

# Morph and sex composition of Ruffs on Russian tundra in June 1994: are satellite males more prone to migrate northwards than resident males?

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To test the hypothesis of J.G. van Rhijn that satellite male Ruffs *Philomachus pugnax* are more likely than resident males to follow Reeves northward to their predominant subarctic and arctic breeding grounds, I tallied the numbers of females and males in either satellite or resident plumage at five stations in the Russian arctic (67-70°N, 41-68°E) visited between 10 and 20 June 1994. Since the percentage of satellites among males on the north Russian tundra (4%) is smaller or similar than the percentage around or on leks in temperate staging and breeding areas, the hypothesis is not supported.

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## INTRODUCTION

Ruffs *Philomachus pugnax* belong to the most fascinating waders by virtue of their extravagant and variable plumages, their weird and wonderful reproductive behaviours and their rather extreme sexual size- and plumage-dimorphism (van Rhijn 1991). Reeves are quite standard *Calidris*, and much smaller than Ruffs. It are these males that feature multicoloured ruffs and head-tufts during the mating season. Behaviourally and plumage-wise Ruffs come in two types. Resident males defend mating courts, assembled in leks, against other residents of this lek and usually have darkly coloured head-tufts with ruffs in any colour. Satellite males do not defend mating territories on leks, and are characterized by light-coloured and unpatterned ruffs and head-tufts.

J.G. van Rhijn (1991, p. 160) hypothesized that resident and satellite Ruffs not only show a dichotomy in sexual behaviour linked to plumage, but that the two morphs might show differences in migratory behaviour as well. Given that females would be able to copulate on southerly (temperate zone) leks and to carry stored semen during the migratory flights to northerly (subarctic and arctic) breeding areas, and that northward migration entails a cost, there would be strong selective pressure on males to fly as least far as possible without compromising the likelihood of intercepting receptive females. Resident males, competing on leks, might thus refrain from flying further northwards and remain at southern staging areas where many females pass through. In contrast, sexually opportunistic satellite males, copulating with females on and off leks, might be most successful in areas with rather low densities of competitors, e.g. on the extensive subarctic and arctic tundra breeding grounds. Van Rhijn (1991) states: "If this idea is correct, one should expect high frequencies of satellites in northern breeding areas

and lower frequencies on the southern leks."

In June 1994, whilst participating in the Swedish-Russian expedition "Tundra Ecology-94" (Johansson 1994; Jönsson & Alerstam 1995; Kjellén 1995; Lindström *et al.* 1995), I had the opportunity to collect some data that help to test this hypothesis. Based on the ice-breaker *Akademik Fedorov*, we visited a series of land stations by helicopter, each visit lasting one or two days. During every visit we searched a large area of tundra habitat for breeding waders. I made notes on the sex and plumage of each Ruff that we came across.

## METHODS

Five tundra stations were visited where Ruffs were observed (Table 1). We came to land sometime in the morning, established camp, and went out for fieldwork for the rest of the day. We usually slept during the polar summer night and resumed fieldwork in the morning until we were picked up sometime in the afternoon. Only at southwest Yamal Peninsula did we stay a second night, although we moved camp to higher ground in the early morning of the second day (19 June). At each site we searched a large area for displaying waders and active nests. When wader nests were found, excursions were usually interrupted to capture and mark incubating adults (see Lindström *et al.* 1995).

Whilst in the field I tallied sex and plumage of every individual Ruff encountered, whether on the ground as solitary feeding individuals, (displaying) on a lek, or overflying in small flocks. Since I made sure that birds observed on permanent leks (only found at Kolgujev Island and on Yamal Peninsula) were registered not more than once, it is unlikely that many individuals were

repeatedly sampled. Of each bird I noted sex (females are much smaller than males and do not carry colourful ruffs and head-tufts, although they showed quite extensive variation in body plumage), and for males, whether they showed a satellite plumage or a resident plumage (e.g. van Rhijn 1991, p. 64). Satellites are characterized by

light (white) head-tufts and usually by light and unpatterned Ruffs as well. Birds with dark head-tufts in combination with any type of Ruff were considered residents. I spent too little time at the leks to verify this categorization with behavioural observations.

Table 1. Morph and sex composition of Ruffs *Philomachus pugnax* encountered on five breeding areas in arctic Russia in June 1994. The percentages of putative residents (dark tufts and variably coloured ruffs) and satellites (light tufts and ruffs) are given as proportions of the males, the percentages females as proportions of the total numbers of birds encountered at each site.

Site	Latitude	Longitude	Dates	Resident		Satellite		Females	
				n	% males	n	% males	n	% birds
				Kola Peninsula	67°	41°	10-11 June	18	100%
Kanin Peninsula	68°	46°	12-13 June	7	100%	0	0%	1	20%
Kolgujev Island	69°	50°	14-15 June	38	95%	2	5%	3	7%
Pechora Delta	69°	53°	16 June	26	93%	2	7%	6	18%
Yamal Peninsula	70°	68°	18-20 June	72	96%	3	4%	19	20%
All sites			10-20 June	161	96%	7	4%	32	16%

## RESULTS AND DISCUSSION

Overall, 16% of the 200 Ruffs seen from 10-20 June on the Russian tundra at latitudes 67-70° were females, with little variations from site to site (Table 1). This percentage is at the low end of female proportions during April-May in The Netherlands (van Rhijn 1991, p. 131). The only successfully located (and captured) incubating female was on Kanin Peninsula. Of the 168 males seen, only 4% were in satellite plumage. This proportion varied little from site to site, although at the first two land stations (Kola and Kanin) no satellite plumaged males were seen at all. There is no evidence for geographic trends in either sex or morph ratio.

Data of this kind might be subject to various biases. Observations on leks could bias against satellites most of times (D. Lank *pers. comm.*). Relative satellite abundance could also be affected by the phase of the breeding season, about which we have precious little information. The strength of this little study is the use of a single observer; there should be no effects of observer bias on the variation between sites. Bearing these points in mind, my figures can be tentatively compared with those in the literature. The percentage of putative satellites is similar to that in visually observed spring staging flocks in The Netherlands (van Rhijn 1991, p. 67). It is rather lower than the percentages of light-ruffed males (8-52%) sampled at various breeding locations (van Rhijn 1991, p. 65). Four percent putative satellite males is also smaller than the overall population average of 16% satellites (Lank & Hugie in press).

The percentage of satellite males encountered on the north Russian tundra seems smaller or similar than the percentages around or on leks in temperate staging and breeding areas, the hypothesis of van Rhijn (1991), that

satellite Ruffs are more likely than residents to follow the females to the northern breeding grounds, is not supported.

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