

Additional file 2: Table S1. Location of aminoacyl-tRNA synthetase (aaRS) genes in *B. bovis* genome

Class	aaRS Domain	NCBI ref seq	Location on the genome
Class 1	CRS	XP_001608890.1	Chromosome: 1; NW_001820854.1 (213,842..216,104)
	ERS	XP_001612304.1	Chromosome: 3; NC_010575.1 (2549536..2551963)
	ERS	XP_001610985.1	Chromosome: 4; NW_001820857.1 (1466874..1469147)
	IRS	XP_001611793.1	Chromosome: 3; NC_010575.1 (1424596..1427947)
	IRS	XP_001610095.1	Chromosome: 2; NC_010574.1 (1311463..1314951)
	LRS	XP_001611815.1	Chromosome: 3; NC_010575.1 (1475915..1479279, complement)
	LRS	XP_001609402.1	Chromosome: 4; NW_001820855.1 (539055..541414)
	MRS	XP_001610587.1	Chromosome: 4; NW_001820857.1 (630862..632643)
	MRS	XP_001612148.1	Chromosome: 3; NC_010575.1 (2200980..2202476, complement)
	MRS	XP_001608849.1	Chromosome: 1; NW_001820854.1 (134046..135650, complement)
	QRS	XP_001611769.1	Chromosome: 3; NC_010575.1 (1372794..1374591)
	RRS	XP_001609801.1	Chromosome: 2; NC_010574.1 (655787..657722)
	RRS	XP_001609088.1	Chromosome: 1; NW_001820854.1 (647,158..649,312)
	VRS	XP_001611967.1	Chromosome: 3; NC_010575.1 (1810529..1813583, complement)
	WRS	XP_001611386.1	Chromosome: 3; NC_010575.1 (592262..594369, complement)
	WRS	XP_001612001.1	Chromosome: 3; NC_010575.1 (1887054..1888531, complement)
	YRS	XP_001609749.1	Chromosome: 2; NC_010574.1 (540163..541419)
	YRS	XP_001611016.1	Chromosome: 4; NW_001820857.1 (1531632..1533484, complement)
Class 2	ARS	XP_001612285.1	Chromosome: 3; NC_010575.1 (2501122..2504128)
	DRS	XP_001609334.1	Chromosome: 4; NW_001820855.1 (378504..380540)
	FRS α	XP_001611853.1	Chromosome: 3; NC_010575.1 (1571702..1573116, complement)
	FRS β	XP_001612083.1	Chromosome: 2; NC_010574.1 (1311463..1314951)
	FRS	XP_001610235.1	Chromosome: 2; NC_010574.1 (1604993..1606376)
	GRS	XP_001609027.1	Chromosome: 1; NW_001820854.1 (515758..517968)
	HRS	XP_001609284.1	Chromosome: 4; NW_001820855.1 (275950..278763, complement)
	HRS	XP_001611649.1	Chromosome: 3; NC_010575.1 (1101974..1103755)
	KRS	XP_001609428.1	Chromosome: 4; NW_001820855.1 (591547..593661)
	KRS	XP_001609643.1	Chromosome: 2; NC_010574.1 (293315..295247)
	NRS	XP_001612247.1	Chromosome: 3; NC_010575.1 (2410705..2412560)
	NRS	XP_001610875.1	Chromosome: 4; NW_001820857.1 (1236282..1238192, complement)
	PRS	XP_001612221.1	Chromosome: 3; NC_010575.1 (2351560..2352935, complement)
	PRS	XP_001609304.1	Chromosome: 4; NW_001820855.1 (314665..317009, complement)
	SRS	XP_001610648.1	Chromosome: 4; NW_001820857.1 (748324..749832, complement)
	SRS	XP_001609299.1	Chromosome: 4; NW_001820855.1 (306236..307846)
	TRS	XP_001610740.1	Chromosome: 4; NW_001820857.1 (953999..956347)
I, L, M, V family protein		XP_001611804.1	Chromosome: 3; NC_010575.1 (1443965..1446518, complement)

Additional file 2: Table S2. Location of aminoacyl-tRNA synthetase (aaRS) genes in *B. microti* genome

Class	aaRS Domain	NCBI ref seq	Location on the genome
Class 1	CRS	XP_021338184.1	Chromosome: II; NC_027206.1 (826197..828451, complement)
	ERS	XP_021337593.1	Chromosome: IV; NC_034969.1 (34244..36453, complement)
	ERS	XP_021337505.1	Chromosome: I; NC_027205.1 (974269..975592, complement)
	ERS	XP_021338716.1	Chromosome: III; NC_027207.2 (1235559..1237230)
	IRS	XP_021338677.1	Chromosome: III; NC_027207.2 (1068796..1072954, complement)
	IRS	XP_021338798.1	Chromosome: III; NC_027207.2 (1562429..1565398)
	LRS	XP_021337733.1	Chromosome: IV; NC_034969.1 (621518..625071, complement)
	LRS	XP_012647396.1	Chromosome: I; NC_027205.1 (597415..599724, complement)
	MRS	XP_012648167.1	Chromosome: II; NC_027206.1 (722671..724797, complement)
	MRS	XP_021338698.1	Chromosome: III; NC_027207.2 (1151518..1152878)
	QRS	XP_012649219.1	Chromosome: III; NC_027207.2 (1082921..1084707)
	RRS	XP_021338636.1	Chromosome: III; NC_027207.2 (918904..920932)
	RRS	XP_021337238.1	Chromosome: I; NC_027205.1 (32141..34258, complement)
	VRS	XP_021337780.1	Chromosome: IV; NC_034969.1 (816074..819549)
	WRS	XP_012649970.1	Chromosome: IV; NC_034969.1 (763000..764613)
	WRS	XP_021338434.1	Chromosome: III; NC_027207.2 (198738..201162)
	YRS	XP_012649345.1	Chromosome: III; NC_027207.2 (1294030..1295723, complement)
	YRS	XP_021337265.1	Chromosome: I; NC_027205.1 (107774..109612)
Class 2	ARS	XP_021338305.1	Chromosome: II; NC_027206.1 (1204560..1208246, complement)
	DRS	XP_021337443.1	Chromosome: I; NC_027205.1 (710638..712484)
	FRS α	XP_021337722.1	Chromosome: IV; NC_034969.1 (564105..565775, complement)
	FRS β	XP_021337782.1	Chromosome: IV; NC_034969.1 (834295..836286, complement)
	FRS α	XP_012647761.1	Chromosome: I; NC_027205.1 (1273511..1274958, complement)
	GRS	XP_021338402.1	Chromosome: III; NC_027207.2 (81321..83465)
	HRS	XP_012647814.1	Chromosome: II; NC_027206.1 (64572..67064)
	HRS	XP_012648429.1	Chromosome: II; NC_027206.1 (1173650..1174852, complement)
	KRS	XP_021337612.1	Chromosome: IV; NC_034969.1 (116666..118638, complement)
	KRS	XP_021338251.1	Chromosome: II; NC_027206.1 (1022160..1023620)
	NRS	XP_012650212.1	Chromosome: IV; NC_034969.1 (1197307..1198923, complement)
	NRS	XP_021338757.1	Chromosome: III; NC_027207.2 (1398075..1399724)
	PRS	XP_021338015.1	Chromosome: II; NC_027206.1 (115969..118564, complement)
	PRS	XP_012650016.2	Chromosome: IV; NC_034969.1 (857011..858287, complement)
	SRS	XP_012650114.1	Chromosome: IV; NC_034969.1 (1028282..1029628)
	SRS	XP_012647836.1	Chromosome: II; NC_027206.1 (107095..108846)
	TRS	XP_021338448.1	Chromosome: III; NC_027207.2 (246629..249114)
	I, L, M, V family protein	XP_012649205.1	Chromosome: III; NC_027207.2 (1055301..1057887, complement)

Additional file 2: Table S3. Location of aminoacyl-tRNA synthetase (aaRS) genes in *B. bigemina* genome

Class	aaRS Domain	NCBI ref seq	Location on the genome
Class 1	CRS	XP_012767680.1	Chromosome: II; NC_027217.1 (1455622..1457912)
	ERS	XP_012770110.1	Chromosome: V; NC_027220.1 (37704..40216, complement)
	ERS	XP_012766722.1	Chromosome: I; NC_027216.1 (1853771..1855902)
	IRS	XP_012769037.1	Chromosome: III; NC_027218.1 (1841478..1844843, complement)
	IRS	XP_012766327.1	Chromosome: I; NC_027216.1 (999044..1002912, complement)
	LRS	XP_012769005.1	Chromosome: III; NC_027218.1 (1776022..1779636)
	LRS	XP_012770143.1	Chromosome: V; NC_027220.1 (117175..119616, complement)
	MRS	XP_012767735.1	Chromosome: II; NC_027217.1 (1560112..1562554)
	MRS	XP_012769850.1	Chromosome: IV; NC_027219.1 (357103..358646, complement)
	QRS	XP_012769058.1	Chromosome: III; NC_027218.1 (1888149..1889966, complement)
	RRS	XP_012767290.1	Chromosome: II; NC_027217.1 (632367..634360, complement)
	RRS	XP_012769919.1	Chromosome: IV; NC_027219.1 (493195..495650)
	VRS	XP_012768834.1	Chromosome: III; NC_027218.1 (1384216..1387278)
	WRS	XP_012768699.1	Chromosome: III; NC_027218.1 (1054286..1056372, complement)
	WRS	XP_012769504.1	Chromosome: III; NC_027218.1 (2992002..2993534, complement)
	YRS	XP_012767250.1	Chromosome: II; NC_027217.1 (544432..545768)
	YRS	XP_012766067.1	Chromosome: I; NC_027216.1 (472950..474419)
	YRS	XP_012766758.1	Chromosome: I; NC_027216.1 (1939628..1941496, complement)
Class 2	ARS	XP_012770131.1	Chromosome: V; NC_027220.1 (87545..90615, complement)
	DRS	XP_012770238.1	Chromosome: V; NC_027220.1 (308776..310974)
	FRS	XP_012768895.1	Chromosome: III; NC_027218.1 (1528896..1530512, complement)
	FRS α	XP_012766171.1	Chromosome: I; NC_027216.1 (688744..690185, complement)
	FRS β	XP_012769613.1	Chromosome: III; NC_027218.1 (3250943..3253097, complement)
	GRS	XP_012767840.1	Chromosome: II; NC_027217.1 (1809587..1811785)
	HRS	XP_012769971.1	Chromosome: IV; NC_027219.1 (601480..604475, complement)
	HRS	XP_012769231.1	Chromosome: III; NC_027218.1 (2375579..2377369, complement)
	KRS	XP_012768205.1	Chromosome: II; NC_027217.1 (2624165..2626533)
	KRS	XP_012767128.1	Chromosome: II; NC_027217.1 (281041..282759)
	NRS	XP_012765953.1	Chromosome: I; NC_027216.1 (249179..251011)
	NRS	XP_012766585.1	Chromosome: I; NC_027216.1 (1539515..1541539, complement)
	PRS	XP_012769944.1	Chromosome: IV; NC_027219.1 (540336..542572)
	PRS	XP_012765957.1	Chromosome: I; NC_027216.1 (261183..262820)
	SRS	XP_012769786.1	Chromosome: IV; NC_027219.1 (229527..231047)
	SRS	XP_012769949.1	Chromosome: IV; NC_027219.1 (549903..551537, complement)
	TRS	XP_012766432.1	Chromosome: I; NC_027216.1 (1220381..1222800)
	I, L, M, V family protein	XP_012769025.1	Chromosome: III; NC_027218.1 (1822370..1825204)

Additional file 2: Table S4. Location of aminoacyl-tRNA synthetase (aaRS) genes in *P. tigris* genome

Class	aaRS Domain	NCBI ref seq	Location on the genome
Class 1	CRS	XP_015397731.1	NW_006712098.1 (1078650..1132218, complement)
	CRS	XP_015400127.1	NW_006711693.1 (2578699..2622625)
	ERS	XP_007084157.1	NW_006711882.1 (4118593..4139145)
	IRS	XP_015399843.1	NW_006712473.1 (1506440..1574795)
	IRS	XP_007072911.1	NW_006711278.1 (349712..414421, complement)
	LRS	XP_007080026.1	NW_006711819.1 (32264710..32340767)
	LRS	XP_007088460.1	NW_006711971.1 (4264107..4429196)
	MRS	XP_007075037.1	NW_006711628.1 (144160..157631)
	QRS	XP_007088554.1	NW_006711971.1 (7266925..7273932, complement)
	RRS	XP_007077700.1	NW_006711788.1 (14803963..14828592)
	RRS	XP_007076978.1	NW_006711778.1 (2692426..2769550, complement)
	VRS	XP_007098881.2	NW_006712705.1 (200508..215033)
	VRS	XP_007090645.1	NW_006712025.1 (396853..409507, complement)
	WRS	XP_007094971.1	NW_006712282.1 (4298457..4328773)
	YRS	XP_007092492.1	NW_006712094.1 (2571397..2600068, complement)
	YRS	XP_007092493.1	NW_006712031.1 (479126..499149, complement)
Class 2	ARS	XP_007085183.2	NW_006711908.1 (4101073..4113902)
	ARS	XP_007074943.1	NW_006711606.1 (42950..67155, complement)
	DRS	XP_015400574.1	NW_006712715.1 (7346161..7409642, complement)
	DRS	XP_007084072.1	NW_006711880.1 (2964458..2993387, complement)
	EPRS	XP_007072912.1	NW_006711278.1 (452950..524839)
	FRS α	XP_007098251.1	NW_006712602.1 (1559016..1567149)
	FRS β	XP_007073195.1	NW_006711318.1 (6965601..7499787, complement)
	GRS	XP_015396756.1	NW_006712022.1 (1905276..1949920, complement)
	HRS	XP_007077962.1	NW_006711792.1 (4962409..4976212, complement)
	HRS	XP_007077964.1	NW_006711792.1 (4962409..4976212, complement)
	KRS	XP_007083410.1	NW_006711869.1 (3950134..3964758)
	KRS	XP_007083409.1	NW_006711869.1 (3950134..3964758)
	NRS	XP_007080534.1	NW_006711828.1 (4584305..4601802)
	NRS	XP_007079024.1	NW_006711808.1 (2280775..2410379, complement)
	SRS	XP_007076496.1	NW_006711766.1 (5545761..5567409, complement)
	SRS	XP_007097046.1	NW_006712432.1 (16767230..16776766, complement)
	TRS	XP_007097493.1	NW_006712501.1 (1906291..1931672, complement)
	TRS	XP_015395662.1	NW_006711963.1 (728205..744187)