



# Article

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## Brittle stars (Echinodermata: Ophiuroidea) from the continental shelf off Angola and Namibia

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### Abstract

The fauna occurring in waters off South-West Africa is of a remarkable composition and highly diverse due to local water bodies, flow conditions and abiotic factors. These parameters predominate as a result of the cooperation of a major coastal upwelling system (the Benguela Current Large Marine Ecosystem), the Benguela Current flowing northwards, the southward directed Angola Current and the Angola–Benguela Frontal Zone formed in the transition zone of both water currents. This area has been insufficiently explored within the last decades and major gaps in biodiversity knowledge exist to date. Two expeditions were conducted in 2004/2008, which collected benthic fauna samples. This is a list of brittle stars found and a comprehensive research study relating to Ophiuroidea in waters off Angola and Namibia. 17 species could be identified at depths from the littoral zone down to 125 m. The known depth and geographical distributions were extended for several species. Short diagnoses and ecological data are included.

**Key words:** Benguela Current Large Marine Ecosystem, Angola–Benguela Frontal Zone, West Africa, Macrozoobenthos, Ophiurida

### Introduction

The Benguela Current Large Marine Ecosystem (BCLME) is one of the world's major coastal upwelling systems. Located in the South-East Atlantic Ocean, it stretches from the Cape of Good Hope northwards into waters off Angola along the South-West African coast. The African shelf near the mouth of the river Cunene represents a unique environment. Freshwater and sediment plumes reach the ocean just where the northward-flowing cold, nutrient-rich Benguela Current diverges from the Namibian coast and meets the southward-flowing warm, nutrient-poor Angola Current forming a convergence zone at ~14–16°S known as Angola–Benguela Frontal Zone (ABFZ) (Meeuwis & Lutjeharms 1990). This transboundary area separates the northerly tropical ecosystem from the upwelling-driven ecosystem further south with its upwelling center in the vicinity of Lüderitz (Lass *et al.* 2000). The ABFZ moves seasonally and inter-annually meridionally, causing irregular anomalies in temperature, salinity and oxygen concentration. These patterns were recently described in detail by Mohrholz *et al.* (2008).

In terms of variability at the ecosystem level the distribution and abundance for several animal populations have been studied intensively, especially for fish, pelagic larvae and crustaceans. Faunistic analyses of certain macrofaunal groups inhabiting this area have been documented in Zettler *et al.* (2009) as well as in Bochert and Zettler (2009, 2010, 2011). A comprehensive taxonomic study has been published for another echinoderm class (Holothuroidea) with the participation of our working group (Thandar *et al.* 2010), based on the same sampling stations as we analyze in the present study. For most taxonomic groups this area has not been sufficiently explored and therefore, there are major biodiversity gaps (Konar *et al.* 2010). Faunal data applying to the macrozoobenthos sampled at the western coast of Africa in general and in the vicinity of the ABFZ in particular have been sparse in the past decades. Explorations were, historically, more intense in the western part of the Atlantic Ocean as well as in the Indo–Pacific area (Alva & Vadon 1989). Particularly, the role of echinoderms in the structure of West African ecosystems is still unsolved. Taxonomy and distribution of brittle stars north of the Equator were studied