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NOTA

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Black Vulture (*Coragyps atratus*): bath and drink

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RESUMO: Urubu-de-cabeça-preta (*Coragyps atratus*): banhar e beber. Poucos estudos sobre aves enfocam comportamentos como o tomar banho ou água, essenciais para a maioria das aves. Apresento aqui os comportamentos de banhar e beber do urubu-de-cabeça-preta (*Coragyps atratus*). Essas aves ubíquas tomam banho principalmente em dias quentes, mas também se banham em dias frios. Usam poças rasas em riachos de águas límpidas, poças barrentas, ou tomam banho de chuva. Os banhos podem ser em grupo (com hierarquia presente), aos casais, ou solitários. Os urubus tomam desde água límpida de riachos, até a poluída por esgotos urbanos e a ligeiramente salina de estuários. A função do banho possivelmente está relacionada à termorregulação, além de manutenção da plumagem. O banho também pode servir para impedir acúmulo de ácido úrico que se forma durante a urohidrose, mecanismo mais comum de termorregulação em urubus. Tomar água poluída pode estar relacionado com a capacidade de essas aves neutralizarem toxinas de alimento em decomposição, ao passo que tomar água ligeiramente salina pode ser uma característica de populações que vivem à beira-mar.

PALAVRAS-CHAVE: Cathartidae, manutenção, asseio de plumagem, tomada de líquido.

KEY-WORDS: Cathartidae, maintenance behaviour, plumage care, liquid uptake.

Several papers describe uncommon or odd natural history features for a variety of Brazilian birds. Some recent examples include fruit dispersal by raptors, deer cleaning by trumpeters, bait-fishing by herons, and dog cleaning by vultures (*e.g.* Galetti and Guimarães 2004, Peres 1996, Sazima 2009, 2010). On the other hand, there is a general lack of papers describing common behaviours such as bathing or drinking, inasmuch as these seem to be regarded as too much trivial to merit a place in the literature. However, both of these behaviours are vital for the maintenance and living of birds (*e.g.* Burton 1985), and there still are facets of these two behaviours that remain unexploited.

I describe here the bathing and drinking behaviours of the Black Vulture (*Coragyps atratus*), comment on the circumstances they occur, and relate them to other vital behaviours such as feather maintenance and thermoregulation.

METHODS

Bathing and drinking vultures were recorded whenever spotted during field trips in the areas of Ubatuba (~22°26'S, 44°04'W) and Campinas (~22°54'S, 47°03'W) in South-eastern Brazil. The birds were observed with naked eye, through 10 × 50 binoculars and a 70-300 telephoto zoom lens mounted on a SLR camera, from a distance of about 3-50 m. "Ad libitum" and "behaviour" sampling rules (Martin and Bateson 1986), both of which are adequate for opportunistic records, were used throughout the observations. Additionally, I analysed a series of photographs and a short video-clip taken by a colleague in the area of Ilhabela (~23°49'S, 45°22'W), also in South-eastern Brazil. Voucher copies of digital photographs are on file at the Museu de Zoologia da Universidade Estadual de Campinas (ZUEC). Water salinity at tidal streams was measured with a hand refractometer.

RESULTS

I recorded Black Vultures bathing in places as diverse as shallow pools in clear water streams, muddy puddles in pastures, and urban ponds (Figures 1-3). Bathing takes place mostly on warm days (air temperature up to 36°C), but vultures bathe in cold and windy days as well (down to about 15°C). Habitually the bird enters the water up to its thighs or belly, lowers the carpal end of one wing and immerses it, then lowers the opposite wing and do the same while raising the now soaked wing, and lowers and pushes the head underwater. It then raises the head and the wing (Figure 1), and splashes itself with energetic sideways motions of the body while fluffing the feathers up. Occasionally it lowers one wing only and pushes the

head underwater, then lowers the other wing and raises both the head and the wing, splashing the water over its body. Its plumage, particularly on the breast and belly becomes thus soaked. While still in the water, the bird stands upright and beats the wings vigorously soaking the body further, as the wings touch the water surface at times. After the bath, the bird leaves the water usually moving and rearranging the wings and ruffles its now soaked plumage (Figure 2). Once out of the water, the bird often outspreads the wings, its back to the sun (Figure 3). Bathing is always followed by preening bouts.

Vultures bathe solitarily, in couples, or in groups. When bathing in groups, hierarchy among the group members is usually displayed, dominant individuals displacing the others from a given site in a pool or puddle. Black Vultures also bathe under drizzles (Figure 4), and even under rainstorms. While rain-bathing, the bird outspreads the wings and may remain stationary or walk slowly (Figure 4). Rain-bathing may be performed solitarily or in groups. In the latter instance there are hierarchy displays.

I recorded vultures drinking from crystal clear pools, rain puddles, lakes polluted with domestic sewage, and even from tidal streams with salinity up to 8‰. When salinity is higher, however, the vultures seek other water sources to drink (*e.g.* rain puddles). To drink, the bird may be at the water edge or standing in the water up to the thighs and occasionally up to the belly. It lowers the head and usually immerses the bill completely (Figure 5), while briefly opening and closing it. However, in shallow puddles, only part of the bill is immersed (Figure 6). To swallow, the bird raises the head and usually holds it horizontally (Figure 5). As it occurs while bathing, when drinking in groups there are hierarchy displays and the dominant individuals expel others from a drinking spot.

DISCUSSION

A prominent feature of bathing Black Vultures is the asynchronous lowering of wings into the water (Rea 1983, present paper), a behaviour that differs from bathing by several other birds, which move the wings more or less synchronously during the bath (*e.g.* Rea 1983, Carboneras 1992, Collar 2005). However, birds such as swans and spoonbills drop their wings asynchronously (*e.g.* Burton 1985, IS *pers. obs.*), whereas some gulls drop their wings both synchronously and asynchronously during bathing bouts (IS *pers. obs.*). Thus, the role of asynchronous versus synchronous or roughly synchronous movements of wings during bathing, if any, remains unclear.

One way vultures regulate body temperature is through urohydrosis (Snyder and Snyder 1991, Houston 1994, Sick 1997). These birds void their excretory wastes on the legs, a behaviour that cools these appendages as the water contained in the wastes evaporates (Houston 1994, Sick 1997). As the water also cools the blood circulating under the evaporative surfaces of the legs, the blood cooled this way circulates through the body and thus radiate excessive heat (Snyder and Snyder 1991, Houston 1994). A behaviour that would prevent a dangerous build-up of uric acid through urohydrosis is bathing (Snyder and Snyder 1991), which is a way to regulate body temperature as well.

Bathing in cold days and rain-bathing may have other function than regulation of body temperature, however. As the lives of vultures depend on the efficiency of their wings, feather maintenance is of utmost importance to these birds (Houston 1994). Thus, bathing in cold days and under rain washes the feathers and may help in their maintenance, inasmuch that after a rain-bath the birds carefully preen the feathers into shape (Houston 1994, IS *pers. obs.*). Sunning, including after a bath, plausibly maintain the flight feathers in optimal conditions (Houston 1994).

Agonistic interactions among vultures are a common sight whenever these birds congregate (Houston 1994, Buckley 1999), be it at roosts, food sources (even the weird ones, *see* Sazima 2010), or bathing and drinking places (present paper). Adults are dominant over juveniles, and aggression is directed mostly towards nonkin individuals (Buckley 1999).

Drinking in vultures is roughly similar to that found in several other birds, although vultures do not throw head back as most birds do (*e.g.* Burton 1985, de Juana *et al.* 2004), but hold it horizontally (Buckley 1999). The ability to drink water polluted with domestic sewage may be related to the carrion-eating habits of vultures. These birds likely have evolved mechanisms to cope with bacterial toxins found in carcasses and decayed food (Houston 1994, Sick 1997). As domestic sewage mostly does not contain poisons other than bacterial toxins and bacteria themselves, the black vulture benefits from its ability to detoxify bacterial poisons (Buckley 1994) while drinking water polluted with human domestic wastes. However, drinking saline water (even if slightly) may be a problem, as the bird must cope with the thus ingested salt. How vultures deal with the salt uptake remains unresolved, as they have no salt glands (their kidney may perhaps cope with small quantities of salt). As I recorded drinking slightly saline water only for vultures that dwell at or near the seashore, their populations possibly differ from those in the inland regarding water type uptake. Additionally, these seashore populations scavenge mostly on fishes and other marine organism either discarded by fishermen or washed ashore. Thus, seafood adds to the salt excretion issue.

As a final remark, I note that even trivial but vital behaviours such as bathing and drinking merit closer

FIGURES 1-6: Black Vultures (*Coragyps atratus*) bathing and drinking. (1) In a clear stream pool, a vulture splashes the water on its body with sideways motions. (2) Muddy puddles are used for baths as well, this vulture bathing in a cold, windy day. (3) In warm weather, a vulture spreads its wings, fluffs its body feathers up, and orients its back towards the sun after a bath. (4) Collective bath under a drizzle in a cloudy, warm day. (5) Three vultures drink from a tidal stream, the first aligned individual with its bill almost completely immersed and the third one at the final phase of swallowing. (6) A vulture drinks from a shallow, 2.5 cm deep rain puddle. Photographs by Paulo Dutra (1) and Ivan Sazima (2-6).

attention by the field and lab biologists, who may find them complex (*see* Reis *et al.* 2010) and appealing.

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