

New species and synonymies in the genus *Synagelides* Strand in Bösenberg & Strand, 1906 (Araneae: Salticidae)

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Summary

Taxonomic notes are provided on sixteen *Synagelides* species from the Oriental Region. Among these, seven new species of *Synagelides* are diagnosed, figured and described: *S. bagmaticus* sp. n. (♂♀, Nepal), *S. darjeelingus* sp. n. (♂♀, India, West Bengal), *S. doisuthep* sp. n. (♂♀, Thailand), *S. kosi* sp. n. (♂♀, Nepal), *S. kualaensis* sp. n. (♂, Malaysia), *S. lehtineni* sp. n. (♂, India, Tamil Nadu) and *S. sumatranus* sp. n. (♂♀, Indonesia, Sumatra). Six new synonymies are established: *Synagelides dhaulagiricus* Bohdanowicz, 1987 (♀), *S. himalaicus* Bohdanowicz, 1987 (♂), *S. jiricus* Bohdanowicz, 1987 (♀), *S. thodungus* Bohdanowicz, 1987 (♂) and *S. wyszynskii* Bohdanowicz, 1987 (♂) are synonymised with *Synagelides martensi* Bohdanowicz, 1987; *S. gorapanicus* Bohdanowicz, 1987 (♂) is synonymised with *Synagelides oleksiaki* Bohdanowicz, 1987. The male of *Synagelides palpaloides* Peng, Tso & Li, 2002 is described for the first time.

Introduction

According to Platnick (2005), the genus *Synagelides* Strand in Bösenberg & Strand, 1906 currently comprises 30 valid species, primarily from the Nepalese Himalayas and China. More than half of them (18 species) remain known from single sexes. Especially problematic are the species described by Bohdanowicz (1978, 1987) from Bhutan and Nepal; of the 16 species described by him, only four were diagnosed from both sexes. We are of the opinion that the problem arose partly because Bohdanowicz did not even try to consider variation in the copulatory organs of *Synagelides*, which is known to be a universal phenomenon in Salticidae rather than an exception. He clearly stated (Bohdanowicz, 1987: 67) that, concerning Nepal, “*Synagelides* appears to be one of those nightmare genera in which every specimen seems to be a separate species and in which, most puzzling, we have at present no indication how to match sexes.” As a result he described some species from specimens of opposite sexes collected from the same localities, e.g. the ♂ holotype of *S. himalaicus* and the ♀ holotype of *S. jiricus* were collected from the same locality in Nepal, Mt. Chordung near Jiri.

We have no doubt that the species diversity of *Synagelides*, especially that of the *cavalierieri* species group (*sensu* Bohdanowicz, 1987), is extremely high in the Himalayas, but it has definitely been overestimated

owing to the description of every specimen as a separate species by the latter author. We have been able to re-examine Bohdanowicz’s types of 14 species (types for two species have not been traced) and found that six of them should be synonymised. At the same time, for some species described from single females (e.g. *S. wuermlii*, *S. wangdicus*, etc.) we could not come to a certain solution (see below). Thus, the present paper is intended (1) to clarify the taxonomic status and reveal new synonymies for a number of *Synagelides* species previously described from the Nepalese Himalayas, and (2) to diagnose and (re)describe nine *Synagelides* species from the Oriental Region.

It is likely that some of the species treated or described below, e.g. *S. palpaloides* or *S. sumatranus*, could equally well be assigned to the genus *Agorius* Thorell, 1877. The problem of interrelationships between *Agorius* and *Synagelides* needs special attention, as the two genera may need to be synonymised and, if so, all the species names of *Synagelides* would be transferred to *Agorius*. We have not scrutinised this problem here, as it is outside the scope of the present study and it will be addressed properly by one of us (DL). At this point, it is necessary to note that all the newly described species are related to those previously placed in *Synagelides* by various authors.

Specimens for this study were borrowed from or distributed among the following museums and personal collections: BMNH=Department of Entomology, British Natural History Museum, London, UK (Ms J. Beccaloni); MHNG=Muséum d’Histoire Naturelle, Genève, Switzerland (Dr P. Schwendinger); NHMB=Naturhistorisches Museum, Basel, Switzerland (Dr A. Hänggi); RMNH=National Natural History Museum, Leiden, The Netherlands (Dr C. L. Deeleman-Reinhold); SMFM=Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (Dr P. Jäger); ZMUM=Zoological Museum of Moscow University, Moscow, Russia (Dr K. G. Mikhailov); ZMTU=Zoological Museum, University of Turku, Turku, Finland (Dr S. Koponen).

Abbreviations used in the text: AME=anterior median eye, ap=apical, Mt=metatarsus, PLE=posterior lateral eye, Tb=tibia, v=ventral. 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.

Survey of species

Synagelides bagmaticus sp. n. (Figs. 1–6)

Types: Holotype ♂ (ZMTU) from Nepal, Bagmati, Shivapuri, Mohanpokhari, 2000 m a.s.l., mountain bush, 14 May 1979, P. T. Lehtinen. Paratypes: 1♂ (ZMTU), together with holotype; 2♀ (ZMTU), Nepal, Bagmati, Phulchoki Mt., 2050 m a.s.l., moist stony brook valley, 12 May 1979, P. T. Lehtinen; 5♂ 2♀ (ZMTU), same locality, 2000 m a.s.l., dry litter of sparse bush, 12 May 1979, P. T. Lehtinen.

Etymology: Named after the type locality, Bagmati in Nepal.

Diagnosis: This new species can be easily distinguished from the described *Synagelides* species by the strong, wide and deeply notched posterior cymbial outgrowth (Fig. 3), the absence of visible tibial apophyses (Fig. 4) and grooves in the epigyne (Fig. 5), as well as by the relatively simple structure of the spermathecae, consisting of winding insemination ducts and bean-shaped receptacles (Fig. 6).

Distribution: Nepal: Phulchoki Mt. and Shivapuri.

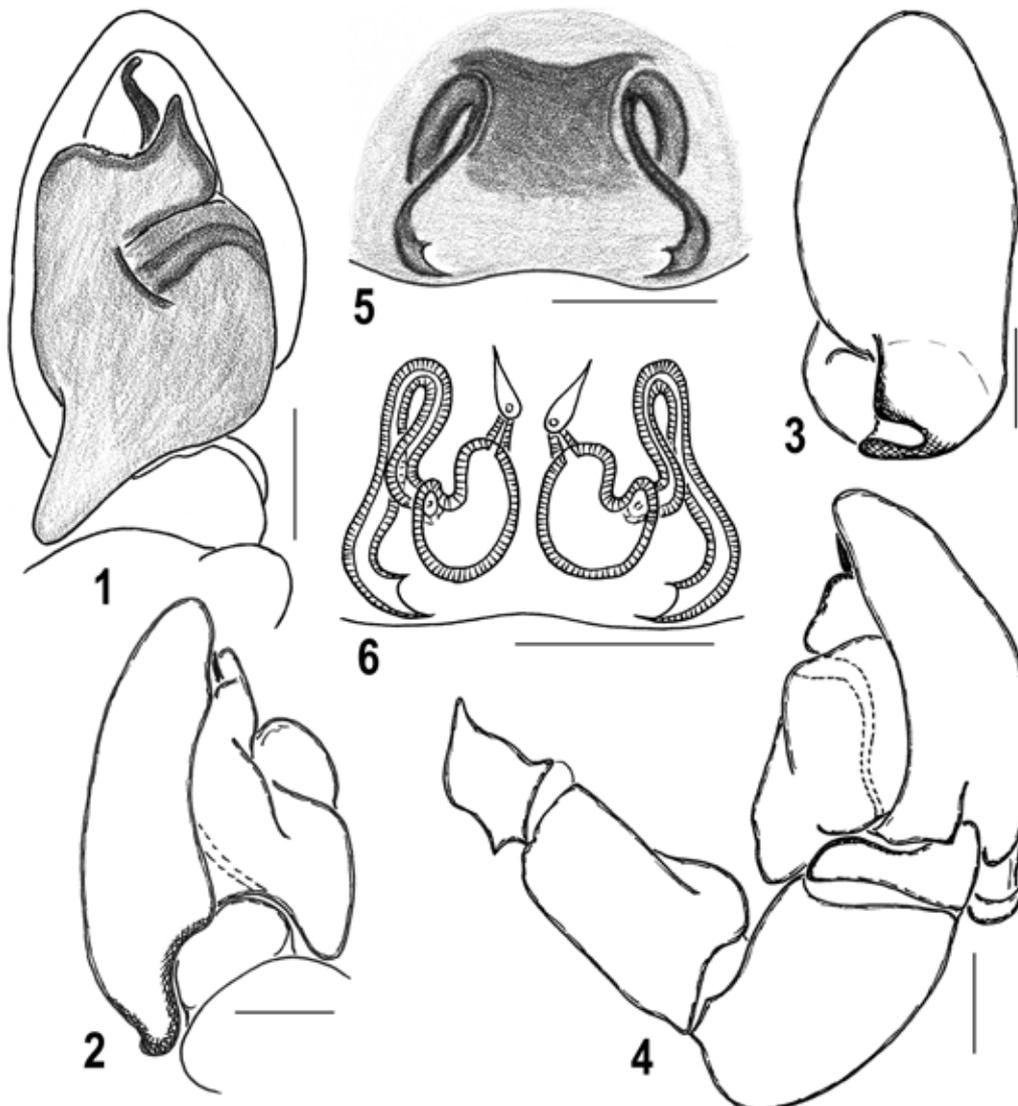
Description: *Male* (paratype from Phulchoki Mt.): Carapace 1.35 long, 0.82 wide, 0.53 high at PLE. Ocular field 0.75 long, 0.85 wide anteriorly, 0.78 wide posteriorly. Diameter of AME 0.28. Cheliceral length 0.35. Clypeal height 0.05. Abdomen 1.25 long, 0.73 wide. Length of leg segments: I 0.93+0.53+0.63+0.38+0.25; II 0.63+0.38+0.38+0.43+0.28; III 0.63+0.25+0.45+0.48+0.28; IV 0.95+0.33+0.75+0.63+0.33. Leg spination: I: Tb v 2-2-2ap, Mt v 2-2. Coloration: Carapace orange-brown, fovea not visible. Eye field orange-brown, black around eyes. Sternum, maxillae and labium orange. Abdomen: dorsum brown,

light band around anterior lateral surface, light band medially, two light spots between; venter yellow-brown, no pattern. Book lung covers, spinnerets and legs yellow-brown. Palp orange-brown, structure as in Figs. 1-4.

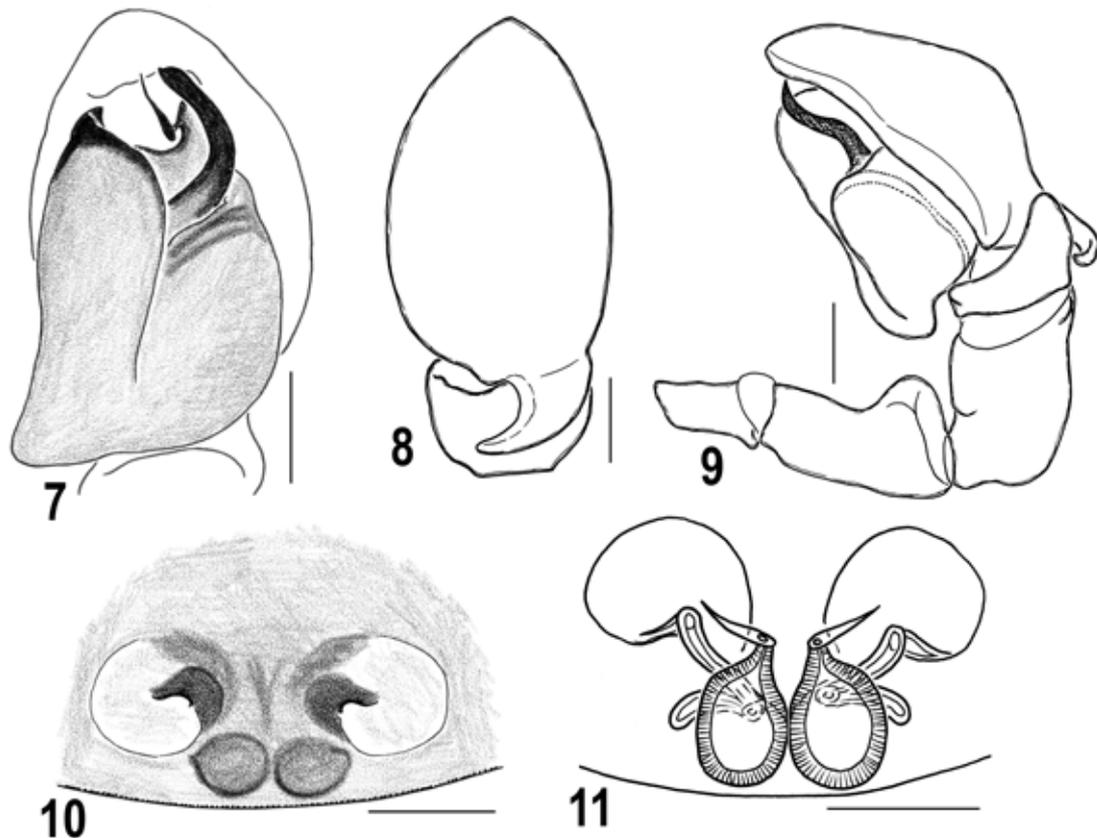
Female (paratype from Phulchoki Mt.): Carapace 1.38 long, 0.80 wide, 0.53 high at PLE. Ocular field 0.88 long, 0.85 wide anteriorly, 0.82 wide posteriorly. Diameter of AME 0.30. Cheliceral length 0.33. Clypeal height 0.05. Abdomen 1.35 long, 0.78 wide. Length of leg segments: I 0.75+0.53+0.56+0.32+0.32; II 0.60+0.35+0.38+0.35+0.25; III 0.63+0.32+0.38+0.48+0.32; IV 0.78+0.43+0.73+0.65+0.33. Leg spination: I: Tb v 2-2-2, Mt v 2-2ap. Coloration as in male, except abdomen, which has a small chevron behind medial band. Palps yellow-brown. Epigyne and spermathecae as in Figs. 5, 6.

Synagelides darjeelingus sp. n. (Figs. 7-11)

Types: Holotype ♂ (ZMTU) from India, West Bengal, Darjeeling, Manibhanjan, 2100 m a.s.l., low bush, 1 May 1979, P. T. Lehtinen. Paratypes: 1♀ (ZMTU),



Figs. 1-6: *Synagelides bagmaticus* sp. n. (paratypes from Nepal, Bagmati, Phulchoki Mt.). 1 Male palp, ventral view; 2 Ditto, mesal view; 3 Cymbium, dorsal view; 4 Male palp, retrolateral view; 5 Epigyne; 6 Spermathecae, dorsal view. Scale lines=0.1 mm.



Figs. 7–11: *Synagelides darjeelingus* sp. n. (♂ holotype from India, Darjeeling, Manibhanjan and ♀ paratype from India, Darjeeling, Ghoom). **7** Male palp, ventral view; **8** Cymbium, dorsal view; **9** Male palp, retrolateral view; **10** Epigyne; **11** Spermathecae, dorsal view. Scale lines=0.1 mm.

West Bengal, Darjeeling, Bhanjan road, c. 4 km W of Ghoom, 2300 m a.s.l., cloud forest, 1 May 1979, P. T. Lehtinen; 3♀ (ZMTU), West Bengal, Darjeeling, c. 1.5 km from Sukhiapokri, 2350 m a.s.l., cloud forest with stones, 1 May 1979, P. T. Lehtinen.

Etymology: Named after the type locality, Darjeeling in West Bengal.

Diagnosis: This species can be easily distinguished from all the described *Synagelides* species by the strong, hook-shaped proximal process of the cymbium (Fig. 8), and the very thin and inconspicuous embolus hidden underneath the curved finger-like median apophysis (Fig. 7) in males, as well as by the very short and lightly sclerotised insemination ducts and the oval receptacles in females (Fig. 11). Also, this species seems to display one of the simplest conformations of the female copulatory organs, comparable only to some Chinese species, such as *S. huangsangensis* Peng *et al.*, 1998 or *S. lushanensis* Xie & Yin, 1990 (see Peng *et al.*, 1993: fig. 815; 1998: fig. 13).

Distribution: India: Darjeeling.

Description: *Male* (holotype): Carapace 1.48 long, 0.98 wide, 0.65 high at PLE. Ocular field 0.95 long, 0.98 wide anteriorly, 0.95 wide posteriorly. Diameter of AME 0.35. Cheliceral length 0.25. Clypeal height 0.05. Abdomen 1.43 long, 0.78 wide. Length of leg segments: I 1.05+0.53+0.73+0.48+0.38; II 0.68+0.35+0.53+0.48+0.33; III 0.72+0.25+0.48+0.63+0.35; IV 0.93+0.38+0.88+0.85+0.38. Leg spination: I: Tb v 2-2-2, Mt v 2-2ap. Coloration: Carapace red-brown, stippled,

fovea well-marked. Eye field red-brown, black around eyes. Clypeus red-brown. Sternum, maxillae and labium orange-brown. Abdomen: dorsum brown, white band around anterior lateral surface, two light spots medially; venter yellow, brown line in centre and two either side. Book lung covers yellow. Spinnerets light brown. Legs orange-brown, tibiae dark brown. Palp red-brown, structure as in Figs. 7–9.

Female (paratype from Sukhiapokri): Carapace 1.53 long, 0.93 wide, 0.75 high at PLE. Ocular field 0.88 long, 0.93 wide anteriorly, 0.95 wide posteriorly. Diameter of AME 0.33. Cheliceral length 0.35. Clypeal height 0.03. Abdomen 1.73 long, 1.18 wide. Length of leg segments: I 0.98+0.55+0.73+0.45+0.28; II 0.73+0.35+0.48+0.38+0.25; III 0.75+0.23+0.48+0.55+0.28; IV 0.98+0.33+0.75+0.70+0.38. Leg spination: I: Tb v 2-2-2, Mt v 2-2ap. Coloration as in male, except abdomen: no constriction; dorsum brown, white band around anterior lateral surface, two small lines in chevron shape medially; venter yellow-brown, with two lines of dots running from epigyne to spinnerets, brown dot between, two brown lines either side. Palps orange-brown. Epigyne and spermathecae as in Figs. 10, 11.

Synagelides doisuthep sp. n. (Figs. 12–17)

Types: Holotype ♂ (MHNG) from northern Thailand, Chiang Mai Province and District, Doi Suthep-Pui National Park, Doi (=Mount) Suthep, evergreen hill forest near Pin Pak Pai Waterfall, 1180 m a.s.l., pitfall

traps, 28 June–28 July 1986, leg. P. J. Schwendinger. Paratypes: 1♀ (MHNG), together with holotype; 1♀ (MHNG), same locality, 1180 m a.s.l., 28 June–28 July 1986, P. Schwendinger.

Etymology: The specific name is a noun in apposition taken from the type locality, Doi Suthep in northern Thailand.

Diagnosis: This species can be easily distinguished from all the known *Synagelides* species by the peculiar conformation of the embolar division, in which the embolus, tegular and median apophyses are extended distally and are subparallel (Figs. 12, 13), and by the short, triangular tibial apophysis (Fig. 15) in males, and by the Ω -shaped epigynal grooves, the rather short insemination ducts and the narrow, elongated receptacles in females (Figs. 16, 17).

Distribution: Thailand, Doi Suthep.

Description: *Male* (holotype): Carapace 2.20 long, 1.40 wide, 0.88 high at PLE. Ocular field 1.45 long, 1.50 wide anteriorly, 1.48 wide posteriorly. Diameter of AME 0.53. Cheliceral length 0.55. Clypeal height 0.05. Abdomen 2.20 long, 1.30 wide. Length of leg segments: I 1.58+1.30+1.00+0.65+0.35; II 1.03+0.53+0.65+0.73+0.37; III 1.00+0.51+0.70+0.85+0.38; IV 1.25+0.63+1.10+1.15+0.40. Leg spination: I: Tb v 0-2-2-2, Mt v 2-2ap. Coloration: Carapace yellow-brown, with brown margins. Black around eyes. Sternum yellow. Maxillae, labium and chelicerae yellow, tinged with brown. Abdomen: dorsum and sides grey-brown, with thin transverse white line in area of poorly-marked constriction; venter yellow; dorsum covered with brownish scutum. Book-lung covers and spinnerets brownish

yellow. Leg I: femora, tibiae and metatarsi brown, patellae, tarsi and coxae yellow. Remaining legs yellow, with femora brown on anterior and posterior sides. Palp brownish yellow, structure as in Figs. 12–15.

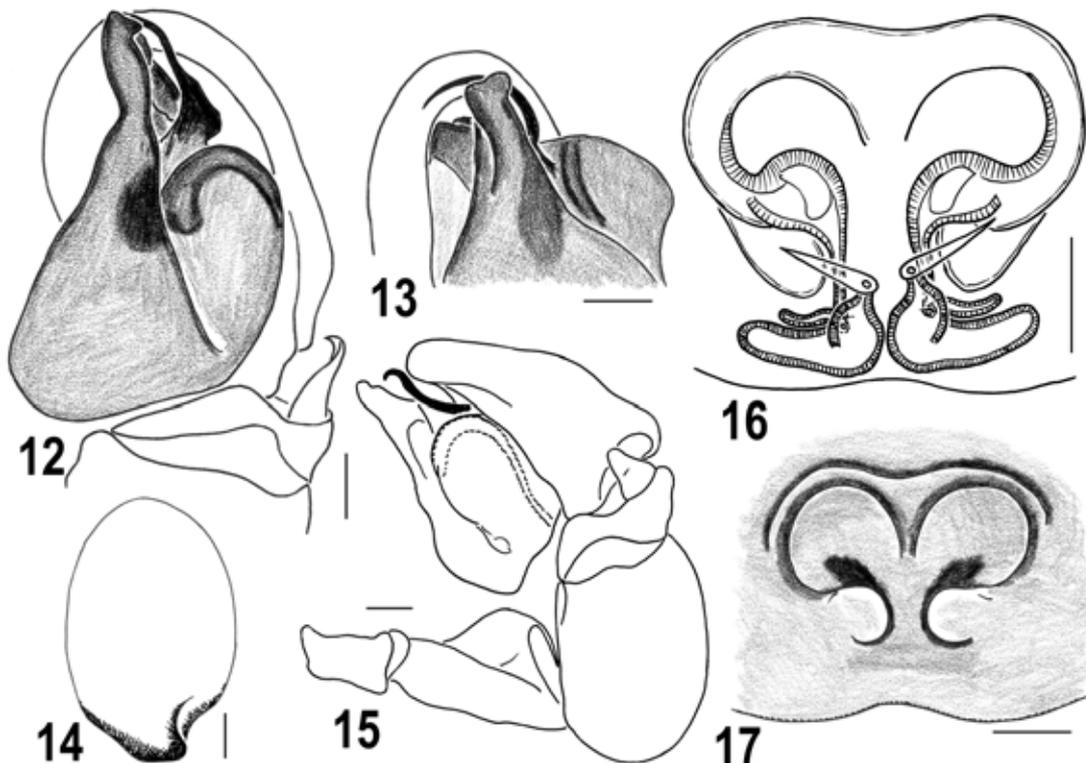
Female (paratype from Doi Suthep): Carapace 2.13 long, 1.45 wide, 0.88 high at PLE. Ocular field 1.35 long, 1.48 wide anteriorly, 1.43 wide posteriorly. Diameter of AME 0.48. Cheliceral length 0.43. Clypeal height 0.13. Abdomen 2.88 long, 1.85 wide. Length of leg segments: I 1.5+1.13+0.93+0.52+0.38; II 1.03+0.48+0.33+0.65+0.33; III 1.03+0.43+0.73+0.88+0.38; IV 1.13+0.53+1.13+1.15+0.52. Leg spination: I: Tb v 0-2-2-2, Mt v 2-2ap. Coloration as in male, except abdomen: dorsum light brown, no constriction, brownish chevron medially, two bold spots anteriorly; venter light brown, with two faint lines running from book lungs to spinnerets. Legs with dark brownish band on prolateral surface, palps yellow-brown. Epigyne and spermathecae as in Figs. 16, 17.

***Synagelides gosainkundicus* Bohdanowicz, 1987 (Fig. 19)**

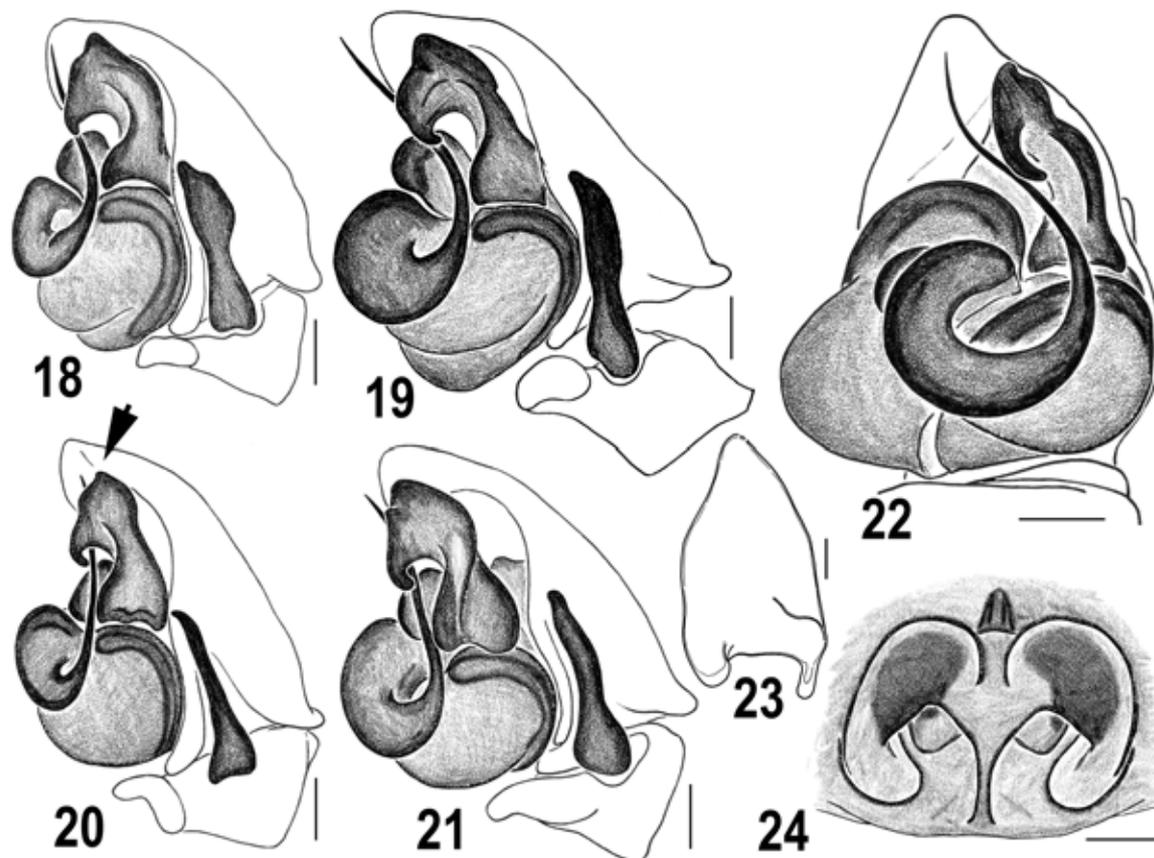
Synagelides gosainkundicus Bohdanowicz, 1987: 78–79, figs. 45–46 (♂ holotype in SMFM; examined).

Type: Holotype ♂ (SMFM, 33173) from Nepal, Rosuwa Distr., Irisuli Valley, ascent to Syng Gyang, Gosainkund, 2000–2100 m a.s.l., 23 April 1973, J. Martens.

Comments: This species is most similar to *S. kosi* sp. n., from which it can be easily distinguished by the thicker and stronger tibial apophysis (cf. Figs. 19 and 21). Of the species described previously, *S. gosainkundicus* is



Figs. 12–17: *Synagelides doisuthep* sp. n. (♂ holotype and ♀ paratype from Thailand, Doi Suthep). 12 Male palp, ventral view; 13 Embolar division, mesal view; 14 Cymbium, dorsal view; 15 Male palp, retrolateral view; 16 Spermathecae, dorsal view; 17 Epigyne. Scale lines=0.1 mm.



Figs. 18–24: *Synagelides* spp. **18** *S. walesai* Bohdanowicz, 1987 (δ holotype from Nepal, Lalitpur Distr., Phulchoki Mt.), male palp, retrolateral view; **19** *S. gosainkundicus* Bohdanowicz, 1987 (δ holotype from Nepal, Rosuwa Distr., Gosainkund), male palp, retrolateral view; **20** *S. oleksiaki* Bohdanowicz, 1987 (δ holotype from Nepal, Ramechap Distr., Thodung near Those), male palp, retrolateral view. **21–24** *S. kosi* sp. n. (δ holotype and ♀ paratype from Nepal, Kosi). **21** Male palp, retrolateral view; **22** Male palp, ventral view; **23** Cymbium, dorsal view; **24** Epigyne. Scale lines=0.1 mm.

rather close to *S. walesai* Bohdanowicz, but differs from it in the longer and slightly narrower tibial apophysis and the clearly larger embolus (cf. Figs. 19 and 18). For description of the species see Bohdanowicz (1987: 78).

Synagelides kosi sp. n. (Figs. 21–24, 32)

Types: Holotype δ (NHMB) from Nepal, Kosi, Phkode N of Bhalukhop, 27°24'N/87°25'E, 3100 m a.s.l., sifting of vegetation debris and moss in forest, 15–17 June 2001, exp. Basel. Paratypes: 4 ♀ (NHMB), together with holotype; 1 ♀ (NHMB), Nepal, Kosi, Pakhribas (=Pakhri Bash), 27°03'N/87°18'E, 1700–1900 m a.s.l., sifting vegetation debris in ravine in very degraded montane forest, 27–28 May 2001, exp. Basel; 1 ♀ (NHMB), Nepal, Kosi, Chauki, 27°11'–12'N/87°27'–28'E, 2600–3000 m a.s.l., sweeping & beating of vegetation, 22–24 June 2001, exp. Basel; 1 δ (NHMB), Nepal, Kosi, Gufa Pokhari (=Gupha Pokhari), 27°17'N/87°30'E, 2900 m a.s.l., sifting of leaf litter, moss, dead wood and branches of *Rhododendron/Abies* forest, 21 June 2001, exp. Basel.

Etymology: The specific name is a noun in apposition taken from the type locality, Kosi in Nepal.

Diagnosis: The male of *S. kosi* is most similar to that of *S. gosainkundicus*, but can be distinguished by the narrower tibial apophysis and the slightly smaller size of the bulbus (cf. Figs. 21 and 19). The female of *S. kosi* is

very close to those of *S. martensi* Bohdanowicz and *S. ullerensis* Bohdanowicz, but the spermathecae are clearly larger, with more strongly developed C-shaped sclerotised loops (arrowed in Fig. 32) and longer insemination ducts (cf. Figs. 32 and 31, 33; all the spermathecae are illustrated at the same scale).

Distribution: Nepal: Kosi.

Description: *Male* (holotype): Carapace 1.70 long, 1.10 wide, 0.73 high at PLE. Ocular field 1.10 long, 0.96 wide anteriorly, 1.10 wide posteriorly. Diameter of AME 0.33. Cheliceral length 0.33. Clypeal height 0.10. Abdomen 1.68 long, 1.08 wide. Length of leg segments: I 1.03+0.78+0.83+0.45+0.33; II 0.73+0.38+0.50+0.50+0.28; III 0.78+0.38+0.50+0.61+0.30; IV 1.03+0.48+0.53+0.80+0.35. Leg spination: I: Tb v 0-2-2-2-2, Mt v 2-2ap. Coloration: Carapace yellowish brown, with brownish veins; eye field darker (brown), black around eyes. Sternum, maxillae, labium and chelicerae yellow, tinged with brown. Abdomen yellow-grey, without marked pattern; dorsum with two rounded scuta (anterior and posterior). Book-lung covers and spinnerets brownish yellow. All legs yellow, but anterior sides of all femora brown. Palp yellow, structure as in Figs. 21–23.

Female (paratype from Nepal, Kosi, Phkode N of Bhalukhop): Carapace 1.63 long, 1.20 wide, 0.73 high at PLE. Ocular field 1.10 long, 1.05 wide anteriorly, 1.20 wide posteriorly. Diameter of AME 0.35. Cheliceral

length 0.50. Clypeal height 0.08. Abdomen 2.40 long, 1.53 wide. Length of leg segments: I 1.03+0.70+0.88+0.48+0.30; II 0.80+0.41+0.51+0.55+0.28; III 0.83+0.40+0.58+0.68+0.30; IV 1.06+0.51+0.90+0.93+0.38. Leg spination: I: Tb v 0-2-2-2-2, Mt v 2-2ap. Coloration as in male, but slightly lighter; there is no abdominal scutum, and femora of all legs yellow anteriorly. Palps yellow. Epigyne and spermathecae as in Figs. 24, 32.

Synagelides kualaensis sp. n. (Figs. 28–30)

Type: Holotype ♂ (ZMTU) from Malaysia, Kuala Lumpur, Templer's Park, 28 August 1980, coll.?

Etymology: Named after the type locality, Kuala Lumpur in Malaysia.

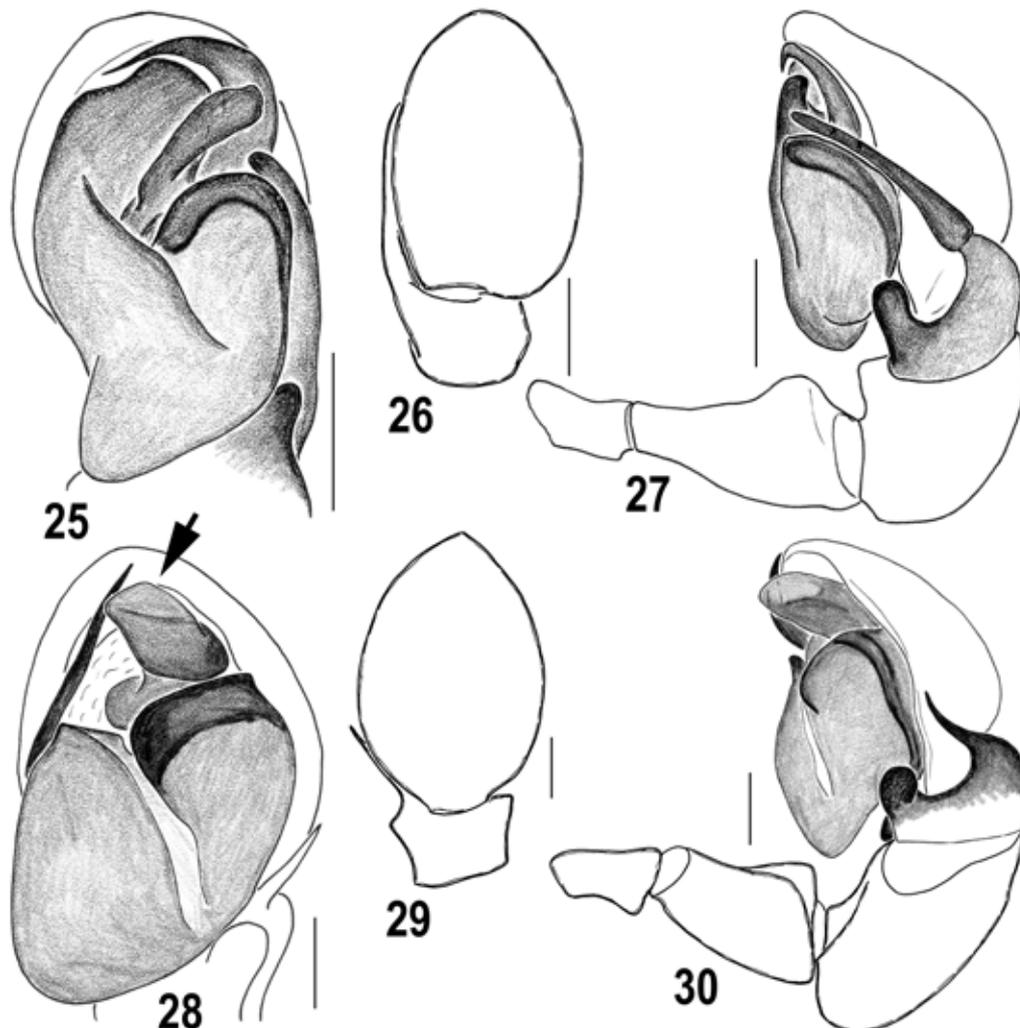
Diagnosis: This species can be distinguished from all other described *Synagelides* species, except for *S. lehtineni* sp. n. from India (see below), by the presence of two, clearly developed tibial apophyses, knob-like ventral and claw-like dorsal (Fig. 30), as well as by the unusually wide and strong median apophysis (arrowed in Fig. 28) and the rather straight embolus. From

S. lehtineni this new species can be easily distinguished by the absence of the long, movable dorsal tibial apophysis (cf. Figs. 30 and 27) and by the different conformation of the embolar division (cf. Figs. 28 and 25).

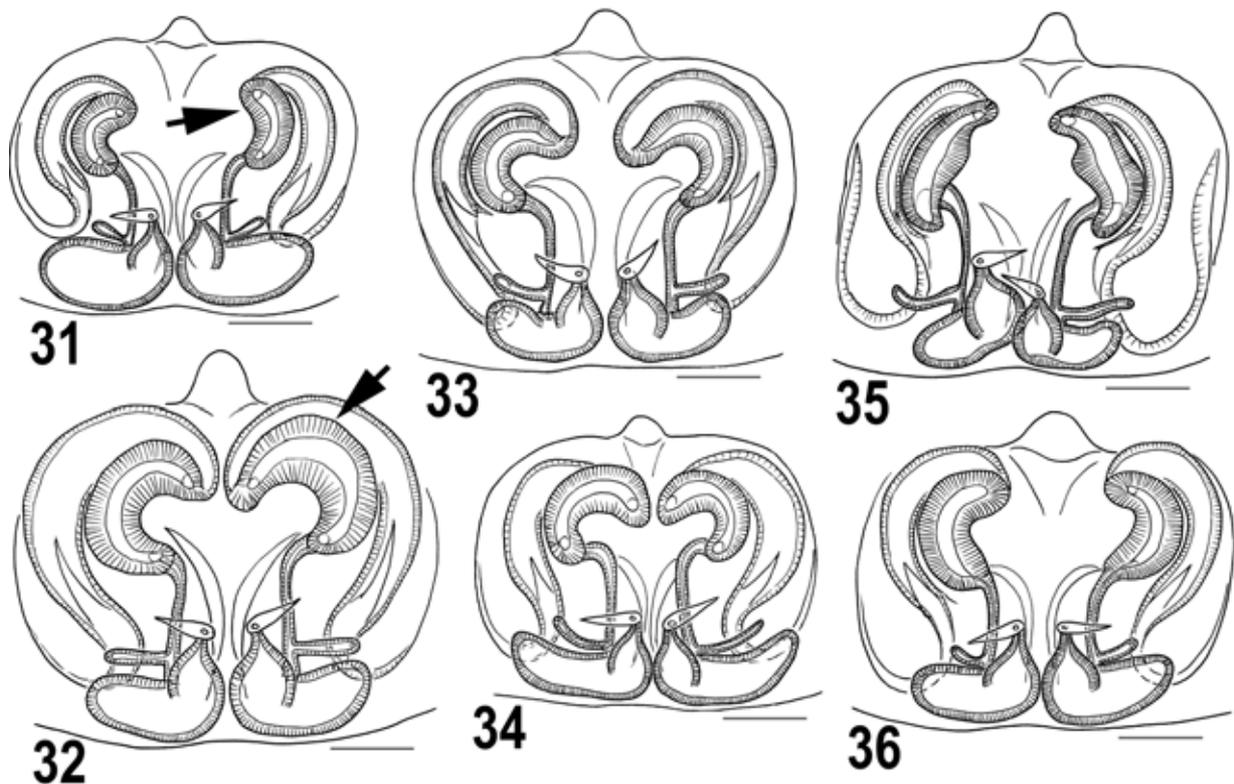
Distribution: Malaysia: Kuala Lumpur.

Description: *Male* (holotype): Carapace 1.63 long, 1.08 wide, 0.55 high at PLE. Ocular field 1.12 long, 1.10 wide anteriorly, 1.05 wide posteriorly. Diameter of AME 0.38. Cheliceral length 0.18. Clypeal height 0.03. Abdomen 1.48 long, 0.75 wide. Length of leg segments: I 0.95+0.75+0.75+0.35+0.25; II 0.62+0.25+0.45+0.48+0.25; III 0.58+0.25+0.35+0.58+0.25; IV 0.75+0.25+0.82+0.55+0.38. Leg spination: I: Tb v 0-0-2-2, Mt v 2-2ap. Coloration: Carapace red-brown, stippled, with well-marked fovea. Eye field red-brown, black around eyes. Clypeus red-brown. Sternum, maxillae and labium orange-brown. Abdomen: dorsum brown, constricted medially, slight red-brown patterning medially; venter red-brown, pale band 1/3 from anterior end. Book lung covers orange-brown. Spinnerets pale yellow, darkening on prolateral surface. Palp orange-brown, structure as in Figs. 28–30.

Female: Unknown.



Figs. 25–30: **25–27** *Synagelides lehtineni* sp. n. (♂ paratype from India, Tamil Nadu, Torapata). **25** Male palp, ventral view; **26** Cymbium, dorsal view; **27** Male palp, retrolateral view. **28–30** *S. kualaensis* sp. n. (♂ paratype from Malaysia, Kuala Lumpur). **28** Male palp, ventral view; **29** Cymbium, dorsal view; **30** Male palp, retrolateral view. Scale lines=0.1 mm.



Figs. 31–36: Spermathecae of *Synagelides* spp., dorsal views. **31** *S. ullerensis* Bohdanowicz, 1987 (♀ holotype from Nepal, Parbat Distr., Ulleri); **32** *S. kosi* sp. n. (♀ paratype from Nepal, Kosi); **33** *S. martensi* Bohdanowicz, 1987 (♀ paratype from Nepal, Dolpo Distr., Gompa near Tarakot); **34** *S. tukchensis* Bohdanowicz, 1987 (♀ holotype from Nepal, Mustang Distr., Tukche); **35** *S. oleksiaki* Bohdanowicz, 1987 (♀ paratype from Nepal, Ramechhap Distr., Thodung near Those); **36** *S. walesai* Bohdanowicz, 1987 (♀ paratype from Nepal, Lalitpur Distr., Phulchoki Mt.). Scale lines=0.1 mm.

***Synagelides lehtineni* sp. n.** (Figs. 25–27)

Types: Holotype ♂ (ZMTU) from India, Tamil Nadu, Nilgiri, Torapata, 2550 m a.s.l., montane forest, 22 April 1979, P. T. Lehtinen. Paratypes: 1♂ (ZMTU), together with holotype; 1♂ (ZMTU), India, Tamil Nadu, Nilgiri, Doddabatta, 2700 m a.s.l., on bush, 22 April 1979, P. T. Lehtinen.

Etymology: The species is named after the famous Finnish arachnologist, Dr Pekka Lehtinen (Turku), who collected the type series.

Diagnosis: This species can be distinguished from all other described *Synagelides* species, except for *S. kualaensis* sp. n. from Malaysia (see above), by the presence of two, clearly developed tibial apophyses, short ventral and long, movable dorsal (Fig. 27), as well as by the unusual conformation of the embolar division (Fig. 25). From *S. kualaensis* this new species can be easily distinguished by the presence of the long, movable dorsal tibial apophysis (claw-like and fixed in *S. kualaensis*; cf. Figs. 27 and 30) and by the different conformation of the embolar division (cf. Figs. 25 and 28). Also, *S. lehtineni* is the smallest (less than 2.3 mm in length) representative of *Synagelides* we have seen.

Distribution: India: Nilgiri.

Description: *Male* (paratype from Torapata): Carapace 1.15 long, 0.72 wide, 0.68 high at PLE. Ocular field 0.68 long, 0.72 wide anteriorly, 0.75 wide posteriorly. Diameter of AME 0.22. Cheliceral length 0.20. Clypeal height 0.05. Abdomen 1.13 long, 0.45 wide. Length of leg segments: I 0.52+0.32+0.38+

0.28+0.28; II 0.43+0.15+0.25+0.25+0.15; III 0.45+0.18+0.25+0.32+0.25; IV 0.58+0.25+0.43+0.32+0.25. Leg spination: I: Tb v 2-2-2, Mt v 2-2ap. Coloration: Carapace yellow-brown, fovea poorly marked. Eye field yellow-brown, black around eyes. Clypeus yellow-brown. Sternum, maxillae and labium yellow. Abdomen: dorsum yellow-brown; sides and venter yellow, with greyish longitudinal stripes on sides. Book lung covers yellow, spinnerets and legs yellow. Palp yellow-brown, structure as in Figs. 25–27.

Female: Unknown.

***Synagelides martensi* Bohdanowicz, 1987** (Figs. 33, 37–40)

Synagelides martensi Bohdanowicz, 1987: 68–69, figs. 5–9 (♂ holotype in SMFM; examined).

Synagelides wyszynskii Bohdanowicz, 1987: 71–72, figs. 17–22 (♂ holotype in SMFM; examined). **New synonymy.**

Synagelides thodungus Bohdanowicz, 1987: 75–76, figs. 30–34 (♂ holotype in SMFM; examined). **New synonymy.**

Synagelides himalaicus Bohdanowicz, 1987: 76–78, figs. 35–44 (♂ holotype in SMFM; examined). **New synonymy.**

Synagelides dhaulagiricus Bohdanowicz, 1987: 79–80, figs. 49–55 (♀ holotype in SMFM; examined). **New synonymy.**

Synagelides jiricus Bohdanowicz, 1987: 83, figs. 62–63 (♀ holotype in SMFM; examined). **New synonymy.**

Types: Holotype ♂ and paratype ♀ of *S. martensi* (SMFM, 33167) from Nepal, Dolpo Distr., Gompa near Tarakot, 3300–3400 m a.s.l., 2–6 June 1973, J. Martens. Holotype ♂ and paratype ♀ of *S. wyszynskii* (SMFM, 33169) from Nepal, Solukhumbu Distr., Lughla, 2950 m

a.s.l., 23 October 1970, J. Martens. Holotype ♂ and paratype ♀ of *S. thodungus* (SMFM, 33171) from Nepal, Ramechap Distr., Thodung near Those, 3200 m a.s.l. [*Abies-Tsuga-Rhododendron* forest], 3–7 September 1970, J. Martens. Holotype ♂ of *S. himalaicus* (SMFM, 33172) from Nepal, Ramechap Distr., Chordung Mt. near Jiri, 2900 m a.s.l., 1 April 1973, J. Martens. Holotype ♀ of *S. dhaulagiricus* (SMFM, 33175) from Nepal, Parbat Distr., eastern Dhaulagiri, Thakkhola, between Gorapani Pass and Ulleri, 2460 m a.s.l., 15 December 1969, J. Martens. Holotype ♀ of *S. jiricus* (SMFM, 33178) from Nepal, Ramechap Distr., ascent to Chordung Mt. from Jiri, 2600–3000 m a.s.l., 16 January 1970, J. Martens.

Comments: The five species synonymised with *S. martensi* have practically identical structures of the copulatory organs to those of *S. martensi* (Figs. 33, 37–40) and have to be synonymised with it. The name *S. martensi* has page priority over the other names and hence is the valid one for this species.

Diagnosis: This species is most closely related to *S. oleksiaki* Bohdanowicz, but can be distinguished from it by the pointed tip of the median apophysis in males (arrowed in Fig. 40; cf. Fig. 20) and the shorter glandular ducts and structure of the C-shaped sclerotised loops in females (cf. Figs. 33 and 35).

Distribution: Nepal and northern India (Uttar Pradesh).

Description: *Male* (Nepal, Shivapuzi, Mohanpokhazi): Carapace 1.35 long, 0.95 wide, 0.58 high at PLE. Ocular field 0.93 long, 0.80 wide anteriorly, 0.95 wide posteriorly. Diameter of AME 0.28. Cheliceral length 0.35. Clypeal height 0.08. Abdomen 1.33 long, 0.85 wide. Length of leg segments: I 1.08+0.93+0.83+0.38+0.32; II 0.63+0.38+0.43+0.40+0.28; III 0.62+0.28+0.42+0.45+0.30; IV 0.93+0.38+0.75+0.68+0.33.

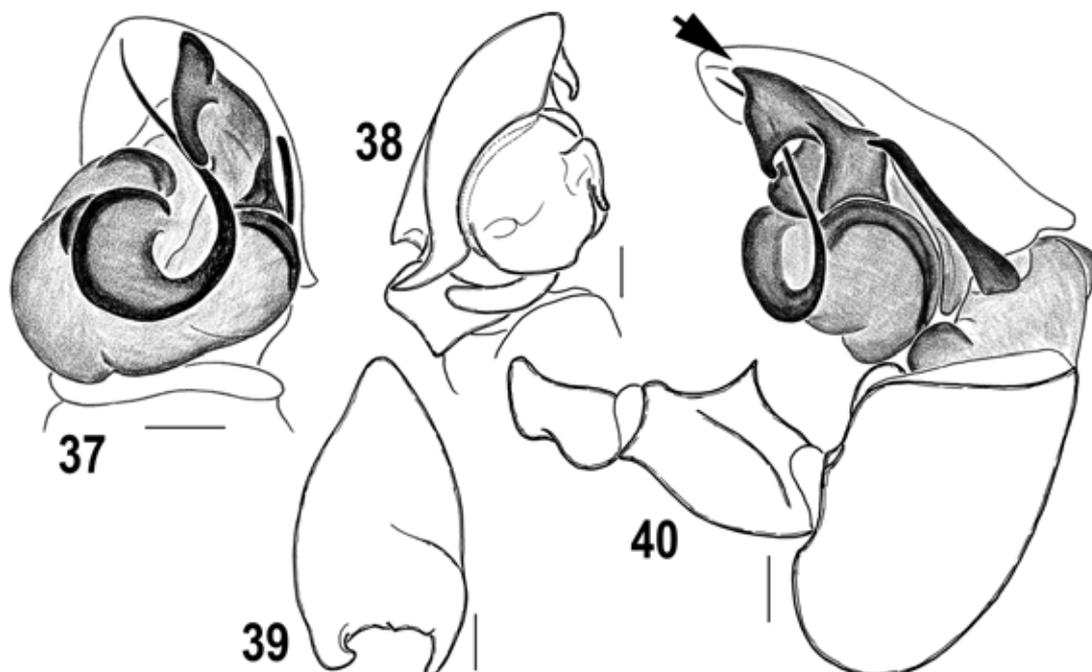
Leg spination: I: Tb v 2-2-2-2, Mt v 2-2ap. Coloration: Carapace yellow-brown, stippled, depressed in centre. Eye field yellow-brown, black around eyes. Clypeus yellow-brown. Sternum, labium and maxillae yellow. Abdomen: dorsum brown, two yellow spots at anterior and two lighter spots wider apart posteriorly, about midway; venter yellow, no pattern. Book lung covers yellow. Spinnerets, legs and palps yellow. Palpal structure as in Figs. 37–40.

Female (paratype from Nepal, Tarakot): Carapace 1.81 long, 1.25 wide, 0.70 high at PLE. Ocular field 1.15 long, 1.09 wide anteriorly, 1.20 wide posteriorly. Diameter of AME 0.38. Cheliceral length 0.45. Clypeal height 0.05. Abdomen 1.78 long, 1.15 wide. Length of leg segments: I 1.15+0.78+0.93+0.48+0.30; II 0.85+0.44+0.55+0.58+0.30; III 0.65+0.43+0.58+0.70+0.38; IV 1.15+0.55+0.90+0.98+0.43. Leg spination I: Tb v 2-2-2-2, Mt v 2-2ap. Coloration: Specimen looks faded. Carapace yellow, tinged with brown and darker (brown) on margins. Black around eyes. Sternum, maxillae, labium and chelicerae yellow, tinged with brown. Abdomen: dorsum and sides brownish, venter yellow. All legs yellow with brownish femora. Palps yellow, tinged with brown. Spermathecae as in Fig. 33.

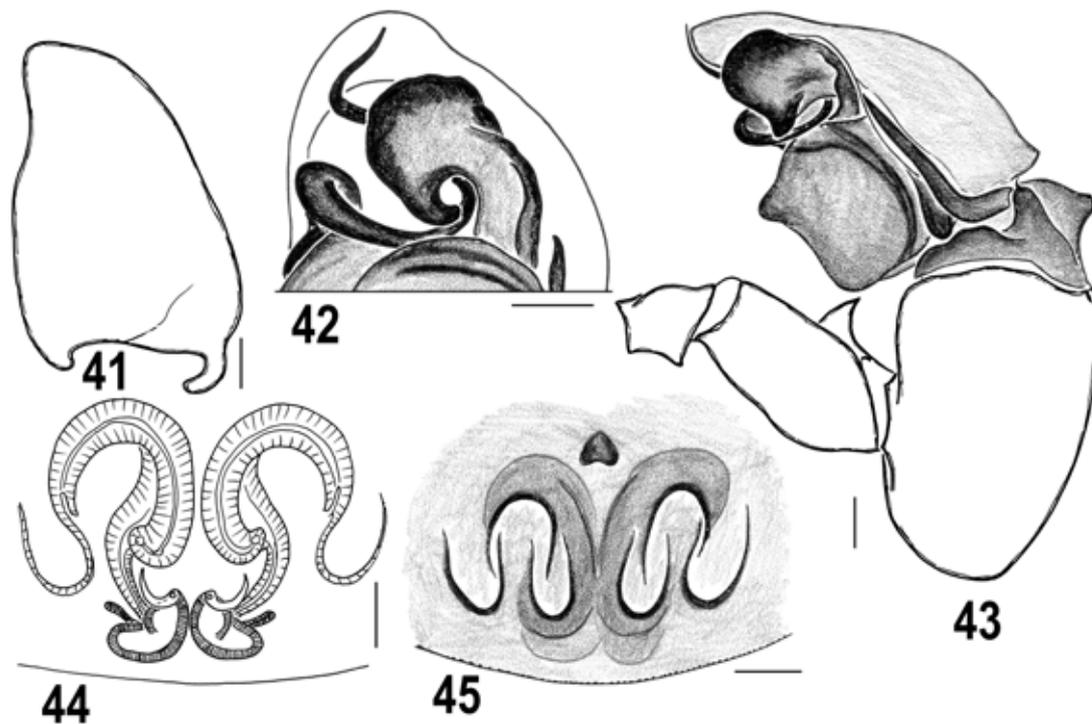
Other material examined: NEPAL: 2♂ (ZMTU), Bagmati, Shivapuzi, Mohanpokhazi, 2000 m a.s.l., mountain bush, 14 May 1979, P. T. Lehtinen; 1♂ (ZMTU), Bagmati, Sunderijal, 1380 m a.s.l., pine forest, 13 May 1979, P. T. Lehtinen & G. Buddibatar. INDIA: 1♂ (ZMTU), Uttar Pradesh, Kumaon Nainital, 1950 m a.s.l., *Quercus* litter, 15 April 1979, P. T. Lehtinen.

***Synagelides oleksiaki* Bohdanowicz, 1987** (Figs. 20, 35)

Synagelides oleksiaki Bohdanowicz, 1987: 69–71, figs. 10–16 (♂ holotype in SMFM; examined).



Figs. 37–40: *Synagelides martensi* Bohdanowicz, 1987 (♂ holotype from Nepal, Dolpo Distr., Gompa near Tarakot). 37 Male palp, ventral view; 38 Ditto, mesal view; 39 Cymbium, dorsal view; 40 Male palp, retrolateral view. Scale lines=0.1 mm.



Figs. 41–45: *Synagelides palpaloides* Peng, Tso & Li, 2002 (from Taiwan, Alishan Mts). **41** Cymbium, dorsal view; **42** Embolar division, ventral view; **43** Male palp, retrolateral view; **44** Spermathecae, dorsal view; **45** Epigyne. Scale lines=0.1 mm.

Synagelides gorapanicus Bohdanowicz, 1987: 79, figs. 47–48 (♂ holotype in SMFM; examined). **New synonymy.**

Types: Holotype ♂ and paratype ♀ of *S. oleksiaki* (SMFM, 33168) from Nepal, Ramechap Distr., Thodung near Those, 3200 m a.s.l. [*Abies-Tsuga-Rhododendron* forest], 3–9 April 1973, J. Martens. Holotype ♂ of *S. gorapanicus* (SMFM, 33174) from Nepal, Parbat Distr., between Sikha and Gorapani Pass, 2300–2700 m a.s.l., 11 July 1973, J. Martens.

Comments: The ♂ holotype of *S. gorapanicus* has an identical palpal structure to that of the ♂ holotype of *S. oleksiaki* (cf. Fig. 20 with Bohdanowicz, 1987: figs. 47–48) and hence the name *S. gorapanicus* should be synonymised with *S. oleksiaki*. For description of the species see Bohdanowicz (1987: 69).

Diagnosis: This species is most closely related to *S. martensi*, but can be distinguished from it by the blunt tip of the median apophysis in males (arrowed in Fig. 20; cf. Fig. 40) and the longer glandular ducts and different structure of the C-shaped sclerotised loops in females (cf. Figs. 35 and 33).

Other material examined: NEPAL: 1♂ (BMNH), Sikha, 28°25'N/83°41.1'E, c. 2480 m a.s.l., mixed deciduous forest (under rotting logs), 21–28 May 1954, K. H. Hyatt.

***Synagelides palpaloides* Peng, Tso & Li, 2002** (Figs. 41–45)

Synagelides palpaloides Peng, Tso & Li, 2002: 4–5, figs. 13–16 (♀ holotype in National Museum of Natural Science, Taichung, Taiwan; not examined).

Synagelides palpalis (nec Żabka, 1985; misidentified): Peng, Tso & Li, 2002: 3–4, figs. 9–12 (♂).

Comments: Judging from the authors' illustrations (Peng *et al.*, 2002: figs. 10–11), it is safe to conclude that

these authors actually studied the male of *S. palpaloides* rather than that of *S. palpalis*; the former was described by Peng *et al.* (2002) from a single female. Both their studied males were collected together with the ♀ holotype of *S. palpaloides*, i.e. from the Hui-Sun Experimental Forest Station (Taiwan), and there is no doubt that both sexes belong to the same species. Thus, *S. palpalis* does not occur in Taiwan, as currently accepted (Platnick, 2005), and is restricted to Vietnam and the Chinese province of Hainan (Song & Chai, 1991; Song *et al.*, 1999; Peng & Li, 2003).

Diagnosis: This species is most similar to *Synagelides palpalis* Żabka, 1985 from Vietnam, but males can be easily distinguished by the longer, spiral-shaped embolus, the stronger, hook-shaped median apophysis and the more curved, L-shaped tibial apophysis (cf. Figs. 42, 43 and Żabka, 1985: figs. 573, 574). The females of *S. palpaloides* seem to differ in having a wider epigyne, with W-shaped course of its grooves (cf. Fig. 45 and Żabka, 1985: figs. 577, 578); however, the differences between females of both species, especially in the spermathecae, are not obvious. The male of *S. palpaloides* is described here for the first time.

Distribution: Taiwan (Wushikan, Alishan Mts, Hui-Sun) (Peng *et al.*, 2002; present data).

Description: **Male** (Taiwan, Alishan Mts): Carapace 1.75 long, 1.12 wide, 0.75 high at PLE. Ocular field 1.15 long, 1.17 wide anteriorly, 1.12 wide posteriorly. Diameter of AME 0.40. Cheliceral length 0.28. Clypeal height 0.08. Abdomen 2.18 long, 1.25 wide. Length of leg segments: I 0.95+0.85+0.92+0.35+0.32; II 0.85+0.38+0.58+0.33+0.32; III 0.95+0.35+0.72+0.68+0.38; IV 1.02+0.42+1.07+0.98+0.52. Leg spination: I: Tb v 0-2-2-2-2, Mt v 2-2ap. Coloration: Carapace red-brown, including eye field (eyes surrounded by black). Clypeus,

sternum, maxillae and labium red-brown. Abdomen constricted: dorsum red-brown, lighter medially; venter lighter red-brown, with light lines laterally. Book-lung covers light red-brown. Spinnerets yellow-brown. Legs and palps red-brown. Palpal structure as in Figs. 41–43.

Female (Taiwan, Alishan Mts): Carapace 1.75 long, 1.12 wide, 0.75 high at PLE. Ocular field 1.02 long, 1.12 wide anteriorly, 1.07 wide posteriorly. Diameter of AME 0.38. Cheliceral length 0.23. Clypeal height 0.08. Abdomen 2.25 long, 1.25 wide. Length of leg segments: I 0.95+0.88+0.85+0.37+0.32; II 0.82+0.33+0.48+0.42+0.32; III 0.78+0.33+0.55+0.48+0.38; IV 1.02+0.42+1.07+0.98+0.52. Leg spination: I: Tb v 0-2-2-2-2, Mt v 2-2ap. Coloration as in male, except abdomen: dorsum light brown, no constriction, two faint chevrons in posterior half; venter yellow-brown, with darker lines laterally. Epigyne and spermathecae as in Figs. 44–45.

Material examined: TAIWAN: 1♂ (ZMTU), Taichung Prov., Wushikan, 1000 m a.s.l., litter within *Asplenium*

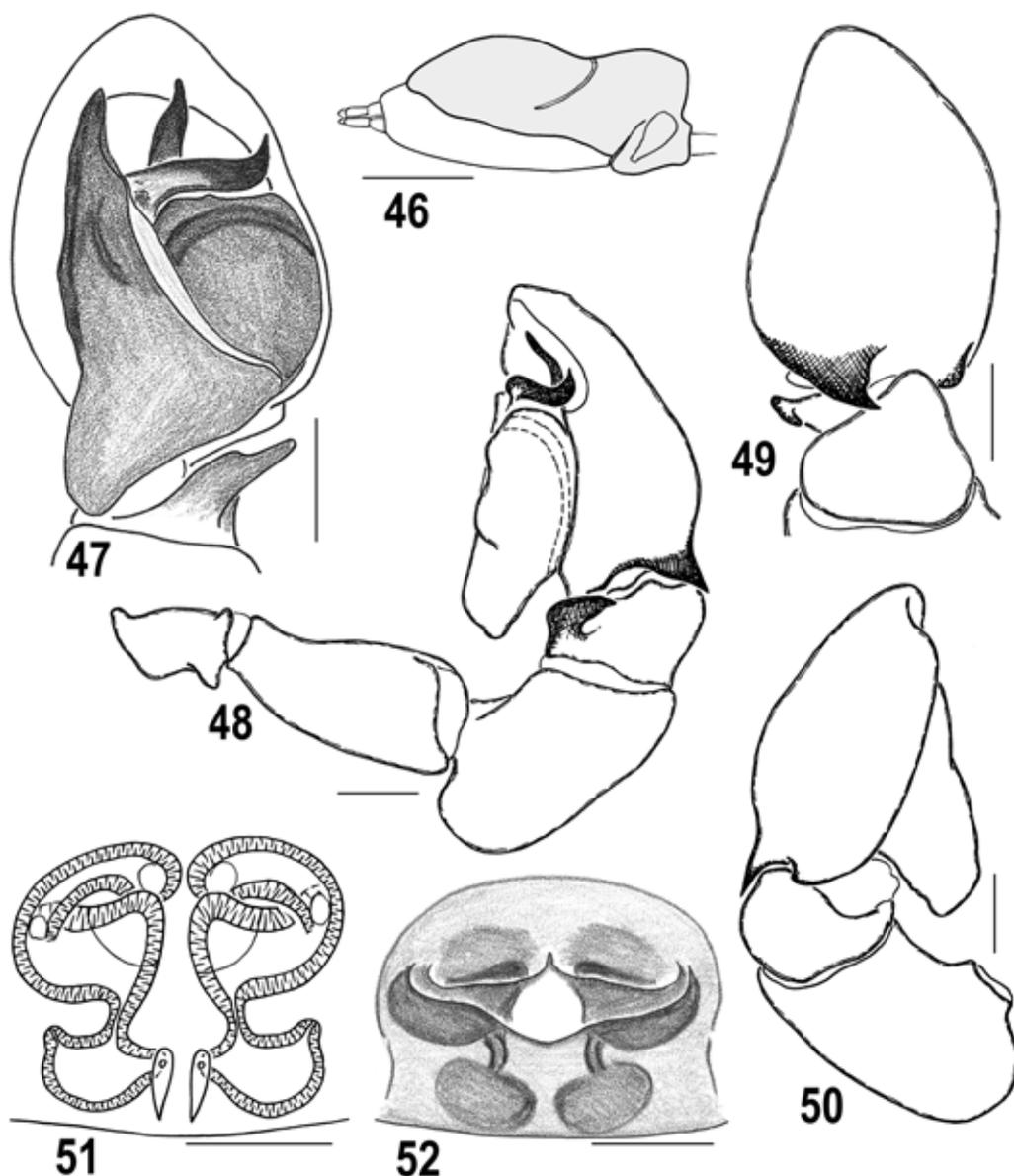
nidus, 27 November 1997, P. T. Lehtinen; 2♂ 1♀ (ZMTU), Chiayi Co., Alishan Mts, 2270 m a.s.l., moss, lichen and litter on moist rock slope, 4 November 1987, P. T. Lehtinen; 1♀ (ZMTU), Yunlin Co., Tauli, S. bottom of stony brook and litter in bamboo, 3 November 1987, P. T. Lehtinen.

Comparative material: *Synagelides palpalis* Żabka, 1985: VIETNAM: 1♀ (ZMUM), Kat Ba island, Trung Trang Vil., summer 1989, T. K. Sergeeva.

Synagelides sumatranus sp. n. (Figs. 46–52)

Types: Holotype ♂ (RMNH) from Indonesia, Sumatra, Mt. Singalang, Anai, 400–520 m a.s.l., secondary forest, 9–24 June 1994, S. Djojosedharmo. Paratypes: 5♂ 7♀ (RMNH), together with holotype; 8♂ 20♀ (RMNH), same locality, 400–500 m a.s.l., ? June 1994, S. Djojosedharmo.

Etymology: Named after the type locality, Sumatra.



Figs. 46–52: *Synagelides sumatranus* sp. n. (♂ and ♀ paratypes from Indonesia, Sumatra, Anai). 46 Male abdomen, lateral view; 47 Male palp, ventral view; 48 Ditto, retrolateral view; 49 Cymbium, dorsal view; 50 Male palp, mesal view; 51 Spermathecae, dorsal view; 52 Epigyne. Scale lines=0.1 mm.

Diagnosis: This species is distinct from all the described species of *Synagelides* by having the embolus and median apophysis equally developed (both look like thick, finger-shaped processes, Figs. 47, 48) and by the short, hooked and unmovable tibial apophysis (Fig. 48) in males, and by the subparallel grooves of the epigyne (Fig. 52) and the short, wide and sclerotised insemination ducts of the unique configuration of the vulva (Fig. 51) in females.

Distribution: Indonesia: Sumatra.

Description: *Male* (paratype from Sumatra, Mt. Singalang): Carapace 1.32 long, 0.95 wide, 0.53 high at PLE. Ocular field 0.88 long, 0.90 wide anteriorly, 0.95 wide posteriorly. Diameter of AME 0.38. Cheliceral length 0.25. Clypeal height 0.08. Abdomen 1.43 long, 0.95 wide. Length of leg segments: I 0.88+0.55+0.58+0.43+0.28; II 0.63+0.23+0.42+0.45+0.28; III 0.62+0.33+0.53+0.58+0.28; IV 0.68+0.38+0.72+0.60+0.35. Leg spination: I: Tb v 0-0, Mt v 2-2ap. Coloration: Carapace red-brown, stippled, with depression in centre. Eye field dark red-brown, eyes surrounded by black. Sternum, maxillae and labium orange-brown. Abdomen with red-brownish scutum, covering most of dorsum, sides and anterior part of venter (Fig. 46); dorsum dark red-brown, with light band and constriction medially; venter yellow, orange-brown anteriorly, with red-brown spots in four longitudinal lines on yellow section. Book lung covers orange-brown, spinnerets yellow-brown. Legs orange-brown. Palp red-brown, structure as in Figs. 47–50.

Female (paratype from Sumatra, Mt. Singalang): Carapace 1.58 long, 1.13 wide, 0.63 high at PLE. Ocular field 1.13 long, 1.15 wide anteriorly, 1.13 wide anteriorly. Diameter of AME 0.38. Cheliceral length 0.35. Clypeal height 0.08. Abdomen 2.05 long, 1.25 wide. Length of leg segments: I 0.98+0.63+0.75+0.42+0.25; II 0.63+0.32+0.75+0.42+0.25; III 0.63+0.35+0.58+0.60+0.32; IV 0.93+0.48+0.75+0.88+0.45. Leg spination: I: Tb v 0-2-2, Mt v 2-2ap. Coloration as in male, except abdomen and palps. Abdomen without scutum; dorsum brown, no constriction, with two yellow spots on anterior end, one on each side (some specimens had a smaller second pair closer together slightly more posteriorly), and with a yellow band at mid length, curving posteriorly (some specimens had a second band with less curvature posteriorly, joining the first laterally); venter yellow, uniform, only two faint lines of dark spots. Palps orange brown. Epigyne and spermathecae as in Figs. 51–52.

***Synagelides tukchensis* Bohdanowicz, 1987** (Fig. 34)

Synagelides tukchensis Bohdanowicz, 1987: 81–82, figs. 57–59 (♀ holotype in SMFM; examined).

Type: Holotype ♀ (SMFM, 33176) from Nepal, Mustang Distr., eastern Dhaulagiri, Thak, Tukche (=Tukuche), left side of river, 2600–2800 m a.s.l., 2 October 1969, J. Martens.

Comments: By the rather narrow and elongated receptacles, *S. tukchensis* is distinct from all other *Synagelides* species we have studied (cf. Figs. 34 and 31–33, 35, 36;

all the spermathecae are shown at the same scale). By the same character, the female of *S. tukchensis* is similar to that of *S. wangdicus* Bohdanowicz, 1978 from Bhutan (see Bohdanowicz, 1978: figs. 6–11). Although the ♀ holotype of *S. tukchensis* is rather faded, its dorsum seems not to have a longitudinal brownish band, which is well-marked in *S. wangdicus* (Bohdanowicz, 1978: fig. 6). Also, the ♀ holotype of *S. wangdicus* is almost twice the size of that of *S. tukchensis*. Unfortunately, we have been unable to re-examine the spermathecae of *S. wangdicus*, the slide preparation of which was not found in the NHMB (A. Hänggi, pers. comm.). For description of *S. tukchensis* see Bohdanowicz (1987: 81).

***Synagelides ullerensis* Bohdanowicz, 1987** (Fig. 31)

Synagelides ullerensis Bohdanowicz, 1987: 82–83, figs. 60–61 (♀ holotype in SMFM; examined).

Type: Holotype ♀ (SMFM, 33177) from Nepal, Parbat Distr., eastern Dhaulagiri, Thakkhola, Ulleri, 2000–2100 m a.s.l., 12–13 July 1973, J. Martens.

Comments: Of the *Synagelides* females we have studied, *S. ullerensis* seems to differ clearly in having the shortest and least curved insemination ducts, and in the less developed C-shaped sclerotised ducts (arrowed in Fig. 31, cf. Figs. 32–36; all the spermathecae are shown at the same scale). For description of *S. ullerensis* see Bohdanowicz (1987: 82).

***Synagelides wangdicus* Bohdanowicz, 1978**

Synagelides wangdicus Bohdanowicz, 1978: 27–29, figs. 6–11 (♀ holotype in NHMB; examined).

Type: Holotype ♀ (NHMB, 2590a) from Bhutan, “Basel-Bhutan Expedition 1972, Dariula 3100 m — Wangdi 26/6” [Bohdanowicz (1978) gave the locality label as ‘Dorjula, 3100 — Wangdi-Phodrang, 26/6, 55’].

Comments: This species seems to be related to *S. tukchensis* (see above), but differs in its larger size (almost twice the size of the ♀ holotype of *S. tukchensis*) and in having a longitudinal brownish band on the dorsum (see Bohdanowicz, 1978: fig. 6). Unfortunately, we have been unable to re-examine and illustrate the spermathecae of *S. wangdicus*, as the slide preparation was not found in the NHMB (A. Hänggi, pers. comm.). For description of *S. wangdicus* see Bohdanowicz (1978: 27).

***Synagelides walesai* Bohdanowicz, 1987** (Figs. 18, 36)

Synagelides walesai Bohdanowicz, 1987: 72–75, figs. 23–29 (♂ holotype in SMFM; examined).

Types: Holotype ♂ and paratype ♀ (SMFM, 33170) from Nepal, Lalitpur Distr., Kathmandu Valley, Phulchoki Mt., 2600–2700 m a.s.l., 25–30 January 1970, J. Martens.

Comments: This species is distinct in its body coloration, with both sexes having a brownish longitudinal stripe on the dorsum. By its palpal structure, the male of *S. walesai* is most similar to that of *S. gosainkundicus*,

but differs in having a smaller bulbus, a shorter and slightly wider tibial apophysis and a smaller embolus (cf. Figs. 18 and 19). The female of *S. walesai* is very similar to that of *S. wangdicus* from Bhutan (cf. Fig. 36 and Bohdanowicz, 1978: figs. 6–11). Both species have a similar colour pattern of the dorsum, but *S. walesai* seems to differ in having rounded rather than elongated receptacles (Fig. 36). Unfortunately, we have been unable to re-examine the spermathecae of *S. wangdicus*, as the slide preparation was not found in the NHMB (A. Hänggi, pers. comm.). For description of *S. walesai* see Bohdanowicz (1987: 72).

Synagelides wuermlii Bohdanowicz, 1978

Synagelides wuermlii Bohdanowicz, 1978: 23–27, figs. 1–5 (♀ holotype in NHMB; examined).

Type: Holotype ♀ (NHMB, 2591a) from Bhutan, “Basel-Bhutan Expedition 1972” [Bohdanowicz (1978) gave the locality label as ‘20 km S Thimphu, 18.5.1972’].

Comments: Reasoning from Bohdanowicz’s figures alone (1978: figs. 4–5), this species definitely belongs in the *cavalerieri* species group (*sensu* Bohdanowicz, 1987), but we have been unable to diagnose and illustrate it as, unfortunately, the slide preparation of its spermathecae was not found in the NHMB (A. Hänggi, pers. comm.). For description of *S. wuermlii* see Bohdanowicz (1978: 23).

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