

Order CUBOMEDUSAE

Scyphomedusae with umbrella margin not cleft into lappets; with four interradial tentacles or groups of tentacles situated on gelatinous, wing-shaped or spatula-shaped structures (pedalia); with four periradial sense organs situated within niches on the sides of the bell; with four wide periradial sacs extending outwards from the central stomach into the subumbrellar cavity, incompletely separated by interradial septa; with four pairs of leaf-shaped gonads attached along the interradial septa and extending into the gastrovascular space; the opening of the bell cavity partly closed by an annular diaphragm (velarium).

Family CARYBDEIDAE

Cubomedusae with four simple or tripartite interradial tentacles; four stomach pouches without diverticula.

Genus *Carybdea* Péron & Lesueur 1809

Carybdeidae with four simple pedalia; stomach flat, without mesenteries; gastric cirri forming brush-like bundles at the interradial corners of the stomach, or (if expanded) crescentic areas extending horizontally.

Type-species: *C. marsupialis* (Linné).

PÉRON & LESUEUR 1809, p. 332: *Carybdea* n.g. HAECKEL 1880, p. 439: as *Charybdea*.
MAYER 1910, p. 506. BIGELOW 1938, p. 136: revision.

Carybdea alata Reynaud 1830

60–80 mm high (var. *grandis* 230 mm high), 50 mm, or more, wide; exumbrella without warts; sensory niches enclosed by a pair of covering scales below and by one above; gastric filaments in crescentic areas extending horizontally at the corners of the stomach; tentacles simple.

REYNAUD 1830, p. 95, Pl. 33, fig. 1: *Carybdea alata* n.sp.; southern Atlantic. HAECKEL 1880, p. 440, Pl. 25, figs. 5–8: as *Charybdea pyramis* n.sp.; West Indies; p. 441: as *C. alata*; South Africa. AGASSIZ & MAYER 1902, p. 153, Pl. 6, figs. 26–31: as *Ch. grandis* n.sp.; southern Pacific. MAYER 1906, p. 1135, Pl. 1, figs. 2–2c: as *Ch. moseri* n.sp.; Hawaiian Islands. MAYER 1910, p. 510: as *C. alata*; p. 511: as *C. alata* var. *pyramis*; p. 511, text-fig. 329: as *C. alata* var. *grandis*; p. 512: as *C. alata* var. *moseri*. MAYER 1915a, p. 171: as *C. alata* var. *grandis*; Borneo; Philippines. MAYER 1917a, p. 189, fig. 3: as *C. alata* var. *grandis*; Borneo; Philippines. BIGELOW 1918, p. 400: *C. alata*; Providence Channel; Florida; Bahama Bank. STIASNY 1919a, p. 37, fig. 5: as *C. alata* var. *moseri*; Sumatra. LIGHT 1921, p. 29: as *C. alata* var.

grandis; Philippines. THIEL 1928, p. 4: as *Ch. grandis*, =*Ch. alata* var. *grandis*; Mariana Islands, Pacific; Atlantic. MENON 1930, p. 3, Pl. 1, fig. 3: as *Ch. madraspatana* n.sp.; Madras, India. STIASNY 1931a, p. 139: Japan; Ceylon. BIGELOW 1938, p. 144, figs. 11-16: *C. alata*, =*pyramis*, *grandis*, *moseri* and *madraspatana*; non = *Tamoya alata* Uchida, Stiasny and Rao; Bermudas. STIASNY 1939b, p. 18, figs. 1-4: *Ch. alata*; Red Sea. STIASNY 1939c, p. 42: *Ch. alata*; mouth of Congo, W. Africa. STIASNY 1940a, p. 5: *Ch. alata*; tropical parts of Atlantic, Pacific and Indian oceans. RANSON 1945b, p. 313: *Ch. alata*; Sandwich Islands; Indochina. RANSON 1949, p. 136: *Ch. alata*; Caribbean Sea; Marquesas Islands, Pacific. CHU & CUTRESS 1954, p. 9: as *Ch. moseri*; cause of dermatitis; Hawaii.

Carybdea aurifera Mayer 1900

Young medusa, probably = *C. sivickisi* Stiasny 1926.

MAYER 1900b, p. 70, Pl. 25, figs. 81-3: *Charybdea aurifera* (young medusa) n.sp.; Florida. MAYER 1910, p. 510, text-fig. 328: *C. aurifera*. BIGELOW 1938, p. 139: ? = *C. sivickisi* Stiasny. HEDGPETH 1954, p. 277: Gulf of Mexico.

Carybdea marsupialis (Linné 1758)

Up to 40 mm high, 30 mm wide; exumbrella with numerous nematocyst-warts mainly around the interradial; sensory niches with covering scale above, but entry open below; gastric cirri dendritic, the filaments primarily arising from a single trunk; tentacles simple.

LINNÉ 1758, p. 660: as *Medusa marsupialis* n.sp. PÉRON & LESUEUR 1809, p. 333: *Carybdea marsupialis*, n.g. HAECKEL 1880, p. 442: as *Charybdea marsupialis* (Mediterranean) and *Ch. murrayana* n.sp.; W. Africa. CONANT 1897, p. 8, fig. 8: as *Ch. xaymacana* n.sp.; Jamaica, West Indies. MAYER 1910, p. 507, Pl. 58, figs. 1-5: *C. marsupialis*; Mediterranean Sea; p. 509, Pl. 56, figs. 5-7, Pl. 57, fig. 1: as *C. xaymacana*; Bahamas; p. 512: as *C. murrayana*. BIGELOW 1918, p. 399: as *C. marsupialis* var. *xaymacana*; between Bermudas and Bahamas. STIASNY 1919a, p. 34: *C. marsupialis*; p. 35, text-figs. 1-4: as *C. xaymacana*; Haïti. THIEL 1928, p. 4: *Ch. marsupialis*; Naples, Italy. STIASNY 1930a, p. 6: *Ch. marsupialis*; Naples, Italy. NOBRE 1931, p. 26: Portugal. THIEL 1935a, p. 5: *Ch. marsupialis*; poisonous effect. BIGELOW 1938, p. 139, figs. 3-10: synonyms: *C. xaymacana* and *murrayana*; Bermudas. RANSON 1945b, p. 313: *Ch. marsupialis*; Algier, N. Africa. ROSSI 1950, p. 28: *Ch. marsupialis*; Golfo di Rapallo, Italy. KRAMP 1955a, p. 308: off Sierra Leone, W. Africa; reference to Haeckel. KRAMP 1955b, p. 162: revision of the determination of Haeckel's specimens from Malaya and Atlantic.

Carybdea rastoni Haacke 1886

35 mm high, 25-30 mm wide; exumbrella with numerous nematocyst-warts, mainly around the interradial; sensory niches with covering scale above, but entry open below; phacellae diffuse, the filaments arising from several trunks arranged in a row; tentacles simple.

HAACKE 1886, p. 554: *Charybdea rastonii* n.sp. KISHINOUE 1910, p. 6, Pl. 1, figs. 7-9: as *Ch. mora* n.sp.; Japan. MAYER 1910, p. 508: *C. rastonii*; (tropical Pacific; S. Australia); p. 726: = *C. mora* Kishinouye. MAYER 1915a, p. 170: Philippines.

MAYER 1917a, p. 187, fig. 2: Philippines. YATSU 1917, pp. 1-12, figs. 1-5: Misaki, Japan. STIASNY 1922e, p. 515: *Ch. rastonii*; Philippines; La Jolla. OKADA 1927a, pp. 241-9, figs. 1-3: development; Japan. UCHIDA 1927b, p. 226: *Ch. rastonii*; Japan. UCHIDA 1928a, p. 376: *Ch. rastonii*; size. UCHIDA 1929b, p. 157, Pl. 3, fig. 7, text-figs. 60-80: Japan. STIASNY 1931a, p. 139: *Ch. rastonii*; Japan. STIASNY 1935, p. 10: Malayan Archipelago. ISHIDA 1936, pp. 449-52: on digestion; Japan. STIASNY 1937b, p. 204: Malay Archipelago. BIGELOW 1938, pp. 136-9. UCHIDA 1938a, p. 148: *Ch. rastonii*; Japan. UCHIDA 1938b, p. 43: Japan. UCHIDA 1938c, p. 57: Japan. UCHIDA 1947b, p. 341: *Ch. rastonii*; Japan. CHIU 1954b, p. 56. UCHIDA 1954, pp. 209-19: Japan. UCHIDA 1955a, p. 15: Japan. KRAMP 1956a, p. 5: Marquesas Islands, Pacific. SOUTHCOTT 1958, p. 58, fig. 2E: *C. rastoni*. YAMAZI 1958, p. 138: Tanabe Bay, Japan.

Carybdea sivickisi Stiasny 1926

10-12 mm high, 12-14 mm wide; exumbrella warty; sensory niches without well developed covering scale; tentacles simple.

STIASNY 1926a, p. 240, figs. 1-4: *Charybdea sivickisi* n.sp.; Philippines. BIGELOW 1938, pp. 136-9: ? = *C. aurifera* Mayer.

Carybdea stiasnyi Bigelow 1938

23 mm high, 20 mm wide, with an apical depression; exumbrella smooth; sensory niches enclosed by a pair of covering scales below and by one above; phacellae in horizontal clusters in the corners of the stomach; tentacles with lateral branches.

STIASNY 1930c, p. 3, figs. 1-7: as *Charybdea* sp.; New Guinea. BIGELOW 1938, p. 136: *Carybdea stiasnyi* n.sp.

Genus *Tamoya* Müller 1859

Carybdeidae with four simple pedalia; stomach deep, connected with the subumbrella by well developed perradial mesenteries; gastric cirri in bands extending vertically along the walls of the stomach, in the interradii.

Type-species: *T. haplonema* Müller.

MÜLLER 1859b, p. 1: *Tamoya* n.g. HAECKEL 1880, p. 442. MAYER 1910, p. 512: *Tamoya* in part. BIGELOW 1938, p. 150: revision.

Tamoya gargantua Haeckel 1880 (non Lesson 1830)

Up to 220 mm high and 135 mm wide; ? = *T. haplonema*.

HAECKEL 1880, p. 444: *Tamoya gargantua* n.sp.; Samoa Islands. MAAS 1903, p. 4: as *T. bursaria* n.sp.; Malay Archipelago. KISHINOUE 1910, p. 7, Pl. 1, fig. 10: as *T. virulenta* n.sp.; Japan. MAYER 1910, p. 512: *Bursarius cythereae* Lesson 1830 from New Guinea and *T. bursaria* Maas 1909, probably = *Carybdea alata* var. *grandis*; p. 726: *T. virulenta* = *C. alata*. STIASNY 1919a, p. 38, figs. 6-11: as *T. bursaria*; Malay Archipelago. STIASNY 1929c, p. 196: as *T. alata* (= *T. bursaria*); Malaya. UCHIDA 1929b, p. 172, figs. 81-8: as *T. alata*, = *T. virulenta*; Japan. STIASNY 1930c, p. 5: as *T. alata*; New Guinea. RAO 1931a, p. 27: as *T. alata*; Indian Ocean; p. 28:

as *Tamoya* sp. STIASNY 1935, p. 10: as *T. alata*; Malay Archipelago. ?MENON 1936, p. 2: as *Tamoya* sp.; India. STIASNY 1937a, p. 210, figs. 1-3: as *T. alata*; Arabian Sea. STIASNY 1937b, p. 204: as *T. alata*; Malay Archipelago. BIGELOW 1938, pp. 150, 151: discussion of *T. bursaria* and *alata*, probably = *T. gargantua* Haeckel; *bursaria* obsolete name. RANSON 1945b, p. 314: as *T. bursaria*; Indochina. UCHIDA 1947a, pp. 314-16, figs. 12, 13: as *T. bursaria*, = *T. virulenta* Kishinouye 1910 and *alata* Uchida 1929 and Stiasny 1929-37; N. Australia. POPE 1951, pp. 270-2: as *Tamoya*; New South Wales, Australia. UCHIDA 1954, pp. 209-19: as *T. bursaria*; Japan. KRAMP 1956b, p. 237: *T. gargantua* Haeckel, non Lesson; discussion of the specific name; *bursaria* should not be used; Iranian Gulf. KRAMP 1958b, p. 371: as *T. bursaria*; Mergui Archipelago, Indian Ocean. YAMAZI 1958, p. 138: as *T. bursalis*; Tanabe Bay, Japan.

Tamoya haplonema Müller 1859

90 mm high, 55 mm wide; exumbrella with nematocyst warts; sensory niches on ovoid prominences of exumbrella, bounded above and below by a rounded covering-scale; velar canals complexly forked (opposite to *Carybdea*).

MÜLLER 1859b, p. 1, Pls. 1, 2: *Tamoya haplonema* n.g., n.sp.; Brazil. HAECKEL 1880, p. 443: *T. haplonema* and *prismatica* n.sp.; West Indies. MAYER 1910, p. 513, Pl. 57, fig. 2; east coast of U.S.A., north to Long Island. BIGELOW 1914b, p. 25: New England, east coast of U.S.A. BOONE 1928, p. 1: West Indies. BOONE 1933, p. 39: Bahamas; West Indies. STIASNY 1934a, p. 339, fig. 1: description; French Congo. BIGELOW 1938, p. 151, figs. 17-23: Bermudas. RANSON 1949, p. 137: French Guinea; Senegambia; Luderitz Bay, S.W. Africa. KRAMP 1955a, p. 287: off Sierra Leone, W. Africa. VANNUCCI 1957a, pp. 594-6: (Brazil). KRAMP 1959b, p. 15: West Africa.

Genus *Tripedalia* Conant 1897

Carybdeidae with four interradial groups of tentacular pedalia, each tentacle being mounted upon a separate, unbranched pedaliolum which arises from the bell margin.

Type-species: *T. cystophora* Conant.

CONANT 1897, p. 9: *Tripedalia* n.g. MAYER 1910, p. 513.

Tripedalia cystophora Conant 1897

12 mm high, 15 mm wide; four interradial groups, each with three separate pedalia, each with one tentacle; six unforked velar canals in each quadrant.

CONANT 1897, p. 9, fig. 9: *Tripedalia cystophora* n.g., n.sp.; Jamaica, W. Indies. MAYER 1910, p. 514: text-fig. 330. STIASNY 1926a, p. 243: Philippines.

Family CHIROPIDAE

Cubomedusae with four interradial clusters of tentacles; the four stomach pouches with eight diverticula.

Genus *Chirodopus* Haeckel 1880

Chirodripidae with eight branched, or feathered sac-like projections from the four perradial stomach pouches into the bell cavity; the free margins of the eight gonads have grape-like swellings.

Type-species: *C. gorilla* Haeckel.

HAECKEL 1880, p. 447: *Chirodopus* n.g. MAYER 1910, p. 518.

Chirodopus gorilla Haeckel 1880

Up to 150 mm high, 120 mm wide; each pedaliu with 9-11 tentacles upon as many long, tapering, finger-like processes.

HAECKEL 1880, p. 448, Pl. 26, figs. 1-8: *Chirodopus gorilla* n.g., n.sp.; W. Africa. MAYER 1910, p. 518, text-fig. 332. VANHÖFFEN 1920, p. 17: W. Africa. THIEL 1928, p. 16: W. Africa. STIASNY 1931a, p. 139: S. Africa. KRAMP 1955a, p. 288, figs. 9-12: new description; Liberia, W. Africa; p. 308: reference to Haeckel. KRAMP 1959b, p. 17, figs. 2, 3a, 3b, 4: off Moanda, West Africa; new description.

Chirodopus palmatus Haeckel 1880

100 mm high, 70 mm wide; each pedaliu with 21 fingers and tentacles.

HAECKEL 1880, p. 448: *Chirodopus palmatus* n.sp.; near St Helena, off west coast of Africa. MAYER 1910, p. 519.

Chirodopus sp. Stiasny 1922

STIASNY 1922e, p. 555: *Chirodopus* sp.; Philippines.

Genus *Chironex* Southcott 1956

Chirodripidae in which the eight gastric saccules projecting into the bell cavity from the perradial stomach pouches are functioning gonads; the gonads along the interradii inside the stomach pouches obliterate.

Type-species: *C. fleckeri* Southcott.

SOUTHCOTT 1956, pp. 259-80: *Chironex* n.g.

Chironex fleckeri Southcott 1956

Up to 118 mm high; each pedaliu with up to 12 fingers and tentacles; gastric saccules in pairs as lobulated projections from upper portion of the stomach pouches.

SOUTHCOTT 1956, pp. 259-80, Pls. 1, 2, figs. 1, 3, 4, Pl. 3, text-figs. 1-23: *Chironex fleckeri* n.g., n.sp.; Australia. SOUTHCOTT 1958, p. 58; 1959, pp. 572 ff., fig. 3.

Genus *Chiropsalmus* L. Agassiz 1862

Chirodripidae with finger-shaped, unbranched, hernia-like pouches which

project from the four perradial stomach pouches into the bell cavity; the free margins of the eight leaf-shaped gonads entire and simple.

Type-species: *C. quadrumanus* (Müller).

L. AGASSIZ 1862, p. 174: *Chiropsalmus* n.g. HAECKEL 1880, p. 446. MAYER 1910, p. 515. THIEL 1928, p. 7: as *Chiromedusa* n.g. THIEL 1936a, pp. 298 ff.: genus *Chiromedusa* is referred to *Chiropsalmus*.

Chiropsalmus buitendijki Horst 1907

65–70 mm high and wide; each pedalum with five or six fingers and tentacles in a linear series on the outer side of the main shaft: eight long, simple, finger-shaped subumbrella gastric saccules, nearly as long as the depth of the bell cavity.

HORST 1907, p. 101, Pl. 2, figs. 1–6: *Chiropsalmus buitendijki* n.sp.; Java. MAYER 1910, p. 515. STIASNY 1919a, p. 46, figs. 12–14: Malay Archipelago. STIASNY 1926b, p. 249: Australia. MENON 1936, p. 2: India. RANSON 1945b, p. 314: Indochina. NAIR 1951, p. 71: Trivandrum coast, India. POPE 1953b, p. 111: Australia. SOUTHCOTT 1956, p. 276: comparison with *Chironex fleckeri*. KRAMP 1959b, p. 16: comparison with *C. quadrumanus*.

Chiropsalmus quadrigatus Haeckel 1880

70–100 mm high, 80–100 mm wide or more; each pedalum with 5–9 fingers and tentacles, irregularly placed; eight gastric saccules laterally flattened and cock's-comb-shaped.

HAECKEL 1880, p. 447: *Chiropsalmus quadrigatus* n.sp.; Rangoon, Indian Ocean. MAYER 1910, p. 516, text-fig. 331: Philippines. LIGHT 1914a, pp. 291–5: Philippines. LIGHT 1914b, p. 197: Philippines. MAYER 1915a, p. 171: Philippines. MAYER 1917a, p. 190, fig. 4: Philippines. STIASNY 1922e, p. 517: Johore Strait; Rangoon. THIEL 1928, p. 13, fig. 6: remarks. STIASNY 1931a, p. 139: Philippines. THIEL 1935a, p. 5, fig. 5: poisonous effect. MENON 1936, p. 2: India. STIASNY 1937a, p. 213, figs. 4–9: new description; Maldives Islands, Indian Ocean. RANSON 1945b, p. 314: Indochina; Gulf of Thailand. POPE 1953b, p. 111, fig.: Australia. KRAMP 1955b, p. 162. SOUTHCOTT 1956, pp. 254, 255, 258: report on stinging; pp. 265, 270: comparison with *Chironex fleckeri* n.sp. SEARLE 1957, p. 70, fig. 1: Singapore. SOUTHCOTT 1958, p. 58. KRAMP 1959b, p. 16: comparison with *C. quadrumanus*. SOUTHCOTT 1959, pp. 574, 576.

Chiropsalmus quadrumanus (Müller 1859)

100 mm high, 140 mm wide; each pedalum with 7–9 fingers and tentacles, irregularly placed; each of the four gastric saccules gives rise to two finger-shaped, hernia-like sacs.

MÜLLER 1859b, pp. 1–11, Pls. 2, 3, figs. 18–32: as *Tamoya quadrumanus* n.sp.; coast of Brazil. L. AGASSIZ 1862, p. 174: *Chiropsalmus quadrumanus* n.g. MAYER 1910, p. 515, Pl. 57, fig. 3: North Carolina, east coast of U.S.A. KRUMBACH 1925, p. 574: Sumatra. STIASNY 1926b, p. 250, fig. 1: Australia. RAO 1931a, p. 28: Indian

Ocean. RANSON 1945*b*, p. 314: French Guiana, S. America. RANSON 1949, p. 137: mouth of Amazone. VANNUCCI 1954, p. 120, Pl. 5, figs. 1-6: description; São Paulo, Brazil. SOUTHCOTT 1956, pp. 270, 272-4, Pl. 2, fig. 2: comparison with *Chironex fleckeri* n.sp. VANNUCCI 1957*a*, pp. 594-6: Brazil. KRAMP 1959*b*, p. 16, fig. 1: West Africa; Venezuela, South America; comparison with other species.

Chiropsalmus zYGONEMA Haeckel 1880

60 mm high, 40 mm wide; each pedaliuM with only two, asymmetrical fingers and tentacles; the finger-like stomach pouches very small.

HAECKEL 1880, p. 641: *Chiropsalmus zYGONEMA* n.sp.; coast of Argentine. MAYER 1910, p. 517. THIEL 1928, p. 15: remarks; is considered = *C. quadrigatus*. SOUTHCOTT 1956, p. 277.