<u>日時</u> 6月18日(火) 15:00~16:00

場所 苫小牧研究林 講堂

Wonderful gilled newts. Eco-ethology and conservation of a polyphenism, facultative paedomorphosis.

(驚くべき、鰓のあるイモリ:条件依存的な幼形成熟の生態行動学と保全学)

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During their life cycle, newts usually undergo a metamorphosis that makes the transition between the aquatic gilled larval stage and the terrestrial metamorphosed stage. One of the characteristics of this shift is the resorption of the gills and the closure of gill slits. However, in some populations, whereas some individuals metamorphose, others retain their larval features while acquiring sexual maturity, a heterochronic pattern known as facultative paedomorphosis and thought to play an important role in both ecology and evolution.

Facultative paedomorphosis is a polyphenism in which alternative phenotypes are produced in response to environmental cues. Although paedomorphs are often associated with deep alpine lakes, they can also be present in semi-permanent ponds. In such risky habitats, paedomorphs can avoid detrimental waters by transforming into metamorphs, the dispersal phenotype. Being paedomorphs in such risky conditions remains advantageous as it allows an early reproduction (i.e. progenesis), yet at the price of low reproductive pay-offs. This does not preclude large gene flows across phenotypes, which can favour their persistence. Female biased sex-ratios are yet found in natural populations of paedomorphs, due to the higher metamorphosis rate and lower sexual activity of paedomorphic males.

Coexisting paedomorphs and metamorphs exhibit temporal, spatial and food resource partitioning. Temporal partitioning occurs in sites where metamorphs leave water for land during a part of the year whereas micro-habitat and food specializations are found during their aquatic cohabitation. Their different trophic morphology can explain the different diet patterns but also their preferences for different micro-habitats. This shows that facultative paedomorphosis is a trophic polyphenism and that its selection is not only caused by the advantages of life in water versus on land, but also through an optimal use of aquatic resources.

Sadly, the low number of populations of paedomorphs and their restriction to the aquatic habitat make them particularly vulnerable. There are indeed declining at a very high rate across all their distribution range. For instance, the most remarkable populations of paedomorphs, previously known as subspecies in the Balkans all vanished. The main driver of this decline is

the introduction of alien species, extirpating first paedomorphs and then metamorphs. The only hope is that, being a polyphenism, paedomorphosis shows fast resilience but this is not likely in isolated areas where populations constitute evolutionary significant units. Conservation actions should therefore take place to remove threats and protect the main populations of paedomorphs as a highly valuable part of diversity.

Recent references:

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