

## Notes on *Xysticus kempeleni* Thorell, 1872 and two closely related spider species (Araneae, Thomisidae)

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**Abstract** — The poorly known crab spider *Xysticus laetus* Thorell, 1875 (Thomisidae) is redescribed and illustrated on the basis of the holotype and new specimens from the eastern Mediterranean. Its distribution within this region is clarified. *Xysticus orientalis* Nosek, 1905 is removed from synonymy with *X. kempeleni* Thorell, 1872 and is considered a junior synonym of *X. laetus*. A new species, *Xysticus abditus* sp.nov. (♂), is described from Bulgaria and Turkey.

**Key words** — *Xysticus*, redescription, new species, Central Europe, the Mediterranean, Minor Asia

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### Introduction

The thomisid fauna of the eastern Mediterranean remains poorly understood, despite recent progress in research on some local faunas. For instance, nearly 40 species of Thomisidae were recognised in Israel and Sinai (Levy, 1985). According to the latest checklist by Topçu *et al.* (2005), the Turkish thomisid fauna consists of at least 56 valid species. A new checklist of the Greek Thomisidae (Bosmans & Chatzaki, 2005) comprises 42 valid species, two of which are treated as endemics. Yet, many species remain known from only one or two localities and/or only from the original descriptions, e.g. *Xysticus apricus* L. Koch, 1876 (♂ from Italy), *X. caucasicus* L. Koch, 1878 (♀ from Georgia), *etc.* The present work deals with a group of three closely related species from the *sabulosus* species group (= *Psammitis*), of which one is new. To date, all of them have been treated as *Xysticus kempeleni* Thorell, 1872 by various authors. Thus, the main purpose of this paper is to provide up-dated and reliable diagnoses for these species and to rectify to some extent their distribution in the eastern Mediterranean. I have not examined all the available material of these species from all possible sources and therefore the western and eastern limits of their distribution need further clarification.

Specimens for this study were borrowed from, or are distributed among the following museum and personal collections: IZBA=Institute of Zoology, Bulgarian Academy of Sciences, Sofia, Bulgaria (Prof. C. Deltchev); LNMCLiverpool Museum, National Museums Liverpool, Liverpool, UK (Mr. G. Night); MBCGMuseo Civico di Scienze Naturali “Enrico Gaffi”, Bergamo, Italy (Dr. P. Pantini); MMUM=Manchester Museum, Manchester, UK (Dr. D.V. Logunov); NHMB=Naturhistorisches Museum, Basel, Switzerland (Dr. A. Hänggi); NHMW=Naturhistori-

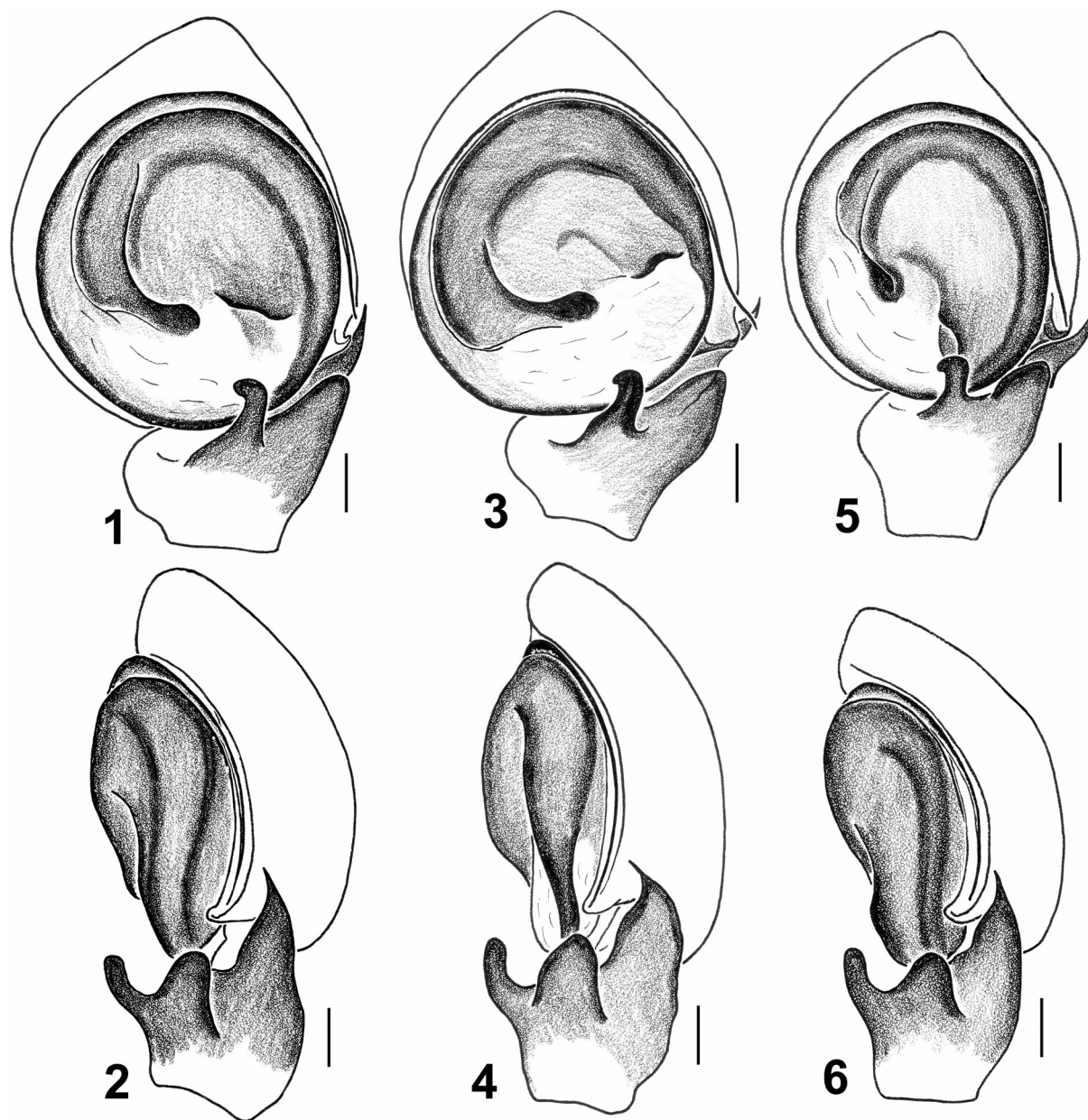
sches Museum, Vienna, Austria (Dr. J. Gruber); NUAM=Arachnology Museum of the Niğ de University, Niğ de, Turkey (Dr. A. Topçu); PCJW=Personal collection of Mr. Jörg Wunderlich (Hirschberg, Germany); PCTB=Personal collection of Mr. Theo Blick (Hummeltal, Germany); PSUN=Zoology Department of the Perm State University, Perm, Russia (Dr. S. L. Esysunin); SMFM=Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (Dr. P. Jäger); SMNH=Swedish Museum of Natural History, Stockholm, Finland (Dr. T. Kronstedt); ZMHU=Zoological Museum of the Helsinki University, Helsinki, Finland (Dr. T. Pajunen); ZMUM=the Zoological Museum of the Moscow State University, Moscow, Russia (Dr. K. G. Mikhailov). The format of the description and the terminology follows Ono (1988). All measurements are in mm.

### Survey of species

*Xysticus abditus* sp. nov.  
(Figs. 3, 4, 7)

*Type material.* The ♂ holotype (SMNH) from Turkey, Niğ de Prov., Çamardı Distr., Maden Vil. (37°49′ 56″N, 34° 58′ 53″E), c. 1439 m a.s.l., 26.05.2002, K. Kunt. — Paratypes: 1♂ (IZBA), Bulgaria, c. 2 km S of Kamenitsa Vil., Struma Valley, pitfall traps, 05.04–09.05.2002, S. Lazarov; 1♂ (IZBA), same locality, 11.08.2002, S. Lazarov; 1♂ (IZBA), Bulgaria, Svilengrad Town, Mezek Vil. (the castle), under stones, c. 240 m a.s.l., 26.04.2002, B. Petrov.

*Etymology.* The specific epithet is derived from the Latin word ‘*abdo*’ (in its derivative form ‘*abditus*’), meaning ‘to hide, to conceal’; the idea referring to the fact that this species has been misidentified with its closely related species, *X. kempeleni* [e.g. the faunistic records from Bulgaria by



**Figs. 1–6** Left male palps of *Xysticus* spp., median (1, 3, 5) and retrolateral (2, 4, 6) views. — 1–2, *X. kempeleni* Thorell 1872, from Austria: Leithagebirge; 3–4, *X. abditus* sp. nov., the holotype; 5–6, *X. laetus* Thorell, 1875, from Greece: Leonidion. Scale: 0.1 mm.

Deltshev *et al.* (2004) and Lazarov (2005)].

**Diagnosis.** This new species is most closely related to the Central European *X. kempeleni* and the Mediterranean *X. laetus*, but the males can be easily distinguished by the position of the tegular ridge, which is at 2 o'clock (as per a clock face) in *X. abditus* sp. nov. (Fig. 3) and at 4 and 6 o'clock in *X. kempeleni* (Fig. 1) and *X. laetus* (Fig. 5) respectively. The new species is also similar to North American *X. punctatus* Keyserling, 1880 (see Dondale & Redner, 1978: Figs. 667–671), but differs from it in the position of tegular ridge and the narrower intermediate tibial apophysis. The female of *X. abditus* sp. nov. remains unknown.

**Distribution.** Known from Bulgaria and Turkey only (Fig. 7), but presumably the species is more widespread.

**Description** (the holotype). Measurements. Carapace: 2.00 long, 2.00 wide. Abdomen: 1.95 long, 1.83 wide. Clypeus 0.17 long, chelicera 0.69 long. Eye sizes and interdistances: MOA-WA 0.46, MOA-WP 0.51, MOA-L 0.37, AME 0.07, ALE 0.12, PME 0.07, PLE 0.09, AME-AME 0.32, AME-ALE 0.12, PME-PME 0.36, PME-PLE 0.34.

Legs measurements:

	Femur	Patella	Tibia	Metatarsus	Tarsus
I	1.85	0.85	1.30	1.35	0.98

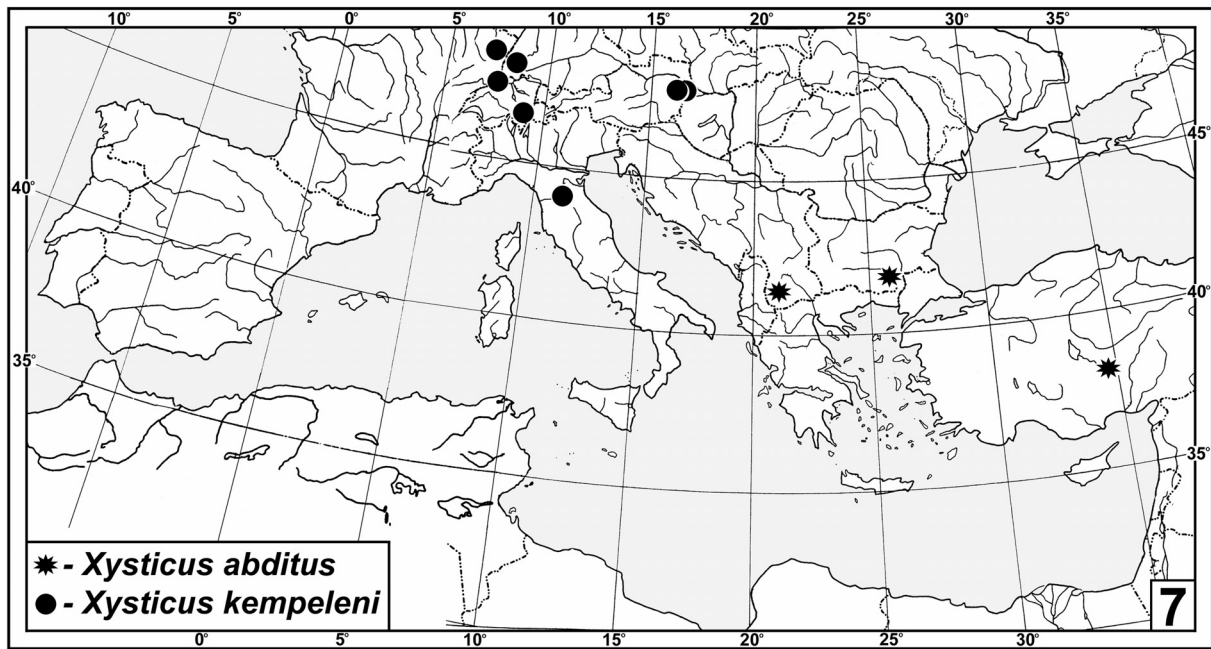


Fig. 7 Distribution of *Xysticus abdutus* sp. nov. (star) and *X. kempeleni* Thorell 1872 (circle). One dot may represent more than one close locality.

II	1.93	0.84	1.35	1.28	0.98
III	1.35	0.58	0.88	0.63	0.58
IV	1.35	0.58	0.91	0.70	0.60

Colour. Carapace dark brown, with a thin V-shaped figure in cephalic region and a white transverse stripe from PLE to PLE across MOA. Sternum, maxilla, labium and chelicerae brownish, with numerous yellowish patches. Abdomen grey of brownish, dorsally with three thin transverse white stripes and a white stripe along the anterior margin. Book-lung covers yellow. Spinnerets brownish. Legs I and II: femora, patellae and tibiae dark brown, metatarsi and tarsi yellow. Legs III and IV spotty (brown+yellow). Spination of leg I: Fm d 0-1-1-1-0, pr 0-1-1, Tb pr and rt 1-1-1, v 0-2-2-2ap, Mt v 2-0-2-2ap. Palps yellow-brown, with dark brown femora and yellowish patches on cymbium. Palpal structure as in Figs. 3, 4.

Female unknown.

*Xysticus kempeleni* Thorell, 1872  
(Figs. 1, 2, 7, 8-12)

*Xysticus kempeleni* Thorell, 1872: 245 (D♂; the ♂ holotype not located and not examined). For a complete list of references see Platnick (2006).

**Material examined.** FRANCE: 1♂1♀ (PCTB), 1♂ (MMUM), Alsace, 03.1995, T. Blick. — AUSTRIA: 1♂ (SMFM, 12134/1; a separate ♂ palp in the same vial with the ♂ of *X. ninni*), Burgenland, Leithagebirge, 18.07.1960, de Lattin; 1♂ (PCJW), Haschberg next to Haschhof in Klosterneuburg, date?, H. Malicky; 1♀ (NHMW, 20.411),

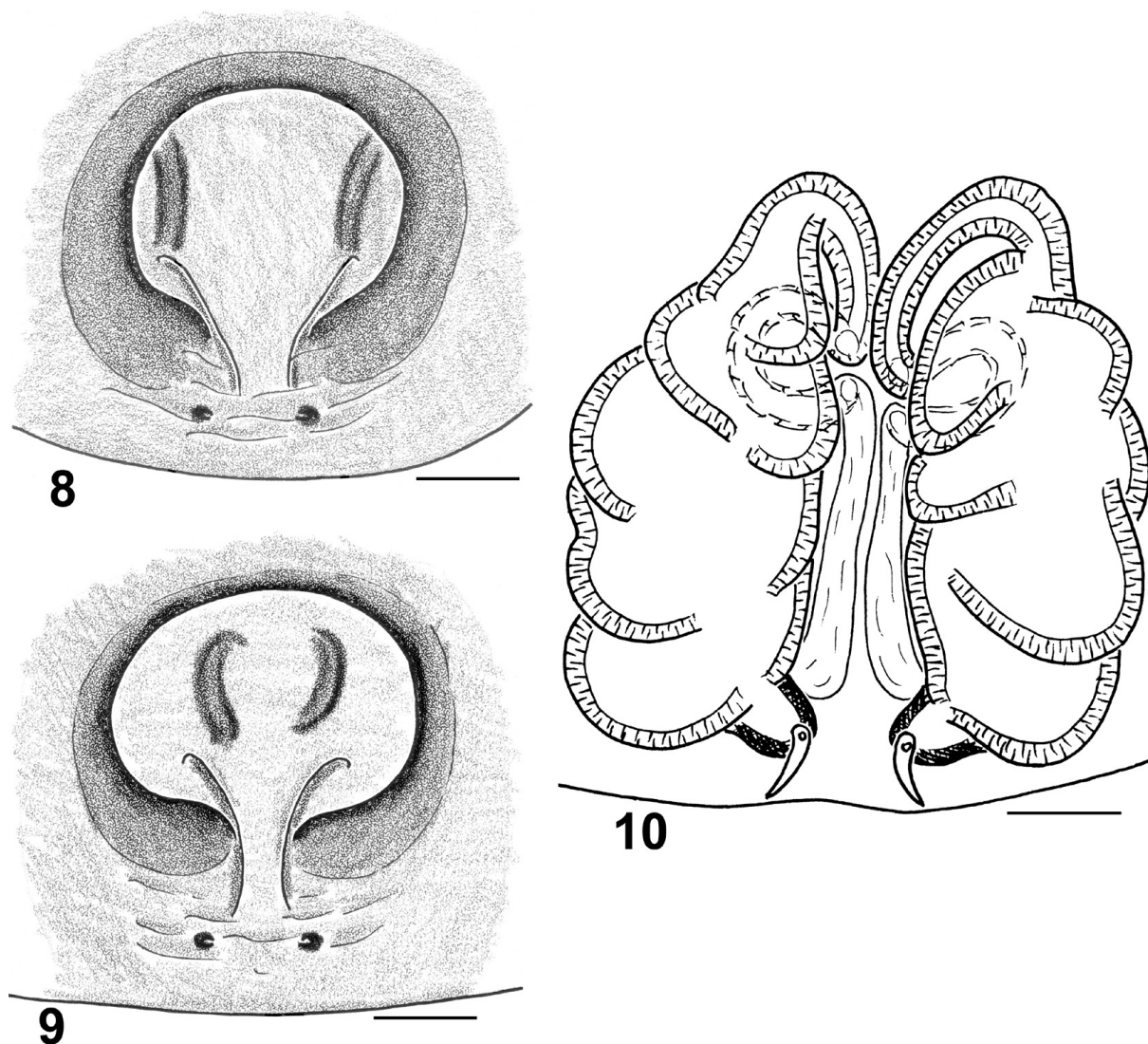
Vienna, Grinzing, E of Friedhof, c. 235 m a.s.l., 12.06.1977, J. Gruber. — GERMANY: 2♂ (PCJW), 'IV - Kaiserstuhl' [SW Germany, the volcanic area 'Kaiserstuhl' near Freiburg]. — SWITZERLAND: 2♂3♀ (NHMB, 434b), vicinities of Basel, Herrenmatt, 1949, ex coll. E. Schenkel; 1♀ (NHMB, 434h), Tessin, Centovalli, Palagnedra, meadow, 14.05.1991, Mawiti; 1♂ (NHMB, 434g), Tessin, Mte. Generoso, Pree, meadow, 23.03.1989, Mawiti. — ITALY: 1♂ palp (SMNH, 199/1124), no exact locality and date, '(Canestrini ded.)' [this specimen was used by Thorell (1875a: p. 132) for the comparison with *X. laetus*]; 1♂ (MBCG), Umbria, Perugia, Sigillo, verso Monte Cucco, c. 850 m a.s.l., 01-06.1992, P. Pantini & M. Valle.

**Diagnosis.** See below comments under 'Diagnosis' of *X. laetus*.

**Comments.** I have been unable to trace and to re-examine the ♂ holotype of *X. kempeleni*, which is not available in the Göteborg Natural History Museum (Sweden), the NHMW, the SMNH or the ZMHU (personal communications of the corresponding curators). Thorell (1872: p. 245-246) described this species based on a single ♂ presumably collected from Austria. Thus, my notion of what is true *X. kempeleni* is based on re-examination of some comparative material from Austria, Germany and Switzerland, including the ♂ palp examined by Thorell himself (see above), as well as on the account published by Roberts (1998).

**Distribution.** Central Europe (Fig. 7; Simon, 1875: sub *Xysticus lineatus*; Bosmans & Janssen, 1982; Roberts, 1998; present data). Helsdingen (2006) reported *X. kempeleni* from at least 20 European countries, including Russia, whereas Canard (2005) described it as occurring throughout





**Figs. 8–10** Female copulatory organs of *X. kempeleni* Thorell 1872 from Austria: Vienna (8, 10) and Switzerland: Basel (9). — 8, 9, epigynes; 10, spermathecae. Scale: 0.1 mm.

Europe, the Mediterranean and the Middle East. Nevertheless, the precise distribution of this rare species should be further clarified. According to the present data, most of the records of *X. kempeleni* from the eastern Mediterranean, the Balkans, Minor Asia and the Crimea (e.g. Kovblyuk, 2003; Bosmans & Chatzaki, 2005; Topçu *et al.*, 2005; *etc.*), of which I have been able to re-examine the pertinent material (see below under ‘Material examined’), should actually be referred to *X. laetus*. Yet, the records of *X. kempeleni* from the western Balkans (Šilhavý, 1944), Lebanon (Assi, 1986), Israel (Levy, 1985), the European part of Russia and Central Asia (see Mikhailov, 1997) need to be further verified through re-examination of the pertinent material. To date, I have been unable to obtain these specimens.

*Xysticus laetus* Thorell, 1875  
(Figs. 5, 6, 13–20)

*X. lestus* Thorell, 1875b: 91 (D♂♀, lapsus; the ♂ syntype in ZMHU; examined).

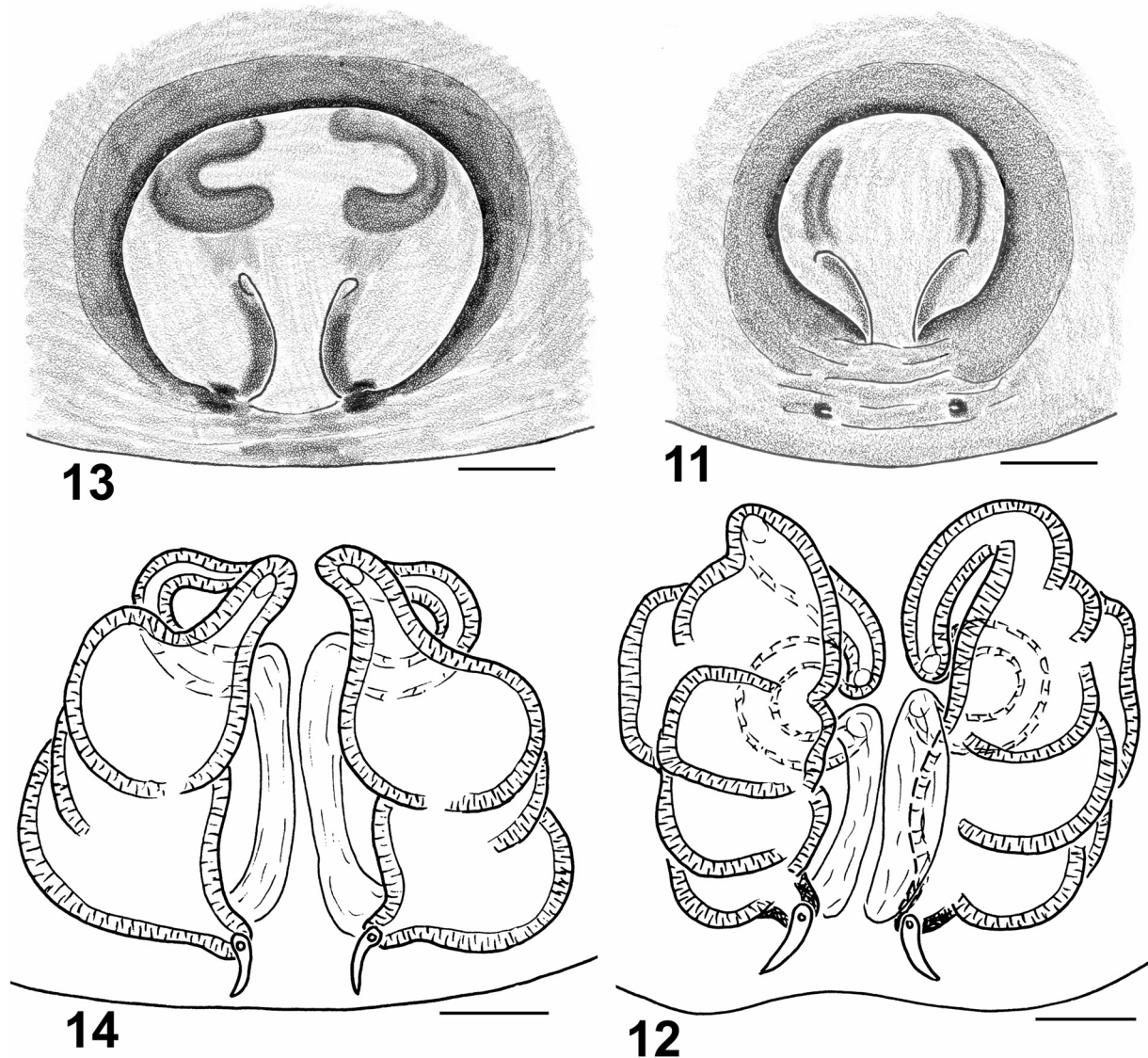
*X. laetus*: Thorell, 1875a: 131 (♂♀).

*Xysticus orientalis* Nosek, 1905: 133, Fig. 13 (D♀; the ♀ holotype in NHMW; examined). **New synonymy.**

*Xysticus kempeleni* (nec Thorell, misidentified): Simon, 1932: p. 834, Fig. 1252.

*Psammitis kempeleni* (nec Thorell, misidentified): Wunderlich, 1995: 759; mistakenly synonymized *X. orientalis* with *X. kempeleni*.

**Type material.** The ♂ and 3 immature syntypes of *X. laetus* (ZMHU, 20.494; the ♂ with both palps detached)



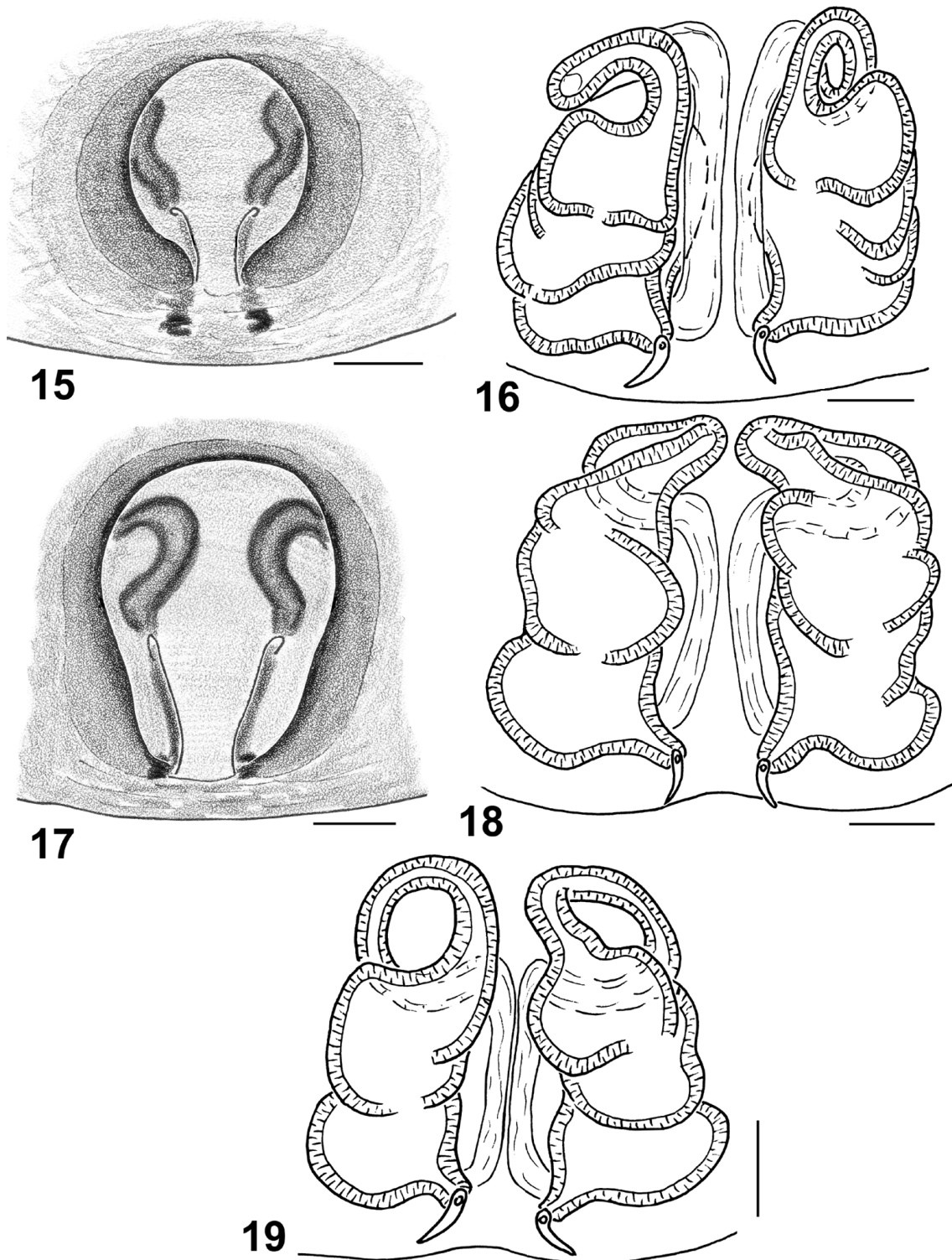
**Figs. 11–14** Female copulatory organs of *X. kempeleni* Thorell 1872 from Switzerland: Basel (11–12) and *X. laetus* Thorell, 1875 from Turkey: Ilgün (the holotype of *X. orientalis* of Nosek, 1905). — 11, 13, epigynes; 12, 14, spermathecae. Scale: 0.1 mm.

from Ukraine, the Crimea, Sudak, 1860 [this ♂ was used by Thorell (1875b: 91) in the original description]. — The ♀ holotype of *X. orientalis* Nosek, 1905 (NHMW, 21.437), from Turkey, 'As. Min.: Ilgün', 9–10.05.1902, A. Penther.

**Material examined.** ITALY: 3♀ (NHMW; det. hitherno as *X. kempeleni*), Calabria, Paganetti-Humler, 1906, Reimoser. — HUNGARY: 6♀ (SMNH, 198/1109a; det. hitherto as *X. kempeleni*), 'Panscovan, (Herman ded.)'. — GREECE: 1♂ (SMFM, 30345; det. hitherno as *X. kempeleni*), Morea, Leonidion, 'Slg. Rower, 1935 (ex RII/6127)'; 1♀ (SMFM, 6131; det. hitherno as *X. kempeleni*), 'Athen, *X. acerbus* (Thor), Rower det. 1935'; 1♀ (SMFM, 39723; det. hitherno as *X. kempeleni*), [Thira?] 'Akrotiri-Ebene', (ex RII/1662); 1♀ (PCJW; det. hitherno as *X. kempeleni*), Crete (no exact locality); 1♀ (LNCM), Lesbos, Mytilini Castle (39°06'49"N, 26°33'54"E), under prostrate, spreading plant by coastal boulder, 24.04.1997, S. Judd; 1♀ (LNCM),

Lesbos, Skala Kallonis (39°12'25"N, 26°13'13"E), behind beach and along river, 23.04.1997, S. Judd; 1♂ (LNCM), Chios, Volissos River (38°28.41'N, 25°56.25'E), 9.04.1999, M. J. Taylor; 1♀ (LNCM), Chios, Kallimasia (38°18'N, 26°07'E), edge of concrete lane below main road 29.04.1997, C. Felton. — CROATIA: 8♀ (NHMW; det. hitherno as *X. kempeleni*), Dalmatia, Castelnuovo, 1903, Reimoser. — BULGARIA: 4♂ (IZBA; det. hitherno as *X. kempeleni*), Balchik Town, Kranevo, 16.06.1995, V. Popov; 1♀ (IZBA; det. hitherno as *X. kempeleni*), Severno-Chernomorie, Kavarna Town, 12.06.1996, V. Popov & I. Kreteva. — TURKEY: 3♀ (MMUM), Nevşehir Prov., Ürgüp Distr. (no exact locality), under stones, 22.06.2005, H. Demir; ♀ (NUAM), Çankırı Prov., Çerkeş Distr., Işık Mt., under stones, 27.07.2005, H. Demir; 1♀ (NUAM), Çankırı Prov., Korgun Distr., Kızılsın Vil., under tree bark, 28.07.2005, H. Demir; 1♀ (NUAM), Konya Prov., Yunak Distr., Beşikli





**Figs. 15–19** Female copulatory organs of *X. laetus* Thorell, 1875 from Iran: Nashtarood-Khoshkadaran (15–16), Turkey: Ürgüp Distr. (17–18) and Azerbaijan: Lenkoran (19). — 15, 17, epigynes; 16, 18–19, spermathecae. Scale: 0.1 mm.

Vil., under stones, 13.05.2005, H. Demir; 1♀ (NUAM), Kır-ikkale Prov., Keskin Distr., Yenyapan Vil., under stones, 21.06.2005, H. Demir; 1♀ (LNMC), Bolu, c. 21 km E of Akçakoca (41°06' 27"N, 31°15' 54"E), sparse mixed weeds

on road slope above snore, wet field with *Juncus* adjacent to stream, 18.05.1994, S. Judd & C. Felton; 1♀ (LNMC), Yozgat (40°01' 43"N, 34°37' 21"E), Bogazkale, Bashkent Motel, grassy hillside, *Populus* copse with *Ranunculus*

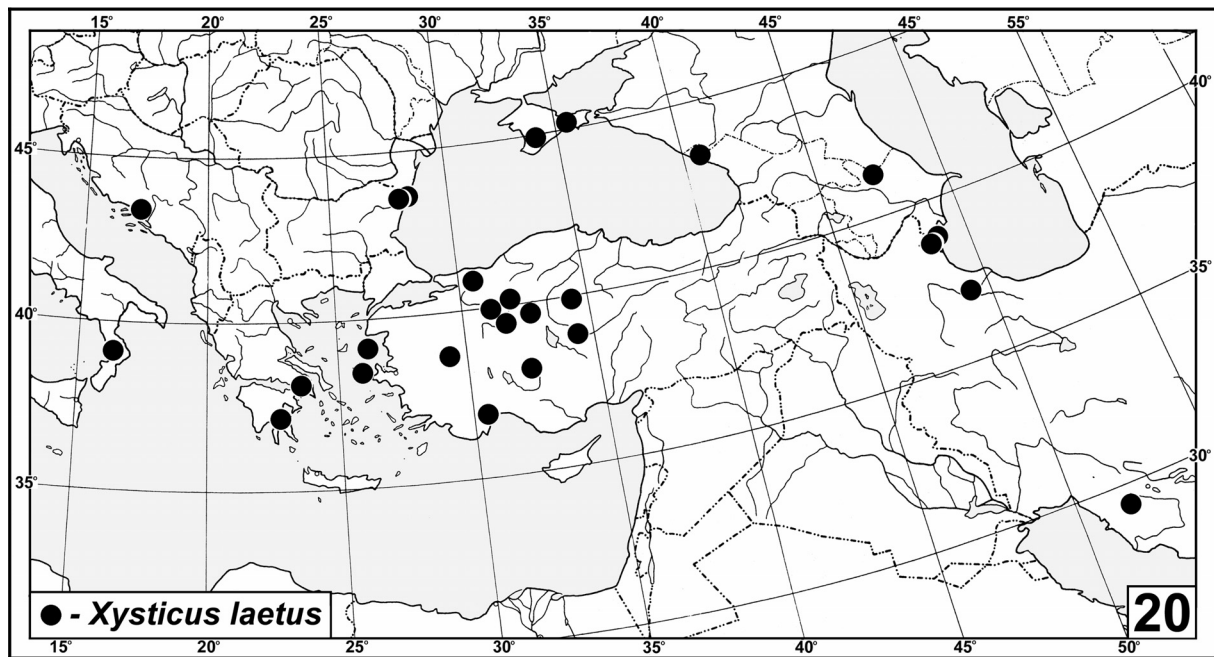


Fig. 20 Distribution of *X. laetus* Thorell, 1875. One dot may represent more than one close locality.

dominant, 14.05.1994, S. Judd & C. Felton; 1♀ (LNCM), Niğde (38°19' 37"N, 34°14' 34"E), ca 33 km E of Aksaray, Selime Bridge, disturbed river bank and herb-rich limestone cliff base, 10.05.1994, S. Judd & C. Felton; 1♀ (LNCM), Antalya, near Imamli, c. 3 km W of Yesiloz, vegetated upper beach next to Cag Motel, 8.06.1993, C. Felton. — UKRAINE: 1♂ (SMNH, 1197), 'Russia, Simferopol (A. v. Nordmann)', [The Crimea; this specimen was examined by Thorell (1875a: 131), who reported the locality as 'Simferopolin Cherson']; 2♂ (ZMUM), the Crimea, Saky Distr., railway station Pribrezhnaya, *Phragmites* community on sand (pitfall traps), 27.03–6.04.2000, M. M. Kovblyuk; 1♂5♀ (SMNH), the Crimea, Sovetski Distr., near Uvarovka, meadow steppe (sweeping), 29.04.1999, M. M. Kovblyuk. — GEORGIA: 1♂ (PSUN, 3534; det. hitherto as *X. kempeleni*), Abkhazia, near Sukhumi, sweeping on grass meadow, 5.05.1958, N. Kuznetsova. — AZERBAIJAN: 1♂ 7♀ (PSUN, 3537; det. hitherto as *X. kempeleni*), Gäncä, on alfalfa cropland, 1932, V. N. Rekach; 1♀ (MMUM), Lenkoran Distr., N of Lenkoran (38°50' N, 48°49' E), c. 20 m a.s.l., seashore bog, 22.05.2003, Yu.M. Marusik; 1♀ (MMUM), same distr., vicinities of Vel Vil. (38°38' N, 48°52' E), 20 m a.s.l., seashore, 22.05.2003, Yu.M. Marusik; 1♂ 5♀ (MMUM), same distr., vicinities of Aurora Vil. (38°40' N, 48°52' E), 20 m a.s.l., 23–28.05.2001, Yu.M. Marusik. — IRAN: 7♀ (SMNH), Mazandaran Prov., Nashtarood-Khoshkadarán (36.750°N, 51.033°E), 9–10.06.2000, Yu.M. Marusik; 9♀ (MMUM), Fars Prov., c. 25 km NE of Shiraz, Zarghan, Aradegan Park (29°47' N, 52°44' E), 25.05.2000, Yu.M. Marusik.

**Diagnosis.** *X. laetus* is very similar to *X. kempeleni* and *X. punctatus* sp. nov., but its males can be easily separated

by the position of tegular ridge (at 6 o'clock, compared to 2 and 4 o'clock in related species; cf. Figs. 5 and 1, 3). The females of *X. laetus* are poorly separable from those of *X. kempeleni*, as females of both species are quite variable, but seem to be distinguishable by the position of the loop formed by the insemination ducts relating to the receptacles (apical in *X. laetus* and median in *X. kempeleni*; cf. Figs. 14, 16, 18, 19 and 10, 12). The most typical females of both species are shown in Figs. 11–14, some variants of both species are shown in Figs. 8–10, 15–19. Males are required to reliably separate both species. Yet, the female of *X. abditus* sp. nov. remains unknown and cannot be diagnosed here.

**Comments.** It is very likely that *Xysticus frater* Herman, 1879 described after a single female from Hungary (Herman, 1879) is actually a junior synonym of *X. laetus* rather than *X. kempeleni*. Although I have not been able to re-examine the ♀ holotype of the latter species, the six females from Hungary I have examined (all of them were donated to T. Thorell by O. Herman, see above) are identical to other material of *X. laetus*.

**Distribution.** The current data support the idea of the eastern Mediterranean distribution of *X. laetus*, which definitely occurs from Italy in the west throughout the Balkans and Minor Asia to the East Caucasus and Iran (Fig. 20). But I am sure that this species is more widespread. For instance, it might occur in France, Spain and Portugal, from where *X. kempeleni* has been reported (Helsdingen, 2006). Reasoning from the original illustration by Simon (1932: Fig. 1252), it is clear that he treated *X. laetus* as *X. kempeleni*, but his earlier record (Simon, 1875: pl. 7, Fig. 12; sub *Xysticus lineatus*) seemed to belong to true *X. kempeleni*. The records from southern regions of European Russia and Central

Asia (see Mikhialov, 1997) may also belong to *X. laetus*, though to date I have been unable to obtain and re-examine the material of *X. kempeleni* from these regions.

**Description** (♂♀ from Azerbaijan: Lenkoran, Aurora). Measurements (♂/♀). Carapace: 1.98/2.70 long, 2.23/2.70 wide. Abdomen: 2.25/3.65 long, 1.68/32.5 wide. Clypeus 0.19/0.25 long, chelicera 0.73/0.95 long. Eye sizes and interdistances: MOA-WA 0.51/0.64, MOA-WP 0.54/0.70, MOA-L 0.43/0.52, AME 0.08/0.09, ALE 0.14/0.14, PME 0.07/0.08, PLE 0.10/0.11, AME-AME 0.36/0.48, AME-ALE 0.19/0.27, PME-PME 0.39/0.51, PME-PLE 0.37/0.47.

Legs measurements:

	Femur	Patella	Tibia	Metatarsus	Tarsus
I	2.93/2.48	1.20/1.15	2.50/1.75	2.75/1.68	1.50/1.00
II	2.85/2.50	1.15/1.15	2.2.5/1.88	2.33/1.60	1.38/0.95
III	1.60/1.63	0.70/0.80	1.05/1.03	0.85/0.85	0.61/0.70
IV	1.65/1.70	0.68/0.83	1.13/1.10	0.93/1.00	0.63/0.75

Colour. Male. Carapace brownish, with white veins and a yellow transverse line from PLE to PLE across MOA; thoracic part with a longitudinal, median, triangular-shaped yellow band. Sternum brownish, with numerous yellow patches. Maxillae and labium yellow-brown. Chelicerae brown, each with a transverse, anterior yellow stripe. Abdomen brown, but dorsum with cream-coloured, thin transverse lines and a cream-coloured stripe along the anterior margin. Book-lung covers and spinnerets brownish. Legs I and II darker: femora brown with yellowish spots, but tarsi entirely yellow. Legs III and IV lighter: spotty (yellow + brown). Spination of leg I: Fm d 1-1-2-2-1-0, Tb pr and rt 1-0-0-1, v 0-2-2-2ap, Mt v 0-2-0-2-2ap. Palps yellow-brown, structure as in Figs. 5, 6.

Female. Colour as in male, but lighter (elsewhere light yellow-brown instead of dark brown), face almost completely yellow, abdomen sandy-coloured. Spination of leg I: Fm d/pr 1-1-1-1-0, Tb v 0-2-2-2ap, Mt v 0-2-2-2-2ap. Palps yellowish brown. Epigyne and spermathecae as in Figs. 13–19.

#### Acknowledgments

I wish to express my deep gratitude to the following colleagues: Theo Blick (Hummeltal, Germany), Christo Deltchev (IZBA), Dr. S. L. Eshunin (PSUN), Ambros Hänggi (NHMB), Jürgen Gruber (NHMW), Peter Jäger (SMFM), Torbjørn Kronestedt (SMNH), Guy Night (LNMC), T. Pajunen (ZMHU), Paolo Pantini (MBCG), Aydın Topçu (NUAM) and Jörg Wunderlich (Hirschberg, Germany), for allowing me access to the collections of their museums or to their private collections. I am also obliged to Christo Deltchev (Sofia, Bulgaria) for his help with the bibliography of the Bulgarian spider fauna. Yuri Marusik (Magadan, Russia) and Torbjørn Kronestedt (Stockholm, Sweden) are thanked for giving access to their unpublished ms on the Thorell types. Finally, many thanks go to an anonymous referee who indicated a number of errors and defects in the typescript. Dave Penney (Manchester, UK) kindly edited the English of the final draft.

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Received May 2 16, 2006 / Accepted August 19, 2006