 6,7:z ₄ ,z ₂₄ :-
II Krugersdorp	=	II 50:e,n,x:1,7
II Kuilsrivier	=	II <u>1</u> ,9,12:g,m,s,t:e,n,x
Lanka	=	Weltevreden var. 15 ⁺
II Lethe	=	II 41:g,t:-
II Lichtenberg	=	II 41:z ₁₀ :z ₆
II Limbe	=	II <u>1</u> ,13,22:g,m,t:[1,5]
II Lincoln	=	II 11:m,t:e,n,x
II Lindrick	=	II 9,12:e,n,x:1,[5],7
II Llandudno	=	II 28:g,(m),[s],t:1,5
II Lobatsi	=	II 52:z ₄₄ :1,5,7
II Locarno	=	II 57:z ₂₉ :z ₄₂
IV Lohbruegge	=	IV 44:z ₄ ,z ₃₂ :-

II Louwbester	=	II 16:z:e,n,x
II Luanshya	=	II 1,13,23:g,m,[s],t:[e,n,x]
II Lundby	=	II 9,46:b:e,n,x
II Lurup	=	II 41:z ₁₀ :e,n,x,z ₁₅
II Luton	=	II 60:z:e,n,x
II Maarssen	=	II 9,46:z ₄ ,z ₂₄ :z ₃₉ :z ₄₂
III Maartensdijk	=	IIIa 40:g,z ₅₁ :-
II Makoma	=	II 1,4,[5],12,[27]:a:e,n,x
II Makumira	=	II 1,4,12,[27]:e,n,x:1,[5],7
V Malawi	=	V 66:z ₆₅ :-
II Manica	=>	II 1,9,12:g,m,[s],t:[1,5,7]:[z ₄₂]
Manila	=	Lexington var. 15 ⁺
II Manombo	=	II 57:z ₃₉ :e,n,x,z ₁₅
V Maregrosso	=	V 66:z ₃₅ :-
IV Marina	=	IV 48:g,z ₅₁ :-
IV Maritza	=>	Salford
II Matroosfontein	=	II 3,10:a:e,n,x
Menhaden	=	Give var. 15 ⁺ ,34 ⁺
II Merseyside	=	II 16:g,t:[1,5]
Mexicana	=>	Muenchen
II Midhurst	=	II 53:l,z ₂₈ :z ₃₉
Minneapolis	=	Anatum var. 15 ⁺ ,34 ⁺
Mission	=>	Isangi
II Mjimwema	=	II 1,9,12:b:e,n,x
II Mobeni	=	II 16:g,[m],[s],t:[e,n,x]
II Mondeor	=	II 39:l,z ₂₈ :e,n,x
II Montgomery	=	II 11:a:d:e,n,z ₁₅
II Mosselbay	=	II 43:g,m,[s],t:[z ₄₂]
II Mpila	=	II 3,10:z ₃₈ :z ₄₂
II Muizenberg	=>	II 1,9,12:g,m,[s],t:[1,5,7]:[z ₄₂]
IV Mundsburg	=	IV 11:g,z ₅₁ :-

II Nachshonim	=	II <u>1</u> ,13,23:z:1,5
II Nairobi	=	II 42:r:-
II Namib	=	II 50:g,[m],s,t:[1,5]
Nancy	=	Nchanga var. 15 ⁺
II Neasden	=	II 9,12:g,s,t:e,n,x
II Negev	=	II 41:z ₁₀ :1,2
II Ngozi	=	II 48:z ₁₀ :[1,5]
Newbrunswick	=	Give var. 15 ⁺
Newhaw	=	Muenster var. 15 ⁺
Newington	=	Anatum var. 15 ⁺
Nienstedten	=	Ohio var 14 ⁺
Nissii	=>	Ohio
II Nordenham	=	II <u>1</u> ,4,12,27:z:e,n,x
II Noordhoek	=	II 16:l,w:z ₆
II Nuernberg	=	II 42:z:z ₆
IV Ochsenzoll	=	IV 16:z ₄ ,z ₂₃ :-
II Odijk	=	II 30:a:z ₃₉
II Oevelgoenne	=	II 28:r:e,n,z ₁₅
Onderman	=	Amersfoort var. 14 ⁺
Oregon	=>	Muenchen
II Ottershaw	=	II 40:d:-
II Oysterbeds	=	II 6,7:z:z ₄₂
Pankow	=	Shangani var. 15 ⁺
IV Parera	=	IV 11:z ₄ ,z ₂₃ :-
II Parow	=	II 3,10, <u>15</u> :g,m,s,t:-
II Perinet	=	II 45:g,m,t:e,n,x,z ₁₅
II Phoenix	=	II 47:b:1,5
Pikine	=>	Altona
Portsmouth	=	London var. 15 ⁺
II Portbech	=	II 42:l,v:e,n,x,z ₁₅
Pueris	=>	Newport
Pullorum	=>	Gallinarum

II Quimbamba	=	II 47:d:z ₃₉
II Rand	=	II 42:z:e,n,x,z ₁₅
II Rhodesiense	=	II 9,12:d:e,n,x
II Roggeveld	=	II 51:-:1,7
II Rooikrantz	=	II 1,6,14:m,t:1,5
Rosenthal	=	Butantan var. 15 ⁺ ,34 ⁺
IV Roterberg	=	IV 6,7:z ₄ ,z ₂₃ :-
II Rotterdam	=	II 1,13,22:g,t:1,5
II Rowbarton	=	II 16:m,t:[z ₄₂]
Ruki	=>	Ball
Rutgers	=>	Give
IV Sachsenwald	=	IV 1,40:z ₄ ,z ₂₃ :-
Saka	=>	Sya
Sakai	=	Postdam
II Sakaraha	=	II 48:k:z ₃₉
Salinatis	=>	Duisburg
II Sarepta	=	II 16:l,z ₂₈ :z ₄₂
Schottmuelleri	=	Paratyphi B
II Seaforth	=	II 50:k:z ₆
Selandia	=	Nyborg var. 15 ⁺
IV Seminole	=	IV 1,40:g,z ₅₁ :-
II Setubal	=	II 60:g,m,t:z ₆
II Shomron	=>	IIIa 18:z ₄ ,z ₃₂ :-
Siegburg	=	Cerro var. 14 ⁺
II Simonstown	=	II 1,6,14:z ₁₀ :1,5
Simsbury	=>	Senftenberg
Sladun	=>	Abony
II Slangkop	=	II 1,6,14:z ₁₀ :z ₆ :z ₄₂
II Slatograd	=	II 30:g,t:-
IV Soesterberg	=	IV 21:z ₄ ,z ₂₃ :-
II Sofia	=	II 1,4,12,[27]:b:[e,n,x]
II Soutpan	=	II 11:z:z ₃₉

II Springs	=	II 40:a:z ₃₉
VI Srinagar	=	VI 11:b:e,n,x
II Stellenbosch	=	II 1,9,12:z:1,7
II Stevenage	=	II 1,13,23:[z ₄₂]:1,[5],7
II Stikland	=	II 3,10:m,t:e,n,x
II Suarez	=	II 1,40:c:e,n,x,z ₁₅
II Suederelbe	=	II 1,9,12:b:z ₃₉
Suez	=	Shubra
Suipestifer	=	Choleraesuis
II Sullivan	=	II 6,7:z ₄₂ :1,7
II Sunnydale	=	II 1,40:k:e,n,x,z ₁₅
II Sydney	=>	IIIb 48:i:z
II Tafelbaai	=	II 3,10:z:z ₃₉
Taihoku	=	Meleagridis
Thielallee	=	Oranienburg var. 14 ⁺
Thomasville	=	Orion var. 15 ⁺ ,34 ⁺
Tim	=>	Newington
II Tokai	=	II 57:z ₄₂ :1,6:z ₅₃
II Tosamanga	=	II 6,7:z:1,5
Tournai	=	Stockholm var. 15 ⁺
II Tranoroa	=	II 55:k:z ₃₉
Tuebingen	=	Amager var. 15 ⁺
IV Tuindorp	=	IV 43:z ₄ ,z ₃₂ :-
II Tulear	=	II 6,8:a:z ₅₂
II Tygerberg	=	II 1,13,23:a:z ₄₂
II Uphill	=	II 42:b:e,n,x,z ₁₅
II Utbremen	=	II 35:z ₂₉ :e,n,x
II Veddel	=	II 43:g,t:-
Venusberg	=>	Nchanga
II Verity	=	II 17:e,n,x,z ₁₅ :1,6
IV Volksdorf	=	IV 43:z ₃₆ ,z ₃₈ :-
II Vredelust	=	II 1,13,23:l,z ₂₈ :z ₄₂

VI Vrindaban	=	VI 45:a:e,n,x
II Wandsbek	=	II 21:z ₁₀ :z ₆
IV Wassenaar	=	IV 50:g,z ₅₁ :-
II Westpark	=	II 3,10:l,z ₂₈ :e,n,x
Wildwood	=	Meleagris var. 15 ⁺ ,34 ⁺
II Wilhemstrasse	=>	II 52:z ₄₄ :1,5,7
II Winchester	=	II 3,10:z ₃₉ :1,[5],7
II Windhoek	=	II 45:g,m,s,t:1,5
II Woerden	=	II 17:c:z ₃₉
Womba	=>	Altendorf
II Woodstock	=	II 16:z ₄₂ :1,(5),7
II Worcester	=	II <u>1</u> ,13,23:m,t:e,n,x
Wuerzburg	=>	Miami
II Wynberg	=	II <u>1</u> ,9,12:z ₃₉ :1,7
Zagreb	=>	Saintpaul
II Zeist	=	II 18:z ₁₀ :z ₆
II Zuerich	=	II 1,9,12,46,27:c:z ₃₉