

# ERRATA

Taxonomy of Deep-Sea  
Trachyleberidid,  
Thaerocytherid, and  
Hemicytherid Genera  
(Ostracoda)

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# Errata

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The following corrections are announced by the authors of Smithsonian Contributions to Paleobiology, No. 96, *Taxonomy of Deep-Sea Trachyleberidid, Thaerocytherid, and Hemicytherid Genera (Ostracoda)*.

1. The catalog numbers of USNM 607200, USNM 607202, and USNM 607203 are erroneous and should be replaced by ZMH K-42870. These three specimens were deposited with the single catalog number of ZMH K-42870 in the Crustacean collection of the Zoologisches Museum Hamburg, University of Hamburg, Germany.
2. The size of USNM 607223 *Protocythere sulcatoperforata* (Brady, 1880) noted in Figure 9M, N, Figure 10N, P, and in Table 1 is erroneous. The images in Figures 9M, N and 10N, P and the dimension given in Table 1 are erroneously 125% larger than actual size. In addition, this specimen is probably an A-1 juvenile instead of adult.

Following this page are seven corrected pages that replace the corresponding incorrect pages in the originally published online version of record (VoR) for Smithsonian Contributions to Paleobiology, No. 96, found here:  
<http://opensi.si.edu/index.php/smithsonian/catalog/book/83>

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*Poseidonamicus*, *Bradleya*). Because of the seeming ease with which many features of ornament can change, we have placed greater weight on muscle scar features for delimiting genera. This emphasis has been traditional in the taxonomy of trachyleberidids and allied groups, although opinions have differed somewhat about its merit (Pokorný, 1964a; Hazel, 1967). Nevertheless, it is clear that no single character or suite of characters will suffice for reliable taxonomy, and even with our emphasis on muscle scars, we still employ features from all aspects of the carapace form.

We present here a taxonomic framework for deep-sea Trachyleberididae, Thaerocytheridae, and Hemicytheridae. Soft anatomy has been useful in resolving taxonomic difficulties in ostracods (e.g., Jellinek and Swanson, 2003 and Brandão, 2008, 2010 for deep-sea ostracods), and molecular approaches have helped resolve relationships among cytheroid families (Yamaguchi, 2003; Yamaguchi and Endo, 2003). Although we would not be able to incorporate molecular or anatomic information directly for many of the species that we consider here because they are extinct, integrating these species into a broader phylogenetic framework would provide a firmer basis for the taxonomy of even fossil members of this group. Such an integrated phylogenetic analysis, although clearly desirable, is not yet feasible given the state of the knowledge of this group. Accordingly, we

emphasize here the documentation of morphological features so that they may be fruitfully incorporated into future efforts. We also present numerous high-resolution images; for some taxa, these images represent the first published documentation of internal, hinge, and muscle scar features.

#### SAMPLE DETAILS AND ABBREVIATIONS

Core samples are specified by standard Ocean Drilling Program (ODP) notation (core/section/interval) or depth interval in centimeters. All specimens with a USNM number were digitally imaged uncoated in low-vacuum mode with a Philips XL-30 environmental scanning electron microscope (SEM) with LaB6 electron source. Additional SEM images were provided by ostracod experts, including M. A. Ayress, E. K. Kempf, and I. Mazzini. Figured specimens were deposited in the National Museum of Natural History (Washington, D.C., catalog numbers USNM 607201, USNM 607204–USNM 607866, and USNM 608273) unless they were already deposited elsewhere. Both formal catalog numbers and Yasuhara's personal catalog numbers are shown. Localities of specimens used for the current study are shown in Figures 1–4. Figure 5 summarizes the morphological characters and their terminology. Detailed information about the specimens

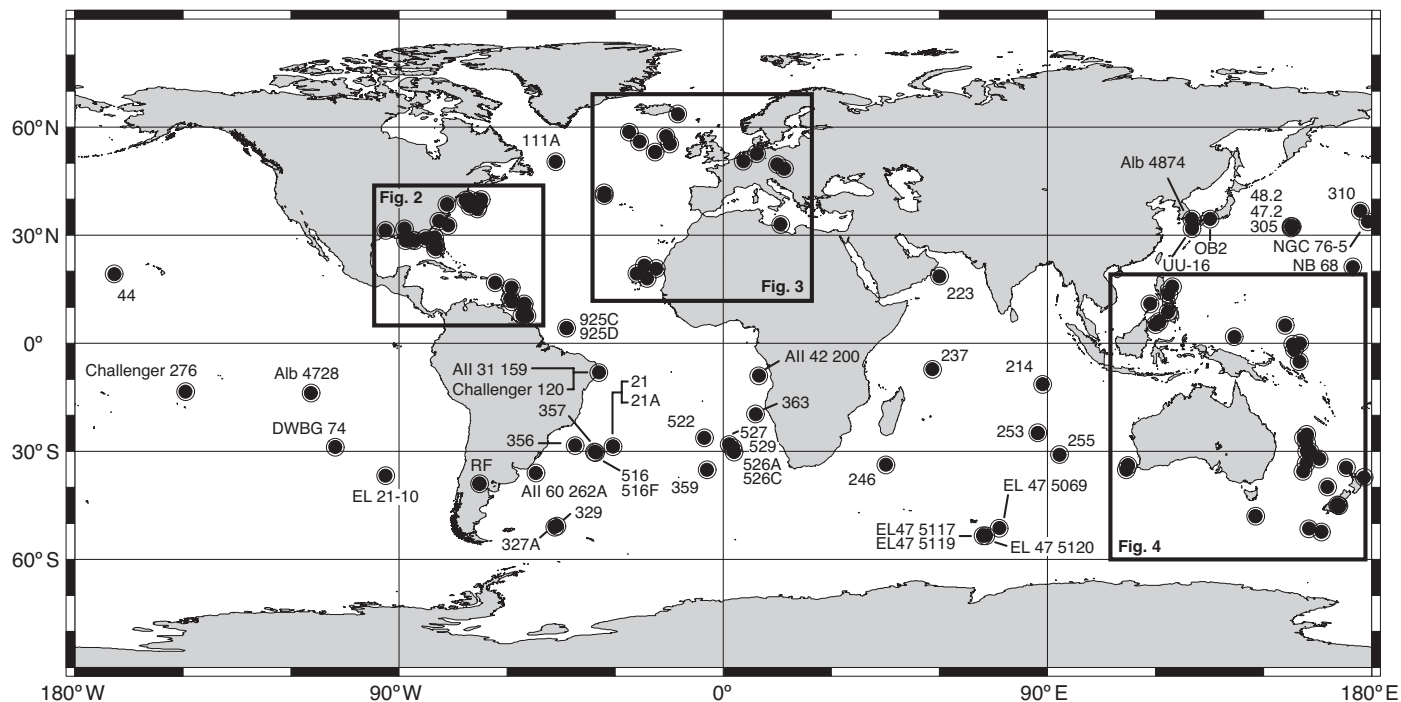


FIGURE 1. Map showing locations of samples included in the present study. For Ocean Drilling Program and Deep Sea Drilling Project sites, only numeric station codes are shown. Some locality names are sampling stations of the following oceanographic research vessels: *Albatross* (Alb), *Atlantis II* (All), *Eltanin* (EL), and *Knorr* (KN). Woods Hole Oceanographic Institution (WHOI) samples were collected as a part of the U.S. Geological Survey/WHOI Continental Margin (CONMAR) Program. RF, Rocca Formation. See Appendix (Table A1) for detailed locality information. The map was created using Ocean Data View (<http://odv.awi.de/>).

TABLE 1. List of specimens used for the present study, with dimensions provided for selected specimens.

Catalog No.	MY No. <sup>a</sup>	Species	Length <sup>b</sup> (mm)	Height <sup>b</sup> (mm)	T <sup>a</sup>	V <sup>a</sup>	Instar <sup>a</sup>	Sex <sup>a</sup>	Region <sup>c</sup>	Age	WD <sup>a</sup>		Figure
											(m)	Part	
ZMH K-42870	TRA1109	<i>Trachyleberis scabrocuneata</i>	0.905	0.469		R	A	F	JP	Holocene	21.91	6	A
USNM 607201	TRA1113	<i>Trachyleberis scabrocuneata</i>	—	—		R	A	F	JP	Holocene	21.91	6	B, E-F, I
ZMH K-42870	TRA1110	<i>Trachyleberis scabrocuneata</i>	0.981	0.472		L	A	M	JP	Holocene	21.91	6	C
ZMH K-42870	TRA1112	<i>Trachyleberis scabrocuneata</i>	—	—		L	A	F	JP	Holocene	21.91	6	D, G-H
USNM 607204	TRA219	<i>Abrocycthereis malaysiana</i>	0.883	0.524		L	A	?	NWP	Modern	900	7	A-B
USNM 607205	TRA220	<i>Abrocycthereis malaysiana</i>	0.872	0.513		R	A	?	NWP	Modern	900	7	C-D
USNM 607206	RB314	<i>Abyssocythere atlantica</i>	1.043	0.652		L	A	?	NWA	Modern	3865	7	E
USNM 607207	RB315	<i>Abyssocythere atlantica</i>	1.056	0.569		R	A	?	NWA	Modern	3865	7	F-G
USNM 607208	RB317	<i>Abyssocythere atlantica</i>	1.020	0.589		R	A	?	NWA	Modern	3865	7	H-I
USNM 607209	RB316	<i>Abyssocythere atlantica</i>	1.070	0.695		L	A	?	NWA	Modern	3865	7	J
USNM 607210	RB330	<i>Abyssocythere atlantica</i>	—	—		L	A	?	NWA	Modern	4425	7	K
USNM 607211	RB331	<i>Abyssocythere atlantica</i>	—	—		R	A	?	NWA	Modern	4425	7	L
USNM 607212	TRA121	<i>Abyssocythere diagenona</i>	0.971	0.573		L	A	?	SEA	Late Eocene	1054	7	M-N
USNM 607213	TRA122	<i>Abyssocythere diagenona</i>	0.903	0.551		L	A	?	SEA	Late Eocene	1054	7	O
USNM 607214	TRA123	<i>Abyssocythere diagenona</i>	0.948	0.521		R	A	?	SEA	Late Eocene	1054	7	P-Q
USNM 607215	TRA236	<i>Abyssocythere diagenona</i>	1.047	0.551		R	A	?	SEA	Early Oligocene	4441	7	R-S
USNM 607216	TRA762	<i>Abyssocythere scotti</i>	0.919	0.533	P	L	A	?	SWA	Late Campanian	2400	7	T-U
USNM 607217	TRA309	<i>Abyssocythere scotti</i>	0.872	0.457	P	R	A	?	SWA	Late Miocene	1519	9	A-B
USNM 607218	TRA312	<i>Abyssocythere scotti</i>	0.938	0.579	P	L	A	?	SWA	Late Miocene	1519	9	C-D
USNM 607219	TRA747	<i>Abyssocythere scotti</i>	0.846	0.457	H	R	A	?	SWA	Maastrichtian	2400	9	E-F
USNM 607220	RB186	<i>Protocythere vitjasi</i>	1.463	0.928		L	A	?	NWP	Pliocene	2903	9	G-H
USNM 607221	RB187	<i>Protocythere vitjasi</i>	1.386	0.819		R	A	?	NWP	Pliocene	2903	9	I-J
USNM 607222	GSM244	<i>Protocythere sulcatoperforata</i>	1.363	0.774		R	A	?	NWA	Pliocene	4940	9	K-L
USNM 607223	USGSD149	<i>Protocythere sulcatoperforata</i>	1.118	0.777		L	A-1?	?	NA	Late Pliocene	3427	9	M-N
USNM 607224	TRA854	<i>Acanthocythereis araneosa</i>	0.799	0.405		L	A	M	NAM	Eocene	OC	12	A-B
USNM 607225	TRA856	<i>Acanthocythereis araneosa</i>	0.767	0.391		R	A	M	NAM	Eocene	OC	12	C-D
USNM 607226	TRA861	<i>Acanthocythereis araneosa</i>	0.763	0.455		L	A	F	NAM	Eocene	OC	12	E
USNM 607227	TRA862	<i>Acanthocythereis araneosa</i>	0.718	0.394		R	A	F	NAM	Eocene	OC	12	F-G
USNM 607228	TRA858	<i>Acanthocythereis cf. araneosa</i>	0.633	0.337		L	A	?	NAM	Eocene	OC	12	H
USNM 607229	TRA859	<i>Acanthocythereis cf. araneosa</i>	0.612	0.335		R	A	?	NAM	Eocene	OC	12	I
USNM 607230	TRA860	<i>Acanthocythereis cf. araneosa</i>	—	—		R	A	?	NAM	Eocene	OC	12	J
USNM 607231	TRA855	<i>Acanthocythereis stenzeli</i>	0.692	0.405		L	A	?	NAM	Eocene	OC	12	K
USNM 607232	TRA857	<i>Acanthocythereis stenzeli</i>	0.708	0.390		R	A	?	NAM	Eocene	OC	12	L-M
USNM 607233	TRA842	<i>Actinocythereis exanthemata</i>	0.875	0.464		L	A	F	NAM	Miocene	OC	12	N-O
USNM 607234	TRA841	<i>Actinocythereis exanthemata</i>	0.904	0.432		L	A	M	NAM	Miocene	OC	12	P
USNM 607235	TRA843	<i>Actinocythereis exanthemata</i>	0.892	0.472		L	A	F	NAM	Miocene	OC	12	Q
USNM 607236	TRA844	<i>Actinocythereis exanthemata</i>	0.881	0.449		R	A	F	NAM	Miocene	OC	12	R-S
USNM 607237	TRA845	<i>Actinocythereis exanthemata</i>	0.845	0.432		R	A	F	NAM	Miocene	OC	12	T

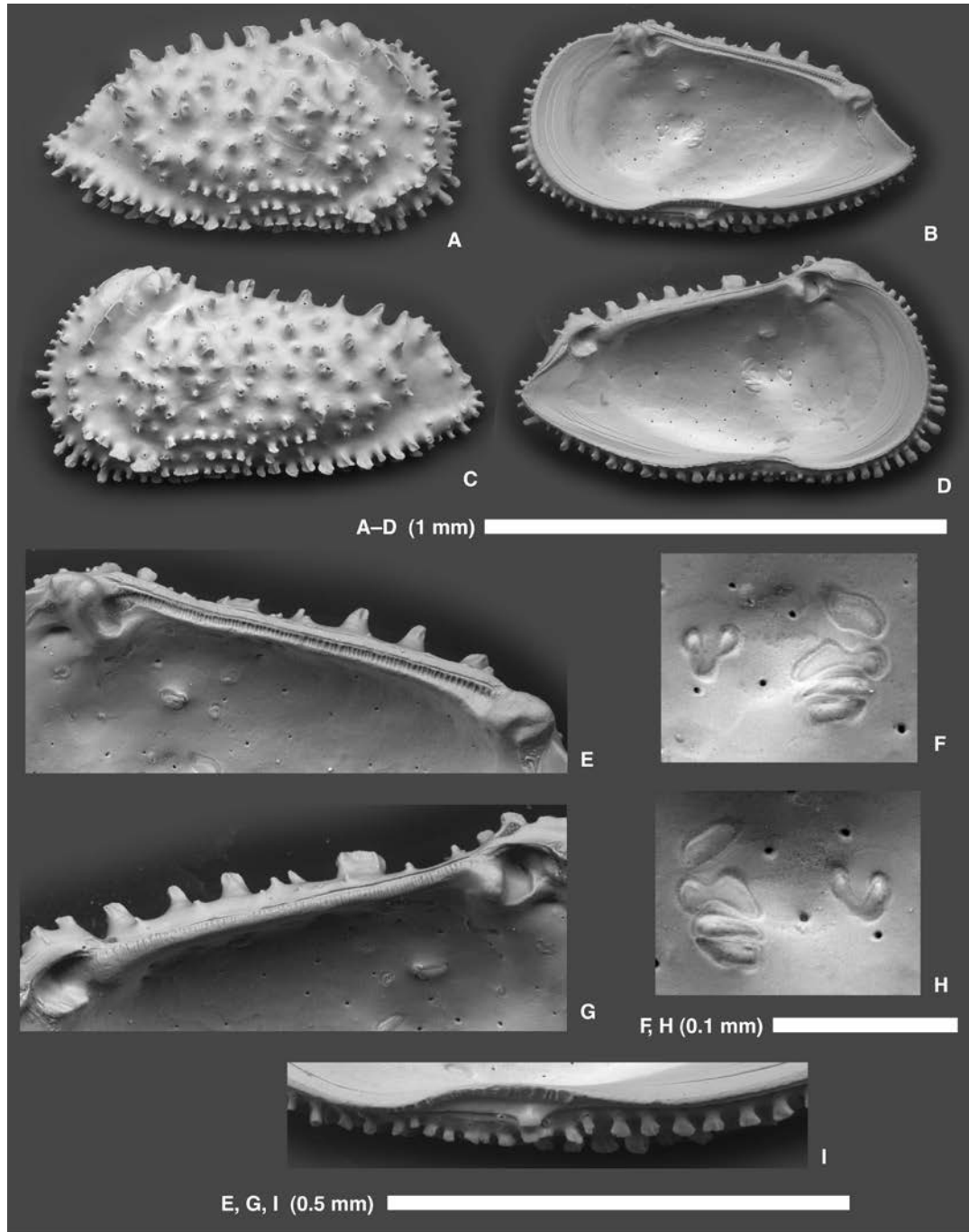


FIGURE 6. Scanning electron microscope images of *Trachyleberis scabrocuneata* (Brady, 1880). All specimens are from OB2, Holocene, Osaka Bay (Japan). A, C, lateral views; B, D–I, internal views. A, TRA1109 (ZMH K-42870), adult RV. B, TRA1113 (USNM 607201), adult RV. C, TRA1110 (ZMH K-42870), adult LV. D, TRA1112 (ZMH K-42870), adult LV. E–I, internal details. E, TRA1113 (USNM 607201), adult RV, hingement. F, TRA1113 (USNM 607201), adult RV, subcentral muscle scars. G, TRA1112 (ZMH K-42870), adult LV, hingement. H, TRA1112 (ZMH K-42870), adult LV, subcentral muscle scars. I, TRA1113 (USNM 607201), adult RV, ventromarginal area showing snap-knob structure. Scale bars represent 1 mm for A–D, 0.1 mm for F and H, and 0.5 mm for E, G, and I.

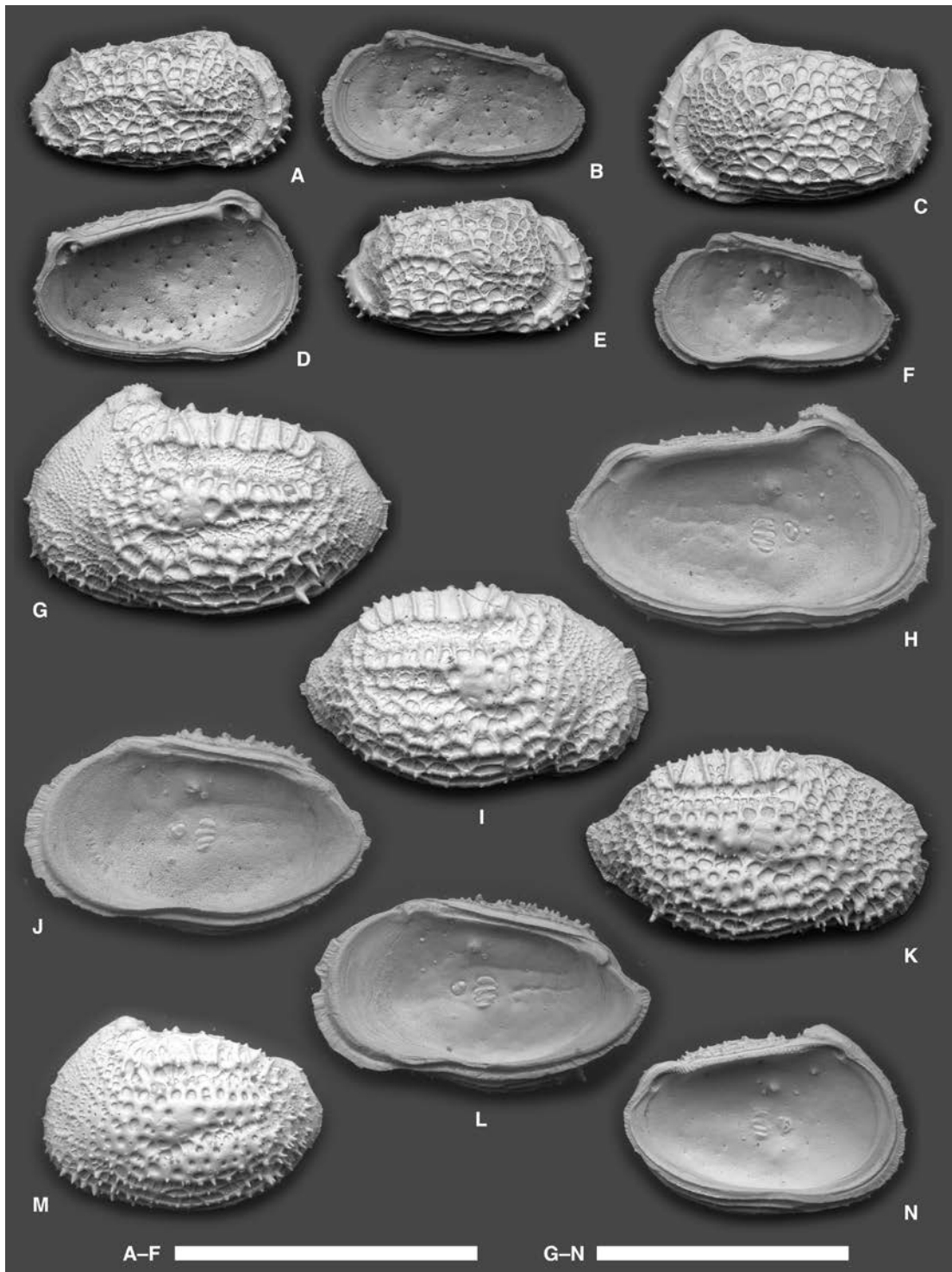


FIGURE 9. Scanning electron microscope images of *Abyssocythere scotti* sp. nov., *Protocythere vitjasi* (Schornikov, 1975), and *Protocythere sulcatoperforata* (Brady, 1880). A, C, E, G, I, K, M, lateral views; B, D, F, H, J, L, N, internal views. A–F, *Abyssocythere scotti* sp. nov. A–B, TRA309 (USNM 607217), adult RV from DSDP 329, 5/6/80–88, late Miocene, southwestern Atlantic. C–D, TRA312 (USNM 607218), adult LV from DSDP 329, 5/6/80–88, late Miocene, southwestern Atlantic. E–F, TRA747 (USNM 607219), adult RV from DSDP 327A, 12/3/50–55, Maastrichtian, southwestern Atlantic. G–J, *Protocythere vitjasi* (Schornikov, 1975). G–H, RB186 (USNM 607220), adult LV from DSDP 305, 3/2/50–56, Pliocene, northwestern Pacific. I–J, RB187 (USNM 607221), adult RV from DSDP 305, 3/2/50–56, Pliocene, northwestern Pacific. K–N, *Protocythere sulcatoperforata* (Brady, 1880). K–L, GSM244 (USNM 607222), adult RV from DSDP 541, 14/4/36, Pliocene, northwestern Atlantic. M–N, USGSD149 (USNM 607223), A-1? LV from DSDP 607, 14/5/17–19, late Pliocene, North Atlantic. Scale bars represent 1 mm.

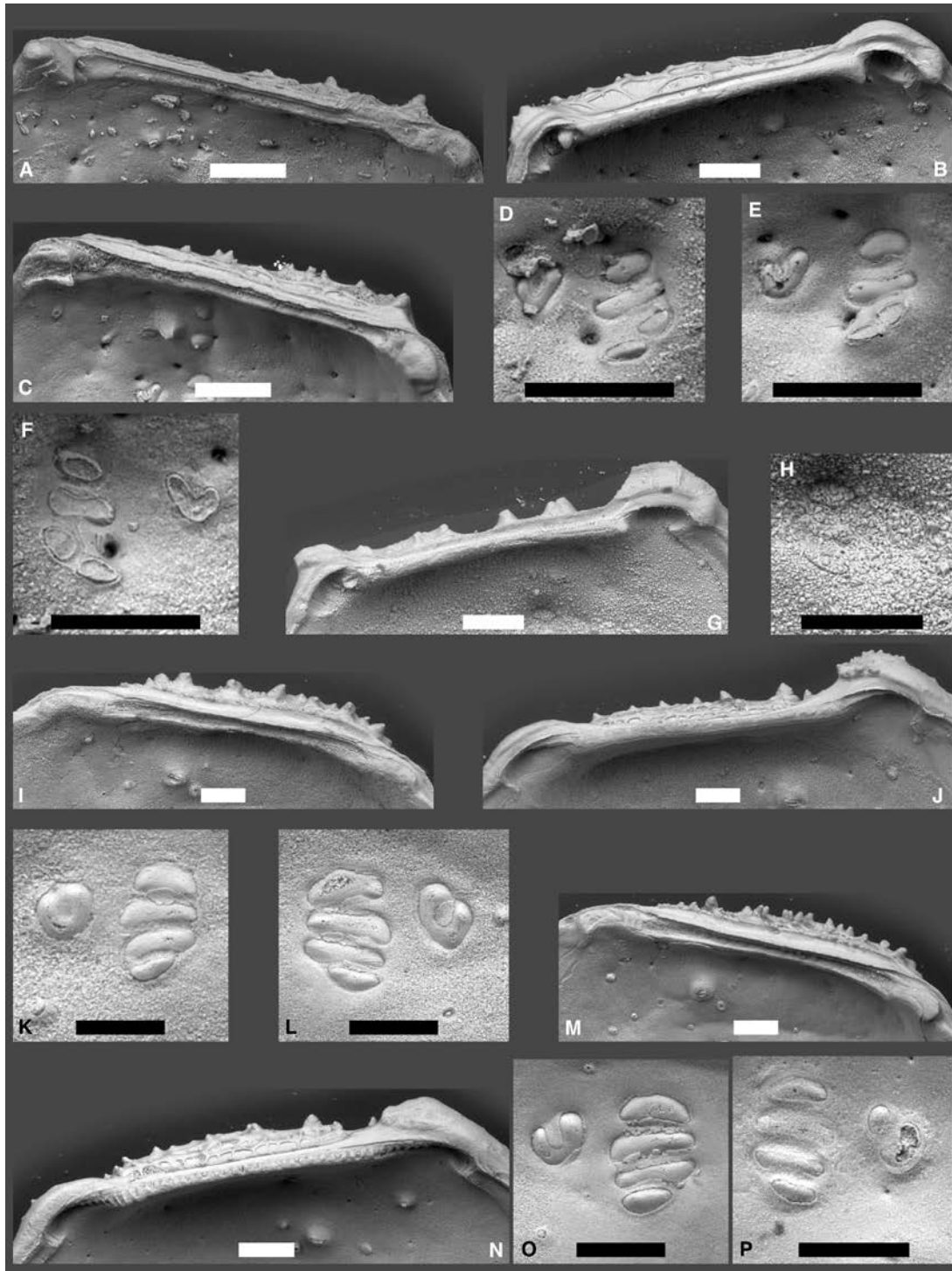


FIGURE 10. Internal details of *Abyssocythere scotti* sp. nov., *Abyssocythere* sp. 1, *Protocythere vitjasi* (Schornikov, 1975), and *Protocythere sulcatoperforata* (Brady, 1880). A–F, *Abyssocythere scotti* sp. nov. A, TRA309 (USNM 607217), adult RV, hingement. B, TRA312 (USNM 607218), adult LV, hingement. C, TRA747 (USNM 607219), adult RV, hingement. D, TRA309 (USNM 607217), adult RV, subcentral muscle scars. E, TRA747 (USNM 607219), adult RV, subcentral muscle scars. F, TRA312 (USNM 607218), adult LV, subcentral muscle scars. G–H, *Abyssocythere* sp. 1, TRA651 (USNM 607723), adult LV. G, hingement. H, subcentral muscle scars. I–L, *Protocythere vitjasi* (Schornikov, 1975). I, RB187 (USNM 607221), adult RV, hingement. J, RB186 (USNM 607220), adult LV, hingement. K, RB187 (USNM 607221), adult RV, subcentral muscle scars. L, RB186 (USNM 607220), adult LV, subcentral muscle scars. M–P, *Protocythere sulcatoperforata* (Brady, 1880). M, GSM244 (USNM 607222), adult RV, hingement. N, USGSD149 (USNM 607223), A-1? LV, hingement. O, GSM244 (USNM 607222), adult RV, subcentral muscle scars. P, USGSD149 (USNM 607223), A-1? LV, subcentral muscle scars. Scale bars represent 0.1 mm.

TABLE A1. Detailed information for the specimens used in the present study.

Catalog No.	MY No. <sup>a</sup>	Species	T <sup>a</sup>	V <sup>a</sup>	Instar <sup>a</sup>	Sex <sup>a</sup>	Region <sup>b</sup>	Locality code <sup>c</sup>	Section <sup>a,d</sup>	Age <sup>a</sup>	Lat <sup>a</sup> (deg)	Long <sup>a</sup> (deg)	WD <sup>a</sup> (m)	Figure No.	Part
ZMH K-42870	TRA1109	<i>Trachyleberis scabrocostata</i>	R		A	F	JP	OB2	106	Holocene	34.597	135.158	21.91	6	A
USNM 607201	TRA1113	<i>Trachyleberis scabrocostata</i>	R		A	F	JP	OB2	106	Holocene	34.597	135.158	21.91	6	B, E-E,I
ZMH K-42870	TRA1110	<i>Trachyleberis scabrocostata</i>	L		A	M	JP	OB2	106	Holocene	34.597	135.158	21.91	6	C
ZMH K-42870	TRA1112	<i>Trachyleberis scabrocostata</i>	L		A	F	JP	OB2	106	Holocene	34.597	135.158	21.91	6	D, G-H
USNM 607204	TRA219	<i>Abrocythereis malaysiana</i>	L		A	?	NWP	Alb 5469	Modern	Modern	13.733	123.700	900	7	A-B
USNM 607205	TRA220	<i>Abrocythereis malaysiana</i>	R		A	?	NWP	Alb 5469	Modern	Modern	13.733	123.700	900	8	B, E
USNM 607206	RB314	<i>Abyssocythere atlantica</i>	L		A	?	NWA	KN 25 sta 291	Modern	Modern	10.102	-55.233	3865	7	E
USNM 607207	RB315	<i>Abyssocythere atlantica</i>	R		A	?	NWA	KN 25 sta 291	Modern	Modern	10.102	-55.233	3865	7	F-G
USNM 607208	RB317	<i>Abyssocythere atlantica</i>	R		A	?	NWA	KN 25 sta 291	Modern	Modern	10.102	-55.233	3865	8	F, I
USNM 607209	RB316	<i>Abyssocythere atlantica</i>	L		A	?	NWA	KN 25 sta 291	Modern	Modern	10.102	-55.233	3865	8	H, J
USNM 607210	RB330	<i>Abyssocythere atlantica</i>	L		A	?	NWA	KN 25 sta 288	Modern	Modern	11.037	-55.092	4425	7	K
USNM 607211	RB331	<i>Abyssocythere atlantica</i>	R		A	?	NWA	KN 25 sta 288	Modern	Modern	11.037	-55.092	4425	8	G, K
USNM 607212	TRA121	<i>Abyssocythere diagenona</i>	L		A	?	SEA	DSDP 526C	7/1/79-86	Late Eocene	-30.123	3.138	1054	7	L
USNM 607213	TRA122	<i>Abyssocythere diagenona</i>	L		A	?	SEA	DSDP 526C	7/1/79-86	Late Eocene	-30.123	3.138	1054	8	M, Q
USNM 607214	TRA123	<i>Abyssocythere diagenona</i>	R		A	?	SEA	DSDP 526C	7/1/79-86	Late Eocene	-30.123	3.138	1054	7	O
USNM 607215	TRA236	<i>Abyssocythere diagenona</i>	R		A	?	SEA	DSDP 522	34/1/	Early	-26.114	-5.130	4441	8	P-Q
USNM 607216	TRA762	<i>Abyssocythere scotti</i>	P	L	A	?	SWA	DSDP 327A	113-120	Oligocene	-50.871	-46.784	2400	7	L, O
USNM 607217	TRA309	<i>Abyssocythere scotti</i>	P	R	A	?	SWA	DSDP 329	100-105	Campanian	-50.655	-46.096	1519	9	R-S
USNM 607218	TRA312	<i>Abyssocythere scotti</i>	P	L	A	?	SWA	DSDP 329	5/6/80-88	Late	-50.655	-46.096	1519	10	A, D
USNM 607219	TRA747	<i>Abyssocythere scotti</i>	H	R	A	?	SWA	DSDP 327A	12/3/	Maastrichtian	-50.871	-46.784	2400	9	C-D
USNM 607220	RB186	<i>Protocythere vitjasi</i>	L		A	?	NWP	DSDP 305	3/2/50-56	Pliocene	32.002	157.850	2903	10	B, F
USNM 607221	RB187	<i>Protocythere vitjasi</i>	R		A	?	NWP	DSDP 305	3/2/50-56	Pliocene	32.002	157.850	2903	9	E-F
									50-55				10	C, E	
													9	G-H	
													10	J, L	
													9	I-J	
													10	I, K	



USNM 607222	GSM244	<i>Protocythere sulcatoperforata</i>	R	A	?	NWA	DSDP 541	14/4/36	Pliocene	15,520	-58,728	4940	9	K-L
USNM 607223	USGSD149	<i>Protocythere sulcatoperforata</i>	L	A-1?	?	NA	DSDP 607	14/5/ 17-19	Late Pliocene	41,001	-32,957	3427	10	M, O
USNM 607224	TRA854	<i>Acanthocythereis araneosa</i>	L	A	M	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	M-N
USNM 607225	TRA856	<i>Acanthocythereis araneosa</i>	R	A	M	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	N, P
USNM 607226	TRA861	<i>Acanthocythereis araneosa</i>	L	A	F	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	A-B
USNM 607227	TRA862	<i>Acanthocythereis araneosa</i>	R	A	F	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	B, F
USNM 607228	TRA858	<i>Acanthocythereis cf. araneosa</i>	L	A	?	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	C-D
USNM 607229	TRA859	<i>Acanthocythereis cf. araneosa</i>	R	A	?	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	A, D, G
USNM 607230	TRA860	<i>Acanthocythereis cf. araneosa</i>	R	A	?	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	E
USNM 607231	TRA855	<i>Acanthocythereis stenzeli</i>	L	A	?	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	F-G
USNM 607232	TRA857	<i>Acanthocythereis stenzeli</i>	R	A	?	NAM	Cook Mountain Formation	Outcrop	Eocene	31,450	-93,750	OC	12	C, E, H
USNM 607233	TRA842	<i>Actinocythereis exanthemata</i>	L	A	F	NAM	Calvert Formation	Outcrop	Miocene	38,600	-76,517	OC	12	I
USNM 607234	TRA841	<i>Actinocythereis exanthemata</i>	L	A	M	NAM	Calvert Formation	Outcrop	Miocene	38,600	-76,517	OC	12	J
USNM 607235	TRA843	<i>Actinocythereis exanthemata</i>	L	A	F	NAM	Calvert Formation	Outcrop	Miocene	38,600	-76,517	OC	12	L-M
USNM 607236	TRA844	<i>Actinocythereis exanthemata</i>	R	A	F	NAM	Calvert Formation	Outcrop	Miocene	38,600	-76,517	OC	12	L-N
USNM 607237	TRA845	<i>Actinocythereis exanthemata</i>	R	A	F	NAM	Calvert Formation	Outcrop	Miocene	38,600	-76,517	OC	12	N-O
USNM 607238	TRA221	<i>Actinocythereis vincyardensis</i>	L	A	M	NWA	Alb 2555	Modern	Modern	39,883	-71,533	244	14	O, S
USNM 607239	TRA222	<i>Actinocythereis vincyardensis</i>	R	A	M	NWA	Alb 2555	Modern	Modern	39,883	-71,533	244	14	P
USNM 607240	TRA223	<i>Actinocythereis vincyardensis</i>	L	A	F	NWA	Alb 2544	Modern	Modern	40,029	-70,400	235	14	Q
USNM 607241	TRA224	<i>Actinocythereis vincyardensis</i>	R	A	F	NWA	Alb 2544	Modern	Modern	40,029	-70,400	235	14	R-S
USNM 607242	TRA903	<i>Actinocythereis purii</i>	R	A	M?	NAM	Cocoa Sand Member	Outcrop	Late Eocene	31,900	-88,400	OC	14	P-R

(continued)