MOULT OF THE EUROPEAN SWALLOW

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Introduction

Mr A.D.S.Hewitt and the W.B.C. ringers have been banding European Swallows for over a decade, initially at Rosherville, Germiston and subsequently at Melrose Bird Sanctuary, Johannesburg. During the 1973/74 season 3923 birds were ringed and of these 419 (i.e. 10.7%) were processed. Moult, weight and morphological data were collected. An analysis of the moult of the remiges and rectrices is presented below.

Methods

A sample of approximately 10% was randomly chosen from each day's catch for detailed analysis. Where possible the age and sex of each bird were determined. The colouration of the forehead, throat and throat-band were noted. The birds were weighed and the wing chord and tail (both centre and streamer) length was recorded.

Each remex and rectrix feather was inspected. The status of each feather was recorded as growing, newly grown or old. The code used is that set out in the W.B.C. Ringers Manual (P. 9-14, 16) i.e.,

0	Old feather remaining
1	Feather missing or new feather in pin
2	New feather 1/3 grown
3	New feather 2/3 grown
4	New feather nearly full grown
N or 5	New feather fully developed

The primary feathers are numbered descendantly (i.e., from the body outwards). The secondary feathers are numbered ascendantly. The true secondaries being 1 to 6 and the tertials 7, 8 and 9. The tenth (or outermost) feather is vestigial and its moult was not recorded.

Results

The data have been summarised and are presented in Tables 1-4. For each of the 18 ringing occasions the means of the moult scores of the primary, secondary, tertial and tail feathers are shown in Table 1. The maximum moult scores are 45, 30, 15 and 60 respectively. The mean moult scores and the sample ranges are plotted in Figs.1 and 2. The sample standard deviations were computed but are not shown for lack of space.

The percentage of all birds moulting a given primary, secondary, tertial or tail feather are given in Tables 2, 3 and 4. Also shown is the proportion of birds with completed or with moult not started.

Discussion

Remiges: The primaries moult descendantly, in sequence at a fairly uniform rate. The first birds commence primary moult in mid-November and the last in mid-December. By the middle of January 50% of the birds have moulted five primary feathers. The first complete moults were noted at the end of February. By March the majority of birds are growing the outer two primary feathers only.

The tertial moult is difficult to monitor and may be underrepresented in the moult scores. Tertial moult takes place in December prior to the secondary moult. Mendelsohn (1973) Ann.Ivl. Mus. 28:79-89) has suggested that the tertials moult in the sequence middle/inner/outer, but our data are ambiguous on this point.

The true secondaries moult ascendantly and in sequence. The moult starts in December and is completed in March. The secondary moult in the population as a whole is less highly synchronised than the primary moult.

Rectrices: The tail moult proceeds centrifugally beginning in December. By early March more than half the birds have completed their moult. The moult sequences is 1,2,3,4,6,5 or 1,2,3,6,4,5, but the outer two or three feathers on each side complete growth at approximately the same time.

Conclusions

The findings of the W.B.C. group are in general agreement with those of Mendelsohn. The moult study will be continued for another two or three years. It is hoped that the accumulated data will enable greater precision of analysis and may reveal seasonal variations.

If similar studies are carried out at other localities it may then be possible to detect regional differences, if any exist.

Acknowledgements

I should like to thank Mr.A.D.S.Hewitt for permission to write up this work on behalf of the W.B.C. group, and furthermore to express my appreciation to those ardent and water-resistant ringers who have helped to collect these data.

TABLE 1

The Mean Moult Scores

DATE	SAMPLE	MOULT SCORE			
		Primary	Secondary	Tertiary	Tail
4.11.73	1	0	0	0	0
11.11.73	2	0	0	0	0
18.11.73	33	3.27	0.24	0	0
25.11.73	24	4.58	0.58	0	0
2.12.73	22	12.50	1.23	0.59	0.41
23.12.73	16	17.56	6.88	3.80	0
30.12.73	19	20.11	4.00	0.74	3.63
12.01.74	13	26.15	0.08	4.54	3.46
15.01.74	11	27.18	7.64	12.64	12.55
3.02.74	16	30.88	16.13	15	25.31
10.02.74	31	33.16	17.42	15	27.20
17.02.74	25	35.72	19.20	15	43.68
24.02.74	54	36.89	21.54	15	42.94
2.03.74	28	37.93	22.89	15	45
3.03.74	35	40.46	24.40	14.97	50.59
10.03.74	35	41.60	26.49	15	51.11
17.03.74	38	43.44	28.42	14.87	56.79
24.03.74	15	43.93	29.29	15	58

TABLE 2

Proportion of Individuals Growing a Given Primary Feather

(numbers in columns are percentages)

DATE	SAMPLE SIZE	Not Started	Moulting Feather									Moult Complete
			1	2	3	4	5	6	7	8	9	
4.11.73	1	100										
11.11.73	2	100										
18.11.73	33	21	70	52	21							
25.11.73	24	13	88	71	25	4						
2.12.73	22	9	14	45	59	9	5					
23.12.73	16	0	6	6	25	56	44	25				
30.12.73	19	0			16	32	58	32				
12.01.74	13	0	8			15	31	31	15			
15.01.74	11	0	9			9	9	55	27			
03.02.74	16	0						44	56	25		
10.02.74	31	0						35	42	32	16	
17.02.74	25	0						8	44	44	32	
24.02.74	54	0						15	48	61	41	2
2.03.74	28	0						15	36	43	43	0
3.03.74	35	0					3		11	69	71	6
10.03.74	35	0							9	46	71	17
17.03.74	39	0								15	72	28
24.03.74	15	0								7	73	27

TABLE 3

Proportion of Individuals Growing a Given Secondary of Tertiary Feather

(numbers in columns are percentages)

DATE	SAMPLE SIZE	TERTIARY					SECONDARY						
		NOT STARTED	FEATHER			COMPLETE	NOT STARTED	FEATHER					COMPLETE
			9	8	7			6	5	4	3	2	1	
4.11.73	1	100					100							
11.11.73	2	100					100							
18.11.73	33	100					94					3	3	
25.11.73	24	100					79				4	17		
2.12.73	23	73	23				77					5	14	
23.12.73	16	13	50	50	13		13				13	50	50	
30.12.73	19	95			5		16					32	32	
12.01.74	13	40			13	7	93						7	
15.01.74	11		18	9	9	55	9	9			27	27	18	
03.02.74	16					100		6	19	44	31			
10.02.74	31					100		13	23	39	29	10		
17.02.74	25					100		28	24	36	16	8		
24.02.74	54					100		22	28	41	13	2	2	13
2.03.74	28					100		32	40	21	14			11
3.03.74	35		3			97		37	46	17	3			11
10.03.74	35					100		31	46	3				34
17.03.74	39					100		31	15					59
24.03.74	15					10		33						67

TABLE 4

Proportion of Individuals Growing a Given Tail Feather

(numbers in columns are percentages)

DATE	SAMPLE SIZE	LEFT TAIL *								RIGHT TAIL *							
		Moult not Started	Feather 6	5	4	3	2	1	Moult Complete	Moult Complete	Feather 1	2	3	4	5	6	Moult not Started
04.11.73	1	100															100
11.11.73	2	100															100
18.11.73	33	100															100
25.11.73	24	100															100
02.12.73	22	86	5				5	9			14						86
23.12.73	16	94						6			6						94
30.12.73	19	68				5	26	21			16	21	5				68
12.01.74	13	36	15			15	27	31			38	23	15			8	31
15.01.74	11	18	18		18	18	64	18			18	55	18	18		18	18
03.02.74	16		69	6	38	25	38	19			13	44	25	31	19	69	
10.02.74	30	10	30	10	27	42	13	3			3	17	40	27	13	30	10
17.02.74	22		55	55	32	18	5	5	5	5		5	18	36	59	64	
24.02.74	54		61	63	39	35	2		9	11		2	22	41	46	59	
02.03.74	27		74	52	26	11			11	11		4	7	26	52	70	
03.03.74	34		68	53	26	3			18	24				24	50	65	
10.03.74	35		60	37	20				34	31				23	43	63	
17.03.74	39		31	28	5				67	67				5	28	26	
24.03.74	15		27	27					67	67					27	27	

* Bird as seen from above & facing away

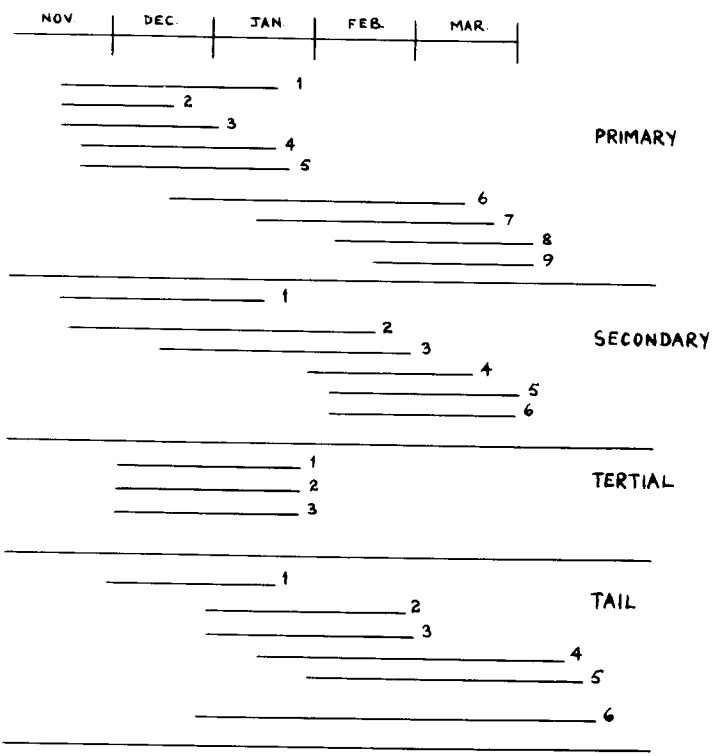


FIG 1

TIMES FOR WHICH 90% OF THE POPULATION ARE GROWING A PARTICULAR FEATHER.

FIG 2(a)

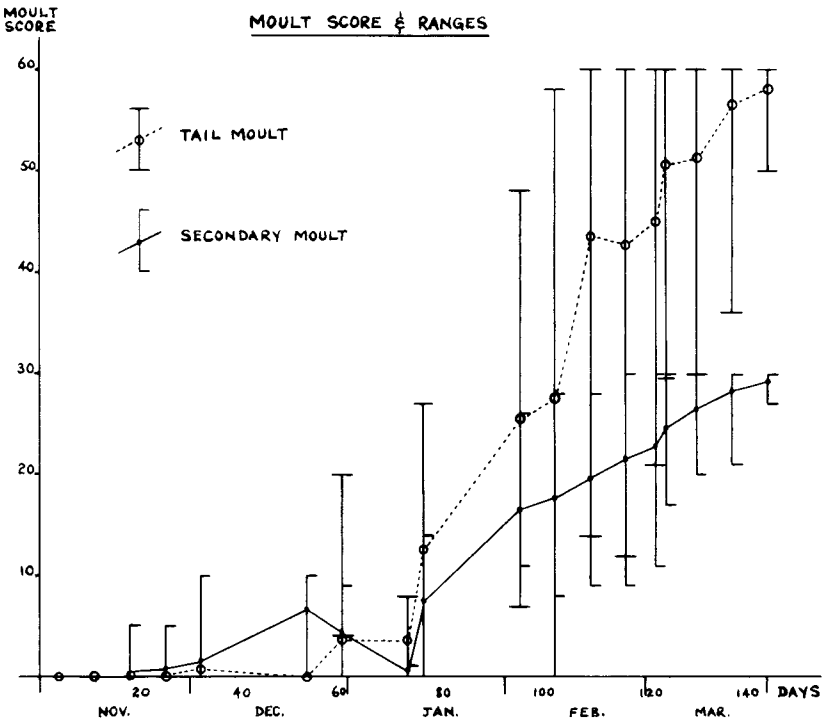
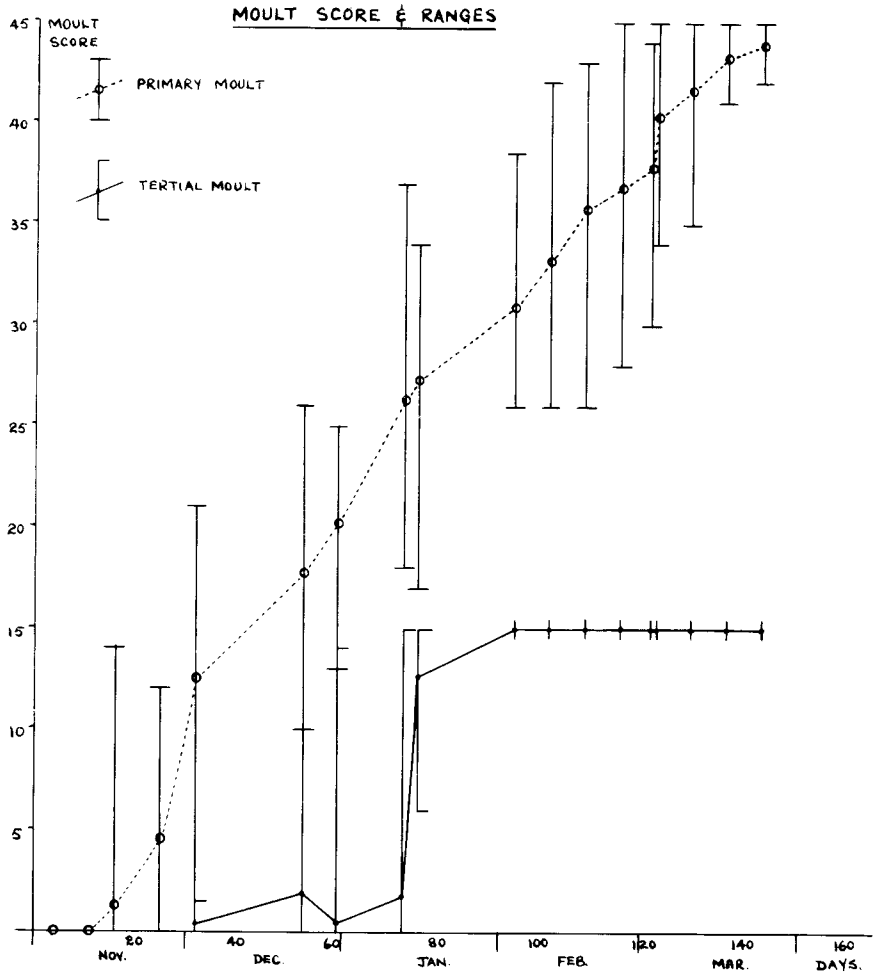

MOULT SCORE
MOULT SCORE & RANGES
60
50
40
30
20
10
TAIL MOULT
SECONDARY MOULT
20
40
60
80
100
120
140
DAYS
NOV.
DEC.
JAN.
FEB.
MAR.

FIG 2(b)


MOULT SCORE & RANGES
MOULT SCORE
PRIMARY MOULT
TERTIAL MOULT
45
40
35
30
25
20
15
10
5
20
40
60
80
100
120
140
160
NOV.
DEC.
JAN.
FEB.
MAR.
DAYS.