

## Description of the imago of *Meridialaris spina* Pescador & Peters 1987 (Insecta: Ephemeroptera)

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The genus *Meridialaris* Peter & Edmunds, 1972 (Ephemeroptera: Leptophlebiidae) was established to include all South American *Deleatidium* Eaton, 1884 (Peter & Edmunds 1972). The only exception was *D. vittatum* Thew, 1960, a species described from Brazil and latter synonymized with *Ulmeritoides haarupi* (Esben-Petersen, 1912) by Peters *et al.* (2005). As the type species of the genus, Peters and Edmunds (1972) designated *M. laminata* (Ulmer, 1920). Pescador & Peters (1987) described three new species and synonymized other two.

Except for *M. tintinabula* Pescador & Peters, 1987, found in northern Argentina at high altitude, the remaining species are only represented in Southern Argentina and Chile (Domínguez 1998; Domínguez *et al.* 2006; Pessacq 2009). The genus is currently composed of the following species: *M. biobionica* (Ulmer, 1938), *M. chiloeense* (Demoulin 1955a), *M. diguillina* (Demoulin, 1955b), *M. inflata* Pescador & Peters, 1987, *M. laminata*, *M. patagonica* (Lestage, 1931), *M. spina* Pescador & Peters, 1987 and *M. tintinnabula*. Of these species, *M. inflata* is only known from the male imago, *M. spina* from the nymph and *M. patagonica* from the female, but this last species is impossible to identify with confidence (Pescador & Peters 1987). The remaining species are known from all stages.

Sampling sites were visited in several occasions in 2005, 2006 and 2008. The nymphs were collected with D-Frame aquatic nets. The adults were collected with Malaise traps. About 15 nymphs were reared in laboratory, using one small bucket filled with water and rocks from the collection site and provided with aerators. When subimagos emerged, they were carefully transported to individual cages for the final molting.

The stream where the specimens were collected flows through a pine tree plantation (*Pinus contorta*), with patches of native vegetation (*Notophagus dombeyi*, *Fuxia* sp., *Chusquea* sp., *Austrocedrus chilensis*) on its margin. It has between 0.7-2 meters width and 5-30 cm depth. Water temperature ranged between 4.7–12 °C and ph between 7.3–7.75.

Drawings were made with the aid of a camera lucida coupled to a Leika DMLB microscope.

All specimens are deposited in the “Laboratorio de Investigaciones en Ecología y Sistemática Animal” (LIESA, Chubut province, Argentina) and Florida A.M. University (FAMU, Florida State, United States of America) collections.

### *Meridialaris spina* Pescador & Peters 1987

(Figs 1–8)

*Meridialaris spina* Pescador & Peters 1987: 174; Hubbard *et al.* 1992; Domínguez *et al.* 1994: 56; Domínguez *et al.* 2006; Pessacq 2009: 156.

**Specimens examined.** Nine nymphs, Argentina, Chubut province, unnamed stream, 500 m before Epuyen Lake, access road to Puerto Patriada, 42°08'17" S 71°31'56" W, 5/3/05, Di Prinzi leg. Three nymphs, same data except 12/5/05. Four nymphs, same data except 3/20/06. 32 nymphs, same data except 11/16/08, Pessacq leg. Three ♂ and two ♀ imagos, same data except, Malaise trap 12/2–16/08. One ♂ imago + exuvia, same data except, 12/9/08, emerged at laboratory 12/13/08. Two ♂ imagos + exuvia, same data except, 12/16/08, emerged at laboratory 12/16/08.

**Male imago:** measurements (mm, n=5): total length: 8.4–9.2 (8.8 ± 0.4), fore wing: 8.9–9.8 (9.5 ± 0.42).

Head: dark brown; antennae brown; ocelli whitish; upper portion of eyes light brown and lower portion black.

Thorax: nota dark brown; pleura light brown with irregular darker areas; sterna dark brown. Forewing (Fig. 1) membrane hyaline; longitudinal veins light brown, transversal cross veins lighter than longitudinal ones; costal cross veins and veins between Sc and R1 barely visible; pterostigma cloudy white; ICu<sub>1</sub> slightly divergent from CuA; fourteen

to eighteen costal cross veins. Hind wing (Fig. 2) oval, wing membrane hyaline; longitudinal veins barely visible, except for Sc light brown; reduced number of transversal cross veins, represented by four to six light brown costal cross veins and four barely visible transversal veins between Sc and R<sub>1</sub>. Legs yellow; apex of femur brown; basal fore tibia brown.

Abdomen (Figs 3, 4): all terga brown; terga II–VI with two dark brown longitudinal dorsal bands and two light spots at anterior sides of bands, sides with a light brown pattern basally wider; tergum VII with an anterior lighter stripe and two elongated black dorsal maculae with two light spots. Sternum I brown; sterna II–VIII with a medial brown spot, anterior half yellow, posterior half light brown; sternum IX white. Genitalia (Fig. 6–8): forceps whitish, angular bend on inner margin of segment one well developed, at about 1/3 distance from base; segment three slightly shorter than segment two. Styliger plate with a shallow U shape posteromedian emargination (Fig. 8). Penes (Fig. 6, 7) whitish; approximately rectangular, with distal margins slightly convergent, apex with a shallow U shaped cleft and with two apical curved blade-like processes. Inner to this last structures, two conical lobes covered with hair-like setae. Caudal filaments and cerci whitish, segments covered with short spine-like setae and with an apical ring of brown long spine-like setae.

**Female imago:** measurements (mm, n=1): total length : 9.1, fore wing: 10.

Head: anterior dorsal region half gray; posterior dorsal half light brown, antennae light brown, ocelli whitish with gray base, eyes black.

Thorax: pronotum light brown, meso and metathoracic nota brown, pleura light brown and sterna brown; wings same as in male except veins darker; 16–18 subcostal cross veins in forewing; legs same as in the male.

Abdomen (Fig. 5): tergum I brown, terga II–III light brown, with a medial dark brown area with two lateral yellow spots and a medial yellow narrow stripe, two distolateral big light brown spots and a dark brown stripe on segment distal margin; terga IV–VI light brown, with two small brown triangular areas on middle of segment basal margin and with two distolateral brown semicircles and a dark brown stripe on segment distal margin; terga VII–VIII same as previous but slightly darker; terga IX and X brown. Sterna I–VII brown, VIII–IX whitish. Ninth sternum with rounded apex.

**Comments on the nymph.** The nymphs show an abdominal coloration pattern characterized by terga I–VII and X mostly brown (with two big middle light yellow spots in segments IV and V in some specimens), segment VIII with a big triangular light yellow area with its base occupying most of the segment distal margin, and segment IX almost entirely light yellow. Femora show a wide variation in coloration pattern and in thoracic pro and mesonota there are two lateral small yellow spots.

In the original description (Pescador & Peters 1987), a wide variation in the color pattern is addressed, most nymphs have “a reduced tergal maculae that are confined near the posterolateral corners”, but a few specimens have “slender and elongated sublateral maculae that extend almost the entire length of the terga” or “abdominal terga faintly washed with brown which obfuscates the pattern of maculae”. Additionally, “pro and mesonota lack spots” and femora shows “basal and apical yellow spots”. Structural characters agree with the original description.

**Diagnose and comments on related species.** The imago of *Meridialaris spina* can be easily separated from other species of the genus by the presence of two conical lobes covered with hair-like setae on penes apex (Figs. 6, 7).

This species can be separated from all other congeners by combination of the following characters: 1) ICu<sub>1</sub> slightly divergent from CuA; 2) reduced number of transversal cross veins in hind wing, represented by four to six costal cross veins and four transversal veins between Sc and R<sub>1</sub>; 3) femora lack median band; 4) abdominal coloration pattern as in Figs. 3–4; 5) angular bend on inner margin of segment one of forceps well developed.

Based on the overall similarity of the penes, particularly the presence of hair-like setae, and the well developed bend on inner margin of segment one of the genital forceps, *M. spina* appears closely related to *M. chiloense* and *M. biobionica*. In *M. biobionica*, ICu<sub>1</sub> is strongly divergent from CuA, while in *M. chiloense* this vein is parallel to slightly divergent from CuA (slightly divergent in *M. spina*). Additionally, the margins of penes are slightly apically attenuated in these two species, but almost parallel in *M. spina*.

*Meridialaris spina* was formerly known only from Chile and the provinces of Neuquén and Río Negro in Argentina (Pessacq 2009), this is the first record from the Chubut province.

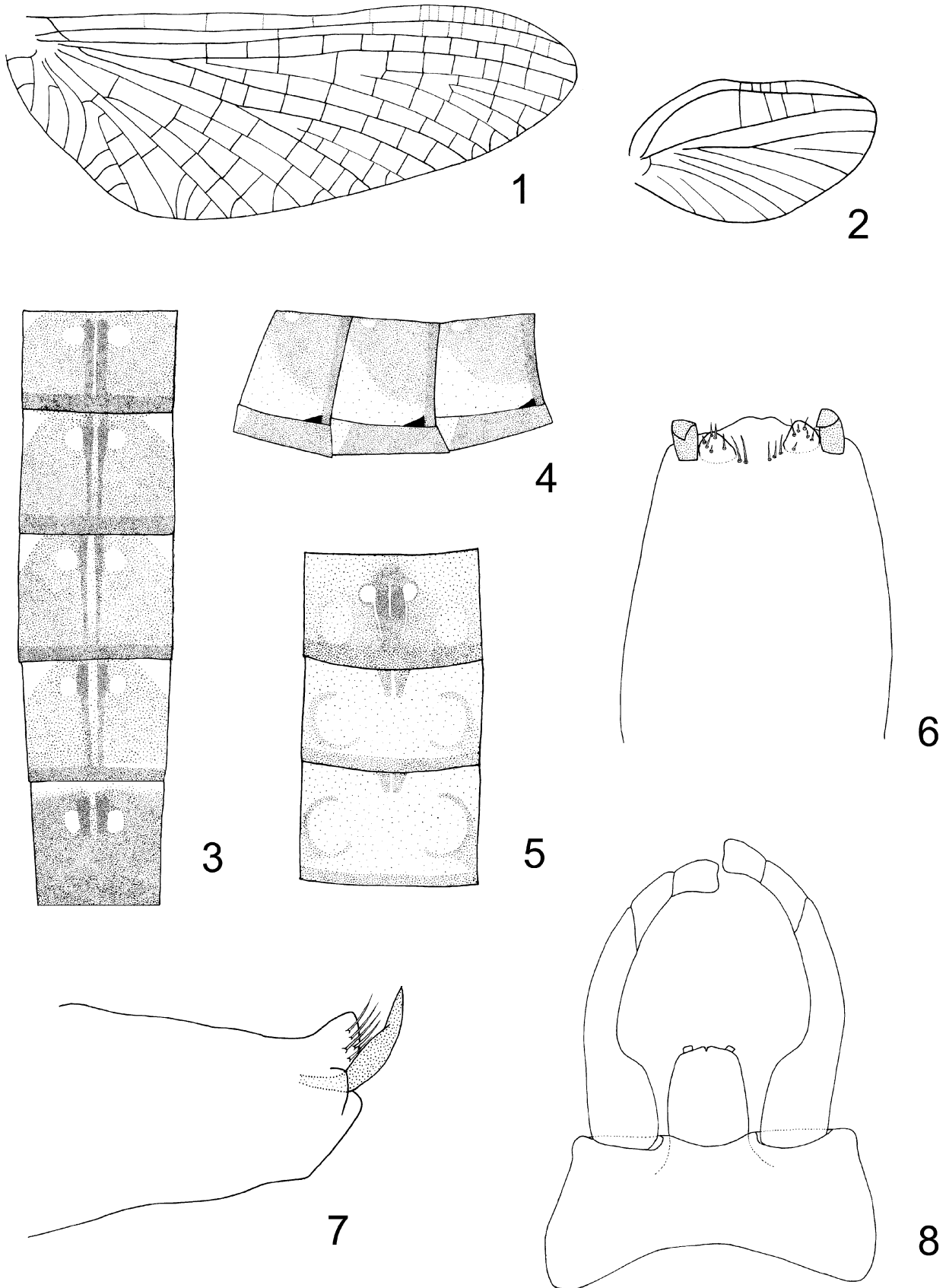
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**FIGURES 1–8.** *Meridialaris spina* imago. 1, male imago forewing. 2, male imago hind wing. 3 male imago, abdominal segments III–VII, dorsal view. 4, male imago, abdominal segments III–V, lateral view. 5, female imago, abdominal segments III–V, dorsal view. 6, penes, dorsal view. 7, penes, lateral view. 8, genitalia, ventral view.

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