





## Scientific Note

# First record of *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae) in the state of Pernambuco, Brazil, associated with hen poultry systems

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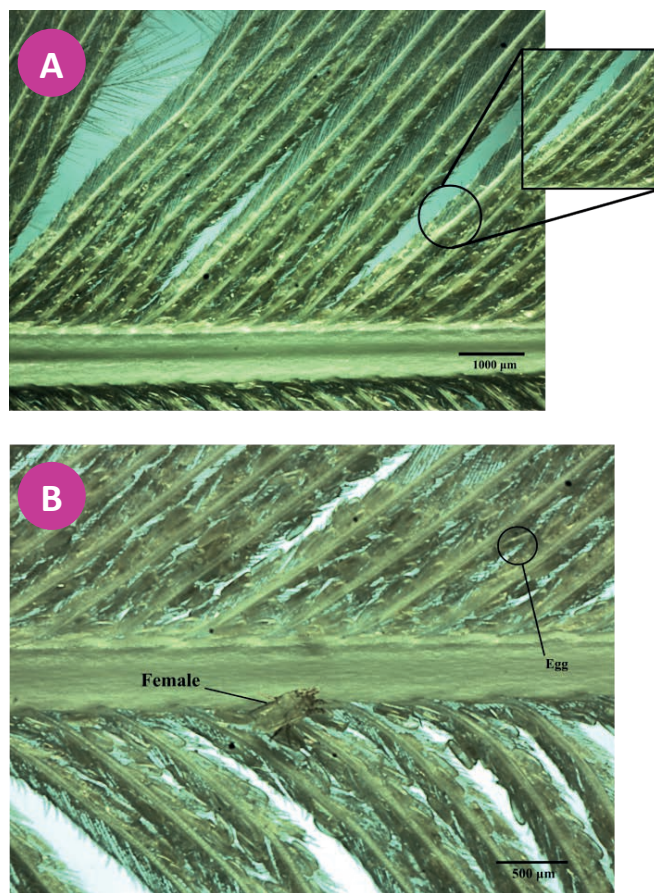
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**Abstract.** Mites of the genus *Megninia* Berlese, 1883 (Sarcoptiformes: Analgidae) are known ectoparasites of birds in intensive production systems, however, their distribution in Brazil remains poorly documented. This study reports the first record of the feather mite *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae) in the state of Pernambuco, Brazil. Samples were collected from two farms with different rearing systems: Vertical Automatic, Californian and Cage Free. Monthly surveys were conducted between January and November 2024, totaling 11 collections. *M. ginglymura* appears to be prevalent among poultry farms in Brazil; however, limited efforts have been made to mitigate its impacts, primarily due to a lack of targeted research. Baseline studies such as this are essential for guiding future research aimed at characterizing populations in poultry systems and reducing the impacts caused by *Megninia* mites.

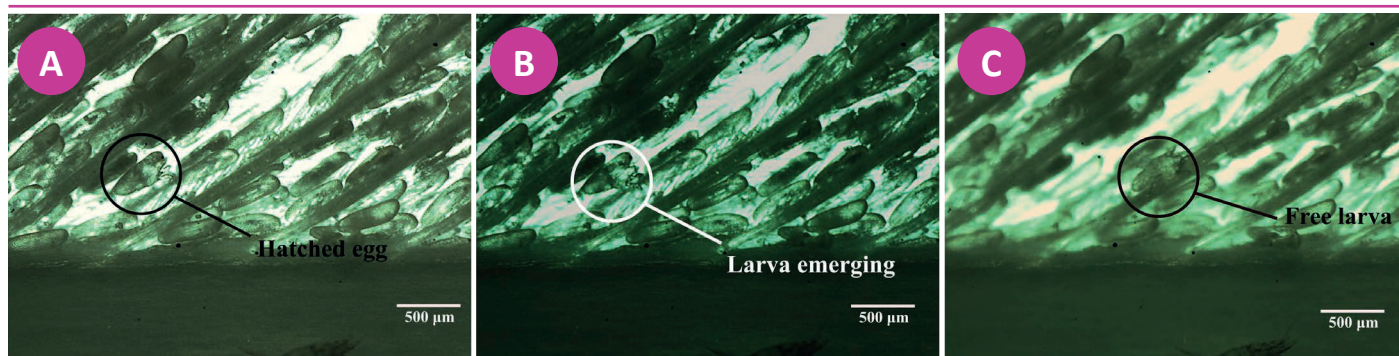
**Keywords:** Feather mites, Ectoparasite, Mites distribution.

Species of the genus *Megninia* Berlese, 1883 (Sarcoptiformes: Analgidae) are recognized ectoparasites of birds, particularly in laying hens reared under intensive production systems. The conventional system is the most widely used in Brazil, characterized by the use of cages primarily of two types: pyramidal cages, known as the Californian model, which account for approximately 64% of facilities, and the vertical cages, which represent around 36% (Groot & Vizú 2021). In these systems, the space available per bird is limited (ranging from 350 cm<sup>2</sup> to 450 cm<sup>2</sup>) and management practices such as beak trimming (partial beak removal), forced moulting (induced by severe restriction of feed and water) and high-density confinement are commonly employed. In contrast, cage-free system allow hens to roam freely within indoor sheds, though they still lack access to outdoor areas. These systems provide greater opportunities for birds to express their natural behaviors, such as nesting and perching, through the use of enrichment structures installed within the sheds (Vits et al. 2005).

The confined conditions in intensive systems, coupled with limited options for effective control of ectoparasites, especially in the context of acaricide resistance, create favorable environments for mites like *Megninia* to thrive. Infestations are often associated with decreased egg production, largely due to elevated stress levels and increased susceptibility to various pathologies common in confined poultry populations (Horn et al. 2018). Although the life cycle of *Megninia* species remains poorly documented (Horn et al. 2018), mites of the Analgidae family typically undergo four developmental stages: larva, protonymph, tritonymph and adult (Flechtman 1973; Hernandez 2021). Females may be oviparous or ovoviviparous, attaching their eggs to the barbs of feathers. *Megninia* species feed and develop directly on the feathers of their avian hosts (Fig. 1A-B; 2A-C). According to Tucci et al. (2005) the mite's saliva can trigger allergic reactions causing symptoms such as itching. *Megninia* feeding allows secondary bacterial infection to develop, resulting in a pyoderma, this condition can reduce egg production by 20%, impacting the poultry industry (Horn et al. 2018).



**Figure 1.** Feathers of Poultry hens infested with *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae). A. Eggs of *M. ginglymura* B. Females of *M. ginglymura* (setae).



**Figure 2.** Emergence of *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae) larvae from an egg-infested feather attached to the barbs of a hen's feather. A. hatching egg B. emerging larva C. free-living larva.

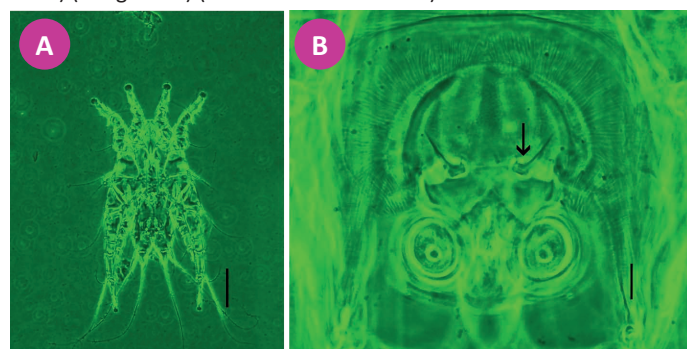
In Brazil, the first record of *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae) was reported in 1939 in the state of São Paulo, where these mites were found parasitizing *Gallus gallus* (L., 1758) (Phasianidae) (Reis 1939). Subsequent records have documented the presence of this species in four additional states: Ceará (Amaral et al. 1975), Paraíba (Mendonça et al. 1984), Rio de Janeiro (Duarte et al. 1987) and Rio Grande do Sul (Silva et al. 2013). In addition to *M. ginglymura*, another species of the genus, *Megninia cubitalis* (Méglin, 1877) (Sarcoptiformes: Analgidae), has also been reported in several states: Paraíba (Mendonça et al. 1984), Rio de Janeiro (Duarte et al. 1987), Bahia (Bastos & Coelho 1963), Rio Grande do Sul (Kessler & Marques 1973), São Paulo (Amaral et al. 1974) and Minas Gerais (Rezende et al. 2015).

With the aim of contributing to the knowledge of the distribution of the *Megninia* species in Brazil, monthly collections were conducted between January and November of 2024 on two farms in Pernambuco state. The first farm, located in the municipality of Paudalho (7°53'49"S, 35°10'48"O), with Automatic Vertical and Californian rearing systems, with the Bovans and Lohmann LS breeds; the second farm, situated in the municipality of São Bento do Una (8°31'22"S, 36°26'38"O), utilized Californian and Cage-Free rearing systems, with the Lohmann Brown and Brown Nick H&N°. During each sampling event, ten chickens were selected (Horn et al. 2018). In the Californian system, birds were randomly selected from cages spaced one meter apart, while in the Cage-Free system, hens were sampled randomly from a semi-open space. From each hen, two feathers were collected from five different body regions: ventral, dorsal, wing, neck and cloacal area, totaling ten feather per bird. Feathers were placed in plastic containers with 20 ml of 70% ethanol and transported to the laboratory. The feathers were then examined under a stereoscopic microscope for mite collection, the mites were mounted using Hoyer's medium on microscope slides (Flechtman 1985) and the subsequently identified under a phase-contrast optical microscope (Olympus BX41). All the studied material was deposited at the Laboratory of Acarology of the Federal University of Pernambuco, Recife, Brazil.

*Megninia ginglymura* was the only species collected of this genus recovered during the survey. A total of 3,474 adult specimens were mounted and identified from the collected feathers, including 1,627 males and 1,847 females. Although other developmental stages such as larvae and nymphs were observed, they were not mounted or considered for species identification purposes. The species identification was performed based on the morphological traits described by Gaud et al. (1985). In males, diagnostic features included anal setae bifid at base, merged by a thin membrane, adanal apodemes extending beyond the anus, opisthosomal lobes long, with a conspicuous pseudo-articulation at base (Fig. 3A-B). Female specimens (Fig. 4A) exhibited a prominent anal protuberance at the posterior edge of the opisthosoma, minute pores of the opisthosomal gland and posterior opening of the terminal spermiduct, epigynum angular, in the shape of a circumflex accent (^), positioned anteriorly between the central ends of epimeres II (Fig. 4B), setae C<sub>2</sub> (Coxa IV) much shorter than setae C<sub>3</sub> (subgenitals) (Fig. 4C).

We provide the first record of *M. ginglymura* associated with the poultry systems in the state of Pernambuco (Fig. 5). This record includes

three rearing systems in which the incidence of this ectoparasitic mite may vary, but the species was present in all the collection sites. Notably, previous records for Pernambuco indicated that *M. cubitalis* was found in association with the Atlantic Canary, *Serinus canaria* (L., 1758) (Fringillidae) (Nascimento et al. 1982).



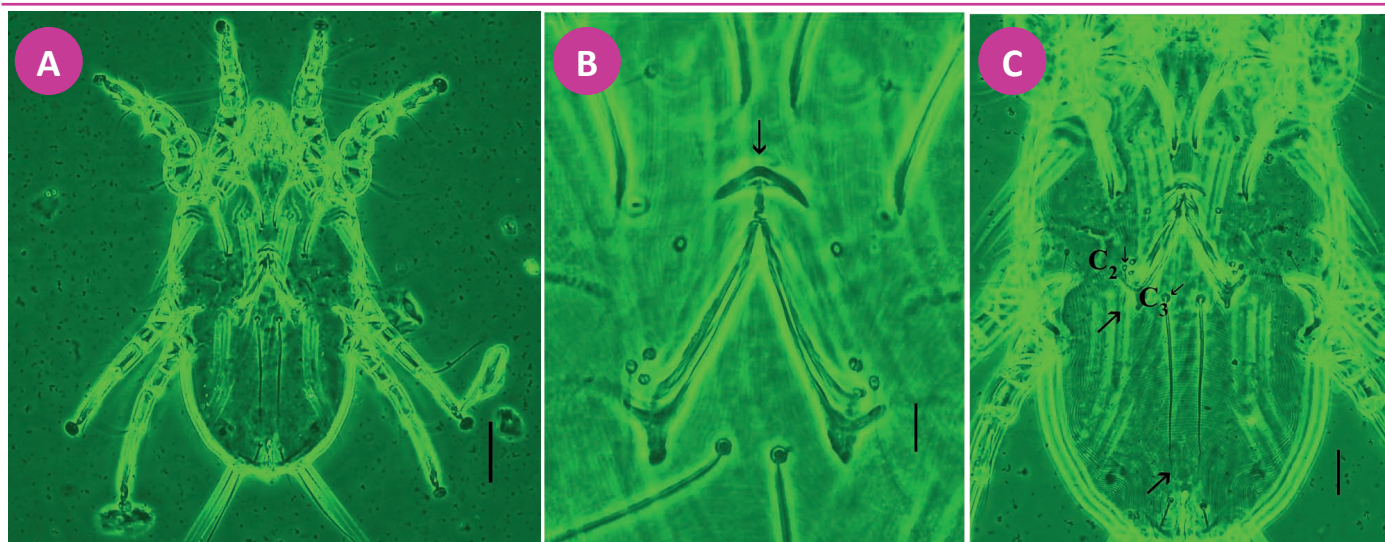
**Figure 3.** Male of *Megninia ginglymura* (Méglin, 1877) (Sarcoptiformes: Analgidae). A. ventral view B. anal region, the setae shows the bifid anal seta. Scale bar 10 µm.

Recent studies on *Megninia* species associated with poultry systems have primarily focused on their impacts, epidemiology and control practices of this parasite (Rezende et al. 2013; 2015; Horn et al. 2018). *Megninia ginglymura* seems to be the most frequently reported. However, other ectoparasites such as *M. cubitalis*, the red poultry mite, *Dermanyssus gallinae* (De Geer, 1778) (Dermanyssidae) and the northern fowl mite, *Ornithonyssus sylviarum* (Canestrini & Fanzago, 1928) (Macronyssidae), are also commonly encountered. Notably, *D. gallinae* and *O. sylviarum* are considered among the most economically damaging mites in poultry industry, due to their high reproductive rates, reported and the ones responsible for the most significant economic losses among poultry industries hematophagous feeding behavior, and resistance to control measure (Sparagano & Giangaspero 2011; Teixeira et al. 2020).

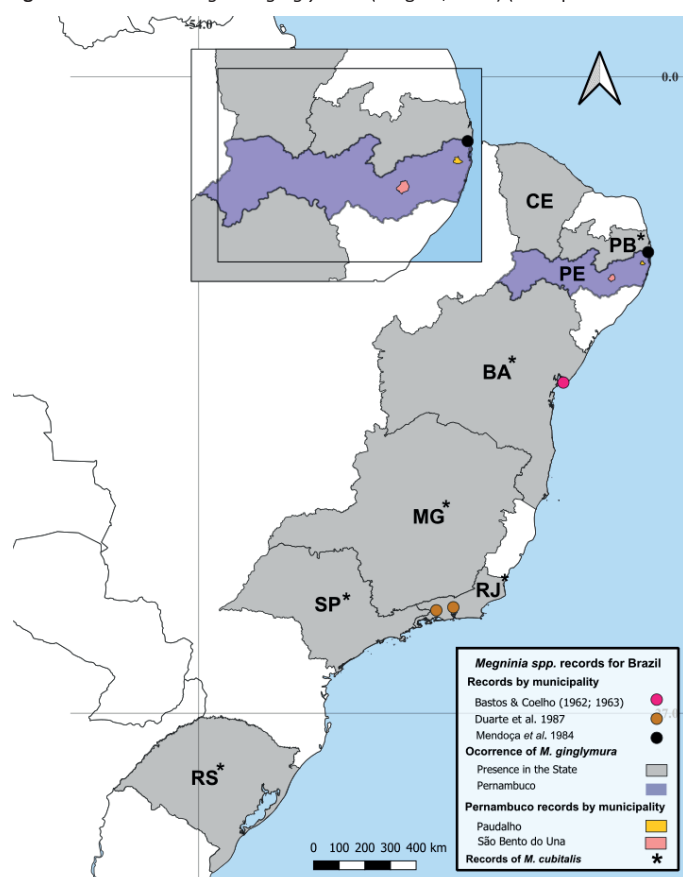
During the identification process, a high degree of variation was observed in some structures commonly used for the identification of *M. ginglymura*. These structures are primarily based on Gaud et al. (1985). The most significant variation was detected in the female epigynum, which exhibited a subtriangular to convex shape. Setae C<sub>1</sub> and C<sub>2</sub> remained consistent in most specimens; however C<sub>2</sub> occasionally displayed positional variation, appearing closer to Coxae IV in some females. One of the key diagnostic traits described by Gaud et al., the shape of the ovipore valves, which are not emarginated in *M. ginglymura*, was stable across all specimens examined. Male diagnostic features appeared more consistent, particularly the anal bifid setae joined by a membrane is visible in most specimens. Morphological variation between males and females has been observed within the Analgidae family, primarily manifesting as continuous polymorphism, often influenced by size variation (Krantz & Walter 2009).

This study confirms the occurrence of *M. ginglymura* at the laying hen systems in the State of Pernambuco. Based on this taxonomic identification, future research could assess the impacts of this ectoparasite on its hosts and its economic implications.





**Figure 4.** Female of *Megninia ginglymura* (Mégnin, 1877) (Sarcoptiformes: Analgidae). A. ventral view B. epigynum C. setae c2 e c3 scale bar 10 µm.



**Figure 5.** Distribution map of *M. ginglymura* and *M. cubitalis* including the first records for the State of Pernambuco, Brazil.

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## Authors' Contributions

MBGD: Investigation, Validation, Writing - review & editing; IVCG: Investigation, Validation, Writing - review & editing; LRAS: Investigation, Validation, Writing - review & editing; JSDC: Investigation, Validation, Writing - review & editing. AAPN: Investigation, Validation, Writing - review & editing; NJF: Investigation, Methodology, Validation, Writing - review & editing. JWSM: Investigation, Validation, Writing - review & editing.

## Conflict of Interest Statement

The authors declare no conflict of interest.

## References

- Amaral, V.; Santos, S. M.; Rebouças, M. M.; Chiarelli, V. (1974) Nota sobre a ocorrência de *Megninia cubitalis* (Mégnin, 1877) (Acarina Analgidae) em *Galius galius domesticus* (L.) no Estado de São Paulo, Brasil. *O Biológico*, 40: 296-300.
- Amaral, V.; Santos, S. M.; Furtado, M. S. F.; Rebouças, M. M. (1975) Ocorrência das espécies *Megninia cubitalis* (Mégnin, 1877) e *M. ginglymura* (Mégnin, 1877) (Acarina Analgidae) em *Galius gallus domesticus* (L.) no Estado do Ceará, Brasil. *O Biológico*, 41: 238-9.
- Bastos, W. D.; Coelho, M. P. (1963) Primeira constatação no Brasil de *Megninia cubitalis* parasitando *Gailus domesticus* de Salvador, Bahia. *Boletim do Instituto Biológico da Bahia*, 6: 26-31.
- Duarte, M. J. F. Araujo, L. G.; Silva, R. de C. F.; Bonaccorsi, R. A.; Waizbort, R. F. (1987) Ocorrência de *Megninia ginglymura* em *Gallus gallus* no Estado do Rio de Janeiro. *Pesquisa Agropecuária Brasileira*, 22(8): 855-858.
- Flechtmann, C. H. W. (1973) *Ácaros de importância médico-veterinária*. São Paulo: Nobel.
- Flechtmann, C. H. W. (1985) *Ácaros de importância médico veterinária*. 3.ed. São Paulo: Nobel.
- Gaud, P. S.; Atyeo, W. T.; Barré, N. (1985) Les Acariens du genre *Megninia* (Analgidae) parasites de *Gallus gallus*. *Acarologia*, 26(2): 171-182.
- Groot, E.; Vizú, J. B. Z. (2021) Preferência dos consumidores por sistemas de produção de ovos com diferentes condições de bem-estar animal. *Revista de Economia e Agronegócio*, 19 (1): 1-24. doi: [10.25070/rea.v19i1.11450](https://doi.org/10.25070/rea.v19i1.11450)
- Hernandes, A. (2021) Família Analgidae Trouessart & Mégnin, 1884. In: Barros-Battesti, D. M.; Machado, R. Z.; André, M. R. (Eds.), *Ectoparasitofauna Brasileira de Importância Veterinária. Volume 1. Acarofauna de Importância Veterinária: Acariformes*. 1 ed. Jaboticabal.
- Horn, T.B.; Granich, J.; Körbes, J. H.; Silva, G. L.; Ferla, N. J. (2018) Mite fauna (Acari) associated with the poultry industry in different laying hen management systems in Southern Brazil: a species key.

- Acarologia*, 58(1): 140-158. doi: [10.24349/acarologia/20184233](https://doi.org/10.24349/acarologia/20184233)
- Kessler, R. H.; Marques, N. M. (1973) Ocorrência de *Megninia cubitalis* (Megnin, 1877) parasitando *Gallus gallus* (L) no Rio Grande do Sul, Brasil. *Arquivos da Faculdade de Veterinária UFRGS*, 1: 25-9.
- Krantz, G. W.; Walter, D. E. (2009) A Manual of Acarology. 3ed Edition. Texas Tech University Press, Lubbock.
- Mendonça, I. L.; Pereira, I. H. O.; Saukas T. N. (1984) Ácaros plumícolas em *Gallus gallus domesticus* no Estado da Paraíba. *Caderno Ômega da Universidade Federal Rural de Pernambuco Série Veterinária*, 1(1): 45-51.
- Nascimento, S. J.; Nascimento, A. M. L. C.; Silva, C. A.; Travasso, T. E. (1982) Ocorrência do *Megninia cubitalis* em canário do império (*Serinus canarius*). *Veterinária Pernambucana da Sociedade Pernambucana de Medicina Veterinária*, 2 (2): 6.
- Reis, J. (1939) Alguns parasitas de *Gallus gallus* verificados em São Paulo. *Arquivos do Instituto Biológico*, 10: 147-57.
- Rezende, L. C.; Cunha, L. M.; Martins, N. R. S.; Teixeira, C. M.; Oliveira, P. R. (2015) Epidemiology of *Megninia* sp. in laying flocks from the States of Minas Gerais, Brazil. *Brazilian Journal of Veterinary Parasitology*, 24 (2): 198-203. doi: [10.1590/S1984-29612015027](https://doi.org/10.1590/S1984-29612015027)
- Rezende, L. C.; Cunha, L. M.; Teixeira, C. M.; Oliveira, P. R.; Martins, N. R. S. (2013) Mites affecting hen egg production – some considerations for Brazilian farms. *Ciência Rural*, 43(7): 1230-1237. doi: [10.1590/S0103-84782013005000088](https://doi.org/10.1590/S0103-84782013005000088)
- Sparagano, O. A. E.; Giangaspero, A. (2011) Parasitism in egg production systems: the role of the red mite (*Dermanyssus gallinae*). In: Nys, Y.; Bain, M.; Van Immerseel, F. (Eds.), *Improving the Safety and Quality of Eggs and Egg Products*, pp. 394-414. Sawston, Cambridge, Woodhead Publishing. doi: [10.1533/9780857093912.3.394](https://doi.org/10.1533/9780857093912.3.394)
- Silva, G. L.; Ferla, N. J.; Toldi, M.; Faleiro, D. C. C. (2013) Mite fauna (Acari) associated to commercial laying hens and bird nests in Vale do Taquari, Rio Grande do Sul, Brazil. *Biotemas*, 26(4): 253-262. doi: [10.5007/2175-7925.2013v26n4p253](https://doi.org/10.5007/2175-7925.2013v26n4p253)
- Teixeira, C. M.; Oliveira, T. M. D.; Soriano-Araújo, A.; Rezende, L. D. C.; Oliveira, P. R. D.; Cunha, L. M.; Martins, N. R. D. S. (2020) *Ornithonyssus sylviarum* (Acari: Macronyssidae) parasitism among poultry farm workers in Minas Gerais state, Brazil. *Ciência Rural*, 50: e20190358. doi: [10.1590/0103-8478cr20190358](https://doi.org/10.1590/0103-8478cr20190358)
- Tucci, E. C.; Guastali, E. A. L.; Rebouças, M. M.; Mendes, M. C.; Gama N. M. S. Q. (2005) Infestação por *Megninia* spp. em criação industrial de aves produtoras de ovos para consumo. *Arquivos do Instituto Biológico*, 72(1): 121-124. doi: [10.1590/1808-1657v72p1212005](https://doi.org/10.1590/1808-1657v72p1212005)
- Vits, A.; Wetzenbürger, D.; Hamann, H.; Distl, O. (2005) Production, egg quality, bone strength, claw length, and keel bone deformities of laying hens housed in furnished cages with different group sizes. *Poultry Science*, 84(10): 1551-1519. doi: [10.1093/ps/84.10.1511](https://doi.org/10.1093/ps/84.10.1511)