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First Records of Helminth Parasites of *Dicentrarchus labrax* in the Western Coast of Algeria

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ABSTRACT

From January to July 2011, a parasitical investigation was carried out on a selective sample of 10 *Dicentrarchus labrax* (Total Length 35 – 53 cm) from the Algerian western coast. Selective criteria concerned the freshness of the fishes, their sampling within the 12 hours following their gill-net catch, followed by an immediate dissection. We announce, for the first time in Algeria, the presence in *Dicentrarchus labrax* of 8 Helminth parasites; *Diplectanum aequans*, *Serranicotyle labracis* (Monogenea), *Cainocreadium labracis*, *Bucephalus labracis*, *Bucephalus baeri*, *Bucephalus minimus* (Digenea), larval stage of Tetraphyllidea (Cestoda) and larval stage L4 of *Hysterothylacium aduncum* (Nematoda) respectively with a prevalence of 20%, 10%, 90 %, 50%, 40%, 50%, 50% and 60%. The target of this investigation is to evaluate the parasitical threats towards the intensive sea farming of *Dicentrarchus labrax* in Algeria.
KEYWORDS : *Dicentrarchus labrax*; Parasites; Monogenea; Digenea; Cestoda; Nematoda; Algeria.

1. INTRODUCTION

The parasitofauna of *Dicentrarchus labrax* has been investigated in the Mediterranean Sea and in the Eastern coast of the Atlantic under both wild and intensive farming conditions leading to a very abundant literature [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28]. In Algeria, very few works were realised on this fish and only in the Eastern coast on copepods [29, 30, 31], and on infectious and parasitical diseases in both wild environment and intensive fish farming [32, 33, 34].

The only parasitical records are those for Mellah Lagoon within El Kala National Park [33, 35] indicating the presence in *D.labrax* of *Myxobolus sp*., *Microcotyle sp*., *Acanthostomum imbutiforme*, *Lernaeolophus sultanus*, *Ergasilus lizae* and *Caligus minimus*. Regarding the increasing number of intensive fish farming as well as the lack of parasitical surveys in the Algerian western coast, it was appropriate to carry out this investigation on the Helminth parasites in order to contribute to the knowledge of the potential harmful threats to *D.labrax* farming.

2. MATERIALS & METHODS

Sampling fishes for parasitical investigation was based upon 3 major criteria "Freshness of the fish", "Gill-net catch since 12 hours" and "Immediate dissection". From January to July 2011, within the local fish markets of Oran, selective samplings enabled the collection of 10 *D.labrax* specimens (Total Length from 35 to 53 cm).

After dissection, fresh slides of Monogeneans were observed under low and high magnification for rapid identification. Monogeneans, Digeneans and Cestodes were isolated, fixed and stored in 70% ethanol. Nematodes were relaxed and cleaned in a Petri dish then fixed and stored in a mixed solution of glycerine (50ml) and ethanol 70% (950 ml). Digeneans were stained in acetocarmine, dehydrated through a graded alcohol series, cleared in oil of winter green and whole mounted in Canada balsam. Prevalence, Mean intensity and Abundance were calculated as defined in the literature [36, 37].

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3. RESULTS

During this investigation 227 parasites were collected including 03 monogeneans, 203 digeneans, 11 cestode larval stages and 10 nematode larval stages. For the first time in Algeria, we announce the presence in *D.labrax* of *Diplectanum aequans* (Monogenea: Diplectanidae), *Serranicotyle labracis* (Monogenea: Microcotylidae), *Cainocreadium labracis* (Digenea: Opecoelidae), *Bucephalus labracis*, *Bucephalus baeri*, *Bucephalus minimus* (Digenea: Bucephalidae), larval stage of Tetraphyllidea (Cestoda) and larval stage L4 of *Hysterothylacium aduncum* (Nematoda: Anisakidae). The monogeneans *Diplectanum aequans* and *Serranicotyle labracis* are less frequent on the gills of *D.labrax* whereas the digeneans are more abundant and diversified.

Specific Prevalence results show homogenous values for *Bucephalus labracis*, *Bucephalus baeri* and *Bucephalus minimus*. The latter shows the highest Mean intensity whereas the highest occurrence belongs to *Cainocreadium labracis*.

Sampled from the stomach and the intestine, larval stages of Tetraphyllidea are easily identified upon the presence in the scolex of four muscular bothridia. Larval stages L4 of the Nematode *Hysterothylacium aduncum* were found in the stomach, the intestine and the rectum. Specific Prevalence, Mean intensity and Abundance are indicated in Table 1.

Table 1: Results of the survey on the Helminth parasites of *Dicentrarchus labrax* from the western Algerian coast.

Parasites	Prevalence	Abundance	Mean Intensity	Location on the host
Monogenea				Gills
***Diplectanum aequans* (Wagener, 1857) Diesing, 1858**	20%	0,2	2	
***Serranicotyle labracis* (Van Beneden & Hesse, 1863)**	10%	0,1	1	
Digenea				
***Cainocreadium labracis* (Dujardin, 1845) Nicoll,1909**	90%	3,2	3,5	Intestine
***Bucephalus labracis* Paggi et Orrechia, 1965**	50%	1	2	Pyloric Caeca
***Bucephalus baeri* Maillard et Saad-Farès, 1981**	40%	3,3	8,25	Rectum
***Bucephalus minimus* (Stossich 1887)**	50%	12,8	25,6	Intestine
Cestoda : Tetraphyllidea (Larval stage)	50%	1,1	2,2	Œsophagus, Stomach, Intestine
Nematoda (Larval stage L4)	60%	1	1,66	
***Hysterothylacium aduncum* (Rudolphi, 1802)**				Stomach, Intestine, Rectum

4. DISCUSSION

All identified parasites *Diplectanum aequans*, *Serranicotyle labracis*, *Cainocreadium labracis*, *Bucephalus labracis*, *Bucephalus baeri*, *Bucephalus minimus*, larval stage of Tetraphyllidea and larval stage L4 of *Hysterothylacium aduncum* are reported in the European and the Mediterranean areas as well as in intensive farming off-shore cages [27, 38, 39, 40].

Collected from only two hosts, *Diplectanum aequans* and *Serranicotyle labracis* are less frequent on the gills of *D.labrax* and should be considered as rare species. In fact, rare species have a prevalence of less than 6% whereas satellite species show a higher prevalence of 6% to 40% [41]. *D.aequans* and *S.labracis* are reported in *D.labrax* in the Mediterranean Sea [10], in Golfe du Lion [13], Portugal [16], Corsica [18], Italy [42, 43] and Turkey [44]. *Diplectanum aequans* and *Diplectanum laubieri* are also reported in *D.labrax* in the Mediterranean area [8, 15], parasitizing the gills of its host [17, 18, 45]. According to Mladineo [46] *D.aequans* is the most prevalent and abundant parasite in intensive farming in the Adriatic Sea. In Sardinia, Merella & al. [40] indicate that its prevalence ranges from 24,2% to 80,2% and that the highest occurrence (80,2%) is recorded during the cold season. In confined breeding conditions such as in off-shore cages, *D.aequans* can infest several hosts and reach high levels of

infestation [18, 47] leading to severe histopathological changes including hypertrophy, hyperplasia and necrosis of the gills causing mortalities [48]. The occurrence recorded during this survey for *D.aequans* (20%) and *S.labracis* (10%) in *D.labrax* reflects the low level of parasitism in wild conditions but we should predict serious concern for these two parasites in intensive farming conditions as mentioned in the literature [18, 40, 46, 47].

On the other hand, most digeneans have an unremarkable shape that gives very little indication to their identity [49]. Although that Bucephalidae specimens have distinct taxonomic features [50], *Bucephalus baeri* and *Bucephalus labracis* look like each other and have the same size and can be distinguished by the length of their excretory vesicle [9]. Moreover, *Bucephalus minimus* can be easily recognized from the others through its globular shape and its straw-yellowish eggs [6, 7, 5]. It is known that digeneans (larval or adult stages) can be found in various organs in their hosts (intestine, liver, muscles, eyes ...). In fishes, Cribb [49] indicate that digeneans are primarily parasites of the gut but they also occur under the scales, on the gills, in the swim bladder, body cavity, urinary bladder, gall bladder, flesh, ovary and circulatory system.

Cainocreadium labracis and *Bucephalus minimus* are generally found in the intestine. Rare amongst our samplings, *Bucephalus labracis* was exclusively located in the pyloric cæca whereas *Bucephalus baeri* was found in the rectum. This distribution suggests an inter-specific competition [**7**] between *Bucephalus labracis, Bucephalus baeri, Bucephalus minimus* and *C. labracis* which occupy different micro-habitat. In this survey, *C.labracis* exhibits the highest prevalence and *B.baeri* the highest mean intensity but no pathological symptoms were observed in the investigated fishes.

Species of the genus *Cainocreadium* display a very high specificity for their hosts. *C.labracis* was reported in 1989 as the only known species in the western Mediterranean [12] and specific to *D.labrax* [24]. However, *Cainocreadium dentecis* was described in the same area and defined as specific to *Dentex dentex* [21]. In open waters, *D.labrax* is not infested by digeneans [52]. Nevertheless, in Mellah Lagoon at El Kala National Park, the presence in *D.labrax* of *Acanthostomum imbutiforme*, actually *Timoniella imbutiforme*, is confirmed [35].

Concerning Tetraphyllideans, adult stages are known to have a large geographical distribution parasitizing various fishes [53, 54] predominantly in the spiral intestine and the stomach of chondrichthyan fishes essentially all orders of sharks and rays [55]. Nevertheless, similar larval stages of Tetraphyllideans were already found in Italy in *D.labrax* [27]. During this survey, larval stages of Tetraphyllidea were located in the stomach and the intestine of wild *D.labrax* but detailed morphological examination for generic and specific identification was not performed on the specimens. No pathogenic effects were observed neither in the oesophagus, stomach or intestine of the examined fishes. However, there is no indication of induced lesions by Tetraphyllideans in wild or reared *D.labrax* in the consulted literature.

On the other hand, larval stages L4 of *Hysterothylacium aduncum* have already been reported in *D.labrax* in Sète Lagoon [11] and in the Adriatic Sea [46] although that *H.aduncum* is known to have a large geographical distribution in Europe and Asia [56]. Finally, according to various authors, pathogenic effects are mostly linked to Protozoan, Helminth and Crustacean parasites mainly under intensive farming conditions [17, 19, 25, 27, 33, 34, 38, 39, 40, 46]. In this parasitological survey no particular pathogenesis was observed on wild *D.labrax*.

Conclusion

This preliminary survey is a contribution to the knowledge of the Helminth parasites of *D.labrax*. Further parasitical investigation should be undertaken on both wild and reared fishes for a better understanding and monitoring of the threats towards the developing intensive sea farming of *D.labrax* in Algeria. Particular attention will be required for ectoparasitic monogeneans who can lead to severe damage in fish-farming.

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