

SEA LAMPREY, *Petromyzon marinus*, AMMOCOETE

MOVEMENTS IN THE SUBSTRATE

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EXTENDED ABSTRACT ONLY – DO NOT CITE

Sea lamprey, *Petromyzon marinus*, is highly appreciated in Portugal and consequently submitted to an intense fishery during upstream reproductive migration in the rivers where natural populations still subsist.

Sea lamprey life cycle is well documented, but it is comprehensible that the knowledge about ammocoete behaviour during the burrowing phase is scarce (see Hardisty and Potter, 1971; Hardisty, 1979).

Habitat destruction (water pollution and sand extraction) is pointed out as a major factor affecting the sea lamprey populations by its effect on the ammocoete fraction of the populations.

Such threats might be specially negative for sea lamprey populations if we consider the length of the ammocoete burrowing phase. Consequently the understanding of the ammocoete behaviour during the burrowing phase is of enormous interest both in a management and in conservation perspective.

As referred by Hardisty and Potter (1971) the study of the larval behaviour is difficult except when thin section aquaria or artificial substrates are used. But even using thin section aquaria we have found that the amount of information that can be obtained by direct observation of the ammocoetes is rather reduced.

In order to obtain information on the ammocoete movement patterns during the borrowing phase we used a thin section aquarium (60x30x3 cm) with a sandy substrate very similar to the natural one (Young *et al.*, 1990).

A PIT tag was surgically implanted in the anterior part of the abdominal cavity of six ammocoetes (mean length - 12.69 cm and mean weight - 2.65 g). During two five days trials in consecutive weeks the position of each ammocoete was registered every hour. Mean temperature during the trials was 23.1 °C (22-24 °C) is similar to the registered in the river Estorãos (Lima basin), where ammocoetes were caught (Carneiro & Valente, personal communication). Water velocity in the aquarium section was 0.4 cm.s⁻¹.

Almost all ammocoete activity (99.29 %) (Figure 1) was restricted to the upper 4.5 cm of the substrate. Even considering that the PIT tag was implanted in the anterior third of the body, this means that sea lamprey only in exceptional occasions is found deeper.

The only observed behaviour at the substrate surface was the formation of the typical conical depressions (Hardisty, 1979) that reveals the ammocoete mouth position. Such behaviour occurs during all the 24 hour period but with more intensity during the daylight period (57%).

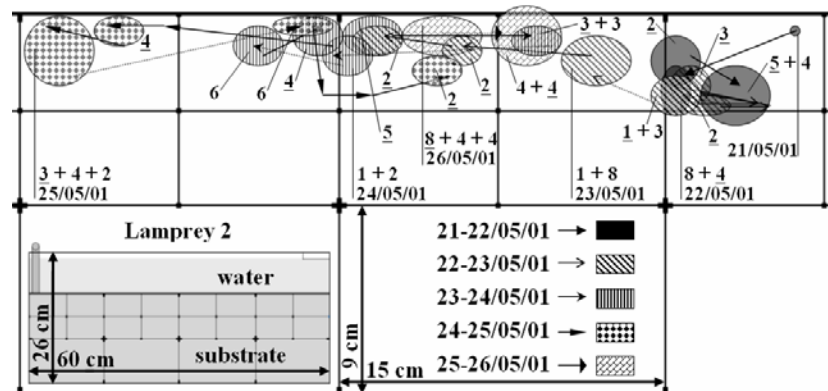


Figure 1 – Scheme with part of the frontal view of the aquarium showing the movements of one of the sea lamprey ammocoetes during a five day trial. In the left lower corner a general scheme of the aquarium. Closed areas represent sites where ammocoetes were detected in two or more consecutive occasions and represents possible detection errors. Underlined numbers indicate time (n. of hours) spent in any location during day time and the other during night time. Arrows with

continuous line represent movements during day time and arrows with discontinuous line represent movements during night.

Another important observation, which is in disagreement with the literature (Enequist, 1937 cited by Hardisty, 1979; Sterba, 1962 cited by Hardisty & Potter, 1971), is the high mobility of most of the ammocoete in this upper substrate layer. As evidenced in figure 1 most ammocoete move inside the substrate without leaving it; surface activity was a rarely observed behaviour.

The burrowing activity registered during the two trial showed that ammocoetes may move during all the 24 h period, but are more active during the illuminated period (Table 1). Only one ammocoete showed more activity during the night (ammocoete number 5 in Table 1), but this was the lamprey that exhibited less mobility during both trials.

In spite of all the work analyzing sea lamprey ammocoete behavior and preferences in the wild, none focused, as far as we know, in the burrowing behavior and movement patterns in the substrate.

Lamprey	Day	Night
1	64,44	35,56
2	55,81	44,19
3	60,00	40,00
4	60,42	39,58
5	44,83	55,17
6	58,33	41,67
Mean	58,20	41,80

Table 1 – Mean activity of each ammocoete during day and night (in percentage) during a five day trial.

Our work proves that new technologies, such as the use of PIT tags, might be used to further enlighten our knowledge on the sea lamprey ammocoete behavior.

It is evident in our results that ammocoetes use only a thin upper layer of the river bottom.

Sea lamprey ammocoetes seem to be very active in the substrate and do not assume a static or immobile feeding position in the substrate. On the

contrary the majority seem to be very active, and such activity occurs along the 24 hour period.

Acknowledgements

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Reference

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