Sarus crane *Antigone antigone* predating on chicks of grey-headed swamphen *Porphyrio poliocephalus*

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Tropical wetlands host diverse breeding birds, but there is little information on aspects such as the predation of chicks. Diet of omnivorous waterbirds is poorly recorded in India, especially during the breeding season when they require to hunt more carnivorous foods to facilitate rapid chick growth. In the present study, we observed a sarus crane pair in western Uttar Pradesh, India, predating on chicks of grey-headed swamphen – not reported earlier in the diet of this species. Review of the literature, search of photographs available on the World Wide Web and consulting experts suggested that chicks of other birds are extremely rare in sarus crane diet. Additionally, the existing literature suggests waterbird chicks as widespread but rare in the diet of cranes globally, though at least one study suspects cranes to be major predators of waterbird chicks. The chicks of other birds seem to be a ready source of nutrition for omnivorous cranes and the rarity of such predation seems worthy of specific studies.

Keywords: Crane, diet, hunting, swamphen, wetlands.

WETLANDS in the tropics, like in India, house multiple sympatric breeding bird species, many of which breed during the monsoon season[1]. The overlap in breeding suggests the availability of bird chicks for potential predators, especially large species such as cranes.

Cranes are generically described as omnivorous, though robust studies of diet are not common[2–5]. Crane species outside Europe and North America are poorly studied, though observations on feeding biology have been steadily increasing[6,7]. These observations indicate of how poorly even basic crane habits are documented and are needed for many more species and locations, especially since habitat deterioration is altering crane behaviour and feeding habits[8–11].

One species that has received increased scientific attention in the past decade is the sarus crane *Antigone antigone* which has gone from being a species with 'precious little' published on it[12], to one of the better-understood crane species globally[13]. However, most work on the species is biased towards habitat use and breeding biology, with relatively little known of its feeding habits. The sarus crane appears flexible in adapting to different conditions with diets suiting individual locations. In their breeding areas in Australia, where they inhabit *Eucalyptus*-dominated regional ecosystems, sarus cranes feed across a relatively narrow trophic level with a diverse plant diet[14–16]. In Southeast Asia, where they inhabit seasonally flooded *Dipterocarp* forests, their diet is dominated by tubers of aquatic plants[17]. In South Asia, where these cranes largely inhabit open floodplains dominated by cereal-based agriculture, there are no detailed studies yet on their diet. However, anecdotal observations show that their diet includes a long list of plant items, including both wild species (e.g. *Carex* sp., *Elaeocharis* sp., grasses) and domestic crops (e.g. corn, peas, potato, rice, wheat, sorghum and other millets). In addition, sarus crane in South Asia feeds on various animal matter, including insects, amphibians, eggs of turtles and birds, and rodents[13]. In this study, we add one more item to the diet of the sarus crane and review available information (published literature, experts working on the species and photographs available online) to understand if it has been documented previously in the crane diet. We also discuss the apparent rarity of such items in the crane diet.

One of us (JW) is a regular weekend visitor to Dhanauri wetlands in western Uttar Pradesh, India, where several breeding pairs and non-breeding flocks of sarus crane reside[18]. On 20 August 2021, within the territory of a breeding pair that had two chicks, an adult crane was seen holding a chick of purple swamphen *Porphyrio poliocephalus*. It appeared to have chanced upon a family of swamphens and had captured a chick. After a few minutes of beating the swamphen chick with its beak, the adult walked away from the dead chick. On 15 April 2022, at a location about 100 m from the sighting in 2021, an adult sarus crane was seen chancing upon a purple swamphen family and grabbing a young chick (Figure 1). The adult crane walked towards its chick (<10 days of age) and its partner with the swamphen chick in its beak. The two adults performed a small dance with wings open (Figure 1). Thereafter, the swamphen chick was shaken violently a few times and beaten with its beak by the sarus crane. The crane chick approached closer and the adult bird broke small pieces of the swamphen chick with violent twists, which it

Figure 1. (Left) Photograph of adult sarus crane in the Dhanauri wetlands, Uttar Pradesh, India, with a newly caught chick of grey-headed swamphen. (Middle, top) Two adult cranes engaging in a dance with a freshly caught chick with adult swamphens watching in the foreground. (Middle, bottom) Adult crane twisting off bits of the swamphen chick. (Right) Adult crane feeding the head of a swamphen chick to its own chick. Photographs by JW.

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Table 1. Records in the literature and the Web of cranes hunting waterbird chicks

Crane species	Species hunted	Source of information
Sandhill crane *Antigone canadensis*	Mallard *Anas platyrhynchos*	https://www.projectnoah.org/spottings/23922008
	Little green heron *Butorides virescens*	https://www.startribune.com/sandhill-cranes-kills-then-eats-green-heron-chick/307462131/
Brolga *Antigone rubicunda*	*Young of marshland birds	Ref. 22
Red-crowned	Mallard	Ref. 2
Crane *Grus japonensis*	Great reed warbler *Acrocephalus arundinaceus*	Ref. 2
Black-necked crane *Grus nigricollis*	Redshank *Tringa* species	https://www.facebook.com/photo/?fbid=10158783438-664937&set=gm.10156646773317411
Common crane *Grus grus*	Aquatic warbler *Acrocephalus paludicola*	Ref. 23
	*Black-headed gull *Chroicocephalus ridibundus*	Ref. 24
	*Various waders	Ref. 25

*Suspected hunting.

then fed to its chick (Figure 1). Several pieces were also eaten by both adult birds before they proceeded to preen themselves during the five minutes of observation. The first observation was during the peak normal breeding time of the sarus cranes[13,19]. The second observation of predation was during summer when only a few crane pairs breed again following unsuccessful breeding during the previous regular season[10]. Sarus crane breeding pairs are strongly territorial, retaining the same territory for multiple years[13,19]. The two observations are therefore considered to be of the same crane pair.

The literature review revealed no prior published information on sarus cranes predating on chicks of other birds, though we found documentation of predation on the eggs of both waterbirds (spot-billed ducks *Anas poecelorhyncha*[7]) and terrestrial birds (laughing dove *Streptopelia senegalensis*[12]). We searched ~4000 photographs available online (eBird, Facebook, Google search, Wikipedia images) and found two previous instances of sarus cranes predating on the chicks of grey-headed swamphens (Sultanpur Bird Sanctuary in Haryana, India – A. Yadav, September 2018 and Dhanauri wetlands – S. S. Suresh, November 2018). The two sites are <70 km from each other. During the former instance, the adult sarus crane was without its chicks and ate the swamphen chick (A. Yadav, pers. commun.). During the latter instance, the adult sarus crane fed the predated chick to its two chicks (>5 weeks of age; as deduced from the photograph). Experts who have been studying sarus cranes for over 80 cumulative human-years have not observed such predation on chicks of other species in Australia (J. D. A. Grant and E. C. Scambler, pers. commun.), Gujarat (K. Kathju, pers. commun.), Madhya Pradesh (R. Shan, pers. commun.), Myanmar (M. Win, pers. commun.), Nepal and Rajasthan (unpublished information).

Our observations and review of available information suggest that chicks of other birds are decidedly rare in the sarus crane diet, though the breeding pair in Dhanauri wetlands hunted swamphen chicks more than once. During three of the four observations, sarus cranes had very young chicks of their own, suggesting that the carnivorous diet of the young cranes facilitated such hunting. However, the apparent rarity of such hunting is not entirely explicable since many other locations in South Asia have breeding sarus cranes alongside good populations of breeding waterbirds, including swamphens. The regular hunting habit of one breeding pair at Dhanauri suggests that it is a habit that sarus crane pairs can get used to, though it is not clear why such hunting is localized. Sarus cranes in South Asia rarely display behaviours observed only in one location. The only known previous example of such localized behaviour is the habit of an adult crane covering its eggs with vegetation prior to walking away from its nest in response to disturbance[20]. Other documented unusual behaviours, such as unseasonal nesting or the occurrence of trios, were also rare but widespread[10,11]. Currently, all observations of hunting of waterbird chicks by sarus cranes were in two wetland sites <70 km from each other. It seems possible, therefore, that such hunting behaviour is currently localized. However, as the chicks of the hunting sarus cranes disperse more widely, the behaviour may become more widespread.

Of the 15 extant crane species, we could find evidence for five species hunting chicks of other birds in all the continents with cranes, except in Africa (Table 1). The rarity of observations is surprising since most cranes have a diverse diet comprising prey similar in size to waterbird chicks, such as large crabs and small mammals[2]. Most cranes also breed in wetlands alongside smaller breeding waterbirds. Such hunting of waterbird chicks by cranes is carefully mentioned by Johnsgard[2]. It is then inexplicably excluded from subsequent species accounts and reviews of cranes likely due to assumptions that this behaviour was too rare to find a mention in general species accounts. There is, however, growing concern that increasing populations of some crane species, such as the Eurasian crane *Grus grus* which predates on chicks of other birds, could negatively impact waterbird species of conservation concern[21]. Careful and multi-year documentation of crane diet is missing for most species, especially during the breeding season when adults are catering to chicks that require a carnivorous, calcium-rich diet to enable rapid growth[2].

Surprisingly cranes do not hunt chicks of birds, given the apparent access to chicks of multiple bird species at their

breeding sites. As our observations suggest, hunting chicks is clearly rewarding and apparently not too difficult for the large sarus cranes. This apparent anomaly seems worthy of specific studies.

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