Feature: Homosexuality in the animal kingdom

Ornela De Gasperin Quintero describes the wealth of homosexual behaviour in the animal kingdom

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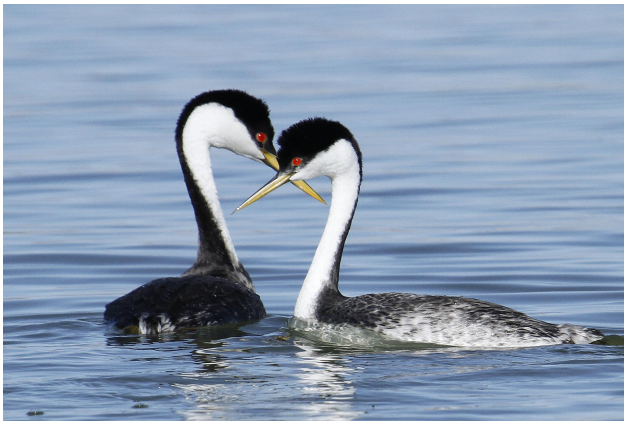

Same-sex sexual behaviours are widespread in humans. In the US alone, close to 10 per cent of the population has had sexual encounters with a member of their own sex, and throughout our history numerous examples of homosexual behaviour have been documented. The oldest record of homosexual behaviour dates back to 2400 BC, in ancient Egypt. Indeed, just last year the British Museum launched a book called "A Little Gay History", that depicts the expression of homosexuality in all cultures across our history. But it turns out that we are not the only animals to experience same-sex sexual encounters.

Since the 1700s naturalists have been describing sexual interactions between individuals of the same sex across different animal species. Scientists like George Edwards speculated that these behaviours were 'abnormalities', and suggested that they violated the 'law of procreation'. Around the late 1800s researchers ventured into finding a cause for these phenomena, suggesting that perhaps a lack of members of the opposite sex triggered them. And in the 1980s efforts were concentrated in understanding the physiological bases of this 'disordered' condition. Same sex sexual encounters were considered maladaptive, since natural selection should favour individuals that are able to pass on more copies of their genes. But as the years passed, the number of species observed to engage in same-sex sexual behaviours increased, and around the 1990s researchers began to question whether these behaviours might have an evolutionary advantage.

Nowadays we know that thousands of animal species have sexual interactions with individuals of their own sex. The extent of these behaviours varies considerably: from courtship displays and sexual encounters to the formation of long-term couples. In some cases the extent of same-sex sexual behaviours is so large that it exceeds that of opposite sex interactions. Examples have been described in animals as different as bugs and apes, and in all types of vertebrates.

Among mammals, bottlenose dolphins have the highest rate of homosexual behaviour known, and both males and females interact with members of the same sex. Many apes also engage in same-sex sexual interactions. For example, bonobos spend a long time massaging the genitals of members of their own sex, and these encounters can produce female orgasm. Among fish, guppies in lab conditions show courtship displays towards other males, and this tendency persists even when females are re-introduced into male-only tanks. Amphibians and reptiles are no exception; some males of the garter snake, nicknamed 'she-males', mimic females and other males court them when there are no females around.

Birds show the most remarkable examples of same-sex sexual behaviours, as members of the same sex can form long-term pairs. Two striking examples are the Laysan albatross and Zebra finch. Female Laysan albatrosses in Hawaii form pairs with other females when they can't access a male partner. They fertilize their eggs by copulating with males of the colony, and then together incubate the eggs and raise their chicks. Throughout the breeding season they perform courtship displays and copulatory behaviours towards one another, and spend time grooming each other. In the Zebra finch both males and females form long-term pair bonds.

Same-sex sexual behaviours are common among invertebrates as well. A particularly interesting example occurs in marine snails of the species Crepidula fornicate, as members of this species can change their sex. All individuals start off as males, and if they pair up with another male then one of them simply switches into being a female. These are just a few examples of the thousands of same-sex sexual interactions known to occur in the animal kingdom.

Many different hypotheses have been proposed and tested to explain the advantages of these behaviours. Most studies of homosexual behaviours have been performed in the wild, and outstanding advantages have been linked to them. With such a vast number of examples of animals showing same-sex sexual behaviours, it shouldn't be surprising that their function greatly varies across different species according to its particular social and mating system.

Among animals that live in social groups, like dolphins, woodpeckers and many apes, same-sex sexual behaviours are usually used to express affection and affiliation towards members of the group, and to reinforce long-term relationships. They can also help mark dominance ranks among individuals, reduce social tension, and reconcile members of the group after disputes. A remarkable study carried out in 1990 in the olive baboon showed that same-sex sexual behaviours are correlated with the reproductive success of the individuals expressing them. In this species, males form social groups and have a high rate of sexual behaviours towards one another. They embrace and 'mount' each other, and touch and handle each other's genitals. Researchers quantified the frequency of these behaviours across different social groups and compared this rate with the success of the group. They found that groups in which males mounted and manipulated each other's genitals more frequently formed the most cohesive groups, and these groups were the most successful when fighting-off rival groups.

On the other hand, rather than living in groups, many animal species form long-term pair bonds. Frequently, having a partner increases the chances that an individual will survive and/or reproduce, as a pair can synchronize its foraging schedule and help each other when fighting predators or competitors off. Social partnership has been proposed as an explanation for the formation of same sex long-term pair bonds, as shown by albatrosses and zebra finches. In zebra finches a skew in the proportion of males or females in a population shifts the number of same-sex pairs, and both males and females form same-sex bonds. These unions are as selective and stable as male-female pairs, and they are unlikely to be disrupted even if members of the opposite sex are again abundant.

In the case of the garter snake, the benefits of male-male courtship behaviours are very different. In the spring, thousands of snakes emerge after eight months of hibernation in Manitoba, Canada. Snakes are weak and slow after hibernating, and are vulnerable to predator attack. In order to raise their bodies' temperature, they produce a pheromone that mimics the scent of females. This attracts courting males, who strongly press their bodies against the newly emerged 'she-males', raising their body temperature, and protecting them from potential predators.

Homosexual interactions can also increase how sexually attractive an individual looks to members of the opposite sex. In a recent study carried out in 2013 on the fish Poecilia mexicana, researcher David Bierbach and colleagues presented females with videos of males courting males or females, and found that females showed higher attraction towards males that were performing higher intensity courtship displays, regardless of whether they were courting males or females.

For a long time, same sex sexual behaviours seemed maladaptive because we thought that the only way of leaving copies of our genes, which are the units of natural selection, was by having offspring, and that same-sex sexual interactions reduced the amount of offspring produced by an individual. Now we now that not only are these encounters incredibly common across the animal kingdom, but that they are the product of their evolutionary history and can have substantial effects on the reproductive success of individuals.

So, how many times have you seen birds taking turns to feed their chicks? Next time, keep in mind; they may be same-sex lovers.

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