Arxius de Miscel·lània Zoològica, 21 (2023): 13–17 ISSN: 1698–0476

Heterospecific nest material kleptoparasitism: observations of grey herons, *Ardea cinerea*, removing material from the nests of monk parakeets, *Myiopsitta monachus*

F. S. E. Dawson Pell, J. C. Senar, B. J. Hatchwell

Dawson Pell, F. S. E., Senar, J. C., Hatchwell, B. J., 2023. Heterospecific nest material kleptoparasitism: observations of grey herons, *Ardea cinerea*, removing material from the nests of monk parakeets, *Myiopsitta monachus. Arxius de Miscel·lània Zoològica*, 21: 13–17, Doi: https://doi.org/10.32800/amz.2023.21.0013

Abstract

Heterospecific nest material kleptoparasitism: observations of grey herons, Ardea cinerea*, removing material from the nests of monk parakeets,* Myiopsitta monachus. Nest material kleptoparasitism occurs when an individual steals material from another individual's nest. Here we document 69 observations of grey herons, *Ardea cinerea*, removing nest material from the nests of monk parakeets, *Myiopsitta monachus*. The observations coincided with the breeding season of grey herons in Barcelona. We observed the behaviour by multiple individuals, across two years, at multiple nests in four different monk parakeet nesting trees, suggesting that theft of nesting material by grey herons is prevalent in this population. The large nests of the monk parakeet may present a rich source of nesting material that is less costly to collect than gathering nest material elsewhere. Our observations add to the relatively limited number of reports of nest material kleptoparasitism in wild birds and especially between heterospecifics.

Key words: Grey heron, *Ardea cinerea*, Monk parakeet, *Myiopsitta monachus*, Nest material, Kleptoparasitism

Resumen

Cleptoparasitismo heteroespecífico de material de nidificación: observación de garzas reales, Ardea cinerea*, extrayendo material de nidos de cotorras argentinas* Myiopsitta monachus. Se produce cleptoparasitismo cuando un individuo roba material del nido de otro individuo. Aquí documentamos 69 observaciones de garzas reales, *Ardea cinerea*, llevándose material de nidos de cotorras argentinas, *Myiopsitta monachus*. Las observaciones coincidieron con la época de cría de las garzas reales en Barcelona. Observamos el comportamiento de múltiples individuos durante dos años en numerosos nidos situados en cuatro árboles distintos de nidificación de cotorras argentinas, lo que sugiere que el robo de material de nidificación por parte de las garzas reales es prevalente en esta población. Los grandes nidos de las cotorras argentinas pueden constituir una rica fuente de material de nidificación más fácil de obtener que en otros lugares. Nuestras observaciones se suman al número relativamente limitado de informaciones sobre cleptoparasitismo de material de nidificación en aves silvestres y especialmente entre heteroespecíficos.

Palabras clave: Garza real, *Ardea cinerea*, Cotorra argentina, *Myiopsitta monachus*, Material de nidificación, Cleptoparasitismo

Resum

Cleptoparasitisme heteroespecífic de material de nidificació: observació de bernats pescaires, Ardea cinerea*, extraient material de nius de cotorretes pitgrises* Myiopsitta monachus. Es produeix cleptoparasitisme quan un individu roba material del niu d'un altre individu. Aquí documentem 69 observacions de bernats pescaires, *Ardea cinerea*, enduent–se material de nius de cotorretes pitgrises, *Myiopsitta monachus*. Les observacions van coincidir amb l'època de cria dels bernats pescaires a Barcelona. Vam observar el comportament de múltiples individus durant dos anys en nombrosos nius situats en quatre arbres diferents de nidificació de cotorretes pitgrises, la qual cosa suggereix que el robatori de material de nidificació per part dels bernats pescaires és prevalent en aquesta població. Els grans nius de les cotorretes pitgrises poden constituir una rica font de material de nidificació més fàcil d'obtenir que en altres llocs. Les nostres observacions se sumen al nombre relativament limitat d'informacions sobre cleptoparasitisme de material de nidificació en ocells silvestres i especialment entre heteroespecífics.

Paraules clau: Bernat pescaire, *Ardea cinerea*, Cotorreta pitgrisa, *Myiopsitta monachus*, Material de nidificació, Cleptoparasitisme

Received: 18/11/2022; Conditional acceptance: 19/01/2023; Final acceptance: 13/02/2023

Francesca S. E. Dawson Pell, Ben J. Hatchwell, Ecology and Evolutionary Biology, School of Biosciences, University of Sheffield, Western Bank, S10 2TN Sheffield, UK.– Juan Carlos Senar, Museu de Ciències Naturals de Barcelona, Psg. Picasso s/n., 08003 Barcelona, Spain.

Corresponding autor: J. C. Senar. E–mail: jcsenar@bcn.cat

Introduction

Nest material kleptoparasitism, also referred to as nest material theft or nesting robbing, occurs when an individual steals nest material from another individual's nest (e.g. Slager et al., 2012; Thompson et al., 2017). Such kleptoparasitism has been reported in a number of bird species, among conspecifics (e.g. Moreno et al., 1995; Eberhard, 1998; Thompson et al., 2017) and heterospecifics (e.g. Jones et al., 2007; Slager et al., 2012).

Amongst the commonest explanations for kleptoparasitism of nesting material is that it reduces the costs of collecting material. As nest building is an energetically expensive activity (Mainwaring and Hartley, 2013), there may be energetic benefits to the parasite of collecting material from nearby nests as opposed to gathering nest material from the surrounding environment. Furthermore, individuals may also save time by collecting material from the nest of another as opposed to gathering themselves from the environment as suitable material can be found clustered at a nest rather than spread out (Ley et al., 1997). Further explanations include the lack of availability of suitable material in the vicinity (Ley et al., 1997). However, there are also a number of risks to the parasite associated with kleptoparasitism, including the transfer of parasites or the risk of attack by nest residents (Moreno et al., 1995; Ley et al., 1997).

The victims of kleptoparasitism may also incur costs from the loss of nesting material. For example, theft of stones may reduce nest quality in chinstrap penguins, *Pygoscelis antarctica*, increasing the risk of nests flooding with the associated risk of nest failure (Moreno et al., 1995). Nest material kleptoparasitism can also lead to individuals abandoning their nests (Vanderwerf, 1998), and there is also the risk of injury when engaging in nest defence against thieves (Moreno et al., 1995).

Here we present observations of heterospecific nest material kleptoparasitism by grey herons, *Ardea cinerea*, from the nests of monk parakeets, *Myiopsitta monachus*.

Methods

We studied monk parakeets (Dawson Pell et al., 2021) at nests in Ciutadella Park, Barcelona, Spain (41.39º N 2.17º E) on the north–east coast of the Iberian Peninsula. Ciutadella Park comprises approximately 30 ha of native and exotic vegetation and also contains the city's zoological gardens.

The first monk parakeet nests recorded in Barcelona were in Ciutadella Park in 1975 (Batllori and Nos, 1985), and since then this park has become an area of high monk parakeet nest density (Dawson Pell et al., 2021). A colony of grey herons established itself in 1974 in the zoological gardens within Ciutadella Park (Xampeny, 1974) and in 2018 and 2019 (García, 2019, 2020), this colony was estimated at 94–95 and 94 breeding pairs respectively (García and Bonfil, 2021).

We observed monk parakeet behaviour during the breeding season (April–July) in 2018 and 2019 at nests in ten mature pine trees, *Pinus halepensis*. Each nest was observed for one hour every two–seven days in 2018, and for one hour every two–eleven days in 2019. Multiple nests in a single nesting tree were observed simultaneously from the ground by the observer (F. S. E. Dawson Pell) using binoculars. Observation periods of each nest alternated between the morning and afternoon and also between early and late watches within the morning and afternoon to cover the range of available daylight hours. A total of 390 observation hours were conducted across two years (2018: total 263 h; 2109: total 127 h).

Whilst observing monk parakeet behaviour, we also observed grey herons removing nest material from their nests. We recorded the time, date, number of herons involved in each incident, and the response of monk parakeets present in the tree.

Results

We observed grey herons removing nest material from monk parakeet nests on 69 occasions over two years. Incidents of kleptoparasitism were recorded in April (54 %), May (38 %) and June (9 %), coinciding with the breeding season of the grey heron in Spain (García and Bonfil, 2007). Most observations of kleptoparasitism were at nests in one nesting tree (78 %), the remainder occurring at three other nesting trees. In the tree where most incidents occurred, seven different monk parakeet nests were targeted for kleptoparasitism.

On six occasions, two herons stole sticks simultaneously from different nests in the same tree, and on one occasion, three herons stole sticks from the same monk parakeet nest simultaneously, showing that multiple herons exploited this nesting material resource. On the occasion that three herons were observed stealing sticks from the same nest simultaneously, the three birds were fighting amongst themselves whilst on the nest. It is likely that the kleptoparasitic herons were from the nearby heronry in the zoological gardens although we did not observe the location the stolen sticks were taken to in order to confirm this.

The typical response of monk parakeets to heron kleptoparasitism at their nests was to fly from the nest to perch nearby, vocalising loudly. Other birds nesting in the same tree would join in with vocalisations even when the herons were not at their nests. We never observed physical attacks by monk parakeets on the herons. Once the herons had departed with the stolen material, monk parakeets were sometimes observed making immediate efforts to repair the damage by rearranging sticks in the locations the herons had been. We never observed a monk parakeet abandoning its nest due to kleptoparasitism by herons.

Discussion

Monk parakeet nests are exploited by other vertebrate species as both a refuge and for breeding (e.g. Martella et al., 1985; De Lucca, 1992), however, our observations record a further route for exploitation, through kleptoparasitism, a behaviour only anecdotally reported previously (García and Tomás, 2006). Our observations add to the relatively small number of reports of heterospecific kleptoparasitism of nesting material in birds. We observed the behaviour by multiple individuals, across two years, in four different nesting trees and multiple monk parakeet nests, indicating that it is not an isolated behaviour by a single individual. Grey herons have been observed preying on the nests of monk parakeets in Barcelona (García and Tomás, 2006), and such behaviour may be related to the kleptoparasitic behaviour recorded here, but in our observations, the herons departed with sticks, and no predation was seen.

Monk parakeets use their nests year–round and they often have a high parasite load in summer (F. S. E. Dawson Pell, personal observation; Mori et al., 2019). Theft of material from these nests may therefore present a risk if parasites are transferred with the stolen materials to grey heron nests. A further risk of kleptoparasitism is the risk of attack by residents (Moreno et al., 1995), but we never saw monk parakeets attacking herons, perhaps because of the substantial size difference between the species.

The most likely explanations for nest material kleptoparasitism are that it saves time and energy. Nest building is likely to be energetically expensive (Mainwaring and Hartley, 2013) so the large sitck nests of monk parakeets present a rich source of easily accessible nesting material for grey herons with nests in the vicinity. In addition, herons typically breed in large heronries, occasionally with other heron species (Voisin, 1991; Kushlan and Hafner, 2000), that may result in competition for nesting materials with conspecifics and heterospecifics, so other sources of sticks may be depleted.

It is notable that monk parakeets are an invasive species in Spain (the first nests were recorded in Barcelona in 1975; Batllori and Nos, 1985), whereas the grey heron is a native species. It is not known whether this kleptoparasitism is a new behaviour adopted by herons in response to the new resource offered by monk parakeet nests, or whether kleptoparasitism of conspecific or heterospecific nests occurred previously, with a recent switch to exploit monk parakeets.

In summary, these observations add to the relatively limited evidence for heterospecific nest material kleptoparasitism.

Acknowledgements

Fieldwork was funded by a NERC studentship to F. S. E. Dawson Pell through the ACCE Doctoral Training Partnership and supported by research project CGL–2016–79568–C3–3–P and CGL–2020 PID2020–114907GB–C21 awarded to J. C. Senar from the Ministry of Economics and Enterprise, Spain. Thanks also to Parcs i Jardins of Barcelona City Council for facilitating work in Barcelona parks. We thank Josep García and an anonymous reviewer for their helpful comments on this paper.

References

Batllori, X., Nos, R., 1985. Presencia de la Cotorrita Gris (*Myiopsitta monachus*) y de la Cotorrita de Collar (*Psittacula krameri*) en el Área Metropolitana de Barcelona. *Miscel·lània Zoològica*, 9: 407–411, https://other.museucienciesjournals.cat/other/mz/mz-volum-09-1985/presencia-de-la-cotorrita-gris-myiopsitta-monachus-y-de-la-cotorrita-de-collar-psittacula-krameri-en-el-area-metropolitana-de-barcelona

Dawson Pell, F. S. E., Senar, J. C., Franks, D. W., Hatchwell, B. J., 2021. Fine–scale genetic structure reflects limited and coordinated dispersal in the colonial monk parakeet, *Myiopsitta monachus*. *Molecular Ecology*, 30(6): 1531–1544, Doi: 10.1111/mec.15818

De Lucca, E. R., 1992. Nidificación del Halconcito Colorado (*Falco sparverinus*) en nidos de Cotorra (*Myiopsitta monachus*). *El Hornero, Revista de Ornitologia Neotropical*, 13(3): 238–240.

Eberhard, J. R., 1998. Breeding biology of the monk parakeet. *The Wilson Bulletin*, 110(4): 463–473, http://www.jstor.org/stable/4163993

García, J., 2019. *Informe sobre l'activitat d'anellament de polls de Bernat pescaire* Ardea cinerea*. Temporada 2018*. Informe intern ICO/Memòria per Generalitat de Catalunya. Departament de Medi Ambient i Habitatge, Barcelona.

García, J., 2020. *Informe sobre l'activitat d'anellament de polls de Bernat pescaire* Ardea cinerea*. Temporada 2019*. Informe intern ICO/Memòria per Generalitat de Catalunya. Departament de Medi Ambient i Habitatge, Barcelona.

García, J., Bonfil, J., 2021. Bernat pescaire *Ardea cinerea*. In: *Atles dels ocells nidificants de Catalunya: Distribució i abundància 2015–2018 i canvi des de 1980 (*Franch, M., Herrando, S., Anton, M., Villero, D., L. Brotons, Eds.). ICO/Cossetània Edicions, Barcelona.

García, J., Bonfil, J., 2007. Evolución temporal de la población reproductora de garza real, *Ardea cinerea*, en Cataluña (noreste de España) durante el período 1940–2004: selección de biotipos y estado de las colonias. *Ecología*, 21: 121–144.

García, J., Tomás, X., 2006. Primeras interacciones depredatorias de Garza Real *Ardea cinerea* sobre nidos de Cotorra Argentina *Myiopsitta monachus* en Barcelona. *Revista Catalana d'Ornitologia*, 22: 35–39.

Jones, K. C., Roth, K. L., Islam, K., Hamel, P. B., Smith, C. G., 2007. Incidence of Nest Material Kleptoparasitism Involving Cerulean Warblers. *The Wilson Journal of Ornithology,* 119(2): 271–275, Doi: 10.1676/05-145.1

Kushlan, J. A., Hafner, H., 2000. *Heron Conservation*. Academic Press, San Diego, California, USA.

Ley, A. J., Oliver, D. L., Williams, M. B., 1997. Theft of nesting material involving honeyeaters (Meliphagidae). *Corella*, 21(4): 119–123.

Mainwaring, M. C., Hartley, I. R., 2013. The energetic costs of nest building in birds. *Avian Biology Research*, 6(1): 12–17, Doi: 10.3184/175815512X13528994072997

Martella, M. B., Navarro, J. L., Bucher, E. H., 1985. Vertebrados asociados a los nidos de la cotorra *Myiopsitta monachus* en Córdoba y La Rioja. *Physis*, 43(105): 49–51.

Moreno, J., Bustamante, J., Vifiuela, J., 1995. Nest maintenance and stone theft in the Chinstrap penguin (*Pygoscelis antarctica*) 1. Sex roles and effects on fitness. *Polar Biology*, 15: 533–540, Doi: 10.1007/BF00239644

Mori, E., Sala, J. P., Fattorini, N., Menchetti, M., Montalvo, T., Senar, J. C., 2019. Ectoparasite sharing among native and invasive birds in a metropolitan area. *Parasitology Research*, 118(2): 399–409, Doi: 10.1007/s00436-018-6174-2

Slager, D. L., McDermott, M. E., Rodewald, A. D., 2012. Kleptoparasitism of Nesting Material from a Red–faced Spinetail (*Cranioleuca erythrops*) Nest Site. *The Wilson Journal of Ornithology*, 124(4): 812–815.

Thompson, L., Davies, J. P., Bildstein, K. L., Downs, C. T., 2017. Removal (and attempted removal) of material from a Hooded Vulture *Necrosyrtes monachus* nest by a starling and a Hooded Vulture. *Article in Ostrich–Journal of African Ornithology*, 88(2): 183–187.

Vanderwerf, E. A., 1998. Breeding biology and territoriality of the Hawaii creeper. *The Condor*, 100(3): 541–545, Doi: 10.2307/1369721

Voisin, C., 1991. *The herons of Europe*. A&C Black, Edimburg, UK.

Xampeny, J., 1974. Aves en semilibertad. *Revista Del Parque Zoológico de Barcelona*, 21: 11–12.