Journal of the Marine Biological Association of the United Kingdom

cambridge.org/mbi

First record of *Stygiomedusa gigantea* (Discomedusae: Ulmaridae) from Southern Africa, with a comment on scyphozoan distribution

Mark J. Gibbons, Erich Maletzky* and Lessyn Kalwenya*

Department of Biodiversity and Conservation Biology, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa

Abstract

A single *Stygiomedusa gigantea* was caught by demersal crab trawl off Namibia at a fishing depth of 750 m. Although widely considered to be globally distributed in meso- and bathypelagic waters, this represents the first record of the species from the SE Atlantic and only the second from around Africa. The photographed specimen differs slightly from previous observations and attention is drawn to accurately recording future material.

Marine Record

*National Marine Institute Research Centre (NatMIRC), P.O. Box 912, Swakopmund, Namibia

Cite this article: Gibbons MJ, Maletzky E, Kalwenya L (2024). First record of *Stygiomedusa gigantea* (Discomedusae: Ulmaridae) from Southern Africa, with a comment on scyphozoan distribution. *Journal of the Marine Biological Association of the United Kingdom* **104**, e88, 1–3. https://doi.org/10.1017/S0025315424000833

Received: 7 July 2024
Revised: 12 August 2024
Accepted: 28 August 2024

Keywords:
Benguela Current; date of first description; distribution; diversity; jellyfish

Corresponding author:
Mark J. Gibbons;
Email: mgibbons@uwc.ac.za

Stygiomedusa gigantea (Browne, 1910) is one of the largest jellyfish in the world and possesses broad oral arms that may reach 10 m in length (Jarms and Morandini, 2019). It is a bathypelagic species that, based on scattered records, is assumed to have a global distribution (Benfield and Graham, 2010; Nascimento *et al.*, 2024). Although commonly reported from the Southern Ocean and the western US seaboard, there is only one record of this magnificent animal from Africa: a single specimen caught off Cabinda Province, Angola, from a depth shallower than 930 m (Repelin, 1967).

Here, we report on another specimen that was caught from the RV *Mirabilis* using a Super Gisund trawl net during a survey for deepsea red crab resources off northern Namibia (19.72°S, 11.39°E) on 11 August 2022. The net was towed for a period of 30 min at a speed of 1.6 ms^{-1}, covering a distance of 2.89 km, and was disgorged on deck at ~16H57 local time. The bottom depth was 750 m, which is not unusual for this species (Benfield and Graham, 2010). The bottom temperature was 4.8°C, which is much warmer than that recorded from the depths in polar seas where many other specimens have been caught, but it is similar to that observed when captures have been made in temperate waters (Benfield and Graham, 2010).

Although the specimen was discarded after capture, there can be no doubt that it belongs to the genus *Stygiomedusa* (Figure 1). It is deep red/black in colour, possesses long strap-like oral arms and there are no marginal tentacles: the radial canals are pronounced and cream-coloured. Unfortunately, the specimen was not measured on deck, but the size of the jellyfish bell was approximated to be 45.6 cm in diameter (Supporting Figure 1).

Jarms and Morandini (2019) define *S. gigantea* (in part) as having rhopalar radial canals that are 'simple proximally for one quarter of their length before anastomosing in a net-like fashion…[while]…inter-rhopalar radial canals are simple for half their length before joining the anastomoses of the rhopalar radial canals'. This disagrees with the observations here, and clear anastomoses between all radial canals can be seen throughout their length (Figure 1). While this resembles the partial abnormality noted by Russell and Rees (1960) of an adult caught measuring 50 cm across the bell in the Bay of Biscay, it is in full agreement with the observations of Harbison *et al.* (1973) of a specimen with a bell diameter of 140 cm collected in the mid North Atlantic. And it agrees too with the description of *Stygiomedusa stauchi* made by Repelin (1967) of an individual caught (75 cm bell diameter) off the mouth of the Congo River, and of a specimen investigated by Cornelius (1973) from off Cape Horn.

The pattern and arrangement of radial canals in (e.g.) Rhizostomeae are commonly used to diagnose genus identity, in part (Jarms and Morandini, 2019). And while Cornelius (1972) might have considered them useful to separate what were then regarded as two species of *Stygiomedusa* (*Stygiomedusa fabulosa* Russell, 1959; *S. stauchi* Repelin, 1967), Harbison *et al.* (1973) suggested that differences in '…radial canal patterns are in all likelihood due solely to ontogenetic reasons.' With access to additional material, Cornelius (1973) revised his earlier thoughts, noting that hitherto collected specimens represented a continuous morphological series between those displaying 'unbranched interrhopalar canals and rhopalar canals with a simple 'back-to-back B' anastomosis as in the holotype of *S. fabulosa* (Russell and Rees, 1960) to [those with] a completely reticulated condition as in the holotype of *S. stauchi* (Repelin, 1967)'. The specimen reported here is of a similar size to that reported by Cornelius (1973) with full anastomoses but is much smaller than those reported by Harbison *et al.* (1973) or Repelin (1967) in a similar condition. This suggests that

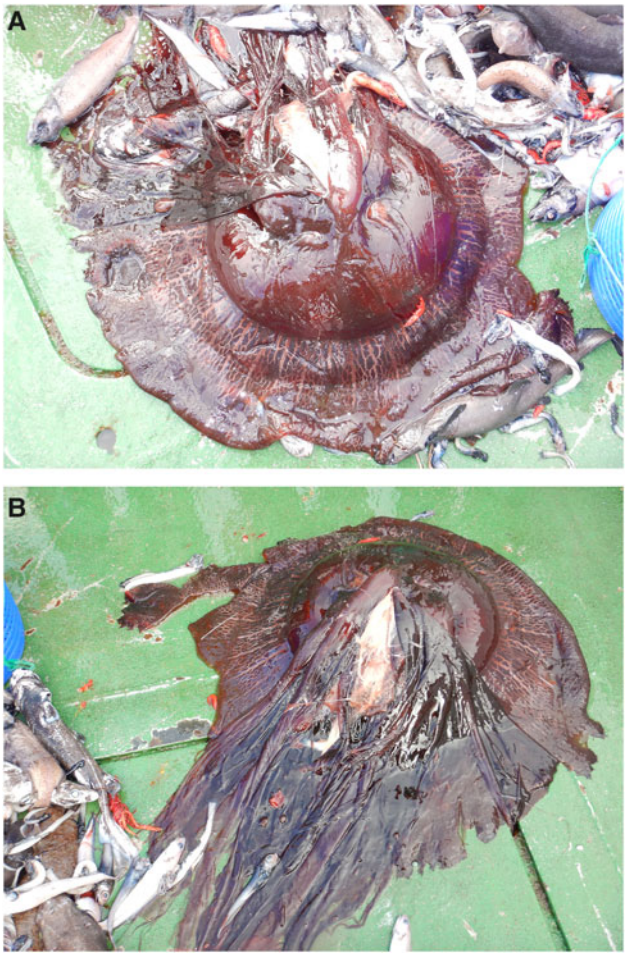

Figure 1. Photographs of a specimen of *Stygiomedusa gigantea* with an estimated bell diameter of 45.6 cm, on the deck of the RV *Mirabilis* in August 2022. Note the typical red/black colour, the broad oral arms and the network of anastomosing radial canals.

ontogeny may not explain the pattern of reticulation in *Stygiomedusa*, but in the absence of either the specimen itself or molecular material, we must concur with conventional wisdom. That said, we urge colleagues to pay attention to the pattern of radial canals in future and to also try and collect samples for DNA analysis.

The diversity of form amongst species within the paraphyletic family Ulmaridae (Bayha *et al.*, 2010; Lindsay *et al.*, 2023) is unrivalled among Discomedusae. Some species lack marginal tentacles (*Deepstaria, Stygiomedusa, Tiburonia*), some have greatly elongated oral arms (*Stygiomedusa*) and others possess short oral arms that do not extend beyond the bell margin (*Deepstaria*). Although we know little about the life-cycle of most species, we can assume that the majority are metagenetic, though one (*Stygiomedusa*) is considered to be viviparous (Russell, 1959). Uniquely among Discomedusae, the family Ulmaridae includes a number of deep-water species. These are distributed among six subfamilies (Table 1). At present, each of these subfamilies is represented by a single genus, all of which are monotypic except for *Deepstaria*, which is considered to have two species.

Within the Ulmaridae, genera that are meso-or bathypelagic have a more recent date of first description (mean = 1976, Table 1) than those with a shallower bathymetric distribution (mean = 1873, Table 1) (ANOVA $F_{1,12} = 25.34$, $P < 0.001$, Table 1). While this can be explained, in part, as a reflection of recent advances in our ability to explore the deep-sea, it also mirrors an increase in effort to sample an environment in which such species are uncommon or rare (Lindsay *et al.*, 2023). The date of first description is generally related to geographic distribution (e.g. Gibbons *et al.*, 2005), with taxa having an earlier date of description being more widespread. The data presented in Table 1 clearly refute that idea, at the level of the genus or the subfamily level, because the more recently described species have generally wider, or assumed wider, distributions than earlier-described taxa!

Table 1. The date of first designation of the different subfamilies and genera in the family Ulmaridae

Subfamily	Genus	Authority	Date	Number Species	Maximum bell Diameter (cm)	Distribution
Aureliinae		Agassiz	1862	27		
	Aurelia	Lamarck	1816	26	46.0	Localised/ Regional
	Aurosa	Haeckel	1880	1	8	Localised
Deepstariinae		Larson	1986	2		
	Deepstaria	Russell	1967	2	7.5	Widespread
Poraliinae		Larson	1986	1		
	Poralia	Vanhöffen	1902	1	2.5	Widespread
Santjordiinae		Lindsay, Grossmann, Montenegro & Morandini	2023	1		
	Santjordia	Lindsay, Grossmann, Montenegro & Morandini	2023	1	10	Localised
Stellamedusinae		Raskoff & Matsumoto	2004	1		
	Stellamedusa	Raskoff & Matsumoto	2004	1	9.4	Regional
Sthenoniinae		Mayer	1910	1		
	Sthenonia	Eschscholtz	1829	1	30	Localised
Stygiomedusinae		Russell & Rees	1960	1		
	Stygiomedusa	Russell	1959	1	150	Widespread

(*Continued*)

https://doi.org/10.1017/S0025315424000833 Published online by Cambridge University Press

Table 1. (*Continued.*)

Subfamily	Genus	Authority	Date	Number Species	Maximum bell Diameter (cm)	Distribution
Tiburoniinae		Matsumoto, Raskoff & Lindsay	2003	1		
	Tiburonia	Matsumoto, Raskoff & Lindsay	2003	1	75	Regional
Ulmarinae		Kramp	1961	8		
	Diplulmaris	Maas	1908	2	18	Localised
	Discomedusa	Claus	1877	2	9	Localised/ Regional
	Floresca	Haeckel	1880	1	5	Localised
	Parumbrosa	Kishinouye	1910	1	20	Localised
	Ulmaris	Haeckel	1880	2	3	Localised

Also shown are the number of species, the maximum bell diameter of species and known distribution. Taxa in bold typeface, meso- or bathypelagic. Data from WoRMS (2024) and Jarms and Morandini (2019).

Supplementary Material. The supplementary material for this article can be found at https://doi.org/10.1017/S0025315424000833

Acknowledgements. MJG would like to thank the Namibian Ministry of Fisheries and Marine Resources and the National Marine Information and Research Centre in Swakopmund for their ongoing support of his research into regional jellyfish. The comments of the two anonymous reviewers have greatly helped to clarify the text and arguments posited here, for which we are grateful.

Author Contributions. MJG conceived the idea for the work based on photographs taken by EM and LK. All authors contributed to the writing and data analysis, and all authors have reviewed the manuscript.

Financial Support. MJG would like to thank the NRF and the University of the Western Cape for their support of his research, while EM and LK acknowledge the Ministry of Fisheries and Marine Research.

Competing interest. None.

Ethical Standards. Not applicable.

Data Availability. The authors confirm that the data supporting the findings of this study are available within the article.

References

Bayha KM, Dawson M, Collins AG, Barbeitos MS and Haddock SHD (2010) Evolutionary relationships among scyphozoan jellyfish families based on complete taxon sampling and phylogenetic analysis of 18s and 28s ribosomal DNA. *Integrative and Comparative Biology* **50**, 436–455.

Benfield MC and Graham WM (2010) In situ observations of *Stygiomedusa gigantea* in the Gulf of Mexico with a review of its global distribution and habitat. *Journal of the Marine Biological Association of the United Kingdom* **90**, 1079–1093.

Cornelius PFS (1972) The second occurrence of *Stygiomedusa fabulosa* [Scyphozoa]. *Journal of the Marine Biological Association of the United Kingdom* **52**, 487–488.

Cornelius PFS (1973) A taxonomical appraisal of the two species of *Stygiomedusa* [Coelenterata, Scyphozoa], with the first Southern Ocean records. *Journal of the Marine Biological Association of the United Kingdom* **53**, 609–613.

Gibbons MJ, Richardson AJ, Angel MV, Buecher E, Esnal G, Fernandez Alamo MA, Gibson R, Itoh H, Pugh P, Boettger-Schnack R and Thuesen E (2005) What determines the likelihood of species discovery in marine holozooplankton: is size, range or depth important? *OIKOS* **109**, 567–576.

Harbison GR, Smith KL and Backus RH (1973) *Stygiomedusa fabulosa* from the North Atlantic: its taxonomy, with a note on its natural history. *Journal of the Marine Biological Association of the United Kingdom* **53**, 615–617.

Jarms G and Morandini AC (2019) *World Atlas of Jellyfish: Scyphozoa Except Stauromedusae*. München: Dölling Und Galitz.

Lindsay DJ, Grossmann MM, Montenegro J and Morandini AC (2023) A new subfamily of ulmarid scyphomedusae, the Santjordiinae, with a description of *Santjordia pagesi* gen. et sp. nov. (Cnidaria: Scyphozoa: Discomedusae: Semaeostomeae: Ulmaridae) from the Sumisu Caldera, Ogasawara Islands, Japan. *Zootaxa* **5374**, 533–551.

Nascimento LS, Haddad MA and Nogueira Júnior M (2024) The first record of the deep-sea jellyfish *Stygiomedusa gigantea* (Scyphozoa: Semaeostomeae) from the tropical Southwestern Atlantic found on social media. *Zoologia* **41**, e23082.

Repelin R (1967) *Stygiomedusa stauchi* n. sp. scyphomédusae géante des profondeurs. *Cahiers O.R.S.T.O.M., série Océanographie* **5**, 23–28.

Russell FS (1959) A viviparous deep-sea jellyfish. *Nature* **4698**, 1527–1528.

Russell FS and Rees WJ (1960) The viviparous scyphomedusa *Stygiomedusa fabulosa* Russell. *Journal of the Marine Biological Association of the United Kingdom* **39**, 303–317.