

Bathroom fly - Family Psychodidae (Insecta: Diptera).

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The Psychodidae family belongs:

Series Schizophora: All flies with a ptilinal suture in head; larvae with no external head structure, mouth hooks visible through cuticle, one pair of prothoracic spiracles and one pair of posterior spiracles, each with either three slits or a mass of small pores; larvae with fore-end pointed and hind end truncate are called maggots; larvae with both ends blunt and fleshy, with bulges and tracts of spines, are called grubs.

Section Acalyptrate: Thoracic squamae calypters that join the base of the wing to the thorax are small or evanescent; small soft-bodied flies; major families well established; placement of genera uncertain; families can be grouped according to food preferences of larvae.

The infraorder Nematocera Psychodomorpha includes two common families, Psychodidae and Scatopsidae, and other very small and rare families. In some classifications, the group is paraphyletic (Figure 1) [1-3].

As with other insects, the best-known groups are those with greater involvement in the economy or human health. Phlebotominae is the best-known subfamily within Psychodidae, precisely because it contains several vector species of pathogenic protozoa such as Leishmania. The other subfamilies cause very little or no known impact on human lives, except some species of Psychodinae considered household pests, known as bathroom flies [4-6].

The Psychodidae family has a cosmopolitan distribution with members that occur in diverse habitats, mainly in humid environments, being more diverse in the tropics. Habitats, from stagnant water, and humid environments to semi-desert places. Adults are found in shady places and close to humid places [7-9].

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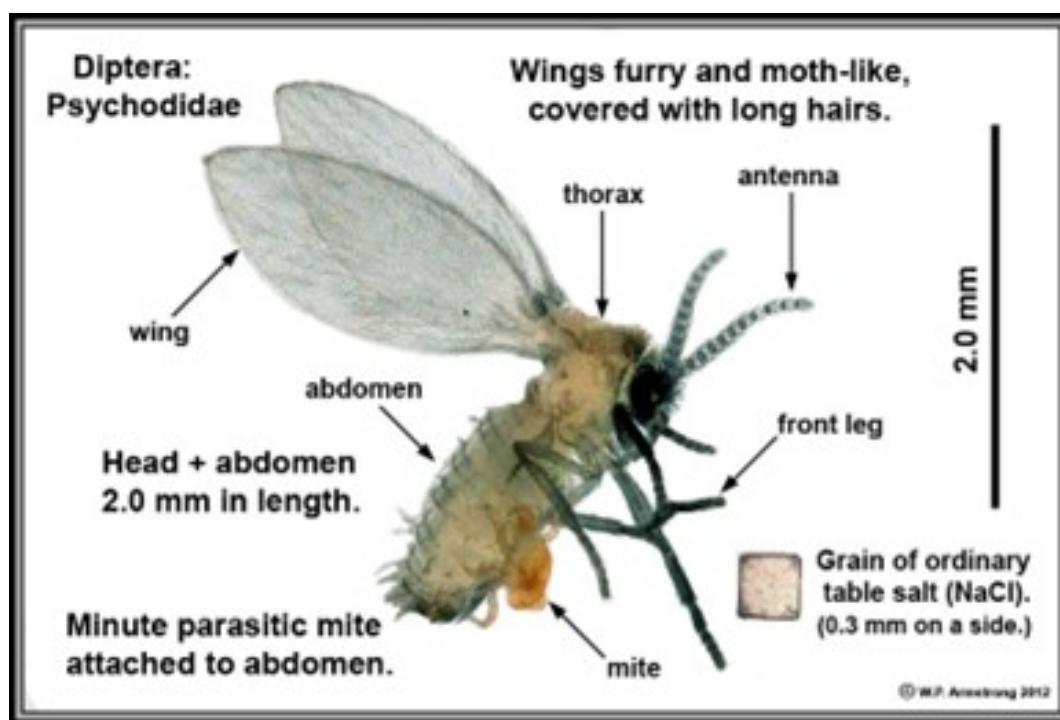


Figure 1 Drain or bathroom fly (Williston, 1893): A tiny fly in your shower. Source: <https://www.waynesword.net/redmite6.htm>.

The larvae feed on decomposing organic matter, occupying terrestrial environments subfamily Phlebotominae, humid and aquatic environments, such as bromeliads, waterfalls *Maruina* Müller, 1895, and stream banks. Because they are generally abundant, they play an important role in the decomposition of organic matter and the release of nutrients into the environment. The main species are of the genus *Psychoda* Latreille 1796, the most common being: *Psychoda alternata* Say, 1824, *Psychoda cinerea* Banks, 1894, *Psychoda satchelli* Quate, 1955, in addition to the species *Telmatoscopus albipunctatus* (Williston, 1893). The adults, very small about 2 mm, have a robust body with many bristles, wings covered with dense hair, appear like a small moth, and color varying between light brown and gray. These insects are nocturnal: females lay groups of 10 to 200 eggs, hatching within 32 to 48 hours. Eggs, larvae, and pupae are found in humid places, together with organic films formed by residues from the natural peeling of skin, hair, dander, and fungi present in bathrooms and kitchens, in drains, sewage pipes, toilet joints, and bathroom stalls, cracks in tiles and walls [7-13].

The larval cycle is approximately 9 to 15 days, and the pupa cycle is approximately 20 to 40 hours. The process from egg to adult insect takes approximately two weeks, depending on environmental conditions and food availability. Adults make irregular flights with reduced autonomy, remaining close to drains and walls, and close to the humidity of bathrooms and kitchens. They live in this phase for about 15 days (Figure 2) [13-14].



Figure 2. Counterclockwise from top left: Drain fly (Diptera: Psychodidae) larva, pupa, and adult. Sources: Photo credit: Matt Bertone and

Prevention

Despite belonging to the same family as straw mosquitoes (transmitters of leishmaniasis or bauru ulcer), the flies do not transmit diseases. However, they cause great discomfort by their mere presence or lead to entomophobia (terror of insects). If you don't want these flies flying around in your bathroom, always keep the place very clean. This means washing the edges of drains with a brush, drying the floor after bathing, and stopping possible infiltrations in sinks and toilets [15-16].

Control

In the case of these flies, prevention is still the best measure. However, heavier cleaning is recommended with bleach or a product that contains chlorine in its formula, especially in places where the insect can develop, such as cracks, shower channels next to the floor, drains, and any place where there is an accumulation of moisture or water.

It is also recommended to keep tiles, floors, and toilets with grout and connections up to date. The use of common insecticides is unnecessary, as the products on the market only eliminate adult insects and not eggs or larvae. In the case of severe infestations, hiring an urban pest control company is still the solution [16-18] .

References

- [1] Rafael JÁ, Aguiar AP, Amorim DS. Knowledge of insect diversity in Brazil: challenges and advances. *Neotropical Entomology*. 2009; 38(5): 565-570.
- [2] Cordeiro DP. Phylogeny of *Psychoda* sensu lato (Diptera, Psychodidae, Psychodinae) and the use of molecular markers in correlation of sexes and identification of species in Brazil [Ph.D. dissertation]. Curitiba: Federal University of Paraná; 2013.

- [3] Carvalho CJB, Rafael JA, Couri MS, Silva VC. Diptera. In: Rafael JA, Melo GAR, Carvalho CJB, Casari SA, Constantino R, eds. *Insects from Brazil: Diversity and taxonomy*. 1st ed. Ribeirão Preto: Editora Holos; 2012. p. 701-743.
- [4] Kvitte GM, Wagner R. Psychodidae. In: Kirk-Spriggs AH, Sinclair BJ, eds. *Manual of Afrotropical Diptera. Nematoceros Diptera and lower Brachycera*. 2nd ed. South African: National Biodiversity Institute (SANBI Publishing); 2018. p. 602–632.
- [5] Jezek J, Yagci S. Common Non-biting month flies (Insecta, Diptera, Psychodidae) new to the fauna of Turkey. *Acta Parasitologica Turica*. 2005; 29(3): 188–192.
- [6] Bravo F, Araújo MX, Vilarinho N. A new genus and new species of Sycoracinae (Diptera: Psychodidae) from the Neotropical region with keys to the extant genera of the subfamily and males of the Neotropical species of *Sycorax*. *Neotropical Entomology*. 2023; 52(1): 697-708.
- [7] Cordeiro DP, Wagner R. Family Psychodidae. Thorp and Covich's *Freshwater Invertebrates*. 2018; 3: 765-770.
- [8] Araújo M, Bravo FX. A new species of *Trichomyia* (Diptera: Psychodidae: Trichomyiinae) and report of antennal sensilla in adult. *Papeis Avulsos de Zoologia*. 2018; 8: 1–4.
- [9] Alexander B, Freitas JM, Quate LW. Some Psychodidae (Diptera) from Atlantic Forest in South-Eastern Brazil, with descriptions of *Trichomyia dolichopogon* sp. nov. and *Trichomyia riocodensis* sp. nov. *Brazilian Journal of Biology*. 2001; 61(3): 467–474.
- [10] Wagner R, Masteller EC. New moth flies (Diptera: Psychodidae) and a key to species from Puerto Rico. *Proceedings of the Entomological Society of Washington*. 1996; 98(3): 450–464.
- [11] Evans AV. *Field Guide to insects and spiders of North America*. 1st ed. New York: Sterling Publishing Co., Inc. New York. 2007.
- [12] Leaves CL. *Insects of the Los Angeles Basin*. 1st ed. Los Angeles: Natural History Museum of Los Angeles County. 1993.
- [13] Dubois A. The relationships between taxonomy and conservation biology in the century of extinction. *Accounts Report - Biologics*. 2003; 326(1): 9–21.
- [14] Cumming JM, Wood DM. Adult morphology and terminology. In: Kirk-Spriggs AH, Sinclair BJ, eds. *Manual of Afrotropical Diptera*. 1st ed. Pretoria: South African National Biodiversity Institute; 2017; p. 89-133.
- [15] Beran B, et al. Two new species of Psychodidae (subfamilies Trichomyiinae and Psychodinae). *Zootaxa*. 2010; 64: 59–64.
- [16] Kvitte GM, Wagner R. Psychodidae (sand flies, moth flies, or owl flies). In: Kirk-Spriggs AH, Sinclair BJ, eds. *Manual of Afrotropical Diptera. Nematoceros Diptera and lower Brachycera*. 1st ed. Pretoria: South African National Biodiversity Institute; 2017. p. 607-632.

[17] Camico JL, Rafael JA, Vieira CBC. Diversity of Psychodinae (Diptera, Psychodidae) from The INPA Collection of Invertebrates with emphasis on species of *Philosepedon* [Internet]. Manaus: Scientific Initiation Congress of the Amazonas State Research Support Foundation; @2012 [cited 2024 Jan 04]. Available from https://repositorio.inpa.gov.br/bitstream/1/3288/1/pibic_inpa.pdf.

[18] Biological Institute. Harmless, but present: eliminate bathroom flies just by cleaning [Internet]. São Paulo: Government of the State of São Paulo; @2012 [cited 2024 Jan 04]. Available from <http://www.biologico.sp.gov.br/noticia/inofensivas-mas-presentes-elimine-as-mosquinhos-de-banheiro-sobre-com-limpeza>.