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Sex: What For?

Cloning is not the solution

In most other animal species, mating is not by far as pleasant as it is for humans. In our case, the sexual and reproductive behaviors are distinct, as sex has rather the role of bonding and forming social connections. But in some animal species, the male is 'dying' to have sex...literally! In praying mantis (*Mantis religiosa*), soon after mating or during mating, the female starts devouring its partner, head first! The Pacific salmon make huge efforts to swim upward on the river, to lay their eggs upstream. Once this is done, they die. Most humans won't give their life for a sexual encounter, but the majority would assume deadly risks to defend their children, as they carry their genes. Transmitting the DNA is the most important part of the fight for survival. It's about mortal organisms gaining immortality. It is our link with the remote hominid ancestors from the caves or the African savanna, with the primitive unicellular organisms from a remote past. Still, why should we have sex? There are lizard populations made just of females, like many species wall lizards of the genus *Darevskia* (southwest Asia) or whiptail lizards, also called racerunners (*Cnemidophorus* genus), from US and Mexico. One example is *C. sonorae* from southwest Texas. These females reproduce asexually, just like bacteria, through cloning. Each egg contains a complete set of the mother's genes and each offspring is the exact copy (clone) of its mother, reproduction taking place without the intervention of the males. In this case, if males are not necessary, what's sex for then? Are males really necessary in life, when we see simpler patterns? In the end, this way, the females transmit 100 % their genes, while through sex just 50 %, the other 50 % coming from the male. Still, most living things are the result of sex. There must be a major advantage. The answer is in the evolution. Does evolution stop when the organism is completely adapted to its environment? Negative: this is a continuous race. The world is complex, full of viruses and bacteria, predators and preys, competitive species, and animals must keep the pace with the others, at least at the same speed, even if we have the impression, for example, that human evolution has stopped. A species that has stopped to evolve as a response to the threats and challenges of its environment is doomed. In some species, sexual and asexual reproduction coexist, like in some fish from Cichlidae family encountered in Mexican lakes. Scientists noticed that fish reproducing asexually are much more vulnerable to the attack of a parasite giving them a darker color than that of fish which reproduce sexually. Cloning organisms are easy targets for a fast evolving parasite. Those with a sexual reproduction are moving targets, much harder to attack. Each new individual represents a new DNA combination from its mother and father. This is it: sex produces a recombination of the genes, which is the best defense against the biotic and abiotic factors. Sex provides variation, improving a species' chances of survival in a world dominated by a relentless competition. This is what males do: ensure that females won't lose their offspring. Having sex probably originated more than 1.5 billion years ago, when two microorganisms colliding in the primordial ocean changed unwittingly in a short episode some genes. That may have made them stronger, boosting their survival chances. Males and females appeared later, when a casual mutation produced some small, swift germ cells searching another germ cell with a different specialization: storing food to feed a new life. The first are the sperm cells, and their owners are called males; the second are eggs produced by females. Males produce millions of sperms, there are no savings in the attempt to produce as many offspring as possible. The eggs, being bigger, require more energy investment, and the females produce a more limited number. That's why in most species, females must be choosy when selecting a mate, in order to avoid wasting her reproductive potential with a male carrying bad genes. Males and females require different things: quantity versus quality. This explains the sex war. This explains the heavy and energy expensive tail of the peacock, being rather a risk for survival. And you can look at the shiny colors of many fish, insects, birds and reptiles, lion's mane, horns and antlers in hoofed mammals or to the birds' song. Or if you like, big muscle and shoulders in man. They 'advertise' the man's quality genes. Males have two strategies in getting a sex partner: competition and 'advertising'. Males can fight to control directly the females or the resources the females need (food, territory, shelter and so on). In the case of the male peacock, the larger and brighter the tail, the more females that male will have. In fact, the big tail (extrapolated to secondary sexual traits in general) means the male is stronger and healthier,

carrying the best genes for the next generation. Weaker males cannot display impressive secondary sexual traits. Through big ornaments, the male shows off his higher amount of vital energy. But females have to choose not only good genes, but also sometimes a good partner, helping her in caring and protecting the young, fact that also increases offspring's survival. This is how monogamy appeared. In song birds, when the male abandons the nest, the offspring have a very limited chance of survival, thus it won't spread its genes. Monogamy is the social solution. In monogamy, the male and the female must form bonds (just like in the case of the humans). But monogamy turns females more "male" (not all the males are the best gene carriers), and males too are more "female", as they must look also for quality. Females got a solution: adultery, which happens from humans to foxes and song birds. Many studies show that while the "husband" may be a male with a lower level of aggressiveness, which forms easier social bonds being careful and attentive fathers, females from humans to animals are sexually attracted to "macho" males, more aggressive and unstable, less responsible with their paternity, but which signal stronger genes. Sometimes, males and females exchange roles; such is the case of the polyandry. In the case of the Jacana birds (also called lily trotters), so many chicks are eaten by crocodiles, that the species found an odd solution: the female lays the eggs, but the male nests and takes care of the young. Freed by the youngsters' care, the female can produce rapidly more eggs, increasing the chances of reproduction and the species' survival. In this case, the female looks for quantity, not quality. Female Jacanas fight between them to 'gain' the males, and in time, they become masculinized, acquiring traits specific to males: aggressiveness, power, bigger size and instability. A strong female can gather around her a "harem" made of 4-5 males. When a female conquers the territory of another one, she often breaks the other's eggs and kills the chicks of the defeated female. This way, the males will take care of her eggs. In the next hours, the female harasses intensively the male(s) which will mate with her. In the end, there are no clear-cut roles for the two sexes.