

Reciprocal mounting and copulation behaviour of Chilean Flamingos *Phoenicopterus chilensis* in the Zwillbrocker Venn

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Summary

Since 1982 free living flamingos have successfully bred in the Zwillbrocker Venn Nature Reserve in Germany. From 1994 Chilean Flamingos (*Phoenicopterus chilensis*) in the breeding colony have been observed in acts of reciprocal mounting and copulation. The introductory spinning round, the alternating mounts and the ensuing copulations are described.

The flamingos in the Zwillbrocker Venn are wild living animals. It is therefore hard to determine whether two flamingos showing reciprocal copulation behaviour are indeed paired couples, unpaired, or perform extra-pair sexual intercourse. Neither do we know whether these combinations are male-male, female-female or male-female. Same sex-pair bonds and same sex sexuality exist in many animal species in which male-female relations are customary.

The change of male-female roles during copulations as was shown by Chilean Flamingos in the Zwillbrocker Venn is quite unique and has only been described for few other bird species, and has not been described for flamingos ever before, neither for wild populations, nor for captive groups.

The spinning round that is shown before mounting and copulation take place, indicates that these copulations are not typical. The lack of aggression between the birds involved, and the change of roles without demur also indicate that dominance behaviour is not a likely cause. Perhaps this behaviour is due to the small size of the population in Western Europe. Or maybe it is a form of restlessness caused by an unbalanced male-female or age-cohort group composition.

Introduction

The only known breeding colony of free living flamingos in Western Europe can be found in the Zwillbrocker Venn Nature Reserve, Germany (6°41'E 52°03'N) (TREEP 2000, 2006; TREEP & IKEMEYER 2006). It was established in 1982.

Almost annually the flamingos raise some young at the breeding place. In nineteen successful years at least 102 chickens hatched, 77 fledged and 13 (during the 1980s) were taken to zoological gardens. Since 1987 young flamingos that hatched in the breeding colony have been ringed. Until 1994 with small metal rings. From 1995 on five cm broad red rings with an unique alpha-numeric code of four digits are used. About 50 per cent of the flamingos can now be recognized individually.

The West European flamingo population has been quite stable for some decades already and now counts about 35 to 40 Chilean Flamingos (*Phoenicopterus chilensis*), 1 Caribbean Flamingo (*Phoenicopterus ruber*) and 10 to 15 Greater Flamingos (*Phoenicopterus antiquorum/ roseus*). The annually changing number of Greater Flamingos could be due to an exchange with resident populations in Southern Europe and Kazakhstan. The three species live together in a mixed group all the year round and breed at a joint breeding place.

No special measures are taken to protect or to favour the flamingos; they only benefit from the protecting measures that are taken for the wildlife in general. Unnecessary disturbance is avoided. Therefore during breeding seasons human visit of the breeding island is restricted.

Since 1992 the breeding colony has been observed annually by the author, from appr. March (arrival of

the flamingos) to September (fledging of the young flamingos), during many days every year, using binoculars and a telescope. From each observation a day report was written. Observations were also made at the places where the flamingos stay during autumn and winter. During the breeding season in 1994 the breeding colony was intensively watched from a shelter that had been constructed very close to the colony.

Observations made by other ornithologists and the scientific staff of the Biological Station in Zwillbrock have been added to the data that were obtained by the author. The summarized observation results have recently been published (TREEP 2006, TREEP & IKEMEYER 2006). Observation of the colony will be continued in the future.

In this paper a highly remarkable copulation behaviour in Chilean Flamingos in the Zwillbrocker Venn, unknown until now, will be described and discussed.

Atypical Copulation Behaviour

In the preamble to the actual breeding in the colony many typical copulations are performed in the way as it has been described in flamingo literature (SUCHANTKE 1959). In short: female and male enter the water, the female is followed by the male. The male announces his wish to copulate by bending his neck over the body of the female and touching her back with his bill. If the female is willing to concede, she puts her head into the water (called: false-feeding) and slightly spreads her wings. The male mounts and, after finding his balance, lowers his body until his cloaca reaches the cloaca of the female. After cloacal contact of only a few seconds, he rises again, sometimes grips a few neck feathers of the female for

a second. Then he jumps off, over the head of the female.

In 1994 at several occasions observers of the breeding colony in the Zwillbrocker Venn noticed a remarkable behaviour in two Chilean Flamingos (KEßLER 2001, TREEP 2005): two robust flamingos, from posture looking like male birds, entered the water. The bird walking behind tried to touch the back of the bird in front with his bill, communicating his desire to copulate. The bird in the front, not willing to concede, turned around and, changing the roles, in his turn tried to touch the back of the other bird. The two birds now stood opposite each other. At this point a few times they showed some displeasure, threatening each other with their bills and swaying necks, but this quarrelling has never been seen ending in a real row. Again both birds tried to come behind the other one but they did not succeed. This resulted in a rather prolonged rotary motion of the two bodies, the breasts pressed against each other and the necks crossed like hockey sticks, sometimes the necks interlaced.

At some occasions after some time the body contact was discontinued and the two flamingos split up. However at other occasions a different behaviour was shown: after some time the rotation stopped and both birds now actually tried to jump on the back of the other bird. As the other bird was not willing to cooperate, the attempts to mount, often performed from the front or from aside, were doomed to fail. A few times it was observed that this behaviour lured other Chilean Flamingos nearer, who seemingly tried to interfere in the game. Sometimes also trying to jump on the backs of the two birds. Which was apparently not appreciated by them and together they drove away the spoil-sports.

When the other birds started nest building and egg laying, the two flamingos continued their attempts to copulate with each other. They also tried to build a nest for themselves. After some time they began to trouble other birds on their nests. In the end they even attacked some newly hatched chickens and it was clear that the disturbance caused by them influenced the breeding success of the flamingo colony in 1994 negatively.

Comparable disturbing behaviour by a male pair in the flamingo colony at Rotterdam Zoo was described by KING (1993, 1994).

Between 1994 and 2001 the spinning around, followed by failing mounting efforts from two robust Chilean Flamingos, were observed annually. There is neither clear evidence that in each year this behaviour was shown by the same two birds (the flamingos that were observed in these years had no rings on their legs), nor that the birds really were males.

In early spring 2004 again two robust unringed Chilean Flamingos were observed in showing rotation behaviour as described above. Then a surprising event took place: After having rotated together for some

time, the necks intertwined, bird A finally succeeded to position himself behind bird B and without hesitation mounted bird B and performed a complete copulation. After he had finished he jumped off forward. Immediately bird B mounted bird A and in his turn also copulated. Followed again by bird A and once more by bird B. All four copulations looked very natural and complete. The bird playing the "female role" kept his head in the water and slightly spread his wings, as is usual in that role.

The cycle was interrupted when other Chilean Flamingos started interfering, also trying to mount the bird in the "female" position. After the interruption the spinning around was resumed, again followed by reciprocal copulations. The performance finally was cut off due to increased impediment by other birds. A few weeks later again reciprocal copulations were observed (TREEP 2005).

In spring 2005 reciprocal mounting and copulation behaviour was shown by at least three couples of Chilean Flamingos, one of them being a couple from which the partners both hatched and banded in the Zwillbrocker Venn (ZV11 in 2001 and ZV23 in 2002).

Another couple was formed by an unringed bird and a bird from 2002 (ZV24): after the usual spinning around, that lasted only short, the three year-old bird was mounted by the older one. After this bird had copulated and had jumped down, it seemingly awaited the mounting from the younger bird and when this took not place immediately, it looked back and seemed to invite its mate to perform the mounting and copulation act, which was in fact carried out by the younger bird after its delayed reaction.

In April 2006 at least ten Chilean Flamingos were showing reciprocal mounting and copulation behaviour, involving one bird that hatched in 1991 (metal ring left), two birds from 2001 (ZV10 and ZV11) and two birds from 2002 (ZV23 and ZV24). Reciprocal mounting attempts and mountings followed by copulations could be observed almost daily, on some occasions several pairs performing at the same time, the introductory rotation behaviour lasting shorter and shorter. It seemed that the execution of the copulation acts became less serious, untidier. Many mounts were broken off and a renewed spinning around was seldom seen. ZV11 and ZV23 showed reciprocal copulation behaviour together on several days, and also the combinations ZV11 with ZV24 and ZV24 with the flamingo that hatched in 1991 were observed. On 26 April the following event was observed: One of the nests had been built some 100 meters away from the bigger colony. On the mound a Chilean Flamingo was incubating an egg, that had been laid a few days before. Another, unringed, flamingo (the presumed partner) stood next to the nest, the head hidden in his feathers. After a long period of resting, the bird woke up and walked slowly into the direction of the bigger

breeding colony. From that location another, unringed, Chilean Flamingo arrived. Together they went into deeper water. After having copulated mutually they walked close to the isolated nest. Here again they reciprocally copulated, which was followed by a "feeding session" lasting about a quarter of an hour, during which the bills were kept close to each other in the water surface. After this the second flamingo returned to the breeding colony and the first flamingo resumed its position next to the breeding flamingo on the nest.

On 7 April 2007 flamingos ZV23 and ZV11 showed reciprocal mountings and copulation attempts for the third subsequent year. On 13 April however, ZV23 was observed in reciprocal copulation behaviour with two other unringed flamingos with an interjacent period of only ten minutes. Afterwards its two sex partners performed reciprocal mountings and three alternating copulations together. On 20 May flamingo ZV11 and an unringed bird changed breeding positions on a recently built nest, containing an egg.

On 10 April two unringed flamingos, clearly differing in size, apparently a male-female combination, entered the water. The smaller bird in the leading position, the bigger one followed. After a short time the second bird bent over, signalling its desire to copulate. The smaller bird however did not concede, but stepped aside and positioned itself behind the other one. Than the smaller bird mounted, copulated and jumped off. About a minute later on its turn the bigger bird performed the same act. In this case the reciprocal mountings and copulations were not preceded by the meanwhile habitual rotating movements. (Postscript 2012: From 2007 this male-female-couple have been seen annually during their own differing (from the other Chilean Flamingos) performance of reciprocal copulations).

Discussion

Physical contact between humans and free living flamingos in Western Europe is restricted to the banding sessions of the young flamingos born in the Zwillbrocker Venn breeding colony. Gender determination of birds now has become possible from feather tissue analysis. Therefore in 2007, during the banding of the flamingo chickens, feathers of them have been collected for that purpose. From all other birds in this population the gender is unknown, as is also the case in all other wild populations.

Greater Flamingos and Caribbean Flamingos show a clear gender dimorphism, but in Chilean Flamingos it is difficult to determine the sexes from sight. Males in general are only slightly bigger than females. It therefore is hard to determine whether two flamingos showing reciprocal mounting and copulation behaviour are male-male, female-female or male-female combinations. Most probably the robust Chilean Flamingos described for the years 1994 and 2004 were male birds, but it is doubtful whether all ten

birds showing this behaviour in 2006 were males; a few of them were rather small birds. In a reciprocal mounting and copulation situation without introductory spinning around described for 2007 the two birds differed clearly in size.

It is not certain whether the birds that show this atypical behaviour indeed are paired couples, are unpaired, or they perform extra-pair copulations. Some flamingos involved, who could be recognized by the rings on their legs, showed also promiscuity in this behaviour.

Same sex sexual activity in animals is more widespread than was assumed until recently (BAGEMHIL 1999). Same sex-pair bonds do not inevitably lead to sexual activity of the partners towards each other. One or both of the partners may have extra-pair heterosexual contacts only. This behaviour is known for male-male pairs in captive flamingos (KING 2006).

In many species homosexual extra-pair copulations from partners of typical male-female-pairs have been observed and sometimes are widely present, e.g. in males of several heron species (BAGEMHIL 1999). This could be explained by dominance behaviour or sexual restlessness during the reproductive season.

In some cases one of the partners in same-sex pairs adopts the behaviour of the opposite sex (both in males and females), and acts like it when having sexual intercourse with the same-sex partner. In other cases the roles of the two partners within a partnership may change from time to time, e.g. in Greylag Geese (*Anser anser*) (BAGEMHIL 1999). A captive male-male flamingo pair was described in which the male and female roles appeared to have changed in the next year, however they never performed perfect copulations. (KING 2006).

Until now nothing is known about same-sex sexual behaviour of wild flamingos, not even of the very well studied colony in the Camargue, France. Yet it has been assumed for quite a long time that the occasional clutches of two eggs in flamingo nests must have been produced by two females, sharing one nest (TREP, 2005). The same-sex sexual behaviour in captive flamingos on the other hand has been studied intensively during the last decade. KING (1993, 1994) described the presence of a male-male pair within the flamingo group of Rotterdam Zoo. She also made an inventory of the observations on this theme with other captive flamingo flocks belonging to the *Phoenicopterus*-genus (KING 2006). In 80 per cent of all captive colonies atypical partnerships could be recorded. Not only male-male-pairs or female-female-pairs were recorded, but also triple partnerships and even quartets (in any combination).

Several kinds of atypical sexual activities could be recorded: two males, both having a male-female partnership made sexual approaches towards each other. A female copulating with her female partner,

also had extra-pair intercourse with a male. A male and a female, besides their "normal" pairings, tried several times to copulate in the reversed way. Extra-pair and extra-triple sexual encounters, both hetero- and homosexual, are often seen in flamingos. Perfect copulations in male-male flamingo relations were not recorded, but are often seen in female-female contacts.

Copulating flamingos often draw the attention of other flamingos, who try to interfere (KING, pers. comm.), and sometimes the intended mounting is taken over by another bird (TREP 2005). Forced copulations (rapes), male-male (KING 2006) and male-female (TREP 2005), have been recorded.

The changing of mouter and mountee positions during copulation activity is known for only few other bird species: Hammerheads (*Scopus umbretta*), female Purple Swamphens (*Porphyrio porphyrio*), females in Oystercatcher-trios (*Haemathopus ostralegus*), male Black-headed Gulls (*Larus ridibundus*), male Emus (*Dromaius novaehollandiae*), male Humboldt Penguins (*Spheniscus humboldti*), male Adélie Penguins (*Pygoscelis adeliae*), male Black-Rumped Flamebacks (*Dinopium benghalense*) and Blue-Bellied Rollers (*Coracias cyanogaster*). In the last species the exchange of positions is performed repeatedly, with as many as 28 mounts alternating between the partners in succession (BAGEMHIL 1999). Could this behaviour be compared with the six alternating mountings and copulations as observed in the Chilean Flamingos in the Zwillbrocker Venn in 2004?

The introductory spinning around, the alternating mounting and the reciprocal copulation in the Zwillbrocker flamingos has not been described ever before. Yet it is hard to imagine that this behaviour should never have occurred before in (Chilean) Flamingos and should have been recently invented by the West European flamingo population.

The lack of real aggression during the whole sequence indicates that this reciprocal copulating is not just dominance-related behaviour. Maybe this behaviour can be explained by a restless-ness caused by the small size of the colony, by a possible gender unbalance, or by shortages in age cohorts: flamingos prefer same age birds for pair forming (CÉZILLY ET AL. 1997). This leaves many birds unpaired that nevertheless want to have sex. The growth of the number of birds involved during the last three years makes it look like a kind of contagious behaviour.

However, the Greater Flamingos within the population have never been seen showing this behaviour, although it is obvious that male Greater Flamingos are over-represented in the breeding colony.

Conclusion

The changing of mouter and mountee positions during copulation activity has neither been described for captive nor for wild flamingos.

Although being a free living population, the population is a very small one and can therefore not simply be compared with the big wild populations. One should be very prudent in drawing general conclusions from animal behaviour in deviating circumstances. On the other hand this knowledge could encourage other researchers to look more deeply into flamingo sexual interactions in wild populations.

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