

Haliclystus californiensis: a “new” species of stauromedusa (Cnidaria: Staurozoa) from the northeast Pacific



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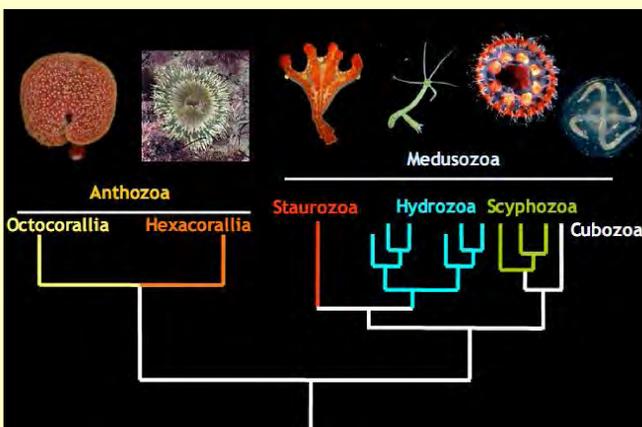
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Introduction

- Stauromedusae are stalked, cryptic, benthic medusozoan cnidarians distributed mostly in shallow, temperate and polar waters.
- ~50 species have been described worldwide.¹⁻²
- In the past, Stauromedusae was placed in Class Scyphozoa, but recent phylogenetic analyses suggest that the group represents the earliest diverging clade of extant medusozoans.³⁻⁵

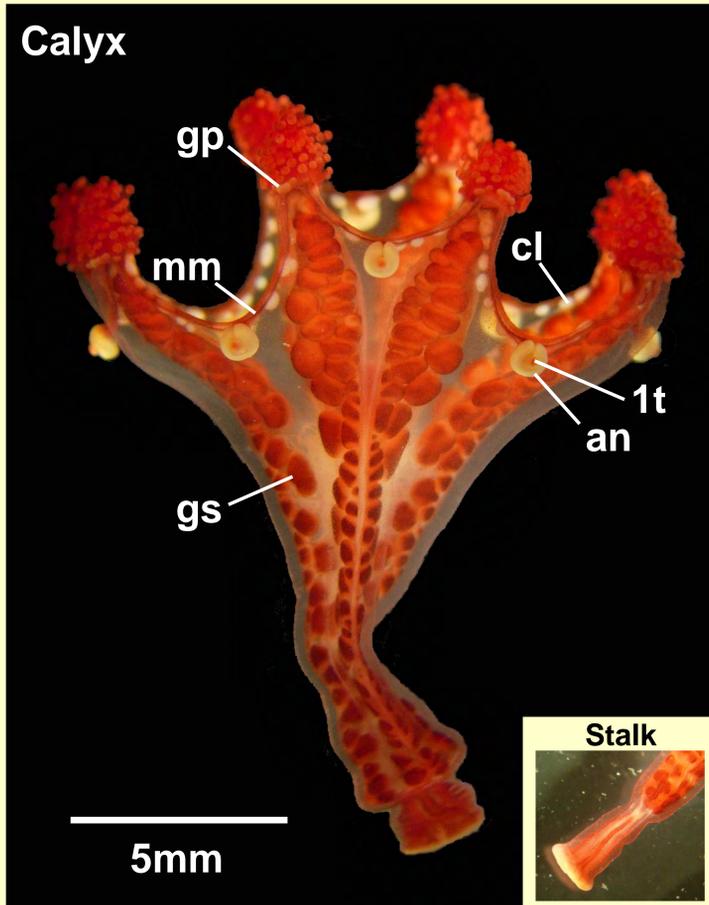


- The establishment of Staurozoa as a new class highlights the importance of the systematics of Stauromedusae.⁴⁻⁶
- The genus *Haliclystus* Clark, 1863 now includes eleven described species and one *nomen nudum*.
- *Haliclystus californiensis* was described in detail in the Ph.D. thesis of G. F. Gwilliam⁷, but the description was never published.

Haliclystus californiensis

Dimensions of cnidae found in the gastric filaments and secondary tentacles of *H. californiensis*. Measurements provide the minimum, mean, and maximum length of each type of cnida sampled.

Cnidae	Length (µm)	Width (µm)	n
Isorhiza	15.21-23.71-29.13	4.98-6.61-9.26	50
Eurytele (ovoid)	26.86-30.58-34.74	15.00-16.85-19.35	11
Eurytele (round)	8.30-13.22-19.68	8.80-10.32-13.11	40



Diagnosis

- All labels correspond with the figure to the left.
- Calyx conical, slightly longer than wide, tapering toward stalk; overall shape resembles martini glass. Stalk 1/4 length of calyx.
- Gonads extending from base of calyx to tips of each of eight arms; 40 to 50 gonadal sacs (gs) within each gonad, 3 or 4 abreast at widest.
- Each arm tipped with cluster of 60 to 80 club-tipped secondary tentacles, up to 5 basal tentacles on exumbrellar side possessing swollen glandular pads (gp).
- Eight primary tentacles (1t) line marginal muscle (mm) on interradial and perradial axes. Large, horseshoe-shaped anchors (an) wrap around each primary tentacle. Perradial marginal notches between arms about twice as wide and deep as interradial notches.
- White nematocyst clusters (cl) line subumbrellar margin. Without pigment stripes along calyx.
- Exumbrellar surface grainy with nematocysts; subumbrellar surface smooth.



Comparison with other *Haliclystus* species

	Geographic range	Gonadal sacs	Secondary tentacles	Stalk:calyx length	Anchor shape	Reference
<i>H. antarcticus</i>	Antarctica, S. Argentina, S. Chile	50-150	6-224	1/2 to 2/3 length	Biscuit-shaped	Pfeffer 1889; Kramp 1961; Miranda et al. 2009
<i>H. auricula</i>	N Atlantic, N Pacific	30-200	Usually 100 or more, but as few as 30	Equal length	Coffee bean-shaped	Rathke 1806; Mayer 1910, Hirano 1997
<i>H. borealis</i>	N Pacific	50, ranging from 30 to 100	20-30	<1/3 length	Large, round, with longitudinal furrow	Uchida 1933; Ling 1937; Kramp 1961; Hirano 1986
<i>H. californiensis</i>	NE Pacific	40-50	60-80	1/4 length	Horseshoe-shaped	This paper; Gwilliam 1956
<i>H. kerguelensis</i>	S Indian	?	50	Twice as long	Small, oval, with tentacular knob	Vanhöffen 1908; Kramp 1961
<i>H. monstrosus</i>	NW Pacific	Unknown; 4-8 rows at widest	About 100	1/2 length	Large, flattened, margins incurved	Naumov 1961
<i>H. octoradiatus</i>	N Atlantic	10-70	30-120	Equal length	Large, round	Lamarck 1816; Hirano 1997; Miranda et al. 2009
<i>H. salpinx</i>	NE Atlantic, N Pacific	40-120	60-70, may be up to 250	Much longer	Large, trumpet-shaped	Clark 1863; Kramp 1961; Mills & Larson 2007
<i>H. "sanjuanensis"</i>	NE Pacific	200-300, but as few as 150	100-150	2/3 length	Coffee bean-shaped	Gellermann 1926; Hirano 1997; Mills & Larson 2007
<i>H. sinensis</i>	NW Pacific (China)	17-20	20-25	1/2 length	Globular, slightly wider than tall	Ling 1937
<i>H. stejnegeri</i>	N Pacific (Alaska to Japan)	100-150, but as many as 250	70-100, but as many as 200	1/2 length	Egg-shaped, taller than wide	Kishinouye 1899; Uchida 1929; Ling 1937, 1939; Kramp 1961; Hirano 1986; Miranda et al. 2009
<i>H. tenuis</i>	NW Pacific	30-50	20-60	1/2 length	Globular, wider than tall	Kishinouye 1910, Uchida 1929*, Ling 1937*, 1939*, Hirano 1986*, Hirano 1997

*Described as *H. auricula*

References

- Mills, C.E. (1999 to present). Stauromedusae: list of all valid species names. Friday Harbor Laboratories, Friday Harbor, Washington. Available from <http://faculty.washington.edu/cemills/Staurolist.html>.
- Daly, M., Brugler, M.R., Cartwright, P., Collins, A.G., Dawson, M.N., Fautin, D.G., France, S.C., McFadden, C.S., Opresko, D.M., Rodriguez, E., Romano, S.L. & Stake, J.L. (2007) Zootaxa, 1668, 127–182.
- Collins, A.G. & Daly, M. (2005) Biol Bull, 228, 221–230.
- Collins, A.G., Schuchert, P., Marques, A.C., Jankowski, T., Medina, M., & Schierwater, B. (2006). Syst Biol, 55, 97–115.
- Van Iten, H., Leme, J.M., Simões, M.G., Marques, A.C. & Collins, A.G. (2006) J Syst Palaeontol 4, 109–118.
- Collins, A.G. (2002) J Evol Biol, 15, 418.
- Gwilliam, G.F. (1956) Ph.D. Thesis. University of California, Berkeley, pp 1–192.

Known Distribution



Nine specimens have been found along the coast of California. The holotype, pictured above, was found at Otter Point in Monterey Bay. Other specimens were found in Bodega Bay to the north and Santa Cruz Island to the south.

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