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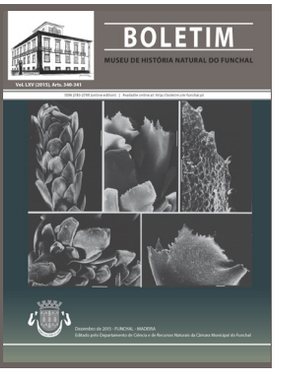

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Prof. Dr. Lipke Bijdeley Holthuis and the Canary Islands carcinology: a tribute

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With 4 figures

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ABSTRACT: This paper is dedicated to the memory of the Dutch carcinologist, Lipke Bijdeley Holthuis (1921-2008) as a tribute to his legacy. His carcinological interests and his contribution to the carcinology of the Canary Islands are summarized. His discoveries in the Canaries within the framework of the CANCAP project, amongst other great scientific expeditions in the eastern Atlantic, are referenced. Also highlighted is the importance he attributed to taxonomy.

Keywords: L. B. Holthuis, tribute, carcinology, Canary Islands.

RESUMO: Este artigo é dedicado à memória do carcinologista holandês Lipke Bijdeley Holthuis (1921-2008), constituindo um tributo ao seu legado. O autor sumariza os interesses carcinológicos de L. B. Holthuis e as suas contribuições para a carcinologia das Ilhas Canárias. É também feita referência à sua contribuição no âmbito do projeto CANCAP, entre outras grandes expedições científicas no Atlântico oriental, e à importância que ele atribuía à taxonomia.

Palavras-chave: L. B. Holthuis, tributo, carcinologia, Ilhas Canárias.

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Professor Dr. Lipke Bijdeley Holthuis was a "living encyclopaedia" who dedicated his exceptional and interesting life to the taxonomy and systematics of Crustacea, zoological nomenclature and the history and bibliography of natural history. He was also regarded as "The institutional Memory" of the Leiden Museum where he worked for 67 years. Holthuis is considered one of the "undisputed greats" of carcinology and "the greatest carcinologist of our time" (Fransen & van Oijen, 2008; Pieters & Cadée, 2009; Fransen *et al*., 2010).

An extensive Holthuis' biography was published by Fransen *et al*. (2010), including his early years, education, work at the Rijksmuseum van Natuurlijke Historie (now Naturalis) in Leiden, collecting and collections, carcinological interests, *Crustaceana* and editorship, the history of natural history, nomenclature, teaching, awards, "Krabbelaria" (he collected everything related to Crustacea), and publication statistics.

His scientific career started in 1941 with his first publications. His last publication was issued in 2009, many months after he passed away. In those 69 years (1941-2009), he produced 620 titles. He was the most prolific carcinologist of the 20th century. This stream of publications resulted in the description of 428 taxa new to science, including 338 new species (Fransen & van Oijen, 2008; Fransen *et al*., 2010). Except for a few plant taxa, these were all crustaceans, with a clear bias towards the decapods (90%) (Fransen *et al*., 2010). For a complete listing of all publications by L. B. Holthuis see: www.repository.naturalis.nl, or also see Fransen *et al*. (2010).

L. B. Holthuis' carcinological interests and contributions to the Canary Islands carcinology

Holthuis studied various groups of Crustacea: stomatopods (*e.g*. Holthuis, 1941, 1984; Holthuis *et al*., 1980), isopods (*e.g*. Holthuis, 1949b), mysidaceans (*e.g*. Holthuis & Sivertsen, 1967), cirripeds (*e.g*. Holthuis & Sivertsen, 1967), and groups of decapods like shrimps, lobsters (Holthuis, 1983), and true crabs (*e.g*. den Hartog & Holthuis, 1984).

A new isopod species from the Canary Islands, *Zonophryxus dodecapus* (Isopoda, Dajidae), was described by Holthuis (1949b). Many years later, a colour photograph of this ectoparasite attached to the top of the cephalothorax of a narwal shrimp (*Plesionika narval*) from the type locality, was first published by me (González, 1995). Another isopod (same species?) was also observed by me on stripped soldier shrimps (*Plesionika edwardsii*) from both the Canary and the Cape Verde Islands.

In the late 1940's Holthuis started to devote more and more studies to caridean and stenopodidean shrimps (*e.g*. Dohrn & Holthuis, 1950; Holthuis & Maurin, 1952; Lewinsohn & Holthuis, 1978). The 1955 publication of keys to help identify recent genera of these groups of shrimps (Holthuis, 1955) was one of his early seminal works that resulted from these studies. His major research effort was directed towards these groups for the rest of his life, culminating in a much revised and extended version of the publication in the early 1990s (Holthuis, 1993).

A remarkable contribution to the carcinology of the Canary Islands was 'The Caridean Crustacea of the Canary Islands' (Holthuis, 1949a). This paper is based mainly on littoral material collected in the Canaries during 1947 by Dr. G. Thorson of the Universitets Zoologiske Museum at Copenhagen and, to a lesser extent, by Dr. C. O. van Regteren Altena of the former Rijksmuseum van Natuurlijke Historie at Leiden. At that time, the shrimp fauna of the Canary Islands was very poorly known (just seven species, mainly reported by Viera y Clavijo (1799-1810), Brullé (1837-1839), Heller (1863), Koelbel (1892), Rathbun (1900) and Balss (1925)). The material examined by Holthuis (1949a) consisted of 12 species, nine of which were not recorded previously from the Canary Islands, bringing the total number of known caridean species from that archipelago up to 16. As the very few data about the carcinological fauna of the region were scattered over several publications, Holthuis thought it useful to include in his paper, a compilation of all the information about the Canary Islands Caridea (deep-sea species excluded) known to him. Holthuis pointed out that one of the main reasons that the shrimps of the Canaries were so little known, was probably the inaccessibility of the larger part of the shores, which made collecting possible only at certain places and at certain times.

The work of Holthuis (1949a) is, therefore, the first annotated catalogue of the caridean shrimps from the Canary Islands, including the first record of *Gnathophyllum americanum* (Gnathophyllidae), *Periclimenes scriptus* (Palaemonidae), *Latreutes fucorum*, *Lysmata seticaudata* and *Trachycaris restricta* (Hippolytidae), *Aegaeon cataphractus* (as *Pontocaris cataphracta*) and *Philocheras trispinosus* (as *Pontocaris trispinosus*) (Crangonidae). The

presence of *Gnathophyllum elegans* (Gnathophyllidae), *Palaemon serratus*, *P. xiphias* (Palaemonidae) and *Athanas nitescens* (Alpheidae) in the Canary Islands was also confirmed by Holthuis (1949a).

As a result of the Danish scientific expedition to the coasts of Tropical West Africa in 1945-1946 on board the R/V "Atlantide", Holthuis (1951) made a remarkable contribution to the knowledge of the Caridea of this eastern Atlantic region, including the first record of *Hippolyte coerulescens* (Hippolytidae) from the Canary Islands.

Based on specimens from the North Atlantic deep-sea collected by the 1910 Norwegian expedition on board the vessel "Michael Sars", Sivertsen & Holthuis (1956) recorded many decapod crustaceans for the first time from the Canary Islands and adjacent waters: *Acanthephyra tenuipes* (as *A. gracilipes*), *A. stylorostratis*, *Heterogenys microphthalma* (as *Acanthephyra microphthalma*), *Hymenodora gracilis*, *Meningodora vesca* and *Notostomus distirus* (Acanthephyridae), *Systellaspis debilis* (Oplophoridae), *Nematocarcinus ensifer* (Nematocarcinidae), *Heterocarpus grimaldii* and *Plesionika heterocarpus* (Pandalidae). The presence of *Stylopandalus richardi* (Pandalidae) in the Canary Islands was also confirmed by Sivertsen & Holthuis (1956).

Holthuis also kept his interest in other groups, with numerous studies appearing on Dendrobranchiata and various lobsters groups. This is reflected in the extensive reference catalogues he accumulated for these taxa over the past six decades (Fransen *et al*., 2010).

As a result of the French expeditions on board the "Travailleur" (1882) off Morocco and the Canaries, and the "Talisman" (1883) between the Strait of Gibraltar and the Cape Vert in Senegal, Holthuis (1980a) reported on the identity of *Benthonectes filipes* (as *Hapalopoda investigator*) (Benthesicymidae) and other shrimps collected.

With the aid of these catalogues he prepared the annotated FAO species catalogues on shrimps and prawns (Holthuis, 1980b, 1987), lobsters (Holthuis, 1981a, 1987, 1991), and true crabs (Holthuis, 1981b), which are of interest to fisheries.

His studies on Brachyura gained momentum when his cooperation with Raymond B. Manning started in the 1970s (Fransen *et al*., 2010). The first major product of this cooperation was the impressive study of West African Brachyuran Crabs (Manning & Holthuis, 1981), followed by the revision of deep-sea red crab family Geryonidae (Manning & Holthuis, 1989), among other crab families.

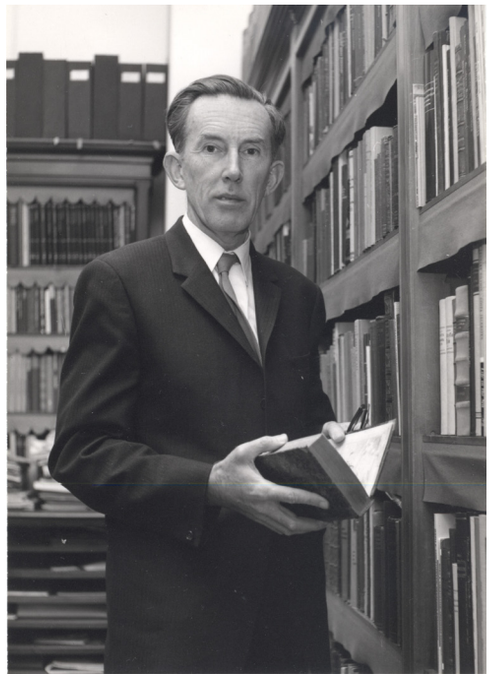

Fig. 1 – Lipke Bijdeley Holthuis in 1973.

Holthuis *et al*. (1980) first recorded the brown spiny lobster *Panulirus echinatus* (Palinuridae) from the Canaries, and reported on its restricted distribution in a few localities of both the western (NE Brazil and off-shore islands) and eastern (Canary and Cape Verde Islands) Atlantic Ocean.

Manning & Holthuis (1981) surveyed the West African marine brachyuran crab fauna, comprising 218 named species in 120 genera and 26 families. Sixteen new genera and 24 new species were recognized. Several of these brachyuran species were reported from the Canary Islands, including the first record of *Detocarcinus balssi* (as *Neotroglocarcinus balssi*) (Cryptochiridae).

Quoting Fransen *et al*. (2010), "Holthuis insisted that taxonomy was a core biological discipline…This was even during times when taxonomy was dismissed as irrelevant and people flocked to new disciplines, such as molecular science… Whilst modern day systematic scientists are often forced by the vagaries of funding and the bureaucratic pressure to devote the majority of their research time to the pursuit of phylogenetic publications, invariably in higher profile journals, we would do well to remember his firm stance to focus on collection expansion and that most fundamental of biological sciences, taxonomy.".

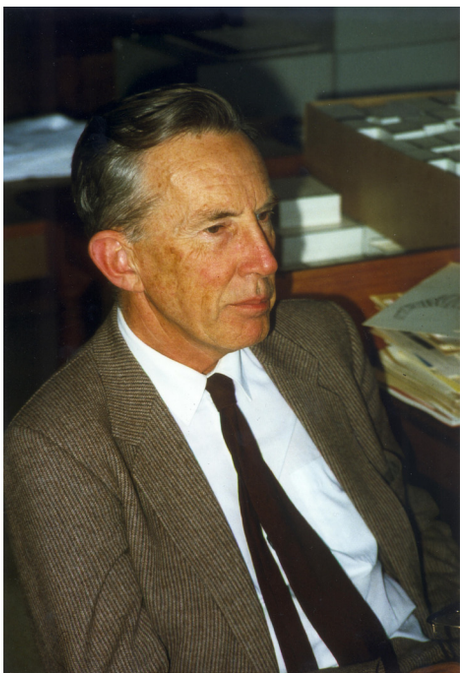

Fig. 2 – Lipke Bijdeley Holthuis in 1982.

CANCAP Expeditions and its encouragement to the carcinology of the Canary Islands

In the framework of the CANCAP (Dutch 'Project for marine biological research in the CANarian-CAPeverdean Region') (1976-1986), seven expeditions were made on board the R/V "Tydeman" to the North Atlantic, between Morocco and Senegal, as well to the Macaronesian archipelagos. These expeditions included a series of shore collecting in Canary Islands' waters (den Hartog, 1984). As a result, an enormous amount of carcinological material was examined and many papers were published. For instance, a note about an interesting association between Zoantharia species and the crab *Platypodiella picta* (Xanthidae), recorded at this time for the first time from the Canaries, was published by den Hartog & Holthuis (1984).

I had the opportunity to lead the fishing survey campaign "Canarias 85" on board the R/V "Taliarte" in which, during June and July of 1985, we collected a lot of fishes and decapod crustaceans with longlines and pots in all the islands of the Canary archipelago between 100 and 1000 meters of depth. We received help from Lipke Holthuis and Charles Fransen for the identification of several crustaceans in subsequent years. The faunistic and fishing results were published by González *et al*. (1988).

In the late 1980's and early 1990's, Fransen visited me two or three times at my laboratory in the 'Instituto Canario de Ciencias Marinas' (at that time 'Centro de Tecnología Pesquera de Gran Canaria'), in order to establish a cooperation between his collecting activities and our identification works. Holthuis became curator of the Division of Crustacea of the former Rijksmuseum van Natuurlijke Historie at Leiden, in 1950 and remained in this position until his retirement in 1986. At that time, Fransen was a researcher at this Museum and working in the Holthuis' group. Within that cooperative atmosphere, Fransen talked to me about Prof. Dr. Holthuis, handed me his last publications (Fransen, 1990, 1991a, 1991b, among others) and encouraged me to enlarge my research from fishes to decapod crustaceans.

On the occasion of the *5th Symposium Fauna and Flora of the Cape Verde Islands*, held at Leiden in October of 1989, Charles Fransen kindly invited me to stay for a week at the Museum and introduced me to Holthuis. My colleague and friend Manuel Biscoito, a marine zoologist working as curator at the Funchal Natural History Museum, accompanied us during that unforgettable visit to Holthuis' impressive office, who greeted us kindly, offering us a cup of tea that he prepared at the time and maintaining an interesting conversation with us. Another series of events took place those days. Manuel contributed to this Symposium with probably his seminal work on deep-sea decapod crustaceans (latter appeared as Biscoito, 1993), and kindly helped me with the English of my presentation on the biology of the Macaronesian parrotfish. Therefore, it is absolutely true that during that stage of my career, I received important professional influences from Lipke B. Holthuis, Charles Fransen and Manuel Biscoito.

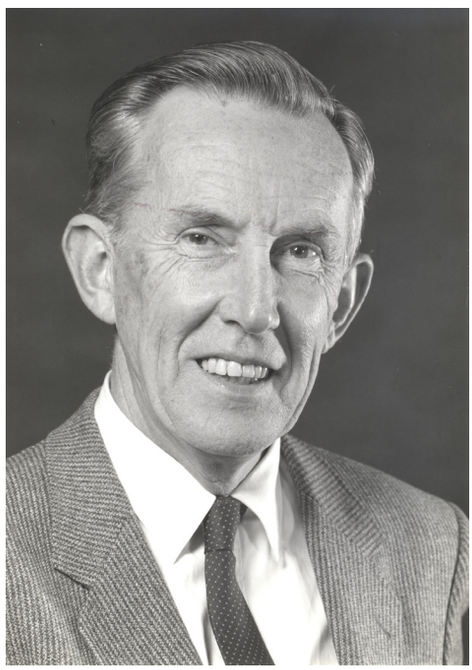

Fig. 3 – Lipke Bijdeley Holthuis in 1995.

My studies on crustaceans gained momentum when this cooperation with these colleagues commenced and also due to the fact we had to deal with many specimens belonging to new or poorly known species from the Canary Islands waters. Since 1988 (González *et al*., 1988), to date, fishes apart, I have authored or co-authored 53 titles on taxonomy, biology, conservation or fisheries of mysidaceans, cirripeds and mainly decapods (94%) (Triay-Portella *et al*., 2014; Biscoito *et al*., 2015). Fourteen of these articles (26%) appeared before December of 1995 (mainly in national or Macaronesian journals) and 39 publications (74%) after this date (mainly articles in peer-reviewed journals and books).

In early 1995, I sent a letter (there was no email) to Fransen, asking for his critical review of a draft manuscript on the decapod crustaceans from the Canary Islands. In that letter I also asked for a prologue, as well as photographs of the great European carcinologists whose work has contributed to the knowledge of decapods of the Canaries to illustrate my work. Then something amazing happened. I was informed by Holthuis that Fransen was currently participating in expeditions in Asia and would not return before the scheduled date of the publication of the manuscript. Holthuis therefore kindly accepted to address all my requests in Fransen's absence. As the manuscript was in Spanish and Holthuis' knowledge of this language was very limited, mistakes on records and/or distribution of species from the Canaries are attributable only to me. Holthuis gave me excellent photographs to illustrate the history chapter on carcinology of the Canary Islands (see González, 1995), and also prepared a magnificent prologue to accompany his portrait. Until the last day of my life I shall be indebted to Holthuis and Fransen; their advice, literature, support and assistance made the publication of my annotated and illustrated "Catálogo de los crustáceos decápodos de las islas Canarias" possible, including 266 decapod species regularly occurring in the Canary Islands waters, with more than 200 original colour photographs of more than 100 species.

In his preface (Holthuis, 1995) of my catalogue (González, 1995), Holthuis (Fig. 3) kindly wrote that, "like the book of Zariquiey (1968) on the Iberian decapods is being used throughout the Mediterranean and western Europe by all professionals and amateur carcinologists, this publication of Dr. González will transcend far beyond the area of the Canary Islands and shall also be consulted by specialists and enthusiasts in the broadest sense.".

I am convinced that the teachings and encouragement of my three mentors were instrumental in my career as a marine taxonomist, part-time between carcinology and ichthyology due to many research projects in the Canary Islands region and Macaronesia *sensu lato* (Cape Verde Islands and southern Morocco and Western Sahara included) in which I have participated. My great fortune and opportunity was that my three mentors came my way, encouraging me to feel passion for taxonomy, nomenclature and the etymology of marine fishes and crustaceans.

Fig. 4 – Lipke Bijdeley Holthuis in 2007.

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