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On the underparts coloration of a population of the barn owl *Tyto alba "guttata"* in southern Lower Saxony, Germany

1. Introduction

The remarkable differences in the coloration of the underparts in the European barn owls north of the alps lead to the distinction of two subspecies: the western *alba* and the eastern *guttata*. Between these two there is a zone with intermediate birds. Voous (1950) stressed the question how this type mix could be explained. Using museum specimen he determined in a ten step scale the frequency of the variants within Europe eastward to "East"Germany (presented in a five step scale). From the distribution of the transition colours Voous deduced that the two source types, *alba* and *guttata*, post glacially had spread from two centres (western Mediterranean countries and perhaps Bulgaria – Crimea) northward in direction to central Europe. There they interbred in a large scale. After Voous "the existence of intermediary populations in eastern and central France indicates that in the contact zones the brown bellied birds are going to remove the white genotypes".

As recorded dispersal of fledglings does occur over several hundred kilometres. So even in western France specimen with underparts not white (GLUTZ von BLOTZHEIM 1994) and in NE Poland (TISCHLER in GLUTZ von BLOTZHEIM 1994) and in Hungary (MÁTICS & HOFFMANN 2002) such with entirely white underparts do exist. From the hybridization zone records were published concerning the relative frequency of the transition colorations (ROULIN 1996, for western Switzerland, with a colour table, and MÁTICS & HOFFMANN 2002, for Hungary). Onto that studies have been made on the genetics (MÁTICS et al. 2005), the alterations during the process of aging (ROULIN 1999 b), the function in mate choice (ROULIN 1999 a, MÁTICS et al. 2002), and on functional aspects of the spottiness (ROULIN et al. 2001).
Obviously today the interbreeding process has not finished. So it seems to be appropriate to communicate the colour distribution of a temporally and geographically limited sample.

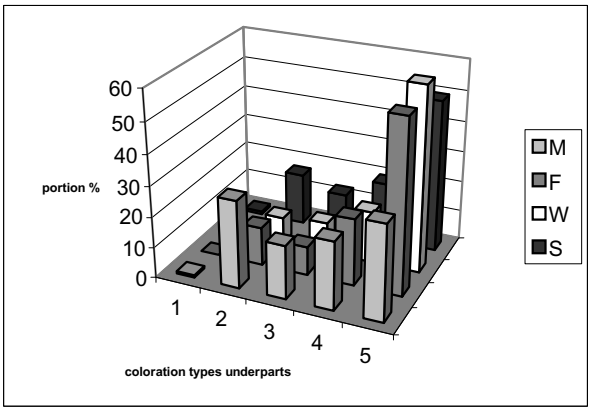

Fig. 1: Frequency distribution of underparts coloration of all individuals (S) and by sexes. N = 126 • (M), 159 • (W) and 33 individuals of unknown sex (F).

2. Material

When ringing caught or trapped (mostly breeding) barn owls in southern Lower Saxony (about 15 km around Einbeck, 9.87° East, 51.82° North) during the last 10 years the underparts coloration of the birds was judged by appearance. The spectrum was cut into 5 types:

1 underparts totally or almost white, spottiness scarce to missing (corresponding to photo 1a ROULIN 1996)
2 belly light with few spots, breast slightly darker (photo 1b ROULIN 1996)
3 intermediate (not figured by ROULIN 1996)
4 belly dark with distinct spottiness (weakly lighter than on photo 1c ROULIN 1996)
5 belly very dark with dominant spottiness (photo 1d ROULIN 1996)

Type 1 represents "*alba*", the two types 4 and 5 "*guttata*". In total the coloration of 318 specimen was registered (as judged from weight and brood patch 126 were • and 159 •). In birds caught several times only the coloration type found at the first control was included. (Alterations eventually occurring with age will be reported later.)

3. Result

In total individuals with dark underparts are predominant. However, a clear difference between the sexes is observed (fig. 1): About one half of the • is very dark, whereas this proportion in the • only reaches about 30%. In contrast, in the latter the proportion of the very light individuals (types 1 and 2) nearly makes up 30% and only less than 10% in the • . The distribution in the specimen not sexed makes guessing that the proportion of the sexes is about 1:1.

4. Discussion

It is verified that in this barn owl population both extremes of the spectrum appear in both sexes but that the • mostly are clearer than the • . As expected the proportion of the dark birds (types 4 and 5) making 70% is clearly lower than in the Hungarian ones with 84%, correspondingly that of the lighter ones (types 1 and 2) making just 20% against less than 10% in the Hungarian population is as clearly higher (not separated for the sexes; MÁTICS & HOFFMANN 2002). The birds in Switzerland belonging with about 50% of the • and about 80% of the • to the lighter types (ROULIN 1996) prove to be much nearer to "*alba*".
Looking at the • we can assume that this population is a not spectacular transitional one close to the area of type 5, meaning "guttata". Not so looking at the • : Here we are astonished by the remarkably high proportion of type 2 and also a higher one of the types 3 and 4. We could speculate that in the farer past a clearly higher immigration of "*alba*-" • and additionally in the nearest past a new wave had happened. If this later immigration were still going on the proportion of type 1 should be

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higher. As condition for such a difference between the sexes there should be a linkage of the underparts coloration to the sexes. Moreover an increased immigration of • would contradict all hitherto knowledge of the young barn owls dispersive behaviour. Females move apparently farer. So MÁTICS (2003) writes that between Hungary and Switzerland more • and more "*guttata*" are exchanged than • a nd "*alba*".

5. Summary

The underparts coloration of 318 breeding barn owls was investigated. In the • , the distribution among 5 coloration types is non spectacular and has its predominant peak at the type "*guttata*". In the • , not only the lighter types ("*alba*") are more frequent but there is a second peak in the very light types. The authors speculate that this could reflect a recent immigration from the west.

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