Supplementary Table 1. Major pathogenic virulence factors and its corresponding genes and functions used in the comparative analysis against *Sphingomonas spp*.

Genus	Major Tested Virulence factors	Corresponding tested Genes or function
Brucella	Immune-evasion	Btp1/TcpB (Toll-interleukin-1 receptor (TIR) domain)
	Intracellular survival	Cyclic β-1,2-glucan synthase (Cgs), gmd; manA; manC; per; pgm; pmm/manB; wbkA; wbkB; wbkC; wzm; wzt; and RicA (Rab2 interacting conserved protein A)
	Regulation	BvrR-BvrS two-component system
	Secretion system	BMEII0025; BMEII0026; BMEII0027; BMEII0028; BMEII0029; BMEII0030; BMEII0031; BMEII0032; BMEII0033; BMEII0034; BMEII0035; type IV secretion system
Helicobacter	Adherence	babA; babB; hopZ; sabA;
	Endotoxin	gluE; gluP; kdtB; lpxB; rfaC; rfaJ; rfbD; rfbM; wbcJ; wbpB;
	Enzyme	ureA; ureB; ureE; ureF; ureG; ureH; ureI;
	Molecular mimicry	fucT; fucU; neuA; neuB;
	Motility	flaA; flaB; flgG
	Proinflammatory effect	napA; oipA;
	Secretion system	cag1; cag10; cag11; cag12; cag13; cag14; cag15; cag16; cag17; cag18/cagL; cag19; cag2; cag20; cag21; cag22; cag23 (cagE/picB); cag24; cag25; cag3; cag4; cag5 (virD4); cag6; cag7; cag8; cag9; virB11; type IV secretion system.
	Toxin	vacA
	Type IV secretory protein	cagA
	Pathogenicity islands	cag-PAI
Campylobacter	Adherence	cadF; Cj1415c; Cj1416c; Cj1421c; Cj1422c; Cj1423c; Cj1425c; Cj1426c; Cj1427c; Cj1429c; Cj1430c; Cj1431c; Cj1432c; Cj1433c; Cj1434c; Cj1435c; Cj1436c; Cj1437c; Cj1438c; Cj1440c; Cj1442c; fcl; glf; gmhA2; kfiD; kpsC; kpsD; kpsE; kpsF; kpsM; kpsS; kpsT; Cj0983; Cj1135; Cj1136; Cj1137c; Cj1138; Cj1139c; Cj1140; Cj1144c; Cj1145c; gmhA; htrB; neuA1; neuB1; neuC1; waaC; waaD; waaE; waaF; waaV; porA; peb1A.
	Invasion	ciaB, ciaC (invasion antigens)
	Motility	Cj0371; Cj1312; Cj1313; flaA; flaB; flaC; flaD; flaG; flgB; flgC; flgD; flgE; flgE2; flgG; flgG2; flgH; flgI; flgK; flhA; flhB; flhF; fliA; fliD; fliE; fliF; fliG; fliH; fliI; fliL; fliM; fliN; fliP; fliQ; fliR; fliS; fliY; motA; motB; pflA; ptmA; ptmB.
	Secretion system	Cjp54; virB10; virB11; virB4; virB8; virB9; virD4; type IV secretion system.
	Toxin	cdtA; cdtB; cdtC;

Genus	Major Tested Virulence factors	Corresponding tested Genes or function
Legionella	Adherence	htpB; omp28; pilB; pilC; pilD;
	Enzyme	mip;
	Iron uptake	ccmC; iraAB; frgA; feoA; feoB;
	Motility	flaA; flgA; flgB; flgC; flgD; flgE; flgF; flgG; flgH; flgI; flgK; flgL; flhA; flhB; flhF; fliA; fliD; fliE; fliF; fliG; fliH; fliJ; fliM; fliN; fliO; fliP; fliQ; fliR; fliS; motA; motB;
	Nutrient acquisition	phtA;
	Regulation	csrA; letA; letS; relA; rpoS;
	Secretion system	lspD; lspE; lspF; lspG; lspH; lspI; lspJ; lspK; lspL; lspM; pilD; (Type II secretion system). dotA; dotB; dotC; dotD; icmB; icmC; icmD; icmE; icmF; icmG; icmH; icmJ; icmK; icmL; icmM; icmN; icmO; icmP; icmQ; icmR; icmS; icmT; icmV; icmW; icmX; lepA; lepB; lidA; lvgA; ralF; sdeA/laiA; sdeB; sdeC; sdeD; sidA; sidB; sidC; sidE; sidF; sidG; sidH; vipA; vipD; vipE; vipF; wipA; wipB; wipC; ylfA; ylfB (type IV secretion system)
	Stress protein	gspA (global stress gene) katA; katB; sodB; sodC;
	Toxin	RtxA
	Unclassified	enhA; enhB; enhC; ligA;
Pseudomonas	Adherence	fleN; fleQ; fleR; flgC; flgD; flgE; flgF; flgG; flgH; flgI; flgJ; flgK; flgL; flhA; flhB; flhF; fliC; fliD; fliE; fliF; fliG; fliH; fliI; fliJ; fliM; fliN; fliO; fliP; fliQ; fliR; waaA; waaC; waaF; waaG; waaP; wzy; wzz; chpA; chpB; chpC; chpD; chpE; fimT; fimU; fimV; pilA; pilB; pilC; pilD; pilE; pilF; pilG; pilH; pilI; pilJ; pilK; pilM; pilN; pilO; pilP; pilQ; pilR; pilS; pilT; pilU; pilV; pilW; pilX; pilY1; pilY2;
	Antiphagocytosis	Alg44; Alg8; algA; algB; algD; algE; algF; algG; algI; algJ; algK; algL; algP; algQ; algR; algU; algX; algZ; mucA; mucB; mucC;
	Biosurfactant	rhlA; rhlB;
	Iron uptake	fptA; pchA; pchB; pchC; pchD; pchE; pchF; pchG; pchH; pchI; pchR; fpvA; pvdA; pvdD; pvdE; pvdS;
	Pigment	phzM; phzS (Pyocyanin)
	Protease	aprA; lasA; lasB.
	Regulation	lasI; lasR; rhlL; rhlR;
	Secretion system	xcpP; xcpQ; xcpR; xcpS; xcpT; xcpU; xcpV; xcpW; xcpX; xcpY; xcpZ (Type II secretion system)
	Toxin	toxA; exoS; exoT; exoU; exoY; plcH;