



Being too good is not good in nature

By Jo-Anne Nina Sewlal



Darwin's theory of natural selection can be summarized in one phrase "survival of the fittest." An individual is not regarded as fit until their offspring survive and reproduce offspring of their own so that the

genes of an individual are passed to their grandchildren. In order to reproduce, many species have developed strategies to attract mates. However, as we will see, nature has put a limit as to how far or how perfect these mechanisms.

The basic concept of natural selection is that our environment is not static but constantly changing in small ways. Also in populations of species not all individuals are the same, some are more adapted to these changes than others. The result is that they will survive or thrive in these new conditions and go on to reproduce.

For example, if there is a 2°C decrease in the temperature of an area, individuals in a

species that have more dense hair are more adapted to the temperature change. One would think that the hairier the individual, the more adapted they would be, however, this is not the case. Those with very dense hair would get too overheated and it would be quite difficult for them to survive, especially with the stress of finding food and escaping from predators. So it is most common that individuals with the mid-range of hair density would be best suited. This brings me to the point that being too good is not good at all.

This is best seen in what is known as super normal stimuli which is often employed by males to attract mates. Some examples include the Fiddler Crab (*Uca* sp.). The males of this species have an enlarged claw while the other is of normal size. The large claw is used to attract females and fight other males for females while the smaller claws are used to feed.

Besides being attractive to females it is also used by females as an indication of the health of the male. A healthy male who is free of parasites and diseases will be able to produce a large claw and be strong enough to support its weight. It is attractive to females so by mating the male with the largest claw his genes will be passed to her offspring so that her sons will be healthy and attractive to females meaning that they stand a greater chance of mating with many females passing on her genes to future generations. However, having a very large claw is very dangerous to the male. Its size makes the male very visible to predators. It is also quite heavy so that it slows down the male when it comes to avoiding predators.

Another example is the long elaborate tail of peacocks which are used to attract peahens. One would think that the longer the tail, the more attractive he is to the females. This is true but too long a tail becomes a burden for the males as it makes them too heavy and cumbersome to fly and an easy target for predators.

It is not only morphological features that can be too good sometimes; an animal's behaviour can be too effective. An important behaviour in some species is the formation of territories which is mostly carried out by males. These territories contain resources such as food which would in turn attract females. Therefore the benefits of holding a territory are food and mates. However, the larger the territory the more likely it is to be stolen or challenged by a rival male. The amount of animals on these territories also makes them a target for predators.

Therefore defending the territory takes a lot of time and energy on the part of the male holding it. More time is spent guarding the territory and resources than mating and passing on his genes to the next generation. Also with large territories, males of lower position in the hierarchy or rival males without territories can sneak in and mate with the females. So again the alpha male's fitness is jeopardized.

Being too good does not only applies to animals but to plants as well. When we think of a forest or any type of natural vegetation it is a common belief that the fewer disturbances it receives will be most beneficial to the organisms and the amount of biodiversity it contains. This is true to a point. Through the process of ecological succession, an area which has undergone extreme disturbance causing

the vegetation to be removed for example through human activities or natural disasters like fires or hurricanes, the first plants that arrive are regarded as generalists in that they can inhabit a wide range of habitats such as grasses. This stage is referred to as primary succession. Over time as these plants grow and die the decomposing organic matter is enough to provide support and nutrients for larger vegetation like shrubs to become established. Eventually the area would be repopulated by trees. This stage is called secondary succession.

Of course this is the trend provided that no great disturbances happen during the succession stages. However little or no disturbances mean that the habitat is very stable and it is occupied by specialist species. But in habitats that experience moderate disturbance there will be a mixture of generalist and specialist species because the disturbances create more ecological niches which need to be filled. So that it has a higher number of species than extremely disturbed habitats or those that experience little or no disturbance - this is termed Intermediate Disturbance Hypothesis.

We can see that our environment is self-regulating and maintains the biodiversity found in it. Therefore the least influence we exhibit on nature through our activities the better. Instead we should strive to live and advance in harmony with our environment.

Jo-Anne Nina Sewlal BSc., MPhil., Ph.D., FLS., CBiol., CSci., MSB., Dept of Life Sciences, University of the West Indies

Jo-Anne will try her best in this game called "Survival of the Fittest"