

BREVIA

Untypical eggs of the Barn Swallow (*Hirundo rustica*)

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In years 2001–2007 research has been done on breeding biology of the Barn Swallow in an untypical population nesting inside bunkers in Oder Valley near Zielona Góra (51° 56' N 15° 30') in western Poland (Czechowski & Zduniak 2005). The bunkers are small, 2–3 - room war shelters built before the break of the Second World War. During the research there was nesting from 1 to 9 Barn Swallow pairs in a single bunker (Czechowski 2007).

On 18 May 2006, during the inspection in one of the bunkers' nests, there was found an untypical small egg. During the following control exercised on 1 June 2006 in the same nest there was found a Barn Swallow's clutch consisting of 4 eggs characterized by very small dimensions. During the control of 8 June there were still 4 eggs in the nest (there was no mature bird observed); the control of 22 June revealed 1 whole egg and 1 damaged egg lying under the undamaged nest. At the same time the birds have not been trying to breed in the nest during the rest of the season.

All the eggs have been measured with a calliper with the accuracy of 0.1 mm. To calculate the egg's volume a following formula was used (Manning 1979): $V = 0.507 \cdot L \cdot B^2 / 1000$, where V – volume [cm^3], L – length [mm], B – breadth [mm].

The dimensions of particular eggs (length \times breadth and volume) were: 1. - 12.5 \times 9.1 and 0.52; 2. - 12.1 \times 9.0 and 0.50; 3. - 12.1 \times 9.2 and 0.52; 4. - 11.3 \times 8.5 and 0.41. During the research the average dimensions of an egg of the described clutch appeared significantly smaller than the dimensions of the eggs in the nests of the same amount of laid eggs (Fig. 1). The eggs in the described nest were of the same colour as typical Barn Swallow eggs. Only near the rounded end there was a greater concentration of spots. Moreover, in the found broken egg there was no yolk.

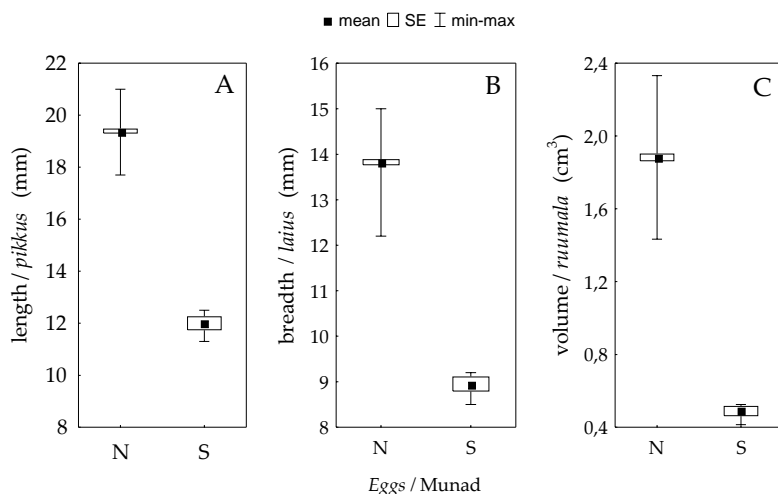


Figure 1. Egg dimensions (N – normal eggs, S – untypical small eggs) in the Barn Swallow population nesting in bunkers near Zielona Góra (W Poland.)

Joonis 1. *Punkris pesitsevate suitsupääsukeste munade mõõtmed* (N – tavapärased munad, S – kääbusmunad) L.-Poolas Zielona Góra lähistel.

The described eggs were significantly smaller than the eggs laid by the Barn Swallows, not only in this particular population. The dimensions of the eggs of the described clutch differed substantially from the range obtained in Poland during the research done by Nitecki (1964): length 19.0 – 21.0 mm, breadth 13.0 – 14.5 mm and Zieliński and

Bañbura (1998): 19.4 – 19.7 mm x 13.5 – 13.8 mm. The measured dimensions of eggs are also outside of the range for other European populations (Ward 1995: 17.6 - 21.8 mm x 12.8 – 14.9 mm; Cramp 1998: 16.7 – 23.0 mm x 12.3 – 14.8 mm).

Untypical small eggs were observed among many species of songbirds (Rothstein 1973, Borgstrom 2004), for example Tree Swallow (*Tachycineta bicolor*) - other species of swallow (Dring 1980, Bartel 1986). Small eggs were also recorded among species of birds from other taxonomic categories such as: ducks, geese, skuas and woodpeckers (Koenig 1980a, Svensson 2002, Mallory *et al.* 2004). The described cases usually regarded one “small” egg in a clutch. Only among some species, such as Mallard (*Anas platyrhynchos*; Lincoln 1934) and Bobwhite Quail (*Colinus virginianus*; Hernandez *et al.* 2006) there have been found whole nests of eggs of unusual dimensions, just as in the case characterized in the present paper.

The described clutch was the only untypical one among other 532 clutches (consisting of 1552 eggs) recorded during this research (occurrence frequency = 0.258%). Exceptionally small eggs were found equally rarely among other species of passerine (Borgstrom 2004), such as: European Pied Flycatcher (*Ficedula hypoleuca*, 0.025% of 16000 eggs), Blue Tit (*Parus caeruleus*, 0.012% of 8000), Great Tit (*Parus major*, 0.020% of 15000). Similar situation has been recorded in case of: House Wren (*Troglodytes aedon*, 0.148% of 1347 eggs; Kendeigh *et al.* 1956), Starling (*Sturnus vulgaris*, 0.1% of 2000; Ricklefs 1957), Red-winged Blackbird (*Agelaius phoeniceus*, 0.182% of 1100; Rothstein 1973) and Common Grackle (*Quiscalus quiscula*, 0.079% of 1272 – field research and 0.536% of 560 – museum collection; Rothstein 1973). More often untypical small eggs were observed among woodpeckers *Picidae* (museum collection, 17 species), where the occurrence frequency of such eggs was 0.476% (n = 7979) (Koenig 1980a). Similarly high frequency (4.321% of 1157 eggs) was obtained in case of Acorn Woodpecker (*Melanerpes formicivorus*, field research; Koenig 1980a).

There were made attempts to find out the factors affecting the frequency of laying small eggs. The way of nesting (hollows or open nests, single or communal nesting) or the sequence of eggs in a clutch as

well as the sequence of clutches by particular hens during breeding season among „multi-brooded” species or the age of hens have no significant direct influence on the increase in probability of laying untypical eggs (Kendeigh *et al.* 1956; Koenig 1980a, b; Mulvihill 1987).

At the same time the most common and the most probable cause of laying small eggs are: the temporary disorders, infections and injuries of reproductive system (Rothstein 1973, Koenig 1980a). Laying small eggs by the same hen in the following clutches during one single reproductive season can also imply constant injury of reproductive system (Mulvihill 1987). The same cause should be considered in the case of clutches consisting only of small eggs (Mulvihill 1987).

The described eggs are not fully developed when it comes to their dimensions as well as their anatomy. That is why it is considered that laying of such eggs has no genetic basis (Rothstein 1973). Because of that fact a natural selection does not work against the genotypes of specimen laying small eggs and it cannot eliminate such anomaly (Rothstein 1973). That is why untypical eggs are being observed in the following generations of birds' population; however the frequency of their occurrence is very low.

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