

**Table S1.** List of species used in this study.

<b>Infraclass</b>	<b>Order</b>	<b>Family</b>	<b>Species</b>	<b>Length (bp)</b>	<b>Gebank</b>
Pteriomorpha	Arcida	Arcidae	<i>ANadara broughtonii</i>	44333	OM807131
			<i>Tegillarca granosa</i>	31589	KJ607173
		Cucullaeidae	<i>Cucullaea labiata</i>	25845	KP091889
	Mytilida	Mytilidae	<i>Perna perna</i>	18415	KM655841
			<i>Bathymodiolus septemdierum</i>	17069	AP014562
			<i>Mytilus galloprovincialis</i>	16744	DQ399833
			<i>Mytilus trossulus</i>	18652	AY823625
	Ostreida	Ostreidae	<i>Crassostrea hongkongensis</i>	18617	MZ337404
			<i>Crassostrea ariakensis</i>	18414	FJ841964
			<i>Crassostrea gigas</i>	18224	MZ497416
			<i>Saccostrea cucullata</i>	16396	KP769562
		Pinnidae	<i>Atrina pectinata</i>	16811	KC153059
			<i>Pinna rudis</i>	18264	LC634517
		Isognomnidae	<i>Isognomon bicolor</i>	25122	OP095038
			<i>Isognomon nucleus</i>	33662	ON722380
			<i>Isognomon alatus</i>	30636	OP067230
		Margaritidae	<i>Pinctada albina</i>	23841	OR529434
			<i>Pinctada imbricata</i>	31435	KX669229
			<i>Pinctada margaritifera</i>	15556	OR529435
			<i>Pinctada maxima</i>	16994	GQ452847
		Pteriidae	<i>Pteria penguin</i>	17344	KU552127
	Pectinida	Pectinidae	<i>Argopecten irradians</i>	16221	DQ665851
			<i>Argopecten purpuratus</i>	16266	KF601246
			<i>Chlamys farreri</i>	20889	EF473269
		Propeamussiidae	<i>Catillopecten sp</i>	17979	OQ434059
			<i>Propeamussium sp</i>	18132	OM038107
Heteroconchia		Vesicomysidae	<i>Archivesica marissinica</i>	17374	MK948426
		Cardiidae	<i>Tridacna squamosa</i>	20930	KP205428

**Table S2.** Best fit partitions and substitution models.

	Set Partition (Conducted by PartitionFinder 2)	Best Model for BI and ML (Selected by PartitionFinder 2)
Best Partition CDS genes (BIC= 505451.10)	Atp6 1th	TRN+I+G
	Atp6 2th	TVM+I+G
	Atp6 3th	TRN+G
	Cox1-2-3 1th	GTR+I+G
	Cox1-2-3 2th	GTR+I+G
	Cox1-2-3 3th	TIM+G
	Cytb 1th	HKY+I+G
	Cytb 2 th	TVM+I+G
	Cytb 3 th	TRN+G
	Nad1-2-3-4-4L-5-6 1th	GTR+I+G
	Nad1-2-3-4-4L-5-6 2th	GTR+I+G
	Nad1-2-3-4-4L-5-6 3th	TRN+G
Best Partition rRNA genes (BIC= 53439.43)	rrnS	GTR+G
	rrnL	GTR+I+G

**Figure S1.** Relative synonymous codon usage (RSCU) of mitochondrial genome of *P. albina* (Left column for each amino acid) and *P. margaritifera* (Right column for each amino acid).

