

REVERSED MODES OF MOULT OF FLIGHT FEATHERS IN THE
BLACKBROWED ALBATROSS *DIOMEDEA MELANOPHRIS*

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INTRODUCTION

The first attempt to elucidate the modes of moult of flight feathers of albatrosses, based on a sample of 24 birds plus the literature, was made by Brooke (1981). On 26 February 1982, 10 albatrosses (nine Blackbrowed *Diomedea m. melanophris* and one Shy *D. e. cauta*) were collected by the Southern Ocean Pelagic Seabird Research Programme of the FitzPatrick Institute at 34 08S, 17 55E, i.e. west of the Cape Peninsula, South Africa. These birds were examined by us a few days later as part of an ongoing study of the modes of moult of albatross flight feathers.

SHY ALBATROSS

The modes of moult seen in the one adult Shy Albatross were consistent with the points made by Brooke (1981) save that the three outermost primaries in each wing were growing. This again shows as with the adult Blackbrowed Albatross taken on 28 June 1979 (Brooke 1981) that a major reduction of c. 0.5 m in the total wingspan need not seriously inconvenience an adult nonbreeding albatross in its foraging.

BLACKBROWED ALBATROSS

Brooke (1981) claimed that in immature albatrosses the alula quills moulted in the simple descending mode. However, this seems not to be true as only one of the six immature Blackbrowed Albatrosses examined may show this mode whereas the other five show wave moult as in adults. An alternative view is that the mode of moult among the four functional alula quills is an ascending two centred one (A2 before A1, A4 before A3) and that aberrations are found among adults.

All the albatrosses examined show the three centred mode of moult in the tail feathers (rectrices) as laid down by Brooke (1981). Unfortunately, the sample has not increased our understanding of the mode in the secondaries, the most difficult group of flight feathers to elucidate in birds. Brooke (1981) commented on the high incidence (79 %) of interrupted moult of the primaries in adult and immature albatrosses. Seven of the 10 birds examined show interrupted moult. The overall incidence of interrupted moult is now 76 % (n = 29).

The most interesting finding in the sample of nine Blackbrowed Albatrosses (three adults and six immatures : first year birds

are rare in the southern Benguela current region (Morant *et al.* in press) is that four of the birds show a reversed or ascending mode of moult in the primaries (Table 1) and one of them a reversed or descending mode in the inner secondaries. In this last bird (Imm. I in Table 1) P1-7 are growing and P8-10 are worn or old. In the normal descending mode in birds this would mean that P1 had nearly finished growing, that P7 had only just started growing and that the other five showed stages in between. However, in this bird the reverse applies and P1 is the youngest, least grown and, by implications, last dropped of the series. Both wings show identical modes and stages of growth, i.e. are completely symmetrical. A reversed sequence is also found in the inner secondaries of each wing where S22-25 are growing with S25 the longest instead of the shortest grown feather.

DISCUSSION

Comment is needed on Adult III in Table 1 : while the pattern of the left wing looks like an example of the simple descending mode it seems likely, in view of events in the right wing and the marked tendency to symmetry in the moult of the primaries shown by albatrosses and most other birds, that an ascending mode starting at P7 or P3 has been completed leaving no trace of the event detectable by macroscopic inspection. This implies that the outer primaries, at least of the left wing, will moult in the normal descending mode. In view of the variability of modes in the Blackbrowed Albatross it does not seem impossible that a reverse mode should only occur in a subset of the primaries. After all, this is the normal mode in the Falconidae, some parrots and hornbills and a few genera in other families (Stresemann & Stresemann 1966: 19).

It is highly unusual to find a reversal of mode, a reversal of the direction of moult, as individual variation in one species in an Order in which the descending mode is the general pattern. However, four of 15 (27 %) adult and immature Blackbrowed Albatrosses examined have shown reversed or ascending mode of moult in the primaries and one of them in the secondaries as well. This situation is probably normal and not pathological or aberrant in the Blackbrowed Albatross, the species of which we have seen the greatest number of specimens. It may well occur in other albatrosses and should be looked for.

It is clear that further work is required on the modes of moult of flight feathers in albatrosses and, when these have been firmly established, on the ecological pressures that have led to these strategies of replacing the major feathers.

REFERENCES

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TABLE 1
 PRIMARY MOULT SCORES* OF FOUR BLACKBROWED ALBATROSSES *DIOMEDEA MELANOPHRIS* SHOWING THE
 REVERSED OR ASCENDING MODE

Specimen	Wing	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Imm. I	Left	2	2	3	3	3	4	4	0	0	0
	Right	2	2	3	3	3	4	4	0	0	0
Imm. II	Left	1	1	2	3	4	5	5	5	5	5
	Right	1	2	2	3	4	5	5	5	5	5
Adult III	Left	5	5	5	5	5	5	5	1	0	0
	Right	0	2	3	5	5	5	5	0	0	0
Adult IV	Left	5	2	2	3	3	4	4	0	0	0
	Right	5	0	2	3	3	4	4	0	0	0

*after Snow (1967)

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Shy Albatross (D.C. Cauta)