

A new species of *Empis* (*Xanthempis*) from Morocco (Diptera, Empididae, Empidinae)

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Abstract. – A new species of the subgenus *Xanthempis* Bezzi of the genus *Empis* Linnaeus is described from Morocco: *E. (X.) widanensis* n. sp. is the first *Xanthempis* species found in the Rif. It is the fourth species of this subgenus known for this country and North Africa as whole. A key including the four known Moroccan species, as well as two additional species distributed in Southern Spain, is given.

Résumé. – Une nouvelle espèce d'*Empis* (*Xanthempis*) du Maroc (Diptera, Empididae, Empidinae). Une nouvelle espèce appartenant au sous-genre *Xanthempis* Bezzi du genre *Empis* Linné est décrite du Maroc: *E. (X.) widanensis* n. sp. est la première espèce de *Xanthempis* trouvée dans le Rif. C'est la quatrième espèce de ce sous-genre connue au Maroc et dans l'ensemble de l'Afrique du Nord. Une clé d'identification est proposée pour ces quatre espèces marocaines ainsi que deux autres espèces distribuées dans le sud de l'Espagne.

Keywords. – Taxonomy, identification key, Rif.

Xanthempis Bezzi, 1909, is a Palearctic subgenus of the genus *Empis* Linnaeus, 1758 (Diptera: Empididae), distributed from Western Europe to Japan. The subgenus was erected by BEZZI (1909) to include 20 species; since then 40 additional species were described (CHVÁLA, 1981, 1994, 1996; COLLIN, 1926; DAUGERON, 1997, 2000, 2009; DAUGERON & CHARBONNEL, 2000; DAUGERON & LEFEBVRE, 2015; FREY, 1955; SHAMSHEV, 1998, 2007; SHAMSHEV & KUSTOV, 2008).

Xanthempis has been found for the first time in North Africa only twenty years ago (DAUGERON, 1997), and three species from Morocco were described at this occasion: *E. (X.) chopardi* Daugeron, 1997, *E. (X.) ifranensis* Daugeron, 1997, and *E. (X.) edithae* Daugeron, 1997; the first two species are distributed in the Middle Atlas, and the third species was collected at high altitude in the High Atlas.

This study is the fourth in a series fully or partially focused on the North African empidine biodiversity (see DAUGERON, 1997, 2009; BAHID *et al.*, 2017), the aim of which is to describe the fourth Moroccan and North African species belonging to *Xanthempis*: *E. (X.) widanensis* n. sp.

MATERIAL AND METHODS

Morphological terminology follows McALPINE (1981), except for the antennal structure, which follows STUCKENBERG (1999). Interpretation of male genital sclerites is based on DAUGERON (1997). Male genitalia were dissected and macerated in hot 10% KOH, positioned in glycerine and drawn using a camera lucida.

The material studied in this work is deposited in the collection of Diptera of the Muséum national d'Histoire naturelle, Paris (MNHN), and the Institut Scientifique de Rabat, Université Mohammed V. An inventory number beginning with the initials ED (meaning *Entomology* and

Diptera, respectively) was attached to each specimen deposited in MNHN and data captured in the related collection database (<https://science.mnhn.fr/institution/mnhn/collection/ed/item/search>).

The distribution map of the new species was created using a geographical information system (GIS) software (ArcGIS, version 10.2).

Abbreviations. – **cer**, cercus; **epn**, epandrium; **ej ap**, ejaculatory apodeme; **hyp**, hypandrium; **ph**, phallus.

RESULTS

Family **Empididae** Latreille, 1804

Subfamily **Empidinae** Latreille, 1804

Genus ***Empis*** Linnaeus, 1758

Subgenus ***Xanthempis*** Bezzi, 1909

Empis (Xanthempis) widanensis n. sp. (fig. 1-3)

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HOLOTYPE: ♂, Maroc, Chefchaouen, forêt Bab Hammou, Daya Bayn Widane (S3), 700 m (35°1'27.71"N - 5°09'44.13"W), 17.IV.2017, net sweeping (2017MAR008) (ED10572, MNHN).

PARATYPE: 1 ♀, Maroc, Larache, Moulay Abdelsalam, Ain Sedrouia (S2), 1027 m (35°19'39"N - 5°31'8.34"W), 23.IV.2017, net sweeping (2017MAR007) (ED10573, MNHN).

OTHER MATERIAL: 2 ♂, Maroc, Larache, Tazia (S1), 720 m (35°20'52"N - 5°33'12"W), 23.IV.2017, net sweeping (2017MAR002); 2 ♂, Maroc, Tetouan, Anissar (Project of Bouhachem Natural Park) (S4), 930 m (35°22'24"N - 5°31'40"W), 21.V-14.VII.2016, Malaise trap (2016MAR013); 1 ♀, Maroc, Douar Mchaa, Lalla Outka (S5), 1199 m (34°44'13.37"N - 4°49'22.17"W), net sweeping (2017MAR021).

Diagnosis. – Yellowish species of medium size with three wide black scutal stripes, hypandrium with lateral setae.

Description of male

Head. Occiput blackish to yellowish along margin of eyes with row of spine-like setae on each side. Ocellar triangle not strongly prominent with a few fine, short setae. Antennae blackish, scape, postpedicel long (3.5 and 6.5 times the pedicel length respectively). Frons as broad as face, brownish, face yellow, postgena yellowish. Labrum twice the head height, yellowish to blackish at tip, labium dark brown, palpi yellow with short bristly-hairs. Dichoptic, all ommatidia of equal size.

Thorax. Antepnotum bilobed, brownish medially to yellow laterally with row of 4-5 short spine-like setae laterally. Prosternum and propisternum with a few short bristly hairs. Postpronotal lobe yellowish with 1 strong, long seta and a few short anterior ones. Scutum yellow in ground color, with broad median black stripe, and 2 wide black stripes between dorsocentral setae and notopleuron, except at the front at the level of the postpronotum; narrow to indistinct yellow space between stripes. Scutellum blackish to dark brown at margin and laterally, mediotergite blackish to yellow laterally. Katepisternum and katepimeron brownish to blackish anteriorly and ventrally respectively. Acrostichals absent, dorsocentrals missing but insertion of one row of probably fine, rather short setae except for stronger, longer prescutellars. Laterotergite with about 10 setae, stronger, longer anteriorly. Scutellum with pair of strong, long apical setae, pair of short, fine subapicals. Anterior and posterior spiracles blackish and brownish respectively. Other strong, long black setae as follows: 1 notopleural, 1 presutural supraalar, 1 postalar.

Legs entirely yellow, somewhat dark on tarsi. A few distinct short setae on tibiae dorsally and apically, on first fore tarsomere apically.

Wings (6.5 mm) slightly tinged with brown, all veins well sclerotized, complete except subcostal vein. Anal lobe not strongly developed, obtuse. Indistinct brown stigma. Halteres yellow.

Abdomen yellow in ground colour. Tergites brownish dorsally and on lateral margins, yellow laterally. Distinct rather strong, long setae only at base and on posterior margin of segment 8.

Hypopygium (fig. 1): cercus typical of the *E. (X.) stercorea* group. Epandrium subtriangular with dorsal row of strong, long setae, strong, long setae at tip. Hypandrium with 2-4 short apical setae, 2-4

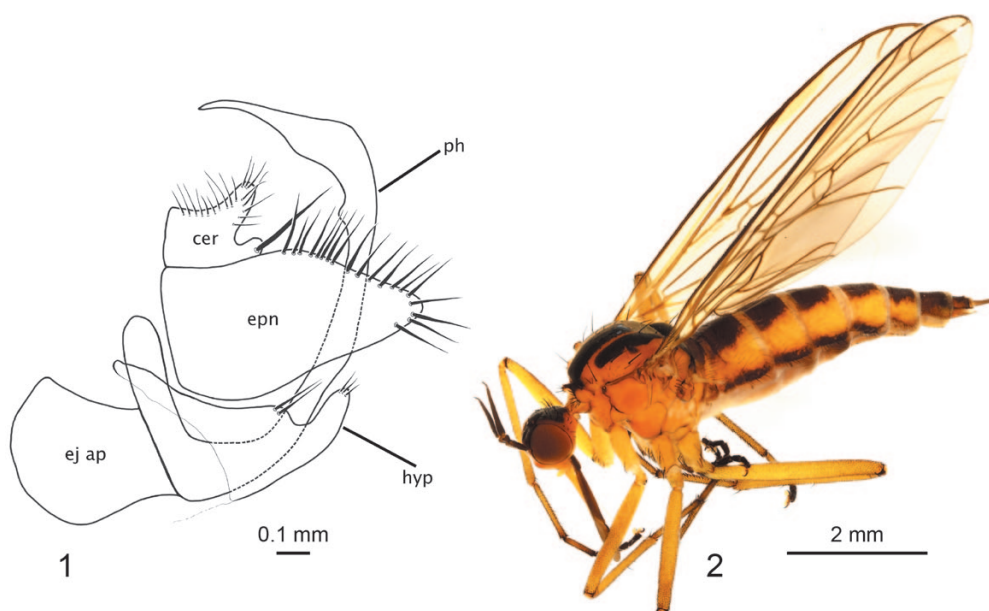


Fig. 1-2. – *Empis (Xanthempis) widanensis* n. sp. – 1, Male hypopygium (holotype). – 2, Female, habitus (paratype).

long setae on lateral margin. Phallus long but rather straight, not forming a wide posterior loop, with a characteristic anteroapical swelling.

Female. – Fig. 2. Similar to male except for the following characters: katapisternum and katepimeron entirely yellow, abdomen pointed at tip with cercus longer than broad, last three tergites entirely brownish.

Etymology. – The name of the species is derived from the type-locality.

Distribution. – Morocco: Rif (fig. 3).

Differential diagnosis. – With its three scutal stripes, *E. (X.) widanensis* n. sp. looks roughly like *E. (X.) trigramma* Wiedemann, 1822, and *E. (X.) adriani* Chvála, 1994. However, among these three species only *E. (X.) widanensis* belongs to the *E. (X.) stercorea* group such as defined by DAUGERON (1997). Within this group, *E. (X.) widanensis* belongs to a complex of species mainly distributed around the Mediterranean basin and characterized by the presence of lateral setae on the hypandrium (fig. 1; see also DAUGERON, 1997: fig. 1-2; DAUGERON, 2000: fig. 1, 10-11; SHAMSHEV & KUSTOV, 2008: fig. 3, 5, 7). This complex includes *E. (X.) algecirasensis* Strobl, 1909 (Spain), *E. (X.) assalemensis* Daugeron, 2000 (Iran), *E. (X.) chopardi* (Morocco), *E. (X.) concolor* Verral, 1872 (the only species of the complex widely distributed in western Europe), *E. (X.) edithae* (Morocco), *E. (X.) grichanovi* Shamshev & Kustov, 2008 (Caucasus), *E. (X.) kuntzei* Becker, 1910 (Corsica), *E. (X.) pseudoconcolor* Shamshev & Kustov, 2008 (Caucasus) and *E. (X.) teberdaensis* Shamshev & Kustov, 2008 (Caucasus).

E. (X.) widanensis is closely related to *E. (X.) chopardi* and *E. (X.) edithae* on the basis of the presence of an anteroapical swelling of the phallus, but differs from them by the presence of three distinct black scutal stripes.

Key to species of *Xanthempis* from Morocco and Southern Spain

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|--|--------------------------------------|
| 1. Scutum entirely yellow | 2 |
| – Scutum greyish or with distinct black stripes | 3 |
| 2. Scape and pedicel brownish, occiput blackish in its upper part and laterally | <i>E. (X.) algecirasensis</i> Strobl |
| – Scape and pedicel yellow, occiput with a blackish median spot | <i>E. (X.) nevadensis</i> Chvála |

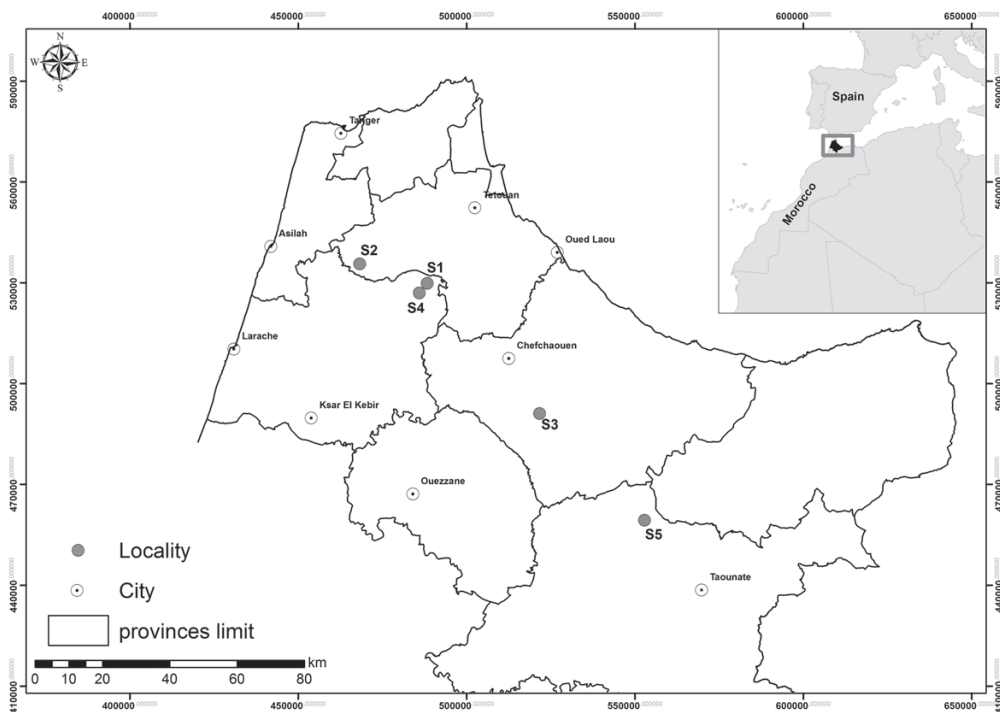


Fig. 3. – Map of Morocco showing the distribution of *Empis (Xanthempis) widanensis* n. sp.

3. Scutum with 3 wide black stripes, dorsocentral setae present on a narrow yellow space between stripes *E. (X.) widanensis* n. sp.
 – Scutum with another pattern: widely greyish to blackish or with a single wide black stripe between dorsocentral setae 4
4. Scape and postpedicel short (less than 3 and 6 times the pedicel length respectively), thorax mainly dusted grey *E. (X.) ifranensis* Daugeron
 – Scape and pedicel lengthened (4 and 8 times the pedicel length respectively), thorax yellowish to blackish 5
5. Scutum widely greyish to blackish also around postpronotal lobes *E. (X.) edithae* Daugeron
 – Scutum with a distinct wide black stripe between dorsocentral setae, somewhat brownish between dorsocentral setae and notopleuron, yellow around postpronotal lobes *E. (X.) chopardi* Daugeron

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