First neotropical record of the genus *Hormopeza* Zetterstedt, 1838 (Diptera, Empididae)

Christophe DAUGERON
Laboratoire d'Entomologie, Muséum national d'Histoire naturelle, EP 90 du CNRS,
45 rue de Buffon, F-75231 Paris cedex 05 (France)

Daugeron C. 1999 — First neotropical record of the genus *Hormopeza* Zetterstedt, 1838 (Diptera, Empididae). *Zoosystema* (21) 1 : 121-126.

ABSTRACT
The genus *Hormopeza* Zetterstedt (Empididae, Oreogetoninae) is recorded for the first time from the neotropical region, with the description of a new species, *Hormopeza dureti* n.sp., from Brazil. This species is defined by the combination of the following male characters: the eyes are dichoptic with face broader than frons, the epandrial lamellae are formed of two characteristic processes, a single membranous processus arises from between postgonites, and the apical filament of phallus is short. A narrow relationship between the three southern hemisphere species known now is inferred on the basis of the presence of dichoptic eyes in the male.

KEY WORDS
Diptera,
Empididae,
Hormopeza,
new species,
neotropical region.

RÉSUMÉ
Première mention néotropicale du genre Hormopeza *Zetterstedt, 1838 (Diptera : Empididae).*
Le genre *Hormopeza* Zetterstedt (Empididae, Oreogetoninae) est pour la première fois répertorié en région néotropicale, et une espèce nouvelle provenant du Brésil, *Hormopeza dureti* n.sp., est décrite. Cette espèce est définie par la combinaison des caractères mâles suivants : les yeux sont dichoptiques, avec la face plus large que le front, les lamelles épandriales sont formées de deux processus caractéristiques, un unique processus membraneux est présent entre les postgonites, et le filament apical du phallus est court. Une relation de parenté étroite entre les trois espèces de l'hémisphère sud à présent connues est supposée par la présence d'yeux dichoptiques chez le mâle.

MOTS CLÉS
Diptera,
Empididae,
Hormopeza,
nouvelle espèce,
région néotropicale.

INTRODUCTION

The genus *Hormopeza* Zetterstedt, 1838, was previously known from the Nearctic, Palearctic and Oriental regions (Frey 1953; Melander 1965; Steyskal 1969; Chvála & Wagner 1989; Smith 1975) with nine recognized species, of which two are Holarctic in distribution. Recently, Sinclair (1995a) added two southern hemisphere species respectively from South Africa (Natal) and Australia (Tasmania) (see Appendix). I add here a twelfth species, *Hormopeza dureti* n.sp., from Brazil (Minas Gerais).

Species of *Hormopeza* are commonly recognized by the particular shape of the third segment of the antenna; the first flagellomere being very broad with a short style (Collin 1961 ; Sinclair 1995a, b); this style bearing a further apical segment present as a small bristle. An apical bristle-like segment is also found in other Empidoidea (*e.g.* in the tribe Hilarini and the genera of the *Dryodromia* group). Unfortunately, the antennae of the single male specimen from Brazil are missing, but the combination of the following characters allows assigment of this species to *Hormopeza*: the wing venation (R_{4+5} forked with R_4 and R_5 strongly divergent, the obtuse junction of CuA_2 and A_1, and the slightly sclerotized veins on the posterior half of the wing, *e.g.* see Collin 1961, fig. 105), the absence of the tarsal claws of fore legs (Collin 1961 ; Sinclair 1995a) and the structure of male genitalia (Fig. 1), especially the presence of postgonites (Fig. 1B, C) and a phallus ending in an apical filament (Sinclair 1995a, b; Fig. 1C).

MATERIALS AND METHODS

The single male of *Hormopeza dureti* n.sp. was found in the Neotropical Duret collection recently acquired by the Muséum national d'Histoire naturelle, Paris (MNHN). The specimen is glued to a piece of cardboard.

The morphological terms follow McAlpine (1981), except for the male genitalia for which the homologies and terms of Sinclair (1996), Sinclair *et al.* (1994) and Cumming *et al.* (1995) are preferred. Since the epandrium of the Empidoidea is deeply cleft mediodorsally, the term of epandrial lamella for the lateral sclerites of the epandrium is used (Daugeron 1997a).

The male genitalia were macerated in hot 10% KOH. Chlorazol black was used to stain some parts of hypopygium. Specimens were drawn in glycerin using a camera lucida.

SYSTEMATICS

Hormopeza dureti n.sp.
(Fig. 1)

TYPE MATERIAL. – Holotype ♂ [red label], Christophe Daugeron dét., 1998, Brésil, Minas Gerais, Ing. Dolabella réc., 13.V.1964 (MNHN, Duret collection, 788: 93).

DISTRIBUTION. — Brazil (Minas Gerais).

ETYMOLOGY. — The species is dedicated to Dr Pedro Duret.

MALE DESCRIPTION

Head

Occiput dark grey with pair of distinct yellowish paravertical bristles. Ocellar triangle prominent with only bristly hairs. Pedicel and flagellum of antennae missing, scape very short. Proboscis very short, oblique, palpi lighter than labella. Eyes dichoptic but face broader than frons, facets all of equal size.

Thorax

Dusted greyish to blackish, all bristles brownish to yellowish. Prosternum and proepisternum not fused, consequently prosternum small, isolated between the front coxae. Postpronotum with at least two distinct rather strong and long bristles. Acrostichals biserial, short. Dorsocentrals irregularly biserial, a little longer than acrostichals, ending with long, strong prescutellar bristle. Several short presutural intraalars. One strong, rather long presutural supraalar. Three strong, long notopleurals. Scutellum with two pairs of strong, long, apical bristles, two pairs of shorter, lateral bristles and fringe of very short bristles. Laterotergite bare.

Legs
Hindlegs missing on the type specimen. Coxae blackish to brownish in the lower part, with distinct yellow bristles anteriorly. Femora, tibiae and tarsi blackish to brownish, somewhat shining, covered with numerous very short bristles or bristly hairs. Tibiae with some bristles distinctly stronger and longer. Pulvilli distinct, tarsal claws of forelegs absent.

Wings
Hyaline, veins brownish to yellowish on anterior half of wing, becoming faintly sclerotized and thus very faint on posterior half. All veins complete except A_1, indistinct towards the margin of wing. R_{4+5} forked with R_4 and R_5 strongly divergent and R_4 almost invisible at base. Costa ending at R_5. Anal lobe well developed with right angled. One halter not visible, second one broken.

Abdomen
Greyish dusted at base, otherwise shining blackish with distinct yellowish bristles on lateral and hind margins of segments, especially in the anterior part of abdomen. Tergite 8 desclerotized mediolaterally.

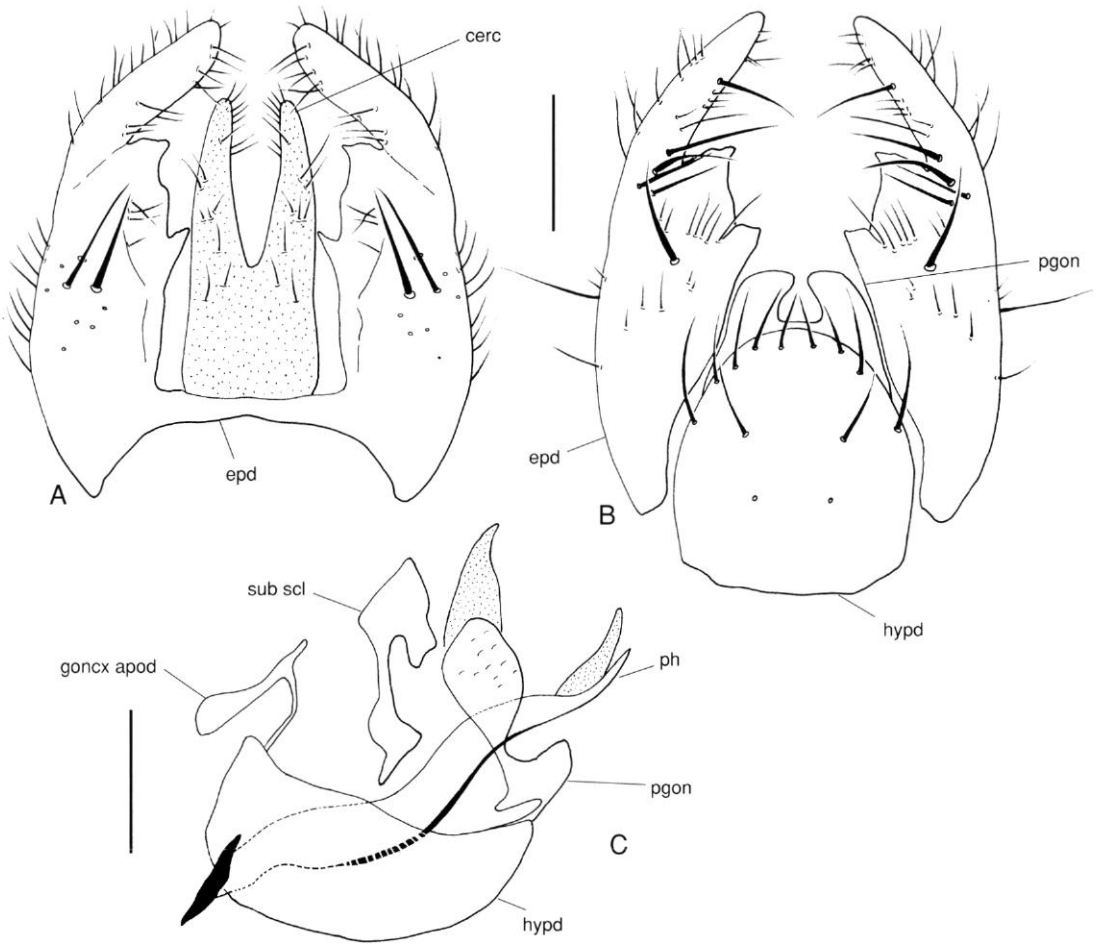

FIG. 1. — Male hypopygium of *Hormopeza dureti* n.sp. **A**, dorsal view; **B**, ventral view; **C**, lateral view. Abbreviations: **cer**, cercus; **epd**, epandrium; **goncx apod**, gonocoxal apodeme; **hypd**, hypandrium; **pgon**, postgonites; **ph**, phallus; **sub scl**, subepandrial sclerite. Scale bar: 0.2 mm.

Hypopygium (Fig. 1)
Cerci long, almost unsclerotized and bearing some fine and short bristly hairs especially at the apex (Fig. 1A). Epandrium not paired but deeply cleft mediodorsally, each lateral epandrial lamella formed of two processes, the first one long, the second one shorter, respectively rounded and pointed apically (Fig. 1A, B). Hypandrium with fringe of distinct, rather long bristles on apical margin (Fig. 1B), postgonites perpendicular to the hypandrial plate, arising from between them, a single membranous process (Fig. 1C). Phallus rather short, with short apical filament (Fig. 1C).

Female unknown.

DISCUSSION

Although the genus *Hormopeza* is rarely collected, especially in the southern hemisphere, its presence in the Neotropical region allows to recognize it as distributed worldwide.
In the male of *H. dureti*, the tarsal claws of forelegs are absent as in the males of the two other species of the southern hemisphere (Sinclair 1995a) and the Holarctic species *H. obliterata* Zetterstedt, 1838 (Collin 1961). This is probably a generic character, as Sinclair noted (1995a), and thus another autapomorphy of *Hormopeza* (in addition to the particular structure of the antenna), although its presence must be ascertained in all the known remaining species.
The dichoptic eyes in male being only present in the three southern hemisphere species, it is possible that *Hormopeza dureti*, *H. hadrocerca* Sinclair (from Tasmania) and *H. natalensis* Sinclair (from South Africa) form a monophyletic group within the genus. Nevertheless, eyes of *H. dureti* are more widely separated on face than on frons. On the other hand, this character must be used with caution on account of its homoplasic tendency in the Empidoidea (Sinclair 1995a).
By the shape of postgonites and the presence of a single process arising from between them (Fig. 1C), *H. dureti* seems closer to *H. hadrocerca* Sinclair than *H. natalensis* Sinclair (see Sinclair 1995a, figs 1, 4). This hypothesis is in agreement with known biogeographical data. Indeed the separation between Africa and South America is anterior to that between South America and Australia which have remained in contact *via* Antarctica until at least the Maastrichtian (– 70 Ma); the separation between Australia and Antarctica occurring between this period and the Eocene (– 50 Ma) (Matile 1990).
Little is known of the life history of the genus *Hormopeza* as the species are rather rare in nature, but frequently encountered swarming in smoke (they are also called empidid smoke flies) (Collin 1918; Kessel 1952, 1958, 1965). Species of *Hormopeza* are predators, found to prey upon the swarms of the platypezid smoke flies of the genus *Microsania* Zetterstedt, 1837 (Collart 1953; Kessel 1965).
On the other hand, it is not sure that mating obligatory takes place in swarms, contrary to what Sinclair indicated (1995a), because only one mating pair has been observed by Kessel (1965) close to a swarm; further observations are therefore urgently required. In fact, in the Empidoidea, it seems that only species of the subfamily Empidinae form obligatory mating swarms, except species of some subgenera belonging to the genus *Empis* Linnaeus, 1758 or *Rhamphomyia* Meigen, 1822, for instance *Lundstroemiella* Frey, 1922 (*Rhamphomyia* Meigen), *Xanthempis* Bezzi, 1909 and probably *Lissempis* Bezzi, 1909 (*Empis* Linnaeus) (Chvála 1994; Daugeron 1997b and in prep.).

Acknowledgements
I thank L. Matile (MNHN, Paris) and two anonymous reviewers for their helpful comments. This work has been partly supported by the Société entomologique de France (SEF) grant Cousin.

REFERENCES

Chvála M. 1994. — The Empidoidea (Diptera) of Fennoscandia and Denmark. III. Genus *Empis*. *Fauna Entomologica Scandinavica* 29: 146-174.
Chvála M. & Wagner R. 1989. — Empididae: 228-336, *in* Soós A. & Papp L. (eds), *Catalogue of Palearctic Diptera 6, Therevidae-Empididae*. Elsevier, Amsterdam.
Collart A. 1953. — *Hormopeza obliterata* Zetterstedt en Belgique (Diptera Empididae). *Bulletin de l'Ins-*

titut royal des Sciences naturelles de Belgique 29 : 1-4.
Collin J. E. 1918. — *Hormopeza obliterata* Zetterstedt associated with *Melanophila acuminata* De G. on burning pines in Berkshire. *Entomologist's Monthly Magazine* 54: 278-280.
— 1961. — Empididae: 1-782, *in British Flies 6*. Cambridge University Press, Cambridge.
Cumming J. M., Sinclair B. J. & Wood D. M. 1995. — Homology and phylogenetic implications of male genitalia in Diptera-Eremoneura. *Entomologica scandinavica* 26: 120-151.
Daugeron, C. 1997a. — Découverte du sous-genre *Xanthempis* Bezzi en Afrique du Nord et description de trois espèces nouvelles (Diptera : Empididae). *Annales de la Société entomologique de France* 33 : 155-164.
— 1997b. — Evolution of feeding and mating behaviors in the Empidoidea (Diptera: *Eremoneura*): 163-182, *in* Grandcolas P. (ed.), The Origin of Biodiversity in Insects: Phylogenetic Tests of Evolutionary Scenarios, *Mémoires du Muséum national d'Histoire naturelle* 173: 354 p.
Frey R. 1953. — Sudien über ostasiatische Dipteren. II. Hybotinae, Ocydromiinae, *Hormopeza* Zett. *Notulae Entomologicae* 33: 57-71.
Kessel E. L. 1952. — Another American fly attracted to smoke (Empididae). *Pan-Pacific Entomologist* 28: 56-58.
— 1958. — The smoke fly, *Hormopeza copulifera* Melander (Diptera: Empididae). *Pan-Pacific Entomologist* 34: 86.
— 1965. — *Microsania* as prey for *Hormopeza* (Diptera: Platypezidae and Empididae). *Wasmann Journal of Biology* 23: 225-226.
Loew H. 1864. — Diptera Americae septentrionalis indigena. Centuria quinta. *Berliner Entomologische Zeitschrift* 8: 49-104.
Matile L. 1990. — Recherches sur la systématique et l'évolution des Keroplatidae (Diptera, Mycetophiloidea). *Mémoires du Muséum national d'Histoire naturelle* (A) 148 : 1-682.
McAlpine J. F. 1981. — Morphology and terminology – adults: 9-63, *in* McAlpine J. F. *et al.* (eds), *Manual of Nearctic Diptera 1*. Agriculture Canada Monograph 27.
Melander A. L. 1902. — A monograph of the North American Empididae. Part. I. *Transactions of the American Entomological Society* 28: 195-367.
— 1928. — Diptera Empididae: 94-97, *in* Wystman P. (ed.), *Genera Insectorum, Fascicule 185*. Louis Desmet-Verteneuil, Bruxelles.
— 1965. — Family Empididae: 446-481, *in* Stone A. *et al.* (eds), *A Catalog of the Diptera of America North of Mexico*. United States Department of Agriculture, Agriculture Handbook, Washington.
Sinclair B. J. 1995a. — New species of *Hormopeza* Zetterstedt from South Africa and Tasmania (Diptera: Empididae). *Annals of the Natal Museum* 36: 203-208.
— 1995b. — Generic revision of the Clinocerinae (Empididae), and descriptions and phylogenetic relationships of the Trichopezinae, new status (Diptera: Empidoidea). *Canadian Entomologist* 127: 665-752.
— 1996. — Review of the genus *Acarterus* Loew from southern Africa, with description of seven new species (Diptera: Empidoidea, Hybotinae). *Annals of the Natal Museum* 37: 215-238.
Sinclair B. J., Cumming J. M. & Wood D. M. 1994. — Homology and phylogenetic implications of male genitalia in Diptera – Lower Brachycera. *Entomologica scandinavica* 24: 407-432.
Smith K. G. V. 1975. — Empididae: 185-211, *in* Delfinado M. D. & Hardy D. E. (eds), *A Catalog of the Diptera of the Oriental Region. Volume II, Suborder Brachycera through Division Aschiza, Suborder Cyclorrhapha*. The University Press of Hawaii, Honolulu.
Steyskal G. C. 1969. — New species of Empididae of the genera *Empis*, *Hilara* and *Hormopeza* from Georgia, with a synopsis of the North American species of *Hormopeza*. *Annals of the Entomological Society of America* 62: 292-299.
Zetterstedt J. W. 1838. — Dipterologis Scandinaviae. Sect. 3. Diptera: 477-868, *in Insecta Lapponica*. Leipzig.

Submitted on 17 February 1998;
accepted on 11 June 1998.

APPENDIX

Catalog of species of the genus *Hormopeza* Zetterstedt, 1838

H. brevicornis Loew, 1864: 83. Nearctic (Canada: Northwest Territories; United States: Alaska to California and South Dakota, New Hampshire).

H. bullata Melander, 1902: 274. Nearctic (Canada: Ontario; United States: Wyoming).

H. copulifera Melander, 1928: 96. Nearctic (United States: Alaska to Washington and Idaho); Palearctic (Finland, East Siberia, North European Territory).

H. dureti Daugeron, n.sp. Neotropical (Brazil: Minas Gerais).

H. fumicola Steyskal, 1969: 297. Nearctic (United States: Georgia).

H. hadrocerca Sinclair, 1995: 206. Australasian (Australia: Tasmania).

H. natalensis Sinclair, 1995: 204. Afrotropical (South Africa: Natal).

H. nigricans Loew, 1864: 83. Nearctic (Canada: Alberta, Yukon Territory; United States: Alaska, Idaho).

H. nitida Frey, 1953: 70. Oriental (Burma: Kambaiti).

H. obliterata Zetterstedt, 1838: 540. Palearctic (Belgium, Finland, Great Britain, North European Territory, Sweden, West Siberia); Nearctic.

H. senator Melander, 1928: 95. Nearctic (United States: District of Columbia).

H. virgator Melander, 1928: 96. Nearctic (United States: Idaho, Washington).