

Remige moult in Spotted Flycatcher (*Muscicapa striata*) on its West African wintering grounds

Information on the timing of moult of the Palaearctic Spotted Flycatcher (*Muscicapa striata*) on its African wintering grounds is generally scarce. Here, we present data on remige moult of six Spotted Flycatchers mist-netted between 1995 and 1999 in Comoé National Park and at the research station of Lamto, Ivory Coast.

Spotted Flycatchers usually moult remiges on their wintering grounds (GINN & MELVILLE 1983) with few exceptions (JENNI & WINKLER 1994). Birds moulting primaries were recorded between November and April (DIESELHORST 1961, STRESEMANN 1963, GATTER 1997). KASPAREK (1981) states that remige moult starts at the beginning of November and finishes at the end of March. Moult was calculated to last about 82 days, however, the linear regression method used by KASPAREK (1981) is insufficient to get realistic estimations of the timing of moult (UNDERHILL & ZUCCHINI 1988).

The sequence of primary (P) moult starts at the distal end of the wing with P9 (descendant numbering) and proceeds in the proximal direction (DIESELHORST 1961, STRESEMANN 1963, WILLIAMSON 1972). Sequence of secondary (S) and tertial (T) moult is debated in literature. Contradicting views are whether S moult starts after the renewal of all T (STRESEMANN 1963) or can start earlier (JENNI & WINKLER 1994) or whether S moult starts with S6 (STRESEMANN 1963) or as frequently with S1 as with S6 (WILLIAMSON 1972). Former studies (DIESELHORST 1961, STRESEMANN 1963, WILLIAMSON 1972) only investigated museum skins where the moult of proximate feathers is sometimes difficult to detect (JENNI pers. com).

Study area and methods

Comoé National Park lies in the north-east of the country. Main habitats are various types of savanna, gallery forest along the larger rivers and isolated forests in the south (for details see POILECOT 1991). The Spotted Flycatcher is a frequent migrant that winters there in small numbers (SALEWSKI 2000). The ecological station of Lamto lies at the southern fringe of the south Guinea savanna zone at 6°13' N, 5°02' W. The habitat is mainly *Borassus* palm savanna with gallery forest along the river Bandama and forest patches in the savanna (for details see THIOLLAY 1998). The Spotted Flycatcher is a very common migrant at Lamto (THIOLLAY 1971, pers. obs.). Spotted Flycatchers in Comoé National Park (bird 1 and 2, Table) were mist-netted at c. 8°45' N, 3°49' W in patches of open forest in the savanna. In Lamto all birds (birds 3 – 6, Table) were mist-netted in savanna. Moult was recorded on a moult card of the „Dachverband Deutscher Avifaunisten“. Remiges were scored according to GINN & MELVILLE (1983) where an old feather scores 0, a new feather 5 and missing or growing feathers between 1 and 4. Nomenclature of feathers follows JENNI & WINKLER (1994). All birds were handled by VS except bird 1, which was handled by S. EGGERS.

Acknowledgements: We thank the 'Ministère des Eaux et Forêts de la Côte d'Ivoire' for permission to work in Comoé National Park and Prof. K.E. LINSENMAIR for permission to use the facilities of the research camp of the University of Würzburg in the park. We thank the president of the University of d'Abobo, Abidjan, Prof. DAOUADA AIDARA and R. VUATTOUX for permission to work and stay at the ecological research station of Lamto. S. EGGERS, J. FRY, F. GÖKEN, K. KOUADIO, A. K. KOUADIO, LAKADO, L. POMERENCKE, D. V. STÜNZNER-KARBE, S. SCHMIDT, D.T. TIETZE and K.P. YAO gave invaluable help in the field. P. JONES, J. DIERSCHKE and J. VICKERY helped with the literature search. H. RAINEY and O. MUISE kindly improved our English. The study was supported by the Deutsche Forschungsgemeinschaft and Volkswagen AG.

Results and Discussion

Spotted Flycatchers were mist-netted between November and March (Table). With the exception of one bird in January, all individuals showed remige moult (Table). Birds 1 and 5 were in early stages of remige moult in February. In contrast, bird 3 had already a P score of 24 on both wings in November and therefore, had started moult much earlier. Additionally, bird 4 also had a much higher P score (41/41) in February compared to the other birds mist-netted in this month. The only bird mist-netted in March had almost completed P moult (49/50). These data suggest a high variation in

Table: Moults scores of remiges of six Spotted Flycatchers mist-netted in Ivory Coast, West Africa (meaning of moult scores see: study area and methods).

Tabelle: Daten zur Schwingenmauser von sechs in der Elfenbeinküste, Westafrika, gefangenen Grauschnäppern (Bedeutung der Mauserklassen siehe: study area and methods).

no.		1		2		3		4		5		6	
date		14 Feb 95		9 Jan 96		20 Nov 98		4 Feb 99		4 Feb 99		4 Mar 99	
wing		l	r	l	r	l	r	l	r	l	r	l	r
tertiaries	9	0	1	0	0	0	0	0	0	0	0	5	5
	8	0	0	0	0	0	0	0	0	0	0	2	2
	7	0	0	0	0	0	0	0	4	0	0	5	5
secondaries	6	8	8	0	0	5	0	0	0	0	2	0	0
	5	8	8	0	0	3	1	5	5	2	1	0	0
	4	8	8	0	0	0	0	1	0	0	0	0	0
	3	8	8	0	0	0	0	0	0	0	0	3	3
	2	8	8	0	0	0	0	5	5	0	0	2	2
1	8	8	0	0	0	0	0	0	2	0	4	4	
primaries	1	0	0	0	0	0	0	0	0	0	0	4	5
	2	0	0	0	0	0	0	2	2	0	0	5	5
	3	0	0	0	0	0	0	4	4	0	0	5	5
	4	0	0	0	0	0	0	5	5	0	0	5	5
	5	0	0	0	0	2	2	5	5	0	0	5	5
	6	0	0	0	0	3	3	5	5	0	0	5	5
	7	2	1	0	0	4	4	5	5	2	2	5	5
	8	4	4	0	0	5	5	5	5	5	5	5	5
	9	4	4	0	0	5	5	5	5	5	5	5	5
	10	0	0	0	0	5	5	5	5	1	5	5	5

the onset of moult in Spotted Flycatchers; some birds starting moult as early November or even late October, whereas others still had not begun to moult in January or were in early stages of moult in February. Therefore, we can confirm KASPAREK'S (1981) statement regarding the moult period (early November to end of March) but this period represents the extreme dates for the whole population rather than the absolute timing of moult in individuals. Whether there is an among year variation in timing of moult cannot be investigated with the low number of birds in this study.

Most birds were in active moult in February and March, which coincides with the dry season in West Africa. This is in contrast to findings by BENSCH et al. (1991) and JONES (1995) who suggested that Palaearctic migrants should avoid moulting in the dry season because of resource depletion during this time. Although it can be argued that the dry season is less severe in the southern Guinea savanna (Lamto), intensive moult in several Palaearctic migrant species in the dry season in Comoé National Park (SALEWSKI 1999) indicate that previous theories of timing of moult of migrants in West Africa cannot be generalised.

With respect to the sequence of moult, all birds moulting PP showed an ascendant sequence from P9 to P1 and P10 moulting about when P7 is shed (STRESEMANN 1963, WILLIAMSON 1972, JENNI & WINKLER 1994). With respect to TT, we could not confirm that they generally started to moult at the beginning of P moult (STRESEMANN 1963). Birds 3 - 5 had a considerable number of PP new or growing but had not started T moult yet, with the exception of bird 4, which had one T growing and already had new P10 - 4. S moult did not start after the renewal of the TT (STRESEMANN 1963, WILLIAMSON 1972, GINN & MELVILLE 1983). Birds 3 - 5 had already started S moult without shedding any of the TT, with the exception of bird 4, which had one T growing and already had four new SS. JENNI & WINKLER (1994) came to a similar conclusion after examining two museum skins. The data suggest that sequence of S moult might also vary individually and is not always symmetrical (birds 3 and 5). S moult might start with S6 (bird 3), S5 (possibly birds 4 and 5), S1 (birds 5 and 6) or with S2 (possibly

bird 4). Bird 6 had probably preceeded P moult with S1 - 3 symmetrically in an ascendant sequence. Bird 6 is therefore the only individual that showed the moult sequence proposed by KASPAŘEK (1981).

In summary, we suggest that the onset of prenuptial moult in Spotted Flycatchers is very variable and takes place mainly in the dry season in West Africa. PP moult follows the normal ascendant sequence described for the species. T moult starts after the beginning of P moult and, contrary to many earlier authors, often after the beginning of S moult. S moult seems to be very variable and can start with S1, S2, S5 or S6. As the four birds analysed in our study had already different sequences of S moult, the variation is probably much greater. The differences between the individuals of our study and the differences to the results of former authors (DIESELHORST 1961, STRESEMANN 1963, WILLIAMSON 1972) reflect a great variation of moult in Spotted Flycatchers which might not only be due to different wintering latitudes.

Zusammenfassung

Schwingenmauser des Grauschnäppers (*Muscicapa striata*) im westafrikanischen Überwinterungsgebiet.

Wir untersuchten die Schwingenmauser von sechs Grauschnäppern in ihrem Überwinterungsgebiet in der Elfenbeinküste, Westafrika. Mauser wurde zwischen November und März festgestellt und der Zeitpunkt des Mauserbeginns war sehr variabel. Ein Großteil der Schwingen wurde in der Trockenzeit gemausert, wenn das potentielle Nahrungsangebot im Vergleich zur Regenzeit geringer ist. Dieser Befund widerspricht gängigen Theorien zum Mauserverlauf in Westafrika. Handschwingen wurden in der für die Art typischen ascendenten Reihenfolge gemausert. Die Schirmfedermauser begann jedoch, entgegen Angaben früherer Autoren, erst einige Zeit nachdem die ersten Handschwinge vermausert waren und meist auch erst nach dem Beginn der Armschwinge. Die Sequenz der Armschwinge mauser war sehr variabel und unterschied sich bei allen vier Vögeln, von denen Daten hierzu vorlagen. Als erste vermauserte Schwinge trat dabei S1, S2, S5 oder S6 auf. Die von uns gefundenen Unterschiede in der Mausersequenz bei den untersuchten Vögeln und im Vergleich zu Angaben früherer Autoren drücken eine höhere Variabilität in der Schwinge mauser von Grauschnäppern aus als bisher angenommen wurde.

References

- Bensch, S., D. Hasselquist, A. Hedenström & U. Ottosson (1991): Rapid moult among Palearctic passerines in West-Africa - an adaptation to the oncoming dry season. *Ibis* 133: 47–52. * Diesselhorst, G. (1961): Ascendente Handschwinge-Mauser bei *Muscicapa striata*. *J. Orn* 102: 360–366. * Gatter, W. (1997): The birds of Liberia. Aula, Wiesbaden. * Ginn, H.B., & D.S. Melville (1983): Molt in birds. BTO, Thetford. * Jenni, L., & R. Winkler (1994): Molt and ageing of European passerines. Academic Press, London. * Jones, P. (1995): Migration strategies of Palearctic migrants in Africa. *Isr. J. Zool* 41: 393–406. * Kasparek, M. (1981): Die Mauser der Singvögel Europas – ein Feldführer. DDA, Lengede. * Poilecot, P. (1991): Un écosystème de savanne soudanienne: Le Parc Nationale de la Comoé (Côte d'Ivoire). Bietlot, Gilly. * Salewski, V. (1999): Untersuchungen zur Überwinterungsökologie paläarktischer Singvögel in Westafrika unter besonderer Berücksichtigung der Wechselwirkungen zu residenten Arten. PhD-thesis, Wilhelmshaven, Oldenburg. * Idem (2000): The birds of Comoé National Park. *Malimbus* 22: 55–76. * Stresemann, V. (1963): Zur Richtungsumkehr der Schwinge- und Schwanzmauser von *Muscicapa striata*. *J. Orn.* 104: 101–111. * Thiollay, J.-M. (1971): L'avifaune de la région de Lamto (Moyenne Côte-d'Ivoire). *Annales de L'Université D'Abidjan* 4: 5–132. * Idem (1998): Long-term dynamics of a tropical savanna bird community. *Biodiversity and Conservation* 7: 1291–1312. * Underhill, L., & W. Zucchini (1988): A model for avian primary moult. *Ibis* 130: 358–372. * Williamson, K. (1972): Reversal of normal moult sequence in the Spotted Flycatcher. *Br. Birds* 65: 50–51.

Volker Salewski, Franz Bairlein and Bernd Leisler

Addresses of the authors:

Institut für Vogelforschung, „Vogelwarte Helgoland“, An der Vogelwarte 21, 26386 Wilhelmshaven, Germany (VS, FB), email: volker.salewski@web.de; Forschungsstelle der Max-Planck-Gesellschaft für Ornithologie, Vogelwarte Radolfzell, 78315 Radolfzell-Möggingen, Germany (BL).

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Vogelwarte - Zeitschrift für Vogelkunde](#)

Jahr/Year: 2001/02

Band/Volume: [41_2002](#)

Autor(en)/Author(s): Salewski Volker, Bairlein Franz, Leisler Bernd

Artikel/Article: [Remige moult in Spotted Flycatcher \(*Muscicapa striata*\) on its West African wintering grounds 301-303](#)