REVISTA DE Biología Tropical

Phataria unifascialis (Valvatida: Ophidiasteridae) from the Eastern Pacific: Redescription and skeletal morphology

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Abstract: The starfish *Phataria unifascialis* is widely distributed in the eastern cost of the Pacific Ocean, found on rocky bottoms, at depths between 0 and 50 m. The original description of *P. unifascialis* made by Gray in 1840 was brief and inaccurate in some important aspects, such as distribution area, plate arrangement and ambulacral spines. Here, we improve the description of *P. unifascialis* with SEM images and description of its mesodermal skeleton on the basis of a large sample. Rev. Biol. Trop. 65(Suppl. 1): S258-S271. Epub 2017 November 01.

Key words: Asteroidea; Ophidiasteridae; *Phataria unifascialis*; redescription; SEM; Eastern Pacific.

Phataria unifascialis is a well-known starfish that inhabits the rocky bottoms of the Eastern Ocean Pacific shallow waters (Alvarado & Solís-Marín, 2013). The starfish *Phataria unifascialis* belongs to the family Ophidiasteridae Verrill, 1870, which includes 28 valid genera, mostly shallow water, from tropical and subtropical regions. The species are a conspicuous feature of coral reef fauna. Asexual reproduction by fission occurs in a few species, but fertilization, planktotrophic or lecitothrophic larvae, and bipinnaria and/or brachiolaria stages are more common in the Ophidiasteridae family (Mortensen, 1921). The genus *Phataria* was proposed by Gray (1840) as a subgenus of the genus *Linckia*, and later was raised to genus by Sladen (1889). This genus differs from the others of the family Ophidiasteridae by having the papular areas in a longitudinal row or two in the radios, small granules in papular areas and big granules in the abactinal plates. Currently the genus *Phataria* has only two valid species: *P. unifascialis* (Gray, 1840) and *Phataria mionactis* Ziesenhenne, 1942.

Morgan and Cowles (1996) studied some aspects of the behaviour, physiology and demography of *Phataria unifascialis*, were examined to determine whether cool temperature was an important factor limiting this species' distribution in the northern regions of the Gulf of California. Individuals in the population at Bahia de Los Angeles, in the northern gulf, were of larger mean size but were significantly less abundant than at Loreto, a site in the southern gulf. Smaller size classes were also less abundant or missing in the Bahia de Los Angeles population, suggesting limited recruitment. Pyloric caecae and gonads were of similar size at both locations making it unlikely

that food limitation or lack of reproductive potential was the limiting factor.

The population at Loreto contained a distinct reproductively-primed subgroup which was not observed at Bahia de Los Angeles. Activity of the species remained relatively constant with temperature down to 17ºC, the winter surface water temperature characteristic of Loreto, but dropped sharply at the 14°C water temperature characteristic of the Bahia de Los Angeles winter. Metabolic rates at these low temperatures were elevated over expected rates even though activity was reduced, suggesting metabolic stress. The species' moderate oxyregulating ability also disappeared at low temperature. Taken together, these data suggest that the low temperatures of the northern gulf may well be an important factor limiting this species' northern distribution in the Gulf (Morgan & Cowles, 1996).

The purpose of the present study is to redescribe the species and its morphology based on several major ossicle types in the ophidiasterid.

MATERIAL AND METHODS

In this work 804 specimens were reviewed and they are deposited at the Colección Nacional de Equinodermos, "Dra. María Elena Caso Muñoz", (CNE, ICML, UNAM) and Los Angeles County Museum, Los Ángeles, California, USA (LACM) (Table 1). Organisms were observed using both an optic microscope (Olympus® SZX7) and scanning electron microscope (SEM) imaging (Laboratorio de Microscopía Electrónica de Barrido en el Instituto de Biología (IB), UNAM, Microscope JEOL JSM-6360LV). In order to observe the skeleton of *P. unifascialis* the skin

TABLE 1
Examined material of *Phataria unifascialis* and *Phataria mionactis*

CUADRO 1
Material examinado de *Phataria unifascialis* y *Phataria mionactis*

	Catalogue number	Number of specimens	Locality
Phataria unifascialis	ICML-UNAM 2.18.0	1	El Revolcadero, Acapulco, Guerrero, Mexico (16° 47' 45" N, 99° 51' 17" W).
Phataria unifascialis	ICML-UNAM 2.18.1	21	Isla Roca Partida, Baja California Sur, Mexico (24° 10' 00" N, 110° 18' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.6	20	La Paz, Baja California Sur, Mexico (24° 08' 00" N, 110° 23' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.8	6	Isla Patos, Sonora, Mexico (29° 16' 00" N, 112° 27' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.12	2	Between Isla Ballena and Roca Partida, Baja California Sur, Mexico (24° 20' 00" N, 110° 18' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.14	1	Bahía Eclipse, Isla Roca Partida, Baja California Sur, Mexico (24° 10' 00" N, 110° 18' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.19	1	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24° 30' 00" N, 110° 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.23	32	La Paz, Baja California Sur, Mexico (24° 08' 00" N, 110° 23' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.24	28	La Paz, Baja California Sur, Mexico (24° 08' 00" N, 110° 23' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.26	3	Mazatlán, Sinaloa, Mexico (23° 12' 00" N, 106° 25' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.28	8	Cañón beach, Mazatlán, Sinaloa, Mexico (23° 11' 00" N, 106° 25' 00" W).

TABLE 1 (Continued)

	Catalogue number	Number of specimens	Locality
Phataria unifascialis	ICML-UNAM 2.18.29	11	Playa Norte, Mazatlán, Sinaloa, Mexico (23˚ 14' 13" N, 106˚ 26' 45" W).
Phataria unifascialis	ICML-UNAM 2.18.30	2	Playa Norte, Mazatlán, Sinaloa, Mexico (23˚ 14' 13" N, 106˚ 26' 45" W).
Phataria unifascialis	ICML-UNAM 2.18.31	2	Isla Chivos, Mazatlán, Sinaloa, Mexico (23˚ 12' 00" N, 106˚ 26' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.32	1	The Crestón hill, off the lighthouse, Sinaloa, Mexico (23˚ 10' 47" N, 106˚ 26' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.33	9	The Crestón hill del lado Est. Mazatlán, Sinaloa, Mexico (23˚ 10' 57" N, 106˚ 25' 51" W).
Phataria unifascialis	ICML-UNAM 2.18.34	23	Next to the Hermano del Sur, Sinaloa, Mexico (23˚ 11' 04" N, 106˚ 26' 03" W).
Phataria unifascialis	ICML-UNAM 2.18.35	6	Next to Isla Venados, Sinaloa, Mexico (23˚ 13' 52" N, 106˚ 28' 19" W).
Phataria unifascialis	ICML-UNAM 2.18.36	13	15 m from Isla Venados, Sinaloa, Mexico (23˚ 13' 43" N, 106˚ 27' 56" W).
Phataria unifascialis	ICML-UNAM 2.18.37	15	Between Hermano del Norte and Hermano del Sur, Sinaloa, Mexico (23˚ 11' 10" N, 106˚ 26' 30" W).
Phataria unifascialis	ICML-UNAM 2.18.38	6	Proximities of Isla Cardones, Sinaloa, Mexico (23˚ 10' 52" N, 106˚ 24' 10" W).
Phataria unifascialis	ICML-UNAM 2.18.39	2	Between Isla Cardones and Isla de Chivos, Sinaloa, Mexico (23˚ 10' 41" N, 106˚ 24' 25" W).
Phataria unifascialis	ICML-UNAM 2.18.40	7	Between Isla Cardones and Isla de Chivos, Sinaloa, Mexico (23˚ 10' 41" N, 106˚ 24' 25" W).
Phataria unifascialis	ICML-UNAM 2.18.41	13	The Escollera, Sinaloa, Mexico (23˚ 10' 38" N, 106˚ 25' 22" W).
Phataria unifascialis	ICML-UNAM 2.18.42	7	Next to the Hermano del Sur, Sinaloa, Mexico (23˚ 11' 04" N, 106˚ 26' 21" W).
Phataria unifascialis	ICML-UNAM 2.18.43	31	Cove beneath the tower at Paseo Centenario, Sinaloa, Mexico (23˚ 11' 07" N, 106˚ 25' 41" W).
Phataria unifascialis	ICML-UNAM 2.18.44	5	Next to the Hermano del Norte, Sinaloa, Mexico (23˚ 11' 22" N, 106˚ 26' 15" W).
Phataria unifascialis	ICML-UNAM 2.18.45	8	In the "entrance" of Hermano del Sur, Sinaloa, Mexico (23˚ 10' 56" N, 106˚ 26' 29" W).
Phataria unifascialis	ICML-UNAM 2.18.46	4	Off Isla Venados, Sinaloa, Mexico (23˚ 13' 53" N, 106˚ 28' 20" W).
Phataria unifascialis	ICML-UNAM 2.18.47	11	Next to the south part of Isla de Lobos, Sinaloa, Mexico (23˚ 13' 42" N, 106˚ 27' 54" W).
Phataria unifascialis	ICML-UNAM 2.18.48	1	In the "entrance" of Isla de Chivos, Sinaloa, Mexico (23˚ 10' 34" N, 106˚ 25' 06" W).
Phataria unifascialis	ICML-UNAM 2.18.49	3	Off the radio tower, Mazatlán, Sinaloa, Mexico (23˚ 11' 08" N, 106˚ 25' 43" W).
Phataria unifascialis	ICML-UNAM 2.18.50	3	Two meters away of Hermano del Sur, Sinaloa, Mexico (23˚ 10' 51" N, 106˚ 26' 39" W).
Phataria unifascialis	ICML-UNAM 2.18.51	9	Off Isla Venados, Sinaloa, Mexico (23˚ 13' 44" N, 106˚ 28' 17" W).
Phataria unifascialis	ICML-UNAM 2.18.52	9	Off Isla Venados, Sinaloa, Mexico (23˚ 13' 53" N, 106˚ 28' 20" W).
Phataria unifascialis	ICML-UNAM 2.18.53	7	North cove of Isla de los Pájaros, Sinaloa, Mexico (23˚ 15' 41" N, 106˚ 28' 46" W).

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TABLE 1 (Continued)

	Catalogue number	Number of specimens	Locality
Phataria unifascialis	ICML-UNAM 2.18.54	30	Cove between the Isla de Chivos and Isla Venados, Sinaloa, Mexico (23˚ 13' 44" N, 106˚ 27' 56" W).
Phataria unifascialis	ICML-UNAM 2.18.55	25	Isla Venados, one side towards Isla Pájaros, Sinaloa, Mexico (23˚ 14' 34" N, 106˚ 28' 20" W).
Phataria unifascialis	ICML-UNAM 2.18.56	10	60 m to the east of Isla Cardones, Sinaloa, Mexico, Mexico (23˚ 10' 42" N, 106˚ 24' 12" W).
Phataria unifascialis	ICML-UNAM 2.18.57	37	70 m to the southwest of Isla de Venados, Sinaloa, Mexico (23˚ 14' 01" N, 106˚ 27' 57" W).
Phataria unifascialis	ICML-UNAM 2.18.58	20	Noth part of Isla de los Pájaros, Sinaloa, Mexico (23˚ 15' 40" N, 106˚ 39' 12" W).
Phataria unifascialis	ICML-UNAM 2.18.59	38	100 m west of Isla Cardones, Sinaloa, Mexico (23˚ 10' 43" N, 106˚ 24' 25" W).
Phataria unifascialis	ICML-UNAM 2.18.60	1	80 m southeast of Isla de Chivos, Sinaloa, Mexico (23˚ 10' 42" N, 106˚ 24' 48" W).
Phataria unifascialis	ICML-UNAM 2.18.61	9	East of Isla Pájaros, Sinaloa, Mexico (23˚ 15' 13" N, 106˚ 28' 32" W).
Phataria unifascialis	ICML-UNAM 2.18.62	9	Between Isla Venados and Isla de Lobos, Sinaloa, Mexico (23˚ 15' 13" N, 106˚ 28' 32" W).
Phataria unifascialis	ICML-UNAM 2.18.63	1	Next to Hermano del Sur, Sinaloa, Mexico (23˚ 11' 06" N, 106˚ 26' 19" W).
Phataria unifascialis	ICML-UNAM 2.18.64	10	Next to Isla de Lobos, Sinaloa, Mexico (23˚ 13' 47" N, 106˚ 28' 19" W).
Phataria unifascialis	ICML-UNAM 2.18.65	2	Next to Isla de Chivos, Sinaloa, Mexico (23˚ 10' 54" N, 106˚ 24' 48" W).
Phataria unifascialis	ICML-UNAM 2.18.66	4	Between Isla Venados and Isla de Lobos, Sinaloa, Mexico (23˚ 13' 43" N, 106˚ 27' 58" W).
Phataria unifascialis	ICML-UNAM 2.18.67	5	Next to Isla Venados, Sinaloa, Mexico (23˚ 14' 06" N, 106˚ 27' 57" W).
Phataria unifascialis	ICML-UNAM 2.18.68	4	Southwest to Isla de Pájaros, Sinaloa, Mexico (23˚ 15' 12" N, 106˚ 29' 03" W).
Phataria unifascialis	ICML-UNAM 2.18.69	8	Southwest of Isla Venados, Sinaloa, Mexico (23˚ 13' 53" N, 106˚ 27' 50" W).
Phataria unifascialis	ICML-UNAM 2.18.70	2	Southeast of Isla Cardones, Sinaloa, Mexico (23˚ 10' 43" N, 106˚ 24' 12" W).
Phataria unifascialis	ICML-UNAM 2.18.71	12	Northeast of Isla Pájaros, Sinaloa, Mexico (23˚ 15' 39" N, 106˚ 28' 37" W).
Phataria unifascialis	ICML-UNAM 2.18.72	10	West of Isla Cardones, Sinaloa, Mexico (23˚ 10' 40" N, 106˚ 24' 28" W).
Phataria unifascialis	ICML-UNAM 2.18.73	1	Next to Isla Cardones, Sinaloa, Mexico (23˚ 10' 43" N, 106˚ 24' 23" W).
Phataria unifascialis	ICML-UNAM 2.18.74	1	East of Isla de Lobos, Sinaloa, Mexico (23˚ 13' 38" N, 106˚ 27' 57" W).
Phataria unifascialis	ICML-UNAM 2.18.75	1	In the "entrance" of Isla de Lobos, Sinaloa, Mexico (23˚ 11' 21" N, 106˚ 28' 13" W).
Phataria unifascialis	ICML-UNAM 2.18.76	4	Playa Norte, Mazatlán, Sinaloa, Mexico (23˚ 14' 13" N, 106˚ 26' 45" W).
Phataria unifascialis	ICML-UNAM 2.18.77	15	Next to Isla de la Piedra, Sinaloa, Mexico (23˚ 11' 10" N, 106˚ 24' 18" W).
Phataria unifascialis	ICML-UNAM 2.18.78	11	La Escollera, Sinaloa, Mexico (23˚ 10' 50" N, 106˚ 25' 30" W).

TABLE 1 (Continued)

	Catalogue number	Number of specimens	Locality
Phataria unifascialis	ICML-UNAM 2.18.79	2	Between Isla de la Piedra and Isla de Chivos, Sinaloa, Mexico (23˚ 10' 56" N, 106˚ 24' 39" W).
Phataria unifascialis	ICML-UNAM 2.18.80	9	Next to Isla Cardones, Sinaloa, Mexico (23˚ 10' 42" N, 106˚ 24' 13" W).
Phataria unifascialis	ICML-UNAM 2.18.81	7	Next to Isla Cardones, Sinaloa, Mexico (23˚ 10' 45" N, 106˚ 24' 13" W).
Phataria unifascialis	ICML-UNAM 2.18.87	1	Next to Isla Venados, Sinaloa, Mexico (23˚ 14' 21" N, 106˚ 28' 01" W).
Phataria unifascialis	ICML-UNAM 2.18.95	2	Isla la Ballena, Baja California Sur, Mexico (24˚ 25' 00" N, 110˚ 20' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.96	1	Los Islotes, Baja California Sur, Mexico (24˚ 36' 00" N, 110˚ 23' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.97	1	La Gaviota, La Paz, Baja California Sur, Mexico (24˚ 17' 13" N, 110˚ 20' 34" W).
Phataria unifascialis	ICML-UNAM 2.18.101	6	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.102	1	Puerto Escondido, Baja California Sur, Mexico (25˚ 50' 00" N, 111˚ 16' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.103	17	Puerto Balandra, Baja California Sur, Mexico (24˚ 31' 48" N, 110˚ 31' 15" W).
Phataria unifascialis	ICML-UNAM 2.18.104	4	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.105	15	La Gaviota, La Paz, Baja California Sur, Mexico (24˚ 17' 13" N, 110˚ 20' 34" W).
Phataria unifascialis	ICML-UNAM 2.18.106	10	El Embudo, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 33' 00" N, 110˚ 22' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.107	2	Bahía Falsa, Baja California Sur, Mexico (24˚ 20' 00" N, 110˚ 01' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.108	2	Bahía Falsa, Baja California Sur, Mexico (24˚ 20' 00" N, 110˚ 01' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.109	1	Bahía Falsa, Baja California Sur, Mexico (24˚ 20' 00" N, 110˚ 01' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.110	37	Puerto Balandra, Baja California Sur, Mexico (24˚ 31' 48" N, 110˚ 31' 15" W).
Phataria unifascialis	ICML-UNAM 2.18.111	1	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.112	2	Barra de Pulmo, Baja California Sur, Mexico (23˚ 24' 05" N, 109˚ 32' 34" W)
Phataria unifascialis	ICML-UNAM 2.18.113	6	El Corralito, La Paz, Baja California Sur, Mexico (24˚ 35' 00" N, 110˚ 30' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.114	2	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.115	1	La Bonanza, La Paz, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 15' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.116	9	Bahía San Gabriel, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W)
Phataria unifascialis	ICML-UNAM 2.18.117	2	Estero de los Cuates, Baja California Norte (31˚ 50' 00" N, 116˚ 50' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.118	1	Los Frailes, La Paz, Baja California Sur, Mexico (23˚ 23' 32" N, 109˚ 25' 00" W).

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TABLE 1 (Continued)

	Catalogue number	Number of specimens	Locality
Phataria unifascialis	ICML-UNAM 2.18.119	18	El Embudo, Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.120	2	Los Islotes, Baja California Sur, Mexico (24˚ 35' 09" N, 110˚ 24' 09" W).
Phataria unifascialis	ICML-UNAM 2.18.121	1	Bahía San Carlos, Guaymas, Sonora, Mexico (27˚ 58' 56" N, 110˚ 58' 36" W).
Phataria unifascialis	ICML-UNAM 2.18.122	3	Isla Espíritu Santo, Baja California Sur, Mexico (24˚ 30' 00" N, 110˚ 21' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.123	1	Puerto Libertad, Sonora, Mexico (24˚ 54' 14" N, 112˚ 41' 27" W).
Phataria unifascialis	ICML-UNAM 2.18.125	1	Los Islotes, Baja California Sur, Mexico (24˚ 35' 05" N, 110˚ 24' 56" W).
Phataria unifascialis	ICML-UNAM 2.18.126	1	Los Islotes, Baja California Sur, Mexico (24˚ 35' 05" N, 110˚ 24' 56" W).
Phataria unifascialis	ICML-UNAM 2.18.127	1	Los Islotes, Baja California Sur, Mexico (24˚ 35' 57" N, 110˚ 24' 59" W).
Phataria unifascialis	ICML-UNAM 2.18.128	3	Los Islotes, Baja California Sur, Mexico (24˚ 35' 57" N, 110˚ 24' 20" W).
Phataria unifascialis	ICML-UNAM 2.18.130	21	El Coyote cove, La Paz, Baja California Sur, Mexico (24˚ 10' 00" N, 110˚ 18' 00" W).
Phataria unifascialis	ICML-UNAM 2.18.139	1	Los Islotes, Baja California Sur, Mexico (24˚ 35' 57" N, 110˚ 23' 59" W).
Phataria unifascialis	ICML-UNAM 2.18.151	1	South of Isla Santa Catalina, Baja California Sur, Mexico (25˚ 30' 54" N, 110˚ 46' 41" W).
Phataria unifascialis	ICML-UNAM 2.18.152	1	Isla Las Ánimas, Baja California Sur, Mexico (25˚ 06' 52" N, 110˚ 30' 28" W).
Phataria unifascialis	ICML-UNAM 2.18.156	2	Bahía San Carlos, Guaymas, Sonora, Mexico (27˚ 56' 27" N, 111˚ 05' 30" W).
Phataria unifascialis	ICML-UNAM 2.18.157	3	El Peruano, Guaymas, Sonora, Mexico (27˚ 54' 30" N, 110˚ 58' 11" W).
Phataria mionactis	LACM 761.1 Holotype	1	La Plata Island, Ecuador (no lat long data).

was removed with regular household bleach (NaClO), after that the individual skeletal plates were extracted from specimens or parts of them immersed, using regular household bleach, rinsed in tap water, dried, mounted on aluminium stubs and gold-coated (modified from Thuy & Stöhr, 2016).

RESULTS

Systematics

Phataria unifascialis (Gray, 1840) (Figs. 1-7)

Linckia (Phataria) unifascialis Gray, 1840
Linckia bifascialis Gray, 1840
Linckia unifascialis Gray, 1840
Ophidiaster suturalis Müller & Troschel, 1842

Original description (Gray, 1840): Rays trigonal, tapering, back with three rows of flat ossicula; sides with a single abroad band of pores; rather more than three times as long as broad.

Emended description: Five rays, tapering, papular areas only in the abactinal surface, the papular areas are in one longitudinal row along the arm, and also have two small rows of papular areas at both sides of the main row. Three longitudinal rows of carinal plates along the arm. Both surfaces are cover by granules, in

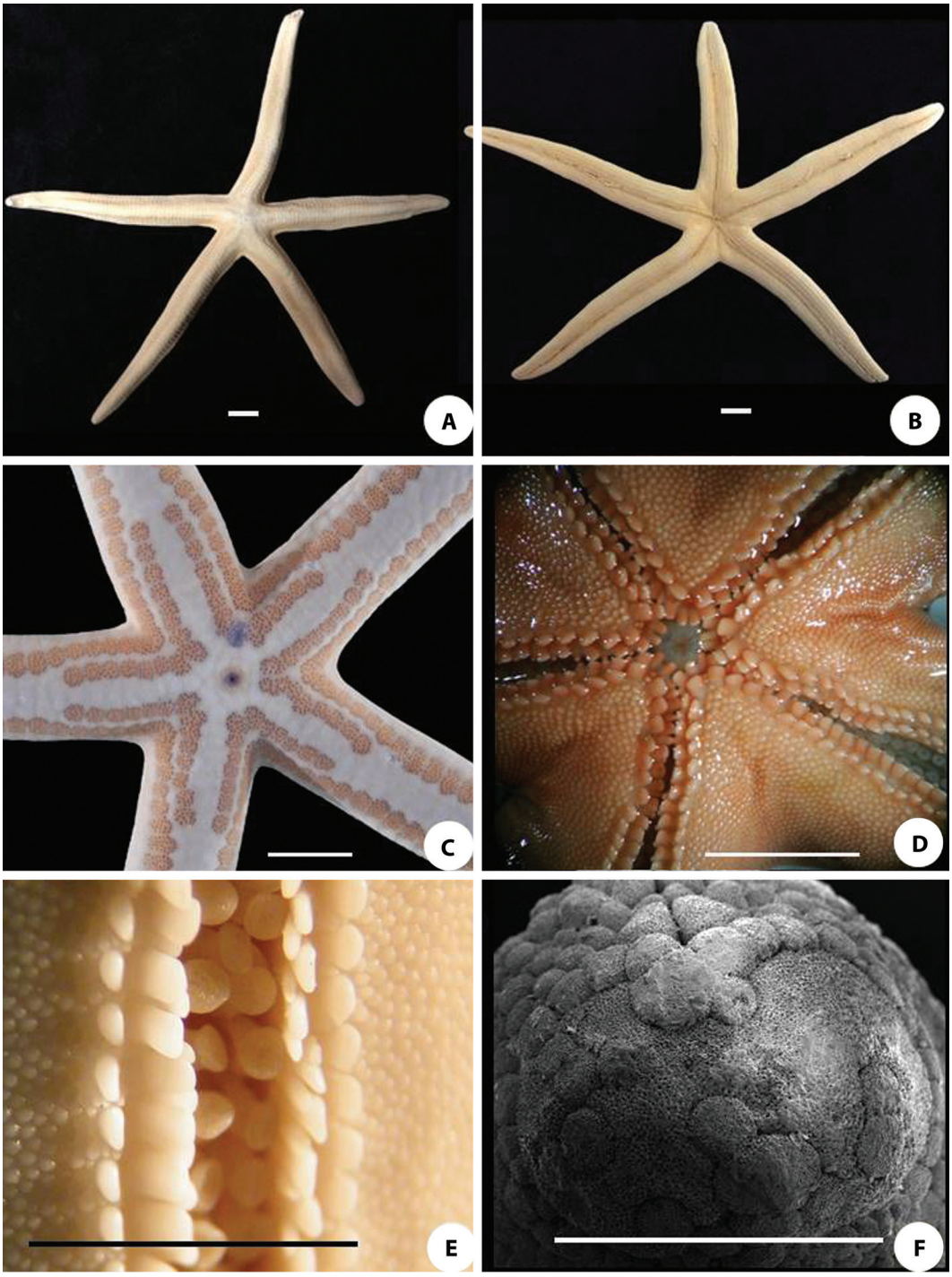

Fig. 1. *Phataria unifascialis*. A) Abactinal view; B) Actinal view; C) Abactinal disc; D) Actinal disc; E) Actinal arm; F) Terminal plate; (A,B,C and D scale bar=1cm; E and F scale bar= 0.5cm).
Fig. 1. *Phataria unifascialis*. A) Vista abactinal; B) Vista actinal; C) Disco abactinal; D) Disco actinal; E) Brazo actinal; F) Placa terminal; (A,B,C y D escala=1cm; E y F escala= 0.5cm).

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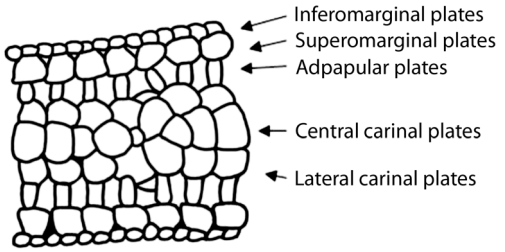

Fig. 2. *Phataria unifascialis*. Skeleton of the arm in abactinal view.
Fig. 2. *Phataria unifascialis*. Vista abactinal del esqueleto del brazo.

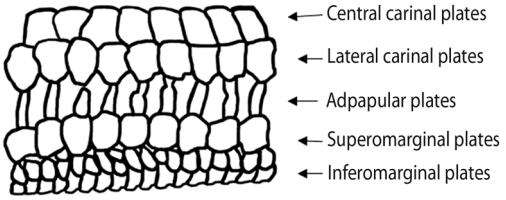

Fig. 3. *Phataria unifascialis*. Skeleton of the arm in a lateral view.
Fig. 3. *Phataria unifascialis*. Vista lateral del esqueleto del brazo.

the abactinal one there are small granules in the papular areas and bigger ones on the abactinal plates. The actinal surface with smaller, rounded granules with little space between them. The anus is located in the center of the disc; only one rounded madreporite with radial striations. Only one row of ambulacral spines; such spines are wider in the base and tapering (Fig. 1).

Morphology of the skeletal ossicles. The abactinal area is composed of carinal plates, adpapular plates and superomarginal plates (Fig. 2, Fig. 4 and Fig. 6). The actinal area is composed of inferomarginal plates, actinal plates, adambulacral plates and ambulacral furrow plates (Fig. 3, Fig. 5 and Fig. 7).

Type locality: "Bay of Caracas, West Columbia" (data from holotype label). But there is any locality in the Pacific Ocean with this name.

Type material: NHM 1938.5.12.4 (Natural History Museum, London).

Geographic distribution: Eastern Pacific. Mexico, El Salvador, Costa Rica, Panama, Colombia, Ecuador and Peru (Pérez-Ruzafa, A., Alvarado, J. J., Solís-Marín, F. A., Hérnandez, J. C., Morata, A., Marcos, C., … & Barraza, E, 2013).

Bathymetric distribution: From 0 and 50 m (Pérez-Ruzafa et al., 2013).

DISCUSSION

The original description made by Gray (1840) did not include the basic information to indetify *P. unifascialis* as a separated and independent genus of Ophidiasteridae, instead the specie was included in the genus *Linckia* (Gray, 1840). Gray's original description can be practically used to describe various genus or species within the family (i.e. *Pharia*, *Phataria*, *Narcissia*, *Linckia*, etc). The diagnosis presented in this work has the main taxonomical characters to unequivocally can identify the specimens belonging to this species. There are three main contributions in this new emended diagnosis: 1) the papular areas are distributed in one longitudinal row along the arm, and two small rows can reach half or less the main row at both sides of the main longitudinal papular row; 2) there are three longitudinal rows of carinal plates along each arm, and 3) there is only one row of ambulacral spines that are wider in the base and tapering. Currently the genus *Phataria* has only two valid species: *Phataria unifascialis* (Gray, 1840) and *Phataria mionactis* Ziesenhenne, 1942. The specie *Phataria mionactis,* which has a restricted distribution to the Galapagos Islands, is distinguished by the presence of two continuous rows of papular areas at both sides of the main row (Fig. 8); the carinal plates are in an irregular arrangement, smaller than those in *P. unifascialis*. The abactinal plates are convex in *P. mionactis* and flat in *P. unifascialis* (see Figs. 2 and 8).

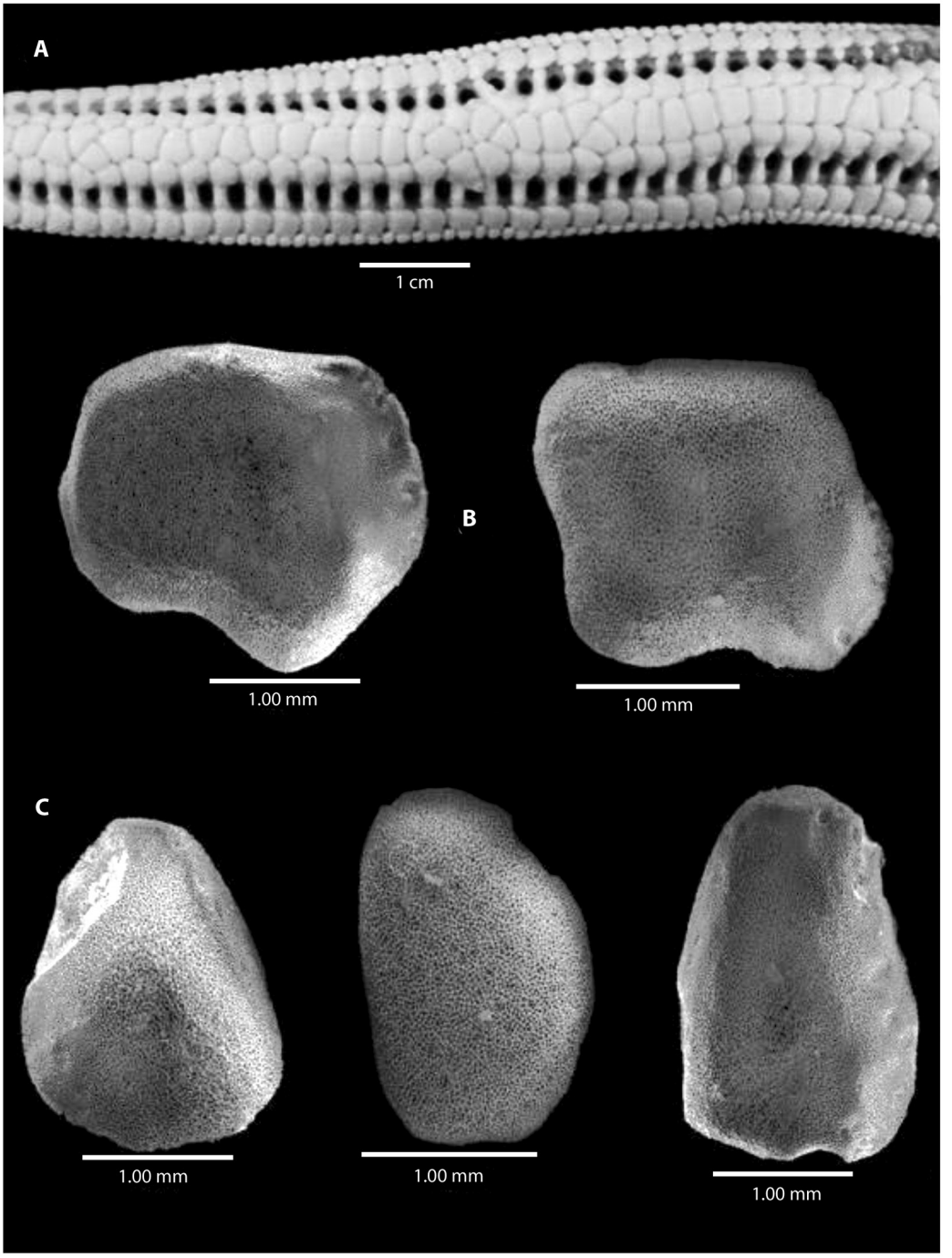

Fig. 4. *Phataria unifascialis.* A) Abactinal view of a duneded arm; B) Lateral carinal plates; C) Central carinal plates.
Fig. 4. *Phataria unifascialis*. A) Vista abactinal de un brazo desnudo; B) Placas carinales laterales; C) Placas carinales centrales.

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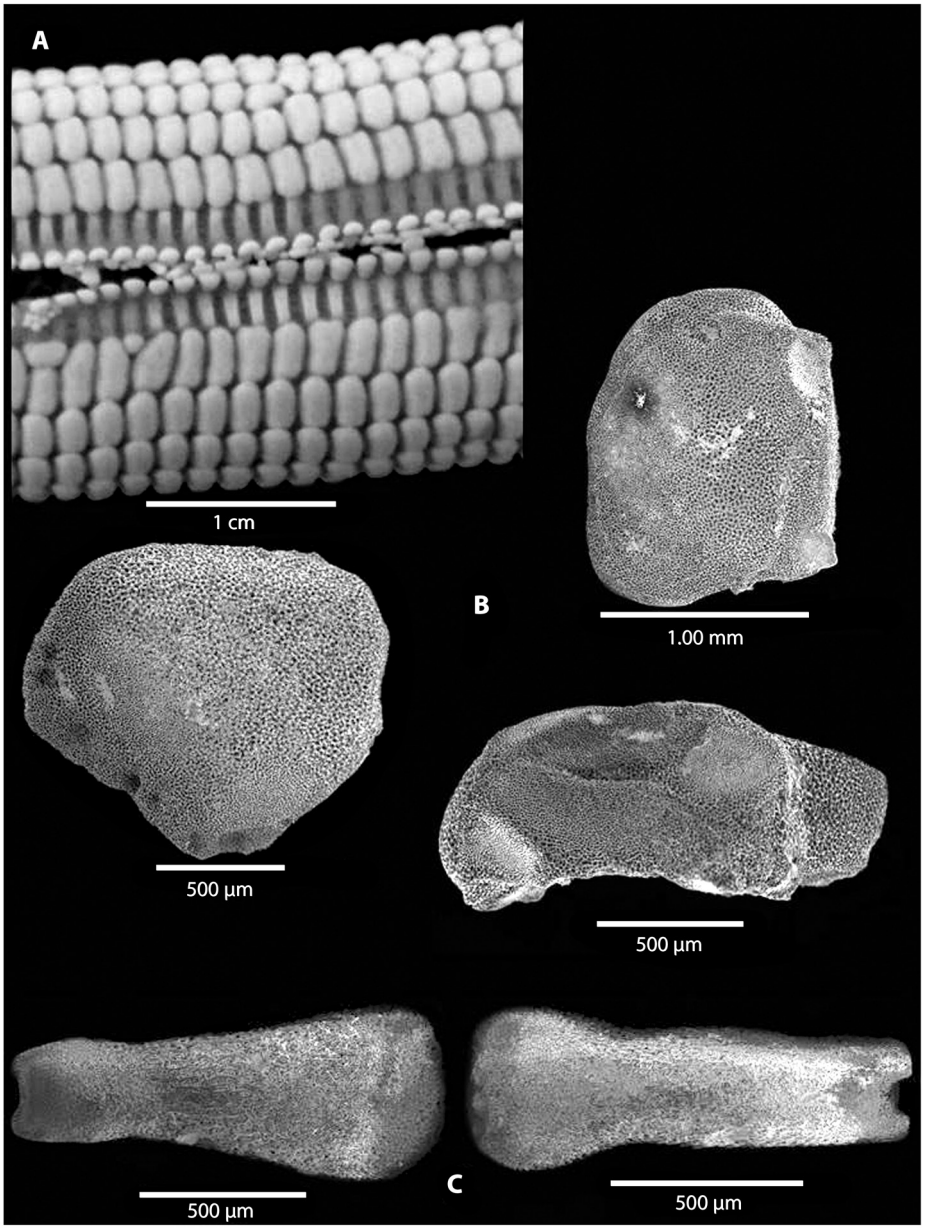

Fig. 5. *Phataria unifascialis.* A) Abactinal view of a duneded arm; B) Adambulacral plates; C) Adambulacral spines.
Fig. 5. *Phataria unifascialis.* A) Vista abactinal de un brazo desnudo; B) Placas adambulacrales; C) Espinas adambulacrales.

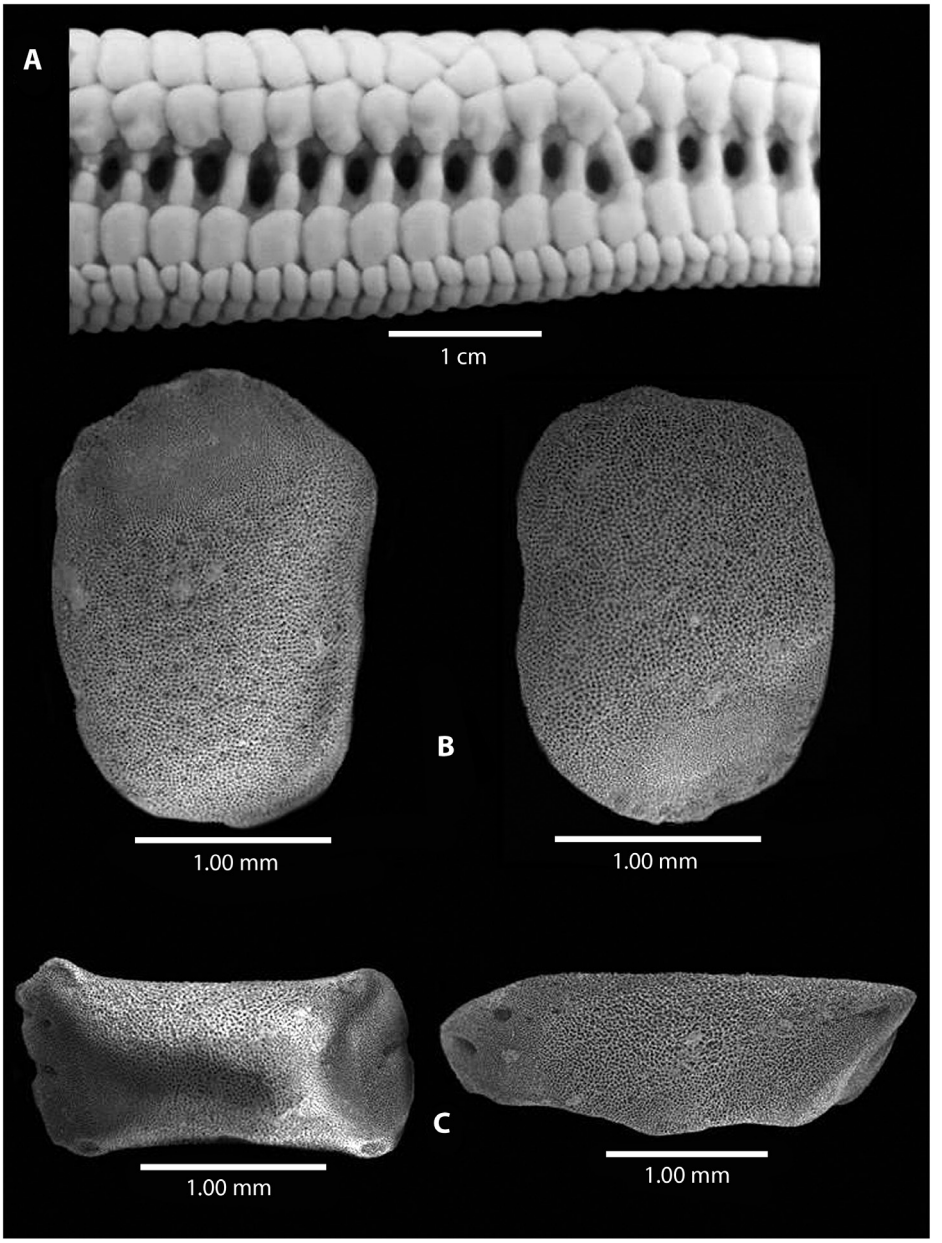

Fig. 6. *Phataria unifascialis.* A) Lateral view of a duneded arm; B) Superomarginal plates; C) Adpapular plates.
Fig. 6. *Phataria unifascialis.* A) Vista lateral de un brazo desnudo; B) Placas súperomarginales; C) Placas adpapulares.

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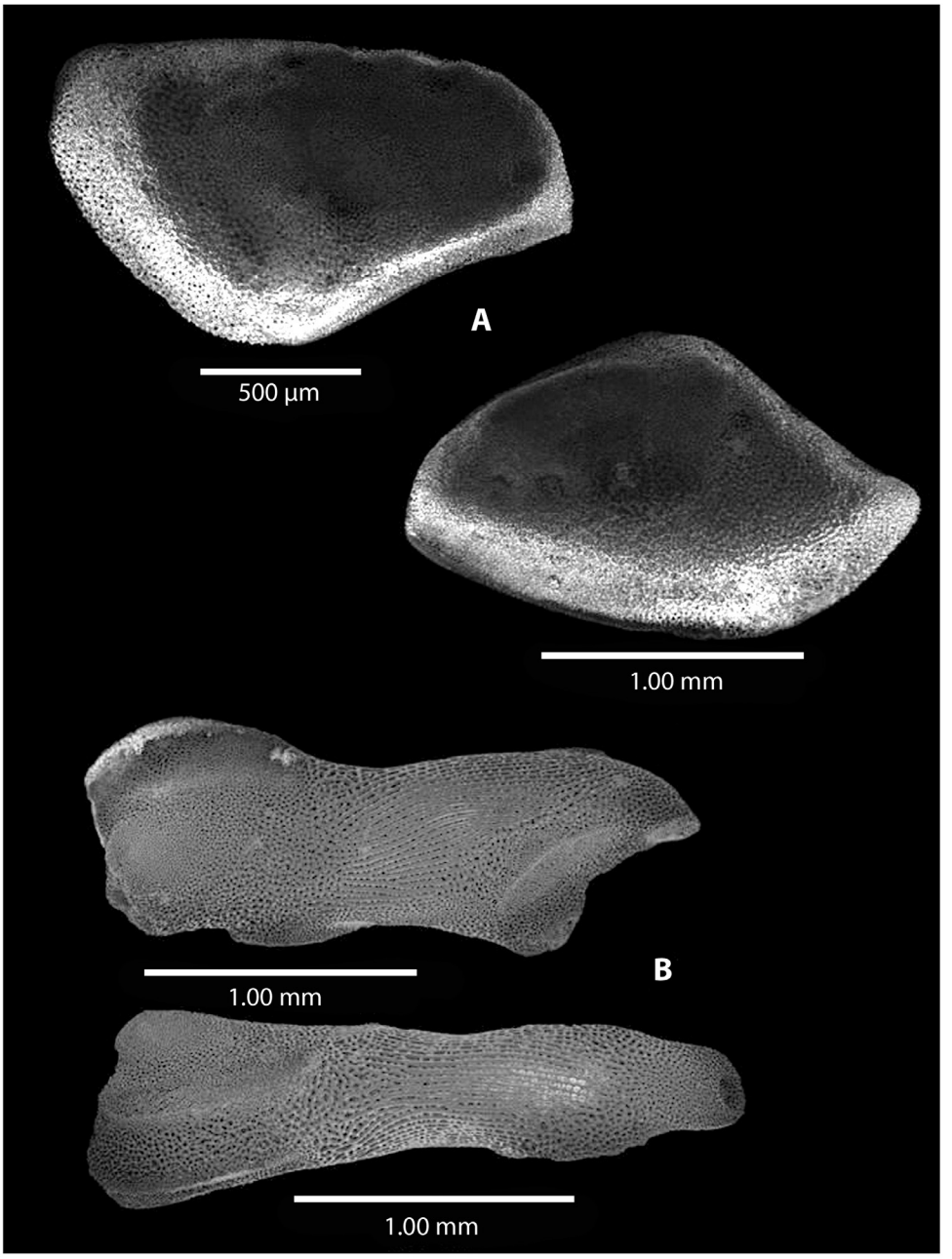

Fig. 7. *Phataria unifascialis.* Holotype LACM 761.1. A) Actinal plates; B) Plates of the ambulacral furrow.
Fig. 7. *Phataria unifascialis.* Holotipo LACM 761.1. A) Placas actinales; B) Placas del surco ambulacral.

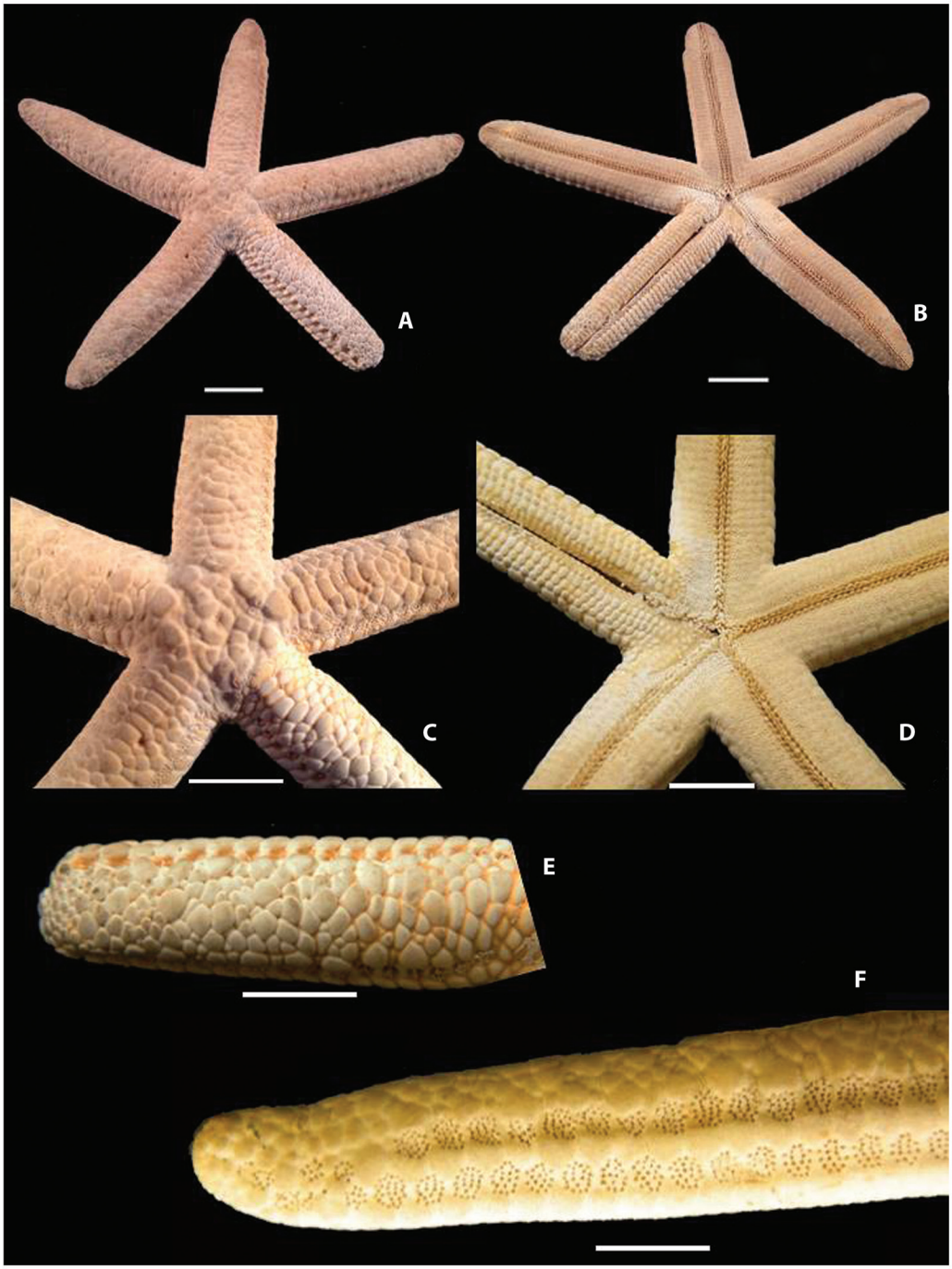

Fig. 8. *Phataria mionactis*. A) Abactinal view; B) Actinal view; C) Abactinal disc; D) Actinal disc; E) Abactinal arm; F) Longitudinal rows of papular areas; (Scale bar= 1cm).
Fig. 8. *Phataria mionactis*. A) Vista abactinal; B) Vista actinal; C) Disco abactinal; D) Disco actinal; E) Brazo abactinal; F) Hileras longitudinales de áreas papulares; (Escala= 1cm).

The type locality of *P. unifascialis* was not mentioned by Gray (1840), nevertheless the locality in the holoype label reads: "Bay of Caracas, West Columbia, Venezuela" (Andrew Cabrinovic pers. comm.). Ziesenhenne (1937), mentions that the type locality of the species was "Bay of Caracas, west coast of Colombia". There is no locality in the Colombian Pacific under that name and because the species has a known distribution on the American Pacific Ocean coasts, the type locality is not in Venezuela since this country is located in the Atlantic Ocean. More research is needed to determine the original type locality of *P. unifascialis*.

The use of plate morphology in Asteroidea identification is higly recommended as presented by Turner and Dearborn (1972). More efforts need to be done in order to use these taxonomic characters, even though type material is so limited and fragile. Whenever material is available, skeletal morphology studies are suggested.

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RESUMEN

***Phataria unifascialis* (Echinodermata: Asteroidea) de la costa este del Océano Pacífico: redescripción y morfología del esqueleto.** La estrella de mar *Phataria unifascialis* está ampliamente distribuida sobre fondos rocosos entre 0 y 50 m de profundidad en Pacífico Este. La descripción original de *P. unifascialis* realizada por Gray en 1840 fue breve e inexacta en algunos aspectos importantes; actualmente tenemos más información sobre la morfología de esta especie. Este trabajo incluye una descripción detallada de *P. unifascialis* añadiendo por primera vez imágenes SEM y descripción de sus placas esqueléticas.

Palabras clave: Asteroidea; Ophidiasteridae; *Phataria unifascialis*; redescripción; SEM; Pacífico Este.

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