

and anti-HRP (Sigma) (Jan & Jan 1982), but they did not recognize any neuronal elements.

**Acknowledgments.** We thank Mr. W. Godo and Dr. T. Akiyama for their help in collecting cephalopods, and Ms. M. Yoshioka, Dr. S. Segawa, Dr. K. Fujita, and Mr. K. Kidokoro for supplying some cephalopod samples. Thanks are also due to Dr. Sv. Bolatzky for his kind help in preparing the manuscript.

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#### *Crepidula dilatata* Lamarck, 1822, Truly Living in the Southwestern Atlantic

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*Crepidula fecunda* Gallardo, 1979, was described from Bahía Chinquiue (41°31'S–73°03'W) in the Chilean Pa-

cific. The distribution ranges from the type locality, 41°S, to 45°S off the Chilean coast. According to Gallardo (1979), *C. dilatata* Lamarck, 1822, can only be differentiated by its direct development and the presence of embryos consuming nurse eggs. Adult morphological features are identical. Therefore, earlier records referring to the presence of *C. dilatata* in the Atlantic coast of South America (Parodiz, 1939) need validation. The type locality of *C. dilatata* remains unknown. Mermod (1950) mentioned in a commented list of the types from Lamarck's collection, the Western coast of South America as a probable type locality. Gallardo (1979) recorded *C. dilatata* Lamarck, from 21°11'S to 43°47'S. He also stated (in Spanish in the original): "It is probable that future studies including developmental stages, will expand this distribution particularly towards the Argentine Atlantic coast."

This note confirms the presence of *C. dilatata* (Figures 1–9) in Argentine waters and restricts *C. fecunda* to Chile.

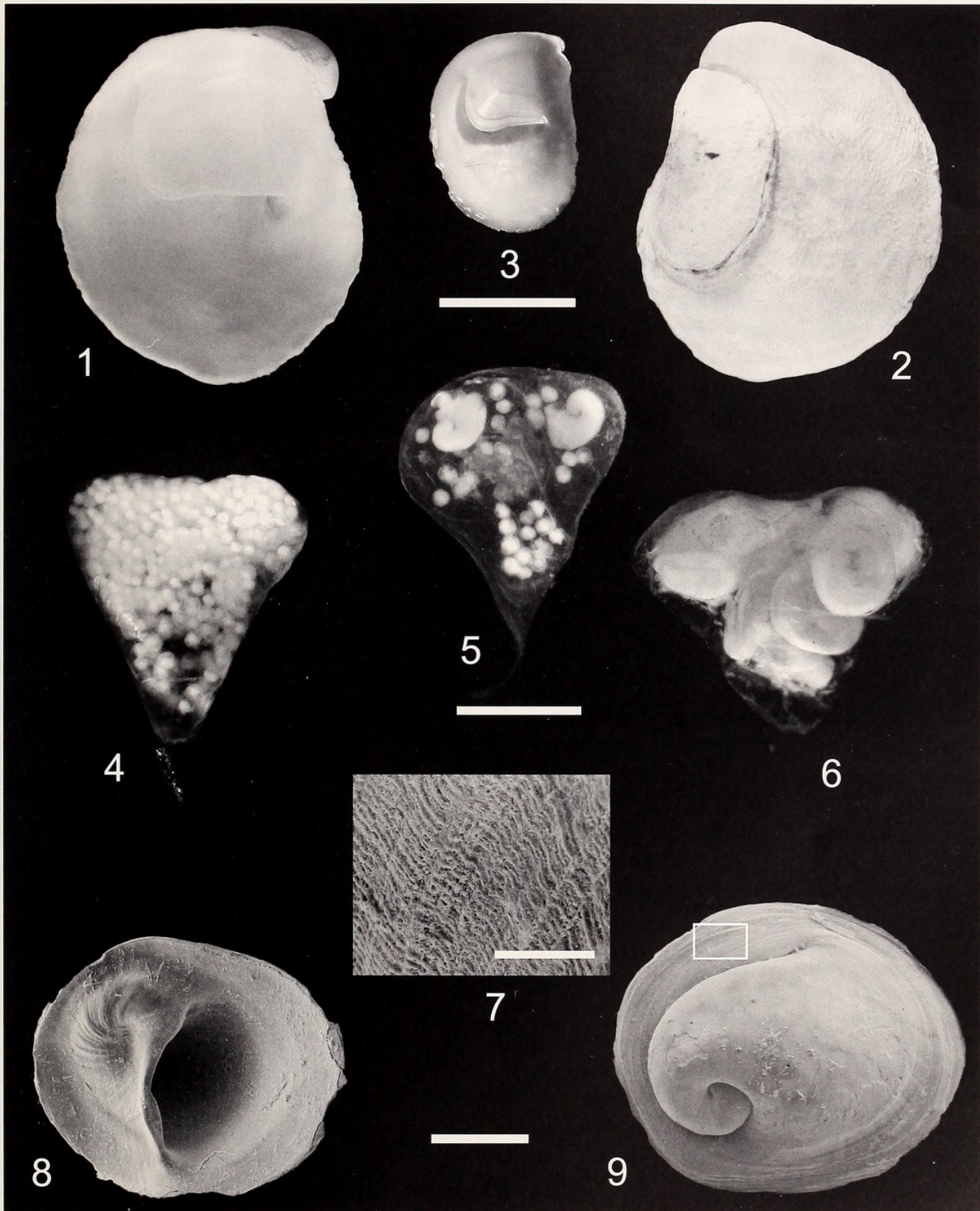
Egg capsules and adult males and females were collected from Bahía Ensenada, Ushuaia (~55°S) by SCU-BA diving in 3–4 m depth, attached to the root of the common kelp *Macrocystis pyrifera* (Linnaeus); Punta Peñas, Puerto San Julián (49°15'S–67°39'W) in 2 m depth; and Punta Dos Hermanas, Puerto Deseado (47°10'S; 2–3 m depth) in Santa Cruz province; and several localities around Golfo Nuevo (~42°30'S) in Chubut province (subtidal). All collections were made during February 2000.

We studied more than 100 brooding females (voucher material was deposited in Museo Argentino de Ciencias Naturales, number MACN 33901). Most females were brooding egg masses at advanced stages of embryonic development, containing embryos and uncleaved nurse eggs or crawling juveniles. This fact confirms the presence of *C. dilatata* in the southern Atlantic, and as far as we observed, restricts *C. fecunda* to the Pacific.

The observed material was completely homogeneous, with only one developmental mode characterized by the presence of nurse eggs. Each egg capsule ( $n = 150$ ) contained 203–375 eggs (mean = 303, SD = 54) with only two to 12 developing embryos, representing as an average 2.4% of the initial egg number. The average uncleaved egg diameter was 214  $\mu\text{m}$  (SD = 13  $\mu\text{m}$ ,  $n = 72$ ). The egg diameter distribution adjusted to a normal distribution with a single mode was 212  $\mu\text{m}$ . Hatching occurred at a crawling juvenile stage. The egg capsule size averaged 3873  $\mu\text{m}$  in length and 3954  $\mu\text{m}$  in width (SD = 648 and 527  $\mu\text{m}$ , respectively). Brooding females measured 11–32 mm (mean = 22 mm) in shell length, but in this protandric species the loss of penis can be already observed at 11 mm of shell length. Males (with a penis) measured 7–19 mm of shell length.

The Argentine material agrees with Gallardo's (1976,





Figures 1-9. *Crepidula dilatata*. Figure 1. Internal view of a female shell; scale bar = 1 cm. Figure 2. Dorsal view of the same specimen with a male shell in stacking position. Figure 3. Internal view of the male specimen from Figure 2. Figure 4. Egg capsule removed from a just laid egg mass; scale bar under 5. Figure 5. Egg capsule with embryos and remaining nurse eggs; scale bar = 2 mm. Figure 6. Egg capsule just prior to hatching with no remaining nurse eggs; scale bar under 5. Figure 7. SEM detail of the ornamentation of the embryonic shell in Figure 8; scale bar = 50  $\mu$ m. Figure 8. SEM, apertural view of the larval shell; scale bar = 0.5 mm. Figure 9. SEM, dorsal view of the embryonic shell; scale bar = 0.5 mm.



Table 1

Comparison of reproduction of Argentine and Chilean specimens of *Crepidula dilatata* Lamarck, 1822.

Source	Egg capsules per egg mass	Eggs per egg capsule	Embryos per egg capsule	Egg diameter ( $\mu\text{m}$ )	Crawling juvenile length ( $\mu\text{m}$ )	Male shell length ( $\mu\text{m}$ )	Female shell length ( $\mu\text{m}$ )
Gallardo, 1979	22–29	308–1016	15–18	195–263	900–1300	6–26	12–53
Chaparro & Paschke, 1990	—	—	—	—	1075–1600	—	—
Present study	9–22	203–375	2–12	197–263	740–1600	7–19.1	11–32

Table 2

Regression and correlation analysis of eggs and egg capsules of *Crepidula dilatata* Lamarck, 1822.

	$r^2$	F	m	P
Egg capsule length-number of eggs per egg capsule (n = 150)	0.33	7.25	0.05	0.05
Number of egg capsules per egg mass-egg capsule length (n = 30)	0.14	4.39	54.8	0.05
Number of egg capsules per egg mass-number of eggs per egg capsule (n = 30)	0.07	1.15	3.57	0.05
Egg capsule length-egg capsule width (n = 150)	0.24	8.63	0.4	0.05

1977, 1979) and Gallardo & Garrido's (1987) general description of the reproduction of *C. dilatata*. We noted, however, some differences. The maximum adult shell length was lower in the Argentine samples than those from Chile (Table 1). This fact could account for the fewer egg capsules per brood found in the Argentinean material (Table 1). There were also fewer developing embryos per egg capsule in the Atlantic sample compared with those studied by Gallardo (1979). The uncleaved egg diameter was between 197 and 263  $\mu\text{m}$ , similar for the Chilean population (Table 1), but we never found two different groups of egg diameters as suggested by Gallardo (1976, 1979). Further studies with a greater number of animals from both sides of the continent would clarify this matter.

There is a linear relationship between the number of egg capsules per brood and the number of eggs. When the egg mass has more egg capsules, each egg capsule is larger and contains more eggs (Table 2).

The number of eggs per capsule, the presence of nurse eggs, the hatching shell size, and the hatching stage as crawling juveniles agree with *C. dilatata*'s reproductive pattern as described by Gallardo (1979) and Chaparro & Paschke (1990). We therefore consider the presence of *C. dilatata* along the Argentine coast to be truly demonstrated. As far as we know, there is no evidence to include *C. fecunda* in the South Atlantic fauna.

This contribution was supported in part by a Coopera-

tive Argentina-Brazil-Chile Research Grant from Fundación Antorchas, Argentina and the project BID 802/OC-AR-PICT No. 01-04321 from the National Agency for Scientific and Technical Promotion, Argentina. Two anonymous reviewers kindly improved the manuscript.

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Penchaszadeh, Pablo E., Pastorino, G, and Cledon, M. 2002. "Crepidula dilatata Lamarck, 1822, truly living in the southwestern Atlantic." *The veliger* 45, 172–174.

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