

New species on the list of species with intraspecific nest parasitism

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Received: September 27, 2018 – Revised: January 07, 2019 – Accepted: February 19, 2019



Haraszthy, L. 2019. New species on the list of species with intraspecific nest parasitism. – Ornis Hungarica 27(1): 166–206. DOI: 10.2478/orhu-2019-0010

Abstract Intraspecific nest parasitism has only recently received more attention from ornithologists. In 2001, Yom-Tov published a list of 234 species that had exhibited this behaviour. I have since found literature data on four additional species in which intraspecific nest parasitism has been observed. No such record has so far been published from Hungary. This study presents records on 25 species from Hungary and on one species from Croatia, out of which I have not found any reference for intraspecific nest parasitism in the literature for Cattle Egret (*Bubulcus ibis*), Eurasian Thick-knee (*Burhinus oedicnemus*), Black-winged Stilt (*Himantopus himantopus*), Collared Pratincole (*Glareola pratincola*), Mediterranean Gull (*Larus melanocephalus*), Little Tern (*Sternula albifrons*), Whiskered Tern (*Chlidonias hybrida*), Eurasian Roller (*Coracias garrulus*) and Eurasian Jackdaw (*Corvus monedula*). In addition to records from Hungary, for Black-headed Gull (*Larus ridibundus*) and Mediterranean Gull I also present observations from Slovakia, and for Common Shelduck (*Tadorna tadorna*) from Germany.

Keywords: intraspecific nest parasitism, new species on the list: Cattle Egret (*Bubulcus ibis*), Eurasian Thick-knee (*Burhinus oedicnemus*), Black-winged Stilt (*Himantopus himantopus*), Collared Pratincole (*Glareola pratincola*), Mediterranean Gull (*Larus melanocephalus*), Little Tern (*Sternula albifrons*), Whiskered Tern (*Chlidonias hybrida*), Eurasian Roller (*Coracias garrulus*), Eurasian Jackdaw (*Corvus monedula*)

Összefoglalás A fajon belüli fészekparazitizmus – „összetojás” – (intraspecific nest parasitism) csak a legutóbbi időben keltette fel az ornitológusok figyelmét. Yom-Tov 2001-ben közreadott jegyzékében 234 fajt említ, melyeknél ezt a jelenséget észlelték. Azóta további négy fajnál is felfedezték az összetojást. Magyarországról eddig erre a jelenségre vonatkozóan nem közöltek adatokat. Jelen tanulmányban 25 fajról magyarországi és egy faj esetében horvátországi adatokat közlök, melyek közül a pásztorgém (*Bubulcus ibis*), ugartyúk (*Burhinus oedicnemus*), gólyatöcs (*Himantopus himantopus*), székicsér (*Glareola pratincola*), szerezcsensirály (*Larus melanocephalus*), kis csér (*Sternula albifrons*), fattyúszerkő (*Chlidonias hybrida*), szalakóta (*Coracias garrulus*) és a csóka (*Corvus monedula*) vonatkozásában a szakirodalomban nem találtam utalást arra, hogy ezeknél az összetojást már észlelték volna.

Kulcsszavak: fajon belüli fészekparazitizmus, 25 magyarországi faj, 9 új faj a világlistán

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It has very long been known that certain bird species, in particular some cuckoos, but also representatives of some other bird families, such as the Black-headed Duck (*Heteronetta atricapilla*) or various whydah species (*Vidua* spp.) do not build a nest but instead lay their eggs in the nests of other species that incubate their eggs and raise their young (Johnsgard 1997, Soler 2017).

A much less explored phenomenon is known as intraspecific nest parasitism, when some females lay some or all of their eggs in the nests of conspecifics. In the majority of cases, this behaviour is difficult or impossible to prove. In species with uniformly coloured eggs, the coloration rarely provides a clue to distinguishing the eggs of two or more females. In species where the eggs typically bear markings, it is still not easier to unambiguously determine the origin of eggs, but the ground colour or the distribution of markings may give a clue in some cases. Unequivocal evidence to the simultaneous presence of eggs from the female occupying the nest and incubating the clutch and from a stranger female can only be obtained from genetic analysis of the chicks. However, this method is obviously not suitable for rapid field work.

This difficulty is certainly the reason why the first list published by Yom-Tov (1980) only mentions 53 species, in which it had been confirmed that two or more females laid eggs in the same nest and only the owner of the nest incubated on them.

The study of the breeding biology of birds has increasingly received more attention in the last 35–40 years. Thanks to this, the updated list of Yom-Tov (2001) twenty years later already contained 234 species. Since then, intraspecific nest parasitism has been observed in some further species: Pied Avocet (*Recurvirostra avosetta*) (Hötker 2000), Northern Flicker (*Colaptes auratus*) (Bower & Ingold 2004), Song Sparrow (*Melospiza melodia*) (Latif *et al.* 2006), Black-headed Gull (*Larus ridibundus*) (Duda & Chętnicki 2012) and Common Redshank (*Tringa totanus*).

When should a clutch be considered intraspecifically parasitised and how to confirm this?

Yom-Tov (1980) laid down the possible basis of evidence in the following eight points:

1. *Direct observation*

In most cases, this is not possible, but it may sometimes occur. As new ways of individual marking are now available, there will be more opportunity to obtain evidence with this direct method.

2. *Biochemical examination of protein polymorphism of the eggs*

3. *Genetical evidence*, obtained similarly to the former category, by biochemical examination of the eggs or chicks, but in this case the results are compared with similar examination of the parents.

4. *Distinction based on the coloration and markings of the eggs*

This method may only provide definite evidence to intraspecific nest parasitism in a few species. Such a case is known in e.g. Common Moorhen, which rarely, but regularly lays its eggs in Little Bittern nests (Haraszthy 2018).

5. *Irregular sequence of appearance of eggs*

By systematically checking one or more clutches on a daily basis, it may occur that the number of eggs in a clutch grows by two or more within 24 hours. In such cases, it is almost certain that the eggs come from more than one female.

6. *Appearance of new eggs after completion of the clutch and start of incubation*

After the start of incubation on the mean clutch size typical of the species, no more egg is laid in most species. If new egg(s) appear in the clutch some days after the start of incubation, they are certainly from strange females.

7. *Prolonged hatching or two groups of hatchlings*

A significant part of bird species start incubation only on the complete or near-complete clutch. If the number of eggs increases under a female that has been incubating for days, the new eggs are in all likelihood from strange female(s). Similarly, if hatching occurs in two groups among the chicks, that is an evidence to nest parasitism. The first group of hatchlings belong to the owner of the nest, while several days later and probably not on the same day, but prolonged in the order of egg laying the eggs of the strange female hatch.

8. *Significantly larger clutches than the average*

The number of eggs in a clutch may be significantly higher than the mean clutch size typical of the species, even twice as large or more. In my opinion, however, large clutches have to be considered with caution, as it may happen that in the same nest or nestbox the parents do not remove the eggs of their failed first clutch and lay the second clutch next to the first. The added eggs of the first brood may still remain in the nest even after the nestlings of the second brood fledge. I have observed such a case in e.g. Barn Swallow (*Hirundo rustica*) (see photo).

It may also happen that the female dies during or after laying the first clutch, and the male occupies the same nest with his new mate, which lays her eggs next to the ones that remained in the nesthole.

Another situation may be that after fighting for a suitable nest-site, the pair occupies a nest-hole where conspecifics have already started to lay eggs or have even completed the clutch. The new pair lay their own eggs in the occupied nesthole or perhaps nest, next to the eggs already lying there, and incubation begins on this oversized clutch. If the new female starts egg laying soon after occupying the nesthole, it may even happen that both clutches hatch, asynchronously, and the new parents raise all of them.

Despite the large number of eggs unambiguously originating from two females, the above cases cannot be considered as intraspecific nest parasitism. However, in those cases where the growth of clutch size is continuous, the additional eggs are certainly the result of intraspecific nest parasitism.

Among which species is intraspecific nest parasitism more frequent?

13% of all known bird species can be considered as colonial breeders (del Hoyo *et al.* 1992), but out of the 234 species listed by Yom-Tov (2001) 134 (57.3%) breed in colonies.

The proportion of nidifugous species is also high. The reason for this is that clutch size is usually higher among them than in similarly sized nidicolous species (Ar & Yom-Tov 1978). In their case, an unexpected increase in the number of eggs does not necessarily instigate abandonment of the clutch. The latter is a common response to an extra large

clutch size, which I have observed in Common Shelduck (*Tadorna tadorna*) in Germany, as well as in Greylag Goose (*Anser anser*) and Red-crested Pochard (*Netta rufina*) in Hungary.

Nidifugous species start incubation after laying the last egg or the one before the last, as it is of utmost importance for them that hatching is synchronous. However, the parents do not protect the eggs before the clutch is complete, so strange female(s) can lay their own eggs among them uninterrupted.

The raising of nidifugous chicks requires significantly less parental effort that does not necessarily increase with the number of chicks, and this augments the success of parasitising females (Sorenson 1992).

Evaluation of species breeding in Hungary

Among the 234 species listed by Yom-Tov in 2001, 41 are regular, occasional or former (extinct) breeders in Hungary. Based on publications since, I have added Pied Avocet (*Recurvirostra avosetta*) (Hötker 2010) and Black-headed Gull (*Larus ridibundus*) (Duda & Chectnicki 2012) to Yom-Tov's list.

Pheasants (Phasianidae): Eurasian Quail (*Coturnix coturnix*), Common Pheasant (*Phasianus colchicus*), Grey Partridge (*Perdix perdix*), Black Grouse (*Tetrao tetrix*)

Ducks (Anatidae): Greylag Goose (*Anser anser*), Common Goldeneye (*Bucephala clangula*), Smew (*Mergellus albellus*), Goosander (*M. merganser*), Common Shelduck (*Tadorna tadorna*), Red-crested Pochard (*Netta rufina*), Common Pochard (*Aythya ferina*), Ferruginous Duck (*A. nyroca*), Tufted Duck (*A. fuligula*), Garganey (*A. querquedula*), Gadwall (*A. penelope*), Mallard (*Anas platyrhynchos*)

Pigeons (Columbidae): Wood Pigeon (*Columba palumbus*), Turtle Dove (*Streptopelia turtur*)

Grebes (Podicipedidae): Red-necked Grebe (*Podiceps grisegena*), Black-necked Grebe (*P. nigricollis*), Great-Crested Grebe (*P. cristatus*)

Rails (Rallidae): Corn Crake (*Crex crex*), Common Coot (*Fulica atra*), Common Moorhen (*Gallinula chloropus*)

Hérons (Ardeidae): Squacco Heron (*Ardeola ralloides*), Purple Heron (*Ardea purpurea*)

Avocets (Recurvirostridae): Pied Avocet (*Recurvirostra avosetta*) (Hötker 2010)

Plovers (Charadriidae): Northern Lapwing (*Vanellus vanellus*)

Snipes (Scolopacidae): Black-tailed Godwit (*Limosa limosa*), Eurasian Woodcock (*Scolopax rusticola*)

Gulls (Laridae): Black-headed Gull (*Larus ridibundus*) (Duda & Chectnicki 2012), Common Tern (*Sterna hirundo*)

Falcons (Falconidae): Lesser Kestrel (*Falco naumanni*)

Crows (Corvidae): Eurasian Magpie (*Pica pica*)

Tits (Paridae): Willow Tit (*Poecile montanus*), Great Tit (*Parus major*)

Swallows and Martins (Hirundinidae): Barn Swallow (*Hirundo rustica*), Collared Sand Martin (*Riparia riparia*)

Starlings (Sturnidae): Common Starling (*Sturnus vulgaris*)

Thrushes (Turdidae): Fieldfare (*Turdus pilaris*)

Old World Flycatchers (Muscicapidae): European Pied Flycatcher (*Ficedula hypoleuca*)

Sparrows (Passeridae): House Sparrow (*Passer domesticus*), Tree Sparrow (*P. montanus*)

Presentation of cases in Hungary

For several decades, I have been studying the breeding biology of bird species breeding in Hungary, and since 2001 I have made a point of searching for, checking and documenting nests on photos. I checked 8,500 nests between 1970 and 2018, and found 64 among them where I considered intraspecific nest parasitism confirmed. Except for one case, I concluded on intraspecific nest parasitism on the basis of a much larger clutch size than that typical of the species, but in some cases, egg markings also indicated this phenomenon.

During this period, I or my colleagues observed intraspecific nest parasitism, or in some other cases they provided photographic evidence to this phenomenon, in the following species.

Common Pheasant

On 19 April 1981, I found a Common Pheasant nest with 19 eggs in a Black Locust plantation near the Merzse marsh in the outskirts of Budapest. The clearly visible difference in shade of the uniformly coloured eggs and their large number point to their origin from at least two females (*Photo 1*).

Greylag Goose

On 25 March 2011, I checked several nests in the Csákvári marsh. One of the nests contained 11 eggs that lay in the unlined nestcup built of reedmace fragments. The external measurements of this nest were 70×90 cm, with a 30 cm diameter nestcup. The external diameter of the nearby six-egg nest was 60 cm, with a 20 cm wide cup, while the external parameters of a third, four-egg nest were 50×60 cm, with a 25 cm diameter nestcup. The eggs were warm in the biggest clutch (*Photo 2*). On 25 April 2013, there were 9 eggs in an abandoned nest found in the reed belt of the Apaji fishponds (*Photo 3*). On 8 May 2013, I photographed an abandoned Greylag Goose nest with 14 eggs at the Apaji fishponds. One of the eggs had already broken. (*Photo 4*). On 7 May 2018, I found a deserted nest with 10 eggs on a small island of the Kis-Balaton marsh, under the trees of a Great Cormorant colony (*Photo 5*).

In my experience, in those Greylag Goose breeding sites where large water surfaces are only diversified by narrow reed fringes or small reed islands, intraspecific nest parasitism occurs regularly.

Common Shelduck

In a nest checked on 15 May 2016 near Dunatetőten, there were 13 eggs. According to Hori (1969), clutches over 12 eggs come from two or more females. If this is true for all clutches, then the 13-egg clutch had to contain egg(s) from a strange female (*Photo 6*). On 29 May 2016, Bernd Heinze and I visited the Gollwitz area of Insel Poel in northern Germany, where Common Shelducks breed in plastic barrels buried in the ground. Out of six nests examined, four contained eggs from two or more females. These latter nests contained 15, 16, 19 and 31 eggs, respectively. The 31-egg nest had been abandoned, but the female was incubating the clutch of 19 eggs (*Photo 7–10*).

Red-crested Pochard

On 6 May 2011, I checked the nests on the islands of the Rétszilasi fishponds. Only one island was suitable for the breeding of Red-crested Pochards, but it was entirely occupied by gulls, and there was hardly any vegetation on it to provide cover for the nests. As I approached the island, only Red-crested Pochards swam away from there. Below the little vegetation, it was literally strewn with duck eggs. They were scattered all over, many singly, some in small groups, loosely together or clustered more like in a nest. I found two clutches in good order, one with 25 eggs, the other with 18. The situation was similar on my 16 May 2017 visit, too. There were eggs scattered all around, stained with faeces. I found two clutches of the species, containing 17 and 29 eggs respectively (*Photo 11–13*).

Ferruginous Duck

On 9 June 2011, I found Mallard and Ferruginous Duck nests in several patches of emergent vegetation in a wetland flooded for nature conservation purposes near Somogyfajsz. One of the Ferruginous Duck nests contained 26 eggs, incubated by the female. Thus, in this case, this small duck did not abandon the extremely oversized clutch (*Photo 14*).

Tufted Duck

On 12 June 2004, I checked six Tufted Duck nests on a small island of the Soponyai fishponds with László Csihar and István Staudinger, and the number of eggs in the nests were 7, 8, 8, 8, 9 and in one nest, 16. The only safe nesting site out of reach of foxes was this small island, hardly larger than a room (*Photo 15*).

Mallard

On 16 May 2011, I checked the duck nests on some smaller islands of the Rétszilasi fishponds. I found four Mallard nests hidden among nettle, containing 12, 13, 15 and in the fourth nest, 19 eggs. Among the latter, three eggs had a distinctly different shade from the rest, visible on the photo, but presumably not only these three came from a strange Mallard (*Photo 16*).

Black-necked Grebe

On 27 June 2006, Levente Visszó and myself discovered a colony that was just being formed on the Zámolyi reservoir, and at that time consisted of only four nests. The number of nests reached 26 on 4 July, and new nests continued to be found until 20 July. During our investigation, we identified three cases of intraspecific nest parasitism. The first nest contained 2 eggs on 4 July, but already 7 eggs on 7 July (this clutch was later abandoned by the birds), in other words the number of eggs increased from 2 to 7 in three days, i.e. more than one egg appeared per day. Another nest was still empty on 4 July, but contained 6 eggs three days later, out of which one disappeared by 11 July (the remaining eggs were not incubated by the birds, and were still in the nest on 3 August, concealed with nesting material). In this case, too, the number of eggs grew by more than one per day. The third nest contained 4 eggs on 4 July and 7 eggs on 7 July. In this last case intraspecific nest parasitism is likely because of the 7 eggs, since according to Prinzinger (1979), clutches of 7 or more eggs come from two or more females (*Photo 17–18*).

Common Moorhen

On 8 May 1977, László Vilmos Szabó found a clutch of 21 eggs in a nest built on a young ash (*Fraxinus* sp.) in the flooded Vajdalahosi forest (Hortobágy). In all likelihood, the clutch had been laid by two or possibly three females (*Photo 19, Szabó L. V.*).

Cattle Egret

On 17 May 2018, I checked the Cattle Egret nests in a woodland heronry at Soponya, in the immediate vicinity of, and partly on the same tree as the nests of Little Egret (*Egretta garzetta*), Black-crowned Night-heron (*Nycticorax nycticorax*) and Squacco Heron (*Ardeola ralloides*). In one of the nests, where we had previously seen the incubating Cattle Egret, I found 9 eggs (*Photo 20*).

Purple Heron

On 16 May 2013, I checked 21 nests of the Purple Heron colony in the reedbeds of Böddi-szék marsh, where clutch sizes were the following: 1×2, 1×3, 3×4, 11×5, 3×6 and in one nest 2 chicks +3 eggs. In addition, I found a nest that contained eight eggs (*Photo 21*).

Eurasian Thick-knee

On 18 May 2007, Attila Szilágyi found four eggs in a nest in an *Artemisio-Festucetum* sward, at Angyal-háza steppe, Hajdúszoboszló. Within the clutch, two couples of eggs can easily be set apart on pattern, indicating their origin from two females (*Photo 22, Szilágyi A.*).

Pied Avocet

On 7 June 2007, we checked the breeding colony on a flat island created by the low water level of the Dinnyési Fertő marsh with László Fenyvesi and Antal Széll. In addition to Pied Avocets (*Recurvirostra avosetta*), Black-winged Stilts (*Himantopus himantopus*), Common Redshank (*Tringa totanus*), Little Ringed Plover (*Charadrius dubius*) and Common Tern (*Sterna hirundo*) formed the colony. The Avocet nests contained 2×2, 5×3, 8×4 as well as 1×5, 1×6 and 1×7 eggs, while three of the nests also had 1 or 2 chicks next to the eggs. In two other nests, we found 1 and 4 chicks. The clutches of 5, 6 and 7 eggs were undoubtedly from two females each. We also found two clutches where some further eggs lay next to the clutch but in a separate group. These can be regarded as nest parasitic attempts, in which the strange female did not lay the eggs in the chosen nest, but immediately next to it, hoping that the incubating bird will roll them below itself (*Photo 23–26*).

Black-winged Stilt

On 7 June 2007, we found five Black-winged Stilt nests at the Dinnyési Fertő marsh with four eggs in each, except for one that had eight eggs in it (*Photo 27*). On 5 June 2008, László Fenyvesi and I checked the breeding island in the Dinnyési Fertő marsh. Breeding species included Black-winged Stilt, Little Ringed Plover, Pied Avocet, Common Redshank, Black-headed Gull and Common Tern. A total of 48 Black-winged Stilt nests were checked, with the following clutch sizes: 3×1, 7×2, 11×3, 16×4, 6×5, 2×6, 1×7, 2×8. Five-egg (6), 6-egg (2) and 7 as well as 8-egg (2) clutches were the result of intraspecific nest parasitism (*Photo 28–34*).

Collared Pratincole

Ádám Kis found a six-egg clutch in the Nagy meadow at Kisújszállás on 14 June 2017, which was certainly laid by two females (*Photo 35, Széll A*).

Black-headed Gull

On 5 June 2008, we checked 231 nests with eggs in a Black-headed Gull colony at Dinyés with László Fenyvesi. Clutch sizes were as follows: 31×1, 88×2, 115×3 and 1×4. The eggs in the biggest clutch could clearly be divided into two pattern types of two eggs each, which certainly came from two females (*Photo 36*). On 30 April 2017, we counted the nests in a gull colony with Slovak and Hungarian colleagues on an island of the river Danube forming the border between Hungary and Slovakia. 4,200 pairs of Black-headed and 230 pairs of Mediterranean Gulls bred in the colony. I checked 691 Black-headed Gull nests, most of which contained three eggs, while some only had two eggs. However, in two nests the clutch was larger, with five eggs in one, and four eggs in the other. These latter clutches were almost certainly from two females each, based on the number of eggs and the pattern differences within the clutches, which means they were the result of intraspecific nest parasitism (*Photo 37–38*).

Mediterranean Gull

On 4 June 1978, while ringing nestlings in a Black-headed Gull colony in the Kelemen-szék sodic lake at Fülöpszállás, I also found a Mediterranean Gull nest with five eggs, which were undoubtedly from two females. This was not the first case when intraspecific nest parasitism was found in Mediterranean Gull in Hungary. In early May 1955, Beretzk (1957) found a 3+1 clutch at Lake Fehér near Szeged, and concluded that the eggs originated from two females. Without providing sample size, Széll and Bakacsi (1996) estimated that 10–20% of Mediterranean Gull clutches contain two eggs, while the majority have three eggs, and less than 5% consist of four eggs. In the latter group, they observed that one egg always differed in pattern from the remaining three, which indicates the clutch had been laid by two females (*Photo 39*).

On 30 April 2017, I found four eggs in a Mediterranean Gull nest on an island of the river Danube forming the border between Hungary and Slovakia. One egg had a distinctly different pattern from the rest and certainly originated from a strange female (*Photo 40*).

Little Tern (Croatia)

On 20 June 2018, Robert Crnković and I were searching for Little Tern nests at a salt pond in Central Dalmatia (Croatia). We found seven in total, containing 3×3 and 3×2 eggs, while one already abandoned nest had four eggs, which in all likelihood came from two females. The pair that had built the nest probably abandoned it because they did not adopt the strange eggs (*Photo 41*).

Whiskered Tern

Between 1974 and 2018, I checked more than 300 Whiskered Tern nests with eggs. In 7 of these nests, I found 4 eggs, while the rest contained 1-3 eggs. In Whiskered Tern, four-egg clutches are without any doubt laid by two females. This does not mean that each egg in all three-egg clutches is laid by the female that owns the nest and incubates the eggs. In addition, once I even found a six-egg clutch. On 8 July 2006, Levente Viszló and I checked a Black-necked Grebe colony of 39 nests on the Zámolyi reservoir. Next to the colony, there were 6 Whiskered Tern nests, too. In one of the nests, we found four eggs. (*Photo 42*). On 3 July 2008, I also found a few nests near Földes, one of which contained 4 eggs. (*Photo 43*). On 16 May 2013 near Dunatetőtlen, in a Whiskered Tern colony established next to a Black-necked Grebe colony (39 nests) also contained a clutch of four eggs (*Photo 44*). On 18 May 2015, József Berdó, Zoltán Oroszi and myself found a newly formed, mixed colony of Black-necked Grebes, Black-headed Gulls and Whiskered Terns on the same site. Most of the grebe and tern nests were still empty. Five tern nests, however, already had eggs, and two of them contained four eggs each as a result of two females laying in the same nest. The 28 Black-headed Gull nests already had full clutches (*Photo 45–46*). On 10 June 2016, I searched through a part of the Black-necked Grebe and Whiskered Tern colony on the same spot. The Whiskered Tern nests contained 3×2, 20×3 and 1×4 eggs (*Photo 47*). On 1 July

2016, Gábor Szalai and I checked the Great Crested Grebe (*Podiceps cristatus*) colony established on the Zámolyi reservoir. Approaching the colony was only possible by passing along the scattered, 100-strong Whiskered Tern colony. We checked 31 nests, three of which already had nestlings, while 7 nests had two, 18 nests three, 2 nests four and 1 nest six eggs. In this clutch, which was without any doubt the result of intraspecific nest parasitism, the eggs were already cold, the parents had abandoned the nest (*Photo 48–49*).

Eurasian Roller

On 4 July 2014, Tamás Kiss found 8 nestlings during the regular checkup of a nestbox in the vicinity of Kisszállás. Between 2010 and 2014, the breeding of 40 pairs of Eurasian Roller was observed, and in the „better” years of this period, more than 4 nestlings fledged per nest, and one or two pairs even had six nestlings. He observed several times that a helper adult contributed to feeding the nestlings (*Photo 50, Kiss T.*).

Common Kestrel

The clutch size in Common Kestrel is normally 5-7 eggs, clutches above this size are certain to contain egg(s) from a strange female. Based on their pattern, the 9-egg clutch I checked had six eggs from one female and three from another. This clutch was in a nestbox near Tiszaeszlár, the photograph was taken on 20 May 2007. (*Photo 51*).

Eurasian Jackdaw

Jackdaws regularly occupy nestboxes erected for Common Kestrel or other species, or sometimes specifically for Jackdaws. These pairs form a smaller or larger colony. In such situations, I found clutches from intraspecific nest parasitism on two occasions. On 26 April 2016 at Földes, there were 12 eggs in a nestbox erected on the stable of a farmstead. On the photo, it is clearly visible from the egg pattern that one female laid 7, while the other laid 5 eggs into the same nestbox (*Photo 52*). On 18 April 2017 at Apajpuszta, three pairs of Jackdaws occupied the nestboxes erected for Rollers on some Black Locust trees. One of the boxes contained 5+5 eggs that were clearly from two females, while I found 4 and 5 eggs in the other two boxes (*Photo 53*).

Great Tit

On 22 April 2007, I found a 17-egg clutch in a nestbox at Pilisszentiván. This very high number of eggs indicates intraspecific nest parasitism (*Photo 54*).

Barn Swallow

In itself, the large clutch size is not always proof that the eggs were laid by two females. The first clutch of a pair of Barn Swallows in the only occasionally used bathroom of our

weekend cottage consisted of four eggs, but they were sterile. The adults did not push out the eggs from the nest, but laid their new clutch next to them and successfully fledged all five juveniles. It cannot be excluded that the female was replaced by another, but this is not underpinned by the rather similarly patterned eggs of the two clutches (*Photo 55*).

Common Starling

On 1 May 2018, Gábor Szalai found a clutch of 9 eggs in a nestbox near Vértesboglár. The mean number of nestlings in 173 nests checked between 2009–2015 in the area was 4.4. Eight of these nests had seven nestlings each, which must have been the result of two females laying in each nest, since according to Yom-Tov *et al.* (1974), clutches above six eggs are the result of intraspecific nest parasitism (*Photo 56*).

Tree Sparrow

On 8 June 2018, Gábor Szalai found a Tree Sparrow clutch of 10 eggs in a nestbox at Forrapuszt, near Csákvár. It can be clearly seen that they came from two females (*Photo 57*).

Acknowledgements

I am grateful to Ádám Kis, Gábor Szalai, Tamás Kiss, Attila Szilágyi and Robert Crnković for sharing their records with me, and to Tamás Kiss, Antal Széll and Attila Szilágyi for their photographs.

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Photo 1. Common Pheasant; 1. fotó közönséges fácán



Photo 2. Greylag Goose; 2. fotó nyári lúd



Photo 3. Greylag Goose; 3. fotó nyári lúd



Photo 4. Greylag Goose; 4. fotó nyári lúd



Photo 5. Greylag Goose; 5. fotó nyári lúd



Photo 6. Common Shelduck; 6. fotó bütykös ásólúd



Photo 7. Common Shelduck; 7. fotó bütykös ásólúd



Photo 8. Common Shelduck; 8. fotó bütykös ásólúd



Photo 9. Common Shelduck; 9. fotó bütykös ásólúd



Photo 10. Common Shelduck; 10. fotó bütykös ásólúd



Photo 11. Red-crested Pochard; 11. fotó üstökösréce



Photo 12. Red-crested Pochard; 12. fotó üstökösréce



Photo 13. Red-crested Pochard; 13. fotó üstökösréce



Photo 14. Ferruginous Duck; 14. fotó cigányréce



Photo 15. Tufted Duck; 15. fotó kontyos réce



Photo 16. Mallard; 16. fotó tőkés réce



Photo 17. Black-necked Grebe; 17. fotó feketenyakú vöcsök



Photo 18. Black-necked Grebe; 18. fotó feketenyakú vöcsök



Photo 19. Common Moorhen; 19. fotó vízityúk



Photo 20. Cattle Egret; 20. fotó pásztorgém



Photo 21. Purple Heron; 21. fotó vörös gém



Photo 22. Eurasian Thick-knee; 22. fotó ugartyúk



Photo 23. Pied Avocet; 23. fotó gulipán



Photo 24. Pied Avocet; 24. fotó gulipán



Photo 25. Pied Avocet; 25. fotó gulipán



Photo 26. Pied Avocet; 26. fotó gulipán



Photo 27. Black-winged Stilt; 27. fotó gólyatöcs



Photo 28. Black-winged Stilt; 28. fotó gólyatöcs



Photo 29. Black-winged Stilt; 29. fotó gólyatölcs



Photo 30. Black-winged Stilt; 30. fotó gólyatölcs



Photo 31. Black-winged Stilt; 31. fotó gólyatöcs



Photo 32. Black-winged Stilt; 32. fotó gólyatöcs



Photo 33. Black-winged Stilt; 33. fotó gólyatöcs



Photo 34. Black-winged Stilt; 34. fotó gólyatöcs



Photo 35. Collared Pratincole; 35. fotó székcicsér



Photo 36. Black-headed Gull; 36. fotó dankasirály



Photo 37. Black-headed Gull; 37. fotó dankasirály



Photo 38. Black-headed Gull; 38. fotó dankasirály



Photo 39. Mediterranean Gull; 39. fotó szerencsensirály



Photo 40. Mediterranean Gull; 40. fotó szerencsensirály



Photo 41. Little Tern; 41. fotó kis csér



Photo 42. Whiskered Tern; 42. fotó fattyúszerkő



Photo 43. Whiskered Tern; 43. fotó fattyúszerkő



Photo 44. Whiskered Tern; 44. fotó fattyúszerkő



Photo 45. Whiskered Tern; 45. fotó fattyúszerkő



Photo 46. Whiskered Tern; 46. fotó fattyúszerkő



Photo 47. Whiskered Tern; 47. fotó fattyúszerkő



Photo 48. Whiskered Tern; 48. fotó fattyúszerkő



Photo 49. Whiskered Tern; 49. fotó fattyúszerkő



Photo 50. Eurasian Roller; 50. fotó szalakóta



Photo 51. Common Kestrel; 51. fotó vörös vércse



Photo 52. Eurasian Jackdaw; 52. fotó csóka



Photo 53. Eurasian Jackdaw; 53. fotó csóka



Photo 54. Great Tit; 54. fotó széncinege



Photo 55. Barn Swallow; 55. fotó füstifecske



Photo 56. Common Starling; 56. fotó seregély



Photo 57. Tree Sparrow; 57. fotó mezei veréb

