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I need some ants too: heterospecific and conspecific social facilitation of anting in congeneric crows from India

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Abstract - Anting is a self-maintenance behaviour in birds involving the application of ants to feathers, yet it remains poorly documented in India. We report an observation of active anting in a Large-billed Crow (*Corvus macrorhynchos*) and House Crows (*Corvus splendens*) from Coonoor, Nilgiris, southern India. The behaviour occurred beneath a cypress tree in the presence of Yellow ants (*Anoplolepis gracilipes*) and was analysed using a video-based ethogram. Active anting constituted the dominant activity. Notably, two House Crows subsequently exhibited similar behaviour after observing the Large-billed Crow, indicating heterospecific social facilitation. This note provides rare documentation of anting and social learning in Indian crows.

Keywords - anting, heterospecific social facilitation, House crow, Large-billed crow, nilgiris.

Riassunto - Mi servono anche delle formiche: facilitazione sociale eterospecifica e conspecifica del comportamento di “anting” nei corvi congenerici dell’India.

L’“anting” è un comportamento di auto-manutenzione negli uccelli che consiste nell’applicare formiche sulle penne, ma rimane ancora poco documentato in India. Riportiamo delle osservazioni di “anting” attivo in un corvo dal becco grande (*Corvus macrorhynchos*) e in corvi domestici (*Corvus splendens*) a Coonoor, nei Nilgiri, nell’India meridionale. Il comportamento si è verificato sotto un albero di cipresso in presenza di formiche gialle (*Anoplolepis gracilipes*) ed è stato analizzato utilizzando un etogramma basato su registrazioni video. L’anting attivo ha costituito l’attività dominante. In particolare, due corvi domestici hanno successivamente mostrato un comportamento simile dopo aver osservato il corvo dal becco grande, facendo

presumere una facilitazione sociale eterospecifica. Questa nota fornisce una rara documentazione dell'anting e dell'apprendimento sociale nei corvi indiani.

Parole chiave: anting, corvo dal becco grande, corvo domestico, facilitazione sociale eterospecifica, Nilgiri.

Anting is a widespread yet rarely observed stereotypic behavior that has been documented in more than 200 bird species (Clayton *et al.*, 2010; Wiles, 2011, Ohkawara *et al.*, 2022; Sarlin *et al.*, 2023; Avilés, 2024). Reports also indicate that certain birds and mammals engage in anting using both natural materials, such as plants and arthropods, and human-made objects (Sarlin *et al.*, 2023). The behavior occurs in two distinct forms. In active anting, birds deliberately pick up ants or other items in their bills and rub them across their feathers, employing both living and non-living materials. In contrast, passive anting involves birds positioning themselves within ant colonies, allowing ants to crawl through their plumage and bite them (Carter, 1966; Simmons, 1985; Morozov, 2015).

The adaptive significance of anting has been the subject of several hypotheses, ranging from parasite control to feather conditioning and chemical defense (Ali, 1936; Whitaker, 1957; Revis & Waller, 2004; Ohkawara *et al.*, 2022). If anting functions as a parasite-control strategy, its occurrence should peak during rainy seasons when ectoparasites such as lice and mites are most active and infestation risk is highest (Potter, 1970; Potter & Hauser, 1974; Clayton *et al.*, 2010). Ants of the genus *Formica* are most frequently associated with this behavior (Revis, 2002; Eisner & Aneshansley, 2008). At least 24 ant species have been recorded in connection with anting (Whitaker, 1957), including *Formica exsectoides* (Eisner & Aneshansley, 2008), *Formica obscuripes* (Wiles & McAllister, 2011), and *Lasius spathopus* and *Lasius nipponensis* (Ohkawara *et al.*, 2022). A comprehensive review by Revis (2002) further documented 32 species from the subfamily Formicinae and 10 non-Formicinae species five belonging to the Myrmicinae and five to the Dolichoderinae being used in anting.

Anting is particularly prevalent among members of the family Corvidae, with the genus *Corvus* showing notable examples (Hendricks & Norment, 2015; Padrón, 2024). Worldwide, eight species within this family have been documented exhibiting anting behavior. These include the Rook (*Corvus frugilegus*), Carrion Crow (*C. corone*), Hooded Crow (*C. cornix*), Common Raven (*C. corax*), Australian Raven (*C. coronoides*), Hawaiian Crow (*C. hawaiiensis*), Northwestern Crow (*C. caurinus*), and American Crow (*C. brachyrhynchos*) (Hendricks & Norment, 2015).

The Yellow Crazy Ant (*Anoplolepis gracilipes* Fr. Smith) is recognized as one of the world's 100 worst invasive alien species (Luque *et al.*, 2014; Lin *et al.*, 2023; Dukit *et al.*, 2026). Facilitated by human trade, it has established itself as a formidable invader across Southeast Asia and beyond, where it disrupts native fauna, reduces species richness, and promotes the proliferation of Hemiptera pests (Angulo *et al.*, 2022). This species is typically found in moist lowland habitats but is uncommon in arid regions and at elevations above 1200 m (Wetterer, 2005). Its origin remains debated: while first described from India as *A. longipes* (Jerdon, 1851), many authors consider it native to tropical Asia, whereas others suggest an African origin (Wetterer, 2005). Regardless of its provenance, *A. gracilipes* poses a serious threat to biodiversity and native species abundance in areas where it has been introduced (Lee & Yang, 2022).

In India, references to anting behavior are extremely limited, with the earliest account coming from Ali (1936), who noted its occurrence in the Jerdon's Leafbird (*Chloropsis jerdoni*). Later, Carter (1966) provided the first detailed description of active anting in the Indian Myna, marking a significant contribution to the documentation of this behavior in the region. Despite

these early accounts, anting is an unknown and peculiar behaviour where rather than saying it is rare, it would be more accurate to say that it has not been properly observed (Potter, 1970). The term heterospecific refers to individuals of different species that interact socially with one another. Heterospecific sociality refers to animals receiving social benefits, such as information or aggregation advantages, not only from members of their own species but also from members of other species (Sridhar & Guttal, 2018). Social facilitation in birds does refer to the strengthening or triggering of an already existing behavior in an individual bird as a result of observing another bird performing the same behaviour (Thorpe, 1951).

Anting behavior by Jungle Crows (*Corvus macrorhynchos*) and House Crows (*Corvus splendens*) was recorded in Coonoor, The Nilgiris, India, on January 10, 2026, at 11:00 AM. The site lies at an elevation of approximately 1820 m. On this day, light drizzle and intermittent rainfall created damp conditions. The behavior was observed near a Cypresses Tree belongs to family Cupressaceae, where a large aggregation of Yellow Crazy Ants (*Anoplolepis gracilipes*) was present. Both Jungle Crows (*Corvus macrorhynchos*) and House Crows (*Corvus splendens*) engaged in anting in association with this ant colony. To the best of our knowledge, this represents the first documented record of *Anoplolepis gracilipes* being used for anting. This behaviour lasted for 2.45 minutes that was been video graphed using a phone. We performed an ethogram analysis (Fig. 1) using that video, in which we observed 9 different types of behaviours, and we have assigned 9 different codes for these. Behaviours were categorized using a predefined ethogram comprising: active anting (AAN), pecking/ant handling (PK), preening (PR), vigilance (VA), head turning (HT), wing stretching (WS), interspecific interaction (IN), and chase (CH).

Each behaviour was coded with start and end times (in seconds). During 131 seconds of observation, active anting (AAN) was the most frequently occurring behaviour in the Large-billed crow, accounting for 42-45% of the total time. This involved deliberately rubbing ants on the tail, wings, and legs. Ant collection, along with pecking (PK), accounted for approximately 8-10% of the time, representing the retrieval of ants after the anting process. Preening (PR) occupied approximately 18-20% of the time and frequently occurred after the anting activity, used to reach different parts of the body. Head turning (HT) accounted for approximately 10-12% of the total time, involving scanning the surroundings and monitoring conspecifics and heterospecific birds. Vigilance (VA) behaviour constituted about 15-17% of the activity budget. Wing stretching (WS) was a rare behaviour, contributing only about 2-3% to the total time. (Fig. 2).

Interspecific interaction (IN), including reactions to house crows, was approximately 2%, while chase-related behaviour (CH) accounted for <1% of the total time. While the Large-billed Crow was engaged in active anting, a Common House Crow observed the behaviour and subsequently exhibited similar actions. We observed this anting behaviour to be considered as an heterospecific social facilitation. While a Jungle Crow was actively anting, three House Crows observed what the Jungle Crow was doing and then engaged in anting themselves. (Figs. 3, 4).

Heterospecific social facilitation

Heterospecific sociality refers to animals receiving social benefits, such as information or aggregation advantages, not only from members of their own species but also from members of other species (Sridhar & Guttal, 2018). Social facilitation in birds does not refer to learning a new behaviour through imitation, but rather to the strengthening or triggering of an already existing behaviour in an individual bird as a result of observing another bird performing the same behaviour (Thorpe, 1951). A congener is an organism belonging to the same genus. It shares close evolutionary and behavioural similarities with another species (Kortmulder, 1985). Three individual House Crows arrived at the location where the Large-billed Crow (LBC) was

anting. The first House Crow (HC1) observed and hunted ants, but did not engage in anting. Shortly after, the two other House Crows (HC2 and HC3) arrived and began anting, sitting opposite to where the Large-billed Crow was perched on the ground. House Crow HC1 spent approximately 70-75% of its time pecking to eat ants and 25-30% on vigilance. It engaged in 0% ant-rubbing. Meanwhile, HC2 and HC3 allocated approximately 40-45% of their observed time to active anting, 20-25% to pecking at ants, 15-20% to vigilance, and the remaining time to brief maintenance behaviours before moving on.

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SUPPLEMENTARY INFORMATION/ INFORMAZIONI SUPPLEMENTARI

Additional Supplementary Information may be found online for this article.

S1: A video illustrating ‘anting’ behaviour in the Large-billed Crow (*Corvus macrorhynchos*) and House Crow (*Corvus splendens*). / Video che illustra il comportamento di “anting” nel corvo dal becco grande (*Corvus macrorhynchos*) e nel corvo domestico (*Corvus splendens*).

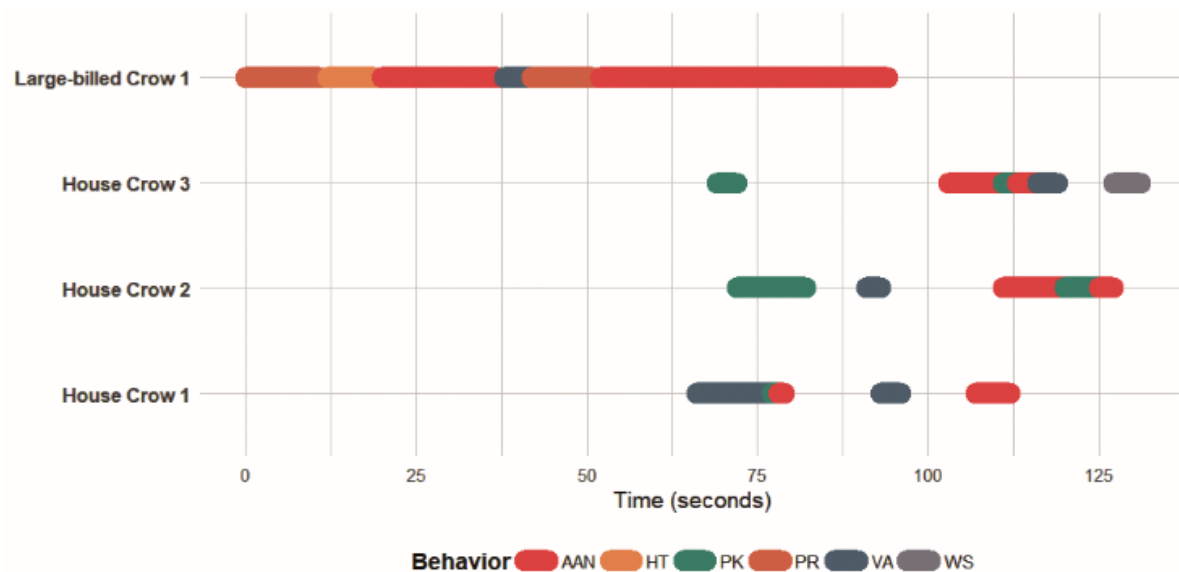


Fig. 1 - Illustration of the Ethogram timeline of anting and associated behaviour. / Illustrazione della cronologia dell'etogramma relativa al comportamento “anting” e ai comportamenti associati.

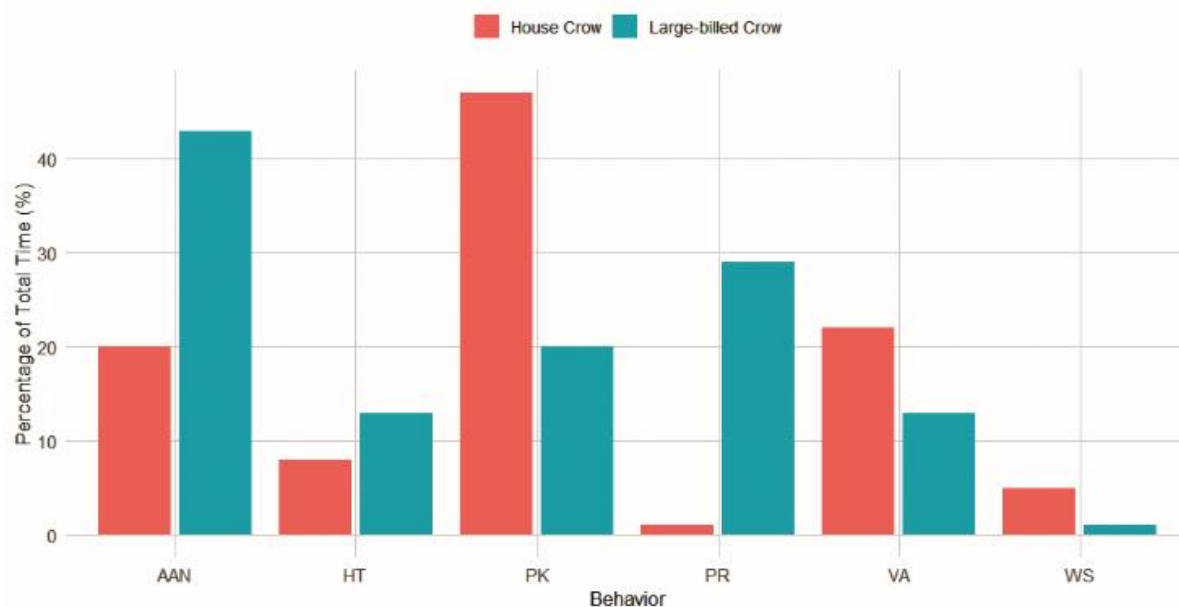


Fig. 2 - Illustration of behavioral time budget comparison between species. / Illustrazione del confronto tra la distribuzione del tempo dedicato ai diversi comportamenti nelle diverse specie.

Behavioural Transition Network During Heterospecific Anting

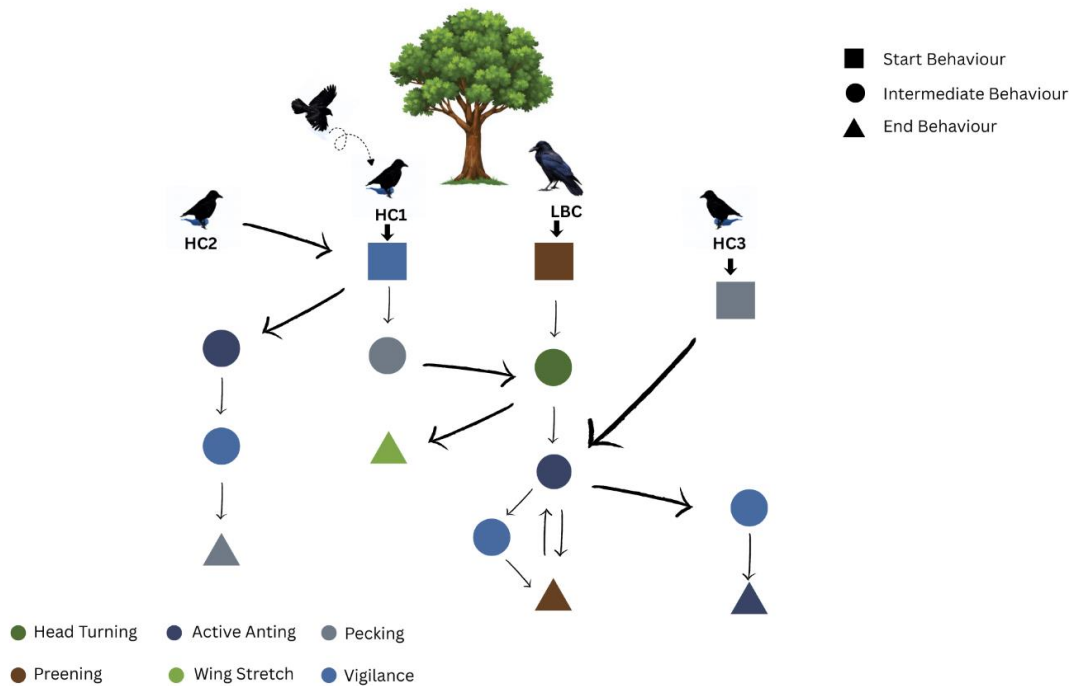


Fig. 3 - Illustration of the behavioral transition network during Heterospecific anting. / Illustrazione della rete di transizione comportamentale durante l'interazione eterospecifica tra formiche.

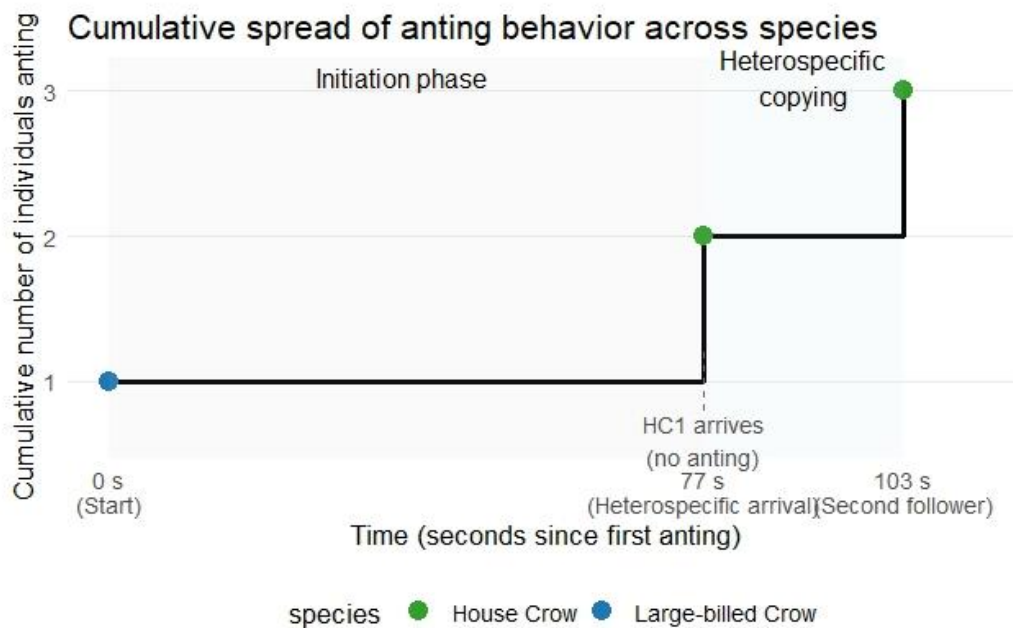


Fig. 4 - Illustration of the cumulative spread of anting behavior across species. / Illustrazione della diffusione cumulativa del comportamento di "anting" tra le diverse specie.