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PREDAÇÃO OPORTUNISTA EM ENXAMES MIGRATÓRIOS DE *APIS MELLIFERA* LINNAEUS, 1758 (HYMENOPTERA, APIDAE) POR *PIAYA CAYANA* (LINNAEUS, 1766) (CUCULIFORMES, CUCULIDAE)

OPPORTUNISTIC PREDATION ON MIGRATORY SWARMS OF *APIS MELLIFERA* LINNAEUS, 1758 (HYMENOPTERA, APIDAE) BY *PIAYA CAYANA* (LINNAEUS, 1766) (CUCULIFORMES, CUCULIDAE)

DEPREDACIÓN OPORTUNISTA EN ENJAMBRES MIGRATORIOS DE *APIS MELLIFERA* LINNAEUS, 1758 (HYMENOPTERA, APIDAE) POR *PIAYA CAYANA* (LINNAEUS, 1766) (CUCULIFORMES, CUCULIDAE)

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Resumo
A predação constitui um dos principais processos ecológicos responsáveis pela regulação populacional e pela estruturação das comunidades biológicas. No Brasil, abelhas do gênero Apis representam um recurso alimentar explorado por diversos predadores oportunistas, incluindo vertebrados e invertebrados. O presente estudo relata o primeiro registro documentado de predação de *Apis mellifera* por *Piaya cayana* (Cuculidae), ave amplamente distribuída nas regiões neotropicais. A observação foi realizada em 23 de setembro de 2025, durante amostragem de avifauna em uma área rural do município de Itapagipe, Minas Gerais. Um indivíduo adulto de *P. cayana* foi observado capturando abelhas em voo, durante um evento de migração de *A. mellifera*. A predação ocorreu por aproximadamente 10 minutos, período em que foram consumidas dezenas de abelhas sem que houvesse comportamento agressivo significativo por parte do enxame. A alta densidade de presas associada à vulnerabilidade das colônias migratórias pode favorecer eventos oportunísticos desse tipo. *Piaya cayana* é conhecida por sua dieta predominantemente carnívora, composta por insetos e pequenos vertebrados, ajustando suas estratégias de forrageamento conforme a disponibilidade local de recursos. Assim, este registro amplia o conhecimento sobre a ecologia trófica da espécie e evidencia sua plasticidade alimentar, indicando capacidade de exploração de novos recursos em condições de abundância de presas.
Palavras-chave: Comportamento alimentar, Ecologia trófica, Forrageamento oportunista, Interação interespecífica

Abstract
Predation is one of the main ecological processes responsible for population regulation and the structuring of biological communities. In Brazil, bees of the genus Apis represent a food resource exploited by several opportunistic predators, including both vertebrates and invertebrates. The present study reports the first documented record of predation on *Apis mellifera* by Piaya cayana

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(Cuculidae), a bird species widely distributed throughout the Neotropical region. The observation took place on September 23, 2025, during an avifaunal survey conducted in a rural area of Itapagipe, Minas Gerais State, Brazil. An adult P. cayana was observed capturing bees in flight during a migratory event of *A. mellifera*. Predation lasted approximately 10 minutes, during which dozens of bees were consumed without any significant aggressive response from the swarm. The high prey density associated with the vulnerability of migratory colonies may favor opportunistic events of this nature. Piaya cayana is known for its predominantly carnivorous diet, consisting mainly of insects and small vertebrates, and adjusts its foraging strategies according to local resource availability. This record expands the current knowledge on the trophic ecology of the species and highlights its dietary plasticity, demonstrating its ability to exploit novel food resources under conditions of prey abundance.
Keywords: Feeding behavior, Interspecific interaction, Opportunistic foraging, Trophic ecology.

Resumen
La depredación constituye uno de los principales procesos ecológicos responsables de la regulación poblacional y de la estructuración de las comunidades biológicas. En Brasil, las abejas del género Apis representan un recurso alimenticio explotado por diversos depredadores oportunistas, incluidos vertebrados e invertebrados. El presente estudio reporta el primer registro documentado de depredación de *Apis mellifera* por Piaya cayana (Cuculidae), ave ampliamente distribuida en las regiones neotropicales. La observación se realizó el 23 de septiembre de 2025, durante un muestreo de avifauna en una zona rural del municipio de Itapagipe, Minas Gerais. Se observó a un individuo adulto de P. cayana capturando abejas en vuelo durante un evento de migración de *A. mellifera*. La depredación se prolongó por aproximadamente 10 minutos, periodo durante el cual fueron consumidas decenas de abejas sin que se registrara un comportamiento agresivo significativo por parte del enjambre. La alta densidad de presas asociada a la vulnerabilidad de las colonias migratorias puede favorecer eventos oportunistas de este tipo. Piaya cayana es conocida por su dieta predominantemente carnívora, compuesta por insectos y pequeños vertebrados, ajustando sus estrategias de forrajeo según la disponibilidad local de recursos. Así, este registro amplía el conocimiento sobre la ecología trófica de la especie y evidencia su plasticidad alimentaria, indicando su capacidad para explotar nuevos recursos en condiciones de abundancia de presas.
Palabras-clave: Comportamiento alimentario, Ecología trófica, Forrajeo oportunista, Interacción interespecífica.

1. Introduction

Predation constitutes one of the essential biotic processes that regulate population dynamics and influence the structural organization of ecological communities (ROMERO & KORICHEVA, 2011). In Brazil, bees represent an important food resource exploited by a variety of opportunistic predators, including vertebrates such as mammals and birds, as well as certain invertebrates (ROUBIK, 1989; BRECHBÜHL et al., 2010). Additionally, there are reports mainly from beekeepers indicating predation by organisms such as frogs and geckos; however, these interactions appear to occur at low frequency, representing occasional events (SEZERINO et al., 2020).

Apis mellifera is not native to the American continent. In Brazil, particularly in

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the southern region, European immigrants introduced several subspecies of this species, including *Apis mellifera mellifera*, *A. m. ligustica*, *A. m. carnica*, and *A. m. caucasica*. In 1956, Professor Warwick Estevam Kerr introduced African queens of *Apis mellifera* scutellata with the objective of developing a breeding program that combined the docility of European bees with the high productivity of African bees (WIESE, 2000). However, the program was never fully implemented, as the accidental release of some queens by a visiting beekeeper led to swarming and the dispersal of colonies in the region. This event marked the beginning of the Africanization process of *A. mellifera* populations in Brazil (WIESE, 2000).

The squirrel cuckoo, *Piaya cayana*, has a wide geographic distribution, ranging from central Mexico to northern Argentina (SKUTCH, 1966; PAYNE & KIRWAN, 2018), inhabiting highland forests, forest edges, and secondary woodland formations (ONIKI & WILLIS, 1999). The species exhibits a predominantly carnivorous diet, with a preference for invertebrates and small vertebrates (BENT, 1940; PAYNE, 2005). Some Old World species also incorporate plant material, such as shoots and fruits, into their diet, reflecting variable feeding patterns over time (PAYNE, 1997). Among New World species, plant consumption occurs occasionally or seasonally, resulting in a more diversified diet (ROSENBERG et al., 1990; HUGHES, 1997).

The present study aims to report the first documented record of a trophic interaction between *Apis mellifera* and *Piaya cayana*, contributing to the understanding of the feeding ecology and predatory behavior of this Neotropical cuculid species.

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2. Results and discussion

On September 23, 2025, at approximately 10:00 AM, during an avifaunal survey conducted in a rural area of Itapagipe, in the interior of Minas Gerais State, Brazil, a trophic interaction was observed between an adult individual of *Piaya cayana* and *Apis mellifera* bees (Figure 1) during a colony migration event. The bird was perched atop a tree, from which it captured bees in flight, exhibiting active hunting behavior.

The observation lasted approximately 10 minutes, during which the *P. cayana* individual was seen preying on dozens of bees, without eliciting any significant defensive or aggressive behavior from the swarm, which merely flew around in large numbers. The predator remained stationary between capture attempts, seizing insects individually with rapid and precise pecking movements.

Apis mellifera swarms display a social migratory behavior, characterized by the collective movement of entire colonies in search of areas with higher resource availability. The term “abandonment” refers to the spontaneous departure of a colony from a site due to adverse environmental conditions or predation pressure (FLETCHER, 1978). In addition to reproductive swarming, other types occur, such as migratory and abandonment swarms, which are more frequent among Africanized bees (HEPBURN & RADLOFF, 1998). During these movements, colonies become more vulnerable to predation, both by specialized predators and opportunistic species.

Neotropical species belonging to the family Cuculidae are predominantly strictly carnivorous, feeding on grasshoppers, true bugs, arachnids, frogs, small lizards, and snakes, as well as bird eggs, nestlings, and small mammals such as rodents (BELTZER, 1995; SICK, 1997). In ecological studies focused on trophic structure, these birds are often categorized as insectivorous, due to their high consumption of invertebrates (PIRATELLI & PEREIRA, 2002; TELINO-JUNIOR et al., 2005; VALADÃO et al., 2006).

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Prey selection by predators is influenced by multiple factors, including specific nutritional requirements, which vary according to the physiological state or life cycle of the individual, such as during growth, reproduction, or nutritional deficiency (COUTO et al., 2025). The composition of *A. mellifera* is estimated at 10–15% protein and approximately 5% lipids (MATSUURA & YAMANE, 1990; WINSTON, 1991), values relatively modest compared to those of certain insect larvae, which may contain up to 50% protein and 35% lipids, representing a higher-energy resource with lower risk of chemical or physical defense (COUTO et al., 2023; YANDI et al., 2023).

Furthermore, factors such as high local prey abundance and ease of capture can modify the feeding patterns of opportunistic predators, resulting in temporary trophic specializations directed toward abundant or easily accessible prey species.



Figure 1. *Piaya cayana* preying on a swarm of *Apis melífera.* Photo by Couto, R.M.P.

3. Conclusion

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Foraging behavior and habitat utilization exert a decisive influence on prey selection in *Piaya cayana*, a species recognized as an opportunistic forager, capable of adjusting its diet according to the local availability of invertebrates, thereby optimizing feeding opportunities. Although previous records report the consumption of Hymenoptera from the family Pergidae by *P. cayana* (REPENNING et al., 2009), the present study represents the first documented account of *Apis mellifera* predation by this species, providing a detailed description of its predatory behavior and the strategies employed during prey capture.

4. Acknowledgments

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5. Bibliographical references

BELTZER, A.H. 1995. Biologia alimentar do pirincho *Guira guira* (Aves: Cuculidae) no vale aluvial do médio rio Paraná, Argentina. **Revista Latino-Americana de Ecologia 2** (1/3): 13-18.

BENT, A.C. 1940. **Histórias de vida de cucos, chupas-cabras, beija-flores e seus aliados norte-americanos.** Washington, Smithsonian Institution, Museu Nacional dos EUA, Boletim 176, 506p.

BRECHBÜHL, R.; KROPF, C. & BACHER, S. 2010. Impact of flower-dwelling crab spiders on plant-pollinator mutualisms. **Basic and Applied Ecology**, 11: 76-82.

COUTO, R.M.P., DOS SANTOS, P.S., & SATURNO, G. 2025. Feeding behavior of *Guira guira* during parental care and trophic interaction with anurans. **Cuadernos de Educación y Desarrollo,** 17(6), e8524-e8524.

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COUTO, R.M.P., MIGUEL, M.C.; OLIVEIRA, E.S.; & RAQUEL SOARES JULIANO, R.S. (2023). Utilização de farinha de Mosca Soldado Negro (Hermetia illucens) na elaboração de ração peletizada. **XIV Semana da biologia** – SEMABIO, UFMS, Três Lagoas MS

FLETCHER, D. J. C. 1978. The African Bee. *Apis mellifera adansonii*, in Africa. Annals **Review Entomology** 23: 151-171.

HEPBURN, H.R.; RADLOF, S.E. 1998. Honeybees of Africa. Springer-Verlag Berlin **Heidelberg**, 366p.

HUGHES, J.M. 1997. Cuculiformes: Cuculidae. *Coccyzus minor* (Cuco-do-mangue), págs. 1-20. *Em* : A. POOLE & F. GILL (Orgs.). **The Birds of North America n.º 299.** Ithaca, Laboratório de Ornitologia Cornell, 20 págs.

MATSUURA, M; YAMANE, S. 1990. **Biology of the vespine wasps**.

ONIKI, Y. & WILLIS, E.O. 1999. Construção de ninhos e incubação inicial em cucos-esquilos (*Piaya cayana*). **Ararajuba** 7: 23–25.

PAYNE, R. & KIRWAN, G.M. 2018. Esquilo-cuco comum (*Piaya cayana*). *Em* del HOYO, J., ELLIOTT, A., SARGATAL, J., CHRISTIE, DA & DE JUANA, E. (eds.) *Manual dos pássaros do mundo Vivos*. **Lynx Edições**, Barcelona.

PAYNE, R.B. 1997. Família Cuculidae (cukoos), p. 508-607. *In* : J. DEL HOYO; Em A. ELLIOT & J. SARGATAL (Eds). **Manual das aves do mundo 4. Sandgrouse to Cuckoos.** Barcelona, Edições Lynx, 679p.

PAYNE, R.B. 2005. **Os cucos: Cuculidae.** Oxford, Oxford University Press, 618p.

PIRATELLI, A. & M.R. PEREIRA. 2002. Dieta de aves na região leste de Mato Grosso do Sul, Brasil. **Ararajuba 10** (2): 131-139.

REPENNING, M., BASSO, H.C.D.P., ROSSONI, J.R., KRÜGEL, M.M., & FONTANA, C.S. (2009). Análise comparativa da dieta de quatro espécies de cucos (Aves: Cuculidae), no sul do Brasil. **Zoologia** *(Curitiba)*, *26*, 443-453.

REMUNOM
ISSN 2178-6925

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Pages: 1-09

ROMERO, G.Q. & KORICHEVA, J. (2011). Contrasting cascade effects of carnivores on plant fitness: a meta-analysis. **Journal of Animal Ecology**, 80: 696-704.

ROSENBERG, D.K.; M.H.; WILSON & F. CRUZ. 1990. Distribuição e abundância do anis-de-bico-liso *Crotophaga ani* (L.) nas Ilhas Galápagos, Equador. **Biological Conservation 51** : 113-124.

ROUBIK D.W. (1989). Ecology and natural history of tropical bees. Cambridge Univ. Press, **Cambridge**, 514p.

SEZERINO, A.A.; SATTLER, A.; CELLA, I.; COAN, L.F.B.; SCASSO, R.E. & CUNHA, R. 2020. Manejos para o controle de doenças, pragas e predadores das abelhas *Apis mellifera* no sul do Brasil. **Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina**. Florianópolis, Santa Catarina.

SICK, H. 1997. **Ornitologia Brasileira.** Rio de Janeiro, Ed. Nova Fronteira, 912p.

SKUTCH, A.F. 1966. Anotações sobre a história de vida de três cucos-americanos tropicais. **Wilson Bull** . 78: 139–165.

TELINO-JÚNIOR, W.R.; M.M. DIAS; S.M. DE A. JÚNIOR; R.M. LYRA-NEVES & M.E.L. LARRAZÁBAL. 2005. Estrutura trófica da avifauna na Reserva Estadual de Gurjaú, Zona da Mata Sul, Pernambuco, Brasil. **Revista Brasileira de Zoologia 22** (4): 962-973.

VALADÃO, R.M.; A.G. FRANCHIN & O. MARÇAL JR. 2006. A avifauna no Parque Municipal Santa Luzia, zona urbana de Uberlândia, Minas Gerais. **Bioscience Journal 22** (2): 97-108.

WIESE, H. 2000. Apicultura novos tempos. **Guaíba: Agropecuária**. 424 p.

WINSTON, M.L. 1991. The biology of the honey bee. **Harvard university press**.

YANDI, I., ÖZTÜRK, R.Ç., KOCABAS, M., KURTOGLU, I.Z., & ALTINOK, I. 2023. Nutritional composition of black soldier fly (Hermetia illucens) reared on chicken waste meal, fruit & vegetable waste, and their mixture. **Journal of Insects as Food and Feed**, 9(5), 557-568.

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