

Description of a new *Chersodromia* Walker (Diptera: Hybotidae, Tachydromiinae) from salt marshland at the Reserva natural de s'Albufereta, Mallorca, Spain

Patrick GROOTAERT & David BRICE

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Chersodromia albuferetaensis sp. nov. is described from salt marshland at the Reserva natural de s'Albufereta on Mallorca. The male is characterised by a long spine-like right cercus and having the 4th and 5th abdominal sternite set with a cushion of thick bristles.

Key words: *Diptera, Hybotidae, Chersodromia, new species, salt marshes, Mallorca, Spain.*

DESCRIPCIÓ D'UNA NOVA ESPÈCIE DE *Chersodromia* (DIPTERA: HYBOTIDAE, TACHYDROMIINAE) D'UNA ZONA HUMIDA SALOBROSA DE LA RESERVA NATURAL DE S'ALBUFERETA, MALLORCA, ESPANYA. Es descriu *Chersodromia albuferetaensis* sp. nov. a partir d'una zona humida salobrosa de la Reserva natural de s'Albufereta a Mallorca. El mascle es caracteritza per un cerc llarg en forma d'espina en la vorera dreta i per tenir la quart i cinquè esternit abdominal engastat amb un coixí de cerdes gruixades.

Paraules clau: *Diptera, Hybotidae, Chersodromia, espècies noves, salines, Mallorca, Spain.*

Patrick GROOTAERT, Royal Belgian Institute of Natural Sciences, O.D. Taxonomy and Phylogeny, Entomology, Vautier street 29, B-1000 Brussels, Belgium. Email: Patrick.Grootaert@naturalsciences.be ; urn:lsid:zoobank.org:author:B80BC556-9087-4D0D-9D69-7FA9BE5779C4 ; David BRICE, The Crescent, Franklea Close, Ottery St Mary, Devon, England EX11 1US (email: ischiolepta20@gmail.com).

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Introduction

Chersodromia Walker, 1849 is a genus of small, mainly coastal beach dwelling predacious flies. They run around on the sand resembling small spiders and rarely fly. They are usually found in the supralittoral zone, though a few species visit the eulittoral at low tide, and while some prefer the shaded areas in the dune areas. In the Mediterranean region, the species are threatened by the

mass tourism and the daily beach cleaning of the supralittoral zone where they search for prey or hide in burrows of amphipods from exposure to the sun.

The revision of *Chersodromia* by Chvála (1978) remains the key paper in the study of the Mediterranean *Chersodromia*. Unfortunately, the paper of Beschovski (1973) on two new species from the Black Sea was not fully integrated in Chvála's revision (l.c.). After Chvála's review (1978) several short

papers on Mediterranean *Chersodromia* were published (Raffone, 1984, 1994, 2004; Raffone *et al.*, 1988; Chvála, 1995; Plant, 1995; Stark, 1995; Grootaert & Shamshev, 2008, 2010; Grootaert *et al.*, 2010, 2012) and in the near future, when more areas have been inventoried, a new review of *Chersodromia* is needed to clarify this mass of short papers.

If the species from the Black Sea are included, nearly 30 species of *Chersodromia* have been described from Europe. Here, we add a new species belonging to the *C. speculifera*-group characterised by a conical antenna with an apical stylus.

In the present paper a new species of *Chersodromia* is described from salt marshes in the Reserva natural de s'Albufereta on Mallorca. As far as we know, the genus *Chersodromia* Walker was not yet reported from Mallorca as such, but since this genus is typical for beach habitats all over the world, it was expected to occur here.

Materials and methods

Insects were collected with a hand net and a Malaise trap placed at the outer side of the Reserva natural de s'Albufereta near Alcúdia (Mallorcan Spain) at the coordinates: N 39° 52' 20.9'' E 3°05'05.1''. The material was collected in 70% alcohol and preserved as indicated in the species description.

Observations

Chersodromia albuferetaensis sp. nov.

Figs 1 - 3.

Derivatio nominis

The name refers to the type locality, s'Albufereta on Mallorca where the new

species was found.

Type material. Holotype male: Spain, Mallorca, Reserva natural de s'Albufereta, N 39° 52' 20.9'' E 3°05'05.1'', collected in a Malaise trap on a bed of Sea Purslane (*Sesuvium portulacastrum*) with Tamarisk and Stone Pines behind the trap and a scrubby dry, sandy/stony clearing (in alcohol; leg. M. Welch & D. Brice). The holotype is deposited at Royal Belgian Institute of Natural Sciences, Brussels, RBINS.

Paratypes. 11 males and 8 females same data as holotype: 5 males, 4 females coll. RBINS, 5 males and 2 females in collection of Dave Brice. 1 male and 2 females, same locality, 7.v.2023, swept from pines behind the area with Sea Purslane (coll. RBINS).

Diagnosis. A small species of the *C. speculifera*-group [*sensu* Chvála, 1978] with two pairs of long black vertical bristles. Postpedicel elongate, in male 2.5 times as long as wide, in female shorter: 1.5-2 times as long as wide. Stylus apical, 1.5 times as long as postpedicel in male; twice as long in female. Legs largely yellow, sometimes dusky. Fore tarsus in male with tarsomeres 5 contrastingly darkened, other tarsomeres yellowish. In female, tarsomeres 3-5 of all legs brown. Wing longer than abdomen, membrane whitish with pale yellowish veins in both sexes. Right cercus long, spine-like, concealed in epandrium, left cercus bifurcate, half as long as right cercus. Left surstylus large, somewhat rectangular, a little longer than the right cercus. Male with sternite 4 on anterior $\frac{3}{4}$ with a cushion of densely set thickened dark bristles, sternite 5 with a smaller cushion occupying only the anterior half.

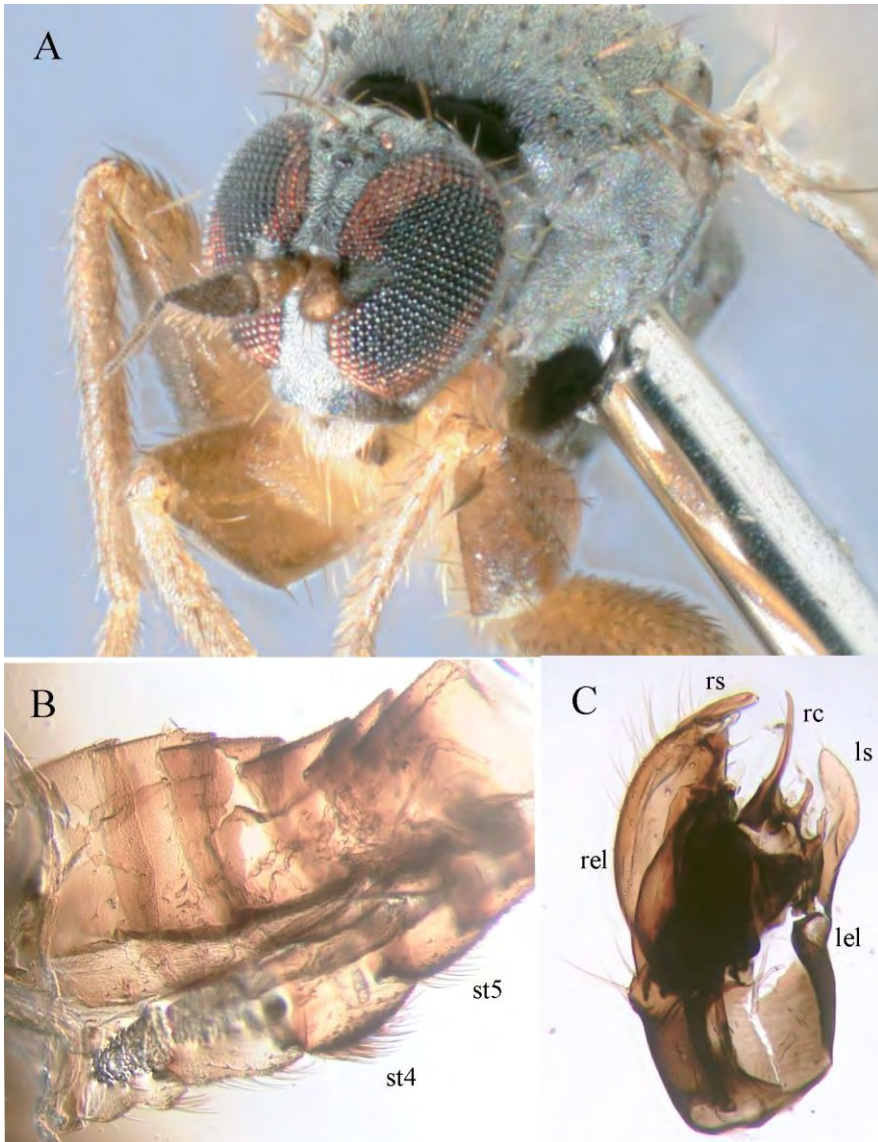


Fig. 1. *Chersodromia albuferetaensis* sp. nov. A. Head and anterior part of thorax; B. abdomen macerated, showing the cushions composed of densely set thick bristles on sternite 4 and 5; C. Dorsal view on epandrium with cerci. Abbr.: lel: left epandrial lamella; ls: left surstylus; rc: right cercus; rs: right surstylus; rel: right epandrial lamella; st: sternite. Copyright Diptera Identification Services 2023.

Fig. 1. *Chersodromia albuferetaensis* sp. nov. A. Cap i part anterior del tòrax; B. abdomen macerat, mostrant els coixins composts de cerdes gruixudes densament col·locades a l'esternit 4 i 5; C. Vista dorsal sobre epandrium amb cercs. Abr.: lel: lamel·la epandrial esquerra; ls: sobreestil esquerre; rc: cerc dret; rs: sobreestil dret; rel: lamel·la epandrial dreta; st: esternit. Copyright Diptera Identification Services 2023.

Description

Male: Body length: 1.8 – 2 mm; wing: 1.4 – 1.5 mm.

Head. Black in ground-colour. Frons wide, in front slightly wider than pedicel, widening towards ocellar triangle. Face above wider than front of frons, strongly widening below, silvery dusted (Fig. 1A). Gena below eye a little wider than postpedicel, at most one fifth of height of eye. Ocellar and vertical bristles black. One pair of anterior ocellars, a little longer than postpedicel, crossing; 1 pair of equally long median ocellars diverging; 1 pair of minute posterior ocellars. Two pairs of verticals: inner pair longest, erect and crossing; outer pair somewhat shorter than inner pair and diverging. Postocular pubescence black, short and bristly on occiput, shorter and finer below. Antenna brown, with brownish tinged pedicel (sometimes dusky yellowish) and brown postpedicel; pedicel with circlet of short black bristles, except 2 ventral bristles nearly as long as pedicel is wide; postpedicel conical, 2.5 times as long as wide; stylus, 1.5 times as long as postpedicel (Fig. 2). Proboscis yellowish brown. Palpus yellowish, half as long as postpedicel, with yellow pubescence and several long yellow setae; apical seta as long as palpus (Fig. 1).

Thorax brownish black in ground-colour, covered with black bristles and some hair-like setae. A long pronotal seta. Postpronotal lobe with 1 strong seta. Mesonotum with 1 long erect presutural supra-alar, 2 notopleurals, 1 postsutural supra-alar, 1 long postalar; acrostichals biseriate, half as long as dorsocentrals, extending to base of scutellum; 3-4 equally long dorsocentrals among shorter hair-like setae; 1 pair of very long, crossing apical scutellars with short hair-like seta at each side.

Wing very pale, somewhat milky white, with pale yellowish veins. Basal part of costa

transparent, whitish up to R_1 , from there yellowish up to tip of wing. Veins R_{4+5} and M_{1+2} slightly divergent basally but parallel when meeting costa. Upper basal cell (br) as long as lower basal cell (bm). One very long black costal bristle on inside and while on the outside a short one, only 1/3 of the length of the one at the inside. Squama white with indistinct white setae. Haltere whitish, but knob dusky above; stalk white.

Legs almost uniformly yellow, but mid and hind coxae brown, femora somewhat dusky tinged. Apical tarsomere of all tarsi darkened, on fore tarsus even black or sometimes apical fore tarsomeres 2 brownish also. Fore coxa with yellow setae. Fore femur swollen on basal two-thirds; ventrally with row of short pale bristles about one quarter as long as femur is wide; 1 fine brown anterior preapical. Fore tibia much shorter than fore femur; with 1 black dorsal bristle on basal third, and a preapical anteroventral and posteroventral seta. Fore tarsus longer than tibia; Mid femur more slender than fore femur; ventrally with a few short brown bristles; anterior preapical as long as femur is wide. Mid tibia also much shorter than mid femur; with indistinct ventral setation (lacking distinct spine-like setae) and a long apical seta longer than tibia is wide. Hind femur longest and as wide as mid femur; with 1 long brown preapical anterior and 1 evenly long preapical anteroventral seta. Hind tibia as long as femur, set with long black bristles: 2 anteroventrals, 2 anterior and 1 anterodorsal seta near middle. All setae only a little longer than tibia is wide.

Abdomen. Tergite 1 narrow, other tergites equally long; all set with short pale setae. Sternite 1 very small; sternite 4 densely set on anterior $\frac{3}{4}$ with a cushion of densely set thickened dark bristles, sternite 5 with a smaller cushion occupying only the anterior half (Fig. 1B).

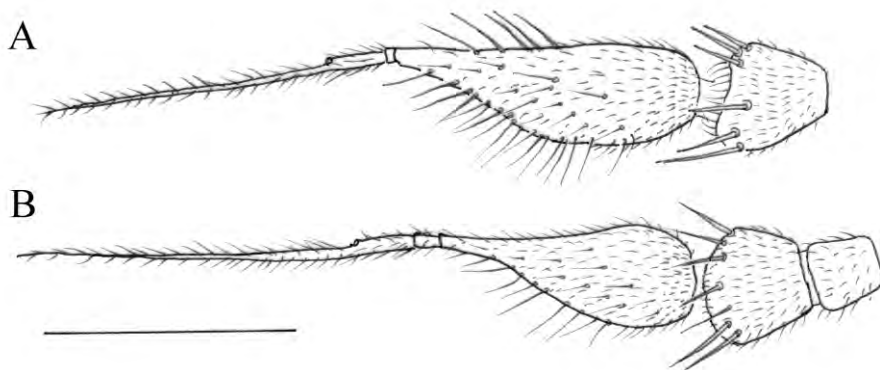


Fig. 2. *Chersodromia albuferetaensis* sp. nov. A. antenna male; B. antenna female. Scale 0.1 mm. (image P. Grootaert).

Fig. 2. *Chersodromia albuferetaensis* sp. nov. A. antena mascle; B. antena femella. Escala 0,1 mm. (imatge P. Grootaert).

Genitalia (Figs 1C, 3). The right cercus is long spine-like, about as long as the left surstylus and not protruding from the epandrium (Fig. 3C). In lateral view, it can be seen that it is dorsoventrally bent, and bears a fine seta on the apical third (Fig. 3A), a seta on the basal third and a seta at its base. The base of the right cercus is connected to the left cercus with a narrow sclerotized bridge running behind the anus. The left cercus is bi-furcate and bears at its base a keel-like projection that is turned inward and only clearly visible in lateral view (Fig. 3A).

The right epandrial lamella is almost entirely covered with microtrichia (Fig. 3B). A pointed projection is present on its apical border (Fig. 3B: dp). The right corner of the apical margin of the right epandrial lamella is somewhat produced and bent inward, bearing a patch of densely set microtrichia (Fig. 3A).

The right surstylus articulates with the dorsal apical margin of the right epandrial lamella and bears at its base at the left side a papilla bearing a seta, another short seta is

present at the inside of the surstylus (Fig. 3C), while at its tip there is only a minute seta. The right epandrial lamella bears numerous large setae on its right side (Fig. 3B) and the area between the dorsal projection (dp) and the insertion of the right surstylus is only very shallowly excavated (in contrast with *C. foddaiiae* Raffone, 1994).

The anus (epiproct) is whitish, lacks microtrichia on its apical half, while the basal half is covered with microtrichia (Fig. 3C).

The left epandrial lamella bears a patch of setulae on the right apical corner, the remainder not being microtrichose. The left surstylus is large, somewhat rectangular and bears only few setulae on its border. It is twice as long as the left cercus and as long as the right cercus.

Female: Body 1.7–2.1 mm; wing 1.6–1.7 mm. Almost identical to male, but with some sexual dimorphism. Antenna with postpedicel shorter than in male and stylus longer (Fig. 2B). Palpus brown with a brown apical seta (palpus yellow in male with a

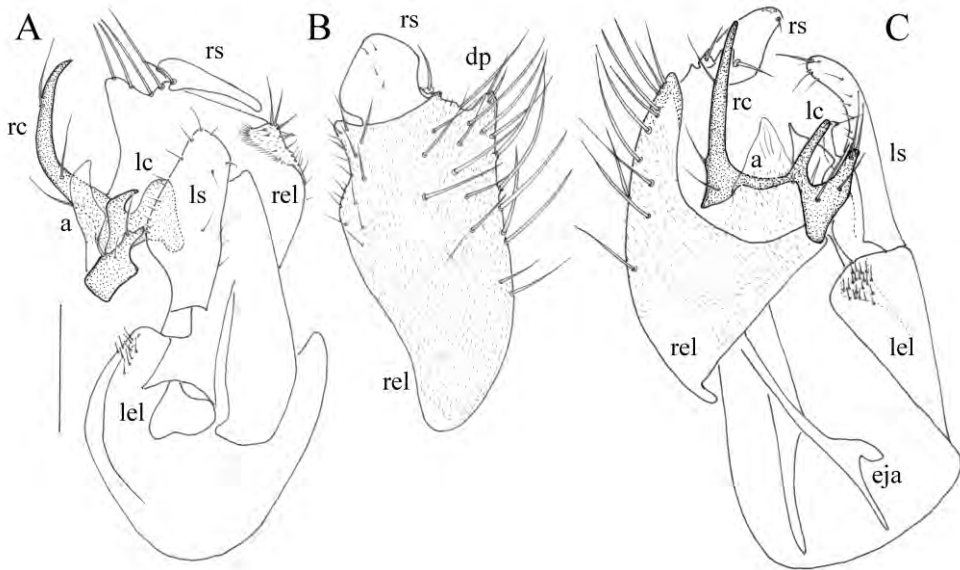


Fig. 3. *Chersodromia albuferetaensis* sp. nov. male terminalia: A. Ventral view on left epandrial lamella (lel) with left surstylus (ls) and the inner side of the right epandrial lamella (rel); lateral view on right cercus (rc), anus (a) and bifurcate left cercus (lc); B. Lateral view on right epandrial lamella and right surstylus (rs) with the pointed dorsal projection (dp); C. Dorsal view on epandrium, long spine-like right cercus connected with a bridge below the anus to the bifurcate left cercus (lc). The large left surstylus articulates with the tip of the left epandrial lamella bearing a patch of setulae on its right side. eja: ejaculatory apodeme. Scale 0.1mm. (image P. Grootaert).

Fig. 3. *Chersodromia albuferetaensis* sp. nov. terminals masculins: A. Vista ventral de la lamel·la epandrial esquerra (lel) amb surestilus esquerre (ls) i la cara interna de la lamel·la epandrial dreta (rel); vista lateral sobre cerc dret (rc), anus (a) i cerc esquerre bifurcat (lc); B. Vista lateral de la lamel·la epandrial dreta i el surestil dret (rs) amb la projecció dorsal punxeguda (dp); C. Vista dorsal de l'epandri, cerc dret llarg com una columna vertebral connectat amb un pont per sota de l'anus al cerc esquerre bifurcat (lc). El gran surstil esquerre s'articula amb la punta de la lamel·la epandrial esquerra que porta un pegat de sètules al seu costat dret. eja: apodema ejaculator. Escala 0,1 mm. (imatge P. Grootaert).

yellow apical seta).

Legs more yellowish brown, but variable. Colour of tarsomeres identical to male i.e., tarsomeres 5 of all legs brown. Setae on hind tibia are stronger and longer than in male.

Haltere with knob entirely dusky brownish. Mid tibia with a strong black apical ventral seta. Abdominal sternites 4 and 5 lacking cushions of thick bristles. Segment 8 long; cercus short, brown.

Distribution and habitat. Spain, Balears, Isla de Mallorca, Reserva natural de s'Albufereta, about 1 km Northwest of the city of Alcúdia (Fig. 4). Collected near a saltmarsh.

Discussion

Chersodromia albuferetaensis sp. nov. is a species with yellow legs, but there is



Fig. 4. View on the outer side of the Reserva natural de s'Albufereta near Alcúdia (Mallorca, Spain) showing the Malaise trap in a field of purslane. Copyright Photo Mark Welch.

Fig. 4. Vista de la part posterior de la Reserva natural de s'Albufereta prop d'Alcúdia (Mallorca) que mostra la trampa Malaise en un camp de verdolaga. Copyright Foto Mark Welch.

some variation in the intensity of the darkening of the femora. The presence of a long spine-like right cercus, indicates that the new species is closely related to two species from Italy: *Chersodromia ancilottoi* Raffone, Rampini & Scarpa, 1988, described from the Laguna south of Venice and *Chersodromia foddaiiae* Raffone, 1994, described from Porto Tolle (Rovigo) in the Po Delta, a little South of Venice. In both these species, the right cercus is even longer, whip-like and protruding far beyond the tip of the right epandrial lamella. In the new species, the right cercus is spine-like, thicker than in the other two species and almost concealed in the epandrium. The right cercus bears a single fine subapical seta, while there are two long setae in *C. ancilottoi* (Raffone *et al.*, 1988; Fig. 3) and apparently there is no subapical seta on the right cercus in *C. foddaiiae*. The area between the dorso apical

epandrial projection (dp) and the right surstylus is shallowly excavated, while in *C. foddaiiae* it is deeply excavated resulting in a robust dorsal projection (Raffone, 1994: Figs. 2, 3). The dorso-apical projection is long and sharp in *C. ancilottoi* and it is likely that the excavation is also quite deep (Raffone *et al.*, 1988: Fig. 3) in that species.

When using Chvála's (1978) key, the new species will lead to couplet 10, the *speculifera*-group and eventually to couplet 11 in having two pairs of vertical bristles and to couplet 12 in having a conical postpedicel and the male having a simple dorsal process to the right epandrial lamella. The antenna sometimes looks bicoloured as the pedicel is often pale (yellowish), what would lead to *C. speculifera* Walker, 1852, but generally the antenna is unicolourous brownish. Couplet 13 would then lead to *C. nigrosetosa* Chvála, 1970, but the male terminalia (Chvála, 1978:

Figs 39-41) are distinctly different with a short right cercus and a simple (not bifurcate) left cercus; a different left surstylus 1 and 2: surstylus 1 is somewhat is needle-like in lateral view (Fig. 42) while surstylus 2 is broader, bearing numerous setulae at the ventral side. In the new species only surstylus 2 is clearly developed; surstyli 1 and 3 are not distinct.

The species *C. ancilottoi* Raffone, Rampini & Scarpa, 1988 and *C. foddaiiae* Raffone, 1994 are not yet in Chvála's key and can already be split at couplet 11 (males only):

11. Antenna with postpedicel conical and right cercus very long, spine-like or whip-like11a
 -. Antenna with postpedicel conical but right cercus short, neither spine-like nor whip-like..... other species

11a. Postpedicel at least 2-2.5 times as long as wide. Right cercus spine-like nearly as long as right epandrial lamella, bearing a single fine subapical seta
*Chersodromia albuferetaensis* sp. nov.
 -. Postpedicel 1.5-2 times as long as wide. Right cercus finer, whip-like and protruding from the epandrium 11b

11b. Left cercus bifurcate with a long right leg and a much shorter left leg; right cercus with 2 subapical setae (Raffone *et al.*, 1988: Fig. 3).....
C. ancilottoi Raffone, Rampini & Scarpa, 1988
 -. Left cercus bifurcate, half-moon shaped with both legs equally long; right cercus lacking subapical setae (Raffone, 1994: Fig. 2) *C. foddaiiae* Raffone, 1994

It is not clear which ecological parameters determine the specific habitat of

the new species and the two related Italian species. Apparently all three species are confined to the outer sides of Mediterranean saltmarshes in contrast to most other *Chersodromia* species that are active in the supralittoral zone of sandy beaches or at the foot of the dunes or even in the dunes themselves.

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References

Beschovski, V.L. 1973. Deux nouvelles espèces du genre *Chersodromia* (Diptera: Empididae): *Chersodromia milanchvalai* sp. n. et *Chersodromia bureschi* sp. n. du littoral bulgare de la Mer Noire. *Zoologischer Anzeiger*, 191: 337-342.

Chvála, M. 1978. Revision of Palaearctic species of the genus *Chersodromia* Walk. (Diptera, Empididae). *Acta entomologica Musei nationalis Pragae*, 39(1977): 55-138.

Chvála, M. 1995. Two new species of mountain *Tachydromia* and *Chersodromia* (Diptera: Hybotidae), inhabiting a stony riverbed in the Julian Alps. *Acta Universitatis Carolinae Biologica*, 38(2): 91-98.

Grootaert, P. & Shamshev, I. 2008. Notes on the beach-dwelling genus *Chersodromia* (Diptera: Hybotidae) from Tunisia: description of a new brachypterous species with notes on brachyptery in empidoids. *Bulletin de la Société royale belge d'Entomologie*, 144: 57-63.

- Grootaert, P., Shamshev, I. & Andrade, R. 2010. Notes on *Chersodromia* from Portugal, Spain and France with the description of a new brachypterous species (Diptera, Hybotidae, Tachydromiinae). *Bulletin de la Société royale belge d'Entomologie*, 146: 203-206.
- Grootaert, P. & Shamshev I. 2010. A new *Chersodromia* Walker (Diptera: Hybotidae) from shore of the Sea of Azov (Russia). *Zootaxa*, 2645: 64-68.
- Grootaert P., Shamshev I. & Kustov, S. 2012. New records of *Chersodromia* Walker (Diptera: Hybotidae) from the shore of Black Sea and Sea of Azov (Caucasus, Russia) with description of a new species. *Centre for Entomological Science Ankara. Miscellaneous papers*, 156: 1-9.
- Plant, A. 1995. *Chersodromia* (Diptera, Empidoidea, Hybotidae) from the Maltese Islands with descriptions of two new species. *Studia dipterologica* 2(1): 51-56.
- Raffone, G. 1984. Descrizione di una nuova specie di *Chersodromia* Walker della Grecia (Diptera Empididae). *Societa Veneziana di Scienze Naturali-Lavori*, 9(1): 59-60.
- Raffone, G. 1994. Descrizione di una nuova specie di *Chersodromia* Walker (1849) del Delta del Po (Italia nord orientale) (Diptera, Brachycera, Hybotidae). *Societa Veneziana di Scienze Naturali-Lavori*, 19: 11-14.
- Raffone, G. 2004. Nuovi dati sulla fauna ditterologica del Delta del Po (Diptera Brachycera Microphoridae, Hybotidae, Empididae). *Quaderno di Studi e Notizie di Storia Naturale della Romagna*, 19: 55-62.
- Raffone, G., Rampini, L. & Scarpa, G. 1988. Ricerche biologiche nel rifugio faunistico del W.W.F. della valle dell'Averto 1. Diptera Empididae, Hybotidae, Dolichopodidae, Sciomyzidae, Opomyzidae, Sepsidae, Muscidae (gen. *Lispe*). *Societa Veneziana di Scienze Naturali-Lavori* 13: 17-30.
- Stark, A. 1995. A new *Chersodromia* (Diptera, Empidoidea, Hybotidae) from Jordan. *Studia dipterologica*, 2(1): 69-72.

