

Impact of pit-tagging on behaviour, growth and survival in Alpine newts, *Mesotriton alpestris*

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Passive integrate transponder devices allow investigations into physiological, ecological and behavioural traits of many animals, included newts. This marking technique gives a more reliable assessment than the most usual other marking techniques because of its unique permanent code and inside insertion. Nevertheless, it is important to evaluate its potential invasive effects on several traits. Because most studies evaluated the impact on recovery, mortality and growth, we aimed at measuring additional patterns at a more detailed scale, i.e. behaviour. We compared survival, growth and behaviour of 16 pit-tagged and 16 unmarked adult Alpine newts *Mesotriton alpestris* in the laboratory. The size of the newts was taken at the beginning and at the end of experiment. To quantify behaviour, we applied replicated visual observations in the aquaria and carried out video-tracking analyses in specific arenas. All the individuals survived to the implantation and recovered from tag injection. During the study, pit-tagged newts had a significant lower growth than unmarked newts. The visual observations showed no significant impact of tag on feeding and courtship behaviours. However, we noted a slight difference in shelter use in marked newts. The video-tracking analyses did not highlight any significant effects on movement, distance and speed. In conclusion, despite some slight differences between marked and unmarked newts, this technique is not destructive and has no major invasive effects. This study shows that more studies should integrate quantitative behavioural analyses to estimate the adequateness of methodologies and that further works are needed on the effects of pit-tagging.

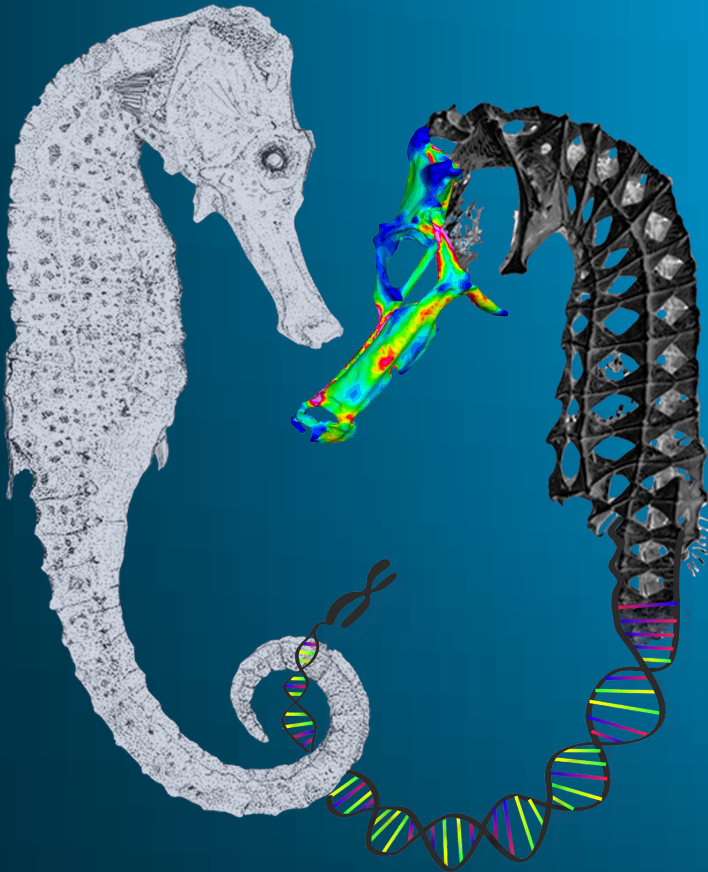
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