



## SHORT NOTE

**PREDATION OF ATLANTIC GHOST CRABS (*OCYPODE QUADRATA*, OCYPODIDAE) BY WHITE-NECKED HAWK (*BUTEOGALLUS LACERNULATUS*, ACCIPITRIDAE) IN UBATUBA, SÃO PAULO, BRAZIL**Lucas Machado Botelho<sup>1,\*</sup> · Elsie Laura Rotenberg<sup>1</sup> · Edelcio Muscat<sup>1</sup><sup>1</sup> Projeto Dacnis, Estrada do Rio Escuro 4754, Sertão das Cotias, Ubatuba, São Paulo, Brazil.

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**Abstract** · The White-necked Hawk (*Buteogallus lacernulatus*) is an uncommon mid-sized raptor of the Atlantic lowland forest in Brazil, often considered an opportunistic predator, although scarce data is available on its diet. Here, we present novel information on its feeding habits: we observed a White-necked Hawk preying on Atlantic Ghost Crabs (*Ocypode quadrata*) on a sandy beach frequented by humans in south-eastern Brazil. The hawk's presence in an anthropized location and the first record of its feeding on crabs add to the notion that it has a diversified diet and an opportunistic feeding behavior.

**Resumo** · Predação de Caranguejos Fantasma do Atlântico (*Ocypode quadrata*, *Ocypodidae*) pelo gavião-de-pescoço-branco (*Buteogallus lacernulatus*, *Accipitridae*) em Ubatuba, São Paulo, Brasil

O Gavião-pombo-pequeno (*Buteogallus lacernulatus*) é uma ave de rapina incomum de porte médio, hábitos florestais e considerada um predador oportunista, embora pouco se saiba sobre suas presas preferidas. Aqui apresentamos novas informações sobre seus hábitos alimentares: observamos um gavião-pombo-pequeno atacando caranguejos maria-farinha (*Ocypode quadrata*) na areia de uma praia frequentada por humanos no sudeste do Brasil. A presença do gavião em um local antropizado e o primeiro registro de predação de caranguejo somam-se à teoria de que ele possui uma dieta diversificada e um comportamento alimentar oportunista.

**Key words:** Crustacean · Diet · Natural History · Opportunistic feeding · Predation · Raptor

The White-necked Hawk (*Buteogallus lacernulatus*, Temminck 1827) is endemic to the Brazilian Atlantic Forest, where it inhabits slopes and coastal moist broad leaf forests (*restingas*) and more continental regions (Zorzini et al. 2006, Carvalho & Marini 2007, Amaral & Cabanne 2008), from the states of Santa Catarina in the south up to Paraíba in the northeast (Sick 1997, Ferguson-Less & Christie 2006, Roda & Pereira 2006, Srbek-Araújo et al. 2009, Sigrist 2013). The species' population has been declining (Bierregaard-Jr 1995) and its size is estimated at less than 10,000 individuals (ICMBio 2014). Thus, it is listed as a vulnerable species by the International Union for Conservation of Nature in its Red List of Endangered Species (IUCN 2020).

Considered a broad generalist with opportunistic feeding habits, White-necked Hawks prey on mollusks, small birds, amphibians, reptiles, and insects (Sick 1997, Garsk & Andrade 2004, Olmos et al. 2006, Srbek-Araújo et al. 2009, Sigrist 2013, Tanaka et al. 2019); however, they feed predominantly on invertebrates, particularly arthropods (Martuscelli 1996, Bierregaard et al. 2020). Nonetheless, there is insufficient information about its specific prey choices (Srbek-Araújo et al. 2009).

We observed a juvenile White-necked Hawk foraging on a sandy beach known as Vermelha do Centro in Ubatuba, state of São Paulo, Brazil (23°27'50"S, 45°02'59"W), on 22 and 23 March 2021, between 06:00 h and 11:00 h, for a total of around 10 h of monitoring. During this period, we recorded three episodes of Atlantic Ghost Crab (*Ocypode quadrata* Fabricius, 1787) predation (Figure 1). In two of them, the hawk captured the crabs inside their burrows by introducing the whole tarsus and catching them. On the third event, the hawk swooped down from its perch on an Indian almond tree (*Terminalia catappa* Linn) (Myrtales: Combretaceae) to catch a crab crawling on the sand. The perch was approximately 4 m high.

After capturing the crabs, the hawk stayed on the ground and first removed the chelipeds before the remaining appendages. It then opened the abdomen with its bill and devoured the inner organs while discarding the legs and carapace (Figure 2). This procedure was similar in all three predation episodes and took approximately five minutes each time. The hawk's nictitating membrane was visible during pereopod removal (Figure 3), probably a mechanism to protect the eyes from a possible accident with the crab's chelae and perforating dactyls (Pisa 2011).

White-necked Hawks depends on preserved environments (Mikich & Bérnils 2004), and thus foraging in an anthropized location, such as a beach with strong human presence, is unusual (Figure 4) and possibly related to the high population density of Atlantic Ghost Crabs in the area (Negreiros-Fransozo et al. 2002). In addition, feeding on crabs further illustrates the oppor-



**Figure 1.** White-necked Hawk (*Buteogallus lacernulatus*) capturing an Atlantic Ghost Crab (*Ocypode quadrata*) in Ubatuba, São Paulo, Brazil (photographs by Lucas Botelho).



**Figure 2.** Discarded Atlantic Ghost Crab (*Ocypode quadrata*) carapace and pereopods after White-necked Hawk (*Buteogallus lacernulatus*) predation in Ubatuba, São Paulo, Brazil (photographs by Lucas Botelho).

tunistic feeding behavior of the White-necked Hawk (Martuscelli 1996, Garsk & Andrade 2004) and it is also clear that this forest bird can use other types of habitats, although records in the literature are scarce. This first record of *B.*

*lacernulatus* preying on a crustacean contributes to the knowledge of the feeding habits of this elusive species.



**Figure 3.** The White-necked Hawk's (*Buteogallus lacernulatus*) nictitating membrane is visible during the removal of Atlantic Ghost Crab (*Ocypode quadrata*) pereopods in Ubatuba, São Paulo, Brazil (photographs by Lucas Botelho).



**Figure 4.** Juvenile White-necked Hawk (*Buteogallus lacernulatus*) foraging on the sand close to people at Vermelha do Centro beach in Ubatuba, São Paulo, Brazil (photographs by Lucas Botelho).

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