

MONOPELOPIA CARAGUATA (CHIRONOMIDAE: TANYPODINAE: PENTANEURINI) AND PHYTOTELMATOCLADIUS DELAROSAI (CHIRONOMIDAE: ORTHOCLADIINAE): TWO PHYTOTELMATOUS CHIRONOMIDS DISTRIBUTED FROM FLORIDA TO ARGENTINA

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Phytotelmata are structures present in terrestrial plants such as modified leaves, leafaxils, flowers, stem holes or depressions, open fruits and fallen leaves. These structures allow water to impound and are more common in tropical areas where plant diversity and rainfall are higher (Fish 1983). The phytotelmata provide a suitable habitat where immature chironomids are common inhabitants.

In this contribution, the occurrence of the chironomid species *Monopelopia caraguata* Mendes et al. (Chironomidae: Tanypodinae: Pentaneurini) and *Phytotelmatocladius delarosai* Epler (Chironomidae: Orthoclaadiinae) are reported in Argentina for the first time. A list of the American phytotelmatous chironomids (except for species inhabiting tree holes and bamboo internodes) with the host plant and references is presented in Table 1.

Immatures stages of *Monopelopia* Fittkau (Chironomidae: Tanypodinae) have been found living in small bodies of water such as ponds, marshes and streams or phytotelmata. Of the phytotelmatous species, *M. tillandsia* Beck et Beck, *M. mikeschwartzi* Epler, *M. gesta* (Roback), *M. caraguata* Mendez et al. and an undescribed *Monopelopia* species were reported living in the impounded water of bromeliads (Poales: Bromeliaceae) (Cranston 2007; Cranston & Epler 2013). *Monopelopia tillandsia* was reported living in *Tillandsia*, *Catopsis* and *Hohenbergia* in Florida and Cuba (Beck & Beck 1966; Roback 1987; Bello et al. 2011). *Monopelopia mikeschwartzi* and *M. gesta* were reported living in *Aechmea paniculigera* (Swartz) Grisebach (Bromeliaceae) in Jamaica (Epler & Janetzky 1999; Cranston & Epler 2013), whereas the undescribed species of Cranston (2007) was reported living in *Guzmania* in Puerto Rico. *Monopelopia caraguata* was reported developing in species of *Vriesea*, *Nidularium*, *Hohenbergia* and *Aechmea* in southern Brazil (Mendez et al. 2003) and in solution holes in the Everglades National Park, Florida, USA (Jacobsen 2008). Up to present, this species was not found developing in bromeliads in Florida (R. Jacobsen, J. H. Epler and J. H. Frank, personal communication).

The cosmopolitan *Eryngium* L. (Apiaceae) includes more than 200 species distributed in temperate and tropical areas, but these species develop phytotelmata only in southern Brazil and

Argentina (Campos 2010). Plants of this genus grow on the ground and have a simple structure and are annuals, differing from bromeliads, which comprise mainly perennial epiphytic plants with a complex structure.

Larvae of *Monopelopia caraguata* were collected from *Eryngium* plants and reared in the laboratory. This is the first report of this chironomid species associated with the terrestrial *Eryngium* plants in a temperate region. *Monopelopia caraguata* co-occurred in some *Eryngium* plants with *Polypedilum parthenogeneticum* Donato et Paggi (Chironomidae: Chironominae) and *Metricnemus eryngiotelmatus* Donato et Paggi (Chironomidae: Orthoclaadiinae), which are common inhabitants of *Eryngium* in Argentina.

Phytotelmatocladius (Chironomidae: Orthoclaadiinae) is a monospecific genus described from bromeliad phytotelmata in southern Florida and Brazil (Epler 2010). Because only female adults and pupae have been collected or reared, this author postulated that this taxon could be parthenogenetic. Immatures of *P. delarosai* were recently collected from the impounded water of *Bromelia balansae* Mez (Bromeliaceae) in a botanical garden at FCAyF-UNLP (Facultad de Ciencias Agrarias y Forestales- Universidad Nacional de La Plata, Buenos Aires, Argentina). This bromeliad species is exotic to this region, being native to Paraguay, Brazil and the northeast of Argentina (Zuloaga et al. 2008). Of the reared *P. delarosai*, only female adults emerged, which were maintained in separate vials containing little water. The females laid their eggs which hatched 7 days later; therefore, we confirm the assumption of Epler (2010) that *P. delarosai* could be parthenogenetic.

In the sampling of *Eryngium* plants in FCAyF-UNLP close to *B. balansae* plants, *P. delarosai* was not collected. Besides, *Monopelopia caraguata*, *Metricnemus eryngiotelmatus* and *Polypedilum parthenogeneticum* were not collected from *B. balansae*, suggesting a possible specificity or preference of those chironomids for each plant species.

Material Examined

Monopelopia caraguata: ARGENTINA, Buenos Aires Province, Punta Lara, ex *Eryngium* sp.

TABLE 1. LIST OF THE PHYTOTELMATOUS CHIRONOMIDS IN THE AMERICAS.

Orthoclaadiinae	Taxa	Host plant	Country	References
Orthoclaadiinae	<i>Antilocladius antecalcus</i>	<i>Nidularium innocenti</i>	Brazil	Pinho et al. 2005
	<i>Cricotopus</i> sp	<i>Eryngium elegans</i>	Argentina	Campos 2010
	<i>Linnophyes</i> sp	<i>Nidularium innocenti</i>	Brazil	Pinho et al. 2005
	<i>Mesosmittia patrihortae</i>	<i>Nidularium innocenti</i>	Brazil	Pinho et al. 2005
	<i>Metricnemus abdominoflavatus</i>	<i>Tillandsia guatemalensis</i>	Honduras	Mendez et al. 2011
	<i>Metricnemus edwardsi</i>	<i>Nidularium innocenti</i>	Brazil	Pinho et al. 2005
	<i>Metricnemus eryngiotelmatus</i>	<i>Tillandsia, Billbergia, Catopsis</i>	Costa Rica	Picado 1913
	<i>Metricnemus knabi</i>	<i>Tillandsia utriculata</i>	USA	Fish 1976
	<i>Metricnemus</i> sp	<i>Darlingtonia</i>	USA	Jones 1916
		<i>Eryngium horridum; E. stenophyllum, E. aff. serra, E. elegans, E. cabreriae, Dipsacus fullonum</i>	Argentina	Donato & Paggi 2005, Siri et al. 2008a,b, Campos 2010
		<i>Sarracenia purpurea</i>	USA to Canada	Bradshaw 1983, Nastase et al. 1995
		<i>Tillandsia turneri</i>	Colombia	Ospina et al. 2004
		<i>Tillandsia guatemalensis</i>	Honduras	Mendez et al. 2011
		<i>Bromeliads, Dipsacus</i>	USA	Epler 2001, Frank & Fish 2008, Miller 1971
	Tanypodinae	<i>Orthoclaadius</i> sp	<i>Heliamphora</i> spp	Venezuela
<i>Orthoclaadiinae</i> sp		<i>Bromeliads</i>	Costa Rica	Jaffe et al. 1992
<i>Phytotelmatoclaadius delarosai</i>		<i>Aechmea nudicaulis, Neoregelia concentrica</i>	Brazil	Picado 1913
		<i>Bromelia balansae</i>	Brazil	Sodré et al. 2010
		<i>Bromeliads</i>	Argentina	present study
		<i>Bromeliads</i>	Brazil	Epler 2010
		<i>Aechmea, Vriesea, Billbergia</i>	USA	Epler 2010
<i>Ababesmyia costaricensis</i>		<i>Aechmea, Vriesea, aff. serra, E. elegans, Aechmea distichantha</i>	Costa Rica	Picado 1913
<i>Larsia</i> sp			Argentina	Campos 2010, pers. obs.
<i>Monopelopia caraguata</i>		<i>Vriesea splitgerberi</i>	Brazil	Torreias 2008
		<i>Eryngium</i> spp	Argentina	present study
		<i>Aechmea nudicaulis, Hohenbergia augusta, Nidularium innocenti, Vriesea gigantea, V. philippocoburgii, V. vagans</i>	Brazil	Mendes et al. 2003, Pinho et al. 2005
		<i>Solution holes</i>	USA	Jacobsen 2008, Frank & Fish 2008, Cranton & Epler 2013

*As reported by Epler & Janetzky (1999), due to taxonomic changes and the general difficulty involved in identifying Chironomidae, the preceding names from Laessle (1961) must be viewed with skepticism until the material is re-examined. **Nomina dubia (Sæther et al. 2010).

TABLE 1. (CONTINUED) LIST OF THE PHYTOTELMATOUS CHIRONOMIDS IN THE AMERICAS.

Taxa	Host plant	Country	References
<i>Monopelopia gesta</i>	<i>Aechmea paniculigera</i>	Jamaica	Epler & Janetzky 1999, Cranston & Epler 2013
<i>Monopelopia mickeschwartzi</i>	<i>Aechmea paniculigera</i>	Jamaica	Epler & Janetzky 1999
<i>Monopelopia tillandsia</i>	<i>Tillandsia, Catopsis, Hohenbergia</i> <i>Tillandsia utriculata, Tillandsia spp</i>	Cuba USA	Bello et al. 2011 Beck & Beck 1966, Fish 1976, Frank & Fish 2008
<i>Monopelopia</i> sp	<i>Bromeliads, Aechmea nudicaulis, Neoregelia concentrica</i>	Brazil	Winder 1977, Sodr�e et al. 2010
<i>Pentaneura</i> sp	<i>Catopsis nitida</i> Bromeliads <i>Helicornia</i> Bromeliads Bromeliads	Puerto Rico Brazil Costa Rica Jamaica	Cranston 2007 Winder & Silva 1972 Naeem 1990 Laessle 1961 (*) Miller 1971
Tanypodinae spp	<i>Aechmea fendleri, Hohenbergia stellata</i>	US Virgin Islands Venezuela	Miller 1971 Liria 2007
Chironominae sp	<i>Aechmea fendleri, Hohenbergia stellata</i>	Venezuela	Liria 2007
<i>Chironomus anonymus</i>	<i>Aechmea paniculigera</i>	Jamaica	Epler & Janetzky 1999
<i>Chironomus</i> sp	Bromeliads	Costa Rica	Picado 1913
<i>Corynoneura</i> sp	Bromeliads	Jamaica	Laessle 1961 (*)
<i>Cryptochironomus</i> sp	<i>Vriesea splitgerberi</i>	Brazil	Torreias 2008
<i>Polypedilum katingangi</i>	Bromeliads	Jamaica	Laessle 1961 (*)
	<i>Aechmea lindeni, Canistrum lindeni, Neoregelia laevis, Nidularium innocenti, Vriesea philippocoburgii, V. vagans</i>	Brazil	Pinho et al. 2013
<i>Polypedilum marcondesi</i>	<i>Nidularium innocenti, Vriesea vagans</i>	Brazil	Saether et al. 2010
<i>Polypedilum panacu</i>	<i>Tillandsia guatemalensis</i>	Honduras	Mendes et al. 2011
<i>Polypedilum parthenogeneticum</i>	<i>Eryngium pandanifolium</i>	Argentina	Donato & Paggi 2008
<i>Polypedilum pedipalpus</i> **	Bromeliads	Costa Rica	Picado 1913, Spies et al. 2009
<i>Polypedilum solimoes</i>	<i>Aechmea lindeni, Canistrum lindeni, Neoregelia laevis, Nidularium innocenti, Vriesea philippocoburgii, V. vagans</i>	Brazil	Pinho et al. 2013
<i>Polypedilum cf tritum</i>	<i>Aechmea paniculigera</i>	Jamaica	Epler & Janetzky 1999
<i>Polypedilum</i> spp	<i>Eryngium horridum; E. stenophyllum, E. aff. serra, E. elegans, E. cabrerarae</i>	Argentina	Siri et al. 2008b, Campos 2010

*As reported by Epler & Janetzky (1999); due to taxonomic changes and the general difficulty involved in identifying Chironomidae, the preceding names from Laessle (1961) must be viewed with skepticism until the material is re-examined. **Nomina dubia (Saether et al. 2010).

TABLE 1. (CONTINUED) LIST OF THE PHYTOTELMATOUS CHIRONOMIDS IN THE AMERICAS.

Taxa	Host plant	Country	References
	<i>Nidularium innocentii</i> , <i>Vriesea vagans</i> , <i>V. splitgerberi</i> , <i>Aechmea nudicaulis</i> , <i>Neoregelia concentrica</i>	Brazil	Pinho et al. 2005, Torreias 2008, Sodré et al. 2010
<i>Rheocricotopus</i> sp	<i>Musa</i>	Costa Rica	Lichtwardt 1994
<i>Stenochironomus atlanticus</i>	<i>Tillandsia turneri</i>	Colombia	Ospina et al. 2004
	<i>Canistrum lindenii</i> , <i>Neoregelia laevis</i> , <i>Nidularium innocentii</i> , <i>Vriesea philippocoburgii</i> , <i>V. vagans</i>	Brazil	Pinho et al. 2005
<i>Tanytarsini</i> sp	<i>Nidularium innocentii</i>	Brazil	Pinho et al. 2005
	<i>Tillandsia utriculata</i>	USA	Fish 1976
<i>Tanytarsus bromelicola</i>	<i>Guzmania berteroniana</i>	Puerto Rico	Cranston 2007
	<i>Tillandsia</i>	USA	Cranston 2007
<i>Tanytarsus</i> sp. nr <i>confusa</i>	Bromeliads	US Virgin Islands	Miller 1971
<i>Tanytarsus</i> sp	<i>Vriesea splitgerberi</i>	Brazil	Torreias 2008

*As reported by Epler & Janetzky (1999); due to taxonomic changes and the general difficulty involved in identifying Chironomidae, the preceding names from Laessle (1961) must be viewed with skepticism until the material is re-examined. **Nomina dubia (Sæther et al. 2010).

S 34° 51' 10" W 57° 57' 33", 7 m asl, adult male reared from larva, 4-VIII-2004, Donato col.; Adult female reared from larva, same data except for Jan 2008; ARGENTINA, Buenos Aires province, Punta Lara, ex *Eryngium* sp. S 34° 54' 37" W 57° 55' 34", 14 m asl, adult male reared from larva, 10-IX-2013, Donato & Siri cols.

Phytotelmatocladus delarosai: ARGENTINA, Buenos Aires province, La Plata, ex *Bromelia balansae* Mez at the Jardín Botánico y Arboretum, Facultad de Ciencias Agrarias y Forestales (FCAYF) (UNLP), S 34.912881° W 57.9332227°, adult female reared from larva, collected 9-VIII-2012, emerged 18-VIII-2012, laid their eggs which hatched on 25/26-VIII-2012, Donato & Siri cols.

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SUMMARY

The geographic distribution of the 2 phytelmatous chironomids *Monopelopia caraguata* and *Phytotelmatocladus delarosai* is found to extend southward into Argentina, and the occurrence of parthenogenesis in the latter species is corroborated under laboratory conditions.

Key Words: Apiaceae, Bromeliaceae, *Catopsis*, *Eryngium*, *Hohenbergia*, *Tillandsia*, parthenogenesis

RESUMEN

Se extiende la distribución geográfica de las especies fitotelmatas *Monopelopia caraguata* y *Phytotelmatocladus delarosai* hacia el sur en Argentina, y se corrobora bajo condiciones de laboratorio la ocurrencia de partenogénesis en esta última especie.

Palabras Clave: Apiaceae, Bromeliaceae, *Catopsis*, *Eryngium*, *Hohenbergia*, *Tillandsia*, partenogénesis

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