

Tap patiently, hit safely: a preying tactic of the White Woodpecker on social wasp nests

Ivan Sazima¹

¹ Museu de Zoologia - Universidade Estadual de Campinas, CP 6109, CEP 13083-970, Campinas, SP, Brazil. isazima@gmail.com

Received on 9 April 2014. Accepted on 26 June 2014.

ABSTRACT: The Neotropical woodpecker *Melanerpes candidus* is one of the few bird species known to attack wasp or bee colonies to feed on the brood and honey of these colonial stinging insects. I describe herein a foraging tactic that lessens the risk posed by the nest-defending Paulistinha wasps (*Polybia paulista*) and allows this woodpecker to feed on the brood with no or little disturbance by the wasps. The bird taps repeatedly on the branch that supports the paper wasp nest, about 2-3 m below the nest. During this process, the nest-defending wasps attack the woodpecker. When the attack is intense, the bird retreats from the nest vicinity only to return instants later. After a while, the woodpecker climbs slowly but steadily towards the nest while tapping continuously, the wasps retreating to the nest top and fleeing away. With the nest largely wasp-free, the bird perches on the nest and preys on the brood. This subtle foraging tactic of *M. candidus* and its driving the wasps away from their nest contrasts with the sudden, rash, and nest-damaging attacks described for other bird species that prey on wasp and bee broods, such as the Neotropical falcon *Ibycter americanus* and the Old World buzzards of the genus *Pernis*.

KEY-WORDS: *Melanerpes candidus*, specialized predation, social Hymenoptera.

Very few bird species attack bee and wasp colonies to feed on the brood and honey of these stinging, nest-defending insects. The most iconic plunderers of wasp and bee nests are the Honey Buzzards, species of the Old World accipitrid genus *Pernis* (Thiollay 1994). These birds boldly attack wasp or bee colonies, break a comb piece and fly away to feed on the brood (Figure 1a). Alternatively, they consume the brood on the spot or carry comb pieces to feed their nestlings (Thiollay 1994, Bhardwaj 2008).

A less known wasp nest marauder is the Red-throated Caracara (*Ibycter americanus*), a New World falcon (White *et al.* 1994). This raptor makes bold and quick nest-damaging attacks to drive the wasps away (McCann *et al.* 2013), and once the nest defenders are gone the bird feeds on the brood (Figure 1b). Conversely, this falcon breaks pieces of the nest and feeds on the brood and adults on the pieces fallen to the ground (Sick 1997).

Besides these two raptor genera, there is another pillager on wasp and bee nests: the White Woodpecker (*Melanerpes candidus*), a species confined to South America (Winkler & Christie 2002). This bird is long known as a wasp nest marauder feeding on the brood and honey (Kerr 1892, Chubb 1910, Hempel 1949, Sick 1997), but to the best of my knowledge its foraging tactics are mentioned en passant or are poorly described in the available records that mention attack on wasp nests (see references above).

Herein I provide a documented record of a foraging tactic of the White Woodpecker while preying on the paper nests of a small polistine wasp in Southeastern Brazil. I comment on this tactic and compare it briefly to the foraging tactics of the Red-throated Caracara and the Honey Buzzards, besides providing a few insights on this woodpecker pillager and its prey.

I observed the foraging behaviour of the White Woodpecker on paper wasp nests on three occasions at the Parque Ecológico Prof. Hermógenes de Freitas Leitão F^o (22°48'42"S, 47°04'21"W), Campinas, São Paulo, South-eastern Brazil. This park has a total area of 13.4 ha, of which about 75 % are occupied by a pond surrounded by trees, bushes and grass patches (see Corbo *et al.* 2013 for a sketchy map). The foraging birds were observed with the naked eye and recorded with a 70-300 telephoto zoom lens mounted on a SLR camera from a distance of about 10 m. Throughout the observational sessions I used the "ad libitum" and "sequence" samplings (Altmann 1965), both of which are adequate for opportunistic records. The description of the foraging tactic is based on the best-documented episode. Seven wasp individuals and small papery comb pieces containing a few cells are housed as vouchers at the hymenopteran collection of the Museu de Zoologia da Universidade Estadual de Campinas (access number ZUEC-HYM 134).



FIGURE 1. Two bird species renowned for raiding wasp or bee colonies. The Oriental Honey Buzzard (*Pernis ptilorhyncus*: Accipitridae) flies away from a beehive with a comb piece in its talons (a); the Red-throated Caracara (*Ibycter americanus*: Falconidae) uses its bill to dismantle a paper wasp nest fixed to a tree trunk (b). Photo credits: Chongyew Tan (a); Christian Pachaud (b).

The best-substantiated episode of the White Woodpecker (*Melanerpes candidus*) preying on a colony of the Paulistinha paper wasp (*Polybia paulista*) was recorded on 22 February 2014 at noon. When I arrived at the scene (1224 h), the foraging behaviour was already in course and, thus, I am unable to tell how long the whole episode lasted.

A small woodpecker group (three individuals) was calling and flying from one branch to another of an ant tree (*Triplaris americana*) about 12 m tall. Upon a close inspection, I observed a male that was repeatedly and almost continuously tapping at a section of a particular branch (Figure 2a). Looking higher at this branch, I noticed a wasp nest (Figure 2b) whose surface and the lower section of the supporting branch were covered with highly alert wasps, most of them moving actively with open wings and some flying nearby. The wasp colony was at about 8 m from the ground and the bird was tapping at a distance of about 2-3 m below the nest.

While the woodpecker was tapping on the branch that supported the nest, it was approached and attacked by the nest-defending wasps several times mostly on the head and face. The woodpecker snatched and ate some of

the attacking wasps, but when their number increased the bird scratched its head, retreated along the branch and finally fled away only to return instants later and resume its branch tapping. When it was about 1 m from the nest the bird began to climb slowly but steadily upwards while tapping continuously (Figure 2c), a behaviour that likely caused the wasps to retreat to the nest top or flee away deserting the nest (Figure 2c-d). Only when the nest surface was essentially wasp-free, the woodpecker approached the nest from behind and quickly perched on its surface (Figure 2e), opened the outer layer and began to feed on the wasp brood within the comb cells. The process from when I first noticed the tapping to the attack to the nest lasted 23 min (1224-1247 h). However, it probably lasted longer as its outset was not recorded. While perched on the nest the woodpecker pulled its head within the nest to reach the brood, and from time to time it tore out pieces of the outer envelope (Figure 2f), thus enlarging its feeding surface and reaching deeper into the nest. The bird worked on the wasp nest for 18 min (1247-1305 h) before it left. At 1304 h it was joined by another male, which attempted to balance itself on the nest together with the first bird. The second bird left at 1307 h, joining the small group perched on another tree about 5 m away. The three birds vocalised and climbed on the branches, but no one came back to the partially destroyed nest for the ensuing 15 min that I remained near the tree. The next day I inspected the further damaged nest, which indicates that the woodpeckers returned later to feed on the remaining brood.

I tested the reaction of the Paulistinha wasp towards a potential predator on an intact nest at the study area, tapping gently the branch about 2 m below the nest, an action that caused the wasps to cover the nest surface and fly nearby. After 10 min, I cautiously advanced about 30 cm towards the nest, still tapping gently, and was almost instantly attacked by a swarm of 20-30 wasps that aimed at, and successfully stung, my head and face. The wasps followed me as far as about 5 m away from their colony.

When attacking paper wasp colonies, the White Woodpecker employs a subtle tactic to reach, and feed on, the brood of the aggressively defended nest of polistine wasps. As far as I am aware, the attacks of this bird on paper wasps' and stingless bees' colonies remain poorly described, if at all. Most authors simply state that groups of this woodpecker attack and break into wasp or bee nests and do not elaborate further (Hempel 1949, Sick 1997, Patterer *et al.* 2003, Winkler & Christie 2002).

Although a small group of the White Woodpecker was actually recorded near the wasp colony, only one individual worked actively towards a situation to minimise the wasp attacks and consequent stings. The continuous, long-lasting and repeated tapping was plausibly the most important feature that caused the wasps to desert the nest. Thus, this woodpecker probably relies on this

prolonged tapping to exploit the nest-deserting behaviour that is characteristic of swarm-founding polistine wasps in presence of an external stress on the colony (Jeanne 1991). This mass desertion (termed absconding swarm) comprise all members of the colony (Hunt 2007) and is regarded as an adaptive response to great stress or nest destruction, such as that imposed by numerous or persistent predators (West-Eberhard 1982, McCann *et al.*, 2013). The White Woodpecker's tapping behaviour may certainly be regarded as persistent, and as soon as

the colony is deserted, the bird safely tears the nest and preys on the brood, as the attack risk from the few wasps remaining nearby is minimal.

The paper wasp *Polybia paulista* is regarded as a highly aggressive species by some authors (Henrique-Simões *et al.* 2011), and hardly aggressive by others (Souza *et al.* 2008). However, given the head scratching and fleeing responses by the tapping White Woodpecker and my own painful experience, I would classify this wasp species as highly aggressive. Alarm recruitment is recorded for the swarm-



FIGURE 2. A foraging tactic employed by the White Woodpecker (*Melanerpes candidus*) to prey on the paper nest of the Paulistinha wasp *Polybia paulista* (Vespidae). The woodpecker taps continuously near the base of the branch that supports the wasp colony (a); the bird approaches the colony from below (w), while the alert wasps spread over the nest surface and a section of the supporting branch (b), the woodpecker proceeds to tap and climb upwards while the wasps retreat to the nest top or flee away (c-d); with no active wasps on the colony, the bird climbs to the nest and begins to peck and feed on the wasp brood within the comb cells (e); tearing the outer envelope, the woodpecker enlarges the feeding surface (f).

founding paper wasp *Polybia occidentalis*, and probably occurs in other polistine species (Jeanne 1991). Alarm recruitment seems to occur in *P. paulista* as well, given the quick appearance of numerous individuals on the nest surface when their colony is disturbed even if slightly but persistently, as exemplified by the tapping woodpecker or myself (present paper). Thus, preying on the brood of this and other polistine colonies that are aggressively defended would require specialised tactics, and the persistent tapping by the White Woodpecker qualifies as such.

The brood and possibly honey of colonial stinging and stingless hymenopterans are important in the diet of the White Woodpecker (Kerr 1892, Hempel 1949, Sick 1997, Winkler & Christie 2002, Patterer *et al.* 2003) and this bird probably displays more than one tactic to obtain this food type. Besides the tap-and-attack tactic reported herein, group attacks in which several individuals take turns or made massive attacks on the nests plausibly occur as well, but these still wait to be substantiated. Additional, natural history-oriented observations on this common and widespread woodpecker may shed light on this issue.

The subtle foraging tactic of the White Woodpecker and its driving the wasps away by determinedly tapping on the nest-supporting branch contrasts with the rushing and nest-damaging attacks described for other bird species that prey on wasp and bee broods. For instance, the Red-throated Caracara (*Ibycter americanus*) of the Neotropics relies on “hit-and-run” attacks that damage the nest structure and cause the wasps to desert the nest (McCann *et al.* 2103). Similarly, the Old World buzzards of the genus *Pernis* also employ the hit-and-run tactic, tearing off a comb piece and fly away or consume the brood *in situ* (Thiollay 1994, present paper). Moreover, these raptors deliver comb pieces to feed their nestlings (Huang *et al.* 2004, Bhardwaj 2008).

The foraging behaviour of the White Woodpecker reported herein results from so-called anecdotic, natural history-oriented observations, often disregarded by theory-trained biologists. Nevertheless, this kind of observation draws attention to phenomena that latter may prove more widespread or commoner than previously thought (Maddock *et al.* 2011, Woehler *et al.* 2013, Jaafar & Dexiang 2014). Additionally, natural history-oriented studies may offer new insights (Costa-Pereira 2012, D’Angelo & Sazima 2014, Dinets *et al.* 2014), and bear the potential to address evolutionary and conservation issues (Gerlach 2006, Zuanon *et al.* 2006, Campos e Silva 2012).

ACKNOWLEDGEMENTS

I thank to the staff of the Parque Ecológico Prof. Hermógenes de Freitas Leitão Fº for allowing my field

studies at the park; Sidnei Mateus for friendly support and the confirmation of my preliminary identification of the wasps; my family for loving support in the field and at home; the CNPq for an earlier financial support.

REFERENCES

- Altmann, J. (1965).** Observational study of behavior: sampling methods. *Behaviour*, 49: 227-267.
- Bhardwaj, G.S. (2008).** Photo essay: a brief glimpse into the private world of the Oriental Honey-Buzzard *Pernis ptilorhynchus*. *Indian Birds*, 4: 154-156.
- Campos e Silva, J. V. (2012).** Roost of leaf-tossers (genus *Sclerurus*) in the Brazilian Amazon: hints of the low density in fragmented environments. *Revista Brasileira de Ornitologia*, 21: 129-132.
- Chubb, C. (1910).** X.-On the birds of Paragway. *Ibis*, 52: 263-285.
- Corbo M.; Macarrão A.; D’Angelo G. B.; Almeida C. H.; Silva W. R. & Sazima I. (2013).** *Aves do campus da Unicamp e arredores*. Vinhedo: Avisbrasiliis Editora.
- Costa-Pereira, R. (2012).** Small fishes follow large mammals suspending sediment. *Revista Chilena de Historia Natural*, 85: 361-364.
- D’Angelo, G. B. & Sazima, I. (2014).** Commensal association of piscivorous birds with foraging otters in South-eastern Brazil, and a comparison of such relationship of piscivorous birds with cormorants. *Journal of Natural History*, 48: 241-249.
- Gerlach, J.; Muir, C. & Richmond, M. D. (2006).** The first substantiated case of trans-oceanic tortoise dispersal. *Journal of Natural History*, 40: 2403-2408.
- Hempel, A. (1949).** Estudo da alimentação natural das aves silvestres do Brasil. *Arquivos do Instituto Biológico de São Paulo*, 19: 237-268.
- Henrique-Simões, M.; Cuozzo, M. D. & Friciro-Costa, F. A. (2011).** Social wasps of Unilavras/Boqueirão Biological Reserve, Ingaí, state of Minas Gerais, Brazil. *Check List*, 7: 656-667.
- Huang, K-Y.; Lin, Y-S. & Severinghaus, L. L. (2004).** Nest provisioning of the Oriental Honey Buzzard (*Pernis ptilorhynchus*) in Northern Taiwan. *Journal of Raptor Research*, 38: 367-371.
- Hunt, J. H. (2007).** *The evolution of social wasps*. Oxford: Oxford University Press.
- Jaafar, Z. & Dexiang, C. (2014).** Goby and shrimp associations: more than meets the eye. *Reef Sites*, doi: 10.1007/s00338-014-1143-4.
- Jeanne, R.L. (1991).** The swarm-founding Polistinae, p.191-231. In: Ross, K. G. & Mathews, R. W. (eds.). *The social biology of wasps*. Ithaca: Cornell University Press.
- Kerr, J. G. (1892).** On the avifauna of the lower Pilcomayo. *Ibis*, 1: 120-152.
- Maddock, S.; Tolhurst, B.; Brown, M.; Peck, M.; Pérez, E. V. & Morales, J. N. (2011).** Body bending behaviour: more widespread than previously thought? New reports from two snake species of Northwest Ecuador. *Herpetology Notes*, 4: 079-081.
- McCann, S.; Moeri, O.; Jones, T.; Scott, C.; Khaskin, G.; Gries, R.; O’Donnell, S. & Gries, G. (2013).** Strike fast, strike hard: the Red-Throated Caracara exploits absconding behaviour of social wasps during nest predation. *PLoS ONE*, 8: e84114. doi:10.1371/journal.pone.0084114.
- Patterer, A. N.; Beltzer, A. H. & Rossetti, M. A. (2003).** Dieta de *Melanerpes candidus* carpintero blanco (Aves: Picidae) en el valle de inundación del Río Paraná, Argentina. *Revista FAVE – Ciencias Veterinarias*, 2: 132-139.
- Sick, H. (1997).** *Ornitologia brasileira, uma introdução*. Rio de Janeiro: Editora Nova Fronteira.
- Souza, M. M.; Silva, M. J.; Silva, M. A. & Assis, N. R. G. (2008).** A

- capital dos marimbondos: vespas sociais Hymenoptera, Vespidae do município de Barroso, Minas Gerais. *MG.Biota*, 1: 24-38.
- Thiollay, J. M. (1994).** Family Accipitridae (hawks and eagles), p.216-277. In: J. del Hoyo, A. Elliot & J. Sargatal (eds.). Handbook of the birds of the world. Vol.2. New World vultures to guineafowl. Barcelona: Lynx Edicions.
- West-Eberhard, M. (1982).** The nature and evolution of swarming in tropical social wasps (Vespidae, Polistinae, Polybiini). *Social insects in the tropics*. Ciudad Universitaria: Smithsonian Tropical Research Institute.
- White, C. M.; Olsen, P. D. and Kiff, L. F. (1994).** Family Falconidae (falcons and caracaras), p.52-205. In: J. del Hoyo, A. Elliot & J. Sargatal (eds.). Handbook of the birds of the world. Vol.2. New World vultures to guineafowl. Barcelona: Lynx Edicions.
- Winkler, H. and Christie, D. A. (2002).** Family Picidae (woodpeckers), p.296-558. In: J. del Hoyo, A. Elliot & J. Sargatal (eds.). Handbook of the birds of the world. Vol.7. New Jacamars to woodpeckers. Barcelona: Lynx Edicions.
- Woehler, E. J.; Saviolli, J. Y.; Francini, C. L. B.; Neves, T. and Francini, R. B. (2013).** Insect prey of breeding South American Terns. *Marine Ornithology*, 41: 199-200.
- Zuanon, J., Bockmann, F. A. and Sazima, I. (2006).** A remarkable sand-dwelling fish assemblage from central Amazonia, with comments on the evolution of psammophily in South American freshwater fishes. *Neotropical Ichthyology*, 4: 107-118.

Associate Editor: Carlos Bianchi