

# market squid

*Loligo opalescens*

## BIOLOGY FACT SHEET



## San Diego seafood profiles

### Taxonomic description

- A small open ocean mollusk possessing eight arms and two longer tentacles used for mating and prey capture [1]
- A mix of iridescent white and purple, but can change colors in response to the environment [1]
- Swims backwards through the water, propelled by valves near the head [1]
- Produce "ink," a dark pigment released into the water to divert the attention of predators [2]
- Adults reach lengths of 30cm (12in) [2]

### Distribution

- Ranges from southeastern Alaska to Bahía Asunción in Baja California, Mexico [2]
- Most abundant through Punta Eugenia in Baja California, and Monterey Bay, California [1]

### Life history

- After mating, females release egg cases which are attached to the seafloor
- Each case contains 200 to 300 eggs [2]
- Larval squid hatch after 3-5 weeks [2]
- Spawning occurs April – November in Northern California, and October – May in Southern California [3]
- Reaches maturity six months after hatching [4]
- Short life span, living an average of 188 days, 300 at most, and dying shortly after spawning [4]

### Habitat

- Found offshore, except during spawning which occurs in the near shore coastal waters [2]
- In the water column from the surface to 792m (2,600ft) depths [1]
- Migratory, forms massive schools [1]

- Feeds on small crustaceans, fish and other squid [2]
- Preys on many species including marine mammals and large pelagic fish [2]

### References

- [1] NOAA FishWatch. Fish Watch and Seafood Profiles. California Market Squid: [www.fishwatch.gov/seafood\\_profiles/species/squid/species\\_pages/market\\_squid.htm](http://www.fishwatch.gov/seafood_profiles/species/squid/species_pages/market_squid.htm)
- [2] Recksiek, C.W., H. W. Frey. Biological, Oceanographic, and Acoustic Aspects of the Market Squid, *Loligo Opalescens* Berry. Fish Bulletin 169. [http://content.cdlib.org/view?docId=kt7k4005pp&&doc.view=entire\\_text](http://content.cdlib.org/view?docId=kt7k4005pp&&doc.view=entire_text)
- [3] Leet, W.S. California Market Squid. 2001. California's Living Marine Resources: A Status Report. Sacramento: California Dept. of Fish and Game. 295-298.
- [4] Butler, et al. 1999. Age and Growth of Market Squid Off California. CalCOFI Rep.: 40.
- [5] <http://sanctuarysimon.org/species/loligo/opalescens/california-market-squid>

### Did you know?

The frenzy of a spawning event, with thousands of squid grasping one another, will leave many individuals mutilated by the powerful suckers on the tentacles of their would-be mates! [5]



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## FISHERY FACT SHEET

*Loligo opalescens*



Purse seiner hauling catch off Southern California

## San Diego seafood profiles

### Seasonal availability

- Available in San Diego from Sept-March [1]

### Managing authority

- California Department of Fish and Wildlife, with NOAA Fisheries and Pacific Fishery Management Council, adhere to a sustainable monitoring and management plan
- Establishes seasonal catch limits, monitors fishery for environmental impacts, and designates temporary closures to allow for uninterrupted spawning [1]

### Status of the fishery

- Sensitive to water temperatures – catch decreases with warming in El Niño years, increases with cooler waters of La Niña [3]
- Largest California commercial fishery by volume in 1993 with 47,100 tons landed [3]
- Became most valuable California fishery resource by 1996 at \$33.3 million [3]
- Demand largely dictated by overseas markets

- Entire stock replaces itself semi-annually even in the absence of fishing, and is able to recover from drastic decreases in the population [3]

### Gear type

- Purse seine nets are laid out by seiner vessels to encircle and haul spawning schools
- Brail vessels use hydraulic dip nets
- Use of lights to attract squid to the surface is legal throughout California

### Potential ecosystem impacts

- Attractant lights can disturb nesting seabirds; to circumvent this, wattage is limited and lights are shielded [3]
- Haul chains and bottoms of purse-seines can scrape and drag against the seafloor, damaging the benthic ecosystem [1,4]
- Bycatch is minimal, mostly composed of sardine, anchovy, or mackerel, but can occasionally include squid egg cases from the

- seafloor if nets are drawn in shallower waters [2,4]
- Observed decrease in average length and weight of market squid (1999-2007) could affect population resilience as female fecundity increases with size [3]

### References

- [1] California Dept. of Fish and Wildlife. 2014. [www.dfg.ca.gov/marine/cpshms/marketsquid.asp](http://www.dfg.ca.gov/marine/cpshms/marketsquid.asp)
- [2] FishWatch. 2014. California Market Squid. NOAA FishWatch U.S. Seafood Facts [www.fishwatch.gov/seafood\\_profiles/species/squid/species\\_pages/market\\_squid.htm](http://www.fishwatch.gov/seafood_profiles/species/squid/species_pages/market_squid.htm)
- [3] California Living Marine Resources. 2006. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=34420>
- [4] Voices of the Bay: Fishery Basics - California Fisheries. Market Squid (*Doryteuthis opalescens*). 2011. <http://sanctuaries.noaa.gov/education/voicesofthebay/pdfs/marketsquid.pdf>

### Did you know?

The mantle of the market squid is covered in pigment cells called chromatophores, which appear as small patches or dots – they allow the squid to change colors to camouflage or to communicate! [2]





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## NUTRITION FACT SHEET

*Loligo opalescens*



Garlic and olive oil calamari fettuccini

<http://atoziti.com/2011/07/31/how-to-clean-calamari-half-ass-lessons-from-the-kitchen-that-would-make-bear-grylls-proud/>

## San Diego seafood

### Edible portions

- Arms (tentacles), mantle (tube), and fins (wings) are all edible [1]

### Description of meat

- Raw squid should be moist, shiny, and ivory colored [1]
- Clean the squid as much as possible before cooking, making sure to cut away the cartilage inside the mantle
- Gently rubbing the body of the squid with your thumbs will remove the thin layer of skin [2]
- Once cooked, the meat turns white and has a mild, slightly sweet taste [1]

### Culinary uses

- Can be thawed and then refrozen without damaging the meat [2]
- Common recipes feature the squid in pasta dishes, soups and stews

- To make calamari: cut squid into 1/3- to 1/2-inch thick rings, dip into flour, and fry in oil until golden brown

### Nutritional information

Nutrition Facts			
Serving Size 28 g			
Amount Per Serving			
Calories 26	Calories from Fat 4		
		% Daily Value*	
Total Fat	0g		1%
Saturated Fat	0g		1%
Trans Fat			
Cholesterol	66mg		22%
Sodium	12mg		1%
Total Carbohydrate	1g		0%
Dietary Fiber	0g		0%
Sugars	0g		
Protein	4g		
Vitamin A	0%	Vitamin C	2%
Calcium	1%	Iron	1%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.			
NutritionData.com			

### Toxicity report

- No known toxins [1]

### Seasonal availability

- Available Sept – March, unless catch limit is reached before end of season [1]

### References

- [1] "California Market Squid." FishWatch: U.S. Seafood Facts. National Oceanic and Atmospheric Administration. [www.fishwatch.gov/seafood\\_profiles/species/squid/species\\_pages/market\\_squid.htm](http://www.fishwatch.gov/seafood_profiles/species/squid/species_pages/market_squid.htm).
- [2] Tin, K. Cooking: How to clean and prepare raw squid for cooking." 25 Oct 2010. [www.youtube.com/watch?v=1fdPI777Ji0](http://www.youtube.com/watch?v=1fdPI777Ji0).
- [3] Market squid, wild-caught. New England Aquarium. [www.neaq.org/conservation\\_and\\_research/projects/fisheries\\_bycatch\\_aquaculture/sustainable\\_fisheries/celebrate\\_seafood/ocean-friendly\\_seafood/species/market\\_squid.php](http://www.neaq.org/conservation_and_research/projects/fisheries_bycatch_aquaculture/sustainable_fisheries/celebrate_seafood/ocean-friendly_seafood/species/market_squid.php)

### Did you know?

The word calamari, the English culinary word for Mediterranean dishes featuring squid, is the Italian word for the animal (singular "calamaro")



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## CULINARY INFO SHEET

*Loligo opalescens*

### STEP 1: CLEAN

#### Tools:

- Cutting Board
- Knife
- Gloves, apron (if harvesting ink for use in pasta or risotto)

#### Method:

1. **SEPARATE** head from body by using the knife and cutting board to cut behind the eyes. Cut just underneath the eyes to separate head from tentacles. Discard head OR use in seafood stock.
2. **REMOVE** the cartilage quill from the body cavity by grasping and pulling the end of the quill. Rub the mantle (tube) between fingers to make sure all of it has been removed.
3. **SPREAD** tentacles to locate beak of squid at the center. Pinch around beak and pull to remove.
4. **CLEAN** mantle by reaching into tube and pulling out innards. Identify ink sac by its glossy, bluish-black hue. If harvesting, don gloves and apron, protect porous surfaces, and separate ink sac from innards. Puncture ink sac and squeeze into a tablespoon of water, wine, or other cooking liquid for later use.
5. **RINSE** mantle under cold running water to remove traces of sand and innards.
6. **SKIN** by pulling pigmented outer layer off of mantle (optional: skin is edible). Pull off fins from mantle, leaving behind only the tube of the body.
7. **CUT** body into rings, strips, squares, or leave whole to stuff.

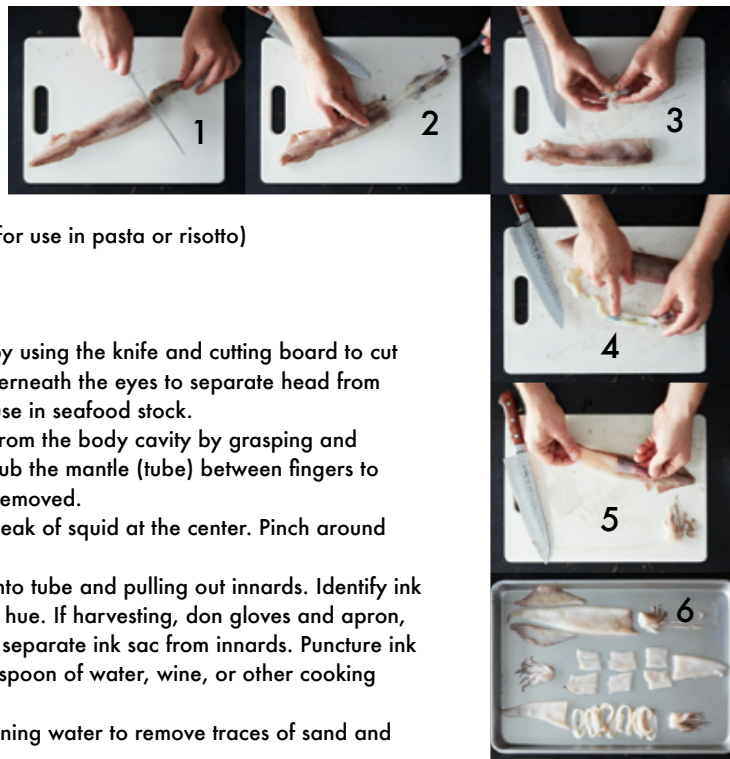


Photo: [food52.com](http://food52.com)

## San Diego seafood profiles

### STEP 2: PREPARE

#### Starter | Garlic Parsley Grilled Squid

From [EatWell101.com](http://EatWell101.com)

##### Ingredients (serves 6):

- 1 3/4 lbs (800g) small squid
- 1 tbsp oil
- 1 tbsp chopped parsley
- 2 cloves garlic
- 1 tbsp breadcrumbs
- Salt and pepper, to taste

##### MARINADE:

- 1 tbsp olive oil
- 1 tbsp apple cider vinegar
- Few sprigs fresh thyme
- 1 pinch Espelette pepper



Photo: Dominique Sauvage

##### Method:

1. Cut squid into strips, leave tentacles whole. Put all the pieces in a large bowl. Add a tablespoon of olive oil, salt and pepper.
2. Coat all the pieces and cook on a hot griddle or cast iron grill.
3. Put the chopped garlic, parsley and breadcrumbs in a bowl and mix.
4. Add breadcrumbs to the flavored squid, stir and leave to brown.
5. Season grilled squid with oil, vinegar, Espelette pepper and thyme

##### SERVING SUGGESTIONS:

Squid ink can be utilized in pasta made from scratch, giving it a subtle, briny flavor and black coloration.

##### OTHER RECIPE IDEAS:

Stuffed squid, steamed or baked; tangy squid salads; deep fried with aioli dipping sauce

#### Entrée | Thai Basil Squid

From [rasamalaysia.com](http://rasamalaysia.com)

##### Ingredients (serves 2):

- 12 oz squid, cleaned and cut into rings, patted dry with paper towels
- 1 tbsp oil
- 3 tbsp Thai roasted chili paste
- 3 bird's eye chiles, crushed
- 1 tsp fish sauce or to taste
- 1 tbsp lime juice
- handful of thai basil leaves



##### Method:

1. Heat up a wok with oil, adding roasted chili paste and chiles
2. Stir fry chiles, then add squid
3. Add fish sauce and lime juice; Stir adding basil leaves
4. When leaves are wilted and squid is firm but tender, dish out and serve immediately with rice.
5. Sprinkle with parsley and serve immediately.

**TIP:** To keep squid from becoming chewy during cooking, set meat to soak in a mixture of pineapple juice and milk beforehand [4]

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California

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UC San Diego

##### References

- [1] Widmeier, W. Food52: [food52.com/blog/7003-how-to-clean-squid](http://food52.com/blog/7003-how-to-clean-squid)
- [2] Cheirrier, C. Eat Well 101: [www.eatwell101.com/marinated-squid-recipe](http://www.eatwell101.com/marinated-squid-recipe)
- [3] Low, B.Y. Rasa Malaysia: <http://rasamalaysia.com/thai-basil-squid/2/>
- [4] Best Home Chef: [www.news.com.au/lifestyle/food/soak-squid-in-milk-before-cooking-plus-9-other-home-cooking-hints/story-fneuz8zt-1226517929708](http://www.news.com.au/lifestyle/food/soak-squid-in-milk-before-cooking-plus-9-other-home-cooking-hints/story-fneuz8zt-1226517929708)