

# QUEEN CONCH

## *Aliger gigas*



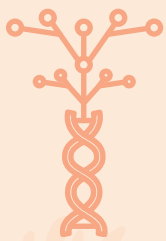
Queen Conch (*Aliger gigas*)  
iNaturalist, De Jesus Castro

### Common Names [12, 17]

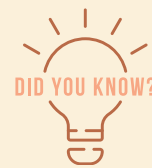
In English, the species is known as the queen conch, conch, or pink conch. In Spanish, it is called carrucho, caracol reina, or caracol rosa. In the Dominican Republic it is referred to as lambí, while in Haitian Creole it is written as lambi.

### Taxonomy & Etymology [6, 18, 19]

Recent taxonomic revisions within the family Strombidae have affected the classification of the queen conch, with the latest update placing it in the genus *Aliger* as *Aliger gigas*.



**Kingdom** → Animalia  
**Phylum** → Mollusca  
**Class** → Gastropoda  
**Order** → Littorinimorpha  
**Family** → Strombidae  
**Genus** → *Aliger*  
**Species** → *Aliger gigas*

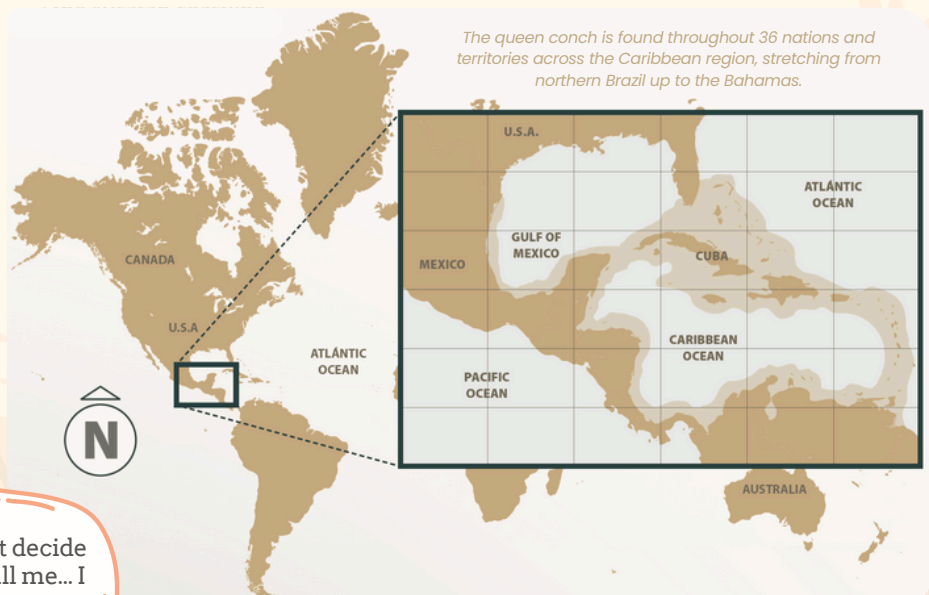


*Aliger gigas* (formerly *Strombus gigas* Linnaeus, 1758) translates to "giant wing-bearer." The genus name *Aliger* derives from the Latin *āla* ("wing") + *-ger* ("bearing"), referring to the wing-like extensions of the adult conch's flared outer lip. The species epithet *gigas* comes from the Ancient Greek *gigas*, meaning "giant". [18]



Queen conch's eyes  
iNaturalist, Robin White - Adapted

They can't decide what to call me... I just roll my eyes



The queen conch is found throughout 36 nations and territories across the Caribbean region, stretching from northern Brazil up to the Bahamas.

Queen conch's range  
datamates.org

# Biology

## Description

The queen conch is one of the largest mollusks native to the Caribbean, growing slowly and reaching lengths of up to 12 inches, weights of around 5 pounds, and lifespans of up to 30 years. Distinctive features include a whorled shell with apical spines and a pink inner lip. With age, a dark periostracum develops on the outside of the shell, obscuring its natural coloration. Shell morphology is variable and shaped by environmental conditions. [4, 6, 11, 17]

The queen conch exhibits sexual dimorphism, with females typically reaching slightly larger sizes than males. Both sexes are primarily distinguished by the presence of a verge in males or an egg groove in females. [4, 11]

Horn et al., (2022) note that *A. gigas* is set apart from other members of its family by its large, heavy shell, short and sharply pointed spire, a brown horny operculum, and the bright pink coloration of the shell's interior, along with differences in distribution and maximum size. [4, 6, 11]



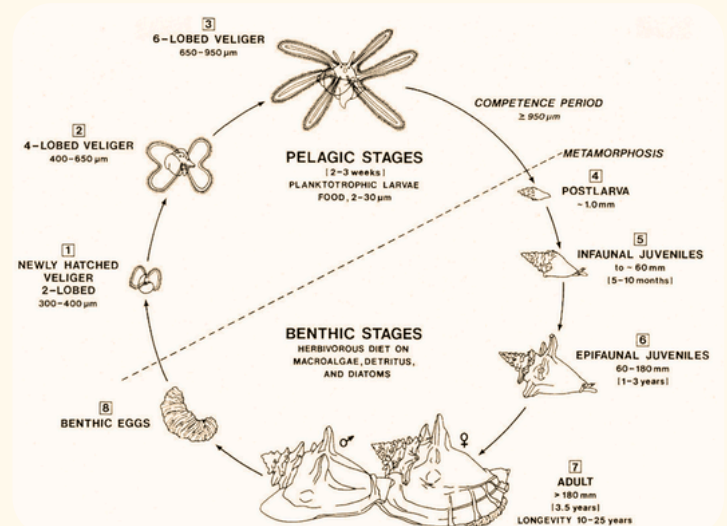
*A. gigas* adult individual (left) and a juvenile shell (right)

Chenu, 1844 & visit TCI

## Life cycle

The queen conch's life cycle begins with benthic eggs deposited in shallow sandy coastal habitats, which hatch within 4 to 5 days. The larvae then enter pelagic stages as planktonic veligers, drifting in the upper water column for two to eight weeks, depending on phytoplankton concentration and water temperature, and either settle locally or disperse to new areas. Upon receiving the right chemical cues, they metamorphose into the post-larval stage, settle on the seabed, and bury themselves in the sediment. After about a year, during warmer summer months, they emerge from the sediment as juveniles and occupy shallow seagrass

beds, habitats that provide food and reduce the risk of predation, which is high during this stage. Growth continues for several years until the edge of the shell lip turns outward to form the flared lip, signaling sexual maturity at roughly 3.5 to 4 years. After the shell lip forms, growth is restricted to increasing shell thickness, especially in the flared lip. Adults then move to a wider range of benthic environments based on temperature, food availability, and predation pressure, with reproduction and feeding occurring in different habitats. [4, 6, 11]



Life cycle of the queen conch by Bonnie Bower-Dennis

Horn et al., (2022)

## Reproduction

Queen conch reproduce through internal fertilization, with males identified by a verge and females by an egg groove. During mating, the male positions himself behind the female and inserts the verge into the egg groove. After copulation, females (which can store fertilized eggs for several weeks before laying) deposit egg masses that may be fertilized by multiple males within 24–36 hours on sandy substrates with low organic content. [4, 6, 11]



*A. gigas* mating with male on the left

jeffrbaldock.wordpress.com



The number of egg masses produced per female is highly variable, ranging from 1 to 25 per season with each egg mass containing about 750,000 eggs each. The egg mass folds into a compact crescent shape and becomes camouflaged as sand grains adhere to it. Incubation lasts 3 to 5 days before hatching into planktonic veligers. [4, 6, 11]

Reproductive success is highly dependent on population density. Because conch form seasonal spawning aggregations, reduced numbers of adults limit mate encounters, extend search times, and lower reproductive output. Copulation itself may stimulate further gamete development, creating a positive feedback loop that is weakened at low densities. Fecundity is variable, but females can produce millions of eggs per season, with egg production strongly influenced by food availability, age, and body condition. Older individuals with thicker lips generally have greater gonad weight and fecundity, but reduced internal shell space may eventually limit reproductive tissue. [4, 6, 11]



Female queen conch laying an egg mass

Community conch

Spawning in queen conch is triggered by rising water temperatures and longer daylight, leading adults to migrate from deeper or offshore feeding grounds to sandy areas for reproduction. These movements give rise to large aggregations (often numbering in the hundreds) that tend to re-form at the same sites each year and are typically dominated by older, highly fecund individuals. The timing and duration of spawning vary across the species' range: activity usually peaks from spring through late summer, extends longer at lower latitudes, and in some regions can occur year-round. Local conditions, habitat distribution, and population density further shape these reproductive dynamics. [4, 6, 11]

## Diet & feeding habits [4, 6, 11]

Queen conch are herbivorous benthic grazers that feed primarily on algae, seagrass detritus, and organic material in the sediment. Juveniles consume macroalgae, epiphytes that live on seagrass, diatoms, cyanobacteria and organic matter in the sediment. Adults feed largely on filamentous algae, and the presence of certain species has been linked to shifts in aggregation behavior and higher population densities.

## Age & growth [4, 5, 6, 11]

Queen conch can live for 25–30 years, but their growth is slow and strongly influenced by environmental factors such as depth, latitude, habitat type, and food availability. Growth rates vary widely: hatchery juveniles may grow about 0.3 mm per day, while those in the wild range from 0.12 to 0.28 mm per day depending on location. Seasonal differences are also marked, with faster growth in summer than in winter. Females generally grow more quickly than males, reach larger sizes, and develop greater tissue weight.

Shell length increases until reproductive maturity is reached but once it exceeds about 22–25 mm, both tissue and gonad weight start to decline. In older conch, especially beyond 10 years, shell layers continue to build inward, reducing internal space and limiting the growth of soft tissues, which leads to a gradual loss of body mass.



Adult queen conch

Reinhard Dirscherl

## Disease & Parasites

Research on queen conch disease consistently points to widespread infection by Apicomplexa-like organisms, commonly found in mollusks and other invertebrates. These parasites, transmitted through feces and infecting the digestive gland, are present across the Caribbean, with prevalence year-round and peaks in the fall months. While some studies link them to disrupted reproductive cycles and reduced gametogenesis, others report no measurable impact on health or reproduction. This has led to the suggestion that environmental stressors such as pollution and elevated water temperatures may also play a role in reproductive irregularities. Given the uncertainty, further research is needed to clarify how these parasites interact with host physiology and whether they significantly limit conch population recovery. [1, 6, 11]

# Importance to man

## Fisheries & economic importance

The queen conch is an iconic Caribbean resource, central to both cultural identity and local livelihoods. It is a valuable fishery in the region, with many island communities depending on it for food and income. Global demand for conch products has tripled since the 1970s, but because the species matures slowly and forms easily harvested aggregations in shallow waters, populations have been heavily exploited. [6, 8, 12, 14]

Despite heavy pressures, queen conch fisheries remain a major economic driver across the Caribbean. In The Bahamas, the fishery generates more than US \$7 million annually and sustains thousands of households. In St. Lucia, conch harvests averaged about US \$920,000 annually over the past decade, peaking at US \$1.18 million in 2017. In Saint Vincent and the Grenadines, queen conch represented 31% of total landings in 2021 and accounted for more than 62% of fisheries export value in 2020, worth nearly US \$3.3 million. In the Turks and Caicos Islands, queen conch is the second most important commercial fishery, supporting exports worth more than US \$3.5 million each year as well as a domestic market, though stocks there are thought to be in decline under growing harvest pressures. Globally, the conch trade has been valued at about US \$60 million annually since the late 1990s, with the United States alone importing 1.4 million kilograms of meat from the Caribbean in 2015. [2, 7, 8, 9, 12, 14]

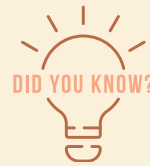
## Inclusion in MPA management

Queen conch is managed through a combination of national and regional measures, including marine protected areas (MPAs), seasonal closures, gear restrictions, and trade regulations under CITES Appendix II. Countries such as The Bahamas, Turks and Caicos Islands, and Saint Vincent and the Grenadines have applied harvest controls and MPA-based protections to sustain stocks. At the regional level, the CITES Regional Queen Conch Fisheries Management and Conservation Plan promotes coordinated measures such as catch limits, traceability, and stronger monitoring to address the challenges of illegal, unreported, and unregulated fishing. Additionally, the United States restricts imports of conch products (including meat, shells, and live animals) from countries such as Grenada and Haiti unless proper conservation measures are in place. These examples show that while queen conch supports local diets, economies, fisheries, and livelihoods, its decline has made careful management and trade regulation essential for the species' future. [2, 3, 9, 13, 14, 15, 16]



Discarded conch shells left after meat harvest

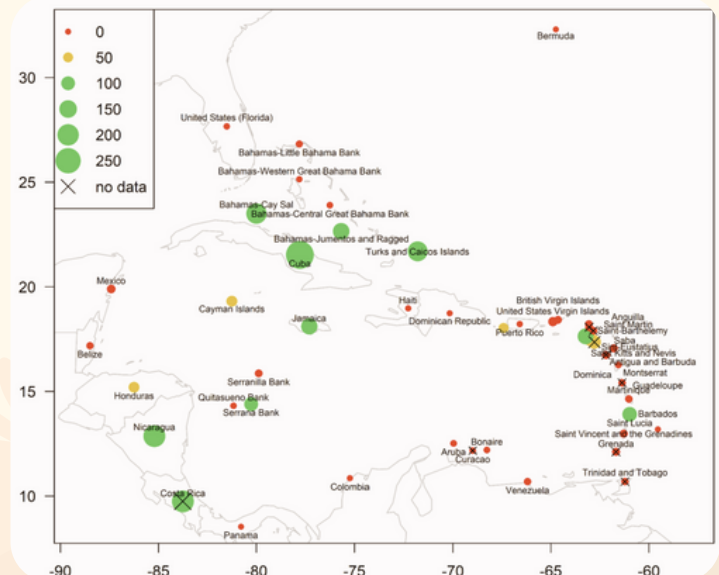
Mike Theiss, National Geographic



## Human connections & Risks

Queen conch supports local diets, fisheries, and export economies, making it a vital resource across the Caribbean. However, dependence

on this fishery also brings risks. Unsustainable harvest has led to population declines and local stock collapses. In addition, divers harvesting conch in deeper waters are exposed to health dangers, including decompression sickness. These challenges highlight the need for careful management and sustainable practices to protect both human livelihoods and the long-term survival of the species. [2, 4, 14]



Adult queen conch densities per hectare (2022)

Green symbols indicate conch populations with >100 adult conch/ha, gold symbols indicate 50-99.9 adult conch/ha, and red symbols indicate <50 adult conch/ha

Horn et al., (2022)



# Aquaculture potential

## Economics

Aquaculture of queen conch has been explored for over 40 years as both a conservation and commercial strategy. However, economic viability remains limited. Large-scale culture is not cost-effective compared to wild harvest, as replacing even one adult reproductive conch would require substantial hatchery capacity and resources beyond what most facilities can sustain. Attempts to offset fishery harvests show that the scale of facilities and investment required would be prohibitively high, making aquaculture more useful for education and conservation engagement than for profitable production. [4, 5, 6, 10]

## Husbandry

Queen conch aquaculture techniques are well established, covering spawning, larval rearing, and nursery phases. Hatcheries can reliably produce juveniles, but survival rates decline once they settle from the larval stage. As they grow, progress slows, and feeding becomes more demanding, since their diet changes with development. These factors make raising conch to larger sizes particularly challenging. [4, 5, 6]

## Broodstock development

Developing reliable broodstock is essential for sustaining queen conch aquaculture. In the past, hatcheries depended on collecting wild egg masses, but this method is inconsistent and cannot support large-scale culture. As an alternative, breeding enclosures or “egg farms” have been created in sandy, low-energy areas where conch naturally occur. These sites are stocked with mature males and females in balanced ratios before spawning season and secured with mesh to contain the animals and protect their egg masses. In captivity, controlled conditions of temperature, salinity, and diet have made it possible for broodstock to produce viable eggs that can be disinfected and incubated in hatcheries. While this reduces reliance on the wild, setting up and maintaining broodstock systems remains labor- and resource-intensive. [4, 5, 11]

## Marketing [2, 4, 5, 10, 14]

- **Meat & shells:** Marketed both as a culinary delicacy, sold fresh or dried, and through its shells, which are crafted into souvenirs, jewelry, décor, and instruments.
- **Tourism-driven demand:** As a luxury dish favored by visitors, it is primarily sold through restaurants and hotels.
- **Aquaculture & new markets:** Hatcheries are developing farm-raised conch for aquariums, restocking programs, and specialty food markets, offering a sustainable alternative to wild harvest.

## Bottlenecks to culture

Even with advances in hatchery and nursery methods, significant challenges remain for queen conch aquaculture. Survival after settlement is still low, and cultured juveniles tend to grow slowly with thinner shells than wild individuals. The dietary shift from the larval stage to juveniles adds complexity to rearing and drives up costs. Combined with the species’ naturally slow growth, these factors reduce overall production efficiency.

Another limitation is the dependence on wild egg masses to supply larvae, which prevents scaling to levels that could replace fishery harvests. Even the largest hatcheries fall short of the numbers needed, and past commercial efforts have struggled with low survival and high operating costs. For these reasons, aquaculture is currently more practical as a conservation or educational tool than as a substitute for wild fisheries. [4, 5, 10]

## Processing

Queen conch processing primarily targets the meat, which represents only 7–8% of the whole animal’s weight. Once harvested, the shell is discarded and the meat undergoes skin removal, cleaning, and freezing—commonly packaged in 5-pound boxes for export markets. Value-added products are also significant: trimmings are used for fritters, chowders, and burgers; shells are traded and pearls, though rare, can fetch prices up to several thousand USD each. Specialized tools are used for shucking, and in the case of aquaculture-raised juveniles, the meat is often processed into 1-pound bags for shipping. [3, 4, 10]



Conch shells at a beachside market in Turks & Caicos

Mike Theiss, National Geographic

- **Trade controlled by CITES Appendix II.**
- **Local laws set size limits, quotas, and seasons.**
- **Overfishing and illegal harvests remain major threats.** [2, 3, 12]



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