

1 Sarus Cranes *Antigone antigone* predating on chicks of Grey-headed Swamphen *Porphyrio*
2 *poliocephalus* and thoughts on waterbird chicks in crane diet

3

4 **Jaswinder Waraich¹, K. S. Gopi Sundar^{2*}**

5 ¹1808, Brahmaputra Apartments, Sector 29, Noida 201301, Uttar Pradesh, India

6 ²Seva Mandir, Old Fatehpura, Udaipur, Udaipur, 313004, Rajasthan, India

7 *Author for communication; gopi.sundar@gmail.com

8

9 **Abstract** Tropical wetlands host a diversity of breeding birds but there is little information on
10 aspects such as predation of chicks. Diet of omnivorous waterbirds are poorly recorded in
11 India, especially during the breeding season when they require hunting more carnivorous
12 foods to facilitate rapid chick growth. We report on observations of one Sarus Crane pair in
13 western Uttar Pradesh, India, predating on chicks on Grey-headed Swamphens – a new item
14 in the diet of this species. Review of literature, search of photographs available on the world
15 wide web and questioning experts suggested chicks of other birds are extremely rare in Sarus
16 Crane diet. Additionally, existing literature suggested waterbird chicks as widespread but rare
17 in the diet of cranes globally, though at least one study suspects cranes to be major predators
18 of waterbird chicks. Chicks of other birds seem to be a ready source of nutrition for
19 omnivorous cranes and the rarity of such predation seems worthy of specific investigation.

20

21 **Keywords:** crane, Dhanauri wetlands, diet, hunting, Uttar Pradesh, waterbirds.

22

23 Wetlands in the tropics, like in India, house multiple sympatric breeding bird species many of
24 which time their breeding with rainfall.¹ The overlap in breeding suggests the availability of
25 bird chicks for potential predators, especially large species such as cranes.

26 Cranes are generically described as being omnivorous though robust studies of diet are not
27 common.²⁻⁵ Crane species resident outside of Europe and north America are particularly
28 poorly studied though observations on feeding biology have been steadily increasing.^{6,7} These
29 observations provide a preliminary indication of how poorly even basic crane habits are
30 documented and are needed for many more species and locations especially given how
31 habitat deterioration is altering crane behavior and feeding habits.⁸⁻¹¹

32 One species that has received increased scientific attention in the past decade is the Sarus
33 Crane *Antigone antigone* that has gone from being a species with “precious little” published
34 on it,¹² to one of the better understood crane species globally.¹³ Most work on the species is,
35 however, biased towards habitat use and breeding biology with relatively little known of its
36 feeding habits. The Sarus Crane appears flexible in adapting to different conditions with diets
37 suiting individual locations. In their breeding areas in Australia, where they inhabit
38 *Eucalyptus*-dominated regional ecosystems, Sarus Cranes fed across a relatively narrow
39 trophic level with a diverse plant diet.¹⁴⁻¹⁶ In south-east Asia, where they inhabit seasonally
40 flooded *Dipterocarp* forests, their diet was dominated by tubers of aquatic plants.¹⁷ In south
41 Asia, where they largely inhabit open floodplains dominated by cereal-based agriculture,
42 there are no detailed studies yet of their diet. However, anecdotal observations show their diet
43 to include a long list of plant items including both wild species (e.g. *Carex* sp., *Elaeocharis*
44 sp., grasses) and domestic crops (e.g. corn, peas, potato, rice, wheat, sorghum and other
45 millets). In addition, Sarus Crane in south Asia take a variety of animal matter including
46 insects, amphibians, eggs of turtles and birds, and rodents.¹³ In this note, we add an item to
47 the diet of the Sarus Crane, review available information (published literature, experts

48 working on the species and photographs available online) to understand if this item has been
49 documented previously in crane diet, and provide some discussion on the apparent rarity of
50 such items in crane diet.

51 One of us (JW) is a regular weekend visitor to Dhanauri Wetland located in western Uttar
52 Pradesh beside Delhi, where several breeding pairs and non-breeding flocks of Sarus Cranes
53 are resident.¹⁸ On 20 August 2021, within the territory of a breeding pair that had two chicks,
54 an adult Sarus was seen holding a chick of a Purple Swamphen *Porphyrio poliocephalus*. It
55 appeared to have chanced upon a family of swamphens and had captured one chick. After a
56 few minutes of beating the swamphen chick with its beak, the adult walked away from the
57 dead chick. On 15 April 2022, in a location about 100 m from the sighting in 2021, an adult
58 Sarus was seen chancing upon a Purple Swamphen family and grabbing a young chick (see
59 Figure 1). The adult swamphens ran after the Sarus which rapidly walked away. The adult
60 Sarus walked to its own single chick (<10 days of age) and partner with the swamphen chick
61 in its beak. The two adults performed a small dance with wings open (Figure 1). After the
62 dance, the swamphen chick was shaken violently a few times, and beaten with the beak by
63 the Sarus. The Sarus chick approached closer, and the adult bird broke small pieces of the
64 swamphen chick with violent twists, which it then fed to its chick. Several pieces were also
65 eaten by both adult birds before they proceeded to preen themselves in the five minutes of
66 observation. The first observation was during the peak normal breeding time of the Sarus
67 Cranes^{13,19} while the second observation of predation was during the summer when very few
68 crane pairs breed again following unsuccessful breeding during the previous regular season.¹⁰
69 Sarus Crane breeding pairs are strongly territorial retaining the same territory for multiple
70 years.^{13,19} The two observations are therefore thought to be of the same crane pair.

71

72 Literature reviews revealed no prior published information on Sarus Cranes predated on
73 chicks of other birds, though we found documentation of predation on eggs of both
74 waterbirds (Spot-billed Ducks *Anas poecelorhyncha*⁷) and terrestrial birds (Laughing Dove
75 *Streptopelia senegalensis*¹²). We searched ~4,000 photographs available online (eBird,
76 Facebook, Google search, Wikipedia images) and found two previous instances of Sarus
77 Cranes predated on chicks of Grey-headed Swamphens from Facebook at Sultanpur Bird
78 Sanctuary in Haryana state, India (A. Yadav, September 2018), and Dhanauri wetlands (S. S.
79 Suresh, November 2018). The two sites are < 70 km from each other. During the former
80 instance the adult Sarus Crane was without chicks of its own and ate the swamphen chick (A.
81 Yadav, pers. comm). During the latter instance the adult Sarus Crane fed the predated chick
82 to its two chicks (> 5 weeks of age; aged from photograph). Enquiries from experts who have
83 been studying Sarus Cranes for over 80 cumulative human-years had not observed such
84 predation on chicks of other species in Australia (J. D. A. Grant and E. C. Scambler, pers.
85 comm.), Gujarat state (K. Kathju, pers. comm.), Madhya Pradesh state (R. Shan, pers.
86 comm.), Myanmar (M. Win, pers. comm.), Nepal and Rajasthan state (unpublished
87 information).

88 Our observations and review of available information suggest that chicks of other birds are
89 decidedly rare in Sarus Crane diet, though the breeding pair in Dhanauri wetlands hunted
90 swamphen chicks more than once. During three of the four observations Sarus Cranes had
91 very young chicks of their own suggesting that the carnivorous diets of the young cranes
92 facilitated such hunting. However, the apparent rarity of such hunting is not entirely
93 explicable since many other locations in south Asia have breeding Sarus Cranes alongside
94 good populations of breeding waterbirds including swamphens. The regular hunting habit of
95 one breeding pair at Dhanauri suggests that it is a habit that Sarus Crane pairs can get used to,
96 though it is not clear why such hunting is so localized. Sarus Cranes in south Asia rarely

97 display behaviours observed only in one location. The only known previous example of such
98 localized behaviour is the habit of an adult crane covering its eggs with vegetation prior to
99 walking away from its nest in response to disturbance.²⁴ Other documented unusual
100 behaviours, such as unseasonal nesting or occurrence of trios, were also rare but
101 widespread.^{10,11} Currently all observations of hunting of waterbird chicks by Sarus Cranes
102 occurs in two wetland sites that are < 70 km from each other. It seems possible therefore that
103 such hunting behaviour is currently localized. However, as the chicks of the hunting Sarus
104 Cranes disperse more widely, the behaviour may become more widespread.

105 Of the 15 extant crane species, we could find evidence for five species hunting chicks of
106 other birds in all the continents with cranes except in Africa (Table 1). The rarity of
107 observations is greatly surprising since most cranes have a diverse diet comprising of prey
108 similar in size to waterbird chicks, such as large crabs and small mammals.² Most cranes also
109 breed in wetlands alongside smaller breeding waterbirds. Such hunting of waterbird chicks by
110 cranes finds careful mention in Johnsgard² and then inexplicably is excluded from subsequent
111 species accounts and reviews of cranes likely due to assumptions that this behaviour was too
112 rare to find mention in general species accounts. There is, however, growing concern that
113 increasing populations of some crane species such as the Eurasian Crane *Grus grus*, that
114 predate on chicks of other birds, could negatively impact waterbird species of conservation
115 concern.²⁵ Careful and multi-year documentation of crane diet is missing for most species
116 especially during the breeding season when adults are catering to chicks that require a
117 carnivorous, calcium-rich diet to enable rapid growth.²

118 It is surprising that cranes do not hunt chicks of birds given the apparent access to chicks of
119 multiple bird species at their breeding sites. As our observation shows, hunting chicks is
120 clearly rewarding and apparently not too difficult for the large Sarus Crane. This apparent
121 anomaly seems worthy of specific investigation.

122

123 **Acknowledgements**

124 We are grateful to the many people who responded to our questions regarding Sarus Crane
125 diet and especially thank A. Arya, R. Ganeshan, J. D. A. Grant, K. Kathju, E. C. Scambler, R.
126 Shan, S. S. Suresh, I. Veltheim, M. Win, and A. Yadav. Observations were made by JW, both
127 authors conducted literature and other reviews, and both wrote the manuscript.

128

129 **References**

- 130 1. Ali, S. and Ripley, S. D., Handbook of the birds of India and Pakistan. Oxford University
131 Press, New Delhi, India, 2001.
- 132 2. Johnsgard, P. A., Cranes of the world. Indiana University Press, Bloomington, Indiana,
133 U.S.A., 1983.
- 134 3. Hunt, H. E. and Slack, R D., Winter diets of Whooping and Sandhill Cranes in south
135 Texas. *J. Wildl. Manage.*, 1989, **53**, 1150-1154.
- 136 4. Avilés, J. M., Sánchez, J. M. and Parejo, D., Food selection of wintering common cranes
137 (*Grus grus*) in holm oak (*Quercus ilex*) dehesas in south-west Spain in a rainy season. *J.*
138 *Zool.*, 2001, **256**, 71-79.
- 139 5. Jasson, J., Plant diet selectivity and some environmental parameters at foraging sites of
140 Wattleed Cranes (*Bugeranus carunculatus*) in Malagarasi wetlands, Tanzania. *Tanzania J.*
141 *Sc.*, 2019, **45**, 32-43.
- 142 6. Gichuki, N., Influence of breeding on foraging behaviour and diet of Crowned Cranes.
143 *Ostrich*, 2000, **71(1 & 2)**, 74-79.
- 144 7. Sundar, K. S. G., Eggs in the diet of the Sarus Crane *Grus antigone* (Linn.). *J. Bombay*
145 *Nat. Hist. Soc.*, 2000, **97**, 429-429.

- 146 8. Li, D., Zhang, J., Chen, L., Lloyd, H. and Zhang, Z., Burrow ambient temperature
147 influences *Helice* crab activity and availability for migratory Red-crowned cranes *Grus*
148 *japonensis*. *Ecol. Evol.*, 2020, **20**, 11523-11534.
- 149 9. Jia, J., Jiao, S., Zang, Y., Zhou, Y., Lei, G. and Liu, G., Diet shift and its impact on
150 foraging behaviour of Siberian Crane (*Grus leucogeranus*) in Poyang Lake. *PLoS One*,
151 2013, **8**, e65843.
- 152 10. Sundar, K. S. G., Yaseen, M. and Kathju, K., The role of artificial habitats and rainfall
153 patterns in the unseasonal nesting of Sarus Cranes (*Antigone antigone*) in south Asia.
154 *Waterbirds*, 2018, **41**, 80-86.
- 155 11. Roy, S., Kittur, S. and Sundar, K. S. G., Sarus Crane *Antigone antigone* trios and their
156 triets: discovery of a novel social unit in cranes. *Ecol.*, 2022, **2022**: e3707.
- 157 12. Gole, P., The status and ecological requirements of Sarus Cranes. Phase I. Report
158 submitted to the Ministry of Environment and Forests, Government of India, New Delhi,
159 India, 1989.
- 160 13. Sundar, K. S. G., Species review: Sarus Crane (*Grus antigone*). In *Crane Conservation*
161 *Strategy* (eds. Mirande, C. M. and Harris, J. T.), International Crane Foundation,
162 Baraboo, Wisconsin, U.S.A., 2019, pp. 323-345.
- 163 14. Barker, R. D. and Vestjens, W. J. M., The food of Australian birds I: non-passerines.
164 CSIRO Publishing, Australia, 1989.
- 165 15. Lavery, H. J. and Blackman, J. G., (Eds.), The cranes of Australia. Division of Plant
166 Industry, Department of Primary Industries, Brisbane, Australia, 1969.
- 167 16. Sundar, K. S. G., Grant, J. D. A., Veltheim, I., Kittur, S., Brandis, K., McCarthy, M. A.
168 and Scambler, E. C., Sympatric cranes in northern Australia: abundance, breeding
169 success, habitat preference and diet. *Emu – Austral Ornith.*, 2019, **119**, 79-89.

- 170 17. Net, Y., Parrott, M., Kimhout, S. and Zalinge, R. V., Foraging preferences of eastern
171 Sarus Crane *Grus antigone sharpii* in Cambodia. *Cambodian J. Nat. Hist.*, **2015(2)**, 165-
172 171.
- 173 18. Gulati, H. and Rana, S., Nest characteristics and breeding success of Sarus Cranes,
174 *Antigone antigone* (Linnaeus, 1758) (Aves: Gruidae) in different habitats at Dhanauri
175 wetland, Uttar Pradesh. *Rec. Zool. Surv. India*, 2021, **121**, 205-210.
- 176 19. Sundar, K. S. G., Are rice paddies suboptimal breeding habitat for Sarus Crane in Uttar
177 Pradesh, India? *The Condor*, 2009, **111**, 611-623.
- 178 20. Fountain, P. and Ward, T., Rambles of an Australian naturalist. From the notes and
179 journals of Thomas Ward. John Murray, London, U.K., 1907.
- 180 21. Cramp, S. and Simmons, K. E. L., The birds of the western Palearctic. Volume II. Oxford
181 University Press, Oxford, U.K., 1980.
- 182 22. Sandgren, L. Tranan kan vara boven bakom skrattdrama [The crane could be the
183 culprit behind the gull drama]. *Fåglar i Närke*, **2019**, 1.
- 184 23. Wirdheim, A., Tranparadoxen. Stjärna eller syndabock [The paradox: star or scapegoat]?
185 *Vår fågelvärld*, **2019**, 2.
- 186 24. Kathju, K., Observations of unusual clutch size, renesting and egg concealment by Sarus
187 Cranes *Grus antigone* in Gujarat, India. *Forktail*, 2007, **23**, 165-167.
- 188 25. Fraixedas, S., Lindén, A., Husby, M. and Lehikoinen, A., Declining peatland bird
189 numbers are not consistent with the increasing Common Crane population. *J. Ornith.*,
190 2020, **161**, 691-700.

191

192 Figure 1. Sequence of photographs taken in Dhanauri wetlands showing adult Sarus Crane
193 with a newly caught chick of Grey-headed Swamphen (left vertical), the two adult cranes
194 engaging in a dance with the freshly caught chick with adult swamphens watching in the
195 foreground (middle, top), the adult crane twisting off bits of the swamphen chick (middle,
196 bottom), and feeding the head of the swamphen chick to its own chick (right vertical).
197 Photographs by Jaswinder Waraich.

198



199

200

201 Table 1. Records in literature and on the world wide web of cranes hunting waterbird chicks.

202 Asterisks mark reports of suspected hunting.

203

Crane species	Species hunted	Source of information
Sandhill Crane <i>A. canadensis</i>	Mallard <i>Anas platyrhynchos</i>	https://www.projectnoah.org/spottings/23922008
	Little Green Heron <i>Butorides virescens</i>	https://www.startribune.com/sandhill-cranes-kills-then-eats-green-heron-chick/307462131/
Brolga <i>A. rubicunda</i>	*“Young of marshland birds”	20
Red-crowned Crane <i>Grus japonensis</i>	Mallard	2
	Great Reed Warbler <i>Acrocephalus arundinaceus</i>	2
Black-necked Crane <i>G. nigricollis</i>	Redshank <i>Tringa</i> sp.	https://www.facebook.com/photo/?fbid=10158783438664937&set=gm.10156646773317411
Common Crane <i>G. grus</i>	Aquatic Warbler <i>A. paludicola</i>	21
	*Black-headed Gull <i>Chroicocephalus ridibundus</i>	22
	*“Various waders”	23

204

205