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Copulatory mechanisms in *Hoplopholcus*, *Stygopholcus* (revalidated), *Pholcus*, *Spermophora* and *Spermophorides* (Araneae, Pholcidae), with additional faunistic and taxonomic data

ANTOINE SENGLET[1]

Mating mechanisms in *Hoplopholcus*, *Stygopholcus*, *Pholcus*, *Spermophora* and *Spermophorides* are described from dissected organs of kryo-fixed and freeze-dried pairs *in copula*. Modified male cheliceral hairs which are shown to have a mechanical function, are referred to as "gripping setae". In the genus *Pholcus* the ventral vulval sclerite is reduced to the anterior margin of the uterus externus; the ventral vulval wall is membranous. During copulation, a characteristic invagination of the sclerotized genital plate is apparently formed by an erectile vulva. A traction of the male cheliceral apical apophyses on the knob of the genital plate is probably required to trigger this invagination. The invaginated genital plate, backed by the unci of the male pedipalps, gives the needed space for the movement of the procursi. The invaginated plate replaces the ventral vulval sclerite, which is extending to the posterior rim of the vulva in *Holocnemus*, *Hoplopholcus* and *Stygopholcus*. In *Spermophora senoculata* DUGÉS, as in *Pholcus*, the apical cheliceral apophyses are coupled to the relatively soft knob (or apophysis) of the female genital plate and traction is applied. To stabilize the traction on the ventral lip of the vulva, *Pholcus* uses the trochanter apophyses and *Spermophora* the anterior cheliceral apophyses. In addition to differences in modified hairs on the male chelicera, several other consistent characters separate the genera *Hoplopholcus* and *Stygopholcus*. These are in the male: shape of the femora, type of sperm duct, and appendages on the procursus. In the female: vulval ventral sclerite fused to the genital plate only in *Stygopholcus* and the central part of the dorsal vulva sclerite extending into a ventral lamina only in *Hoplopholcus*. The genitalia of the hitherto unknown female of *Pholcus spiliensis* WUNDERLICH are described. *Spermophora huberti* SENGLET, *S. mammata* SENGLET, *S. mediterranea* SENGLET, *S. petraea* SENGLET, *S. simoni* SENGLET and *S. valentiana* SENGLET are transferred to *Spermophorides*. *Pholcus osellai* BRIGNOLI is placed in synonymy with *P. opilionoides* (SCHRANK), *P. affinis* SCHENKEL is placed in synonymy with *P. manueli* GERTSCH, and *P. manueli* GERTSCH is revalidated.

Keywords: Araneae, Pholcidae, copulation, mating mechanism, taxonomy, zoogeography

INTRODUCTION

Between 1977 and 1981 several matings of pholcids were observed and some of the spiders were kryo-fixed and freeze-dried. Most of the fixed material remained unstudied, because of the lack of laboratory facilities for carrying out serial sections in a satisfactory way. Recently, I made experiments on dissecting techniques, which gave fair results; they appear to be a suitable complement to the section fashion.

Morphology of the male pedipalp and copulation in pholcids have already been described (see HUHL et al. 1995, HUBER 1995, HUBER 1997, HUBER 1998 and HUBER & EBERHARD 1997). The male pedipalpal tarsus bears two organs; a procursus with more ore less complicated tip and a bulbus with anchoring device and embolus. Before copulation the pedipalps are rotated by 180°. Both emboli and appendix are inserted and anchored; then, both procursi are introduced in the female genital opening; they remain active to the end of copulation (Figs 8, 9, 34).

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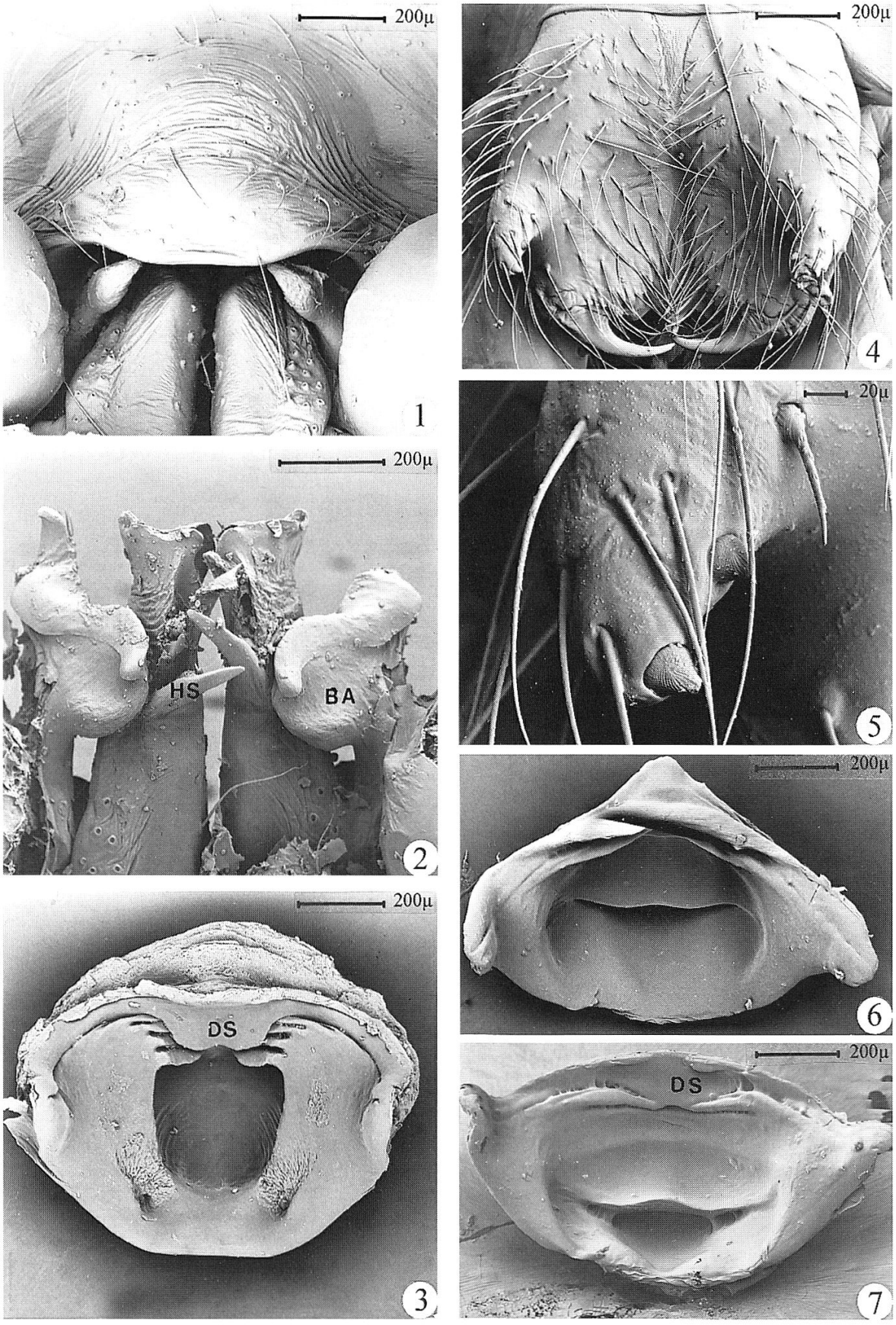
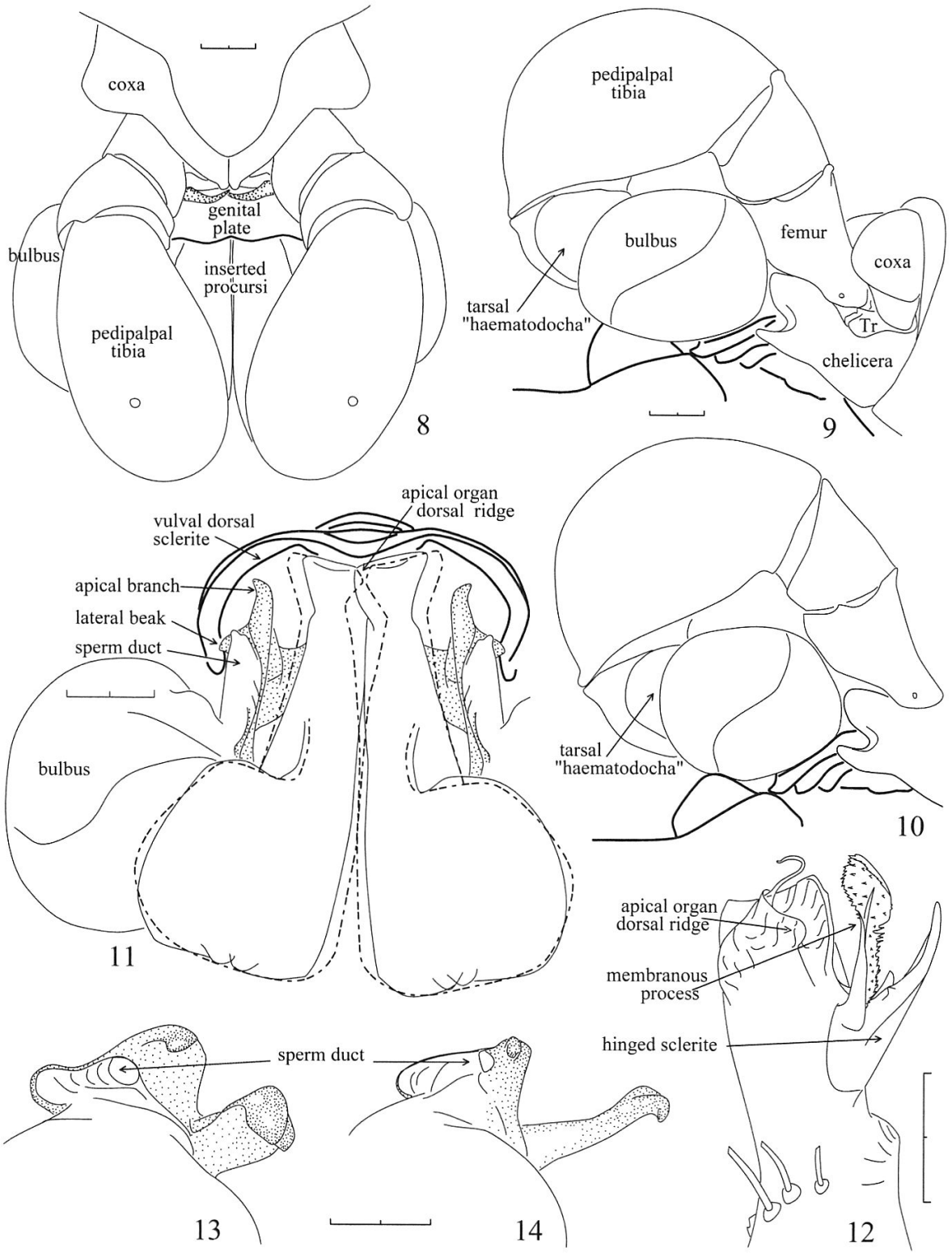


Figs 1-5: *Hoplopholcus minotaurinus in copula*; 1: Genital plate ventral view, with inserted procursi; 2: Procursi extracted, same position; 3: Vulva, dorsal view; 4-5: male chelicerae. Figs 6-7: *H. forskali*, vulva; 6: dorsal view; 7: posterior view. BA = bulbal apoph; DS = vulval dorsal sclerite; HS = hinged sclerite.



Figs 8-12. *Hoplopholcus minotaurinus*; 8-11: *in copula*; 8-9: Pedipalps half inserted; 10: Id., deep insertion; 11: Procursi *in situ*, dorsal view; 12: Resting right procursus, retrolateral view. Figs 13-14: Bulbal apophysis, prolateral view; 13: *H. cecconi*; 14: *H. minous*. Tr = trochanter; female body parts in bold lines. Scale, 0.2 mm.

MATERIALS AND METHODS

Holocnemus minotaurinus SENGLET, 1972, was collected from the type locality on the island of Crete in 1978 and *Stygopholcus photophilus* SENGLET, 1971,

from Greece in the same year. *Pholcus opilionoides* (SCHRANK, 1781) was collected under stones on a xerothermic hill in Switzerland, *Spermophorides huberti* (SENGLET, 1972) and *S. mediterranea* (SENGLET, 1972) from southern France and *Spermophora senoculata* (DUGES, 1836) from Greece.

Inadult spiders were reared in individual plastic boxes. Observation were made in bottomless square plastic boxes turned upside down on their lids. Each box was closed by very fine nylon threads stretching across the top, to enable the spider to suspend its web. An additional transparent plastic film was removed during mating and the spiders were observed under a dissecting microscope. All the females were virgin before mating.

Freeze-fixing during copulation was made with "Givrant 50" (produced by Siceront KF, France), an industrial medium used for testing electronics. It was poured over the spider couple, which then was put into a freezer. Later, the material was freeze-dried in vacuum.

To allow comparison with descriptions, I use "prolateral" and "retrolateral" for the male pedipalpal parts in the normal or resting position. In the genus *Pholcus* WALCKENAER, 1805, I use the classic terms "embolus" and "appendix" for bulbal structures, and "knob" for the fleshy or weakly sclerotized apophysis on the genital plate.

The vulvae (Figs 37, 55-58) were treated with sodium hydroxide and colored with pyrogallic acid, which gives a fine and reversible stain. Objects were cleared in lactic acid and placed on a hollowed microscope slide for observation.

OBSERVATIONS

Hoplopholcus minotaurinus SENGLET, 1972

In 1978 I was able to observe 10 matings of *H. minotaurinus* and one of *H. labyrinthi* KULCZYNSKI, 1903, but unfortunately some notes were lost. They are sister species and their mating behavior is similar. Below is the synthesis of my observations.

After the anchoring of the bulbal apophyses to the female genitalia, a kind of "cleaning" takes place. The procursi are used alternately. One procursus remains at the entrance of the vulva, the active one penetrates obliquely sidewards, then makes a sweeping movement to the center and is extracted. Subsequently the other procursus is inserted. These pre-copulatory insertions, in which the tarsal "haematodocha" remains inactive, last from 3 to 10 minutes.

During the actual copulation both procursi are inserted together along the sides of the vulva, clearly guided by lateral ridges in a furrow of the bulbal apophyses. During this movement the palpal tarsi remain in touch with each others. Next, the procursi tips move close to each other, until they are coupled by their apical organs (Fig. 11), reaching to the expanded middle part of the vulval dorsal sclerite. Now the palpal tarsi are slightly separated. The crossed male ventral hinged sclerites (HS: Fig. 2) are inserted deep into the ventral lodge of the female. In this deepest position there are one or more slow contractions, bringing the tarsi closer to each other, thus slightly separating the tips of the procursi (Fig. 11: dotted line), followed by partial extraction. The tarsal "haematodocha" is slowly deflating during the penetration phase, seemingly by mechanical pressure. The rhythm of the cycles varies from 3 sec. in the beginning, to 44 sec. after 1.5 hours. The copulation observed until the end lasted 2 hours.

Copulatory mechanisms in Hoplopholcus KULCZYNSKI, 1908

Figure 8 displays a copulation in shallow insertion in ventral view. The same couple, in lateral view, shows an inflated tarsal "haematodocha" (Fig. 9); a partially deflated one is seen in another copulation (Fig. 10). Note the cheliceral apophysis on the lateral wrinkles of the genital plate, with the gripping setae (Fig. 5) so tightly pressed into the wrinkles that the tip of the right apophysis broke off during separation (Fig. 4). In Fig. 1 is shown the wrinkled genital plate with inserted procursi; the reinforced lateral folds, characteristic for this genus, represent a counterpart to the lateral gripping setae of the cheliceral apophyses. The procursi are extracted in Fig. 2.

The bulbal apophysis (BA: Fig. 2) shows a proximal lobe, a median hook, a lateral bulge and an apical branch (broken on the right). The proximal lobe remains outside of the vulva; the median hook is nested in the posterior lateral depression of the ventral vulval sclerite (Fig. 3). The apex of a lateral beak (Fig. 11) anchors on the dorsal vulval sclerite; in Fig. 2 the beak is concealed by its basal bulge, the tip of the sperm duct protrudes a little. The apical branch close to the soft dorsal wall of the vulva near the dorsal sclerite seems to canalize the ejaculation to the margin of the vulva. The sperm duct opens just past the lateral beak (Fig. 11) on the dorsal vulval pore plate. Comparision of the bulbal apophysis with that of *H. cecconii* KULCZYNSKI (Fig. 13) and *H. minous* SENGLET, 1972 (Fig. 14) indicates that these two species lack a lateral anchoring beak.

Stygopholcus photophilus SENGLET, 1971

Courtship and mating

Ten mating pairs were observed and many were kryo-fixed. Here I give a digest of different observations. After introduction into the box, the male made some weak swaying, lifting his abdomen upward each time. After 10 min. the male quickly tapped on the female with his front legs and the female faced the male with her forelegs spread apart. Chelicera were fixed after 1.5 min. After the separation, the female chased and attacked the male.

The huge palpal tibiae remained relatively close to each other and did not allow a good observation of the intromission.

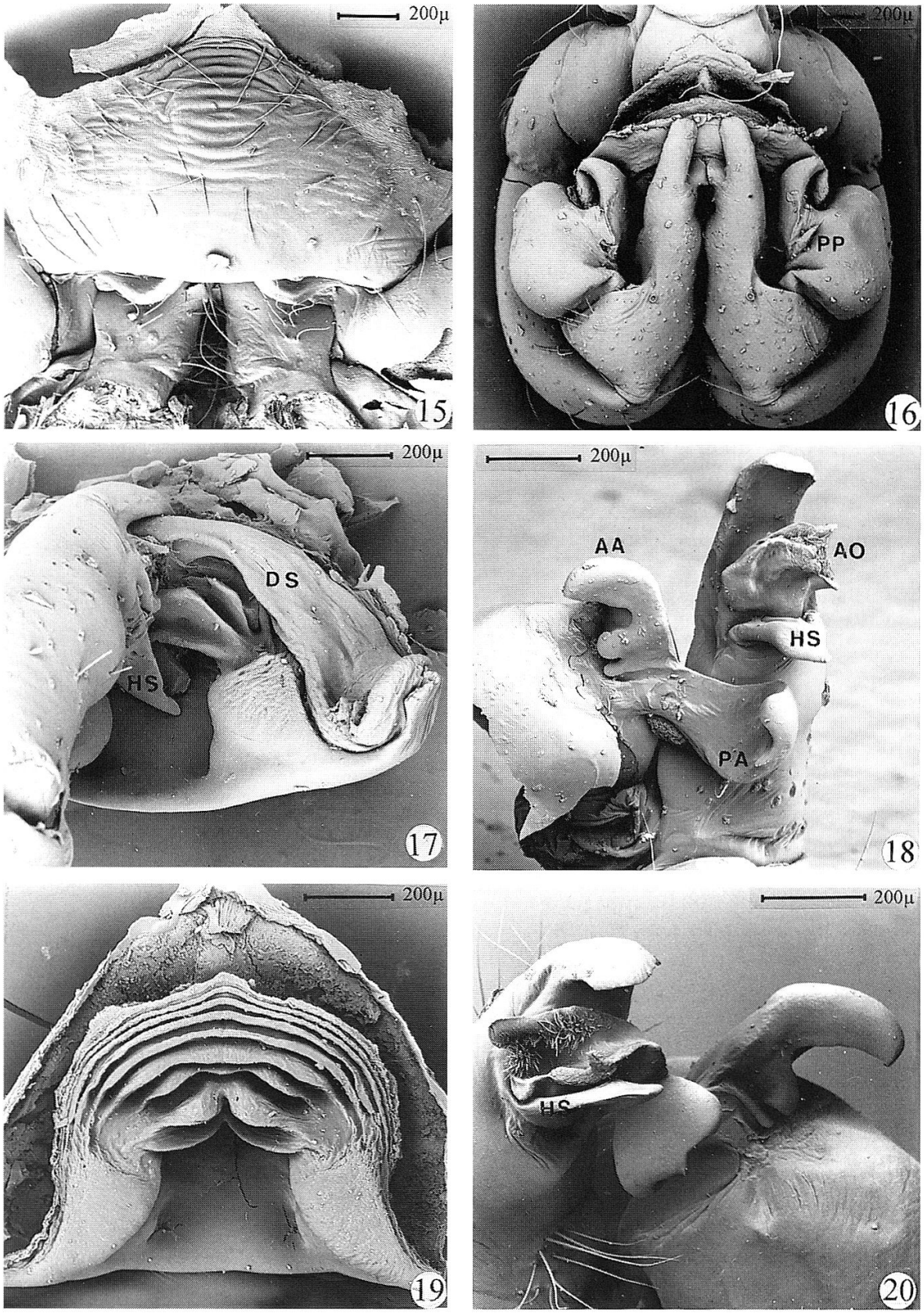
The rhythmic movements were weak and tense; contrary to observations on *Pholcus* and *Hoplopholcus*, there was only little longitudinal movement of the procursi, but a lateral motion and contraction of the palpal tibiae; the tarsal "haematodocha"was deflated in a rather lateral movement.

Phases of one copulatory cycle

1: Relaxed, pedipalps slightly separated; 2: Femora and tibiae move closer to each other; 3: External swelling of the femur-patella joint; 4: Contraction, a sharp jerk pulled back the tibiae a little.

Filling of the pedipalps

One hour four minutes after separation, the male hanging on three legs, became agitated and started spinning. With his third pair of legs he first rubbed a transverse thread over his genital opening in a rhythmic backward-forward move-



Figs 15-20: *Stygopholcus photophilus*; 15-18: *In copula*; 15: Genital plate, ventral view, with inserted procursi; 16: Procursi in situ, dorsal view; 17: Id., posterior view, left procursus extracted; 18: Left procursus and bulbal apophysis, ventral view; 19: Vulva, dorsal view, dorsal sclerite discarded; 20: Apical view of a resting right procursus and bulbal apophysis. AA = bulbal apical apophysis; AO = apical organ; DS = vulval dorsal sclerite; HS = hinged sclerite; PA = proximal bulbal apophysis; PP = pointed process.

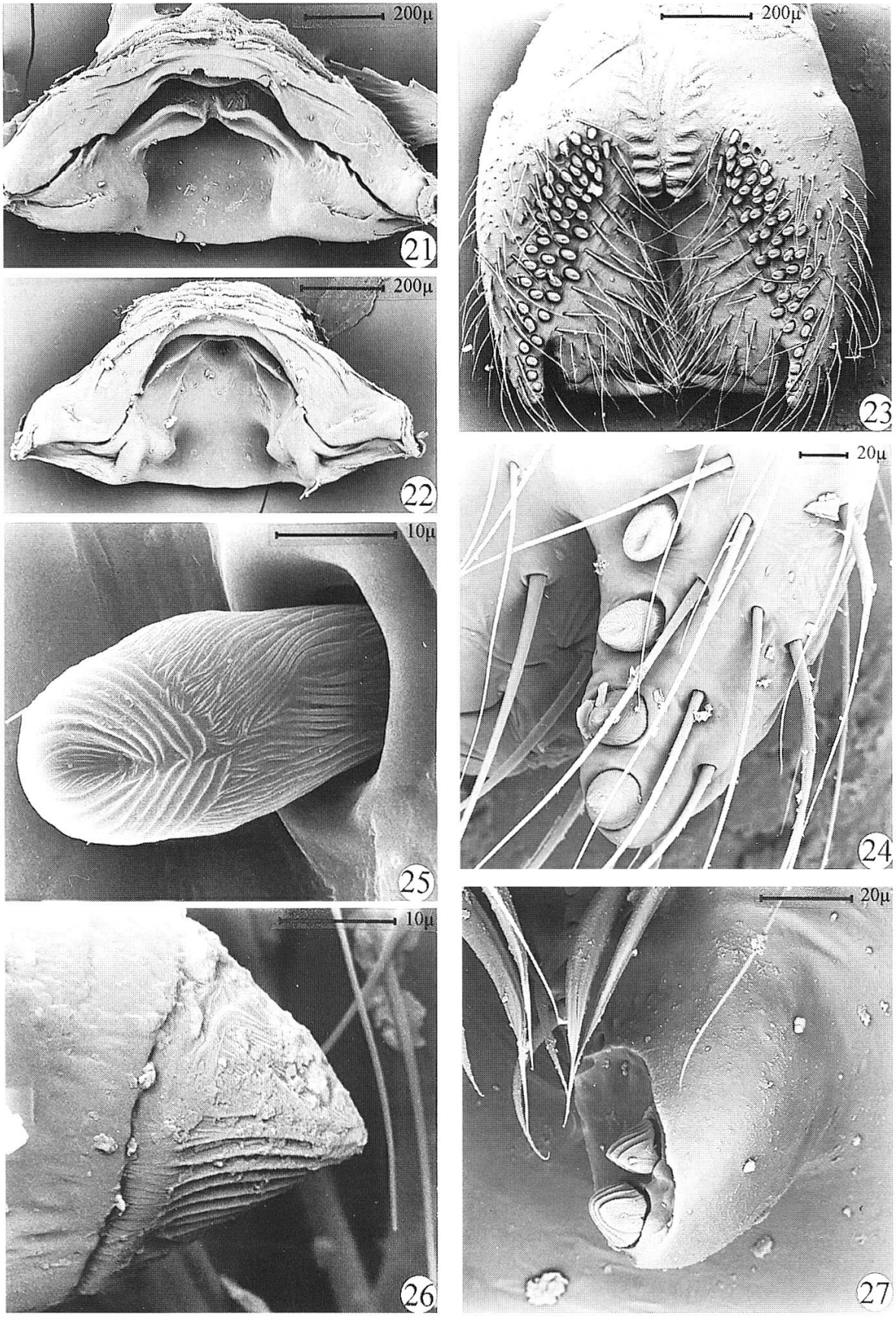


Fig. 21: *Stygopholcus absoloni*, vulva, dorsal view. Fig. 22: *S. skotophilus*, vulva, dorsal view. Figs 23-25: *S. photophilus*; 23: Chelicerae; 24: Cheliceral apophysis; 25: Id., club like gripping seta; Fig. 26: *Ceratopholcus maculipes*, gripping seta. Fig. 27: *Pholcus phalangioides*, cheliceral apical apophysis.

ment. The genital plate became humid as he continued the rubbing. After 40 sec. a milky drop appeared and swelled rapidly. He started swinging vertically, the thread remaining inside the drop. The drop of sperm became larger and appeared elastic. The male lifted the drop and put it down two or three times. After 80 sec. he took the drop with the thread between his open fangs, touching the drop with the bulbus of one palp in alternation. As clearly seen when pulling out of the drop, the sperm was wetting the apical part of the bulbus and the underside of the apical bulbal apophysis up to its tip. After 3 min. the drop became tiny; the pumping continued with interruptions until the thread was discarded 6 min. 30 sec. after the first rubbing

Copulatory mechanisms in Stygopholcus

The strong basal tubercles of the palpal femora are joined below the chelicera. Figure 15 shows the ventral side of the genital plate with inserted procursi; the transverse wrinkles on the anterior surface are just above the fused anterior ventral vulval lodge (Figs. 28, 16). This is just were the chelicera are pressing with their basal transverse median ridges.

Figure 16, gives a dorsal view of the vulva, male pedipalps *in situ*, dorsal vulval wall removed. The procursi are coupled by the dorsal ridges of the apical organ (AO: Figs 18, 20); the dorsal projecting extremity of the procursus rests on the dorsal sclerite (a big male can reach past the sclerite (Fig. 28)). The hook of the proximal bulbal apophysis (PA: Figs 18, 20) fits into the posterior lateral depression of the ventral sclerite (Figs 17, 19). The V-shaped apical bulbal apophysis (AA: Figs 18, 20, 28) holds onto the dorsal sclerite (DS). The hinged sclerites (HS: Figs 17,18, 20) are inserted deep into the ventral lodge. Note in Fig. 28 the fused anterior ventral lodge under the chelicera and the small unsclerotized pointed process (PP: Fig. 16), which is typical of the genus.

In postero-dorsal view (Fig. 17) one procursus is removed; the dorsal ridge of the apical organ is nested in a posterior grove of the dorsal sclerite and the flexed hinged sclerite is deep inside the ventral vulval lodge (compare with the ventral vulval sclerite in Fig. 19, where the dorsal sclerite is removed).

Spermophora senoculata Duges, 1836

In female *Spermophora* the internal dorso-lateral anchoring of the bulbal apophysis found in *Pholcus* is displaced to a fold along the posterior lip of the genital opening. This fold is interrupted in the middle and serves as a dorsal anchoring sclerite. Two copulations were observed.

Like *Pholcus*, *S. senoculata* possesses two bulbal apophyses. The basal one (Figs 30, 49) (? uncus), low, rounded, armed with numerous small teeth, anchors to the posterior lip of the genital opening; the second long and pointed apophysis reaches to the side of the spinnerets. No posterior sclerite is present on the female abdomen. Another convergence with *Pholcus* is the apical cheliceral apophyses grasping a rather soft structure on the rim of the vulva. During mating, the genital plate is strongly stretched by the male chelicera, giving space to the vertical apophyses of the procursi, which are pressed against the ventral sclerotized structure of the uterus externus. To stabilize the traction on the plate, the anterior cheliceral apophyses (AnA: Figs 46, 47, 30) press against both sides of the genital plate. The same is done by the apophyses of the palpal trochanter in *Pholcus opilionoides* (Fig. 42).

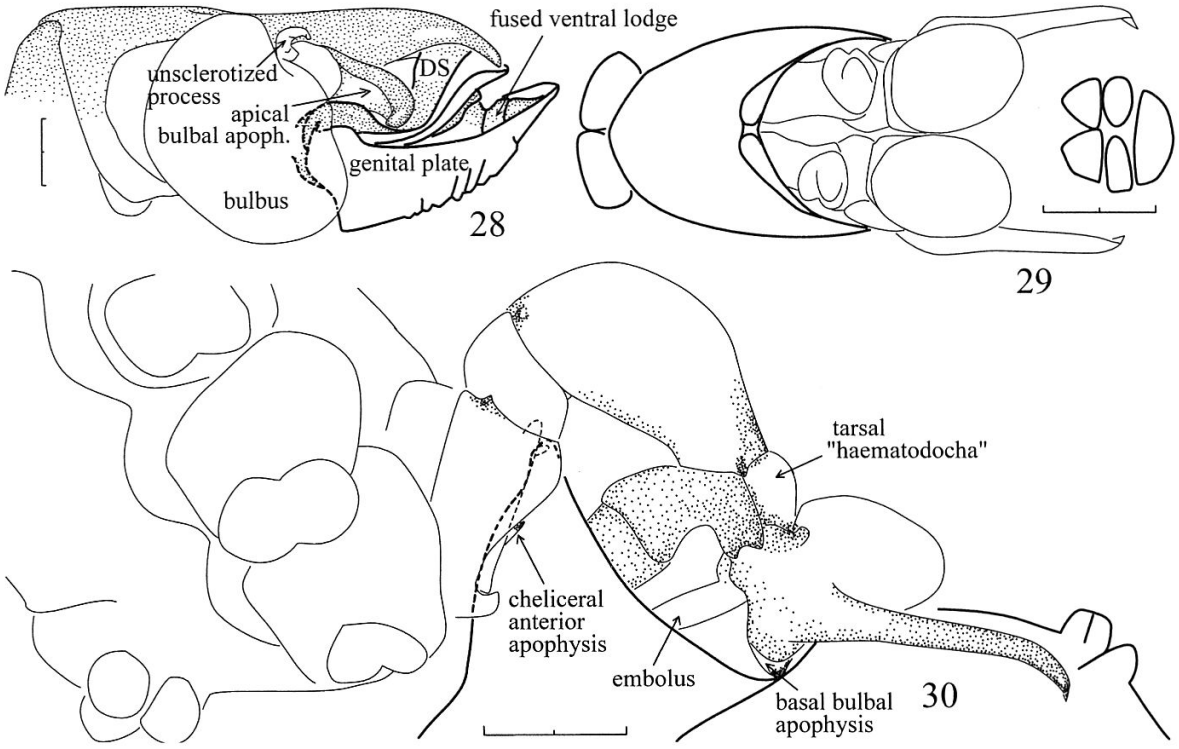


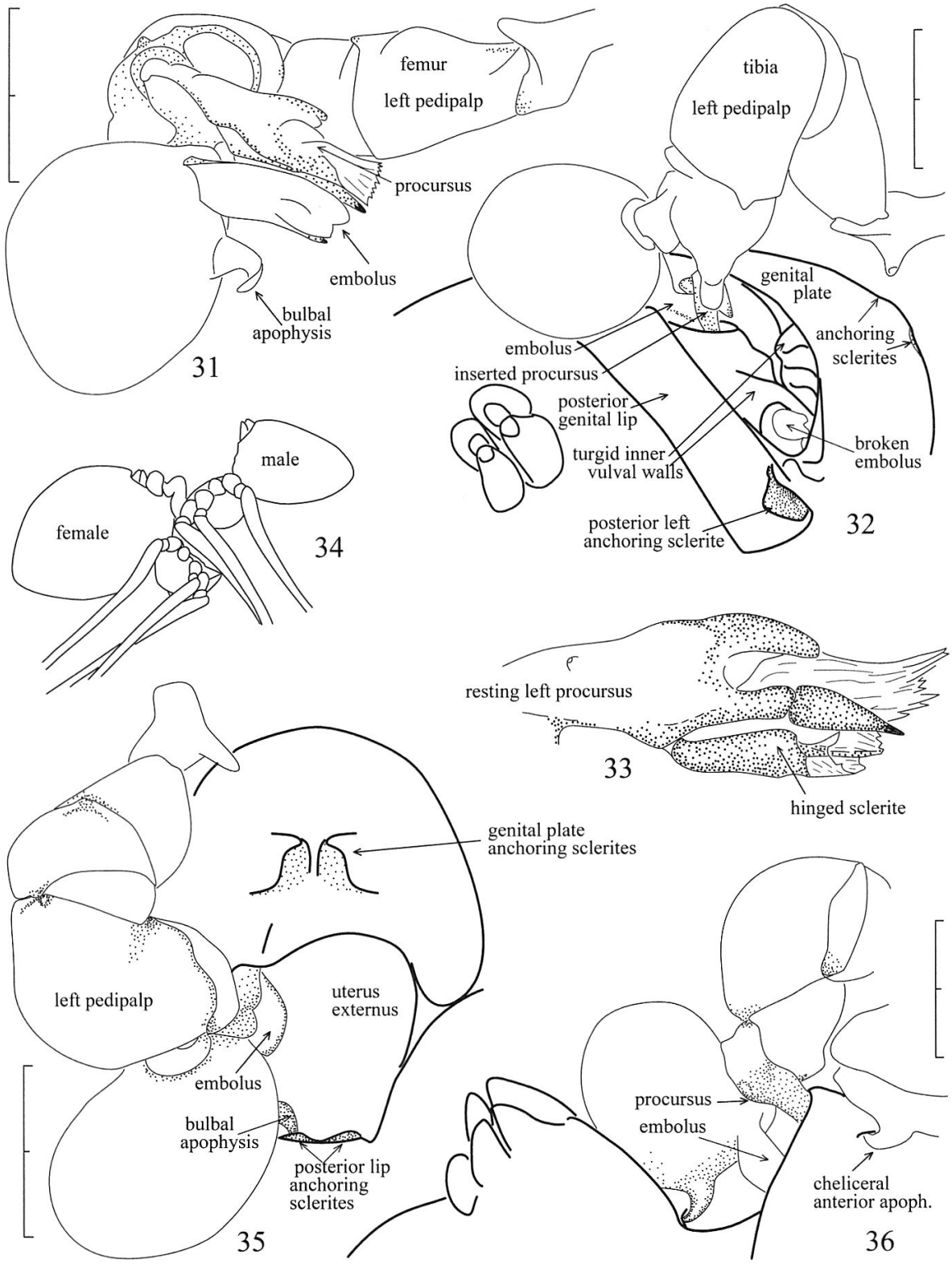
Fig. 28: *Stygopholcus photophilus*, procursus *in situ*, lateral view. Figs 29-30: *Spermophora senoculata*, *in copula*; 29: Genital plate, ventral view, procursi in deep insertion; 30: Another pair, lateral view, in partial extraction. Female body parts in bold lines. Scale, 0.2 mm.

Fig. 30 shows the extracted phase, displaying the bulging tarsal "haematodocha" on the palp of *S. senoculata*. In Fig. 29 we see the deep insertion, where the "haematodocha" is totally deflated (tibia removed).

Spermophorides mediterranea (SENGLET, 1972)

Courtship and mating

Three pairs have been observed. After introduction in the box of the female, the male remained passive for about 40 min., except for some occasional balancing and nodding of the abdomen. After 42 min. the female began to circle around the male, while balancing vigorously. The male responded with nods of the abdomen and his anterior legs slightly touched those of the female. This was repeated several times with periods of rests, until after 45 min. the female gave a strong jolt. The male answered with spasmodic movements of the abdomen, turned around the ♀ and made some spasmodic movements of the whole body, until 47 minutes. The female produced a jolt and turned round to face the male, which opened his 4 anterior legs almost at a right angle, turned over the palps and made a first attempt to anchor the chelicera. After 48 min. the chelicera were fixed; 20 sec. later the bulbs were anchored, followed by introduction of the emboli. The first insertion of the procursi occurred 17 sec. later. The male shook his legs and rubbed them against those of the female, which responded with her legs. 65 sec. after insertion of the procursi, the first move of the right procursus occurred, followed by the left one after 15 sec. The movements were not quite regular; sometimes almost simultaneous, at other times alternately, but directly one after the other.



Figs 31-33. *Spermophorides mediterranea*; 31: *In copula* Left male pedipalp extracted, ventral view; 32: Id., in deep insertion; 33: Tip of a resting left procursus, dorsal view. Figs 34-36: *S. huberti*, *in copula*; 34: Mating position; 35: Genital plate, ventral view, right pedipalp removed; 36: Right pedipalp inserted, lateral view. Female body parts in bold lines. Scale, 0.2 mm.

During one mating of *S. mediterranea*, I was able to observe the movement of the procursi through the genital plate with lateral light and 80x magnification. They were inserted at an angle into the lateral margins of the vulva, penetrating

along the side, over the embolus, then making a sweeping movement toward the center. Finally they reached a parallel position, without touching each other. The procursi were extracted and inserted anew. During the sweeping movement, the hinged sclerite with terminal membranes (prolateral process in a resting palp; Fig. 33) opened up like a fan. Following the movement of the tarsi, the bulb made a partial rotation around the anchoring apophysis.

Copulatory mechanisms in Spermophorides

In Fig. 32 one can see the final step of a deep insertion in a turgid vulva. The ventral inner surface is bulging in the center and the dorsal surface, high and rather flat, encloses the tips of the procursus-embolus complex at the lateral margin. An apical view of the extracted pedipalp (dorsal to the vulva, Fig. 31) shows the procursus pressing the embolus onto the margin of the vulva, his dorsal tip jutting out above the embolus. During insertion movements the procursus slips along the embolus and could force the extrusion of sperm.

In *S. mediterranea* the posterior (dorsal) anchoring sclerites (Fig. 32) of the genital opening, located at the commissure of the lips close to the pore plate, allow a relatively short embolus, which crosses the hook apophysis. In *S. huberti* (one pair observed and fixed) the anchoring sclerites are in the middle of the posterior lip (Figs 35, 36), the longer embolus, diverging from the hook at his base, is inserted right at the commissure. The uterus externus is highly stretched over its length.

Genus Pholcus Walckenaer, 1805

Mating mechanisms have been described in *P. phalangioides* Fuesslin, 1775, and *P. opilionoides* (Uhl et al. 1995, Huber 1995, respectively). Additional observations are given here.

Pholcus opilionoides (Schrank, 1781)

Courtship

In all 6 pairs observed, the male almost entirely destroys the dome of the female web before mating. As soon as the male is placed in the box of the female, he begins to unfasten the web from the wall. Once the web is free from the walls, he continues the reduction from the sides until there remains less than a diameter of 2 cm. The mating takes place suspended from those web remains. The destruction of the web can last up to half an hour, as the male often pauses.

The male rubbed the female vigorously with his fore legs and, as usual, rotated his palps and attemped the cheliceral fixation. This was effective from 17 to 35 min. after introduction into the box. A male cutting some threads before coupling was observed (Uhl et al. 1995: 5) in *P. phalangioides*, but this cannot be compared with the systematic web destruction in *P. opilionoides*.

I have also been able to observe a complete destruction of a female web by a male of *Holocnemus hispanicus* Wiehle, but this happened after mating. After separation of the pair, the male was sitting near the female and cleaning his pedipalps for 13 minutes. Then suddenly he began to destroy the web at some distance from the female, which remained motionless. He did not stop until only a fragment of the web remained around the female.

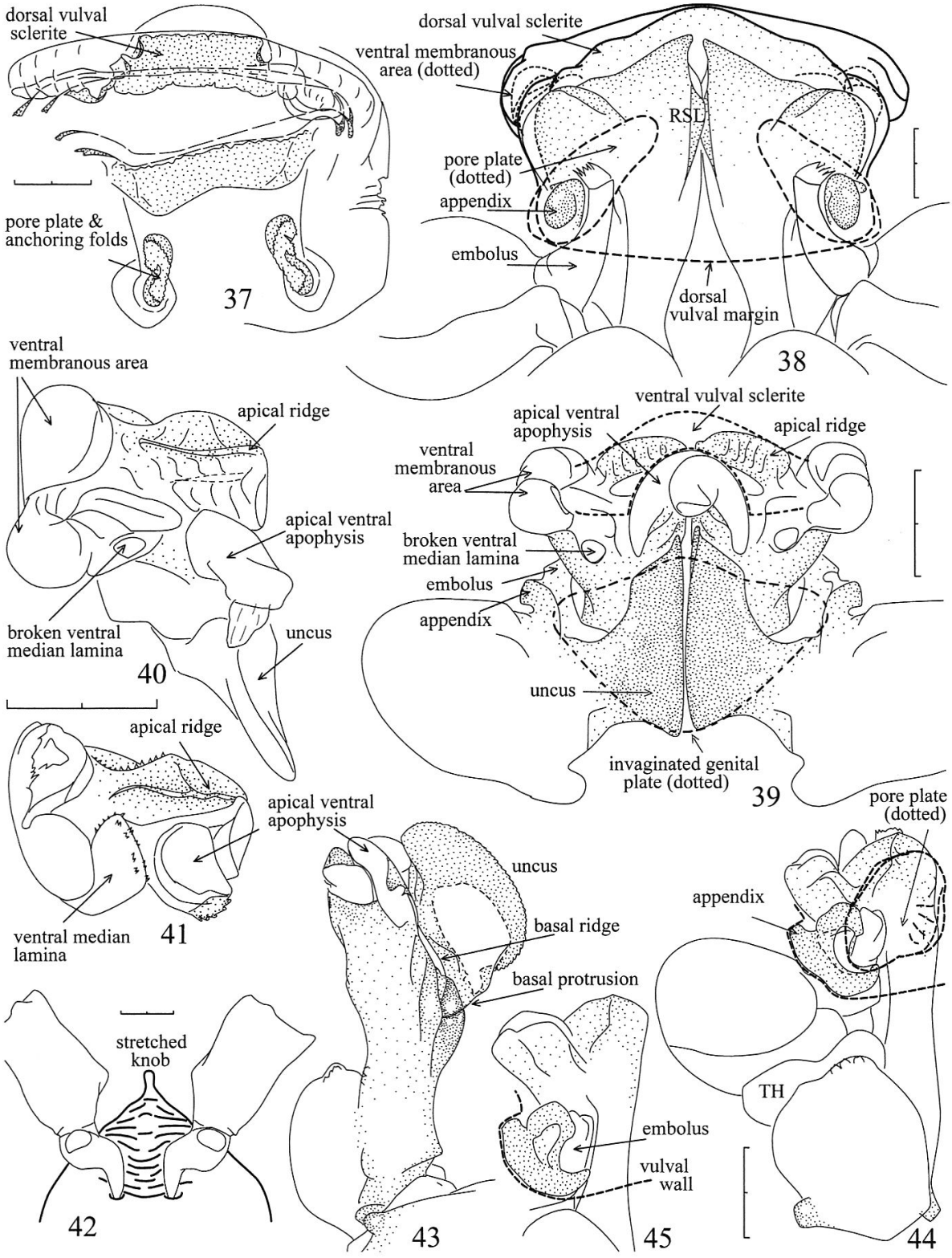


Fig. 37: *Pholcus armeniacus*, turgid vulva, antero-dorsal view. Fig. 38: *P. phalangioides*, *in copula*, dorsal view. Figs 39-45: *P. opilionoides*, *in copula*; 39: Procursi *in situ*, ventral view; 40: Left procursus, apical view; 41: Id., partially extracted, apical view; 42: Trochanter apophyses on genital plate, anterior view; 43: Left procursus partially extracted, retrolateral view; 44: Id., dorsal view; 45: Id., deep insertion dorsal view. RSL = retrolateral sclerotized lamina; TH = tarsal "haematodocha". Female body parts in bold lines. Scale, 0.2 mm.

Copulatory mechanisms in Pholcus

In addition to the stabilization of the rotated pedipalp, the large trochanter apophyses, coupled to the chelicera (Fig. 42), are pressing on the anterior part of the vulva to stabilize the traction on the knob of female genital plate. By doing this, they reach well in front of the invaginated genital plate, down the slope created by the unci (see below: Erectile vulva in *Pholcus*).

Figure 39 gives a ventral view of the procursi in deep insertion, with the vulva removed. The flexed genital plate (interior concavity) and the ventral sclerite are figured in dotted lines. The apical ventral apophyses, highly developed and carrying a fine lamella, are protruding ventrally through the semicircular opening of the ventral sclerite. The ventral membranous area (Figs 39, 40), situated on the prolateral lobe, is divided into two diverging branches; at the base of its ventral root there is a large ventral median lamina broken at the dissection. Figure 40 shows an apical view of the left procursus of Fig. 39. Figure 41 shows the tip of another procursus in a half extracted position, with the ventral median lamina present. Figure 44 (dorsal rim of the vulva and pore plate figured in dotted lines) gives a dorsal view of the same and displays the appendix covering half of the embolus. In the deeply inserted procursus (Fig. 45), the posterior tip of the appendix encloses the embolus in a groove of the procursus stem. The embolus is sclerotized in its basal half and, coupled to the appendix, may be used as a secondary guiding device for the longitudinal and twisting motion of the procursus.

The primary guiding is done by the margin of the basal protrusion of the uncus extended as a ridge along its base, sliding in a longitudinal groove on the ventral part of the procursus in *P. opilionoides* (Fig. 43, in shallow insertion). In *P. phalangioides* this is done by the back side of the slightly arched basal protrusion, on a ridge of the procursus (UHL et al. 1995: 5, 8, Fig. 10).

***Pholcus phalangioides* (FUESSLIN, 1775)**

Four pairs were observed. Figure 38 shows the procursi in deep insertion (dorsal view), with the dorsal wall of the vulva removed. The pore plate and the posterior border of the vulva are figured in bold dotted lines. The appendix protrudes and forms a bulge of the pore plate. The sclerotized dorsal apical projection of the procursi rests on the dorsal vulval sclerite and they are coupled along their margins by the retrolateral sclerotized lamina (RSL). The ventral membranous areas (dotted lines) are inside the unsclerotized lateral ventral pouches of the vulva. A RSL is also present in *P. alticeps* SPASSKY, *P. hyrcanus* SENGLET, *P. persicus* SENGLET , *P. medicus* SENGLET, *P. armeniacus* SENGLET and *P. creticus* SENGLET, but not in *P. opilionoides*.

DISCUSSION

Apparent lack of specific attraction

In 1978 I erroneously placed a male *Holocnemus pluchei* with a female *Stygopholcus photophilus*. The male, very excited, repeatedly waved his pedipalps (stridulation?). The female showed no reaction whatsoever and the male tried to carry out cheliceral fixation on the dorsal side of the female for some minutes. In a more recent attempt a male *S. photophilus* has been placed with a female *H. pluchei*; they had been collected at the same place and I did not check the adult female (last

molt 30. 3. 2000). In less than a minute the male was trying to fix his chelicerae on the genital plate of a receptive female with spread out legs. The fixing attempts lasted 3 min. until the pair was separated.

In both cases the male was excited by a female of a different species, but the reaction of the females were quite distinct. While the *S. photophilus* female remained indifferent, that of *H. pluchei* reacted positively facing the male with spread legs. In all mating observations, the male approaches the female, but copulation does not take place before the female faces the male with spread legs.

Male chelicerae

Mechanical problem of copulatory penetration

In Salticidae and Gnaphosidae, the preliminary position for mating is achieved when the legs of the male hold the female.

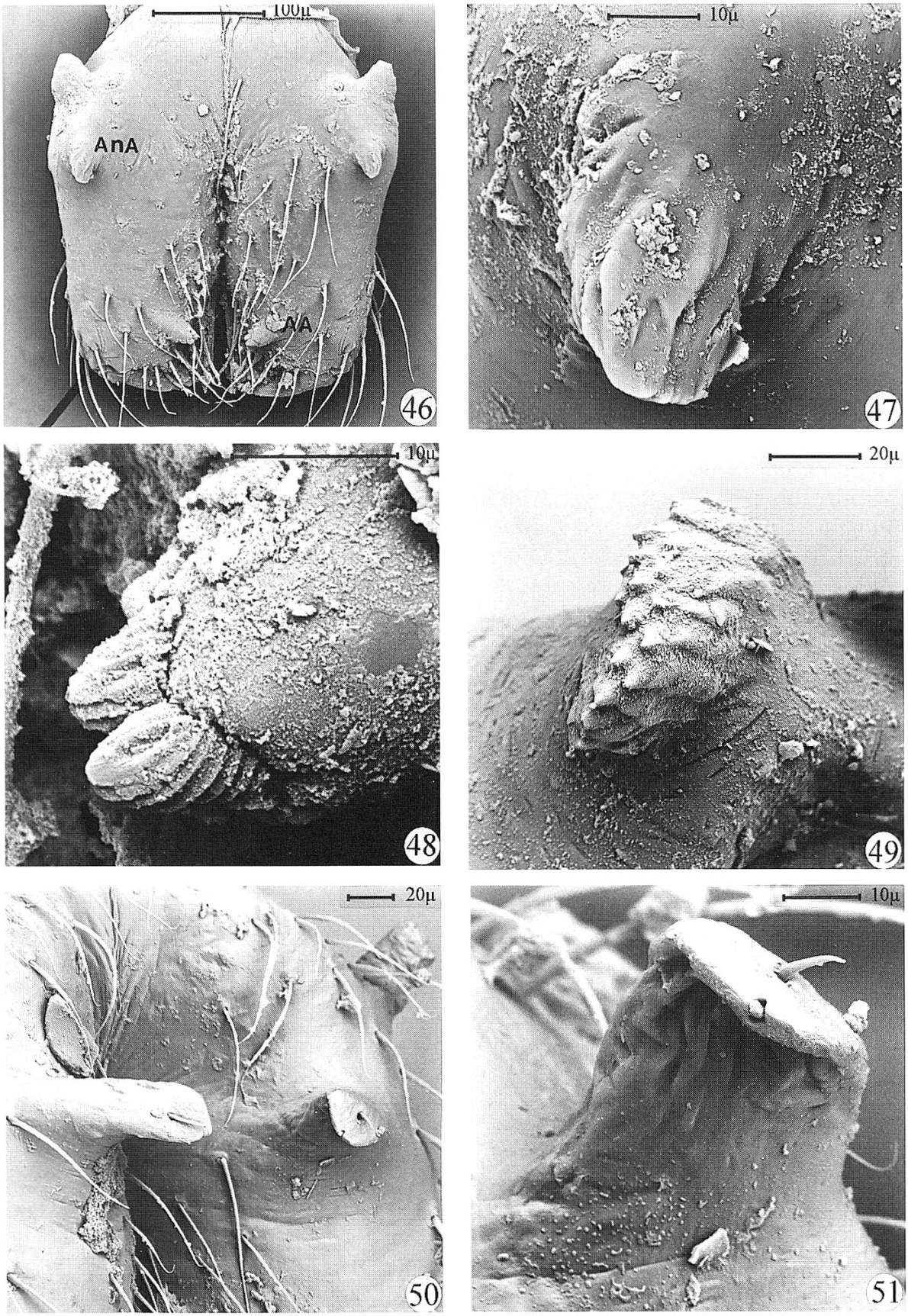
The actual fixation is done by the retrolateral tibial apophysis coupling to a hood or anchoring sclerite, which then allows the intromission in a paired insemination duct through the hydraulic rotation of the bulbus. Tibia and bulbus are to be considered an independent mechanical unit. To allow the insertion of two procursi and bulbal appendages in the genital opening by muscular force, a very strong fixation of the male is needed in the Pholcidae.

The copulation begins with the fixation of the male chelicerae on the female genital plate. At this stage the only contact in the couple, except for some occasional touching of the legs, is made by the fixed chelicerae. Fixation is realized by means of different types of male cheliceral apophyses, generally armed with deeply embedded modified cheliceral hairs. They have a grooved anti-slip surface (Figs 26, 27, 48) which strengthens the gripping action. These hairs will be referred to as "gripping setae". Their disposition and shape vary according to their use in each group.

UHL (1994) considered the cheliceral apophyses modified hairs to have a sensorial function, but she disregarded the need of mechanical reinforcing of the grip. Investigation on the innervation of the gripping setae may show whether they have a sensorial function in addition to a purely mechanical one.

At the apex of the cheliceral apophysis, which is used to grasp a sclerotized depressed anchoring device on the female genital plate, there is usually one conical gripping seta (Fig. 26; HUBER et al. 1999: Fig. 2). This is the case in *Holocnemus*, *Ceratopholcus* and *Crossopriza*. On the cheliceral apophysis of *Hoplopholcus*, however, there are two setae of the conical type, situated not on the apex, but close to it, on the inner side (Figs 4, 5). These setae grip on the postero-lateral wrinkled surface of the genital plate (Figs 1). In addition to one or two apical conical setae, *Stygopholcus* (Figs 23-25) possesses club-like gripping setae, which are movable on their basis, so that they can align themselves in the folds of the genital plate and press their oblique depression surrounded by fine downy ridges (Fig. 25) on the female genital plate. The oblique tips of these setae strongly suggest that they produce a sucking adhesion to the genital plate surface. In Fig. 23, showing chelicerae freeze-dried *in copula*, we see club-like setae pointing in different directions, which is not seen on a resting specimen. On the deepest wrinkles two basal setae were broken during separation.

The same disposition on the inner side of the apical cheliceral apophyses is found in genera like *Pholcus*, which have a rather fleshy or weakly sclerotized anterior knob on the female genital plate, or in *Spermophora senoculata* (AA: Figs 46,



Figs 46-49: *Spermophora senoculata*, male; 46: Chelicerae; 47: Anterior cheliceral apophysis; 48: Apical cheliceral apophysis; 49: Basal bulbal apophysis. Figs 50-51: *Spermophorides mediterranea*, male; 50: Anterior cheliceral apophyses, frontal view; 51: Id., prolateral view. AA = apical apophysis; AnA = anterior apophysis.

48) with an anchoring device on the rim of the plate. Sclerotization is variable in *Pholcus*. In *P. phalangioides* it is relatively strong but restricted to the tip of the appendage. The seizure of the knob by the male cheliceral apophyses is performed at its base for a traction effort on the knob. Counterbalanced by the trochanter apophyses on the anterior part of the genital plate, it gives a firm hold of the chelicerae. The gripping setae (Figs 27, 48), two in *P. phalangioides*, three in *S. senoculata* or four in *P. persicus* SENGLET, are more rounded to have a good hold without injuring the relatively softer structure of the female genital plate.

The anterior cheliceral apophyses of *Spermophora senoculata* (AnA: Figs 46, 47) have no gripping setae. Here the dorsal surface of the lamella-shaped apophysis is entirely sclerotized, with the external surface being reinforced. They press against both sides of the female genital plate to stabilize the traction on the rim of the plate caused by the cheliceral apical apophyses. In *Pholcus opilionoides* the same stabilization is enforced by the palpal trochanter apophyses (Fig. 42).

In Mediterranean *Spermophorides* the anchoring is done by the anterior cheliceral apophyses, which are sclerotized, and like those of *Spermophora*, not armed with gripping setae (Figs 50, 51). The lower reinforced surface of these apophyses pulls on an external sclerotized wall of a pair of pockets on the genital plate of the female (Figs 35, 36). The outer surface of the cheliceral apophysis, which bears tiny hairs, has no mechanical use after the anchoring is done.

Tarsal "haematodocha"

In pholcids a large whitish area can be observed on the prolateral base of the palpal tarsus, close to the insertion of the bulbus. This area has an active role during copulation. The tarsal "haematodocha" is greatly inflated in the retracted phase of the rhythmic movement and then is slowly deflating during deep penetration of the procursus, seemingly by mechanical pressure of the tarsus against the bulbus immobilized by its anchoring apophyses. In *Stygopholcus photophilus* the deflating is achieved in a more lateral torsion of the tarsus, while in the other genera observed it is done rather by the tarsus following the movement of the procursus in a longitudinal motion. Inflating of the membranous base of the bulbus has already been recorded by UHL et al. (1995: 5). This mechanism may be used for the extrusion of sperm.

The Hoplopholcus-Stygopholcus problem

BRIGNOLI (1971b) placed *Stygopholcus* KRATOCHWIL, 1932, in synonymy with *Hoplopholcus* KULCZYNSKI, 1908, on the basis of the erroneous observation that *Hoplopholcus* has gripping setae of the club-like type, like in *Stygopholcus*.

This is given in his key to European genera: "(...)4. ♂: Chelizeren mit kolbenähnlichen „Stacheln"; wenigstens auf den antero-lateralen Processen (...) = *Hoplopholcus* (...)" (BRIGNOLI 1971b: 256; see also pages 258, 265 and Fig. 8 for *H. minous* (sub *palladis*), and page 266 and Fig. 13 for *H. labyrinthi*). An observation under clearing agent could be the cause of his mistake. BRIGNOLI did at last agree that an "infossati" and "libere" type of modified hair exist (BRIGNOLI 1976: 562).

Despite BRIGNOLI's statement (1979: 350) that all characters, except the sensory structures, of *Stygopholcus* correspond with the typical *Hoplopholcus*, there are consistent characters, in addition to the cheliceral club-like setae, which allow to distinguish the two genera.

♂: The shape of the palpal femora: width/length ratio less then 0.75 in *Hoplopholcus* and more than 0. 90 in *Stygopholcus*. External characteristics of the

femur: bearing a longitudinal ridge on its ventro-lateral basal half in *Hoplopholcus* and a strong tubercle at the external base in *Stygopholcus*. Sperm duct opening directly on the bulbus in *Stygopholcus* and on the tip of a duct fused to the apical apophysis in *Hoplopholcus*. Procursus with a long membranous process (Fig. 12) arising from near the base of the hinged sclerite in *Hoplopholcus* only, and presence of hair tufts in the concavity of the apical organ only in *Stygopholcus* (AO: Figs 18, 20).

♀: Ventral vulval sclerite with a ventral lodge anteriorly extended into a tube fused with the genital plate, appearing as an anteriorly dark stain on the genital plate in *Stygopholcus*, and not adhering to the plate in *Hoplopholcus*, which have the central part of the dorsal sclerite expanded in a ventral lamina.

Erectile vulva in Pholcus

In *Pholcus phalangioides* an inflated membranous area posterior to the epigynum has been observed for a receptive female before mating (UHL et al. 1995: 3). I could observe the same phenomenon in *Holocnemus pluchei* (SCOPOLI) and *H. hispanus* WIEHLE, but after separation of the male and female; 40 min. later this area was deflated and looked somewhat wrinkled.

In the genus *Pholcus*, a characteristic invagination of the genital plate occurs during mating. This could be explained by the traction of the male chelicera on the anterior, more or less fleshy knob, but from one casual observation it appears that it is a female mechanism caused by an erectile vulva. Of course a certain traction on the apophysis from the male is probably required to trigger the invagination.

Once I made a peculiar observation while preparing the vulva of a *P. armeniacus* SENGLET (Fig. 37, antero-dorsal view). After being treated with sodium hydroxide for a long time and then transferred to water, the organ inflated to the point of breaking the ligaments joining the dorsal and ventral sclerite on one side. I was extremely surprised to see the genital plate invaginated, which is the normal status in *P. creticus* (SENGLET 1972: Figs 9-10). The sclerites were enclosed in inflated bags. On Fig. 37 one can note a set of turgid membranes on the right side, which are depressed on the broken left side. The pore plates with the anchoring folds are erected.

In the dissected material, the soft inner walls of the vulva are dorsally and ventrally tightly pressed on to the male palpal organs, indicating a turgid vulva during copulation.

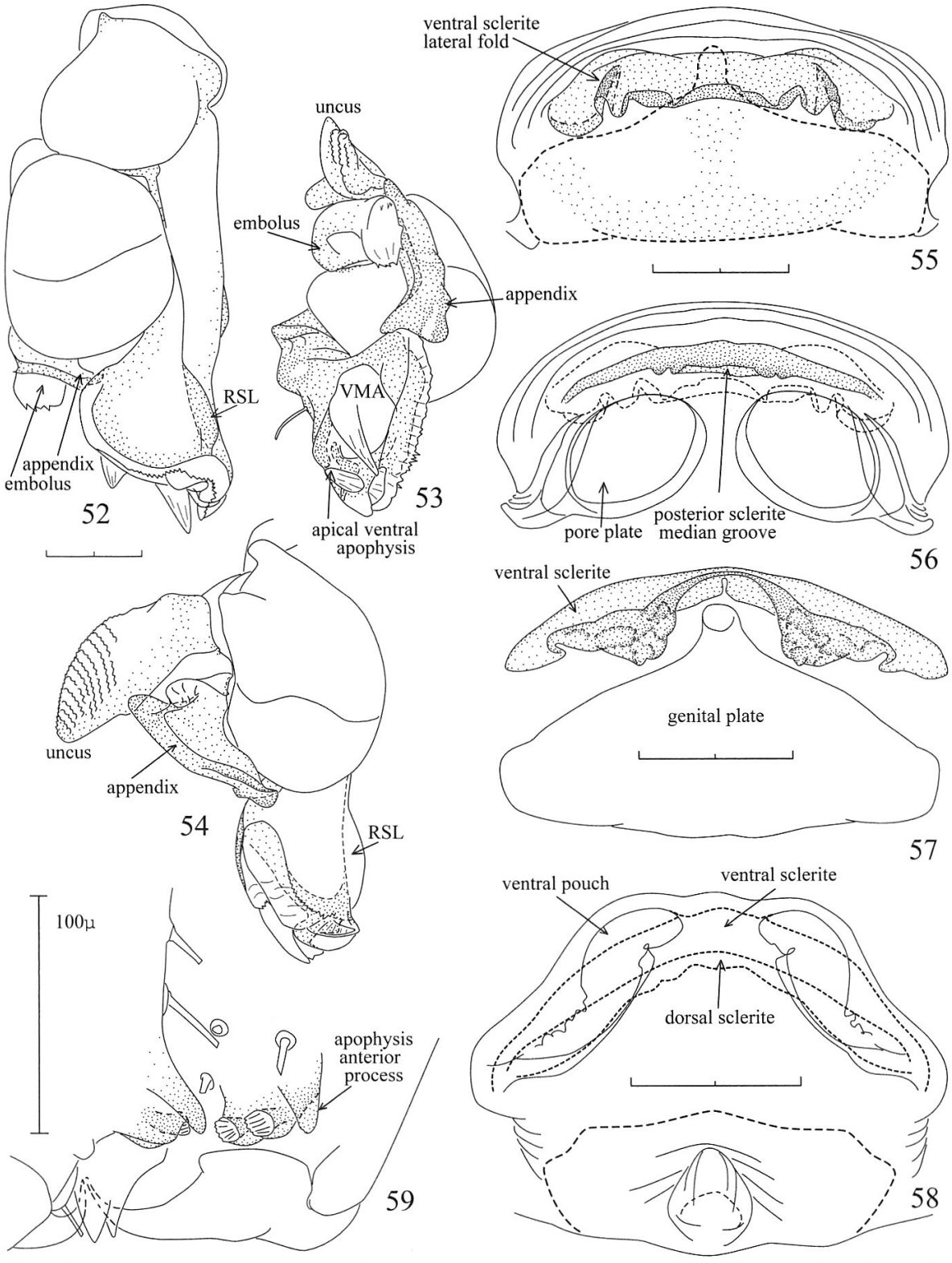
Unlike the ventral vulval sclerite extended to the rim of the vulva found in *Holocnemus*, *Hoplopholcus* and *Stygopholcus*, there is only a soft ventral vulval wall in *Pholcus*.

The needed space for the movements of the procursi is preserved by the joined unci, backing the invaginated genital plate (Fig. 39: dotted line) arched like a roof. The unci are pressed together along their denticulate surface and their rough margins get in contact with the middle part of the genital plate, which is often more sclerotized at the center.

SYSTEMATIC AND FAUNISTIC DATA

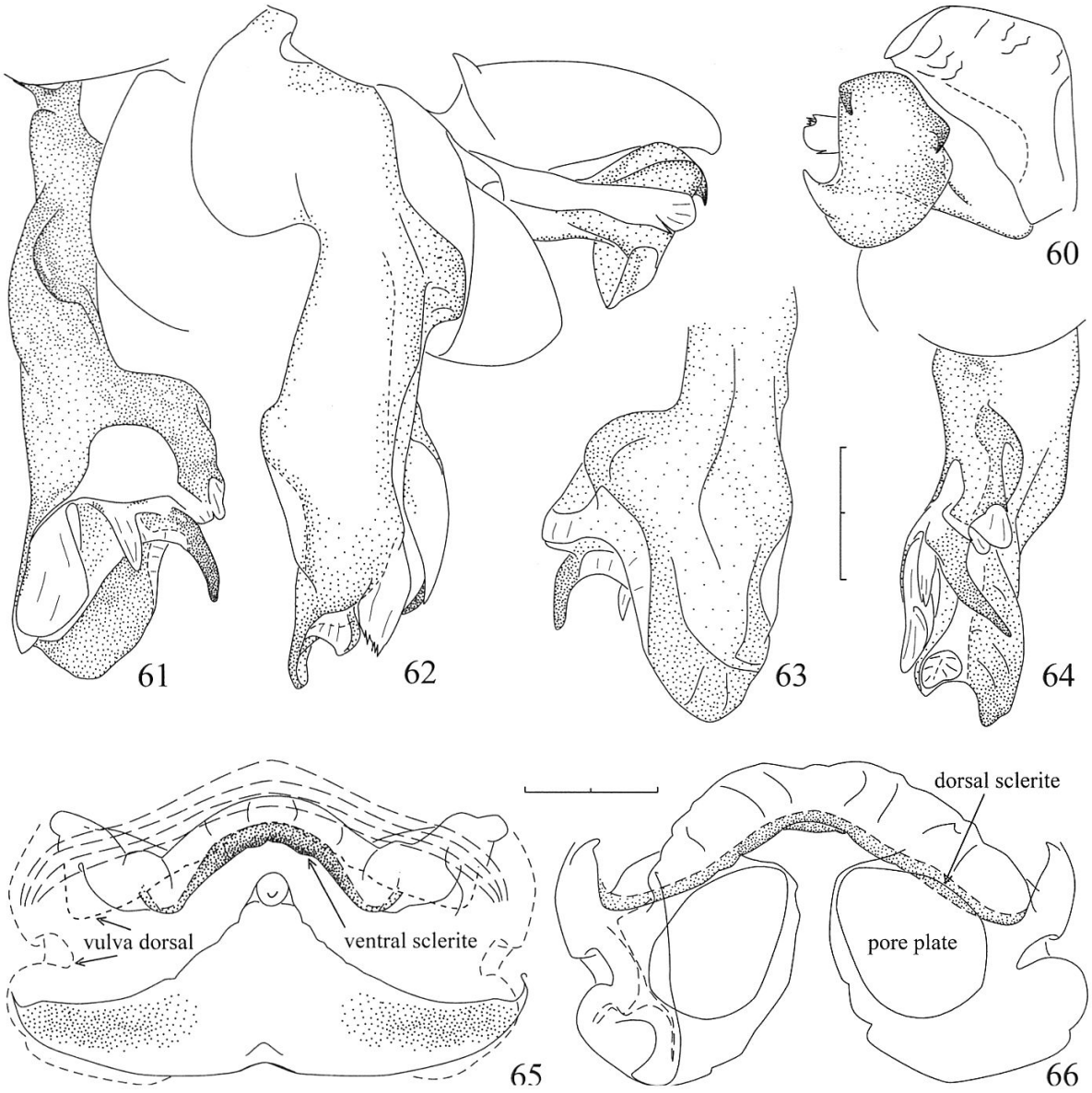
Genus *Hoplopholcus* KULCZYNSKI, 1908

♂: Cheliceral gripping setae of the conical type (Figs 4, 5), restricted to the mesal side of the apical apophyses. Relatively narrow palpal femora (SENGLET 1971: Figs 20, 31), width/length ratio less then 0.75, bearing a longitudinal ridge on its



Figs 52-56: *Pholcus spiliensis*; 52: Left procursus and bulbus, dorsal view; 53: Id., apical view; 54: Id., prolateral view; 55: Vulva, ventral view; 56: Id. dorsal view. Fig. 57: *P. opilionoides*, vulval ventral sclerite. Figs 58-59: *P. creticus*; 58: Vulva, ventral view; 59: male apical cheliceral apophyses, dorso-lateral view. RSL = retrolateral sclerotized lamina; VMA =ventral membranous area. Figs 52-58: Scale, 0.2 mm.

ventro-lateral basal half. Sperm duct opening at the tip of a membranous tube fused to the apical bulbal apophysis (Figs 11, 13, 14). A membranous process, arising



Figs 60-66. *Pholcus manueli*; 60: male bulbal apophyses, prolateral view; 61: Left procursus ventral view; 62: Id., retrolateral view with bulbus, femur removed; 63: Id., dorsal view; 64: Id., prolateral view; 65: Vulva and genital plate, ventral view; 66: Vulva dorsal view. Scale, 0.2 mm.

from the procursus (Fig. 12) at the base of the hinged sclerite, and a plain concavity on the apical organ being typical for this genus.

♀: Genital plate without depressed anchoring sclerites, wrinkled in anterior half, more strongly so on posterior sides. Ventral lodge of vulva not adhering to anterior part of genital plate, variable in shape: a central cavity present in *H. labyrinthi* and *H. minotaurinus* (Fig. 3), wide and occupying the entire width of the ventral sclerite in *H. cecconi* and *H. minous*, an intermediate state present in *H. forskali* (Figs 6, 7). Central part of dorsal sclerite expanded in a ventral lamina, blocking the entrance to the uterus internus (Figs 3, 7). Middle part of this sclerite dorsaly expanded in a furrow, being more pronounced in *H. forskali* (Figs 6, 7) than in *H. minotaurinus* (Figs 3, 11).

Hoplopholcus cecconii KULCZYNSKI (1908)

Material: TURKEY, Sivas: Imranli, 39°53'N, 38°06'E, 15/8/74, 2♂, 1♀; Hafik, 39°51'N, 37°27'E, 15/8/74, 3♂, 2♀; Kayseri, Urgüp, in the cave-church Theodora, 38°35'N, 34°57'E, 17/8/74, very dim light, 1♂, 2♀.

The specimens correspond very well with the drawings of KULCZYNSKI (1908: Figs 6, 7) and BRIGNOLI (1979: Figs 1-5). The distribution of this species, known from Israel and Lebanon, extends thus to central Turkey.

Hoplopholcus forskalii (THORELL, 1871)

Material: YUGOSLAVIA, Vojvodina, Alibunar, 26/5/72, 2♂, 3♀.

Hoplopholcus minotaurinus SENGLET (1972)

Material: CRETE, Lassithi: Zakros (cave Katsibourdou), 35°07'N, 26°12'E, 29/9/99, 12♂, 12♀.

Hoplopholcus minous SENGLET, 1972

Material: CRETE, Chania, Azoghyres /Paleochóra, 28/5/78, in an abandoned house, 1♂, 1♀.

Genus *Pholcus* WALCKENAER, 1805

Pholcus creticus SENGLET, 1971 (Figs 58-59)

Material: GREECE, Crete, Chania, Topólia, Aghia Sophia cave, 5/9/74, 2♂, 6♀; Crete, Azoghyres / Paleochóra, 28/5/78, in an abandoned house, 5♂, 5♀.

This species, with a more globular abdomen and with an invaginated genital plate at rest, differs considerably from the type species, but procursus and bulbal apophyses are typical for *Pholcus*. The bulbal apophyses of *Micropholcus fauroti* (SIMON), which I have been able to see, are different.

In Fig. 58, vulva ventral view, sclerites in dotted lines, we see two paired pouches with deflated ventral walls. A creased ventral vulval wall links the genital plate to the ventral sclerite. In addition to two gripping setae, the male cheliceral apical apophysis is armed with a projecting anterior process (Fig. 59). Seemingly this is used to grasp the large posterior fleshy knob of the female, which is subsequently hold by the gripping setae.

Pholcus manueli GERTSCH, 1937 (Figs 60-66)

Pholcus affinis SCHENKEL 1953, **syn. n.** One male paratype in the collection SCHENKEL (Natural History Museum Basel) examined.
Material: USA, New Jersey, Lambertville, 40°22'N, 74°56'W, leg. Wilton Ivie, 10/50, 5♂, 5♀ (det. Gertsch 79).

KASTON (1977: 6) synonymized this species with *P. opilionoides*, but he did not give any reason for doing so and probably did not see type material. He cited WIEHLE (1953: 39, Figs 93-99). WIEHLE's figures of *P. opilionoides*, compared with those of GERTSCH clearly separate the two species.

The material studied completely correspond with the original description. I restrain myself to give detailed drawings of the vulva and male pedipalp (Figs 60-66).

Pholcus opilionoides (Schrank, 1781) (Fig. 57)

Pholcus osellai BRIGNOLI 1971a, **syn. n.** Described from a single female on the base of a variation of the genital plate. Abundant material from the type locality (La Albufera, Valencia) leaves no doubt that *P. osellai* is conspecific with *P. opilionoides*, which is widespread on the Iberian peninsula and is variable in its size and the shape of its genital plate.

Material: BULGARIA: Plovdiv: Backovo, 21/7/72, 6♂, 7♀; Varna, Varna, 9/7/72, 1♂, 9♀; Slatni Pjasaci, 11/7/722, 1♂, 5♀; Pazardzik: Pestera, 23/7/72, 1♂, 1♀; Blagoevgrad, Sandanski refuge,1224 m, 28/7/72, 1♂, 1♀. FRANCE: North Corsica, Ponte Leccia, 2/6/71, 6♂, 3♀; South Corsica, Sainte Trinité /Porto Vecchio, 25/5/71, 1♂, 1♀; Propriano, 29/5/71, 1♂; Alpes-Maritimes, Villeneuve -Loubet, 7/6/71, 2♂, 4♀; Peymeinade, 7/6/71, 4 ♂; Var: Montauroux, 7/6/71, 1♂, 3♀; Herault, Colombier /Béziers, 11/6/71, 4♂, 6♀. PORTUGAL; Vila Real, Vilarandelo - S. Lourenço /Chaves, 29/8/69, 1♂, 2♀; Guarda, Maceira /Fornos de Algodres, 9/8/71, 1♂, 8♀; Setubal, Marateca /Setúbal, 8/9/69, 1♂, 8♀. ROMANIA: Constanţa, Adamclisi, 31/5/72, 2♂, 2♀; Rasova, 1/6/72, 16♂, 15♀; Vilcea, Calimanesti, 28/6/72, 8♂, 8♀. SPAIN: Barcelona, Alto de los Bruch, 13/6/71, 3♂, 3♀; Valencia, La Albufera, 16/6/7, 12♂, 6♀; Road Requena-Chera, 23/6/71, 1♂, 1♀; Alicante, Elda, 19/6/71, 2♂, 6♀; Murcia, Caravaca, 5/7/71, 2♂, 6♀; Albacete, La Gineta (rio Júcar), 28/6/7, 12♂, 2♀; Ciudad Real, Ojos del Guadiana /Daimiel, 13/8/69, 7♂, 21♀; Granada, Puebla de Don Fadrique, 1000-1200 m, 6/7/71, 1♂, 2♀. SWITZERLAND: Vaud, Onnens, 15/4/78, under stones, 5♂, 6♀.

Typical Mediterranean biotopes for this species are small shelters under low vegetation. Further north or in higher altitude, the shelter is either under stones or in holes of tree trunks (e. g. in Romania).

Pholcus spiliensis WUNDERLICH,1995b (Figs 52-56)

Material: GREECE, Crete, Chania: Frangokastello, 35°11'N, 24°14'E, 4/10/99, under Carex, 2♂, 3♀ (last molt 1-12/11); Rethimnon, Koxare /Spili, 35°14'N, 24°28'E, 3/10/99, under irrigated vegetation, 1♀ (last molt 31/12); Lassithi, Kato Metochi Lassithiou, 900 m, 35°11'N, 25°26'E, 25/9/99, under stone, 1♂, 4♀ (last molt of 1♂, 3♀ on 13-28/10).

I could not find them in the same habitat (irrigation ditch) as before, as sprinkling is generally used nowadays. Like *P. opilionoides*, this small species is living in small shelters under low vegetation; in higher altitudes, stone shelter are used. Only one adult female and various inadult specimens were collected and reared to maturity. Striking in female and juveniles are the blackish legs and light coxae; the legs of male are rather brownish.

The genital plate is sclerotized in the center and along its posterior margin, both lateral sides are whitish. In one well preserved specimen the lateral folds of the ventral vulval sclerite (Fig. 55) can be seen as stains. The dorsal vulval sclerite (Fig. 56) is simple, with a posterior median groove.

The male pedipalp, shown in Figs 52-54 (dorsal, apical and prolateral, respectively), has a rather massive appendix. Contrary to the original description, the embolus is partially sclerotized (Fig. 53). The ventral membranous area of the procursus is situated postero-medially.

Genus *Spermophora* HENTZ, 1841

Spermophora senoculata DUGES,1836

Spermophora topolia ROEWER, 1928; synonymized by WUNDERLICH (1992) under *S. topolita* ROEWER (misspelling).

Material: GREECE, Crete, Chania, Topólia, Aghia Sophia Cave (= type locality of *S. topolia*), 35°25'N, 23°41'E, 5/9/74, 1♂, 2♀; Phthiotida, Theologos, 38°39'N, 23°12'E, 20/6/81, 4♂, 4♀; Malesina, 38°37'N, 23°13'E, 25/6/82, 2♀; Argolida, Achladokampos, 37°31'N, 22°36'E, 4/6/81, 1♀.

This species is the only representative of the genus in Europe.

Genus *Spermophorides* WUNDERLICH, 1992

In this genus, like in *Spermophora*, the dorsal anchoring sclerite is on the posterior lip of the genital opening. In contrast to *Spermophora senoculata*, many Mediterranean species of *Spermophorides* have a simple hook-shaped bulbal apophysis, which is even fused with the embolus in *S. petraea* (SENGLET, 1973a).

Spermophorides elevata (Simon, 1873)

Material: FRANCE, South Corsica, Sartène, 12/9/84, 1♀; ITALY, Sardinia, Oristano, Iz Arénas /Narbolia, 31/5/99, under stones, 7♂, 19♀

Spermophorides huberti (SENGLET, 1973a) **comb. n.**

Spermophora huberti SENGLET, 1973a: 310, Figs 9-16.

Spermophorides mammata (SENGLET, 1973a) **comb. n.**

Spermophora mammata SENGLET, 1973a: 317, Figs 142-50.

Spermophorides mediterranea (SENGLET, 1973a) **comb. n.**

Spermophora mediterranea SENGLET, 1973a: 312, Figs 17-24.
Material: FRANCE, Var, Cogolin, 18/6/78, 2♂, 6♀.

This species is present in the south of France, in Andalusia and on Corsica (SENGLET 1972). WUNDERLICH (1995a) placed a question mark to the record from Corsica (syntypes), but there are no noticeable differences to the Andalusian types. This species was collected at the same locality as *S. huberti* but in a different habitat: the later under stony shelter and *S. mediterranea* under low vegetation.

Spermophorides petraea (SENGLET, 1973a) **comb. n.**

Spermophora petraea SENGLET, 1973a: 315, Figs 33-41.

Spermophorides simoni (SENGLET, 1973b) **comb. n.**

Spermophora simoni SENGLET, 1973: 684, Figs 1-8.
Material: FRANCE, North Corsica, Pino / Cap Corse, 20/5/71, 1♀; Pino / Cap Corse, 24/6/99, under a stone, 1♂.

This species was described from ♂ and ♀ in the collection SIMON without exact locality (Gallia mer-Corsica). I collected a single ♀ in 1971. In 1999 I have been searching thoroughly but found only one ♂ under a shaded stone. There are many old and well built stonewalls offering good shelter for this species in the area, but they cannot be dismantled.

Spermophorides valentiana (SENGLET, 1973a) **comb. n.**

Spermophora valentiana SENGLET, 1973a: 315, Figs 25-32.

Genus *Stygopholcus* KRATOCHVIL, 1932

♂: Pedipalp very massive. Femur ventrally strongly humped, with a width/length ratio of more than 0. 90, bearing a strong tubercle at the external base. Sperm duct opening directly on the bulbus, at the anterior base of the apical apophysis. A small unsclerotized, more or less arched and pointed process raising from the bulbus at the base of the basal bulbal apophysis (PP, Figs 16, 28). Hair tufts present between the ridges of the procursus apical organ (AO, Figs 18, 20)

♀: Medioanterior surface of the genital plate wrinkled. Ventral vulval sclerite anteriorly extended into a tube fused with the genital plate, a structure capable of resisting the great pressure of the huge pedipalp. Fused tube on genital plate appearing as an anteriorly pointed elongated dark stain in *S. photophilus* (see SENGLET 1971: 357, Fig. 52), being circular in all other species. Ventral sclerite showing a more or less pronounced folded wall in front of the lodge (Figs 19, 21-22); anchoring depressions on postero-lateral sides of the lodge specific in shape.

Stygopholcus absoloni (KULCZYNSKI, 1914)

Material: BOSNIA, Zavala / Popovo Polje, monastery, 19/9/70, in small cave, 16♂,12♀; Počitelj / Capljina, 20/9/70, in small cave, 15♂, 8♀; Studenci, 21/9/70, in cave, 4♂, 6♀.

Stygopholcus photophilus SENGLET, 1971

Material: GREECE, Eubea, Artemision / Istiaia, 39°01'N, 23°15'E, 31/8/72, under rocks and tree stumps, 2♂, 4♀; Kato Steni, Aghia Kyriaki, 38°35'N, 23°51'E, 2/9/72, 2♂, 4♀; Corfu, Loutses, 39°47'N, 19°53'E, 20/9/72, 5♂, 14♀; Crete, Chania, Topólia, Aghia Sophia cave, 35°25'N, 23°41'E, 10/10/99, at dim light, 6♂, 4♀.

This epigean pholcid is found in the same biotope and sometimes together with *Holocnemus pluchei* SCOPOLI, in shelters of sunny stone boulders or walls. However they can also be found in relatively dim light as in the Aghia Sophia cave. In a darker part of the same cave occurs Hoplopholcus labyrinthi .

BRIGNOLI's (1979) interpretation of the geographical distribution, with a gap between these two genera in central and southern Greece, is erroneous. *Stygopholcus photophilus* was described from Crete, Peloponnese and Thessaly (SENGLET 1971) and reported from Corfu (BRIGNOLI 1971b, sub *H. kratochvili*).

Stygopholcus skotophilus KRATOCHVIL, 1940

Material: BOSNIA, Sedlari /Popovo Polje, in cave Grabova Pecina, 18/9/70, 3♂, 14♀.

Stygopholcus skotophilus montenegrinus KRATOCHVIL, 1940

Material: YUGOSLAVIA, Montenegro, Lipa Dobersko / Cetinje, 16/9/70, in rock crevice, 2♂, 2♀; Niksic, cave Studenaska Pecina (locus typicus) 16/9/70, 7♂, 10♀.

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RÉSUMÉ

Les mécanismes de l'accouplement de *Hoplopholcus*, *Stygopholcus*, *Pholcus*, *Spermophora* et *Spermophorides* sont décrits. Les genitalia de couples cryofixés *in copula* et lyophilisés sont disséquées. Les setae modifiées des chélicères des mâle ayant une fonction mécanique sont nommées "gripping setae". Au contraire de *Holocnemus*, *Hoplopholcus* et *Stygopholcus* où la sclérite vulvaire ventrale bien sclérotisées, s'étend jusqu'à la lèvre de la vulve, chez *Pholcus* cette sclérite est réduite à la fermeture antérieure de l'utérus externe, avec une paroi ventrale membraneuse. L'invagination de la plaque génitale constatée durant la copulation parait être due à une turgescence de la vulve. Cette érectilité pourrait être déclenchée par la traction exercée par les chélicères du male sur le bouton antérieur de la plaque génitale femelle. L'espace nécessaire pour les mouvements des procursi est préservé par la plaque invaginée maintenue par les apophyses bulbaires (unci), réunies. Chez *Spermophora senoculata* les apophyses apicales des chélicères du mâle exercent une traction sur une apophyse peu sclérotisée située au centre de la lèvre antérieure de la vulve. Pour stabiliser la traction, *S. senoculata* exerce un appuis avec les apophyses antérieures des chélicères, alors que *Pholcus* utilise les apophyses des trochanters en pression. En plus de la différence de type de soies modifiées des chélicères du mâle, plusieurs caractères séparent les genres *Hoplopholcus* et *Stygopholcus*. Ce sont chez le mâle: la forme du fémur, le type d'embolus et l'armature des procursi. Chez la femelle: la sclérite vulvaire ventrale est prolongée en un tube antérieur soudé à la plaque génitale pour *Stygopholcus* seulement et la sclérite vulvaire dorsale est étendue au centre en une lame ventrale chez le seul *Hoplopholcus*. La vulve de *Pholcus spiliensis* WUNDERLICH est décrite. *Spermophora huberti* SENGLET, *S. mammata* SENGLET, *S. mediterranea* SENGLET, *S. petraea* SENGLET, *S. simoni* SENGLET and *S. valentiana* SENGLET sont transférés dans *Spermophorides*. *Pholcus osellai* BRIGNOLI est mis en synonymie avec *P. opilionoides* (SCHRANK), *P. affinis* SCHENKEL est mis en synonymie avec *P. manueli* GERTSCH, et. *Pholcus manueli* GERTSCH est revalidé.

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