

# From one laying to another the female collembolan adapts its eggs to environmental constraints

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Reproductive plasticity – the ability of individuals to modify their reproduction and the characteristics of their progeny according to environmental or social conditions – is a crucial factor in the demographics of animal populations, including man. Two scientists in the Laboratoire Écologie & Évolution (CNRS/Université Pierre et Marie Curie/École normale supérieure de Paris) have demonstrated the adaptive nature of the reproductive behavior of certain arthropods from one laying to another, in the same female.

Thomas Tully and Régis Ferrière, researchers in the Laboratoire Écologie & Évolution, studied populations of Collembola, one of the most ancient and abundant groups of arthropods on Earth. They showed that over the course of evolution, some Collembola populations have acquired an extraordinary ability to adjust their reproductive behavior when faced with abrupt environmental or social change.

From one laying to another, a female can adapt not only the number but the size of her eggs, so that the young will be more capable of surviving in their new environmental conditions. In a food-rich environment, females will tend to lay a larger number of smaller eggs. In a highly competitive environment, where individuals are numerous but food is less abundant, the eggs will be fewer in number but larger, thus allowing larger newborns to survive better under these difficult conditions.

Such flexibility constitutes a major adaptation, but the scientists also noted that the most plastic lines of *Collembola* were also those that experienced the earliest mortality. In this species, two strategies coexist in nature: plastic reproduction at the cost of reduced longevity, or a longer life without any great capacity for reproductive adjustment. Comparison of these two strategies, which diverged at an early stage in the evolutionary history of this species, suggests that accelerated aging could result not simply from more intense reproduction but also from a high level of plasticity and genetic potential for reproduction.

Citation: Reproductive Flexibility: Genetic Variation, Genetic Costs and Long-Term Evolution in a *Collembola* Thomas Tully & Régis Ferrière, *PLoS One*, 15 September 2008

Source: CNRS

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