

**FIRST REPORT OF MAZOCRAES ALOSÆ (HERMAN, 1782),
PRONOPRYMNA VENTRICOSA (RUDOLPHI, 1891) AND
LECITHASTER CONFUSUS ODHNER, 1905 IN PONTIC
SHAD ALOSA IMMACULATA BENNET, 1835
NEAR TURKISH COASTS OF THE BLACK SEA**

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Abstract

*In the present study, a total of 31 specimens of pontic shad, *Alosa immaculata* Bennet, 1835 (Pisces: Clupeidae) caught in the Black Sea coasts near Sinop, Turkey in 2010 were investigated for their parasite fauna. Four parasite species were identified: *Mazocraes alosae* (Herman, 1782), *Pronoprymna ventricosa* (Rudolphi, 1891), *Lecithaster confusus* Odhner, 1905 and *Hysterothylacium aduncum* (Rudolphi, 1802). *H. aduncum* was the core species with infection prevalence of 96.7% and mean intensity value of 97.1 ± 18.1 parasites per infected fish, followed by *M. alosae* (61.3% and 3.2 ± 0.5), *P. ventricosa* (35.5% and ± 12.5) and *L. confusus* (29% and 8.2 ± 2.8), respectively. In the present study, *Mazocraes alosae*, *Pronoprymna ventricosa* and *Lecithaster confusus* are reported from pontic shad off Turkish coasts of the Black Sea for the first time.*

Key words: *Alosa immaculata*, parasites, Black Sea

INTRODUCTION

The pontic shad, *Alosa immaculata* Bennett, 1835 from Clupeidae family, is an anadromous pelagic fish of great economic value for all the Black Sea countries. The main habitats of this species are the Black Sea, the Azov and Caspian Seas [10, 30]. It prefers to feed in the southern part of the Black Sea [9]. There are five *Alosa* species near Turkish Black sea coasts; *Alosa caspia caspia* (Eichwald, 1838), *Alosa maeotica* (Grimm, 1901), *Alosa pontica* (Eichwald, 1838) (Syn; *Alosa immaculata* Bennett, 1835), *Alosa tanaica* (Grimm, 1901) and *Alosa fallax* (Lacepede, 1803) [3,14, 18, 31]. This fish species is captured along all the Black Sea the coasts including Anatolian coast, where present study was conducted near Sinop. Its capture value increased from 720 tonnes to 2582 tones in the last decade with some little fluctuations [1]. However, the overall stocks of pontic shad in the Black

Sea seem to be under threat mainly due to excessive fishing and pollution [20]. Parasite fauna of *Alosa immaculata* (syn.: *Alosa (Caspialosa) kessleri pontica*) near north, NW, western and eastern coasts of the Black Sea have been studied [6, 8,15, 26, 27, 28] as well as in the Sea of Azov [22, 29], Danube [25] and Dniper river [16] estuaries. Nevertheless, despite of economical value of the fishes in Turkey, studies on the parasite fauna of *Alosa* spp. near Turkish coasts of the Black Sea are limited [11] and there were no data on the parasite fauna of the most numerous member of the fish genus in the Black Sea, pontic shad *Alosa immaculata*. Present study is the first one providing data on both parasite fauna and infection levels of *Alosa immaculata* off Anatolian coast of the Black Sea.

MATERIAL AND METHOD

In the present study, the parasite fauna of 31 fish specimens of pontic shad *Alosa immaculata* Bennet, 1835 caught by fishermen near Sinop (Turkey) in 2010 was studied. Parasitological investigation was

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conducted at the Faculty of Fisheries and Aquatic Sciences in Sinop. Dissections were performed with the aid of a dissecting microscope at magnification up to x40 using standard parasitological techniques. The following tissues and organs were examined: skin, fins, gills, mouth, liver, gallbladder, swimbladder, gonads, kidney, heart, lateral musculature, mesenteries, oesophagus, stomach, pyloric caeca and intestine. Metazoan parasites were picked up, counted and treated separately from the lumen and from the surface of the digestive tract. Thin squash preparations were prepared from heart, liver, kidney, gonadal tissue and bile and were examined using a light microscope at magnification x 100–1000.

Infection prevalence (%) and mean intensity and abundance of infection [5] were calculated.

RESULTS

We detected four parasite species in the pontic shad samples: metazoan parasites were represented by one monogenean, two digeneans and one nematode species (Table 1). Overall infection prevalence, mean intensity and abundance values were 96.77%, 110.53 ± 18.78 parasites per infected fish and 106.96 ± 18.51 parasites per examined fish. *Hysterothylacium aduncum* occurred both as freely moving larvae, preadults (stage IV) and adults. Infection prevalence (%) was the highest for *H. aduncum* and followed by *Mazocraes alosae*, *Pronoprymna ventricosa* and *Lecithaster confusus* (Table 1). *Hysterothylacium aduncum* had the maximum mean intensity value (97.06 ± 18.10) and followed by *Pronoprymna ventricosa* (29.72 ± 12.53).

DISCUSSIONS

Despite of diverse parasite fauna of *Alosa immaculate* known in the Black Sea [6, 8, 11, 15, 26, 27, 28], the present study yielded only four helminth parasites, one of ecto-(monogenean) and 3 endoparasitic nature. The number of parasites identified in this fish host in the region studied is similar to those

reported from other authors from this host (Table 1).

The shads, members of Clupeidae family, are anadromous fishes and they migrate to freshwater for spawning and *vice versa* for maturation, largely determined by changes in physiological condition of host. This adaptation to both environments may have more effects on the parasite loads of ectoparasitic nature than internal parasites in migratory fish.

Trematode *P. ventricosa* is known from pyloric caeca and intestine of different marine fishes, mainly Clupeidae, in North-Eastern Atlantic, Mediterranean, Caspian Sea, Black Sea and the Sea of Azov [4].

In the Black Sea it was registered for the first time off Caucasian coasts by [8] – she founded and described four specimens of a new genus, *Pentagramma* (now it is a synonym for *Pronoprymna*) from the gut of one *Alosa immaculata*. Later this trematoda species was found from *Alosa* spp. in NW part of the sea, along Crimean Black Sea coasts (all the data on this region were summarized [15], off Bulgarian coast, in Azov Sea, Paleostomi Lake (Caucasus) and Dniپر and Danube rivers estuaries (Table 1), as well as near Bosphorus Strait [21] – but in later case from another fish hosts.

Hemiurid trematodes *Lecithaster confusus* is also a widely distributed parasite of marine fish. Its second intermediate hosts are marine copepods, this explains infection of plankton-eating Clupaeidae. The helminth has been registered from *Alosa immaculata* as in different region of the Black Sea as in Azov, including rivers estuaria (Table 1).

Mazocraes alosae is a gill monogenean species specific to Clupaeidae and abundant from *Alosa immaculata* all over the Black and Azov seas, following the host (Table 1).

The less specific parasite of four registered is nematode *Hysterothylacium aduncum*. It is widely distributed species known in the Black Sea from a lot of fish species. Pontic shads off Anatolian Black Sea coasts revealed to be highly parasitized with *H. aduncum*, in terms both of larval and adult helminths.

Table 1 Infection indices and localities reported for parasites have been found from *Alosa immaculata* Bennet, 1835 off the Anatolian coast the Black Sea

Parasites	Infection indices		Location	Authors
	P (%)	Intensity		
<i>Mazocraes alosae</i>	45.8	4.5 (1 – 12)	Black Sea: Sevastopol (Crimean coast)	[23]
	13 – 56,6	1 – 16	Azov Sea, Kerch Strait	[29]
	-	-	Black Sea: Sevastopol (Crimean coast)	[13]
	16.6	3.0 (1 – 18)	Black Sea: Sevastopol (Crimean coast)	[27]
	42.1*	3.0 ± 0.5*	Kerch Strait	[28]
	10.7**	4.3 ± 0.8**		
	61.3	3.2 ± 0.5	Black Sea: Sinop (Anatolian coast)	Present study
<i>Pronoprymna ventricosa</i>	4 specimens in 1 fish		Black Sea: Batumi (Caucasian coast)	[8]
	90.3	8 – 38	Black Sea: Novorossiysk (Caucasian coast)	[26]
	83.8	2 – 65	Gulf of Odessa (North-Western Black Sea)	[6]
	20-33	-	Dnieper river delta	[17]
	-	-	Paleostomi Lake	[7]
	7 - 100	3 – 840	Azov Sea, Kerch Strait	[29]
	-	-	Black Sea: Sozopol (Bulgarian coast)	[12]
	-	-	Black Sea: Sevastopol (Crimean coast)	[15]
	-	-	Azov Sea	[22]
	16.6	6.1 (1-37)	Kerch Strait	[27]
	33.3	14.0±4.0	Kerch Strait	[28]
21.4**	121.0±51.2**			
35.5	29.7 ± 12.5	Black Sea: Sinop (Anatolian coast)	Present study	
<i>Lecithaster confusus</i>	-	-	Black Sea: Batumi (Caucasian coast)	[8]
	90.3	15 - 65	Black Sea: Novorossiysk (Caucasian coast)	[26]
	8.3	3.3	Black Sea: Odessa (NW Black Sea)	[6]
	-	-	Danube river estuary	[25]
	-	-	Dniper river estuary	[16]
	-	-	Paleostomi Lake	[7]
	7,1 - 50	1 – 24	Azov Sea, Kerch Strait	[29]
	-	-	Azov Sea, Don river, Taganrog estuary	[22]
	-	-	Black Sea (Crimean coasts)	[15]
	29.0	8.2 ± 2.8	Black Sea: Sinop (Anatolian coast)	Present study
<i>Hysterothylacium aduncum</i>	14 - 86	2 – 50	Azov Sea, Kerch Strait	[29]
	-	-	Black Sea (Crimean coasts)	[15]
	33.0	0.3 (1)	Black Sea: Sevastopol (Crimean coast)	[27]
	66.6	51.5±15.3	Kerch Strait	[28]
	35.7	36.0±15.4		
	96.8	97.1 ± 18.1	Black Sea: Sinop (Anatolian coast)	Present study

during migration of *Alosa*: from the Black Sea to Azov Sea; * from Azov Sea to the Black Sea

CONCLUSIONS

Three marine fish helminthes specific to Clupaeidae fishes, *Mazocraes alosae*, *Pronoprymna ventricosa* and *Lecithaster confusus* are reported from pontic shad off Turkish coasts of the Black Sea for the first time – it gives an additional data on their areas in the Black Sea.

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