

Observations of Sea Birds during the XXI Indian Expedition to Antarctica (2001-2002)

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Abstract

The paper presents the information on birds observed during the XXIst Indian Scientific expedition to Antarctica. Total 26 species of birds were observed during onward voyage between 50° 19' to 69° 51' Latitude (S) & 10° 05' to 16° 00' Longitude (E) and return voyage from 68° 07" to 37° 58' Latitude (S) & 18° 06' to 28° 06' Longitude(E). The distribution, habit and abundance at various locations were also incorporated in the present paper. The observations on South Polar Skua were also recorded in Schirmacher Oasis. Their habit, nesting sites and population in Schirmacher Oasis was also studied.

Introduction

"Antarctica- the name means "Opposite to the Arctic" is the southern most continent. The Antarctic continent is the fifth largest continent, essentially not well known region on the earth. The mainland of Antarctica covers about 15.4 million square miles. The air in Antarctica is extremely dry. The low temperature results in a very low absolute humidity. Like the northern Polar Regions, Antarctica experiences sudden changes that result from the earth's 23.5° tilt from vertical axis. This means that for many weeks during the mid-summer (November to February), it is light around the clock. In mid-winter (June and July) there is corresponding period of continual darkness, when the sun never rises.

Although, both the poles receive very little direct radiation from the sun, but Antarctica is much colder than Arctic for a variety of reasons. There is about eight times more ice in the Antarctic region than Arctic Region and reflects more than 80% of the incoming radiation in the atmosphere, which reduces the heat retaining capacity in comparison to the Arctic. The lowest temperature (- 89.6°) ever recorded on earth was in Antarctica.

In Antarctica, the freshwater is more than any other continent, but it receives least precipitation (5 cm.), which is even lower than precipitation in many desert areas. But, it does snow in Antarctica, and if there is strong winds, then the most ferocious condition prevails, that is called blizzards. A severe blizzard may last a week at a time and visibility reduces to a few feet and wind speed cross over 100 knots. Blizzards may drift the freshly fallen snow to other areas, which may occur eight to ten times a year in coastal areas and they stand still the outdoor human activity. Antarctica is windiest continent on the earth.

Materials and Methods

The birds were observed with binoculars (10x 40), which were useful for the observation during the onward and return voyage. For the visuals record, three still camera and one movie camera were also used. Of these, two S. L. R. Camera of Pentax and Cosina and another for Zoom Camera were carried for slide preparations. Identification of sea birds are mainly done as per the classification of Harisson (1989). While onward journey five days surveillance from 14.01.02 to 18.01.02 and during return voyage from 18.03.02 to 24.03.02.

Observations

The fauna of Antarctic continent is unique to the southern region, which shares a variety of adaptations and enables them to survive in harsh environment. The major groups of animals are birds (sea birds including penguins) and the mammals (seals and whales) and the minute microscopic animals.

Since the commencement of journey from Cape Town on 8th January, 2002, the diversity of birds species at different positions during the voyage between Cape Town and Indian Bay (Antarctica) including Schirmacher Oasis was studied, which revealed the presence of about 26 species of birds. Their abundance and range of observation at different latitude and longitude are also recorded. The classification of sea birds were followed as given by Harisson (1989).

Sea Birds

The Antarctic convergence includes about 65 species of sea birds, but only 12 species breed on Antarctic continent itself (Harisson, 1989). These include pelagic, free ranging; species such as albatrosses and petrels.

While coastal species forage close to sea shore, among them are skuas, cormorants, terns and sheathbills. Among these, legendary albatrosses are the masters of the stormy southern seas.

Order SPHENISCIFORMES
Family SPHENISCIDAE

Penguins

Penguins are the flightless sea birds, mostly with dark upper parts and white underneath. The wings are covered with short flippers like structure covered with scale like feathers. Penguins are seldom seen during sea voyages in Antarctic convergence. They dive at the approach of the ships. Although seven species are known from Antarctica, but only two species i.e. Emperor and Adelie Penguins are observed during the present expedition.

1. Emperor Penguin *Aptenodytes forsteri*

Diagnostic characters: Length 112 to 115 cm. Irish Brown coloured, bill blackish, inner two-third of lower mandible coral pink lilac, legs dark grey. Differs from King Penguin in larger size, blacker head, colour and shape of auricular patches. Sexes alike, no seasonal variation.

Observations: The range of Emperor Penguin may overlap with smaller King Penguin. The species breeds regularly during winter in more than about 30 localities around Antarctic Continent and at the Dion of the Southern Antarctic Peninsula. The first Emperor Penguin was observed on 16.01.02 at the pack ice and subsequently more than 40 emperor penguin were observed from 17th to 21st January, 02. Total number of birds observed during the present expedition were 49, which were sighted between 69° 47' to 69° 51' Latitude (S) & 11° 55' to 12° 43' Longitude (E).

2. Adelie Penguin *Pygoscelis adeliae*

Diagnostic characters: Length 70 cm. Irish white. Bill reddish, tipped black. Body upper parts blue-black and under parts white. Flipper blue black with narrow white trailing edge. Legs pink and soles black. Sexes alike, no seasonal variation. Juveniles separable from adults.

Observations: The King Penguin was observed more common than Emperor Penguin and some times both the species were also found intermixed. Total number of birds observed during the present expedition

were 413, which were sighted between 67° 51' to 69° 51' Latitude (S) & 10° 15' to 12° 48' Longitude (E) from 15th January to 21st January. While return journey at Indian Bay, an Adelie penguin nest was found, where a small colony was present. The ship Magdalena Oldendorff was there for more than three days for the loading and offloading. The eggs were laid by the penguins below the oil tankers. These tankers are kept there continuously for the years to supply the fuel to the Indian Station.

Order PROCELLARIIFORMES

Albatrosses, petrels and shearwaters, storm-petrels, diving-petrels

Family DIOMEDEIDAE

Albatrosses: Of all the seabirds of Antarctica, the legendary albatross is the graceful master of the stormy southern seas. Albatrosses spent most of their lives on the wing, gliding and circling the wind system. They feed mainly on a diet of squid, and breed on sub-Antarctic Islands. The albatross species of the southern oceans include the Royal, Wanderer, Light mantled-Sooty, Grey-headed, Yellow-nosed and Black-browed albatrosses. Of thirteen species of two genera known from Antarctica, only seven species of albatrosses are recorded during the present expedition.

3. Wandering Albatross *Diomedea exulans*

Diagnostic characters: Length 107-135 cm. Wingspan 254-351 cm. Irish brown, orbital ring blue or pink. Bill flesh-white to pinkish with horn colour nails. Upper wing mostly white except for black primaries and narrow margin along secondaries. Legs pinkish to bluish white. The Wandering albatross are the most famous and largest of albatrosses. They have a weight of around 18 lbs. They are generally confused with Royal Albatross, who retain some black, brown or grey on head and females are rather smaller.

Observations: Wandering albatrosses normal pelagic range extends from about 60°S northwards to the tropic of Capricorn. During the onward and return voyage, the range of their sighting extended from 40° 10' to 62° 45' Latitude (S) & 13° 35' to 17° 59' Longitude (E) and total 31 birds were observed during the present expedition from 9th to 16th January and 19th to 23rd March, 02. They follow the ship for long period with characteristic soaring flight on bowed, motionless wings.

4. Royal Albatross *Diomedea epomophora*

Diagnostic characters: Length 107 to 122 cm. Wingspan 305 to 351 cm. Irish dark brown, orbital ring black. Bill pinkish-yellow, cutting edge of upper mandible black. Upper wing mostly white with black primaries and narrow trailing edge (compared with Wanderer, white forewing merges more evenly into dark trailing edge due to finer vermiculation across greater secondary-coverts. Legs pinkish or bluish white.

Observations: In comparison to the Wandering Albatross, Royal Albatross are less inclined to the vessels. Only two birds were observed on 21st March 02, at 51° 48' Latitude (S) & 15° 36' Longitude (E).

5. Black-browed Albatross / Black-browed Mollymawk

Diomedea melanophris

Diagnostic characters: Length 83-93 cm. Wingspan averages 240 cm. Irish brown. Bill bright waxy or orange-yellow, reddish at tip and narrow black line at base. Legs bluish-white.

Observations: Black-browed Albatross are widest and common. The range overlaps with Yellow-nosed and Grey-headed Albatrosses. They were sighted only during the return voyage between 41° 47' to 46° 54' Latitude (S) & 16° 31' to 17° 59' Longitude (E) and total 8 birds were observed on 22nd & 23rd March 02.

6. Yellow-nosed Albatross/ Yellow-nosed Molly Mawk

Diomedea chlororhynchos

Diagnostic characters: Length 71-81 cm. Wingspan 178-205 cm. Irish brown. Bill mostly black with yellow culminicorn and pinkish tip. Head mostly grey, nape and hind neck white. Body upperparts saddle blackish grey, rump white. Under parts mostly white, sides of breast faintly grey. Upper wing blackish, outer primary shafts whitish. Under wing mainly white except for black primaries and narrow margins. Legs pinkish-blue.

Observations: The first bird was sighted on 20th March, 2002 between 57° 43' Latitude (S) & 14° 38' Longitude (E) and another two birds were sighted on 22nd March, 2002 between 46° 54' to Latitude (S) & 16° 27' Longitude (E).

7. Grey-headed Albatross / Grey-headed Mollymawk

Diomedea chrysostoma

Diagnostic characters: Length 81 cm. Wingspan 220 cm. Head mostly blue-grey, paler on fore head and crown, dark mark before and

passing through eye. Upper wing brownish black, outer primary shafts whitish. Under wing mostly white with irregular black markings broadest on leading edge midway along inner wing but not forming conspicuous black wedges as in Black-browed Albatross. Legs whitish-flesh.

Observations: Total three birds were sighted during the return voyage on 22nd March 2002 at 47° 28' Latitude (S) & 16° 16' Longitude (E).

8. Sooty Albatross/ Dark-mantled Sooty Albatross

Phoebetria fusca

Diagnostic characters: Length 84 -89 cm. Wingspan averages 203 cm. Body brown and head sooty brown. Bill black, sulcus yellow or orange. Wings and tail dark brown, primaries and tail blackish with white or yellowish shafts. Legs mauve or greyish-flesh. They resemble light mantled sooty albatross, but usually can be characterise by the darker brown lower back and rump.

Observations: Eight birds were observed during onward journey on 14th January 02 at 69° 29' Latitude (S) & 14° 04' Longitude (E).

9. Light-mantled Sooty Albatross

Phoebetria palpebrata

Diagnostic characters: Length 79-89 cm. Wingspan 183-218 cm. Head venaceous dark brown. Eye - crescent white. Bill black, sulcus violet or blue. Body upperparts pale-ash grey, lower back and rump lightly edged brown. Under parts pale greyish-brown. Wings and tail dark brown, blackish primaries and tail show white or yellow shafts. Legs mauve or greyish-flesh.

Observations: This is one of abundant species of Albatrosses. Of which more than 75 birds were observed during onward and return journeys on 14th January 02 and 19th to 21st March 02 between 50° 54' to 62° 57' Latitude (S) & 13° 20' to 15° 45' Longitude (E).

Family PROCELLARIIDAE

Fulmars, prions, petrels and shearwaters

Petrels

There are many species of petrels in the Antarctica. They are more closer to the sea shore than albatrosses and feed at sea. The largest one is

South Giant Petrel and the smallest are Wilson Storm Petrel, who feed on small marine organisms.

10. Antarctic Fulmar /Silver-grey / Southern Fulmar

Fulmarus glaciaofoides

Diagnostic characters: Length 46-50 cm. Wingspan 114-120 cm. Antarctic Fulmar resembles Arctic Fulmar, but with longer and more delicate bill, longer wings and more strongly patterned upper wings. Bill pink, black at tip with blue nasal tube and yellowish sub terminal band. Legs pinkish-blue.

Observations: The southern or Antarctic Fulmar breeds on steep rocky cliffs on coast of Antarctica and often congregates in large 'rafts' on the ocean to rest, or feed on krill. A gregarious and scavenger bird, feeding and resting together on sea surface. Breeds at several localities on Antarctic Peninsula and continent. Ten birds were sighted during the onward voyage on 13 to 14th January 02 between 50° 49' to 60° 33' Latitude (S) & 15° 10' to 13° 53' Longitude (E) and 19 birds were observed during the return voyage on 18th to 20th March 02 between 57° 14' to 67° 55' Latitude (S) & 12° 28' to 14° 42' Longitude (E).

11. Antarctic Petrel

Thalassoica antarctica

Diagnostic characters: Length 40-46 cm. Wingspan 101-104 cm. Head and body upperparts mainly dark chocolate brown, lower rump and upper tail-coverts white. Bill brownish, sides faintly olive. Forewing including outer 3-5 primaries mostly dark chocolate brown, inner primaries and all secondaries white, narrowly tipped brown, forming conspicuous white sub terminal edge to wing. Tail white, narrowly tipped black. Legs flesh or greyish flesh.

Observations: The Antarctic petrel are known to breed locally in Antarctic continent. Total 156 birds were sighted during both the journeys and the range of their record is generally at 50° Lat. South and presently 156 birds were observed from 14th to 21st January 02 and on 18th March 02, between 59° 31' to 62° 45' Latitude (S) & 10° 07' to 14° 22' Longitude (E). The species was more abundant during the onward voyage.

12. Cape Petrel / Pintado Petrel/ Cape Pigeon

Daption capense

Diagnostic characters: Length 38-40 cm. Wingspan 81-91 cm. Body upperparts black mantle merges into white black and rump, both of which

are boldly marked with black chevrons forming distinctive chequerboard pattern. Under parts white. Under tails-coverts faintly spotted black. Upper wing mostly black except for conspicuous white patch on bases of innermost 5-6 primaries. Under wing mostly white except narrow black margins and tip. Tail mostly black and base white.

Observations: Cape petrels are also known as Painted ones, due to their striking pattern on their back and wings. They are pigeon sized birds nest on sea cliffs and rock crevices. This is a common petrel and recognised by their striking feature of the wings. Total 40 birds were observed, of which 31 birds were sighted during onward voyage on 51° 12' to 67° 55' Latitude (S) & 10° 05' to 157° 53' Longitude (E). and nine birds were sighted during the return voyage from 18th to 21st March 02, between 51° 12' to 67° 55' Latitude (S) & 10° 05' to 157° 53' Longitude (E).

13. Snow Petrel

Pagodroma nivea

Diagnostic characters: Length 30-35 cm. Wingspan 76-97 cm. Wholly white bird confined to pack ice and adjacent Antarctic seas. Appears long-winged in flight, with nearly square tail when folded but distinctly wedge-shaped, when fanned. Irish and bill black. Legs bluish-grey.

Observations: The snow petrel is one of the most beautiful birds in the Antarctica. They are pure white birds with black eyes and black ventrally. This bird is generally seen in pack ice area and also gliding, fluttering and jinking between icebergs. They were observed in hundreds during onward voyage on 14th to 21st January 02 between 61° 14' to 69° 51' Latitude (S) & 10° 03' to 14° 16' Longitude (E) and few in Schirmacher Oasis. About 20 birds were also sighted during the return voyage on 18th March 02 between 66° 35' to 68° 17' Latitude (S) & 12° 28' to 12° 42' Longitude (E).

14. Soft-Plumaged Petrel

Pterodroma mollis

Diagnostic characters: Length 32-37 cm. Wingspan 83-95 cm. Forehead and crown greyish brown narrowly scaled with white on forehead and over eye. Sides of face, chin and throat white with blackish mask before and below eye. Body upperparts mostly neutral grey fringed paler, long scapulars brownish black. Under parts mostly white, variably

complete greyish breast band, sides and flanks lightly streaked grey. Legs pinkish, distal two thirds of webs blackish.

Observations: This bird occasionally follows ships. Only one bird was sighted during the return voyage on 20th March 02 at 46° 23' Latitude (S) & 16° 48' Longitude (E).

15. Blue Petrel

Holobaena caerulea

Diagnostic characters: Length 28-30 cm. Wingspan 58-66 cm. Body upperparts mostly steel-grey; lower back darker. Under parts white except for incomplete dark grey collar. Fore head and fore-crown white mottled with grey and merging into dark blackish grey crown; nape, hind neck and sides of neck white except eye patch. Upper wings mostly steel grey; outer primaries and tips of greater coverts darker, linking across lower back to form open M mark. Under wing white, narrowly margined with grey. Tail squire; steel-grey with narrow black sub terminal band and white tip. This genus is a slightly larger and differs in darker head and unique white tipped tail with Prions.

Observations: The range of the species overlaps with *Prions* spp. The birds were sighted along with Prions at 66° 36' Latitude (S) & 10° 43' Longitude (E) on 15th January, 02.

16. Broad-Billed Prion

(Includes Salvin's and Antarctic Prions)

Pachyptila vittata

Diagnostic characters: Length 25-30 cm. Wingspan 57-66 cm. Body upperparts pale blue except for blackish bar across lower back. Upperparts white. Head dark blue-grey with short, white superciliary highlighted by blackish stripe passing below eye from lores to ear-coverts; lower sides of face, chin and throat white. Tail blue-grey, tip black; sides pale grey. Legs blue.

Observations: The range overlaps with similar Fairy and Thin-billed Prions. The species in hundreds were sighted between 50° 19' to 62° 57' Latitude (S) & 13° 33' to 16° 00' Longitude (E) during onward and return journeys on 12th to 14th January 02 and 19th to 21st March 02. The species is largest among the prions differing from Fairy Prions in dark-headed appearance with often feeding in dense flocks.

17. Fairy Prion / Fulmar Prion***Pachyptila turtur***

Diagnostic characters: Length 25-28 cm. Wingspan 56-60 cm. Body upperparts mostly pale blue-grey; lower back and tips of longer upper tail-coverts blackish. Under parts white. Head mostly pale blue-grey with small diffuse white superciliary often shaded behind eye with blue grey; chin, throat and sides of face white. Tail base mostly blue-grey, broad blackish terminal band, outer feathers pale grey. Undertail white, broadly tipped black.

Observations: This bird also overlaps the range of other species of Prions. The birds were sighted between 50° 14' to 60° 29' Latitude (S) & 14° 04' to 16° 00' Longitude (E) on 12th to 14th January, 02 & on 20th March 02.

18. Thin -Billed Prion / Slender-Billed Prion***Pachyptila belcheri***

Diagnostic characters: Length 26 cm. Wingspan 56 cm. Body upperparts pale blue-grey except for narrow greyish-black bar across lower back. Head mostly pale blue-grey ; lores and long superciliary conspicuously white with dark grey stripe passing below and behind eye; lower side of the face, chin and throat white. Upper wings mostly blue-grey; greyish-black outer primaries, their coverts and tips of some median and secondary -coverts form narrow ill-defined open M marked linked across lower back. Tail blue-grey, tip narrowly black; sides pale grey or whitish.

Observations: More than 200 birds of Thin-billed Prions were sighted between 41° 47' to 62° 13' Latitude (S) & 13° 40' to 17° 59' Longitude (E) on onward as well as return voyage on 12th January and 19th March 02.

19. Grey Petrel / Brown Petrel / Pediunker / Great Grey Shearwater***Procellaria cinerea***

Diagnostic characters: Length 48 cm. Wingspan 117-127 cm. Body upperparts ash-or brownish-grey. Under parts mostly white except for brownish-grey under tail-coverts. Head ash-grey merging without contrast into whitish chin. Upper wings faintly darker than upper parts. Underwing uniform grey. Tail dark-grey. Legs greyish-flesh, webs yellowish, blackish toes.

Observations: Grey petrel is subantarctic species with circumpolar distribution. Total nine birds were sighted during onward and the return voyage between 37° 58' to 60° 00' Latitude (S) & 14° 44' to 18° 06' Longitude (E) on 12th January and between 20th to 24th March, 2002.

20. White-Chinned Petrel / Shoemaker /Cape Hon *Procellaria aequinoctialis*

Diagnostic characters: Length 51-58 cm. Wingspan 134-147 cm. Wholly blackish- brown with variable amount of white on Chin and sides of the face and greyish bases to underside of primaries. Large heavily-built petrel with wedge-shaped tail and broad wings. Intermediate size between larger dark shearwaters and giant petrels. Legs black.

Observations: This is one of the common scavenger bird around the trawlers, habitually follows the ships. This sub Antarctic species was sighted between 46° 23' to 55° 12' Latitude (S) & 15° 12' to 16° 48' Longitude (E) on 13th January & 22nd March, 2002.

21. Flesh-footed Shearwater / Pale-footed Shearwater *Puffinus carneipes*

Diagnostic characters: Length 41-45 cm. Wingspan 99-106 cm. The body wholly brownish-black. Blackish primaries on upper-wing form dark 'triangles' in good light. Under-wing mostly dark brown and bases of primaries silvery white. Diagnostic bill pale horn. Culmen and tip black. Legs flesh- pink. Larger than Sooty Shear-waters.

Observations: This species is also known from Indian and Pacific Oceans. Total three birds were observed at 47° 15' Latitude (S) & 16° 13' Longitude (E) on 22nd March 02.

22. Great Shearwater /Greater Shearwater *Puffinus gravis*

Diagnostic characters: Length 46-53 cm. Wingspan 100-111 cm. Irish brown. Body upperparts, mantle and bill black. Scapulars and short upper-tail coverts dark greyish-brown faintly edged grey-buff. Long upper-tail coverts white forming conspicuous horseshoe over tail. Under parts mostly white except for brownish sides of breast, blackish-brown belly patch and under-tail coverts. Legs flesh and tail blackish.

Observations: This species is one of the most common shearwater observed during the present expedition. Total 198 birds were observed

between 41° 37' to 57° 43' Latitude (S) & 14° 38' to 18° 00' Longitude (E) on 12th January 02 & between 20th to 23rd March 02.

23. Sooty Shearwater

Puffinus griseus

Diagnostic characters: Length 40-46 cm. Wingspan 94-04 cm. Body sooty-brown. Chin, throat and bill greyer. Upperwings mostly sooty-brown, primaries and secondaries darker. Underwings brownish-black with silvery coverts. Legs blackish grey and tail blackish-brown.

Observations: This species is widely distributed in Pacific and Atlantic oceans. This is the most common shearwater observed during the present expedition. Total 226 birds were observed between 46° 15' to 57° 14' Latitude (S) & 14° 42' to 16° 15' Longitude (E) on 12th January, 2002 and between 20th to 22nd March 02.

Family OCEANIIDAE / HYDROBATIDAE Storm-Petrel

24. Wilson's Storm-Petrel

Oceanites oceanicus (Kuhl)

Diagnostic characters: Length 15-19 cm. Wing span 38-42 cm. Body upper parts mostly sooty-brown except for conspicuous rump. Under parts sooty brown, while thighs and undertail-coverts white. Upperwing sooty brown except narrow greyish band across greater coverts. Legs black with yellow or greenish web and tail blackish-brown.

Observations: This is transequatorial migrant in all oceans, but uncommon in the North Pacific. Normally avoids deep sea water, preferring to feed over shallow shelf water. Readily follow ships. Only four birds were observed during the onward journey between 51° 26' to 69° 50' Latitude (S) & 12° 26' to 15° 50' Longitude (E) on 12th to 21st January 02.

Order CHARADRIIFORMES Shorebirds, skuas, gulls, terns, auks

Family STERCORARIIDAE

Skua

The skua is the member of gull family. There are two types of skua found in Southern Oceans, the Antarctic and brown. They spent their winter at sea and breed in Antarctica.

25. South Polar Skua / Mc Cormick's Skua

Catharacta maccormicki

Diagnostic characters: Length 53 cm. Wingspan 127 cm. The body colour varies in Juveniles and adult morphs and there is continuous gradation between light and dark morphs. Juveniles rather greyer and adult are dark brown. In dark morph, head mostly dark brown to blackish. Irish dark brown Bill with a grizzled pale area in it. Body upper-parts uniform blackish brown and under-parts dark brown. Upper and lower wings uniform brownish black; shaft and bases of all the primaries white forming noticeable wing flash. Legs blackish-grey and tail blackish.

Observations: Just after reaching to the continent, skuas were observed, which were attracted probably for the food remains from the ships. Six pairs of skuas along with four juveniles were observed during the XXIst Indian expedition to Antarctica. The range varies from 69° 49' to 62° 45' Latitude (S) & 12° 26' to 17° 59' Longitude (E).

Family LARIDAE

Gulls, terns and noddies

Terns

The terns are widely distributed throughout the world. But the well known species is the Arctic tern, who arrives in large numbers in Antarctica each summer to feed after a journey of 20000 km from their nesting ground in the far North. They are quite smaller than gulls, having narrow, pointed wings, very short legs and moderately webbed legs. They are also known as sea-swallow due to their flight ability of several thousand km.

26. Antarctic Tern

Sterna vittata

Diagnostic characters: Length 41 cm. Wingspan 79 cm. Fore head, crown and lores white, merging well behind hind crown into blackish nape and sides of face. Remaining parts white. Upper parts of the body saddle smoky grey contrasting with white rump in adult breeding. Bill bright red. Legs dark red.

Observations: The Antarctic tern is very similar in appearance to its arctic cousin, a smallish white bird with a black cap and mask and red bill. During the summer months, it breeds on the edge of the Antarctic continent, particularly on the Peninsula and on most of the Antarctic

islands. The flock of nine birds were observed between 66° 35' to 67° 40' Latitude (S) & 12° 30' to 12° 42' Longitude (E) on 18th March 02.

Results and Discussions

The Antarctic water supports rich diversity of seabirds. These birds include pelagic or free-ranging species such as albatrosses and petrels and Coastal species on the contrary forage close to the shore, and among them are skuas, cormorants, terns and sheathbills. A total 26 species of sea birds were recorded during the onward voyage from 50° 19' to 69° 51' Latitude (S) & 10° 05' to 16° 00' Longitude (E) and during return voyage from 68° 07' to 37° 58' Latitude (S) & 18° 06' to 28° 06' Longitude (E) .38° S to 60° S latitude. The sea voyage of first, eleventh and fourteenth expeditions were launched from Goa (India), however, sea voyage of 21st Indian Expedition to Antarctica was launched from Cape Town. During the voyage of first, eleventh and fourteenth expeditions, 13, 32 and 21 species of sea birds were observed (Matondakar & Gomes 1983, Chattopadhyay 1995, Venkataraman 1997), while during the XXIst expedition, 26 species are observed. Although, the period of inward and outward journeys reduced from two months to only 20 days, but the species richness observed in Antarctic continent were almost in the same range.

South Polar Skua studies

The skuas are the member of gull family, who are also known by their nickname 'raptors of the south'. The skuas are fiercely predatory sea birds like snow and other petrels.

The studies on South Polar Skua are continued in and around Scirmacher Oasis. Their nestind sites and population in the Schumacher Oasis are also studied and compared with the earlier studies. Out of six pairs known from the area, five pairs of skua were observed. The Skua nest in rocky areas around the continent to raise just one chick. Total eight nests were observed.

The study was conducted from 22nd January to 4th March 2002. Out of six ringed skua, only one skua ring No. F13145 was observed in Schirmacher Oasis near the Maitri Camp. The population studies of skua have been conducted from 1979-80, 1984-85, 1988-89, 1991-92, 1994-95 and 2001-02. During the last two occasions 10 nests were observed but presently 6 nesting sites were observed. Only two nests were observed with fresh kill of snow petrels for feeding to the young chicks and few

with remnants of snow petrel's wings, which show that snow petrels are the main constituents of food for the chicks. Naturally the skuas fly long distances for the hunting of snow and Wilson's petrels.

The most pertinent observation about the skua has been the offering of remains of chickens, meat and fish by the station camps and the waste thrown outside the camps. Hence, the skuas are always waiting for such offerings, particularly after the food sessions and sometimes they also follow the participants to their visiting places to get some eatables from them. These activities are changing their habit of hunting and thus affecting their natural activities in the Schirmacher oasis and become mainly dependent on the food available from the camps. Which should not be allowed by the camp's Administrators to continue the same and such remains should also be burned in incinerators. So that they return back to their natural habitats and start hunting of snow and Wilson's petrels.

Any person visiting to their nests areas were attacked by the skuas and for these both male and female make aggressive impressions towards the intruders. This habit was observed more aggressive near the Russian station (Novolazarevskaya).

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Annexure-1

List of Sea Birds Observed During the
XXIst Indian Expedition To Antarctica

S.N.	Species/Common Name	Latitude between 'S'	Longitude between 'E'	Sightings Onward & Return voyage	No. of examples sighted
Penguins					
1.	<i>Aptenodytes forsteri</i> Emperor Penguin	69° 47' 69° 51'	11° 55' 12° 43'	16-21.1.02	49
2.	<i>Pygoscelis adeliae</i> Adelie Penguin	67° 27' 69° 51' 70° 45'	10° 15' 12° 48' 11° 44'	15-21.1.02 22-30.1.02	413 2
Albatrosses					
3.	<i>Diomedea exulans</i> Wandering Albatross	40° 10' 59° 47' 41° 47' 69° 47'	14° 19' 16° 00' 13° 35' 17° 59'	10-14.1.02 19-23.1.02	10 21
4.	<i>Diomedea epomophora</i> Royal Albatross	51° 48'	15° 36'	21.3.02	2
5.	<i>Diomedea melanophris</i> Black-Browed Albatross / Black-Browed Mollymawk	41° 47' 46° 54"	16° 31' 17° 59'	22-23.1.02	8
6.	<i>Diomedea chlororhynchos</i> Yellow-Nosed Albatross (Yellow-nosed Molly Mawk)	46° 54' 57° 43'	14° 38' 16° 27'	20-22.3.02	3
7.	<i>Diomedea chrysostoma</i> Grey-Headed Albatross	47° 28'	16° 16'	23.3.02	3
8.	<i>Phoebetria fusca</i> Sooty Albatross/Dark-mantled Sooty Albatross	69° 29'	14° 04'	14.1.02	8
9.	<i>Phoebetria palpebrata</i> Light-mantled Sooty Albatross	60° 29' 61° 08' 50° 54' 62° 57'	13° 20' 14° 04' 13° 33' 15° 45'	14.1.02 19-21.3.02	69 6
Fulmar					
10.	<i>Fulmarus glaciofoides</i> Antarctic Fulmar/ Silver-grey Fulmar/ Southern Fulmar	50° 49' 60° 33'	13° 53' 15° 10'	13-14.1.02	10

(Contd.)

List of Sea Birds Observed During the
XXIst Indian Expedition To Antarctica (Contd.)

S.N	Species/Common Name	Latitude between 'S'	Longitude between 'E'	Sightings Onward & Return voyage	No. of examples sighted
		57° 14' 67° 55'	12° 28' 14° 42'	18-20.3.02	19
Large and Southern Petrels					
11.	<i>Thalassoica antarctica</i> Antarctic Petrel	59° 31' 69° 50' 66° 16' 68° 07'	10° 07' 14° 22' 12° 28' 14° 45'	14-21.1.02 18.3.02	96 61
12	<i>Daption capense</i> Cape Petrel / Pintado Petrel/ Cape Pigeon	51° 12' 67° 27'	10° 05' 15° 53'	12-15.1.02	31
		51° 48' 67° 55'	12° 28' 15° 36'	18-21.3.02	9
13.	<i>Pagodroma nivea</i> Snow Petrel	61° 14' 69° 51' 66° 35' 68° 17'	10° 03' 14° 16' 12° 28' 14° 42'	14-21.1.02 18.3.02	673 20
14.	<i>Pterodroma mollis</i> Soft-plumaged Petrel	46° 23'	16° 48'	22.3.02	1
15.	<i>Holobaena caerulea</i> Blue Petrel	66° 36'	10° 43'	15.1.02	23
Prions (Whalebirds)					
16.	<i>Pachyptila vittata</i> Broad-billed Prion/ Salvin's and Antarctic Prions	50° 19' 60° 14'	14° 16' 16° 00'	12-14.1.02	329
		51° 08' 62° 57'	13° 33' 15° 36'	19-21.3.02	152
17.	<i>Pachyptila turtur</i> Fairy Prion / Fulmar Prions	50° 14' 60° 29' 57° 43'	14° 04' 16° 00' 14° 38'	12-14.1.02 20.3.02	202 4
18.	<i>Pachyptila belcheri</i> Thin Billed Prion / Slender-billed Prion	50° 19' 51° 26'	15° 50' 16° 00'	12.1.02	120
		41° 47' 62° 13'	13° 40' 17° 59'	19.3.02	84

(Contd.)

List of Sea Birds Observed During the
XXIst Indian Expedition To Antarctica {Contd.}

S.N.	Species/Common Name	Latitude between 'S'	Longitude between 'E'	Sightings Onward & Return voyage	No. of examples sighted
Larger Shearwaters and Petrels					
19.	<i>Procellaria cinerea</i> Grey Petrel, Brown Petrel, Pediunker, Great Grey Shearwater	50° 19'	16° 00'	12.1.02	2
20.	<i>Procellaria aequinoctialis</i> White-Chinned Petrel/ Shoemaker / Cape Hen	55° 12'	15° 12'	13.1.02	1
		51° 26'	16° 00'		
		46° 23'	16° 13'	22.3.02	4
		47° 15'	16° 48'		
21.	<i>Puffinus carneipes</i> Flesh-footed Shear water/ Pale-footed shearwater	47° 15'	16° 13'	22.3.02	3
22.	<i>Puffinus gravis</i> Great Shearwater/ Greater Shearwater	51° 12'	15° 53'	13.1.02	2
		51° 26'	16° 00'		
		41° 37'	14° 38'	20-23.3.02	196
		57° 43'	18° 00'		
23.	<i>Puffinus griseus</i> Sooty Shear water	50° 19'	16° 00'	12.1.02	10
		46° 15'	14° 42'	20-22.3.02	216
		57° 14'	16° 15'		
24.	<i>Oceanites oceanicus</i> Wilson's Storm Petrel	51° 26'	12° 26'	12-21.1.02	4
		69° 50'	15° 50'		
Skuas					
25.	<i>Catharacta maccormicki</i> South Polar Skua / McCormick's Skua	69° 49'	12° 26'	20.1.02	1
		70° 44'	11° 23'	22.1.02	12
		70° 47'	11° 52'	08.3.02	
Tern					
26.	<i>Sterna vittata</i> Antarctic Tern	66° 35'	12° 30'	18.3.02	9
		67° 40'	12° 42'		
Total species					26

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Work carried out successfully during the 18th Indian Antarctic Expedition (IAE) and the scientific findings are collated in this report. This expedition was the last one launched from the port of Goa (India). Many Scientific Committee on Antarctic Research (SCAR) mounted international campaigns are very well reflected in the scientific programmes of this expedition. True to the spirit of the Antarctic Treaty, the 18th IAE provided a platform to an Iranian scientist who collaborated with his Indian counterpart in biology. The Eighteenth Indian Scientific Expedition to Antarctica: An Introduction to the Expedition and Achievements (Summary) Ajay Dhar.

ATMOSPHERIC SCIENCES. xxv. German Antarctic (Schwabenland) Expedition: Explored the area east of the Weddell Sea in order to support a territorial claim of an area later claimed by Norway (i.e., Dronning Maud Land). 1938–1939. US Antarctic Service Expedition: Naval task force that was organized to map the coastline of Antarctica and to train military personnel in cold-weather operations. 1946–1947. US Naval Operation Windmill: From the moment of taking the sea, there is scientific work being conducted by the officers and engineering and technical personnel of the sixth Atlantic oceanographic expedition of Hydrographic Service of the Baltic Fleet on the board of the vessel. The Captain of the 2nd Rank Dmitry Puntus, the chief of the Hydrographic Service of the Baltic Fleet is in charge of the campaign. The station is the geographical point, where one or the other oceanographic observations are being conducted. More than 5000 kilometers of the example of trip have been achieved during the cruise by the hydrographic group under the leadership of Senior Lieutenant Pavel Kirilenko. In this work is actively being used the sounder NEL 1000M, having been installed before the campaign.