

# Supporting Information

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Table S1. List of operational taxonomic units (OTUs) to reconstruct the phylogenetic tree of vesicomylid clams (Fig. 5B)

Species name in the DNA Data	Genus	Accession No.	Locality	Depth (m)	Habitat Type	Reference
Vesicomylid clam	<i>Abyssogena</i>	AB629938	Shinkai Seep Field, Mariana Trench	5,550–5,861	seep	Present study
Vesicomylid clam	<i>Abyssogena</i>	AB629939	Shinkai Seep Field, Mariana Trench	5,550–5,861	seep	Present study
Vesicomylid clam	<i>Abyssogena</i>	AB629940	Shinkai Seep Field, Mariana Trench	5,550–5,861	seep	Present study
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF114401	Logatchev Field, Mid-Atlantic Ridge	3,038	vent	(8)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF114402	Logatchev Field, Mid-Atlantic Ridge	3,038	vent	(8)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF114403	Logatchev Field, Mid-Atlantic Ridge	3,038	vent	(8)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF114404	Logatchev Field, Mid-Atlantic Ridge	3,038	vent	(8)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF114405	Logatchev Field, Mid-Atlantic Ridge	3,038	vent	(8)
<i>Vesicomya</i> sp	<i>Abyssogena</i>	EU403471	Logatchev Field, Mid-Atlantic Ridge	3,028	vent	(9)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF008279	Barbados Accretionary Prism	5,000	seep	(7)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF008280	West Florida Escarpment	3,313	seep	(7)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AF008281	West Florida Escarpment	3,313	seep	(7)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AB110774	Ryukyu Trench	5,900	seep	(3)
<i>Calyptogena</i> sp	<i>Abyssogena</i>	AB110775	Ryukyu Trench	5,900	seep	(3)
<i>C. kaikoi</i>	<i>Abyssogena</i>	AB110760	Dai-san Tenryu Canyon, Nankai Trough	3,800	seep	(3)
<i>C. kaikoi</i>	<i>Abyssogena</i>	AB110761	Dai-san Tenryu Canyon, Nankai Trough	3,800	seep	(3)
<i>C. kaikoi</i>	<i>Abyssogena</i>	AB110762	Dai-san Tenryu Canyon, Nankai Trough	3,800	seep	(3)
<i>C. kaikoi</i>	<i>Abyssogena</i>	AB110763	Off Muroto, Nankai Trough	4,800	seep	(3)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF114398	Edge Site, Aleutian Trench	4,947	seep	(8)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF114399	Shumagin Site, Aleutian Trench	3,550	seep	(8)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF114400	Shumagin Site, Aleutian Trench	3,550	seep	(8)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF008282	Japan Trench	6,370	seep	(7)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF008283	Japan Trench	6,370	seep	(7)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AF008284	Japan Trench	6,370	seep	(7)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AB110764	Kuril Trench	4,700–6,200	seep	(3)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AB110765	Kuril Trench	4,700–6,200	seep	(3)
<i>C. phaseoliformis</i>	<i>Abyssogena</i>	AB479088	Kuril Trench	4,819	seep	(6)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143290	Heceta Bank, Oregon	500	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143291	Heceta Bank, Oregon	500	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143292	Eel River, California	512	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143293	Eel River, California	512	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143294	Eel River, California	512	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143295	Eel River, California	512	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143296	Clam Field, Monterey Bay, California	912	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143297	Clam Field, Monterey Bay, California	912	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143298	Clam Field, Monterey Bay, California	912	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143299	Clam Field, Monterey Bay, California	912	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143300	Mt. Crushmore, Monterey Bay, California	650	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143301	Mt. Crushmore, Monterey Bay, California	650	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143302	Mt. Crushmore, Monterey Bay, California	650	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143303	Mt. Crushmore, Monterey Bay, California	650	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AY143304	Invert Cliff, Monterey Bay, California	1,000	seep	(2)
<i>C. pacifica</i>	<i>Calyptogena</i>	AF114393	Monterey Canyon	635	seep	(8)
<i>C. pacifica</i>	<i>Calyptogena</i>	AF114394	Monterey Canyon	600	seep	(8)
<i>C. pacifica</i>	<i>Calyptogena</i>	AF008287	Monterey Canyon	600	seep	(7)
<i>C. elongata</i>	<i>Ectenagena</i>	AF008273	Santa Barbara Channel	500	seep	(7)
<i>C. elongata</i>	<i>Ectenagena</i>	AF008274	Santa Barbara Channel	500	seep	(7)
<i>C. elongata</i>	<i>Ectenagena</i>	AF008275	Santa Barbara Channel	500	seep	(7)
<i>C. elongata</i>	<i>Ectenagena</i>	AF008276	Santa Barbara Channel	500	seep	(7)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141296	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141297	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141298	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141299	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141300	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF141301	Santa Catalina Basin	1,240	whale carcass	(1)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF008261	Guyamas Basin	2,019	vent	(7)
<i>Vesicomya gigas</i>	<i>Archivesica</i>	AF008264	Guyamas Basin	2,000	vent	(7)
<i>C. kawamurai</i>	<i>Akebiconcha</i>	AB191400	Minami Ensei Knoll, Okinawa Trough	640–710	vent	(4)
<i>C. kawamurai</i>	<i>Akebiconcha</i>	AB479089	Suruga Bay & Nankai Trough & Okinawa Trough	300–900	vent & seep	(6)

