Ethosociological Studies of the Black-winged Stilt

Himantopus himantopus himantopus

III. Female-female pairing

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セイタカシギの行動社会学的研究

III. 雌-雌つがい

北川 珠 樹

市川高校

Homosexuality occurs in a number of bird species under captive conditions (FISCHER 1965, LILL 1968, RHJN 1985). However, it appears rare in natural conditions, and is known only in the South African Ostrich *Struthio camelus australis* (SAUER 1972), Western Gull *Larus occidentalis* (HUNT & HUNT 1977), Ring-billed Gull *L. delawarensis* (RYDER et al. 1979, CONOVER et al. 1979, KOVACS & RYDER 1983), California Gull *L. californicus* (CONOVER et al. 1979), Herring Gull *L. argentatus* (FITCH 1979), Greylag Goose *Anser anser* (FABRICIUS 1981), Caspian Tern *Sterna caspica* (CONOVER 1983), and Common Cormorant *Phalacrocorax carbo* (FUKUDA unpubl.). Female-female pairings in the gulls are summarized by UEDA (1985). In the course of ethosociological studies of the Black-winged Stilt *Himantopus himantopus himantopus* (KITAGAWA 1988, in press), three female-female pairs were found during the breeding season, from May to June 1988. Comparison with normal pairs as to nesting territory and incubation activities will be described elsewhere.

STUDY AREA AND METHODS

The study area was open land predominated by *Solidago altissima* within Gyotoku Sanctuary in Ichikawa City, Chiba Prefecture, including two neighbouring artificial ponds (each ca. 50 m × 90 m) into which ditch water pours (see Fig. 2, FP, KITAGAWA in press). These ponds were made in August 1987, and were used for breeding by the Black-winged Stilt in 1988.

Methods adopted are the same as described by KITAGAWA (in press). Observations were made from a corner of one pond without using a blind. Sexes were identified by plumage; the male greenish-black on the wings and back, and the female brown. Sexing of yearlings, whose wings and back are brown and resemble females, was difficult, but became possible after moulting of mantle and back feathers began in early to late spring.

RESULTS

In the breeding season (April to June) of 1988, 25 individuals appeared in the ponds and 10 pairs bred there.

Fig. 1. Periods of permanence of three female-pairs in the breeding site. Fa_n=family codes; F_n=individual codes; =staying in the breeding site; =egg laying; =incubating eggs; =eggs predated.

Fig. 2. Super-normal clutches in the Black-winged Stilt. The first clutch (a) and the second clutch (b) of Fa₁₄₅.

Female-female pair Fa₁₄₅ was composed of two females, F₁₄₅ and F₁₄₆, Fa₁₄₆ of F₁₄₇ and F₁₄₈, and Fa₁₄₇ of F₁₄₈ and F₁₄₉ (Fig. 1).

Fa₁₄₅: This pair stayed in the ponds from May 7 to June 18, but was absent from May 24 to 27. Both females began to lay eggs on May 14 or 15 and laid a total of eight eggs (Fig. 2a). Mounting was not observed, although "dancing" (in copulation postures) was seen once and both birds spent more time in "showing nest spot" (in "nest building" behaviours) than a normal pair before laying eggs. "Showing nest spot" activity occurred continuously for about 45 minutes on May 13. Incubation was made alternately by both females, though some eggs were not covered by the incubating bird. All the eggs were taken on the night of May 22 probably by a snake, and as a result it was not known whether the eggs were fertilized or not. On the next day, the pair stayed at the breeding pond and the North pond (see Fig. 2 in Kitagawa in press) nearby in Gyotoku Sanctuary. They disappeared from there on May 24. On May 28 the pair returned to the breeding pond, built a nest and laid one egg on the same day. There were 5 eggs on May 30, and 7 eggs on June 1 in the nest (Fig. 2b).

Copulation activities were observed twice on May 28 in the egg laying period. In the following descriptions of behaviours, F indicates those behaviours performed by a female during copulation in a normal pair and M those by a male. Female F₁₄₅ approached female F₁₄₆ and solicited copulation by "splashing water" (F) (15:50). Female F₁₄₆ reacted with "splashing water" (F), then "extended neck" (F) to F₁₄₅. Female F₁₄₅ made "irrelevant preening" (M), and thereafter made "half circling round" (M) when female

F₁₄₆ continued "extending neck" (F). Female F₁₄₅ began to feed on the surface of the water. They stopped the copulation activities for about 5 min. Female F₁₄₅ made "splashing water" (F) and "extending neck" (F) again (16:25). Female F₁₄₆ performed "dancing" (M) and "half circling round" (M) twice, but did not make "mounting" (M). Both the females made "extending neck" (F). They stopped the copulation activities for about five minutes.

The nest was predated probably by a snake on the night of June 17. On the next day the pair stayed at the North pond and disappeared on June 19. Three of seven eggs were examined by X-rays on June 7 and were confirmed to be unfertilized.

Fa₁₄₆: Pair F₁₄₇ and F₁₄₈ appeared at the breeding pond on May 11. Copulation was performed in an almost completed form on May 11 and 18. However, F₁₄₈ showed an intimacy with F₁₄₉ on May 21 and they seemed to have formed a new pair.

Fa₁₄₇: Female F₁₄₉ appeared alone at the breeding pond on May 16. It actively contacted with Fa₁₄₆ on May 19, and attacked F₁₄₇ and F₁₄₈ several times. As mentioned above, F₁₄₉ established a new partnership with F₁₄₈ on May 21. They each exhibited "showing nest spot" (which is made by both sexes in a normal pair), many times within their nesting territory and copulated five times. This newly formed pair vigorously drove invading neighbouring families out their nesting territory, but tolerated F₁₄₇, even during the period of searching nest spot or early in the egg laying period. Especially F₁₄₇, the previous partner of F₁₄₈, sometimes got close to F₁₄₈, while F₁₄₉ was indifferent to it. This pair laid the first egg on May 23 and laid a total of four eggs by May 26. They incubated the eggs alternately, but the eggs were predated, probably by a snake, on June 15. The pair disappeared from the breeding site on the same day. It was not known whether the eggs were fertilized or not.

DISCUSSION

The maximum number of individuals observed in autumn within Gytoku Sanctuary exceeded those that bred in my study area, but it was not clear where individuals or families, other than those bred in Shinhama Imperial Preserve, came from (KITAGAWA, in press). However, in Japan this is the only breeding site of the Black-winged Stilt known since 1986 and individuals observed in Gytoku Sanctuary must be the population breeding near this locality.

The sex ratio of this breeding population was female/male=1.4–1.2 ($n=25$). The primary cause for the formation of female-female pairs would be the scarcity of males, for example female-female pairings may occur in a wild population of the Western Gull because of an excess of females (HUNT et al. 1980).

In the Black-winged Stilt the pair bond is usually maintained fairly firmly. However, I observed once in 1986 the male of a pair was replaced by another male (unpubl.). In female-female pairs Fa₁₄₆ and Fa₁₄₇, replacement of a partner by another also occurred. On the other hand, I observed once that a male of a pair pursued a female of the neighbouring pair persistently (unpubl.). This behaviour of the male seemed to be an intention movement for sexual contact with the female. These facts suggest that there is a fair chance for occurrence of extra-pair copulation in the Black-winged Stilt. If a female of a homosexual pair can copulate with a male of a normal pair or a solitary male, her eggs will then be fertilized. In a female-biased population the formation of female-female pairs could therefore be advantageous in increasing the number of offspring under the care of homosexual pairs.

In Fa₁₄₅, F₁₄₅ behaved more male-like and F₁₄₆ more female-like though both exhibited

male behaviours. In F_{146} and F_{147} , F_{147} and F_{149} were male-like and F_{148} female-like. In no case the equivalent relationship was observed between partners in female-female pairs.

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SUMMARY

Homosexuality of the Black-winged Stilt *Himantopus himantopus himantopus* was studied at Gytoku Sanctuary from May to June 1988. Three female-female pairs were established. One pair laid eight eggs at the first nesting and then seven eggs when renesting. The other pair laid four eggs. These 19 eggs were all predated, probably by blue-green snakes. Three of them were confirmed by X-rays inspection to be unfertilized. In all female-female pairs the equivalent relationship was not observed between partners.

摘 要

- 1) 市川市行徳鳥獣保護区内に 1988 年 5 月から 6 月にかけてセイタカシギ *Himantopus himantopus himantopus* 25 個体が現れ、そのうち正常つがい 8 組と 5 羽 3 組の雌同士のつがいが形成された。
- 2) 雌-雌つがいの一つがいは初回の産卵で 8 卵、ヘビによる捕食後の再営巣で 7 卵を産んだ。
- 3) 雌-雌つがいの二つがいは途中でつがいの相手の変更が生じ、その結果、新しく形成された雌-雌つがいの三つがいはその後 4 卵を産んだ。
- 4) 雌-雌つがいの産んだ 19 卵のうち 3 卵は未受精であることが確認されたが、残りについては外敵の捕食により未確認となった。
- 5) 関与した三つがいのうち、3 羽は雄的に、2 羽は雌的に行動した。
- 6) 性比が雌に偏った時の、雌同士の番いの意義について触れた。

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