

A spongillafly new to the French fauna: *Sisyra bureschi* Rausch & Weißmair, 2007 (Neuropterida, Sisyridae)

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Abstract. – Specimens of a spongillafly sympatric with *Sisyra nigra* (Retzius, 1783) and *S. terminalis* Curtis, 1856, were collected in France in the riparian forest of the Loire river and of several of its tributaries in Touraine and Anjou. They were assigned to *Sisyra bureschi* Rausch & Weißmair, 2007, previously considered as Balkanic.

Résumé. – Un Sisyride nouveau pour la faune de France: *Sisyra bureschi* Rausch & Weißmair, 2007 (Neuropterida, Sisyridae). Des spécimens d'un Sisyride sympatrique de *Sisyra nigra* (Retzius, 1783) et de *S. terminalis* Curtis, 1856, ont été collectés dans la ripisylve de la Loire et de quelques-uns de ses affluents secondaires en Touraine et en Anjou. Ils sont rapportés à *Sisyra bureschi* Rausch & Weißmair, 2007, tout d'abord considérée comme une espèce balkanique.

Keywords. – France, Val-de-Loire, faunistics, aquatic insects, new record.

The Sisyridae Handlirsch, 1908, constitute a small Neuropterida family of about sixty worldwide distributed species (MONSERRAT, 1977, 1981; RAUSCH & WEIßMAIR, 2007). Adults of Sisyridae are most often dull-coloured. They are morphologically well characterized by no true gradate transversal veins and few cross veins in the forewing, except in distal part of the costal area. Most of the costal cross veins are not forked; *Sc* is curved distally, confluing to *R1* with which it fuses near the wing tip (fig. 1). The spongillaflies live near streams, ponds and lakes, and their larvae are aquatic, predated on freshwater sponges by means of their conspicuous very elongate, flexible, threadlike, thin sucking jaws (fig. 2).

Five genera are registered: the cosmopolitan *Sisyra* Burmeister, 1839, *Climacia* McLachlan, 1869, whose eleven species (all?) are confined to the New World; *Sisyrella* Banks, 1913,

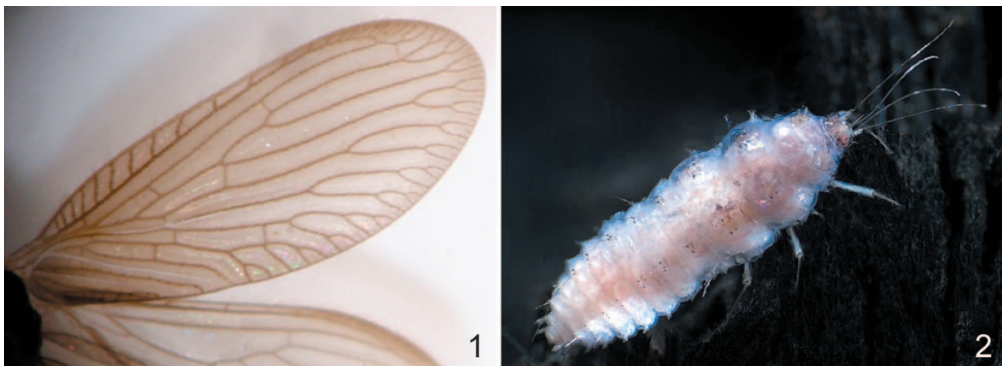


Fig. 1-2. – *Sisyra*. – 1, Forewing of *Sisyra terminalis* (after www.diptera.info/forum). – 2, Larva of *Sisyra* sp. (after www.landcarerecherche.co.nz).

Sisyrina Banks, 1939, and *Sisyborina* Monserrat, 1981, occur in Africa, Asia and Australia. Only the genus *Sisyra* is present in Europe where seven species are known: *Sisyra nigra* (Retzius, 1783) [syn. *S. fuscata* (Fabricius, 1793)], *S. terminalis* Curtis, 1856, *S. dali* McLachlan, 1866, *S. iridipennis* Costa, 1884, *S. jutlandica* Esben-Petersen, 1915, *S. bureschi* Rausch & Weißmair, 2007, and *S. corona* Rausch & Weißmair, 2007.

Concerning the French fauna, the three first mentioned species were recorded on the mainland (LERAUT, 1981; ASPÖCK *et al.*, 2001; JACQUEMIN, 2013); the fourth one was already found in Corsica (LETARDI *et al.*, 2008) and recently in the southwest of France (M. Canard, unpublished data). *Sisyra jutlandica* was not recorded in France but may be expected to do, because living in central and northern Europe, in Germany, Austria, Hungary, Netherlands, Denmark, Sweden and Finland. The two last ones, *S. bureschi* and *S. corona*, more recently described, show distribution areas which were first considered Balkanic (RAUSCH & WEIßMAIR, 2007). Nevertheless, *S. bureschi* seems to occur possibly more largely in Europe such as in Baden-Württemberg, Germany (fig. 3, e) (WEIßMAIR, 2010).

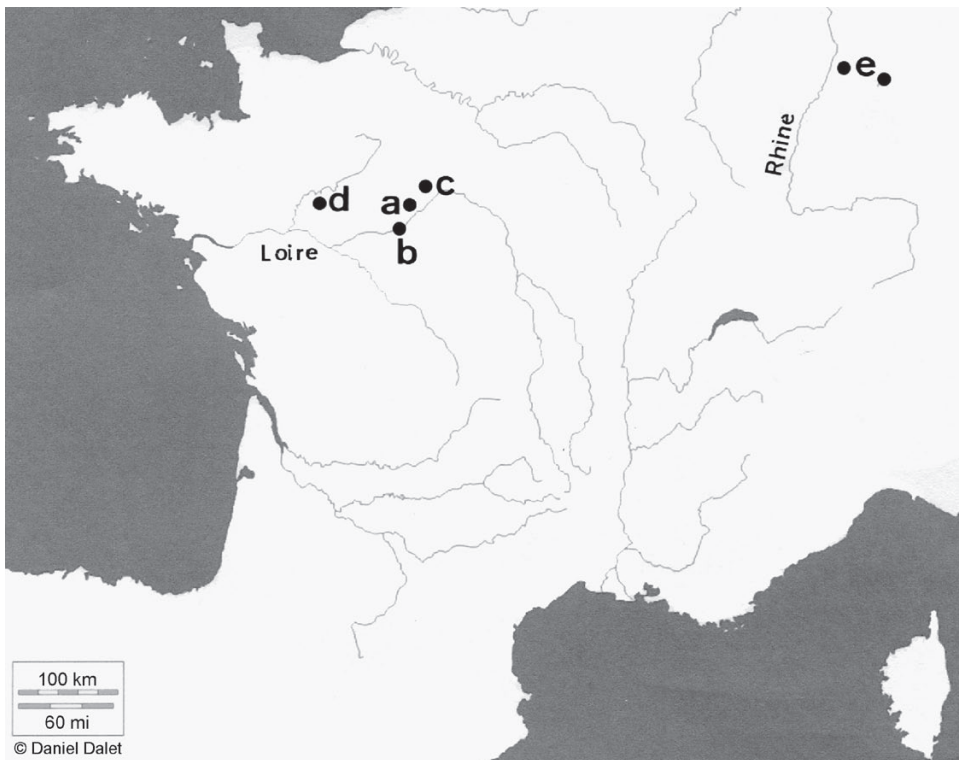


Fig. 3. – Distribution of *Sisyra bureschi* in France and western Germany; black spots and letters indicate the sites of capture (see text) (map after ©histgeo.ac-aix-marseille.fr).

The rivers sheltering the spongillaflies. – The presence of *S. bureschi* is researched in the Loire basin. Samples are carried out in the middle part named “Val-de-Loire” which is a section of the valley lying between Sully-sur-Loire in the Loiret department (45)¹ and Chalonnes-sur-Loire, Maine-et-Loire (49). This territory is included in the world UNESCO heritage (ANONYMOUS, 2000) because of its exceptional biodiversity.

¹ The departments are numbered following the administrative alphabetical code rank.

The Loire is 1,006 km long and so ranks amongst the longest European rivers. It flows through France and its hydrographic basin covers about 117,000 km². The Loir together with the Brenne are its tributaries.

The Loir rises around the Perche county, at Saint-Éman, Eure-et-Loir (28) and flows into the Loire northwards Angers, in the Maine-et-Loire, its length being 311 km, filling a basin of 7,925 km². Its historical use for inland navigation causes a strong anthropogenic impact (several dams and lock gates). Occasional pollutions created by pesticides (aminotriazole) were observed (ANONYMOUS, 2013). Such events have been recurrent since 20 years (ANONYMOUS, 1994).

The source of the Brenne is near Pray, Loir-et-Cher (41). It flows into the Cisse at Vernou-sur-Brenne, in the Indre-et-Loire department (37), it is 54.2 km long with a basin of 263 km². Its hydrologic character renders it very sensitive to chronic pollutions with nitrates, phosphates and pesticides. It has at several times been impacted by strong pollution issues, notably by industrially borne accidents.

Globally, these three rivers show conspicuous low summer water levels and high winter swellings as a consequence of the west European Atlantic rain pattern associated to the Mediterranean-Cevenol regime of the Loire (table I).

In the sections close to the sampling sites, the hydrobiologic quality measured by means of the “*diatomées index*” (PRYGIEL & COSTE, 2000) is estimated “average” for the Loire and “feeble” for both the Loir and the Brenne. Nitrate levels may lead to a high eutrophication, appearing early in the season in March. The banks are covered by a dense riparian forest, constituted mainly of *Fraxinus*, *Populus* and *Salix*.

Table I. – Hydrometric data collected in the control stations situated closer to the sampling sites. After BD Hydro DREAL Centre, Agence de l’Eau Loire-Bretagne.

Sampling site (# department) / river	Vouvray (37) / Loire	Chançay (37) / Brenne	Seiches-sur-le-Loir (49) / Loir
Localisation of the control station (# department)	Tours (37)	Villedômer (37)	Durtal (49)
Distance from the control station to the sampling site	5 km down-stream	12 km up-stream	15 km up-stream
Annual mean flow	357 m ³ /s	1.21 m ³ /s	31.61 m ³ /s
Flow during the driest month of the year	115 m ³ /s	0.385 m ³ /s	6.58 m ³ /s
Flow during the wettest month of the year	615 m ³ /s	2.69 m ³ /s	100 m ³ /s

METHODS AND RESULTS

Sweeping by insect net the vegetation near the river banks of the Loire and rivers of its hydrographic basin, two authors (R. C. and D. T.) collected several male and female specimens of a typical *Sisyra* whose specific identity seems to be reportable to *Sisyra bureschi*. The locations were:

- in the department of Indre-et-Loire (37), near Vernou-sur-Brenne (47°25'19"N - 0°50'47"E) (fig. 3, a), at the ford of “La Thierrière” crossing the river Brenne, 8 ♂ and 2 ♀ on 12.VIII.1990 (R. C.) where they were sympatric with 1 male of *Sisyra nigra*, same site, same date;
- at the same location, 2 ♂ on 9.VIII.2014 (D. T.), on *Fraxinus*, together with several males and females of *Sisyra terminalis* and 1 ♂ of *S. nigra* collected two days before;
- same department, near Vouvray (47°24'46"N - 0°48'00"E) (fig. 3, b), on border of the Loire, 1 ♂ on 8.V.2014 (D. T.);
- same department, near Chançay (47°27'10"N - 0°52'28"E) (fig. 3, c), on the left bank of the Brenne, south of “La Ferme du Moulin Neuf”, 1 ♂ and 4 ♀, on 15.VIII.2014 (R. C.);

– in the department of Maine-et-Loire, near Seiches-sur-le-Loir (47°34'25"N - 0°21'17"W) (fig. 3, d), near the Loir, an affluent of the Sarthe, 1 ♂ and 1 ♀ on 11.VIII.2014 (D. T.), sympatric with *Sisyra nigra*.

DISCUSSION

The original description of *Sisyra bureschi*, especially colour of the antennae, chromatic pattern of the head, colour and venation of the forewing (both males and females) of freshly caught animals and particularly the genital complex of males (fig. 4-7) is good enough for unambiguous diagnosis of specimens. Specific identification was ascertained by one of the authors, one of the descriptors himself of the species (W. W.).

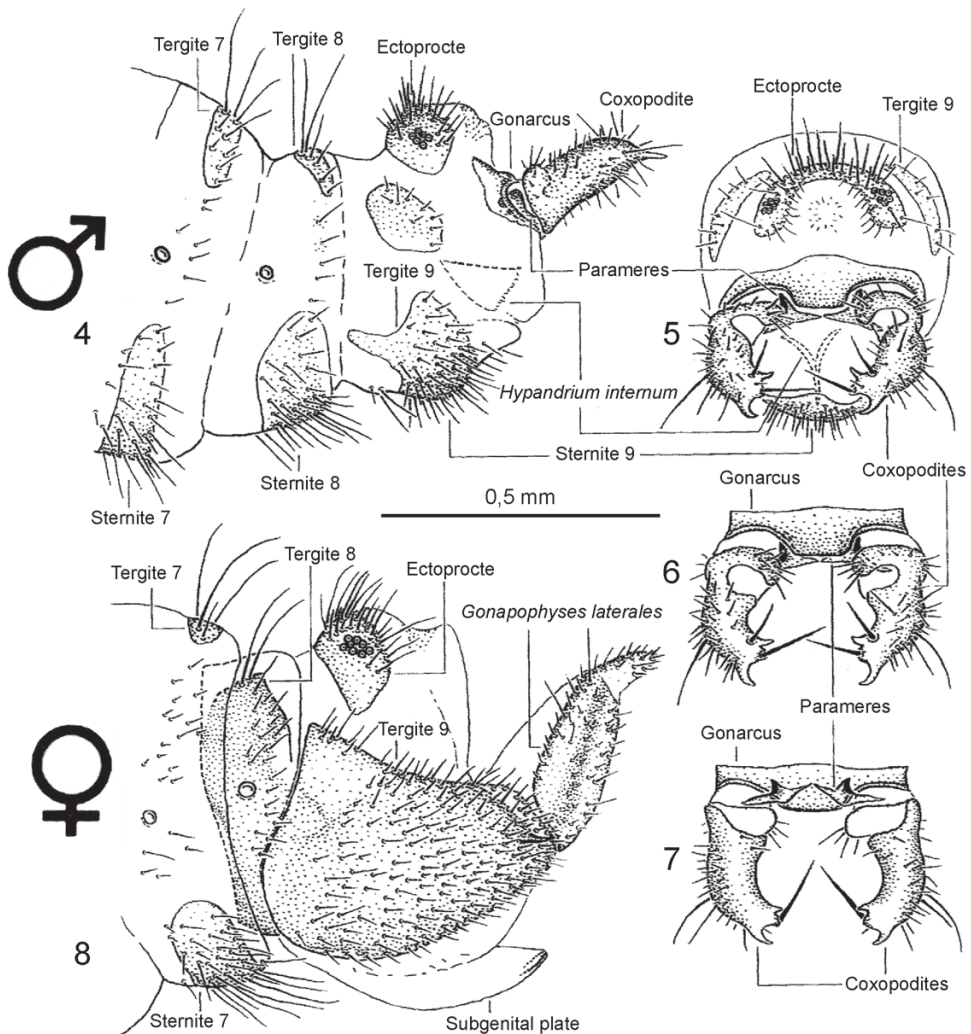


Fig. 4-8. – *Sisyra bureschi* Rausch & Weißmair, genitalia (modified after RAUSCH & WEIßMAIR, 2007). – 4-7, ♂: 4, apex of abdomen, lateral; 5, genital segment, dorso-caudal; 6-7, terminal complex (5, dorsal; 6, ventral). – 8, ♀, apex of abdomen, lateral.

The initial mention of *S. bureschi* gave it as a Ponto-Mediterranean species, first collected in Bulgaria, Croatia and Turkey. It was later recorded in southwestern Germany, Baden-Württemberg. Its finding in the centre of France enlarges westwards its distribution, allowing the opportunity to ascertain it exists elsewhere in Europe.

The size of *S. bureschi* is similar to that of *S. nigra*. Its wings are glassy iridescent, without any black marks whereas the wings of *S. dalii* are lightly spotted. The ground colour of the body is fuscous, different with that of *S. nigra* (black) and the head is yellowish. The genital complex is close to those of *S. terminalis* and *S. dalii*.

The spongillaffies are relatively easy to determine by means of the terminalia in males. However, identifying the species without scrutinizing the genitalia is possible only on freshly caught specimens. *Sisyra bureschi* is ranked amongst the species occurring in Europe in which gross characters out of terminalia are noted in the table II.

After KIRBY (1991), the three commonest west European species are often overlooked (at least in Great Britain) because occurring inaccessibly high in waterside trees and so, under recorded.

Table II. – Gross characters of the seven European *Sisyra* species (b, basal part; t, terminal part).

	<i>S. nigra</i>	<i>S. terminalis</i>	<i>S. dalii</i>	<i>S. iridipennis</i>	<i>S. jutlandica</i>	<i>S. corona</i>	<i>S. bureschi</i>
Ground colour of the body	black	pale fuscous	pale fuscous	bicolour, dark brown and pale fuscous		dark grey	fuscous
Head	shiny black with yellow hairs	ochreous brown, vertex with a brown median stripe	ochreous brown with yellow hairs	fuscous	brown	yellowish or pale brown	pale brown, a dark brown stripe between the eyes
Antennae	unicolourous dark or black	dark (b), white, yellowish (t)	scapus and pedicel yellow orange, flagellum grey	scapus and pedicel bright black, flagellum pale yellow	scapus and pedicel dark brown, flagellum yellow (b) and dark (t)	dark brown	dark brown or black, flagellum slightly lightened distally
Wings	fuscous	colourless or ash grey	yellowish brown spotted	glassy iridescent, all veins pale	pale brown	black brownish	brown
Thorax (pro- and mesonotum)	shiny black with obvious yellow hairs	yellowish brown	ochreous brown	dark brown	sand like	dark brown	brown
Legs	pale brown	pale	pale testaceous	pale testaceous		dark brown (b) yellowish (t)	pale brown

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