World Health Organization

Institut Pasteur

WHO Collaborating Centre for Reference and Research on *Salmonella*

ANTIGENIC FORMULAE OF THE *SALMONELLA* SEROVARS

2007

9th edition

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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

We thank our above-mentioned colleagues from Hamburg and Atlanta for their fruitful collaboration. Special thanks are due to Martine Guibourdenche for her precise work and the preparation of this document.

Contents

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. telelkebir*). 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	***S. enterica***						***S. bongori***
Subspecies	*enterica*	*salamae*	*arizonae*	*diarizonae*	*houtenae*	*indica*	
Characters							
Dulcitol	+	+	–	–	–	d	+
ONPG (2 h)	–	–	+	+	–	d	+
Malonate	–	+	+	+	–	–	–
Gelatinase	–	+	+	+	+	+	–
Sorbitol	+	+	+	+	+	–	+
Growth with KCN	–	–	–	–	+	–	+
L(+)-tartrate[(a)]	+	–	–	–	–	–	–
Galacturonate	–	+	–	+	+	+	+
γ-glutamyltransferase	+[(*)]	+	–	+	+	+	+
ß-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 $\varepsilon_{15}+\varepsilon_{34}$, 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* $_{\alpha(1\text{-}6)}$ located within the major O-antigen cluster on the bacterial chromosome. To take this into account, we suppressed underlining for this factor and provisionnally 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. 15+
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 12_2 after conversion by phage ε_{34}.

Flagellar (H) antigens of the e,n,x/e,n,z_{15} complex

Composition of H antigens e,n,x and e,n,z_{15}

Salmonella	H formula in scheme	Actual H factors	Factor x present
S. enterica subsp. *enterica*	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}	-
S. enterica subsp. *salamae*	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}	-
S. enterica subsp. *diarizonae*	e,n,x	e,n,z_{16}	-
	e,n,x,z_{15}	e,n,z_{15},z_{16}	-
S. enterica subsp. *houtenae*	e,n,x	e,n,x,z_{17}	+
S. enterica subsp. *indica*	e,n,x	e,n,x,z_{17}	+
S. bongori	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 z_{16}, and their formula is in fact e,n,x,z_{16}. Exceptionnally, e,n,x phases can occur without z_{16} and with z_{17}. 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,z_{15}. The so-called factor x in their formula is in fact z_{16}.

All e,n,z_{15} phases have, in addition, factor z_{17}. Factor z_{17} never occurs with e,n,x,z_{15} (which is in fact, e,n,z_{15},z_{16}).

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_2S	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, H_2S) 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 ubiquist, 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, H_2S, 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 C_4 (O:6,7,14), E_2 (O:3,15), and E_3 (O:3,15,34) contained respectively serovars of group C_1 lysogenized by phage 14 (O:6,7 –> O:6,7,14), and serovars of groups E_1

lysogenized by phage ε_{15} (O:3,10 –> O:3,15), or by phages ε_{15} and ε_{34} (O:3,10 –> O:3,15,34). Serovars of these groups are included in group O:7 (C_1) and O:3,10 (E_1).

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*. Rj for Typhi, Rz_{50} 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 z_{66} of Typhi is an additionnal 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

S. enterica	2557
S. enterica subsp. enterica	1 531
S. enterica subsp. *salamae*	505
S. enterica subsp. *arizonae*	99
S. enterica subsp. *diarizonae*	336
S. enterica subsp. *houtenae*	73
S. enterica subsp. *indica*	13
S. bongori	22
Total (genus *Salmonella*)	**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	1,2,12	a	[1,5]	
Nitra	2,12	g,m	–	
Kiel	1,2,12	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	1,4,[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	1,4,[5],12	a	e,n,x	
Tinda	1,4,12,27	a	e,n,z_{15}	
II	1,4,[5],12,[27]	a	e,n,x	
Huettwilen	1,4,12	a	l,w	
Nakuru	1,4,12,27	a	z_6	
II	1,4,12,[27]	a	z_{39}	
Paratyphi B[2]	1,4,[5],12	b	1,2	[z_5],[z_{33}]
Limete	1,4,12,[27]	b	1,5	
II	4,12	b	1,5	
Canada	4,12,[27]	b	1,6	
Uppsala	1,4,12,27	b	1,7	
Abony	1,4,[5],12,[27]	b	e,n,x	
II	1,4,[5],12,[27]	b	[e,n,x]	
Wagenia	1,4,12,27	b	e,n,z_{15}	
Wien	1,4,12,[27]	b	l,w	
Tripoli	1,4,12,27	b	z_6	
Schleissheim[3]	4,12,27	b	–	
Legon	1,4,12,[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	1,4,12,27	c	e,n,z_{15}	
Hallfold	1,4,12,27	c	l,w	
Bury	4,12,27	c	z_6	
Stanley	1,4,[5],12,[27]	d	1,2	
Eppendorf	1,4,12,[27]	d	1,5	
Brezany	1,4,12,27	d	1,6	

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

Neumuenster	1,4,12,27	k	1,6	
II	1,4,12,27	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	1,4,12,27	l,v	1,7	[z_{40}]
Kimuenza	1,4,12,27	l,v	e,n,x	
II	1,4,12,27	l,v	e,n,x	
Brandenburg	4,[5],12	l,v	e,n,z_{15}	
II	1,4,12,27	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	1,4,12,27	l,w	z_6	
Kunduchi	1,4,[5],12,[27]	l,[z_{13}],[z_{28}]	1,2	
Tyresoe	1,4,12,[27]	l,[z_{13}],z_{28}	1,5	
Haduna	4,12	l,z_{13},[z_{28}]	1,6	
Kubacha	1,4,12,27	l,z_{13},z_{28}	1,7	
Kano	1,4,12,27	l,z_{13},z_{28}	e,n,x	
Vom	1,4,12,27	l,z_{13},z_{28}	e,n,z_{15}	
Reinickendorf	4,12	l,z_{28}	e,n,x	
II	1,4,12	l,z_{28}	[e,n,x]	
Heidelberg	1,4,[5],12	r	1,2	
Bradford	4,12,[27]	r	1,5	
Winneba	4,12	r	1,6	
Remo	1,4,12,27	r	1,7	
Bochum	1,4,[5],12	r	l,w	
Southampton	4,12,27	r	z_6	
Drogana	1,4,12,27	r,[i]	e,n,z_{15}	
Africana	4,12	r,i	l,w	
Coeln	1,4,[5],12	y	1,2	
Trachau	4,12,27	y	1,5	
Finaghy	4,12	y	1,6	
Teddington	1,4,12,27	y	1,7	
Ball	1,4,[5],12,[27]	y	e,n,x	
Jos	1,4,12,27	y	e,n,z_{15}	
Kamoru	1,4,12,27	y	z_6	
Shubra	4,[5],12	z	1,2	

Kiambu	1,4,12	z	1,5
II	1,4,12,27	z	1,5
Loubomo	4,12	z	1,6
Indiana	1,4,12	z	1,7
II	4,12	z	1,7
Neftenbach	4,12	z	e,n,x
II	1,4,12,27	z	e,n,x
Koenigstuhl	1,4,[5],12	z	e,n,z_{15}
Preston	1,4,12	z	l,w
Entebbe	1,4,12,27	z	z_6
II	4,12	z	z_{39}
Stanleyville	1,4,[5],12,[27]	z_4,z_{23}	[1,2]
Vuadens	4,12,27	z_4,z_{23}	z_6
Kalamu	1,4,[5],12	z_4,z_{24}	[1,5]
Haifa	1,4,[5],12	z_{10}	1,2
Ituri	1,4,12	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	1,4,12	z_{10}	l,w
Fortune	1,4,12,[27]	z_{10}	z_6
Vellore	1,4,12,27	z_{10}	z_{35}
Brancaster	1,4,12,27	z_{29}	–
II	1,4,12	z_{29}	e,n,x
Pasing	4,12	z_{35}	1,5
Tafo	1,4,12,27	z_{35}	1,7
Sloterdijk	1,4,12,27	z_{35}	z_6
Yaounde	1,4,12,27	z_{35}	e,n,z_{15}
Tejas	4,12	z_{36}	–
Wilhelmsburg	1,4,[5],12,[27]	z_{38}	[e,n,z_{15}]
II	1,4,12,[27]	z_{39}	1,[5],7
Thayngen	1,4,12,27	z_{41}	1,(2),5
Maska	1,4,12,27	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, H_2S, 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 (C_1)

Strains in this group can be lysogenized by phage 14 (O:6,7 —> O:6,7,14, former group C_4).

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Sanjuan	6,7	a	1,5	
II	6,7,14	a	1,5	
Umhlali	6,7	a	1,6	
Austin	6,7	a	1,7	
Oslo	6,7,14	a	e,n,x	
Denver	6,7	a	e,n,z_{15}	
Coleypark	6,7,14	a	l,w	
Damman	6,7,14	a	z_6	
II	6,7	a	z_6	
II	6,7	a	z_{42}	
Brazzaville	6,7	b	1,2	
Edinburg	6,7,14	b	1,5	
Adime	6,7	b	1,6	
Koumra	6,7	b	1,7	
Lockleaze	6,7,14	b	e,n,x	
Georgia	6,7	b	e,n,z_{15}	
II	6,7	b	[e,n,x]	z_{42}
Ohio	6,7,14	b	l,w	[z_{59}]
Leopoldville	6,7,14	b	z_6	
Kotte	6,7	b	z_{35}	
II	6,7	b	z_{39}	
Hissar	6,7,14	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	6,7,14	c	e,n,z_{15}	
Kisii	6,7	d	1,2	
Isangi	6,7,14	d	1,5	

Kivu	6,7	d	1,6	
Kambole	6,7	d	1,[2],7	
Amersfoort	6,7,14	d	e,n,x	
Gombe	6,7,14	d	e,n,z_{15}	
Livingstone	6,7,14	d	l,w	
Wil	6,7	d	l,z_{13},z_{28}	
Nieukerk	6,7,14	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	6,7,14	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	6,7,14	f,g	–	
Eingedi	6,7	f,g,t	1,2,7	
Afula	6,7	f,g,t	e,n,x	
Montevideo[2]	6,7,14	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	6,7,14	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	6,7,14	m,t	[z_{57}]	
Augustenborg	6,7,14	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	
Papuana	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	6,7,14	z_{38}	–	[z_{82}]
IIIb	6,7,14	z_{39}	1,2	
II	6,7	z_{39}	1,5,7	
VI	6,7	z_{41}	1,7	
Hillsborough	6,7	z_{41}	l,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 (C_2-C_3)

Groups O:6,8 (C_2) and O:8 (C_3) 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	8,20	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	8,20	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	
Shipley	8,20	b	e,n,z_{15}	
Presov	6,8	b	e,n,z_{15}	
Bukuru	6,8	b	l,w	
Heistopdenberg	8,20	b	l,w	
Tounouma	8,20	b	z_6	
Banalia	6,8	b	z_6	
Wingrove	6,8	c	1,2	
Gaillac	8,20	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	8,20	c	e,n,x	
Belem	6,8	c	e,n,x	
Quiniela	6,8	c	e,n,z_{15}	
Tado	8,20	c	z_6	
Virginia	8	d	1,2	
Muenchen	6,8	d	1,2	[z_{67}]
Yovokome	8,20	d	1,5	
Manhattan	6,8	d	1,5	[z_{58}]
Portanigra	8,20	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	8,20	d	z_6	
II	6,8	d	z_6	z_{42}
Bardo	8	e,h	1,2	
Newport	6,8,20	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	8,20	e,h	1,7	
Fillmore	6,8	e,h	e,n,x	
Tshiongwe	6,8	e,h	e,n,z_{15}	
Rechovot	8,20	e,h	z_6	
Sandow	6,8	f,g	e,n,z_{15}	
II	6,8	f,g,m,t	[e,n,x]	
Emek	8,20	g,m,s	–	
Chincol	6,8	g,m,[s]	[e,n,x]	
II	6,8	g,m,t	1,7	
Reubeuss	8,20	g,m,t	–	
Alminko	8,20	g,s,t	–	
Nanergou	6,8	g,s,t	–	
Yokoe	8,20	m,t	–	
II	6,8	m,t	1,5	
II	6,8	m,t	e,n,x	
Bassa	6,8	m,t	–	
Lindenburg	6,8	i	1,2	
Bargny	8,20	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	8,20	i	l,w	
Cyprus	6,8	i	l,w	
Kentucky	8,20	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	8,20	r	1,5	
Bovismorbificans[1]	6,8,20	r,[i]	1,5	[R1…]
Noya	8	r	1,7	
Akanji	6,8	r	1,7	
Cocody	8,20	r,i	e,n,z_{15}	
Hidalgo	6,8	r,[i]	e,n,z_{15}	
Brikama	8,20	r,[i]	l,w	
Goldcoast	6,8	r	l,w	
IIIb	8	r	z	
Altona	8,20	r,[i]	z_6	
Giza	8,20	y	1,2	
Lamphun	6,8	y	1,2	
Brunei	8,20	y	1,5	
Tananarive	6,8	y	1,5	
Bulgaria	6,8	y	1,6	

II	6,8	y	1,6	z_{42}
Alagbon	8,20	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	8,20	y	z_6	
Benue	6,8	y	l,w	
Sindelfingen	8,20	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	8,20	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	8,20	z_4,z_{23}	l,w	
Corvallis	8,20	z_4,z_{23}	[z_6]	
Albany	8,20	z_4,z_{24}	–	[z_{45}]
Duesseldorf	6,8	z_4,z_{24}	–	
Tallahassee	6,8	z_4,z_{32}	–	
Bazenheid	8,20	z_{10}	1,2	
Zerifin	6,8	z_{10}	1,2	
Paris	8,20	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	8,20	z_{10}	e,n,z_{15}	
Glostrup	6,8	z_{10}	e,n,z_{15}	
Remiremont	8,20	z_{10}	l,w	
Molade	8,20	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	8,20	z_{29}	[e,n,z_{15}]	
Uno	6,8	z_{29}	[e,n,z_{15}]	

II	6,8	z_{29}	e,n,x
Kolda	8,20	z_{35}	1,2
Yarm	6,8	z_{35}	1,2
Angers	8,20	z_{35}	z_6
Apeyeme	8,20	z_{38}	–
Diogoye	8,20	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 (D_1)

Type	Somatic (O) antigen	Flagellar (H) antigen		
		Phase 1	Phase 2	Other
Sendai[1]	1,9,12	a	1,5	
Miami[1]	1,9,12	a	1,5	
II	9,12	a	1,5	
Os	9,12	a	1,6	
Saarbruecken	1,9,12	a	1,7	
Lomalinda	1,9,12	a	e,n,x	
II	1,9,12	a	e,n,x	
Durban	1,9,12	a	e,n,z_{15}	
II	9,12	a	z_{39}	
II	1,9,12	a	z_{42}	
Onarimon	1,9,12	b	1,2	
Frintrop	1,9,12	b	1,5	
Bata	9,12	b	1,7	
II	1,9,12	b	e,n,x	
Mana	9,12	b	e,n,z_{15}	
II	1,9,12	b	z_6	
II	1,9,12	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	1,9,12	d	1,5	
Tarshyne	9,12	d	1,6	
Eschberg	9,12	d	1,7	
II	1,9,12	d	e,n,x	
Bangui	9,12	d	e,n,z_{15}	
Zega	9,12	d	z_6	
Jaffna	1,9,12	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	1,9,12	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	1,9,12	[f],g,[t]	–	
Enteritidis[3]	1,9,12	g,m	–	
Gueuletapee	9,12	g,m,s	–	
Blegdam	9,12	g,m,q	–	
II	1,9,12	g,m,[s],t	[1,5,7]	[z_{42}]
II	1,9,12	g,m,s,t	e,n,x	
Dublin	1,9,12[Vi]	g,p	–	
Naestved	1,9,12	g,p,s	–	
Rostock	1,9,12	g,p,u	–	
Moscow	1,9,12	g,q	–	
II	9,12	g,s,t	e,n,x	
Newmexico	9,12	g,z_{51}	1,5	
II	1,9,12	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	1,9,12	m,t	[1,2]	
II	1,9,12	m,t	1,5	
II	1,9,12	m,t	z_{39}	
Seremban	9,12	i	1,5	
Claibornei	1,9,12	k	1,5	
Goverdhan	9,12	k	1,6	
Mendoza	9,12	l,v	1,2	
Panama[4]	1,9,12	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	1,9,12	l,w	1,5	
II	1,9,12	l,w	e,n,x	
Itami	9,12	l,z_{13}	1,5	
Miyazaki	9,12	l,z_{13}	1,7	
Napoli	1,9,12	l,z_{13}	e,n,x	
Javiana[4]	1,9,12	l,z_{28}	1,5	[R1…]
Kotu	9,12	l,z_{28}	1,6	

II	9,12	l,z_{28}	1,5	z_{42}
II	9,12	l,z_{28}	e,n,x	
York	9,12	l,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	1,9,12	y	z_{39}	
Mulhouse	1,9,12	z	1,2	
Lawndale	1,9,12	z	1,5	
Kimpese	9,12	z	1,6	
II	1,9,12	z	1,7	
Aurelianis	9,12	z	e,n,z_{15}	
II	1,9,12	z	z_6	
II	9,12	z	z_{39}	
Wangata	1,9,12	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	1,9,12	z_{29}	e,n,x	
Penarth	9,12	z_{35}	z_6	
Elomrane	1,9,12	z_{38}	–	
II	1,9,12	z_{39}	1,7	
Ottawa	1,9,12	z_{41}	1,5	
II	1,9,12	z_{42}	1,[5],7	
Gallinarum	1,9,12	–	–	

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 additionnal 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 (D_2)

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:12_2.

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	1,9,46	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	
Sangalkam	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 (D_3)

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 (E_1)

In this group, strains can be lysogenized by phage ε_{15} (O:3,10 —> O:3,15, former group E_2) then by phage ε_{34} (O:3,15 —> O:3,15,34, former group E_3). **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}{15}	a	1,5	
Oxford	3,{10}{15}{15,34}	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}{15}{15,34}	b	1,5	
Allerton	3,10	b	1,6	
Huvudsta	3,{10}{15,34}	b	1,7	
Benfica	3,10	b	e,n,x	
II	3,10	b	e,n,x	
Yaba	3,{10}{15}	b	e,n,z_{15}	
Epicrates	3,10	b	l,w	
Wilmington	3,10	b	z_6	
Westminster	3,{10}{15}	b	z_{35}	
II	3,10	b	z_{39}	
Asylanta	3,10	c	1,2	
Gbadago	3,{10}{15}	c	1,5	
Ikayi	3,{10}{15}	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}{15}	z_4,z_{24}	–	
II	3,10	z_4,z_{24}	–	
Okerara	3,10	z_{10}	1,2	
Lexington	3,{10}{15}{15,34}	z_{10}	1,5	[z_{49}]
Harrisonburg	3,{10}{15}{15,34}	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}{15}	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}{15,34}	z_{69}	1,7	

Group O:1,3,19 (E_4)

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	1,3,15,19	g,s,t	–
Cannonhill	1,3,{10}{15},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 (G_1) and O:13,23 (G_2) 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	1,13,23	a	1,5	
II	1,13,23	a	1,5	
Mim	13,22	a	1,6	
II	13,22	a	e,n,x	
Wyldegreen	1,13,23	a	l,w	
Marshall	13,22	a	l,z_{13},z_{28}	
II	1,13,23	a	z_{42}	
Ibadan	13,22	b	1,5	
Mississippi	1,13,23	b	1,5	
Oudwijk	13,22	b	1,6	
II	1,13,23	b	[1,5]	z_{42}
Bracknell	13,23	b	1,6	
Rottnest	1,13,22	b	1,7	
Vaertan	13,22	b	e,n,x	
Ullevi	1,13,23	b	e,n,x	
Bahati	13,22	b	e,n,z_{15}	
Durham	13,23	b	e,n,z_{15}	
Sanktjohann	13,23	b	l,w	
II	1,13,22	b	z_{42}	
Haouaria	13,22	c	e,n,x,z_{15}	
Handen	1,13,23	d	1,2	
II	13,22	d	1,5	
Mishmarhaemek	1,13,23	d	1,5	
Friedenau	13,22	d	1,6	
Wichita	1,13,23	d	1,6	[z_{37}]
Grumpensis	1,13,23	d	1,7	
II	13,23	d	e,n,x	
Diguel	1,13,22	d	e,n,z_{15}	

Telelkebir	13,23	d	e,n,z_{15}	
Putten	13,23	d	l,w	
Isuge	13,23	d	z_{6}	
Tschangu	1,13,23	e,h	1,5	
Willemstad	1,13,22	e,h	1,6	
Vridi	1,13,23	e,h	l,w	
II	1,13,23	e,n,x	1,[5],7	
Raus	13,22	f,g	e,n,x	
Havana	1,13,23	f,g,[s]	–	[z_{79}]
Bron	13,22	g,m	[e,n,z_{15}]	
IIIb	13,22	g,m,s	z	
Agbeni	1,13,23	g,m,[s],[t]	–	
II	1,13,22	g,m,t	[1,5]	
II	1,13,23	g,m,s,t	1,5	
II	1,13,23	g,m,[s],t	[e,n,x]	
II	1,13,23	g,m,s,t	z_{42}	
Newyork	13,22	g,s,t	–	
Okatie	13,23	g,[s],t	–	
II	1,13,22	g,t	[1,5]	
II	13,22	g,t	z_{6}	
II	1,13,23	g,t	1,5	
II	13,23	g,t	e,n,x	
II	1,13,23	g,[s],t	z_{42}	
IIIa	1,13,23	g,z_{51}	–	
Washington	13,22	m,t	–	
II	1,13,23	m,t	1,5	
II	1,13,23	m,t	e,n,x	
II	13,22	m,t	z_{42}	z_{39}
II	1,13,23	m,t	z_{42}	
Kintambo	1,13,23	m,t	–	
V	1,13,22	i	–	
Idikan	1,13,23	i	1,5	
Myrria	13,23	i	1,7	
Jukestown	13,23	i	e,n,z_{15}	
Kedougou	1,13,23	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	1,13,23	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	1,13,23	l,z_{28}	z_{42}	
V	13,22	r	–	
Adjame	13,23	r	1,6	
Linton	13,23	r	e,n,z_{15}	
Tanger	1,13,22	y	1,6	
Yarrabah	13,23	y	1,7	
Ordonez	1,13,23	y	l,w	
Tunis	1,13,23	y	z_6	
Winslow	13,22	z	1,5	
II	1,13,23	z	1,5	
IIIb	13,23	z	1,5	
Poona	1,13,22	z	1,6	[z_{44}],[z_{59}]
Farmsen	13,23	z	1,6	
Bristol	13,22	z	1,7	
Ivrysurseine	1,13,23	z	z_6	
Tanzania	1,13,22	z	e,n,z_{15}	
Worthington	1,13,23	z	l,w	[z_{43}]
II	1,13,23	z	z_{42}	
II	13,22	z	–	
Ried	1,13,22	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	1,13,23	z_4,z_{24}	–	
IIIa	13,23	z_4,z_{24}	–	
Roodepoort	1,13,22	z_{10}	1,5	
II	1,13,22	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	1,13,23	z_{29}	1,5	
II	1,13,23	z_{29}	e,n,x	
Agoueve	13,22	z_{29}	–	
Cubana	1,13,23	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	1,13,23	z_{39}	1,5,7
II	1,13,23	[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	
Bousso	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	
Fischerhuette	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	6,14,18	a	e,n,z_{15}	
Fluntern	6,14,18	b	1,5	
Cochise	18	b	1,7	
Rawash	6,14,18	c	e,n,x	
Groenekan	18	d	1,5	
Usumbura	6,14,18	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	6,14,18	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	6,14,18	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}	
Techimani	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	l,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	1,40	b	e,n,x	
Duval	1,40	b	e,n,z_{15}	
Benguella	40	b	z_6	
II	40	b	–	
II	1,40	c	e,n,x,z_{15}	
II	40	c	z_6	
II	1,40	c	z_{39}	
Driffield	1,40	d	1,5	
II	40	d	–	
Tilene	1,40	e,h	1,2	
II	1,40	e,n,x	1,[5],7	
II	1,40	e,n,x,z_{15}	1,6	
Bijlmer	1,40	g,m	–	
Athens	1,40	g,m,s	e,n,x	
II	1,40	g,[m],[s],[t]	e,n,x	
II	1,40	g,[m],[s],t	[1,5]	
II	1,40	g,t	e,n,x,z_{15}	
II	40	g,t	z_{39}	
IV	1,40	g,t	–	
II	1,40	g,[m],[s],t	z_{42}	
IIIa	40	g,z_{51}	–	
IIIb	40	g,z_{51}	e,n,x,z_{15}	
IV	1,40	g,z_{51}	–	
II	40	m,t	e,n,x	
II	40	m,t	z_{39}	
II	1,40	m,t	z_{42}	
IV	40	m,t	–	
IIIb	40	i	1,5,7	

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

Yekepa	1,40	z_{35}	e,n,z_{15}	
V	1,40	z_{35}	–	
IIIa	40	z_{36}	–	
II	1,40	z_{39}	1,5	z_{42}
II	1,40	z_{39}	1,6	
IIIb	40	z_{39}	1,6	
II	40	z_{39}	1,7	
Karamoja	1,40	z_{41}	1,2	
II	1,40	z_{42}	1,6	
II	1,40	$[z_{42}]$	1,(5),7	
II	1,40	z_{81}	z_6	
V	1,40	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	1,42	a	e,n,z_{15}	
II	42	b	1,5	
Orbe	42	b	1,6	
II	42	b	e,n,x,z_{15}	
Tomegbe	1,42	b	e,n,z_{15}	
Frederiksberg	1,42	b	l,w	
Egusitoo	1,42	b	z_6	
II	42	b	z_6	
Antwerpen	1,42	c	e,n,z_{15}	
Kampala	1,42	c	z_6	
II	42	d	z_6	
II	42	e,n,x	1,6	
II	42	g,t	–	
Maricopa	1,42	g,z_{51}	1,5	
IIIa	42	g,z_{51}	–	
IV	1,42	g,z_{51}	–	
II	42	m,t	[e,n,x,z_{15}]	
Waral	1,42	m,t	–	
Kaneshie	1,42	i	l,w	
Borromea	42	i	1,6	
Middlesbrough	1,42	i	z_6	
Haferbreite	42	k	1,6	
IIIb	42	k	e,n,x,z_{15}	
IIIb	42	k	z	
Gwale	1,42	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	1,42	l,w	e,n,x	
Parakou	1,42	l,w	z_{35}	

II	1,42	l,[z_{13}],z_{28}	[z_6]	
Sipane	1,42	r	e,n,z_{15}	
Brive	1,42	r	l,w	
IIIb	42	r	z	
IIIb	42	r	z_{53}	
II	42	r	–	
IIIb	42	r	–	[z_{50}]
Spalentor	1,42	y	e,n,z_{15}	
Harvestehude	1,42	y	z_6	
II	42	z	1,5	
Ursenbach	1,42	z	1,6	
II	42	z	e,n,x,z_{15}	
Melbourne	42	z	e,n,z_{15}	
II	42	z	z_6	
Gera	1,42	z_4,z_{23}	1,6	
Broc	42	z_4,z_{23}	e,n,z_{15}	
IIIa	42	z_4,z_{23}	–	
Toricada	1,42	z_4,z_{24}	–	
IIIa	42	z_4,z_{24}	–	
IV	1,42	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	1,42	z_{10}	z_6	
II	42	z_{10}	z_6	
IIIb	42	z_{10}	z_{35}	
IIIb	42	z_{10}	z_{67}	
Djama	1,42	z_{29}	[1,5]	
II	42	z_{29}	–	
Kahla	1,42	z_{35}	1,6	
Hennekamp	42	z_{35}	e,n,z_{15}	
Tema	1,42	z_{35}	z_6	
Weslaco	42	z_{36}	–	
IV	42	z_{36}	–	
Vogan	1,42	z_{38}	z_6	
Taset	1,42	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	1,44	d	z_{35}	
II	1,44	e,n,x	1,6	
Vleuten	44	f,g	–	
Gamaba	1,44	g,m,[s]	[1,6]	
Splott	44	g,s,t	[1,7]	
II	44	g,t	z_{42}	
IIIb	1,44	g,t	1,5	z_{42}
Carswell	44	g,z_{51}	–	
IV	44	g,z_{51}	–	
Muguga	44	m,t	–	
II	1,44	m,t	z_{42}	
Maritzburg	1,44	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	1,44	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	1,44	z_4,z_{32}	–	
Guinea	1,44	z_{10}	1,7	
Llobregat	1,44	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	1,44	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	
Warmsen	45	d	e,n,z_{15}	
Suelldorf	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	1,47	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)[1]

Former group **O:64** was included in group **O:48**. Factor O :64 was found identical to subfactor O:48_4. 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	1,51	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	1,51	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	1,53	d	z_{39}	
II	53	d	z_{42}	
IIIa	53	g,z_{51}	–	
IV	1,53	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	1,53	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	1,4,[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	1,13,23	g,m,[s],[t]	–	
Agege	3,10	c	e,n,z_{15}	
Ago	30	z_{38}	–	
Agodi	35	g,t	–	
Agona	1,4,[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	8,20	y	1,7	
Alamo	6,7	g,z_{51}	1,5	
Albany	8,20	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	1,40	k	1,6	
Allerton	3,10	b	1,6	
Alma	39	i	e,n,z_{15}	
Alminko	8,20	g,s,t	–	
Alpenquai	6,14	l,v	e,n,z_{15}	
Altendorf	4,12,27	c	1,7	
Altona	8,20	r,[i]	z_6	
Amager	3,{10}{15}	y	1,2	[z_{45}]
Amba	11	k	l,z_{13},z_{28}	
Amberg	6,14,24	l,v	1,7	
Amersfoort	6,7,14	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}{15}{15,34}	g,m,s	–	
Amunigun	16	a	1,6	

Anatum	3,{10}{15}{15,34}	e,h	1,6	[z_{64}]
Anderlecht	3,10	c	l,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	1,4,12,27	d	z_6
Ayton	1,4,12,27	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	1,4,[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	1,4,[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	6,7,14	y	1,5
Bargny	8,20	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	6,14,18	z_4,z_{24}	–	
Bobo	44	d	1,5	
Bochum	1,4,[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	
Bousso	1,6,14,25	z_4,z_{23}	[e,n,z_{15}]	
Bovismorbificans	6,8,20	r,[i]	1,5	[R1…]
Brackenridge	44	z	1,5	
Bracknell	13,23	b	1,6	
Bradford	4,12,27	r	1,5	
Braenderup	6,7,14	e,h	e,n,z_{15}	
Brancaster	1,4,12,27	z_{29}	–	
Brandenburg	4,[5],12	l,v	e,n,z_{15}	
Brazil	16	a	1,5	
Brazos	6,14,18	a	e,n,z_{15}	
Brazzaville	6,7	b	1,2	
Breda	6,8	z_4,z_{23}	e,n,x	
Bredeney	1,4,12,27	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	1,4,12,27	d	1,6	

Brijbhumi	11	i	1,5	
Brikama	8,20	r,[i]	l,w	
Brindisi	11	c	1,6	
Brisbane	28	z	e,n,z_{15}	
Bristol	13,22	z	1,7	
Brive	1,42	r	l,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	l,w	
Bruck	6,7	z	l,w	
Bruebach	39	e,h	1,2	
Brunei	8,20	y	1,5	
Brunflo	16	r	1,7	
Bsilla	6,8	r	1,2	
Buckeye	48	d	–	[z_{58}]
Budapest	1,4,12,27	g,t	–	
Bukavu	1,40	l,z_{28}	1,5	
Bukuru	6,8	b	l,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}{15}{15,34}	b	1,5	
Butare	52	e,h	1,6	
Buzu	[1],6,14,[25]	i	1,7	

C

Caen	16	d	l,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	8,20	z_{10}	e,n,z_{15}	
Christiansborg	44	z_4,z_{24}	–	
Clackamas	4,12	l,v	1,6	
Claibornei	1,9,12	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	8,20	r,i	e,n,z_{15}	
Coeln	1,4,[5],12	y	1,2	
Coleypark	6,7,14	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	8,20	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	1,13,23	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	8,20	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	6,7,14	a	z_6	
Dan	51	k	e,n,z_{15}	
Dapango	47	r	1,2	
Daula	8,20	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	1,4,[5],12	f,g	[1,2]	
Derkle	52	e,h	1,7	
Dessau	1,3,15,19	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	1,13,22	d	e,n,z_{15}	
Dingiri	17	z	1,6	

Diogoye	8,20	z_{41}	z_6	
Diourbel	21	i	1,2	
Djakarta	48	z_4,z_{24}	–	
Djama	1,42	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	1,40	d	1,5	
Drogana	1,4,12,27	r,[i]	e,n,z_{15}	
Dublin	1,9,12[Vi]	g,p	–	
Duesseldorf	6,8	z_4,z_{24}	–	
Dugbe	45	d	1,6	
Duisburg	1,4,12,27	d	e,n,z_{15}	[e,h]
Dumfries	3,10	r,i	1,6	
Dunkwa	6,8	d	1,7	
Durban	1,9,12	a	e,n,z_{15}	
Durham	13,23	b	e,n,z_{15}	
Duval	1,40	b	e,n,z_{15}	

E

Ealing	35	g,m,s	–
Eastbourne	1,9,12	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	1,42	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}{15}	r	1,7
Elokate	9,12	c	1,7
Elomrane	1,9,12	z_{38}	–
Emek	8,20	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	1,4,12,27	z	z_6
Enteritidis	1,9,12	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	1,4,12,27	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	1,42	a	e,n,z_{15}
Falkensee	3,{10}{15}	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
Fischerhuette	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}{15}	z_4,z_{24}	–
Florida	[1],6,14,[25]	d	1,7
Flottbek	52	b	e,n,x
Fluntern	6,14,18	b	1,5
Fomeco	45	b	e,n,z_{15}
Fortlamy	16	z	1,6
Fortune	1,4,12,27	z_{10}	z_6
Franken	9,12	z_6	z_{67}
Frankfurt	16	i	e,n,z_{15}
Frederiksberg	1,42	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	1,9,12	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	8,20	c	1,5
Galiema	6,7,14	k	1,2
Galil	3,10	a	e,n,z_{15}
Gallen	11	a	1,2
Gallinarum	1,9,12	–	–
Gamaba	1,44	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	1,13,23	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	1,44	z_{10}	1,7
Gustavia	11	d	1,5
Gwale	1,42	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	1,4,[5],12	z_{10}	1,2
Halle	28	c	1,7
Hallfold	1,4,12,27	c	l,w
Handen	1,13,23	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}{15,34}	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	1,13,23	i	1,5	
Ikayi	3,{10}{15}	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	1,4,12	z	1,7	
Infantis	6,7,14	r	1,5	[R1…],[z_{37}],[z_{45}],[z_{49}]
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	6,7,14	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	

Ituri	1,4,12	z_{10}	1,5	
Itutaba	9,46	c	z_6	
Ivory	16	r	1,6	
Ivorycoast	50	z_{29}	–	
Ivrysurseine	1,13,23	z	z_6	

J

Jaffna	1,9,12	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	1,9,12	l,z_{28}	1,5	[R1…]
Jedburgh	3,{10}{15}	z_{29}	–	
Jericho	1,4,12,27	c	e,n,z_{15}	
Jerusalem	6,7,14	z_{10}	l,w	
Joal	3,10	l,z_{28}	1,7	
Jodhpur	45	z_{29}	–	[z_{45}]
Johannesburg	1,40	b	e,n,x	
Jos	1,4,12,27	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	6,7,14	c	e,n,z_{15}	

Kaevlinge	16	z_4,z_{24}	–	
Kahla	1,42	z_{35}	1,6	
Kainji	1,3,19	z	1,6	
Kaitaan	1,6,14,25	m,t	–	
Kalamu	1,4,[5],12	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	1,4,12,27	y	z_6	
Kampala	1,42	c	z_6	
Kande	1,3,19	b	e,n,z_{15}	
Kandla	17	z_{29}	–	
Kaneshie	1,42	i	l,w	
Kanifing	1,6,14,25	z	1,6	
Kano	1,4,12,27	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	1,40	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	1,13,23	i	l,w	
Kentucky	8,20	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	1,4,12	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	1,2,12	g,p	–	
Kikoma	16	y	e,n,x	
Kimberley	38	l,v	1,5	
Kimpese	9,12	z	1,6	

Kimuenza	1,4,12,27	l,v	e,n,x	
Kindia	1,3,19	l,z_{28}	e,n,x	
Kingabwa	43	y	1,5	
Kingston	1,4,[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	1,13,23	m,t	–	
Kirkee	17	b	1,2	
Kisangani	1,4,[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	1,4,[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	8,20	z_{35}	1,2	
Konolfingen	28	z_{35}	1,6	
Konongo	41	r	1,7	
Konstanz	8	b	e,n,x	
Korbol	8,20	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	8,20	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	1,4,12,27	l,z_{13},z_{28}	1,7
Kuessel	28	i	e,n,z_{15}
Kumasi	30	z_{10}	e,n,z_{15}
Kunduchi	1,4,[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	8,20	d	z_6
Lagos	1,4,[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	1,9,12	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	1,4,12,27	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	6,7,14	b	z_6	
Lerum	1,3,19	z	1,7	
Lexington	3,{10}{15}{15,34}	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	6,7,14	z_{38}	–	[z_{82}]
Limete	1,4,12,27	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	6,7,14	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	1,44	z_{10}	e,n,x	
Loanda	6,8	l,v	1,5	
Lockleaze	6,7,14	b	e,n,x	
Lode	17	r	1,2	
Lodz	41	z_{29}	–	
Loenga	1,42	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	1,9,12	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}{15}	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	1,47	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	8,20	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	6,7,14	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	1,9,12	a	1,5	
Michigan	17	l,v	1,5	
Middlesbrough	1,42	i	z_6	
Midway	6,14,24	d	1,7	
Mikawasima	6,7,14	y	e,n,z_{15}	[z_{47}],[z_{50}]
Millesi	1,40	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	1,13,23	d	1,5	
Mississippi	1,13,23	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	8,20	z_{10}	z_6	
Molesey	52	b	1,5	

Mono	4,12	l,w	1,5	
Mons	1,4,12,27	d	l,w	
Monschaui	35	m,t	–	
Montaigu	9,46	b	1,2	
Montevideo	{6,7,14}{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}	l,w	
Moscow	1,9,12	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}{15,34}	e,h	1,5	[z_{48}]
Muguga	44	m,t	–	
Mulhouse	1,9,12	z	1,2	
Mundonobo	28	d	1,7	
Mundubbera	54	z_{29}	–	
Mura	1,4,12	z_{10}	l,w	
Mygdal	4,12	z_{91}	–	
Myrria	13,23	i	1,7	

N

Naestved	1,9,12	g,p,s	–	
Nagoya	6,8	b	1,5	
Nakuru	1,4,12,27	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	1,13,23	l,v	e,n,z_{15}	
Nantes	9,46	y	l,w	
Napoli	1,9,12	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,{10}{15}	l,v	1,2	
Ndjamena	1,6,14,25	b	1,2	
Ndolo	1,9,12	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	1,4,12,27	k	1,6	
Neunkirchen	38	z_{10}	[1,5]	
Newholland	4,12,54	m,t	–	
Newjersey	39	k	e,n,x	
Newlands	3,{10}{15,34}	e,h	e,n,x	
Newmexico	9,12	g,z_{51}	1,5	
Newport	6,8,20	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	l,w	
Niarembe	44	a	l,w	
Niederoderwitz	43	b	–	
Nieukerk	6,7,14	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	l,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}{15}	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	1,44	d	z_{35}	
Palime	6,7	z_{35}	e,n,z_{15}	
Panama	1,9,12	l,v	1,5	[R1…]
Papuana	6,7	r	e,n,z_{15}	
Parakou	1,42	l,w	z_{35}	
Paratyphi A	1,2,12	a	[1,5]	
Paratyphi B	1,4,[5],12	b	1,2	[z_5],[z_{33}]
Paratyphi C	6,7,[Vi]	c	1,5	
Paris	8,20	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	1,9,12	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	1,44	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	i	z_6	
Poitiers	6,7	z	1,5	
Pomona	28	y	1,7	$[z_{80}]$,$[z_{90}]$
Pontypridd	18	g,m	–	
Poona	<u>1</u>,13,22	z	1,6	$[z_{44}]$,$[z_{59}]$
Portanigra	8,<u>20</u>	d	1,7	
Portland	9,12	z_{10}	1,5	
Potengi	18	z	–	
Potosi	6,14	z_{36}	1,5	
Potsdam	6,7,<u>14</u>	l,v	e,n,z_{15}	
Potto	9,46	i	z_6	
Powell	9,12	y	1,7	
Praha	6,8	y	e,n,z_{15}	
Pramiso	3,10	c	1,7	
Presov	6,8	b	e,n,z_{15}	
Preston	<u>1</u>,4,12	z	l,w	
Pretoria	11	k	1,2	
Putten	13,23	d	l,w	

Q

Quebec	44	c	e,n,z_{15}	
Quentin	9,46	d	1,6	
Quincy	30	r	1,6	
Quinhon	47	z_{44}	–	
Quiniela	6,8	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	6,14,18	c	e,n,x	
Reading	1,4,[5],12	e,h	1,5	[R1…]
Rechovot	8,20	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	8,20	z_{10}	l,w	
Remo	1,4,12,27	r	1,7	
Reubeuss	8,20	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	1,13,22	z_4,z_{23}	[e,n,z_{15}]	
Riggil	6,7	g,(t)	–	
Riogrande	40	b	1,5	
Rissen	6,7,14	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	1,13,23	z_4,z_{24}	–	
Roodepoort	1,13,22	z_{10}	1,5	
Rosenberg	9,12	g,z_{85}	–	
Rossleben	3,54	e,h	1,6	

Rostock	1,9,12	g,p,u	–	
Rothenburgsort	38	m,t	–	
Rottnest	1,13,22	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	1,9,12	a	1,7	
Saboya	16	e,h	1,5	
Sada	30	z_{10}	1,2	
Saintemarie	52	g,t	–	
Saintpaul	1,4,[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	1,4,[5],12	e,h	e,n,z_{15}	
Sandow	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	8,20	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	1,4,[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	1,4,12,27	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	1,9,12	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}{15}	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	
Shipley	8,20	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	8,20	y	l,w	
Singapore	6,7	k	e,n,x	
Sinstorf	3,10	l,v	1,5	
Sinthia	18	z_{38}	–	
Sipane	1,42	r	e,n,z_{15}	
Skansen	6,8	b	1,2	
Slade	1,3,19	y	e,n,z_{15}	
Sljeme	1,47	f,g	–	
Sloterdijk	1,4,12,27	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}{15}{15,34}	m,t	[1,6]	
Souza	3,{10}{15}	d	e,n,x	
Spalentor	1,42	y	e,n,z_{15}	
Spartel	21	d	1,5	
Splott	44	g,s,t	[1,7]	
Stachus	38	z	–	
Stanley	1,4,[5],12,27	d	1,2	
Stanleyville	1,4,[5],12,27	z_4,z_{23}	[1,2]	
Staoueli	47	k	1,2	
Steinplatz	30	y	1,6	
Steinwerder	3,15,54	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}{15}	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	6,7,14	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	8,20	c	z_6
Tafo	1,4,12,27	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	8,20	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	1,13,22	y	1,6
Tanzania	1,13,22	z	e,n,z_{15}

Tarshyne	9,12	d	1,6	
Taset	1,42	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	1,4,12,27	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	1,42	z_{35}	z_6	
Tempe	30	b	1,7	[z_{33}]
Tendeba	17	y	e,n,x	
Tennenlohe	18	r	1,5	
Tennessee	6,7,14	z_{29}	[1,2,7]	
Tennyson	4,[5],12	g,z_{51}	e,n,z_{15}	
Teshie	1,47	l,z_{13},z_{28}	e,n,z_{15}	
Texas	4,[5],12	k	e,n,z_{15}	
Thayngen	1,4,12,27	z_{41}	1,(2),5	
Thetford	43	k	1,2	
Thiaroye	38	e,h	1,2	
Thies	1,3,19	y	1,7	
Thompson	6,7,14	k	1,5	[R1…]
Tibati	3,10	i	1,6	
Tienba	6,7	z_{35}	1,6	
Tiergarten	44	a	e,n,x	
Tiko	1,40	l,z_{13},z_{28}	1,2	
Tilburg	1,3,19	d	l,w	[z_{49}]
Tilene	1,40	e,h	1,2	
Tinda	1,4,12,27	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	1,42	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	1,42	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	8,20	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	1,51	z	1,6	
Treguier	9,12	z_{10}	z_6	
Trier	16	z_{35}	1,6	
Trimdon	9,46	z_{35}	z_6	
Tripoli	1,4,12,27	b	z_6	
Trotha	40	z_{10}	z_6	
Troy	18	y	1,7	
Truro	3,10	i	1,7	
Tschangu	1,13,23	e,h	1,5	
Tsevie	1,4,12	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	1,4,12	i	z_6	
Tunis	1,13,23	y	z_6	
Typhi	9,12[Vi]	d	–	[j],[z_{66}]
Typhimurium	1,4,[5],12	i	1,2	
Typhisuis	6,7	c	1,5	
Tyresoe	1,4,12,27	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	[z_{27}]
Vellore	1,4,12,27	z_{10}	z_{35}	

Veneziana	11	i	e,n,x
Verona	41	i	1,6
Verviers	45	k	1,5
Victoria	1,9,12	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	6,7,14	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	1,42	z_{38}	z_6
Volkmarsdorf	28	i	1,6
Volta	11	r	l,z_{13},z_{28}
Vom	1,4,12,27	l,z_{13},z_{28}	e,n,z_{15}
Voulte	43	i	e,n,x
Vridi	1,13,23	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	1,4,12,27	b	e,n,z_{15}
Wanatah	1,3,19	d	1,7
Wandsworth	39	b	1,2
Wangata	1,9,12	z_4,z_{23}	[1,7]
Waral	1,42	m,t	–
Warengo	17	z	1,5
Warmsen	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	1,13,23	d	1,6	[z_{37}]
Widemarsh	35	z_{29}	–	
Wien	1,4,12,27	b	l,w	
Wil	6,7	d	l,z_{13},z_{28}	
Wilhelmsburg	1,4,[5],12,27	z_{38}	[e,n,z_{15}]	
Willamette	38	d	1,5	
Willemstad	1,13,22	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	1,13,23	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	1,13,23	a	l,w	

Y

Yaba	3,{10}{15}	b	e,n,z_{15}	
Yalding	1,3,19	r	e,n,z_{15}	
Yaounde	1,4,12,27	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	1,40	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	8,20	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	8,20	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 1,13,23:b:[1,5]:z_{42}
II Alexander	=	II 3,10:z:1,5
II Alsterdorf	=	II 1,40:g,[m],[s],t:[1,5]
II Angola	=	II 1,9,12: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	=	1,4,12,27: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 1,9,12: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	=	Meleagridis 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 Elsiesrivier	=	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:l,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 1,13,23,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 1,13,23: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 1,9,12: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 1,13,22: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 1,13,23: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 1,4,12,27: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}
Omderman	=	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 3,10,15: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 <u>1</u>,9,12:z:1,7
II Stevenage	=	II <u>1</u>,13,23:[z_{42}]:1,[5],7
II Stikland	=	II 3,10:m,t:e,n,x
II Suarez	=	II <u>1</u>,40:c:e,n,x,z_{15}
II Suederelbe	=	II <u>1</u>,9,12:b:z_{39}
Suez	=	Shubra
Suipestifer	=	Choleraesuis
II Sullivan	=	II 6,7:z_{42}:1,7
II Sunnydale	=	II <u>1</u>,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 <u>1</u>,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 <u>1</u>,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	=	Meleagridis 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}