

A New Scaphelline Volute from the Gulf of Mexico

Edward J. Petuch¹ and David P. Berschauer²

¹ Department of Geosciences, Florida Atlantic University, Boca Raton, Florida 33458

epetuch@fau.edu

² 25461 Barents Street, Laguna Hills, California 92653

shellcollection@hotmail.com

ABSTRACT A new subspecies of *Scaphella junonia* has been discovered off the Alacranes Reefs, along the northernmost edge of Campeche Bank, Yucatan Peninsula of Mexico. The new subspecies, here named *Scaphella junonia curryi*, differs from the other four known *S. junonia* subspecies in having the narrowest and most elongated shell, having the strongest and most extensive ribbed sculpture on the spire whorls, and in having a different color pattern composed of very large, almost fused rectangular spots. The new subspecies is confined to the edge of the Campeche Escarpment off the northern Campeche Bank islands and reefs.

KEY WORDS Volute, Volutidae, *Scaphella*, Scaphellinae, Campeche Bank, Alacranes Reefs, Yucatan Peninsula, Mexico

INTRODUCTION

An unusual and striking form of the widespread Carolinian Province *Scaphella junonia* has recently become available on commercial shell dealer's sales lists, with at least four specimens having come to our attention in recent months. These volutes were taken from an old collection and put up for resale, with most of the specimens having been collected in the 1970s. The senior author had seen similar shells, in the late 1960s, while attending school in Veracruz, Mexico, but these had been made into shell craft dolls by local curio vendors and were ruined as research specimens. After inquiring as to their origin, it was found that these unusual volutes had been taken by shrimpers working along the Campeche Bank fishing grounds, particularly in the vicinity of the Alacranes Reefs. This locality was recently corroborated by well-known Mexican diver and collector Andres Montes de Oca, who collected a freshly-dead specimen, occupied by a hermit crab, from 20 m depth off the Alacranes Reefs (Montes de Oca, personal

communication). Over 50 years after its original discovery, there are now enough specimens, with accurate locality and bathymetric data, to be able to finally name this elusive animal, which is described in the following sections.

The holotype of the new subspecies of *Scaphella junonia* is deposited in the type collection of the Department of Malacology, Los Angeles County Museum of Natural History, Los Angeles, California and bears an LACM catalog number.

SYSTEMATICS

Class Gastropoda
 Subclass Sorbeoconcha
 Order Prosobranchia
 Infraorder Neogastropoda
 Superfamily Volutioidea
 Family Volutidae
 Subfamily Scaphellinae
 Genus *Scaphella* Swainson, 1832
 Species *Scaphella junonia* (Lamarck, 1804)

Scaphella junonia curryi Petuch and Berschauer,
new subspecies
(Figure 1 A-F)

Description. (Described as a subspecies of *Scaphella junonia*) Shell proportionally very elongated for species, with long, narrow body and high, elevated spire; early whorls of spire with angled shoulders; shell base color pale orange or yellow-orange, overlaid with 8-11 rows of proportionally very large reddish-brown rectangular checkers, which often fuse with adjacent checkers to form larger elongated rectangles; some specimens with rectangles coalescing into almost solid bands, forming rectilinear network of thin yellow-orange lines superimposed upon solid reddish-brown background (Figure 1 A); spire whorls yellow-orange, marked with 2 rows of large, closely-packed checkers; aperture proportionally narrow, slightly arcuate, colored pale cream-white within interior; calcarella only slightly pointed, dome-like, composed of 2 whorls; first 3 whorls of teleoconch heavily ornamented with strong, closely-packed longitudinal ribs.

Type Material. **HOLOTYPE** - Length 101.2 mm, width 37.9 mm, Trawled from 30 m depth off the Alacranes Reefs, Campeche Bank, Mexico, LACM 3656 (Figure 1 C, D); **OTHER MATERIAL EXAMINED** - length 107.8 mm, same locality and depth as the holotype, in the Berschauer Collection (Figure 1 E, F); length 99.5 mm, same locality and depth as holotype, in the Petuch Collection (Figure 1 A, B).

Type Locality. The type lot of *Scaphella junonia curryi* was trawled from 30 m depth north of the Alacranes Reefs, along the Campeche Escarpment, Campeche Bank, Yucatan Peninsula, Mexico.

Distribution. At present, known only from north of the Alacranes Reefs, but may be

present off other island groups along the Campeche Escarpment of the northern Campeche Bank, such as Cayo Arenas, Bancos Ingleses, and Cayos Arcos.

Ecology. The new Campeche Bank subspecies is found on carbonate mud and shell fragment sediments, in depths of 20-50 m. There it occurs together with the large marginellid *Prunum labiatum* (which is often dredged by the thousands) and the busyconid *Busycoarctum coarctatum*.

Etymology. Named for Gregory Curry of Key West, Florida, volute specialist and one of the regional authorities on the family Volutidae.

Discussion. The Juno's Volute, *Scaphella junonia* (Lamarck, 1804), is now known to encompass a cluster of biogeographically-discrete subspecies. These include:

1. *Scaphella junonia junonia* (Lamarck, 1804) (the nominate subspecies; Figure 2 A, B), which ranges throughout the entire Carolinian Province, from Cape Hatteras, North Carolina south to the Florida Keys and throughout the entire Gulf of Mexico.
2. *Scaphella junonia elizabethae* Petuch and Sargent, 2011, (Figure 2 G, H), which ranges all along the Florida Keys and Dry Tortugas and is associated with living coral reefs.
3. *Scaphella junonia johnstoneae* Clench, 1953 (Figure 2 C, D), which ranges along the Florida Panhandle from Apalachicola westward to Mississippi.
4. *Scaphella junonia butleri* Clench, 1953 (Figure 2 E, F), which ranges all along the Yucatan Peninsula area, from Tabasco State to Quintana Roo State, Mexico.

5. *Scaphella junonia curryi* Petuch and Berschauer, new species (Figure 1 A-F), restricted to the edge of the Campeche Escarpment off the Alacranes Reefs, Campeche Bank, Mexico.

The biogeographical ranges of the five subspecies of *Scaphella junonia* are shown here on Figure 3. With the exception of the wide-ranging and nearly ubiquitous *Scaphella junonia junonia*, all of the other subspecies are restricted to small geographical areas and are genetically isolated from one another. These five taxa also represent the only living members of *Scaphella sensu stricto*, as all of the other “*Scaphella*” species found in the Carolinian and Caribbean Provinces belong to the subgenera (or possibly full genera) *Clenchina*, *Aurinia*, *Rehderia*, and *Caricellopsis* (see Clench, 1953; Petuch and Sargent, 2011; Petuch, 2013; and Petuch and Myers, 2014).

The new subspecies, *Scaphella junonia curryi*, differs from all of the other known *junonia* subspecies in having a narrower and more elongated shell with a proportionally higher spire and larger color spots. Only *S. junonia johnstoneae* (Figure 2 C, D), with its high spire and pale orange base color, is similar to the new Alacranes Reef subspecies. The northern Gulf of Mexico *junonia johnstoneae*, however, differs greatly in the form of the color pattern, having 13-14 rows of small dark brown rectangular spots. *Scaphella junonia curryi*, on the other hand, has 8-11 rows of large reddish-brown checkers that often coalesce to form closely-packed bands of nearly-interconnected rectangles (see Figure 1 A). The new Alacranes Reef subspecies differs from the other four subspecies in having the most heavily-sculptured early whorls, exhibiting strong longitudinal ribs on the first three whorls of the teleoconch.

The nominate subspecies, *Scaphella junonia junonia*, ranges throughout the Carolinian Province but varies greatly in its bathymetric range. Along the eastern coast of the United States, *S. junonia junonia* is found in offshore areas, at depths of around 50 m, often associated with shoals of the large scallop *Argopecten gibbus carolinensis* (Petuch, 2013). Farther south along the Florida Keys, the nominate subspecies follows a bathymetric submergence pattern, occurring at depths of over 100 m and inhabiting a very narrow strip of continental shelf around the periphery of the Keys archipelago (Figure 3). North of the Florida Keys, *S. junonia junonia* comes closer to shore and is frequently found at depths of less than 20 m. At some western Florida localities, such as Marco Island and Sanibel Island, the nominate subspecies lives so close to the shoreline that it is regularly washed ashore after storms. Farther north along the Florida coast and throughout the rest of the Gulf of Mexico, the nominate subspecies again submerges into deeper water, occurring at depths of 60-100 m and sometimes deeper. Along the Yucatan Peninsula *S. junonia junonia* is rare and appears to prefer depths of over 100 m, well below the fishing depth of most shrimpers.

Although the subspecies *S. junonia elizabethae*, *S. junonia johnstoneae*, and *S. junonia butleri* occur within the range of *S. junonia junonia* (Figure 3), they are not sympatric and occur in much shallower water than does the nominate subspecies. These subspecific taxa, then, represent bathymetric subspecies of *S. junonia junonia*, with each having become genetically isolated from its ancestral stock by having developed different depth preferences. Both *S. junonia elizabethae* and *S. junonia butleri* have moved into shallow carbonate coral reef areas (5-25 m depths) and are both components of the fore reef community of the Florida Keys and Campeche Bank reef systems. The new

subspecies, *S. junonia curryi*, prefers depths of 30-50 m and is bathymetrically intermediate between the depth preferences of *S. junonia junonia* (100+ m) and *S. junonia butleri* (5-25 m). For this reason, the northern edge of the Campeche Bank, with its stepped submarine terraces, is the only area within the Carolinian Province where three bathymetric subspecies of *S. junonia* can occur in near proximity (Figure 3). Each subspecies is actually living on its own isolated terrace level and is reproductively isolated from its sister taxa in shallower or deeper water.

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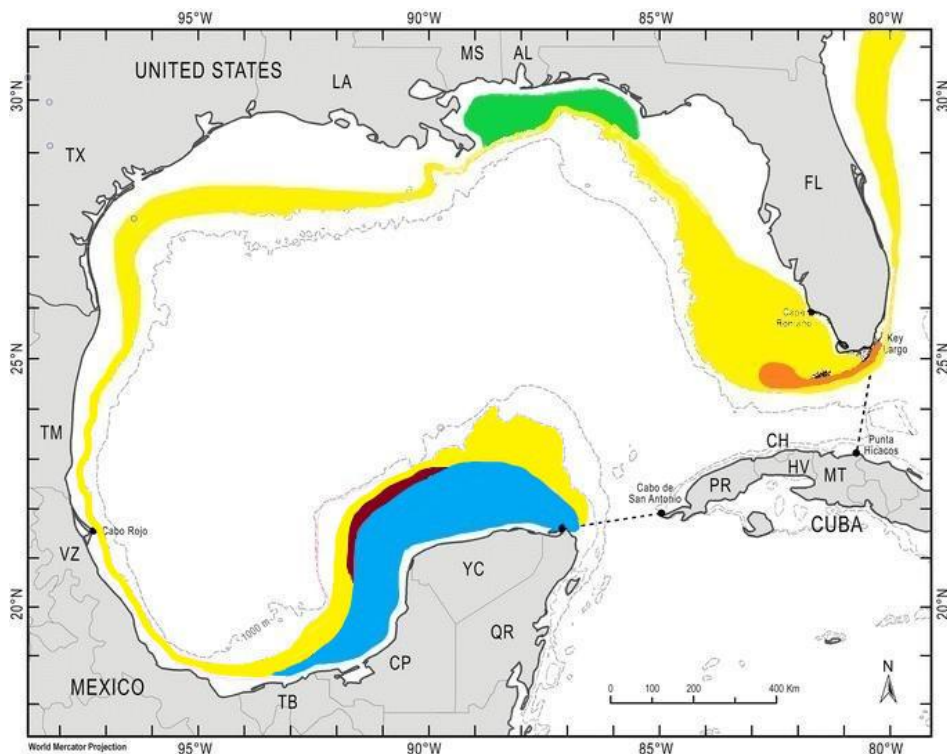


Figure 3. Map Showing the Distributions of the Five Subspecies of *Scaphella junonia*. Yellow= *Scaphella junonia junonia*; Orange= *Scaphella junonia elizabethae*; Green= *Scaphella junonia johnstoneae*; Blue= *Scaphella junonia butleri*; Red= *Scaphella junonia curryi*.

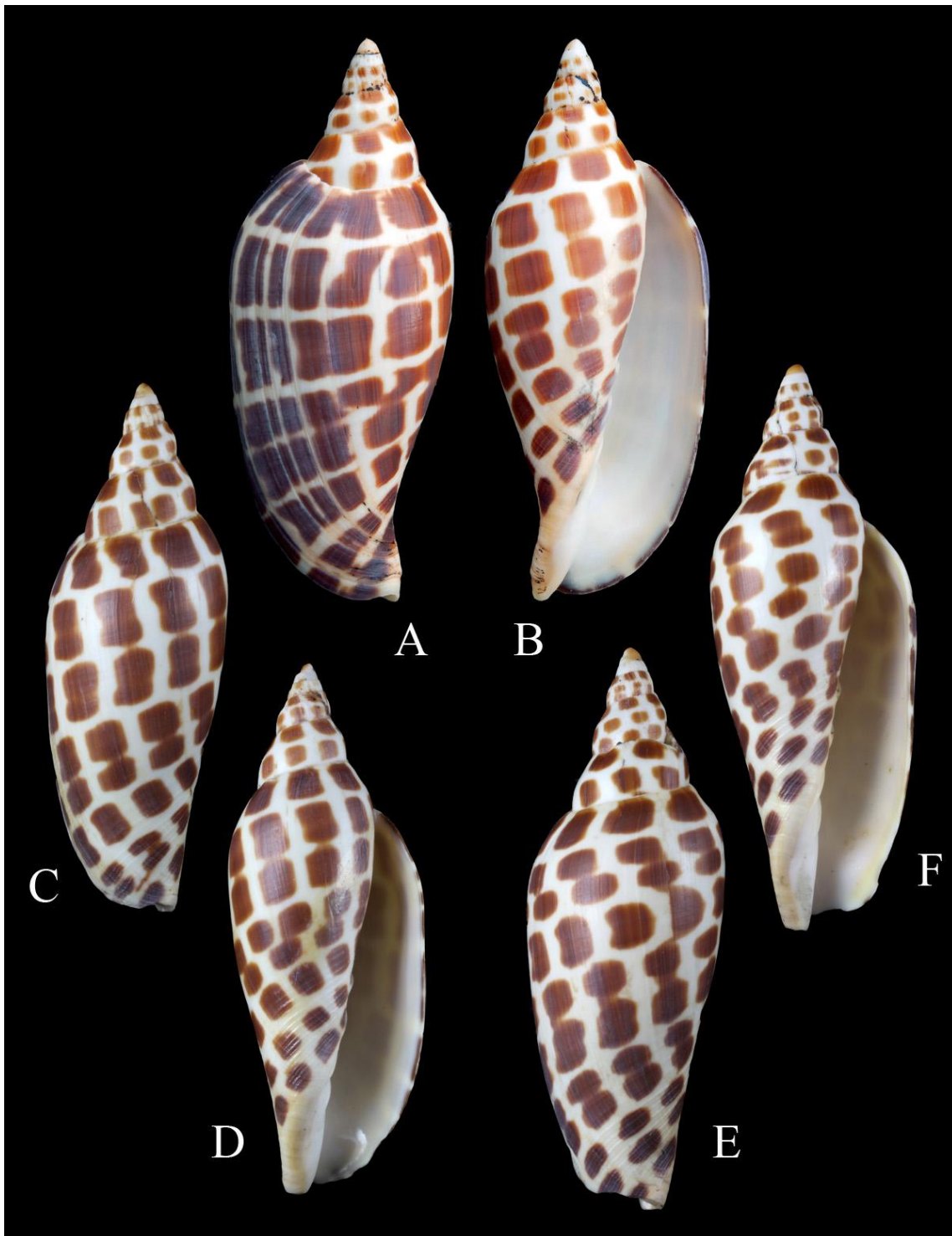


Figure 1. *Scaphella junonia curryi* Petuch and Berschauer, new subspecies.

A, B= Length 99.5 mm, in the Petuch Collection; C, D= Holotype, length 101.2 mm, LACM 3656; E, F= Length 107.8 mm, in the Berschauer Collection. All specimens were trawled from 30 m depth by shrimpers, north of the Alacranes Reefs, Campeche Bank, Mexico.

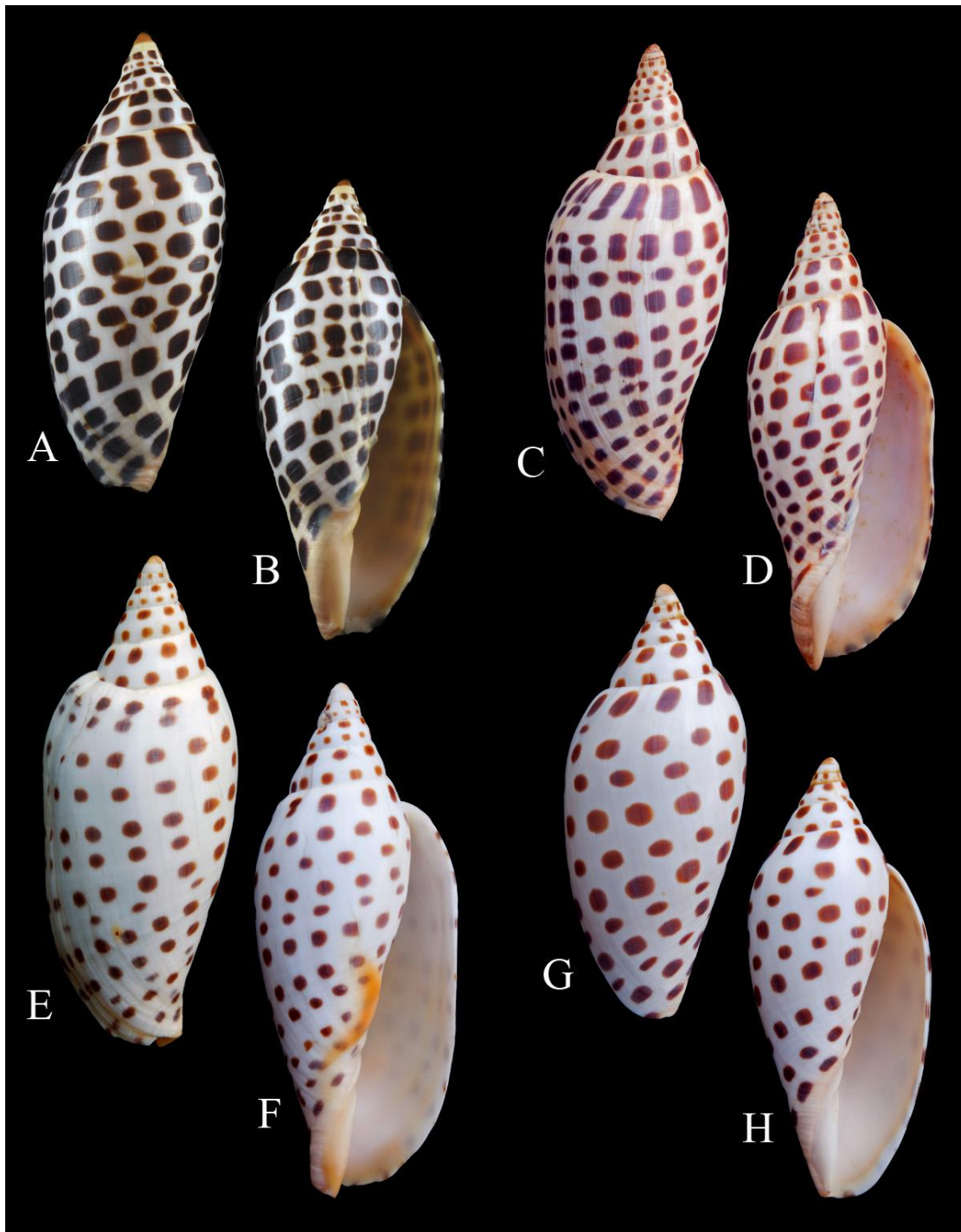


Figure 2. Subspecies of *Scaphella junonia* (Lamarck, 1804) from the Eastern United States and Gulf of Mexico.

A, B= *Scaphella junonia junonia* (Lamarck, 1804), length 112 mm, collected in a crab trap set in 20 m depth, 10 km northwest of Rabbit Key, Ten Thousand Islands, Monroe County, Florida; **C, D=** *Scaphella junonia johnstoneae* Clench, 1953, length 117 mm, trawled by shrimpers from 25 m depth, 50 km south of Dauphin Island, Alabama; **E, F=** *Scaphella junonia butleri* Clench, 1953, length 119 mm, trawled by shrimpers from 25 m depth north of Serpiente Reef, Campeche Bank, off Sisal, Mexico; **G, H=** *Scaphella junonia elizabethae* Petuch and Sargent, 2011, length 113 mm, collected by diver from 20 m depth off Garden Island, Dry Tortugas, western Florida Keys.