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SOME NOTES ON THE ASSOCIATED OCCURRENCE OF THE CRAB *CYCLOES CRISTATA* (BRULLÉ, 1837) (BRACHYURA: CALAPPIDAE) AND TWO TYPES OF BENTHIC FISH IN THE CANARY ISLANDS.

(CANCAP-project, Contributions to the zoology, botany and paleontology of the Canarian-Cape Verdean region of the North Atlantic Ocean, no. 65.

by

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Key words: *Cycloes cristata* (Brachyura, Calappidae); associated occurrence; fish; *Bothus podus; Trachinus* ssp.

A concise survey is presented of the species of the crab genus *Cycloes* De Haan, 1837 (Brachyura: Calappidae).

Notes are presented on the associated ocurrence, on shallow sandy bottoms in the Canary Islands (Lanzarote, Gran Canaria), of the eastern Atlantic *Cycloes cristata* (Brullé, 1837) and the fishes *Bothus podus* (De la Roche, 1809) (Bothidae), *Trachinus draco* L., 1758 and *T.* cf. *araneus* Cuvier, 1829 (Trachinidae).

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INTRODUCTION

Four species of the calappid genus *Cycloes* De Haan, 1837, (= *Cryptosoma* Brullé, 1837: cf. Chace. 1968: 610), are currently recognized (Chace, 1968):

1. *Cycloes granulosa* De Haan, 1837: 71, pl. 19 fig. 3 (India to Japan and Hawaii). Additional references with useful habitus figures: Sakai, 1965: 50-51, pl. 20 fig. 3; 1976: 139, pl. 43 fig. 3

2. *Cycloes bairdii* Stimpson, 1860: 237 (western Atlantic from Bermuda to Brazil). Additional references with relevant habitus figures: Rathbun, 1937:

225-233, pl. 69 figs. 3-4; Desbonne & Schramm, 1867: 52-53, pl. 4 fig. 20 (as *Mursia balquerii*); Verrill, 1901: 18, pl. 2 figs 1, 2; 1908: 423-426, figs. 44a (:419), 46, 47, pl. 27 fig. 2; Chace et al., 1986: 341 (pl. 113)-342.

3. *Cycloes deweti* Chace, 1968: 605-612, figs. 1,2 (St. Helena Island). No additional references.

4. *Cycloes cristata* (Brullé, 1837: pl. Crustacés fig. 2) [= *C. dentata* (Brullé, 1839: 17, fig. on title page)] (eastern Atlantic Islands: Madeira Archipelago, Canary Islands, Cape Verde Islands). Additional references with useful habitus figures are not available with the exception of Stimpson, 1907: 166, pl. 19 fig. 7. For detailed information on the known distribution, see: Stimpson, 1858: 162[60]; 1907: 166; Monod, 1956: 114-115; Guinot & Ribeiro, 1962: 27-28; Türkay, 1976: 62-63.

Little more is known about the biology and natural history of these four species than that they are generally found in sandy habitats in shallow, subtropical and tropical waters. Among their predators are benthic fishes such as Snappers (Lutjanidae) as has been established for *Cycloes bairdii* (cf. Rathbun, 1937: 230-232). An interesting feature of the genus is the possession of what is regarded a stridulation organ (Guinot-Dumortier & Dumortier, 1961). Observations, however, on the actual functioning of this organ in living crabs so far are wanting.

SOME DATA AND FIELD NOTES ON THE EASTERN ATLANTIC *CYCLOES CRISTATA* IN THE CANARY ISLANDS

During the CANCAP-project of the Rijksmuseum van Natuurlijke Historie (RMNH), begun in 1976 and concluded in 1986 (cf. Den Hartog, 1984), *Cycloes cristata* (fig. 1) was obtained at three collecting stations in the Canary Islands, viz.:

Sta. 4 D01. South coast of Lanzarote, west of Punta de Papagayo, 28°50'N 13°47'W; 14-v-1980; snorkeling, 2-6 m, sandy bottom; 4 ♀♀, 1♂; RMNH Crust. 36609 (This station was also visited on 16 and 19-v-1980; material collected on the 16th appears to be mislaid; on the 19th no further crabs were collected).

Sta. 4.001. South of Lanzarote, 28°51'N 13°48'W; 14-v-1980; van Veen-grab, 23 m, sand and shells; 6♀♀, 5♂♂; RMNH Crust. 36610 (one specimen with scars on carapace and ventral side of first pereiopods, suggestive of jaw prints, presumably of a sizeable fish).

Sta. 7.K31. Gran Canaria, Las Palmas, Las Canteras, north side of lagoon behind "La Barra"; 14-ix-1986; snorkeling, ca. 2 m, sandy bottom; 1♂; RMNH Crust. 36611.

The samples mentioned above from Punta de Papagayo (Lanzarote) and Las Palmas (Gran Canaria) were collected by myself, and while collecting this

material I made some interesting field observations. At Punta de Papagayo *Cycloes cristata* proved fairly common. The crabs were rather wary and as soon as I moved down towards them they dug themselves rapidly into the sand.

Fig. 1. *Cycloes cristata*, female specimen (RMNH Crust. 36610), dorsal and ventral view. (photo E. L. M. van Esch).

They seem well-camouflaged in this way, but if one is aware of their presence they are – in spite of this – easily located and taken because they dig only superficially, their stalked eyes peeping about the bottom surface. What struck most, however, was the phenomenon that most individuals observed were in company of one or two fishes, viz., a small flatfish and/or a small weever (*Trachinus* spec.). When the crab moved over the bottom I noticed that the fish(es) generally followed at close distance and I regularly observed them to make snapping movements, presumably at small animal organisms (which I could not see) rooted up from the sand by the walking crab. The crab they leave in peace and I even observed that they tolerated the crab to walk over them without causing disturbance. When the crab ceased to move about and for some reason dug itself into the sand (as happened when I moved in too close), the flatfish and/or the weever also entrenched themselves and waited until the crab again started to move. I noticed, however, that they show a

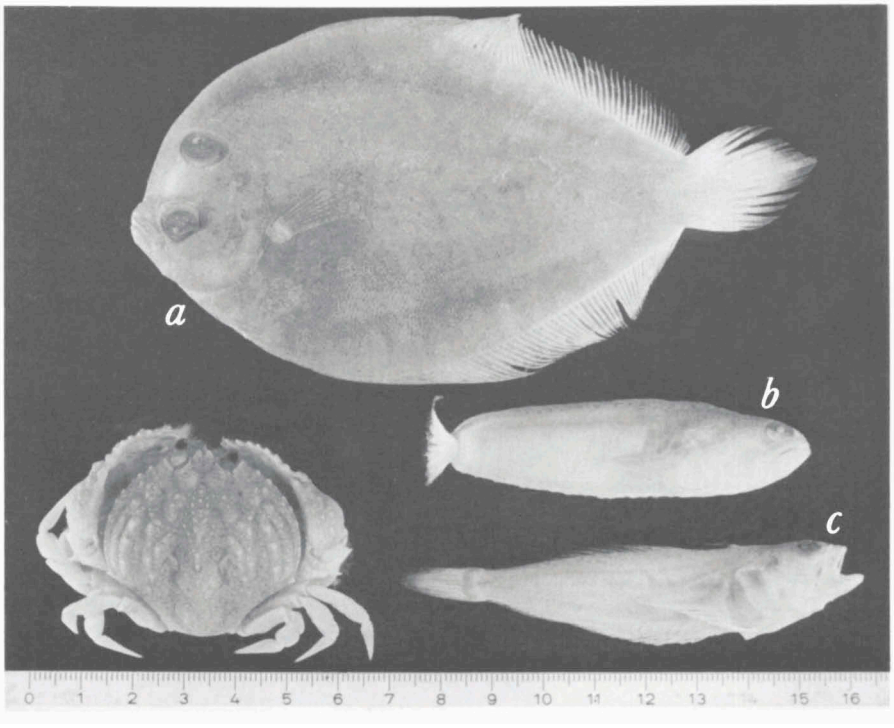

Fig. 2. *Cycloes cristata* (RMNH Crust. 36610) and associated fish collected at Punta de Papagayo, Lanzarote: a. *Bothus podus* (RMNH Pisc. 30550); b. *Trachinus draco* (RMNH Pisc. 30565); c. *T.* cf. *araneus* (RMNH Pisc. 30566). The view of the specimen of *T. draco* is considerably distorted due to its being preserved in a laterally curved, boomerang-like condition; in reality it exceeds the specimen of *T.* cf. *araneas* in length (see the text) (photo: E. L. M. van Esch).

tendency to become "impatient" when there is no action and to abandon their associate after some time. I also noticed change of partner when another crab turned up or moved along.

It is interesting to note that the flatfish and the weever(s) apparently tolerate each other, whereas I never observed a crab being followed by two fishes of the same kind. Occasionally I observed attempts by weevers to change partner, resulting in a confrontation of two individuals and ending with the retreat of one of these. I did not happen to see a confrontation between two flatfishes.

The flatfish, of which one specimen (RMNH Pisc. 30550; total and standard length 132 and 110 mm, respectively) was caught by other members of the expedition was identified as *Bothus podus* (De la Roche, 1809). In addition two weevers were secured in the same locality as the crabs: a juvenile specimen of *Trachinus draco* Linnaeus, 1758 (RMNH Pisc. 30565; total and standard length 97 and 84 mm respectively) and a specimen of *T.* cf. *araneus* Cuvier, 1829 (RMNH Pisc. 30566; total and standard length 88 and 72 mm, respectively). Of these two specimens at least one (caught by Mr. M. van der Knaap) was found associated with *Cycloes* (as my original notes reveal). Unfortunately neither label gives this specific information. However, as I did not see a single non-associated weever in the field, it seems quite likely that both specimens were crab-associated (fig. 2).

Although I initially planned to publish a note on the observation described above, I neglected to do so and forgot about it until August 1986, when my observations were confirmed at Playa de las Canteras, Las Palmas, Gran Canaria (Sta. 7 K31). Here I again collected a specimen of *Cycloes cristata* whose presence was in fact given away by its associate, a specimen of *Bothus podus*.

Chace (1968: 610), in a key to the species of *Cycloes* suggested that the carapace of *C. cristata*, in contrast to that of the other Atlantic species: *C. bairdii* and *C. deweti*, is longer than broad. He based his opinion on the examination of a single male syntype. On the basis of material at my disposal I cannot confirm the general conclusion. According to my own measurements the maximal carapace width generally slightly exceeds the total length (i.e., including the frontal projections). Of the 17 specimens examined 14 were broader than long, one equally long as broad, and two longer than broad (cf. fig. 3).

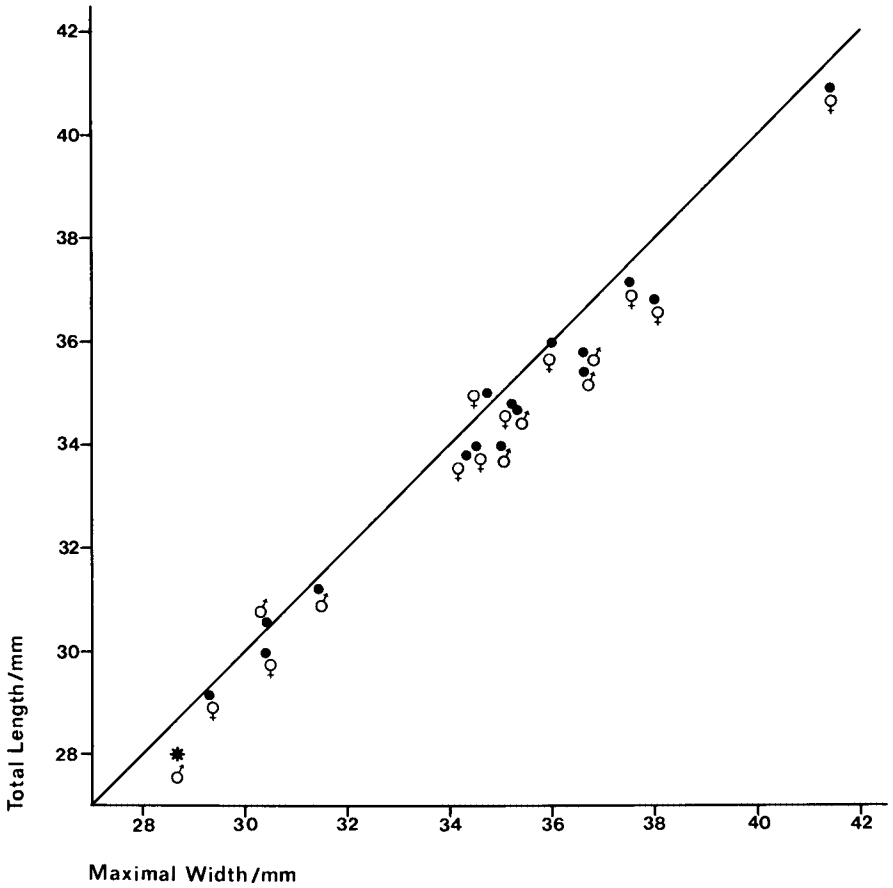

Fig. 3. Total length and maximal width of the carapace of 17 specimens of *Cycloes cirstata* from Lanzarote (16 specimens) and from Gran Canaria (1 specimen; indicated by asterisk). The drawn line represents X = Y.

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