

# First report on effective pollination of *Masdevallia floribunda*, *M. tuerckheimii* and their hybrid (*Orchidaceae-Pleurothallidinae*) by *Zygothrica* fruit flies (*Diptera-Drosophilidae*) in Guatemala

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with 3 figures

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## Summary

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The first report on pollination of two Neotropical orchid species, *Masdevallia floribunda* LINDL., *M. tuerckheimii* AMES and their hybrid by fruit flies is presented. Two presumably undescribed species of the genus *Zygothrica*, tentatively named as *Zygothrica* spec. 1 and spec. 2, were observed as pollinators. The distinct hypercephaly in the examined males, the transparent wing membrane lacking infuscations or markings in both sexes indicate that *Zygothrica* spec. 1 is a member of the *caudata* subgroup of the *dispar* species group. The exact affinities of *Zygothrica* spec. 2 are uncertain, but this species resembles *Z. mesopoeyi* BURLA. Our observations evidenced that the *Masdevallia* flowers attract both males and females of *Zygothrica*, and that both can carry the pollinia. The Estación Experimental de Orquídeas de la Familia Archila, a seminatural plantation located in a cloud forest of Guatemala, is a place of intense pollination activity by *Zygothrica* adults on the flowers of the two *Masdevallia* species, which also leads to effective and frequent hybridization.

## 1. Introduction

Orchids are well known as one of the most advanced groups of flowering plants in the context of adaptation to different forms of zoogamy (especially entomogamy). The pollination by flies (myophily), with all its variations, is the second most common pollination pathway in the *Orchidaceae*, with pollination by species of about 20 families of *Diptera* being known (CHRISTENSEN 1994). According to different estimates (e.g. VAN DER PIJL & DODSON 1966, CHRISTENSEN 1994), 15 to 25 % of orchid species are pollinated primarily by flies. One of the two largest myophilous groups among the orchids is the Neotropical subtribe *Pleurothallidinae* LINDL. (VAN DER PIJL & DODSON 1966).

Many studies have proven the high specificity of relationships in pollination systems in *Orchidaceae*,

but these mostly concern species pollinated by groups of *Hymenoptera* (for instance, euglossine bees; e.g. DRESSLER 1968, WILLIAMS & DODSON 1972, ACKERMAN 1983), the pseudocopulatory mechanism in *Ophrys* L. (BORG-KARLSON 1987, PAULUS & GACK 1990), and pollination by ants in *Zosterophyllanthos* SZLACH. & MARG. (ARCHILA & BERTOLINI 2015b) also known as Darwinian mimicry (ARCHILA & BERTOLINI 2015a). Myophily in orchids is still quite neglected, with only few research papers published up to date (e.g. BORBA & SEMIR 2001), including the studies of Pouyanian mimicry (pseudocopulation) in *Lepanthes* SW. (ARCHILA 2001).

According to TREMBLAY 1992, specialization to a specific pollinator is a common feature in the *Orchidaceae*. However, later studies suggested that this is an exception among angiosperms and gener-

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