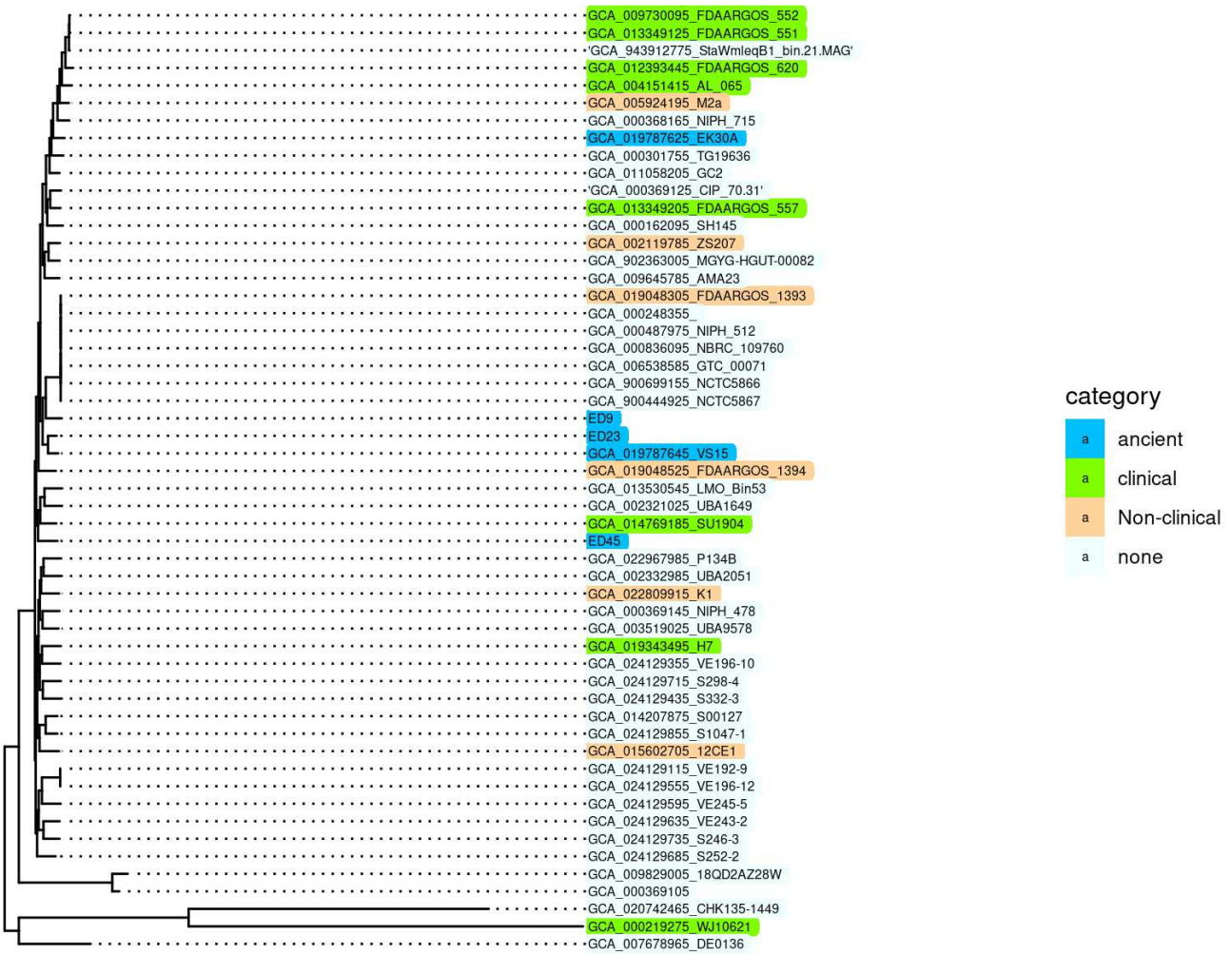

Figure S1. Genome-based phylogeny of *A.lwoffii*. The maximum likelihood tree is based on concatenated nucleotide sequences of single copy genes from all "*Acinetobacter*" genomes. It is clearly seen that the three strains in the lowest part of the tree do not belong to *A.lwoffii*.

Table S1. Clinical strains of *A. lwoffii* used for comparison with environmental strains

Strain	BioProject	Source
SH145	PRJNA38343	Skin
NIPH 715	PRJNA183318	Pus
CIP 70.31	PRJNA183262	Gangrenous lesion
NIPH 478	PRJNA183261	Ear swab
NIPH 512	PRJNA219244	Unknown
TG19636	PRJNA224116	Urine

Table S2. Plasmids from permafrost *A. lwoffii* strains containing genes (operons) of heavy metals and antibiotic resistance

Strain	Plasmid	Size, bp	Heavy metal resistance	Antibiotic resistance genes	Accession number
ED23-35 permafrost, depth 4,5 m	pALWED1.1	287,631	*mer, chr, czc, nreB*	*tet (H)*	CP082144.1
	pALWED1. 3	16,071	*chrBA*	–	CP082145.1
	pALWED1.8	4,135	-	*aadA27*	LN873256.1
ED43-25 permafrost, depth 2,9 m	pALWED2.1	190,039	*mer, ars, cop*	-	KX426229.1
ED9-5A permafrost, depth 6,5 m	pALWED3.6	185,756	*ars, cop, czs*	–	CP032290.2
	pALWED3.1	138,030	*mer, ars, cop, czsx3;czsDx2;nreB*	–	CP083572.1
	pALWED3.5	16,561	*chrAB*	-	CP083573.1
VS15 permafrost, depth 34,0 m	pALWVS1.1	134,096	*cop, czsA, czcD*x2	–	CP080577.1
	pALWED1.8	4,135	-	*aadA27*	LN873256.1
EK30a permafrost, depth 47,9 m	pALWEK1.1	209,982	*cop, czcA,czcD* x2	–	CP032102.1
	pALWEK1.4	8,635	–	*cflA*	CP032107.1
	pALWEK1.5	8,227	*chrBA*	–	CP080639.1
	pALWED1.8	4,135		*aadA27*	LN873256.1

Table S3. Plasmids from modern *A. lwoffii* strains containing genes (operons) of heavy metals and antibiotic resistance

Strain	Plasmid	Size (bp)	Heavy metal resistance	Antibiotic resistance Genes	Accession number
12CE1 Australia, digestive tract of Penaeus plebejus	pR4WN_12 CE1	270906	*cop*	*sul1,qacE, aac(6')-1b4*	MT742180.1
FDAARG0S_1393 Germany, culture_collection	unnamed2	221423	*cop, czc, arsHBC*	-	CP077338.1
	unnamed3	55306	*chrAB,arsCBH, merEDQCPTR*	-	CP077339.1
FDAARG0S_1394 Germany, culture_collection	unnamed1	121296	*cop, czc*	-	CP077370.1
ZS207 Poland, microbial mats from Zloty Stok gold mine	pMZS	186588	*arsHBC;* CusA/CzcA	-	CP019144.2
M2a Hungary, honey	pAVAci98	>27622	*cop, arsHBC, chr, mer, czc**	-	MK993303
AL_065-1 Pakistan, bedside rail in hospital intensive care unit	pAL_065-2	284,005	-	APH(3'')-V1b GNAT, *sul1, qacE, aac(6')-1b4, arr3, blaNDM-ble, sul2-aph(3')-1bx2; bla NDM, ble, floR* ; *aph(6)-1dx2; msr(E)-mph(E); aac(3)-2d*	CP078046.1
	pAL_065-3	158,191	*cop,* CusA/CzcA	-	CP078047.1
	pAL_065-5	13776	*chrBA*	-	CP078049.1
H7 China, chickens	*pH7-250	250175	-	APH(3')VIb, GNAT, *sul1x2,, qacE, aac(6')-1b4, arr3,, floR, msr(E))-mph(E)*	CP072550.1
	pH7-68	68402	*cop x2,czc, arsHBAC*	-	CP072552.1
	pH7-48	48843		*cmlAfloR*	CP072553.1
SU1904, Japan, Homo sapience	pSU1904NDM	43651	-	*bleMBL,blaNDM-1; aphA6*	LC537594.1
JN49-1, China, Homo sapience	pNDM-JN01	41084	-	*bleMBL, blaNDM-1; aphA6*	KM210086.1
WJ10621 China, clinic	pNDM-BJ01	47274	-	*bleMBL, blaNDM-1; aphA6*	JQ001791.1
FDAARG0S_551 USA, Homo sapience	unnamed1	208308	*cop, czcA*	-	CP054821.1
	unnamed4	7854	*chrBA*	-	CP054825.1
FDAARG0S_552 USA, Homo sapience	unnamed1	221520	*cop, czcA*	-	CP046295.1
FDAARG0S_557 USA, Homo sapience	unnamed1	230914	*cop, czsA*	-	CP054804.1
FDAARG0S_620 USA, Homo sapience	unnamed1	198971	*cop, czsA*	-	JAAXYZ010000001.1
	unnamed2	7739	*chrBA*	-	JAAXYZ010000002.1