

Table S1. PCR mix, primers and conditions used for each molecular marker sequenced in this study.

	<i>Cox2</i>	<i>ITS2</i>	<i>Cytb</i>	<i>Cox1</i>	<i>EF1-α</i>
PCR Mix					
Forward Primer (10 μ M)	5 μ l	5 μ l	5 μ l	5 μ l	5 μ l
Reverse Primer (10 μ M)	5 μ l	5 μ l	5 μ l	5 μ l	5 μ l
Template DNA	5 μ l	5 μ l	5 μ l	5 μ l	5 μ l
<i>goTaq</i> G2 Green Master Mix DNA polymerase	25 μ l	25 μ l	25 μ l	25 μ l	25 μ l
Autoclaved distilled water to	50 μ l	50 μ l	50 μ l	50 μ l	50 μ l
PCR Primers					
Forward Primer	F-Leu [28]	senITS2 [57]	CytbF [63]	LCO1490 [64]	M47F [61]
Reverse Primer	R-Lys [28]	ITS2R [62]	A5F [63]	HCO2198 [64]	rcM4.0 [28]
PCR Conditions					
Initial Denaturing	95 °C for 3 min	94 °C for 5 min	95 °C for 12 min	96 °C for 2 min	94 °C for 5 min
Number of cycles	37	35	30	40	40
Denaturing	94 °C for 30 sec	94 °C for 60 sec	95 °C for 30 sec	94 °C for 30 sec	94 °C for 30 sec
Annealing	42 °C for 30 sec	55 °C for 60 sec	40 °C for 30 sec	50 °C for 30 sec	56 °C for 45 sec
Primer extension	72 °C for 15 sec	72 °C for 60 sec	68 °C for 2 min	72 °C for 60 sec	72 °C for 60 sec
Final extension	72 °C for 5 min	72 °C for 10 min	68 °C for 7 min	72 °C for 7 min	72 °C for 7 min

Table S2. List of taxa used in the analysis, including GenBank accession numbers and taxonomic information.

Species	Family	Accession number (<i>cox1-cox2-cytb- EFl-a</i>)
<i>Pulex irritans</i>	Pulicidae	LT797469-LR991748-LT797480-LR744002
<i>Pulex irritans</i>	Pulicidae	LT797466-LR991746-LT797474-LR744005
<i>Archaeopsylla erinacei</i>	Pulicidae	LT604115-LR991706-LT604120-LR744008
<i>Archaeopsylla erinacei</i>	Pulicidae	LT627349-LR991707-LT627350-LR744010
<i>Ctenocephalides felis</i>	Pulicidae	LN827896-LR991701- LN899587-LR743995
<i>Ctenocephalides felis</i>	Pulicidae	LN827900-LR991704- LN899588-LR743997
<i>Ctenocephalides canis</i>	Pulicidae	MN173763-LR991705-LN899589-LR743998
<i>Echidnophaga</i> sp.	Pulicidae	KT376440-MW074397-KM890719-EU336268
<i>Stenoponia tripectinata tripectinata</i>	Stenoponiidae	LK937071-LR989043-LN897473-LR989029
<i>Stenoponia tripectinata tripectinata</i>	Stenoponiidae	LK937072-LR989044-LN897472-LR989030
<i>Stenoponia americana</i>	Stenoponiidae	KM891021-AF424014-KM890757-KM890584
<i>Nosopsyllus fasciatus</i>	Ceratophyllidae	LT158040-MG637390-LT158052-LR743999
<i>Nosopsyllus barbarus</i>	Ceratophyllidae	LN881550-LR991719-LN897469-LR744000
<i>Ceratophyllus gallinae</i>	Ceratophyllidae	KM890960-EU335976-KM890599-EU336255
<i>Chaetopsylla appropinquans</i>	Vermipsyllidae	KM890910-KM890777-KM890642-KM890480
<i>Stephanocircus dasyuri</i>	Stephanocircidae	JN008920-KM890795-KM890658-EU336298
<i>Stephanocircus pectinipes</i>	Stephanocircidae	JN008923-EU336002-KM890619-EU336301
<i>Craneopsylla minerva</i>	Stephanocircidae	KM891000-KM890871-KM890735-EU336321
<i>Tiarapsylla argentina</i>	Stephanocircidae	KM890996-KM890867-KM890731-KM89056
<i>Hystrichopsylla dippei</i>	Hystrichopsyllidae	KM891010-KM890881-KM890747-KM890573
<i>Hystrichopsylla orophila</i>	Hystrichopsyllidae	KM890902-EU336020-KM890632-KM890472
<i>Nearctopsylla genalis</i>	Hystrichopsyllidae	HM398835-KM890866-KM890730-KM890560
<i>Nearctopsylla hyrtaci</i>	Hystrichopsyllidae	KM890922-KM890792-KM890655-KM890493
<i>Neotyphloceras crassispina</i>	Hystrichopsyllidae	KM890944-KM890814-KM890677-KM890513
<i>Chiliopsylla allophyla</i>	Hystrichopsyllidae	KM891001-KM890872-KM890736-KM890566
<i>Rhadinopsylla</i> sp.	Ctenophthalmidae	MG138217-KM890851-KM890715-EU336269
<i>Rhadinopsylla</i> sp.	Ctenophthalmidae	MG138218-KM890784-KM890648-EU336246
<i>Ctenophthalmus cryptotis</i>	Ctenophthalmidae	KM890939-KM890809-KM890672-KM890508
<i>Ctenophthalmus congeneroides congeneroides</i>	Ctenophthalmidae	KM890918-KM890788-KM89065-KM890489
<i>Ctenophthalmus baeticus boisseauorum</i>	Ctenophthalmidae	LR594449-LR991708-LR594470-LR743655
<i>Ctenophthalmus apertus allani</i>	Ctenophthalmidae	LR594443-LR991710-LR594464-LR743648
<i>Neopsylla abagaitui</i>	Ctenophthalmidae	MG138235-KM890847-KM890711-KM890711
<i>Neopsylla mana</i>	Ctenophthalmidae	MF000646-KM890849-KM890712-KM890544
<i>Pygiopsylla hoplia</i>	Pygiopsyllidae	KM890924-KM890794-KM890657-KM890495
<i>Parastivalius novaeguinae</i>	Stivaliidae	KM890901-KM890769-KM890629-EU336324
<i>Tetrapsyllus rhombus</i>	Rhopalopsyllidae	KM890937-KM890807-KM890670-KM890506
<i>Tetrapsyllus maulinus</i>	Rhopalopsyllidae	KM890997-KM890868-KM890671-KM890562
<i>Listronius fortis</i>	Rhopalopsyllidae	KM890942-KM890812-KM890675-KM890511
<i>Polygenis</i> sp.	Rhopalopsyllidae	KM890907-AF424043-KM890639-EU336289
<i>Polygenis roberti</i>	Rhopalopsyllidae	KM890958-KM890830-KM890693-KM890524
<i>Parapsyllus</i> sp.	Rhopalopsyllidae	MK104350-EU335985-KM890604-EU336266
<i>Ectinorus lareschiae</i>	Rhopalopsyllidae	KM890949-KM890820-KM890683-KM890519
<i>Ectinorus ixanus</i>	Rhopalopsyllidae	KM890943-KM890813-KM890676-KM890512
<i>Malacopsylla grossiventris</i>	Malacopsyllidae	KM890898-KM890762-KM890589-KM890469
<i>Phthiropsylla agenoris</i>	Malacopsyllidae	KM891005-KM890763-KM890742- KM890470
<i>Panorpa meridionalis</i>	Panorpidae	LT604125-LR991718-LT604127-LR744012
<i>Panorpa meridionalis</i>	Panorpidae	LT604126-LR991717-LT604128-LR744013
<i>Panorpa meridionalis</i>	Panorpidae	LT604125-LR991716-LT604127-LR744014