

A case of polymelia in the Black-headed Gull *Chroicocephalus ridibundus*

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Polymelia is a malformation consisting of the presence of supernumerary limbs. Although relatively common in farm animals and anurans, it is quite rare in wild vertebrates and, especially, birds. I describe here the case of a Black-headed Gull *Chroicocephalus ridibundus* seen in Barcelona (Catalonia, NE Spain) in January and February 2023 that had an atrophic leg originating from the distal posteromedial part of its right tibiotarsus. It was a healthy-looking bird, apparently in its second winter, and showed normal behaviour with no visible signs of any other pathology or malfunction. We are only aware of one previous case of polymelia in gulls and this is the first time it has been reported in a Black-headed Gull. It is also good example of survival in a bird affected by polymelia.

Key words: polymelia, Black-headed Gull, *Chroicocephalus ridibundus*, Laridae, Catalonia.

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On 12 January 2023 at 15:50 a Black-headed Gull *Chroicocephalus ridibundus* with a malformation on its right tarsus (Fig. 1) was observed at the waterfall in Parc de la Ciutadella, Barcelona (Catalonia, NE Spain; 41°23' N / 2°11' E). It was seen again on 17 January and 24 February of the same year in Barcelona harbour (41°22' N / 2°11' E). An examination of the photographs taken shows a malfunction consisting of a fairly well-developed accessory limb (Fig. 2). This supernumerary leg originated from the distal posteromedial part of the tibiotarsus, and curved slightly towards the back of the limb leaving its toes facing backwards. The foot had perfectly developed rear and middle toes, the outer and inner toes being vestigial. This foot was smaller than normal, exhibiting atrophy but with some mobility (Fig. 2), with a middle finger that changed direction. The gull did not seem to suffer from any other malformation; it behaved normally and this leg seemed not to cause it any apparent discomfort or difficulty. It was of unknown sex and probably a second winter bird (born in 2021) due to the dark spot on its greater covert and orange legs, which

indicates that this congenital malformation had not prevented it from surviving normally during its first two years of life.

This description fits polymelia, a congenital disease consisting of the presence of a supernumerary limb. Its causes are not well known and it is thought that different genetic, teratological factors (pollutants, UV radiation or exposure to chemical or radioactive substances), environmental stress, poor nutrition or the action of parasites could be involved (Hays & Risebrough 1972, Albers *et al.* 2001, Pourlis 2011, Rogers *et al.* 2016, Onmus *et al.* 2017, Perin 2017, Klingler & Glasmann 2019). This anatomical malformation is known in humans and vertebrate animals, especially domestic animals and anurans, but it is very rare in other wildlife groups. Unlike farmed birds, where it is commonplace (Pourlis 2011, Hirschberg *et al.* 2012), polymelia in wild birds is exceptionally rare. The scientific bibliography contains only 15 described cases of polymelia in birds, specifically in American Robin *Turdus migratorius* (Shufeldt 1919), House Sparrow *Passer domesticus* (Stoneman 1932),



Figure 1. Black-headed Gull *Chroicocephalus ridibundus* with polymelia, Parc de la Ciutadella, Barcelona, 12 January 2023.

Gavina riallera Chroicocephalus ridibundus amb polimèlia, Parc de la Ciutadella, Barcelona, 12 de gener de 2023.

Mourning Dove *Zenaid macroura* (Frankowiak 1962, Robbins & Pokras 1995), Common Tern *Sterna hirundo* (Hays & Risebrough 1972), Cattle Tyrant *Machetornis rixosa* (Lopes et al. 1981), Eastern Screech-owl *Otus asio* (Albers et al. 2001), King Penguin *Aptenodytes patagonicus* (Voisin et al. 2002), White-crowned Sparrow *Zonotrichia leucophrys* (Schiller et al. 2007), Swainson's Hawk *Buteo swainsoni* (Rogers et al. 2016), White Stork *Ciconia ciconia* (Onmus et al. 2017), Jackass Penguin *Spheniscus demersus* (Vanstreels et al. 2018, Snyman et al. 2022), Silver Gull *Chroicocephalus novaehollandiae* (Woehler & Holzmann 2020) and Pied Flycatcher *Ficedula hypoleuca* (Fuertes-Recuero et al. 2023). Polymelia is sometimes confused with polydactyly, a pathology in which the fingers of the limbs are duplicated that frequently appears in birds such as raptors, waders, Psittaciformes, Caprimulgiformes or Apodiformes (Chandler 1992, Frey et al. 2001, Crosta et al. 2002, Dogliero et al. 2018). However, there are only five documented cases of polydactyly in gulls: three in the Mew Gull *Larus canus*, one in a Ring-billed Gull *Larus delawarensis* and one in a Black-headed Gull (Sudilowskaja 1958, Ryder & Chamberlain 1972, Pätzold 1984).

Polymelia can diminish the abilities of affected individuals and it is common for it to occur together with other malformations or multiple pathologies, which can hinder mobility (Woehler & Holzmann 2020) or reduce survival possibilities (Robbins & Pokras 1995, Albers et al. 2001, Rogers et al. 2016, Onmus et al. 2017). In fact, most of the cases of polymelia described in the bibliography correspond to specimens that had been found dead or euthanized (eight chicks or immature and three fully developed specimens), and only four of the described cases correspond to live adult birds (in addition to the present case). This fact makes this observation of the Black-headed Gull with polymelia in Barcelona exceptional, not only because it is the first case described for this species and only the second in gulls, but because this bird seems to have survived and migrated with complete normality despite its malformation, which usually has serious consequences for survival in affected birds.

This bird would be part of the contingent of birds from central and northern Europe that winter in our region (Gutiérrez 2011). Data from gulls ringed here and abroad indicate that the Black-headed Gulls that winter in Catalonia come from a large area that ranges from Eng-



Figure 2. Detail of the supernumerary leg, Port of Barcelona, 17 February 2023.
Detall de la pota supernumerària, Port de Barcelona, 17 de febrer de 2023.

land to the Balkans and the Baltic (Heldbjerg & Bregnballe 2020, ICO 2023). Therefore, it is difficult to speculate about the exact origin of the specimen described and even more difficult to determine the possible causes of the malformation, which could be genetic, environmental or teratological in origin as a result of the fusion or the absorption of twin embryos (Stoneman 1932, Pourlis 2011, Onmus *et al.* 2017). It is possible that this malformation was the result of proximity to human activity where it would be exposed to various pollutants, such as radiation from Chernobyl, a specific circumstance that has caused diverse effects on other species (Møller & Mousseau 2001, Bonisoli-Alquati *et al.* 2010a, 2010b). To sum up, this record is an exceptional case of survival of a bird with polymelia, the second record of such a malformation in Laridae and the first one for this species.

Resum

Un cas de polimèlia en la gavina riallera *Chroicocephalus ridibundus*

La polimèlia és una malformació que consisteix en la presència d'extremitats supernumeràries. Tot i ser

relativament comuna en animals de granja i amfibis anurs, és bastant rar en altres vertebrats salvatges, especialment ocells. Aquí es descriu el cas d'una gavina riallera *Chroicocephalus ridibundus* vista a Barcelona (Catalunya, NE d'Espanya) el gener-febrer de 2023, que tenia una pota atròfica addicional sorgida de la part posteromedial distal del tibiotars dret. Era un ocell d'aspecte saludable, aparentment en el seu segon hivern, que mostrava un comportament normal i sense signes visibles de cap altra patologia o mal funcionament. Només es té coneixement d'un cas anterior de polimèlia en gavines, i aquesta és la primera vegada que es detecta en una gavina riallera, i és també un cas excepcional de supervivència en un ocell afectat per aquesta malformació.

Resumen

Un caso de polimelia en la gavina reidora *Chroicocephalus ridibundus*

La polimelia es una malformación consistente en la presencia de miembros supernumerarios. Aunque relativamente común en animales de granja y anfibios anuros, es bastante rara en otros vertebrados salvajes, especialmente aves. Aquí se describe el caso de una gaviota reidora *Chroicocephalus ridibundus* observada en Barcelona (Cataluña, NE de España) en enero-febrero de 2023 que presentaba una pata atrófica adicional,

derivada de la parte posteromedial distal del tibiotarso derecho. Se trataba de un ave de aspecto saludable, aparentemente en su segundo invierno, que mostraba un comportamiento normal y sin signos visibles de ninguna otra patología o mal funcionamiento. Solo conocemos un caso previo de polimelia en gaviotas y esta es la primera vez que se reporta en una gaviota reidora, siendo además un caso excepcional de supervivencia en un ave afectada por esta malformación.

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