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Table S1. Results of detection of KPC-producers directly from positive spiked blood cultures using the Carba NP test

KPC-type	Species and name of the strain	Other β-lactamases	Carba NP test on spiked blood cultures
KPC-2	*E. coli* PSP	None	+
	E. coli DIN	None	+
	E. coli LIL-1	TEM-1 + OXA-9	+
	E. coli KPC BM 16	TEM-1b	+
	E. coli COL	TEM-1 + CTX-M-9	+
	K. pneumoniae KN 633	TEM-1 + CTX-M-12	+
	K. pneumoniae A28006	SHV-11 + TEM-1 + CTX-M-2	+
	K. pneumoniae A33504	SHV-11 + TEM-1 + CTX-M-2 + OXA-9	+
	K. pneumoniae 475	SHV-11 + CTX-M-15	+
	K. pneumoniae H1516-6 COL	TEM-1 + CTXM-15	+
	K. pneumoniae TOR	TEM- + OXA-9	+
	K. pneumoniae SAG	TEM- + OXA-9	+
	K. pneumoniae YC	SHV-11 + SHV-12 + TEM-1 + OXA-9	+
	K. pneumoniae 2303514	SHV-11	+
	K. pneumoniae 588	SHV-11 + TEM-1 + OXA-9	+
	K. pneumoniae LIE	TEM-1 + OXA-9	+
	K. pneumoniae THO	TEM-1 + OXA-9	+
	K. pneumoniae 20111013	TEM-1 + OXA-9	+
	K. pneumoniae TIF	TEM-1 + OXA-9	+
	K. pneumoniae KPC BM 1	SHV-12 + OXA-9 + TEM-1	+
	K. pneumoniae KPC BM 2	SHV-11 + TEM-1 + OXA-9	+
	K. pneumoniae KPC BM 3	SHV-12 + TEM-1+ OXA-9 + FOX	+
	K. pneumoniae KPC BM 4	SHV-11 + TEM-1 + OXA-9	+
	K. pneumoniae KPC BM 5	SHV11	+
	K. pneumoniae KPC BM 6	SHV-5 + OXA-9 + TEM-1	+
	K. pneumoniae KPC BM 8	SHV-12 + OXA-9 + TEM-1	+
	K. pneumoniae KPC BM 11	SHV-12 + TEM-1b + OXA-9	+
	K. pneumoniae KPC BM 12	SHV-11 + TEM-1 + OXA-9	+
	K. pneumoniae KPC BM 14	SHV-11 + TEM-1 + OXA-9	+
	K. pneumoniae MUS	SHV- + TEM-	+
	K. pneumoniae GES	SHV-11 + TEM-1	+
	K. planticola KPC BM 7	SHV-5 + OXA-9	+
	E. cloacae KPC BM 17	None	+
	E. cloacae HPTU 27040557	None	+
	E. cloacae HGM 83048	TEM-1	+
	E. cloacae KPC BM 15	TEM-1 + OXA-9	+
	E. cloacae HPTU 14080435	SHV-11 + TEM-1	+
	E. cloacae CFVL	TEM-3	+
	E. cloacae PSP	TEM-1 + OXA-1	+
	E. aerogenes KPC BM 18	SHV-12 + TEM-1b + OXA-9	+
	C. freundii KPC BM 19	None	+
	C. freundii HPTU	TEM-1	+
	S. marcecens CGNC 7072	TEM-1 + SHV-12	+
	S. marcecens D 6403	TEM-1	+
	Salmonella spp. KPC BM 20	TEM-1	+
KPC-3	*K. pneumoniae* POZ	None	+
	K. pneumoniae KAM	TEM-1	+
	K. pneumoniae KPC BM 9	SHV-12 + TEM-1 + OXA-9	+
	K. pneumoniae KPC BM 13	SHV-11 + TEM-1 + OXA-9	+
	K. ozoenae KPC BM 10	TEM-1 + OXA-9	+

Table S2. Results of detection of VIM-producers directly from positive spiked blood cultures using the Carba NP test

VIM-type	Species and name of the strain	Other β-lactamases	Carba NP test on spiked blood cultures
VIM-1	*E. coli* MAD	CTX-M-3	+
	E. coli VIM BM 14	CMY-13	+
	E. coli VIM BM 15	TEM (ESBL) + TEM-1	+
	K. pneumoniae VIM BM 2	None	+
	K. pneumoniae VIM BM 4	None	+
	K. pneumoniae VIM BM 10	None	+
	K. pneumoniae MAD	CTX-M-3	+
	K. pneumoniae ENN	SHV-5	+
	K. pneumoniae VIM BM 1	SHV-5	+
	K. pneumoniae VIM BM 5	SHV-5	+
	K. pneumoniae VIM BM 7	SHV-5	+
	K. pneumoniae VIM BM 13	SHV-5	+
	K. pneumoniae VIM BM 6	SHV-5 + TEM-1	+
	K. pneumoniae VIM BM 9	SHV-5 + TEM-1	+
	K. pneumoniae ROU	SHV-11 + CTX-M-15	+
	K. pneumoniae VIM BM 3	SHV-12	+
	K. pneumoniae VIM BM 11	SHV-12	+
	K. pneumoniae VIM BM 12	SHV-12	+
	K. pneumoniae VIM BM 8	SHV-12 + TEM-1	+
	E. cloacae VIM BM 17	None	+
	E. cloacae VIM BM 18	None	+
	E.cloacae KAR	SHV-70	+
	E. cloacae VIM BM 16	CTX-M-3	+
VIM-2	*S. marscecens* VIM BM 20	None	+
	S. marscecens VIM BM 19	CTX-M-15	+
	C. freundii CAT	TEM-1 +	+
	C. freundii MIG	TEM-1 + OXA-9 + OXA-10	+
VIM-4	*E. coli* 10 KOW	None	+
	K. pneumoniae HAS	SHV-12 + CMY-4	+
	K. pneumoniae 1 KOW	CTX-M-15 + TEM-1 + SHV-91	+
	K. pneumoniae 2 KOW	CTX-M-15 + TEM-1 + SHV-11	+
	K. pneumoniae 4 KOW	OKpB	+
	K. pneumoniae 6 KOW	CTX-M-15 + TEM-1 + OKpA	+
	K. pneumoniae 7 KOW	SHV-26	+
	E. cloacae KOW	CTX-M-15 + TEM-1 + SHV-31	+
VIM-19	*E.coli* DIH	None	+
	K. pneumoniae DIH	CTX-M-3 + TEM-1	+

Table S3. Results of detection of IMP-producers directly from positive spiked blood cultures using the Carba NP test

IMP-type	Species and name of the strain	Other β-lactamases	Carba NP test on spiked blood cultures
IMP-1	*E. coli* JAP	None	+
	E. coli IMP BM17	TEM-1	+
	K. pneumoniae IMP BM1	None	+
	K. pneumoniae 6852	SHV-5	+
	K. pneumoniae IMP BM2	TEM-15	+
	K. pneumoniae IMP BM3	TEM-15 + CTX-M-15	+
	K. pneumoniae IMP BM4	TEM-1	+
	E. cloacae IMP BM5	None	+
	E. cloacae IMP BM6	None	+
	E. cloacae IMP BM7	None	+
	E. cloacae IMP BM8	None	+
	E. cloacae IMP BM9	None	+
	E. cloacae IMP BM10	None	+
	E. cloacae IMP BM11	None	+
	E. cloacae IMP BM12	None	+
	E. cloacae IMP BM13	None	+
	E. cloacae IMP BM14	None	+
	E. cloacae IMP BM15	None	+
	E. cloacae IMP BM16	None	+
	S. marscecens IMP BM18	None	+
	S. marscecens IMP BM20	None	+
IMP-8	*E. coli* IMP8 TWA	SHV -12	+
	K. pneumoniae IMP8 TWA	None	+
	K. pneumoniae IMP8 + SHV-12 TWA	SHV -12	+
	E. cloacae IMP8 TWA	None	+
	E. cloacae IMP8 + SHV-12	SHV-12	+
IMP-11	*S. marscecens* IMP BM19	None	+

Table S4. Results of detection of NDM-producers directly from positive spiked blood cultures using the Carba NP test

NDM-type	Species and name of the strain	Other β-lactamases	Carba NP test on spiked blood cultures
NDM-1	*E. coli* 5649 GEN	OXA-1 + CMY-30 + TEM-1	+
	E. coli RIC	OXA-1 + OXA-10 + CMY-16 + TEM-1	+
	E. coli GUE	OXA-1 + TEM-1	+
	E. coli 271 AUS	CTX-M-15 + TEM-1	+
	E. coli ALL	OXA-1 + OXA-2 + CTX-M-15 + TEM-1	+
	E. coli IR5 TW D	CTX-M-15 + TEM-1	+
	E. coli CHANZY	CTX-M-15 + TEM-1 + OXA-1	+
	E. coli OMA 20	TEM-1 + CTX-M-15	+
	K. pneumoniae UK	CTX-M-15 + CMY-4 + OXA-1	+
	K. pneumoniae 6642 GEN	CTX-M-15 + OXA-1 + OXA-10	+
	K. pneumoniae 6759 GEN	CTX-M-15 + OXA-1 + OXA-9 + OXA-10 + CMY16 + TEM-1 + SHV-11	+
	K. pneumoniae 1 OMA 601	CTX-M-15 + OXA-1 + OXA-9 + TEM-1 + SHV-28 + SHV-11	+
	K. pneumoniae 2 OMA 419	OXA-1 + SHV-11	+
	K. pneumoniae 7 AFR	OXA-1 + CTX-M-15 + CMY-6 + TEM-1 + SHV-28 + OXA-9	+
	K. pneumoniae IND KIR	OXA-1 + CTX-M-15 + TEM-1 + SHV-28 + OXA-9 + CMY-6	+
	K. pneumoniae OMA 2	TEM-1 + CTX-M-15 + SHV-12 + OXA-9	+
	K. pneumoniae OMA 4	TEM-1 + CTX-M-15 + SHV-12 + OXA-9	+
	K. pneumoniae OMA 8	TEM-1 + CTX-M-15 + SHV-11 + OXA-1	+
	K. pneumoniae OMA 13	TEM-1 + CTX-M-15 + SHV-28 +OXA-1 + OXA-9	+
	K. pneumoniae OMA 15	CTX-M-15 + SHV-130 + OXA-1	+
	K. pneumoniae OMA 16	**OXA-181** + CTX-M-15 + SHV-2 + OXA-1	+
	K. pneumoniae OMA 19	CTX-M-15 + SHV-12 + OXA-1	+
	K. pneumoniae SAB	CTX-M-15 + SHV-11 + OXA-1	+
	K. pneumoniae DIN	TEM-1 + OXA-1 + CTX-M-15 + OXA-9 + CMY-6	+
	K. pneumoniae KIE	SHV-38 + CMY-16 + OXA-10	+
	E. cloacae IR38 C	CTX-M-15	+
	C. freundii STE	**OXA-181** + **VIM-4** + OXA-1 + OXA-9 + OXA-10 + CTX-M-15 + TEM-1	+
	P. mirabilis 7892	OXA-1 + OXA-10 + CMY-16	+
	P. stuartii	OXA-1 + CMY-6 + TEM-1	+
	P. rettgeri IR38	CTX-M-15	+
	Salmonella CAN	CTX-M-15 + TEM-1 + OXA-1 + OXA-9 + OXA-10	+
NDM-4	*E. coli* I5 PN	CTX-M-15 + CMY-6	+
	E. coli FEK	CTX-M-15 + OXA-1	+

* carbapenemases were bolded

Table S5. Results of detection of OXA-48-like-producers directly from positive spiked blood cultures using the Carba NP test

OXA-48-like-type	Speciesand name of the strain	Other β-lactamases	Carba NP test on spiked blood cultures
OXA-48	*E. coli* ROV	None	+
	E. coli HAN	CTX-M-15	+
	E. coli BOU	CTX-M-15	+
	E. coli BER	CTX-M-15	+
	E. coli AME	CTX-M-24 + TEM-1	+
	E. coli BON	CTX-M-24 + TEM-1	+
	E. coli BOK	CTX-M-15	+
	E. coli ZAN	CTX-M-14 + TEM-1	+
	E. coli OMAN 3	CTX-M-15 + TEM-1	+
	E. coli OMAN 22	CTX-M-15 + TEM-1	+
	K. pneumoniae BIC	None	+
	K. pneumoniae BEL	None	+
	K. pneumoniae RAM	None	+
	K. pneumoniae LIB	None	+
	K. pneumoniae LOU	None	+
	K. pneumoniae TIC	None	+
	K. pneumoniae CHA	TEM-1	+
	K. pneumoniae OMAN 14	TEM-1	+
	K. pneumoniae SCO	SHV-11	+
	K. pneumoniae EGY	CTX-M-15	+
	K. pneumoniae BEY	CTX-M-15 + TEM-1	-
	K. pneumoniae DAL	CTX-M-15 + TEM-1	+
	K. pneumoniae ROB	CTX-M-15 + TEM-1	+
	K. pneumoniae BOU	CTX-M-15	+
	K. pneumoniae THPA-1	CTX-M-15 + TEM-1 + OXA-1	+
	K. pneumoniae VSC-1	CTX-M-15 + TEM-1 + OXA-1	+
	K. pneumoniae BEN	CTX-M-15 + SHV-28 + TEM-1	+
	K. pneumoniae DIAR	CTX-M-15 + SHV-11 + TEM-1 + OXA-1	+
	K. pneumoniae ROU	CTX-M-15	+
	K. pneumoniae DUW	CTX-M-15 + SHV-28 + TEM-1	+
	K. pneumoniae AEL	CTX-M-15 + SHV-28 + OXA-1	+
	K. pneumoniae AMS	CTX-M-15 + TEM-1 + OXA-1	+
	K. pneumoniae ELK	CTX-M-15 + SHV-11 + TEM-1	+
	K. pneumoniae SIC	CTX-M-15 + SHV-28	+
	K. pneumoniae BAJ	CTX-M-15 + SHV-28 + TEM-1	+
	K. pneumoniae OMAN 11	CTX-M-14 + TEM-1	+
	K. pneumoniae DOV	CTX-M-15 + SHV-11 + TEM-1 + OXA-1	-
	E. cloacae TUR	SHV-5	+
	E. cloacae 501	CTX-M-15 + TEM-1	+
	E. cloacae BOU	CTX-M-15	+
	E. cloacae BEU	CTX-M-15 + CTX-M--12 + TEM-1	-
	C. koseri ROU	OXA-48	+
	C. koseri REV	OXA-48	+
OXA-181	*K. pneumoniae* OMA	CTXM-15 + OXA-1	-
	K. pneumoniae HOL	CTX-M-15	+
	P. rettgeri RAP	OXA-1	+

Table S6. Results of detection of non-carbapenemase producers directly from positive spiked blood cultures using the Carba NP test

β-lactams resistance	Species and name of the strain	Other β-lactamase	Carba NP test on spiked blood cultures
No	*E. coli* BG 1106 6252	Wild-type	-
	E. coli BG 1106 6367	Wild-type	-
	S. enterica BG 1106 6187	Wild-type	-
Penicillinase	*E. coli* BG 1106 5698	Penicillinase	-
	E. coli BG 1106 6228	Penicillinase	-
	K. pneumoniae BG 1113 0227	Wild-type	-
	K. pneumoniae LIA BG 1106 7725	Wild-type	-
	K. oxytoca BG 1106 6141	Wild-type	-
Chomosome encoded cephalosporinase	*E. cloacae* GRA BG 1106 7746	Wild-type	-
	E. cloacae LIA BG 1106 7725	Wild-type	-
	E. aerogenes BN 1113 0225	Wild-type	-
	M. morganii BG 1106 5902	Wild-type	-
	M. morganii BG 1117 0617	Wild-type	-
	C. freundii HSS BG 1106 7767	Wild-type	-
	S. marcecens SAG BG 1107 4243	Wild-type	-
	S. marcecens JHU BN 1201 0816	Wild-type	-
Aquired-cephalosporinase	*E. coli* GOU	DHA-1	-
	E. coli Ec13 SYD	CMY-2	-
	E. coli LOU	ACC-1	-
	K. pneumoniae FOR	DHA-2	-
	P. mirabilis BIK	ACC-1	-
ESBLs	*E. coli* 10.36	CTX-M-1	-
	S. typhimurium 10.81	CTX-M-1	-
	E. coli 10.121	CTXM-2	-
	E. coli 10.130	CTXM-3 + TEM-1	-
	K. pneumoniae 10.159	CTXM-3 + TEM-1 + SHV-11	-
	E. coli 10.53	CTXM-9 + TEM-1	-
	E. coli 10.46	CTXM-14	-
	E. coli 10.16	CTXM-15	-
	E. cloacae 10.75	CTXM-15	-
	E. coli 10.73	CTXM-27	-
	E. coli C5O52	CTXM-28	-
	E. coli 10.64	CTXM-32 + TEM-1	-
	K. pneumoniae 09.138	TEM-3 + TEM-1	-
	E. cloacae 10.252	TEM-3 + TEM-1	-

	E. coli 10.144	TEM-12 + TEM-1	-
	P. mirabilis 09.177	TEM-21	-
	E. aerogenes 09.34	TEM-24	-
	P. stuartii 09.165	TEM-24	-
	E. coli 10.213	TEM-29	-
	E. coli 09.11	TEM-52	-
	K. pneumoniae 09.169	TEM-52 + TEM-1	-
	P. mirabilis 09.128	TEM-52 + TEM-1	-
	E. aerogenes E2O15	TEM-121	-
	E. coli 09.123	TEM-133	-
	E. coli 09.187	SHV-2a	-
	K. pneumoniae 09.99	SHV-2a	-
	E. coli A7R5	SHV-3	-
	K. pneumoniae 09.217	SHV-5 + TEM-1	-
	E. coli 09.79	SHV-12	-
	K. pneumoniae 09.45	SHV-12	-
	E. cloacae 09.97	SHV-12	-
	E. coli A3R8	VEB-1	-
ESBL or cephalosporinase + impermeability *	*K. pneumoniae* ALE	CTX-M-15 + SHV-1	-
	K. pneumoniae BED	CTX-M-15 + TEM-1 + SHV-1	-
	K. pneumoniae SHI	CTX-M-15 + TEM-1 + SHV-1	-
	K. pneumoniae MEK	CTX-M-15 + SHV-11	-
	K. pneumoniae FOS	CTX-M-15 + TEM-1 + SHV-11	-
	K. pneumoniae LEG	CTX-M-15 + TEM-1 + SHV-12	-
	K. pneumoniae 648236	SHV-2a	-
	K. pneumoniae COO	CTX-M-15 + SHV-28 - TEM-1	-
	K. pneumoniae BER	TEM-1 + SHV-28	-
	K. pneumoniae SCH	CTX-M-15 + TEM-1 + SHV-11	-
	K. pneumoniae ANG	DHA-1	-
	E. cloacae ARF	overexpresion of chromosomic cephalosporinase	-
	E. cloacae BLA	overexpresion of chromosomic cephalosporinase	-
	E. cloacae CON	overexpresion of chromosomic cephalosporinase	-
	E. cloacae HUR	overexpresion of chromosomic cephalosporinase	-
	E. coli MAR	overexpresion of chromosomic cephalosporinase	-
	M. morgannii MAU	overexpresion of chromosomic cephalosporinase	-
	E. aerogenes DEL	overexpresion of chromosomic cephalosporinase	-
	M. morgannii DAU	overexpresion of chromosomic cephalosporinase	-
	E. cloacae POG	overexpresion of chromosomic cephalosporinase	-
	E. cloacae MEU	overexpresion of chromosomic cephalosporinase	-

* all isolates have decrease susceptibility to carbapenems (imipenem and/or meropenem and/or ertapenem)