

Table S5 The primers used for amplification of 16S, *gltA*, *groEL*, *htrA*, *ompA*, *ompB*, *rpoB*, and *COI* genes from *Rickettsia*, *Anaplasma*, *Coxiella* and hosts by PCR.

Primer	Cycle	Bacteria/Host	Gene	annealing temperature	Sequence	Anticipated amplicon length	Reference
Ana-F	1, 2	<i>Anaplasma</i>	16S	52°C	5-GATAGCCACTRGAAGTG GT-3	900 bp	Lu et al., 2022 (for detection)
Ana-R1	1	<i>Anaplasma</i>	16S	52°C	5-CGTGCTGACTTGACATCAT-3		
Ana-R2	2	<i>Anaplasma</i>	16S	52°C	5-CATCTCACGACACGAGCTG-3		
Ric-F	1, 2	<i>Rickettsia</i>	16S	50°C	5-YTACGGAATAACTTTTAGAAA-3	900 bp	Lu et al., 2022 (for detection)
Ric-R1	1	<i>Rickettsia</i>	16S	50°C	5-CATGATGACTTGACRTC GT-3		
Ric-R2	2	<i>Rickettsia</i>	16S	50°C	5-CATCTCACGACACGAGCTG-3		
Cox-R	1, 2	<i>Coxiella</i>	16S	52°C	5-ACTYYCCAACAGCTAGTTCTCA-3	600 bp	Duron et al., 2015 (for detection)
Cox-F1	1	<i>Coxiella</i>	16S	52°C	5-GTAGGAATCTACCTTRTAGWGG-3		
Cox-F2	2	<i>Coxiella</i>	16S	52°C	5-TGAGAACTAGCTGTTGGRGAGT-3		
Ric-glt-F1	1	<i>Rickettsia</i>	<i>gltA</i>	52°C	5-ACTTAYGAYCCGGGCTTTAT-3	1100 bp	Lu et al., 2022
Ric-glt-F2	2	<i>Rickettsia</i>	<i>gltA</i>	52°C	5-CTTTATGTCTACTGCTTCTTG-3		
Ric-glt-R	1, 2	<i>Rickettsia</i>	<i>gltA</i>	52°C	5-AGCTGTCTAGGTCTGCTGATT-3		

Ric-gro-F1	1	<i>Rickettsia</i>	<i>groEL</i>	52°C	5-CCATTACATGATAGAATTGCAA-3	800 bp	Lu et al., 2022
Ric-gro-F2	2	<i>Rickettsia</i>	<i>groEL</i>	52°C	5-GAATTGCAATAAAGCCTATCG-3		
Ric-gro-R	1, 2	<i>Rickettsia</i>	<i>groEL</i>	52°C	5-CCATCATTGCTTTTCTTCTATC-3		
Ana-glt-F1	1	<i>Anaplasma</i>	<i>gltA</i>	50°C	5-CATCCNATGGCTATTYTCAT-3	900 bp	Lu et al., 2022
Ana-glt-R1	1	<i>Anaplasma</i>	<i>gltA</i>	50°C	5-ACTATACCKGAGTAAAAGTC-3		
Ana-glt-F2	2	<i>Anaplasma</i>	<i>gltA</i>	50°C	5-GAYCACGARCARAATGCTTC-3		
Ana-glt-R2	2	<i>Anaplasma</i>	<i>gltA</i>	50°C	5-GAGTAAAAGTCGACRTTKGG-3		
Ana-gro-F1	1	<i>Anaplasma</i>	<i>groEL</i>	54°C	5-GYCAGTGGGCTGGTAATGAA-3	1200 bp	Lu et al., 2022
Ana-gro-R1	1	<i>Anaplasma</i>	<i>groEL</i>	54°C	5-CCWCCTGGTACWACACCTTC-3		
Ana-gro-F2	2	<i>Anaplasma</i>	<i>groEL</i>	52°C	5-ATAGTYATGAAGGAGAGTGAT-3		
Ana-gro-R2	2	<i>Anaplasma</i>	<i>groEL</i>	52°C	5-TCAACAGCAGCTCTAGTWG-3		
Cox-rpoB-F1	1	<i>Coxiella</i>	<i>rpoB</i>	56°C	5-GGGCGRCAYGGWAAGAAAGGSGT-3	550 bp	Duron et al., 2015
Cox-rpoB-R1	1	<i>Coxiella</i>	<i>rpoB</i>	56°C	5-CACCRAACCGTTGACCRCCAAATTG-3		
Cox-rpoB-F2	2	<i>Coxiella</i>	<i>rpoB</i>	56°C	5-TCGAAGACATGCCYTATTTAGAAG-3		
Cox-rpoB-R2	2	<i>Coxiella</i>	<i>rpoB</i>	56°C	5-AGCTTTCCCACCGARGGGTTGCTG-3		
Cox-gro-F1	1	<i>Coxiella</i>	<i>groEL</i>	56°C	5-TTTGAAAAYATGGGCGCKCAAATGGT-3	600 bp	Duron et al., 2015
Cox-gro-F2	2	<i>Coxiella</i>	<i>groEL</i>	56°C	5-GAAGTGGCTTCGCRTACWTCAGACG-3		

Cox-gro-R1	1	<i>Coxiella</i>	<i>groEL</i>	56°C	5-CCAAACCCAGGTGCTTTYAC-3	400 bp	This study
Cox-gro-R2	2	<i>Coxiella</i>	<i>groEL</i>	56°C	5-CGRTC GCCAAAGCCAGGTGC-3		
QD8rpoBin5	1, 2	<i>Coxiella</i> -str.tick8	<i>rpoB</i>	51 °C	5-GAYWTCGTRCTWAA YCCYT TAGG-3		
QD8rpoBmid3	1	<i>Coxiella</i> -str.tick8	<i>rpoB</i>	51°C	5-AWCCYGTGGARCGMGC GTGCAT-3		
QD8rpoBin3	2	<i>Coxiella</i> -str.tick8	<i>rpoB</i>	51°C	5-TCATCTACTARRTGRTTAAGCTT-3		
QR14ELex5	1	<i>Rickettsia</i> -str.tick14	<i>groEL</i>	52°C	5-ARRCACGGYTCARAWGCWCGT-3	650 bp	This study
QR14gELin5	2	<i>Rickettsia</i> -str.tick14	<i>groEL</i>	52°C	5-ATRC CGTAAARGTTACWTTAGG-3		
QR14groEL3	1, 2	<i>Rickettsia</i> -str.tick14	<i>groEL</i>	52°C	5-CCACCACGTAATYTATTKACYAC-3		
htrAex5	1	<i>Rickettsia</i>	<i>htrA</i>	53°C	5-GCTTTACAAAATTCTAAAAACCATATA-3	400 bp	Borsoi et al., 2019
htrAex3	1	<i>Rickettsia</i>	<i>htrA</i>	53°C	5-TGTCTATCAATTCACA ACTTGC-3		
htrAin5	2	<i>Rickettsia</i>	<i>htrA</i>	48°C	5-GCTCTTGCAACTTCTATGT-3		
htrAin5	2	<i>Rickettsia</i>	<i>htrA</i>	48°C	5-CATTGTTCGTCAGGTTGGC-3		
ompBex5	1	<i>Rickettsia</i>	<i>ompB</i>	54°C	5-GTAACCGGAAGTAATCGTTTCGTAA-3	400 bp	Borsoi et al., 2019
ompBex3	1	<i>Rickettsia</i>	<i>ompB</i>	54°C	5-CTTTATAACCAGCTAAACCAC-3		
ompBin5	2	<i>Rickettsia</i>	<i>ompB</i>	51°C	5-GTTTAATACGTGCTGCTAACCA-3		
ompBin3	2	<i>Rickettsia</i>	<i>ompB</i>	51°C	5-GGTTTGGCCCATATACCATAA-3		
LCO1490	1	arthropods	<i>COI</i>	52°C	5-GGTCAACAAATCATAAAGATATTGG-3	650 bp	Lu et al., 2022

HCO2198	1	arthropods	<i>COI</i>	52°C	5-TAAACTTCAGGGTGACCAAAAAATCA-3
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