

Helminths parasites of pompano, *Trachinotus ovatus* (L, 1758) from the harbour Cap Water or Ras El Ma (Mediterranean Coast Of Morocco)

Youssef EL MADHI¹, Taoufik HASSOUNI², Driss LAMRI³, Brahim CHIAHOO⁴, Hassan EL HALOUANI⁵, Youssef EL GUAMRI⁶, Khadija EL KHARRIM⁷, Hajar DARIF⁷, Driss LAMRIOUI⁷, Hicham BARKIA⁷, and Driss BELGHYTI⁷

¹Centre Régional des Métiers d'Éducation et de Formation de Rabat / Khémisset, Maroc

²Centre Régional des Métiers de l'Éducation et de la Formation de Meknès, Maroc

³Centre Régional des Métiers de l'Éducation et de la Formation de Taza, Maroc

⁴Laboratoire de biochimie, nutrition et valorisation des ressources naturelles, Faculté des Sciences, Université Chouaib Eddoukali - El Jadida, Maroc

⁵Laboratoire des Sciences de l'Eau, de l'Environnement et de l'Écologie Faculté des Sciences, Université Mohammed Ier – Oujda, Maroc

⁶Centre Régional des Métiers d'Éducation et de Formation de Marrakech, Maroc

⁷Laboratoire environnement et énergies renouvelables, Faculté des Sciences, Université Ibn Tofail – Kénitra, Maroc

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ABSTRACT: Parasites communities of the pompano, *Trachinotus ovatus* (Linnaeus, 1758) (Pisces; Carangidae) were studied in terms of helminths parasites species composition and with descriptions of prevalence and intensity infection. This pelagic fish is commercial in morocco and is performed on aquaculture.

Between November 2012 to January 2013, 146 specimens were purchased from the harbour of Cap Water or Ras El Ma (Mediterranean Coast Of Morocco) and examined for parasite infection. Four species of helminths parasites were collected and are reported in this work:

Digenean : *Lepocreadium trachinoti* (Wang 1989) ; (Acanthocephala : *Pomphorhynchus françoise* (Golvan and Houin 1963) and *Rhadinorhynchus cadenati* (Golvan 1964); Nematoda : *Camallanus singhi* (Zaidi and khan 1975).

These species were recorded for the first time on the Pompano in Mediterranean Coast Of Morocco. *Rhadinorhynchus cadenati* was the dominant species with highest prevalence (55, 9%), mean intensity (5, 02) and abundance (6, 81).

KEYWORDS: Helminths, *Trachinotus ovatus*, Prevalence, Mediterranean Coast Of Morocco.

INTRODUCTION

The species of the genus *Trachinotus* considered as potential mariculture candidates (Du and Luo, 2004) The pompano, *Trachinotus ovatus* (Linnaeus, 1758) with a potential value for aquaculture has importance for the future development of the aquaculture industry according to (Chervinski, J. and Zorn, 1973). *Trachinotus ovatus* has essential importance for the future development of the aquaculture industry in USA, Venezuela, the Dominican Republic, Bresil and Israël. Which culminated in several intensive, There is some aquaculture experience in Israel (Chervinski and Zorn 1973) and China (Zhang and al 2000).

However, the parasites represent a serious problem on aquaculture of fish. The disease of infection slackening growth and increase mortality in fish, therefore, is a limit factor on succes aquacol farm ((Jeong-Ho 2002, Montero 2003). This lead imporatant to know these parasites (Barnabé and Sillard 1986, Belghyti, 1996)..

The presence of these parasites frequently results in a general debilitation of their fish hosts, this being reflected in a decrease in fish resistance against various infections and the unfavourable infleuence of the envirenement, resulting in immediate decrease in yields in term of fish production. By other hand, it is worth mentioning that, in some regions, fish parasites also represent an important public health problem, because fish may be a source of serious diseases of man (Chou, R. and Lee, H. B. (1997).

In morocco, Carangidae fish are present and commercial (7000 tons/year) but very little is known about their parasites. The objectifs of This paper presents was to determine the helminths parasites, prevalence, abundance and mean intensity of pompano observed in the harbour of Cap Water of Mediterranean Coast Of Morocco and with reference to their pathogenic potential.

MATERIAL AND METHODS

Monthly sample of *Trachinotus ovatus* were purchased from the harbour of Cap Water between November 2012 to January 2013, 146 specimens with total lenght ($8,1\text{cm} \leq \text{TL} \leq 30,2\text{cm}$) were examined for parasite infection. The determinations of host fish were using the key of Lioris and Rucubado (1998).

In the laboratory, for parasites were examined under a light microscope anfdixed with AFA, stored with 70% ethanol, stained in Mayer's haematoxylin, deshydrated through a graded series of ethanol solution, cleared in xylin and monted in Canada balsam.

The digestive tract was opened longitudinally; the contents were examined under a light microscope. Digenea were fixed with AFA, colored in acetic carmine after deshydration in the set of alcohol 70, 80, 85, 90, 95 and 100% (Amato, 1994). Then resolved with alcohol-xylen and xylen and monted in Canada balsam. The Nematodes and Acanthocephale were fixed in liquid of Bouin and mounted in Glycerin-Gelatin (William et al 1998).

The prevalence, abundance and mean intensity were calculated according to (18). Relative dominance was calculated according to Bush et al 1997.

Identification of the parasites was based on morphology and dimensions are given in micrometre. Parasites systematic was done according to Golvan, (1969) Margolis & kabata (1984) Moravec (1994) and was done according to Euzet & Ktari (1970), Wang (1989), Zaidi and khan (1975), Hayward & Rohde (1999)

RESULTS

An parasitological investigation on pompano, *Trachinotus ovatus* (L, 1758) from harbour of Cap Water of Mediterranean Coast Of Morocco revealed the presence of four species of helminths parasites.

One species of Digenean (*Lepocreadium trachinoti*); two species of Achantoccephalan (*Pomphorhynchus françoise* and *Rhadinorhynchus cadenati*) and one species of Nematoda (*Camallanus singhi*).

The epidemiological index (Prevalence, Abundance, Mean intensity) are presented for each parasite population in Table 1.

A total of 431 parasites specimens were harvested. All fish harboured from one or more parasite species and the mean intensity of species per host was $5,91 \pm 1,26$ (SD). *Rhadinorhynchus cadenati* observed in all year, was the dominant species (Fig. 1) with 241 specimens (55, 9%) (125 males and 116 females) and all stad development was detected (mature and immature). But only 27 specimens of *Pomphorhynchus françoise* collected. On other hand, the Digenean and Nematoda were observed low. A total of 10 *Camallanus singhi* were collected from the anus and pyloric ceca and the intensity of infection was very low ($1,35 \pm 0,11$).

DISCUSSION

This study presented the structure of the *T. ovatus* parasites helminths communities from Cap Water of Mediterranean Coast Of Morocco (four endoparasites). The *Rhadinorhynchus cadenati* and *Pomphorhynchus françoise* discribed in the study

showed similarity with the species described by Golvan, 1969. For *R. cadenati* a dominant species with high prevalence and intensity values of infection can that intermediates hosts is abounding in Cap Water of Mediterranean Coast Of Morocco.

The Nematoda *Camallanus singhi* and Trematoda *Lepocreadium trachinoti* showed similarity with species described by Zaidi et Khan (1975) and Wang (1989) respectively.

The parasitic infection was a common problem in fish on aquaculture Boyce (1979). According to Dezfuli (1991) the acanthocephalans attach to the gut using an eversible spiny proboscis and penetrate the gut wall, causing a pronounced host inflammatory reponse. The proboscis of Genus *Rhadinorhynchus* was long and their displacement in fish intestine causing the formation of inflammatory nodules (Oliva et al, 1990). The trunk of genus *Pomphorhynchus* proceeding the damage to the epithelial lining of the fish intestine according to McDonough (1981) For aquaculture, the low prevalence of *Camallanus singhi* was positive factor, Petter et al, (1974) suggest this genus was aquacultur noxious and was restricted to the mucosal layer causing complete destruction of the columnar epithelium. According to Jeong-Ho (2002), the *Camallanus cotti* (guppy) of *Tetrahymena corlissi* in tropical fish farm, mortality reached up to 30%. The Mongeans infection was associated with pathology of the *Trachinotus*, the exemple: In cultured marine fishes of pompano *Trachinotus falcatus* L. from Singapore proceeding gill disease associated with *Paramoeba* sp (Monogean) (Athanasopoulou, et al, 2002).

In conclusion, none of the pompano from Cap Water of Mediterranean examined were free of helminths and prevalence of parasites in *T. ovatus* fishes is high. However, the impact of the parasitic infection was not investigated and further studies are needed in order to determine to which extent the infections influence mortality and performance of the pompano, *Trachinotus ovatus* on aquaculture.

Table 1. Data about parasites of the pompano, *T. ovatus* (L, 1758) from the harbour of Cap Water or Ras El Ma (Mediterranean Coast Of Morocco)

Parasites	Parametrs	Prevalence (%)	Mean intensity (parasites per fish)	Mean Abundance	Organ infected
<i>Lepocreadium trachinoti</i>		2,28	1,70±1,3	0,09±0,20	Operculum
<i>Pomphorhynchus françoise</i>		8,17	3,52±1,42	0,32±0,21	Intestine
<i>Rhadinorhynchus cadenati</i>		55,9	6,37±4,38	4,02±1,95	Intestine
<i>Camallanus singhi</i>		1,96	1,26±0,25	0,03±0,01	Pyloric ceca + Anus

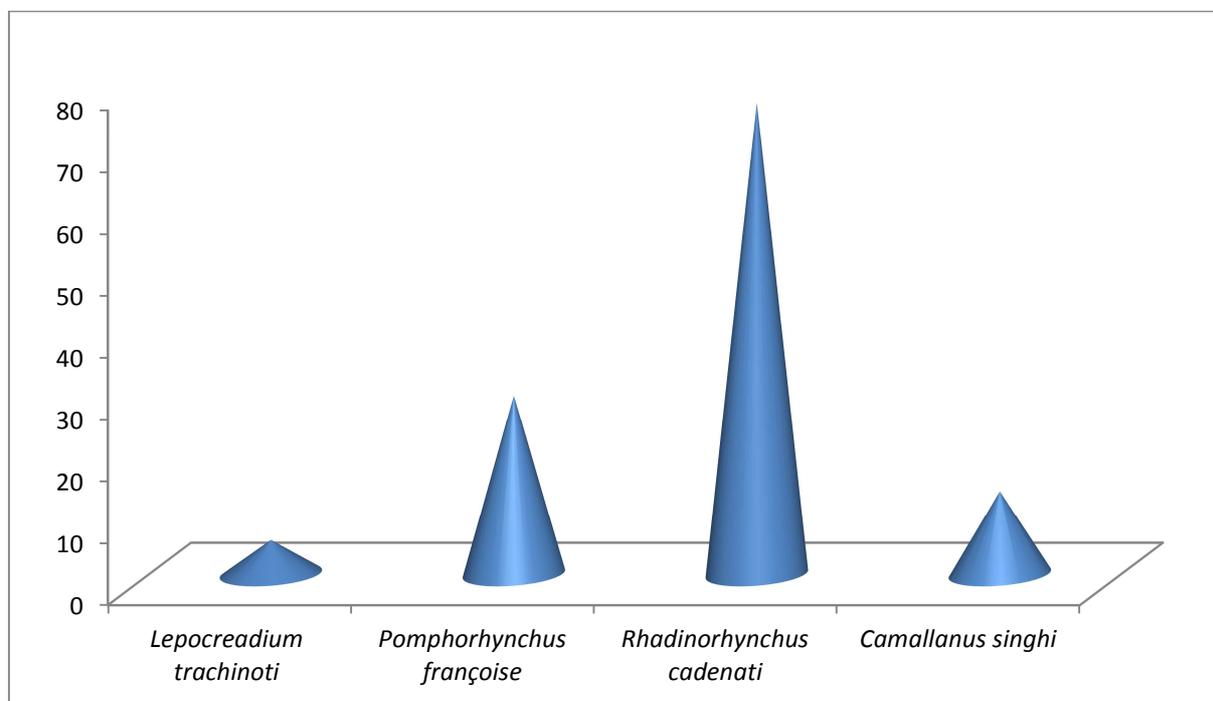


Fig. 1: Relative dominance of parasites of the pompano, *T. ovatus* (L, 1758) from the harbour of Cap Water or Ras El Ma (Mediterranean Coast Of Morocco)

REFERENCES

- [1] Athanassopoulou, F., Cawthorn, R. and Lytra, K. (2002). Amoeba-like infections in cultured marine fish: systemic infection in pompano *Trachinotus falcatus* L. from Singapore and gill disease associated with *Paramoeba* sp. in sea bream *Sparus aurata* L. from Greece. *J Vet Med B Infect Dis Vet Public Health* 49(8):411-2.
- [2] Bush, A. O., Lafferty, K.D., Lotz, J. M. and Shostak, A.W. (1997). Parasitology meets ecology on its own terms: Margolis et al. revisited. *Journal of Parasitology*, 83 : 575–583.
- [3] Chervinski, J. and Zorn, M. (1973). Pompano, *Trachinotus ovatus* L. (Pisces, Carangidae) and its adaptability to various saline conditions. *Aquaculture* 2(3): 241–244.
- [4] Chou, R. and Lee, H. B. (1997). Commercial marine fish farming in Singapore. *Aquaculture Research* 28(10): 767–776.
- [5] Cole, W. M., Rakocy J.E., Shultz, K. A. and Hargreaves, J. A. (1997). Effects of feeding four formulated diets on growth of juvenile palometa, *Trachinotus goodei*. *Journal of Applied Aquaculture* 7(2): 51–60.
- [6] Dezfuli, B. S. (1991). Histopathology in *Leuciscus cephalus* (Pisces: Cyprinidae) resulting from infection with *Pomphorhynchus laevis*. *Parassitologia* 33 (2-3):137-45.
- [7] Du, Tao. and Luo, Jie. (2004). Comparison study on artificial breeding between *Trachinotus ovatus* And *Trachinotus blochii*. *Marine sciences Vol. 28, no. 7*: 76-78.
- [8] Francisco, E. M., Silvia, C. F., Padrós, F. G., Antonio, G. and Juan, A. Raga. (2003). Effects of the gill parasite *Zeuxapta seriola* (Monogenea: Heteraxinidae) on the amberjack *Seriola dumerili* Risso (Teleostei: Carangidae). *Aquaculture* 232(1-4) : 153-163
- [9] Gaspar, A. G. (1997). Selección de peces marinos para cultivos intensivos en el nororiente de Venezuela. Proceedings of the Gulf Caribbean. *Fisheries Institute* 50: 503–512.
- [10] Golvan, J. (1969). Systématique des Acanthocéphales (*Acanthocephala Rudolphi*, 1810). Paris : Mém. Mus. Nat. hist. Nat, 1969 ; fascicule unique 37p.
- [11] Hayward, C.J. and Rohde, K. (1999). Revisions of the monogenean family Gotocotyliidae (Poyopisthocotylea). *Invertebrate taxonomy. Melbourne.13*: 425-460,92 figs, 2tabs.
- [12] Heilman, M. J. & Spieler ; R.E. (1999). The daily feeding rhythm to demand feeders and the effects of timed meal-feeding on the growth of juvenile Florida pompano, *Trachinotus carolinus*. *Aquaculture* 180: 53–64.
- [13] Jeong-Ho, K., Craig, J. H. and Gang-Joon, H. (2002). Nematode worm infections (*Camallanus cotti*, Camallanidae) in guppies (*Poecilia reticulata*) imported to Korea. *Aquaculture* 205 (3-4): 231-235.
- [14] Lazo, J. P., Davis, D.A. and Arnold C.R. (1998). The effects of dietary protein level on growth, feed efficiency and survival of juvenile Florida pompano (*Trachinotus carolinus*). *Aquaculture* 169(3-4): 225–232.
- [15] Lioris, D. and Rucabado, J. (1998). Guide d'identification des espèces pour les besoins de la pêche. Guide d'identification des ressources marines vivantes du Maroc. Barcelona. 282pp.
- [16] Molnar, K. and Szekely, C. (2004). Occurrence and pathology of *Sinergasilus lieni* (Copepoda: Ergasilidae) a parasite of the silver carp and bighead, in Hungarian ponds. *Acta Vet Hung.* 52(1):51-60.
- [17] Petter, A. J., Cassone, J. and France, B. M. (1974). A new pathogenic nematode *Camallanus* in fancy fishes breedings. *Ann Parasitol Hum Comp ;* 49(6):677-83.
- [18] Zaidi, D.A. and Khan, D. (1975). Nematode parasites from fishes of Pakistan. *Pakistan Journal of Zoology.* 1975. 7:1, 51-73.
- [19] Zhang, Q., Hong, W. and Shao, K. (2000). Studies on the taxonomic characters of *Trachinotus ovatus* and *Trachinotus blochii* from net cage mariculture. *J Oceanogr Taiwan Strait* 19(4): 497–505.
- [20] Wang, P.Q. (1987). Digenetic trematodes of marine fishes in pingtan county Fujian Province South China. *Wuyi science journal.*7: 151-163.11.
- [21] Sures, B., Dezfuli, B. S. and Krug, F. (2003). The intestinal parasite *Pomphorhynchus laevis* (Acanthocephal) interferes with the uptake and accumulation of lead (²¹⁰ Pb) in its fish host chub (*Leuciscus cephalus*). *International journal for parasitology* 33 : 1617-1622.