

## On two poorly known *Theridion* species, recently collected in Belgium for the first time (Araneae: Theridiidae)

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### Summary

*Theridion hemerobius* Simon, 1914 (new synonym: *T. antusi* Kasal, 1982) and *T. hannoniae* Denis, 1944 (new synonym: *T. denisi* Wunderlich, 1987) are redescribed. Their ecology and distribution are discussed.

### Introduction

Some European spiders have never been referred to again in the literature since their original description many years ago. Usually this is because either the figures of the copulatory organs are too sketchy, or they were not illustrated at all.

While working on a catalogue of the Belgian Theridiidae (Van Keer & Vanuytven, 1993), one of us (HV) came across a *Theridion* species whose genitalia resembled those of *T. pictum* Walckenaer, but which could not be identified with the currently used keys. We therefore examined all European *Theridion* species, mainly from southern Europe, described by Simon, but not redescribed since that time. Our *Theridion* species appeared to belong to *T. hemerobius* Simon, 1914.

Since then, and since the diagnostic characters have now become clear, the species has been found in several other Belgian localities. Furthermore, during examination of recent literature, a junior synonym was discovered. In the present paper the species is redescribed. We are convinced that *T. hemerobius* will turn up in the collections of many arachnologists, as it appears to be widely spread throughout Europe.

We also include in this paper a redescription of *T. hannoniae* Denis, 1944, another species recently discovered in Belgium. This species also appears to have a wide distribution in Europe. Measurements are in mm. Abbreviation: MNHNP = Muséum national d'Histoire naturelle, Paris.

### *Theridion hemerobius* Simon (Figs. 1–5)

*Theridion hemerobius* Simon, 1914: 264, 268, 297 (descr. ♂, ♀); Caporiacco, 1936: 346; Soyer, 1973: 115; Vanuytven *et al.*, 1990: 16.

?*Theridion berkeleyi* Emerton, 1924: 30 (descr. ♂); Levi, 1957: 51 (descr. ♂, ♀).

*Theridion ornatum*; Tullgren, 1949: 45, fig. 5A (misidentification).

*Theridion berkeleyi*; Wunderlich, 1973: 179; Palmgren, 1974: 24; Hansen, 1988: 192; Deltshv, 1992: 17.

*Theridion antusi* Kasal, 1982: 79 (descr. ♂). New synonymy.

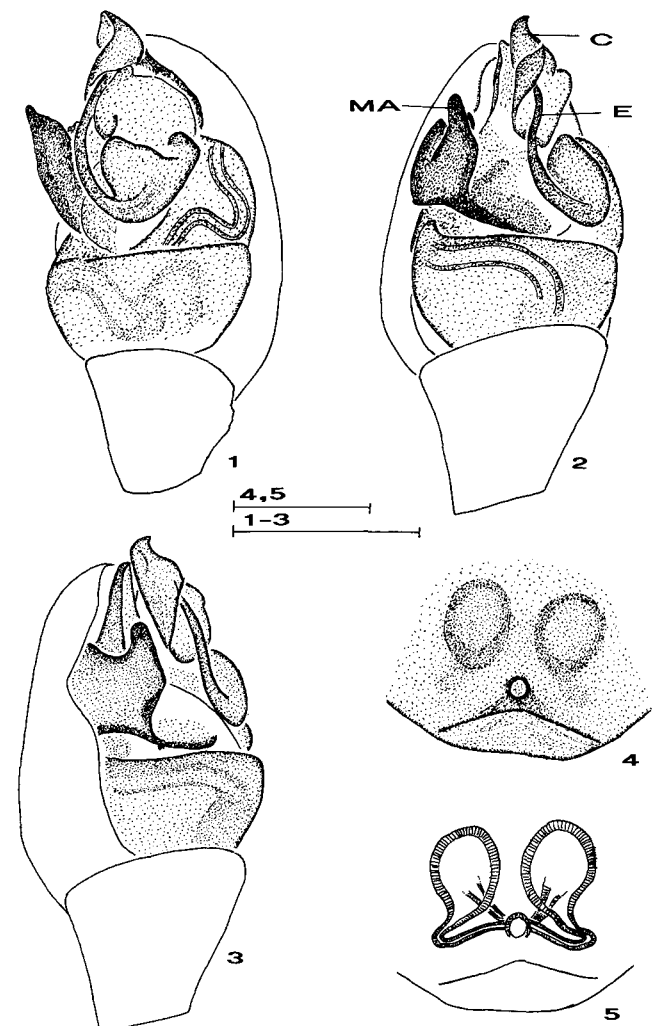
*Theridion ? pictum*; Levy & Amitai, 1982: 96 (misidentification ?).

*Type material*: Lectotype male, by present designation, from France, Landes (MNHNP AR2823). Paralectotypes: 6♂ 4♀, same data; 3♂, Corsica (MNHNP AR2832).

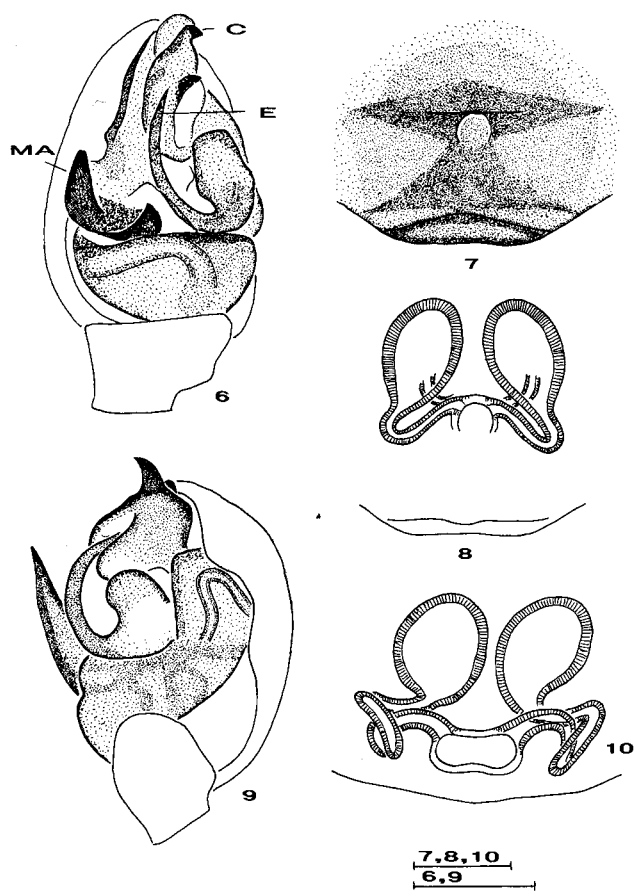
*Diagnosis*: Closely related to *T. pictum* and for a long time confused with it, but clearly differing in the genitalia by the relatively smaller size of the palp and epigyne. Furthermore, males are easily distinguished by the peculiar form of the median apophysis and the terminally hooked conductor (subterminally in *T. pictum*, Fig. 6); females are distinguished by the shape of the posterior rim of the epigyne, and by the very small, rounded central opening (more oval in *pictum*, Fig. 7).

*Remarks*: Simon's (1914) fig. 525 of the male palp is undoubtedly erroneous, and we do not know to which species it refers. Since good drawings of pedipalp, epigyne and vulva of *hemerobius* have never been published, this species has been overlooked for a long time.

Tullgren (1949) gives two figures of the vulva of *T. ornatum* Hahn, 1831 (= *T. pictum* Walckenaer, 1802). One of them (fig. 5A) clearly refers to *T. hemerobius*. According to Wunderlich (1973) who collected some



Figs. 1–5: *Theridion hemerobius* Simon. 1 Male left palp, retrolateral view; 2 Idem, ventral view (C = conductor, E = embolus, MA = median apophysis); 3 Idem, prolateral view; 4 Epigyne, ventral view; 5 Vulva, ventral view. Scale lines = 0.2 mm.



Figs. 6–8: *Theridion pictum* Walckenaer. **6** Male left palp, ventral view (C = conductor, E = embolus, MA = median apophysis); **7** Epigyne, ventral view; **8** Vulva, ventral view.

Figs. 9–10: *Theridion petraeum* L. Koch. **9** Male left palp, retrolateral view; **10** Vulva, ventral view. Scale lines = 0.2 mm.

specimens at the Bodensee, identified by H. W. Levi as *T. berkeleyi*, this figure also refers to *T. berkeleyi* Emerton, 1924, so this species could also become a junior synonym of *T. hemerobius* Simon, 1914. Palmgren (1974) cites Tullgren's species as *T. berkeleyi*. Examination of type material of *T. berkeleyi* remains necessary to confirm this synonymy.

Kasal's (1982) excellent drawings of *T. antusi* obviously refer to *T. hemerobius* as well, the former becoming a junior synonym of the latter.

Levy & Amitai (1982) provisionally identified two females collected in Israel as *T. pictum*. The figures of epigyne and vulva show a very small central opening (0.05 mm), and slightly recurved ducts, as in *T. hemerobius*.

The specific epithet *T. hemerobius* is a latinised Greek noun used in apposition and its termination must hence not be changed to *-um*, as has been done by some authors.

**Description:** Measurements: Male: total length 3.2 (2.4–3.88); cephalothorax 1.46 (1.20–1.79) long, 1.06 (0.96–1.40) wide. Female: total length 3.0–4.45; cephalothorax 1.28–1.50 long, 1.12–1.34 wide.

**Colour:** Cephalothorax pale yellowish with broad median dark band and narrowly darkened margin; legs pale, annulated; abdomen very variable, dorsally mostly

with whitish folium bordered with grey, and ventrally with transverse white spots behind epigastric furrow. In some specimens, the colour of the abdomen resembles *T. varians* Hahn and *T. blackwalli* O. P.-Cambridge, in others it is similar to *T. pictum* but less reddish. Epigastric area distinctly swollen in male.

**Palp** (Figs. 1–3): Length of tibia 0.16–0.19 (0.21–0.25 in *pictum*); length of cymbium 0.35–0.39 (0.52–0.62 in *pictum*). Median apophysis strongly developed and chitinised, forming a large, rounded lobe; conductor elongate, with terminal hook.

**Epigyne** (Fig. 4): With large, lozenge-shaped posterior rim; central opening rounded, very small, 0.02–0.04 mm (0.08–0.12 mm in *pictum*). **Vulva** (Fig. 5): Spermathecae oval, connected by relatively short, curved ducts to the lateral sides of the median depression.

#### Material examined and citations:

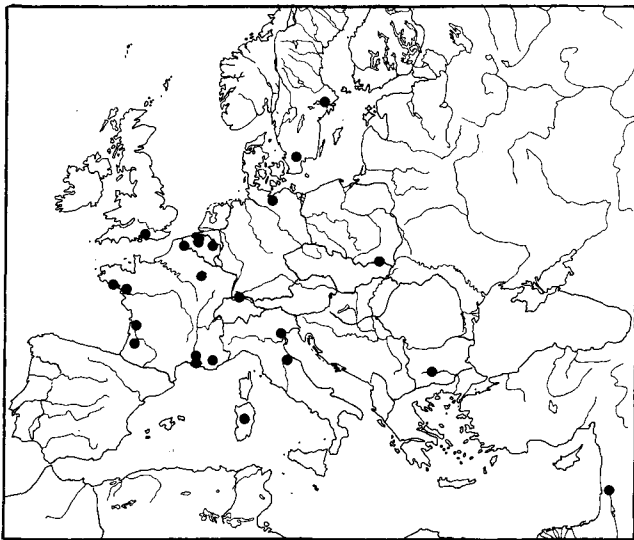
FRANCE: Bouches du Rhone: Franquevaux, 1♀, 17 April 1989 (P. Poot leg.); St-Martin de Crau, 1♂, 16–19 May 1986 (P. Poot leg.). Gironde: without further locality (Simon, 1914). Landes: without further locality (type series; Simon, 1914). Loire Atlantique: Brière marsh, 8♂ 6♀, 31 May 1992 (Coll. M. Askins, S. Dobson, D. Jones, J. Murphy); Guèrande Salt Marsh, 1♀ (Coll. M. Askins). Marne: Givry-en-Argonne, 11♂ 84♀, on bridges near water, 21–24 June 1993, H. Vanuytven leg. Morbihan: La Belle Croix near Sarzeau, 2♀, in small reedy pond in disused quarry (Coll. J. Murphy). Var: Ste. Baume, in rather moist *Quercus pubescens* forest (Soyer, 1973). CORSICA: Without further locality (type series; Simon, 1914). ITALY: Venezia: Venezia, Treporti, 1♀, on bushes near water (Hansen, 1988, sub *berkeleyi*). Pesaro Urbino: Bocca Trabaria, 1♂, August 1932 (Caporiacco, 1936). GREAT BRITAIN: West Sussex: Burton Lake, near Petworth, 4♀, 18 July 1982; 2♀, numerous spiderlings, 7 July 1992, on wooden fence at side of small lake (D. Jones leg.) BELGIUM: Antwerpen: Antwerpen-Rechteroever, near Noordkasteel, 1♂ 1 subadult ♀, among stones along river Scheldt among *Phragmites* vegetation, 20 June 1992. Antwerpen-Linkeroever: 1♀, among stones along river Scheldt, 22 September 1991, and 1♀, 27 September 1992; 1♀, in *Phragmites* vegetation along river Scheldt, 15 September 1992. Limburg: Eastern part of province, 2♂ (Vanuytven *et al.*, 1990). Oost-Vlaanderen: Meerdonk, 1♀, 19 June 1988, 3♀, 16 September 1990, 1♀, 29 September 1990, all in rough reedland (Vanuytven *et al.*, 1990); idem, 1♂, 8 June 1991, 1♂ 2♀, 18 June 1991. West-Vlaanderen: Woumen, de Blankaart, 1♀, 22 June–6 July 1984; 1♂ 1♀, 6–22 July 1984; 1♀, 31 May–14 June 1985 (Decler, 1991). GERMANY: Baden-Württemberg: Bodensee near Konstanz, Wollmatinger Ried nature reserve, 9♂ 7♀, by sweeping *Urtica* close to water (Wunderlich, 1973, sub *berkeleyi*). Mecklenburg-Vorpommern: Müritz (Blick & Sammorey, in press). SWEDEN: Osby i Uppland (Tullgren, 1949, sub *T. ornatum*). South Sweden (L. J. Jonsson, in litt.). SLOVAKIA: Chlmec, Nature reserve "Böll", 2♂, on shrubs in steppe area, 24 June 1976 (Kasal, 1982, holotype and paratype of *T. antusi*). BULGARIA: District of Plovdiv, in fruit garden (Deltshev, 1992, sub *berkeleyi*). ISRAEL: Lake Hula; northern Galilee (Levy & Amitai, 1982, sub *T. pictum*).

**Distribution:** *T. hemerobius* apparently has a wide distribution (Map 1). It is now known from localities in France including Corsica, Belgium, Great Britain, Germany, Italy, Sweden, Slovakia, Bulgaria and Israel.

**Ecology:** The species is linked to different types of ancient eutrophic marshy habitats, such as reed marshes or regularly flooded nitrophilous vegetation, often dominated by *Urtica*. Apparently it is a good indicator species for such habitats.

In the Argonne in France, the species was very common on bridges near water.

In Israel, the species was caught on heads of Papyrus reed (Levy & Amitai, 1982).



Map 1: Distribution of *Theridion hemerobius* Simon.

In Belgium, males were captured only in June, whereas females occurred from June to September.

#### *Theridion hannoniae* Denis (Figs. 16–22)

*Theridion hannoniae* Denis, 1944: 116; Vanuytven, 1987: 23; Thaler & Noflatscher, 1990: 173; Noflatscher, 1990: 68; 1991: 85; Janssen, 1992: 16.

*Theridion denisi* Wunderlich, 1987: 220; 1991: 58, 419. **New synonymy.** *Theridion pyrenaicum*; Baert *et al.*, 1992: 44 (misidentification).

**Diagnosis:** A very small species of the *petraeum* group (Figs. 9, 10, 14). Males are recognised by the shape of the median apophysis with membranous tip and the shape of the elongate conductor; females are recognised by the shape of the median depression and the disposition of the ducts. It is close to *T. pyrenaicum* Denis, 1944, but this species is larger: cephalothorax length of the male is 0.96, of the female 1.00, whereas all specimens of *T. hannoniae* examined by us never had a cephalothorax longer than 0.76 and 0.86 respectively. The median apophysis of the male palp of *hannoniae* is also appreciably smaller than that of *petraeum* and *pyrenaicum* (Fig. 16 cf. 14, 15). The male palp and female vulva (Figs. 11–13) of *T. pyrenaicum* are very close to those of *T. hannoniae*; the median depression of the epigyne appears to be relatively larger in *pyrenaicum* than in *hannoniae* (Fig. 13 cf. 19–22), but further material of *T. pyrenaicum* is needed to allow a biometric study of some parts of the palp and epigyne to decide about the status of this species.

*T. refugus* Drensky, 1929 from Yugoslavia and Romania is another closely related, forgotten species; males have a more elongate conductor in the palp, and females longer, more sinuous ducts in the vulva. The species was recently redescribed by Deltshv (1992).

**Remarks:** Wunderlich's *T. denisi* (1987) is obviously a junior synonym of *hannoniae*. This was decided after comparing material from Belgium with material from Gran Canaria. The type specimens of *T. denisi* were not available.

It seems surprising that despite its wide distribution *T. hannoniae* was only described in 1944. The small *T. lapidicola* Kulczyński, 1887, described from South Tirol, "Eggenthal", is a puzzling species, whose status should be examined.

**Description:** Measurements: Male: total length 1.6–1.7; cephalothorax 0.72–0.76 long, 0.66–0.72 wide. Female: total length 1.6–2.4; cephalothorax 0.62–0.86 long, 0.62–0.84 wide.

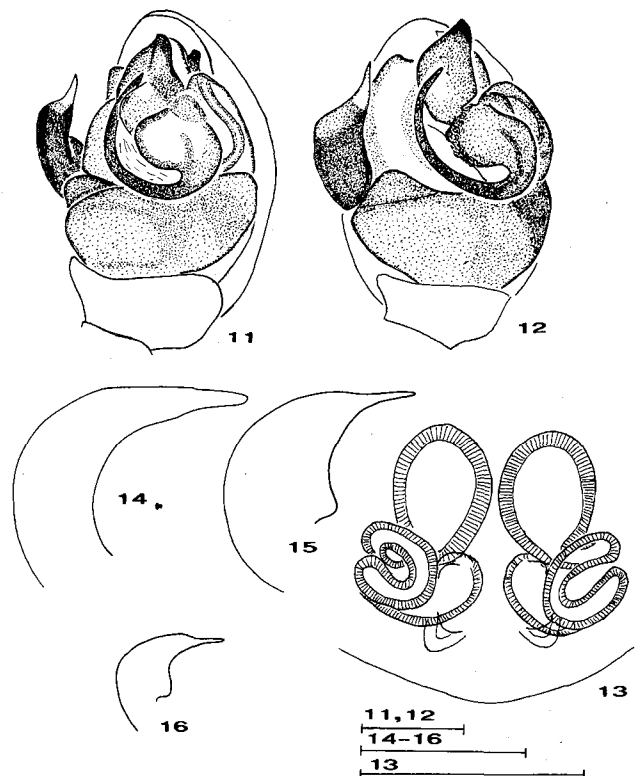
**Colour:** Cephalothorax yellowish brown to dark brown; legs greyish white to yellowish white, all segments clearly annulated; abdomen very variable, in pale specimens grey with clearly defined folium with cream-white spots, in dark specimens dark grey with a series of cream-white spots; venter grey to dark grey with two cream-white spots in front of spinnerets.

**Palp** (Figs. 16–18): Median apophysis strongly developed and heavily sclerotised, but with membranous tip. Conductor elongate, with median depression to receive tip of embolus.

**Epigyne** (Fig. 19): With large, oval median depression, wider than long. Vulva (Figs. 20–22): Spermathecae oval, much larger than median depression, connected by curved ducts to anterolateral corners of depression.

#### *Material examined and citations:*

FRANCE: Alpes maritimes: Menton, 1♀ (MNHNP AR2252, sub *T. pinicola*). Bouches du Rhone: La Crau, 2♀, 6 April 1988 (P. Poot leg.); Graveson, 1♀, 14 April 1989 (P. Poot leg.). Nord: Douchy, 3♂, 2 subadult ♀, among stones (MNHNP AR2837, type series of *T.*

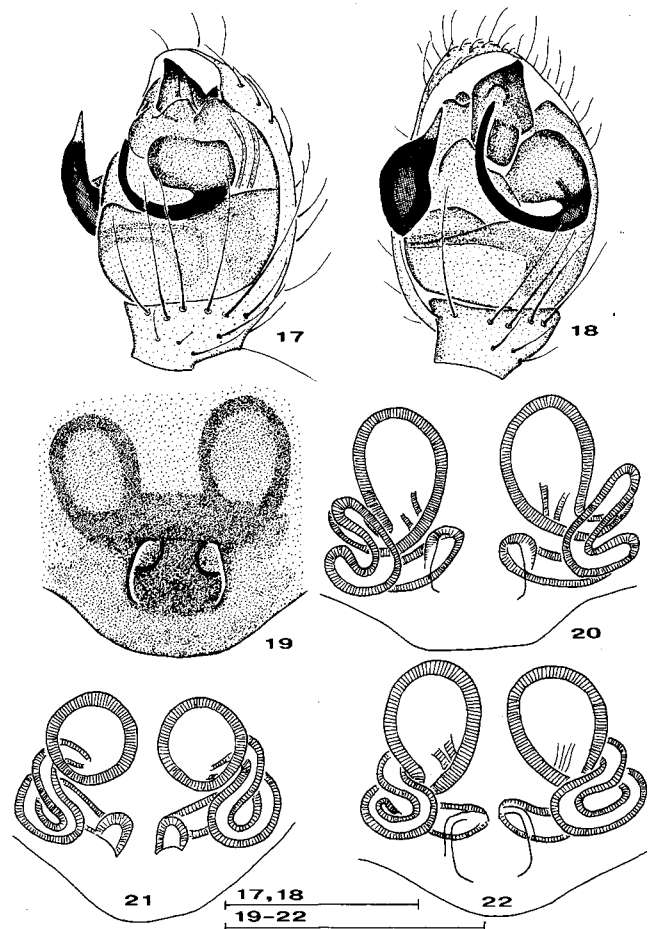


Figs. 11–13: *Theridion pyrenaicum* Denis. **11** Male left palp, retrolateral view; **12** Idem, ventral view; **13** Vulva, ventral view.

Figs. 14–16: Median apophysis of male right palp, prolateral view. **14** *T. petraeum* L. Koch; **15** *T. pyrenaicum* Denis; **16** *T. hannoniae* Denis. Scale lines = 0.2 mm.

*hannoniae*; Denis, 1944); examined. BELGIUM: Antwerpen: Antwerpen-Linkeroever, among stones along river Scheldt: 3♀, 13 October 1985; 3♂ 18♀, 7 August 1986; 2♀ 2 juv., 16 August 1986; 1♀, 24 August 1986 (Vanuytven, 1987). Liège: Aywaille-Remouchamps, carrière de la Falize, 1♀, among stones, 23 July 1990 (Janssen, 1992). Antheit, Corphalie, 2♂, in pitfalls on chalk rocks along river Meuse, June–July 1989 (Baert *et al.*, 1991); idem, 1♂ 1♀, among stones, 2 June 1990 (H. Vanuytven leg.). Namur: Namur, 1♀ 2 juveniles, 16 May 1993, 1♂, 21 May 1993, in abandoned quarry (H. Vanuytven leg.). ITALY: Alto Adige: Güntschna, 1♂, in pitfall (Thaler & Noflatscher, 1989); Mitterburg (Noflatscher, 1991). SPAIN: Alicante: Elche, 90 m, 1♂ 2♀, among stones in palm orchard, 7 August 1991, R. Bosmans leg. Cadiz: Tarifa, 1♀, March 1992 (P. Poot leg.). Gerona: Nuria, Puigmal, Fons de l'Home mort, 1800 m, 1♂ 1♀, among stones, 13 July 1991 (J. Van Keer leg.); Pals, 3♀, 21 December 1986–2 January 1987 (P. Poot leg.). Ibiza: Sta. Eulalia, 1♀, 12 September 1978, 1♀, 28 March 1981 (J. Murphy leg.). Mallorca: Puerto Pollensa, 1♀, 10 April 1975 (J. Murphy leg.). Taragona: Ebro delta, 1♀, 18 June 1987 (P. Poot leg.). PORTUGAL: Algarve: Albufeira, 1♀, 1–9 March 1992 (P. Poot leg.); Tavera, 1♂ 1 subadult ♀, 1♂ 1♀, 15 February 1982 (J. Murphy leg.). ALGERIA: Blida: Chiffa, 250 m, 1♀, among stones along Oued Chiffa, 23 April 1982 (R. Bosmans leg.); Meftah, 900 m, 1♀, in citrus orchard, 2 February 1986 (R. Bosmans leg.). Bordj Bou Arreridj: Sidi Embarek, 900 m, 1♀, among stones in uncultivated fields, 27 February 1990 (R. Bosmans leg.). Boumerdes: Reghaia, 5 m, 1♂, in litter on shore, 6 July 1985 (K. De Smet leg.). Guelma: Hammam Meskoutine, 420 m, 1♀, in grass tussocks around rocks, 2 November 1989 (R. Bosmans leg.). M'sila: 10 km S. Hammam Delaa, 800 m, 1♀, stones along permanent oued, 13 May 1988 (R. Bosmans leg.). Oran: Daiet el Bragat, Sebkhia, 1♀, in dry *Salicornia*, 25 April 1984 (R. Bosmans leg.). Saïda: Between Merdja and Saïda, 850 m, 1♀, among stones in cultivated land, 18 January 1990 (R. Bosmans leg.). Tizi Ouzou: Aïn-el-Hammam, 1150 m, 1♀, among stones around hotel, 9 March 1990 (R. Bosmans leg.). TUNISIA: Beja: Oued Zerga, 300 m, 1♀, in *Olea* orchard, 12 September 1988 (V. Bouters leg.). MACARONESIA: Gran Canaria: Fataga, 1♂ 6♀, among stones (K. Van Keer leg.); Roque Nublo, 1♂ 4♀, among stones (Wunderlich, 1987; holotype and paratypes of *T. denisi*), not examined; Bco de Tirajana, 2♀ 2 juv. (Wunderlich, 1991). Fuerteventura: Betancuria, 2♀, among stones (Wunderlich, 1991). La Gomera: Valle Gran Rey, 1♀, among stones along rivulet (Wunderlich, 1987; paratype of *T. denisi*). Teneriffe: Canadas, 1♀ 1 juv., among stones, Barranco del Inferno, 1♀, among stones (Wunderlich, 1987, paratypes of *T. denisi*). Madeira: 2 km NE Canical, 2♀, among stones (Wunderlich, 1987; paratypes of *T. denisi*).

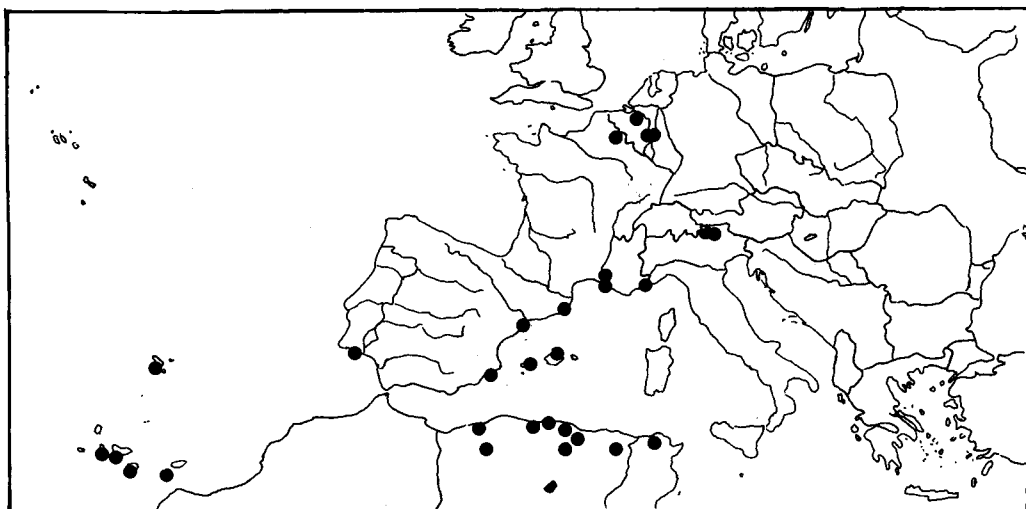
*Examined reference material: T. refugus* Drensky: Romania, Sofia, Wladaya, 1♂ 1♀, June 1916, P. Drensky leg. (Institute of Zoology, Sofia). *T. pyrenaicum* Denis: Andorra: Encamp, Coma de Llops, 2200 m, 1♀, 30 July 1936; Cirque de Pessons, 1 August 1936 (type



Figs. 17–22: *Theridion hannoniae* Denis. 17 Male left palp, retrolateral view; 18 Idem, ventral view; 19 Epigyne, ventral view (Antwerp); 20 Vulva, ventral view (Antwerp); 21 Idem, postero-dorsal view (Antwerp); 22 Idem, ventral view (Elche). Scale lines = 0.2 mm.

series, MNHNP). *T. petraeum* L. Koch: Austria: Palschenkogel, 2200 m, 1♂ 1♀, 1 June 1985, 2♀, June 1982, K. Thaler leg.

*Ecology:* The species has almost always been captured among large stones, where it constructs its very small web in small depressions and irregularities of the stones.



Map 2: Distribution of *Theridion hannoniae* Denis.

The species was first described from France among stones at the base of a colliery spoil heap (Denis, 1944).

In Belgium, it was first collected along the river Scheldt among large stones used to enlarge and fortify the dikes. It was thought that it was imported along with the stones from the southern part of Belgium. Since 1985, after its first discovery, the species has been found on numerous occasions, on the left bank of the river Scheldt from Burcht to Doel and on the right bank from Hoboken to Lillo, for a distance of about 20 km along both sides of the river. It has never been captured more than 500 m away from the river. In this area, the species is very abundant; under one large stone, about 20 individuals (juveniles and adult females mixed) were encountered.

Later, the species was captured in an old quarry in the province of Liège, and was also found on dry chalk rocks, which seems to be the natural habitat of the species in Belgium.

In Antwerp, juveniles and females were found throughout the year, whereas males occur from June to October.

**Distribution:** Widely distributed in mediterranean Europe and Macaronesia, northwards up to Belgium, in the south of Belgium occurring in natural habitats, in the north introduced into man-made habitats (Map 2).

#### Acknowledgements

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