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## **STUDIES ON SOUTH POLAR SKUA (*CATHARACTA MACCORMICKI*) IN AND AROUND MAITRI, SCHIRMACHEAR OASIS, ANTARTICA**

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### **INTRODUCTION**

The harsh combination of rapidly changing temperatures, strong drying winds, irregular water and nutrient supply, frequent snow falls and frosts and continental soil movement due to freezing and thawing means that only a few plants and invertebrates can survive on the ice-free land such as Schirmacher oasis of Antarctica. These areas are capable of supporting life, mostly microinvertebrates in the soil and in moss-water or in the bodies as well as many avian and a few mammalian forms.

Skuas are dark coloured predatory sea birds with conspicuous white flashes in the primary feathers that show only in flight. The dark bill is strongly hooked and is covered at the clawed. Females are on the average large than males. The south polar skuas *Catharacta maccormicki* are well known for their aggressive rapacious habits. They have a rapid, sustained and powerful flight, which enable them to rob many birds. Skuas prey on chicks and eggs, particularly those of penguins and take a heavy toll of small petrels. Skuas characteristically proclaim jurisdiction over a territory by boldly challenging intruders with open wings raised over their back. The challenger is accompanied by a harsh screaming charr' charr charr' They are particularly aggressive in defence of young chicks and engage in a series of swooping dives, striking trespassers with their wings and feet. A perusal of the literature shows that studies on *Catharacta maccormicki* from continental Antarctica is scanty. Hull *et. al.*, (1994) studied the breeding technology of *C. maccormicki* from Magnetic Island. Also other skuas such as arctic skua, great skua and brown skua were studied from different Antarctic islands (Sears *et. al.*, 1995; Young, 1994).

In the present study, habitat, reproduction, population density and the behavioral pattern to the recorded and simulated voices of other skua present in the Schirmacher Oasis were conducted.

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## MATERIAL AND METHODS

The present study was conducted between Jan 14<sup>th</sup> to Feb 14<sup>th</sup>, 1995. All the nesting sites were visited frequently to assess the breeding success. Mist nets were used to catch the skua for ringing studies. The mist net was spread in a conical shape above the ground with one side open. A piece of meat was kept inside the net as a bait to attract the birds. When the birds were busy eating the meat they were chased inside the conical mist net drop and were caught. Since skua has territorial behaviour this mist net trap was laid at different places around Maitri station. Voices of skua were recorded using the tape recorder (SONY, WALKMAN) and played back to the same bird and different pairs and the behaviour was recorded. On a few occasions the voice was mimicked by the author and the behaviour was noted. The recorded voice and the mimicked voice were played to Adelie penguin and the behaviour was noted.

Metal rings (also called 'bands') bearing a return address (Bombay Natural History Society, Bombay) and serial number were used to mark birds to study long distance movements in Antarctica. Individual birds may thus be recognized and their movements, survival and behaviour studied. The markers used in the present study are tarsus rings made of Aluminium. These tarsal rings have numbers large enough to be read with binoculars eliminating the necessity for capturing a bird in order to read its band. Adults were banded on the right tarsus and chicks on the left tarsus.

## RESULTS AND DISCUSSION

A total of six adult skuas and one chick were ringed (Table 1). A ring (No. 13100) was recovered from an adult skua near Russian station (Novalazarevskaya) at Schirmacher Oasis, which was ringed earlier (1991-1992) by Zoological Survey of India Calcutta. The measurements on the morphometry of various body parts of the skua were made (Table 2) while ringing was done. An adelic penguin standard at Maitri during January 1995 was also ringed using 'K' ring (K, 581) and measurements such as beak (7 cm), height (43 cm), flapper length (920 cm) and toe length (10 cm) were made.

**Table 1. :** Data on the ringing of the *Catharacta maccormicki* and *Phygoscelis adeliae*.

S. No.	Name of the species	Status	Sex	Ring No	Date
1.	<i>Phygoscelis adeliae</i>	Adult	?	K581	03.02.95
2.	<i>Catharacta maccormicki</i>	Chick	?	F13150	24.01.95
3.	<i>Catharacta maccormicki</i>	Adult	Female	F13149	13.02.95
4.	<i>Catharacta maccormicki</i>	Adult	Female	F13148	13.02.95
5.	<i>Catharacta maccormicki</i>	Adult	Male	F13147	13.02.95
6.	<i>Catharacta maccormicki</i>	Adult	Male	F13146	15.02.95
7.	<i>Catharacta maccormicki</i>	Adult	Female	F13145	15.02.95

**Table 2.** : Data on the morphometry of the *Catharacta maccormicki* ringed in and around Maitri, Schirmacher oasis during 1994-95 summer (length in cm).

Sl. No.	Ring No.	Beak	Wing	Long feather	Wing width	Leg	Toe			Web	Total
							Middle	Left	Right		
1.	F13150	5.5	30.0	40.0	–	7.5	5.2	4.5	4	–	80.0
2.	F13149	5.0	31.4	31.0	–	17.5	8.0	7.4	4	9	–
3.	F13148	5.0	34.0	29.0	17.5	18.0	7.8	6.5	5	8	–
4.	F13147*	5.5	33.0	40.0	19.0	–	7.0	6.0	6	8	133.0
5.	F13146	5.5	32.0	33.0	19.0	19.0	7.0	6.0	5	–	137.0
6.	F13145	5.6	31.0	38.0	19.0	20.0	7.0	6.0	5	–	–
7.	F13100**	5.2	35.0	40.0	18.0	21.0	7.0	6.0	5	–	–

(\*Bird with torn web on the right leg; \*\*ring recovered from a bird ranged during 1991-92 summer by ZSI, Calcutta)

The ringing programme on the skuas of Schirmacher Oasis was done earlier on two occasions by German scientists in 1984-85 and 1988-89 (Richter *et. al.*, 1990) and on one occasion by Zoological Survey of India, Calcutta in 1991-92 (Table 3). Both the two birds which were ringed in 1991-92 by ZSI using BNHS, Bombay rings were observed in 1994-95 out of which one was recovered. This clearly reveals that, the skuas were returning to the Schirmacher Oasis for breeding,

**Table 3.** : Data on the ringing programme conducted from 1984-1995 at Schirmacher Oasis.

Sl. No.	Name of the station	Number		Year and ring number	Remarks
		Adult	Chick		
1.	George Forster**	4	6	1984–85*	No morphometry measurements
2.	George Forster	–	9	1988–89*	No morphometry measurements
3.	Maitri Station	–	–	1991–92*	No morphometry measurements
4.	Maitri Station	6	–	1994–95 (F13145–F13150)	Measurements taken and ringing in and around Maitri

(\*Ring numbers not available;

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however they were coming to the same nesting site or not is yet to be confirmed due to non-availability of data on the ringing site. During the present study only once the skua was ringed (chick at the nest). All other birds were ringed in and around Maitri station when they come for feeding. A continuous programme on ringing and more studies on both adult and chickens, will help to confirm how many pairs of skuas return to Schirmacher Oasis, or are they the same pairs of skua or a new pair, or are they returning to the same site or not and whether the young visit immediately the next year or how many years later.

### Population

Studies on skua had been conducted in 1979-80, 1984-85, 1988-89, 1991-92 and 1994-95 (present study), Earlier three studies were made by George Forster, GDR (Richter *et. al.*, 1990) and the latter two by Maitri, India (Zoological Survey of India, Calcutta). A total of well-confirmed 10 nets have been found by earlier studies and also by the present (Fig. 1). The number of skua

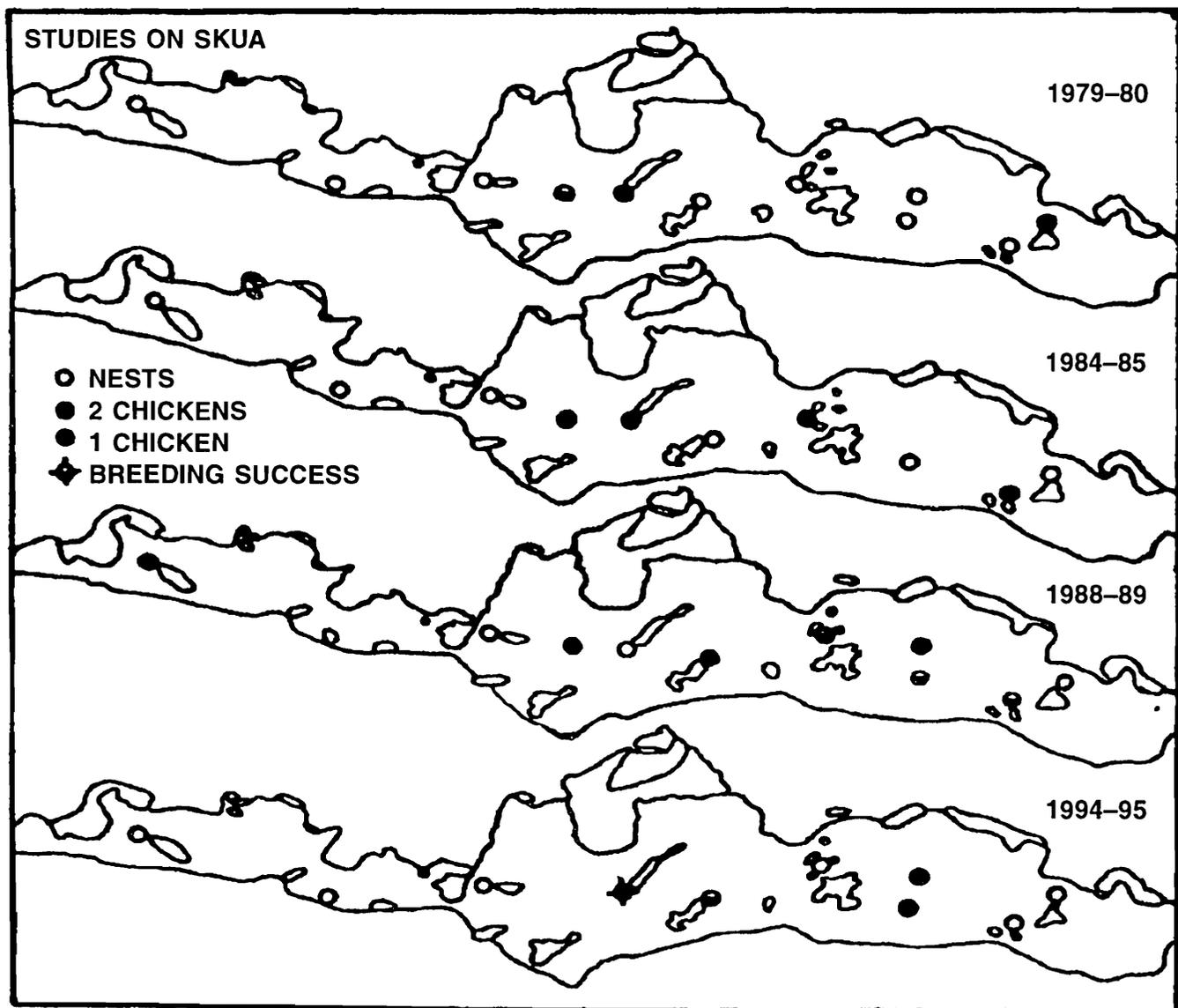


Fig. 1. : Breeding success of South polar skua in the Schirmacher Oasis studied by George Forester and Maitri Station (1979-1995).

nests have not increased during the years and also the population. A total of 15 skuas were seen at Maitri during one time flight and the data on the nests shows that all 10 nesting sites can accommodate 10 pairs (20 birds). It is clear from the present studies that skua nests only near the water body and it warrants a good view of the vicinity. The number of water bodies remains same during the years as the number of nests, and the territorial behaviour of these birds also restricts the increase of nests. The fate of successful chickens are not known clearly, after they leave Schinnacher Oasis. More ringing programmes may give us the data on the migratory pattern and nesting activities of the chickens during the adult phase.

### Breeding

The number of nests, seen, the number of breeding pairs and the breeding success during the present study are shown in Fig. 2. In Schinnacher Oasis the South polar skua arrived/appeared between 25 to 31<sup>st</sup> October (records from winters observers) and the present observation was made

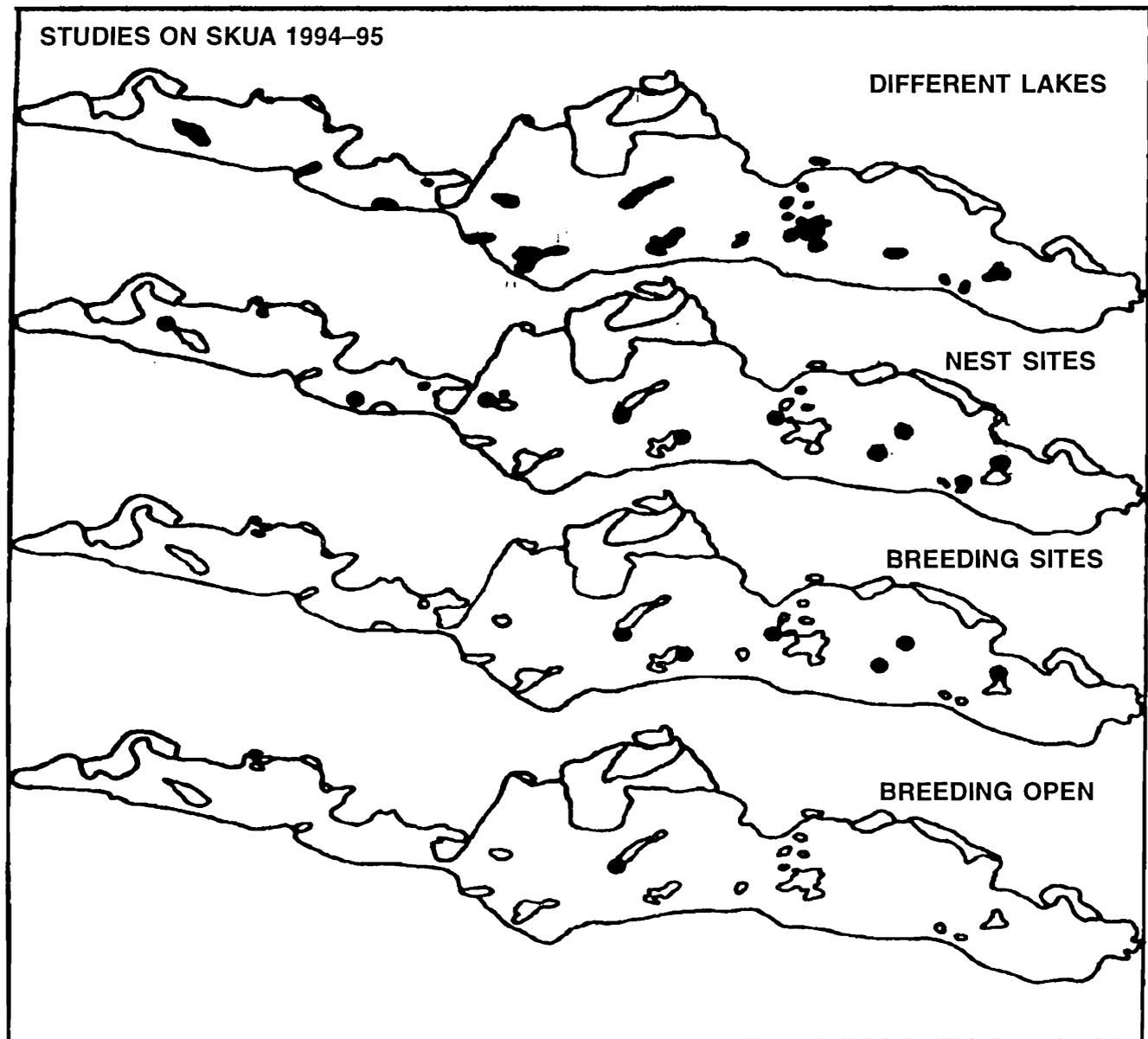


Fig. 2. : Nest sites and the breeding sites of South polar skua in the Schirmacher Oasis in 1994-95 summer.

from January 15 onwards. By the time the expedition team reached the Oasis, already the egg laying, hatching and feeding was started by the skua pairs. All the nesting sites contained with very old remnants of bones of petrels. It is well observed from their behavioural pattern that they never allow other pairs to enter into their nesting sites. The territorial behaviour mainly explains that they will not share their food as well as defend their clutches and chickens from the other skuas. This shows that there is always a chance for the predation of egg and chickens by other skuas whenever it is warranted due to any forced conditions such as nonavailability of food for a number of days due to high wind velocity and blizzard. Therefore, the breeding success of skuas in Schirmacher Oasis highly depends on the feeding conditions. The reduction in number of prey such as snow petrels and Wilson's storm petrels in the Schirmacher Oasis may also affect the breeding success of skua. During the present study, only on two occasions Wilson's storm petrels were seen flying in the Schirmacher Oasis but no snow petrel were observed. It appears that the skuas in Schirmacher Oasis have to fly a long distance for hunting. On one occasion a pair of skua with a chick was seen with the kill of a snow petrel near Indian Bay *i.e.*, about 100 km away from the Oasis. On two occasions fresh kills were observed in the nests visited. However, the rubbish from the stations Novolazarevskaya (Soviet Union), George Forster (GDR) and Maitri (India) are eaten by most of the skuas, which live nearer to these places. It is evident from the present study (Fig. 2) that most of the nests were observed with one or two eggs. Mostly the breeding success takes place only around Maitri or other stations in the Schinnacher Oasis. During 1994-95 (present study) the present author had noticed many skuas visiting regularly in pairs to collect their food such as meat, chicken and fish waste thrown near the garbage dump of Maitri Station. During night (2100-0200 h during Jan-Feb) many birds were observed to roost near Maitri station (near garbage dump and near Annapurna hut) till the morning to collect the rubbish.

### **Behavioural studies**

A variety of studies were conducted on skua that visited Maitri station using recorded voices of adult skuas. When the recorded voices of the skuas were played to the same skua pair, the behaviour was aggression. This was noticed in the case of other skuas too. When the recorded voice was played near the nest with chickens, the adult skua started striking the tape recorder. When the voices of Adelie penguin was played, they started challenging with open wings raised over the back. On an occasion a meat piece was shown to a pair of skua and then hidden under a stone. The skua pair recovered the meat after a search for two hours and forty-five minutes from the place where it was hidden. Immediately after the recovery of the meat piece it was taken to the lake nearby and was placed under water near a well-marked stone. The bird was seen visiting the place where the meat was kept under water, time and again to feed. The same behaviour was observed on many other occasions. A few skua pairs receiving meat pieces from the expedition members directly from hand was observed on some occasions. This mean that the skuas are habituated to the food availability near the expedition stations in the Schirmacher Oasis. After every blizzard

which lasts for about four to five days these birds were seen following every expedition member passing by, to receive food.

### SUMMARY

The Indian Antarctic Station Maitri is situated in the Schirmacher oasis, at Princes Astrid Coast at a distance of about 80–100 km from the open sea. The area of the Schirmacher oasis is about 34 km<sup>2</sup> (70°44'33"S to 70°46'30"S and 11°22'00"E). The low lying hills in the oasis interspersed by many glacial lakes are used by South polar skua *Catharacta maccormicki* as their nesting and breeding sites.

Studies on south polar skua were conducted in and around Schirmacher oasis. Nesting sites, breeding success and population studies of south polar skua were compared with other observations over several years. Out of six breeding pairs, only one could succeed in breeding. One Adelie penguin and six south polar skuas (one chick and five adult) were ringed to study the population density and the migratory pattern. A total of 10 nests were sighted during the present study.

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