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Nesting Observations on a South American Subspecies of Least Grebe (*Tachybaptus dominicus brachyrhynchus*)

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Abstract.—Despite a wide distribution over much of the New World, the behavior of the Least Grebe (*Tachybaptus dominicus*) is still poorly known, and most ecological studies have been performed on Northern Hemisphere subspecies. This note reports two observations during breeding in the South American subspecies *T. d. brachyrhynchus*. Deliberate egg-covering to hide an active nest from an approaching threat was observed, coupled with elusive “hiding” behavior during an opportunistic breeding attempt in a novel habitat (xeric Chaco). Photographic documentation of egg destruction by a domestic Muscovy Duck (*Cairina moschata*) at a Least Grebe nest is also reported. Received 6 November 2019, accepted 5 October 2020.

Key words.—Chaco, egg-covering, egg destruction, Least Grebe, Muscovy Duck, nest defense, trill call

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Least Grebe (*Tachybaptus dominicus*) is a widespread, New World grebe (Podicipedidae), distributed in five subspecies from southern Texas to north-central Argentina (Konter 2001; Fjeldså 2004). Two subspecies occur in South America (Chapman 1899): *T. d. eisenmanni* is restricted to the Pacific region of western Ecuador and northwest Peru and *T. d. brachyrhynchus* occupies the rest of the South American range (Parera 1988; Konter 2001; Fjeldså 2004; Llimona *et al.* 2018), including: Colombia east to the Guianas, and south through Brazil to eastern Bolivia (Herzog *et al.* 2017), Paraguay, subtropical north-central Argentina (Storer 1975; Casañas and Cargnelutti 1997; Nores and Yzurieta 1983; Preisz 2011; Lucero 2013), and Uruguay.

Despite the wide distribution of the Least Grebe, very little has been published on its behavior, and much remains to be learned about its ecology in general. It is known to be a multi-brooded (McNair *et al.* 2008), opportunistic breeder (Patrikeev 2009; Ortega-Álvarez 2013; Hayes 2018) that is ready to breed at any time (Konter 2001, 2014), typically building a floating nest (Gross 1949; Hasse and Hasse 2009) and laying a clutch of 4 to 6 white eggs (Storer 1976, 1992; Fjeldså 2004). However, the vast majority of published works are in reference to the Northern Hemisphere subspecies, and al-

most nothing has been published about the ecology of the widespread South American subspecies: *T. d. brachyrhynchus*.

In Paraguay, *T. d. brachyrhynchus* is perhaps the most commonly encountered grebe, ranging widely across the country in all ecoregions (Guyra Paraguay 2005). It reaches its greatest abundance in the Chaco region of the country, where it benefits from the provision of cattle ponds (“*tajamares*”) in a xeric landscape. The environment in the eastern region of Paraguay is more humid, and the historical range of the species was restricted by the extent of the Atlantic Forest. However, it has benefited from extensive deforestation throughout this region, and its habitat flexibility coupled with well-known dispersive movements have allowed it to expand its range, provided that suitable water sources are available (Smith and Clay *in press*). Here we provide a pair of observations of note on the species in Paraguay that contribute to our knowledge of the ecology of *T. d. brachyrhynchus* (hereafter grebe).

METHODS

Observations took place in the Paraguayan Chaco during June 2011 (Laguna Krul) and December 2018 (Teniente Enciso National Park). The environment in the Paraguayan Chaco is highly xeric, consisting of pristine, dense thorny woodland at the latter locality, but

highly modified into agricultural land at the former locality. The grebes were observed with 10 x 50 binoculars and notes and photographs were taken to document the behaviors observed.

At Teniente Enciso National Park (21° 05' S, 61° 08' W) *T. d. brachyrhynchus* were nesting on a small natural pond (approximately 50 x 25 m diameter) surrounded by dense Chaco woodland, which formed a nearly complete canopy over the water. The pond is a critical source of water for the wildlife of the park, and one of the few permanent water sources in the surroundings. Laguna Krul (22° 34' 36" S, 59° 36' 23" W) is an artificial cattle pond close to human habitation, surrounded by ranchland and with banks denuded of vegetation. The pond is used regularly for drinking by cattle and is permanently occupied by domestic Muscovy Ducks (*Cairina moschata*).

RESULTS

Deliberate Egg-covering in Response to Perceived Approaching Threat

A pair of *T. d. brachyrhynchus* was found nesting on a small, forested pond at Teniente Enciso National Park, Boquerón department, on 1 December 2018. Upon approaching the pond, and before the birds were visible to the observer, the characteristic breeding trill call of the species was heard. A nest was located, a floating platform of vegetation located in the middle of the pond. At the first approach the eggs were covered so that their presence inside the nest was not visible, and the birds remained out of sight. Further approaches to the pond delivered a similar result, so it was decided to approach under cover from a different direction in an attempt to glimpse the birds (as it represented the first report of the species occurring in the park).

Upon this more careful approach it was possible to glimpse the birds, one of which again gave the trill call. In direct response to this call one bird swam quickly towards the exposed eggs ($n = 4$), covering them rapidly with vegetation and re-entering the water, before submerging and disappearing from sight. It was not possible to confirm if the calling bird was also the egg-covering bird, but it was clear that the trill was a warning in response to the approaching "threat," eliciting the egg-covering, and was associated with the elusive behavior of the adults. The adult

birds hid behind submerged tree trunks, slowly submerging and peeking out at the observer, and specifically avoided swimming in open water while the observer was present. These observations broadly agree with those for the nominate subspecies in Cuba (Gross 1949).

Informal playback experiments were performed to gauge the responses of the pair. Playback of the trill call brought both pair members into view, swimming rapidly in close formation (perhaps approximating to "parallel swimming" of Konter 2014) towards the source of the call, trilling in response. If the call was played again, a similar frantic search for the source of the call would take place, followed by another trill. If there was no response, they would immediately return to the elusive behavior shown before, suggesting that this behavior was territorial. Both birds apparently deliberately avoided the vicinity of the nest while the observer was visible. The observation of near adult-sized juvenile birds at the same location during January 2019 suggests that this breeding attempt was successful (Sergio Ríos, pers. commun.)

Nest Destruction by Muscovy Duck

A *T. d. brachyrhynchus* nest was encountered at Laguna Krul, Presidente Hayes department, during June 2011. It was a mound of floating vegetation located on a small, artificial cattle pond next to a human dwelling. Several Muscovy Ducks (duck) were present on the pond, along with the pair of nesting *T. d. brachyrhynchus*. Two uncovered white eggs were present in the *T. d. brachyrhynchus* nest, suggesting that the clutch was not complete. One duck swam up to the nest and, one after the other, grasped the eggs by its bill and tossed them into the water next to the nest (Fig. 1). After doing so the duck swam away, paying no further attention to the nest. The Muscovy Duck did not attempt to consume the eggs nor climb onto the platform, and the grebes made no attempt to defend the nest. We consider this a case of interspecific egg destruction and not egg predation.



Figure 1. Muscovy Duck (*Cairina moschata*) takes an egg of the South American Least Grebe (*Tachybaptus dominicus brachyrhynchus*) in its bill prior to discarding it in the water during egg destruction (Photo by S. Centrón).

DISCUSSION

These observations confirm that *T. d. brachyrhynchus* breeds in the Paraguayan Chaco, and the months (June and December) and localities (one where the species had not been previously recorded; the other on a pond close to human dwelling) suggest that they do so opportunistically, as in other parts of their range (Gross 1949; Palmer 1962; Storer 1992).

Patrikeev (2009) noted that eggs were usually covered with vegetation when the birds were not incubating and described adults as “guarding” the nest, often remaining motionless next to it. This differs from our observations and those of Gross (1949) of deliberate hiding of the nest and elusive behavior in response to potential threat. We suggest that this difference in behavior could be related to the unusual and opportunistic nature of this breeding attempt, in an unfamiliar habitat with limited visibility (pond densely surrounded by forest, with a near complete canopy covering), causing the adults to be extra cautious.

The eggs were apparently left uncovered until the presence of the threat was detected. Palmer (1962) states that eggs are “not voluntarily left uncovered except for a few moments when (the) incubating bird leaves the nest before being relieved”, though they may also be left uncovered during nest repair and to test the safety of a nesting location (A. Konter, pers. commun.). However, in both of our observations eggs apparently were left uncovered during the day. Previous authors have hypothesized that egg-covering acts to both camouflage and prevent overheating of a clutch (Fjeldså 2004; Prokop and Trnka 2011), and that egg temperature may be controlled by egg-covering in warm environments (Patrikeev 2009). Typically, temperatures experienced during December in this area are extremely high and frequently pass 40°C, but on the day of the first observation it was cool (around 20°C), yet eggs were apparently left uncovered only until a threat was detected. This suggests that temperature regulation may be more complicated than has been assumed, and that covering of the

eggs in this case was a deliberate attempt at camouflaging in response to an imminent threat.

Although waterfowl of at least nine species often loaf on the abandoned nest platforms of Podicipedidae, including nests with eggs (Hayes *et al.* 2018a), there are no previous reports of ducks intentionally destroying eggs of grebes. On the other hand, Red-gartered Coots (*Fulica armillata*) have been observed kicking eggs out of Hooded Grebe (*Podiceps gallardoi*) nests (Fjeldså 1986), and Great Blue Herons (*Ardea herodias*) have been observed destroying Red-necked Grebe (*Podiceps grisegena*) eggs (Nuechterlein *et al.* 2003). Such occurrences may be more common than is currently known as they rely on direct and fortuitous observation to be recorded.

Reasons for egg destruction are complex and mechanisms are poorly understood. Conspecific egg destruction has been reported several times in the Podicipedidae (McAllister 1958; Perkins *et al.* 2005; Konter 2008a, 2008b; Summers *et al.* 2009; Hayes *et al.* 2018b), but interspecific egg destruction between two species that show little or no ecological overlap is more difficult to explain. Typically, egg destruction is in order to gain a reproductive or resource advantage (Hrdy 1979; Brown and Brown 1988; Koenig *et al.* 1995; Hayes *et al.* 2018b), related to brood parasitism (Peer 2006; Fiorini *et al.* 2014), or a behavioral characteristic that has evolved under strong selective forces related to the two former explanations (Spooner *et al.* 1997; Brewer 2001). These can be broken down into four broad hypotheses: 1) consumption or predation hypothesis; 2) nest usurpation hypothesis; 3) competition hypothesis; and 4) predator-avoidance hypothesis. The observed behavior of the duck immediately rejects the first two hypotheses, but the remaining two are possibly applicable to this situation. The competition hypothesis suggests that destruction of neighbor's eggs may occur when strong competition occurs for limited resources (Brewer 2001). The predator-avoidance hypothesis states that egg removal from neighboring nests makes breeding activity less visible to predators and

creates decoys that reduce search efficiency of predators (Finch 1990). Whilst we are unable to reject either of these hypotheses, it is unclear whether or not they adequately explain why a non-parasitic, domestic duck (presumably under no resource restraints) would destroy a grebe nest. Birds could potentially remove eggs from a nest to usurp the nest for loafing, but waterfowl often loaf on grebe nests with eggs present (Hayes *et al.* 2018a), and in this case the duck made no attempt to climb onto the nest. Other speculative explanations include simple vandalism on behalf of the duck or as a proactive response by the ducks to the notoriously aggressive behavior of Least Grebes (Palmer 1962) in an attempt to evict them from the pond. Unfortunately, it is difficult to draw solid conclusions from a single observation.

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