Brief Reports • Tiedonantoja

Do Arctic Skuas *Stercorarius parasiticus* exploit and follow terns during the fall migration?

J. Dennis Wuorinen

Wuorinen, J. D., Department of Zoology, University of Helsinki, P. Rautatiekatu 13, SF–00100 Helsinki, Finland

Received 30 September 1991, accepted 14 November 1991

Introduction

No birds are known to be obligatory kleptoparasites, but individual Arctic Skuas (*Stercorarius parasiticus)* are thought to use this feeding method throughout most of the year (for a review, see Furness 1987). The species relies heavily on kleptoparasitism during the breeding season (Grant 1971; Arnason & Grant 1978). Taylor (1979) has suggested that the species might follow migrating Arctic Terns during the fall migration and there are notes on Arctic Skuas robbing terns in the southern hemisphere during the northern winter (Furness 1983). In this paper I describe my observations on the relationships between loafing terns and migrating Arctic Skuas in Tvärminne (60° N, 23° E), Southern Finland, in the late summer 1990.

Observations

Common (*Sterna hirundo*) and Arctic Terns (*S. paradisaea*) gathered at a loafing site near the island Pappasharun in the Tvärminne Archipelago during the last week of July (Table 1). On 8 August, the first migrating Arctic Skua (a pale individual) was seen near this site. From that day onwards pale skuas were seen almost daily. The highest number was counted on 15 August when three pale skuas were seen sitting on the same small group of cliffs as the loafing terns. The last pale skua was observed on this location on 26 August and the terns disappeared about four days later.

About 5 km westward from Pappasharun, at the islands Hundholmarna, another loafing group of terns was present on 10 August. Five skuas were seen at an adjacent island. Two of these birds were pale, one was intermediate and the other two were dark. At both this site and Pappasharun, I several times observed the skuas robbing terns returning to the loafing sites. Both the skuas and the terns had disappeared by 14 August.

On 15 August a dark intermediately coloured skua was seen near a loafing group of about 40 terns on the Island Klovan. Somewhat later the

same day, six other skuas were seen near another group of terns at the island Klovaskär. Four of these skuas were pale, one intermediate, darkish, and the sixth entirely dark. These islands are located a few kilometers apart and about five kilometers eastward from Pappasharun.

Baltic Arctic Skuas are almost exclusively melanic individuals; only about 4% of the population are pale (Hildén 1971). At least 67% of the skuas observed in Tvärminne were pale or intermediately coloured. Thus the birds observed during the late summer of 1990 most probably came from regions outside the Baltic. 91.4% of the skuas migrating through the Gulf of Finland in the springs 1970–1979 were pale individuals (Hario 1986).

As skuas, and especially the pale individuals, show considerable individual variation in their plumage patterns, it was possible to identify individual birds at the different locations and my observations concern at least 15 different birds. Three pairs, all representing the dark morph (J. Palmgren, pers. com.), breed in the area. These breeding birds were never seen loafing with the terns in the same way as the migrating birds. The migrant skuas were mostly loafing near the terns and occasionally flew off and intercepted terns bringing in fish to their fledged young sitting in the loafing groups.

The terns in Tvärminne fledged their young at the end of June and in early July and the terneries were abandoned about one week later. In the outer archipelago the terns fledged their young somewhat later and loafing sites on low open skerries near the terneries were formed at this time (Table 1). The first Arctic Skuas appeared soon after the formation of the groups.

Discussion

The terns provide an easily detectable and probably fairly predictable food source for skuas. According to R. W. Furness (1987), Arctic Skuas migrate along inshore waters during the fall migration and the birds are known to stop for a few days at sites with aggregations of terns and small gulls. In the Gulf of Finland the fall migration of skuas is usually much more sparse than the spring migration (Hario 1986). My observations are probably thus exceptional. Concentrations of migrating skuas usually occur on locations where larids are abundant (e. g. Kushert 1981). B. L. Furness (1983) reported Arctic Skuas robbing terns, Hartlaub's (*Larus novaehollandiae*) and Sabine's (*L. sabini*) gulls at a site near Cape Town. The skuas followed the terns as these moved by.

I suggest that the fall migration in Arctic Skuas is adjusted to the migration of terns, either directly by following terns migrating from their Arctic breeding grounds or by exploiting the loafing sites adopted by terns along the migration routes. The following observations support this suggestion. First, the groups of loafing terns are

Table 1. The known dates for fledging of last young in colony, abandonment of colonies, and formation of loafing groups by Terns in the observation area 1990. The loafing groups were formend on skerries adjacent to the main colonies. The Pappasharun colony consists of Common and Arctic Terns, the other being single-species colonies of Arctic Terns. The number of skuas present referes to the archipelago zone as a whole.

Locality	Terns fledged	Colony abandoned	Loafing group formed	Loafing group abandoned	Skuas present
Near mainland					0
Vikarskär	6.7	9.7	no group formed		
Sjöbörksk.	26.6	9.7	no group formed		
Stengrund	6.7	14.7	no group formed		
Outer archipelago					> 15
Ören	10.7	23.7	23.7	18.8	
Pappasharun	9.7	15.8	31.7	31.8	

at least partly made up of migrating birds from other areas, as terns from the inner archipelago had left the entire area about one week before the loafing groups were formed (Table 1). Hario et al. (1986) have shown that the loafing sites are not formed by birds from the nearest colony alone; the number of outside birds in them may raise the number of juveniles by as much as 45%.

Second, Arctic Terns breeding in Kandalaksha Bay, White Sea, leave their nest sites "en masse in the middle of the last third of July" (Bianki 1977). This corresponds with the formation of the loafing groups in the Baltic. The terns probably migrate nonstop over the mainland before reaching the Baltic (Bianki 1977), thus making the transit overland in hours rather than days.

Third, the formation of the loafing groups of terns and the appearance of the skuas more or less coincided, as did also the disappearance of the terns and skuas.

Fourth, most of the observed skuas were pale individuals, thus apparently originating from areas outside the Baltic.

Acknowledgements. I thank the Tvärminne Zoological station for providing facilities and equipment during the field work. I am grateful to Mikael Kilpi and Torsten Stjernberg for criticism of early versions of the manuscript, and to Martti Hario, Hannu Pietiäinen and an anonymous referee for valuable comments on the final version.

Sammanfattning: **Följer höstflyttande arktiska labbar flyttande tärnor?**

Vid månadsskiftet juli-augusti 1990 observerades små grupper av huvudsakligen ljusa, sannolikt arktiska labbar rasta tillsammans med silver- och fisktärnor i ett område nära Tvärminne, Hangö. Labbarna, totalt minst 15 individer, observerades under samma tid som grupper av rastande tärnor, sk. klubbar, fanns i området. De kleptoparasiterade på tärnorna som hämtade fisk till ungfåglar i klubbarna. Observationerna av labbarna sammanföll i tid med bildandet och upplösandet av tärnklubbarna, varför detta kunde indikera att flyttande arktiska labbar antingen flyttar tillsammans med arktiska tärnor eller utnyttjar klubbar av rastande tärnor utmed flyttvägarna.

References.

Arnason, E. & Grant, P. R. 1978: The significance of kleptoparasitism during the breeding season in a colony of Arctic Skuas Stercorarius parasiticus in Iceland. — Ibis 120:38–54.

Bianki, V. V. 1977: Gulls, shorebirds and alcids of Kandalaksha Bay. — Keter Publishing House, Jerusalem. 250 pp.

Furness, B. L. 1983: The feeding behaviour of Arctic Skuas Stercorarius parasiticus wintering off South Africa. — Ibis 125 :245–251.

Furness, R. W. 1987: The skuas. — T & AD Poyser, Calton. 363 pp.

Grant, P. R. 1971: Interactive behaviour of Puffins (Fratercula arctica L.) and Skuas (Stercorarius parasiticus L.). — Behaviour 40:263–281.

Hario, M. 1986: Itämeren lokkilinnut. — Lintutieto Oy, Helsinki. 263 pp.

Hario, M., Komu, R., Muuronen, P. & Selin, K. 1986: Saaristolintujen kehitys Söderskärillä vuosina 1963–86 ja eräitä poikastuottoon vaikuttavista tekijöitä (Summary: Population trends among archipelago birds in Söderskär bird sanctuary 1963–1986). — Suomen Riista 32:79–90.

Hildén, O. 1971: Occurrence, migration and colour phases of the Arctic skua (Stercorarius parasiticus) in Finland. — Ann. Zool. Fenn. 8 :223–230.

Kushert, V. H. 1981: Das vorkommen der Raubmöwen (Stercorariidae) auf Helgoland unter besonderer Berücksichtigung des Einfluges im Sommer 1979. — Die Vogelwelt 102: 121–132.

Taylor, I. R. 1979: The kleptoparasitic behaviour of the Arctic Skua Stercorarius parasiticus with three species of tern. — Ibis 121 :274–282.