Growing old in the wild

The conventional belief is that animals don't live into old age, but succumb much earlier to "unnatural" causes. Recent research, however, indicates there's old age in the wild, too.

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EVERY living thing was born at some time and must die, sooner or later. True, but the traditional assumption is that animals in the wild never live long enough to grow old. And, while old age is a "natural" cause of death for human beings, animals die earlier of "unnatural" causes.

However, animals kept under labs are known to die of old age. To distinguish between longevity in artificial conditions and in nature, the terms "physiological life span" (for the former) and "ecological life span" (for the latter) are often used.

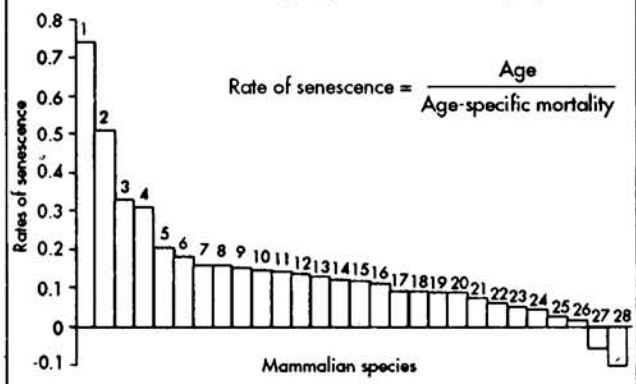
Recent detailed research studies of mammalian populations in the wild and careful statistical analysis of such data by Daniel Promislow of the University of Oxford belie the traditional wisdom concerning old age in the wild. Defining senescence, or ageing, as an increase in the rate of mortality with age, Promislow found significant evidence of ageing in 26 out of 56 wild mammalian populations examined, including the impala, buffalo, sheep, deer, hippopotamus, fox, lion, badger, bear, rabbit, bat, horse, seal, monkey, chimpanzee, elephant, vole and squirrel (See figure).

Ageing is lower in species with large brain size. Animals with large brains relative to their body size, may be able to learn better and live longer — by not falling, prey for example, to other animals.

In addition to finding evidence of ageing in natural populations, Promislow found a number of interesting correlates. Rates of ageing were positively correlated with the number of litters produced per year, the number of offspring produced per year and age at eye-opening and negatively correlated with age at reproductive maturity, inter-litter interval and litter weight. In other words, rates of ageing are high in species with rapid development, short generation time and high fecundity.

Animals also grow old

Evidence of senescence (ageing) in mammalian populations



Rate of senescence is measured as the ratio of age to age-specific mortality. Higher the rate of senescence, more the chance of mortality with increasing age. Occasionally, there are data from two different populations for the same species. 1=Rabbit, 2=Horse, 3=Rodent, 4=Vole, 5=Rabbit, 6=Squirrel, 7=Buffalo, 8=Bat, 9=Sheep, 10=Lion, 11=Water-buck, 12=Impala, 13=Deer, 14=Seal, 15=Buffalo, 16=Sheep, 17=Seal, 18=Badger, 19=Monkey, 20=Chimpanzee, 21&22=Hippopotamus, 23=Bear, 24=Seal, 25=Elephant, 26=Sheep, 27=Badger, 28=Fox.

Source: DEL Pomislow, Evolution.

Promislow also found senescence is lower in species with large brains. It has also been suggested that animals with large brains relative to their body size may be able to learn better and live longer — by not falling prey for example, to other animals.

But there are two findings of Promislow that do not easily fit into established theory. One is that the onset of ageing often begins well after the age of reproductive maturity, which goes against the theory that ageing begins immediately after reproductive maturity. The other is that mortality rates actually decrease significantly with age for species such as the badger and the fox. An answer that Promislow gives to his apparently paradoxical finding is that as animals grow older they may get better at avoiding predators and thereby lower mortality rates. The difficulty with this explanation is that other species also should display similar learning abilities. A more general explanation may be that all animals become "wiser" as they get older because only the relatively better specimens survive and these accumulate useful experiences as they age.

Estimates of rates of ageing, as measured by changes in mortality rates, may thus be underestimating true ageing. This means, of course, that ageing in wild animals may be even more common than Promislow's findings in the case of 26 mammalian populations. It may be comforting to know that the old age problem is not unique to humans. They are a problem in the wild, too! ■

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