

Salticidae of Middle Asia. 4. A review of the genus *Euophrys* (*s.str.*) C. L. Koch (Araneae, Salticidae)

Dmitri V. Logunov

Zoological Museum,
Institute for Systematics and Ecology of Animals,
Siberian Division of the Russian Academy of Sciences,
Frunze Street 11, Novosibirsk, 630091, Russia

Summary

Euophrys (*s.str.*) is redefined to include only the members of the former *frontalis* species group (altogether 29 species and 1 subspecies are currently included in the genus). Five species of *Euophrys* (*s.str.*) have been recorded in the Middle Asian salticid fauna, of which three are new to science: *E. kirghizica* sp.n., *E. talassica* sp.n. and *E. turkmenica* sp.n. All reported species are described, figured and diagnosed, with a distribution map for each species.

Introduction

According to Nenilin (1984) only one species of *Euophrys* (*s.str.*), namely *E. frontalis* (Walckenaer, 1802), was reported from Middle Asia. Recently, Wesołowska (1996) has found *E. uralensis* Logunov, Cutler & Marusik, 1993 in SW Kopetdagh, Turkmenistan. I have examined all the material studied by both Nenilin and Wesołowska. Both species occur in Middle Asia (see below).

Additionally, Saveljeva (1970) reported on *E. pictilis* Simon, 1871 from East Kazakhstan Area. So far, nobody has been able to restudy Saveljeva's specimens and hence the occurrence of *E. pictilis* in E. Kazakhstan requires confirmation. At present, *E. pictilis* is known only from central and southern Europe (Prószyński, 1990).

The aims of the present paper are (1) to define the genus *Euophrys* (*s.str.*), and (2) to review all the *Euophrys* species ever reported from Middle Asia. A total of five Middle Asian species are studied, three of them being described as new to science.

Material and methods

The work is based on newly collected material from Middle Asia. Specimens used in this study were borrowed from or are distributed among the following museums and a personal collection: ISE=Zoological Museum of the Institute for Systematics and Ecology of Animals, Novosibirsk, Russia; LON=Natural History Museum, London, England; SMFM=Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. Main, Germany; SVO=personal collection of S. V. Ovtchinnikov, Bishkek, Kirghizstan; ZISP=Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMMU=Zoological Museum of the Moscow State University, Moscow, Russia.

The format of descriptions follows Logunov (1992) and Logunov *et al.* (1993). For the leg spination the system adopted is that used by Ono (1988). The sequence of leg segments in measurement data is as

follows: femur+patella+tibia+metatarsus+tarsus. All measurements are in mm.

Genus *Euophrys* C. L. Koch, 1834

Type species: Aranea frontalis Walckenaer, 1802, by subsequent designation.

Definition: Small to medium size spiders ranging from about 2.8 to 4.9 mm in length. Sexual dimorphism well pronounced. Males usually more colourful than females, especially their legs, clypeus and palpi; legs I usually bear dorsal and ventral fringes of strong hairs/scales (especially on tibiae, patellae and metatarsi); sometimes legs III and IV are also brightly ornamented, e.g. in *Euophrys flavoatra* (Grube, 1861). Females usually yellow to brownish, with typical reticulate colour markings on dorsum; often/always females of different species cannot be separated from each other by their genital structure (for other details see Logunov *et al.*, 1993). *Carapace:* moderately high (Fig. 8), yellow-brown to black, with eye field usually darker; fovea present, as a small elongated impression; eye field transverse-rectangular, with width 1.2–1.4 times larger than length; quadrangle length 42–52% of carapace length. *Clypeus:* vertical and rather low; height 12–42% of AME diameter; colour and shape of transverse bands of hairs/scales, and those on anterior sides of chelicerae, in most cases are of the utmost taxonomic importance for distinguishing species, e.g. cf. Figs. 35, 38, 41. *Chelicerae:* vertical and small, usually a little longer in males; promargin with 2 small teeth, retromargin with 1 tooth (Fig. 10). *Maxillae:* longer than wide; usually with an apical keel-shaped ridge (arrowed in Fig. 9). *Labium:* small, triangular, apex rounded and directed anteriorly. *Sternum:* oval. *Abdomen:* oval, 1.3–1.5 times longer than wide; yellow to black (females usually lighter), with typical reticulate colour markings on dorsum (better expressed in light species); abdomen usually covered with long setae (Fig. 2); males always with an elongate dorsal scutum, but some species, e.g. *E. frontalis*, also have a ventral scutum. *Legs:* moderately short; yellow to black; legs I in males usually bear dorsal and ventral fringes of strong, long hairs/scales (Figs. 25, 30); trichobothrial base as in Fig. 3. *Leg formula:* in both sexes usually IV,III,I,II or IV,I,III,II; sometimes males have first leg longest—I,IV,III,II. *Female palp:* normal shape, without apical claws. *Male palp:* cymbium simple, in some species covered with long hairs of various colours; single tibial apophysis varies in length, but always present (Figs. 7, 19, 24); distal haematodocha well developed (Fig. 4: DH), shaped like *Helix* shell when expanded (see Logunov, 1992: figs. 28–31); course of sperm duct rather complex (Fig. 12); embolus always thin, thread-like and spirally coiled (Figs. 4: E, 6, 18, 23), joined to tegulum by distal haematodocha only (Fig. 4: DH). *Female genitalia:* epigyne simple, weakly sclerotised, with internal structures usually visible through integument; a median septum always present (Fig. 5: MS); copulatory openings always screened by small rounded and heavily sclerotised lids (Figs. 5: L, 14, 21); insemination ducts simple, rather thin and

spirally twisted; spermathecae large and ovoid (Figs. 15, 22).

Diagnosis: Among other congeners of the *Euophryinae* *Euophrys* (*s.str.*) is closest to *Talavera* (*sensu* Logunov, 1992), but can be easily distinguished from it by the following characters: tibial apophysis always present (absent in *Talavera*); embolus thread-like and coiled (thick, straight or hook-shaped in *Talavera*); maxillae with an apical keel-shaped ridge (arrowed in Fig. 9; absent in *Talavera*); median septum in epigyne present (absent in *Talavera*); insemination ducts spirally twisted (straight or slightly curved in *Talavera*); strongly pronounced sexual dimorphism (absent in *Talavera*). According to this diagnosis, the genus *Euophrys* (*s.str.*) is hereafter restricted to the so-called *frontalis* species group only. As stated earlier (Logunov, 1992), the members of the *aequipes* species group belong to *Talavera* (see also above diagnosis), while those of the *erratica* species group should be transferred to *Pseudeuophrys* (Logunov, in preparation). Regarding South American “*Euophrys*” species, at least some of them belong to a new genus (M. E. Galiano, pers. comm.), whereas the others need further examination.

Species included: At present, the following 29 species and 1 subspecies can be safely included in the genus *Euophrys* (*s.str.*): *E. frontalis* (Walckenaer, 1802); *E. acripes* (Simon, 1871); *E. baliola* (Simon, 1871); *E. canariensis* Denis, 1941; *E. dhaulagirica* Žabka, 1980; *E. everestensis* Wanless, 1975; *E. innotata* (Simon, 1868); *E. flavoatra* (Grube, 1861)*; *E. gambosa* (Simon, 1868)*; *E. gambosa mediocris* Simon, 1937; *E. graeca* Bristowe, 1935; *E. herbigrada* (Simon, 1871)*; *E. kirghizica* sp.n.*;

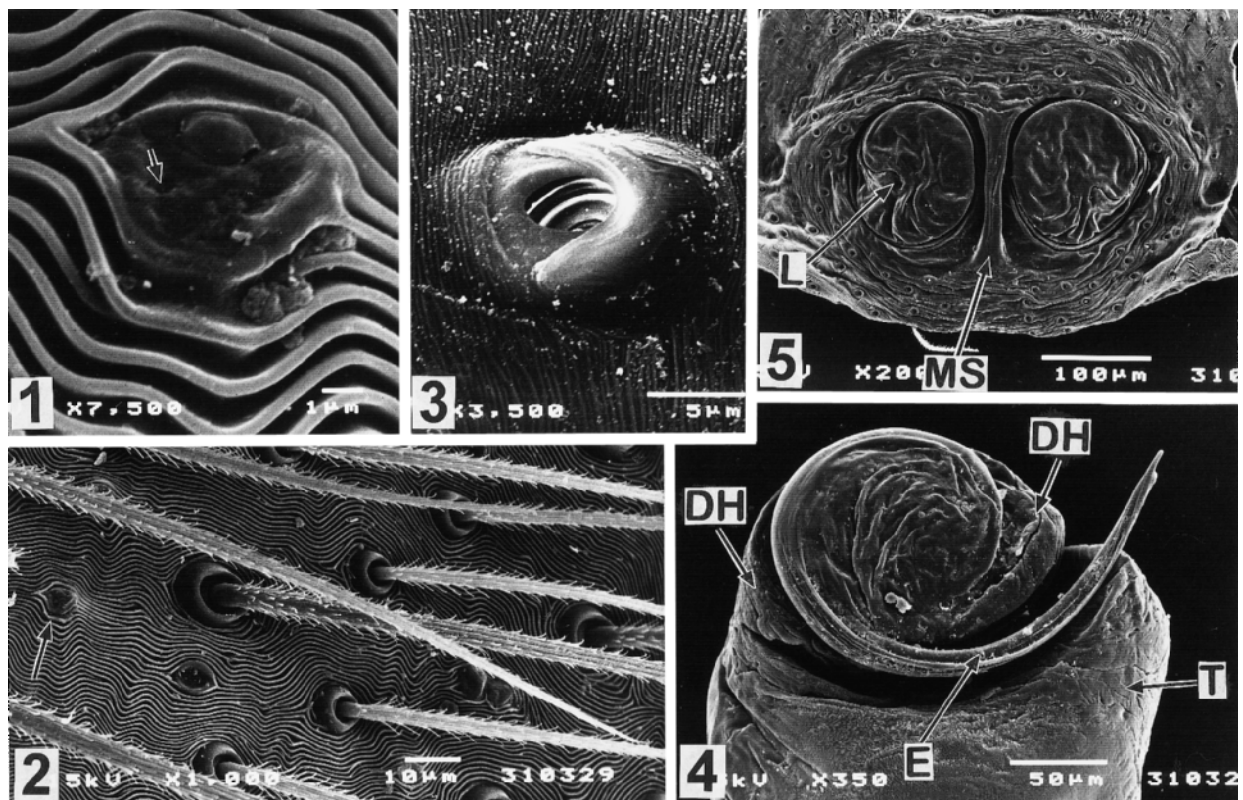
E. luteolineata (Simon, 1871); *E. monadnock* Emerton, 1891*; *E. nepalica* Žabka, 1980; *E. nigratarsis* (Simon, 1868); *E. omnisuperstes* Wanless, 1975; *E. proszynskii* Logunov, Cutler & Marusik, 1993*; *E. pseudogambosa* Strand, 1915*; *E. rufibarbis* (Simon, 1868)*; *E. rufimana* (Simon, 1875); *E. sedula* (Simon, 1875); *E. sulfurea* (L. Koch, 1867)*; *E. terrestris* (Simon, 1871)*; *E. talassica* sp.n.*; *E. turkmenica* sp.n.*; *E. uralensis* Logunov, Cutler & Marusik, 1993*; *E. yulungensis* Žabka, 1980; *E. kataokai* Ikeda, 1996*.

The above listed species marked with an asterisk have been checked or studied by the author (D.L.), while reliable information about other species included was published by Simon (1937), Wanless (1975) and Žabka (1980).

Distribution: *Euophrys* (*s.str.*) seems to be chiefly restricted to the Palaearctic region, but single species are known from the Nearctic, Oriental and Afrotropical regions as well (primarily from the areas neighbouring the Palaearctic).

Euophrys frontalis (Walckenaer, 1802) (Figs. 1–16)

Material examined: **Black form:** KIRGHIZSTAN: 1♂ 2♀ (ISE), Osh Area, Naukatskiy Distr., Kirghiz-Ata Canyon, Karagoi natural boundary, 2600 m, 11 June 1985 (A. A. Zyuzin); 2♀ (ZMMU), same locality, July 1986 (A. A. Zyuzin); 1♂ 1♀ (ZISP); Kirova forestry, 1200 m, 1 June 1981 (S. L. Zonshtein); 1♂ (ZMMU), Dzhahal-Abad Area, Sary-Chelek Reservation, env. of Arkit, 29 May 1993 (S. V. Ovtchinnikov); 2♂ (ISE), same locality, 1900 m, 18 August 1992 (A. A. Zyuzin & A. A. Feodorov); 1♂ (ZISP), Issyk-Kul Distr., summer 1977 (S. L. Zonshtein); 1♂ (ISE), Kirghizskiy Mt. Range, Oktorgai massif, Orlovka, 16 June 1992 (S. V. Ovtchinnikov); 1♂ 1♀ (ZISP), Uzun-Akhmat River, 4 June 1995 (S. V. Ovtchinnikov); 2♂ (ZMMU),



Figs. 1–5: Genital and somatic characters of *Euophrys frontalis* (Walckenaer, 1802) (specimens from Finland). **1** Abdominal skin pore; **2** Abdominal skin, anterior part of dorsum, setae and pore (arrowed); **3** Trichobothrial base; **4** Embolar division of bulb; **5** Epigyne. Abbreviations: L=lid, MS=median septum, DH=distal haematodocha, E=embolus, T=tegulum.

Kara-Balta Town, W of Bishkek, 25 May 1995 (S. V. Ovtchinnikov); 1♂ (ISE), Kyzyl-Ungur [=Kyzylunkjur], 10 June 1995 (S. V. Ovtchinnikov); 2♀ (ISE), Transalai Mt. Range, c. 20 km W of Danart-Kurgan, 9 July 1995 (S. V. Ovtchinnikov); 1♀ (ISE), same range, Chonbiliuli River, 28 July 1986 (S. V. Ovtchinnikov); 1♀ (ZISP), same range, Molo Stand, 3100 m, 15 July 1983 (S. V. Ovtchinnikov); 1♀ (ZMMU), Kungei Alaa-Too Mt. Range, Chon-Urjukty River canyon, 2000 m, 8 July 1983 (S. V. Ovtchinnikov); 1♀ (ISE), Atbashinskiy Mt. Range, Bosoto Stand, 27 July 1987 (S. V. Ovtchinnikov). KAZAKHSTAN: 1♂ (ISE) Almaty Area, c. 10 km N of Otar, summer 1989 (C. K. Tarabayev & M. Zarko); 2♂ 1♀ (ISE), same area, Dzhambul'skiy Distr., 80–95 km NW of Uzunagach, Aktau Mts., 17 May 1992 (A. A. Feodorov & A. A. Zyuzin). TURKMENISTAN: 2♂ (ZISP), C. Kopetdagh Mts., Germab, June 1982 (G. T. Kuznetsov).

Light (yellow) form: KIRGHIZSTAN: 1♂ 3♀ (ISE), Kirghizskiy Mt. Range, c. 20 km S of Bishkek, Malinovoje Canyon, 28 July 1984 (S. V. Ovtchinnikov); 1♂ 4♀ (SVO), Chu River Valley, Dzhanghi-Pakhta natural boundary, 10 June 1986 (S. V. Ovtchinnikov); 1♂ (ZMMU), same locality, 20 July 1985 (S. V. Ovtchinnikov). TURKMENISTAN: 1♂ (ZISP), SW Kopetdagh Mts., Khasar Mt., scree, 8 May 1982 (V. Y. Fet); 1♀ (ZISP), same locality, Kara-Kala, Parkhai, 26 April 1987 (T. Pavlenko). IRAN: 1♂ (SMFM), "Elburs-Geb., Masandaran, 25 km südl. Amol westl. Seidental des Heraz", 490–560 m, 29 June 1978 (Martens & Pieper).

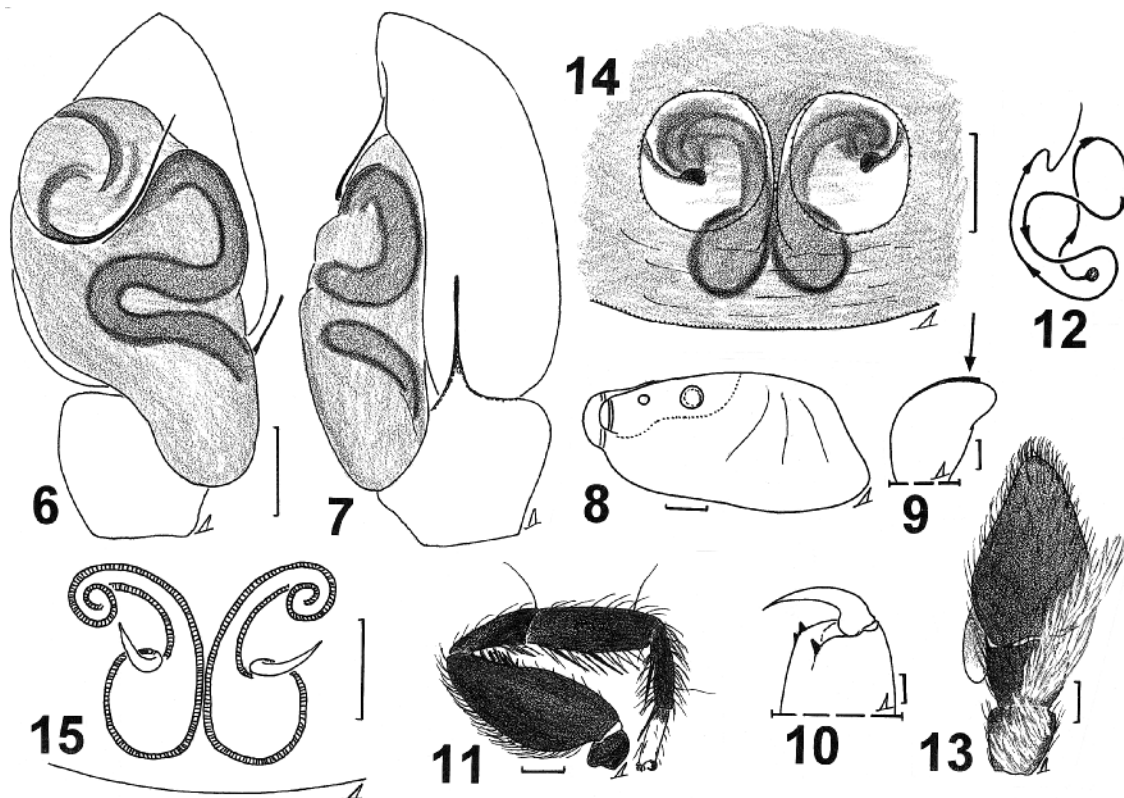
Comparative material: Numerous specimens from the Caucasus, as well as from different regions of Russia (see Logunov *et al.*, 1993).

Diagnosis: *E. frontalis* differs from all other known species by the presence of conspicuous dorsal tufts of white hairs on the male palp (Fig. 13). Two distinct colour forms of *E. frontalis* have been found in Middle Asia (for distinguishing characters between them see Table 1). At first glance it would seem that there are two separate species involved, especially considering that the

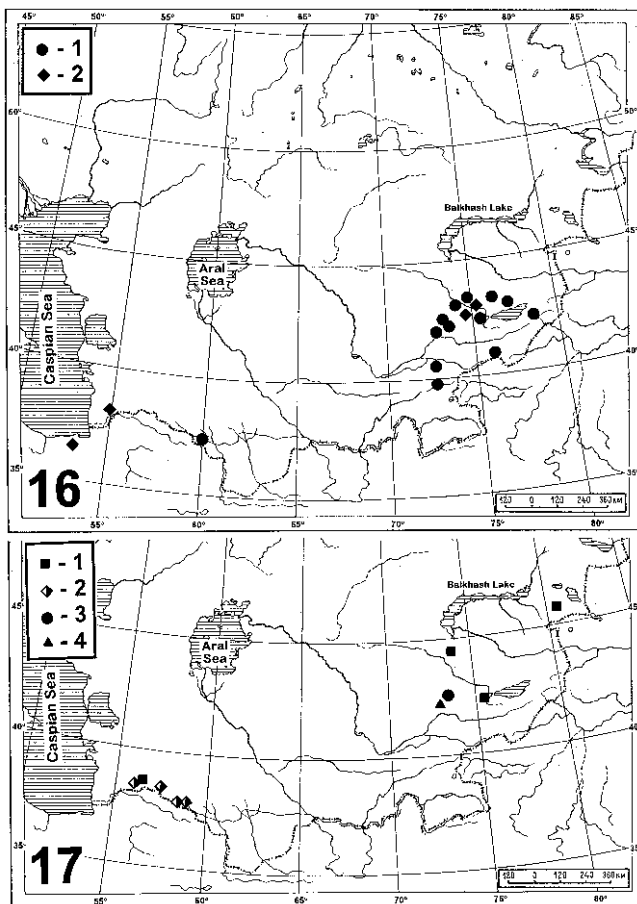
black form is practically restricted to Kirghizstan (Fig. 16) and that *E. frontalis* shows, at least in Siberia, a very low degree of variability in coloration (Logunov *et al.*, 1993). However, the yellow form has also been found in Kirghizstan. Moreover some specimens from both Middle Asia and the Caucasus were found to be somewhat intermediate between the two colour forms and could not be clearly referred to either of them. Therefore, currently I prefer to consider both forms as colour variations of the same species, until more conclusive evidence becomes available.

Distribution: Trans-Palaeartic species. All the Middle Asian localities (separately for black and yellow forms) are shown in Fig. 16.

Description: **Male** (from Osh, Dzhahal-Abad and Issyk-Kul, Kirghizstan, $n=6$): Carapace 1.65–2.00 long, 1.10–1.43 wide, 0.83–0.90 high at PLE. Ocular area 0.75–0.85 long, 1.04–1.20 wide anteriorly and 1.03–1.23 wide posteriorly. Diameter of AME 0.35–0.40. Abdomen 1.55–1.82 long, 1.03–1.25 wide. Cheliceral length 0.48–0.55. Clypeal height 0.10–0.13. Length of leg segments: I 0.90–1.20+0.50–0.60+0.55–0.75+0.48–0.53+0.35–0.40; II 0.83–1.03+0.50–0.63+0.40–0.63+0.35–0.40+0.30–0.38; III 0.90–1.10+0.40–0.53+0.50–0.64+0.53–0.70+0.35–0.38; IV 1.03–1.28+0.45–0.50+0.73–0.90+0.75–0.95+0.48–0.50. Leg spination: I: Fm d 0-1-1-2ap; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-2; Tb pr 0-1, v 1-1-2ap; Mt v 2-2ap. III: Fm d 0-1-1-1, pr 0-0-1-1; Pt rt 0-1-0; Tb pr 1-1, rt 1-1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 1-1-1; Pt rt 0-1-0; Tb pr and rt 1-1-1, v 1-2ap; Mt pr and rt 1-1-2ap, v 1-0-2ap.



Figs. 6–15: Genital and somatic characters of *Euophrys frontalis* (Walckenaer, 1802) (black form, specimens from Kirghizstan). 6 Male palp, ventral view; 7 Ditto, retrolateral view; 8 Male carapace, lateral view; 9 Male maxilla, ventral view, apical keel-shaped ridge arrowed; 10 Male chelicera, posterior view; 11 Male leg I, lateral view; 12 Schematic course of seminal duct; 13 Male palp, dorsal view; 14 Epigyne; 15 Spermathecae. Scale lines=0.1 mm (6–10, 12–15), 0.25 mm (11).



Figs. 16–17: Middle Asian localities of the *Euophrys* species. **16** *E. frontalis* (1=black form, 2=yellow form); **17** *E. uralensis* (1), *E. turkmenica* (2), *E. talassica* (3), *E. kirghizica* (4).

Coloration of black form (coloration of yellow form see Logunov *et al.*, 1993): Carapace brown to dark brown, with black around eyes. Eyes of row I surrounded by dark scales. Clypeus dark brown, hairless. Sternum and chelicerae dark brown. Maxillae and labium dark brown with yellow apex. Abdomen dark grey-brown. Both dorsal and ventral scuta present. Book-lung covers brown-yellow. Spinnerets dark brown. All legs dark brown, but tarsi I and II yellow completely or in their

distal halves. Leg I as in Fig. 11. Palpus dark brown, with yellowish bulbous. Palpal cymbium, patella and tibia covered with tufts of long white hairs (Fig. 13). Palpal structure as in Figs. 4, 6, 7.

Female (from Kirova sovkhos, Kirghizstan, $n=1$): Carapace 1.85 long, 1.25 wide, 0.95 high at PLE. Ocular area 0.85 long, 1.11 wide anteriorly and 1.18 wide posteriorly. Diameter of AME 0.35. Abdomen 2.63 long, 1.90 wide. Cheliceral length 0.55. Clypeal height 0.13. Length of leg segments: I 1.08+0.59+0.65+0.48+0.40; II 0.95+0.50+0.51+0.43+0.38; III 1.03+0.45+0.60+0.63+0.43; IV 1.25+0.54+0.93+1.08+0.48. Leg spination: I: Fm d 0-1-1-2; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-2; Tb pr 0-1, v 1-1-2ap; Mt v 2-2ap. III: Fm d 0-1-1-1, pr 0-0-1-1; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-1; Tb pr 1-1-1, v 1-2ap; Mt pr and rt 1-1ap, v 2-2ap. Coloration: Carapace brownish yellow, with dark brown eye field and black around eyes. Eyes of row I surrounded by white scales. Clypeus yellow, hairless. Sternum, maxillae, labium and chelicerae yellow. Abdomen yellow, with typical brown reticulate colour markings. Book-lung covers and spinnerets yellow-brown. All legs yellow. Epigyne and spermathecae as in Figs. 14, 15.

Euophrys kirghizica, sp.n. (Figs. 17–22)

Types: Holotype ♂ (ISE) Kirghizstan, Dzhahal-Abad Area, Sary-Chelek Reservation, c. 4 km W of Arkit, Tuman'yak River, 20 June 1992 (A. A. Zyuzin & A. A. Feodorov). Paratypes: 1♂ 1♀ (ZMMU), same reservation, Aflatun River, Batrakhly Canyon, 1300 m, 28 July 1983 (K. Mikhailov).

Etymology: The specific epithet refers to the type locality.

Diagnosis: Among the Middle Asian congeners of *Euophrys* this species is most similar to *E. turkmenica* sp.n. and *E. talassica* sp.n. Distinguishing characters from the former species are given in Table 2. From *E. talassica* it can be separated by absence of the bulge on the tegulum (cf. Figs. 18 and 23), absence of the ventral

<i>E. frontalis</i> (black form)	<i>E. frontalis</i> (yellow form)	<i>E. herbigrada</i>
1. Tufts of white hairs on cymbium present.	Tufts of white hairs on cymbium present.	Tufts of white hairs on cymbium absent.
2. Male palp brownish, with dark brown femur.	Male palp yellow-brown, with brown femur.	Male palp completely yellow to white, with femur brown (basally)+yellow (apically).
3. Tibial apophysis relatively long (Fig. 7).	Tibial apophysis relatively long (see Logunov <i>et al.</i> , 1993: fig. 10B).	Tibial apophysis relatively short (see Roberts, 1995: 146).
4. Band of white squamose hairs on clypeus absent.	Band of white squamose hairs on clypeus absent.	Band of white squamose hairs on clypeus present.
5. Dark scales around AME.	Red scales around AME.	White scales around AME.
6. Sternum, maxillae and labium dark brown.	Sternum, maxillae and labium yellow.	Sternum, maxillae and labium brown.
7. Leg I dark brown, but yellow tarsi; dense ventral fringe of hairs on tibia present.	Leg I brownish-yellow, ventral fringe of hairs on tibia absent.	Leg I dark brown, but yellow tarsi; dense ventral fringe of hairs on tibia present.
8. Leg II brown, but yellow tarsi.	Leg II yellow, with all segments but tarsi with dark brown ventral stripes.	Leg II brown, but yellow tarsi, with patellae, tibiae and metatarsi yellowish dorsally.
9. Legs III, IV completely brown.	Legs III, IV completely yellow.	Legs III, IV brown, but yellow tarsi.
10. Ventral scutum present.	Ventral scutum present.	Ventral scutum absent.

Table 1: Differences between males of black and yellow forms of *E. frontalis* and *E. herbigrada*.

fringe on leg I (cf. Figs. 20 and 25) and the abdominal coloration (grey or with reticulate markings in *E. kirghizica*, with a dorsal stripe in *E. talassica* as in Fig. 26).

Distribution: The type locality only (Fig. 17).

Description: *Male* (paratype): Carapace 1.75 long, 1.20 wide, 0.75 high at PLE. Ocular area 0.88 long, 1.15 wide anteriorly and 1.08 wide posteriorly. Diameter of AME 0.35. Abdomen 1.78 long, 1.25 wide. Cheliceral length 0.50. Clypeal height 0.08. Length of leg segments: I 1.05+0.58+0.63+0.53+0.38; II 0.95+0.53+0.53+0.50+0.30; III 1.03+0.43+0.63+0.63+0.43; IV 1.15+0.53+0.80+0.83+0.33. Leg spination: I: Fm d 0-1-1-2; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-2; Tb pr 0-1, v 1-2-2ap; Mt v 2-2ap. III: Fm d 0-1-2-2; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-3; Tb pr and rt 1-1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. Coloration: Carapace lustrous yellow-brown, with black around eyes. Eyes of row I surrounded by white hairs. Clypeus lustrous yellow-brown, hairless. Sternum yellow, tinged with brown. Maxillae, labium and chelicerae yellowish brown. Abdomen dark grey, only dorsal elongate scutum present. Book-lung covers yellow, tinged with brown. Spinnerets dark grey. All legs lustrous brownish, but coxae and tarsi I yellow. Palp brownish yellow. Cymbium uniformly covered with light hairs. Palpal structure as in Figs. 18, 19.

Female (paratype): Carapace 2.08 long, 1.35 wide, 0.93 high at PLE. Ocular area 1.04 long, 1.30 wide anteriorly and 1.33 wide posteriorly. Diameter of AME 0.38. Abdomen 2.78 long, 2.13 wide. Cheliceral length 0.60. Clypeal height 0.15. Length of leg segments:

I 1.13+0.55+0.68+0.40+0.38; II 1.30+0.58+0.55+0.40+0.38; III 1.20+0.58+0.58+0.68+0.38; IV 1.38+0.58+0.98+0.98+0.50. Leg spination: I: Fm d 0-1-1-1; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-1; Tb pr 0-1, v 1-1-2ap; Mt v 2-2ap. III: Fm d 0-1-1-1; Tb pr and rt 0-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-1; Tb pr and rt 0-1-1, v 1-0-2ap; Mt pr and rt 1-1-2ap, v 1-0-2ap. Coloration: Carapace lustrous yellowish brown, with black around eyes. Clypeus yellowish brown, sparsely covered with light hairs. Sternum, maxillae, labium and chelicerae brownish yellow. Abdomen yellow, with typical brown reticulate colour markings. Book-lung covers, spinnerets, palps and all legs yellow, but tinged with brown. Epigyne and spermathecae as in Figs. 21, 22.

Euophrys talassica, sp.n. (Figs. 17, 23–26)

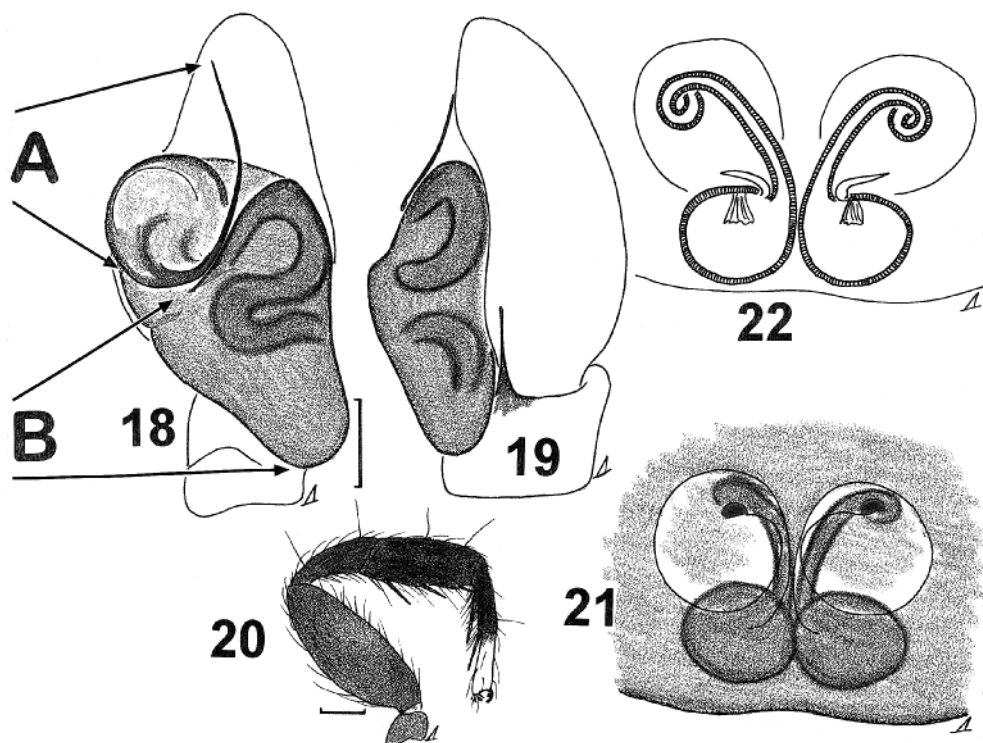
Types: Holotype ♂ (ISE), Kirghizstan, Talasskiy Mt. Range, pass on Besh-Tam, 16 August 1986 (S. V. Ovtchinnikov). Paratype: 1♀ (ISE), together with holotype.

Etymology: The specific epithet refers to the type locality.

Diagnosis: *E. talassica* differs from all other species of *Euophrys* known to me by having a bulge on the tegulum (arrowed in Fig. 23: B) and unusual dorsal abdominal colour markings in both sexes (Fig. 26).

Distribution: The type locality only (Fig. 17).

Description: *Male* (holotype): Carapace 1.95 long, 1.30 wide, 0.85 high at PLE. Ocular area 0.85 long, 1.23 wide anteriorly and 1.13 wide posteriorly. Diameter of



Figs. 18–22: *Euophrys kirghizica*, sp.n. **18** Male palp, ventral view; **19** Ditto, retrolateral view; **20** Male leg I, lateral view; **21** Epigyne; **22** Spermathecae. Scale lines=0.1 mm (18–19, 21–22), 0.25 mm (20). A/B ratio=length of embolus relative to length of tegulum (see Table 2).

<i>E. kirghizica</i>	<i>E. turkmenica</i>	<i>E. frontalis</i> (black form)
1. Tufts of white hairs on cymbium absent.	Tufts of white hairs on cymbium absent.	Tufts of white hairs on cymbium present (Fig. 13).
2. Embolus larger (relative to tegulum length), i.e. A/B ratio almost equal to 1 (Fig. 18).	Embolus smaller (relative to tegulum length), i.e. A/B ratio significantly less than 1 (Figs. 27, 28).	Embolus smaller (relative to tegulum length), i.e. A/B ratio significantly less than 1.
3. Coxae yellow.	Coxae brown to black.	Coxae brown to black.
4. Tarsi I yellow.	Tarsi I black.	Tarsi I yellow.
5. Ventral scutum absent.	Ventral scutum absent.	Ventral scutum present.

Table 2: Differences between males of *E. kirghizica*, *E. turkmenica* and *E. frontalis* (black form).

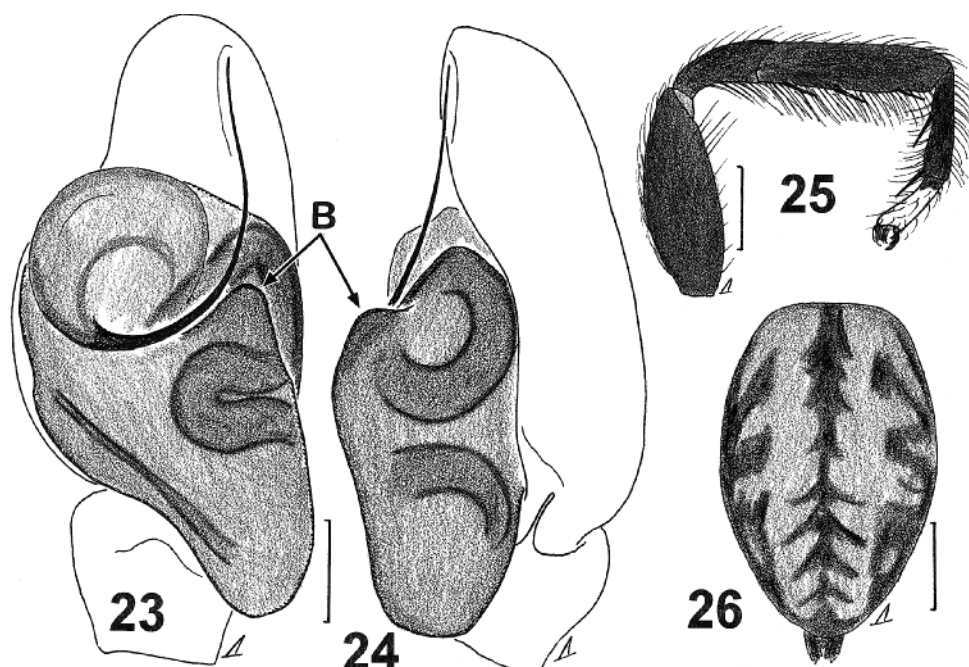
AME 0.38. Abdomen 1.90 long, 1.35 wide. Cheliceral length 0.63. Clypeal height 0.10. Length of leg segments: I 1.28+0.65+0.98+0.60+0.45; II 1.10+0.65+0.70+0.55+0.40; III 1.10+0.53+0.70+0.63+0.45; IV 1.18+0.55+0.90+0.80+0.50. Leg spination: I: Fm d 0-1-1-2; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-2; Tb pr 0-1, v 1-2-2ap; Mt v 2-2ap. III: Fm d 0-1-1-3; Tb pr 0-1, rt 1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-1; Pt rt 0-1-0; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-1-2ap, v 1-2ap. Coloration: Carapace yellowish brown, sparsely covered with white hairs. Eye field brown, with black around eyes. Eyes of row I surrounded by white hairs. Clypeus brownish yellow, covered with long white hairs which overhang chelicerae. Sternum and chelicerae yellowish brown, maxillae and labium same colour, but with white apices. Abdomen: dorsum yellow, with colour markings as in Fig. 26; sides and venter grey. Book-lung covers yellowish. Spinnerets grey. All legs light brown, but coxae yellowish and all tarsi yellow but brown basally. Palp light brown with cymbial apex yellow. Cymbium uniformly covered with light and dark hairs. Palpal structure as in Figs. 23, 24.

Female (paratype): Carapace 1.78 long, 1.25 wide, 0.73 high at PLE. Ocular area 0.93 long, 1.23 wide anteriorly and 1.14 wide posteriorly. Diameter of AME

0.41. Abdomen 2.13 long, 1.50 wide. Cheliceral length 0.35. Clypeal height 0.05. Length of leg segments: I 0.98+0.53+0.70+0.50+0.34; II 0.90+0.54+0.53+0.45+0.30; III 0.95+0.53+0.58+0.58+0.38; IV 1.15+0.58+0.85+0.83+0.45. Leg spination: I: Fm d 0-1-1-2; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-2; Tb pr 0-1, v 1-2-2ap; Mt v 2-2ap. III: Fm d 0-1-1-2; Tb pr and rt 0-1, v 1-2ap; Mt pr and rt 2ap, v 1-2ap. IV: Fm d 0-1-1-1; Pt rt 0-1-0; Tb pr and rt 0-1, v 1-2ap; Mt pr 2ap, rt and v 1-2ap. Coloration as in male, but lighter (yellow colour predominates). Chelicerae and all legs yellow, the latter scarcely tinged with brown. Epigyne and spermatheca structures are not shown, because this female was obtained by me without the genitalia, which seemed to have been lost during an earlier study.

Euophrys turkmenica, sp.n. (Figs. 17, 27–32)

Types: Holotype ♂ (ISE), Turkmenistan, SW Kopetdagh Mts., Kara-Kala, Parkhai, 27–29 March 1993 (D. V. Logunov). Paratypes: 8♂ (ISE), 6♂ (ZMMU), together with holotype, 27–29 March 1993 (S. V. Ovtchinnikov & D. V. Logunov); same locality, 27 April 1987 (A. A. Zyuzin); 2♂ 1♀ (ZISP), same distr., Eldere, 28 May–1 June 1982 (N. S. Ustinova & B. P. Zakharov); 2♂ (SVO), C. Kopetdagh Mts., Bakharden,



Figs. 23–26: *Euophrys talassica*, sp.n. (holotype). 23 Male palp, ventral view; 24 Ditto, retrolateral view; 25 Male leg I, lateral view; 26 Male abdomen, dorsal view. Scale lines=0.1 mm (23, 24), 0.5 mm (25, 26). Abbreviation: B=bulge of tegulum.

4 May 1993 (S. V. Ovtchinnikov); 6♂ (ISE), 1♂ (ZMMU), same massif, Firyuza, 4 May 1987 (V. V. Dubatolov); 1♂ (ZISP), same locality, 4–5 April 1991 (V. V. Dubatolov); 2♂ (ZMMU), same massif, c. 20 km S of Geok-Tepe, Dushak Mt., 2400–2500 m, 19 April 1989 (K. G. Mikhailov); 1♂ (ISE), c. 12 km SW of Annau, Kalininskiy Reserve, 23–25 April 1988 (A. V. Barkalov); 8♂ 1♀ (ISE), same locality, 1–5 April 1987 (V. V. Dubatolov).

Etymology: The specific epithet refers to the type locality.

Diagnosis: *E. turkmenica* is most similar to *E. kirghizica* and *E. frontalis*. All distinguishing characters are given in Table 2. From *E. uralensis* this species can be separated by dark brown/black male palps, sparser fringe on leg I, absence of a dense band of white hairs on the clypeus, and black tarsi III and IV (yellow in *E. uralensis*).

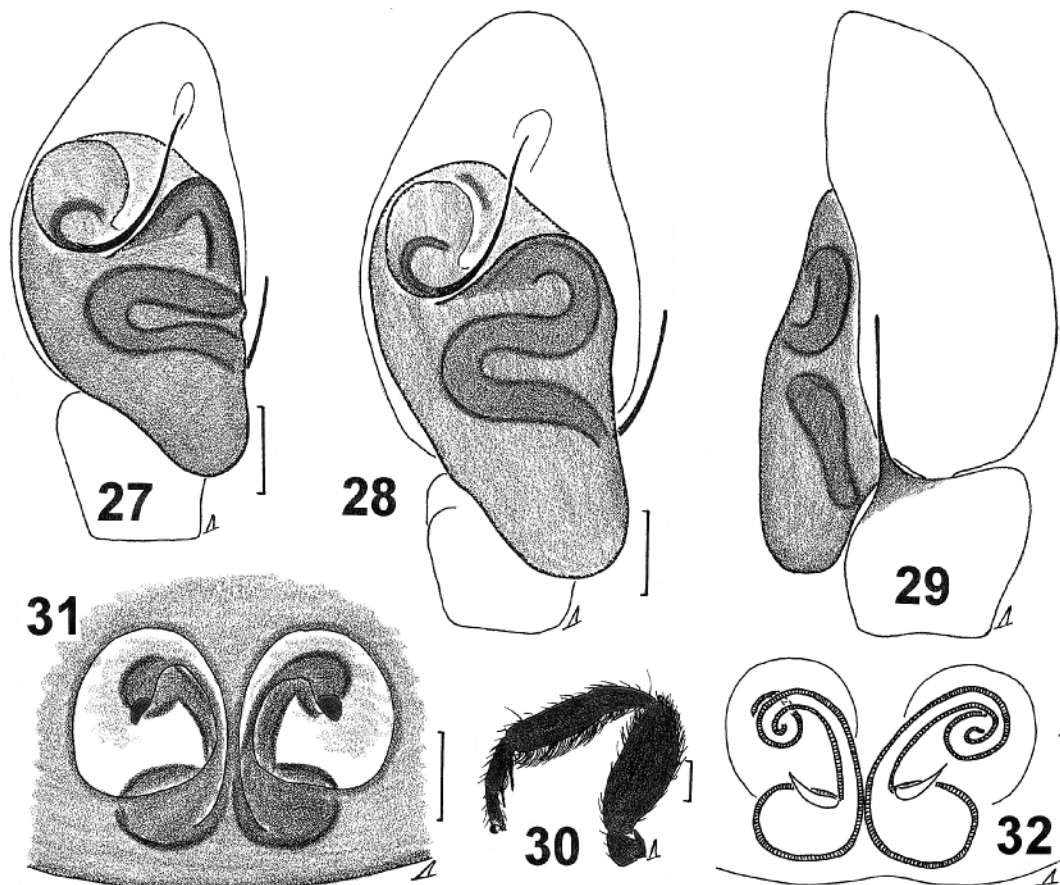
It is interesting to note that males of this species showed clear variability in the tegulum length (cf. Figs 27 and 28). However, all other diagnostic characters suggest that both forms are conspecific.

Distribution: Turkmenistan (Fig. 17).

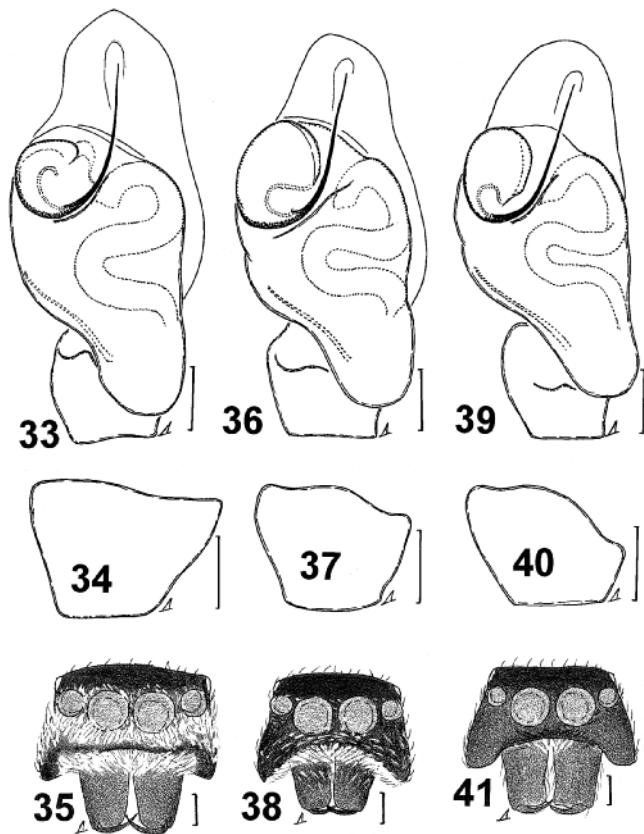
Description: *Male* (from C. and SW Kopetdagh, Turkmenistan, $n=23$). Carapace 1.48–2.20 long, 1.03–1.65 wide, 0.73–1.05 high at PLE. Ocular area 0.75–0.93 long, 0.90–1.23 wide anteriorly and 0.93–1.28 wide posteriorly. Diameter of AME 0.26–0.35. Abdomen 1.38–2.13 long, 0.95–1.50 wide. Cheliceral length 0.43–1.08. Clypeal height 0.08–0.15. Length of leg seg-

ments: I 0.85–1.45+0.43–0.78+0.55–1.03+0.40–0.65+0.28–0.48; II 0.78–1.30+0.40–0.68+0.45–0.83+0.38–0.63+0.33–0.45; III 0.85–1.20+0.40–0.66+0.48–0.78+0.48–0.80+0.35–0.45; IV 0.93–1.43+0.43–0.70+0.65–1.03+0.65–1.05+0.38–0.48. Leg spination: I: Fm d 0-1-1-1-2; Tb v 2-2-2ap; Mt v 2-2ap. II: Fm d 0-1-1-1-2; Tb v 1-1-2ap; Mt v 2-2ap. III: Fm d 0-1-1-1-2; Pt rt 0-1-0; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-1-2; Pt rt 0-1-0; Tb pr and rt 1-1-1, v 1-0-2ap; Mt pr, rt and v 1-1-2ap. Coloration: Carapace brown to black. Eyes of row I surrounded by light hairs. Clypeus brown to black, sparsely covered with white hairs. Sternum, maxillae, labium and chelicerae dark brown to black. Abdomen dark grey-brown, only dorsal scutum present. Book-lung covers and spinnerets dark grey. All legs completely dark brown and rather densely covered with black hairs. Tibiae and patellae of legs I and II ventrally covered with dense brushes of black hairs (Fig. 30). Palp dark brown, but bulbus sometimes yellowish. Cymbium uniformly covered with black hairs. Palpal structure as in Figs. 27–29.

Female (from Eldere, SW Kopetdagh, Turkmenistan, $n=1$): Carapace 1.78 long, 1.20 wide, 0.80 high at PLE. Ocular area 0.85 long, 1.13 wide anteriorly and 1.18 wide posteriorly. Diameter of AME 0.36. Abdomen 2.60 long, 1.93 wide. Cheliceral length 0.40. Clypeal height 0.06. Length of leg segments: I 0.93+0.48+0.53+0.43+0.31; II 0.85+0.50+0.45+0.40+0.33; III 0.98+0.53+0.55+0.55+0.33; IV 1.13+0.55+0.80+0.83+0.45. Leg spination: I: Fm d 0-1-1-1-2; Tb v 2-2-2ap; Mt v



Figs. 27–32: *Euophrys turkmenica*, sp.n. 27, 28 Male palp, ventral view; 29 Ditto, retrolateral view; 30 Male leg I, lateral view; 31 Epigyne; 32 Spermathecae. Scale lines=0.1 mm (27–29, 31–32), 0.25 mm (30).



Figs. 33–41: **33–35** *Euophrys sulfurea* (L. Koch, 1867) from France; **36–38** *Euophrys uralensis* Logunov, Cutler & Marusik, 1993 from the Caucasus; **39–41** *Euophrys pseudogambosa* Strand, 1915 from Israel. **33, 36, 39** Male palp, ventral view; **34, 37, 40** Male palpal tibia, median view; **35, 38, 41** Male face. Scale lines=0.1 mm (palps and tibiae), 0.25 mm (faces).

2-2ap; II: Fm d 0-1-1-1-2; Tb pr 0-1, v 0-1-2ap; Mt v 2-2ap. III: Fm d 0-1-1-1-2; Pt rt 0-1-0; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-2ap, v 2-2ap. IV: Fm d 0-1-1-1-2; Pt rt 0-1-0; Tb pr and rt 1-1, v 1-2ap; Mt pr and rt 1-1-2ap, v 1-2ap. Coloration: Carapace yellowish brown, with black around eyes. Eyes of row I surrounded by white hairs. Clypeus yellow, sparsely covered with white hairs. Sternum, maxillae, labium and chelicerae yellowish brown. Abdomen yellow, with typical brownish reticulate colour markings. Book-lung covers and spinnerets yellowish brown. All legs and palpi yellow, but tibiae and metatarsi brownish. Epigyne and spermathecae as in Figs. 31, 32.

E. sulfurea

1. Male palpal femora brown (basally)+ yellow (apically).
2. Male palpal tibia as in Fig. 34.
3. Embolus smaller (relative to tegulum length) (Fig. 33).
4. Clypeus with pair of white transverse bands of hairs (Fig. 35), sometimes more weakly expressed than in Fig. 35.
5. Coxae II-IV yellow, weakly tinged with brown.
6. Tarsi I yellow.

E. uralensis

- Male palpal femora fully yellow, sometimes as in *E. sulfurea*.
- Male palpal tibia as in Fig. 37.
- Embolus larger (relative to tegulum length) (Fig. 36).
- Clypeus with single row of white hairs along ventral margin (Fig. 38), sometimes with weak upper band, if so see characters 2 and 3.
- Coxae II-IV dark brown.
- Tarsi I dark brown to black.

E. pseudogambosa

- Male palpal femora fully dark brown but yellow tips.
- Male palpal tibia as in Fig. 40.
- Embolus smaller (relative to tegulum length) (Fig. 39).
- Clypeus lacks bands of white hairs (Fig. 41), but sometimes ventral margin with weak row of white hairs.
- Coxae II-IV brown.
- Tarsi I yellow.

Table 3: Differences between *E. sulfurea*, *E. uralensis* and *E. pseudogambosa*.

Euophrys uralensis Logunov, Cutler & Marusik, 1993 (Figs. 17, 36–38)

Material examined: KAZAKHSTAN: 1♂ (ISE), Dzhungaria, near Sarkand, 28 July 1991 (S. V. Ovtchinnikov); 1♂ 2♀ (ISE), Moiynkum Distr., c. 17 km E of Khantau, Khantau Mts, foot of Sunkar Mt., 12 June 1990 (A. A. Feodorov & A. A. Zyuzin). KIRGHIZSTAN: 1♂ 1♀ (SVO), Kirghizskiy Mt. Range, Oktorgai massif, Orlovka, 16 June 1992 (S. V. Ovtchinnikov).

Comparative material: *Euophrys herbigrada* (Simon, 1871): 1♂ (LON), Great Britain, Jersey, Les Quennevais, 16 June 1979 (S. A. Williams). *Euophrys sulfurea* (L. Koch, 1867) (Figs. 33–35): 1♂ (LON), France, Pyrénées-Orientales, Vallespil., Arles-sus-Tech, entrance to Gorge La Fon, 26 June 1962 (D.J.C.); 2♂ 1♀ (. . .), “Cornell U., Lot 581, Sub 590”, without locality label. *Euophrys pseudogambosa* Strand, 1915 (Figs. 39–41): 2♂ (ISE) Israel, 15 km S of Haifa, Nahal Oren Canyon, 12 January 1995 (I. P. Gorlov); 1♂ 1♀ (SMFM, 4974, 2465, ♂ lectotype, ♀ paralectotype), “Palestine, Jaffa-Kehoboth, 18.4.1913, J. Aharoni”.

Diagnosis: This species is closely related to *E. pseudogambosa* from Israel and *E. sulfurea* from the Mediterranean. All distinguishing characters are given in Table 3. These three species are also close to *E. flavoatra*, but can be easily separated by the brown legs III and IV (yellow in *flavoatra*), unswollen male palpal tibia and male palpal femur, and tibiae and patellae covered with white hairs rather than orange/red ones as in *E. flavoatra* (for other details see Logunov *et al.*, 1993).

Furthermore, *E. uralensis* may turn out to be a junior synonym of *E. herbigrada*. Unfortunately, I was unable to study type specimens of this species or any specimens from France, the type locality for *E. herbigrada*, but saw a single male from Jersey only. The examination of this specimen, as well as a detailed description by Merrett (1995), shows that *E. herbigrada* seems to be recognisable at least by the presence of a pair of dense bands of white squamose hairs on the clypeus (in both males and females), yellow tarsi I and brown+yellow male palpal femora. However, at least the Caucasian specimens of *E. uralensis* differ from the Middle Asian specimens in having yellow tips on tarsi I and a weakly expressed transverse band of white hairs on the clypeus. So, the differences between *E. herbigrada* and *E. uralensis* reported above might be considered an artefact. The problem appears to require further study involving more numerous specimens of both species.

Distribution: S. Urals, SE Caucasus, SW Turkmenistan, E. Kazakhstan and Kirghizstan (Logunov *et al.*, 1993; Wesołowska, 1996; current data).

All the Middle Asian localities of *E. uralensis* are shown in Fig. 17.

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