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Anting behaviour with millipedes by the dendrocolaptid bird *Xiphocolaptes albicollis* in southeastern Brazil

Ivan Sazima^{1,2,3}

¹Museu de Zoologia, Universidade Estadual de Campinas – UNICAMP,
Rua Albert Einstein, s/n, CP 6109, CEP 13083-970, Campinas, SP, Brazil

²Corresponding author: Ivan Sazima, e-mail: isazima@gmail.com, www.unicamp.br

³Retired and associated as voluntary researcher

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Abstract: Several bird species practice anting. While anting a bird holds an ant or other arthropod that produces toxic or irritating secretions and rubs it on the plumage. Here I describe the White-collared Woodcreeper (*Xiphocolaptes albicollis*) rubbing its body with millipedes of the orders Spirostreptida and Polydesmida while foraging among banana stumps or at bromeliad clumps in southeastern Brazil. On three occasions I recorded the bird holding a millipede in the bill and rubbing it against its chest, belly, and wings. From time to time the millipede was “chewed”, and hammered against the substratum and then rubbed on the plumage again. After a while the millipede was ingested or dropped. Bromeliads harbour a rich fauna that includes mosquitoes, ticks, spiders, and snakes, and some of them may be potential hazards to birds that forage among the accumulated plant debris. The toxic secretions of millipedes may act as a deterrent against some of these hazardous animals, and the woodcreeper’s behaviour also reduces the noxiousness of a toxic prey before ingestion.

Keywords: Aves, Dendrocolaptidae, anting behaviour, foraging behaviour, millipedes, toxic secretion, “*Xiphocolaptes albicollis*”.

SAZIMA, I. Comportamento de formicar-se com milípedes pela ave dendrocolaptídea *Xiphocolaptes albicollis* no sudeste do Brasil. Biota Neotrop., 9(1): <http://www.biotaneotropica.org.br/v9n1/pt/abstract?short-communication+bn00609012009>

Resumo: Diversas espécies de aves praticam o formicar, comportamento no qual a ave segura uma formiga ou outro artrópode que produza secreção tóxica ou irritante e a esfrega na plumagem. Descrevo aqui o Arapaçu-de-garganta-branca (*Xiphocolaptes albicollis*) formicando-se com milípedes das ordens Spirostreptida e Polydesmida durante procura de alimento entre tocos de bananeiras ou em tufo de bromélias, no sudeste do Brasil. Em três ocasiões registrei a ave mantendo no bico um milípede e esfregando-o no peito, na barriga e nas asas. De vez em quando o milípede era mandibulado, golpeado contra o substrato e esfregado na plumagem novamente. Após certo tempo o milípede era ingerido ou descartado. Bromélias abrigam uma fauna rica que inclui mosquitos, carrapatos, aranhas e serpentes, alguns dos quais podem constituir risco para aves que ali forrageiam. A secreção tóxica dos milípedes pode agir como repelente contra alguns destes animais danosos. Adicionalmente, o comportamento do arapaçu reduz o grau de toxidez da presa antes da sua ingestão.

Palavras-chave: aves, Dendrocolaptidae, comportamento de formicar, comportamento alimentar, milípedes, secreção tóxica, “*Xiphocolaptes albicollis*”.

Introduction

Several bird species, mostly from passerine families, display anting behaviour worldwide (e.g. Groskin 1950, Simmons 1966, Potter 1970, Clunie 1974, 1976, Clark & Clark 1990, Sick 1997, Craig 1999). While anting a bird holds an ant and rubs it on the plumage. Besides ants, birds display anting with other arthropods that produce irritating or toxic substances, the most notable of them being millipedes (review in Parkes et al. 2003). Among Neotropical birds, anting is reported for several species of the Dendrocolaptidae (e.g. Groskin 1950, Willis 1972, Marantz et al. 2003, Parkes et al. 2003).

I am aware of only one record of a dendrocolaptid anting with a millipede, the Strong-billed Woodcreeper *Xiphocolaptes promeropirhynchus* (Lesson), in Central America (Parkes et al. 2003). I report here on anting with millipedes by the White-collared Woodcreeper *Xiphocolaptes albicollis* (Vieillot), while foraging among banana pseudostem stumps and bromeliad clumps in southeastern Brazil. As this woodcreeper customarily dismantles old leaves in bromeliads and pokes into holes in trunks, I note that the noxious secretions of millipedes may function as a deterrent against ectoparasites and other potentially hazardous animals that dwell in such places. Additionally, anting reduces the toxicity of noxious prey types.

Material and Methods

Records of foraging and anting behaviour were made at two forested sites in southeastern Brazil, the Parque Estadual da Serra do Mar near the Rio-Santos road (23° 20' 40" S and 44° 52' 20" W; ca. 70 m.a.s.l.), Ubatuba, São Paulo, and the Parque Nacional do Itatiaia near Maromba (22° 24' 55" S and 44° 36' 50" W; ca. 1.100 m.a.s.l.), Itatiaia, Rio de Janeiro. At both localities the woodcreepers were observed through binoculars and a 300 mm auto-focus telephoto lens at a distance of about 4 to 10 m. "Ad libitum" and "behaviour" sampling rules (Martin & Bateson 1986), which are adequate for opportunistic observations and/or records of rare behaviours, were used throughout. Digital photographs were taken as vouchers, besides being used for further analyses, description and illustration of the anting and foraging behaviours. Millipedes from the Ubatuba site were identified by comparison with other individuals caught in the same stumps from which the bird extracted the ones it used for anting.

Results

At the Ubatuba site, a White-collared Woodcreeper (*Xiphocolaptes albicollis*) was recorded foraging among banana pseudostem stumps on 21 February 2008 at about 12:30 PM. From a cranny in one such stump it extracted a millipede of the Spirostreptidae, *Gymnostreptus* sp. (Figure 1a), "chewed" it with the bill tip (Figure 1b) and hammered it against the stump for a while. Afterwards it began to rub the millipede on its chest, belly, and wings (Figure 1c). As the bird was partly concealed behind the stump, I was unable to see whether other body parts were rubbed as well. From time to time the millipede was hammered against the stump and then rubbed on the plumage again. After a while the millipede was chewed a little more and ingested. The whole episode, from catching to swallowing lasted about 2-3 minutes. The same individual caught another, smaller millipede (also a *Gymnostreptus* sp.) on an adjacent banana stump, chewed and hammered it against the stump, and rubbed it shortly on its chest and wings. Afterwards the bird dropped the millipede and flew out of sight.

At the Itatiaia site, an individual of the same woodcreeper species was recorded foraging in epiphytic bromeliad clumps on 25 April 2008 at about 10:00 AM. The bird grasped and pulled the dead leaves at the base of a bromeliad (Figure 2a) and pushed its bill in

the spaces created this way. In doing so the bird's body came in close contact with dead leaves and accumulated plant debris (Figure 2b). During such foraging the bird caught a flattened dark brown millipede about 2-3 cm long, possibly a species of the order Polydesmida. The bird chewed the millipede with the bill (Figure 2c), hammered it for



Figure 1. White-collared Woodcreeper (*Xiphocolaptes albicollis*) foraging among banana stumps and anting with a millipede of the Spirostreptidae (*Gymnostreptus* sp.): the bird holds the millipede in the bill tip (a); the millipede is chewed with the bill tip (b); the bird rubs the millipede on its breast and wings (c).

Figure 1. Arapaçu-de-garganta-branca (*Xiphocolaptes albicollis*) forrageando entre tocos de bananeira e formicando-se com um milípede Spirostreptidae (*Gymnostreptus* sp.): a ave segura um milípede no bico (a); o milípede é mandibulado na ponta do bico (b); a ave esfrega o milípede no peito e nas asas (c).

a while and rubbed it shortly on the chest and wings, after which the arthropod was swallowed. The whole episode, from catching to swallowing the millipede lasted about 1 minute.

Discussion

The function of anting remains controversial in the literature, irrespective of the behavioural variation among the bird species. The

explanations most often suggested for the function of anting may be conveniently grouped as follows: 1) removal of toxic or distasteful substances before ingestion of prey; 2) control of skin infections and/or ectoparasites; 3) reduction of skin irritation during moult and/or feather maintenance; 4) sensory stimulation (e.g. Willis 1972, Potter 1970, Judson & Bennett 1992, Wenny 1998, Lunt et al. 2004). Experimental evidence is available for removal of toxic substances (Judson & Bennett 1992) and fairly convincing evidence is presented for treatment against ectoparasites (Berggren 2005). Several authors concur with the view that anting likely has more than one function, and that these functions are not mutually exclusive (e.g. Potter 1970, Willis 1972, Lunt et al. 2004).

Compared to anting with ants, anting with millipedes is much less common, as only seven bird species are reported to use these latter arthropods for anting (review in Parkes et al. 2003), and the present record adds one species to this handful of millipede users. Millipedes are renowned for the production of toxic and noxious secretions such as benzoquinones, alkaloids, hydrogen cyanide, and benzaldehyde (e.g. Blum & Woodring 1962, Wheeler et al. 1964), most of them known as predator-deterrents (Eisner & Meinwald 1966).

Bromeliads harbour a rich fauna that includes insects, spiders, and snakes (Leme & Marigo 1993), and some of them may be potential hazards to birds that forage among the clumps, and a similar situation is found in banana stumps (IS pers. obs.). While foraging among bromeliads clumps and banana stumps the White-collared Woodcreeper comes in close contact with bunches of old leaves and plant debris in which ectoparasites (ticks and mosquitoes), as well as harmful invertebrates (tarantulas) and vertebrates (snakes) are often found (IS pers. obs.). Rubbing millipedes previously chewed and hammered – which cause them to liberate their secretions – on the chest and belly, as recorded here for the woodcreeper, may be considered as a behaviour to keep away some of these potentially harmful animals, irrespective of their sensory modes to orient themselves towards the bird. As in one of my records the woodcreeper used the chewed and hammered millipede for rubbing its plumage but did not eat the arthropod afterwards, this may imply that the rubbed substances have indeed repellent and/or deterrent functions.

On the other hand, the same chewing, hammering, and rubbing may be regarded as a way to lessen the effects of ingesting a toxic or distasteful prey (e.g. Willis 1972, Judson & Bennett 1992). Thus, use of millipedes by the White-collared Woodcreeper probably serves a dual function at least: repellent or deterrent against ectoparasites and other harmful animals, and treatment of a toxic prey before ingestion. Of course, additional functions cannot be ruled out but these two seem the most plausible and in agreement with my observations of this woodcreeper handling millipedes.

Curiously, among woodcreepers anting with millipedes is presently known for two species of the genus *Xiphocolaptes* only (Parkes et al. 2003, present paper). However, such behaviour may occur in other species of the genus and perhaps other large dendrocolaptid species as well, especially those that forage among bromeliad clumps, banana stumps, and bunches of old leaves with accumulated plant debris.

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References

BERGGREN, A. 2005. Comparing anting hypothesis predictions to observations of behavior in a North Island robin (*Petroica australis longipes*). *Notornis*, 52(2):112-114.



Figure 2. White-collared Woodcreeper (*Xiphocolaptes albicollis*) foraging among dead leaves of a bromeliad and eating a millipede: the bird inspects a dead leaf (a); the bird lunges at a prey (b); the bird chews a small millipede, possibly of the order Polydesmida (c).

Figura 2. Arapaçu-de-garganta-branca (*Xiphocolaptes albicollis*) forrageando entre as folhas mortas de uma bromélia e mandibulando um milípede: a ave inspeciona uma folha morta (a); a ave arremete contra uma presa (b); a ave mandibula um pequeno milípede, possivelmente da ordem Polydesmida (c).

- BLUM, M.S. & WOODRING, J.P. 1962. Secretion of benzaldehyde and hydrogen cyanide by the millipede *Pachydesmus crassicutis* (Wood). Science, 138(3539):512-513.
- CLARK, C.C. & CLARK, L. 1990. "Anting" behavior by common grackles and European starlings. Wilson Bull. 102(1):167-169.
- CLUNIE, F. 1974. A Fiji black-faced shrikebill anting with a millipede. Notornis, 21(1):80-81.
- CLUNIE, F. 1976. Jungle mynah "anting" with a millipede. Notornis, 23(1):77.
- CRAIG, A.J.F.K. 1999. Anting in Afrotropical birds: a review. Ostrich, 70(3-4):203-207.
- EISNER, T. & MEINWALD, J. 1966. Defensive secretions of arthropods. Science, 153(3742):1341-1350.
- GROSKIN, H. 1950. Additional observations and comments on "anting" by birds. Auk, 67(2):201-209.
- JUDSON, O.P. & BENNETT, T.D. 1992. 'Anting' as food preparation: formic acid is worse on an empty stomach. Behav. Ecol. Sociobiol. 31(6):437-439.
- LEME, E.M.C. & MARIGO, L.C. 1993. Bromélias na natureza. Marigo Comunicação Visual, Rio de Janeiro.
- LUNT, N., HULLEY, P.E. & CRAIG, A.J.F.K. 2004. Active anting in captive Cape white eyes *Zosterops pallidus*. Ibis, 146(2):360-362.
- MARTIN, P. & BATESON, P. 1986. Measuring behaviour, an introductory guide. Cambridge University Press, Cambridge.
- MARANTZ, C.A., ALEIXO, A., BEVIER, L.R. & PATTEN, M.A. 2003. Family Dendrocolaptidae (woodcreepers). In Handbook of the birds of the world. Volume 8. Broadbills to tapaculos (J. del Hoyo, A. Elliot & D.A. Christie, eds.). Lynx Edicions, Barcelona, p. 358-447.
- PARKES, K.C., WELDON, P.J. & HOFFMAN, R.L. 2003. Polydesmidan millipede used in self-anointing by a strong-billed woodcreeper (*Xiphocolaptes promeropirhyncus*) from Belize. Ornitol. Neotrop. 14:285-286.
- POTTER, E.F. 1970. Anting in wild birds, its frequency and probable purpose. Auk, 87(4):692-713.
- SICK, H. 1997. Ornitologia brasileira. Editora Nova Fronteira, Rio de Janeiro.
- SIMMONS, K.E.L. 1966. Anting and the problem of self-stimulation. J. Zool. 149(2):146-162.
- WENNY, D. 1998. Three-striped warbler (*Basileuterus tristriatus*) "anting" with a caterpillar. Wilson Bull. 110(1):128-131.
- WHEELER, J.W., MEINWALD, J., HURST, J.J. & EISNER, T. 1964. trans-2-dodecenal and 2-methyl-1, 4-quinone produced by a millipede. Science 144(3618):540-541.
- WILLIS, E.O. 1972. The behavior of plain-brown woodcreepers, *Dendrocincla fuliginosa*. Wilson Bull. 84(4):377-420.

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