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RESEARCH ARTICLE

ISOPOD ECTO- PARASITES IN MULLET FISH FROM SUDANESE RED SEA WATERS

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ABSTRACT

Objective: this was a cross sectional study aimed to search for ecto-parasites in mouth of mullet fish obtained from the Sudanese Red Sea Coast.
Material and Methods: a number of 1540 mullet fish was included in the study. The body surface and mouth parts of fish were examined for presence of parasites and surrounding tissues were examined for pathological effects.
Results: one new species for the region was identified (Cymothoa exigua) and fish hosts were also identified (Valamugil Buchanani, Valamugil Seheli, and Mugil Cephalus).
Conclusion: The study is the first to report presence of Cymothoa exigua in the Sudanese Red Sea Coast.

INTRODUCTION

The order Isopoda represents the second largest order of Crustaceans (WoRMS, 2015). They are part of the greatest fish ectoparasite group and are easy to identify due to their size, morphological aspects and because they are easily found on the outer part of fish bodies (Ruppert Edward *et al*., 2004). They may be observed on the fins, in the mouth, gill chambers, or nostrils, or occasionally in self-made pockets in the flesh of their hosts (Brusca and Gilligan, 1983). They provide portals of entry for other pathogens in fish (Horton and Okamura, 2003). As Cymothoidae family isopods prefer fishes as host, they inhabit freshwater, brackish water and the sea environment, as an ectoparasite of various fish species (Niel L Bruce and Marilyn Schotte, 2011). They are haematophagous; feeding on their host blood by producing an anticoagulant substance from their latero-oesophagus glands (Srour Marc, 2012). Members of this family have been recorded from the Mediterranean Sea (Trilles, 1964, Ramdane *et al*., 2007), Adriatic Sea (Mladineo, 2006), Black Sea (Kononenko, 1998) and Atlantic Ocean (HORTON, 2000).

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Marine isopods are poorly studied animals in many regions of the world and some groups remain completely undescribed (El-Shahawy and Desouky, 2010). The Cymothoidae fauna of diverse localities along the Red sea coast have been rarely or incompletely studied (Hiekal and El-Sokkary, 1990). To our knowledge, this study is the first in the Sudanese part of the red sea coast. Therefore, the objective of the present study was to focus on the analyses of the isopoda fish parasitic fauna of the Sudanese coastal waters of the Red Sea.

MATERIALS AND METHODS

This was a cross sectional study conducted at Portsudan main fish market as landing site, in which fish received from different regions of the Sudanese part of the red sea (northern Mohamedgoul, central Daimanoor lagoon, and southern Sawakin site). Mullet fish was collected by fishermen using nets during the period between February and October 2014. The study was carried out in 1540 mullet fish and aimed to look for mouth - dwelling blood- feeding isopod ecto-parasites. Collection and examination of parasites: weight, length, and depth of each fish were measured. The whole body surface of fish, inside the mouth, and gill arches were examined for parasites. Mouth parts and appendages were carefully dissected using dissecting needle and forceps. After being

photographed, parasites were removed from their host and preserved in 10% formalin. Sampling date, locality, and site of attachment of parasite on the host fish were recorded. The overall prevalence (number of infested hosts /number of examined hosts), and intensity (total number of parasites /number of infested hosts) were calculated. The parasites were identified macroscopically according to Pillai, (1954), Bowman, (1978), Bruce and Harrison-Nelson, (1988) and Ramesh Kumar *et al*. (2011). Photographs were taken by using Samsung digital camera 10.1 mega pixels. Fish scientific names were checked according to Froese and Pauly (2011). Data on collecting period, sampling area, name and size of host as well as the location of fish capture, were noted. The geographical distribution and host species were also specified. Finally, we compiled a check-list of all cymothoids reported to the present time from the Sudan red sea waters. Data was collected intables and includedweight, length, parasites and their locations, prevalence, and intensity.

Ethical clearance

The study protocol was scientifically reviewed and approved by the Ethical Review Board of University of Khartoum. Verbal consent was obtained from each participant fisherman.

RESULTS AND DISCUSSION

Among the 1540 mullet fish specimens examined, only 441 were infected with an isopod parasite (28.6 %). The detected isopod was Cymothoa Exigua Schioedte and Meinert, 1884; body length was 35-41mm and width was 8-10 mm. Morphological characteristics were as described according to WoRMS (2015). It was found only in the buccal cavity attached to the tongue. This species of parasite is recorded for the first time in Sudan Red Sea waters; prevalence (p = 28.6%). Cymothoa Exigua is widely distributed in waters of Red Sea (Al-Zubaidy and Mhaisen, 2013), Atlantic Ocean (Trilles, 1991), Mediterranean Sea (Cafer Erkin KOYUNCU, 2015), and Adriatic Ocean (Mladineo, 2006). Our results are in agreement with those from Yemen (Al-Zubaidy and Mhaisen, 2013) and Mediterranean areas. Our results confirmed the preferential occurrence of this species on Mugilidae family. The species of the infected fish were Valamugil Buchanani (local name is Quoy), Valamugil Seheli (local name is Elgelani), and Mugil Cephalus (local name is Abu Geshra) of the family Mugilidae (Table 1).

Table 1. Numbers and Types of the infected Fishes from Sudan Red Sea waters

Fish Species	Positive Numbers	Fish Length Range (cm)	Location
Valamugil Buchanani	193	17.1-29.9	North and South Red Sea coasts (Mohamedgoul and Sawakin)
Valamugil Seheli	169	30-39.9	Central Coast (Daimanoor lagoon)
Mugil Cephalus	79	40-49.9	Central Coast (Daimanoor lagoon)
Total	441		

Conclusion

The study is the first in reporting and recording the presence of Cymothoa Exigua Schioedte and Meinert, 1884 in the Sudanese Red Sea Coast.

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