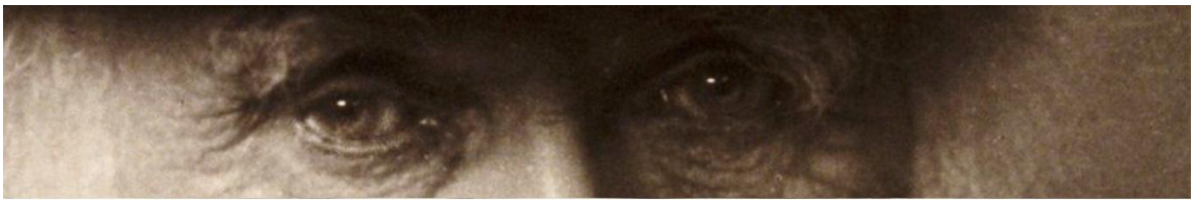

Charles Darwin *In Memoriam*

Evolutionary looks at the why of biological and cultural phenomena.

LEER EN ESPAÑOL

Why do onychophorans and camels need the same gestation time?

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ABSTRACT: **One of the many mysteries surrounding onychophorans, is why, despite their small body size, they have gestation periods that are as long as gestation in some mammals. Here we propose that the causes are infrequent feeding and the Mandatory Minimum Size model, according to which they must be born sufficiently developed to hunt their own food and survive adverse microclimates.**

KEYWORDS: broad gestation, development, low feeding frequency, onychophoran female.

In the zoological world, a rule states that the greater the size of the animal, the longer the time it takes for its gestation, that is why the mouse takes 3 weeks and the elephant needs 2 years, but the case of onychophorans is extraordinary, because eggs usually take 4 to 8 months to hatch, and a case of 17 months to hatch was recorded. In addition, some viviparous species require up to 13 months of gestation, 4 months longer than a human (Havel et al., 1989; Sherbon & Walker, 2004), and as long as the camel (Agarwal, Khanna, Agarwal, & Dwaraknath, 1987).

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Why did such long development periods evolve in such a small worm? Apparently, until now, nobody has proposed a hypothesis to explain this.

On a general level, we know that larger eggs and cold climates require more development time. In aquatic insects, one month is normal; although there are also very long periods in other invertebrates, for example, some crabs need as much time as onychophorans (Gillooly & Dodson, 2000).

In onychophorans, motherhood requires an important development of females, which must invest between 12 and 30 % of their weight in reproduction, so females take a long time to mature and only reproduce when they are between 15 months and 3 years old (Sherbon & Walker, 2004).

A possible reason for their slow development is that the metabolism of onychophorans is slow. This is reflected in low feeding frequency (often once a month). In regions where food is scarce, the energy available for the production of biomass and embryos is reduced and probably inconstant.

Peripatopsid onychophorans, in general, live in less favorable habitats than peripatids, which are tropical. Many peripatopsids live most of their life in familiar nuclei in a single log, or in several logs few meters away; females usually do not leave their tiny home ranges, minimizing desiccation and exposure to predators. But low mobility increases

competition for food and explains the evolution of a marked social hierarchy, in which the largest females feed first.

Here we propose that fluctuating and scarce food prevents the allocation of the abundant resources necessary for a rapid ontological development. This effect is reinforced according to the "Mandatory Minimum Size" model for newborn onychophorans proposed by Monge-Nájera (1994, 1995). According to this model, neonates must have a minimum size to survive physiologically in dry or cold climates, and to be able to hunt. Combining the ideas of scarce food and minimum obligatory size, it is reasonable to think that onychophorans, which must be born sufficiently developed to hunt their own food and survive difficult microclimatic conditions, require such a prolonged gestation.

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