

Observation of a Middle Spotted Woodpecker *Dendrocoptes medius* with aberrant, brown-coloured plumage

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Abstract Birds with atypical colours in their plumage are not uncommon however, the potential causes of such aberrations have not been widely examined. Aberrant brownish-rufous phaeomelanin is one type of plumage colour that has been recorded in numerous bird species, including those which essentially contain only eumelanin (black) pigments, including several European woodpeckers. A Middle Spotted Woodpecker *Dendrocoptes medius* with aberrant phaeomelanised plumage observed in the Bükk Hills, Hungary, is detailed here and an evaluation of the possible nature of this form of plumage discussed.

Keywords: woodpeckers, *Dendrocoptes medius*, aberrant plumage, phaeomelanised

Összefoglalás Az atipikus színű tollazattal rendelkező madarak nem ritkák, azonban az albinizmus és a leucizmus kivételével az ilyen rendellenességek lehetséges okait nem vizsgálták széles körben. A rendellenes barnás-vöröses phaeomelanin a tollazati pigmentek egyik típusa, amelyet számos madárfajnál, európai harkályoknál is feljegyeztek, beleértve azokat is, amelyek tollazata lényegében csak eumelanin (fekete) pigmenteket tartalmaz. Itt egy a Bükk-hegységben megfigyelt közép fakopáncsot (*Dendrocoptes medius*) mutatunk be rendellenes feomelanizált tollazattal, és értelmezzük a tollazat e formájának lehetséges kialakulását.

Kulcsszavak: harkályok, fakopáncsok, *Dendrocoptes medius*, rendellenes tollazat, feomelanizált

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Introduction

Melanism is defined as an increase of dark pigment in the plumage, resulting in a blackish appearance. However, there is often no increase of pigment and melanism does not necessarily involve dark pigment alone. Also, many different mutations in many different genes promote melanism, which may explain why it is the commonest colour aberration in birds. The main pigments that influence plumage colour are melanins, and these can be divided into eumelanin and phaeomelanin (van Grouw *et al.* 2021). In many bird species, feather colour is determined by eumelanin alone, but eumelanin does not always occur as black, but can also show as different shades of brown or grey. Phaeomelanin creates reddish-brown to pale-buff feathers. When both eumelanin and phaeomelanin are present, a variety of greyish-brown colours result. The intricate patterns that often embellish feathers

are due to variations in the type, extent and dissemination of these melanin pigments. This type of plumage colour has been documented for several members of the European Picidae, including the Black Woodpecker *Dryocopus martius* (Gorman 2011) and the Great Spotted Woodpecker (Blume 1977). However, little has been published on this subject for the Middle Spotted Woodpecker *Dendrocoptes medius* (van Grouw *et al.* 2021). We might note, however, that there are documented cases of all-black melanistic Middle Spotted Woodpeckers (Konieczny 2000).

Middle Spotted Woodpecker – background

The Middle Spotted Woodpecker occurs in the Western Palearctic region where it is resident and sedentary and typically inhabits mixed temperate deciduous woodlands, especially with old oaks *Quercus*, hornbeams *Carpinus* and elms *Ulmus* (Pasinelli 2000). It is also found in riverine woods, parkland, parks and rural gardens (Gorman 2004). The bulk of the population is in south-east Europe, and in recent years it is considered to have expanded its distribution and increased in number elsewhere on the continent (Robles & Pasinelli 2020). In Hungary, Middle Spotted Woodpeckers are locally common, and the population assessed as showing a slightly increasing trend (Gorman *et al.* 2022).

Middle Spotted Woodpecker – description of usual plumage

Middle Spotted Woodpeckers are around 20–22 cm in length with a wingspan of 33–34 cm. Both adults are essentially black and white. The throat and upper breast are white with a cream, buff or greyish tinge. There is a thin black malar stripe which on some birds may be lacking entirely. Even when a malar stripe is present, it never starts from the lower mandible, but begins a little way short. The ear-coverts are cream-white, often dusky, and crossed only partially by a black post-auricular stripe. Black stripes run from each side of the throat down to the upper sides of the breast where they merge into black streaks on the upper flank. The flanks are heavily streaked black. The lower breast, belly and flanks are basically white though often yellowish, especially in the spring. This yellow wash may reach the leg feathering. The lower belly, under-tail coverts and ventral area are pink. The mantle, inner scapulars, back, rump and upper tail coverts are matt black. The outer scapulars are white and form oval patches. The primaries and secondaries are black, heavily dotted and barred white. Some of the rows of white spots on the flight feathers may join to form bars. The upper wing-coverts are black. The inner median wing-coverts white with black bases. The greater coverts are black with white tips. The axillaries are dusky white. Most of the tail is black though the outer two rectrices have white dots. Males and females overlap in measurements and indeed, this species is only slightly sexual dimorphic in plumage. An all-red crown is characteristic of both males and females, but it is marginally longer in males and in the nesting period brighter and juts out at the rear like a crest. In addition, the red crown of females is often tinged orange, yellowish or rusty at the rear. However, crown colour and size are frequently variable and without good views these features can be difficult to judge in the field (Gorman 2004).

Observation of an aberrant individual

During the first week of May 2023, in the village of Noszvaj, Bükk Hills, Hungary, I observed a pair of adult Middle Spotted Woodpeckers at their nest. The pair were feeding small nestlings and regularly visited with food. During my first observation, on May 1st, an adult landed at the nest cavity entrance with food and made a few quiet calls. Owing to the brevity of the view, I was at first unable to verify the sex of this individual. Almost at once, its partner came out of the cavity and briefly landed on an adjacent tree. I immediately noticed that the exiting bird was abnormally coloured. Instead of having a black back, the bird was coloured brown in that area of plumage. Other areas of black plumage (wings, tail, facial stripes) and white and red areas were unaffected, retaining their usual colourations. During the next change-over at the nest, the aberrant bird landed below the cavity entrance and remained motionless until its mate came out. I was then able to verify that the waiting bird was the male, owing to it having the crown features mentioned above, and being able to compare it to its mate on numerous subsequent occasions.



Figure 1. Male Middle Spotted Woodpecker (*Dendrocoptes medius*) with aberrant, brown, phaeomelanised plumage. Noszvaj, Bükk Hills, Hungary, 01.05.2023.

1. ábra Középfakopáncs hím (*Dendrocoptes medius*) rendellenes, barna, feomelanizált tollazattal. Noszvaj, Bükk-hegység, Magyarország, 2023.05.01.

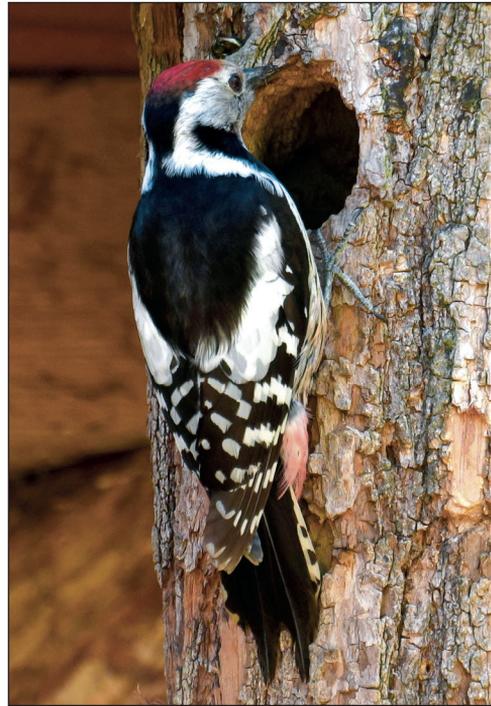


Figure 2. Female Middle Spotted Woodpecker (*Dendrocoptes medius*) with normal black plumage. Noszvaj, Bükk Hills, Hungary, 01.05.2023.

2. ábra Középfakopáncs tojó (*Dendrocoptes medius*) normál fekete tollazattal. Noszvaj, Bükk-hegység, Magyarország, 2023.05.01.



Figure 3. Male (with aberrant brown back) and female (with normal black back) Middle Spotted Woodpeckers (*Dendrocoptes medius*) changing over at the nest cavity. Noszvaj, Bükk Hills, Hungary, 01.05.2023.

3. ábra Hím (rendellenes barna hátú) és tojó (normál fekete hátú) közép fakopáncs (*Dendrocoptes medius*) váltja egymást a fészkelőhelyen. Noszvaj, Bükk-hegység, Magyarország, 2023.05.01.

Discussion

Numerous occurrences of colour aberrations in birds, involving melanism, leucism, albinism and others, have been documented for a wide range of species. For example, Coppersmith Barbets (Gayen *et al.* 2022), Greater Coucals (Alby *et al.* 2023), Indian Pied Starlings (Jangir *et al.* 2013) and House Sparrow and several other species (van Grouw 2021). In nature, 'brown' male woodpeckers are rare because they can only be born from a 'brown' mother and a normally-coloured father that is heterozygous for this mutation and, of course, from parents that are both 'brown'; with that colour defined as a heritable mutation which affects the synthesis of the eumelanin (van Grouw *et al.* 2021). Among the array of plumage aberrations described, brown plumage aberration, which is characterized by a qualitative reduction of eumelanin, has attracted been studied (Zbyryt *et al.* 2021). Several explanations for aberrant coloured plumages in woodpeckers are possible. The first concerns exposure to sunlight, which is bleaching of the feathers. When birds are seen in strong light, especially in flight, they may seem to be brown coloured as the light shines through their feathers; alternatively, some observers have suggested that birds with brownish tones are those that have lived in more open areas such as clear-cuts and have thus been exposed to more direct sunlight, thereby causing their plumage to fade from black to brown. In some cases, this might be true, as bleaching by the sun can occur, but it does not adequately explain why birds that spend all of their time in the shady interior of forests, as most woodpeckers do, can have brownish plumage. Neither does it answer the question of why some individuals, which are sedentary and inhabit the same area all year round (which are presumably subject to the same light exposure), are brown one year, but black the next.

A second hypothesis relates to the fact that woodpeckers use tree cavities. It is sometimes suggested that the aberrant colour could be the result of tree sap wearing or colouring the feathers. However, the extent of affected plumage found in many individuals, including the Middle Spotted Woodpeckers detailed in this paper, exceeds the degree likely to make regular contact with sap seepage at a nest hole. The argument that siblings from the same brood are unaffected also suggests pigmentation rather than colouring or abrasion by tree sap as the cause (van Grouw *et al.* 2021).

Diet has also been suggested as a possible cause of aberrant plumage colour. It is thought that aberrant feather colouration is related to poor condition, being provoked by poor diet during the moulting period. Nutrition not only influences the quality of feathers but also their colouration. In the case of the Black Woodpecker, individuals with brown plumage are almost always seen during the second half of the annual moult cycle, that is, between March and August (Gorman 2011). After moulting in the autumn, all Black Woodpeckers have fresh black plumage and the majority of birds in most years stay black throughout the year. But certain individuals in some years show brown tones by the end of winter. Such birds are often even paler by spring, and in late summer just before they moult, they are often at their palest. Other individuals are more or less black throughout the spring but become brownish during the summer. This pattern suggests that the poorer the quality of the feathers, the earlier they start to turn brown and the paler they end up. Regarding the

Great Spotted Woodpecker, Blume (1977) stated that birds that had brownish plumage when caught for ringing had normal black plumage when re-trapped a year later. It was assumed that a ‘disturbed’ moult may have been the cause for the aberration in colour. Indeed, such colour aberrations have been found only in adults and appear to be temporary, with normal plumage being attained once more during the next moult.

Conclusion

Plumage aberrations in birds are intriguing owing to the potential insights they provide into genetic and physiological processes (Hill & McGraw 2006, Guay *et al.* 2012, Price-Waldman & Mary 2021). So far, this type of brown colour aberration has been found only in adult woodpeckers and appears to be temporary, with normal plumage being grown again during their next moult. This subject has not been widely studied, but it is assumed that a ‘disturbed’ moult may be the cause for such aberrant coloured feathers. The cause of brown feathering in areas where they should be black is most likely to be external, not due to ageing or genetics as the production of phaeomelanin is not permanent. To conclude, this case of brown plumage aberration in the Middle Spotted Woodpecker draws attention to the variability and complexity of avian plumage aberrations.

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