

Observations on parental care of the Eurasian Spoonbill (*Platalea leucorodia*) during the post-fledging dispersal

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Abstract The number of available publications on the post-fledging parental care of wading birds (herons, ibises, spoonbills, and storks) and many other bird species is limited. In this study, I summarised the available knowledge collated from the observations of the Eurasian Spoonbills (*Platalea leucorodia*) in Hungary. A part of the available data is based on observations of colour-ringed individuals. The latest feeding event of a young by its parent was observed at Lake Csaj on 5 October 2020. The youngsters were being fed by their parents for 43 days (observed maximum) during the post-fledging dispersal. However, I estimated that this behaviour could even last for as long as 53 days. The parents lead (care for) their yearlings for 51 days (observed maximum), again I estimated that it could potentially last for a longer period of 63 days. The estimated length of parental care and feeding period could be longer or a little bit shorter during the post-fledging dispersal because it was not possible to follow the life of the families exactly. During parental care (feeding and leading of chicks), the majority of the colour-ringed Spoonbills were observed 2–26 km to the natal colonies of yearlings and the breeding colonies of the adults. However, on some occasions, they were 111–145 km far from those colonies. During the post-fledging dispersal, Spoonbills care for their chicks for a longer time than the European breeding heron species. A possible reason could be that the bills of young Spoonbills are not appropriate for fishing effectively at the beginning of fledging because of their shorter length and their less efficient hydrodynamic effect during lateral sweeping. Another reason could be that Spoonbills are tactile foragers and need more time to learn fishing. Based on data of a juvenile followed by a GPS device, learning the migration route and stop-over sites from parents or experienced adults could be important for Spoonbills, otherwise, young migrating alone with no accomplished individuals may not find the optimal routes and the proper stop-over areas. In the case of Spoonbills, we still do not know exactly the features of parental care during the post-fledging dispersal and have even less data on it during the migration. Thus, I request potential observers along the Adriatic Flyway to record the observations of parent-offspring interactions (feeding by parents, begging) particularly the Hungarian colour-ringed adults and/or young individuals and send data to the author's e-mail address.

Keywords: parental feeding, begging, parental leading, post-fledging dispersal and migration, Threskiornithidae, colour-ringing

Összefoglalás Általánosan elmondható, hogy a gázlómadarak (gémek, ibiszek, kanalásgémek és gólyák) és sok más madárfaj kirepülést követő utódgondozásáról kevés a hozzáférhető irodalmi adat. Ebben a dolgozatban a kanalásgémek hazai megfigyeléseit foglaltam össze. Az adatok egy része színes gyűrűs megfigyeléseken alapul. A legkésőbbi etetést 2020. október 5-én a tömörkényi Csaj-tavon észleltem. A színes gyűrűs madarak megfigyelései alapján az etetések a kirepülést követően 43 napig (észlelt maximum), míg a becslések alapján 53 napig tartanak. Ugyancsak a színes gyűrűs kanalásgémek megfigyelései szerint a kirepülés után 51 napig (észlelt maximum), míg a becslések szerint 63 napig vezetik az öregek a fiókákat. A megadott becslült etetési és fiókavezetési időszakok akár hosszabbak, vagy kissé rövidebbek is lehetnek, mivel a családok életét nem lehetett pontosan követni. A szülői gondoskodás alatt a legtöbb esetben a gyűrűs kanalásgémeket az adott évben az általuk használt gémtelepől 2–26 km-re figyelték meg, de az elmozdulások a dokumentált esetek kisebb részében 111–145 km-esek is lehettek. A kanalásgémek hosszabb ideig gondozzák a fiókákat a kirepülés után, mint a hazai gémtepeken költő

gémfélék. Ennek lehetséges oka, hogy a fiatal kanalasgémek csőre a kirepülést követően még nem alkalmas a hatékony halászatra a hossza és a hidrodinamikai tulajdonságai miatt és/vagy, mivel a kanalasgémek tapintással kutatják fel a zsákmányukat, lehetséges, hogy több időre van szükségük megtanulni halászni. Egy GPS-jeladós fiatal kanalasgém útvonalát alapján valószínű, hogy fontos a szülőktől, vagy más tapasztalt öregektől megtanulni a vonulási útvonalat és a megállóhelyek (stop-over) elhelyezkedését, mert a tapasztalt példányok nélkül vonuló fiatalok nem biztos, hogy megtalálják azokat. A kanalasgémeknél – más gázlómadarakhoz hasonlóan – a kirepülés utáni diszperzió során az utódgondozást még nem ismerjük részleteiben és a vonulás alatti gondoskodásról még ennél is kevesebbet tudunk, ezért kérjük a megfigyelőket, hogy az Adriai Madárvonulási Útvonalon jegyezzék fel a magyar színes gyűrűs öreg és/vagy fiatal kanalasgémek megfigyelése esetén is a szülő-fióka interakciókat (etetés, koldulás) és azt juttassák el a szerző e-mail címére.

Kulcsszavak: etetés, koldulás, fiókavezetés, kirepülés utáni diszperzió és vonulás, íbiszfélék, színes gyűrűzés

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Introduction

Parental care during the post-fledging dispersal and migration is essential for offspring to learn important behaviour elements from their parents and develop their own skills: fledglings 1) improve their flight skills, 2) learn how to socialise with other conspecific individuals, 3) acquire foraging behaviour and food preferences, 4) learn how to avoid predators, and 5) acquire migration routes (McIntyre & Collopy 2006, Hayes & Barzen 2016). The learning process during the post-fledging period is vital. However, despite its importance it has not been investigated in detail and is one of the least-studied life history stages of many bird species because it is often difficult to follow fledglings after they leave their nests or colonies (McIntyre & Collopy 2006).

The Eurasian Spoonbill (*Platalea leucorodia*) (hereafter Spoonbill) is a regular colonial breeder in Hungary and its population was estimated at 850–1,300 pairs between 2002 and 2013 and then 550–900 pairs between 2014 and 2020 (Pigniczki 2021). In Hungary, the first Spoonbills appear in the breeding colonies from late February and early March (Haraszthy 2019). The egg-laying and the start of the incubation are estimated at approximately from the middle of March onwards (Pigniczki 2015, 2021). Both parents take part in the incubation, and then, both of them care for and feed the chicks (Cramp 1977, Bloomfield 2001). Adults feed their chicks by regurgitation (Cramp 1977). In Hungary, Spoonbills start to fledge from the end of May and fledging could last until the middle of August, depending on the date of egg-laying (Pigniczki Cs. unpublished data). The fledging estimated by Cramp (1977) happens when the chicks are 45–50 days old, however, they leave their nests and move to a trampled down place close by when they are approximately 30 days old. Hancock (1992) judged the fledging when the chicks are 45–54 days old. In England, Bloomfield (2021) found that nestlings leave their nests when they are 31–42 days old (mean: 37.2 days). After fledging and departure from the colonies, parents move together with their young up to at least ten weeks. During this period, parental feeding continues as long as young increasingly find their food alone (Cramp 1977). At the same time, Cramp (1977) reported that the age of independence of the young is not yet known.

There is no further literature information available on parental care of Spoonbills when the families started their post-fledging dispersal. The main goal of this publication is to provide an overview of the observations related to parental care of Spoonbills during the post-fledging dispersal in Hungary and attract the attention of the ornithologists, ring-readers, birdwatchers, and bird photographers working in the field to collect and report behavioural data.

Material and Methods

I used the data of the colour-marked Spoonbills and one of the GPS-tagged individuals for this study. The method of colour-ringing in Hungary was described in detail in several previous publications (Pigniczki & Végvári 2015, Pigniczki *et al.* 2016). The chicks were captured for colour-marking when their ages were estimated at 3–5(–6) weeks old. During the ringing, it was not possible to measure the chicks thus no estimation is available on their accurate age. I used the records of colour-ringed Spoonbills 1) marked in Hungary and observed in Hungary or abroad and 2) the data of individuals with Serbian or Croatian origin and observed in Hungary.

An adult female Spoonbill was trapped in her foraging area at a fishpond (Lake Csaj) on 25 March 2018 and then was equipped with a GPS device. I used some continuously inspected leg loops to catch her. The GPS device mounted on her back is an OrniTrack E-25 2G GPS-GSM device (produced by Ornitela) the weight of which is approximately 25 g. This type of device basically forwards the collected data via a 2G network. If the 2G network is not available then the data transmission happens via a GSM network. It was not possible to weigh the captured individual, but the bird was in a good condition (no sharply outstanding sternum was detected by hand). According to Triplet *et al.* (2008), a Spoonbill weighs 1800–2400 g, thus the mass of the device and harnesses did not exceed the 3% of the bodyweight of the captured specimen.

Not only parental feeding of the young was treated as an indicator of parental care, but also the begging behaviour of the chicks if it was tolerated by the adult. Strange adults do not tolerate begging fledglings that belong to other families and these young were often attacked, however, parents never attacked their own offspring (Pigniczki Cs. unpublished observations). Thus, if an adult tolerated begging but young was not being fed I treated that as an indicator of parental leading. During begging, young are following adults and bobbing their heads rhythmically up and down and giving a continuous, high-pitched shrilling, and rasping “cheeerr” call (Cramp 1977, Bloomfield 2021, Pigniczki Cs. unpublished observations). When a parent feeds an offspring, the young put its bill into the pharynx or the throat of the parent to have the regurgitated food (*Figure 1*) (Cramp 1977, Pigniczki Cs. unpublished observations).

During the field observations, two methods were used to collect data on parental care. One of the methods was a scan sampling: when I observed a Spoonbill flock, I regularly noted if I observed that a yearling was being fed by an adult. If the birds were not marked it was not possible to decide whether that family was observed previously or not. During 2020 (between 14 July and October 5) and on 27 June 2021, I noted if pieces of food were fallen



Figure 1. An adult Spoonbill is feeding its fledged offspring. Note that the young insert its bill into the throat of the adult to get the regurgitated food (Photo: Cs. Pigniczki)

1. ábra Öreg kanalasgém eteti a kirepült fiókáját. A fiatal a csőrét a szülő torkába dugja, hogy megszerezze a visszaöklendezett táplálékot (Fotó: Pigniczki Cs.)

into the water while parents fed their young. The other method was noting the behaviour of the colour-ringed juveniles and adults: in this case, I recorded 1) the begging behaviour of juveniles toward adults, and 2) when yearlings were being fed by adults.

When I estimated the length of parental leading and feeding of youngsters during post-fledging dispersal, I regarded the age of the Spoonbills uniformly as three weeks (21 days) old during marking because no biometric data of nestlings is available. I considered the age of the fledging to be 50 days. Hence, it was generally estimated that Spoonbills fledged on the 29th day after their marking. In the case of a fledgling, where the difference between the day of its marking and the day of its first observation out of the colony was lesser than 29, I treated the day of the first observation out of its colony as the estimated fledging day. The difference in days between the last day when parental care (leading or feeding by parents) was observed in the case of a given young and the estimated fledging day and plus one day added is the estimated length of parental care. In the case of observed length of parental care, I applied the difference between the first and the last day when parental care was detected and plus one day added.

The natal colony of a youngster was identified if that has a colour-mark. It was possible to determine the breeding colony of the adults, 1) if a GPS device indicated that, 2) if a colour-ringed adult was observed in a particular colony, 3) if a colour-ringed adult was regularly observed during the breeding period in the vicinity of a colony, and 4) if a colour-ringed adult led or fed at least one colour-ringed fledgling. To calculate the distance between two locations, I used the ‘fossil’ package in R (Vavrek 2011).

Results

During post-fledging dispersal, adult Spoonbills led their fledglings to wetlands near their natal colonies. While yearlings stay in one location, adults may forage in other areas and I often observed that adults arrive to feed their fledged young in the ‘kindergartens’. Juveniles were also observed when they learnt fishing: they often caught pieces of reed from the water and they held them in their bills.

Adults care for their chicks for quite a long. They fed their chicks even in early October (1 October 2019 and 5 October 2020) as was observed in the case of unmarked families at Lake Csaj (*Table 1*). The youngsters obtain their food from the throat of their parents. It was observed seven times on 48 occasions (14.6%) that smaller or bigger pieces of

Table 1. The date of the latest observed parental feeding of young between 2017 and 2021 in Hungary

1. táblázat Az évente legkésőbb megfigyelt etetések dátumai 2017–2021 között Magyarországon

Date of observations of the last parental feed in each year
12 September 2017
20 September 2018
1 October 2019
5 October 2020
20 August 2021

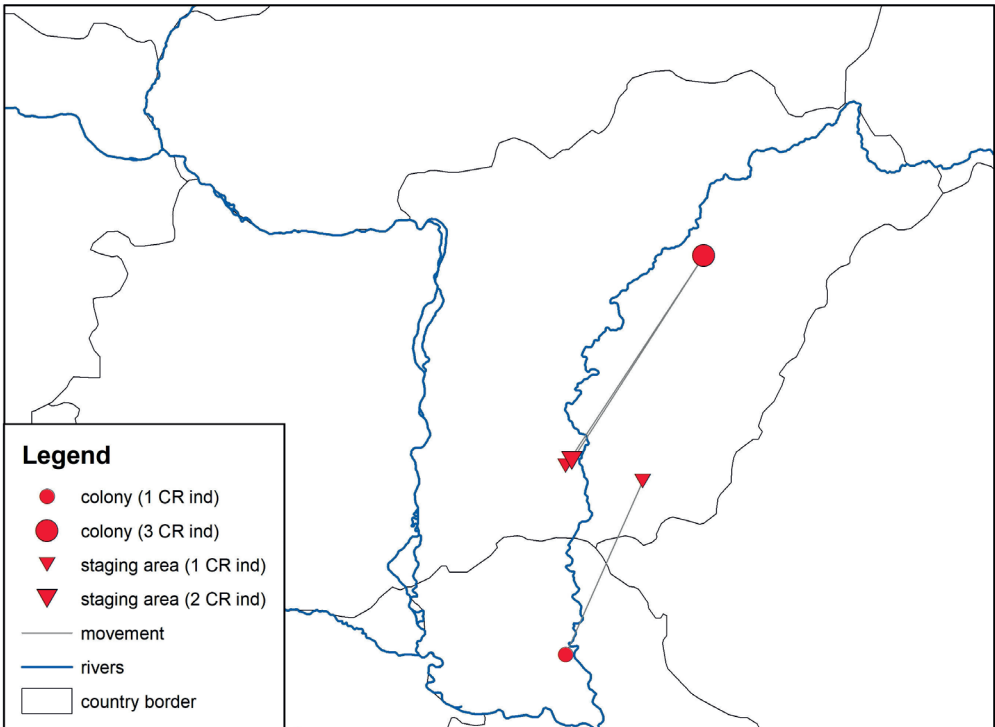


Figure 2. Long-distance movements (over 100 km) of Spoonbill families during parental care between the natal/breeding colonies and the staging areas during dispersal movements

2. ábra A kanalasgém-családok hosszú távú (100 km feletti) diszperziós elmozdulása az utódgondozás alatt a kelési/fészkelőtelep és a későbbi tartózkodási helyek között

Table 2. The latest dates, the distances from the natal/breeding colonies, the estimated and the observed lengths of periods when young Spoonbills are fed by their parents or the adult Spoonbills feed their chicks. In some cases, a row contains the data of young and their parents as well. In these cases, where the data of offspring and parents differ from each other are separated with interrupted lines. The table contains those data when the parents and/or yearlings had colour rings

2. táblázat Kanalasgém fiatalok legkésőbbi etetésének, vagy az öregek legkésőbbi fiókaetetésének dátuma, távolsága a kikelési-/fészkelőhelytől, a becsült és a megfigyelt etetési gondoskodás hossza. Bizonyos esetekben egy-egy sor tartalmazza a fiatal és az öreg adatait is. Ezekben az esetekben, ahol az utódok és a szülők adatai között eltérés van, szaggatott vonallal választottam el. A táblázatban az azonosítható, színes gyűrűs egyedek adatai szerepelnek

Colour-ring code	Age	Natal/breeding colony	Location and date of last observation of parental fed	Distance from colony (km)	Estimated length of periods when young are being fed by their parents (days)	Observed length of periods when young are being fed by their parents (days)
JH53	1	Hortobágy Fishpond	Lake Csaj, 27 July 2017	140	37	NA
JL50	1	Lake Péteri	Lake Csaj, 8 September 2017	13	53	40
JH72	1	Lake Fehér (Szeged)	Nagy-Széksós-tó, 14 August 2017	18	11	9
JH79	1	Lake Fehér (Szeged)	Lake Csaj, 12 September 2017	25	33	30
JP06	1	Ürbő Fishpond	Apaj-puszta, 2 July 2018	3	7	NA
RaBf/GYG	10				NA	NA
JP31	1	Lake Fehér (Szeged)	Fertő (Szeged), 13 July 2018	4	8	NA
J997	4				NA	NA
JP58	1	Lake Fehér (Szeged)	Fertő (Szeged), 1 August 2018	4	19	16
J806	6				NA	NA
JP59	1	Lake Fehér (Szeged)	Fertő (Szeged), 19 July 2018	4	6	NA
J806	6				NA	NA
JT49	1	Hortobágy Fishpond	Hortobágy Fishpond, 17 June 2019	2	6	6
aGBf/GYL	12				NA	NA
JP95	1	Lake Fehér (Szeged)	Nagy-Széksós-tó, 11 August 2019	19	43	43
J02F	1	Lake Fehér (Szeged)	Nagy-Széksós-tó, 1 August 2019	18	31	18
J03F	1	Lake Fehér (Szeged)	Nagy-Széksós-tó, 11 August 2019	18	40	40
E MT	1	Becej Fishpond (Serbia)	Lake Fehér (Kardoskút), 2 August 2011	111	37	NA
B/W [TK]	6				NA	NA
B/R [GK]	15	Lake Fehér (Szeged)	Nagy-Széksós-tó, 9 August 2017	18*	NA	NA

Table 3. The latest observations, the distances from the natal/breeding colonies, the estimated and the observed lengths of periods when young Spoonbills are led by their parents or the adult Spoonbills lead their chicks. In some cases, a row contains the data of young and their parents as well. In these cases, where the data of offspring and parents differ from each other are separated with interrupted lines. The table contains those data when the parents and/or yearlings had colour rings

3. táblázat Kanalasgém fiatalok szülei általi vezetésének a legkésőbbi megfigyelési dátuma, távolsága a kikelési-/fészkelőhelytől, a becsült és a megfigyelt gondoskodás hossza. Bizonyos esetekben egy-egy sor tartalmazza a fiatal és az öreg adatait is. Azokban az esetekben, ahol az utódok és a szülők adatai között eltérés van, szaggatott vonallal választottam el őket. A táblázatban az azonosítható, színes gyűrűs egyedek adatai szerepelnek

Code	Age	Natal/breeding colony	Location and date of last observation of parental leading	Distance from colony (km)	Estimated length of parental leading (days)	Observed length of parental leading (days)
J662	1	Lake Kolon	Böddi-szék, 5 July 2013	17	14	2
J663	1	Lake Kolon	Böddi-szék, 5 July 2013	17	14	3
J364	1	Lake Csaj	Lake Csaj, 28 July 2015	4	56	33
L/L [HE]	12				NA	NA
J936	1	Hortobágy Fishpond	Büdös-szék (Pusztaszer), 8 August 2015	145	63	51
J816	1	Lake Fehér (Szeged)	Lake Csaj, 28 July 2015	26	44	44
GYa/RBfG	7				NA	NA
JL38	1	Lake Csaj	Lake Csaj, 27 July 2017	4	49	49
JL51	1	Lake Péteri	Lake Csaj, 8 September 2017	13	53	42
JL70	1	Lake Péteri	Lake Csaj, 7 September 2017	13	42	34
JH75	1	Lake Fehér (Szeged)	Nagy-Széksós-tó, 21 August 2017	18	18	13
J18H	1	Hortobágy Fishpond	Nagy-szik, 16 July 2020	21	47	47
J173	7	Hortobágy Fishpond	Lake Csaj, 3 September 2017	141	NA	NA
J278	5+	Vidre-ér Fishpond	Lake Csaj, 27 August 2019	7	NA	NA

the regurgitated food fell into the water while adults fed their young. After 13 days of her estimated fledging, a juvenile (ring code: J707) foraged independently at Lake Fehér (near Gátér) on 16 June 2015. J707 foraged on small food (probably aquatic animals) and later, held a twig in her bill.

Based on observations of colour-ringed juveniles, adult Spoonbills care for and feed their chicks not only in the vicinity of their natal colonies (range: 2–26 km), but also in larger

distances (111 km, 140 km, 141 km, and 145 km) (*Figure 2, Table 2, Table 3*). Observations on long-distance dispersal (100+ km) were detected from late July. Adult Spoonbills lead their young from one place to another. One of the adults [ring code: LYa/(Bf)RY] led and fed its offspring to two different locations: the first place was at Fertő (near Szeged) on 28 June 2015 and five days later, the other place was at Lake Csaj on 3 July 2015, with 28 km distance between them.

During the post-fledging dispersal, 6–43 days was the length of the observed parental feeding period of young (*Table 2*). It was estimated that youngsters were being fed by parents for up to 53 days (7.6 weeks) (range: 6–53 days, median: 31 days) after their fledging. 2–51 days was the length of observed parental leading of yearlings (*Table 3*). It was estimated that the parental leading could last even for 63 days (nine weeks) (range: 14–63 days, median: 45.5 days) after fledging.

Discussion

Based on observations during the post-fledging dispersal, I estimated the maximum length of parental feeding and leading periods in Central European Spoonbills and they could last for 7.6 and 9.0 weeks, respectively. These periods could be even longer 1) if the chicks were older during their markings and fledged earlier than it was estimated and 2) if it was not possible to follow the parent-young relationships until the end. In contrast, these periods could also be shorter if some of the young fledged later than they were estimated. Cramp (1977) stated that parental care may last up to at least ten weeks. The result of this paper gives a roughly similar estimation. However, parental care could be even longer and needs further observations to have a better understanding of this.

Spoonbills have quite a long parental care period during post-fledging dispersal compared to other species that live in the same environment and are closely related to them. The adults in the Ardeidae family feed their young with regurgitated food. Young chicks get their food directly into their bills, whilst older offspring are being fed with food regurgitated on to the floor of the nest. It was described in the case of Eurasian Bitterns (*Botaurus stellaris*), Black-crowned Night Herons (*Nycticorax nycticorax*), Squacco Herons (*Ardeola ralloides*), Cattle Egrets (*Bubulcus ibis*), Little Egrets (*Egretta garzetta*), Grey Herons (*Ardea cinerea*) and Purple Herons (*Ardea purpurea*) (Cramp 1977). In the case of the Little Egret, young are independent after one month (four weeks) of fledging (Voisin 1991). The yearlings of Grey Herons are independent after two weeks of their fledging or a bit later (Voisin 1991). According to Cramp (1977), young of other species of the Ardeidae family that breed in Europe become independent shortly after fledging. Young Spoonbills get their food from their parents when they put their bills into their parents' throats. The length of the parental feeding period during the post-fledging dispersal was estimated at minimum ten weeks by Cramp (1977). Based on observations of colour-ringed young Spoonbills, they were being fed by their parents for roughly six weeks (43 days) and moved together with their parents for more than seven weeks (51 days). However, estimations based on recent results suggest that yearlings could be fed by adults for eight weeks and with parents caring for them for up

to nine weeks. Probably, the different lengths of the parental care in the case of Spoonbills and herons could be caused by the different foraging techniques and the time needed to learn them: herons are visual foragers while Spoonbills are tactile foragers (Martin & Katzir 1994, Swennen & Yu 2005). Young Great Cormorants (*Phalacrocorax carbo*) are being fed for 40–50 days after fledging and they also insert their heads into their parents' bills (Cramp 1977). In the case of the European Shag (*Gulosus aristotelis*) young are being fed by their parents for 40 days after fledging. When young Shags become independent they spend more time for foraging than adults, because yearlings are inexperienced in that activity (Daunt *et al.* 2007). Young Spoonbills are led by their parents to sites with shallow water where they can start the learning process of fishing. Only a very limited number of observations and notes are available on the exact process of when and how the juveniles start to learn to obtain their prey. A juvenile foraged independently on 16 June, 13 days after of her estimated fledging, however, it was supposed to be being fed by their parents, too. Compared to other species of Ardeidae, young herons start to learn how to catch their prey in the water at the foot of the heronry as soon as they are able to fly. During this period, young herons also visit their nests several times a day and are still taking nourishment from their parents (Voisin 1991).

The longer period of parental care could also be the result of the shape and the length of the bill of young Spoonbills. Spoonbills use their spoon-shaped, flattened, and broad bills and lateral sweeping to shed a vortex off their bill tips that result in hydrodynamic suction on the bottom, which disturbs and makes their prey move. To achieve this, the bill should be kept close to the bottom during foraging (Weihs & Katzir 1994, 2008). According to Cramp (1977), the full bill length is attained when Spoonbills are 3–6 months old. Based on field observations, the bill length of young could be obviously short after fledging (Pigniczki Cs. unpublished observation). It is very likely that a short and growing bill is not optimal for effective fishing at the beginning, besides, the fledglings are inexperienced foragers.

Parents and young Spoonbills move together at the beginning of the post-fledging dispersal. Yearlings are led by their parents to 'kindergartens' in wetlands within the vicinity of the colonies. Parents and their young were often observed between 2–26 km distances from the natal colonies of the chicks in the 'kindergartens'. From late July, there is evidence that parents and juveniles moved together over a hundred kilometres from their breeding or natal colonies. Previously, it was found that juvenile Spoonbills' maximal distance to their natal colonies increased with months during the post-fledging dispersal (Pigniczki & Végvári 2015).

Interestingly, a young Spoonbill was photographed in NE Italy, 408 km far from its natal colony, quite early, on 30 June 2009, after 39 days of its marking (Pigniczki 2015). That individual seemed to start its migration very early because it was observed out of the Carpathian Basin (Pigniczki & Végvári 2015). Based on the recent results, parents, in general, care for their young in June, thus I assume that the adults led that young to Italy. Unfortunately, no data is available whether or not that the youngster was being fed by their parents in Italy. In Hungary, young Spoonbills are being fed by their parents during summer and some of them could potentially be fed up until September, and even as late as early October when most of the juveniles are on their migration or have arrived at their wintering areas (Pigniczki *et al.* 2016). During the migration and the arrival to the wintering areas,

parental care was never reported, probably, because the observers did not pay attention to this phenomenon. In the case of waterbirds, I did not find available data where parents fed their offspring during migration. However, there are several migratory waterbirds where the parents and their offspring migrate together such as described in the case of swans (*Cygnus* sp.), geese (*Anser* sp., *Branta* sp.), and cranes (Gruidae) (Cramp 1977, Hayes & Barzen 2006, Jonker *et al.* 2011, Kölzsch *et al.* 2020). During parental care, the young geese and cranes learn migratory routes from their parents which is called cultural transmission (Hayes & Barzen 2006, Jonker *et al.* 2011). A juvenile Spoonbill with a GPS device left the Balkans and moved to Italy in January when adult Spoonbills stay in their wintering areas. Thus, this young Spoonbill probably moved alone or together with inexperienced conspecifics and although reached Italy flying along a suboptimal route, it seems that he did not find optimal stop-over areas to forage and died within four days (Pigniczki Cs. unpublished data). Based on the GPS track of this young Spoonbill, I suppose that the cultural transmission from parents or strange experienced adults could be essential for Spoonbills as well to learn the migratory routes and the optimal and adequate stop-over sites.

As a summary, the long parental care in the case of Spoonbills could be the result of many factors such as 1) the learning of tactile fishing could be difficult and young need more time to become experienced foragers, 2) their bills are short after the fledging and are not proper tools for fishing. During their parental care, they might have long-distance dispersal movements.

Call for observation of parental care of Eurasian Spoonbills along the Adriatic Flyway

My data analysis indicates that Spoonbill could be an ideal bird species to study the parental care and the parental feeding of young because the Spoonbill is 1) a highly sociable species, 2) easy to detect when yearlings are begging or being fed, and 3) due to colour-rings, easy to identify and follow the individuals. I request ornithologists, birdwatchers, and bird photographers to pay attention and read the code of colour-rings of Hungarian Spoonbills and help collect data on the parental care along the Adriatic Flyway (Hungary, Austria, Slovakia, Romania, Serbia, Croatia, Slovenia, Bosnia & Herzegovina, Montenegro, Greece, Italy, Algeria, Tunisia, and Libya) during the post-fledging dispersal and migration. The requested data are the followings:

1. date and length of the observation,
2. location with exact coordinates,
3. the number of individuals in the Spoonbill flock,
4. the number of yearlings and adults,
5. the code of colour-rings,
6. relationship between colour-ringed adult and colour-ringed young (if both of them have colour-rings),
7. behaviour of colour-ringed birds:

- a. colour-ringed adult is followed by a begging juvenile (no observation of being fed)
 - b. colour-ringed adult feed juveniles
 - c. colour-ringed begging young
 - d. colour-ringed young is being fed
 - e. colour-ringed juvenile forage independently
 - f. no sign of parent-offspring interaction
8. photo or video if available.

I kindly request that the observers send any collected data to myself for accurate recording.

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