Gallotia caesaris feeding on ectoparasite flies from *Pandion haliaetus*

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Resumen: Se describe un comportamiento previamente no observado en el lagarto de Boettger (*Gallotia caesaris*). Varios ejemplares de la subespecie *G. caesaris caesaris* se subieron al dorso de un águila pescadora (*Pandion haliaetus*) y comieron allí moscas parásitas (Diptera, Hippoboscidae) que estaban sobre las plumas; el águila pescadora se hallaba en un nido situado en la costa del mar de las Calmas en la isla de El Hierro. Este comportamiento es otro caso de mutualismo (simbiosis de limpieza) ya que puede contribuir a mejorar la salud de las águilas pescadoras y, por otra parte, es un suplemento alimenticio para los lagartos.

Canarian lizards (genus *Gallotia*, Arnold, 1973) are in general omnivorous, eating several plant species and some insects (Molina-Borja, 1991; Rodríguez *et al.*, 2008). Juveniles may consume more insects, but adults are mainly vegetarians (Valido & Nogales, 1994). Among the consumed plants are "salado" (*Schizogine cericea*), "guaidil" (*Convolvulus floridus*), "lavanda" (*Lavandula* sp.), and petals, flowers and fruits of "tunera" (*Opuntia dilenii*) (Molina-Borja, 1991; Rodríguez *et al.*, 2008). Among the consumed invertebrates are coleopteran, aracnids, formicids and hymenopterans (Rodríguez *et al.*, 2008).

We describe here, for the first time, the feeding of *Gallotia caesaris* specimens on feather parasites of *Pandion haliaetus* nesting in El Hierro (Canary Islands). In that island, *P. haliaetus* reproduction has been reinforced by adding previously built nests on several cliff sites (Trujillo & Rodríguez, 2007). During several periods in which *P. haliaetus* individuals were filmed (by the first author) while they were in the nest (located at the shore of Mar de las Calmas), an undescribed behavior by *G. caesaris caesaris* lizards could be observed. It consisted of several lizards climbing to dorsal feathers of *P. haliaetus* (adult and chick, Figures 1a and b) and performing there typical feeding movements directing their snouts to the feathers (Pedro F. Acosta, unpublished video film). When observed with more detail, the insects eaten by the lizards on *P. haliaetus* back feathers were identified as louse flies (Diptera, Hippoboscidae). These flies are ectoparasites of mammals and birds (Tella *et al.*, 2000) and different species like *Ornithomya avicularia*, *Pseudolynchia canariensis*, *Icosta americana* and *Ornithomya anchineuria* have been described as parasites of raptors (Samour, 2016); another species, *Olfersia fumipennis*, Sahlberg, 1886, has been cited on *P. haliaetus* (Pospischil, 2015). It was impossible to capture any of the louse flies from *P. haliaetus* (not allowed) so we do not know the species.

Commensalism on rests from prey brought by Eleonora's falcon has been cited in lacertids from Mediterranean islands (Delaugerre *et al.*, 2012) and from gull's prey in *Gallotia simonyi* on Roque Chico de Salmor (Siverio & Felipe, 2009). On the other hand, several reports have been published on lizards eating bird ectoparasites, including flies

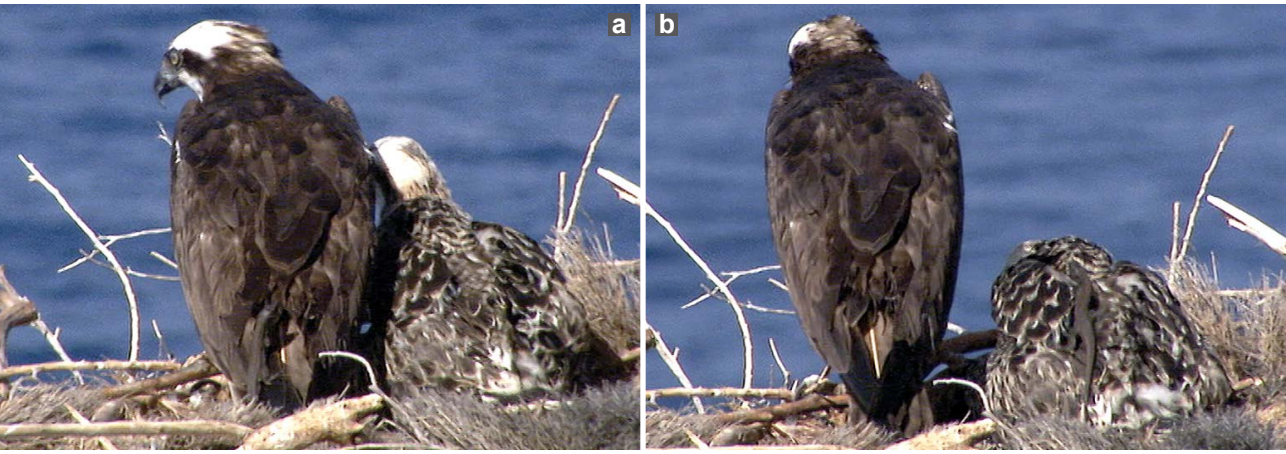

Figure 1: Individuals of *G. caesaris caesaris* on the back of *P. haliaetus* while in nest. (a) Adult. (b) Chick. Pictures obtained from a film recorded by Pedro F. Acosta.
Figura 1: Individuos de *G. caesaris caesaris* sobre la espalda de *P. haliaetus* en el nido. (a) Adulto. (b) Pollo. Fotografías obtenidas de una película grabada por Pedro F. Acosta.

from different families (Kammerer, 1925; Duffy, 1991; Polis & Hurd, 1995). Our observation pose some interesting questions: first of all, this behaviour can be present only in local populations of *G. caesaris caesaris* living close to *P. haliaetus* nests. Secondly, it must contribute to *P. haliaetus* (adults and new-borns) health eliminating or reducing louse flies parasites; these parasites have been shown to affect body condition in other bird species (Senar *et al.*, 1994; Clayton *et al.*, 2010). Moreover, lizards on their part obtain, at least temporarily while birds are on nests, an additional food item supplying animal proteins; therefore, this relationship could be considered an example of mutualism, sometimes named as cleaning symbiosis (McFarland & Reeder, 1974). Nevertheless, this relationship could be more complicated if louse flies endoparasites (Baker, 1967) could also infect lizards (see Johnson *et al.*, 2010 for a revision of the ecological importance of parasites as preys).

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