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Genetical and hormonal monitoring of otters *Lutra lutra* by analysis from spraints

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1. Introduction

The European otter *Lutra lutra* became extinct in The Netherlands in 1988. In combination with habitat destruction and fragmentation, environmental contaminants such as pesticides and polychlorinated biphenyls (PCBs) have been identified as a major cause. In the near future, otters will be re-introduced. Alterra is responsible for the scientific accompanying of the re-introduction. Part of this program is to develop a non-invasive method to monitor the genetical and reproductive status of otters in the field. Based on the available literature it is proposed to analyse excrements. Except for elimination of food remains, otter excrement, the so-called spraints, have a social function in scent communication and are dropped therefore at striking points, which makes them easy to find.

2. Hormonal analyses

One of the mechanisms of action of pesticides and PCBs is the modulation of endocrine pathways that may result in disturbed hormonal homeostasis, and affect growth and reproduction. Therefore a monitoring strategy will be developed to assess exposure and effects of environmental contaminants by analysing hormone metabolism in otters. Progesterone, estrogenes, androgenes and their metabolites can be detected in spraints, and their concentrations differ between sexes and between phases of the breeding cycle so that levels of progesterone and androgenes indicate the gender and, in females, pregnancy (Tschirch *et al.* 1996).

3. Genetical analyses

To find out who is the owner of a spraint, genetic analysis has to be done. Excrements contain cells shed from the intestinal lining; thus DNA from the host itself can be isolated and analysed. DALLAS & PIERTNY (1998) have developed primers for 13 highly polymorphic microsatellites in otters *Lutra lutra*. Microsatellites are simple sequence repeats, very variable and co-dominant. This makes them ideal for analysing the population structure, determine genetic variation and recognising individuals (KOHN & WAYNE 1997). At ALTERRA microsatellite analysis will be optimised and validated to use spraints as source for DNA. Because of the great amount of bacterial DNA and inhibitors in excrements, there are limitations for this technique (TABERLET *et al* 1999). By improving the methodology these difficulties will probably be overcome.

4. Conclusion

Analysing hormone concentrations in spraints is suggested as a non-invasive and practical method to monitor possible effects of environmental contaminations on the reproductive status of free ranging individuals. It can also be used to examine the complex reproductive biology of otters. Microsatellite analysis from spraints is a practical method of identifying the owner of a spraint. Besides that it can be used for monitoring population dynamics and gene flow in otter populations. Compendiously, analysing hormones and DNA from excrements is a promising method, which can be used to examine a wide scale of ecological questions.

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