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# Systematics and phylogeny of Dolichopodinae (Diptera: Dolichopodidae)

SCOTT E. BROOKS

*Department of Natural Resource Sciences, McGill University, Ste-Anne-de-Bellevue, Quebec, CANADA; Present Address: Diptera Unit, Canadian National Collection of Insects, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, K.W. Neatby Building, 960 Carling Avenue, Ottawa, Ontario, K1A 0C6, CANADA; email: brookss@agr.gc.ca*

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## Abstract

The phylogenetic relationships of the subfamily Dolichopodinae was investigated based on the examination of over 340 species of Dolichopodinae from all zoogeographic regions. Sixty-five exemplar species were included in a cladistic analysis based on 74 morphological characters of adult specimens. Twenty genera are recognized in the Dolichopodinae: *Allohercostomus* Yang, Saigusa & Masunaga, *Anasyntormon* Parent, *Argyrochlamys* Lamb, *Cheiromyia* Dyte, *Dolichopus* Latreille, *Gymnopternus* Loew, *Hercostomus* Loew, *Metaparaclius* Becker, *Muscidideicus* Becker, *Ortochile* Latreille, *Paraclius* Loew, *Parahercostomus* Yang, Saigusa & Masunaga, *Pelastoneurus* Loew, *Platyopsis* Parent, *Poecilobothrus* Mik, *Prohercostomus* Grichanov, *Stenopygium* Becker, *Sybistroma* Meigen, *Tachytrechus* Haliday, and *New Genus A*. Eleven genera are newly synonymized: *Halaiba* Parent (=*Argyrochlamys* Lamb); *Lichtwardtia* Enderlein (=*Dolichopus* Latreille); *Phalacrosoma* Becker (=*Hercostomus* Loew); *Steleopyga* Grootaert & Meuffels (=*Hercostomus* Loew); *Proarchus* Aldrich (=*Pelastoneurus* Loew); *Sarcionus* Aldrich (=*Pelastoneurus* Loew); *Pterostylus* Mik (=*Poecilobothrus* Mik); *Ludovicius* Rondani (=*Sybistroma* Meigen); *Nodicornis* Rondani (=*Sybistroma* Meigen); *Gonioneurum* Becker (=*Tachytrechus* Haliday); *Syntomoneurum* Becker (=*Tachytrechus* Haliday). The following new generic combinations are established: *Argyrochlamys breviseta* (Parent), *Argyrochlamys cavicola* (Parent), *Cheiromyia maculipennis* (Van Duzee), *Dolichopus angulicornis* (Grichanov), *Dolichopus clypeatus* (Grichanov), *Dolichopus emelyanovi* (Grichanov), *Dolichopus fractinervis* (Parent), *Dolichopus hilgerae* (Grichanov), *Dolichopus hollisi* (Grichanov), *Dolichopus maculatus* (Parent), *Dolichopus minusculus* (Parent), *Dolichopus mironovi* (Grichanov), *Dolichopus nigrifacies* (Grichanov), *Dolichopus nigrotorquatus* (Parent), *Dolichopus nikolaevae* (Grichanov), *Dolichopus sukharevae* (Grichanov), *Dolichopus tikhonovi* (Grichanov), *Hercostomus amoenus* (Becker), *Hercostomus argyreus* (Wei & Lui), *Hercostomus briarea* (Wei & Lui), *Hercostomus dactylocera* (Grootaert & Meuffels), *Hercostomus fulgidipes* (Becker), *Hercostomus hubeiensis* (Yang), *Hercostomus imperfectus* (Becker), *Hercostomus postiseta* (Yang & Saigusa), *Hercostomus zygolipes* (Grootaert & Meuffels), *Poecilobothrus aberrans* (Loew), *Poecilobothrus chrysozygos* (Wiedemann), *Prohercostomus bickeli* (Evenhuis), *Prohercostomus interceptus* (Meunier), *Prohercostomus intremulus* (Meunier), *Prohercostomus meunierianus* (Evenhuis), *Prohercostomus monotonus* (Meunier), *Prohercostomus negotiosus* (Meunier), *Prohercostomus notabilis* (Meunier), *Prohercostomus noxialis* (Meunier), *Prohercostomus vulgaris* (Meunier), *Stenopygium punctipennis* (Say), *Sybistroma acutatus* (Yang), *Sybistroma apicicrassus* (Yang & Saigusa), *Sybistroma apicilarius* (Yang), *Sybistroma biaristatus* (Yang), *Sybistroma biniger* (Yang & Saigusa), *Sybistroma bogoria* (Grichanov), *Sybistroma brevidigitatus* (Yang & Saigusa), *Sybistroma crinicauda* (Zetterstedt), *Sybistroma curvatus* (Yang), *Sybistroma digitiformis* (Yang, Yang & Li), *Sybistroma dorsalis* (Yang), *Sybistroma emeishanus* (Yang), *Sybistroma eucerus* (Loew), *Sybistroma fanjingshanus* (Yang, Grootaert & Song), *Sybistroma flavus* (Yang), *Sybistroma golanicus* (Grichanov), *Sybistroma henanus* (Yang), *Sybistroma*

  

*impar* (Rondani), *Sybistroma incisus* (Yang), *Sybistroma inornatus* (Loew), *Sybistroma israelensis* (Grichanov), *Sybistroma longiaristatus* (Yang & Saigusa), *Sybistroma longidigitatus* (Yang & Saigusa), *Sybistroma lorifer* (Mik), *Sybistroma luteicornis* (Parent), *Sybistroma miricornis* (Parent), *Sybistroma neixianganus* (Yang), *Sybistroma qinlingensis* (Yang & Saigusa), *Sybistroma sciophillus* (Loew), *Sybistroma sheni* (Yang & Saigusa), *Sybistroma sichuanensis* (Yang), *Sybistroma sinaiensis* (Grichanov), *Sybistroma spectabilis* (Parent), *Sybistroma sphenopterus* (Loew), *Sybistroma transcaucasius* (Stackelberg), *Sybistroma yunnanensis* (Yang), *Tachytrechus alatus* (Becker), *Tachytrechus analis* (Parent), *Tachytrechus beckeri* (Parent), *Tachytrechus giganteus* (Brooks), *Tachytrechus varus* (Becker). *Pelastoneurus lineatus* de Meijere, 1916, junior secondary homonym of *Pelastoneurus lineatus* Aldrich, 1896, is given the new replacement name *Pelastoneurus neolineatus* **nom. nov.** Four genera are excluded from the subfamily including *Colobocerus* Parent, *Katangaia* Parent, *Pseudohercostomus* Stackelberg and *Vetimicrotes* Dyte. A key to the world genera of Dolichopodinae is provided.

**Key words:** Dolichopodidae, Dolichopodinae, phylogeny, classification, morphology

## Introduction

Dolichopodidae are one of the most abundant, widespread and diverse families of Diptera. Recent estimates indicate that there are over 6600 described species in 200 genera (Grichanov 1999b and unpublished data). Dolichopodids are found in all terrestrial habitats from forests to agricultural fields; however, they are particularly diverse and abundant in wet habitats such as humid forests and shores of water bodies. Both larvae and adults of most species are predators on a variety of small insects and other invertebrates. Over the last century the Dolichopodidae has been variously divided into subfamilies both regionally and at a world scale (Lioy 1863–1864; Schiner 1864; Aldrich 1905; Kertész 1909; Becker 1917–1918, 1922a; Robinson 1970a, 1970b; Ulrich 1981; Negrobov 1986).

The Dolichopodinae are one of the most diverse subfamilies of Dolichopodidae. Dolichopodines occur worldwide and currently there are about 1700 described species, comprising approximately 25 percent of the species in the entire family. Depending on which of the previously proposed classifications is followed, the number of genera included in the subfamily ranges from about 23 to 37. Most of the dolichopodine diversity is divided among six large genera including *Dolichopus* Latreille, with about 600 species, *Hercostomus* Loew, with about 470 species (not including species of *Gymnopternus* Loew, which are sometimes included within *Hercostomus* in Old World classifications), *Tachytrechus* Haliday, with about 140 species, and *Paraclius* Loew, *Gymnopternus* and *Pelastoneurus* Loew, with over 100 species each. These genera together comprise about 90% of described dolichopodine species. Dolichopodines are recognized by the possession of a patch of setae on the dorsal surface of the antennal scape, one or more distinct anterior or anterodorsal preapical setae on the mid and hind femora, male abdominal tergite 6 usually bare, and by the typically large, pedunculate genital capsule of males, which projects forward under the preceding abdominal segments.

  