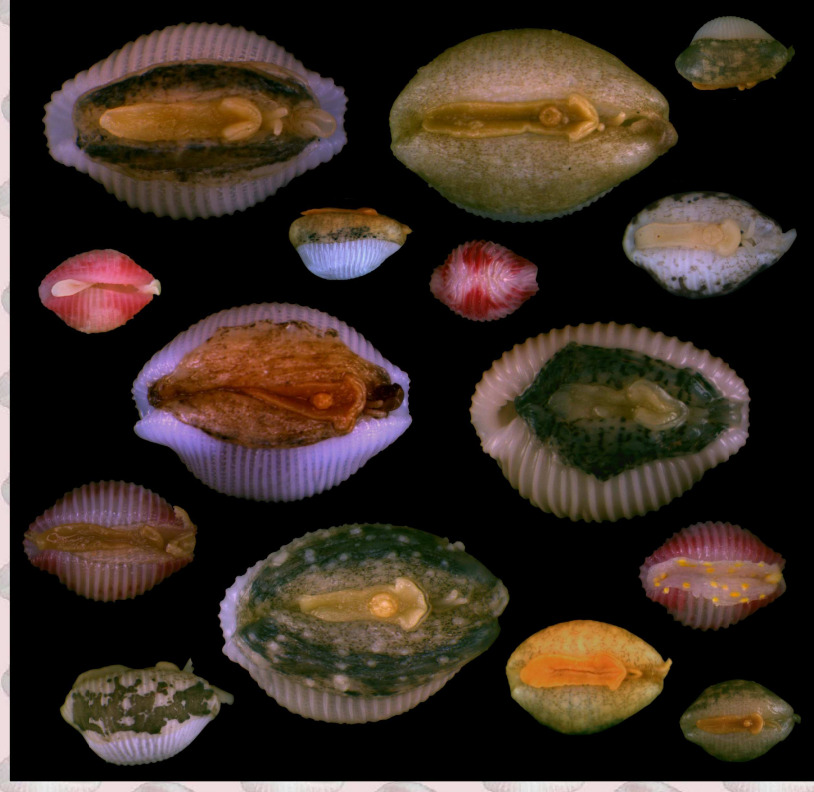


Animals and DNA-Research of TRIVIIDAE (Mollusca: Gastropoda)

Part 1

ALLIED COWRIES

Contribution to the knowledge of Triviidae



Trivid shells and animals of the Florida Museum of Natural History are shown. These specimens will be used for the DNA research on Triviidae.

The first part deals with Triviidae in the collection of the Florida Museum of Natural History, Gainesville, U.S.A. The Triviids are preserved with their animals in ethyl alcohol and were all identified by the senior author on voluntary basis. Several specimens show the mantle, foot and the cephalic tentacles.

All will be used for the DNA research. Herein almost all of the examined specimens are shown by photos. This publication should move the curve between the taxa, their shells and animals as well as the results of the DNA, that will be published in the future.

Almost all Triviidae were described on empty shells only. Therefore, the appearance of animals is usually unknown and living specimens cannot be identified till now.

The aim of this publication is also to give a help to identify those animals. No new descriptions will be given. Therefore, an Online-publication is preferred because it should be available free of charge to anyone.

Descriptions of the mentioned genera are given in Fehse (2002) and Fehse & Grego (2009; 2014). Many species are signed with "cf." because the columella and fossula were covered by the animal. Therefore, the ID is only up to 90% certain.

Animals and DNA-Research of Triviidae – Part 1

(Mollusca: Gastropoda)

ALLIED COWRIES

**Contribution
to the knowledge
of the TRIVIIDAE**

by

Dirk Fehse & Jozef Grego

2019

Impressum

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by

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Niveria pacifica

**Contributions to the knowledge of the Triviidae.
XXXII. Animals and DNA-Research of Triviidae, Part 1.**

(Mollusca: Gastropoda)

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KEYWORDS: TRIVIIDAE, *Niveria*, *Purpurcapsula*, *Pusula*, *Trivia*, *Trivirostra*, animals, DNA-Research.

ABSTRACT

Triviid shells and animals of the Florida Museum of Natural History are shown. These specimens will be used for the DNA research on Triviidae.

INTRODUCTION

The first part deals with Triviidae in the collection of the Florida Museum of Natural History, Gainesville, U.S.A. The Triviids are preserved with their animals in ethyl alcohol and were all identified by the senior author on voluntary basis¹. Several specimens show the mantle, foot and the cephalic tentacles. All will be used for the DNA research. Herein almost all of the examined specimens are shown by photos. This publication should move the curve between the taxa, their shells and animals as well as the results of the DNA, that will be published in the future.

Almost all Triviidae were described on empty shells only. Therefore, the appearance of animals is usually unknown and living specimens cannot be identified till now. The aim of this publication is also to give a help to identify those animals.

No new descriptions will be given. Therefore, an Online-publication is preferred because it should be available free of charge to anyone.

Descriptions of the mentioned genera are given in Fehse (2002) and Fehse & Grego (2009; 2014). Many species are signed with "cf." because the columella and fossula were covered by the animal. Therefore, the ID is only up to 90% certain.

ABBREVIATIONS

UF	–	Florida Museum of Natural History, University of Florida, Gainesville, Florida, U.S.A.
L	–	length
W	–	width
D	–	height
LT	–	labral teeth
CT	–	"columellar teeth" ²

¹ The senior author helped several public collections with the identification of their Eratoidae, Ovulidae, Pediculariidae and Triviidae on voluntary basis.

² In the family Triviidae no columellar teeth are present, with few exceptions in the genus *Triviella* Jousseaume, 1884 because the dorsal ribs are continued over side margins onto the ventrum, parietal lip and columella as well as the fossula. CT means herein the number of ribs that cross the parietal lip.

SYSTEMATIC

Superfamily: **TRIVIOIDEA** Troschel, 1863

Family: **TRIVIIDAE** Troschel, 1863

The higher systematics – the assignment of the genera to subfamilies – of the Triviidae is still fragmentary and has to be clarified by a DNA research. At the moment the Triviidae are assigned to one subfamily – Triviinae Troschel, 1863 – and to three tribes:

Triviellini F.A. Schilder, 1939 ³ :	<i>Prototrivia</i> F.A. Schilder, 1941	1 species
	<i>Triviella</i> Jousseume, 1884	30 species
	<i>Trivellona</i> Iredale, 1931	41 species
	<i>Ellatrivia</i> Iredale, 1931	18 species
Triviini Troschel, 1863:	<i>Semitrivia</i> Cossmann, 1903	4 species
	<i>Trivia</i> Broderip, 1837	39 species
	<i>Niveria</i> Jousseume, 1884	ca. 60 species
	<i>Cleotrivia</i> Iredale, 1930	18 species
	<i>Trivirostra</i> Jousseume, 1884	45 species
	<i>Dolichupis</i> Iredale, 1930	27 species
	<i>Purpurcapsula</i> Fehse & Grego, 2009	7 species
	<i>Pseudopusula</i> Fehse & Grego, 2014	ca. 10 species
	<i>Gregoia</i> Fehse, 2015	17 species
<i>Novatrivia</i> Fehse, 2015	3 species	
Pusulini F.A. Schilder, 1936:	<i>Pusula</i> Jousseume, 1884	26 species
	<i>Quasipusula</i> Fehse & Grego, 2014	1 species

There are at least 350 fossil and recent species known. The similar shaped and related Cypraeidae have a similar diversity but assigned to at least ten subfamilies and 70 genera (Meyer, 2003; Meyer, 2004). Therefore, the Triviidae might be also assigned to several subfamilies and the number of genera will also certainly increased as result of the DNA studies.

³ An extensive referenzlist is given in Fehse, 2002.

Genus: *TRIVIA* Broderip, 1837

Type species: *Cypraea europaea* Montagu, 1808 [= *Cypraea monacha* Da Costa, 1778]; by monotypy.



Fig. 1: *Trivia monacha* (Da Costa, 1778). Collection No. UF479117. Length = 9.2 mm, width = 6.7 mm.

Genus: *TRIVIROSTRA* Jousseaume, 1884

Type species: *Cypraea oryza* Lamarck, 1810; by original designation.

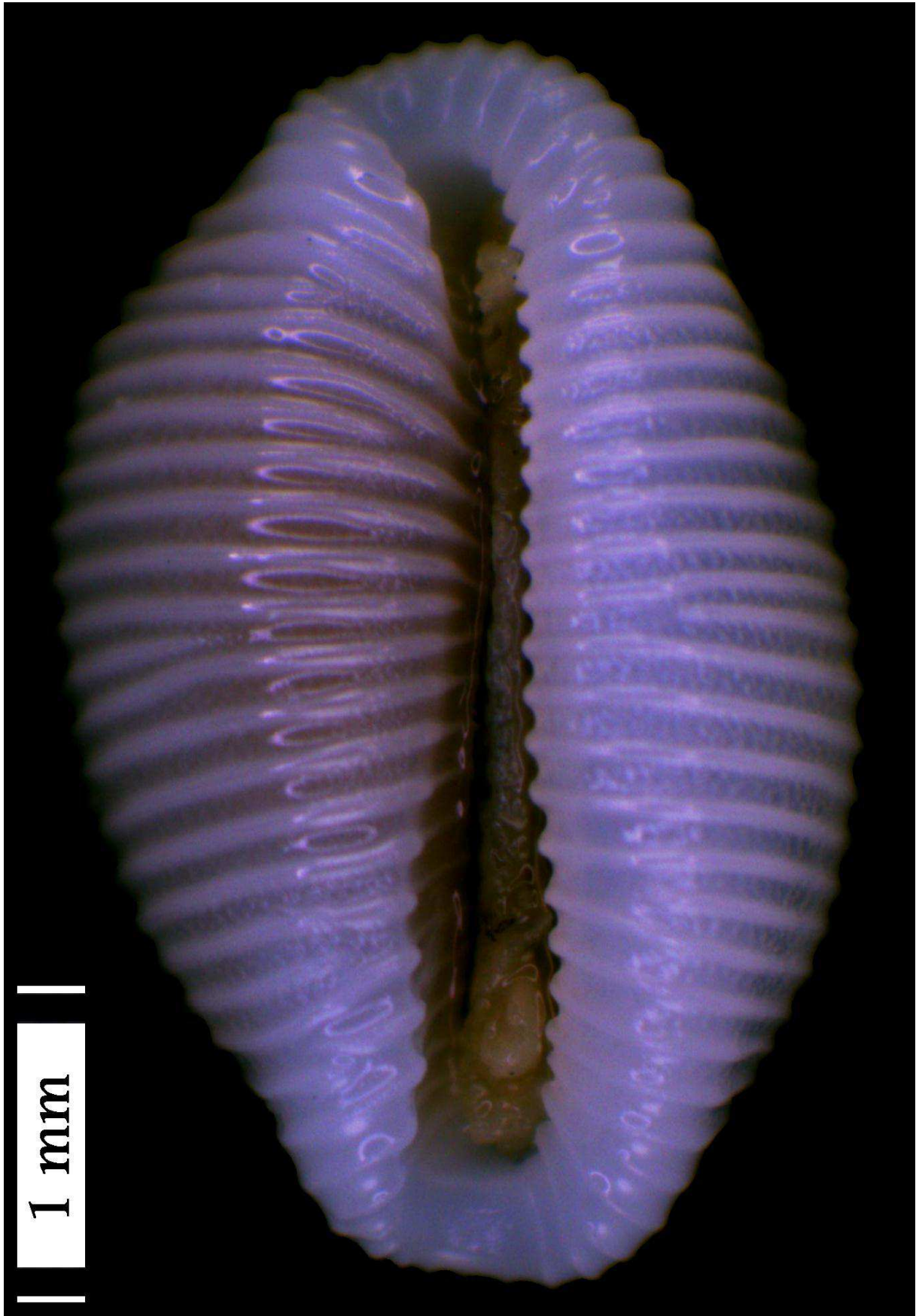


Fig. 2: *Trivirostra matavai* Fehse & Grego, 2013. Collection No. UF289246.

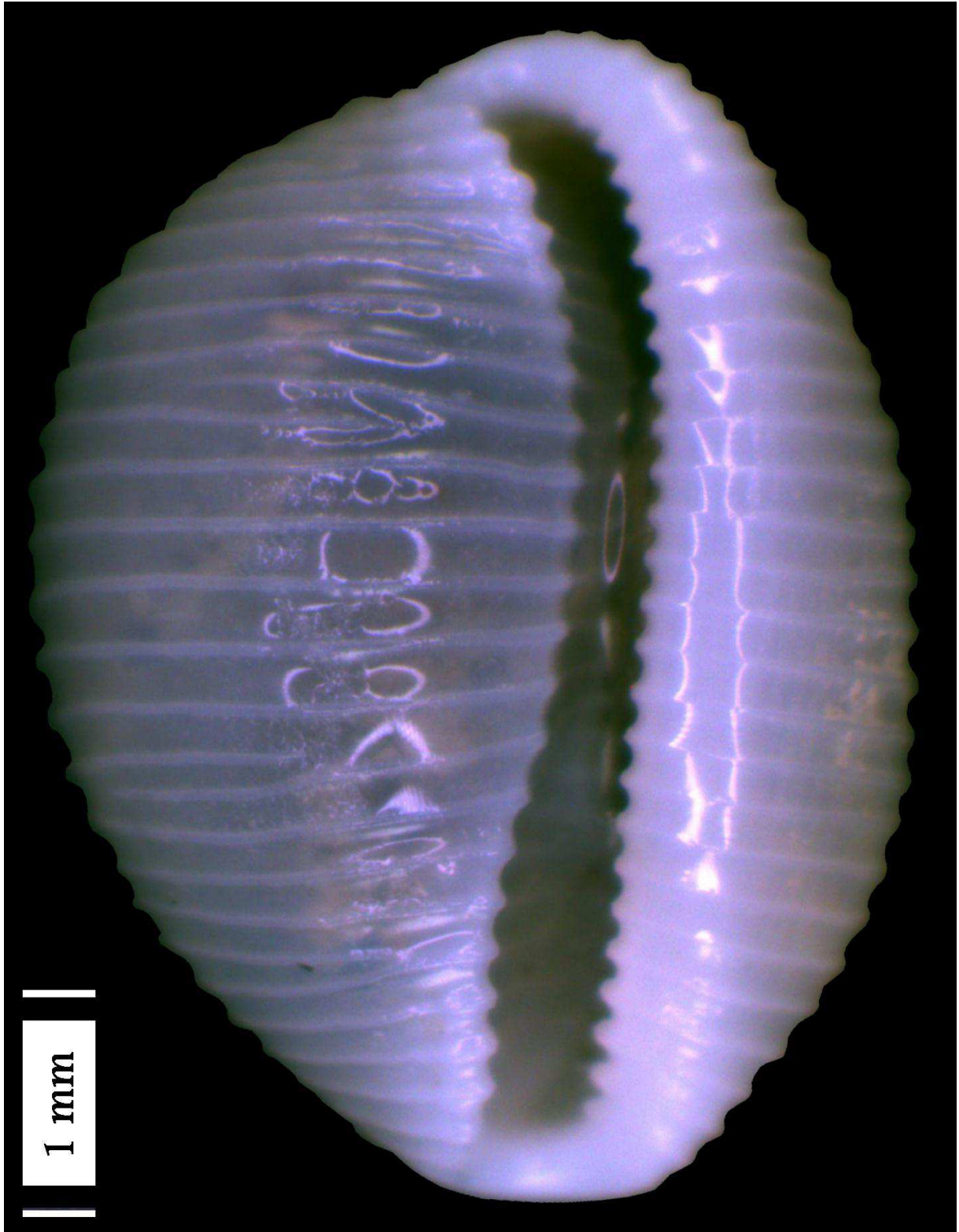


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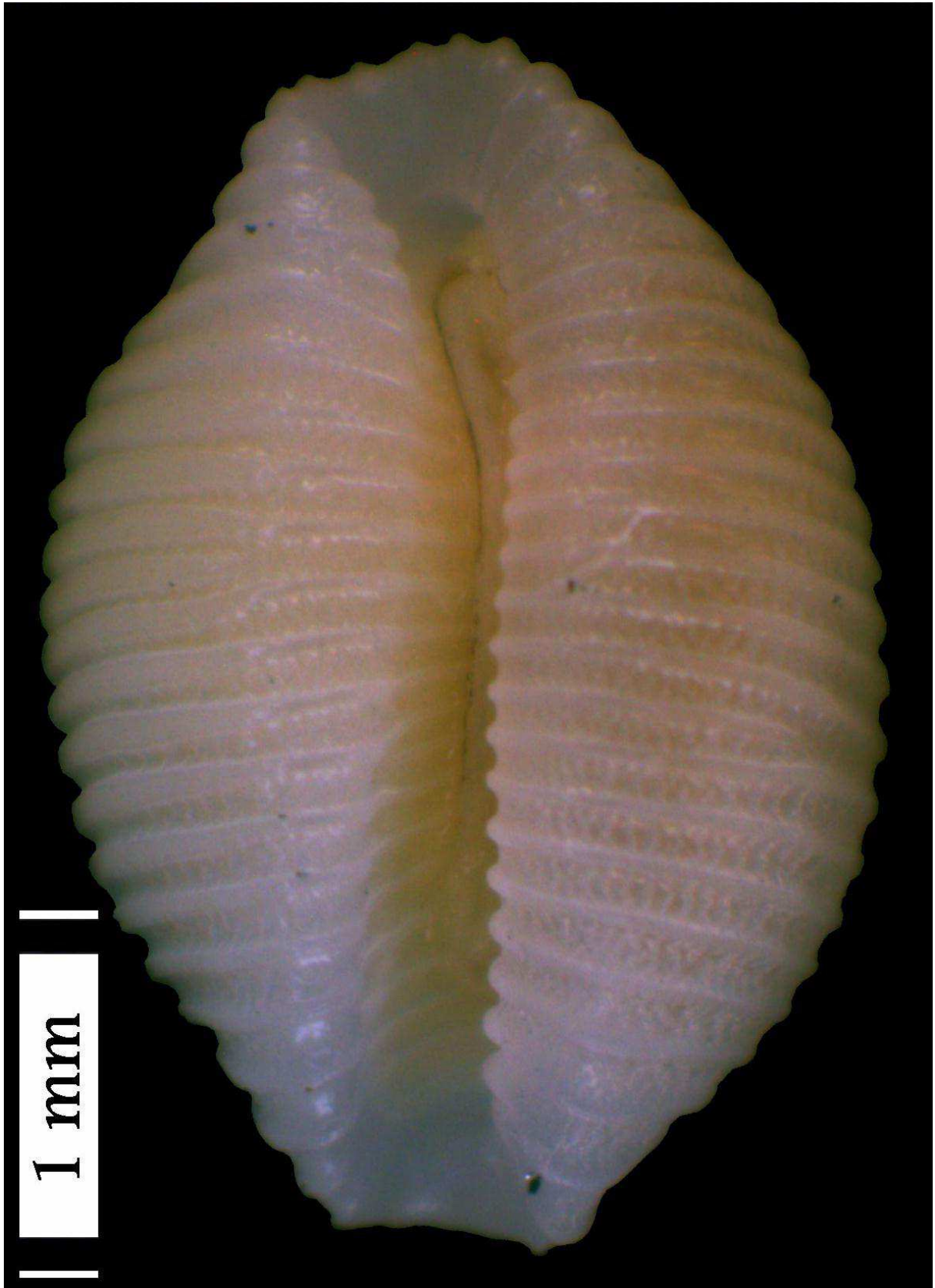


Fig. 4: *Trivirostra edgari* (Shaw, 1909). Collection No. UF290617.

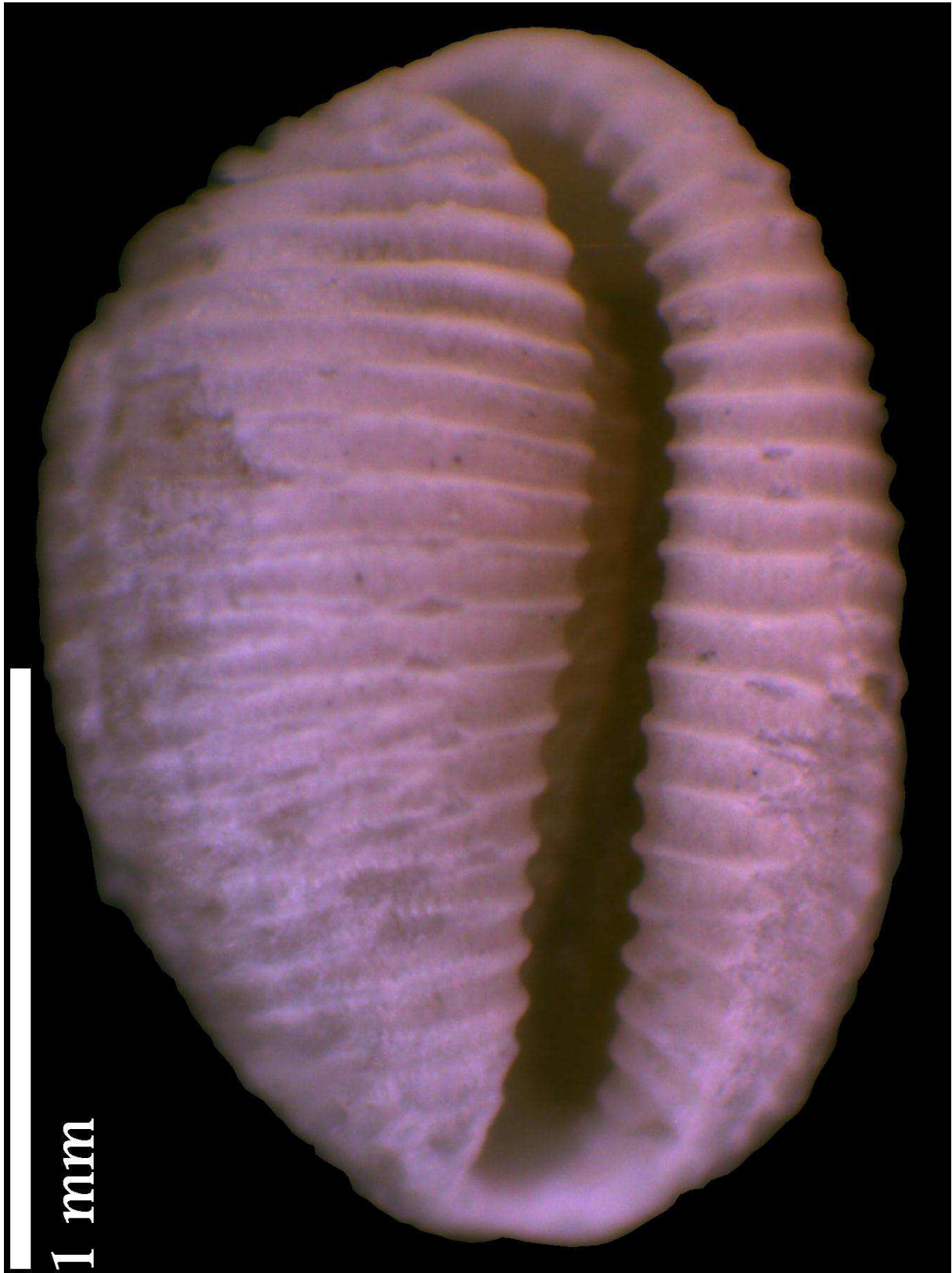


Fig. 5: *Trivirostra thanumi* C.N. Cate, 1979. Collection No. UF290619. Malformed, shell is going to be dissolved.

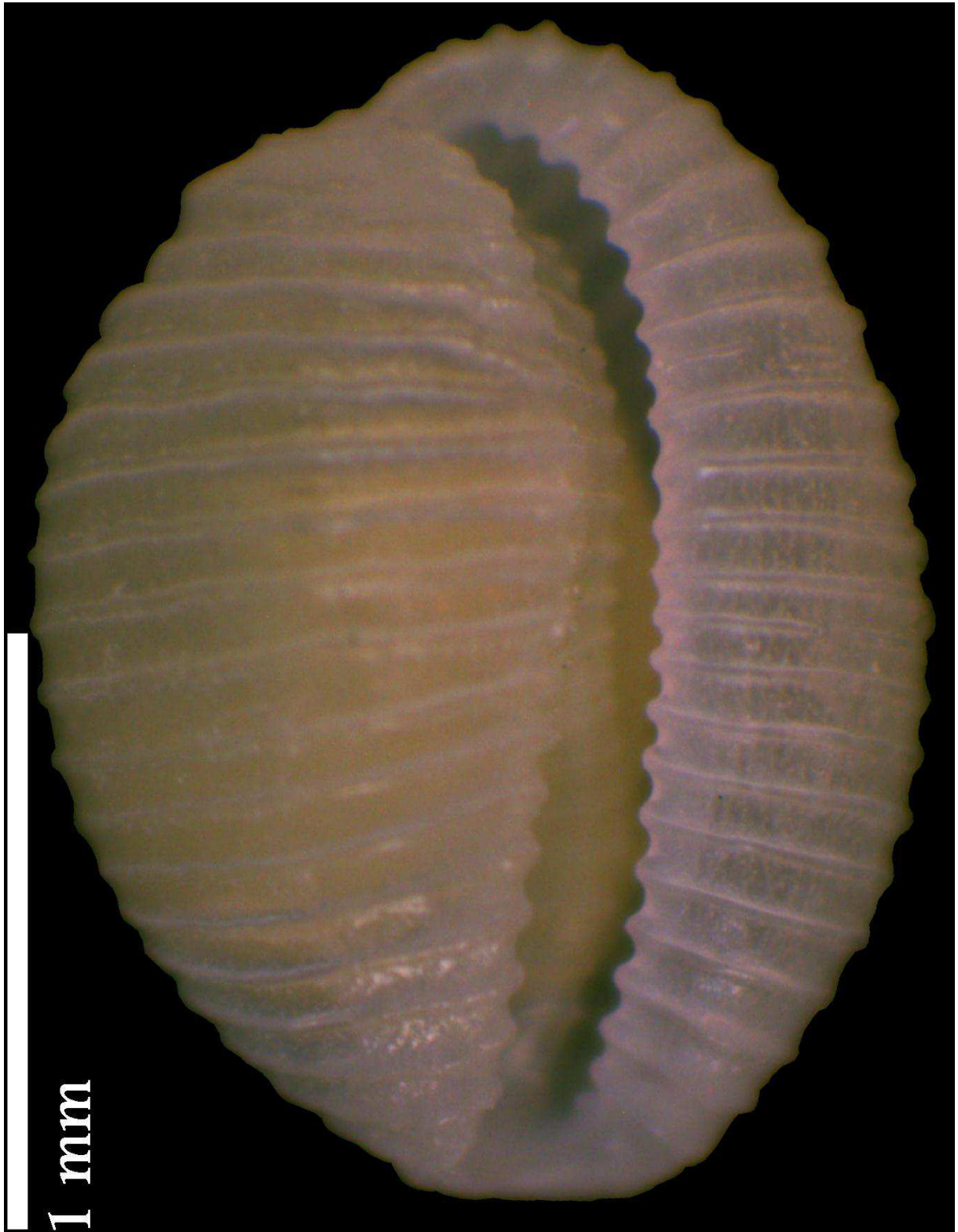


Fig. 6: *Trivirostra ginae* Fehse & Grego, 2002. Collection No. UF290620. Subadult.

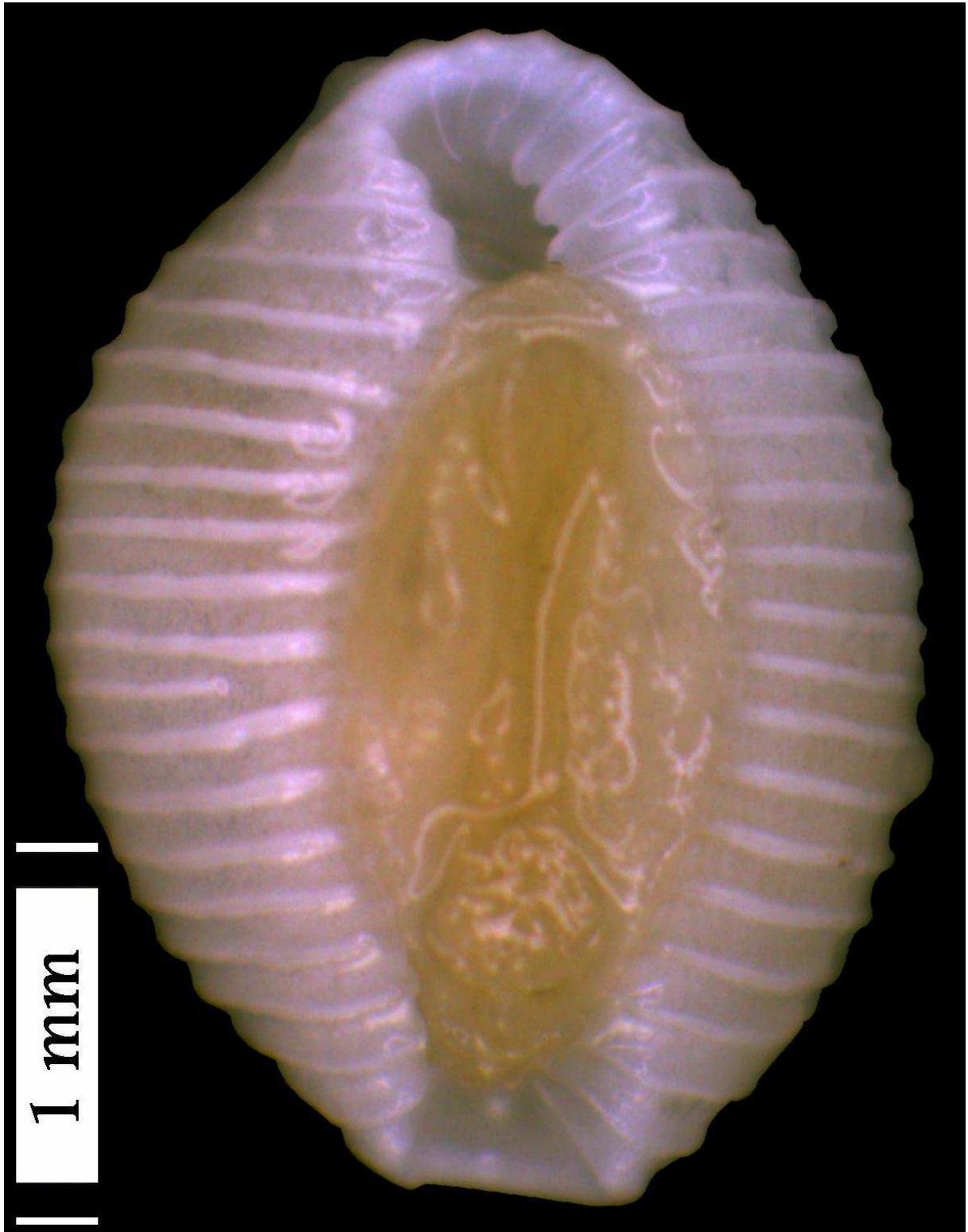


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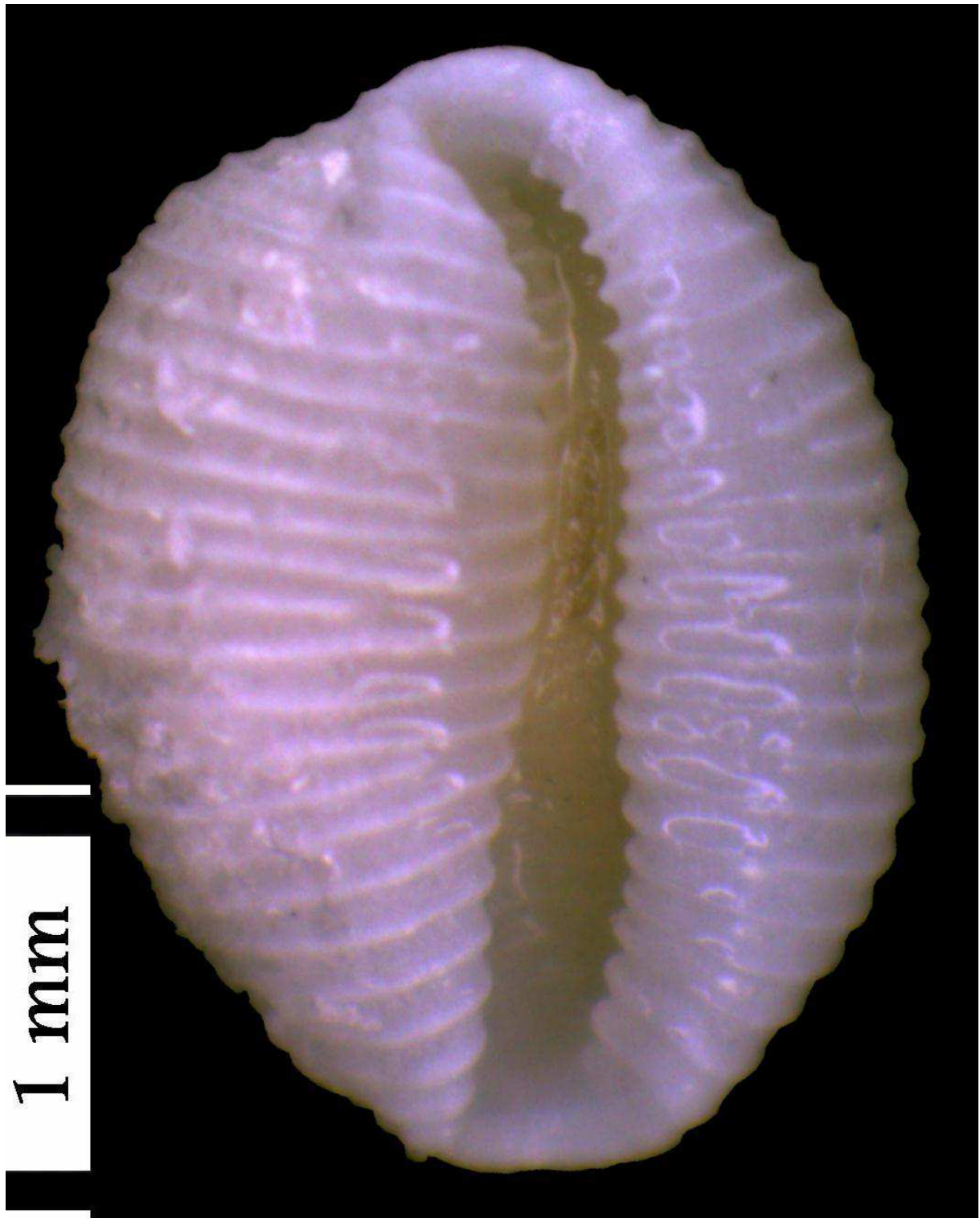


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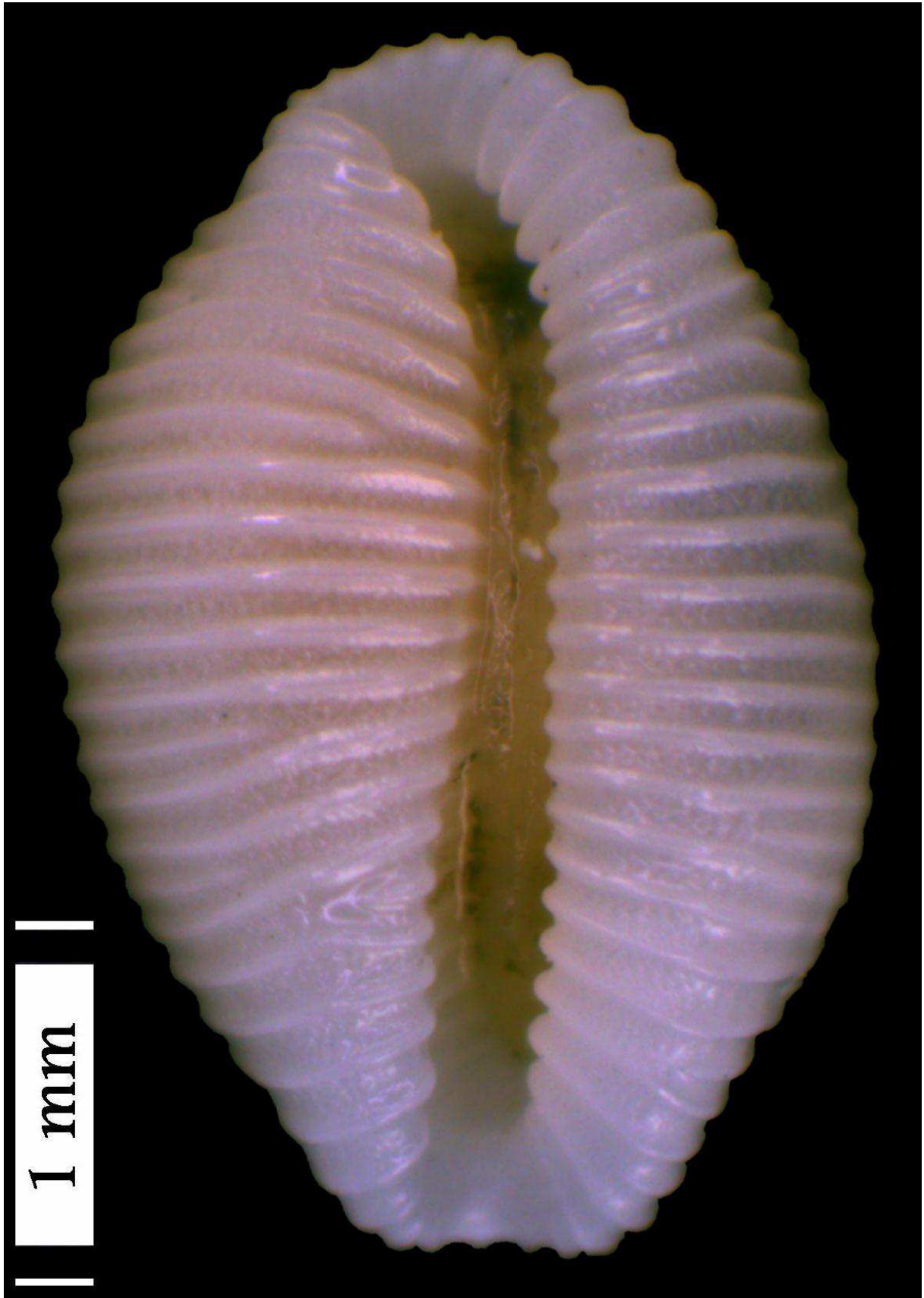


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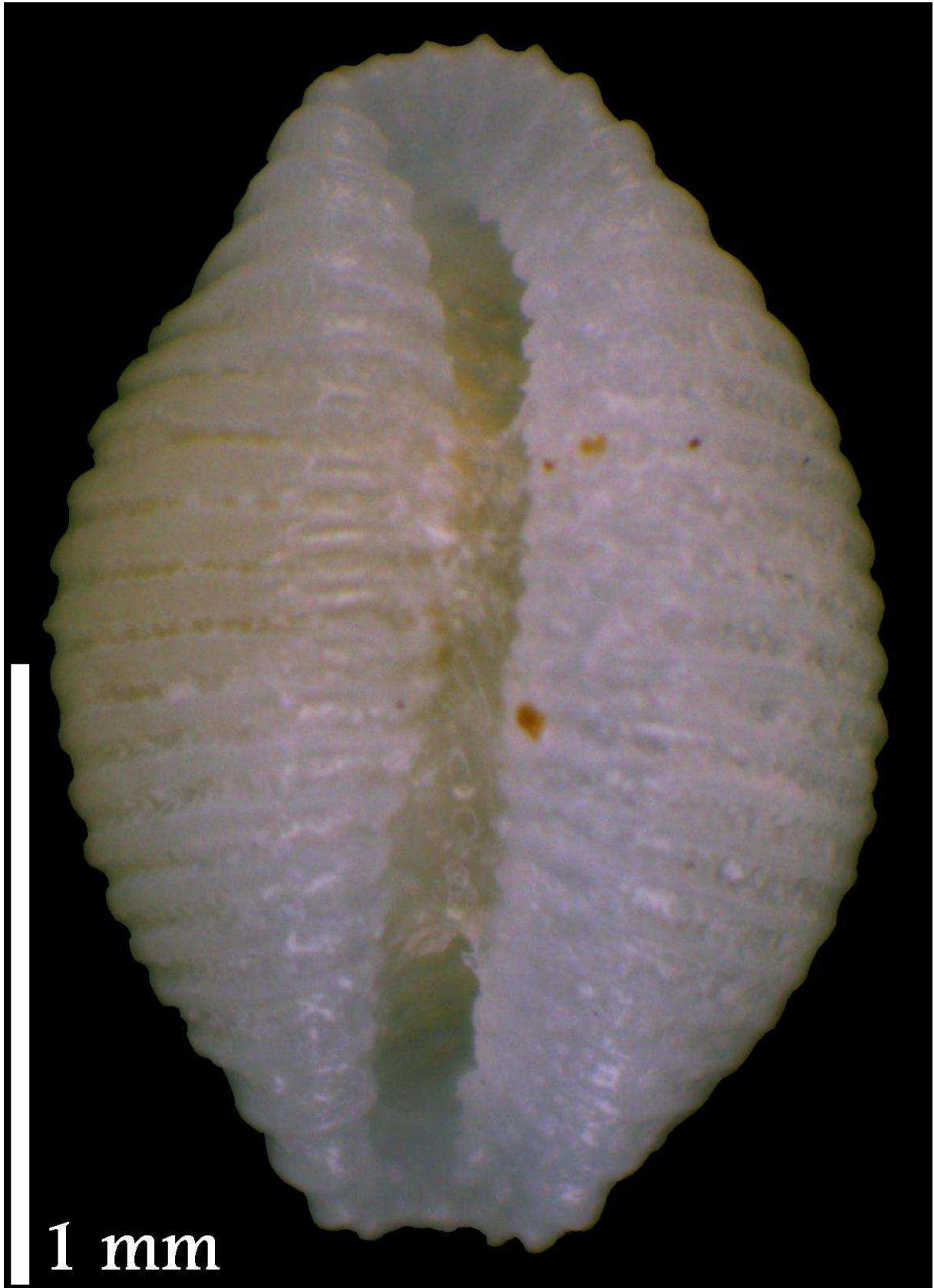


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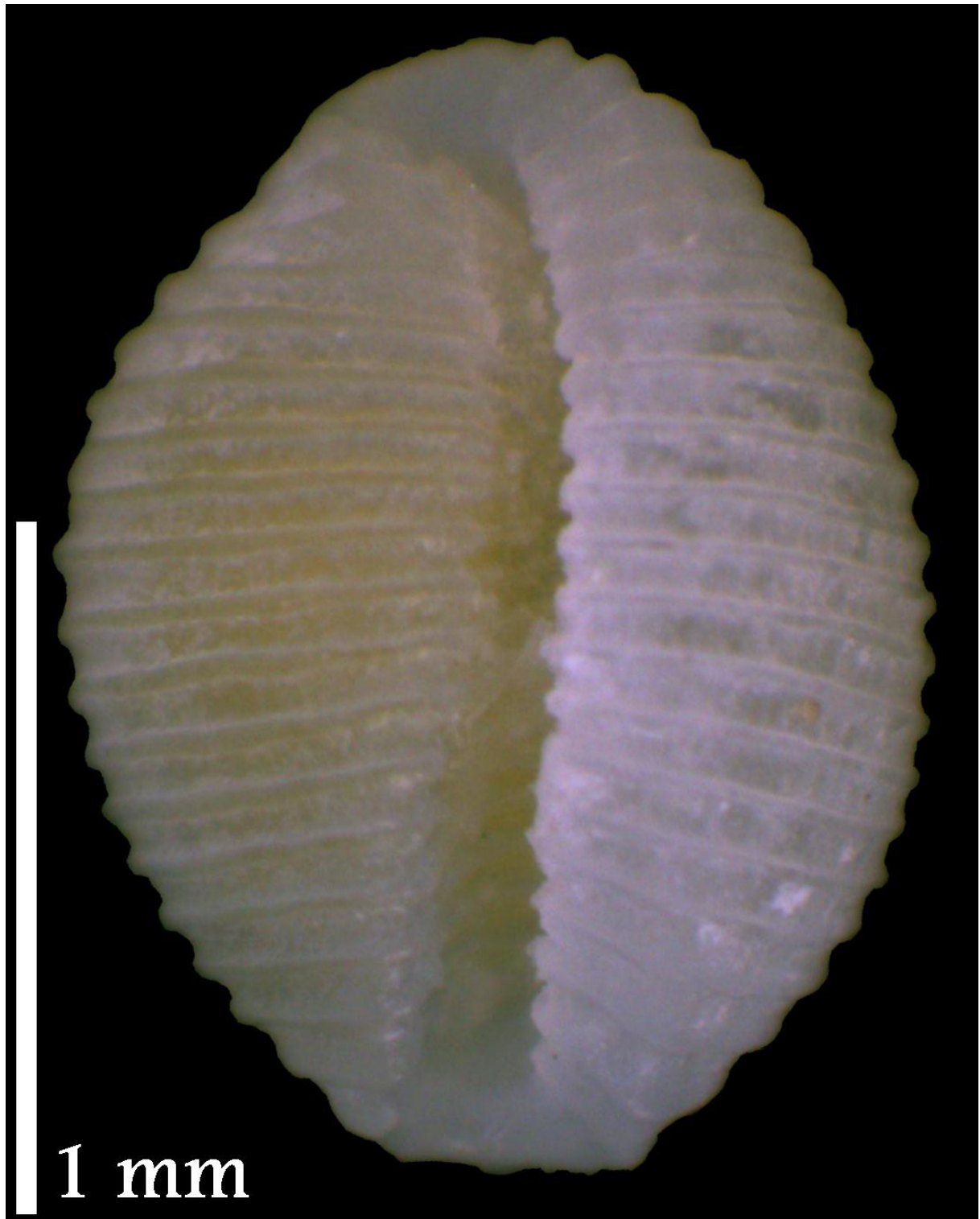


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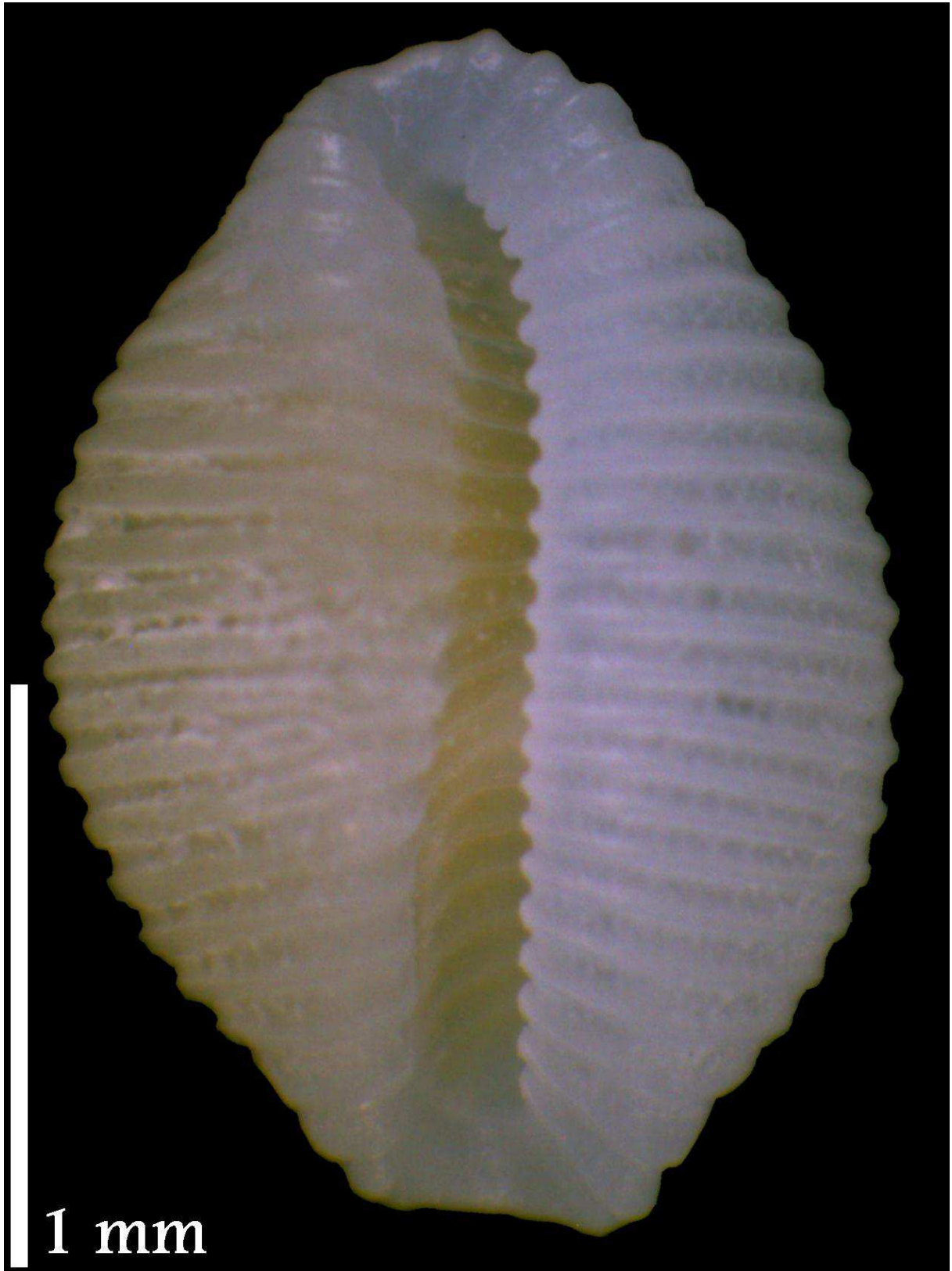


Fig. 12: *Trivirostra ginae* Fehse & Grego, 2002. Collection No. UF290705-3.

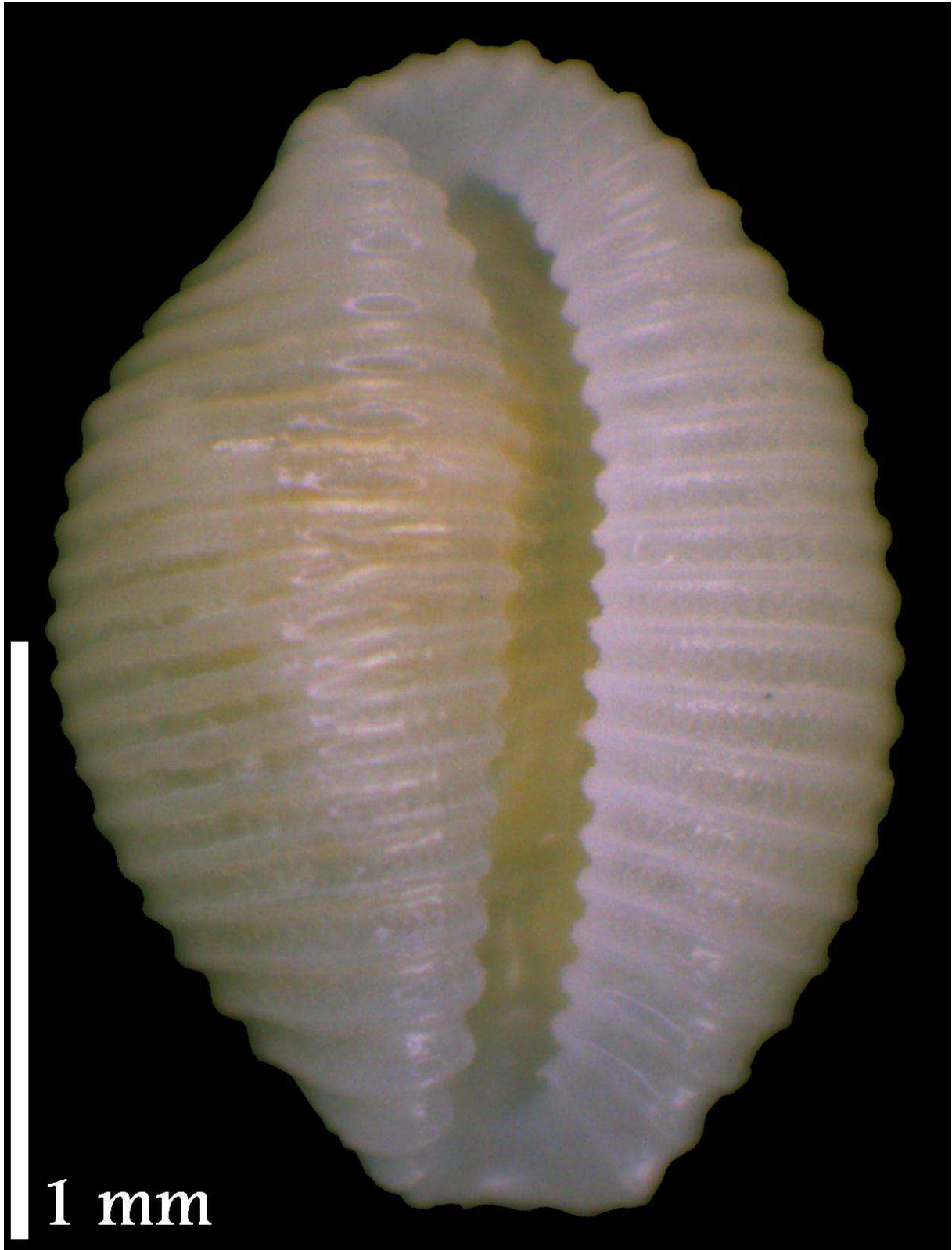


Fig. 13: *Trivirostra ginae* Fehse & Grego, 2002. Collection No. UF290705-4.

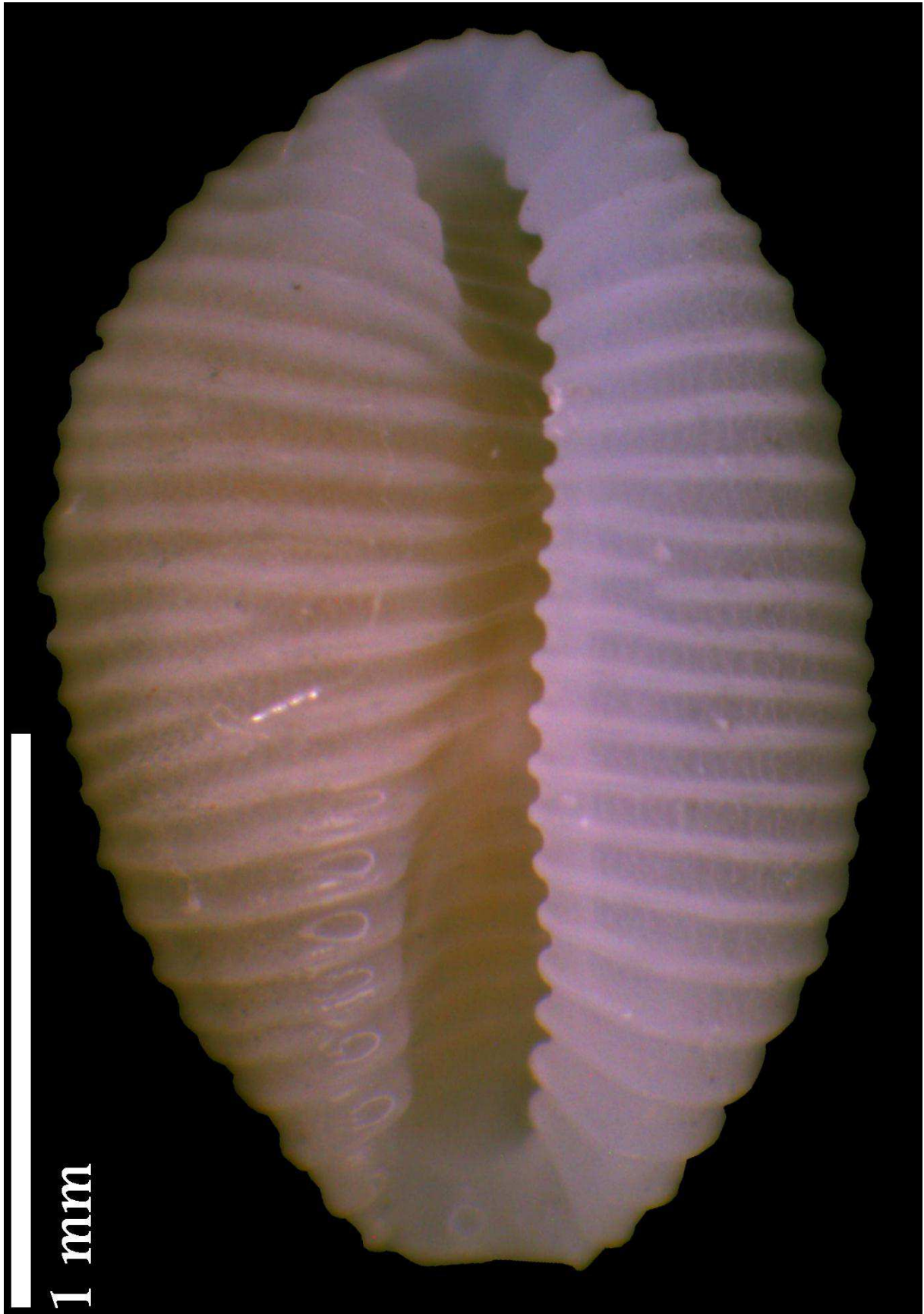


Fig. 14: *Trivirostra thaanumi* C.N. Cate, 1979. Collection No. UF290844. Shell slightly left turned (compare Fehse, 2015A).

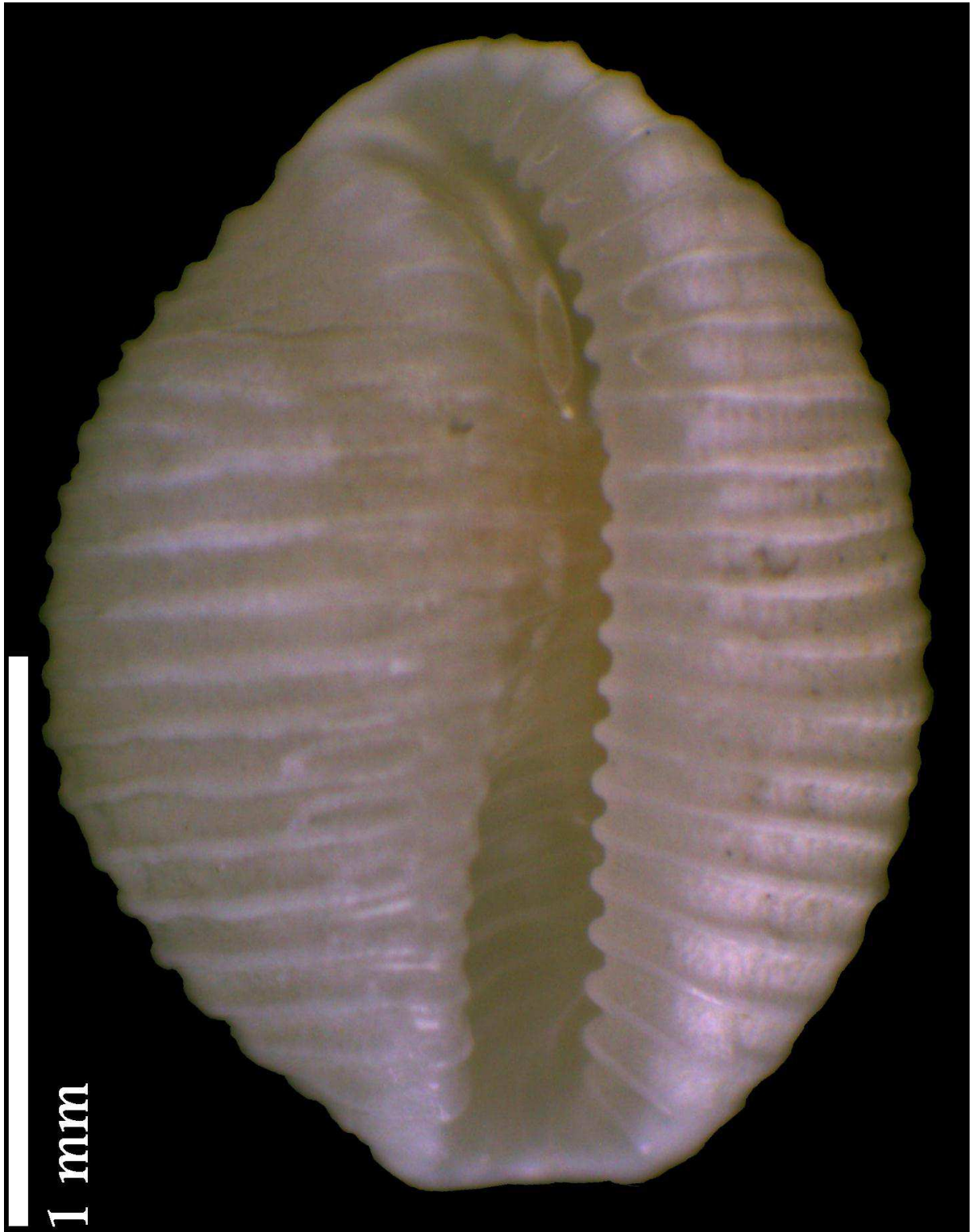


Fig. 15: *Trivirostra ginae* Fehse & Grego, 2002. Collection No. UF290995-1.

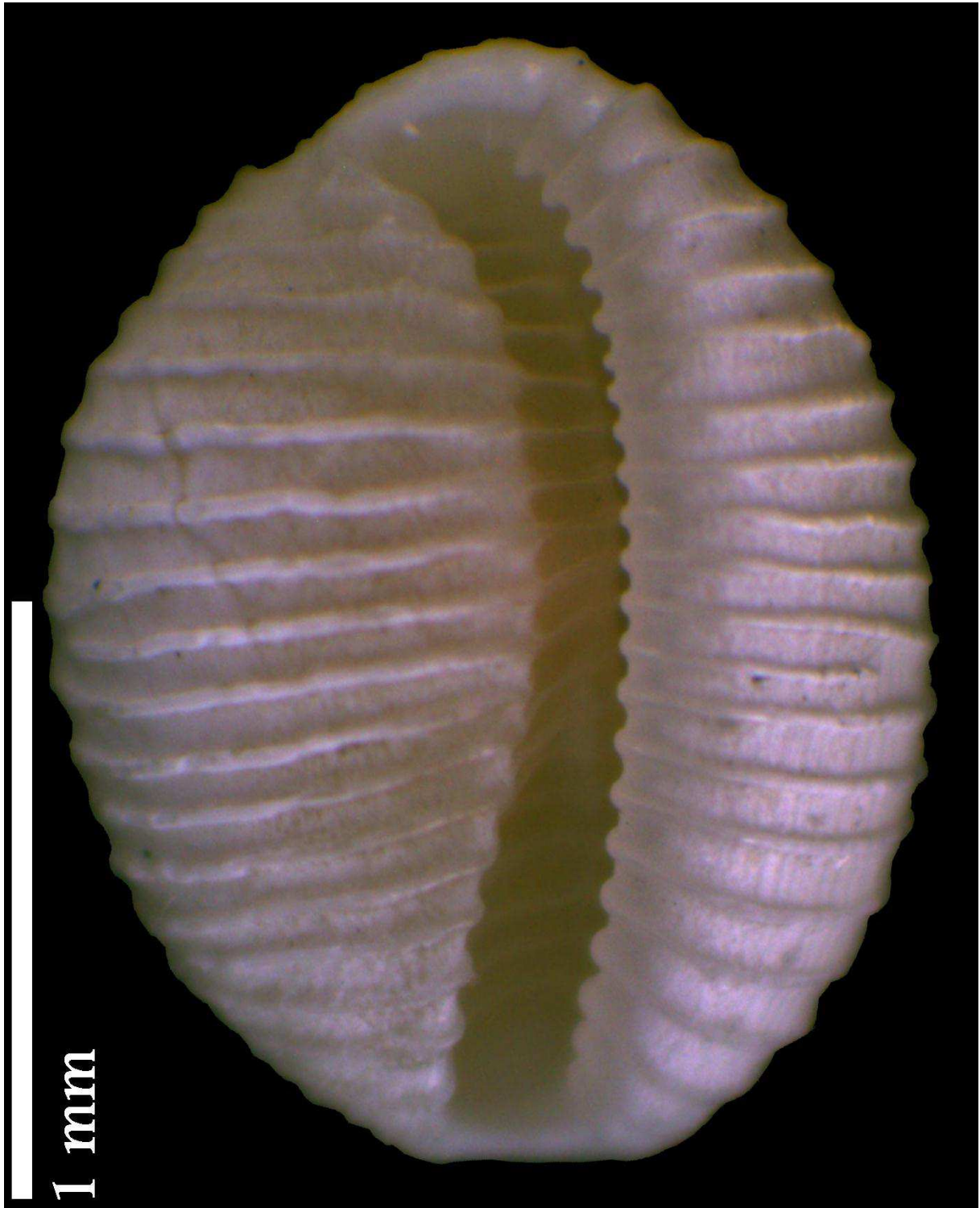


Fig. 16: *Trivirostra ginae* Fehse & Grego, 2002. Collection No. UF290995-2. Subadult.

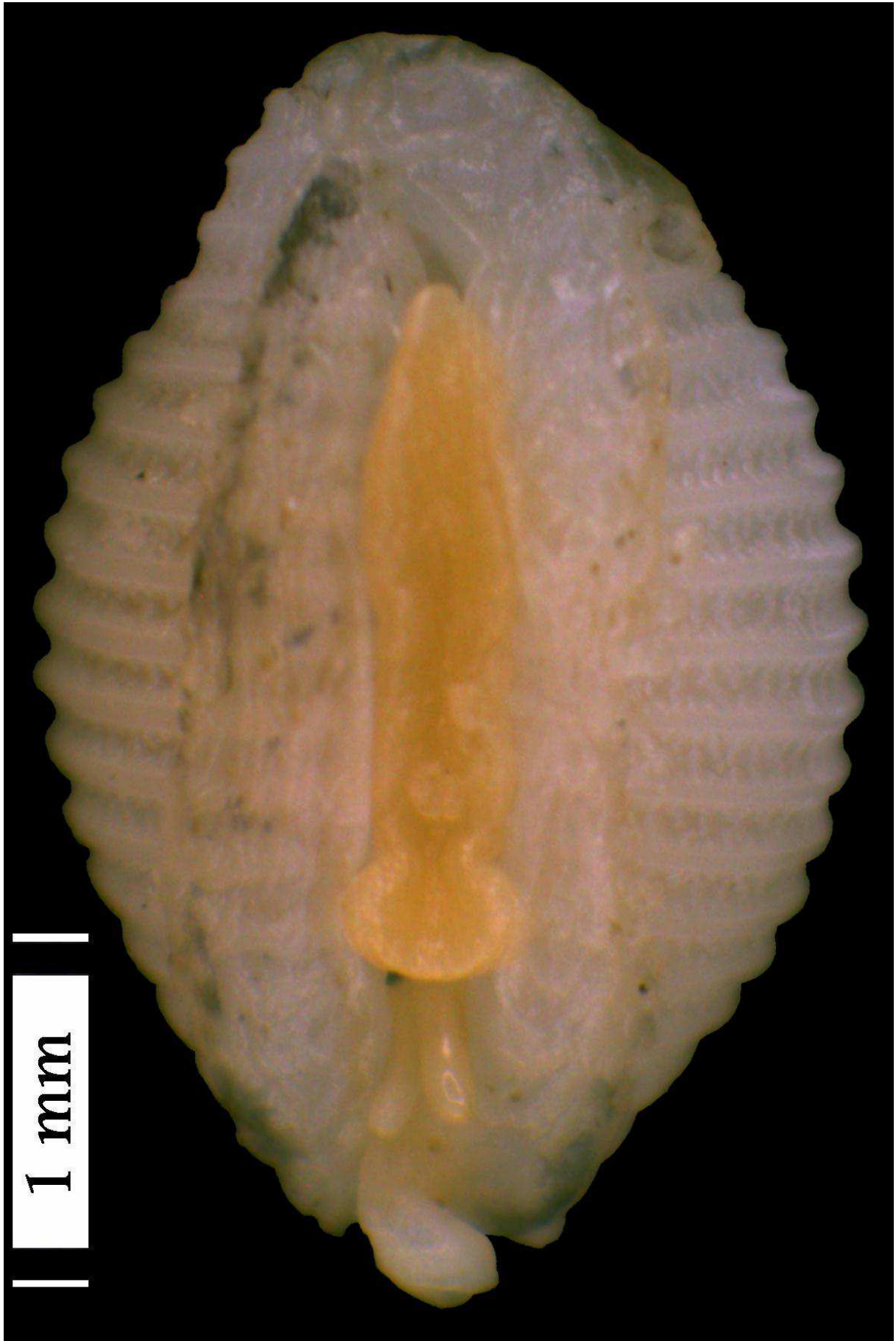


Fig. 17: *Trivirostra leylae* Fehse & Grego, 2013. Collection No. UF292404.

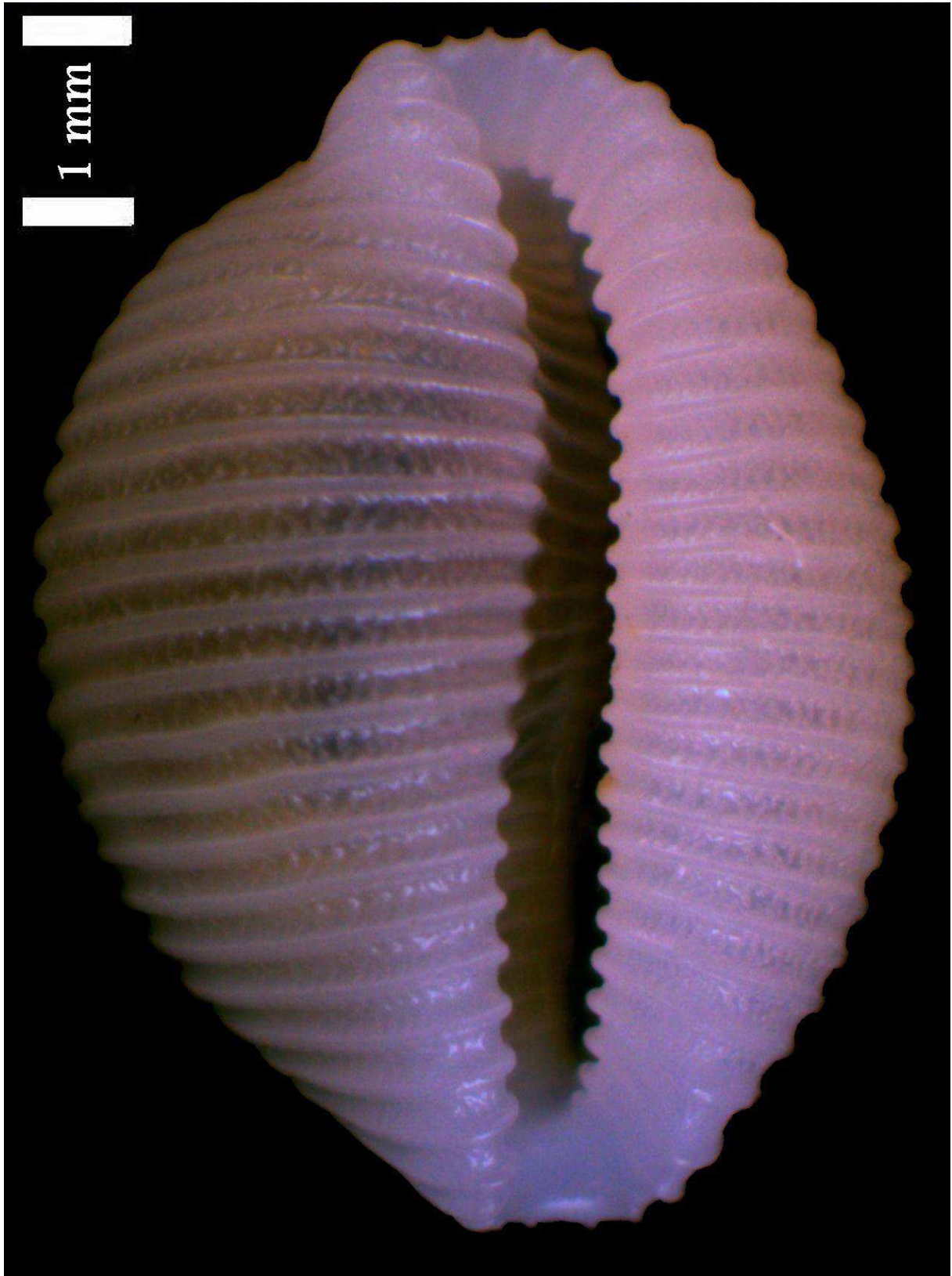


Fig. 18: *Trivirostra vitrina* C.N. Cate, 1979. Collection No. UF293257. Length = 6.6 mm, width = 4.8 mm, height = 4.1 mm.

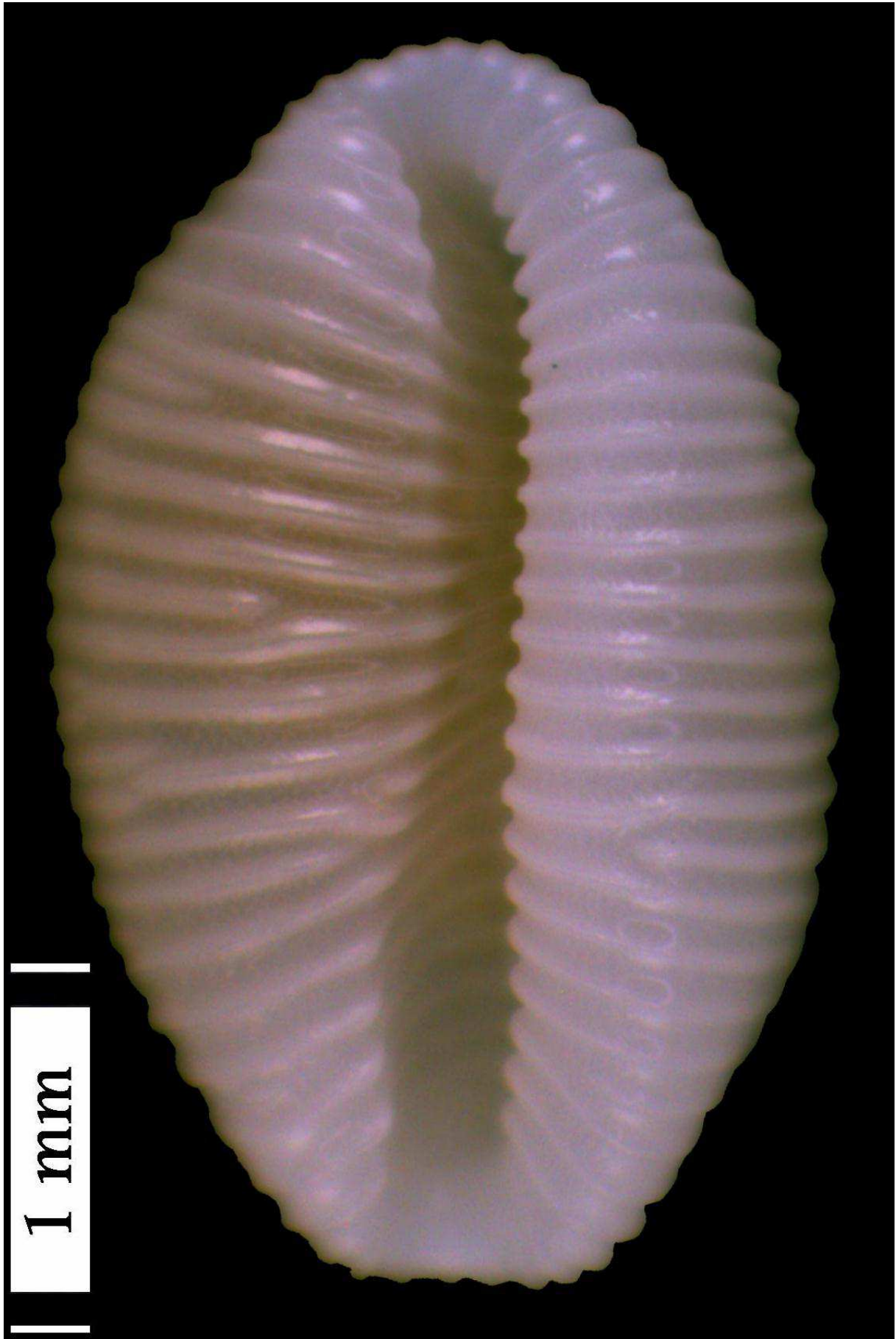


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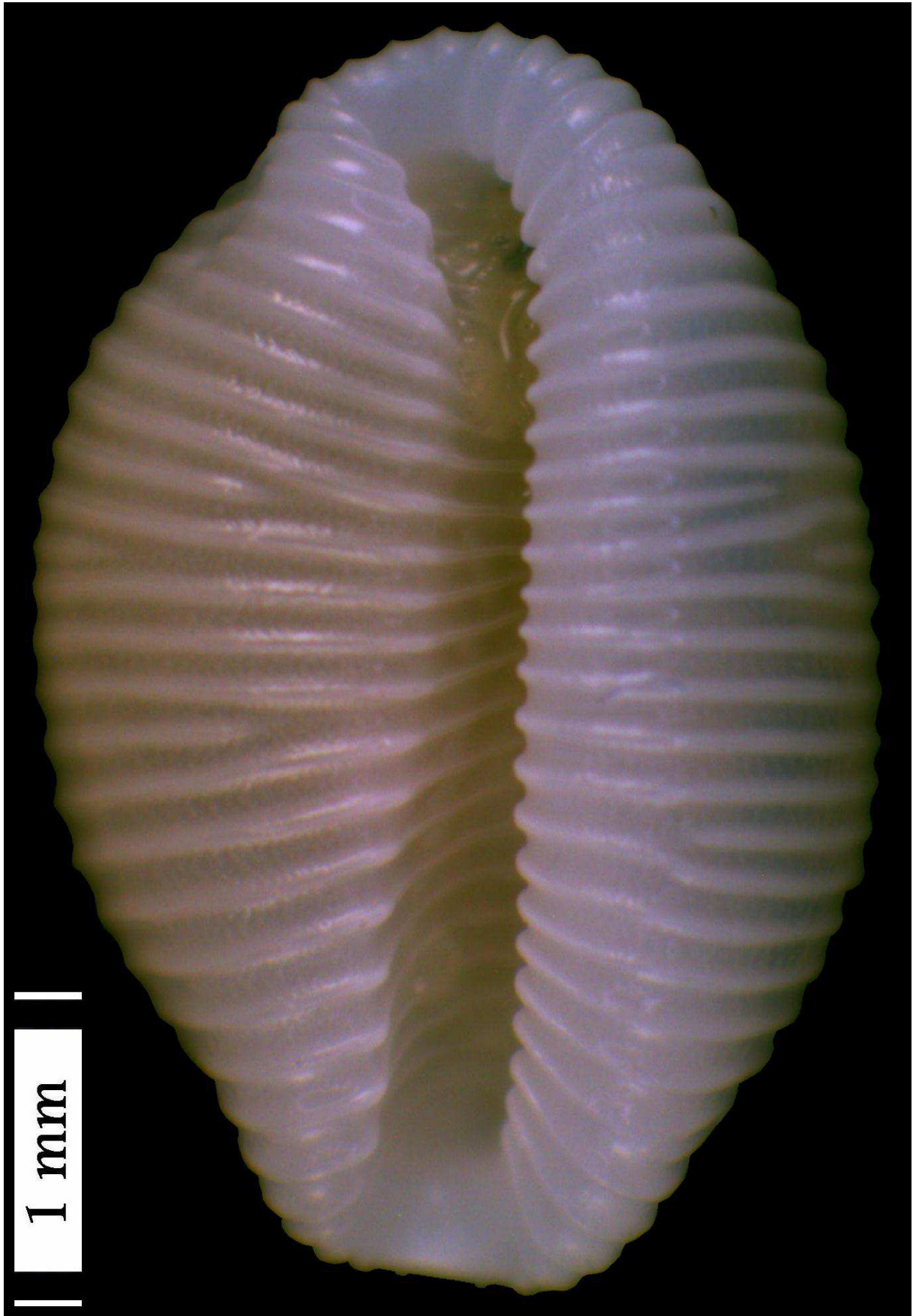


Fig. 20: *Trivirostra* cf. *matavai* Fehse & Grego, 2013. Collection No. UF294425-2.

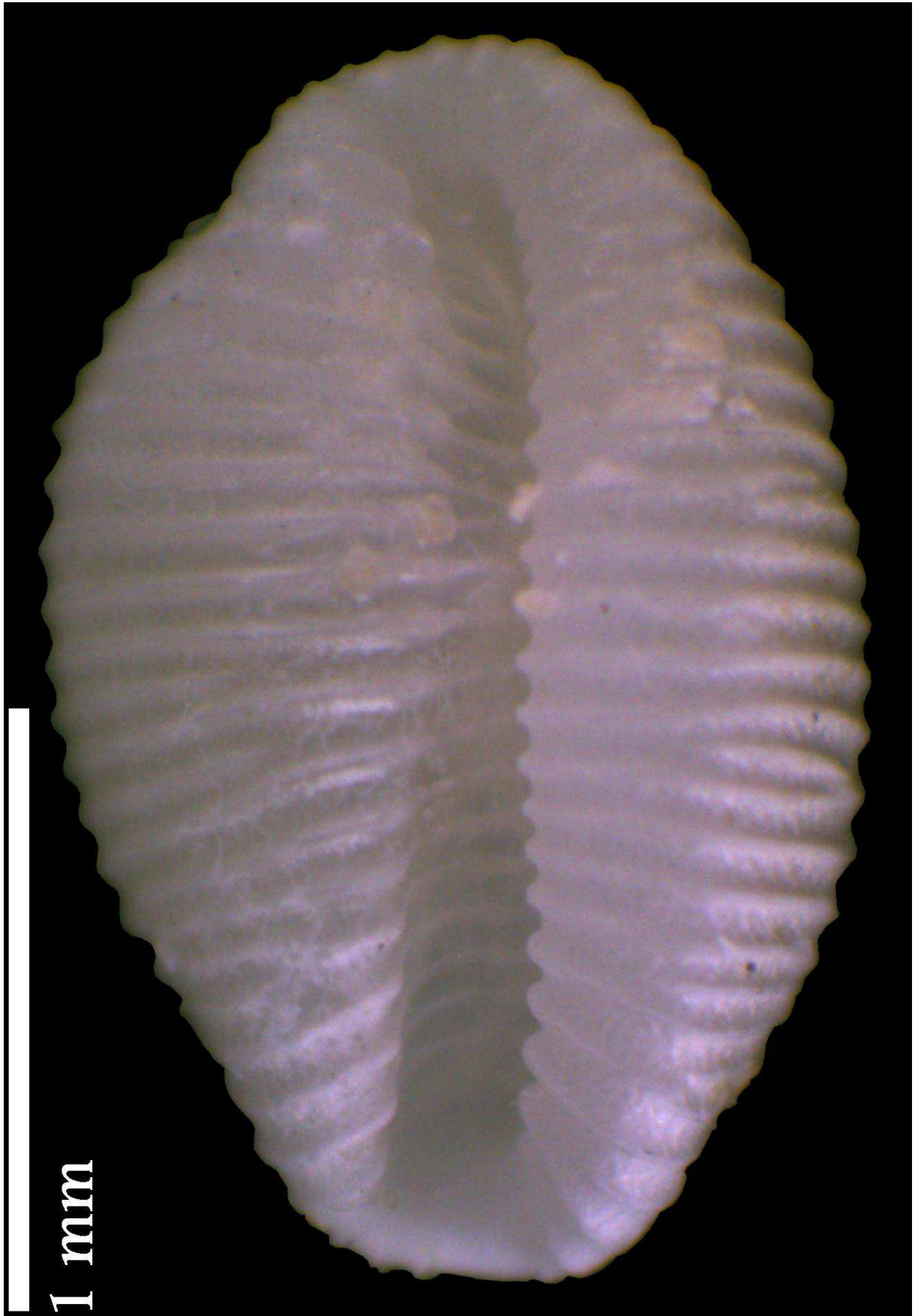


Fig. 21: *Trivirostra hordacea* (Kiener, 1843). Collection No. UF294804.

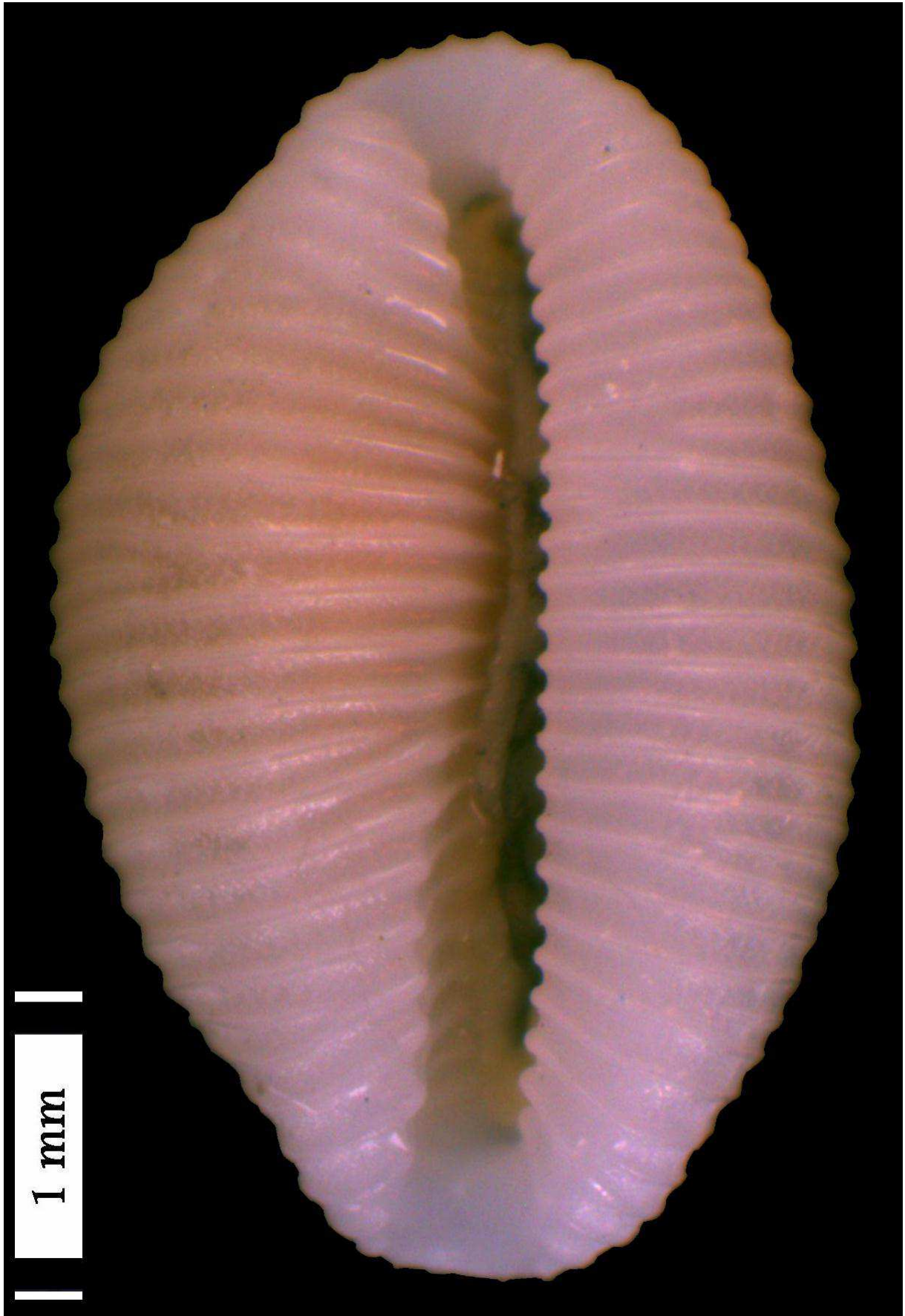


Fig. 22: *Trivirostra matavai* Fehse & Grego, 2013. Collection No. UF295576. Length = 4.8 mm, width = 3.1, height = 2.6 mm.

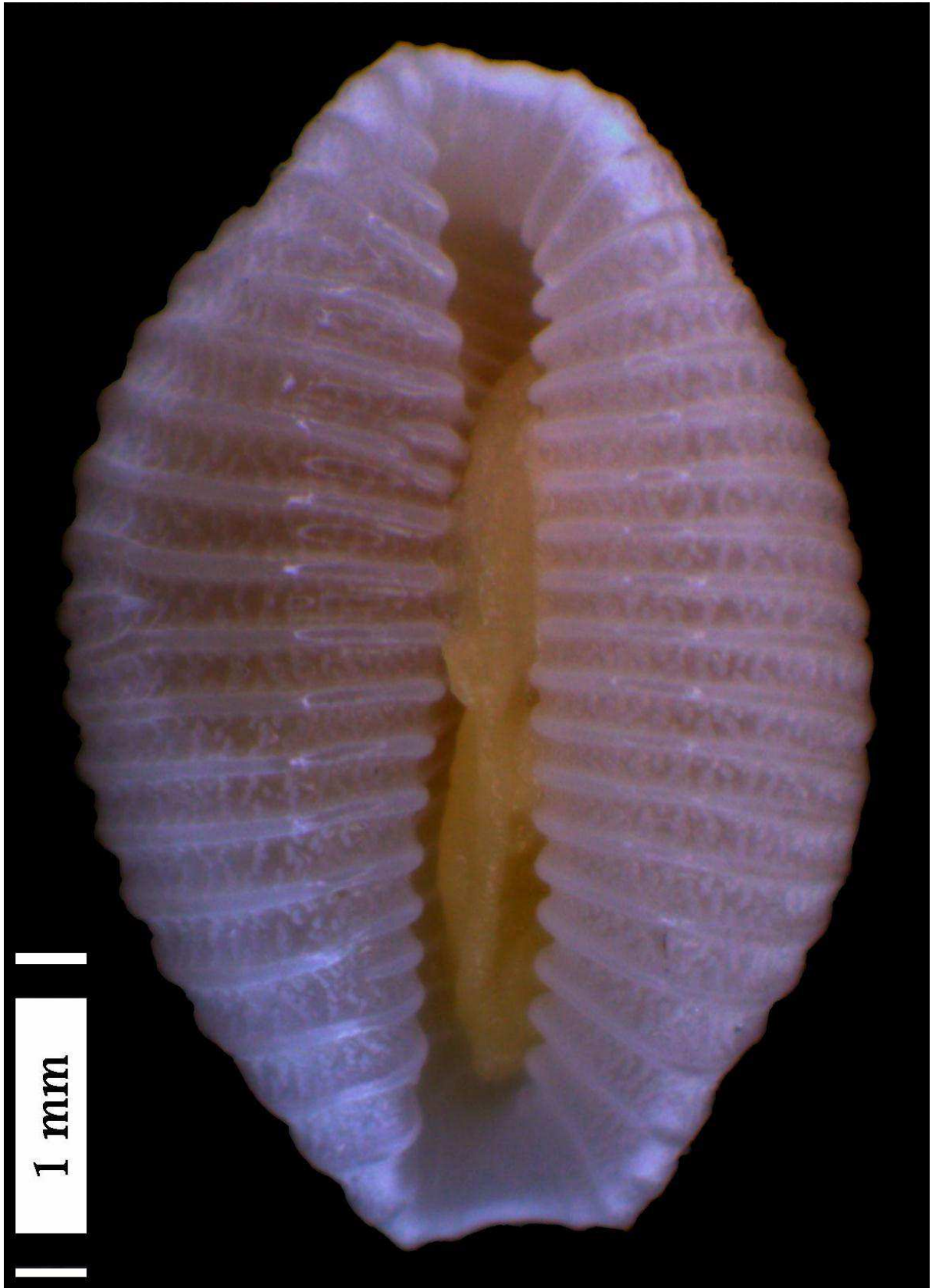


Fig. 23: *Trivirostra leylae* Fehse & Grego, 2013. Collection No. UF296555.

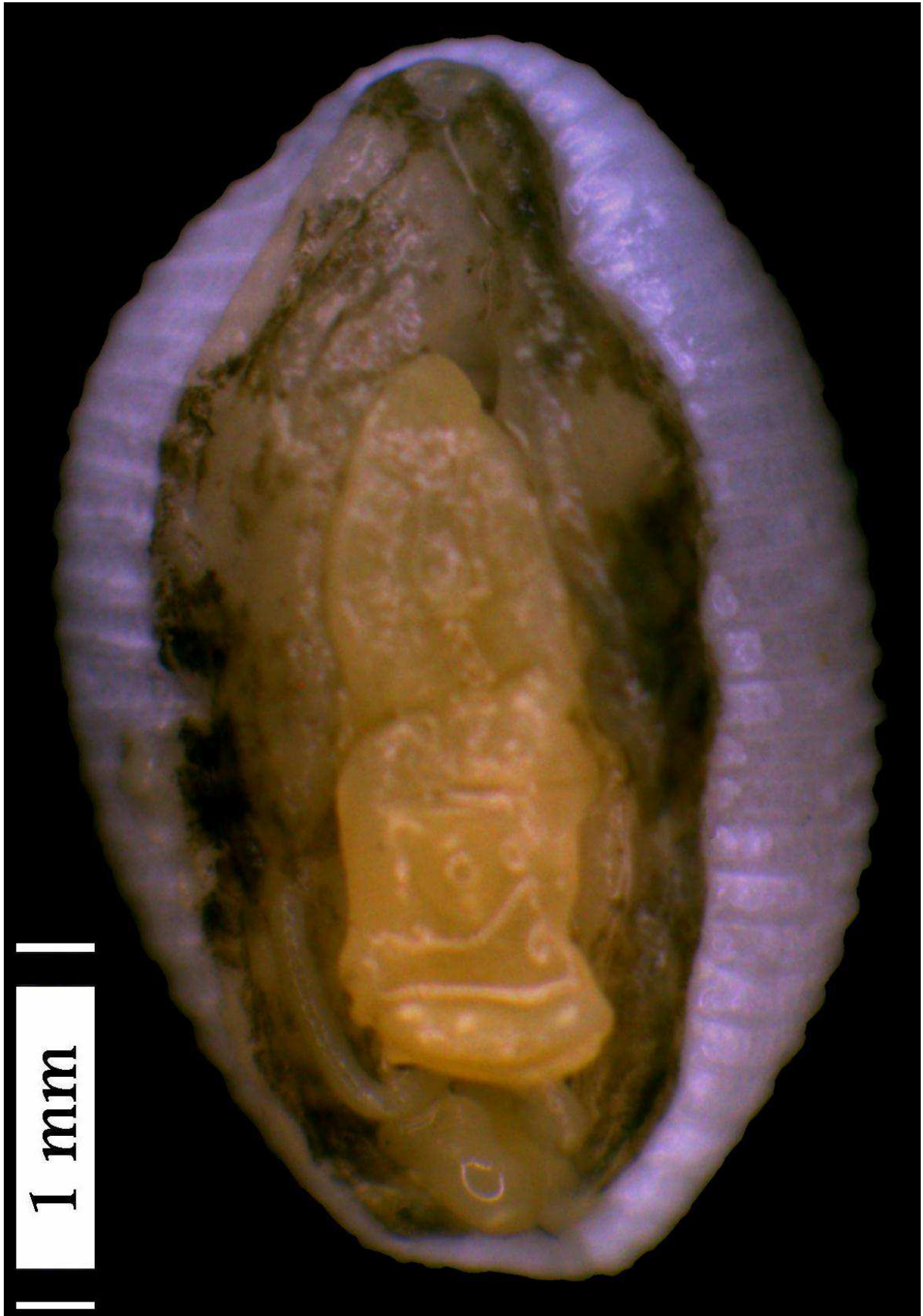


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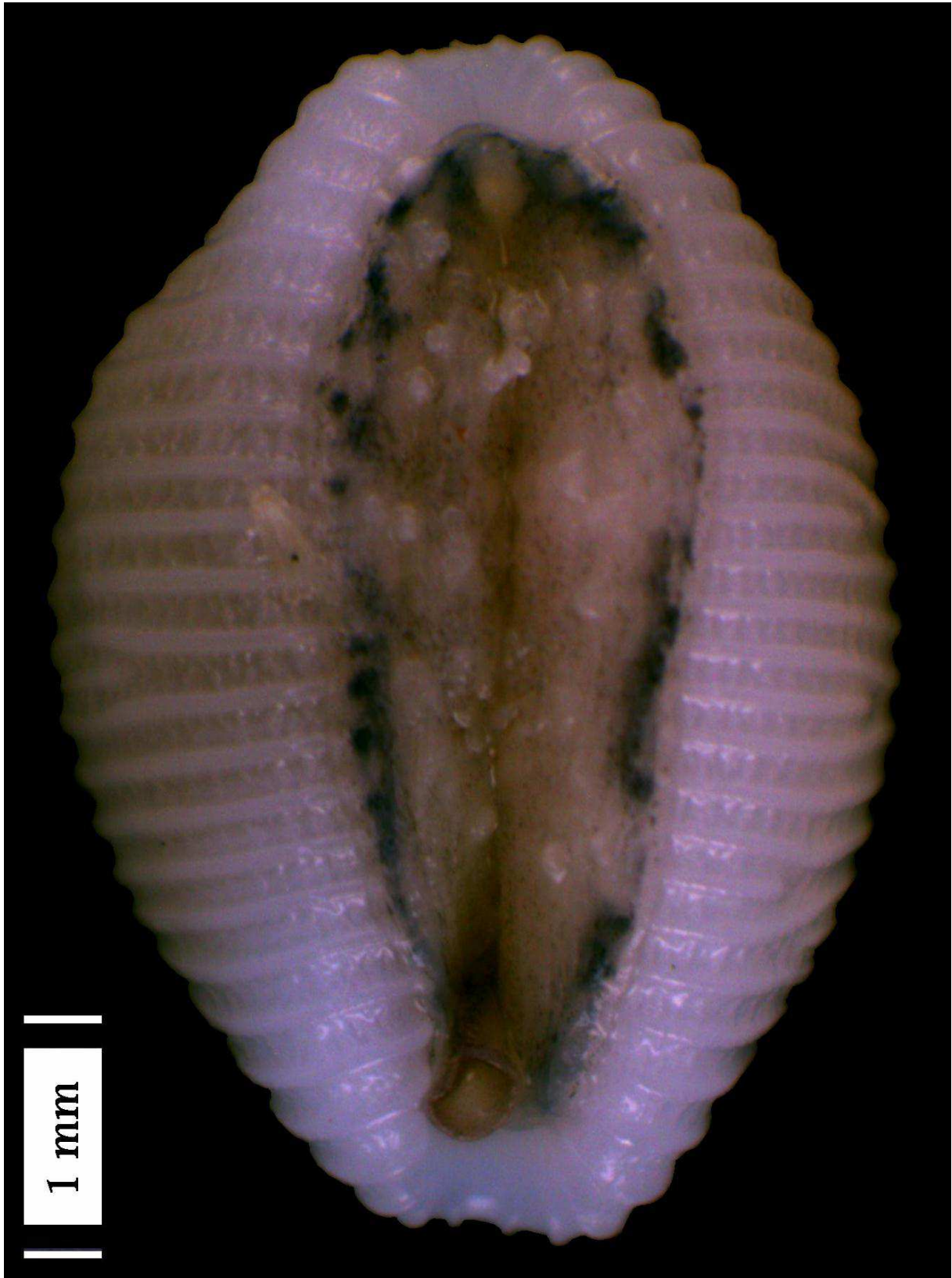


Fig. 25: *Trivirostra* cf. *tryphaenae* Fehse, 1998. Collection No. UF305061. Length = 5.8 mm, width = 4.3 mm, height = 3.7 mm.



Fig. 26: *Trivirostra scabriuscula* (J.E. Gray, 1827). Collection No. UF305164. Seemingly foot partly removed.



Fig. 27: *Trivirostra* cf. *edgari* (Shaw, 1909). Collection No. UF305166. Mantle pattern slightly different to UF414879.

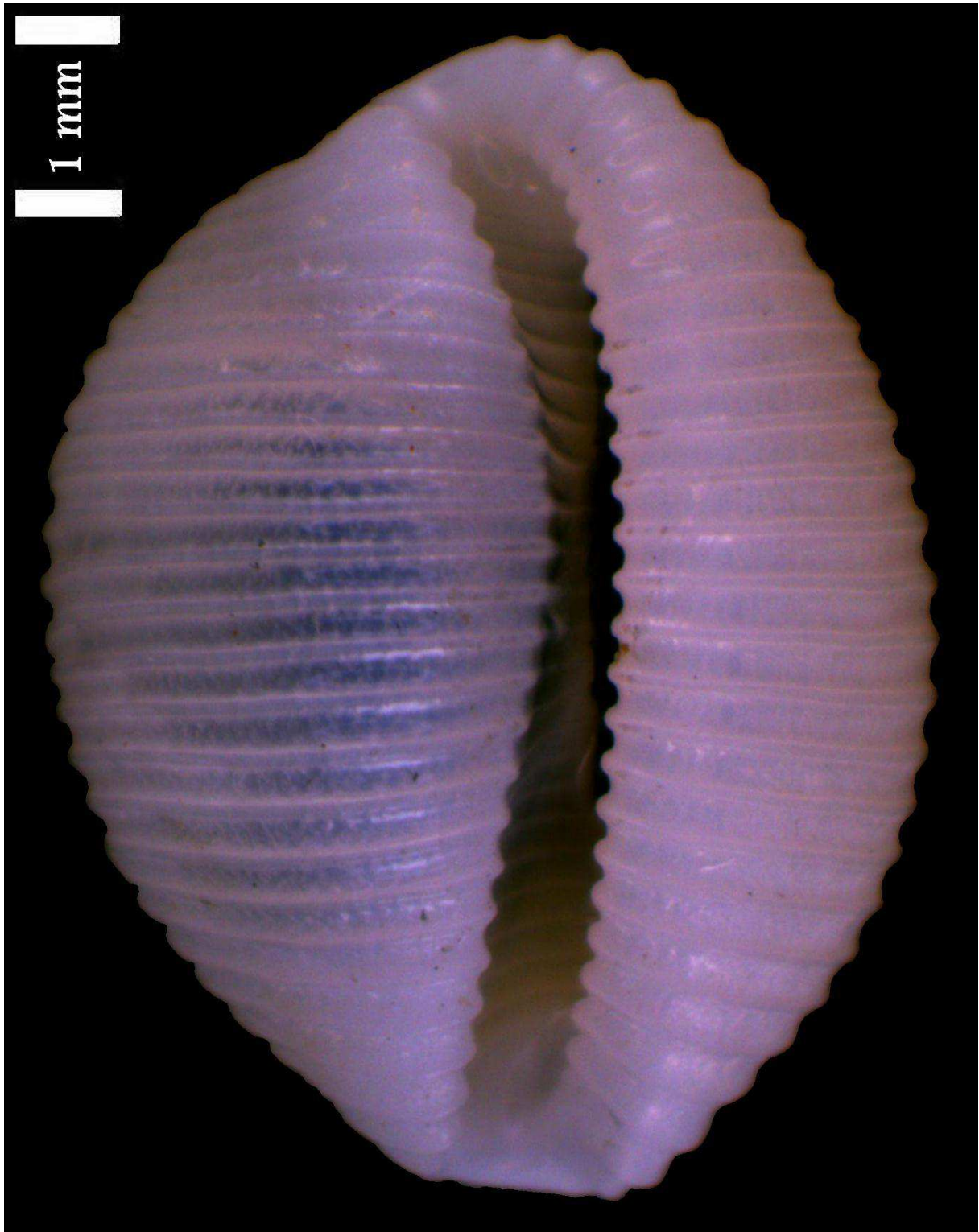


Fig. 28: *Trivirostra* cf. *tomlini* Schilder & Schilder, 1944. Collection No. UF313186. Length = 6.7 mm, width 5.1 mm, height = 4.5 mm.



Fig. 29: *Trivirostra scabriuscula* (J.E. Gray, 1827). Collection No. UF327837.



Fig. 30: *Trivirostra* cf. *thaanumi* C.N. Cate, 1979. Collection No. UF330689.

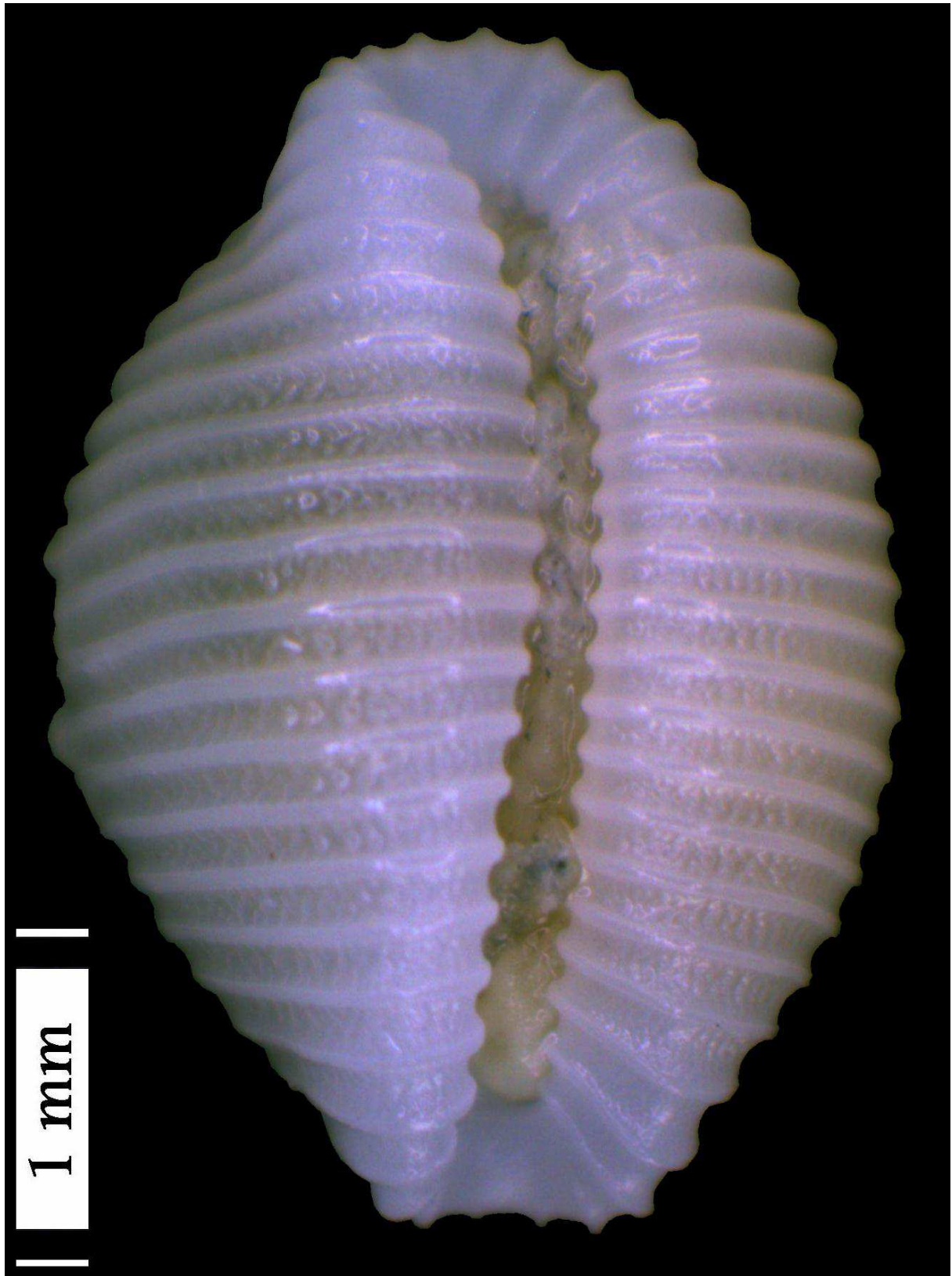


Fig. 31: *Trivirostra cf. edgari* (Shaw, 1909). Collection No. UF384044. Might be a new species.

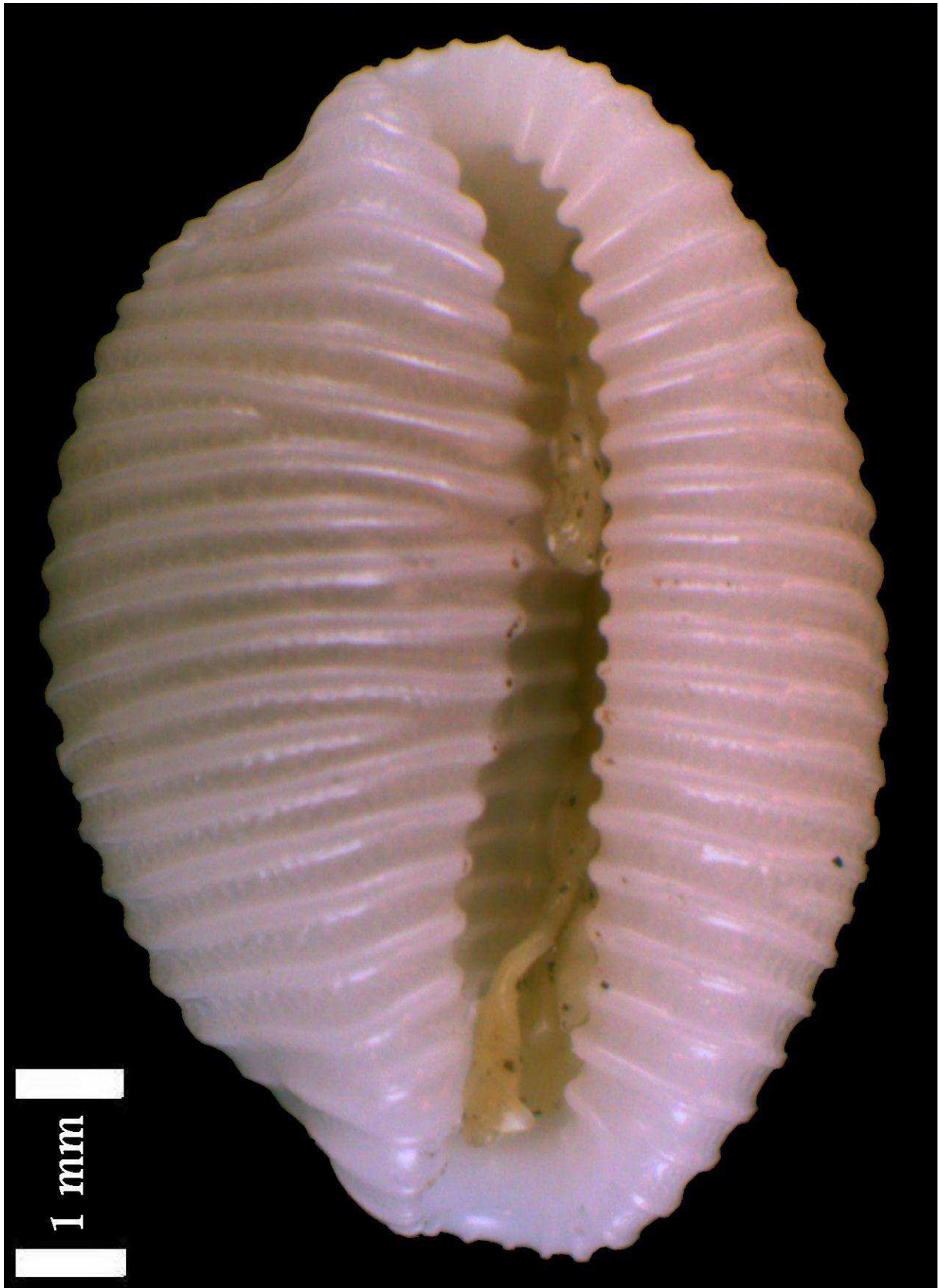


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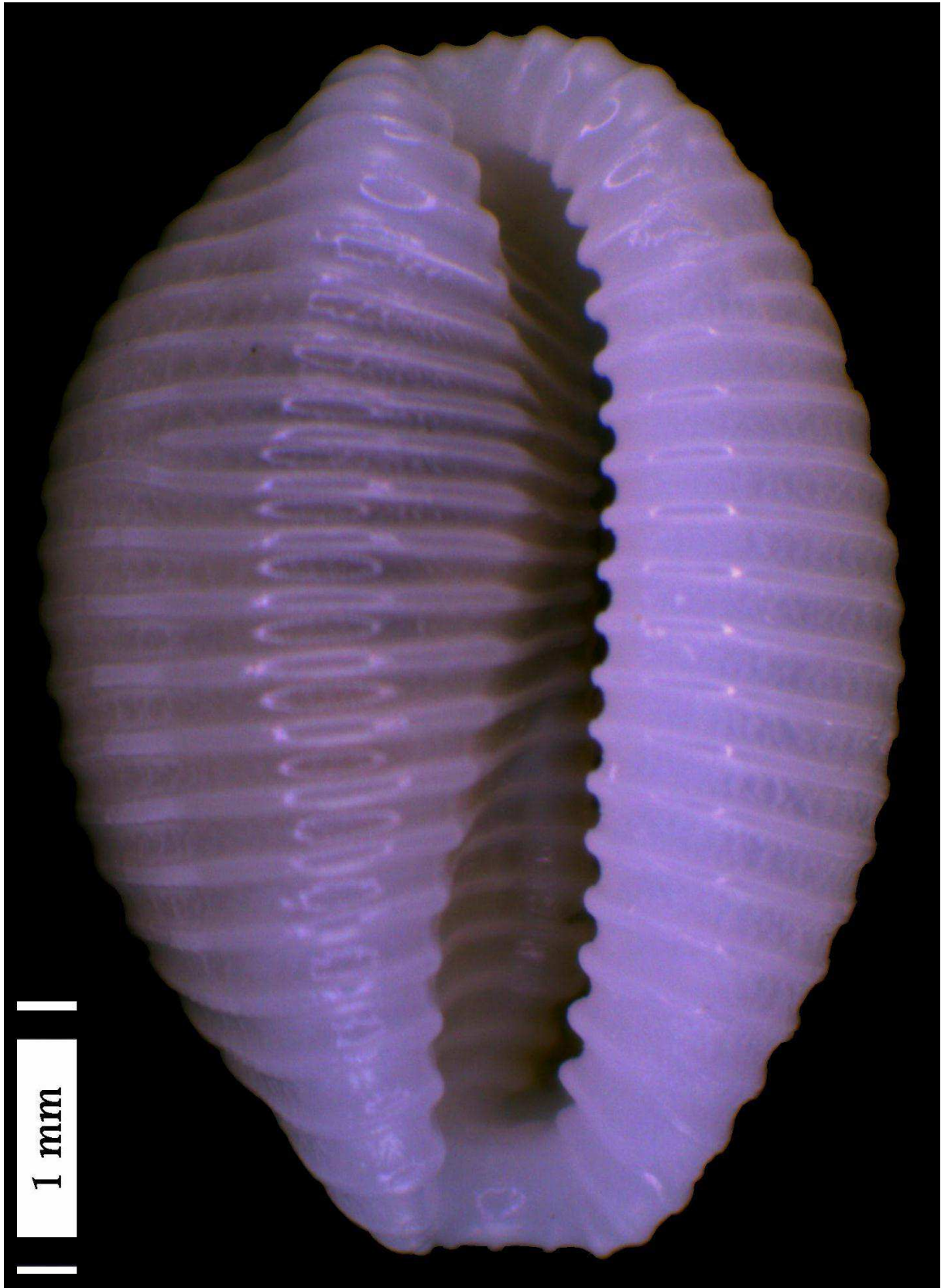


Fig. 34: *Trivirostra shawi* F.A. Schilder, 1933. Collection No. UF401199.

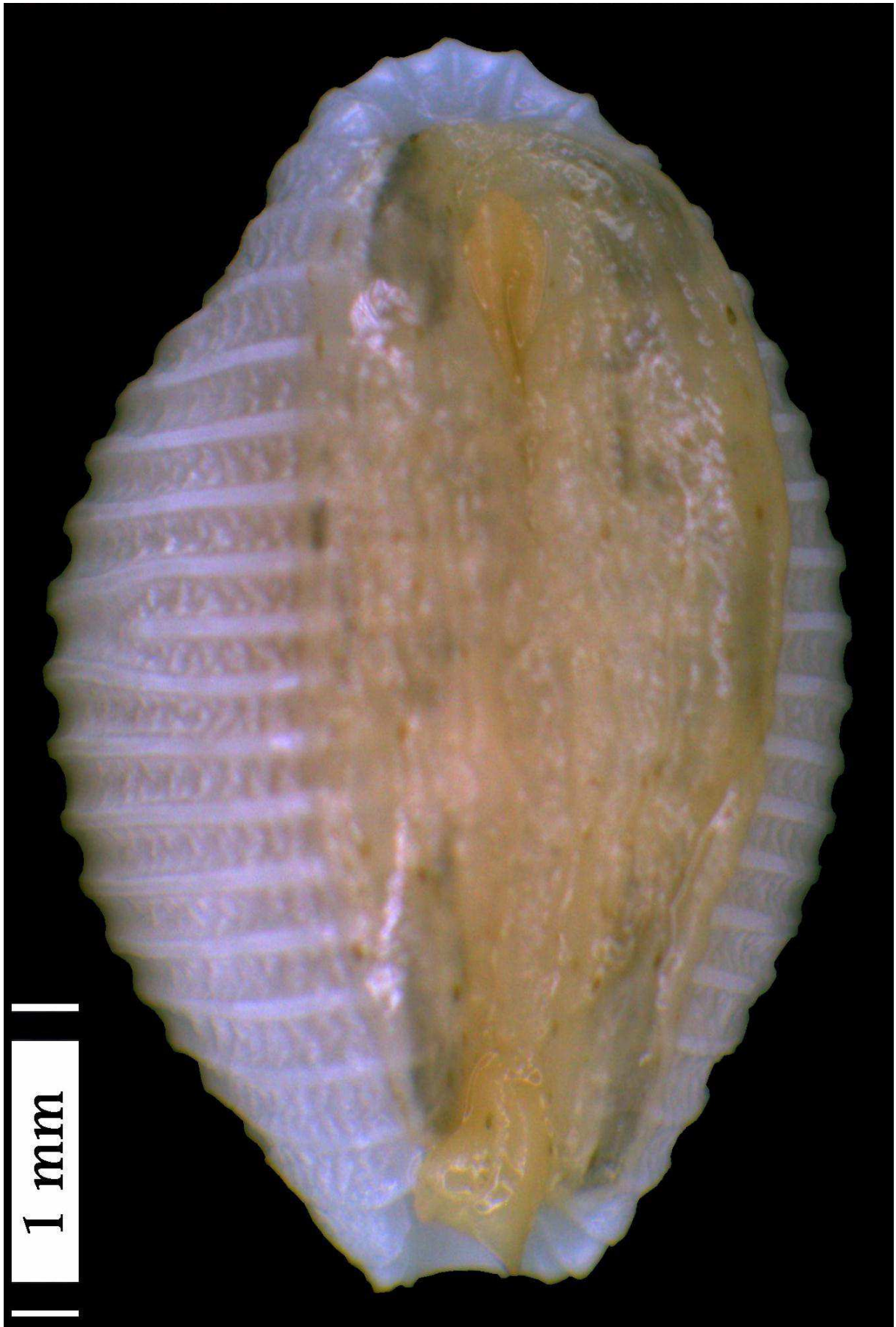


Fig. 35: *Trivirostra leylae* Fehse & Grego, 2013. Collection No. UF411817.

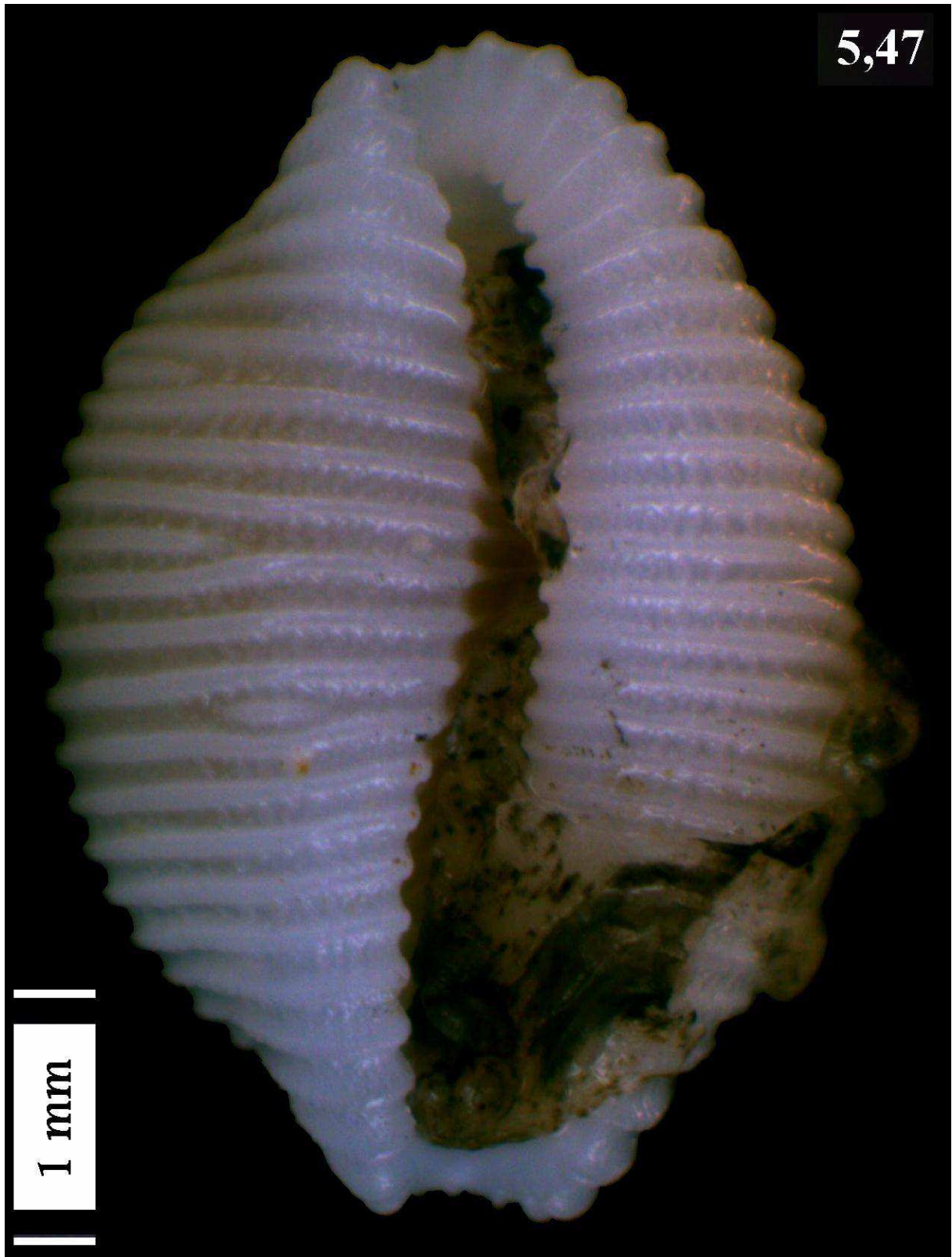


Fig. 36: *Trivirostra insularum* Schilder & Schilder, 1944. Collection No. UF413833. Length = 5.5 mm.

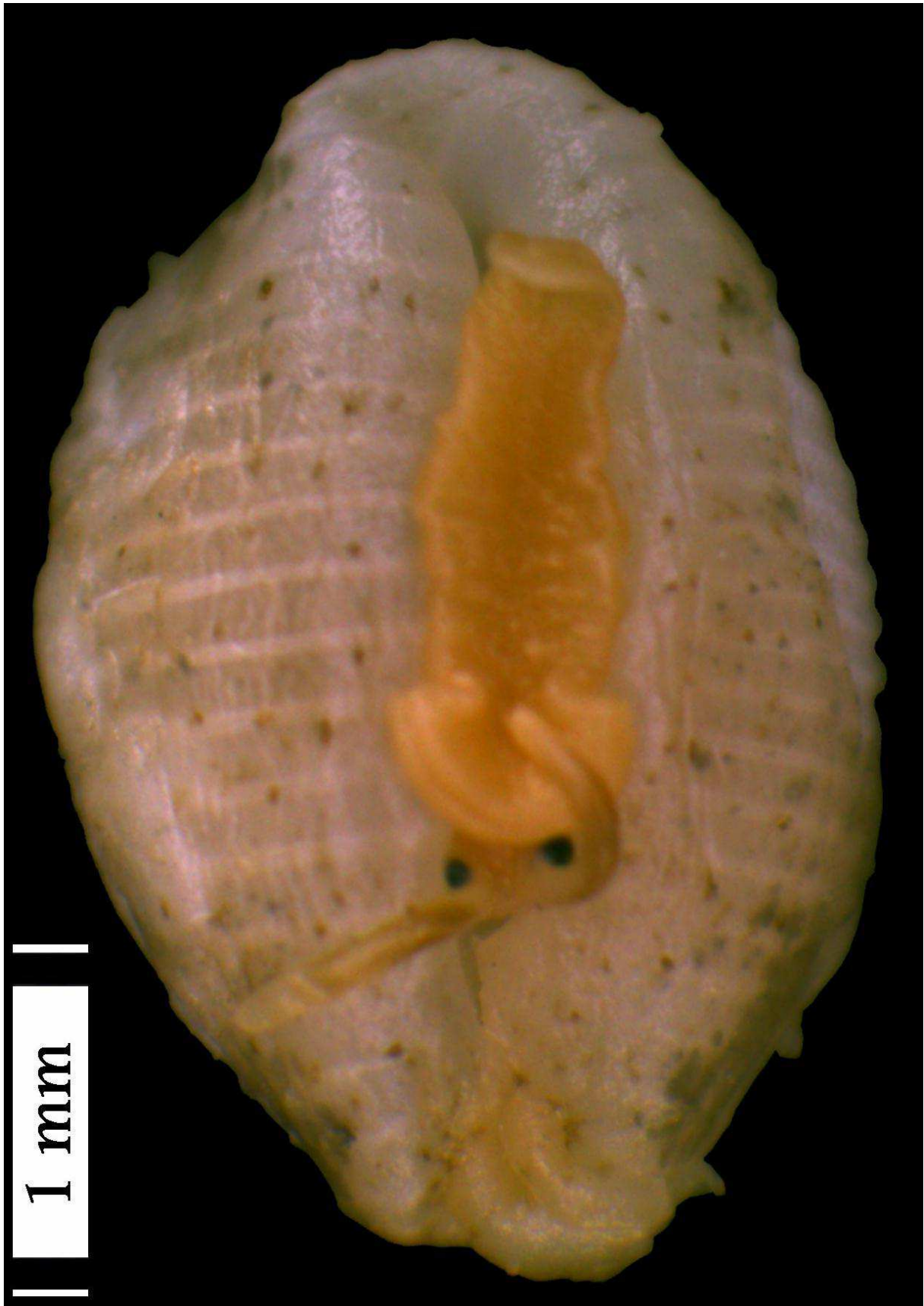


Fig. 37: *Trivirostra edgari* (Shaw, 1909). Collection No. UF414879.

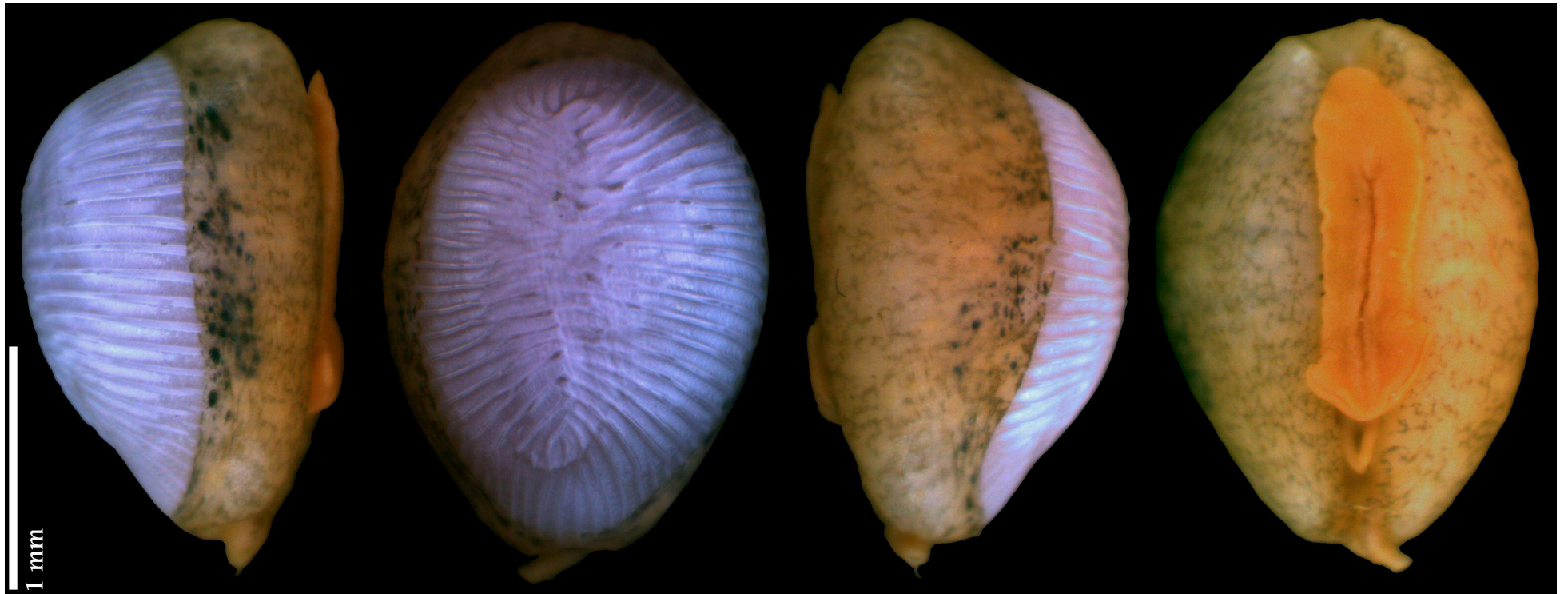


Fig. 38: *Trivirostra* cf. *poppei* Fehse, 1999. Collection No. UF423121.

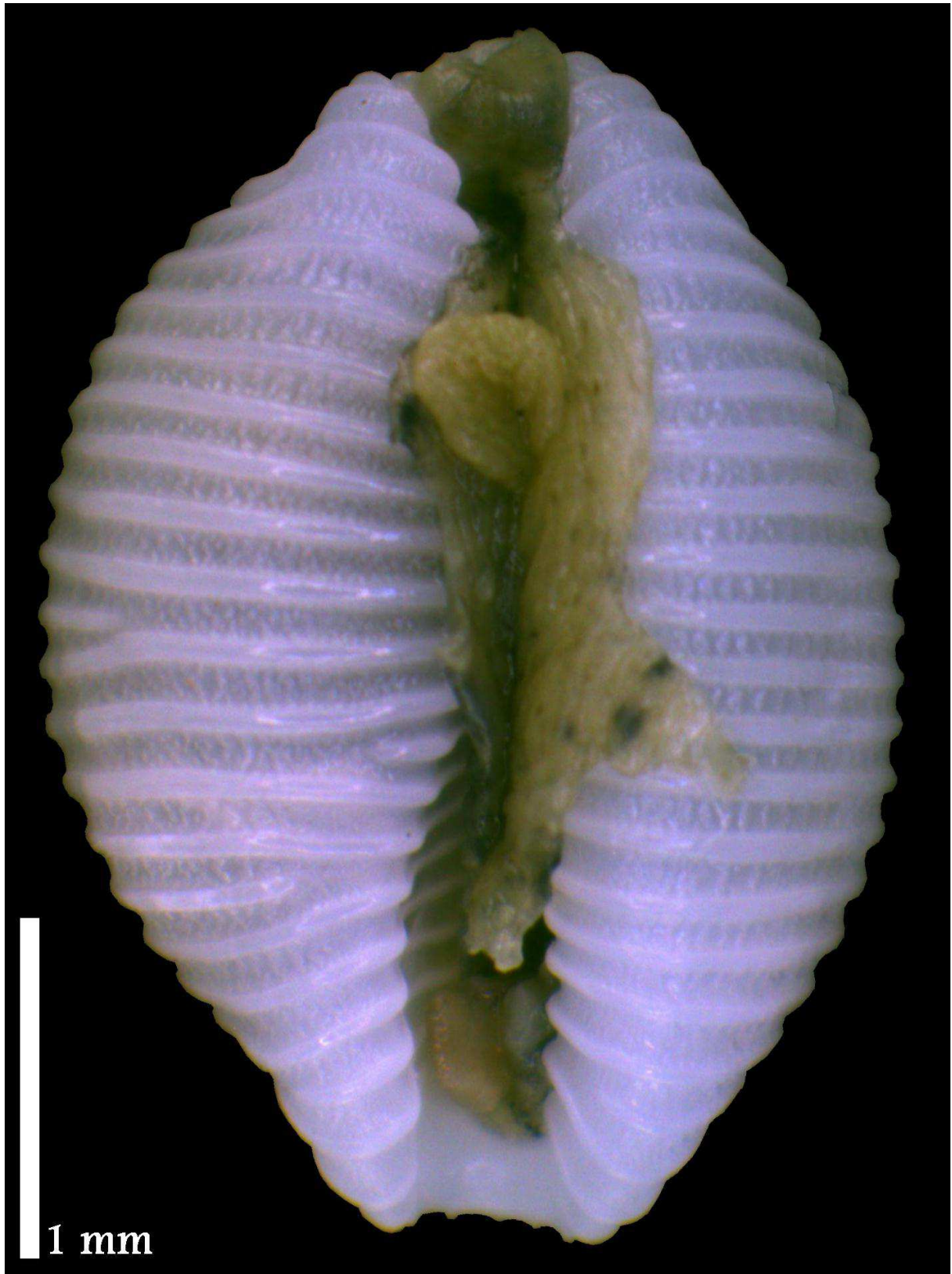


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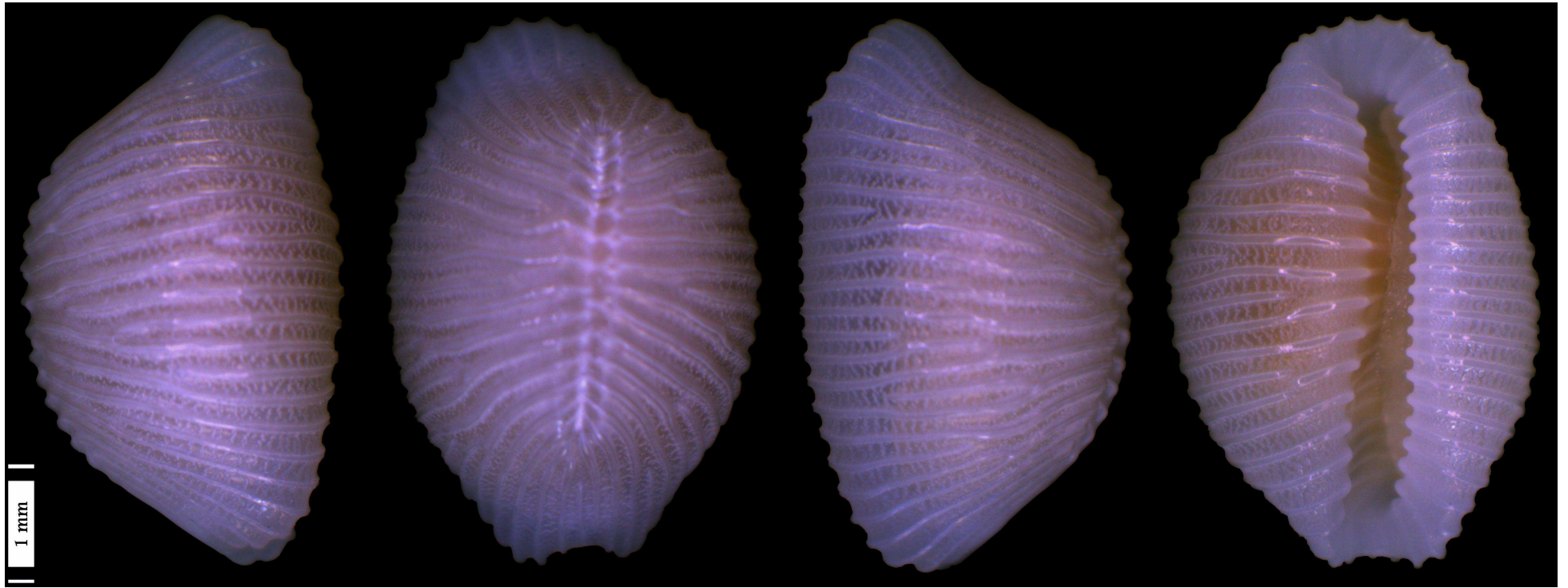


Fig. 40: *Trivirostra pseudotrivellona* Fehse & Grego, 2008. Collection No. UF428004.



Fig. 41: *Trivirostra keehiensis* C.N. Cate, 1979. Collection No. UF428165. Length = 4.7 mm, width = 3.0 mm.

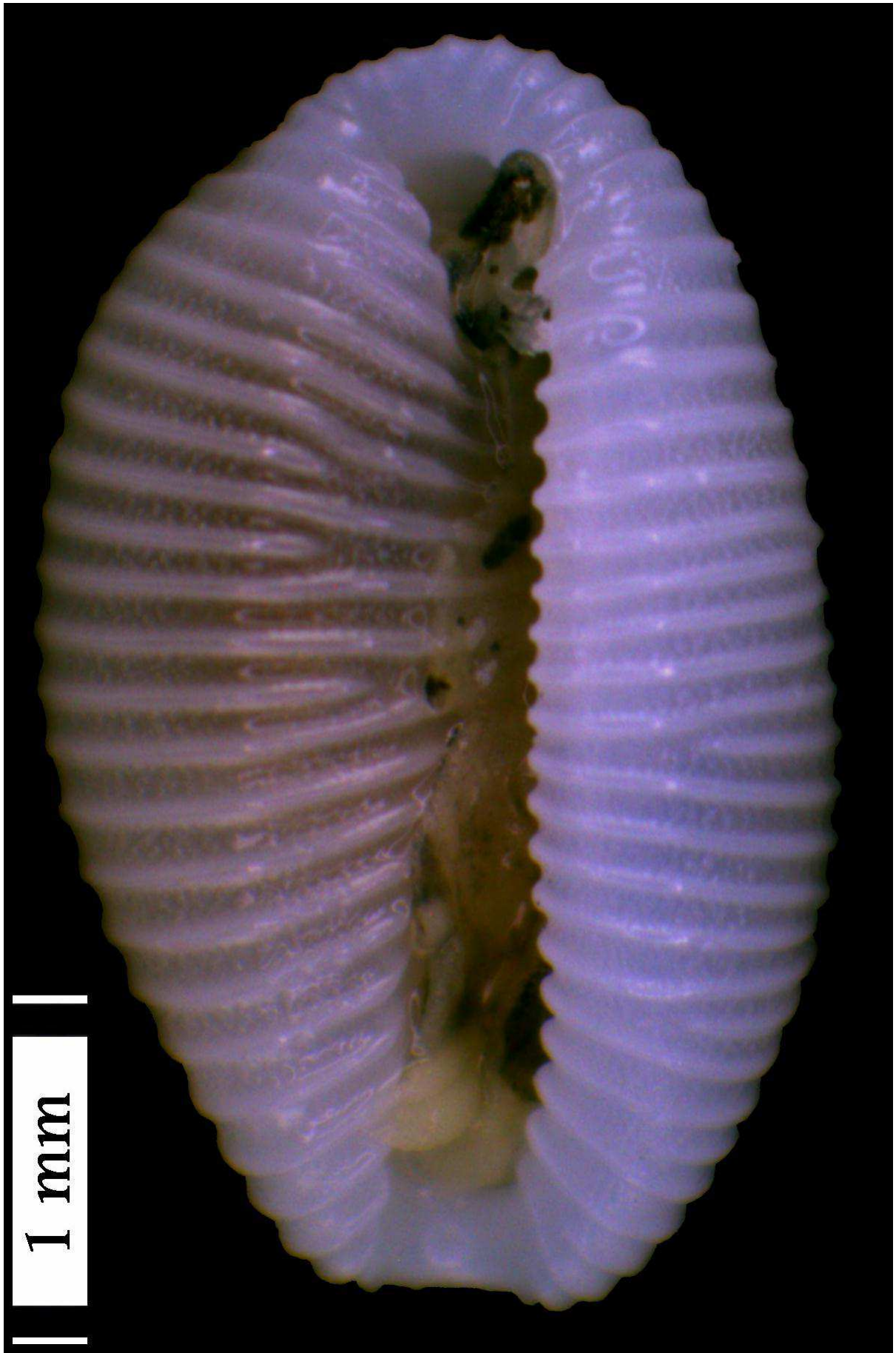


Fig. 42: *Trivirostra hordacea* (Kiener, 1843). Collection No. UF428626-1.



Fig. 43: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF428626-2.

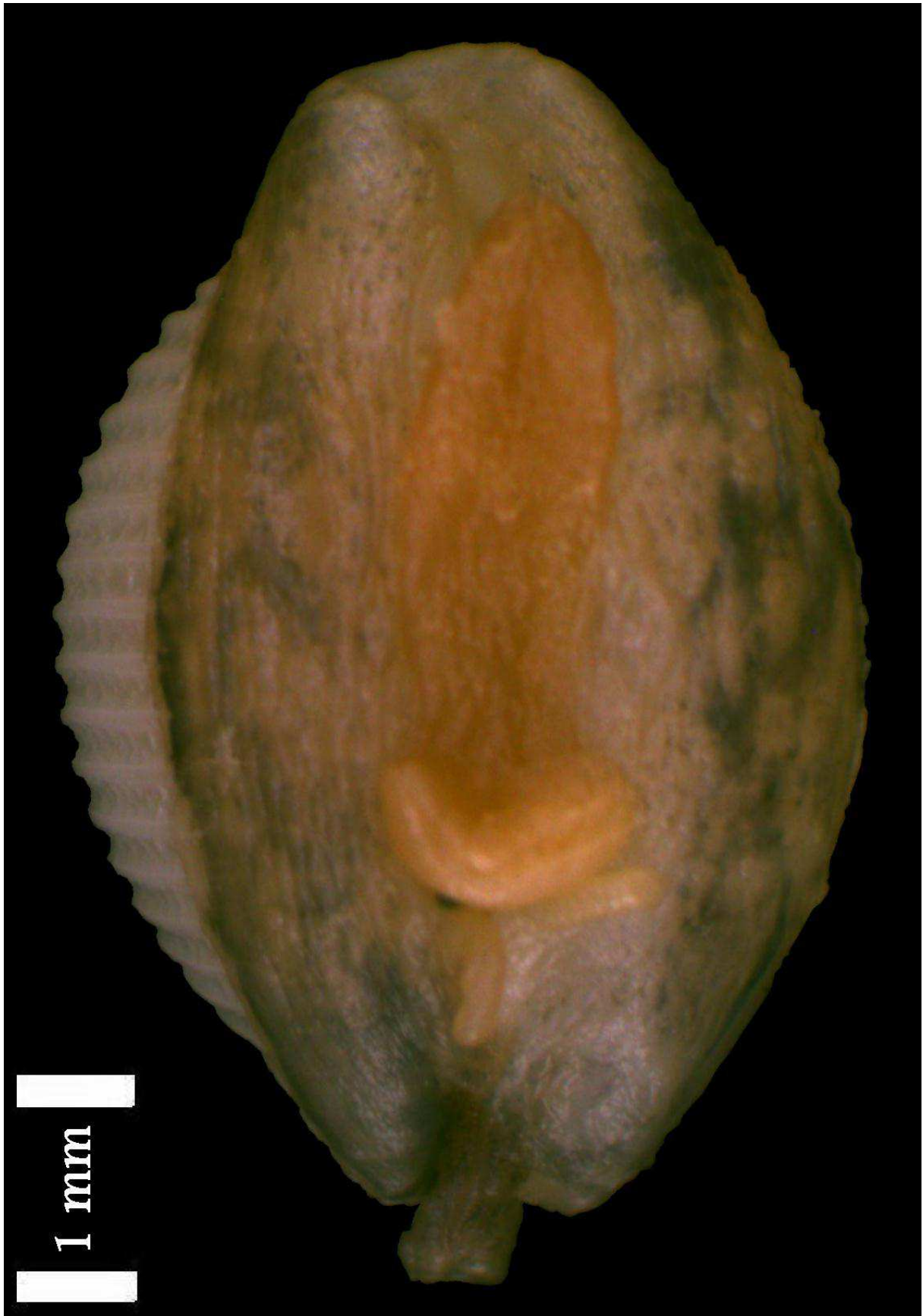


Fig. 44: *Trivirostra* cf. *shawi* F.A. Schilder, 1933. Collection No. UF428626-3.

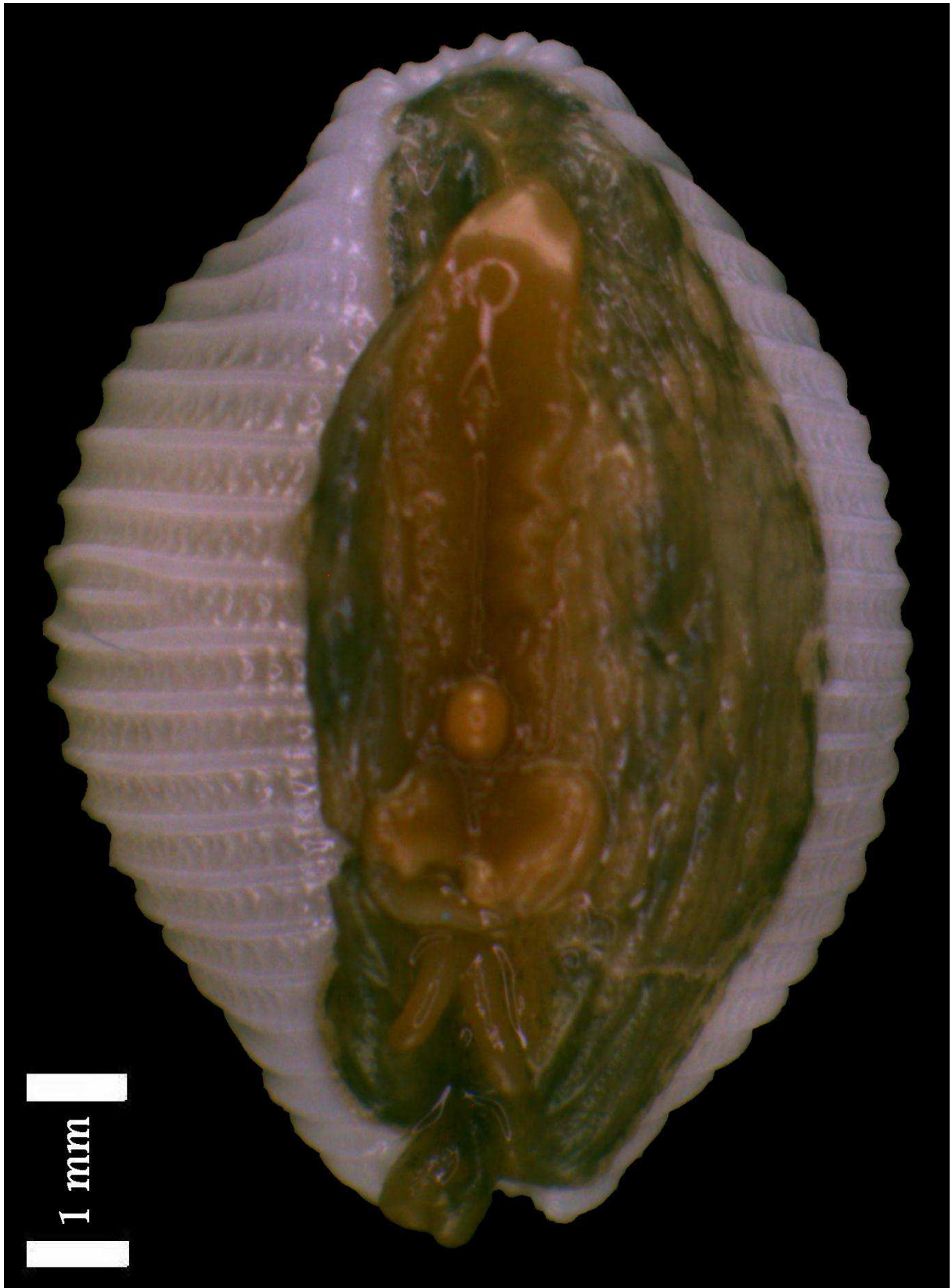


Fig. 45: *Trivirostra* cf. *shawi* F.A. Schilder, 1933. Collection No. UF428626-4.

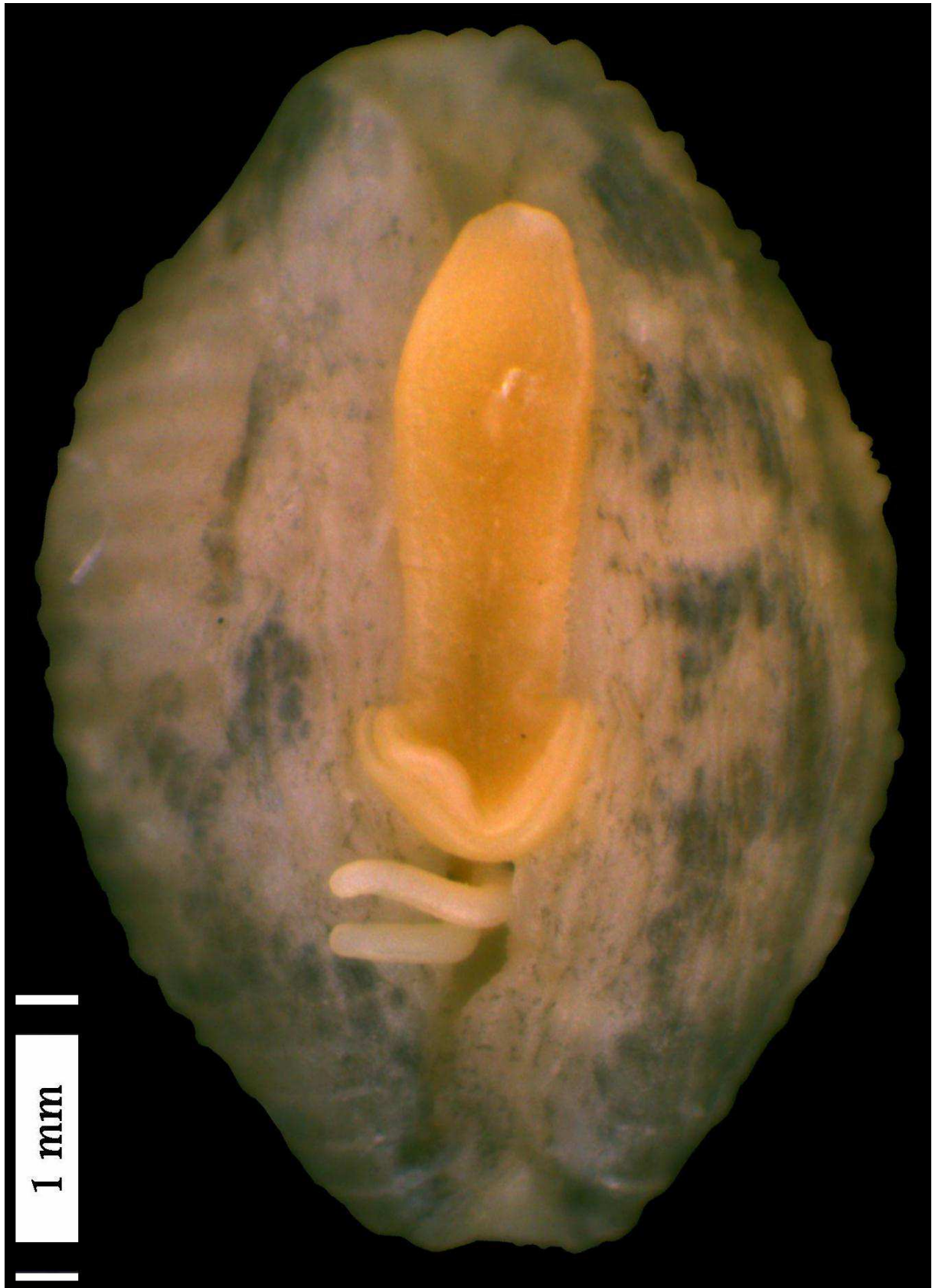


Fig. 46: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF428630.



Fig. 47: *Trivirostra scabriuscula* (J.E. Gray, 1827). Collection No. UF428653.



Fig. 48: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF428657.

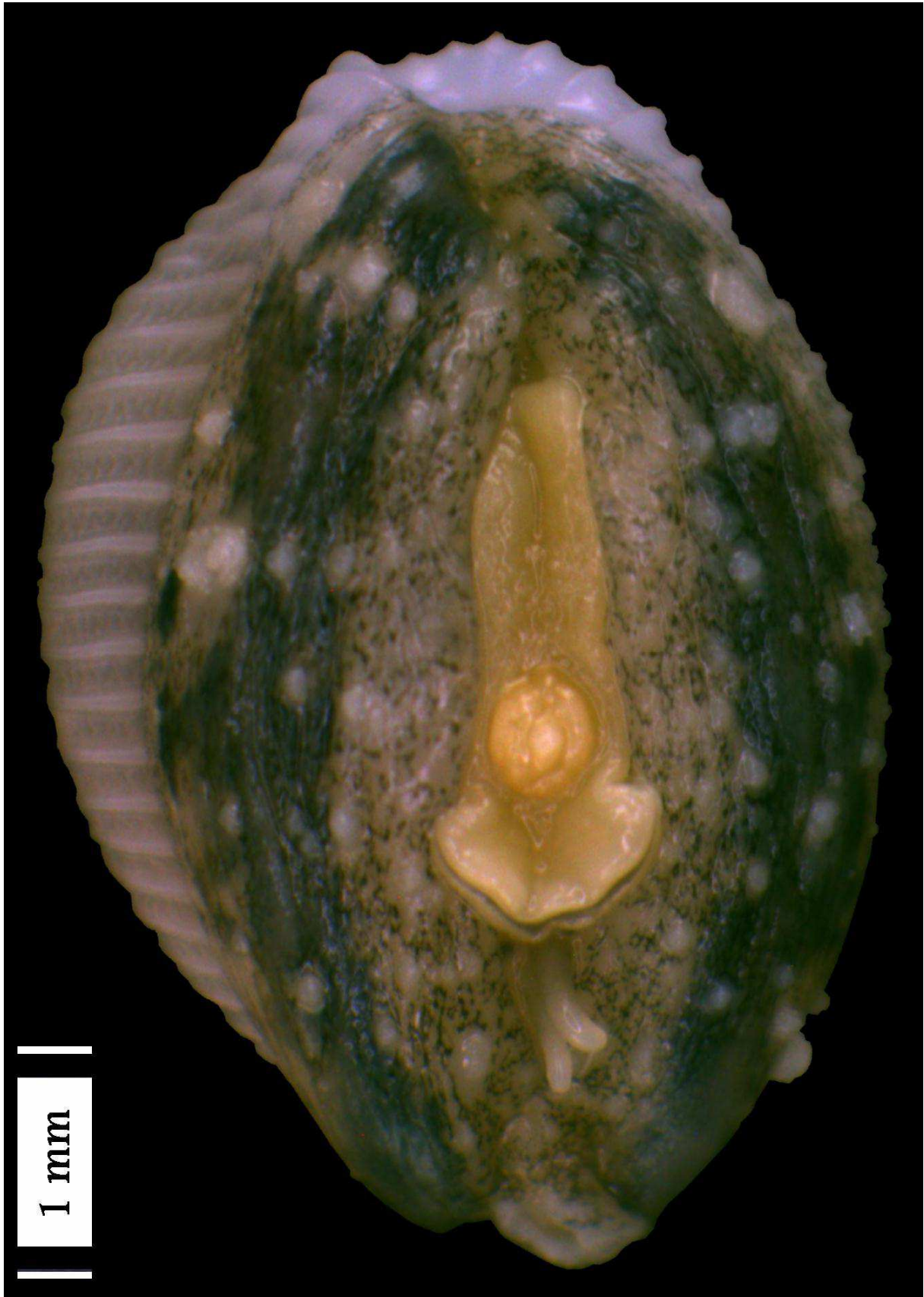


Fig. 49: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF428658.

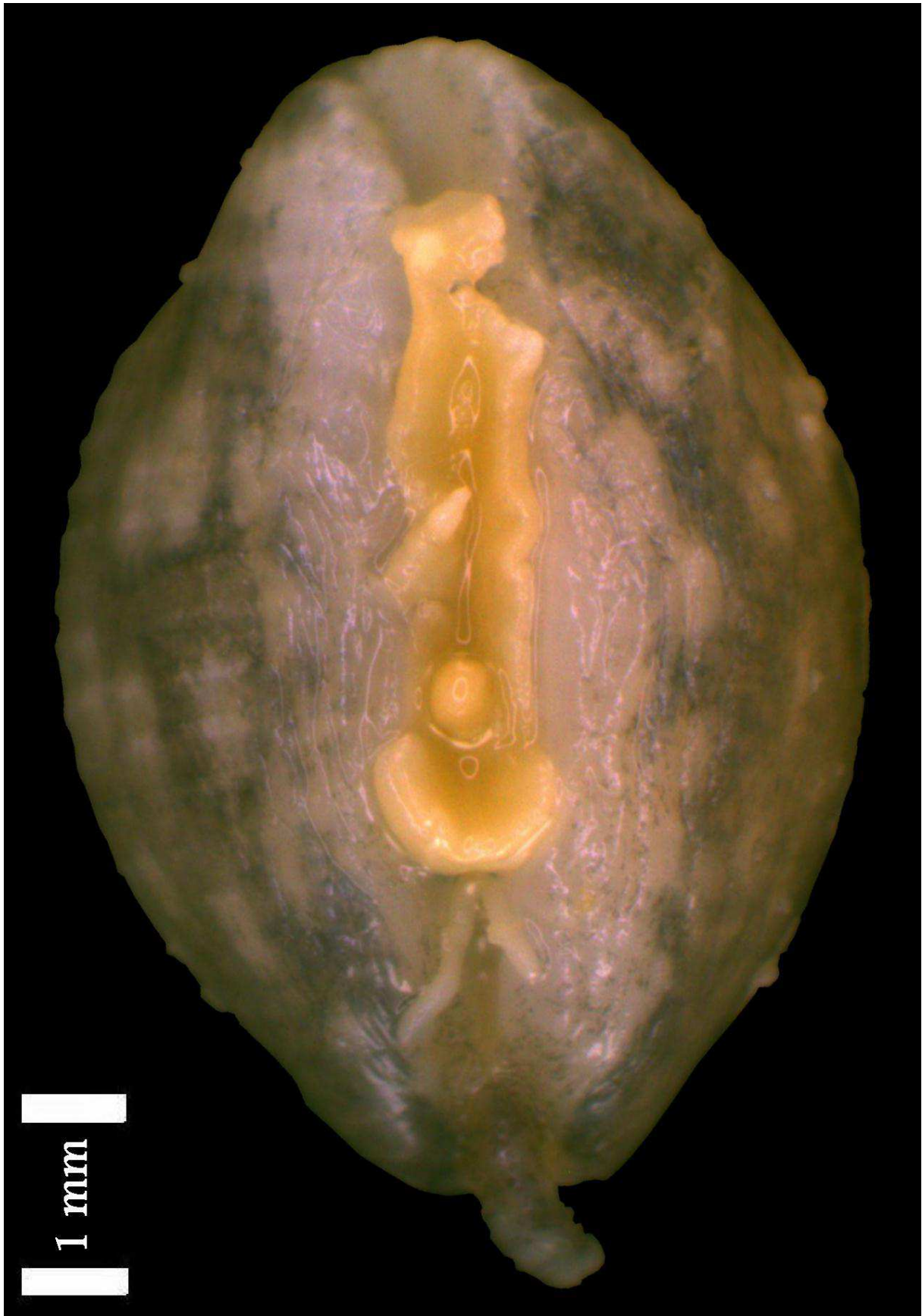


Fig. 50: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF428684.

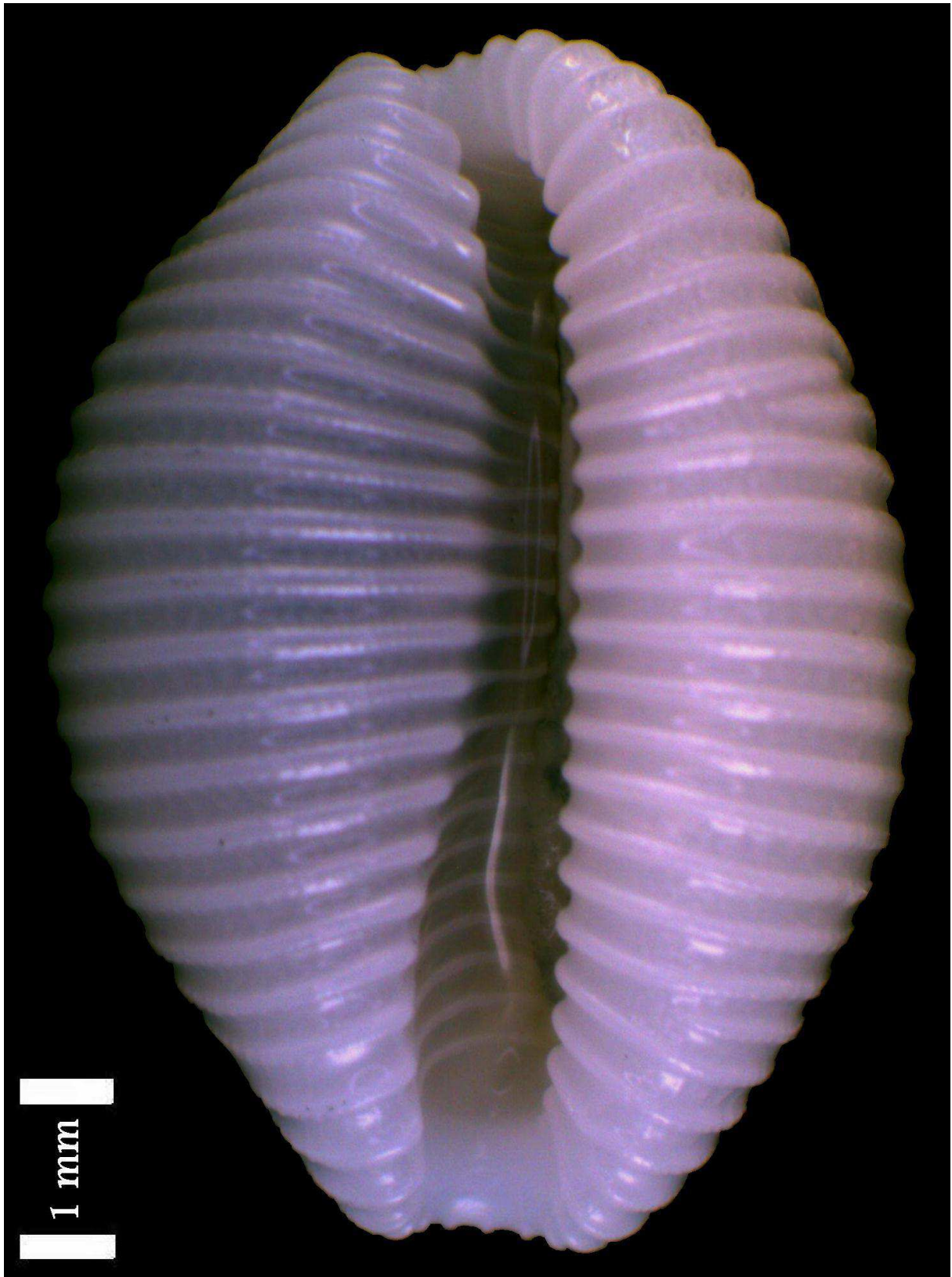


Fig. 51: *Trivirostra* cf. *tryphaenae* Fehse, 1998. Collection No. UF428995. Length = 7.6 mm, width = 5.5 mm, height = 4.8 mm.

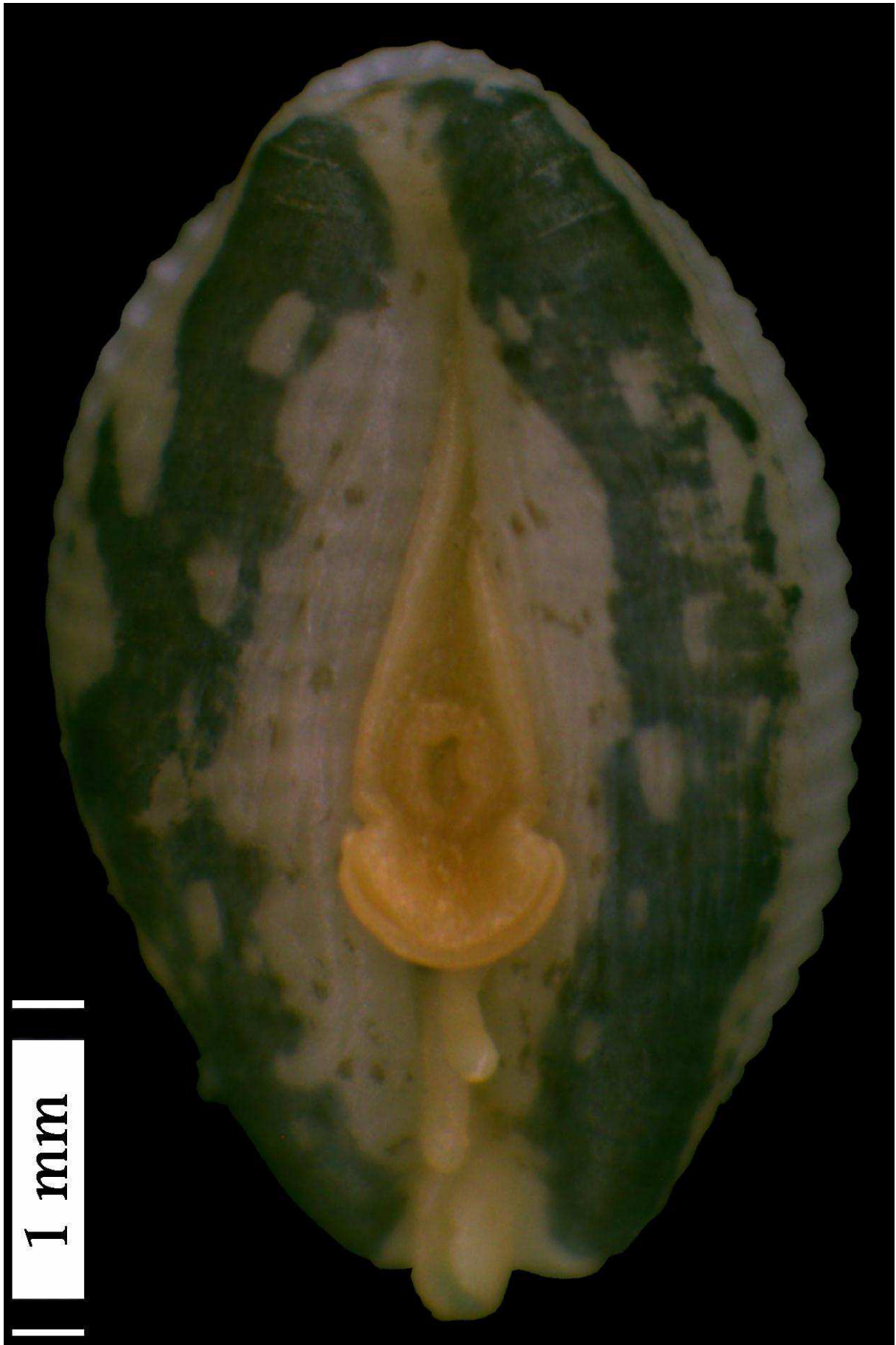


Fig. 52: *Trivirostra* cf. *hordacea* (Kiener, 1843). Collection No. UF435531. Identity somewhat uncertain.



Fig. 53: *Trivirostra* cf. *tryphaenae* Fehse, 1998. Collection No. UF436417. Length = 6.1 mm.

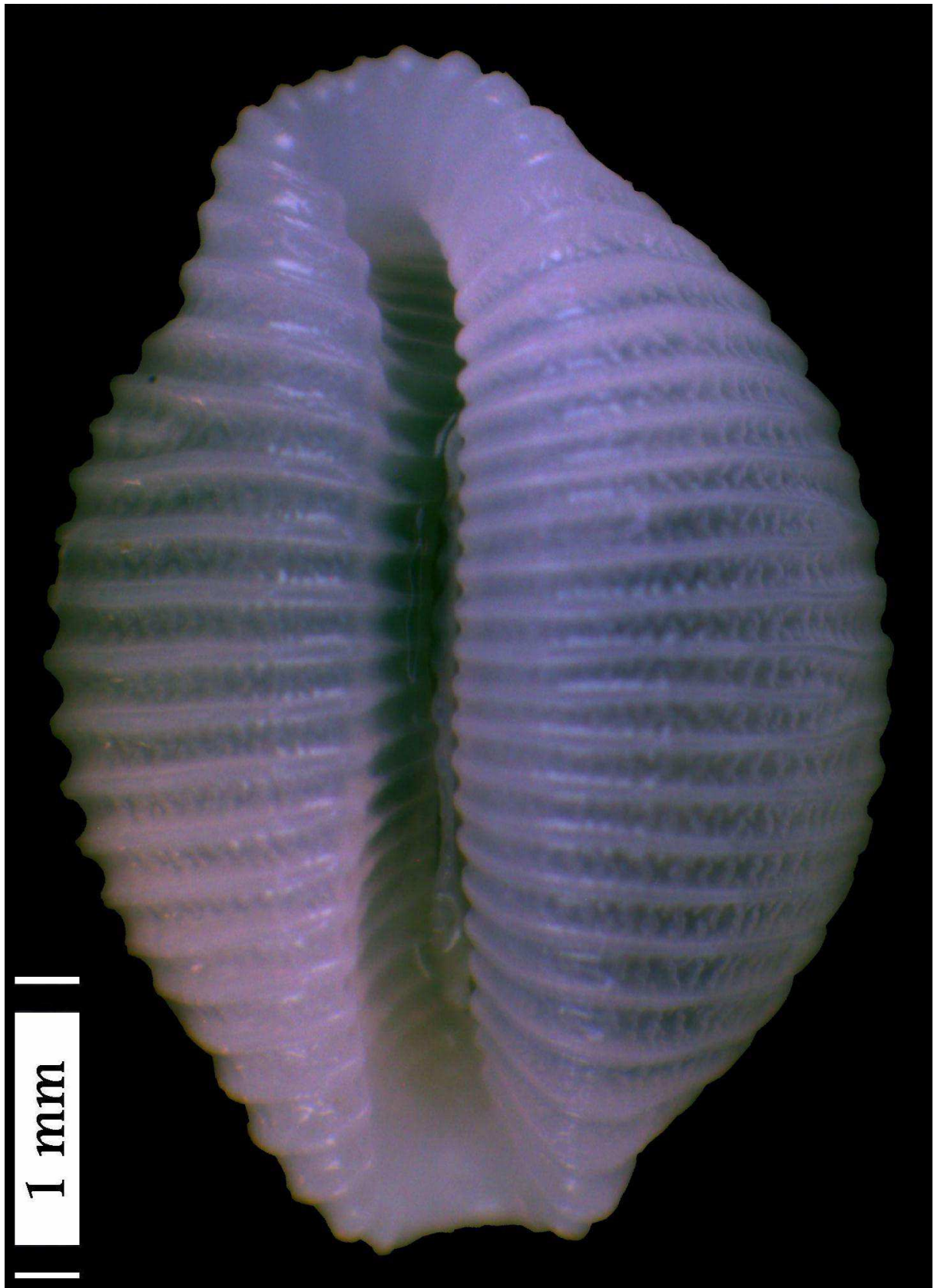


Fig. 54: *Trivirostra edgari* (Shaw, 1909). Collection No. UF436960. Length = 4.4 mm, width = 3.2 mm, height = 2.8 mm. Shell slightly left turned (compare Fehse, 2015A).



Fig. 55: *Trivirostra leylae* Fehse & Grego, 2013. Collection No. UF437060.

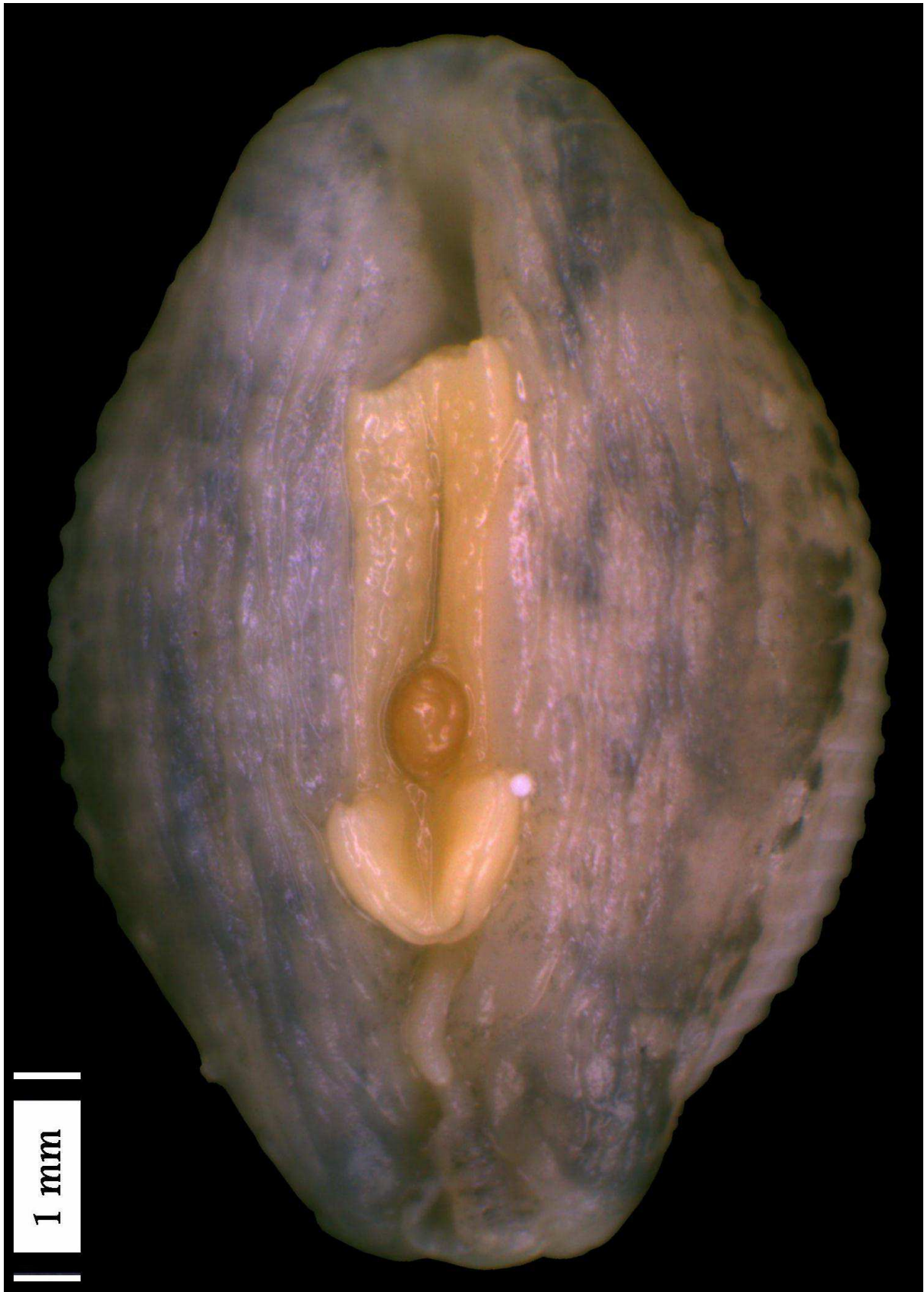


Fig. 56: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF437306.

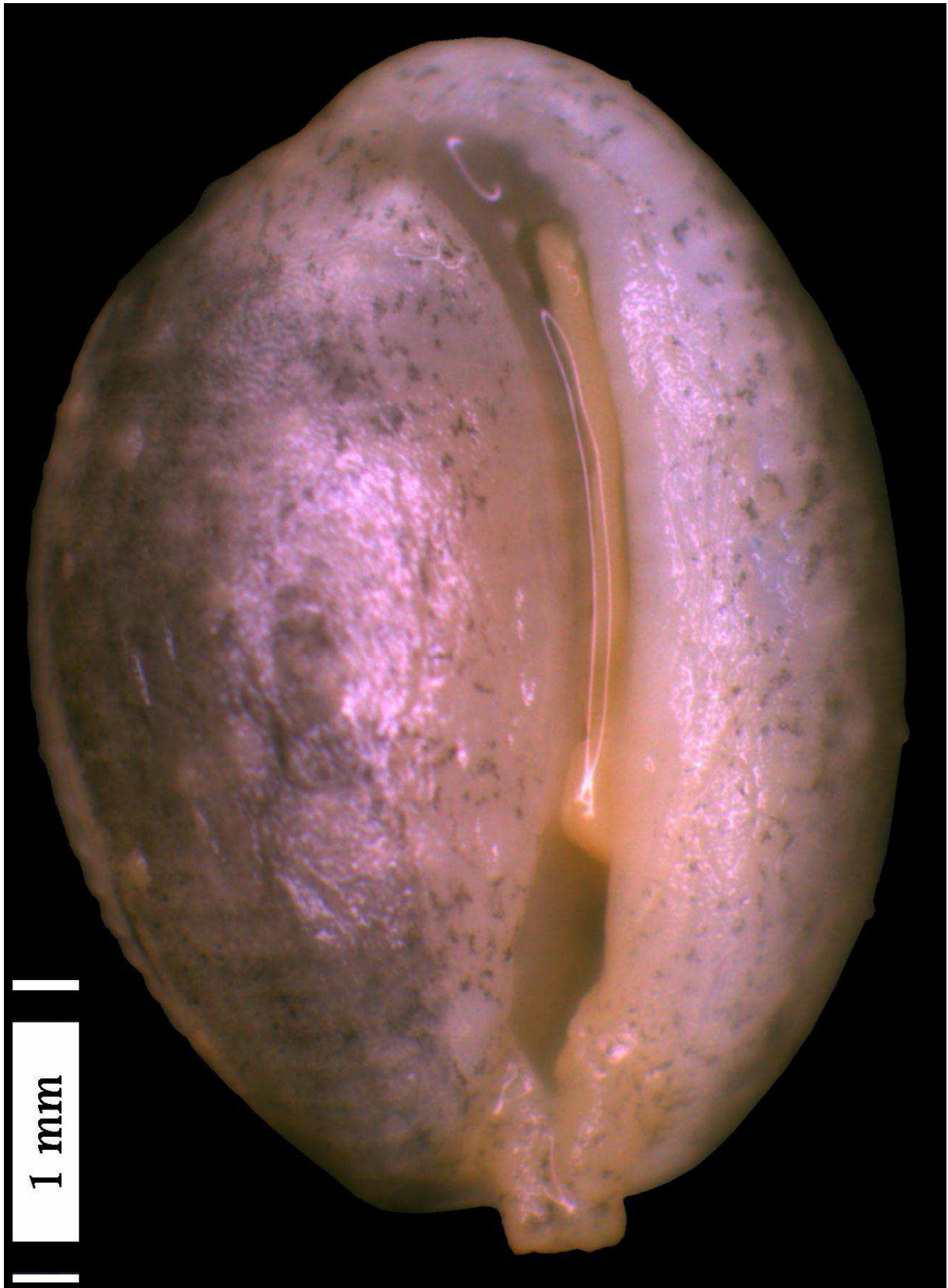


Fig. 57: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF441366.

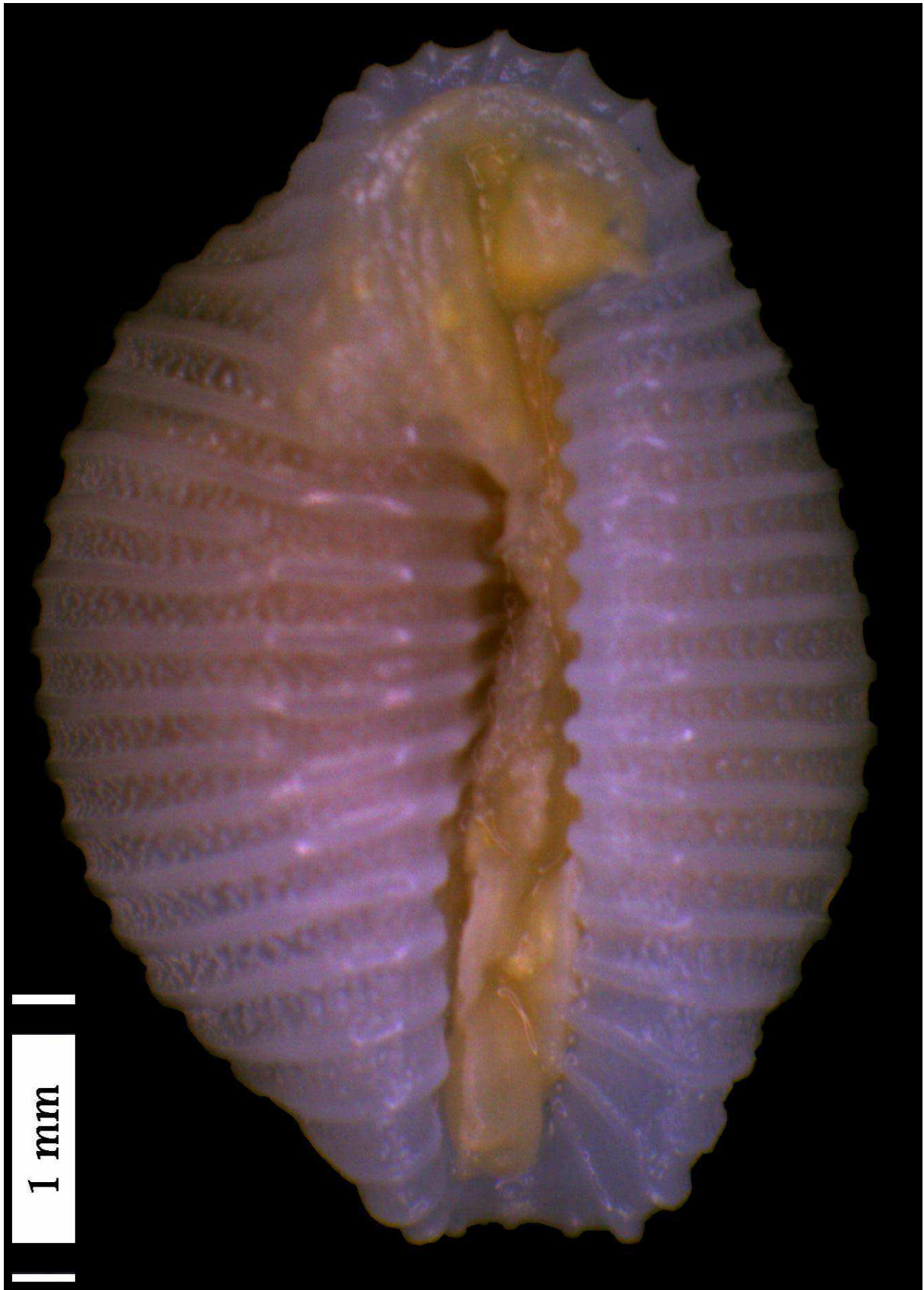


Fig. 58: *Trivirostra* cf. *pseudotrivellona* Fehse & Grego, 2008. Collection No. UF447636.

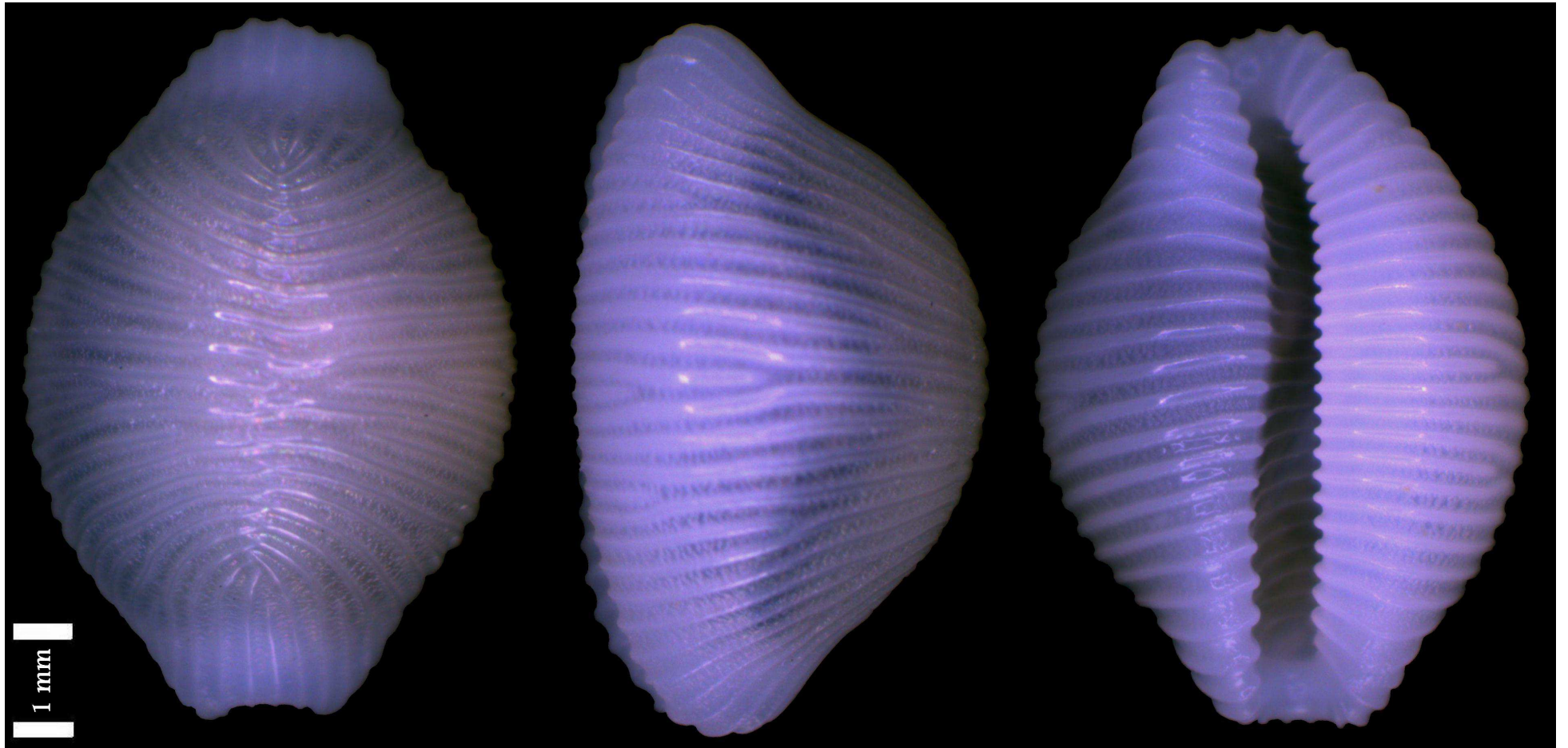


Fig. 59: *Trivirostra triticum* F.A. Schilder, 1932. Collection No. UF455763.

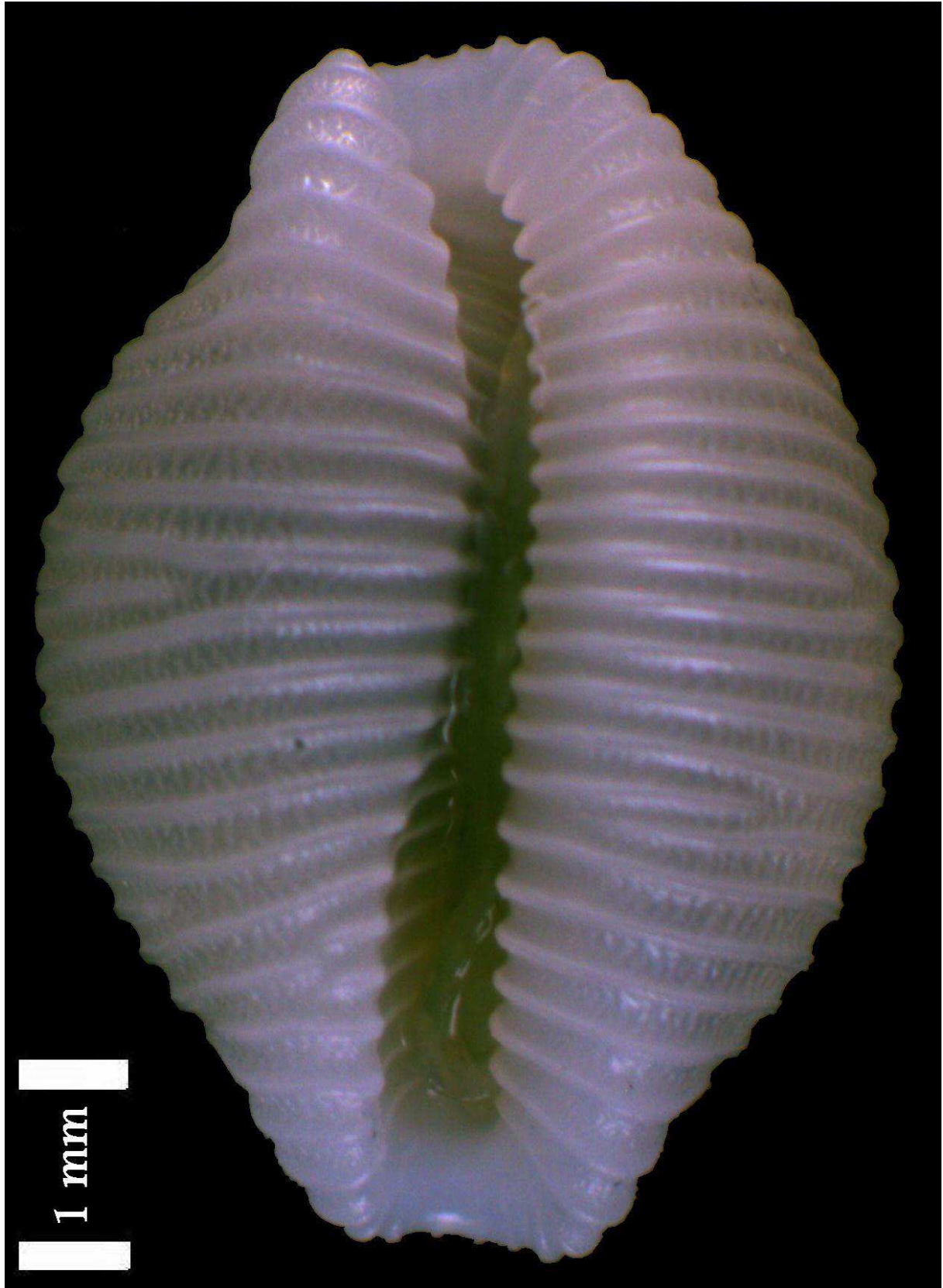


Fig. 60: *Trivirostra* cf. *triticum* F.A. Schilder, 1932. Collection No. UF456171. Length = 6.5 mm, width = 4.7 mm, height = 3.9 mm. Dorsal sulcus unusually shallow.



Fig. 61: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF458317-1.



Fig. 62: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF458317-2.



Fig. 63: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF458317-3.



Fig. 64: *Trivirostra* cf. *oryza* (Lamarck, 1811). Collection No. UF458317-4.



Fig. 65: *Trivirostra scabriuscula* (J.E. Gray, 1827). Collection No. UF458326.



Fig. 66: *Trivirostra subinflata* F.A. Schilder, 1933. Collection No. UF458865. Length = 5.1 mm, width = 3.4 mm, height = 2.9 mm.

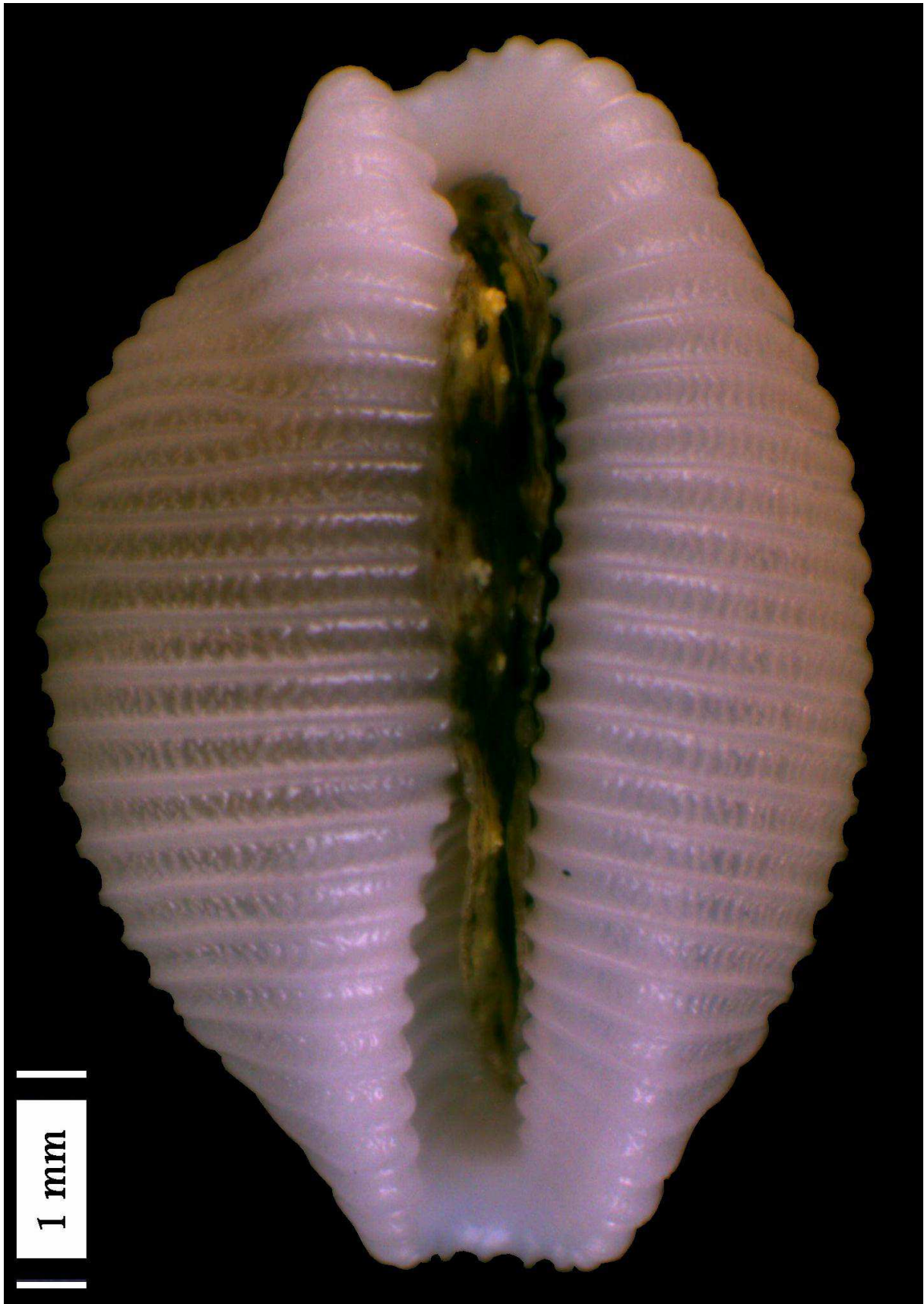


Fig. 67: *Trivirostra* cf. *triticum* F.A. Schilder, 1932. Collection No. UF461463. Dorsal sulcus unusually shallow.



Fig. 68: *Trivirostra* cf. *triticum* F.A. Schilder, 1932. Collection No. UF463223.

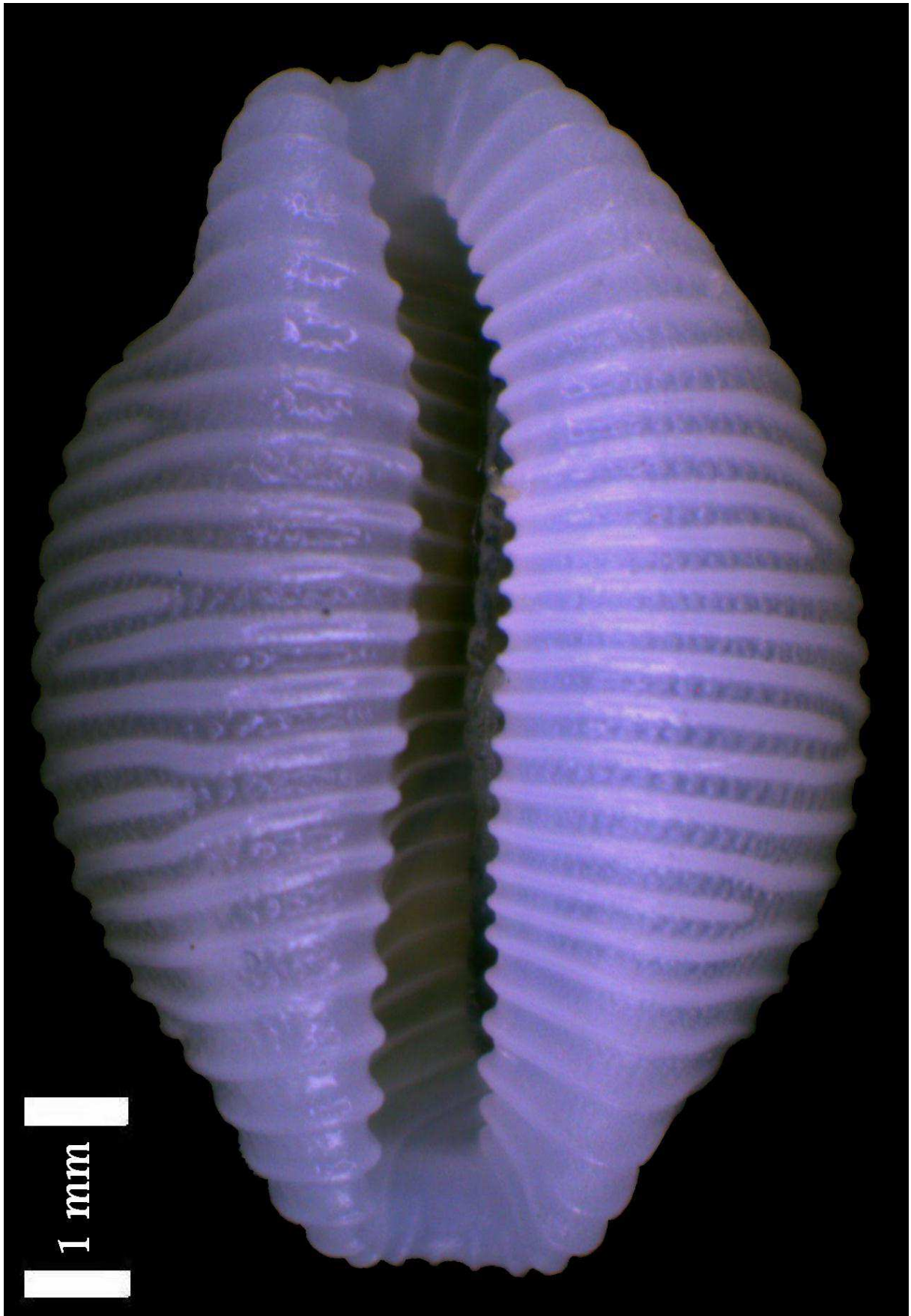


Fig. 69: *Trivirostra triticum* F.A. Schilder, 1932. Collection No. UF463224.

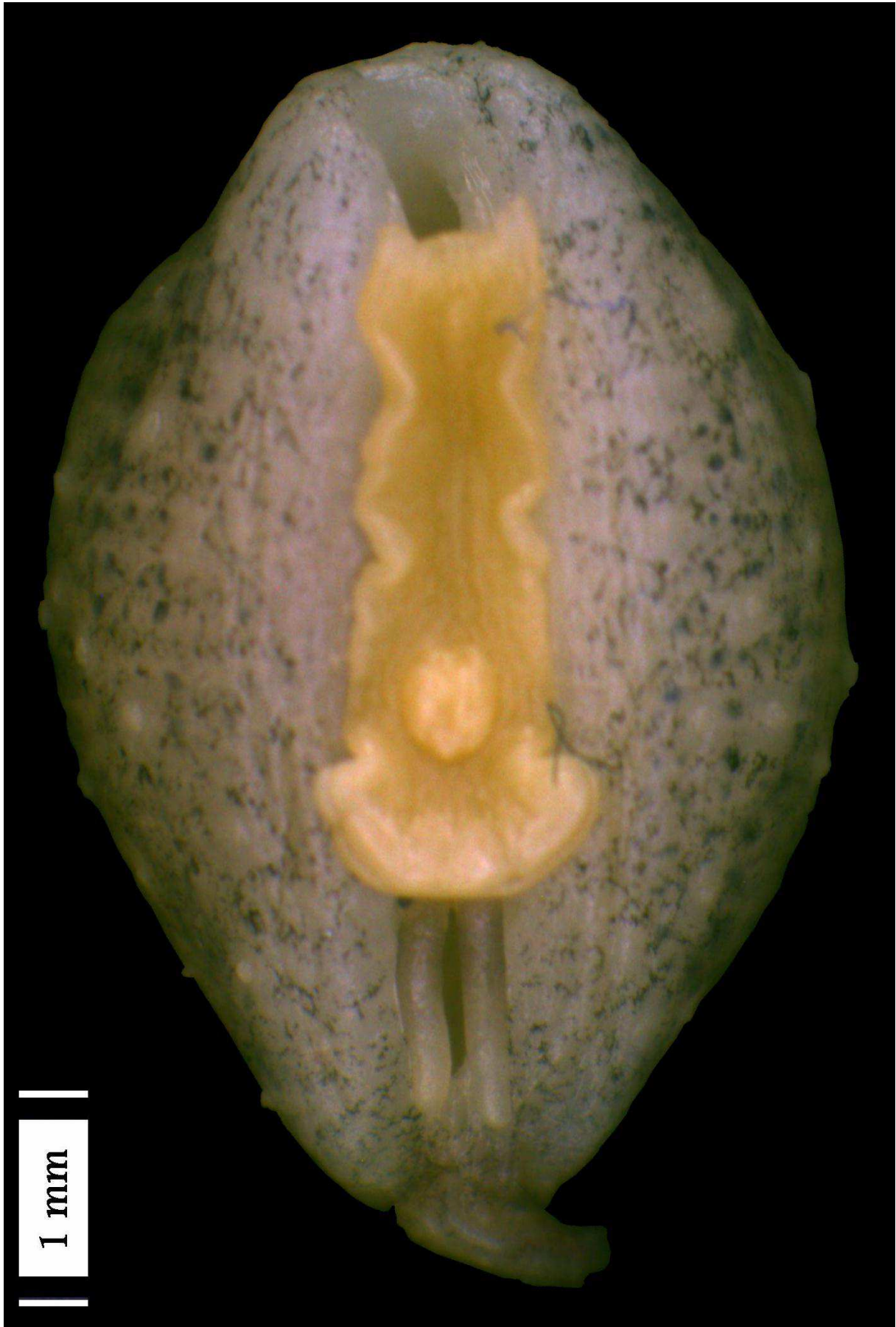


Fig. 70: *Trivirostra natalensis* F.A. Schilder, 1932. Collection No. UF463447.

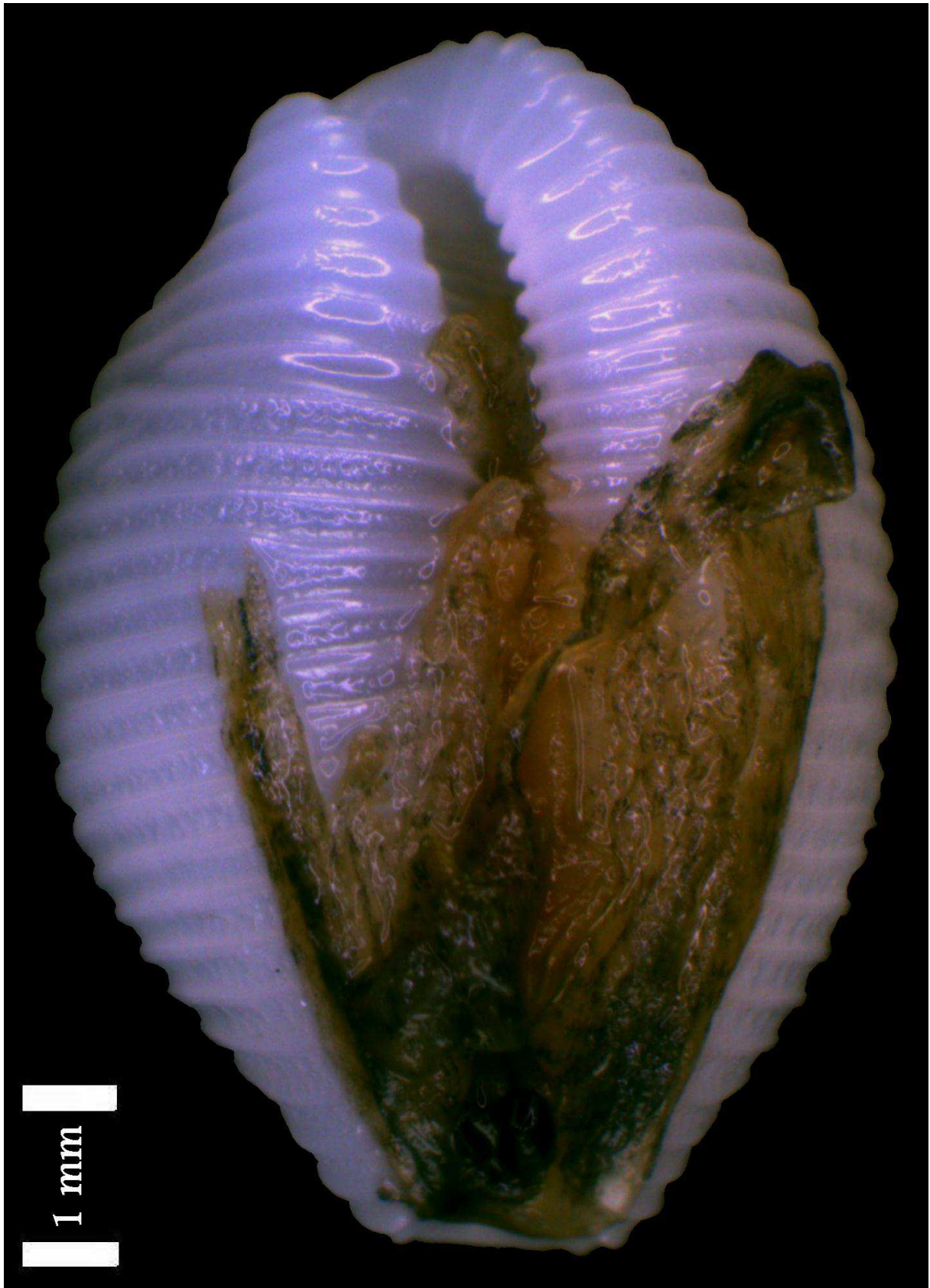


Fig. 71: *Trivirostra triticum* F.A. Schilder, 1932. Collection No. UF463578.



Fig. 72: *Trivirostra cf. akroterion* C.N. Cate, 1979. Collection No. UF464063. Malformed.

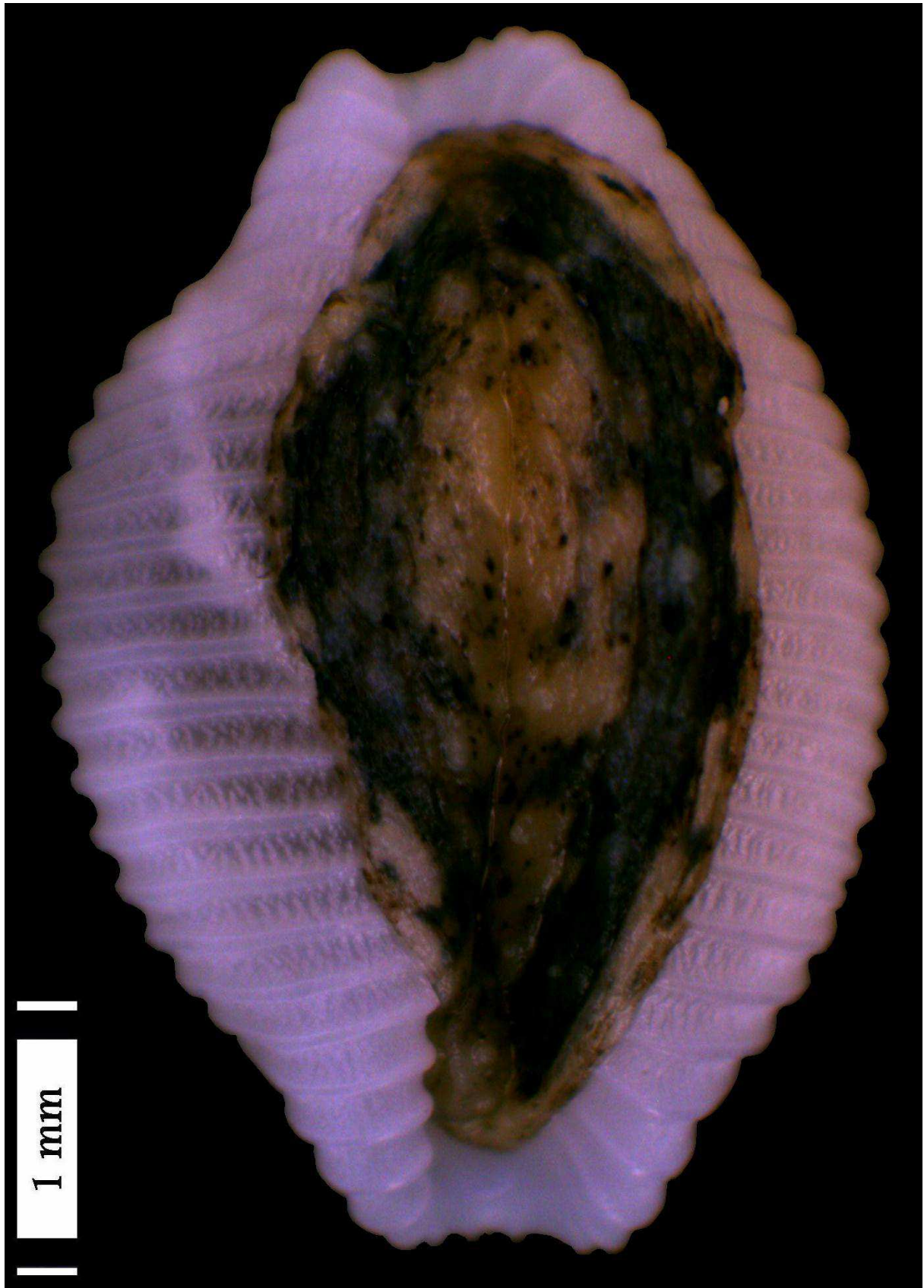


Fig. 71: *Trivirostra cf. triticum* F.A. Schilder, 1932. Collection No. UF476070. Length = 5.4 mm, width = 3.7 mm, height = 3.3 mm.



Fig. 72: *Trivirostra akroterion* C.N. Cate, 1979. Collection No. UF476642. Length = 8.1 mm, width = 5.9 mm, height = 5.1 mm.



Fig. 73: *Trivirostra cf. lacrima* Fehse, 2015F. Collection No. UF401044.



Fig. 74: *Trivirostra* cf. *lacrima* Fehse, 2015F. Collection No. UF411501. Length = 3.7 mm, width = 2.4 mm, height = 2.1 mm.

Genus: *PURPURCAPSULA* Fehse & Grego, 2009
Type species: *Trivirostra rubramaculosa* Fehse & Grego, 2002; by original designation

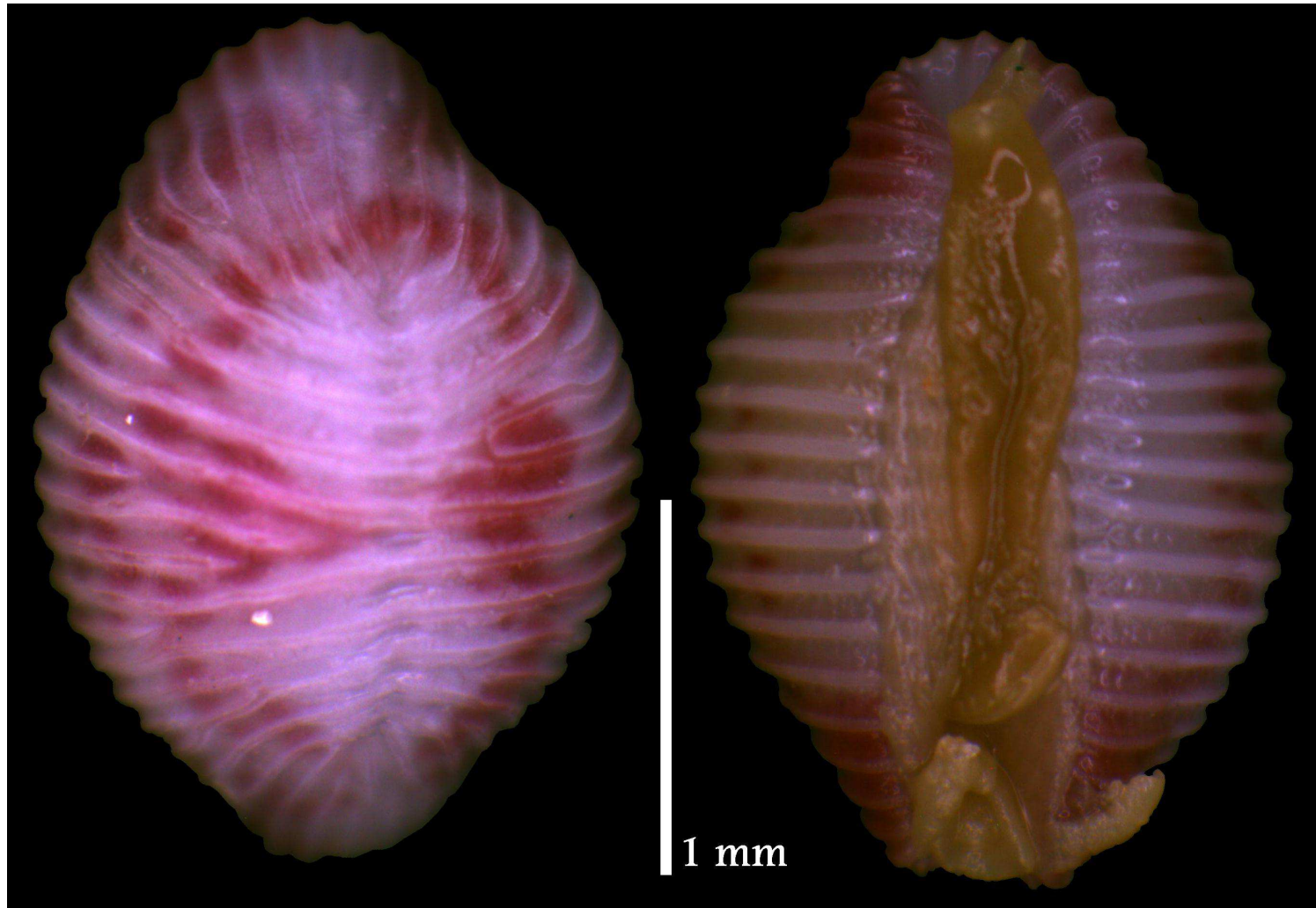


Fig. 75: *Purpurcapsula cf. bayeri* (Fehse, 1999). Collection No. UF414316.

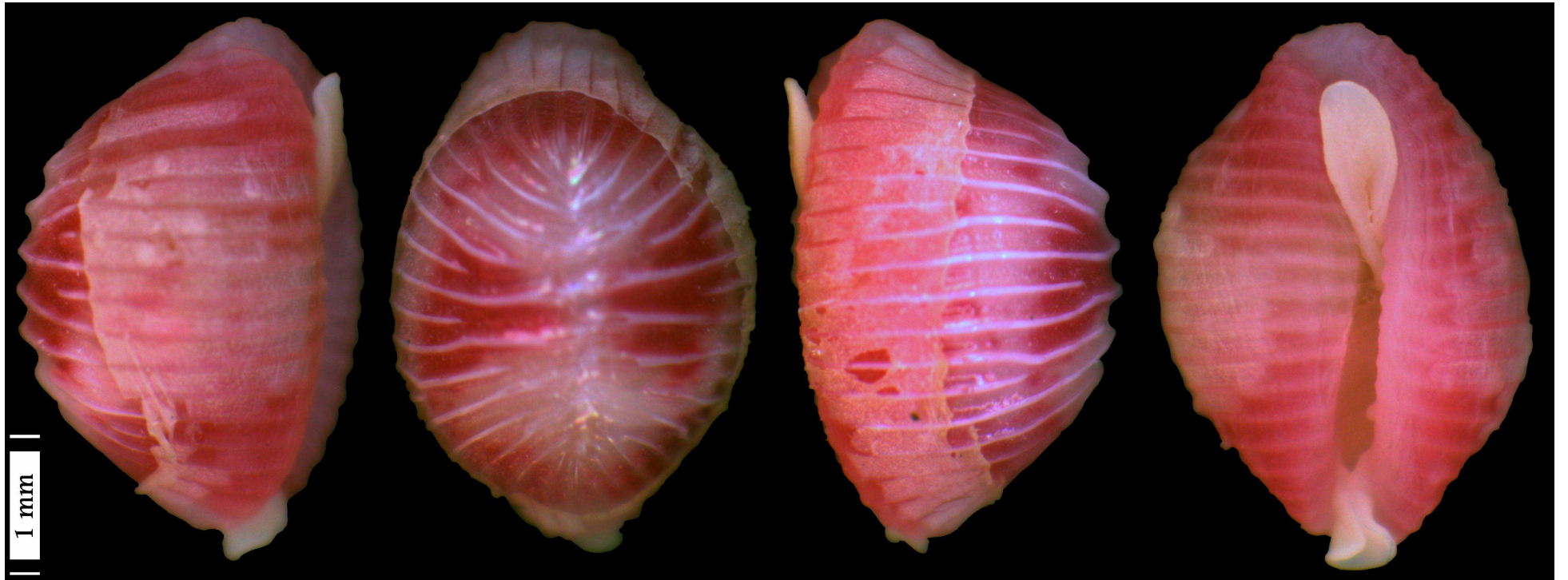


Fig. 76: *Purpurcapsula rubramaculosa* (Fehse & Grego, 2002). Collection No. UF476061.

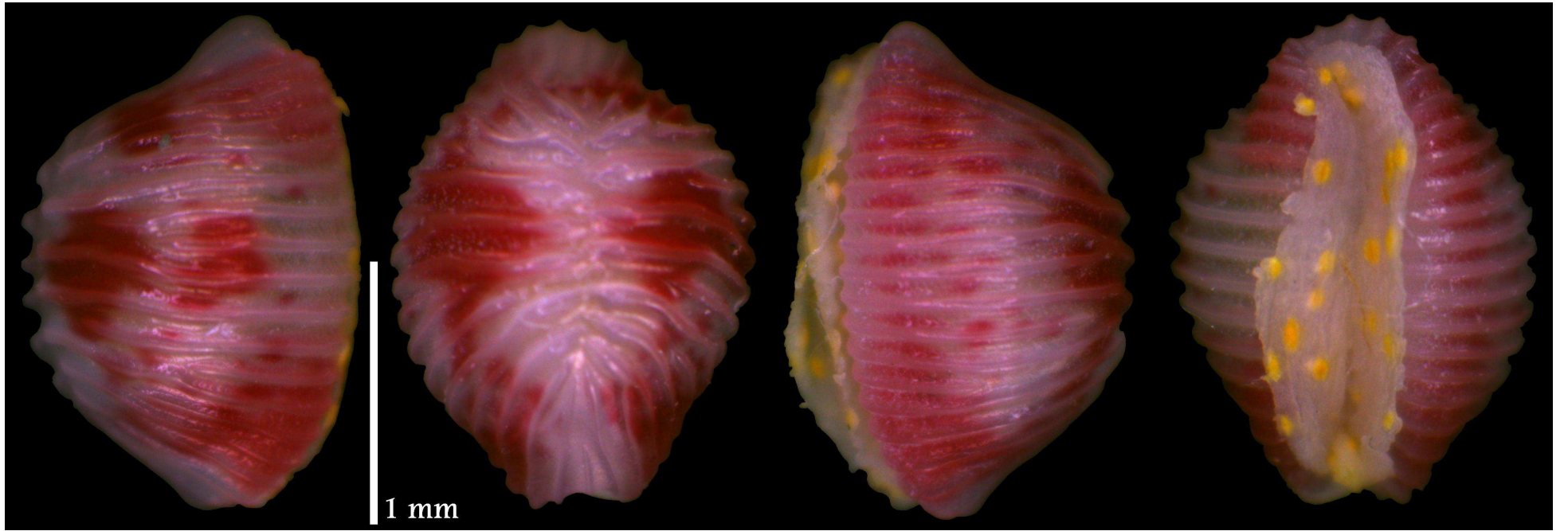


Fig. 77: *Purpurcapsula rubramaculosa* (Fehse & Grego, 2002). Collection No. UF476135.



Fig. 78: *Purpurcapsula rubramaculosa* (Fehse & Grego, 2002). Collection No. UF476469.

Genus: *PUSULA* Jousseaume, 1884

Type species: *Cypraea radians* Lamarck, 1810; by original designation.



Fig. 79: *Pusula pediculus* (Linneaus, 1758). Collection No. UF437554. Length = 8.4 mm, width = 6.3 mm, height = 5.1 mm.



Fig. 80: *Pusula costispunctata* (G.B. Sowerby II, 1870). Collection No. UF437555.



Fig. 81: *Pusula pediculus* (Linneaus, 1758). Collection No. UF437556.



Fig. 82: *Pusula pediculus* (Linnaeus, 1758). Collection No. UF437557.

Genus: *NIVERIA* Jousseaume, 1884

Type species: *Cypraea nivea* Gray, 1824 [= *Trivia nix* Schilder, 1922]; by original designation



Fig. 83: *Niveria maltbiana* (Schwengel & McGinty, 1942). Collection No. UF446888. Length = 11.1 mm.

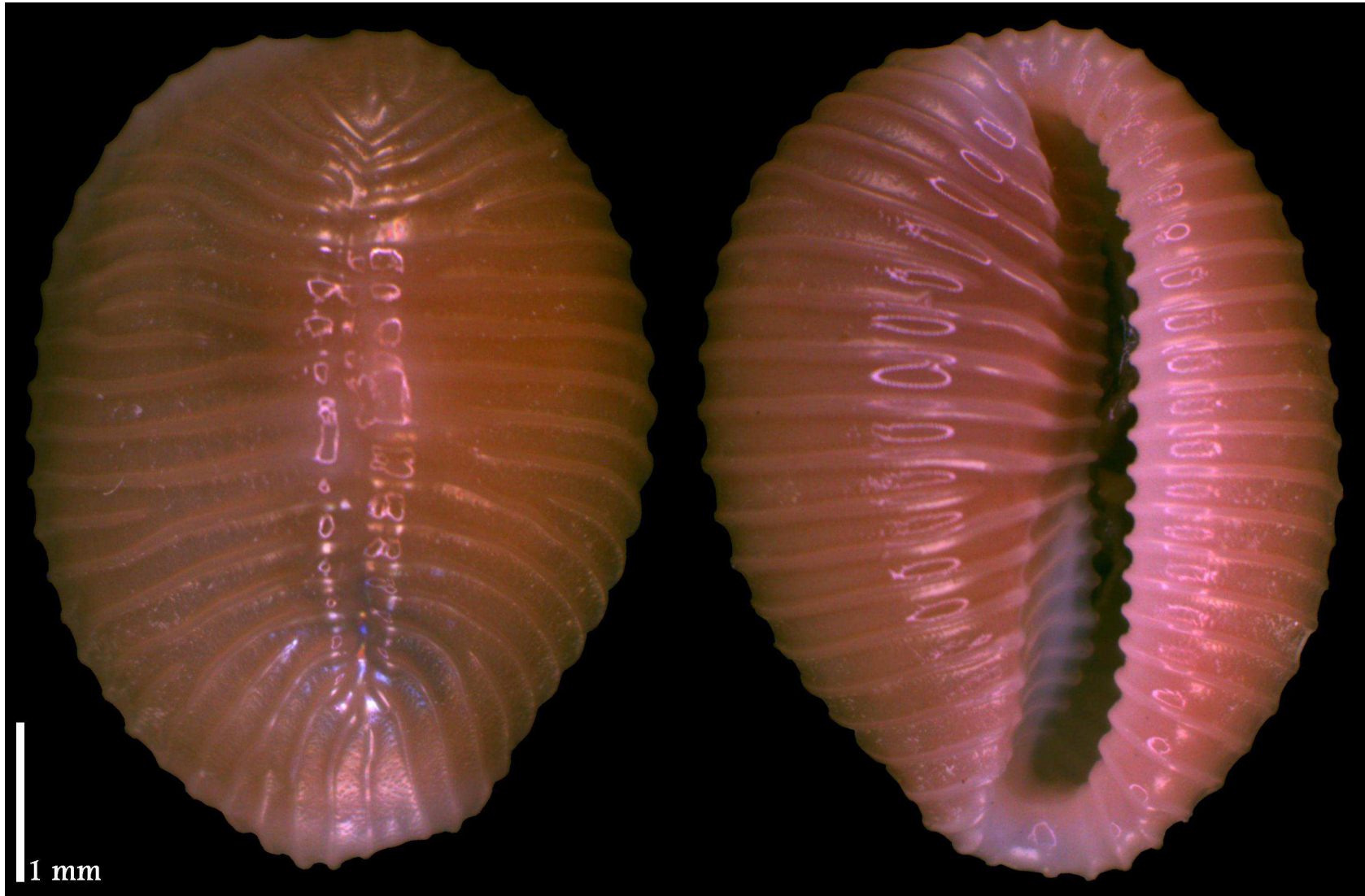


Fig. 84: *Niveria maltbiana* (Schwengel & McGinty, 1942). Collection No. UF450540. Length = 10.1 mm, width = 7.6 mm, height = 6.3 mm.



Fig. 85: *Niveria pacifica* (J.E. Gray in G.B. Sowerby I, 1832). Collection No. UF478091-1. Length = 8.0 mm, width = 5.3 mm, height = 4.2 mm.



Fig. 86: *Niveria pacifica* (J.E. Gray in G.B. Sowerby I, 1832). Collection No. UF478091-2. Length = 7.6 mm, width = 4.9 mm, height = 4.0 mm.

Acknowledgements

We are very grateful to the staff of the Florida Museum of Natural History who made this study possible

REFERENCES

- Cate, C.N. (1979):** A Review of the Triviidae (Mollusca: Gastropoda). – San Diego Society of Natural History, Memoir 10: 1-126, pls. 1-41.
- Fehse, D. (2002):** Beiträge zur Kenntnis der Triviidae (Mollusca: Gastropoda). V. Kritische Beurteilung der Genera und Beschreibung einer neuen Art der Gattung *Semitrivia* Cossmann, 1903. – Acta Conchyliorum, 6: 1-48, pls. 1-7, tabs. 1-3.
- Fehse, D. (2015A):** Contributions to the knowledge of Triviidae. XXIX-A. New Triviidae. Introduction to parts XXIX B to F. – VISAYA, Suppl. 5: 4-15, text figs. 1-17, 1 tab.
- Fehse, D. (2015B):** Contributions to the knowledge of Triviidae. XXIX-B. New Triviidae from the Philippines. – VISAYA, Suppl. 5: 17-47, pls. 1-10, text figs. 1-2 + 12 unnumb., 1 tab.
- Fehse, D. (2015C):** Contributions to the knowledge of Triviidae. XXIX-C. New Triviidae from Taiwan. – VISAYA, Suppl. 5: frontispiece + 49-67, pls. 1-8, text figs. 1 + 12 unnumb., 1 tab.
- Fehse, D. (2015D):** Contributions to the knowledge of Triviidae. XXIX-D. New Triviidae from Indonesia. – VISAYA, Suppl. 5: 69-83, pls. 1-5, text figs. 1-2 + 12 unnumb., 1 tab.
- Fehse, D. (2015E):** Contributions to the knowledge of Triviidae. XXIX-E. New Triviidae from the Australes. – VISAYA, Suppl. 5: 87-111, pls. 1-13, 10 unnumb. text figs., 1 tab.
- Fehse, D. (2015F):** Contributions to the knowledge of Triviidae. XXIX-F. New Triviidae from the Marquesas. – VISAYA, Suppl. 5: 113-130, pls. 1-6, text figs. 1-2 + 9 unnumb., 1 tab.
- Fehse, D. & Grego, J. (2009):** Contributions to the Knowledge of the Triviidae (Mollusca: Gastropoda). X. The Triviidae from the Red Sea with a Description of a New Genus *Purpurcapsula* and a New Species in the Genus *Trivirostra* Jousseaume, 1884. – Visaya, 2 (5): 18-79, 23 text figs., pls. 1-13, 18 maps, 2 tabs., 4 diagrams.
- Fehse, D. & Grego, J. (2014):** Revision of the genus *Pusula* (Mollusca: Gastropoda: Triviidae) – Allied Cowries. Contribution to the knowledge of Triviidae. – Juraj Štefuň (Georg, Žilina, Slovakia): 146 pp., 51 pls., 22 maps, 20 text figs.
- Meyer, C.P. (2003):** Molecular systematics of cowries (Gastropoda: Cypraeidae) and diversification patterns in the tropics. – Biological Journal of the Linnean Society, 79: 401-459, text figs. 1-17.
- Meyer, C.P. (2004):** Toward Comprehensiveness: Increased molecular sampling within Cypraeidae and its Phylogenetic Implications. – Malacologia, 46 (1): 127-156, text figs. 1-7.

Collection numbers, ID of specimens and locality data

photo	Coll. No.	genus	species	author	region	station	section	locality	coordinates	depth	specimens	remarks
✓	UF289246	<i>Trivirostra</i>	<i>matavai</i>	Fehse & Grego, 2013	Fiji	Viti Levu	Hideaway Resort, on Coral Coast	collected at night	? ?	< 2 m	1	aperture covered by animal
	UF289312	<i>Trivirostra</i>	<i>akroterion</i>	(C.N. Cate, 1979)	Fiji	Viti Levu	just W Malevu, 10 km E Sigatola	fringing reef	? ?	0 to 1.5 m	1	shell seems to be empty!!!
✓	UF289315	<i>Trivirostra</i>	<i>sphaeroides</i>	Schilder, 1933	Fiji	Viti Levu	just W Malevu, 10 km E Sigatola	fringing reef	? ?	0 to 1.5 m	1	aperture covered by animal
	UF289444	<i>Trivirostra</i>	<i>akroterion</i>	(C.N. Cate, 1979)	Fiji	Viti Levu	1 km W Mbusa Reef	fringing reef	? ?	0 to 1.5 m	1	shell seems to be empty!!!
	UF290392	<i>Trivirostra</i>	<i>hordacea</i>	(Kiener, 1843)	Niue Island	off Alofi Wharf		outer reef slope and harbour	? ?	5 to 15 m	1	shell seems to be empty!!!
✓	UF290617	<i>Trivirostra</i>	<i>edgari</i>	(Shaw, 1909)	Niue Island	Off Opaahi		outer reef slope, under sides of rocks	? ?	10 to 12 m	1	
✓	UF290619	<i>Trivirostra</i>	<i>thaanumi</i>	C.N. Cate, 1979	Niue Island	Off Opaahi		outer reef slope, under sides of rocks	? ?	10 to 12 m	1	shell is going to be dissolved
✓	UF290620	<i>Trivirostra</i>	<i>ginae</i>	Fehse & Grego, 2002	Niue Island	Off Opaahi		outer reef slope, under sides of rocks	? ?	10 to 12 m	1	subadult
	UF290703	<i>Trivirostra</i>	?		Niue Island	Opaahi		outer reef slope, under rocks	? ?	11 to 15 m	1	ID not possible because juvenile shell
✓	UF290704	<i>Trivirostra</i>	<i>ginae</i>	Fehse & Grego, 2002	Niue Island	Opaahi		outer reef slope, under rocks	? ?	11 to 15 m	2	photo: 1 & 3; aperture covered by animal
✓	UF290704	<i>Trivirostra</i>	cf. <i>hordacea</i>	(Kiener, 1843)	Niue Island	Opaahi		outer reef slope, under rocks	? ?	11 to 15 m	1	photo: 2; aperture covered by animal
✓	UF290705	<i>Trivirostra</i>	<i>ginae</i>	Fehse & Grego, 2002	Niue Island	Opaahi		outer reef slope, under rocks	? ?	11 to 15 m	4	
✓	UF290844	<i>Trivirostra</i>	<i>thaanumi</i>	C.N. Cate, 1979	Niue Island	Opaahi		outer reef slope, rock surfaces in rubble on coarse sand	? ?	7 to 12 m	1	
✓	UF290995	<i>Trivirostra</i>	<i>ginae</i>	Fehse & Grego, 2002	Niue Island	Alofi Wharf		outer reef slope, surfaces of 0.3 to 1 m diameter rocks in rubble field	? ?	6 to 9 m	2	subadult; shell seems to be empty and are going to be dissolved!!!
✓	UF292404	<i>Trivirostra</i>	<i>leylae</i>	Fehse & Grego, 2013	Tuamotu	Rangiroa	ca. 1 km S of NW point of atoll, off Motu Maeherehonae	outer reef slope, under rocks	-14.9287° -147.8578°	6 to 12 m	1	aperture covered by animal
✓	UF293257	<i>Trivirostra</i>	<i>vitrina</i>	C.N. Cate, 1979	Fiji	Viti Levu	on inner channel slope along Eastern Side of Nukubutho channel off Suva Point between N Ureia and poit opposite Joe's and Mary' house	attached to undersides of rocks	18.1792° 178.4715°	3 to 15 m	1	aperture covered by animal
✓	UF294425	<i>Trivirostra</i>	cf. <i>matavai</i>	Fehse & Grego, 2013	Cook Islands	Aitutaki		outer reef flat, undersurfaces of large rocks	? ?	?	2	
✓	UF294804	<i>Trivirostra</i>	<i>hordacea</i>	(Kiener, 1843)	Cook Islands	Aitutaki	Akaiami Motu	snorkel of seaward side (east side) of Motu, rock undersurfaces	? ?	?	1	shell seems to be empty!!!
✓	UF295576	<i>Trivirostra</i>	<i>matavai</i>	Fehse & Grego, 2013	Mariana Islands	Guam Island	Pago Bay	reef flat, under rocks	? ?	0 to 0.5 m	1	
✓	UF296555	<i>Trivirostra</i>	<i>leylae</i>	Fehse & Grego, 2013	Niue Island	Namukulu	Limu, cave area outside S Limu pool	outer reef slope, on walls and ceiling of cave	? ?	20 to 30 m	1	aperture covered by animal
✓	UF296563	<i>Trivirostra</i>	cf. <i>matavai</i>	Fehse & Grego, 2013	Niue Island	Tuapa	Hio Reef flat	reef flat, interstices within coral rock	? ?	?	2	aperture covered by animal
✓	UF305061	<i>Trivirostra</i>	cf. <i>tryphaenae</i>	Fehse, 1998	Mariana Islands	Guam Island	N Pago Island	outer reef flat, under rocks	? ?	0 to 1 m	1	aperture covered by animal
✓	UF305164	<i>Trivirostra</i>	<i>scabriuscula</i>	(J.E. Gray, 1827)	Mariana Islands	Guam Island	Ritidian	exposed	? ?	0 to 1 m	1	aperture covered by animal
✓	UF310166	<i>Trivirostra</i>	cf. <i>edgari</i>	(Shaw, 1909)	Hawaii	Maui	Maalaea Bay	algae wash	? ?	1 to 4 m	1	animal pattern slightly different to UF414879; aperture covered by animal
✓	UF313186	<i>Trivirostra</i>	cf. <i>tomlini</i>	Schilder & Schilder, 1944	Mascarene Islands	Mauritius		?	? ?	?	1	subadult
✓	UF327837	<i>Trivirostra</i>	<i>scabriuscula</i>	(J.E. Gray, 1827)	Caroline Islands		Pohnpei Island	channel and seagrass/ coral flat on reef side	85° 31' 32" S 198° 48' 22" E	0 to 1 m	1	aperture covered by animal
✓	UF330689	<i>Trivirostra</i>	cf. <i>thaanumi</i>	C.N. Cate, 1979	Niue Island	Namukulu	Limu Reef flat	reef flat, pools, and area landward of reef crest, underside of rocks, on hard substrates	? ?	0 to 5 m	2	aperture covered by animal
✓	UF384044	<i>Trivirostra</i>	cf. <i>edgari</i>	(Shaw, 1909)	Mariana Islands	Guam Island	Gun Beach	under rubble	13.5167° 144.8°	5 to 15 m	1	could be new species; aperture covered by animal
✓	UF400946	<i>Trivirostra</i>	cf. <i>bocki</i>	Schilder & Schilder, 1944	Society Islands	Moorea	fore reef ca. 1 km W Avaroa Pass	outer reef slope, under rocks	-17.4764° -149.8306°	5 to 20 m	1	aperture covered by animal
✓	UF400988	<i>Trivirostra</i>	cf. <i>shawi</i>	F.A. Schilder, 1933	Society Islands	Moorea	Fore reef NE Tareu Pass	outer reef slope, extracted from <i>Pocillopora</i> rubble	-17.4836° -149.8581°	22 m	1	aperture covered by animal
✓	UF401044	<i>Trivirostra</i>	<i>lacrima</i>	Fehse, 2015f	Society Islands	Moorea	Fore reef NE Tareu Pass	outer reef slope, extracted from <i>Pocillopora</i> rubble	-17.4836° -149.8581°	22 m	1	aperture partly covered by animal
✓	UF401199	<i>Trivirostra</i>	<i>shawi</i>	Schilder, 1933	Society Islands	Moorea	from Laetitia's rubble	fore reef slope rubble, in rubble picking	? ?	9 to 11 m	1	
✓	UF411501	<i>Trivirostra</i>	<i>lacrima</i>	Fehse, 2015f	Line Islands	Tabuarean Atoll	W side of atoll, N of main reef pass	outer reef slope, dead <i>Pocillopora verrucosa</i> ? Head	3.8681° -159.3742°	0 to 21.2 m	1	shell seems to be empty!!!
✓	UF411817	<i>Trivirostra</i>	<i>leylae</i>	Fehse & Grego, 2013	Line Islands	Kingman Reef	S shore of atoll	outer reef slope	6.3803° -162.3722°	10 to 13.1 m	1	aperture covered by animal
✓	UF413833	<i>Trivirostra</i>	<i>insularum</i>	Schilder & Schilder, 1944	Hawaii	Oahu		rubble extraction	? ?	?	1	
✓	UF414316	<i>Purpurcapsula</i>	cf. <i>bayeri</i>	(Fehse, 1998)	Hawaii		French Frigate Shoal	back reef 60 feet dive	23.8445° -166.3348°	60 feet	1	could be new species; aperture covered by animal
✓	UF414879	<i>Trivirostra</i>	<i>edgari</i>	(Shaw, 1909)	Mariana Islands	Guam Island	Haputo	rubble	? ?	8 to 10 m	1	aperture covered by animal
✓	UF423121	<i>Trivirostra</i>	cf. <i>poppei</i>	Fehse, 1999	Comoros	Mayotte	Passe en S	reef flat, or coral formations & rocks on sand	? ?	1 to 17 m	1	aperture covered by animal
✓	UF427708	<i>Trivirostra</i>	<i>shawi</i>	F.A. Schilder, 1933	Society Islands	Moorea	mid N coast, off Sheraton Hotel	outer reef slope, from within rubble, rubble cracking	? ?	?	1	aperture covered by animal
✓	UF428004	<i>Trivirostra</i>	<i>pseudotrivellona</i>	Fehse & Grego, 2008	Society Islands	Moorea	between Temae and Afareaitu	outer reef slope, brushed from rubble	-17.5145° -149.7616°	17 m	1	
✓	UF428165	<i>Trivirostra</i>	<i>keehiensis</i>	C.N. Cate, 1979	Hawaii	Oahu	off Kewalo	outer reef slope, settling plates	21.289° -157.865°	9 to 12 m	1	
✓	UF428626	<i>Trivirostra</i>	<i>hordacea</i>	(Kiener, 1843)	Australia	Queensland	Lizard Island	Washing machine in dead <i>Pocillopora</i>	-14.6504° 1454621°	?	1	smallest: photo 1; aperture covered by animal
✓	UF428626	<i>Trivirostra</i>	cf. <i>oryza</i>	(Lamarck, 1811)	Australia	Queensland	Lizard Island	Washing machine in dead <i>Pocillopora</i>	-14.6504° 1454621°	?	1	largest: photo 4; aperture covered by animal

photo	Coll. No.	genus	species	author	region	station	section	locality	coordinates	depth	specimens	remarks
✓	UF428626	<i>Trivirostra</i>	<i>cf. shawi</i>	F.A. Schilder, 1933	Australia	Queensland	Lizard Island	Washing machine in dead Pocillopora	-14.6504° 1454621°	?	2	2x mid-sized; photos 3 & 4; aperture covered by animal
✓	UF428630	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Lizard Island	Washing machine in dead Pocillopora	-14.6504° 1454621°	?	1	aperture covered by animal
✓	UF428653	<i>Trivirostra</i>	<i>scabriuscula</i>	(J.E. Gray, 1827)	Australia	Queensland	Washing Machine, N Lizard Island	in dead Pocillopora, rubble extraction	-14.6504° 145.4621°	?	1	aperture covered by animal
✓	UF428657	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Bird Islands, SE Lizard Island	in dead Pocillopora, rubble extraction	-14.6926° 145.4684°	?	1	aperture covered by animal
✓	UF428658	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Bird Islands, SE Lizard Island	in dead Pocillopora, rubble extraction	-14.6926° 145.4684°	?	1	aperture covered by animal
✓	UF428684	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Lizard Island	Washing machine, high energy fore reef, stacked sttling plates	-14.3902° 145.2737°	10 to 12 m	1	aperture covered by animal
✓	UF428995	<i>Trivirostra</i>	<i>cf. tryphaenae</i>	Fehse, 1998	Australia	Queensland	Lizard Island, Hicks Reef	in dead Pocillopora, rubble extraction	-14.4544° 145.5043°	?	1	
✓	UF435531	<i>Trivirostra</i>	<i>cf. hordacea</i>	(Kiener, 1843)	Australia	Western Australia	Ningaloo Reef, Wreck Zirv	reef front, in Pocillopora head	-22.6083° 113.6249°	15 m	1	ID somewhat uncertain; aperture covered by animal
✓	UF436417	<i>Trivirostra</i>	<i>cf. tryphaenae</i>	Fehse, 1998	Society Islands	Moorea	W Cook's Bay Pass, in front of Hilton	reef front, on or near reef crest, exposed at night; SCUBA	-17.4771° -149.8442°	3 to 6 m	1	aperture covered by animal
✓	UF436960	<i>Trivirostra</i>	<i>edgari</i>	(Shaw, 1909)	Society Islands	Moorea	in front of Hilton	fore reef, on rubble and algae	-17.4753° -149.8407°	15 to 20 m	1	
✓	UF437060	<i>Trivirostra</i>	<i>leylae</i>	Fehse & Grego, 2013	Society Islands	Moorea	N Motu Ahe, off MPA post	forereef, in rubble	-17.5496° -149.776°	30 to 35 m	1	aperture covered by animal
✓	UF437306	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Heron Island, Harry's canyon		-23.4744° 151.9505°	12 to 16 m	1	aperture covered by animal
✓	UF437554	<i>Pusula</i>	<i>pediculus</i>	(Linnaeus, 1758)	USA	Florida, Monroe County	Florida Keys, Tennessee Reef	exposed octocoral reef, sand/ rubble substrate	24.7651° -80.7542°	6 m	1	aperture covered by animal
✓	UF437555	<i>Pusula</i>	<i>costispunctata</i>	(G.B. Sowerby II, 1870)	USA	Florida, Monroe County	Florida Keys, Tennessee Reef	exposed octocoral reef, sand/ rubble substrate	24.7651° -80.7542°	6 m	1	
✓	UF437556	<i>Pusula</i>	<i>pediculus</i>	(Linnaeus, 1758)	USA	Florida, Monroe County	Florida Keys, Tennessee Reef	exposed octocoral reef, sand/ rubble substrate	24.7651° -80.7542°	6 m	1	aperture covered by animal
✓	UF437557	<i>Pusula</i>	<i>pediculus</i>	(Linnaeus, 1758)	USA	Florida, Monroe County	Florida Keys, Tennessee Reef	exposed octocoral reef, sand/ rubble substrate	24.7651° -80.7542°	6 m	1	aperture covered by animal
✓	UF441366	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Heron Island	in rubble	-23.5545° 152.0339°	?	1	juvenile; aperture covered by animal
✓	UF446888	<i>Niveria</i>	<i>malbiana</i>	(Schwengel & McGinty, 1942)	USA	Florida	N St. Petersburg, S Big Bend area	hard ground with sponges	28.4592° 84.2718°	98 feet	1	
✓	UF447636	<i>Trivirostra</i>	<i>cf. pseudotrivellona</i>	Fehse & Grego, 2008	Society Islands	Moorea	Afareitu	S Ferry Pass	-17.5294° -149.7619°	15 to 25 m	1	aperture covered by animal
✓	UF450540	<i>Niveria</i>	<i>malbiana</i>	(Schwengel & McGinty, 1942)	USA	Florida	NNW St. Petersburg, S Big Bend area	hard bottom, sponge reef	28.6511° -84.3844°	26 to 30 m	1	
✓	UF455763	<i>Trivirostra</i>	<i>triticum</i>	F.A. Schilder, 1932	Djibouti	Moucha Islands	Maskali Bank, Sunken Buoy dive site	reef slope, in dead coral	11.6992° 43.1432°	7 to 17 m	1	
✓	UF456171	<i>Trivirostra</i>	<i>cf. triticum</i>	F.A. Schilder, 1932	Saudi Arabia	Thuwal	Al-Fahal reef	seaward reef slope & front of	22.2243° 38.9661°	2 to 20 m	1	dorsal sulcus shallow
✓	UF458317	<i>Trivirostra</i>	<i>cf. oryza</i>	(Lamarck, 1811)	Australia	Queensland	Heron Island, Harry's canyon	outer reef	-23.4744° 151.9505°	12 to 16 m	4	aperture covered by animal
✓	UF458326	<i>Trivirostra</i>	<i>scabriuscula</i>	(J.E. Gray, 1827)	Australia	Queensland	Heron Island, Harry's canyon	outer reef	-23.4744° 151.9505°	12 to 16 m	1	aperture covered by animal
✓	UF458865	<i>Trivirostra</i>	<i>subinflata</i>	F.A. Schilder, 1933	Seychelles	Mahe	Port Victoria, SSE Victoria Pier	reef	-4.6319° 55.4736°	0 to 30 feet	1	
✓	UF461463	<i>Trivirostra</i>	<i>cf. triticum</i>	F.A. Schilder, 1932	Saudi Arabia	offshore of Farasan Banks	Dolphen lagoon	reef lagoon and barrier reef	19.0053° 40.1482°	1 to 7 m	1	dorsal sulcus shallow; aperture covered by animal
✓	UF463223	<i>Trivirostra</i>	<i>cf. triticum</i>	F.A. Schilder, 1932	Saudi Arabia	Farasan Banks	Atlantis shoal	sandy shoal with patch reefs	18.1917° 41.1138°	9 to 11 m	1	aperture covered by animal
✓	UF463224	<i>Trivirostra</i>	<i>triticum</i>	F.A. Schilder, 1932	Saudi Arabia	Farasan Banks	Atlantis shoal	sandy shoal with patch reefs	18.1917° 41.1138°	9 to 11 m	1	
✓	UF463447	<i>Trivirostra</i>	<i>natalensis</i>	F.A. Schilder, 1932	Saudi Arabia	Off Thuwal	Abu Shosha Reef	exposed side	22.2044° 39.047°	7 to 8 m	1	aperture covered by animal
✓	UF463578	<i>Trivirostra</i>	<i>triticum</i>	F.A. Schilder, 1932	Saudi Arabia	Farasan Islands	Abu Lad		16.7977° 42.1991°	?	1	aperture covered by animal
✓	UF464063	<i>Trivirostra</i>	<i>cf. akroterion</i>	(C.N. Cate, 1979)	Singapore	Semelank Island	?	?	? ? ?	?	1	malformed; aperture covered by animal
✓	UF476061	<i>Purpurcapsula</i>	<i>rubramaculosa</i>	(Fehse & Grego, 2002)	Saudi Arabia	Gulf of Aqaba	Magna Coast Guard	fore reef, rubble	28.4039° 34.7407°	7 to 8 m	1	aperture covered by animal
✓	UF476070	<i>Trivirostra</i>	<i>cf. triticum</i>	F.A. Schilder, 1932	Saudi Arabia	Gulf of Aqaba	Magna Coast Guard	fore reef, rubble	28.4039° 34.7407°	20 to 25 m	1	aperture covered by animal
✓	UF476135	<i>Purpurcapsula</i>	<i>rubramaculosa</i>	(Fehse & Grego, 2002)	Saudi Arabia	Yanbu	Marker 9	patch reef, rubble	24.4427° 37.2477°	10 m	1	aperture covered by animal
✓	UF476469	<i>Purpurcapsula</i>	<i>rubramaculosa</i>	(Fehse & Grego, 2002)	Saudi Arabia	Yanbu	Marker 9	patch reef, rubble	24.4427° 37.2477°	11 m	1	aperture covered by animal
✓	UF476642	<i>Trivirostra</i>	<i>akroterion</i>	(C.N. Cate, 1979)	New Caledonia	Surprise Island		reef crest, fore reef, back reef	-18.4879° 163.0955°	0 to 3 m	1	aperture covered by animal
✓	UF478091	<i>Niveria</i>	<i>pacifica</i>	(J.E. Gray in G.B. Sowerby I, 1832)	Panama	Venado Island			8.8776° -79.5956°	?	2	shell seems to be empty!!!
✓	UF479117	<i>Trivia</i>	<i>monacha</i>	(Da Costa, 1778)	Spain	Girona Province	Tossa de Mar	exposed rocky sublittoral	41.7226° 2.9396°	2 to 4 m	1	aperture covered by animal