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**The influence of parasites on the  
population status of the European eel,  
*Anguilla anguilla* L.**

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There has been a significant decline in *Anguilla anguilla* throughout its distribution range in the last decades (Haenen et al., 2012). The causes of this decline are yet unclear but are thought to involve multiple environmental and anthropogenic factors. Eel parasites, mainly invasive ones, namely *Anguillicoloides crassus* and *Pseudodactylogyrus* spp., are suspected to play an important role in the eel decline (ICES, 2014).

In our Laboratory several surveys were conducted in eels collected in northern Portuguese rivers (Lima, Cávado, Ave, Douro and Vouga) since the 1980s. A total of 1097 eels were collected by electrofishing or acquired from fishermen and examined for the presence of parasites. A total of 28 parasite species were detected from which 15 are specific to eel host. The detected species are the following:

PROTISTA (Saraiva and Chubb, 1989; Saraiva and Eiras, 1996; Cruz and Eiras, 1997; Cruz and Davies, 1998)

*Ichthyophthirius multifiliis* Fouquet, 1876

*Trichodina jadratica* Raabe, 1958

*Trypanosoma granulorum* Laveran & Mesnil

*Babesiosoma bettencourti* (França, 1908);

MYXOZOA (Saraiva and Chubb, 1989; Saraiva and Molnár, 1990; Saraiva and Eiras, 1996; Hermida et al., 2008)

*Myxidium giardi* Cépède, 1906

*Myxobolus portucalensis* Saraiva & Molnár, 1990

*Hoferellus gilsoni* (Debaisieux, 1925)

*Zschokkella stettinensis* Wierzbicka, 1987;

MONOGENEA (Saraiva and Chubb, 1989; Saraiva, 1995; Rodrigues and Saraiva, 1996; Saraiva and Eiras, 1996; Hermida et al., 2008)

*Pseudodactylogyrus anguillae* (Yin & Sproston, 1948)

*Pseudodactylogyrus bini* (Kikuchi, 1929)

DIGENEA (Hermida et al., 2008)

*Lecithochirium rufoviride* (Rudolphi, 1819)

*Helicometra fasciata* (Rudolphi, 1819)

*Podocotyle* Dujardin, 1845

*Deropristis inflata* (Molin, 1859)

CESTODA (Saraiva and Eiras, 1996; Saraiva et al., 2005; Hermida et al., 2008)

*Bothriocephalus claviceps* (Goeze, 1782)

*Proteocephalus* Weinland, 1858;

NEMATODA (Saraiva and Chubb, 1989; Saraiva and Eiras, 1996; Cardoso and Saraiva, 1998; Saraiva and Moravec, 1998; Saraiva et al., 2002; Saraiva et al., 2005; Hermida et al., 2008)

*Anisakis simplex* (Rudolphi, 1809)

*Contracaecum* Railliet & Henry, 1912

*Cucullanus truttae* Fabricius, 1794

*Paraquimperia tenerrima* (Linstow, 1878)

*Pseudocapillaria tomentosa* (Dujardin, 1843)

*Rhabdochona anguillae* Spaul, 1927

*Spinitectus inermis* (Zeder, 1800)

*Anguillicoloides crassus* (Kuwahara, Niimi & Itagaki, 1974);

ACANTHOCEPHALA (Saraiva and Eiras, 1996; Saraiva et al., 2005; Hermida et al., 2008)

*Acanthocephalus clavula* Dujardin, 1845

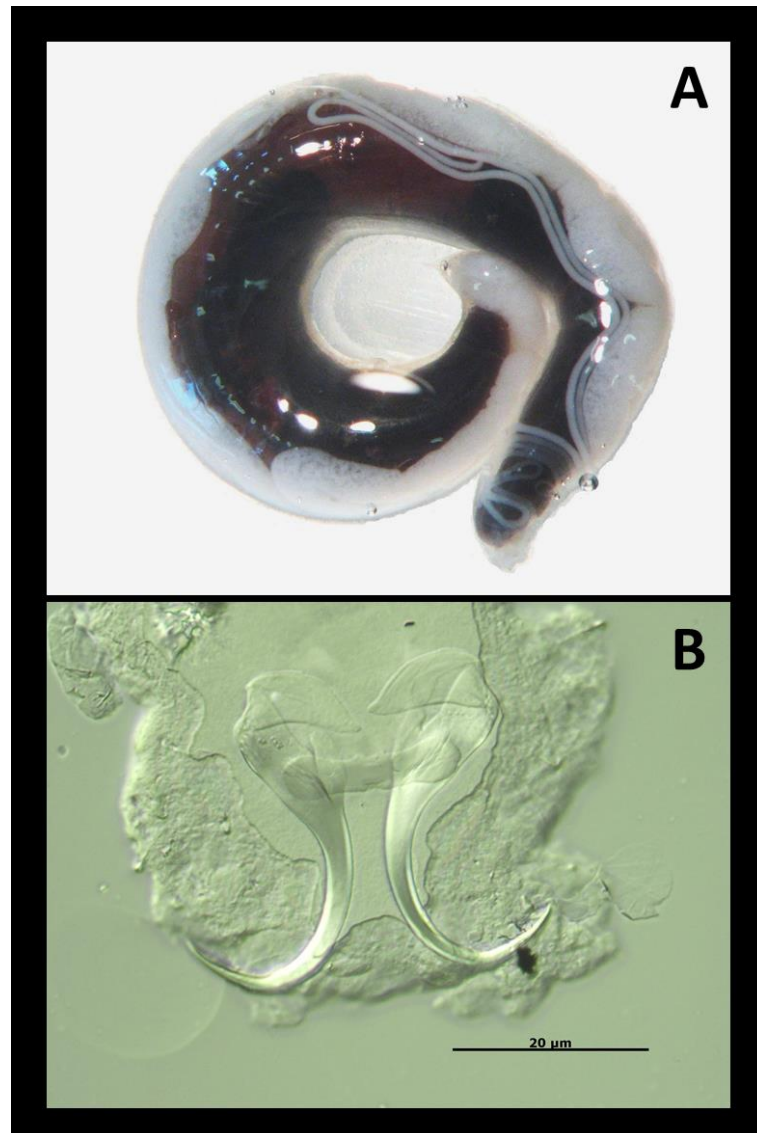
*Pomphorhynchus laevis* (Zoega in Müller, 1776);

CRUSTACEA (Saraiva and Chubb, 1989; Saraiva and Eiras, 1996; Hermida et al., 2008)

*Ergasilus gibbus* Nordmann, 1832

Gnathiidae Leach, 1814.

Some of these parasites can cause several problems on the European eel. From all detected parasites the nematode *A. crassus* (Fig.1A), parasite of the swimbladder, was presumably the most deleterious. It causes swimbladder wall thickening and strong histological changes (hemorrhage, inflammation, necrosis and exudates) causing functional impairment and probably influencing the ability of eels to migrate to their spawning grounds in the Sargasso Sea (Cardoso and Saraiva, 1998). Mass mortalities of eel in Lake Balaton, Hungary were attributed to this parasite (Molnár et al., 1991). Additionally, the monogeneans *Pseudodactylogyrus anguillae* (Fig.1B) and *P. bini* can cause respiratory impairment (hyperplasia, secondary lamella fusion and sometimes hyperaemia) especially when other gill parasites and/or polluted waters are present with potential to compromise eel health and fitness (Saraiva, 1995).



**FIGURE 1.** A: Female of *Anguillicoloides crassus* removed from an eel swimbladder. B: Attaching organ of *Pseudodactylogyrus anguillae*. Photographs by A. Saraiva.

#### CITED REFERENCES

- Cardoso, E., and Saraiva, A. (1998). Distribution and seasonal occurrence of *Anguillicollla crassus* (Nematoda: Dracunculoida) in the european eel *Anguilla anguilla* L. from rivers of north Portugal. *Bull Eur Ass Fish Pathol* 18, 1-4.
- Cruz, C., and Davies, A. (1998). Some observations on *Babesiosoma bettencourti* (Franca, 1908) n. comb. (syns. *Haemogregarina bettencourti* Franca, 1908; *Desseria bettencourti* Siddall, 1995) from eels, *Anguilla anguilla* L., in Portugal. *J Fish Dis* 21, 443-448.
- Cruz, C., and Eiras, J. (1997). Prevalence of *Trypanosoma granulorum* in *Anguilla anguilla* in Portugal. *Bull Eur Ass Fish Pathol* 17, 126-128.
- Haenen, O., Mladineo, I., Konecny, R., Yoshimizu, M., Groman, D., Munoz, P.,

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- Saraiva, A., Bergmann, S., van Beurden, S. (2012). Diseases of eels in an international perspective: Workshop on Eel Diseases at the 15th International Conference on Diseases of Fish and Shellfish, Split, Croatia, 2011. *Bull Eur Ass Fish Pathol* 32, 109-115.
- Hermida, M., Saraiva, A., and Cruz, C. (2008). Metazoan parasite community of a European eel (*Anguilla anguilla*) population from an estuary in Portugal. *Bull Eur Ass Fish Pathol* 28, 35.
- ICES (2014). *Report of the Joint EIFAAC/ICES/GFCM Working Group on Eel*. In ICES CM 2014/ACOM:18.
- Molnár, K., Székely, C. & Baska, F., (1991). Mass mortality of eel in lake Balaton due to *Anguillicola crassus* infection. *Bull Eur Ass Fish Pathol* 11, 211 - 212.
- Rodrigues, A., and Saraiva, A. (1996). Spatial distribution & seasonality of *Pseudodactylogyrus anguillae* & *P. bini* (Monogenea: Pseudodactylogyridae) on the gills of the European eel *Anguilla anguilla* from Portugal. *Bull Eur Ass Fish Pathol* 16, 85-88.
- Saraiva, A. (1995). *Pseudodactylogyrus anguillae* (Yin & Sproston, 1948) Gussev, 1965 and *P. bini* (Kikuchi, 1929) Gussev, 1965 (Monogenea: Monopisthocotylea) in Portugal. *Bull Eur Ass Fish Pathol* 15, 81-83.
- Saraiva, A., Antao, A., and Cruz, C. (2005). Comparative study of parasite communities in European eel *Anguilla anguilla* from rivers of northern Portugal. *Helminthologia* 42, 99-106.
- Saraiva, A., and Chubb, J. (1989). Preliminary observations on the parasites of *Anguilla anguilla* (L.) from Portugal. *Bull Eur Ass Fish Pathol* 9, 88-89.
- Saraiva, A., and Eiras, J. (1996). Parasite community of European eel, *Anguilla anguilla* (L.) in the river Este, northern Portugal. *Res Rev Parasitol* 56, 179-183.
- Saraiva, A., and Molnár, K. (1990). *Myxobolus portucalensis* sp. n. in the fins of the European eel *Anguilla anguilla* L. in Portugal. *Revista Ibérica de Parasitología* 50, 31-35.
- Saraiva, A., and Moravec, F. (1998). Redescription of *Rhabdochona anguillae* (Nematoda: Rhabdochonidae), a parasite of eel, *Anguilla anguilla*, in Europe. *Folia Parasitol (Praha)* 45, 233-238.
- Saraiva, A., Pereira, A., and Cruz, C. (2002). Observations on the occurrence and maturation of *Spinitectus inermis* (Nematoda: Cystidicolidae) in the Sousa River, Portugal. *Folia Parasitol (Praha)* 49, 167-168.