



ON THE PRESENCE OF *ARISTEUS ANTENNATUS* (DECAPODA,
DENDROBRANCHIATA, ARISTEIDAE) OFF THE CANARY ISLANDS AND
MADEIRA (NE ATLANTIC)

BY

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The species composition of the superfamily Penaeoidea Rafinesque, 1815 and the fishing effort on aristeids and penaeids (González et al., 2020) in waters off the Canary Islands have received increasing attention from carcinologists in recent years (González & Santana, 2014; Landeira & González, 2018; González & Landeira, 2019; González & Telle, 2021; González-Lorenzo et al., 2021). Furthermore, deep-sea surveys carried out since the 1980s by the Funchal Natural History Museum, the Funchal Marine Biology Station and the Sea Regional Directorate of Madeira, with bottom fish traps and submersible observations, have gathered new information on the crustacean fauna on the slopes of the Madeira Archipelago (Biscoito, 1993; Araújo et al., 2009, 2013; Biscoito et al., 2017; Braga-Henriques et al., 2022).

Here we report the first occurrence of the blue-and-red shrimp, *Aristeus antennatus* (Risso, 1816) (Aristeidae) off the Canary Islands, based on one large adult recently caught off the island of Lanzarote, and also off Madeira, there based on a reliable underwater observation of the species in its natural habitat.

The Canarian specimen was obtained as part of the research project “Marisco-mac”. Sampling was performed on board the fishing vessel “Atlantis Seis” and

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took place off the west coast of the island of Lanzarote on 23 December 2022. The shrimp was caught as by-catch of the local artisanal fishery of the scarlet shrimp *Aristaeopsis edwardsiana* (Johnson, 1868) with a specialized, highly selective bottom shrimp-trap (González et al., 2020).

The blue-and-red shrimp was sorted on board and preserved in 80% ethanol for later morphological analysis and final identification at the laboratory. The voucher specimen was labelled, curated, data-based and deposited, available for verification in the ICCM study collection at the University of Las Palmas de Gran Canaria (Gran Canaria, Canary Islands).

The postorbital carapace length (pocl) was measured from the posterior margin of the orbit to the posterodorsal border of the carapace, excluding the rostrum (Landeira & Fransen, 2012), and was measured with a digital calliper in millimetres. The sex of the specimen was also recorded according to the presence of petasma or thelycum (e.g., Fransen, 2014).

The Madeiran individual was filmed and photographed in its habitat, using the deep research submersible LULA1000, but the shrimp could not be collected, therefore there is no information regarding size and sex. The dive was part of the DEEP-ML project, with the third author (PB-M) as the scientific observer.

The present systematic classification and higher taxon arrangement follow De Grave & Fransen (2011) and the global database WoRMS (2023). The specimen was well in agreement with the description (morphology and chromatic pattern) and figures provided by Zariquiey Álvarez, 1968: 34, 46-47), Lagardère (1981: vol. 6), Pérez Farfante & Kensley (1997: 39-40) and Fransen (2014: 61-62).

Suborder DENDROBRANCHIATA Spence Bate, 1888

Superfamily PENAEOIDEA Rafinesque, 1815

Family ARISTEIDAE Wood-Mason, 1891 in Wood-Mason & Alcock, 1891

Genus *Aristeus* Duvernoy, 1840

Aristeus antennatus (Risso, 1816) (figs. 1-2)

Material examined.— Voucher code: ICCM524, one adult female (pocl 53.2 mm). Collection locality: NW of the island of Lanzarote, off La Santa, 29°13.443'N 013°42.726'W, 680 m depth, 23 Dec. 2022.

Material observed.— Unsexed individual. Madeira, off Ribeira Brava, 32°38.175'N 017°05.578'W, 861.5 m depth, 4 Sep. 2019, 13:54, LULA1000 Dive 169.

Geographical distribution and biogeography.— Eastern Atlantic Ocean from Bay of Biscay (43°50'N, Alcázar et al., 1983), Portugal and the Azores (Crosnier & Forest, 1973) and along the northwest African coast to the Western Sahara (Lagardère, 1981) or northern Senegal (Fransen, 2014, map) and the Cape Verde Islands (16°52'N, Bouvier, 1908), or even to the southeast Atlantic (Burukovsky & Romensky, 1979); the entire Mediterranean Sea (Palomares & Pauly, 2022); Indian



Fig. 1. *Aristeus antennatus* (Risso, 1816) from off the Canary Islands (ICCM524, female, pochl 53.2 mm). A, Lateral view of the freshly caught shrimp; B, lateral view of the same shrimp preserved in alcohol.

Ocean along the East African coast from South Africa (Natal), Mozambique, Zanzibar and Réunion to the Maldives (Crosnier & Forest, 1973; Pérez Farfante & Kensley, 1997; d'Udekem d'Acoz, 1999; Fransen, 2014). This is the first record



Fig. 2. *Aristeus antennatus* (Risso, 1816) from off Ribeira Brava, Island of Madeira, in its natural habitat at 861 m depth. A, Walking behaviour; B, swimming behaviour.

of this species from the Canary Islands, as well as from Madeira, both located in the Webbnesia ecoregion (Madeira-Salvage-Canaries; Freitas et al., 2019). In agreement with the biogeographic pattern categories proposed by González (2018), the blue-and-red shrimp thus is a pantropical species.

Habitat and biology.— A deep-water, benthic and eurybathic species. It usually inhabits muddy bottoms on the continental and insular slopes, in zones close to submarine canyons (Holthuis, 1980), between 80 and 1140 m depth (González, 2018), even up to 3300 m (Sardà et al., 2004), usually at depths between 350/400 and 800 m (García-Rodríguez & Esteban, 1999; Fransén, 2014) at temperatures

of around 13°C (Fransen, 2014). The temperature at the depth of observation (861.5 m) in Madeira was 9.76°C and salinity 35.51‰. The studied material is well within the depth range given for the species, as well as within its known habitat preferences. The specimen observed was spotted walking on a muddy-sandy bottom (fig. 2A), not far away from rock outcrops, on a moderately inclined slope. At a certain moment, eventually disturbed by the presence of the submersible, it took off a few centimetres above the bottom and swam for a while, boosted by the movement of the pleopods and with the walking legs retracted against the pereion (fig. 2B). In the Mediterranean, it is a characteristic species of bathyal bottoms of compact mud (d'Udekem d'Acoz, 1999), more common between 200 and 250 m depth (Holthuis, 1987). It moves from depths of 200 m during the night to 800 m during the day and changes location within the year (García-Rodríguez & Esteban, 1999).

Spawning takes place in summer (Fransen, 2014). This species is proven much more abundant in the western Mediterranean than in other areas of its distribution; although it is rather common in the eastern Atlantic, it seems to be nowhere abundant (Holthuis, 1987; Fransen, 2014). Several aspects of the species' reproductive biology, as well as of the ecology of this deep-water shrimp in the north-western Mediterranean Sea have been studied in the last decades (Sardà & Demestre, 1987; Demestre & Fortuño, 1992; Sardà et al., 1994, 2003; García-Rodríguez & Esteban, 1999; Grau et al., 2006).

It feeds on small benthic invertebrates, mainly crustaceans and polychaetes; it also feeds on carrion (Lagardère, 1981; Cartes & Sardà, 1989; Fransen, 2014). It is a secondary consumer with a trophic level estimated from its diet composition of 3.30 ± 0.47 (Palomares & Pauly, 2022).

Size: Maximum total length 22 cm, commonly between 10 and 18 cm (Fransen, 2014); 7.1 cm poel (female) (Orsi Relini & Relini, 1998); maximum reported age: 6 years (Ragonese & Bianchini, 1996).

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