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A revision of the genus *Heliophanus* C. L. Koch, 1833 (*Aranei*: *Salticidae*)

[With 960 text-figures]

Abstract. The spider genus *Heliophanus* C. L. Koch, 1833 is revised. All 109 (of which 44 are new) known species are described and figured. For each species a distribution map is given. One generic and 26 specific names are newly synonymized, 24 lectotypes are newly designated. The genus is divided into 16 groups of closely related species and 23 species solo (based on the structure of the genitalia), grouped into three subgenera; a hypothetical phylogenetic tree of the genus is proposed. An attempt to reconstruct the history of the genus range development is presented.

Contents

Introduction

The *Salticidae* are a large, cosmopolitan family of spiders. It consists of approximately 4,000 species classified into about 400 genera. The present classification of the *Salticidae* proposed by SIMON (1901a) and slightly modified by PETRUNKEVITCH (1928), based on the dentation on the lower margin of chelicerae and a few other, arbitrarily chosen characters, groups all the genera into 22 subfamilies divided among three sections (*Pluridentati*, *Unidentati* and *Fissidentati*). Such an artificial system, not infrequently separating closely related genera, has been criticized by PRÓSZYŃSKI (1971a), but the present knowledge of the family does not allow to propose a more comprehensive and cohesive system, which could reflect natural affinities within the group.

Numerous nominate species are unidentifiable due to incomplete and superficial descriptions, especially due to lack of good drawings of their genitalia. This creates a danger of coinage new synonyms, what in turn, could lead to further increase in chaos in the classification of the group. Hence, there is an urgent need to redescribe and make revisions of considerable number of poorly known species. In the last years many arachnologists undertake this task, e. g.: CUTLER 1981, GALIANO 1963, 1965, 1971, HARM 1969, 1971, 1973, 1977, PRÓSZYŃSKI 1968a, b, 1970, 1971b, c, 1973a, PRÓSZYŃSKI and ŻOCHOWSKA 1981, WANLESS 1978a, b, 1981a, b, c, 1982a, WESOŁOWSKA 1981a. Such revisions enable to synonymize numerous specific names, as well as afford a possibility for the study of phylogenetic relationships among different species and genera, what, in consequence, would create a basis for working out the natural system of the family.

Due to considerable morphological uniformity, a proper identification of the spider genus *Heliophanus* causes many troubles. That is why there are numerous unidentified and misidentified specimens in many of the collections. The descriptions given in the prevailing majority of older publications are inadequate. Only a few papers dealing with regional arachnofaunas contain descriptions supplemented with figures rendering a possibility to correctly identify the species (KULCZYŃSKI

1885, 1895a, b, LESSERT 1925, LAWRENCE 1928, PALMGREN 1943, TULLGREN 1944, LOCKET and MILLIDGE 1951, KRAUS 1955, KEKENBOSCH 1961, CANTARELLA 1974, LOCKET, MILLIDGE and MERRETT 1974, PRÓSZYŃSKI 1979, 1982, FLANCZEWSKA 1981, WESOŁOWSKA 1981b). HARM (1971) carried out a revision of a few species of *Heliophanus*. Her paper contains good descriptions and very detailed drawings, enabling to identify the species without any doubt, but it deals only with nine Middle European species.

The genus *Heliophanus* is represented both in the Palaearctic and Ethiopian Regions. It is one of the largest genera in the *Salticidae* and before beginning of this revision it numbered 130 nominate species distributed in the Palaearctic (78), Ethiopian (50), Oriental (1) and Australian (1) Regions. As a result of the revision 11 species are excluded from the genus, 28 are treated as nomina dubia and 26 specific names (21 Palaearctic and 5 Ethiopian) are newly synonymized. Additionaly, it has appeared that the only species of the genus *Trapezocephalus* BERLAND et MILLOT, 1941 belongs in fact to the genus *Heliophanus*. Simultaneously 44 new species (11 Palaearctic and 33 Ethiopian) are described. At present the genus includes 109 known species (42 Palaearctic and 67 Ethiopian).

Methods

Museum materials deposited in numerous collections constituted a basis of this study. If it was only possible, the type-specimens were examined. In some cases, however, the types have been lost or their identification has been made difficult (e. g. the types in the SIMON's collection were in no way marked as such). Species descriptions, provided that the available materials allowed, are based on a fairly numerous series of specimens. In some cases, however, the descriptions are based on single specimens only. Some examined specimens were badly damaged, and many of them were to large extent bleached.

Specimens were examined in a dish with alcohol, the bottom of which was covered with glass beads. The drawings were made with the aid of a reticular eyepiece or camera lucida attached to a stereomicroscope (magnification 7.5–100×). The epigyne and male pedipalp (most often left) were removed for study. The epigyne was macerated in 10% KOH for 24–72 hours at normal room temperature. After drawing, the genitalia were placed in micro-vials with alcohol and put into the vials containing the specimens from which they had been removed. In some cases, however, permanent slides were prepared – the macerated epigynes were mounted in Canada balsam. Some of the epigynes were stained in Chlorazol Black E before mounting.

The measurements which are accurate to 0.1 mm, were made with an eyepiece micrometer. All measurements are given in millimetres. The following measurements were taken: a – length of cephalothorax, b – length of abdomen, c – length of eye field, d – breadth of eye field at level of anterior eyes, e – breadth of eye field at level of posterior eyes. The length of legs segments was not measured, neither chaetotaxy studied.

Considering substantial morphological uniformity of the genus, the structure of genitalia was treated as a main criterion for species recognition. In the case of males, the description always comprises three drawings of the palp, showing its dorsal, ventral and lateral (from the side of tibial apophysis) views, as well as the drawing of pedipalpal femur. The description of the females are supplied with drawings of the epigyne made before and after maceration. An examination of internal structures of epigyne was in most cases necessary, as epigynes of quite different species could have an almost identical external appearance. Only a careful analysis of structure of seminal ducts and

spermathecae – their shape, size and relative positions, as well as the location of copulatory openings could made possible an assignation of specific identity of the examined specimen. In some cases, however, utilization of morphological characters such as size, coloration or presence of setae facilitated the identification. For example *H. aviculus* and *H. cassinicola* differ clearly in the abdomen coloration, but their identification based on the structure of genitalia is much more difficult. In descriptions of similar species a special attention is paid to stressing the differences between them, as clear demonstration of differences is essential for proper identification of the taxa distinguished.

The catalogues of REIMOSER (1919), BONNET (1945–1957), ROEWER (1954), PRÓSZYŃSKI (1971e), CUTLER (1976) and BRIGNOLI (1983) were used in searching for basic literature, distributional data, location of specimens in collections, as well as determination of synonymy.

Abbreviations of depositories

NMB – Naturhistorisches Museum, Basel
MNHU – Museum für Naturkunde der Humboldt-Universität, Berlin
MM – Moravské Muzeum, Brno
IRSN – Institut Royal des Sciences Naturelles, Bruxelles
MCZ – Museum of Comparative Zoology, Harvard University, Cambridge, Mass.
SAM – South African Museum, Cape Town
MZS – Museo Zoologico della Specola, Firenze
SMF – Forschungsinstitut und Museum Senckenberg, Frankfurt a. M.
MCSND – Museo Civico di Storia Naturele "Giacomo Doria", Genova
ZMH – Zoologisches Institut und Museum der Universität, Hamburg
ZMF – Helsingin Yliopisto ja Museo, Helsinki
BMNH – British Museum (Natural History), London
MCSN – Museo Civico di Storia Naturale, Milano
HDZ – Hope Department of Zoology, Oxford
MNHN – Muséum National d'Histoire Naturelle, Paris
NM – Natal Museum, Pietermaritzburg
NR – Naturhistoriska Riksmuseet, Stockholm
MRAC – Musée Royal de l'Afrique Centrale, Tervuren
ZIU – Zoologiska Institution, Uppsala
IZ PAN – Instytut Zoologii Polskiej Akademii Nauk, Warszawa
NHMW – Naturhistorisches Museum, Wien
CRB – private collection of Dr M. RAMBLA and Dr J. BARRIENTOS, Barcelona
CJW – private collection of Mr J. WUNDERLICH, Straubenhardt.

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Definition of the genus and generic characters

Genus *Heliophanus* C. L. KOCH, 1833

Heliophanus C. L. KOCH, 1833 [type-species: *Salticus aeneus* HAHN, 1831, by subsequent designation (SIMON 1901a)]

Trapezocephalus BERLAND et MILLOT, 1941 (type-species: *Trapezocephalus aelurilliformis* BERLAND et MILLOT, 1941, by original designation and monotypy), **syn. n.**

Small to medium spiders, ranging from 2.5 to 7.5 mm in length; most frequently black or dark brown with a metallic shine. Legs short, light, contrasting with dark body. General appearance as in figs. 1, 2.

Cephalothorax elongated, moderately high, widest at level of coxae III; may be to variable extent covered with hairs, the hairs most frequently brown (in some species light), only exceptionally a band of light hairs medially on cephalothorax.

Eyes: arrangement and size typical of the *Salticidae*; anterior laterals and posterior eyes form a trapezium, slightly broadening posteriorly. Eye field: breadth greater than length; length between 0.4 to 0.5 of cephalothorax length; breadth at level of anterior eyes about 0.9 of breadth at level of posterior eyes. If cephalothorax brown, then eye field usually darker, or at least, eyes surrounded with black. In all the species vicinity of anterior eyes with some, slightly thicker, long brown setae, often whole eye field covered with dispersed setae. Eyes in numerous species fringed with small white scales. Sometimes a few such scales form two small spots posteriorly to posterior eyes. White scales easily rub away – thus, their presence is not a permanent character.

Clypeus very narrow, in majority of the species white. Chelicerae small, brown, with single fairly large tooth on retromargin and two smaller teeth on promargin (fig. 3). Maxillae: outer margins almost parallel, apical margins rounded. Labium brown or yellow, tongue-shaped. Sternum brown or yellow, scutiform, with broadly cut anterior margin. Pedicel very short, generally invisible from above, covered up by anterior margin of abdomen.

Abdomen elongated, frequently clothed with dark (less frequently light) hairs, as a rule hairs longer and denser at anterior margin. Majority of species with very narrow light band at anterior margin which extends to the sides and one or two pairs of round (sometimes diagonal) spots dorsally (figs. 23 and 691). Sometimes, at the level of the spots, small lighter indistinct lateral marks. Dorsal pattern

composed of white, easily rubbing away scales, hence its size is variable and the presence of pattern does not constitute a permanent character. Abdomen in majority of *Helafricanus* species with lighter leaf-like posterior pattern (fig. 89), sometimes with longitudinal band of white hairs. Ventrally abdomen usually light, but sometimes dark with two lighter stripes laterally, or with one pair of light marks at the base of spinnerets. Spinnerets small, set at tip of abdomen.

Legs in comparison with the other *Salticidae* genera rather short, generally light, markedly (especially in females) contrasting with dark body. Males sometimes with darker – brown or black – legs, or dark coloration limited to femora. In males of some species, more frequently in bigger African ones, legs I slightly longer and thicker than the others. Tarsus with ventral-subapical scopula. Some specimens, especially dark-egged males, infrequently with spots composed of white scales on distal parts of tibia and patella I, sometimes also II.

Female pedipalp with apical tuft of hairs, generally light, contrasting with dark cephalothorax.

Male pedipalp dark, brown or black, copulatory organ relatively simple. Femur rather robust, in majority of species with a big apophysis, the shape of apophysis is diagnostic for the species; proximally and more ventrally from the apophysis additional protuberance formed by sclerotized femoral margin. Some species without femoral apophysis, but with big patellar apophysis which enters between two tibial apophyses. A few species have only tibial apophyses. Generally two tibial apophyses – distal one, as a rule slightly curved, bigger and small proximal one heavily sclerotized, placed perpendicularly both to the former and to the long axis of the tibia. Bulbus heavily protruding, more or less rounded. Embolus usually short, slender, heavily sclerotized, with sharp tip. Cymbium elongated, sometimes with fovea in place where tibial apophysis reaches it. Outer margin of cymbium, sometimes also that of tibia, fringed with white rubbing scales.

Epigyne small to medium, weakly sclerotized, with one or two smaller openings frequently separated by median septum; in some species after insemination the openings not infrequently are plugged with waxy secretion. Location of copulatory openings variable. Internal structures in majority of species relatively simple, seminal ducts generally straight, spermathecae more or less folliculate, only in some species slightly more complicated.

Systematic arrangement of the species of *Heliophanus*

There are three groups of species within *Heliophanus*, differing in some structural characters and coloration. Each of this groups is composed of species which are more similar among themselves (hence probably more closely related) and are separated by a clear gap from the species from the other groups. Thus designation these groups as separate subgenera seems to be justified.

The subgenus *Heliocapensis* **subgen. n.**

Type-species: *Heliophanus peckhami* SIMON, 1902.

Male pedipalp without patellar apophysis, femoral apophysis usually absent or small, tibial apophyses frequently bifid, shape of bulbus diagnostic, similar in all the species within the subgenus (fig. 18), embolus very short. Epigyne fairly large, with two openings, its posterior margin frequently triangularly elongated. Internal structures of genitalia relatively simple. Body black or dark brown, abdomen with narrow white band at anterior margin, dorsally with one or two pairs of white, most frequently slightly diagonal, marks (fig. 23).

The subgenus comprises 9 known species distributed in South Africa (8) and in the region of Gulf of Guinea (1).

The subgenus *Helafricanus* **subgen. n.**

Type-species: *Heliophanus patellaris* SIMON, 1901.

Male pedipalp with big patellar apophysis and only small femoral protuberance. Epigyne with two openings separated by median septum, seminal ducts straight, directed anteriorly, spermathecae with tendency towards coiling. Body brown, abdomen with narrow white band at anterior margin and diagnostic leaf-like pattern dorsally (fig. 89).

The subgenus consists of 23 known species distributed in the Ethiopian Region (22) and Mediterranean area (1).

The subgenus *Heliophanus* s. str.

Type-species: *Salticus aeneus* HAHN, 1831.

Femur of male pedipalp with big apophysis and additional protuberance proximally and ventrally from the apophysis. Epigyne with single large or two smaller openings separated by median septum, complication of internal structures of genitalia variable, diagnostic for the species. Body dark brown or black, frequently with a metallic sheen. Narrow white band at anterior margin of abdomen and generally one or two pairs of round white marks (fig. 691).

The most numerous subgenus, comprising 77 known species distributed in the Palaearctic and Ethiopian Regions.

The division of *Heliophanus* introduced here is based on suggestions of SIMON (1901b), who proposed to split the genus into three "sections" according to presence and location of apophyses either on femur or patella of male pedipalp. It should be mentioned, however, that the groups created in that way differ, besides the structure of pedipalp, in other characters as well. SIMON proposed to put into one section all the species which lack both femoral and patellar apophyses. In the system accepted here *Heliocapensis* consists not only of such species, but also includes two species with small femoral apophysis (*H. eucharis* and *H. mirabilis*) – a result of possessing a number of characters approximating this group. On the

other hand, some of the species, which according to SIMON's suggestions should belong to this subgenus, have been totally excluded from *Heliophanus*.

Within the subgenera several groups are distinguished, which include the species resembling one another in structure of their genitalia as well as inhabiting neighbouring geographically areas (more detailed descriptions of the species groups see pp. 236–240, figs. 927–940).

The Palaearctic Region | The Ethiopian Region

The subgenus *Heliocapensis*

H. deserticola SIMON, 1901
H. redimitus SIMON, 1910
H. capensis sp. n.
H. peckhami SIMON, 1902
H. bellus sp. n.
H. portentosus sp. n.
H. mirabilis sp. n.
H. claviger SIMON, 1901
H. eucharis SIMON, 1887

The subgenus *Helafricanus*

the *marshalli* group

H. bisulcus sp. n.
H. marshalli PECKHAM et PECKHAM, 1903
H. gloriosus sp. n.
H. insperatus sp. n.

H. edentulus SIMON, 1871

H. undecimmaculatus CAPORIACCO, 1941
H. demonstrativus sp. n.

the *debilis* group

H. congolensis GILTAY, 1935
H. trepidus SIMON, 1910
H. debilis SIMON, 1901
H. patellaris SIMON, 1901
H. villosus sp. n.
H. paulus sp. n.
H. fascinatus sp. n.
H. butemboensis sp. n.

the *crudeni* group

H. giltayi LESSERT, 1933
H. hastatus sp. n.
H. modicus PECKHAM et PECKHAM, 1903
H. imperator sp. n.
H. crudeni LESSERT, 1925
H. kenyaensis sp. n.
H. validus sp. n.
H. kilimanjaroensis sp. n.

The subgenus *Heliophanus* s. str.

the *orchesta* group

H. cassinicola SIMON, 1909
H. aviculus BERLAND et MILLOT, 1941
H. robustus BERLAND et MILLOT, 1941
H. orchesta SIMON, 1885
H. deamatus PECKHAM et PECKHAM, 1903
H. lesserti sp. n.
H. orchestioides LESSERT, 1925
H. harpago SIMON, 1909
H. transvaalicus SIMON, 1901
H. semirasus LAWRENCE, 1928

the *lawrencei* group

H. lawrencei sp. n.
H. falcatus sp. n.

the *kankanensis* group

H. improcerus sp. n.
H. kankanensis BERLAND et MILLOT, 1941

the *hamifer* group

H. mauricianus SIMON, 1901
H. imerinensis SIMON, 1901
H. hamifer SIMON, 1885
H. innominatus sp. n.

the *pratti* group

H. gladiator sp. n.
H. pratti PECKHAM et PECKHAM, 1903

the *apiatus* group

H. apiatus SIMON, 1868
H. encifer SIMON, 1871
H. creticus GILTAY, 1932
H. mordax (O. P.-CAMBRIDGE, 1872)

the *stylifer* group

H. conspicuus sp. n.
H. tribulosus SIMON, 1868
H. ramosus sp. n.
H. stylifer SIMON, 1878

the *ussuricus* group

H. ussuricus KULCZYŃSKI, 1895
H. dampfi SCHENKEL, 1923
H. camtschadalicus KULCZYŃSKI, 1885
H. baicalensis KULCZYŃSKI, 1895
H. curvidens (O. P.-CAMBRIDGE, 1872)

the *decoratus* group

H. glaucus BÖSENBERG et LENZ, 1894
H. decoratus L. KOCH, 1875
H. ibericus sp. n.
H. agricola sp. n.

the *auratus* group

H. simplex SIMON, 1868
H. aeneus (HAHN, 1831)
H. dubius C. L. KOCH, 1835
H. auratus C. L. KOCH, 1835
H. flavipes (HAHN, 1831)
H. equester L. KOCH, 1867
H. ignorabilis sp. n.

the *cupreus* group

H. forcipifer KULCZYŃSKI, 1895
H. cupreus (WALCKENAER, 1802)
H. turanicus CHARITONOV, 1969
H. lineiventris SIMON, 1868
H. kochi SIMON, 1868
H. rufithorax SIMON, 1868
H. machaerodus SIMON, 1909

the *potanini* group

H. potanini SCHENKEL, 1963
H. melinus L. KOCH, 1867
H. patagiatus THORELL, 1875

species with unclear affinities within the subgenus

H. abditus sp. n.
H. acutissimus sp. n.
H. canariensis sp. n.
H. chovdensis PRÓSZYŃSKI, 1982
H. iranus sp. n.
H. malus sp. n.
H. verus sp. n.

H. aberdarensis sp. n.
H. activus (BLACKWALL, 1877)
H. africanus sp. n.
H. alienus sp. n.
H. capicola SIMON, 1901
H. chikangawanus sp. n.
H. deformis sp. n.
H. difficilis sp. n.
H. erythropleurus KULCZYŃSKI, 1901
H. horrifer sp. n.
H. macentensis BERLAND et MILLOT, 1941
H. mucronatus SIMON, 1901
H. nobilis sp. n.
H. ochrichelis STRAND, 1907
H. pauper sp. n.
H. uvirensis sp. n.

Review of the species

THE SUBGENUS *HELIOCAPENSIS*

Heliophanus deserticola SIMON, 1901b

(figs. 4–9, 913)

Material. South Africa: de Aar – 1 ♂ (holotype), 1 ♀ (MNHN 17 341).

Male. Cephalothorax black, anterior eyes sparsely fringed with long brown setae. Abdomen almost black, with narrow light band at anterior margin. Sternum black. Legs I black, legs II–IV dark brown. Pedipalp black, tibia broad, with single small, weakly developed apophysis (figs. 4 and 5), bulbus narrow, embolus very short (fig. 4). Dimensions: a 1.8, b 1.9, c 0.8, d 1.1, e 1.2.

Female. Coloration as in male, legs slightly lighter. Epigyne with single large depression, and triangularly elongated posterior margin (fig. 8). Seminal ducts more or less straight, spermathecae ovoid, heavily sclerotized (fig. 9). Dimensions: a 1.8, b 2.3, c 0.7, d 1.0, e 1.2.

The female resembles *H. redimitus*, may be distinguished by the more elongated posterior margin of epigyne, deeper epigynal groove and slightly different configuration of seminal ducts (cf. figs. 8–9 and 10–11). The male can be distinguished from other species of the subgenus by the diagnostic narrow bulbus and single tibial apophysis (fig. 4).

Identity of data on the label of the examined male with those given in SIMON (1901b) suggests that this specimen is the holotype; the female has not been included in the original descripton.

Heliophanus redimitus SIMON, 1910

(figs. 10–11, 924)

Material. South Africa: Klein Namaland, Kamagams, VII.1904 – 1 ♀ (holotype, MNHU 17 603).

Male. Unknown.

Female. Cephalothorax dark brown, eyes surrounded with black. Abdomen dark brown, with very narrow lighter band at anterior margin; dorsally, approximately half-way of its length, with a pair of small white marks and another pair of slightly larger, less distinct marks posteriorly. Sternum brown. Legs yellow. Epigyne large, oval, with slightly elongated posterior margin and single shallow depression (fig. 10). Internal structures as in fig. 11. Epigynal openings shielded by sclerotized processes. Dimensions: a 1.5, b 1.7, c 0.6, d 0.9, e 1.1.

Resembles *H. deserticola* but may be distinguished by less elongated anterior margin of epigyne, shallower and slightly more oval epigynal depression, as well as slightly different internal structures of genitalia (cf. figs. 10–11 and 8–9).

Heliophanus capensis sp. n.

(figs. 12–17, 915)

Material. South Africa, Cape Province: Clanvilliam District, Sneeuberg, 500–1100 m.a.s.l., VII.1962, leg. N. LELEUP – 1 ♀ (paratype, MRAC 161 135), on the ground, in bushes, among large stones, VII.1962, leg. N. LELEUP – 2 ♀♀, 4 juv. (the larger – holotype, another – paratype, MRAC 132 229); Clanvilliam, VIII.1898, leg. R. LIGHTFOOT – 1 ♀ (paratype, SAM 475); Cape Peninsula, Signal Hill, 19.IX.1901, leg. W. PURCELL – 23 ♀♀ (paratypes, SAM 460), 19.IX.1901, leg. R. LIGHTFOOT – 8 ♀♀ (paratypes, SAM 466), 26.X.1901, leg. W. PURCELL – 1 ♀ (paratype, SAM 465); "Cape Colony", leg. PECKHAM – 1 ♀ (paratype, MNHN 21 878).

Male. Unknown.

Female. Cephalothorax brown, eye field black, sometimes a few white hairs at lateral margins and in vicinity of eyes. Abdomen dark brown, sometimes lighter, with lighter band at anterior margin, which in pale specimens may be invisible; dorsally, half-way of abdomen length, one pair of white diagonal marks, sometimes another pair of similar spots posteriorly, in some specimens spots absent. Sternum brown. Legs yellow, sometimes light brown. Pedipalps yellow. Epigyne oval, with triangularly elongated posterior margin and two large openings (figs. 12–14); seminal ducts straight, spermathecae ovoid (figs. 15–17). Dimensions: a 1.6–1.8, b 1.7–2.3, c 0.6–0.9, d 0.9–1.1, e 1.0–1.1.

Very closely resembles *H. peckhami* but can be distinguished by the shape of epigynal openings (cf. figs 12–14 and 35, 37).

Heliophanus peckhami SIMON, 1902

(figs. 18–38, 925)

Heliophanus Peckhami SIMON, 1902,
Heliophanus Beardii PECKHAM et PECKHAM, 1903, **syn. n.**

Material. South Africa, Cape Province: Clanvilliam District, Sneeuberg, 500–1100 m.a.s.l., on the ground, in bushes, among large stones, VII.1962, leg. N. LELEUP – 2 ♂♂ (MRAC 155 258); "Cape Colony" – 1 ♂ (holotype, MNHN 21 879); Cape Town, Signal Hill – 4 ♀♀ (syntypes of *H. Beardii*, MCZ 249), under stones, 3.V.1976, leg. F. WANLESS – 6 ♂♂, 9 ♀♀ (BMNH); Cape Peninsula, Signal Hill, 19.IX.1901, leg. W. PURCELL – 1 ♂ (SAM 473).

Male. Cephalothorax dark brown, eye field black with a metallic sheen, anterior eyes surrounded with a few long brown setae. Abdomen dark brown or black, with narrow white band along anterior margin and one or two pairs of round or diagonal, white spots dorsally (fig. 23). Sternum brown. Legs orange or light brown. Pedipalp dark, femur with small protuberance (figs. 22, 28 and 34), tibia very broad, with two apophyses, one of them bifid (one of the lobes fairly variable in size – figs. 18–21, 24–27 and 29–33). Dimensions: a 1.7, b 1.5–1.7, c 0.7–0.9, d 0.9–1.0, e 1.0–1.1.

Female. Coloration as in male but two pairs of abdominal spots more pronounced, sometimes also additional lateral marks at the same level. Sternum brown. Legs yellow or light brown. Pedipalps yellow. Epigyne large, oval, with elongated posterior margin and two large oval depressions (figs. 35 and 37). Internal structures as in figs. 36 and 38. Dimensions: a 1.8–1.9, b 1.8–3.6, c 0.7–0.8, d 1.0–1.2, e 1.1–1.2.

The male separated from *H. bellus* by the size of bifid tibial apophysis (cf. figs. 19 and 40). The female very closely resembles *H. capensis* but may be distinguished by the more oval epigynal openings (cf. figs. 35, 37 and 12–14).

Heliophanus bellus sp. n.

(figs. 39–44, 914)

Material. South Africa, Cape Province: Clanvilliam District, Sneeuberg, 500–1100 m.a.s.l., on the ground, among large stones, VII.1962, leg. N. LELEUP – 1 ♂ (holotype, MRAC 161 134).

Male. Cephalothorax dark brown, eye field black, anterior eyes surrounded with a few long brown setae. Abdomen dark brown, with a few white scales on anterior margin and hardly perceptible traces of a pair of white spots dorsally; ventrally dark. Sternum dark brown. Legs I dark brown, with yellow metatarsi and tarsi, remaining legs light brown. Pedipalp dark, tibia very broad, with two apophyses, one of them bifid (fig. 40), embolus very short (fig. 39). Dimensions: a 1.7, b 1.6, c 0.7, d 1.0, e 1.1.

Female. Unknown.

The male closely resembles *H. peckhami*, distinguished by the much larger one of the lobes of bifid tibial apophysis (cf. figs. 39–43 and 18–21, 24–27, 29–33).

Heliophanus portentosus sp. n.

(figs. 45–49, 923)

Material. South Africa, W Cape, Ceres, Tulbagh, VIII.1903, leg. R. LIGHTFOOT – 1 ♂ (holotype, SAM 469).

Male. Cephalothorax brown, eyes surrounded with black. Addomen dark brown, with unconspicuous traces of light band along anterior margin and traces of two pairs of spots dorsally, clothed with short brown hairs. Sternum light brown. Legs light brown. Pedipalp brown, lobe-shaped process near base of femur (fig. 49), tibia with two apophyses, one of them deeply bifid (figs. 45–48), cymbium dorsally with median stripe of white scales. Dimensions: a 1.9, b 1.8, c 0.9, d 1.1, e 1.2.

Female. Unknown.

The species can be distinguished from other species of the subgenus by the diagnostic bifid tibial apophysis (fig. 45).

Heliophanus mirabilis sp. n.

(figs. 50–53, 918)

Material. South Africa, Cape Province: Clanvilliam District, Sneeuberg, 500–1100 m.a.s.l., on the ground, among large stones, VII.1962, leg. N. LELEUP – 1 ♂ (holotype, MRAC 155 259).

Male. Cephalothorax dark brown, eyes surrounded with black, in vicinity of anteriors long brown setae. Abdomen dark brown, with white band along anterior margin and two pairs of small white marks dorsally. Sternum dark brown. Legs dark brown, with slightly lighter metatarsi and tarsi. Pedipalp dark, femoral apophysis large, truncated (fig. 53), tibia broad, with one large apophysis (figs. 50–52). Dimensions: a 1.6, b 1.4, c 0.8, d 1.1, e 1.1.

Female. Unknown.

The male can be distinguished from other species of the subgenus by the large femoral and tibial apophyses (figs. 50–53).

Heliophanus claviger SIMON, 1901b

(figs. 54–63, 921)

Material. South Africa: "Cape Colony", leg. C. MARTIN – 4 ♂♂, 4 ♀♀ (the larger ♂ – lectotype, another – paralectotypes, BMNH 20 128); Cape Peninsula, Simonstown, Red Hill, under bush in sand hills, 8.X.1901, leg. W. PURCELL – 1 ♀ (SAM 463), Signal Hill, 19.IX.1901, leg. W. PURCELL – 1 ♀ (SAM 468); Natal, leg. C. MARTIN – 1 ♀ (MNHN 20 187), Umhlali, X.1938 – 1 ♀ (NM 2453), VI.1958, leg. R. LAWRENCE – 1 ♀ (NM 7013).

Male. Cephalothorax dark brown or black, sometimes eyes surrounded very sparsely with white hairs. Abdomen brown or black, with lighter band along anterior margin and two pairs of white spots dorsally. Sternum brown. Legs light brown, with slightly darker femora. Pedipalp brown, femur with small protuberance (fig. 57), tibia with two tremendous, truncated apophyses (figs. 54–56). Dimensions: a 2.1, b 2.3, c 0.9, d 1.2, e 1.3.

Female. Coloration as in male. Cephalothorax sometimes clothed scarcely with white hairs. Abdomen either uniformly black, or with clear pattern (as in male), covered with short brown hairs. Legs I brown, or at least femora brown, remaining legs yellow. Sternum light brown. Epigyne oval, with well developed depression (figs. 58–60 and 62). Internal structures as in figs. 61 and 63. Dimensions: a 2.3–3.0, b 3.2–3.4, c 1.0–1.2, d 1.5–1.6, e 1.7.

The male separated from other species of the subgenus by two tremendous tibial apophyses (figs. 54–56). The female resembles *H. eucharis*, may be distinguished by the more oval epigyne and more posterior setting of the depression (cf. figs. 58–60, 62 and 69).

Heliophanus eucharis SIMON, 1887

(figs. 64–69, 906)

Material. Ivory Coast: Assinie, leg. C. ALLUAUD – 1 ♂, 1 ♀ (♂ – lectotype, ♀ – paralectotype, BMNH 7562).

Male. Cephalothorax light brown, eyes surrounded with black, anterior eyes sparsely fringed with long brown setae. Abdomen brown, covered with short brown hairs. Sternum light brown. Legs light brown. Pedipalp dark, femur with single, slightly shifted dorsally, apophysis (figs. 67–68), tibia with two not large apophyses (figs. 64–66). Dimensions: a 1.4, b 1.4, c 0.8, d 0.9, e 0.9.

Female. Coloration as in male. Abdomen slightly lighter, dorsally with hardly visible traces of two pairs of spots and lighter transverse band near posterior margin. Epigyne more or less round with posterior margin slightly notched, only one depression (fig. 69). Dimensions: a 1.6, b 1.4, c 0.7, d 0.9, e 1.0.

The male separated from other species of the subgenus by the femoral apophysis (figs. 67–68) but it slightly resembles the species of the subgenus *Heliophanus*. The female resembles *H. claviger* but can be separated by the slightly more rounded shape of epigyne and more posteriorly situated depression (cf. figs. 69 and 58–60, 62).

THE SUBGENUS *HELAFRICANUS*

THE *MARSHALLI* GROUP

***Heliophanus bisulcus* sp. n.**

(figs. 70–74, 910)

Material. South Africa: "Cape Colony" – 1 ♂ (holotype, BMNH 20 180).

Male. Cephalothorax dark brown, eyes surrounded with black, a few long brown setae in vicinity of the anteriors. Abdomen dark brown, covered with short dark hairs. Single, shiny, light hairs dispersed over cephalothorax and abdomen. Sternum dark brown. Pedipalp dark, with single, slightly longer than tibia, patellar apophysis; tibia with three large horizontal apophyses (figs. 70–72). Diagnostic bifid embolus (figs. 70–71 and 73). Dimensions: a 1.9, b 2.2, c 0.9, d 1.1, e 1.2.

Female. Unknown.

From *H. marshalli* may be distinguished by the bifid embolus (cf. figs. 70–71, 73 and 75). Another similar species – *H. gloriosus* – has contorted, cork-screw-shaped embolus and lower margin of cymbium extended into a broad process (cf. figs. 70–73 and 79–81, 83–84), as well as abdomen with usually clearly visible leaf-like pattern.

Heliophanus marshalli PECKHAM et PECKHAM, 1903

(figs. 75–78, 918)

Heliophanus Marshalli PECKHAM et PECKHAM, 1903.

Material. South Africa, Natal: Durban – 1 ♂ (holotype, MCZ 241).

Male. Cephalothorax dark brown, laterally with a few white scales, eyes surrounded with black, eye field with scarce long brown setae. Abdomen dorsally brown, with slightly lighter band along median part; ventrally dark. Sternum dark brown. Legs dark brown. Pedipalp dark, with very large, single patellar apophysis entering among three horizontal tibial apophyses (figs. 75–77). Embolus short, straight (fig. 75). Dimensions: a 2.3, b 2.4, c 0.9, d 1.2, e 1.3.

Female. Unknown.

From *H. bisulcus* and *H. gloriosus* best distinguished by the embolus shape (not bifid, straight – cf. figs. 75 and 70–71, 73 and 79, 83).

***Heliophanus gloriosus* sp. n.**

(figs. 79–89, 911)

Material. Angola: Lac Calundo, net sweeping, 15.XII.1954, leg. E. CARVALHO – 1 ♂ (paratype, BMNH Ang. 4523.8), Mare Tchifuka, net sweeping, 5.VI.1944, leg. E. CARVALHO – 1 ♀ (paratype, BMNH Ang. 4109.11.); Botswana: Kwando River, among *Phragmites* and *Papyrus*, 24.III.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♂, 1 ♀ (♂ – holotype, ♀ – allotype, BMNH).

Male. Cephalothorax dark brown, eye field black, small white spots composed of white scales may occur posteriorly to posterior lateral eyes. Abdomen brown, posteriorly with leaf-like lighter pattern (fig. 89); ventrally light. Sternum brown. Legs yellow, longitudinal brown bands along femora and patellae I. Pedipalp brown, patellar apophysis large, bluntly ended, strongly bent to tibia (figs. 79–81 and 83–84); three horizontal tibial apophyses, the dorsal one very small (figs. 81 and 84); embolus spirally contorted (figs. 79–80 and 83); lower edge of cymbium elongated into a broad process (figs. 81 and 84). Dimensions: a 1.4–1.5, b 1.7-1.8, c 0.6–0.7, d 0.9–1.0, e 0.9–1.1.

Female. Cephalothorax brown, eye field darker, eyes surrounded with black, a few long brown setae in their vicinity, in some specimens eye field and cephalothorax laterally with a few white hairs. Abdomen as in male. Sternum brown. Legs and pedipalps yellow. Epigyne more or less round, weakly sclerotized, with two depressions near posterior margin (figs. 85 and 87); seminal ducts initially broad, further constricted, spermathecae more or less spherical (figs. 86 and 88). Dimensions: a 1.2–1.5, b 1.7–1.8, c 0.6–0.7, d 0.9–1.0, e 0.9–1.1.

The male is similar to *H. bisulcus* and *H. marshalli* but slightly smaller, easy distinguished by the extended lower margin of cymbium and the embolus shape (cf. figs. 79–81, 83–84 and 70–73 and 75–77). The female is distinctive, readily distinguished from all other females of the *marshalli* group by the form of epigyne (figs. 85 and 87).

***Heliophanus insperatus* sp. n.**

(figs. 90–95, 916)

Material. Angola: environs of Dundo, source of Mussungue River (7° 02′ S, 20° 51′ E), gallery forest near road to Turismo, 19.IX.1946, leg. A. MACHADO – 1 ♂ (paratype, BMNH Ang. 23.4); South Africa: Megaliesburg, under stones, 2.IV.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♂ (holotype, BMNH); Zaire: Kivu, Semliki, 1.VIII.1968, leg. R. LEJEUNE – 1 ♂ (paratype, MRAC 135 698).

Male. Cephalothorax brown, eye field black or at least eyes surrounded with black, anterior eyes fringed with long brown setae. Eye field clothed with white hairs, in some specimens white longitudinal band posteriorly to eye field. Abdomen dark brown, with longitudinal band composed of light hairs, as well as usually with lighter leaf-like pattern posteriorly. Sternum light brown. Legs yellow or orange, femora (sometimes also patellae and tibiae) I with brown longitudinal bands; legs I slightly larger than remaining ones, covered with fairly long light hairs. Pedipalp dark, patellar apophysis broadened at tip (figs. 90–92 and 94–95), three horizontal tibial apophyses (figs. 91 and 94), lower margin of cymbium extended into a small lobe-shaped process (figs. 92 and 95). Dimensions: a 1.4–1.7, b 1.2–1.4, c 0.6–0.8, d 0.9–1.0, e 1.0–1.1.

Female. Unknown.

The male closely resembles *H. edentulus*, may be distinguished by the extended lower edge of cymbium, much less pointed horizontal tibial apophyses and different shape of patellar apophysis (cf. figs. 90–92, 94–95 and 96–98).

Heliophanus edentulus SIMON, 1871

(figs. 96–104, 896)

Salticus delectus O. P.-CAMBRIDGE, 1872, **syn. n.**,
Salticus heliophanoides O. P.-CAMBRIDGE, 1872, **syn. n.**

Material. Cyprus: leg. MALICKY – 1 ♂ (CJW); Egypt: 1 ♂, 1 ♀ (syntypes of *S. delectus*, HDZ 1832 t. 86); France, Corsica: 1 ♂ (holotype, MNHN 873); Lebanon: Beirut – 1 ♂,

1 ♀ (MNHN 981); Libya: Ramla [el Kebira] – 3 ♂♂, 2 ♀♀ (MNHN 5972); Morocco: Douar Kef el [Bya] – 1 ♂, 1 juv. (MNHN 6606); [Djebel] Dough – 1 ♀ (MNHN 13 890); Palestine: 9 ♀♀ (syntypes of *S. delectus*, HDZ 1731 t. 34), 1 ♂ (syntype of *S. heliophanoides*, HDZ 1731 t. 68); Syria: leg. B. CAMBOUÉ – 1 ♀ (MNHN 882), 2 ♀♀ (MNHN 881), 1 ♂ (MNHN 908), 1 ♂ (MNHN 1399); Turkey: Shular – 5 ♂♂, 3 ♀♀, 1 juv. (HDZ 1731 t. 45, 48 and 78).

Male. Slenderly built. Cephalothorax brown, eye field black or at least eyes surrounded with black, anterior eyes fringed with sparse long brown setae. In some specimens cephalothorax with a few light hairs, forming sometimes light longitudinal band from eye field to thoracic margin. Abdomen light or dark brown, with light anterior margin and leaf-like pattern slightly posteriorly (fig. 100). Sternum yellow or brown. Legs yellow or brown, sometimes only legs I brown or brown bands along segments of legs I and II. Pedipalp small, brown, femur with two protruding edges (fig. 99), patellar apophysis small, three horizontal tibial apophyses long and sharply ended (figs. 96–98). Dimensions: a 1.7–2.2, b 1.8–3.0, c 0.7–1.0, d 0.9–1.2, e 1.1–1.3.

Female. Coloration as in male. Epigyne oval, with two openings (figs. 101 and 103), breadth of median septum individually variable, seminal ducts straight, spermathecae spirally convoluted (figs. 102 and 104). Dimensions: a 1.8–2.0, b 2.5–2.7, c 0.9–1.1, d 0.9–1.2, e 1.2–1.4.

The male distinguished from *H. insperatus* by the lack of process on lower edge of cymbium, much more pointed tibial apophyses and differently shaped femur (cf. figs. 96–99 and 90–95). The female is separated with difficulty from other species of the subgenus *Helafricanus* but the internal structures of epigyne are diagnostic (figs. 102 and 104), sometimes also the shape and situation of epigynal openings may be useful (fig. 101).

Heliophanus undecimmaculatus CAPORIACCO, 1941

(figs. 105–117, 919)

Material. Ethiopia: Caschei, 30.VI. and 7.VII.1939, leg. E. ZAVATTARI – 3 ♀♀ (the larger – lectotype, another – paralectotypes, MZS); Kenya: Mombasa, Bamburi Beach, 14.VIII.1948, leg. Å. HOLM – 2 ♂♂, 1 ♀ (ZIU 365); Oasis Lodge, Loiyangalani, swept from grasses and sedges, 16.VIII.1977, leg. T. MARTIN – 1 ♀, 5 juv. (BMNH); Somaliland: Sinandogo, 1946, leg. R. ACCIGLIORO – 1 ♂ (MRAC 131 178).

Male. Cephalothorax dark brown, eye field almost black; brown setae in vicinity of anterior eyes and a few white hairs in vicinity of posterior ones. Abdomen dark brown dorsally, dark ventrally. Sternum dark brown. Legs orange or light brown. Pedipalp small, dark brown, four horizontal tibial apophyses, three of them small (figs. 107 and 109), embolus long, spirally convoluted (figs. 105–106). Dimensions: a 1.4, b 1.3, c 0.6, d 0.9, e 1.0.

Female. Cephalothorax dark brown, eye field black. Abdomen dark brown, with hardly perceptible traces of three pairs of lighter marks along median part. Legs yellowish-orange, in some specimens with brown longitudinal bands. Epigyne oval, with two large openings (figs. 112, 114 and 116), internal structures as in figs. 113, 115 and 117. Dimensions: a 1.6–1.9, b 2.1–2.5, c 0.7, d 0.9–1.1, e 1.1–1.2.

The male is closely related to *H. demonstrativus* but slightly smaller, without process on lower edge of cymbium and with differently shaped patellar apophysis (cf. figs. 105–110 and 118–122). The female is distinctive, readily distinguished from other species of the subgenus *Helafricanus* by the form of epigyne (two large epigynal openings – figs. 112, 114 and 116).

Heliophanus demonstrativus sp. n.

(figs. 118–123, 920)

Material. South Africa: East London, 1899, leg. T. WOOD – 1 ♂ (holotype, SAM 471); Fort Beaufort, on wall of house in garden, III.1983, leg. J. HEERDEN – 1 ♂, 1 ♀ (♂ – paratype, ♀ – allotype, BMNH).

Male. Cephalothorax brown, eyes surrounded with black, eye field scarcely covered with long brown setae, few white hairs between anterior eyes, small lighter area posteriorly to eye field. Abdomen light brown, with central lighter band merging posteriorly into leaf-like pattern. Sternum yellow. Legs I light brown, remaining legs yellow. Pedipalp brown, patellar apophysis very small, bluntly ended (figs. 118–122), embolus very large, spirally convoluted (figs. 118–120), lower edge of cymbium extended into small process (figs. 121–122). Dimensions: a 2.6, b 2.6, c 1.2, d 1.4, e 1.5.

Female. Cephalothorax dark brown, eye field black, covered with scarce long brown setae. Dense white hairs posteriorly to eye field. Abdomen brown, with five pairs of lighter marks along median part dorsally, light ventrally, hairs. Legs yellow, femora I with brown longitudinal bands. Pedipalps yellow. Epigyne rounded, weakly sclerotized, with two large openings (fig. 123). Dimensions: a 1.8, b 3.3, c 1.0, d 1.3, e 1.4.

The male can be distinguished from *H. undecimmaculatus* by the presence of process on lower edge of cymbium and slightly differently shaped patellar and tibial apophyses (cf. figs. 118–122 and 105–110). The female is distinctive, readily distinguished from other species of the subgenus *Helafricanus* by the form of epigyne (fig. 123).

THE *DEBILIS* GROUP

Heliophanus congolensis GILTAY, 1935

(figs. 124–132, 907)

Material. São Thomé: Station Boa Vista, 20 km S from São Thomé, 300 m.a.s.l., X.–XI.1973 – 1 ♂, 1 ♀, 1 juv. (MRAC 147 734); Routhe North, 23 km S from São Thomé, 3.X.1973 – 1 ♂, 2 ♀♀, 1 juv. (MRAC 147 662); Ecole Mesquita, 10 km S from São Thomé, 100 m.a.s.l., 10.XI.1973 – 1 ♂, 2 ♀♀, 2 juv. (MRAC 147 712); environs of São Thomé, grasslands by the sea-shore, X.–XI.1973 – 2 ♀♀ (MRAC 147 717), X.1973 – 1 ♀ (MRAC 147 668); coast N 15–18 km, baobab savanna, in litter of trees, 8.–10.X.1973 – 1 ♂, 3 ♀♀ (MRAC 147 702). All specimens: leg. G. SCHMITZ. Zaire: Kivu, Semliki, Lesse valley, 25.VII.1968, leg. R. LEJEUNE – 1 ♀ (MRAC 135 582); Eala, XI.1934, leg. T. GHESQUIÈRE – 1 ♂ (holotype, IRSN 10 482).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black.

Abdomen light or dark brown, in some specimens with leaf-like pattern posteriorly. Sternum brown. Legs light yellow, in some specimens femora brown or with dark longitudinal bands. Pedipalp small, light brown, patellar apophysis small, bluntly ended (figs. 124–129), only one of tibial apophyses well developed, the dorsal one poorly visible (figs. 125–126 and 128–129). Dimensions: a 1.3–1.4, b 1.3, c 0.6, d 0.9, e 0.9–1.0.

Female. Cephalothorax brown, eye field darker, covered with long brown setae in vicinity of anterior eyes, thoracic part covered with single white hairs. In some specimens with small lighter area posteriorly of eye field. Abdomen brown, with light band along anterior margin and central band composed of several pairs of vaguely defined irregular marks. Sternum brown. Legs yellow. Epigyne small, weakly sclerotized, with two openings (fig. 131), internal structures as in fig. 132. Dimensions: a 1.4–1.6, b 1.9–2.1, c 0.6–0.7, d 0.9–1.0, e 0.9–1.0.

The male closely resembles *H. trepidus* but is distinguished by the shape of patellar apophysis (cf. figs. 124–129, and 133–142). The female separated by the internal structures of epigyne (fig. 132), sometimes the shape and situation of epigynal openings may be useful (fig. 131).

Heliophanus trepidus Simon, 1910

(figs. 133–147, 908)

Heliophanus tropicus [sic!]: Roewer 1954, Cutler 1976.

Material. Angola: 110 km SE Moçamedes, 28.VIII.1949, leg. A. Machado – 2 ♂♂ (BMNH Ang. 1955.3.); Botswana: Kwando River, grassland and *Phragmites*, 23.III.1976, leg. F. Wanless – 2 ♂♂ (BMNH); Namibia: Rooibank, V.1905 – 1 ♂, 1 juv. ♀, 1 juv. (♂ – lectotype, MNHU 17 605), 1 ♂ (paralectotype, MNHN 24 305); Andara-Kavango, Okavango River, 1979, leg. M. Badeley – 1 ♂ (MRAC 152 827), 2 ♂♂, 1 ♀, 1 juv. (MRAC 152 822).

Male. Cephalothorax dark brown, eye field black. Abdomen dark brown, posteriorly with clearly contrasting, lighter, oval or leaf-like pattern; light ventrally. Sternum dark brown. Legs light yellow. Pedipalp dark, patellar apophysis small, slightly bifurcated (figs. 133–142), dorsal tibial apophysis under-developed (figs. 135, 139 and 142). Dimensions: a 1.3–1.6, b 1.0–1.7, c 0.6–0.7, d 0.8–1.0, e 0.8–1.1.

Female. Cephalothorax dark brown, a few long brown setae in vicinity of anterior eyes and scarce white hairs posteriorly to posterior eyes. Abdomen dark brown, with light narrow band along anterior margin and irregular lighter area posteriorly. Epigyne round, small, with two depressions partially separated by median septum (figs. 144 and 146), in many specimens plugged with waxy secretion; seminal ducts straight, spermathecae spirally convoluted (figs. 145 and 147). Dimensions: a 1.7, b 1.7, c 0.7, d 1.0–1.1, e 1.1–1.2.

The male closely resembles *H. congolensis*, best distinguished by the slightly bifurcated tibial apophysis (cf. figs. 133–142 and 124–129). The female closely related to *H. debilis*, may be distinguished by slightly smaller and less well developed "pouches" surrounding the epigynal openings (cf. figs. 145, 147 and 159–162); identification, however, very difficult.

Heliophanus debilis Simon, 1901b

(figs. 148–162, 915)

Material. Angola: Dundo, on vegetation, 16.IX.1946, leg. A. Machado – 1 ♂, 1 ♀ (BMNH Ang. 16.3.), environs of museum, net sweeping, 14.V.1949, leg. A. Machado – 1 ♂ (BMNH Ang. 1491.3.); 110 km SE from Moçamedes, Fazenda Vasco Ferreira, 22.VIII.1949, leg. A. Machado – 1 ♂, 2 ♀♀ (BMNH Ang. 1955.3.); Botswana: Thalamakane River, Maun, 3.III.1976 – 3 ♂♂, 1 ♀, grassland heavily grazed, 27.III.1976 – 1 ♀, grassland, ground level, 3.III.1976 – 2 ♂♂, 3 ♀♀, 1 juv., among long grass, 12.III.1976 – 1 ♂, 1 ♀, grass swept, 26.VI.1975 – 13 ♂♂, 14 ♀♀; Moremi Lagoon, 28.XI.1975 – 1 ♂, 1 ♀, 7.X.1975 – 3 ♂♂, 2 ♀♀, net sweeping, 3.X.1975 – 3 ♂♂, 4 ♀♀; Maphaneng Pan, Maun, riverine wood, 24.II.1976 – 1 ♂, short grassland, 24.II.1976 – 1 ♂; Dandrige House, Borro River, Maun, sweeping field layer riverine woodland, 29.II.1976 – 1 ♂; Maqwee Lagoon, grassland, net sweeping, 7.XI.1975 – 3 ♀♀, 26.XI.1975 – 8 ♂♂; Shorobe, 23.–29.VI.1975 – 8 ♂♂, 7 ♀♀; Maun, bushes in riverine forest, 24.X.1975 – 1 ♂, 5 ♀♀; Manxuyane Lagoon, Okavango River, grassland, 1.IV.1976 – 2 ♂♂, 1 ♀, Maun, grassland, net sweeping, 4.III.1976 – 6 ♂♂, 3 ♀♀, 3 juv.; Island Safari Lodge, Maun, riverine forest, 21.IX.1975 – 3 ♂♂, 1 ♀, Maun Road, 21.IX.1975 – 1 ♂; Moshu Bridge, Maun, floodplain grassland field layer, 10.III.1976 – 2 ♀♀; Kvando River, net sweeping, 24.III.1976 – 1 ♂; Shashi River, grass in riverine woodland, 28.II.1976 – 6 ♂♂, 7 ♀♀, floodplain grassland, 31.VIII.1975 – 11 ♂♂, 2 ♀♀; Boronyane River, marsh, 6.IX.1975 – 4 ♂♂, 5 ♀♀. All specimens: leg. F. Wanless et A. Russell-Smith (BMNH); Malawi: Chintheche, 5.X.1977, leg. R. Jocqué – 1 ♂ (MRAC 153 240); South Africa: Transkei, Port St Johns, 1902, leg. G. Shortridge – 1 ♂, 1 ♀ (SAM 462); Natal, Ingwaruma, VI.1954, leg. R. Lawrence – 1 ♀ (NM 5548); Kimberley – 1 ♂, 1 ♀ (♂ – lectotype, ♀ – paralectotype, MNHN 20 134); Haam-Kraal, det. E. Simon – 1 ♂, 1 ♀ (MNHN 17 002); Zaire: Kivu, Zen, Uvira, Luiungi, on the ground in acacia forest, 100 m.a.s.l., 18.III.1956, leg. N. Leleup – 1 ♂ (MRAC 111 249); Uvira, XI.1955, leg. N. Leleup – 1 ♂ (MRAC 84 416).

Male. Cephalothorax brown, eye field black or, at least, eyes surrounded with black, long brown setae in vicinity of anterior eyes. In some specimens thoracic part with central band composed of white hairs. Abdomen brown, with narrow white band along anterior margin, lighter leaf-like pattern posteriorly and in many specimens with central band composed of white hairs; ventrally dark. Sternum brown. Legs yellow, often with brown longitudinal bands (usually only on femora I). Pedipalp brown, patellar apophysis very large, bent towards tibia (figs. 148–150 and 152), two large tibial apophyses (figs. 148–150 and 152). Dimensions: a 1.2–1.7, b 1.3–1.4, c 0.6–0.8, d 0.9–1.0, e 0.9–1.1.

Female. Cephalothorax brown, eye field black, often clothed with single white hairs. Abdomen brown, with light band along anterior margin and leaf-like pattern posteriorly. Sternum brown. Legs yellow. Epigyne oval, with two openings – distance between them individually variable (figs. 153–158) – usually partially plugged with waxy secretion; internal structures as in figs. 159–162. Dimensions: a 1.5–1.7, b 2.0, c 0.7–0.9, d 0.9–1.0, e 1.0–1.1.

The male is distinctive, readily distinguished from all other species of the subgenus *Helafricanus* by the structure of pedipalp; the patellar apophysis is rather robust, the dorsal apophysis of tibia is large, the embolus is long, thin and recurvate (figs. 148–150 and 152). The female very difficult to distinguish from *H. trepidus*; external appearance of epigyne identical, small differences of internal structures (cf. position of copulatory openings – figs. 159–162 and 145, 147) detectable.

Heliophanus patellaris SIMON, 1901b

(figs. 163–175, 926)

Material. South Africa: "Cape Colony" – 4 ♂♂ (larger – lectotype, another – paralectotypes, MNHN 21 882), det. E. SIMON – 7 ♂♂, 1 ♀ (BMNH 20 180), 9 ♀♀ (BMNH 20 128); Grahamstown, 23.IV.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♂ (BMNH); Cape Penisula, Devil Peak, N slope, IX.1901, leg. W. PURCELL – 1 ♀ (SAM 447), Claremont, 1901, leg. C. FRENCH – 2 ♂♂ (SAM 449); Cape Town, on wall of museum, VIII.1901, leg. R. LIGHTFOOT – 1 ♀ (SAM 448); W Cape, Hanover, XI.1901, leg. SCHREINER – 1 ♀ (SAM 450).

Male. Cephalothorax light or dark brown, eye field black, with a few long brown setae in vicinity of anterior eyes, thoracic part with central band of white hairs. Abdomen light or dark brown, in some specimens with central band of light hairs (broader than the thoracic one); ventrally light. Sternum light brown. Legs I brown, remaining legs yellow. Pedipalp brown, very dark, patellar apophysis small, distally broadened (figs. 163–165 and 168–169), diagnostic broadened dorsal tibial apophysis reaches into cymbium (figs. 165 and 167). Dimensions: a 1.6–2.1, b 1.5–2.0, c 0.8–1.0, d 0.9–1.2, e 1.1–1.3.

Female. Cephalothorax brown, eyes surrounded with black. Abdomen yellow, in some specimens with irregular brown marks along median part. Sternum yellow. Legs yellow. Epigyne small, weakly sclerotized, copulatory openings clearly visible (figs. 171 and 173–174); seminal ducts more or less straight, spermathecae form loop (figs. 172 and 175). Dimensions: a 1.9–2.1, b 2.4–2.7, c 0.9, d 1.1–1.2, e 1.2–1.3.

H. patellaris is a distinctive species readily distinguished from all other species by the form of pedipalp (dorsal tibial apophysis reaches into cymbium – figs. 165 and 167) and epigyne (figs. 171 and 173–174).

Heliophanus villosus sp. n.

(figs. 176–179, 919)

Material. South Africa: Cape Town, Signal Hill, under stones, 3.V.1976, leg. F. WANLESS – 1 ♀ (holotype, BMNH).

Male. Unknown.

Female. Cephalothorax dark brown, eye field light brown but eyes surrounded with black. Abdomen black, with pattern composed of white hairs – anterior margin light, longitudinal central band twice crossed by short transverse stripes (fig. 176). Sternum dark brown. Legs brown. Whole body covered with dense, long, brown hairs. Epigyne large, more or less rounded, with one large depression divided partially by median septum (fig. 177); internal structures as in figs. 178–179 (ventral and dorsal views). Dimensions: a 2.1, b 2.2, c 1.0, d 1.4, e 1.4.

H. villosus is a distinctive species readily distinguished from other species by the form of epigyne (fig. 177) and abdominal pattern (fig. 176).

Heliophanus paulus sp. n.

(figs. 176–179, 919)

Material. Botswana: Ilta Lake, side grass, 16.VI.1975, leg. F. WANLESS et A. RUSSELL-SMITH – 3 ♂♂, 1 ♀ (larger ♂ – holotype, another – paratypes, – allotype, BMNH).

Male. Cephalothorax brown, eyes surrounded with black, a few white hairs in vicinity of anterior eyes. Abdomen brown, with leaf-like yellow pattern posteriorly and a pair of lighter marks anteriorly; ventrally light. Sternum light brown. Legs yellow. Pedipalp brown, patellar apophysis distally broadened (figs. 180 and 182), embolus slender with tip hidden under coiled cymbium edge (fig. 180). Dimensions: a 1.3, b 1.3, c 0.6, d 0.8, e 0.9.

Female. Cephalothorax brown, eye field darker, with single white hairs, eyes surrounded with black. Abdomen brown, with central light band composed of five pairs of closely situated marks. Whole body clothed with short brown hairs, slightly longer and denser at anterior margin. Sternum brown. Legs yellow. Pedipalps yellow. Epigyne small, weakly sclerotized with one central depression (fig. 184); internal structures as in fig. 185. Dimensions: a 1.6, b 2.4, c 0.6, d 0.9, e 1.0.

Resembles *H. fascinatus*. The male distinguished by the shape of patellar apophysis and embolus tip (cf. figs. 180–182 and 186–190, 192–195). The female distinguished by the shape of epigynal depression (oval in *H. paulus*, rather rectangular in *H. fascinatus* – cf. figs. 184 and 196, 198).

Heliophanus fascinatus sp. n.

(figs. 186–198, 922)

Material. Botswana: Kwando River, 24.III.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 2 ♂♂, 3 ♀♀ (paratypes, BMNH); Rwanda: Zaza-Kitango, 27.VI.1975, leg. P. NYALUGAKA – 1 ♀ (paratype, MRAC 146 546); Zaire, Kivu: Butembo, road from Muscoza, V.1967, leg. R. LEJEUNE – 2 ♀♀ (paratypes, MRAC 132 815), environs of Butembo, IX.–X.1965, leg. M. CELIS – 3 ♂♂, 11 ♀♀, 5 juv. (paratypes, MRAC 130 155), Uvira, between Kalundu and Kaiunira, VI.1961, leg. P. KISS – 1 ♀ (paratype, MRAC 119 885), Musese, 1934, leg. G. GHESQUIÈRE – 1 ♀ (paratype, MRAC 24 833); Kinschassa, leg. R. VANDERYST – 1 ♂, 1 ♀, 1 juv. (♂ – holotype, ♀ – allotype, MRAC 12 025/12 027).

Male. Cephalothorax brown, eye field darker, covered very sparsely with white hairs, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Small lighter area posteriorly to eye field. Abdomen brown, with yellow heart-like patch posteriorly; ventrally brown. Sternum dark brown. Legs yellow, only femora I with brown longitudinal bands. Whole body covered with short, dense, brown hairs. Pedipalp yellow or brown, patellar apophysis bent slightly towards tibia (figs. 186, 189, 192 and 195), embolus diagnostic, shallowly bifurcated in vicinity of base and with apex sometimes hidden under coiled cymbium edge (figs. 186, 190 and 192–193). Dimensions: a 1.3–1.6, b 1.6–1.7, c 0.6, d 0.9, e 0.9–1.0.

Female. Cephalothorax brown, sometimes with single white hairs, eye field darker. Abdomen brown, with irregular central light band composed of five pairs of closely placed marks; ventrally light; in some specimens, however, dark but then with two light spots at base of spinnerets. Sternum yellow. Legs yellow. Whole body clothed with short, dense, brown hairs. Epigyne small, weakly sclerotized, with single rectangular depression (figs. 196 and 198); seminal ducts almost straight, spermathecae oval (fig. 197). Dimensions: a 1.5–1.6, b 1.6–2.4, c 0.6–0.8, d 0.9–1.0, e 0.9–1.1.

The species is closely related to *H. paulus*. The male separated by the shape of patellar apophysis and tip of embolus (cf. figs. 186–190, 192–195 and 180–182). The female separated by the shape of epigynal depression (cf. figs. 196, 198 and 184).

Heliophanus butemboensis sp. n.

(figs. 199–200, 923)

Material. Rwanda: Bugesera, Biharagu, swept from vegetation in savanna forest, 25.II.1960, leg. N. LELEUP – 1 ♀ (paratype, MRAC 136); Gabiro, VII.–X.1946, leg. R. VERHULST – 2 ♀♀ (paratypes, MRAC 149 566); Zaire: Kivu, environs of Butembo, IX.–X.1965, leg. M. CELIS – 1 ♀ (holotype, MRAC 130 126).

Male. Unknown.

Female. Cephalothorax dark brown, a few long brown setae in vicinity of anterior eyes. In some specimens eye field with single white hairs. Abdomen dorsally dark brown, with traces of narrow white band along anterior margin; ventrally dark with two light spots at base of spinnerets. Sternum very dark. Legs yellow. Pedipalps yellow. Epigyne small, triangular with single large depression (fig. 199); internal structures as in fig. 200. Dimensions: a 1.4, b 1.9–2.5, c 0.6–0.7, d 0.9, e 0.9.

H. butemboensis is a distinctive species readily distinguished from all other species of the subgenus *Helafricanus* by the triangular epigyne with single large depression (fig. 199).

THE *CRUDENI* GROUP

Heliophanus giltayi LESSERT, 1933

(figs. 201–209, 926)

Heliophanus clercki CAPORIACCO, 1949, **syn. n.**

Material. Angola: Lac Calundo, 18.XI.1954, leg. E. CARVALHO, det. F. WANLESS – 1 ♂ (BMNH Ang. 4465.27.); Kenya: Nairobi, 1944, leg. MENEGHETTI – 1 ♂, 2 ♀♀ (syntypes of *H. clercki*, MZS).

Male. Cephalothorax dark brown, eye field dark, sparsely clothed with brown setae. Abdomen dark brown. Sternum brown. Legs yellow, with slightly darker femora. Pedipalp dark, patellar apophysis small, diagnostic is very long and slender proximal tibial apophysis (figs. 201–206), bulbus with large protuberance in vicinity of base of embolus (figs. 201 and 204). Dimensions: a 1.1–1.3, b 1.0–1.1, c 0.5–0.6, d 0.6–0.8, e 0.8–0.9.

Female. Coloration as in male, legs slightly darker. Epigyne more or less rounded with single large depression (fig. 208); internal structures as in fig. 209. Dimensions: a 1.5, b 2.2, c 0.7, d 0.9, e 1.1.

The male is readily separated by the very long and slender proximal tibial apophysis (figs. 201–206). The female slightly resembles *H. modicus* and *H. validus* but may be separated by the internal structures of epigyne (cf. figs. 209 and 221, 223, 225 and 258).

Heliophanus hastatus sp. n.

(figs. 210–214, 925)

Material. South Africa: Melville Koppies, under large stones, 10.IV.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♂ (holotype, BMNH); Natal, Lions River, Howick, down Umgeni River, X.1961, leg. N. LELEUP – 1 ♂ (paratype, MRAC 132 277).

Male. Cephalothorax dark brown, eye field black, long brown setae and single white hairs in vicinity of anterior eyes, thoracic part with central band of white hairs. Abdomen brown, with poorly visible leaf-like pattern and central band of white hairs. Sternum brown. Legs yellow. Pedipalp brown, patellar apophysis bent towards tibia (figs. 210 and 213), embolus diagnostic, with broad base, rapidly constricted distally (fig. 210). Dimensions: a 1.7, b 1.6, c 0.7, d 1.0, e 1.1.

Female. Unknown.

Resembles *H. modicus* but may be distinguished by the diagnostic shape of embolus (cf. figs. 210 and 215).

Heliophanus modicus PECKHAM et PECKHAM, 1903

(figs. 215–225, 907)

Material. Madagascar: Diego-[Suarez], leg. C. ALLUAUD – 3 ♀♀ (MNHN 18 800); South Africa: Willowmore – 3 ♀♀, 3 juv. (larger – lectotype, another – paralectotypes, MCZ 231), 1 ♀ (MNHN 8205); Cilgou Bay – 1 ♀ (MNHN 8825); W Cape, Mt Baths, X.1902, leg. W. PURCELL – 1 ♀ (SAM 458); E Cape, Kirkwood, Dunbrody, 1902, leg. T. O'NEIL – 1 ♀ (SAM 455), 1 ♀ (SAM 457), 1 ♂ (SAM 456).

Male. Cephalothorax brown, eyes surrounded with black. Abdomen yellow, with almost undetectable leaf-like pattern, ventrally light. Sternum brown. Legs yellow. Pedipalp brown, patellar apophysis large, slightly bent towards tibia (figs. 215 and 218), bulbus very much convex (figs. 216–217), with large protuberance in vicinity of base of embolus (fig. 215). Dimensions: a 1.7, b 1.6, c 0.7, d 1.0, e 1.1.

Female. Cephalothorax brown or dark brown, eyes surrounded with black. Abdomen yellow or light brown, with poorly visible leaf-like pattern. Sternum yellow or light brown. Legs yellow. Epigyne oval, with large depression plugged with waxy secretion (figs. 220, 222 and 224); internal structures as in figs. 221, 223 and 225. Dimensions: a 1.5–2.1, b 2.2–2.7, c 0.7–0.9, d 0.9–1.2, e 1.1–1.3.

The male resembles *H. hastatus* but may be distinguished by the shape of embolus (cf. figs. 215 and 210). The female slightly resembles *H. giltayi* and *H. validus* but can be separated by the internal structures of epigyne (cf. figs. 221, 223, 225 and 209 and 258).

Heliophanus imperator sp. n.

(figs. 226–230, 925)

Material. Kenya: Aberdare, 3050 m.a.s.l., in tufty *Alchemilla*, 7.I.1976 – 1 ♂ (holotype, ZIU 365); Mt Kenya, 4200 m.a.s.l., in tufty *Festuca*, 3.I.1976 – 1 ♂ (paratype, ZIU 355); Mt Elgon, Koitobbos, 4150 m.a.s.l., under stones in tufty *Alchemilla*, 13.I.1938 – 1 ♂ (paratype, ZIU); Cherangany Hills, 4 km N from Kaisungur, 2900 m.a.s.l., 9.I.1965 – 1 ♂ (paratype, ZIU 55). All specimens: leg. Å. HOLM.

Male. Cephalothorax very dark, almost black, a few long brown setae in vicinity of anterior eyes, thoracic part with narrow central band of white hairs. Abdomen dark brown, with longitudinal central band of white hairs; ventrally dark. Sternum brown. Legs orange or brown, with yellow metatarsi and tarsi. Whole body clothed with short brown hairs. Pedipalp dark brown, very large tibial and patellar apophyses (figs. 226–229), embolus very short, bulbus with large protuberance in vicinity of base of embolus (figs. 226–227). Dimensions: a 1.6–2.2, b 1.4–2.0, c 0.7–0.9, d 0.9–1.1, e 1.0–1.1.

Female. Unknown.

H. imperator is a distinctive species readily distinguished from other species of the *crudeni* group by the very short embolus (figs. 226–227).

Heliophanus crudeni LESSERT, 1925

(figs. 231–239, 912)

Material. Tanzania, Kilimanjaro: Kiboscho, 3000 m.a.s.l., II.1906, leg. Y. SJÖSTEDT – 4 ♂♂, 5 ♀♀ (larger ♂ – lectotype, another – paralectotypes, NR), Shira Plateau Camp, 29.XI.1948, leg. G. SALT, det. J. DENIS – 1 ♀ (BMNH 1951.4.21.10.), Mawenzi, 4650 m.a.s.l., 19.VI.1948, leg. Å. HOLM – 1 ♀ (ZIU 215), 3650–3750 m.a.s.l., under stones, 20.VI.1948, leg. Å. HOLM – 1 ♀ (ZIU 217), 3800 m.a.s.l., 16.VI.1948, leg. Å. HOLM – 1 ♂, 1 juv. (ZIU 201), 3000 m.a.s.l., 26.VI.1948, leg. Å. HOLM – 1 ♀ (ZIU 240), 3880 m.a.s.l., among sedges, 17.VI.1948, leg. Å. HOLM – 2 ♀♀ (ZIU 203).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black. Abdomen brown, with irregular central band composed of five pairs of closely placed spots. Cephalothorax and abdomen covered with dense, short, light hairs. Sternum brown. Legs yellow, with brown femora. Pedipalp brown, femur with trace of small protuberance (fig. 239), patellar apophysis large, straight (figs. 231–234), dorsal tibial apophysis with well marked edge (fig. 233), embolus spike-shaped (fig. 231). Dimensions: a 2.1, b 2.1, c 0.9, d 1.1, e 1.2.

Female. Coloration as in male. Abdomen slightly lighter, thus contrast between central band and surroundings less clear; very densely haired. Legs yellow. Pedipalps yellow. Epigyne large, with two round openings (figs. 236 and 238). Copulatory openings large, seminal ducts contracting, spermathecae small, heavily sclerotized (figs. 237 and 239). Dimensions: a 1.9–2.0, b 2.4–2.7, c 0.7–0.8, d 1.1, e 1.2.

The male resembles *H. kenyaensis* and *H. validus*, best distinguished by the slightly different shape of embolus, patellar and dorsal tibial apophyses, as well as by the size of protuberance on pedipalpal femur (cf. figs. 231–235 and 240–246 and 253–256). To distinguish male of *H. crudeni* from male of *H. kenyaensis* is especially difficult. The female is distinctive, readily distinguished from all other species of the *crudeni* group by two round epigynal openings (figs. 236 and 238).

Heliophanus kenyaensis sp. n.

(figs. 240–252, 914)

Material. Kenya, Mt Elgon: E slope, 2450 m.a.s.l., 30.I.1979, leg. T. PALM – 1 ♂ (ZIU), S slope, Kimilili River, 2400 m.a.s.l., 30.I.1965, leg. Å. HOLM – 1 ♂ (ZIU 118), bank of a rivulet, 2250 m.a.s.l., 15.III.1938, leg. Å. HOLM – 1 ♂ (ZIU 144), in forest on trees, 2400 m.a.s.l., 1.III.1938, leg. Å. HOLM – 1 ♀ (ZIU 121), bank of ait, stream valley, 3350 m.a.s.l., 28.XII.1937, leg. Å. HOLM – 1 ♀ (ZIU), Magiya Moto, under stones nearby stream, 3580 m.a.s.l., 12.I.1938, leg. Å. HOLM – 2 ♀♀, 2 juv. (ZIU 36), Koitobbos, on stems of *Senecio*, 3650 m.a.s.l., 27.III.1938, leg. Å. HOLM – 1 ♀, 1 juv. (ZIU 169); Mt Marsabit, 1500 m.a.s.l., 28.I.1969, leg. Å. HOLM – 2 ♀♀ (ZIU 148); Lake Naivasha, 1885 m.a.s.l., 18.II.1969, leg. Å. HOLM – 1 ♂ (holotype, ZIU 165); Warges Hill, 1950 m.a.s.l., on vegetation nearby stream, 30.XII.1975, leg. Å. HOLM – 1 ♂, 1 ♀ (ZIU 345); Tanzania: Mt Meru, Olkokola, NE slope, 2750 m.a.s.l., 25.–30.VI.1957, leg. P. BASILEWSKY et N. LELEUP – 1 ♂ (MRAC 111 582); Mt Oldeani, W slope, 2300 m.a.s.l., 13.VI.1957, leg. P. BASILEWSKY et N. LELEUP – 2 ♀♀ (MRAC 11 589); Rwanda: Butare, 21.VI.1979, leg. A. VANDENBERGHE – 1 ♂ (MRAC 152 008); Zaire: Rutshuru, Rwankwi, 1948, leg. J. LEROY – 1 ♀ (allotype, MRAC 134 545). All adult specimens (apart from holotype and allotype) are paratypes.

Male. Cephalothorax dark brown, eye field black, a few long brown setae in vicinity of anterior eyes, thoracic part with narrow central band of white hairs. Abdomen dark brown, with very narrow central band of white hairs; ventrally dark. Sternum brown. Legs yellow or light brown, sometimes only legs I brown (at times legs I with longitudinal brown stripes). Legs I slightly larger than remaining ones. Whole body covered with short, dense, brown hairs, longest at anterior margin of abdomen. Pedipalp dark brown, patellar apophysis large, slightly bent towards tibia (figs. 240 and 242–244), embolus broad at base, distally constricted (figs. 240 and 245–246). Dimensions: a 1.6–1.7, b 1.7–2.2, c 0.8–0.9, d 0.9–1.1, e 1.1–1.2.

Female. Coloration as in male, light band along abdomen slightly broader, composed of irregular marks. Legs yellow. Pedipalps yellow. Epigyne large, heavily sclerotized, with two depressions separated by large triangular septum (figs. 247–249); internal structures as in figs. 250–252. Dimensions: a 2.0–2.3, b 2.9–3.6, c 0.8, d 1.1, e 1.2.

The male resembles *H. crudeni* and *H. validus*, can be distinguished by the broadest base of embolus and relatively small protuberance of pedipalpal femur (cf. figs. 240–246 and 231–235 and 253–256). The female is distinctive, readily distinguished from all other species of the genus *Heliophanus* by the form of epigyne (figs. 247–249).

Heliophanus validus sp. n.

(figs. 253–258, 907)

Heliophanus crudeni: CAPORIACCO 1949, nec LESSERT, 1925

Material. Kenya: Nairobi, 1944, lec. MENEGHETTI – 1 ♂, 2 ♀♀, 1 juv. (♂ – holotype, larger ♀ – allotype, another one – paratype, MZS).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown, posteriorly with lighter central band; ventrally dark. Sternum light brown. Legs orange. Whole body covered with short brown hairs. Pedipalp brown, patellar apophysis very large, broadly tipped (figs. 253–255), femur with conspicuous protuberance (fig. 256). Dimensions: a 1.4, b 1.4, c 0.6, d 0.9, e 0.9.

Female. Coloration as in male but light central band along abdomen longer, more distinct. Epigyne small, with one depression (fig. 257); internal structures as in fig. 258. Dimensions: a 1.3, b 1.9, c 0.7, d 0.9, e 0.9.

The male slightly resembles *H. crudeni* and *H. kenyaensis* but may be distinguished by the markedly larger patellar apophysis and pedipalpal femur with better developed protuberance (cf. figs. 253–256 and 231–235 and 240–246). The female slightly resembles *H. giltayi* and *H. modicus* but can be separated by the internal structures of epigyne (cf. figs. 258 and 209 and 221, 223, 225).

Heliophanus kilimanjaroensis sp. n.

(figs. 259–260, 909)

Material. Tanzania: Kilimanjaro, N from Marangu, SE slope, 2500 m.a.s.l., 24.–25.VII.1957, leg. P. Basilewsky et N. Leleup – 1 ♀ (holotype, MRAC 111 607).

Male. Unknown.

Female. Cephalothorax dark brown, eye field slightly lighter, but eyes surrounded with black, eye field covered with few longer brown setae. Abdomen markedly more rounded than in other species, brown dorsally, dark ventrally. Sternum brown. Legs brown. Epigyne small, heavily sclerotized (fig. 259); seminal ducts straight and short, spermathecae large oval (fig. 260). Dimensions: a 1.5, b 2.7, c 0.8, d 1.0, e 1.1.

H. kilimanjaroensis is a distinctive species readily distinguished from other members of the *crudeni* group by the internal structures of epigyne (fig. 260).

THE SUBGENUS *HELIOPHANUS* S. STR.

THE *ORCHESTA* GROUP

Heliophanus cassinicola Simon, 1909a

(figs. 261–278, 917)

Trapezocephalus aelurilliformis Berland et Millot, 1941, **syn. n.**,
Heliophanus milloti Denis, 1955, **syn. n.**

Material. Burundi: Plain of Ruzizi River, 1968, leg. S. Ndani – 1 ♂ (MRAC 134 295); Guinea Bissau: Rio Cassine, leg. L. Fea – 1 ♂ (holotype, MCSND); Ivory Coast: Man, Danane, VIII.1937, leg. J. Millot – 2 ♀♀ (holotype and paratype of *T. aelurilliformis*, MNHN); Niger: Irabellan, Mts Baguezans, 1200–1300 m.a.s.l., 26.–31.VIII.1947, leg. L. Chopardet et A. Villiers – 2 ♂♂, 1 juv. (syntypes of *H. milloti*, MNHN); Rwanda: Mohazi, Butare, II.1971, leg. P. Nyalaguka – 1 ♂ (MRAC 139 058); Zaire: Ishangi, overflow of Lake Edouard beyond Semliki, 26.–29.XII.1968, leg. R. Lejeune – 1 ♂ (MRAC 135 358); Uvira, on bank of Lake Tanganyika, VI.1958, leg. N. Leleup – 1 ♀ (MRAC 112 625); Kivu, Muenga, Kibongo, on ground, VI.1961, leg. N. Leleup – 1 ♀ (MRAC 119 304), environs of Butembo, IX.–X.1965, leg. M. Celis – 2 ♂♂, 3 ♀♀, 1 juv. (MRAC 130 152).

Male. Cephalothorax dark brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown. Cephalothorax and abdomen clothed with short, dense, light hairs, contrasting with dark background. Sternum brown. Legs brown, with yellow metatarsi and tarsi, legs I larger than the others. Legs clothed with long, dense, brown hairs. Pedipalp brown, single femoral apophysis strongly curved towards the femur (figs. 265 and 269), two small tibial apophyses (figs. 261–264, 267–268 and 271–272). Dimensions: a 2.7–2.9, b 2.2–2.9, c 1.1, d 1.4–1.5, e 1.5–1.6.

Female. Coloration as in male. Whole body clothed with dense, light hairs, longer at anterior margin of abdomen; in some specimens the hairs form small spots posteriorly to lateral eyes. Pedipalps yellow. Epigyne more or less oval, with a ligulate process at posterior margin, between copulatory openings (figs. 273–276). Copulatory openings large, seminal ducts constricting, spermathecae small, spherical (figs. 277–278). Dimensions: a 2.2–3.0, b 2.9–3.7, c 0.9–1.2, d 1.3–1.5, e 1.4–1.7.

The species is closely related to *H. aviculus*, best distinguished by the dark body, clothed with contrasting light hairs (in *H. aviculus* abdomen is light). The position of tibial apophyses in relation to each other is diagnostic in the males (cf. figs. 263–264, 267–268, 272 and 280–281). The female is distinguished by the broader initial section of seminal ducts (cf. figs. 277–278 and 287–288). To distinguish the female of *H. cassinicola* from *H. lesserti* and *H. orchestioides* is also difficult, but the position of copulatory openings and the internal structures of epigyne are distinctive (cf. figs. 273–278 and 324–326 and 337–340).

Heliophanus aviculus Berland et Millot, 1941

(figs. 279–288, 911)

Material. Cameroon: Cameroons River, leg. Rosenberg – 1 ♀ (BMNH); Ivory Coast: Batié, VIII.1937, leg. J. Millot – 1 ♂, 1 ♀ (♂ – holotype, ♀ – paratype, MNHN); Mali: Pesoba, IX.1970, leg. G. Pierrard – 2 ♂♂ (MRAC 138 816); Sikano, IX.1971, leg. G. Pierrard – 1 ♂ (MRAC 142 347); Linzana, VIII.–IX.1971, leg. G. Pierrard – 1 ♂ (MRAC 142 317); Kassarola, VIII.–IX.1971, leg. G. Pierrard – 1 ♂ (MRAC 142 353); Zaire: Faradje, leg. Lang et Chopin – 2 ♀♀ (MRAC 11 875/11 878).

Male. Cephalothorax brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen dark yellow or light brown. Sternum brown. Legs light brown, legs I slightly larger than remaining ones. Abdomen and legs clothed with dense brown hairs. Pedipalp light brown, single femoral apophysis, strongly bent (fig. 286); two small tibial apophyses (figs. 280–281). Dimensions: a 2.3–2.8, b 1.9–2.4, c 0.9–1.1, d 1.2–1.3, e 1.3.

Female. Coloration as in male, abdomen very light. In some specimens cephalothorax clothed with single light hairs. Pedipalps yellow. Epigyne oval with a ligulate process (figs. 285–286). Seminal ducts initially broad, constricting later, spermathecae oval (figs. 287–288). Dimensions: a 2.2–2.8, b 3.1–3.9, c 1.1–1.3, d 1.3–1.6, e 1.4–1.7.

The species is closely related to *H. cassinicola* but may be distinguished by the markedly lighter abdomen. The position of tibial apophyses in relation to each other is distinctive in the males (cf. figs. 280–281 and 263–264, 267–268, 272). The female distinguished by the narrower initial section of seminal ducts (cf. figs. 287–288 and 277–278).

Heliophanus robustus Berland et Millot, 1941

(figs. 289–294, 915)

Material. Ivory Coast: Man, IX.1937, leg. J. Millot – 1 ♂ (holotype, MNHN); Zaire?: Flandria (?), leg. R. Hulstaert – 1 ♂ (MRAC 11 891).

Male. Cephalothorax brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown dorsally, dark ventrally. Cephalothorax and abdomen clothed with short brown hairs, slightly longer and denser at anterior margin of abdomen. Sternum brown. Legs brown, with slightly lighter metatarsi and tarsi. Pedipalp dark, with single femoral apophysis (fig. 292)

and two small tibial apophyses (figs. 290–291 and 294), embolus long and thin (figs. 289 and 293). Dimensions: a 2.2–2.6, b 2.2–2.5, c 1.1–1.2, d 1.4–1.6, e 1.6–1.8.

Female. Unknown.

H. robustus resembles *H. orchesta* but may be readily distinguished by the shape of tibial apophyses (cf. figs. 290–291, 294 and 296–297, 300).

Heliophanus orchesta SIMON, 1885

(figs. 295–309, 906)

Heliophanus ambiguus LESSERT, 1925, **syn. n.**,
Heliophanus decoloratus LAWRENCE, 1928b, **syn. n.**,
Heliophanus orchestioides: CAPORIACCO 1947 (part.: ♂), nec LESSERT, 1925,
Heliophanus decoloratus LAWRENCE, 1927 [sic!]: ROEWER 1954.
Heliophanus orochesta [sic!]: PRÓSZYŃSKI 1971e.

Material. Botswana, Maphaneng Pan, Maun: grubbing edge of riverine woodland, 27.II.1976 – 2 ♀♀, grass tufts in riverine woodland, 26.III.1976 – 1 ♂, 1 ♀, short grassland, 24.II.1976 – 1 ♀, riverine woodland, 24.II.1976 – 6 ♂♂, 1 ♀, riverine woodland, ground layer, 1.IV.1976 – 4 ♂♂, 2 ♀♀, riverine woodland, sweeping field layer, 27.II.1976 – 7 ♂♂, 8 ♀♀, 3 juv.; Shashi River, Maun, grass in riverine woodland, 28.II.1976 – 3 ♂♂, 3 juv.; Kwando River, net sweeping, 24.III.1976 – 1 ♂; Botletle River, 15 km S from Maun, sweeping in riverine woodland, 5.III.1976 – 1 ♂, 3 ♀♀; Thalamakane River, Maun, grassland, ground level, 1.II.1976 – 1 ♂ (pedipalp only); Shaile Camp, riverine woodland, 25.III.1976 – 2 ♂♂, 3 ♀♀, 1 juv.; Dandrige House, Borro River, Maun, sweeping field layer in riverine woodland, 29.II.1976 – 3 ♂♂, 2 ♀♀, 1 juv. All specimens: leg. F. WANLESS et A. RUSSELL-SMITH (BMNH); Kenya: Nyeri, 2000 m.a.s.l., XII.1948, leg. M. STELLE, det. D. CLARK – 1 ♂ (BMNH); Amboseli Nat. Park, 1050 m.a.s.l., 11.III.1970, leg. T. PALM – 2 ♂♂ (ZIU); Kajiado, 1400 m.a.s.l., 31.VII.1957, leg. P. BASILEWSKY et N. LELEUP – 1 ♀ (MRAC 111 599); Madagascar: Imerina, leg. B. CAMBOUÉ – 2 ♂♂, 1 juv. (MNHN 20 177); Malawi: Chintheche, 15.IV.1978, leg. R. JOCQUÉ – 1 ♂ (MRAC 153 029); Namibia: Andara-Kavango, Okavango River, 1979, leg. E. BADDELEY – 2 ♀♀ (MRAC 152 882), 1 ♀ (MRAC 152 828), 1 ♂, 9 juv. (MRAC 152 849), 2 ♂♂ (MRAC 152 819); Kunene River, III.1923, leg. R. LAWRENCE – 3 ♂♂ (syntypes of *H. decoloratus*, SAM 418); South Africa: Pretoria – 2 ♂♂ (larger – lectotype, another – paralectotype, MNHN 7816); Pietermaritzburg, Clarendon, garden, 18.IV.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 2 ♂♂, 2 ♀♀ (BMNH), Town Baeh, on pine trunks, 15.IV.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 4 ♂♂, 2 ♀♀, 1 juv. (BMNH); Transkei, Port St Johns, III.1979, leg. E. BADDELEY – 1 ♂ (MRAC 152 120); Natal, Inohanga, III.1954, leg. R. LAWRENCE – 1 ♂ (NM 5984), 1 ♂ (NM 5993); Tanzania: Kilimanjaro, Kibonoto, V.–IX.1905, leg. Y. SJÖSTEDT – 3 ♂♂, 4 ♀♀ (syntypes of *H. ambiguus*, NR); Moshi, VII.1905, det. L. CAPORIACCO – 1 ♂ (MZS); Zaire: Arara-Aru, X.1952, leg. M. WINAND – 1 ♂ (MRAC 73 994); Mongbwalu, VII.1938, leg. SCHEITZ, det. R. LAWRENCE – 1 ♂ (MRAC 1595/1597); Katanga, Elizabethville, II.1965, leg. J. BAFORT – 1 ♂ (MRAC 127 729); Kivu, Rwankwi, V.1976, leg. J. LEROY – 2 ♀♀ (MRAC 58 367/58 397), VII.1951, leg. J. LEROY – 2 ♀♀ (MRAC 72 003/72 012), Rutshuru, 1946, leg. J. LEROY – 1 ♀ (MRAC 125 456).

Male. Cephalothorax dark brown or black, a few long brown setae in vicinity of anterior eyes. Abdomen dark brown, in some specimens uniform, without any patches, but majority with very narrow white band at anterior margin and one or two pairs of marks composed of white scales; dark ventrally. Sternum dark brown. Legs dark brown or black, sometimes small spots of white scales at bases of segments; legs I larger than remaining ones. Whole body clothed with short dark hairs. Pedipalp dark, femoral apophysis large, strongly curved (figs. 298 and 302), tibial apophysis flat, bilobate, pincers-shaped (figs. 296–297 and 300). Dimensions: a 2.2–3.1, b 2.1–2.7, c 0.9–1.1, d 1.4–1.5, e 1.5–1.7.

Female. Coloration as in male, in some specimens abdomen slightly lighter. Legs brown with yellow metatarsi and tarsi. Body clothed with dispersed white hairs. Epigyne oval, with two depressions, a ligulate process at posterior margin (fig. 307), sometimes closely adherent to abdomen and almost invisible (figs. 308–309). Internal structures as in figs. 310–312 (ventral and dorsal views). Dimensions: a 2.5–2.7, b 3.3–3.8, c 0.9–1.2, d 1.4–1.5, e 1.5–1.7.

The male resembles *H. robustus* but may be readily distinguished by the bilobate tibial apophysis (cf. figs. 296–297, 300 and 290–291, 294). The female slightly resembles *H. lesserti* and *H. orchestioides* but can be separated by the form of epigyne (cf. figs. 304–306 and 324–325 and 337, 339). The internal structures of epigyne are distinctive of each species (cf. figs. 310–312 and 326 and 338, 340).

Heliophanus deamatus PECKHAM et PECKHAM, 1903

(figs. 310–319, 924)

Material. Angola: Humpata, 30.III.1977, leg. A. MACHADO – 1 ♂ (BMNH Ang. 77.1.3.); Malawi: Mts Viphya, Chikangawa, old *Pinus* plantation, V.1978, leg. R. JOCQUÉ – 1 ♂ (MRAC 153 738); Rwanda: Gabiro, VII.–X.1946, leg. R. VERHULST – 2 ♂♂ (MRAC 149 564); South Africa, Transvaal: Makapan – 2 ♂♂ (MNHN 20 165); Zimbabwe: Mashonaland, leg. G. MARSHALL – 1 ♂ (holotype, MCZ 236).

Male. Cephalothorax black, long brown setae in vicinity of anterior eyes. Abdomen black dorsally and very dark ventrally. Sternum dark brown. Legs dark brown, legs I slightly larger than remaining ones. Pedipalp almost black, femoral apophysis very large, hooked (figs. 313 and 318–319), dorsal tibial apophysis flat bilobate, reaching to cymbium (figs. 312 and 316–317). Dimensions: a 2.4–2.7, b 2.2–2.8, c 1.1, d 1.4–1.6, e 1.5–1.7.

Female. Unknown.

H. deamatus is a distinctive species readily distinguished from all other species of the *orchesta* group by the very large, hooked femoral apophysis and the bilobate dorsal tibial apopysis (figs. 312–313 and 316–319).

Heliophanus lesserti sp. n.

(figs. 320–326, 912)

Material. Botswana: Moshu Bridge, N Maun, floodplain grassland, field layer, 10.III.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♂, 1 ♀ (paratypes, BMNH), grubbering in dry grassland, 10.III.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 2 ♀♀ (paratypes, BMNH); Kwando River, net sweeping, 24.III.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♀ (paratype, BMNH); Maqwee Moremi, floodplain grassland, field layer, 25.II.1976, leg. F. WANLESS et A. RUSSELL-SMITH – 1 ♀ (paratype, BMNH); Namibia: Andara-Kavango, Okavango River, 1979, leg. E. BADDELEY – 2 ♂♂ (paratypes, MRAC, 152 819); South Africa, Transvaal: Kaapmuiden, 14.IV.1979, leg. A. ROY – 2 ♀♀ (larger – allotype, another – paratype, MRAC 151 493); Zaire: Kando, 20.–26.III.1931, leg. WITTE – 1 ♂ (holotype, *Heliophanus* sp. n., det. R. LESSERT, MRAC 11 833/11 834).

Male. Cephalothorax dark brown or black, anterior eyes fringed with long brown setae. Abdomen black dorsally, dark ventrally. Sternum black. Legs dark brown, in some specimens with orange metatarsi and tarsi, legs I larger than remaining ones. Abdomen and legs clothed with short dark hairs. Pedipalp brown, small, femoral apophysis short and broad (fig. 323), dorsal tibial apophysis

bilobate, forceps-shaped (figs. 321–322), embolus thin and very long, opposite its base a small process (fig. 320), cymbium narrow, elongated (fig. 322). Dimensions: a 2.4, b 2.2, c 0.9, d 1.2, e 1.4.

Female. Cephalothorax dark brown or black. Abdomen dark brown or black dorsally, dark with traces of two lighter longitudinal bands ventrally. Legs brown, in some specimens with lighter metatarsi and tarsi. Pedipalps yellow. Whole body clothed with dense light hairs, contrasting with background, longer and denser at anterior margin of abdomen. In some specimens hairs greatly rubbed. Epigyne oval, with a ligulate process at posterior margin (figs. 324–325); internal structures as in fig. 326. Dimensions: a 2.6–2.8, b 2.5–3.9, c 1.1–1.2, d 1.4–1.6, e 1.6–1.7.

The male is distinctive, readily separated from all other species of the *orchesta* group by the very long and thin embolus and the narrow cymbium (figs. 320 and 322). To distinguish the female of *H. lesserti* from other species of the *orchesta* group is difficult but the position of epigynal openings and internal structures of epigyne are distinctive (cf. figs. 324–326 and 273–278 and 304–309 and 337–340).

Heliophanus orchestioides Lessert, 1925

(figs. 327–340, 910)

Heliophanus orchestides [sic!]: Roewer 1954,
Heliophanus orchestoides [sic!]: Bonnet 1957, Prószyński 1971e.

Material. Malawi: Mts Viphya, Chikangawa, Parker Road, 9.V.1978, leg. R. Jocqué – 1 ♀ (MRAC 153 630); Tanzania: Kilimanjaro, Kibonoto, VII.–VIII.1905, leg. Y. Sjöstedt – 4 ♂♂, 6 ♀♀ (larger ♂ – lectotype, another – paralectotypes, NR); Mts Uluguru, 1500–1750 m.a.s.l., forest, 6.–13.VI.1971, leg. L. Berger, N. Leleup et J. Debecker – 1 ♂ (MRAC 141 058); Moshi, VII.1905, det. L. Caporiacco – 2 ♀♀ (MZS); Zaire: Shaba, Luiswishi, scattered forest, I.–II.1974, leg. F. Malaisse – 1 ♀ (MRAC 148 931), X.–XI.1973, leg. F. Malaisse – 1 ♂ (MRAC 149 114).

Male. Cephalothorax dark brown or black, if lighter, then eyes surrounded with black, long brown setae in vicinity of anterior eyes. Abdomen brown dorsally, dark ventrally. Sternum yellow or brown. Legs I brown, slightly larger than remaining ones. Legs II–IV yellow or brown with yellow metatarsi and tarsi. Pedipalp dark, femoral apophysis short (fig. 330), dorsal tibial apophysis in form of single tooth (figs. 329 and 333), bulbus with large process opposite to the base of embolus (figs. 327 and 331). Dimensions: a 2.2, b 2.1, c 0.9, d 1.3, e 1.5.

The specimen from Zaire (figs. 334–336) with slightly differently shaped bulbus and considerably shifted towards external edge of cymbium dorsal tibial apophysis; perhaps a different species.

Female. Coloration as in male. Legs yellow with brown femora. Whole body clothed with short dark hairs, cephalothorax with additional single white hairs. Pedipalps yellow. Epigyne oval, with a ligulate process at posterior margin (figs. 337 and 339); internal structures as in figs. 338 and 340. Dimensions: a 2.3–2.9, b 3.7–4.5, c 1.0–1.2, d 1.4–1.7, e 1.6–1.9.

Differences in arrangement of seminal ducts between the paralectotype and the specimen from Zaire most probably result from slightly different inclination of epigynes.

The male slightly resembles *H. harpago* but is readily distinguished by the shape of dorsal tibial and femoral apophyses (cf. figs. 329–330, 333 and 342–344). The female resembles *H. lesserti* and *H. cassinicola*, may be distinguished by the different position of copulatory openings and considerable differences in internal structures of epigyne (cf. figs. 337–340 and 324–326 and 273–278).

Heliophanus harpago Simon, 1909

(figs. 341–345, 913)

Material. Angola: Luimbale, Mt Moko, 1800 m.a.s.l., III.1934, leg. K. Jordan – 1 ♂ (BMHN 1934.12.4.51-70); Gaboon: 1 ♂ (holotype MNHN); Guinea Bissau: Bissau, II.1937, leg. Monard – 1 ♂ (MRAC 11 853); Malawi: Mts Viphya, young spruce plantation, III.–IV.1978, leg. R. Jocqué – 2 ♂♂ (MRAC 153 606); Nigeria: Central Province, 1968, leg. A. Bot Gwong – 1 ♂ (MRAC 135 961); Zaire: Katanga, Luiswishi, 28 km NE from Lubumbashi, 1208 m.a.s.l., savanna, 1974, leg. F. Malaisse – 1 ♂ (MRAC 145 486); Kivu, among foliage, 29.IV.1964, leg. D. Fain – 1 ♂ (MRAC 126 512).

Male. Cephalothorax brown or black, with long brown setae in vicinity of anterior eyes. Abdomen dark brown dorsally, dark ventrally. Sternum brown. Legs I brown, slightly larger than remaining ones. Legs II–IV yellow, sometimes with brown femora. Whole body clothed with short dense dark hairs. Pedipalp brown, femoral apophysis huge, hooked (fig. 344), dorsal tibial apophysis in form of flat forceps (figs. 342–343), bulbus with large protuberance opposite to the base of embolus (fig. 341). Dimensions: a 2.3–2.8, b 2.0–2.7, c 1.0–1.2, d 1.5–1.6, e 1.6–1.9.

Female. Unknown.

The species resembles *H. orchestioides* but may be distinguished by the forceps-shaped dorsal tibial apophysis and the shape of femoral apophysis (cf. figs. 342–344 and 328–330, 332–333).

Heliophanus transvaalicus Simon, 1901b

(figs. 346–353, 922)

Material. South Africa: Makapan – 1 ♂, 1 ♀ (paralectotypes, MNHN 20 183); Kimberley, Pretoria – 3 ♂♂, 2 ♀♀ (larger ♂ – lectotype, another – paralectotypes, MNHN 20 143); locality unknown leg. C. Martin – 1 ♀, 4 juv. (MNHN 20 417).

Male. Cephalothorax black, with long brown setae in vicinity of anterior eyes. Abdomen black dorsally, dark ventrally. Sternum black. Legs I black, slightly larger than remaining ones. Legs II–IV dark brown. Whole body clothed with short dark hairs. Pedipalp dark, femoral apophysis very large, convoluted distally (fig. 349), bulbus with large process opposite to the base of embolus (fig. 346). Dimensions: a 3.0, b 2.9, c 1.3, d 1.7, e 1.9.

Female. Slightly lighter than male. Cephalothorax dark brown, eye field black. Abdomen dark brown dorsally, dark ventrally. Legs light brown. Pedipalps yellow. Epigyne round with two large openings (figs. 350 and 352), plugged sometimes with waxy secretion. Spermathecae elongated very much (figs. 351 and 353), heavily sclerotized. Dimensions: a 3.0, b 3.7, c 1.1, d 1.8, e 2.0.

The male slightly resembles *H. semirasus*, may be best distinguished by the size and shape of femoral apophysis (cf. figs. 349 and 357–358).

Heliophanus semirasus LAWRENCE, 1928a

(figs. 354–358, 914)

Material. Namibia: Kaoko Otavi, 1926 – 2 ♂♂ (larger ♂ – lectotype, another – paralectotype, SAM 419).

Male. Cephalothorax brown, eyes surrounded with black. Abdomen dark brown dorsally, dark ventrally. Sternum dark brown. Legs I light brown, slightly larger than remaining ones. Legs II–IV light brown or orange. Body clothed with sparse dark hairs, denser at anterior margin of abdomen. Pedipalp dark, femoral apophysis bluntly ended (figs. 357–358), large protuberance opposite the base of embolus (fig. 354). Dimensions: a 2.8, b 2.8, c 1.1, d 1.5, e 1.6.

Female. Unknown.

This species resembles *H. transvaalicus* but may be readily distinguished by the shape of femoral apophysis (cf. figs. 357–358 and 349).

THE *LAWRENCEI* GROUP

Heliophanus lawrencei sp. n.

(figs. 359–366, 926)

Material. Angola: environs of Dundo, Dicoco River, 27.XII.1947, leg. A. MACHADO – 1 ♂ (paratype, BMNH Ang. 270.1.); Zaire: Abimba, 22.VI.1925, leg. D. SCHONKOLEN – 1 ♂ (holotype MRAC 11 791); Kivu, 1.VIII.1968, leg. R. LEJEUNE – 3 ♂♂, 1 ♀ (paratypes, MRAC 135 703), 8.VIII.1968, leg. R. LEJEUNE – 1 ♀ (allotype, MRAC 135 478).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black. Abdomen brown, in some specimens with traces of two diagonal marks posteriorly; dark ventrally. Sternum brown. Legs I brown, sometimes with yellow metatarsi and tarsi, legs II–IV yellow with darker basal parts of segments. Pedipalp brown, diagnostic huge femoral apophysis (fig. 362), single small tibial apophysis (figs. 359–361 and 363–364), side of cymbium facing tibial apophysis flattened (figs. 361 and 364). Dimensions: a 1.4–1.6, b 1.1–1.5, c 0.6–0.8, d 0.9–1.0, e 0.9–1.0.

Female. Markedly larger than the male. Cephalothorax brown, eye field black, a few white hairs posteriorly to posterior eyes. Abdomen brown with traces of two diagonal marks posteriorly; ventrally dark with two light marks at base of spinnerets. Legs I brown with yellow metatarsi and tarsi, remaining legs yellow. Epigyne more or less round (fig. 365), heavily sclerotized; internal structures as in fig. 366. Epigynal openings shielded by larger sclerotized processes. Dimensions: a 1.7–1.9, b 2.4–2.5, c 0.8, d 1.1, e 1.1–1.2.

The species is readily distinguished from all other species of the genus *Heliophanus* by the shape of femoral apophysis (fig. 362) and internal structures of epigyne (fig. 366).

The holotype has been labelled "*Heliophanus lawrencei*" by R. LESSERT but never described.

Heliophanus falcatus sp. n.

(figs. 367–375, 908)

Material. Angola: road to Bragança, Chuttes River Lucala, 6.IX.1947, leg. A. MACHADO – 1 ♂ (holotype, BMNH Ang. 1.1.); environs of Dundo, Mussungue River, gallery forest near road to Turismo, 19.IX.1946, leg. A. MACHADO – 1 ♂, 1 ♀ (♂ – paratype, ♀ – allotype, BMNH Ang. 23.4.); Zaire; Kivu, Mbau, forest near Beni, IV.1966, leg. M. CELIS – 1 ♂ (paratype, MRAC 130 382).

Male. Cephalothorax light brown, slightly darker posteriorly, eyes surrounded with black. Abdomen yellow anteriorly, dark brown posteriorly; ventrally dark. Sternum yellow or light brown. Legs yellow, in some specimens with stripes along femora. Pedipalp brown, femoral apophysis large (figs. 370 and 372–373), tibial apophysis spine-formed (figs. 368–369), embolus falciform (figs. 367 and 371), side of cymbium facing tibial apophysis flattened (fig. 369). Dimensions: a 1.4, b 1.2–1.6, c 0.6, d 0.8, e 0.9.

Female. Cephalothorax light brown, eyes surrounded with black. Abdomen light anteriorly, dark brown posteriorly, with traces of two diagonal marks in the middle of its length. Sternum yellow. Legs yellow, with dark stripes along femora I. Epigyne more or less round, with one depression (fig. 374), partially plugged with waxy secretion; internal structures as in fig. 375. Dimensions: a 1.6, b 1.7, c 0.7, d 0.9, e 1.0.

The male may be distinguished from other species of the genus *Heliophanus* by the structure of pedipalp (large femoral apophysis and falciform embolus – figs. 367 and 370–373). The female is distinctive, readily distinguished from other species of the genus *Heliophanus* by the internal structures of epigyne (fig. 375).

THE *KANKANENSIS* GROUP

Heliophanus improcerus sp. n.

(figs. 376–383, 921)

Material. Zaire: Ishangi, overflow of Lake Edouard beyond Semliki, 26.–29.XII.1968, leg. R. LEJEUNE – 1 ♂ (holotype, MRAC 135 357); Kivu, Butembo, Musora Valley, V.1967, leg. R. LEJEUNE – 3 ♂♂, 5 ♀♀ (paratypes, MRAC 132 834), environs of Butembo, IX.–X.1965, leg. M. CELIS – 1 ♂, 1 ♀ (paratypes, MRAC 130 144); Kivu, plain Ruindi, 10.VII.1972, leg. R. LEJEUNE – 2 ♂♂ (paratypes, MRAC 144 628); Kivu, Rwankwi, V.1976 – 1 ♂ (paratype, MRAC 58 367/58 397), 1948, leg. J. LEROY – 5 ♀♀ (paratypes, MRAC 134 487), Rutshuru, 1948, leg. J. LEROY – 3 ♀♀ (paratypes, MRAC 134 543); Kivu, Kambaila, Kalingolingo Valley, VI.1973, leg. R. LEJEUNE – 1 ♀ (allotype, MRAC 145 824).

Male. Cephalothorax dark brown, eye field black, a few long brown setae in vicinity of anterior eyes, scarce white hairs posteriorly to posterior eyes. Abdomen dark brown, in some specimens with two light diagonal marks posteriorly. Sternum brown. Legs yellow with brown femora. Whole body clothed with sparse short dark hairs. Pedipalp brown, femoral apophysis curved distally (fig. 379), single small tibial apophysis (figs. 376–378), side of cymbium facing tibial apophysis flattened (fig. 378). Dimensions: a 1.3, b 1.2, c 0.6, d 0.8, e 0.9.

Female. Coloration like in male. Diagonal light abdominal marks less distinct. Abdomen dark ventrally, with two small light spots at the base of

spinnerets. Legs yellow, only legs I with brown longitudinal stripes or totally dark. Pedipalps yellow. Epigyne small, more or less round, with posterior depression (figs. 380 and 382); internal structures as in figs. 381 and 383. Dimensions: a 1.7–1.8, b 2.4–2.5, c 0.7–0.8, d 1.0, e 1.1.

The species slightly resembles *H. kankanensis* but may be distinguished by the length of embolus (cf. figs. 376 and 384, 388, 392) and single epigynal depression (cf. figs. 380, 382 and 398–399).

Heliophanus kankanensis BERLAND et MILLOT, 1941

(figs. 384–400, 909)

Material. Angola: Dundo, Chiato River, on vegetation, 19.XI.1948, leg. A. MACHADO – 2 ♂♂ (BMNH Ang. 1227.1.); Guinea: Kankan, VIII.1933, leg. L. BERLAND – 1 ♂, 1 ♀ (♂ – holotype, ♀ – paratype, MNHN); Zaire: Chysville, 30.XI.1952, leg. P. BASILEWSKY – 1 ♀ (MRAC 73 886); Kivu, central Semliki valley, 8.VIII.1968, leg. R. LEJEUNE – 8 ♂♂, 1 ♀, 1 juv. (MRAC 135 476), 3.VIII.1968, leg. R. LEJEUNE – 1 ♀ (MRAC 135 534), 1 ♂, 2 ♀♀ (MRAC 135 512), 1.VIII.1968, leg. R. LEJEUNE – 1 ♀ (MRAC 135 698), 1 ♀ (MRAC 135 694).

Male. Body slender and elongated. Cephalothorax brown, eye field darker, eyes surrounded with black. Abdomen brown, in some specimens with traces of two lighter marks posteriorly; dark ventrally. Sternum brown. Legs yellow, in some specimens with brown stripes along femora. Pedipalp dark, femoral apophysis with pointed tip (figs. 387 and 391 and 395), single tibial apophysis (figs. 385–386 and 389–390 and 393–394). Dimensions: a 1.3–1.7, b 1.1–1.6, c 0.6–0.8, d 0.9–1.0, e 0.9–1.1.

The holotype and specimens from Zaire and Angola differ in some structural details (cf. figs. 384–387 and 388–391 and 392–395), perhaps the species is variable.

Female. Shape of body and coloration like in male. Abdomen ventrally with two light marks near the base of spinnerets. Sternum yellow or brown. Legs yellow. Epigyne small, more or less round, with two depressions (figs. 396 and 398–399). Seminal ducts broad (especially in first part), spermathecae elongated (figs. 397 and 400). Dimensions: a 1.4–1.7, b 2.7–2.8, c 0.6–0.8, d 0.9–1.0, e 1.0–1.1.

The species slightly resembles *H. improcerus* but can be distinguished by the length of embolus (cf. figs. 384, 388, 392 and 376) and two epigynal depressions (cf. figs. 396, 398–399 and 380, 382).

THE *HAMIFER* GROUP

Heliophanus mauricianus SIMON, 1901b

(figs. 401–411, 926)

Heliophanus mauritianus [sic!]: BONNET 1957.

Material. Mauritius: leg. C. ALLUAUD – 2 ♂♂, 1 ♀ (larger ♂ – lectotype, another ♂ – paralectotype, MNHN 19 228); Réunion: Piton Maido, 2000 m.a.s.l., 17.III.1974, leg. J. VAN MOL – 1 ♂, 2 ♀♀ (MRAC 146 285), 1 ♂ (MRAC 146 287); Grand Matarum Cirque Cilaos, 1500 m.a.s.l., 16.III.1974, leg. J. VAN MOL – 1 ♂ (MRAC 146 282).

Male. Cephalothorax dark brown, eye field black. Abdomen dark brown. Sternum dark brown. Legs light brown with dark femora. Body clothed with sparse short dark hairs. Pedipalp brown, femoral apophysis slightly curved (figs. 404–405), embolus short (figs. 401 and 406). Dimensions: a 1.4–1.7, b 1.3–2.2, c 0.8, d 0.9–1.0, e 1.0–1.1.

Female. Cephalothorax dark brown, eye field black. Abdomen dark brown, in a single specimen with lighter band at anterior margin and traces of two pairs of light marks. Sternum dark brown. Legs orange, with darker basal parts of segments. Body clothed with short brown hairs. Epigyne with two large depressions, partially plugged with waxy secretion (figs. 409 and 411); internal structures as in fig. 410. Dimensions: a 1.3–1.9, b 2.2–2.5, c 0.9, d 1.1, e 1.2.

The species is best distinguished from other species of the *hamifer* group by the shape of tibial apophysis and short embolus (figs. 401–403 and 406–408) and two epigynal depressions (figs. 409 and 411).

Identity of data on the label of the examined males from Mauritius with those given by SIMON (1901b) suggests that these specimens are syntypes; the female has not been included in the original description.

Heliophanus imerinensis SIMON, 1901b

(figs. 412–419, 925)

Material. Madagascar: Imerina, leg. B. CAMBOUÉ – 2 ♂♂ (larger – lectotype, another – paralectotype, MNHN 20 239), 2 ♂♂ (MNHN 22 242).

Male. Cephalothorax dark brown or black, a few brown setae in vicinity of anterior eyes. Abdomen black dorsally, dark ventrally. Sternum brown. Legs brown, with slightly lighter metatarsi and tarsi. Pedipalp brown, femoral apophysis slightly curved (figs. 415 and 419), tibial apophysis small, shallowly bifurcated (figs. 413 and 417), bulbus narrow, elongated (figs. 412 and 416). Dimensions: a 1.8, b 1.8, c 0.9, d 1.1, e 1.3.

Female. Unknown.

The species closely resembles *H. hamifer* but can be separated by the shape of tibial apophysis (cf. figs. 413, 417 and 420–426).

Heliophanus hamifer SIMON, 1885

(figs. 420–431, 918)

Heliophanus hamifer: WANLESS 1982b.

Material. Madagascar: Diego-[Suarez], leg. C. ALLUAUD – 2 ♀♀ (MNHN 18 800), det. E. SIMON – 1 ♂ (MNHN 1310); Imerina, leg. B. CAMBOUÉ – 3 ♀♀ (MNHN 20 239); Tamatave – 2 ♀♀ (MNHN 9975); Vohibe, VII.1970, leg. A. LAMBILLON – 1 ♂, 1 juv. (MRAC 142 755); Mozambique: 2 ♂♂, 1 ♀ (larger ♂ – lectotype, another ♂ – paralectotype, MNHN 7554); locality unknown: 1 ♀ (MNHN 21 211).

Male. Cephalothorax brown or black. Abdomen dark brown or black dorsally, dark ventrally. Sternum brown. Legs light brown or orange, with brown longitudinal stripes, femora I brown. Pedipalp brown, femoral apophysis small (fig. 427), tibial apophysis diagnostic (figs. 420–426). Dimensions: a 1.4–1.5, b 1.3–1.4, c 0.6–0.7, d 0.9–1.0, e 1.0–1.1.

Female. Cephalothorax dark brown. Abdomen dark brown, in some specimens with traces of two lighter marks posteriorly. Sternum dark brown. Legs brown. Epigyne with large, diagnostically shaped depression (figs. 428 and

430); internal structures as in figs. 429 and 431. Dimensions: a 1.5, b 1.7, c 0.7, d 0.9, e 1.1.

The male closely resembles *H. imerinensis* but may be distinguished by the shape of tibial apophysis (cf. figs. 420–426 and 413, 417). The female resembles *H. innominatus*, may be separated by a different shape of epigynal depression (cf. figs. 428, 430 and 432).

Identity of data on the label of examined males from Mozambique with those given by SIMON (1885) suggests that these specimens are syntypes; the female has not been included in the original description.

Heliophanus innominatus sp. n.

(figs. 432–433, 916)

Material. Madagascar: Diego-[Suarez], leg. C. ALLUAUD – 1 ♀ (holotype, MNHN 1310).

Male. Unknown.

Female. Cephalothorax dark brown, with a few long brown setae in the vicinity of eyes. Abdomen grey-brown dorsally, dark ventrally. Sternum brown. Legs light brown. Epigyne more or less round, with large shallow, diagnostically shaped depression (fig. 432). Seminal ducts straight, spermathecae oval (fig. 433). Dimensions: a 1.9, b 2.1, c 0.8, d 1.2, e 1.3.

The species resembles *H. hamifer* but may be readily separated by the shape of epigynal depression (cf. figs. 432 and 428, 430).

THE *PRATTI* GROUP

Heliophanus gladiator sp. n.

(figs. 434–441, 920)

Material. Kenya: Aberdare, Kinangop, 3900 m.a.s.l., 13.VII.1948, leg. Å. HOLM – 1 ♂, 1 juv. (ZIU 273), 3550 m.a.s.l., spiked fern, grass, 19.VII.1948, leg. Å. HOLM – 1 ♂, 1 ♀ (♂ – holotype, ♀ – allotype, ZIU 296), 2900–2950 m.a.s.l., 19.–21.II.1948, leg. Å. HOLM – 1 ♀ (ZIU 168); Mt Kenya, Teleki Valley, 4450 m.a.s.l., under stones, among fern, 27.VII.1948, leg. Å. HOLM – 1 ♀, 1 juv. (ZIU 314); Teleki Valley, Macinder Camp, 4200 m.a.s.l., 2.–3.I.1976, leg. Å. HOLM – 1 ♀ (ZIU 348); below Firimon Track, 4100 m.a.s.l., 4.VIII.1975, leg. J. VAN GOETHEM – 1 ♀ (MRAC 147 311); Malawi: Mts Viphya, Chikangawa, young *Pinus* plantation, X.1977–II.1978, leg. R. JOCQUÉ – 1 ♀ (MRAC 153 015). All adult specimens (apart from holotype and allotype) are paratypes.

Male. Body strongly rounded. Cephalothorax dark brown, eyes surrounded with black, a few long brown setae in the vicinity of anterior eyes. Abdomen almost black, with a few white hairs on anterior margin; dark ventrally. Sternum brown. Legs light brown. Whole body clothed with short, dense, brown hairs. Pedipalp brown, femoral apophysis diagnostic, with broad base, shallowly bifurcated (fig. 437), two tibial apophyses (figs. 434–436), bulbus rounded, very much convex (figs. 434–435). Dimensions: a 1.7, b 1.9, c 0.7, d 0.9, e 1.0.

Female. Body strongly rounded. Cephalothorax dark brown, eye field black, in some specimens thoracic part with narrow central band of white hairs. Abdomen dark brown dorsally, dark, with two lighter longitudinal bands, ventrally. Sternum dark brown. Legs yellow or orange. Whole body clothed with dense dark hairs. Epigyne oval, heavily sclerotized, with two lateral depressions

(figs. 438–439); internal structures as in figs. 440–441 (ventral and dorsal views). Dimensions: a 1.9–2.0, b 2.2–2.8, c 0.8–0.9, d 1.0–1.1, e 1.1–1.2.

The male resembles *H. pratti* but may be distinguished by the different shape of bulbus and femoral apophysis (cf. figs. 434, 437 and 442, 445–446). The female is distinctive, readily distinguished from other species of the genus *Heliophanus* by the form of epigyne (figs. 438–439).

Heliophanus pratti PECKHAM et PECKHAM, 1903

(figs. 442–446, 916)

Heliophanus Prattii PECKHAM et PECKHAM, 1903.

Material. South Africa: Willowmore, leg. BRAUNS – 1 ♂ (holotype, MCZ 233); Cape Peninsula, Signal Hill, leg. W. PURCELL – 1 ♂ (MCZ 266), Signal Hill + Princess Vlay, 1896–1899, leg. W. PURCELL – 2 ♂♂ (SAM 427), Devil's Peak, below forest, IX.1903, leg. R. LIGHTFOOT – 1 ♂ (SAM 428), Bergvillet Flats, Constantia area, X.1902, leg. W. PURCELL – 1 ♂ (SAM 426).

Male. Body strongly rounded. Cephalothorax almost black. Abdomen dark brown dorsally, dark ventrally. Sternum dark brown. Legs I brown, remaining legs yellow or brown. Pedipalp dark brown, femoral apophysis short, shallowly bifurcated, bluntly ended (fig. 445), two tibial apophyses (figs. 442–443 and 446), bulbus rounded (figs. 442 and 446), outer margin of cymbium fringed with scarce white scales. Dimensions: a 1.7–1.9, b 1.2–1.7, c 0.6–0.7, d 0.9–1.0, e 0.9–1.1.

Female. Unknown.

The species is closely related to *H. gladiator* but may be separated by the larger embolus and shape of bulbus and femoral apophysis (cf. figs. 442, 445–446 and 434, 437).

THE *APIATUS* GROUP

Heliophanus apiatus SIMON, 1868

(figs. 447–455, 897)

Heliophanus apiatus: KRAUS 1955, CANTARELLA 1974.

Material. Italy, Sardinia: leg. K. HARMS – 2 ♂♂ (CJW), coast near Ozieri, 230 m.a.s.l., 21.IV.1954, leg. KAHMAN, det. O. KRAUS – 1 ♂, 1 ♀ (SMF 9328/2); Sicily – 3 ♂♂, 8 ♀♀ (larger ♂ – lectotype, another – paralectotypes, MNHN 880); Spain: Catalonia, leg. K. HARMS – 2 ♂♂, 1 juv. (CJW), Ulldecona, 5.VIII.1975, leg. J. BARRIENTOS – 1 ♂ (CRB 2077).

Male. Cephalothorax dark brown or black with a metallic sheen, a few long brown setae in vicinity of anterior eyes, thoracic part clothed with single white hairs, which, in some specimens, form small marks posteriorly to posterior eyes. Abdomen dark brown or black, with white narrow band at anterior margin and two pairs of marks composed of white scales; dark ventrally. Sternum black. Legs dark brown, in some specimens white scales at bases of segments. Pedipalp black, single pointed femoral apophysis (fig. 450), horizontal tibial apophysis slender, long, heavily sclerotized (figs. 447–448 and 451–452), external margin of cymbium fringed with white scales. Dimensions: a 1.7–1.8, b 1.7–2.0, c 0.7–0.9, d 1.0–1.1, e 1.1–1.2.

Female. Coloration like in male, white abdominal marks slightly smaller,

legs yellow. Epigyne with single large depression (fig. 453); internal structures as in figs. 454–455 (an arrangement of internal structures shown in fig. 454 results from too strong pressing of epigyne by cover glass). Dimensions: a 2.0, b 2.4, c 1.0, d 1.1, e 1.2.

The species resembles *H. encifer* and *H. creticus*, best distinguished by the size and shape of tibial apophyses (cf. figs. 447–449, 451–452 and 456–458, 460 and 467–469) and the slightly different shape of epigynal depression (cf. figs. 453 and 462, 465 and 472, 474).

Heliophanus encifer SIMON, 1871

(figs. 456–466, 900)

Salticus facetus O. P.-CAMBRIDGE, 1872, **syn. n.**,
Heliophanus mordax: KULCZYŃSKI 1911 (part.: ♀), nec O. P.-CAMBRIDGE, 1872,
Heliophanus ensifer [sic!]: BONNET 1957.

Material. Cyprus: leg. H. MALICKY – 1 ♂ (CJW); France, Corsica: 3 ♂♂ (larger ♂ – lectotype, another – paralectotypes, MNHN 851); Palestine: 6 ♂♂, 4 ♀♀ (syntypes of *S. facetus*, HDZ 1786 t. 2. 10, 56), leg. E. SCHMITZ, det. W. KULCZYŃSKI – 1 ♀ (IZ PAN), Hebron, leg. B. CAMBOUÉ, det. E. SIMON – 1 ♂ (MNHN 1397); Syria: 3 ♀♀ (MNHN 881).

Male. Cephalothorax dark brown or black with a metallic sheen, anterior eyes fringed with long brown setae, thoracic part clothed with single white hairs. Abdomen dark brown or black, clothed with dark shiny hairs, with narrow white band at anterior margin and two pairs of spots composed of white scales; in some specimens only one pair of spots or spots absent. Sternum brown. Legs brown, with yellow metatarsi and tarsi or only femora brown. Pedipalp dark, femoral apophysis pointed (figs. 459 and 461), horizontal tibial apophysis very slender (figs. 456–458 and 460), embolus very short, curved (figs. 456 and 460), external margin of cymbium fringed with white scales. Dimensions: a 1.6–1.7, b 1.6–1.9, c 0.8–0.9, d 1.0–1.1, e 1.1–1.2.

Female. Coloration like in male. Legs yellow. Epigyne oval, with deep depression (figs. 462 and 465), sometimes partially plugged with waxy secretion; internal structures heavily sclerotized (figs. 463–464 and 466). Dimensions: a 2.0–2.1, b 2.8–3.5, c 0.8, d 1.1–1.3, e 1.2–1.4.

The species is closely related to *H. apiatus* and *H. creticus*, but may be distinguished by the size and shape of tibial apophysis (cf. figs. 456–458, 460 and 447–449, 451–452 and 467–469) and the shape of epigynal depression (cf. figs. 462, 465 and 453 and 472, 474).

Heliophanus creticus GILTAY, 1932

(figs. 467–475, 896)

Material. Greece, Crete: 2 ♂♂, 4 ♀♀ (CJW); in front of the Omalos plain, 1000–1150 m.a.s.l., 22.IV.1931 leg. A. D'ORCHYMONT – 2 ♂♂ (holotype and paratype, IRSN).

Male. Cephalothorax dark brown or black with a metallic sheen, anterior eyes fringed with long brown setae. Abdomen dark brown or black, clothed with dark shiny hairs; dark ventrally. Sternum black. Legs brown or black with yellow metatarsi and tarsi. Pedipalp black, femoral apophysis with additional tooth (figs. 470–471), horizontal tibial apophysis slender and very long (figs. 467–469). Dimensions: a 1.4–1.5, b 1.4, c 0.6, d 0.9, e 1.0.

Female. Coloration as in male. In some specimens abdomen dorsally with two pairs of very indistinct white marks composed of scales. Legs yellow. Epigyne with large depression (figs. 472 and 474), sometimes plugged with waxy secretion; internal structures as in figs. 475. Dimensions: a 1.6–1.8, b 1.9–2.3, c 0.8, d 1.0–1.1, e 1.1–1.2.

An arrangement of internal structures shown in fig. 473 results from too strong pressing of epigyne by cover glass.

The species resembles *H. apiatus* and *H. encifer* but may be distinguished by the size and shape of tibial apophysis (cf. figs. 467–469 and 447–449, 451–452 and 456–458, 460) and the slightly different shape of epigynal depression (cf. figs. 472, 474 and 453 and 462, 465).

Heliophanus mordax (O. P.-CAMBRIDGE, 1872)

(figs. 476–486, 895)

Salticus mordax O. P.-CAMBRIDGE, 1872,
Salticus dentatidens O. P.-CAMBRIDGE, 1872, **syn. n.**,
Heliophanus mordax: KULCZYNSKI 1911 (part.: ♂).

Material. Afghanistan: Herat Province, Bala Murghab, 470 m.a.s.l., 20.III.–3.VII.1964, leg. O. JAKEŠ – 1 ♂ (MM 51); Palestine: leg. E. SCHMITZ, det. W. KULCZYŃSKI – 4 ♂♂, 1 juv. (IZ PAN); 1 ♂ (holotype, HDZ 1786 t. 17); 4 ♂♂ (syntypes of *S. dentatidens*, HDZ 1786 t. 25, 55, 72, 75); Syria: Damas[cus] – 1 ♂ (MNHN 23 772); Turkey: Amasya – 1 ♂ (MNHN 12 869); locality unknown: 1 ♂ (MNHN 9863).

Male. Cephalothorax brown, eye field black, or at least eyes surrounded with black. Abdomen dark brown, in some specimens with narrow white band at anterior margin and two pairs of marks composed of white scales; dark ventrally. Sternum brown. Legs dark yellow, brown or black. Pedipalp dark, femoral apophysis shallowly bifurcated distally (figs. 479 and 486), dorsal tibial apophysis reaches to cymbium (figs. 478, 482 and 485). Dimensions: a 1.6–2.0, b 1.8–2.2, c 0.7–0.9, d 0.9–1.1, e 1.0–1.2.

Female. Unknown.

H. mordax is a distinctive species readily distinguished from all other species of the genus *Heliophanus* by the structure of pedipalp (fig. 476–486).

THE *STYLIFER* GROUP

Heliophanus conspicuus sp. n.

(figs. 487–491, 901)

Material. Algeria: Ain Sefra, leg. VIBERT – 1 ♂ (holotype, MNHN 23 636); Mecheria – 2 ♂♂ (paratypes, MNHN 6297).

Male. Cephalothorax dark brown, eye field black with a metallic sheen, anterior eyes fringed with long brown setae. Abdomen dark brown dorsally, dark ventrally. Sternum brown. Legs orange or brown. Whole body clothed with short, dark, shiny hairs, a few white hairs at anterior margin of abdomen. Pedipalp dark,

femoral apophysis diagnostic, very broad, shallowly tripartite distally (figs. 490–491). Dimensions: a 1.6, b 1.5, c 0.7, d 1.0, e 1.1.

Female. Unknown.

The species is distinctive, readily separated from other species of the genus *Heliophanus* by the shape of femoral apophysis (figs. 490–491).

Heliophanus tribulosus SIMON, 1868

(figs. 492–502, 898)

Heliophanus Cambridgii SIMON, 1868,
Heliophanus Cambridgei: SIMON 1871,
Heliophanus cambridgei: DAHL 1926,
Heliophanus pubescens DENIS, 1964,
Heliophanus tribulosus: HARM 1971, CANTARELLA 1974, PRÓSZYŃSKI 1976, FLANCZEWSKA 1981.

Material. France: Paris (?), det. E. SIMON – 1 ♂, 1 ♀ (NR 1650c); Erinité, det. E. SIMON – 1 ♂, 1 ♀ (MNHN 477); Bayonne, leg. C. MARTIN – 1 ♂ (MNHN 14 459); Vendée, forest de Saint Nicolas du Paye, 8.VI.1964, leg. J. DENIS – 1 ♂, 1 ♀ (syntypes of *H. pubescens*, MNHN); Corsica: Moviani – 1 ♀ (CJW); Greece: Volos – 1 ♀ (MNHN 13 799); Crete, leg. H. MALICKY – 1 ♀ (CJW); Italy: Altamira – 2 ♂♂, 1 ♀ (CJW); Spain: Santander Province – 1 ♂ (MNHN 13 477); Pozuelo de Calatrava – 2 ♂♂ (MNHN 19 866); Monsagro – 3 ♀♀, 1 juv. (MNHN 6040); Syria: 1 ♂ (MNHN 1399); Turkey: Magnesia [Manisa], leg. F. WERNER – 1 ♂ (NHMW); locality unknown: 1918, leg. B. CAMBOUÉ, det. E. SIMON – 1 ♂ (MNHN 24 807), 1905, leg. C. MARTIN – 3 ♀♀, 1 juv. (MNHN 22 645).

Male. Cephalothorax brown or black, eye field black with a metallic sheen. Abdomen dark brown with narrow white band at anterior margin and one or two pairs of white dorsal marks composed of scales; ventrally light brown with two light marks near base of spinnerets. Sternum light brown or yellow. Legs light brown or yellow, in some specimens with dark longitudinal stripes. Whole body clothed with short, dense, yellowish-brown hairs. Pedipalp light brown, diagnostic tripartite femoral apophysis (figs. 495–497). Dimensions: a 1.6–1.8, b 1.5–2.1, c 0.7–0.9, d 0.9–1.2, e 1.0–1.3.

Female. Coloration like in male, in some specimens abdomen uniformly brown. Epigyne with one large central depression (figs. 498 and 501); internal structures as in figs. 499–500 and 502. Dimensions: a 1.8–1.9, b 2.6–2.9, c 0.7–0.9, d 1.1–1.2, e 1.2–1.3.

The male is distinctive, readily distinguished from other species of the genus *Heliophanus* by the shape of femoral apophysis (figs. 495–497). The female difficult to separate from other species with one large epigynal depression (*H. flavipes*, *H. cupreus*, *H. turanicus*, *H. lineiventris*, *H. kochi*, *H. rufithorax*) but internal structure of genitalia is different in all the above species.

Heliophanus ramosus sp. n.

(figs. 503–506, 900)

Material. Algeria: Nemours – 1 ♂ (paratype, MNHN 11 948); Spain: "Catalogne" – 1 ♂ (holotype, MNHN 13 377); Murcia Province, leg. K. HARMS – 1 ♂ (paratype, CJW); locality unknown: 1 ♂ (paratype, MNHN 19 841).

Male. Cephalothorax rounded, dark brown, eye field black, or at least eyes surrounded with black, a few long brown setae in vicinity of anterior eyes, in some specimens cephalothorax clothed with single white scales. Abdomen dark brown, clothed with scarce dark shiny hairs; ventrally dark. Sternum brown. Legs brown, in some specimens bases of segments with small marks composed of white scales. Pedipalp dark, femoral apophysis bilobate (fig. 506), horizontal tibial apophysis long and slender (figs. 503–506). Dimensions: a 1.6, b 1.6, c 0.7, d 0.9, e 1.1.

Female. Unknown.

The species clearly shows affinities with *H. stylifer* but is easily distinguished by the shape of femoral apophysis (cf. figs. 506 and 510).

Heliophanus stylifer SIMON, 1878

(figs. 507–513, 895)

Heliophanus keyserlingi SIMON, 1878, **syn. n.**,
Heliophanus stylifer: DENIS 1937.

Material. Algeria: Biskra Oasis, leg. E. KEYSERLING – 1 ♂ (holotype, BMNH 8.1.452, 1891/343); leg. E. KEYSERLING – 1 ♂ (holotype of *H. keyserlingi*, BMNH 8.1.451, 1891/342); Constantine, det. E. SIMON – 2 ♂♂, 1 ♀ (MNHN 879); det. E. SIMON – 1 ♂ (MNHN 2387); Morocco: Douar Kef el [Bya] – 1 ♂ (MNHN 11 807); [Djebel] Dough – 1 ♂, 1 ♀ (MNHN 13 890); locality unknown: 1905 – 2 ♂♂ (MNHN 22 645).

Male. Cephalothorax dark brown, eye field black with a metallic sheen, or at least eyes surrounded with black. Abdomen dark brown dorsally, dark ventrally. Cephalothorax and abdomen clothed with short, dark, shiny hairs, in some specimens abdomen with single white hairs additionally. Sternum dark brown. Legs brown. Pedipalp almost black, femoral apophysis deeply bifurcated (fig. 510), horizontal tibial apophysis slender and long (figs. 507–509). Dimensions: a 1.4–1.8, b 1.4–1.8, c 0.6–0.8, d 1.0–1.1, e 1.1–1.2.

Female. Coloration as in male. Epigyne with shallow depression (fig. 511). Seminal ducts more or less straight, spermathecae coiled (figs. 512–513). Dimensions: a 2.0, b 2.1, c 0.9, d 1.1, e 1.2.

The male separated from *H. ramosus* by the shape of femoral apophysis (cf. figs. 510 and 506). The female is difficult to separate from other species with one epigynal depression but internal structures of genitalia are distinctive (figs. 512–513).

THE *USSURICUS* GROUP

Heliophanus ussuricus KULCZYŃSKI, 1895a

(figs. 515–522, 890)

Heliophanus ussuricus: PRÓSZYŃSKI 1979, 1982, WESOŁOWSKA 1981b.

Material. North Korea, Phjŏngan-namdo Province: Thesŏng, 26.V.1965, leg. M. MROCZKOWSKI et A. RIEDEL – 1 ♂, 12 ♀♀, 7 juv. (IZ PAN), Džamo-ri, grassy pebbly valley, 27.V.1965, leg. M. MROCZKOWSKI et A. RIEDEL – 3 ♀♀ (IZ PAN).

Male. Cephalothorax dark brown, eye field black with a metallic sheen. Abdomen dark brown, with very narrow white band at anterior margin and one pair of white small marks in the middle of its length, some specimens with second pair of marks at posterior margin; dark ventrally. Whole body clothed with very short, dark, shiny hairs. Sternum dark brown. Legs yellow, femora I with

longitudinal brown stripes. Pedipalp black, femoral apophysis slightly shifted dorsally, femur ventrally with additional protuberance (figs. 517–518), a few white scales at external margin of cymbium. Dimensions: a 1.4, b 1.6, c 0.6, d 0.9, e 1.0.

Female. Coloration as in male. Legs and pedipalps yellow. Epigyne with single deep depression (figs. 519 and 521); internal structures as in figs. 520 and 522. Dimensions: 1.6, b 2.0, c 0.6, d 0.9, e 1.0.

The species clearly shows affinities with *H. dampfi*. The male unidentifiable (cf. figs. 515–518 and 523–528). The female distinguished by the shape of epigynal depression (posterior margin of the depression distinctly marked – cf. figs. 519, 521 and 529, 532).

Heliophanus dampfi SCHENKEL, 1923

(figs. 523–533, 904)

Heliophanus mariae DAHL, 1926,
Heliophanus dampfi: PALMGREN 1943, TULLGREN 1944, KEKENBOSCH 1961, HARM 1971, MILLER 1971, PRÓSZYŃSKI 1976, 1979.

Material. Belgium: Hautes Fagnes, Baraque Michel, 7.VI.1963, leg. et det. J. KEKENBOSCH – 1 ♀ (IRSN); Hertogenwald, environs of Neu Hattlich, 30.V.1937, leg. A. COLLART, det. J. KEKENBOSCH – 1 ♂ (IRSN); East Germany: "Hochmoor", 1969, det. M. MORITZ – 2 ♀♀ (MNHU 11 469); Erzgebirge, 900 m.a.s.l., VI.–X.1940, leg. BÜTNER, det. E. SCHENKEL – 3 ♂♂, 3 ♀♀ (NMB 2177d); Mecklenburg, Göldenitzer Moor, leg. RABELER – 1 ♂, 1 ♀ (NMB 2177c); Poland: Śnieżnik Kłodzki ("Glatzer Schneeberg"), 2.VI.1903 – 2 ♀♀ (syntypes of *H. mariae*, MNHU 17 600); Soviet Union, Kaliningrad District: "Augstumalmoor", 11.VI.1905 – 1 ♂, 1 ♀ (MNHU 17 596), "Zehlaubruch Ost", leg. A. DAMPF – 2 ♂♂, 2 ♀♀ ("cotype", NMB 2177a), "Kniebis Moor", leg. A. SKWARRA – 3 ♂♂, 4 ♀♀ (NMB 2177b).

Male. Cephalothorax dark brown or black with a metallic sheen. Abdomen black, in some specimens with narrow white band composed of scales at anterior margin; dark ventrally. Sternum dark brown or black. Legs yellow, in numerous specimens with dark longitudinal stripes. Whole body clothed with short, dark, shiny hairs. Pedipalp black, femoral apophysis slightly shifted dorsally, femur ventrally with additional protuberance (figs. 526–527). Dimensions: a 1.3–1.6, b 1.3, c 0.6–0.7, d 0.8, e 0.9.

Female. Coloration like in male, abdomen generally slightly lighter, brown. Legs and pedipalps yellow. Epigyne with single depression (figs. 529 and 532); internal structures as in figs. 530–531 and 533. Dimensions: a 1.5–1.6, b 2.3–2.7, c 0.6–0.7, d 0.9, e 1.0.

The species closely resembles *H. ussuricus*. The male unidentifiable (cf. figs. 523–528 and 515–518). The female separated by the shape of epigynal depression (cf. figs. 529, 532 and 519, 521).

Heliophanus camtschadalicus KULCZYŃSKI, 1885

(figs. 534–535, 890)

Heliophanus camtschadalicus: KULCZYŃSKI 1895a,
Heliophanus camschadalicus [sic!]: REIMOSER 1919.

Material. Soviet Union, Kamchatka: environs of Petropavlovsk, leg. B. DYBOWSKI – 1 ♀ (holotype, IZ PAN).

Male. Unknown.

Female. Cephalothorax brown, eye field black with a metallic sheen, a few brown setae in vicinity of anterior eyes. Abdomen brown dorsally, dark ventrally. Sternum brown. Legs and pedipalps yellow. Epigyne large with single deep central depression (fig. 534); internal structures as in fig. 535. Dimensions: a 1.6, b 1.9, c 0.6, d 0.9, e 1.1.

The species is distinctive, distinguished from other species of the *ussuricus* group by the very large epigyne and its internal structure (figs. 534–535).

Heliophanus baicalensis KULCZYŃSKI, 1895a

(figs. 536–537, 891)

Heliophanus baicalensis: PROSZYNSKI 1979.

Material. Soviet Union, East Siberia: Kultuk on the Baikal Lake – 1 ♀, 2 juv. (♀ – holotype, IZ PAN).

Male. Unknown.

Female. Cephalothorax dark brown, eye field black with a metallic sheen, a few long brown setae in vicinity of anterior eyes. Abdomen dark brown dorsally, dark ventrally. Sternum brown. Legs and pedipalps yellow. Epigyne large, more or less round, with single large depression (fig. 536) plugged with waxy secretion; internal structures as in fig. 537. Dimensions: a 1.8, b 3.6, c 0.8, d 1.1, e 1.2.

The species is distinctive, distinguished from other species of the *ussuricus* group by the form of epigyne and internal structure of genitalia (figs. 536–537).

Heliophanus curvidens (O. P.-CAMBRIDGE, 1872)

(figs. 538–548, 884)

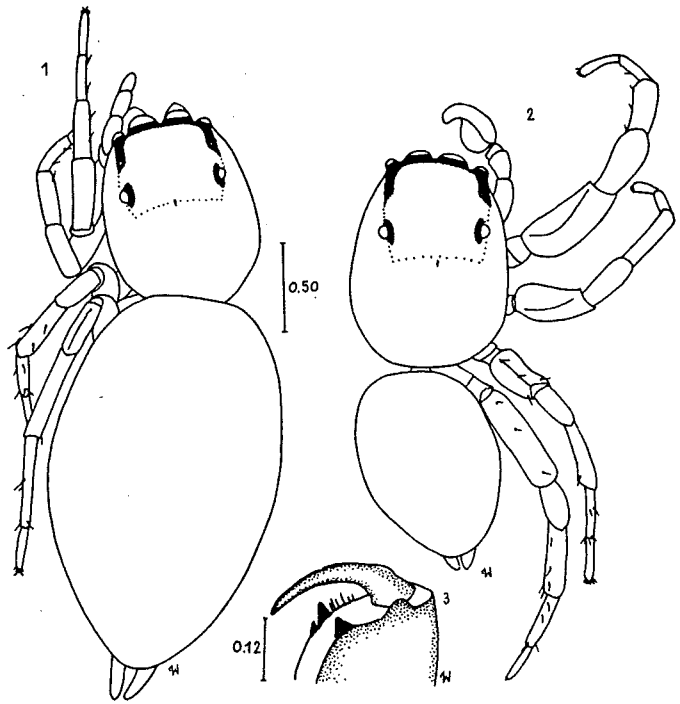
Salticus curvidens O. P.-CAMBRIDGE, 1872,
Heliophanus curvidens: CAPORIACCO 1935, PRÓSZYŃSKI 1982,
Heliophanus berlandi SCHENKEL, 1963, non LAWRENCE, 1937, **syn. n.**,
Heliophanus berlandi: PRÓSZYŃSKI and ŻOCHOWSKA 1981 (part.: ♂).

Material. China, Kansu: Chantschuan near Siningho, 22.IV.1885, leg. POTANIN – 1 ♂ (holotype of *H. berlandi*, MNHN), 1 ♂ ("cotype" of *H. berlandi*, NMB 2176a); Pakistan, Karakorum: Askole, 3100 m.a.s.l., V.1929, det. L. CAPORIACCO – 1 ♂ (MZS); Palestine – 1 ♂ (holotype, HDZ 1786 t. 20).

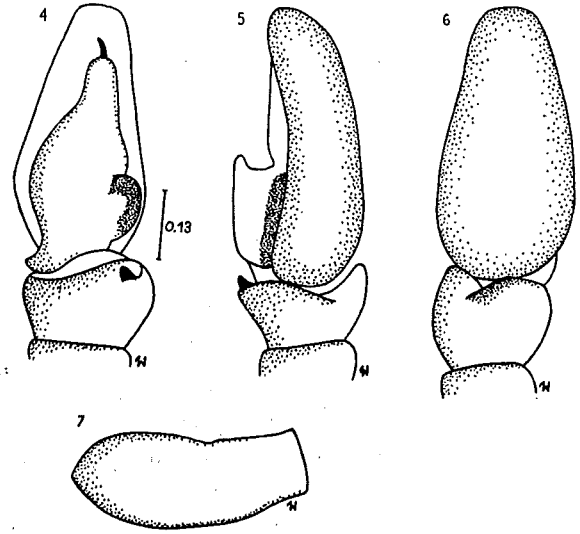
Male. Cephalothorax dark brown, eyes surrounded with black, anterior eyes fringed with long brown setae. Abdomen dark brown, with single white scales along anterior margin; dark ventrally. Sternum brown. Legs brown. Whole body clothed with short brown hairs. Pedipalp brown, femoral apophysis large, curved (figs. 541–542 and 546), embolus falciform (figs. 538 and 543). Dimensions: a 1.3–1.8, b 1.8–2.1, c 0.6–0.7, d 0.9–1.0, e 1.0–1.1.

Female (after PRÓSZYŃSKI 1982). Cephalothorax dark brown. Abdomen blackish-brown, with thin white marginal line of scales and a pair of round dots of white scales posteriorly; ventrally dark, with a pair of regular white dots near the base of spinnerets. Sternum black. Legs greyish-light-brown or blackish-brown. Pedipalps yellow. Epigyne oval, with single, rather narrow depression (fig. 547); internal structure as in fig. 548. Dimensions: a 1.7, b 2.7.

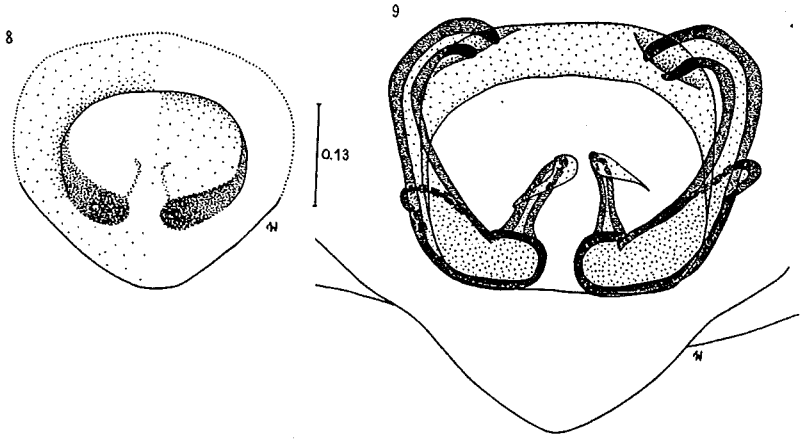
H. curvidens is a distinctive species distinguished from other species of the *ussuricus* group by the structure of pedipalp (figs. 538–546) and shape of the epigynal depression (fig. 547).



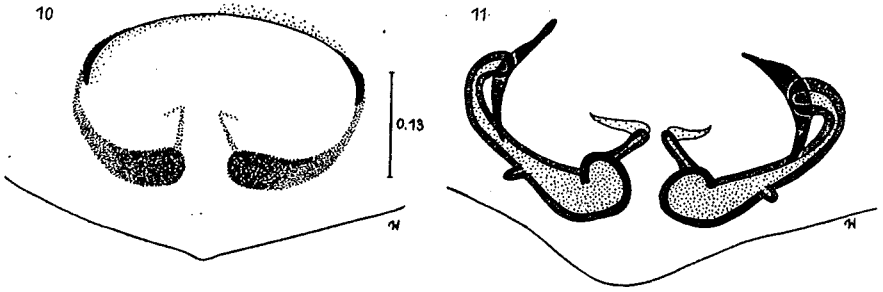
Figs. 1–3. General appearance of *Heliophanus* (*H. lineiventris* SIM.): 1–2 – female and male, dorsal view, 3 – cheliceral dentition.



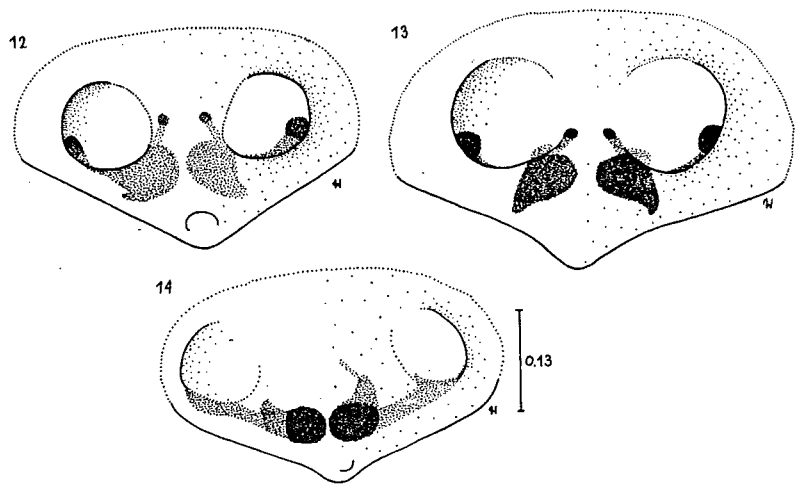
Figs. 4–7. *Heliophanus deserticola* SIM., holotype – male: 4–6 – copulatory organ, ventral, lateral and dorsal views, 7 – pedipalpal femur.



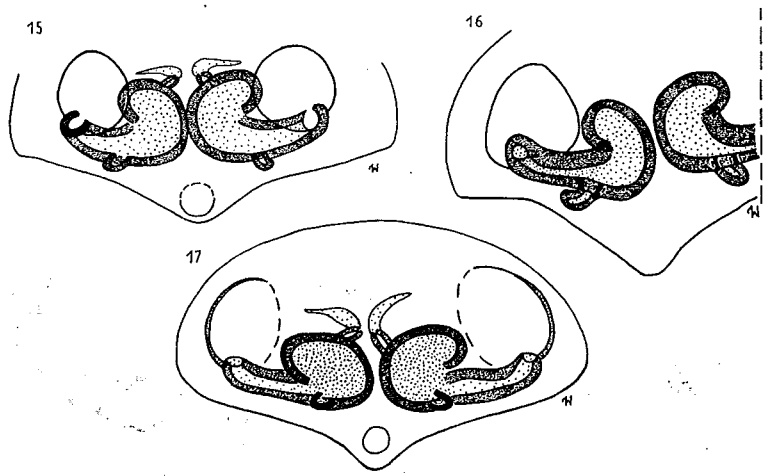
Figs. 8–9. *Heliophanus deserticola* SIM. – female. Epigyne and its internal structures.



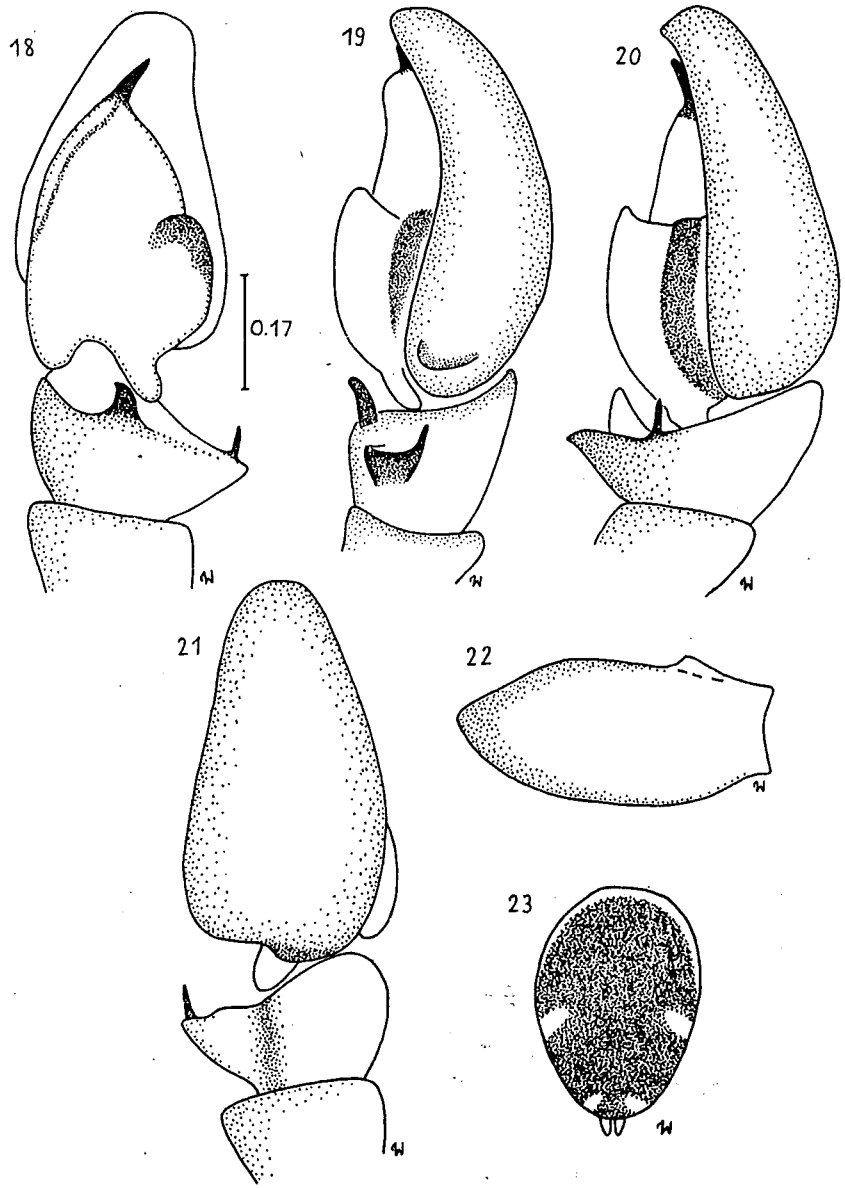
Figs. 10–11. *Heliophanus redimitus* SIM., holotype – female. Epigyne and its internal structures.



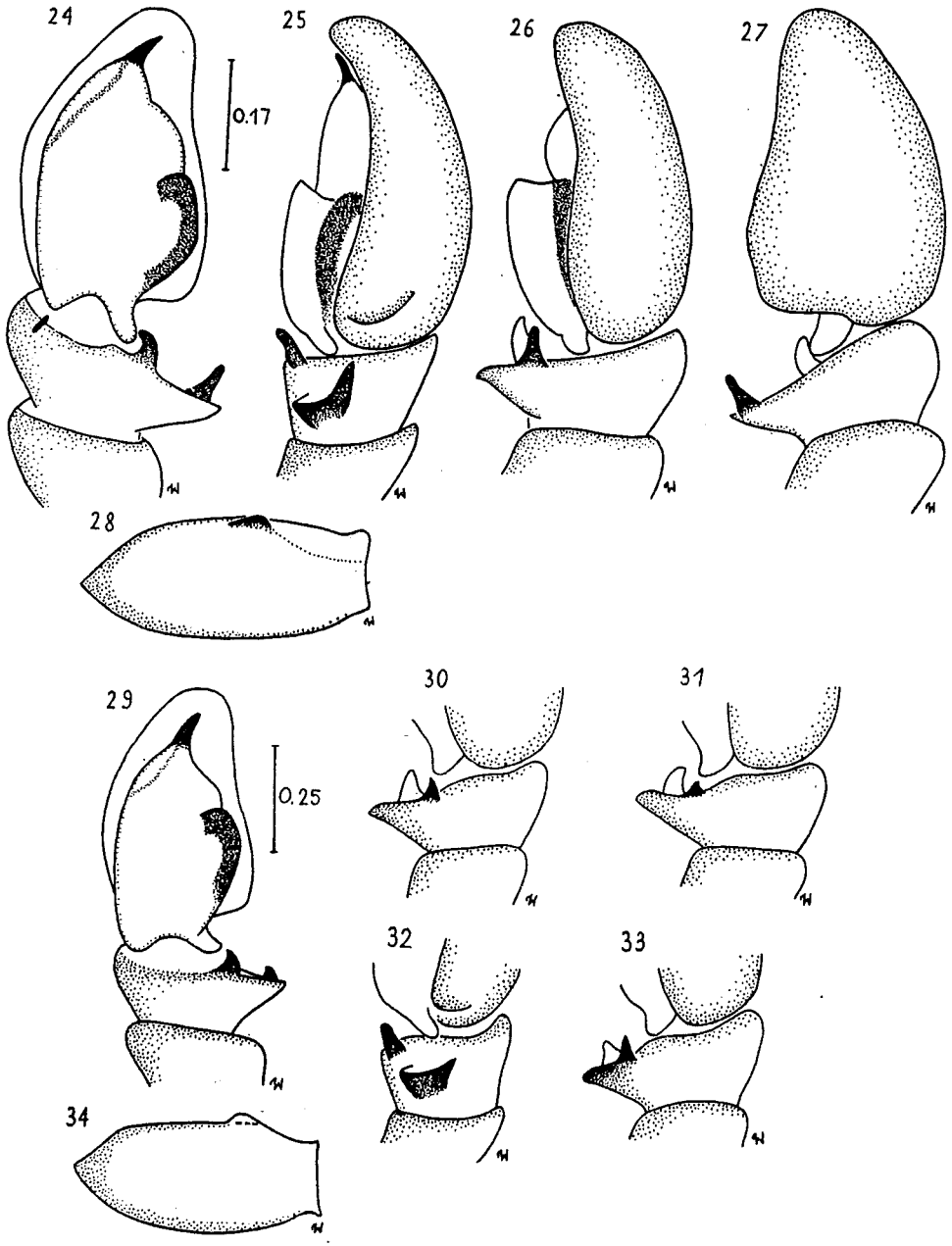
Figs. 12–14. *Heliophanus capensis* sp. n. – female. Epigyne: 12 – holotype, 13 – paratype (MNHN), 14 – paratype (MRAC 161 135).



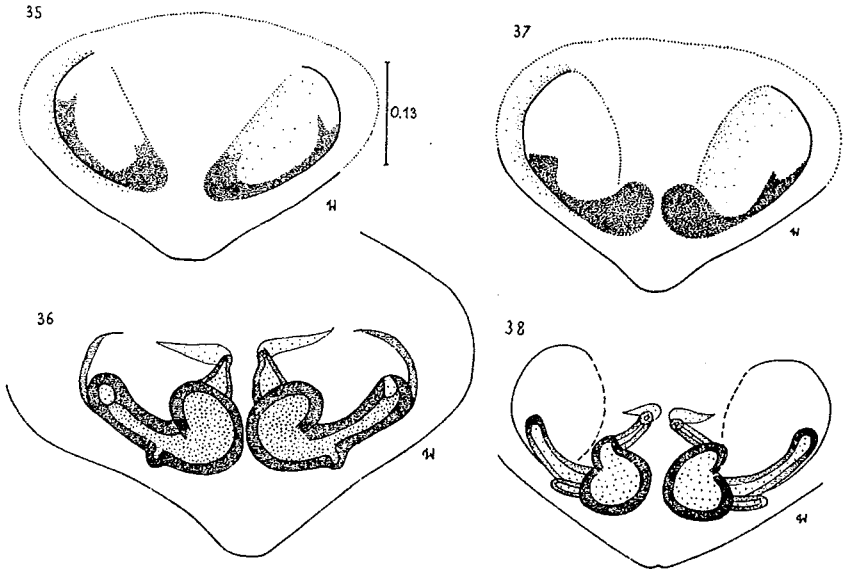
Figs. 15–17. *Heliophanus capensis* sp. n. – female. Internal structures of epigyne: 15 – holotype, 16 – paratype (partially damaged) (MNHN), 17 – paratype (MRAC 161 135).



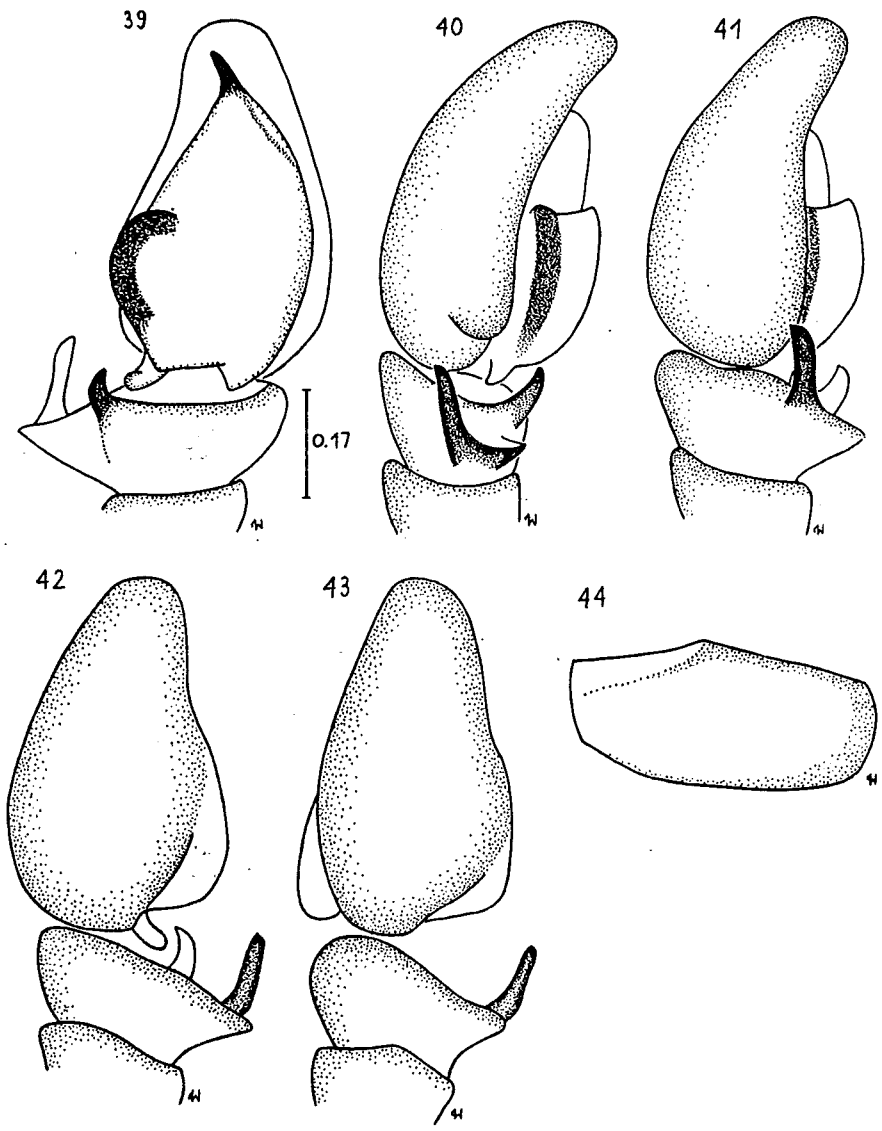
Figs. 18–23. *Heliophanus peckhami* SIM., holotype – male: 18–21 – copulatory organ, ventral, two lateral (small change of pedipalp inclination) and dorsal views, 22 – pedipalpal femur, 23 – abdominal pattern.



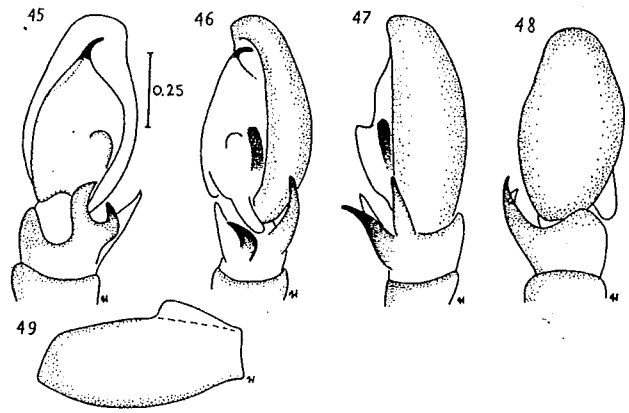
Figs. 24–34. *Heliophanus peckhami* SIM. – male. 24–28 – MRAC specimen: 24–27 – copulatory organ, ventral, two lateral (small change of pedipalp inclination) and dorsal views, 28 – pedipalpal femur. 29–34 – BMNH specimen: 29 – ventral view of copulatory organ, 30–33 – lateral view of the tibia, 34 – pedipalpal femur.



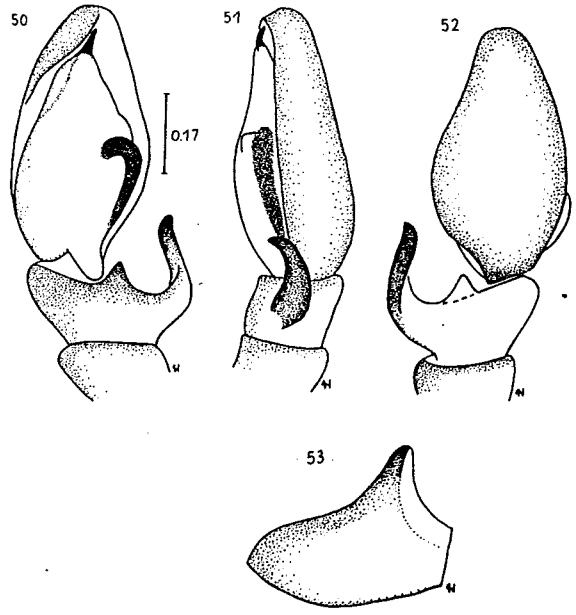
Figs. 35–38. *Heliophanus peckhami* SIM. – female. Epigyne and its internal structures: 35–36 – syntype of *Heliophanus beardii* PKH. et PKH., 37–38 – BMNH specimen.



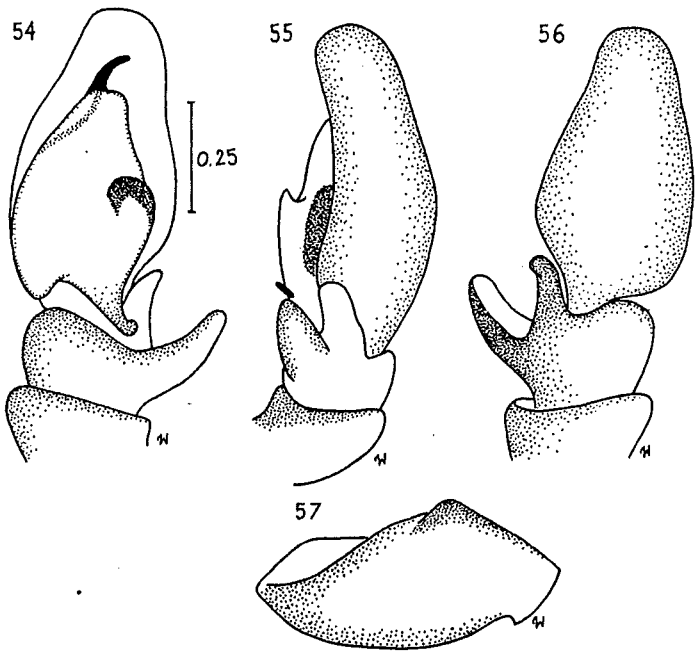
Figs. 39–44. *Heliophanus bellus* sp. n., holotype – male: 39–43 – copulatory organ, ventral, two lateral (small change of pedipalp inclination), latero-dorsal and dorsal views, 44 – pedipalpal femur.



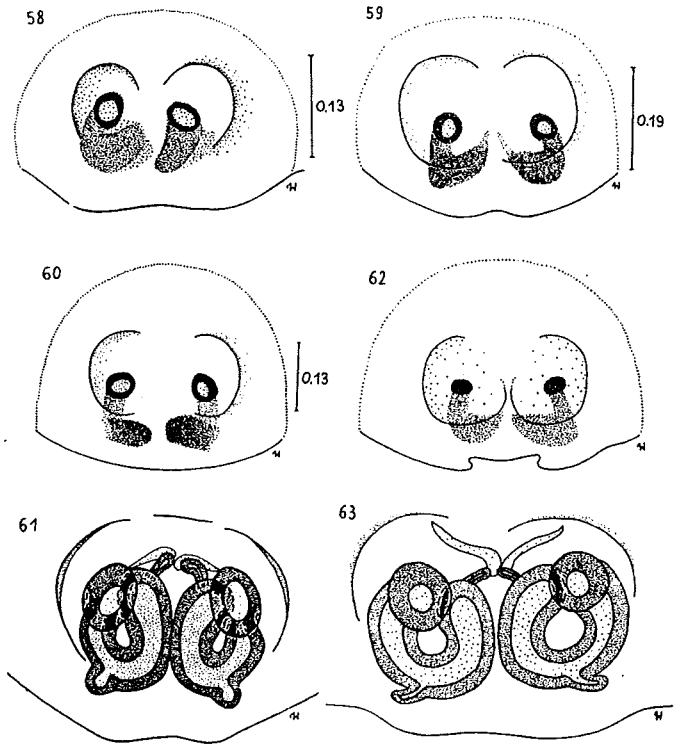
Figs. 45–49. *Heliophanus portentosus* sp. n., holotype – male: 45–48 – copulatory organ, ventral, ventro-lateral, lateral and dorsal views, 49 – pedipalpal femur.



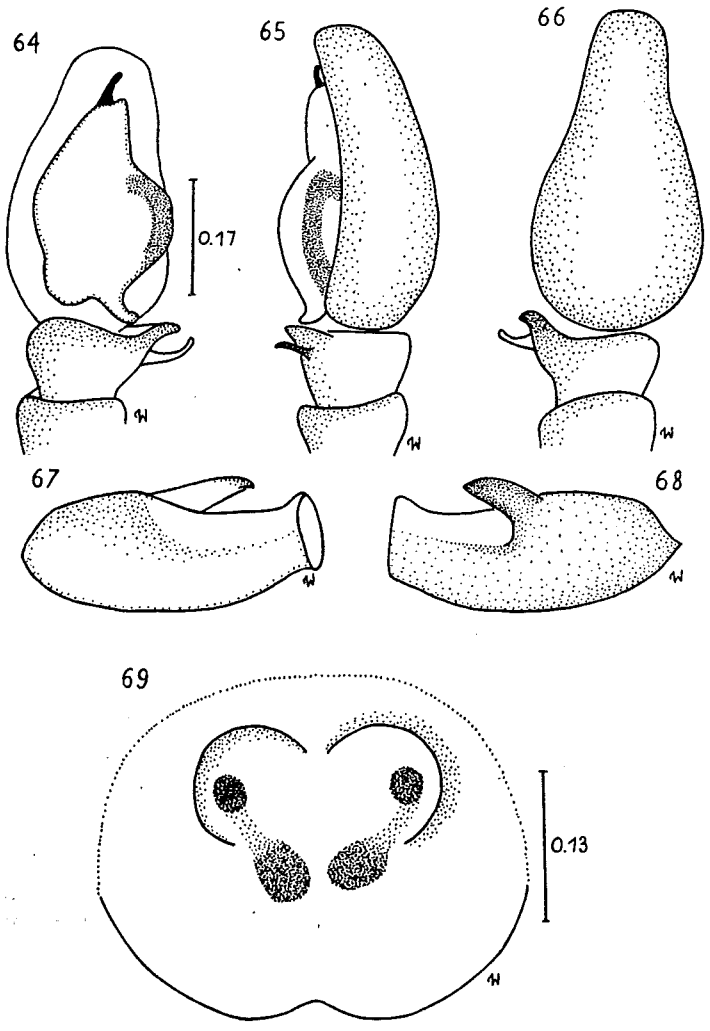
Figs. 50–53. *Heliophanus mirabilis* sp. n., holotype – male: 50–52 – copulatory organ, ventral, lateral and dorsal views, 53 – pedipalpal femur.



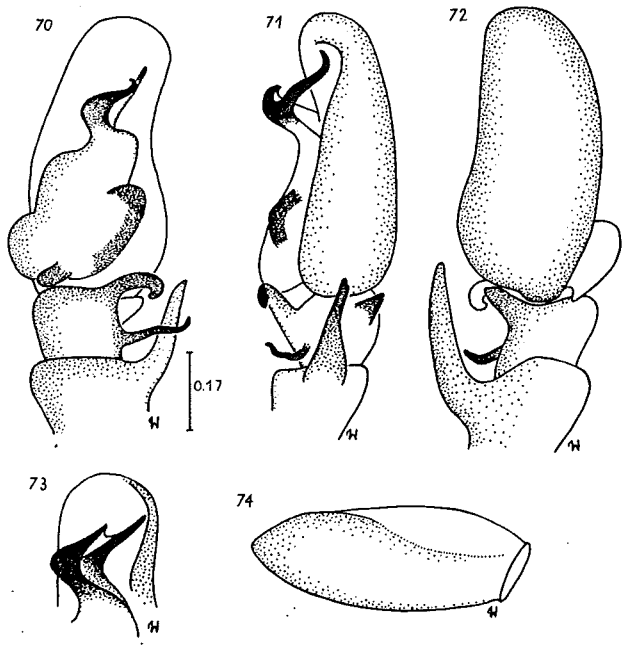
Figs. 54–57. *Heliophanus claviger* SIM., lectotype – male: 54–56 – copulatory organ, ventral, lateral and dorsal views, 57 – pedipalpal femur.



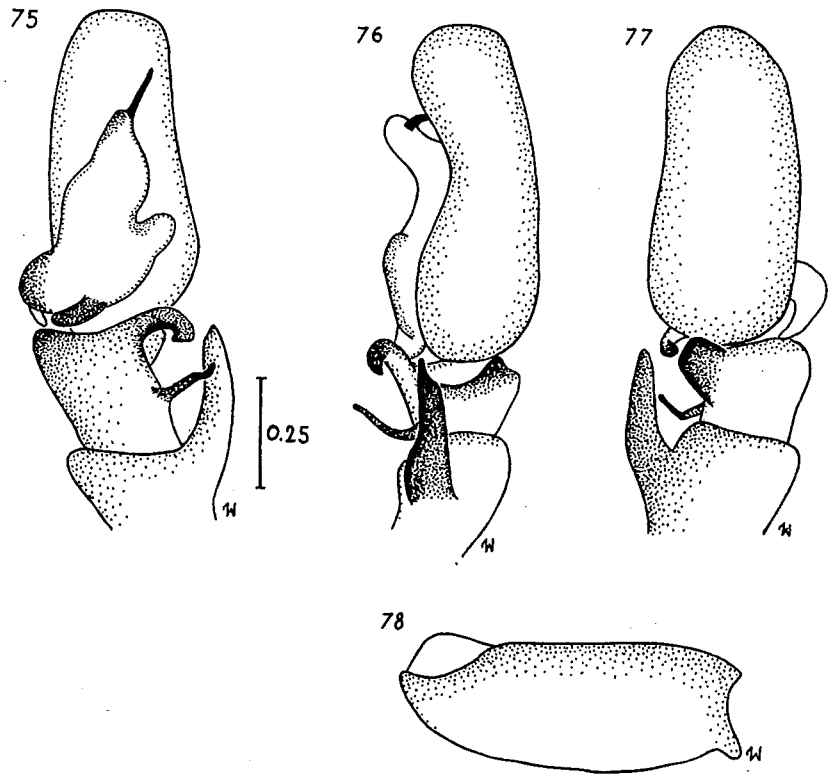
Figs. 58–63. *Heliophanus claviger* SIM. – female. Epigyne and its internal structures: 58 – paralectotype, 59 – SAM specimen, 60–61 – MNHN specimen, 62–63 – NM 7013.



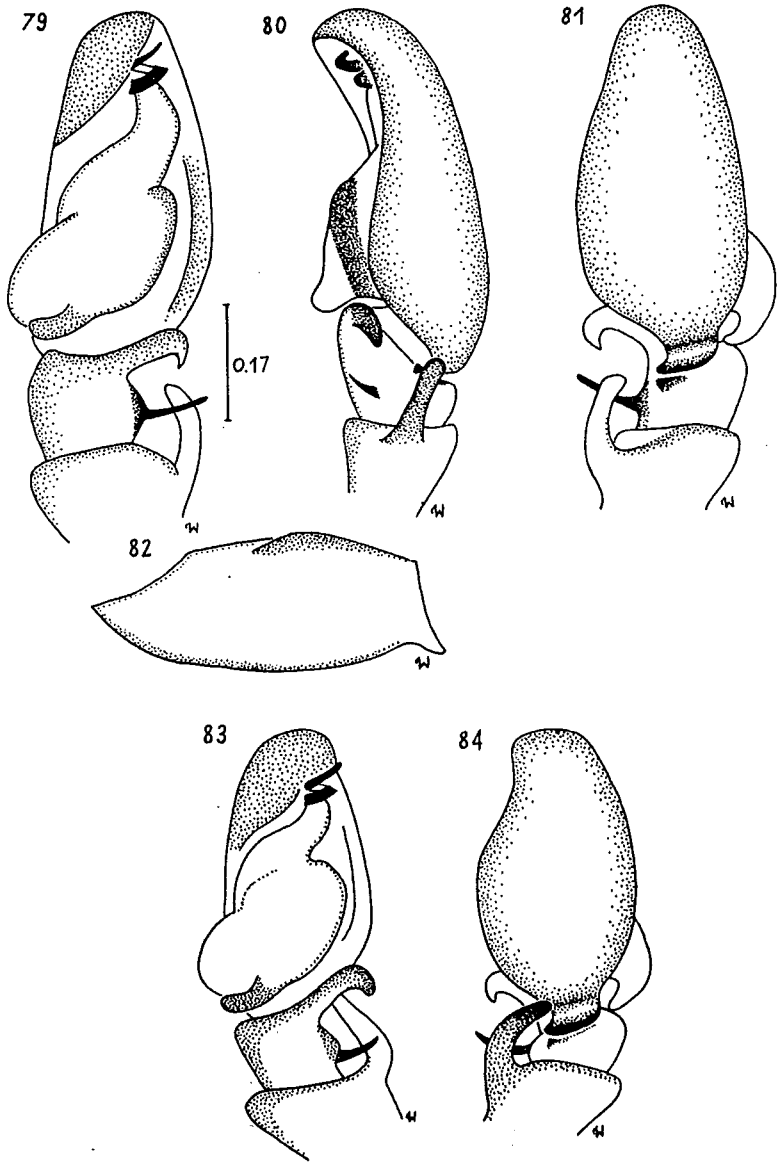
Figs. 64–69. *Heliophanus eucharis* SIM. – male (lectotype) and female (paralectotype). 64–66 – male copulatory organ, ventral, lateral and dorsal views, 67–68 – male pedipalp, femoral apophysis, lateral, inner and outer surface views, 69 – epigyne.



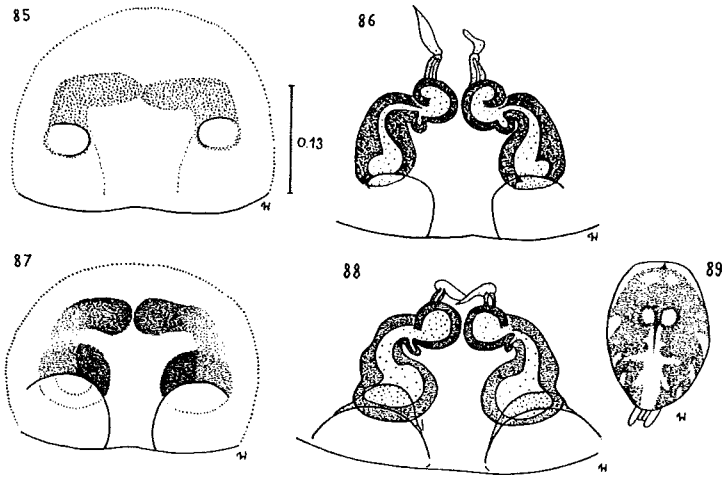
Figs. 70–74. *Heliophanus bisulcus* sp. n., holotype – male: 70–72 – copulatory organ, ventral, lateral and dorsal views, 73 – embolus, 74 – pedipalpal femur.



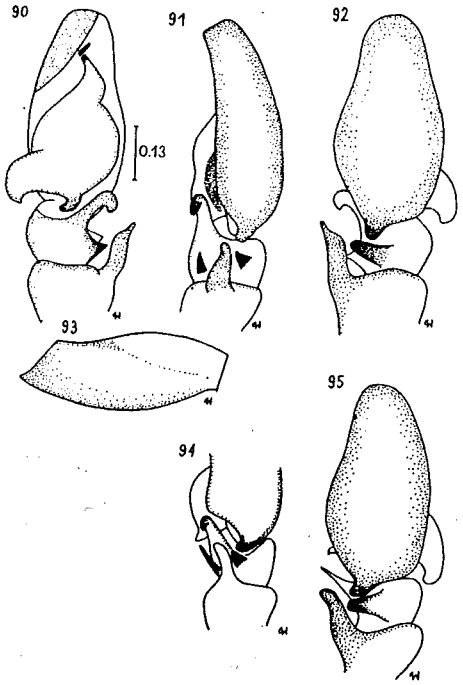
Figs. 75–78. *Heliophanus marshalli* Pkh. et Pkh., holotype – male: 75–77 – copulatory organ, ventral, lateral and dorsal views, 78 – pedipalpal femur.



Figs. 79–84. *Heliophanus gloriosus* sp. n. – male. 79–82 – holotype: 79–81 – copulatory organ, ventral, lateral and dorsal views, 82 – pedipalpal femur. 83–84 – paratype, copulatory organ, ventral and dorsal views.



Figs. 85–89. *Heliophanus gloriosus* sp. n. – female. 85–88 – epigyne and its internal structures: 85–86 – paratype, 87–88 – allotype. 89 – abdominal pattern.



Figs. 90–95. *Heliophanus insperatus* sp. n. – male. 90–93 – holotype: 90–92 – copulatory organ, ventral, lateral and dorsal views, 93 – pedipalpal femur. 94–95 – paratype from Angola: 94 – articulating apparatus, lateral view, 95 – copulatory organ, dorsal view.

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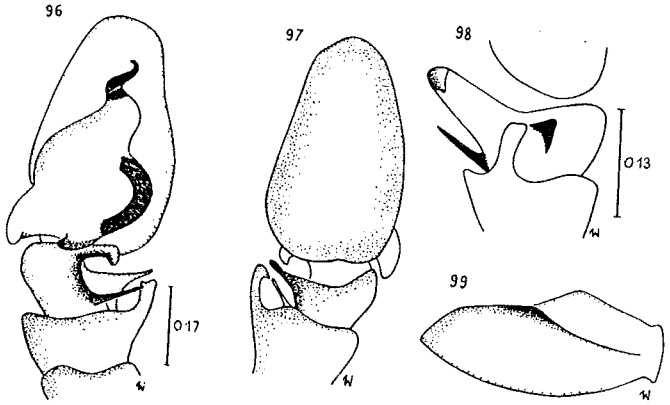
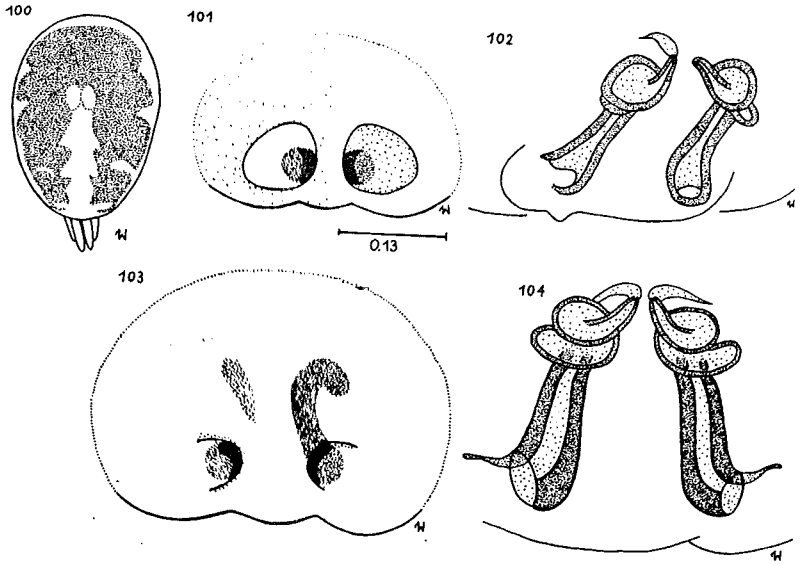
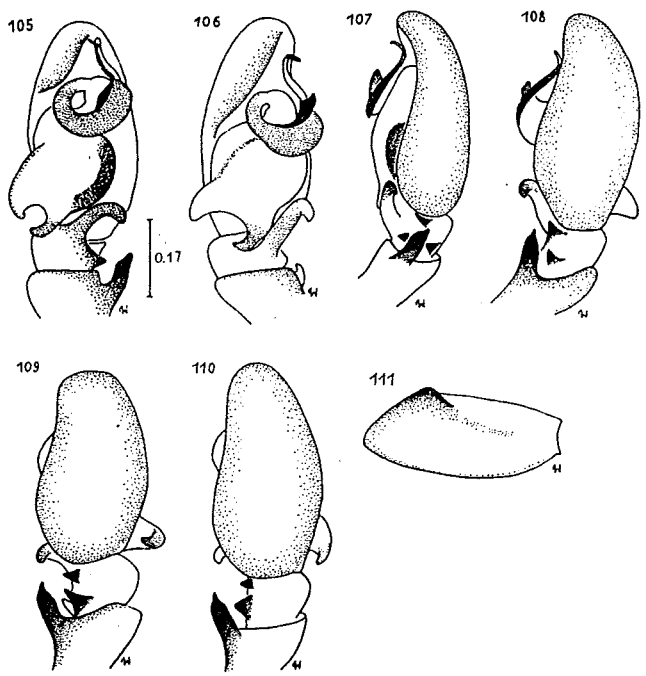


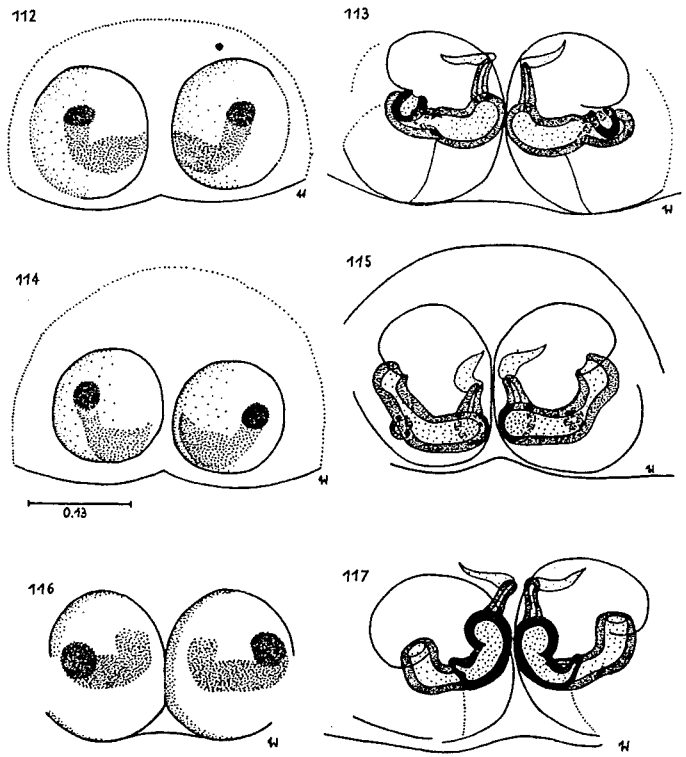
Figs. 96–99. *Heliophanus edentulus* Sim., syntype of *Salticus delectus* O. P.-Camb. – male: 96–97 – copulatory organ, ventral and dorsal views, 98 – lateral view of the tibia, 99 – pedipalpal femur.



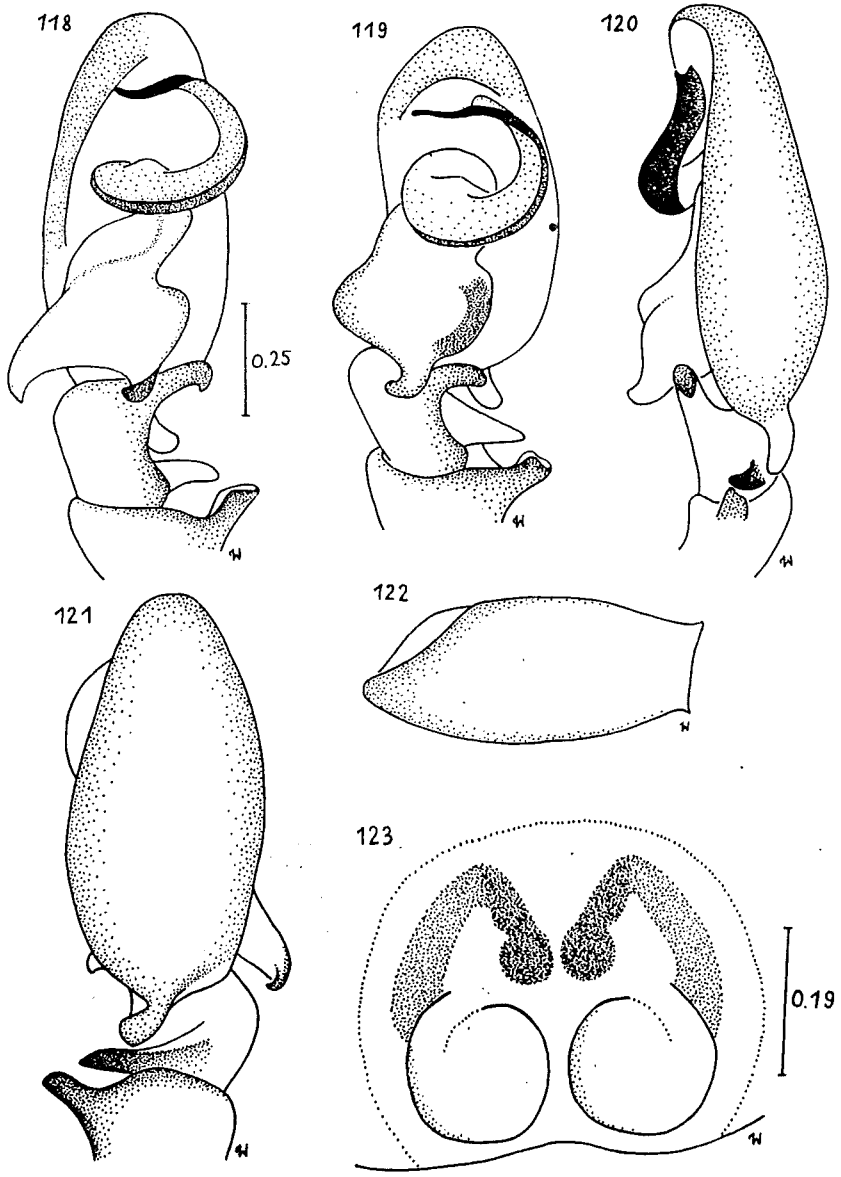
Figs. 100–104. *Heliophanus edentulus* Sim. – female. 100 – abdominal pattern, 101–104 – epigyne and its internal structures: 101 – syntype of *Salticus heliophanoides* O. P.-Camb., 102 – MNHN 881, 103–104 – syntype of *Salticus delectus* O. P.-Camb. from Egypt.



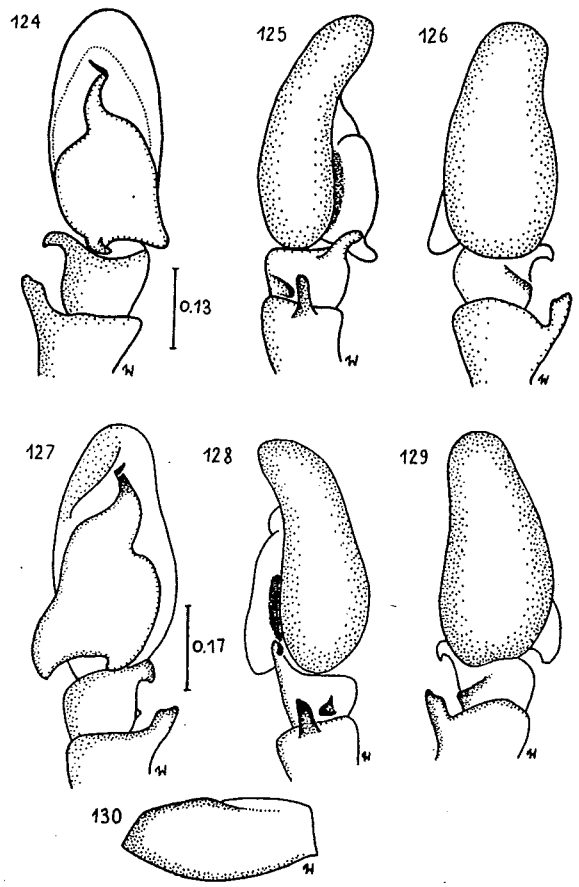
Figs. 105–111. *Heliophanus undecimmaculatus* CAP. – male, specimen from Kenya: 105–110 – copulatory organ, two ventral, two lateral and two dorsal (small change of pedipalp inclination) views. 111 – pedipalpal femur.



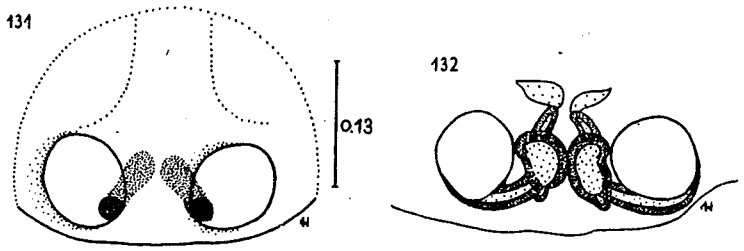
Figs. 112–117. *Heliophanus undecimmaculatus* CAP. – female. Epigyne and its internal structures: 112–113 – lectotype, 114–115 – ZIU specimen, 116–117 – BMNH specimen.



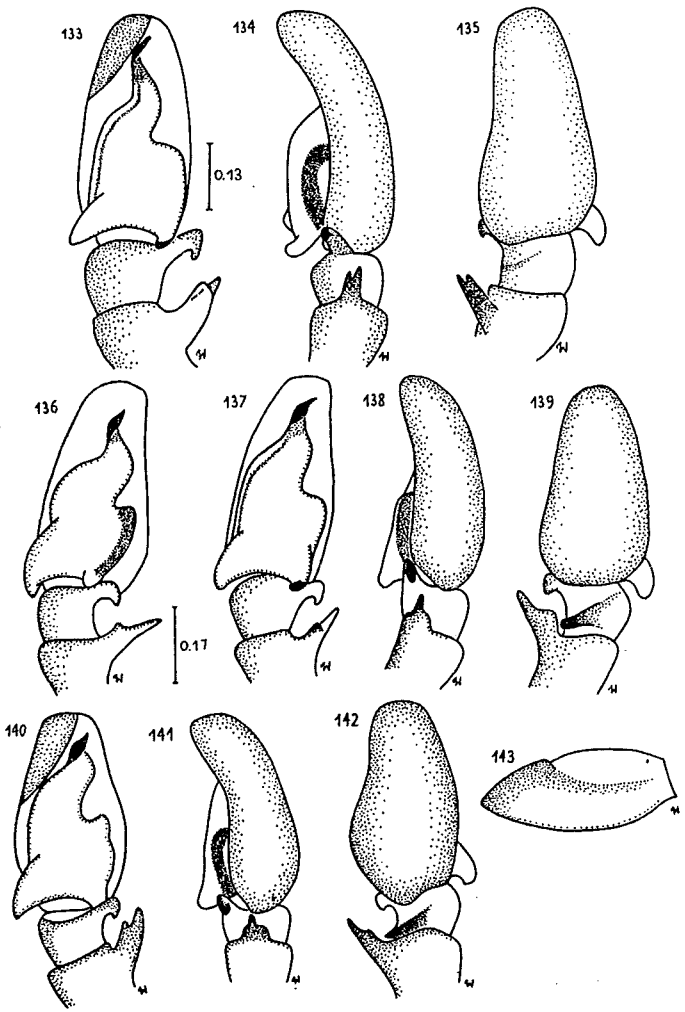
Figs. 118–123. *Heliophanus demonstrativus* sp. n. – male (holotype) and female (allotype). 118–121 – male copulatory organ, ventral, antero-latero-ventral, lateral and dorsal views, 122 – male pedipalpal femur, 123 – epigyne.



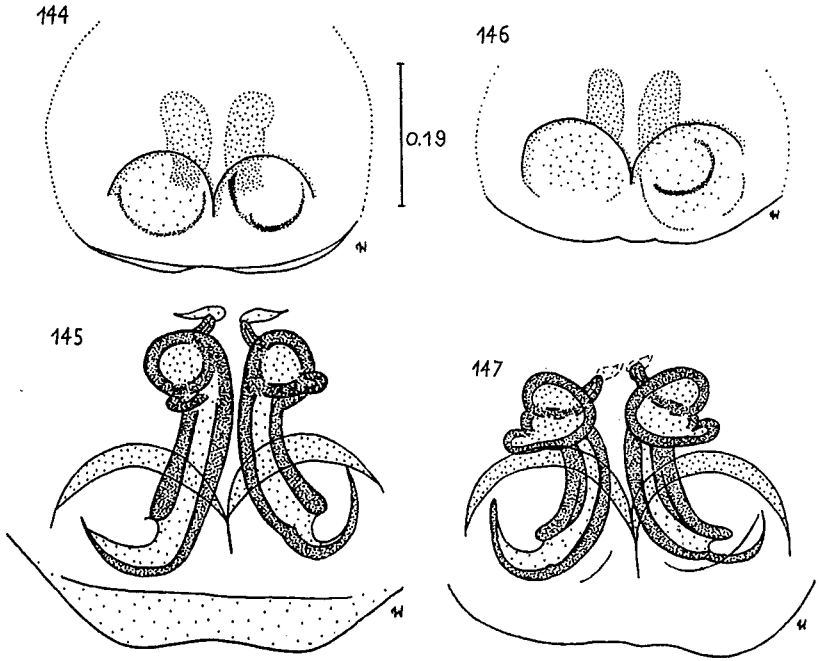
Figs. 124–130. *Heliophanus congolensis* GILTAY – male. 124–126 – holotype, copulatory organ, ventral, lateral and dorsal views. 127–130 – MRAC 147 712: 127–129 – copulatory organ, ventral, lateral and dorsal views, 130 – pedipalpal femur.



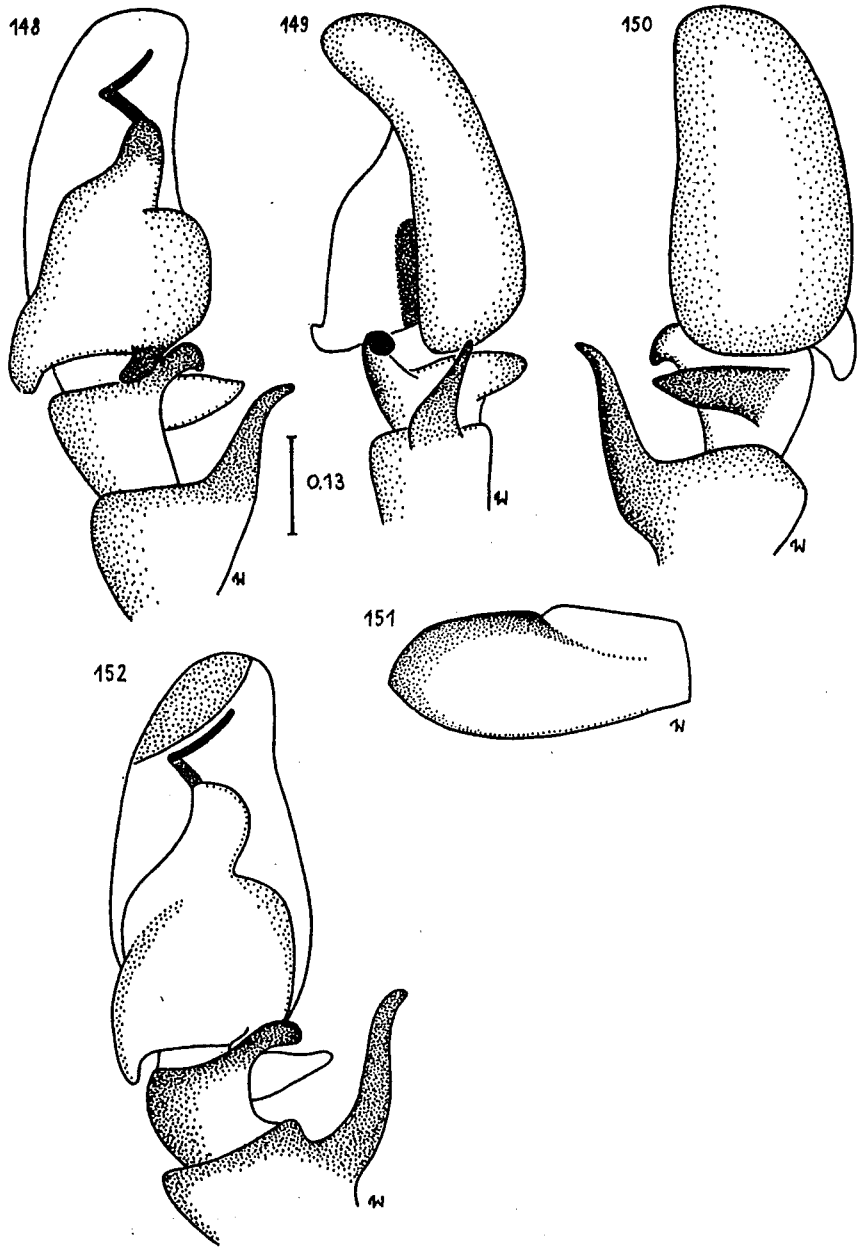
Figs. 131–132. *Heliophanus congolensis* GILTAY – female (MRAC 147 717). Epigyne and its internal structures.



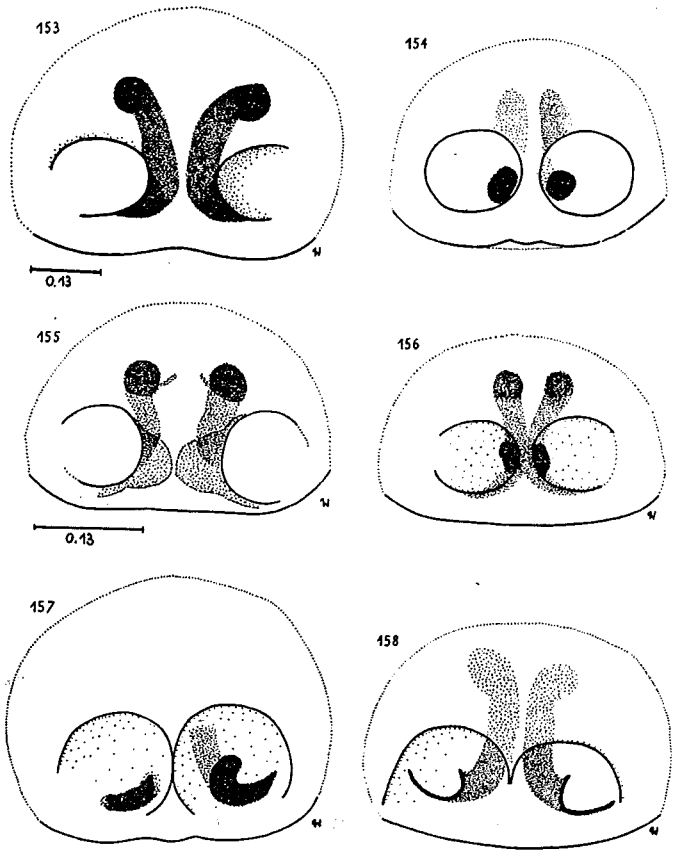
Figs. 133–143. *Heliophanus trepidus* SIM. – male. 133–135 – paralectotype, copulatory organ, ventral, lateral and dorsal views. 136–139 – lectotype, copulatory organ, two ventral (small change of pedipalp inclination), lateral and dorsal views. 140–143 – specimen from Botswana: 140–142 – copulatory organ, ventral, lateral and dorsal views, 143 – pedipalpal femur.



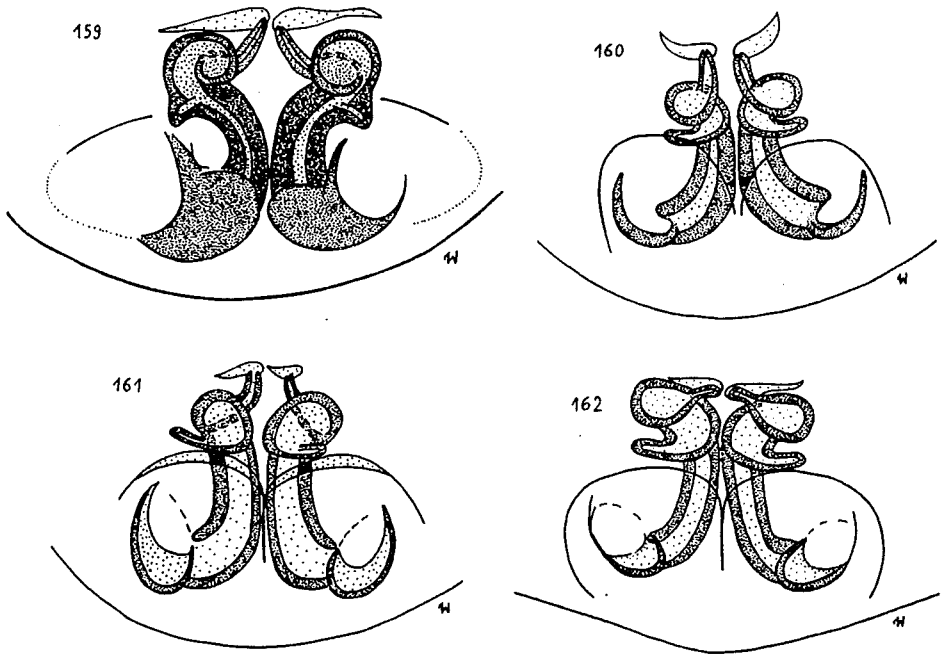
Figs. 144–147. *Heliophanus trepidus* SIM. – female (MRAC 152822 and 152827). Epigyne and its internal structures.



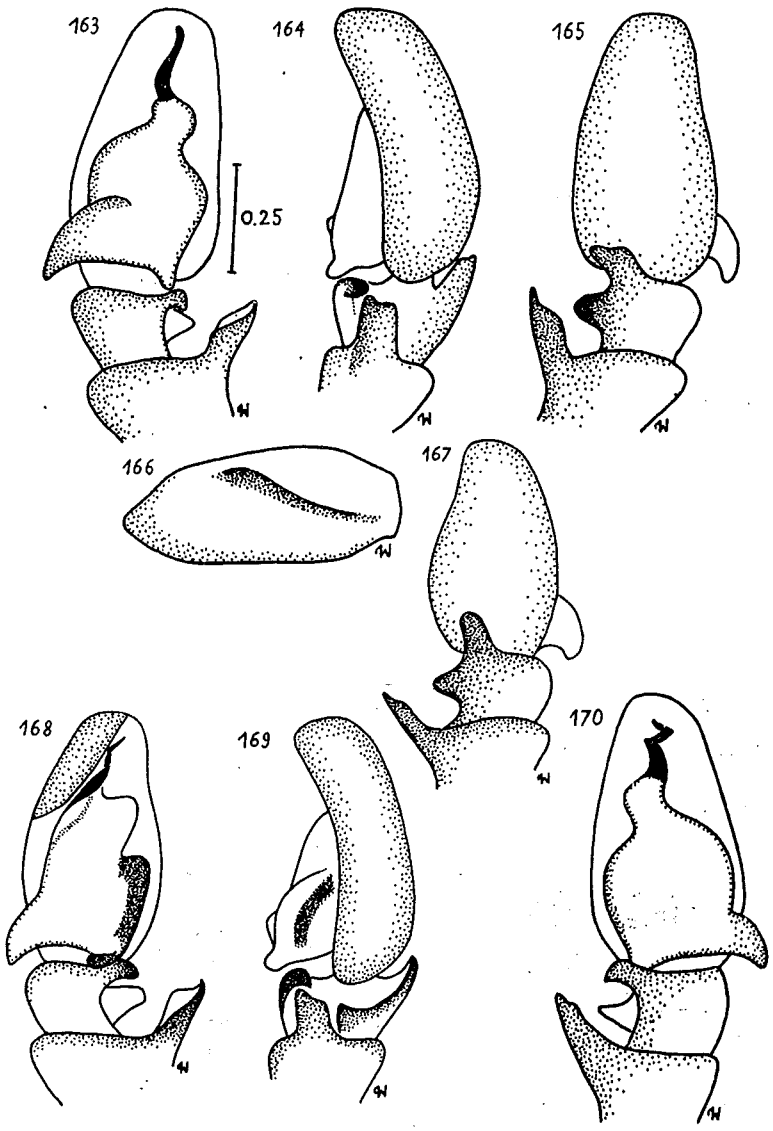
Figs. 148–152. *Heliophanus debilis* SIM. – male. 148–151 – lectotype: 148–150 – copulatory organ, ventral, lateral and dorsal views, 151 – pedipalpal femur. 152 – specimen from Botswana, copulatory organ, ventral view.



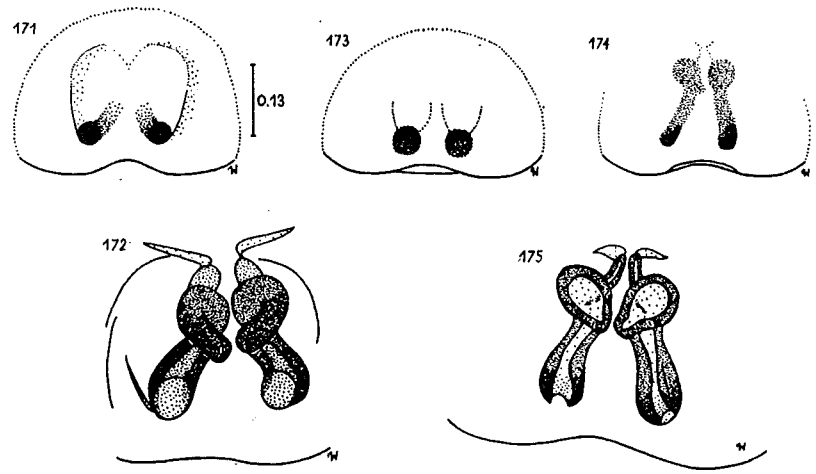
Figs. 153–158. *Heliophanus debilis* SIM. – female. Epigyne: 153 – paralectotype, 154–158 – specimens from Botswana.



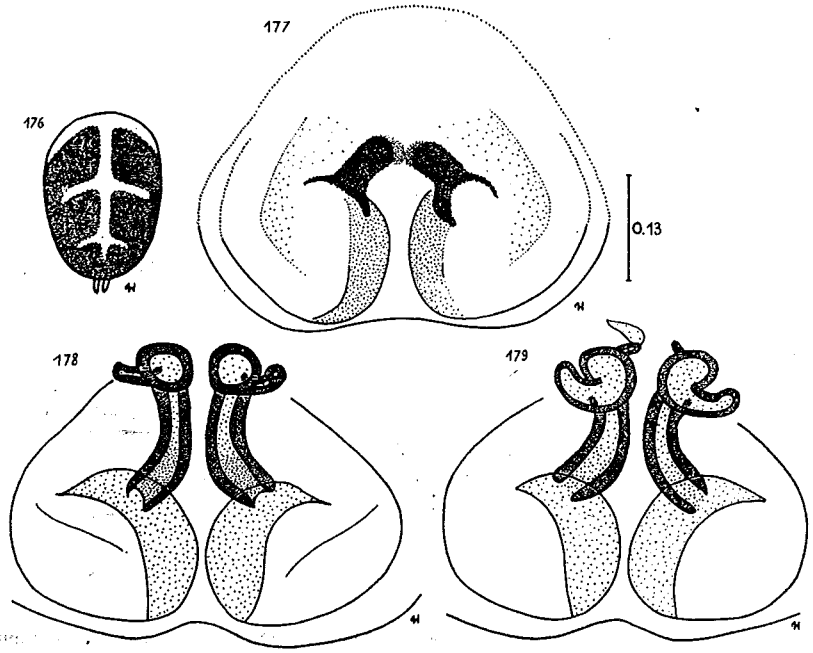
Figs. 159–162. *Heliophanus debilis* SIM. – female. Internal structures of epigyne: 159 – paralectotype, 160–162 – specimens from Botswana.



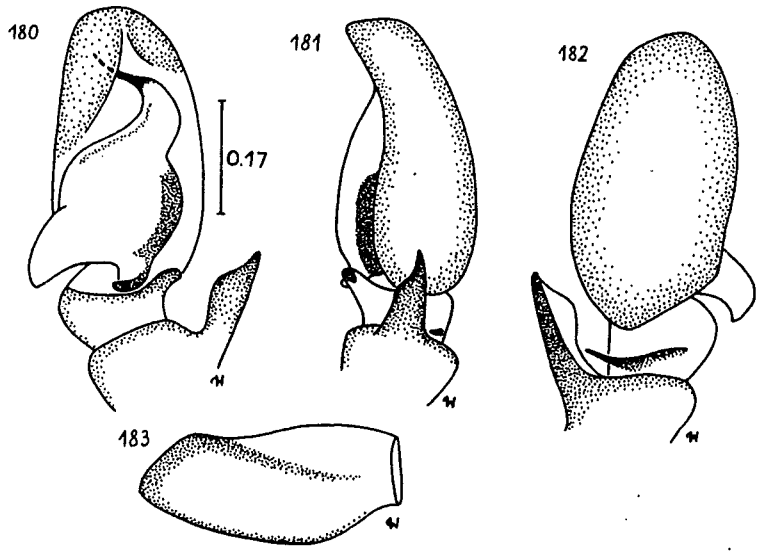
Figs. 163–170. *Heliophanus patellaris* SIM. – male. 163–166 – BMNH 20 180: 163–165 – copulatory organ, ventral, lateral and dorsal views, 166 – pedipalpal femur. 167 – specimen from Grahamstown, copulatory organ, dorsal view. 168–169 – lectotype, copulatory organ, ventral and lateral views. 170 – SAM specimen, copulatory organ, ventral view.



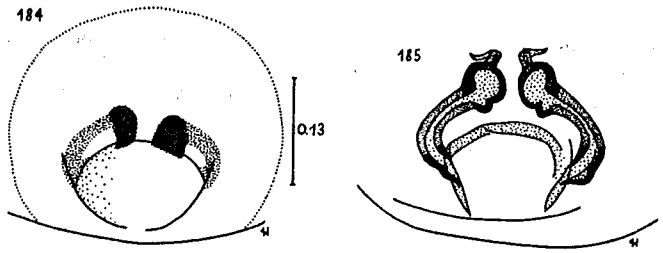
Figs. 171–175. *Heliophanus patellaris* SIM. – female. Epigyne and its internal structures: 171–172 – BMNH 20 180, 173 – BMNH 20 128, 174–175 – SAM 447.



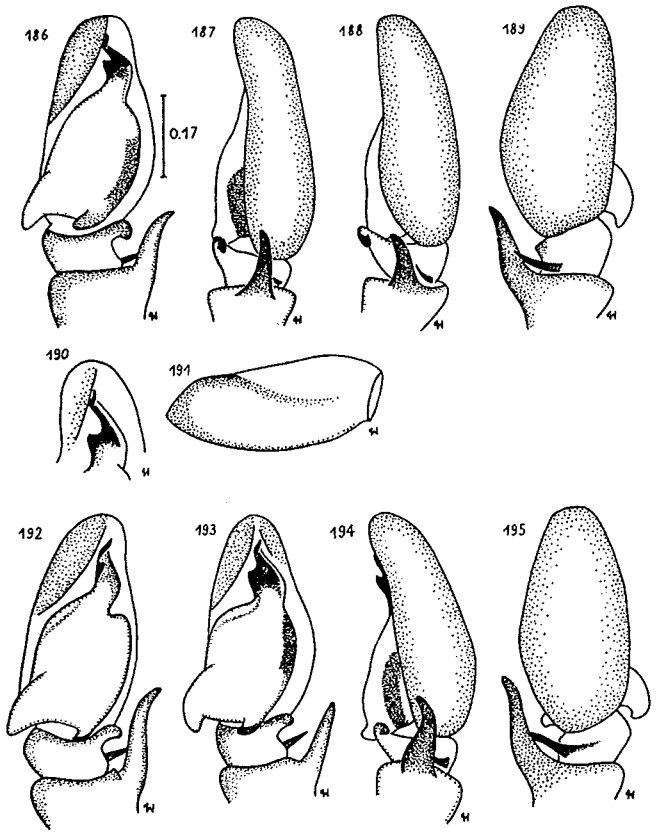
Figs. 176–179. *Heliophanus villosus* sp. n., holotype – female. 176 – abdominal pattern, 177–179 – epigyne and its internal structures, ventral and dorsal views.



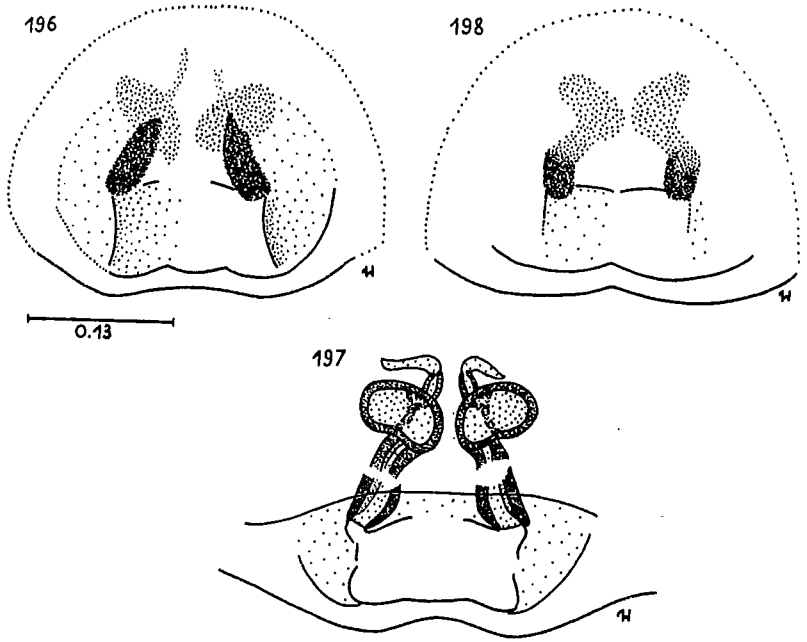
Figs. 180–183. *Heliophanus paulus* sp. n., holotype – male: 180–182 – copulatory organ, ventral, lateral and dorsal views, 183 – pedipalpal femur.



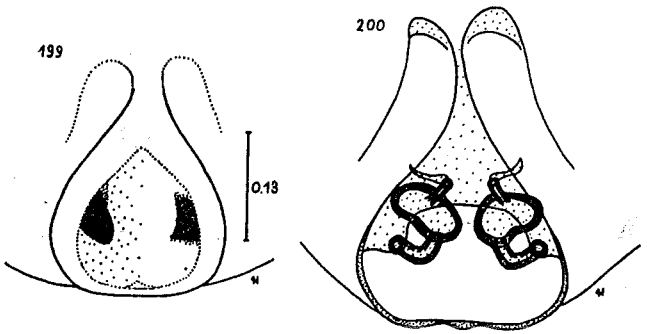
Figs. 184–185. *Heliophanus paulus* sp. n., allotype – female. Epigyne and its internal structures.



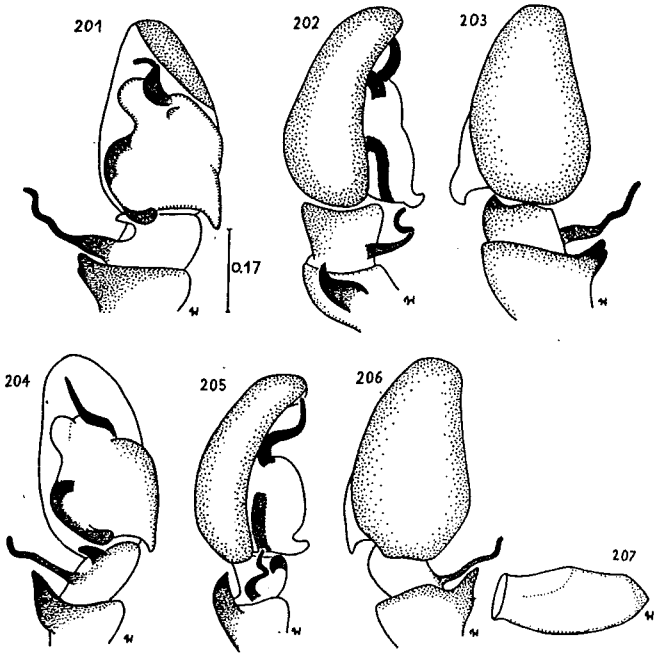
Figs. 186–195. *Heliophanus fascinatus* sp. n. – male. 186–191 – paratype from Botswana: 186–189 – copulatory organ, ventral, two lateral (small change of pedipalp inclination) and dorsal views, 190 – embolus, 191 – pedipalpal femur. 192–195 – paratype (MRAC 130 155), two ventral (small change of pedipalp inclination), lateral and dorsal views.



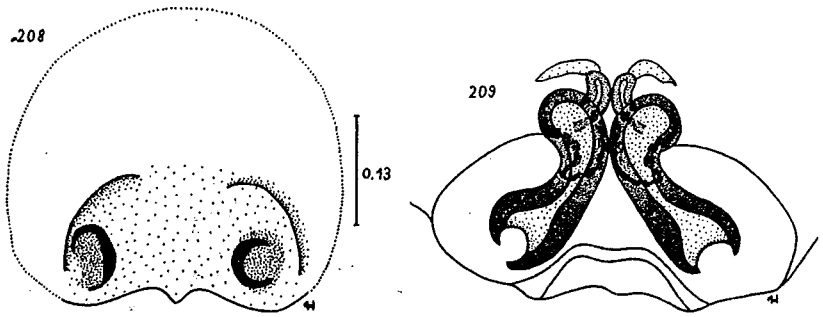
Figs. 196–198. *Heliophanus fascinatus* sp. n. – female. Epigyne and its internal structures: 196–197 – paratype from Botswana (insignificantly damaged), 198 – paratype (MRAC 130 155).



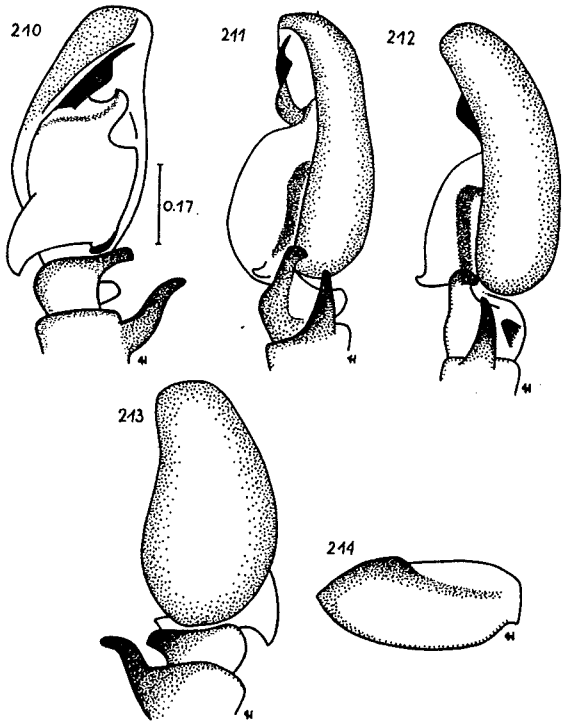
Figs. 199–200. *Heliophanus butemboensis* sp. n., holotype – female. Epigyne and its internal structures.



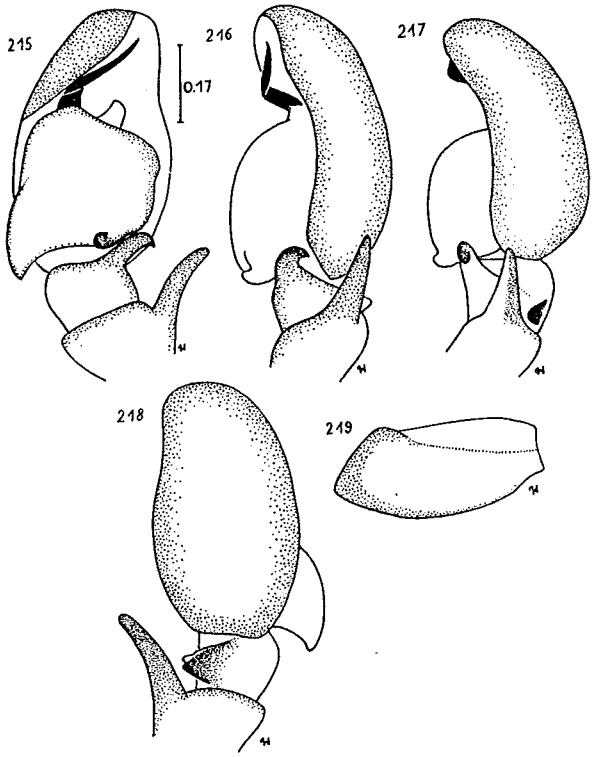
Figs. 201–207. *Heliophanus giltayi* Less. – male. 210–203 – syntype of *Heliophanus clercki* Cap., copulatory organ, ventral, lateral and dorsal views. 204–207 – specimen from Botswana: 204–206 – copulatory organ, ventral, lateral and dorsal views, 207 – pedipalpal femur.



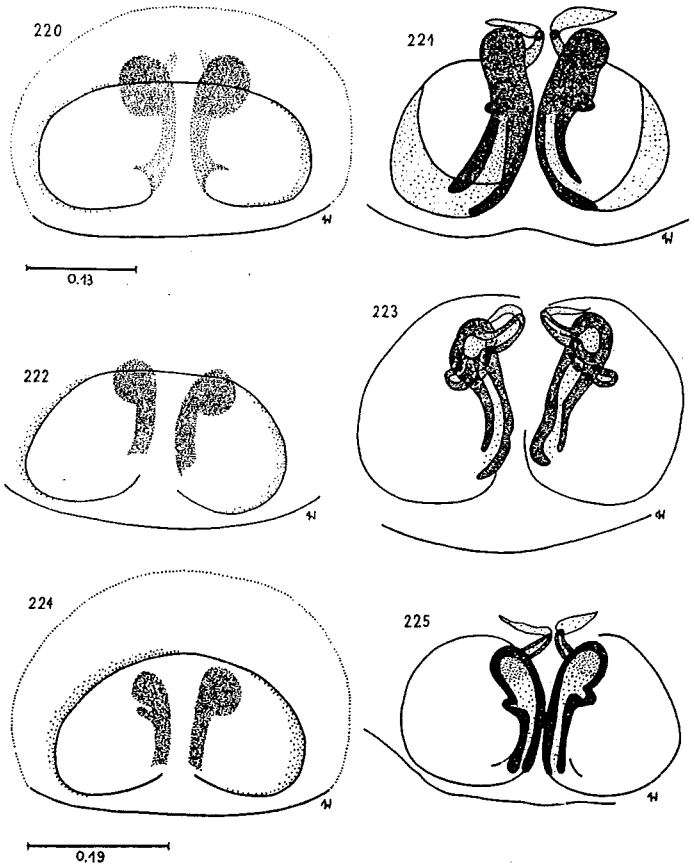
Figs. 208–209. *Heliophanus giltayi* Less., syntype of *Heliophanus clercki* Cap. – female. Epigyne and its internal structures.



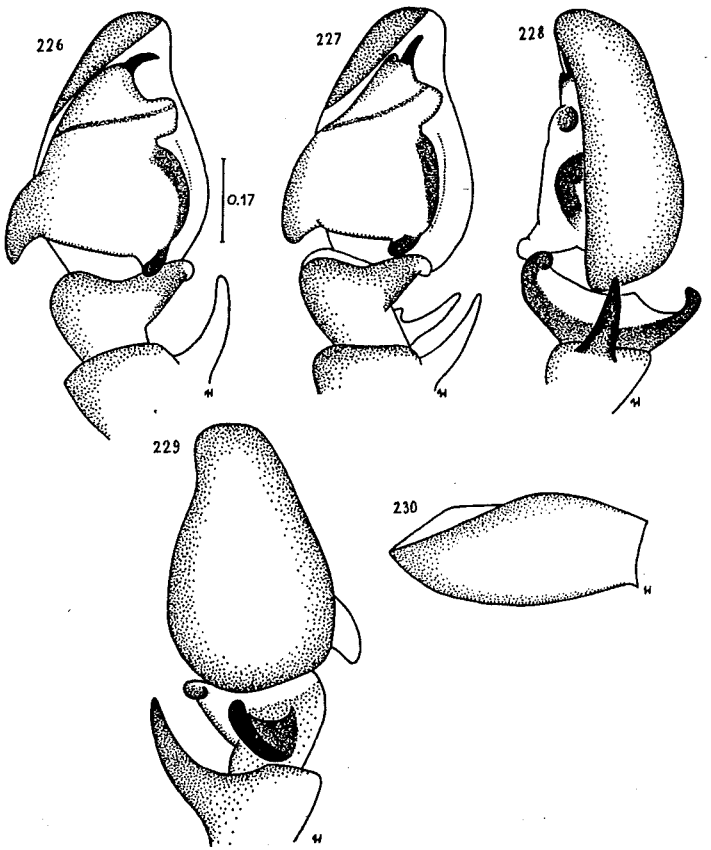
Figs. 210–214. *Heliophanus hastatus* sp. n., holotype – male: 210–213 – copulatory organ, ventral, two lateral (small change of pedipalp inclination) and dorsal views, 214 – pedipalpal femur.



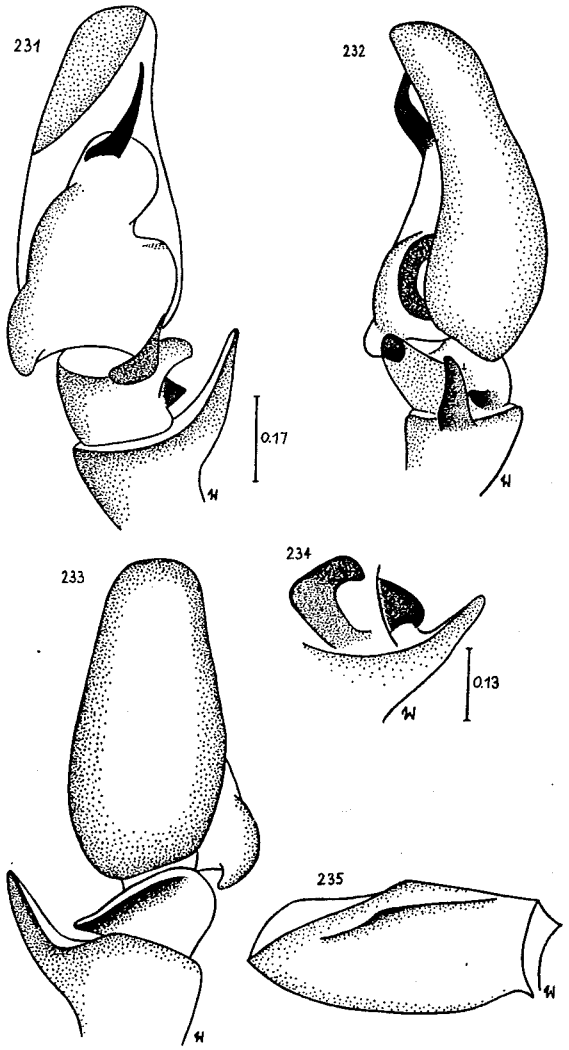
Figs. 215–219. *Heliophanus modicus* Pkh. et Pkh. – male: 215–218 – copulatory organ, ventral, two lateral (small change of pedipalp inclination) and dorsal views, 219 – pedipalpal femur.



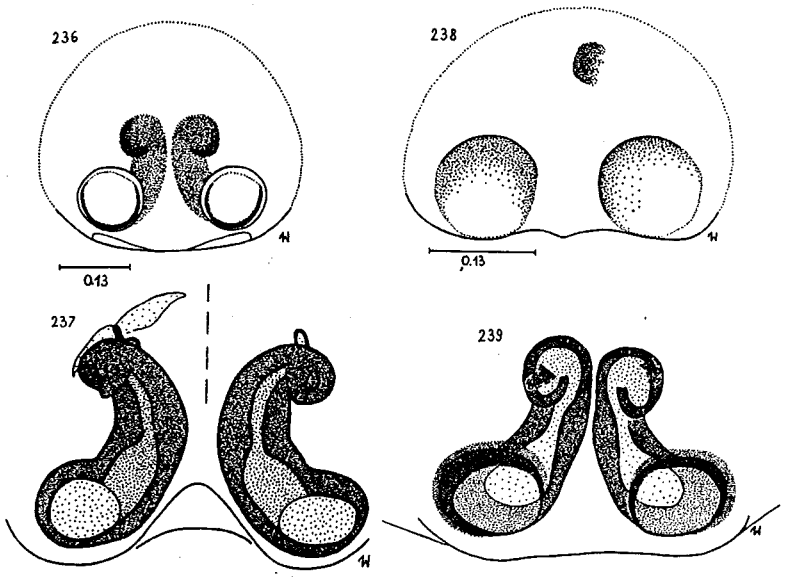
Figs. 220–225. *Heliophanus modicus* Pkh. et Pkh. – female. Epigyne and its internal structures: 220–221 – paralectotype, 222–223 – specimen from Madagascar, 224–225 – SAM 455.



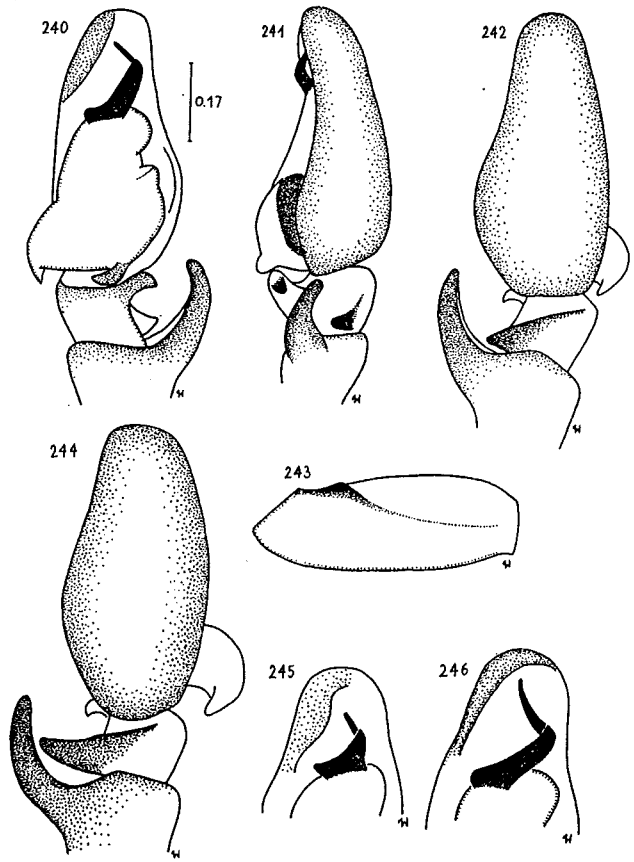
Figs. 226–230. *Heliophanus imperator* sp. n., holotype – male: 226–229 – copulatory organ, two ventral (small change of pedipalp inclination), lateral and dorsal views, 230 – pedipalpal femur.



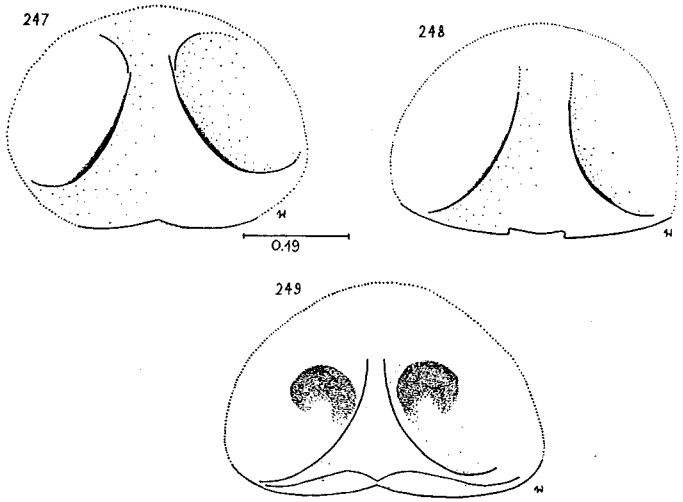
Figs. 231–235. *Heliophanus crudeni* Less., lectotype – male: 231–233 – copulatory organ, ventral, lateral and dorsal views, 234 – antero-ventro-lateral view of tibial apophyses, 235 – pedipalpal femur.



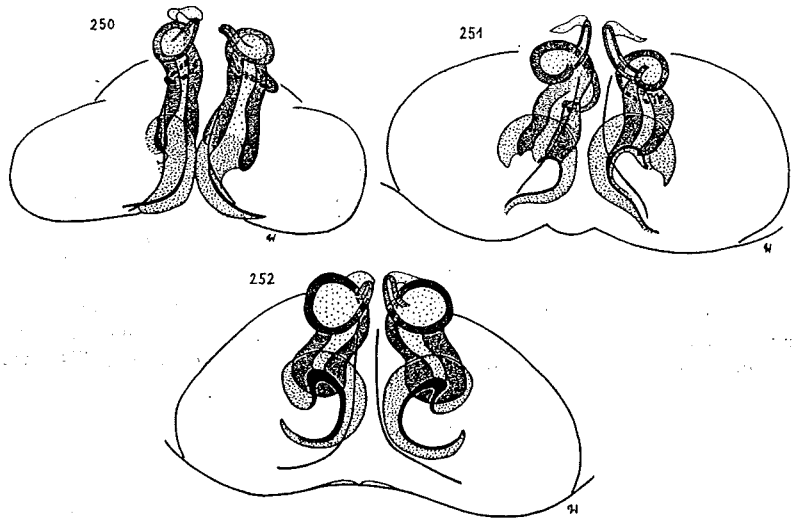
Figs. 236–239. *Heliophanus crudeni* LESS. – female. Epigyne and its internal structures: 236–237 – paralectotype, 238–239 – ZIU 217.



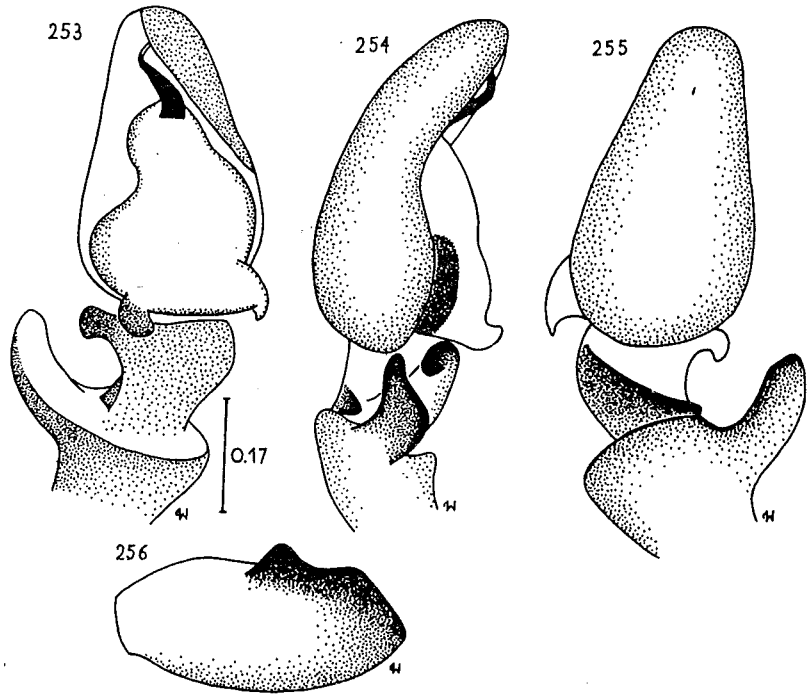
Figs. 240–246. *Heliophanus kenyaensis* sp. n. – male. 240–243 – holotype: 240–242 – copulatory organ, ventral, lateral and dorsal views, 243 – pedipalpal femur, 244–245 – paratype from Rwanda: 244 – copulatory organ, dorsal view, 245 – embolus. 246 – paratype (ZIU 144), embolus.



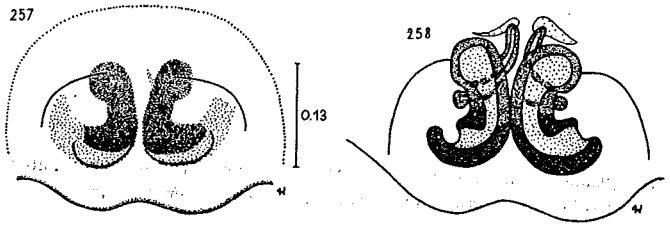
Figs. 247–249. *Heliophanus kenyaensis* sp. n., paratypes (ZIU 169, 36 and 121) – female. Epigyne.



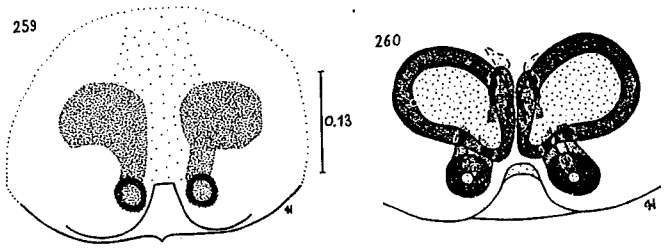
Figs. 250–252. *Heliophanus kenyaensis* sp. n., paratypes (ZIU 148, 36 and 121) – female. Internal structures of epigyne.



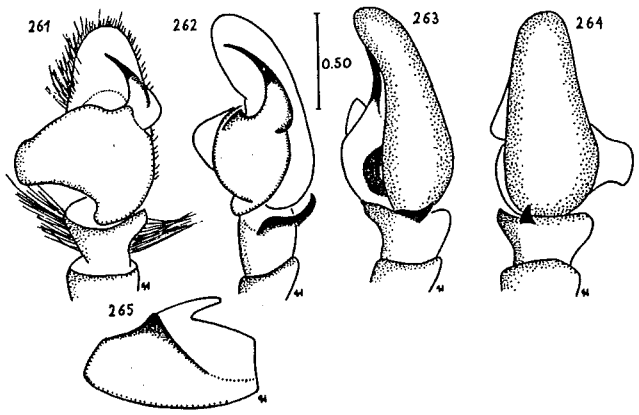
Figs. 253–256. *Heliophanus validus* sp. n., holotype – male: 253–255 – male copulatory organ, ventral, lateral and dorsal views, 256 – pedipalpal femur.



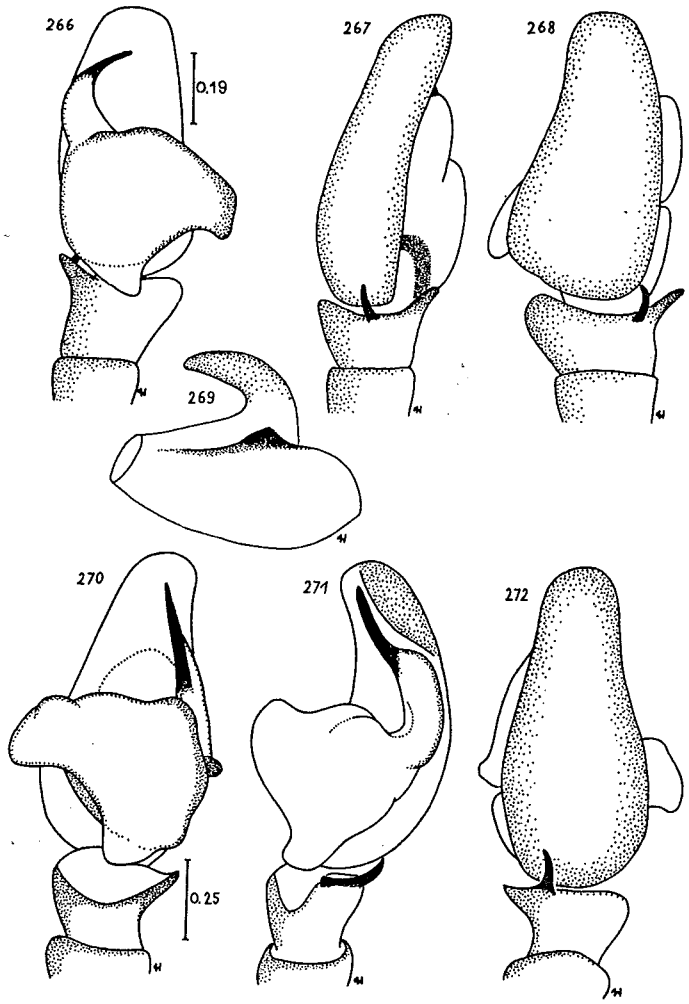
Figs. 257–258. *Heliophanus validus* sp. n., allotype – female. Epigyne and its internal structures.



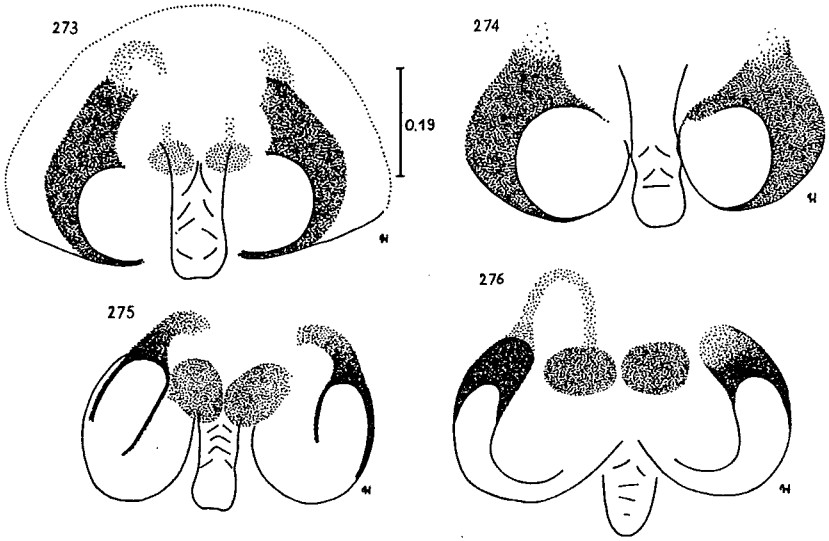
Figs. 259–260. *Heliophanus kilimanjaroensis* sp. n., holotype – female. Epigyne and its internal structures.



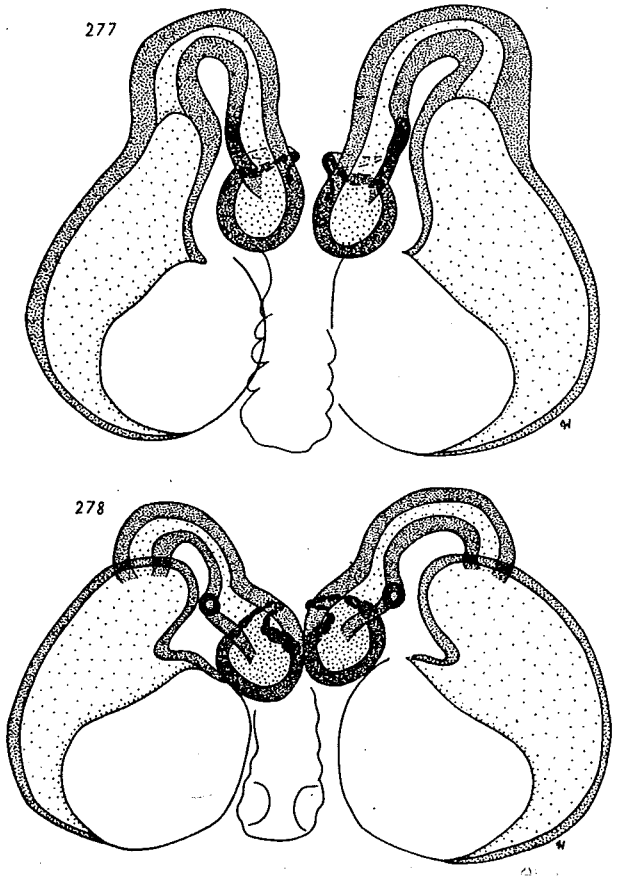
Figs. 261–265. *Heliophanus cassinicola* SIM., holotype – male: 261–264 – copulatory organ, ventral, ventro-lateral, lateral and dorsal views, 265 – femoral apophysis.



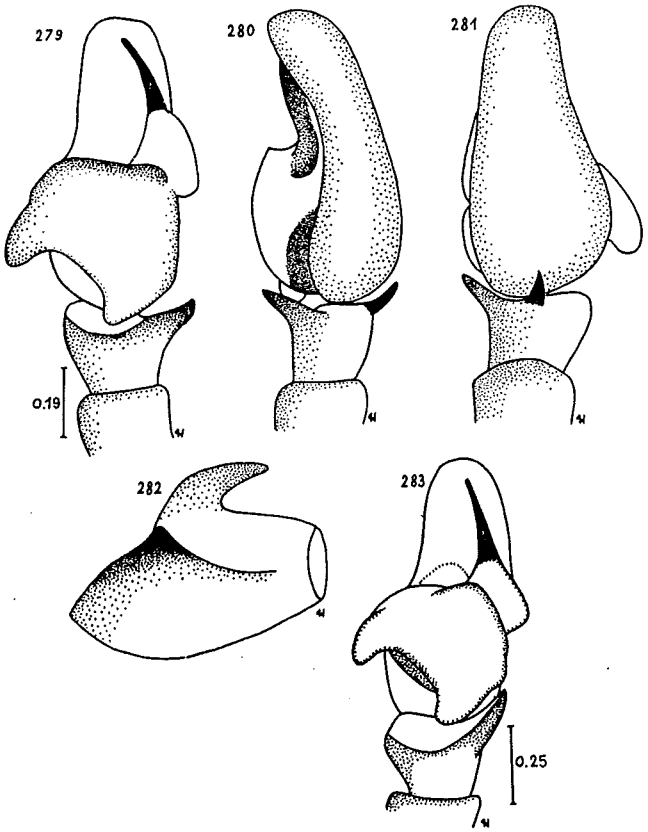
Figs. 266–272. *Heliophanus cassinicola* SIM. – male. 266–269 – holotype of *Heliophanus milloti* DENIS: 266–268 – copulatory organ, ventral, lateral and dorsal views, 269 – femoral apophysis. 270–272 – specimen from Burundi, copulatory organ, ventral, ventro-lateral and dorsal views.



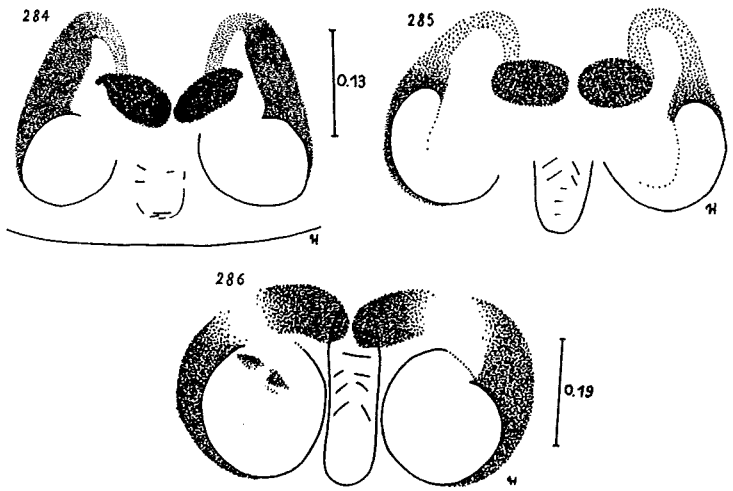
Figs. 273–276. *Heliophanus cassinicola* SIM. – female. Epigyne: 273–275 – MRAC 112 625, 130 152 and 119 304, 276 – holotype of *Trapezocephalus aelurilliformis* BERL. et MILL.



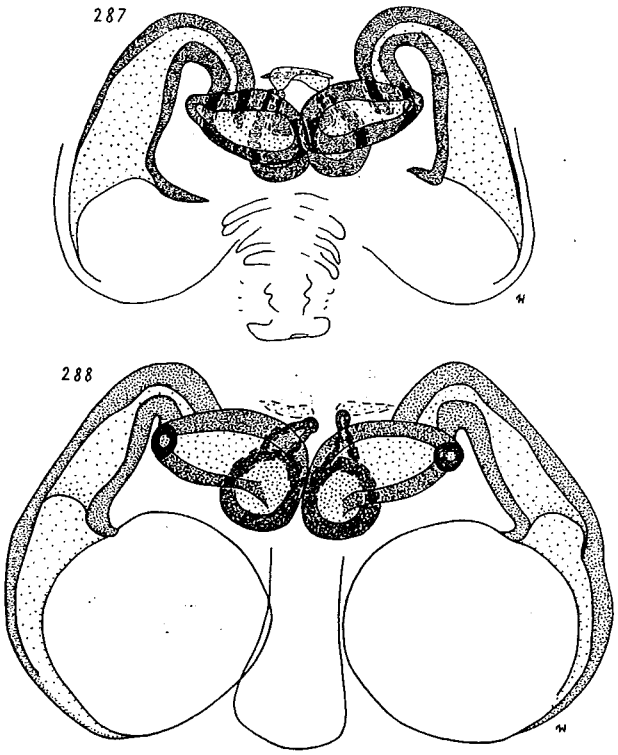
Figs. 277–278. *Heliophanus cassinicola* SIM. – female (MRAC 112 625 and 130 152). Internal structures of epigyne.



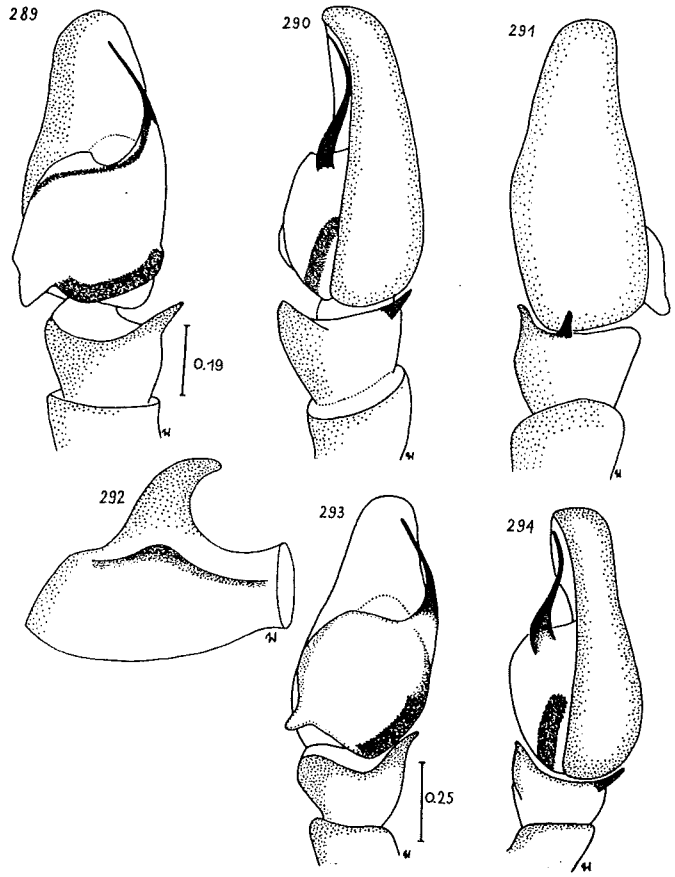
Figs. 279–283. *Heliophanus aviculus* BERL. et MILL. – male. 279–282 – holotype: 279–281 – copulatory organ, ventral, lateral and dorsal views, 282 – femoral apophysis. 283 – MRAC 138 816, copulatory organ, ventral view.



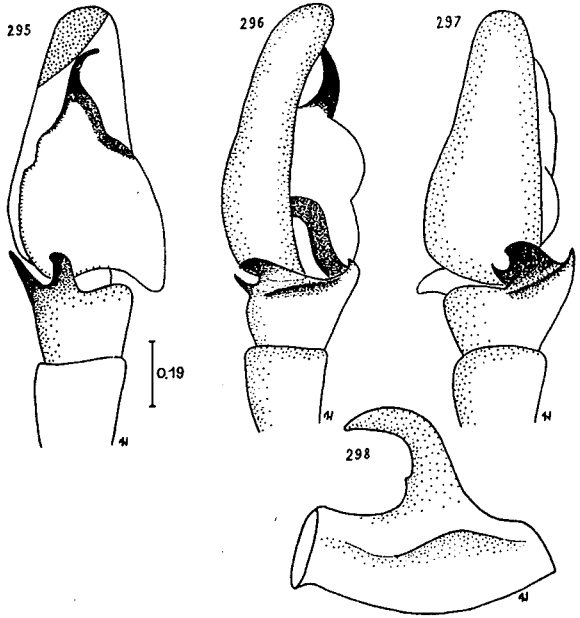
Figs. 284–286. *Heliophanus aviculus* BERL. et MILL. – female. Epigyne: 284 – paratype, 285 – specimen from Cameroon, 286 – specimen from Zaire.



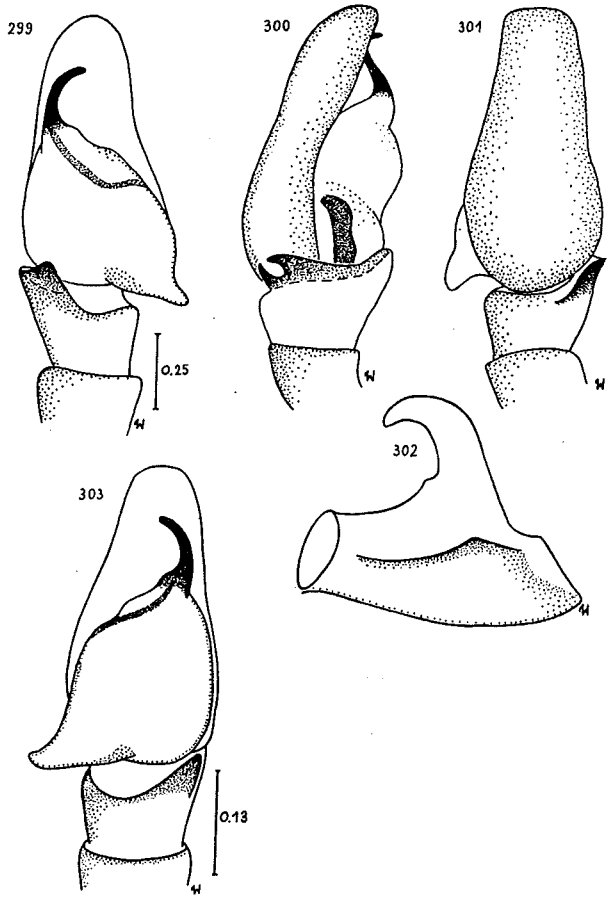
Figs. 287–288. *Heliophanus aviculus* BERL. et MILL. – female. Internal structures of epigyne: 287 – paratype, 288 – specimen from Zaire.



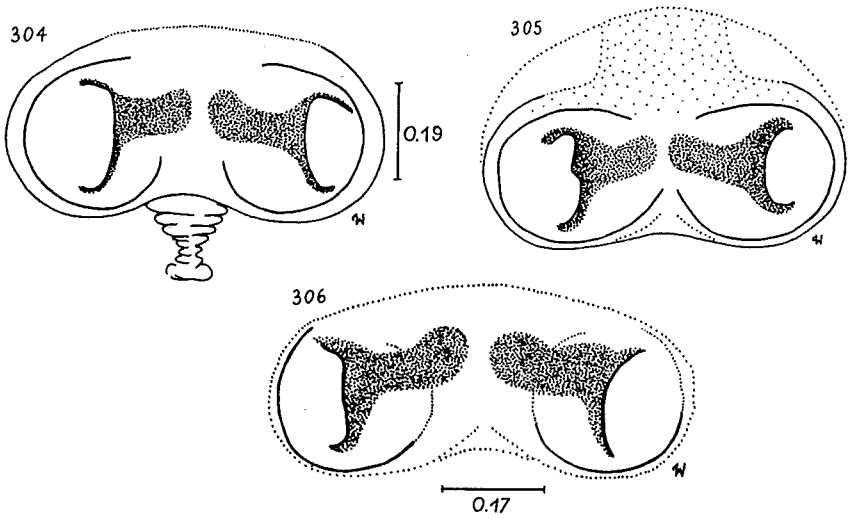
Figs. 289–294. *Heliophanus robustus* BERL. et MILL. – male. 289–292 – holotype: 289–291 – copulatory organ, ventral, lateral and dorsal views, 292 – femoral apophysis. 293–294 – MRAC 11 891, copulatory organ, ventral and lateral views.



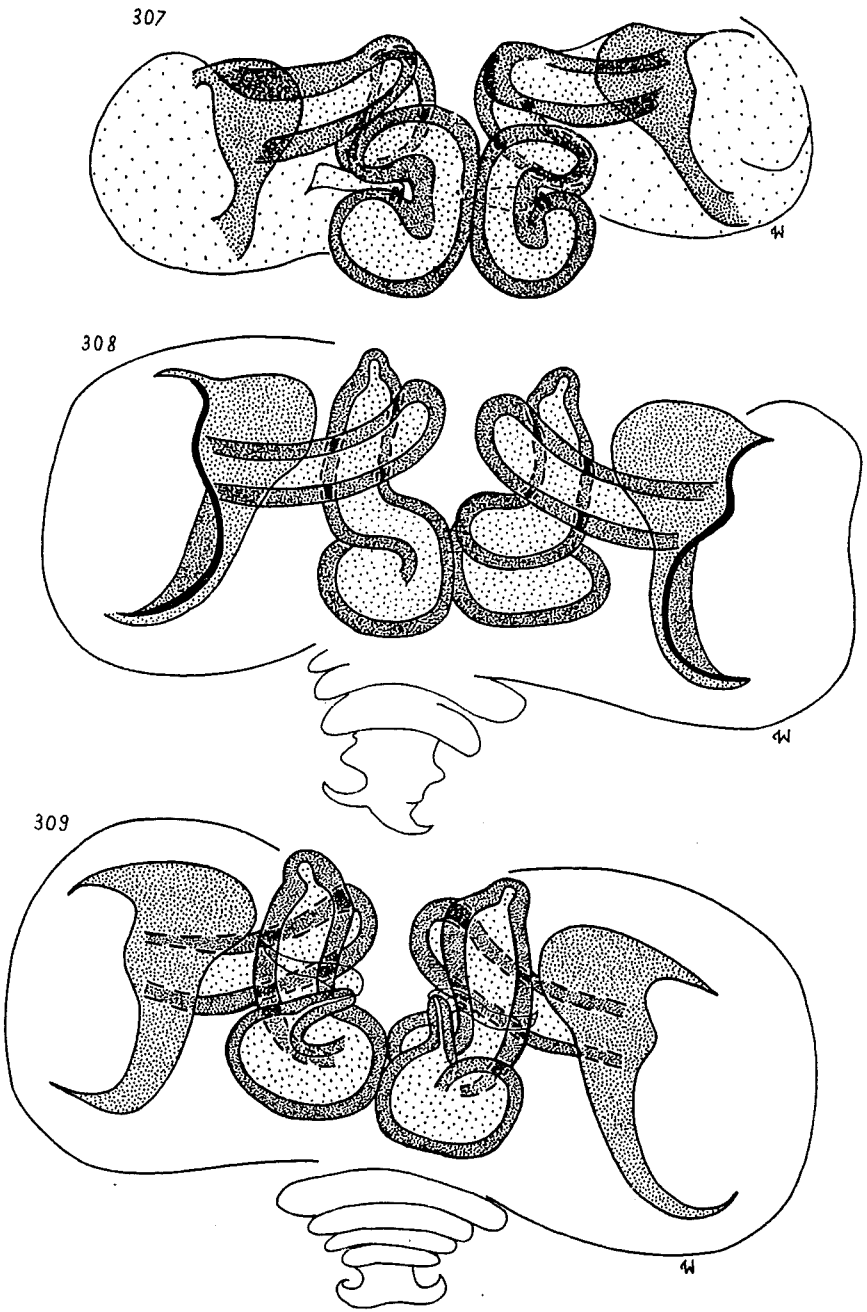
Figs. 295–298. *Heliophanus orchesta* SIM., lectotype – male. 295–297 – copulatory organ, ventral, lateral and latero-dorsal views, 298 – femoral apophysis.



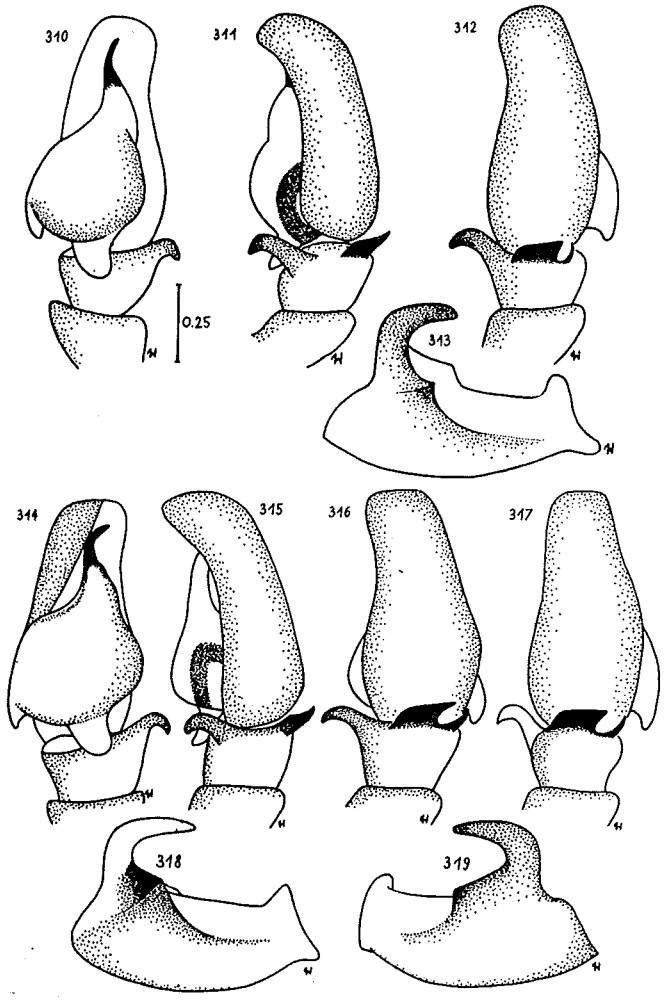
Figs. 299–303. *Heliophanus orchesta* SIM. – male. 299–302 – syntype of *Heliophanus ambiguus* LESS.: 299–301 – copulatory organ, ventral, lateral and dorsal views, 302 – femoral apophysis. 303 – specimen from Botswana, copulatory organ, ventral view.



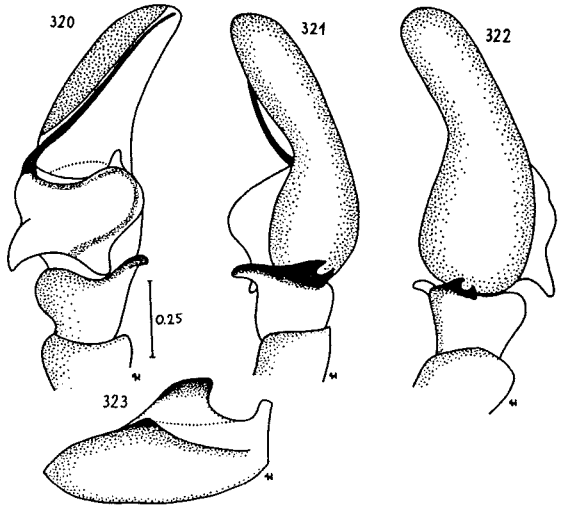
Figs. 304–306. *Heliophanus orchesta* Sim. – female. Epigyne: 304–305 – specimens from Botswana, 306 – syntype of *Heliophanus ambiguus* Less.



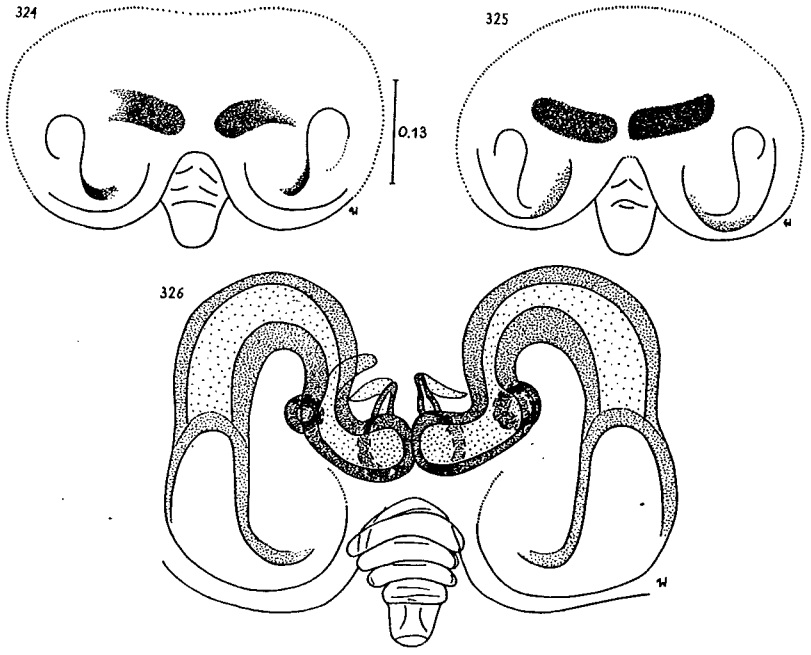
Figs. 307–309. *Heliophanus orchesta* Sim. – female. Internal structures of epigyne: 307 – syntype of *Heliophanus ambiguus* Less., 308–309 – specimen from Botswana, ventral and dorsal views.



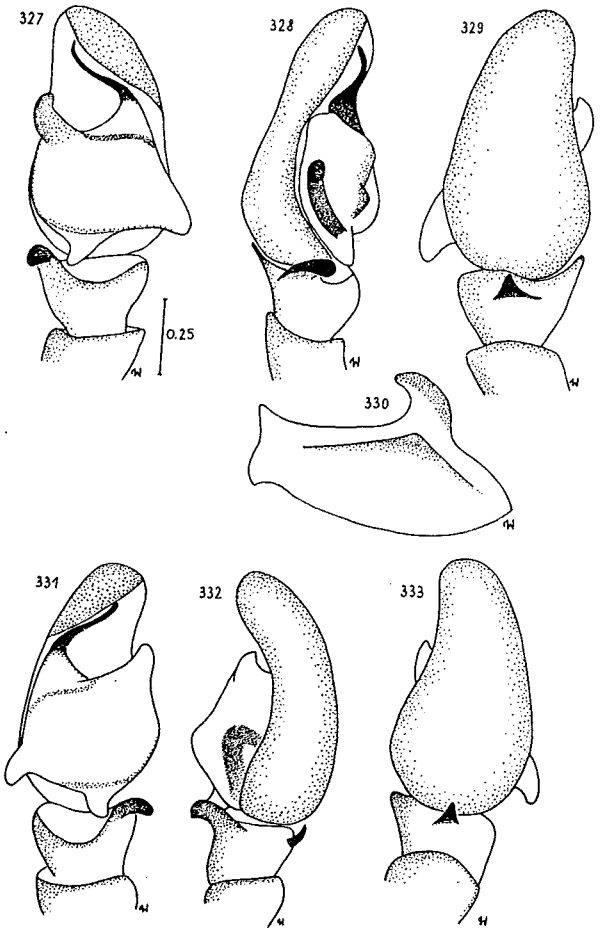
Figs. 310–319. *Heliophanus deamatus* Pkh. et Pkh. – male. 310–313 – holotype: 310–312 – copulatory organ, ventro-lateral, lateral and dorsal views, 313 – femoral apophysis. 314–319 – specimen from Rwanda: 314–317 – copulatory organ, ventral, lateral and two dorsal (small change of pedipalp inclination) views, 318–319 – femoral apophysis, lateral inner and outer surface views.



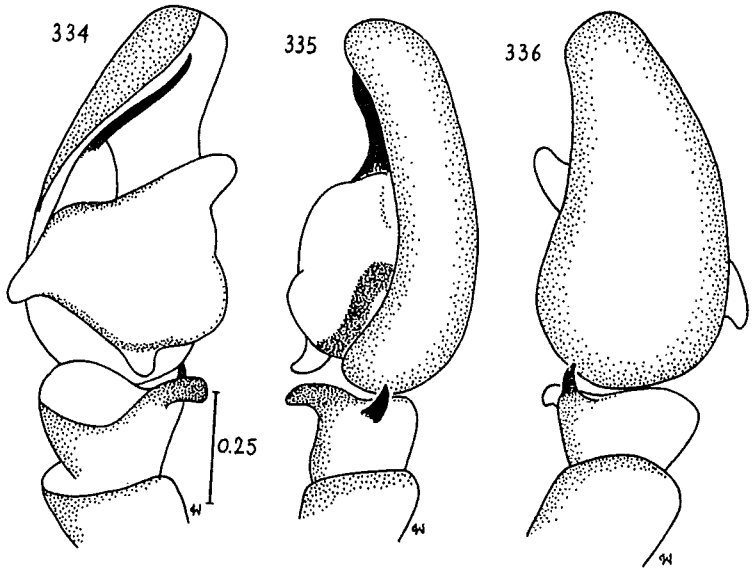
Figs. 320–323. *Heliophanus lesserti* sp. n., holotype – male: 320–322 – copulatory organ, ventral, lateral and dorsal views, 323 – femoral apophysis.



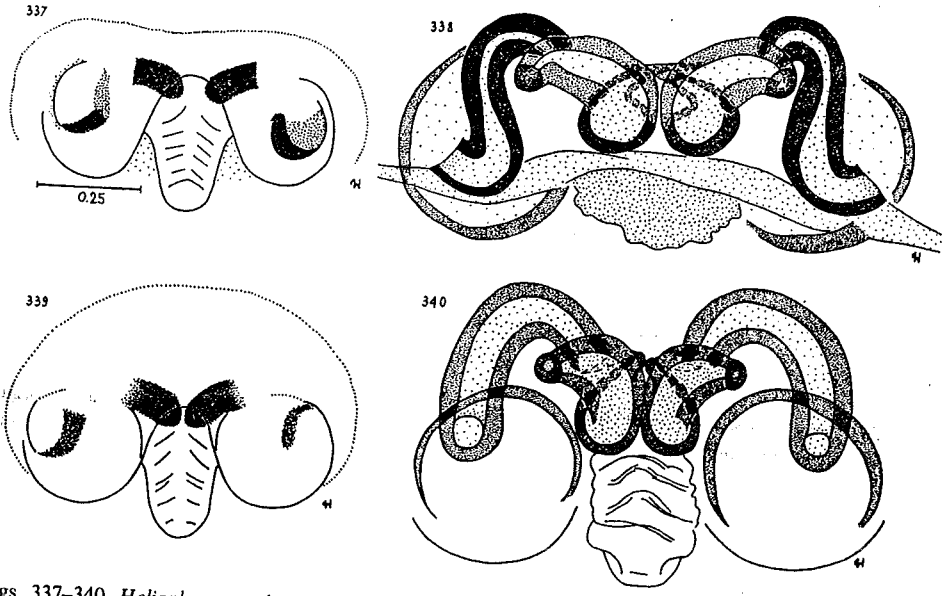
Figs. 324–326. *Heliophanus lesserti* sp. n., paratypes from Botswana – female. Epigyne and its internal structures.



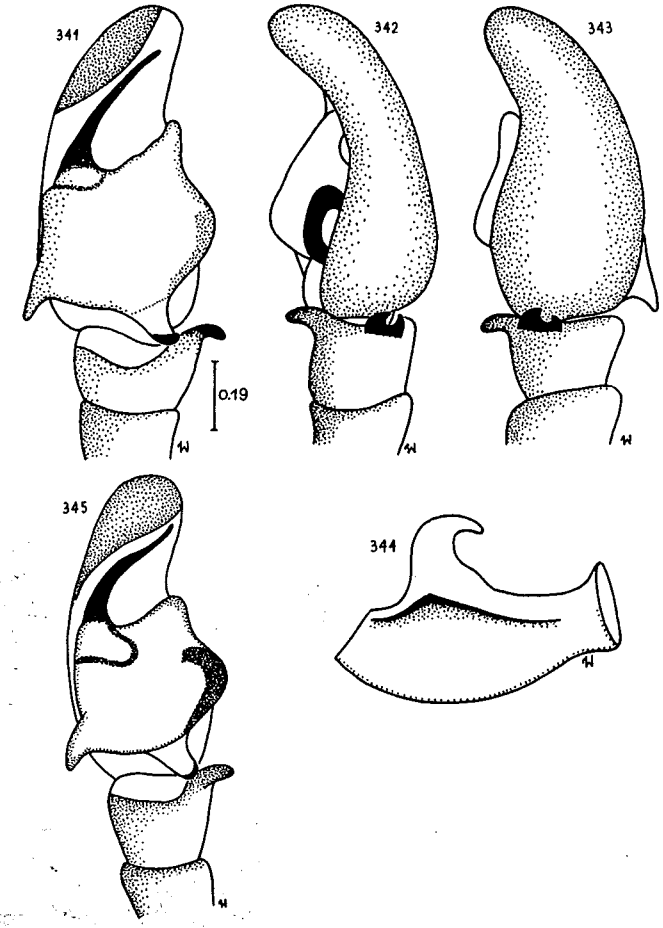
Figs. 327–333. *Heliophanus orchestioides* LESS. – male. 327–330 – lectotype: 327–329 – copulatory organ, ventro-lateral, lateral and dorsal views, 330 – femoral apophysis. 331–333 – MRAC 141 058, copulatory organ, ventral, lateral and dorsal views.



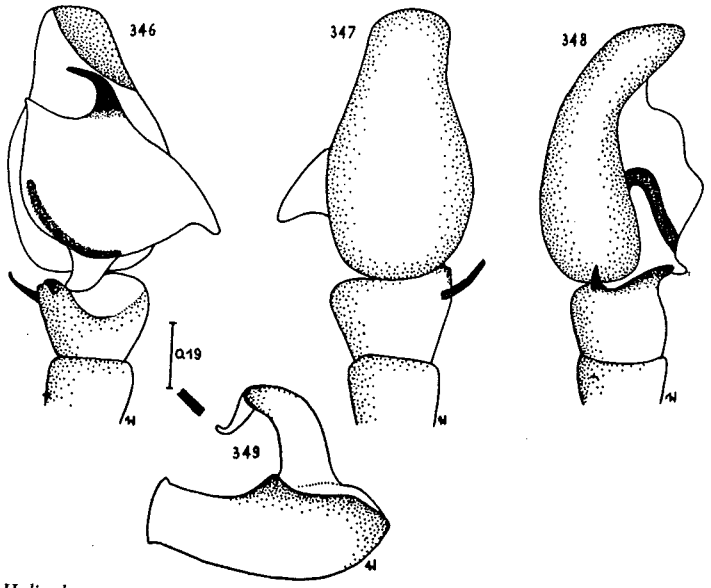
Figs. 334–336. *Heliophanus orchestioides* LESS. – male (specimen from Zaire): copulatory organ, ventral, lateral and dorsal views.



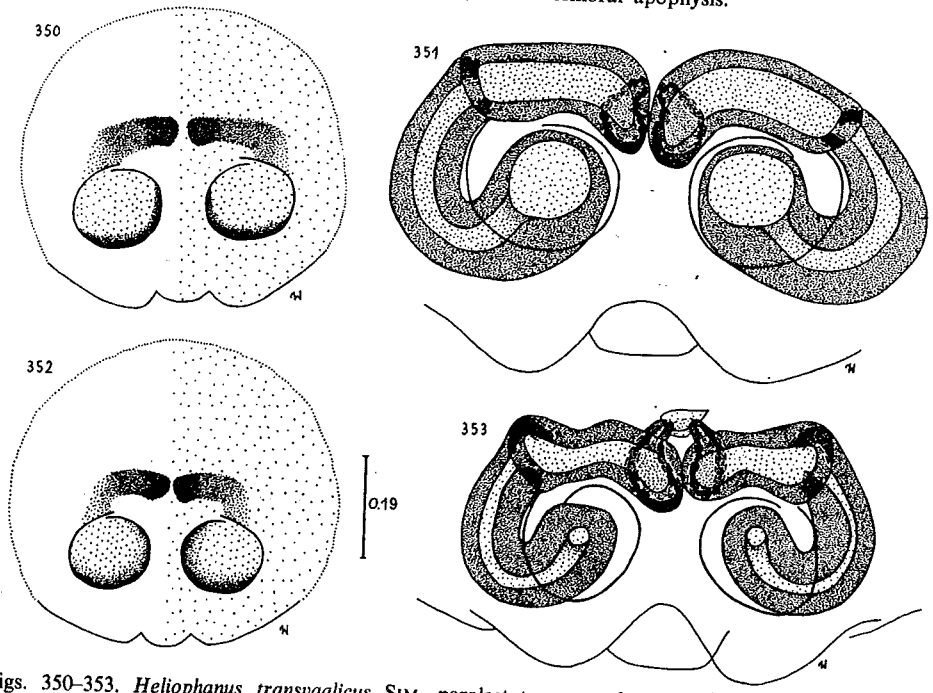
Figs. 337–340. *Heliophanus orchestioides* LESS. – female. Epigyne and its internal structures: 337–338 – paralectotype, 339–340 – MRAC 148 931.



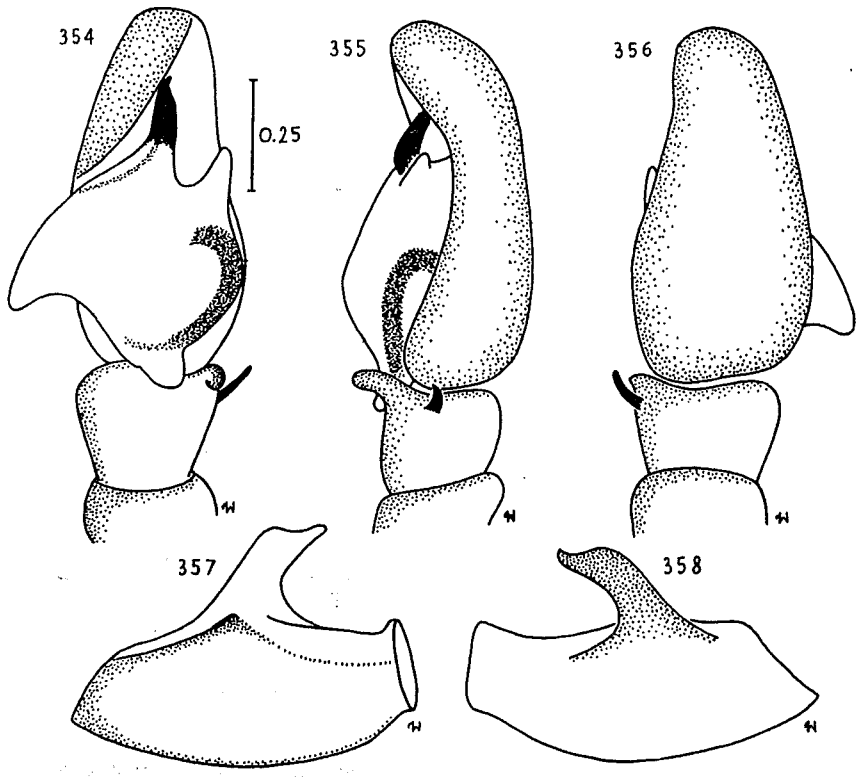
Figs. 341–345. *Heliophanus harpago* SIM. – male. 341–344 – holotype: 341–343 – copulatory organ, ventral, lateral and dorsal views, 344 – femoral apophysis. 345 – MRAC 145 486, copulatory organ, ventral view.



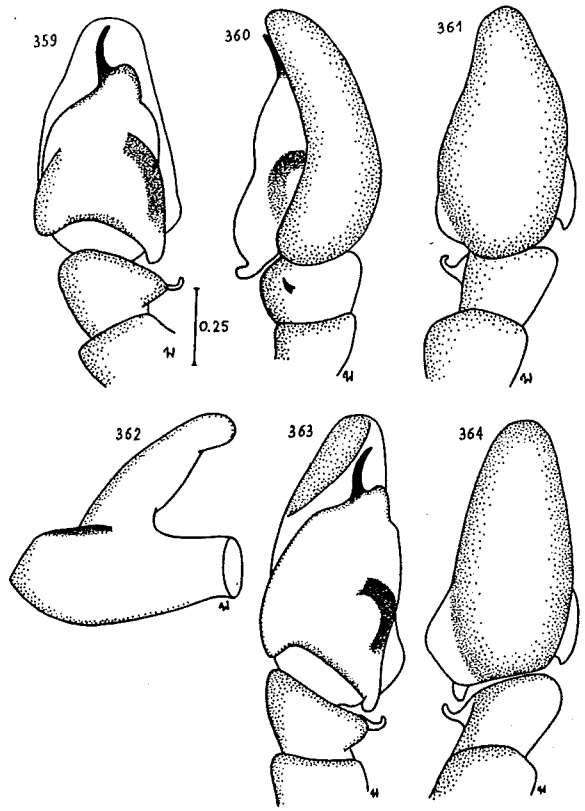
Figs. 346–349. *Heliophanus transvaalicus* SIM., lectotype – male: 346–348 – copulatory organ, ventral, dorsal and lateral views, 349 – femoral apophysis.



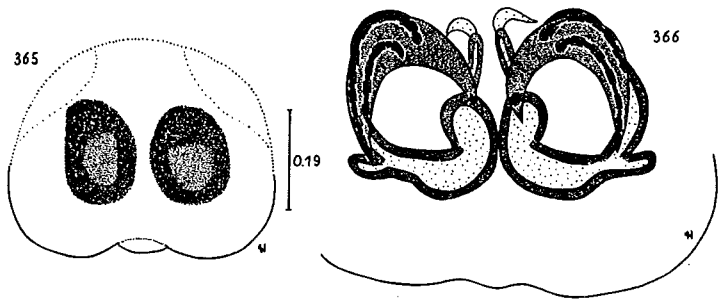
Figs. 350–353. *Heliophanus transvaalicus* SIM. paralectotypes – female. Epigyne and its internal structures.



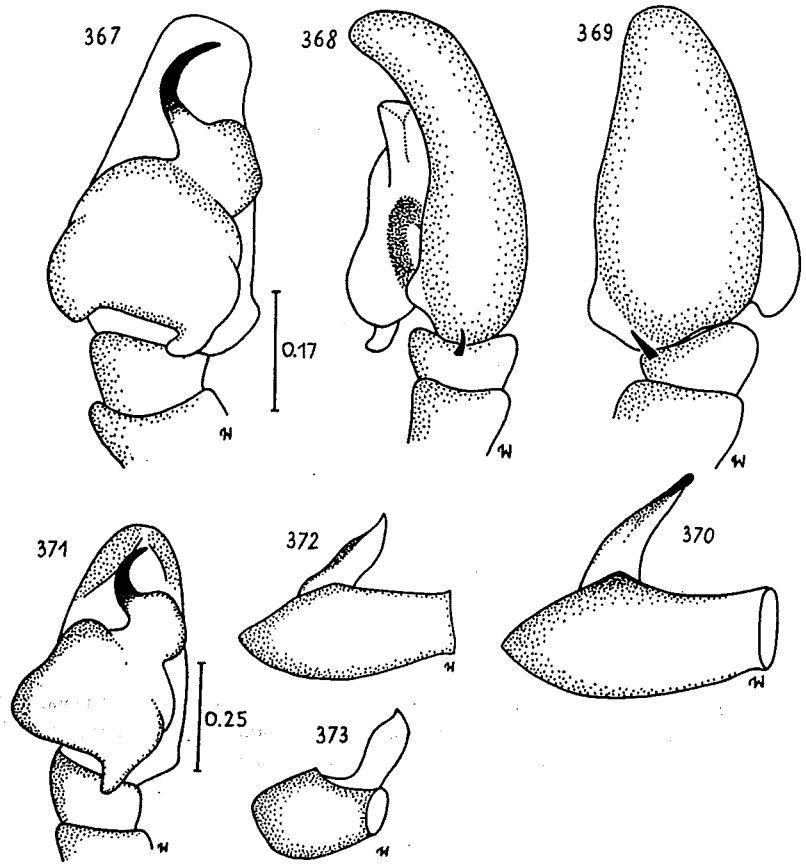
Figs. 354–358. *Heliophanus semirasus* LAWR., lectotype – male: 354–356 – copulatory organ, ventral, lateral and dorsal views, 357–358 – femoral apophysis, lateral inner and outer surface views.



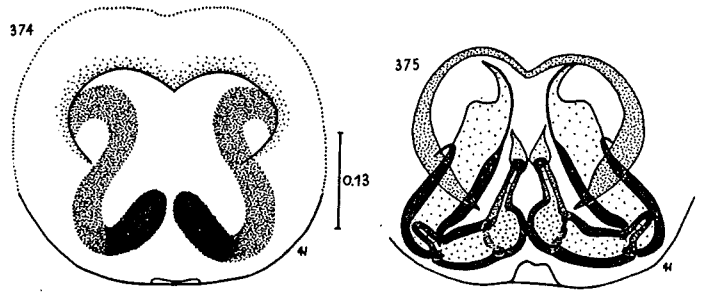
Figs. 359–364. *Heliophanus lawrencei* sp. n. – male. 359–362 – paratype from Angola: 359–361 – copulatory organ, ventral, lateral and dorsal views, 362 – femoral apophysis. 363–364 – holotype, copulatory organ, ventral and dorsal views.



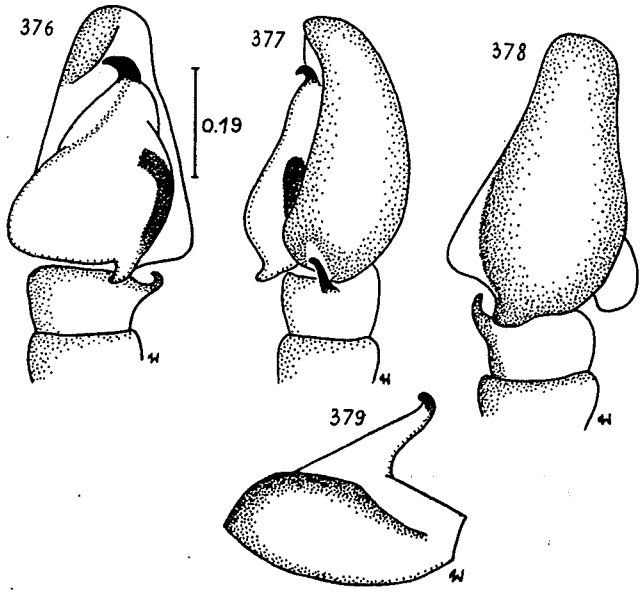
Figs. 365–366. *Heliophanus lawrencei* sp. n., allotype – female. Epigyne and its internal structures.



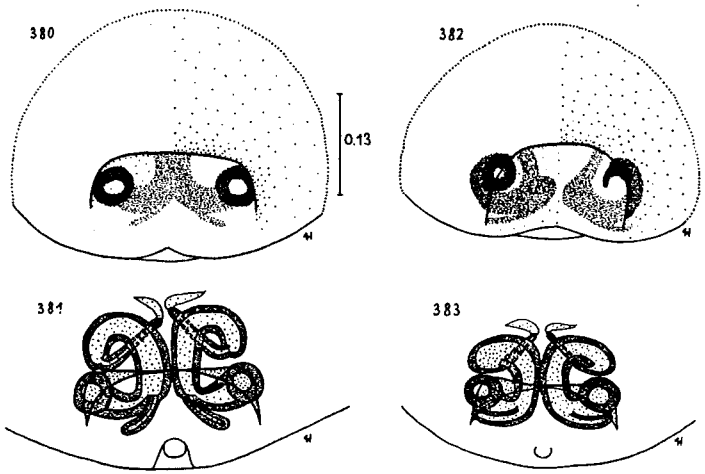
Figs. 367–373. *Heliophanus falcatus* sp. n. – male. 367–370 – holotype: 367–369 – copulatory organ, ventral, lateral and dorsal views, 370 – femoral apophysis. 371–373 – paratype from Zaire: 371 – copulatory organ, ventral view, 372–373 – femoral apophysis, lateral inner and latero-ventral surface views.



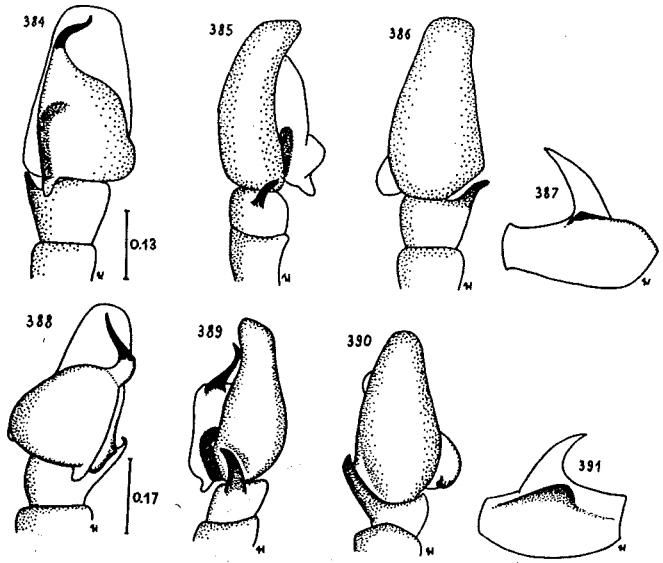
Figs. 374–375. *Heliophanus falcatus* sp. n., allotype – female. Epigyne and its internal structures.



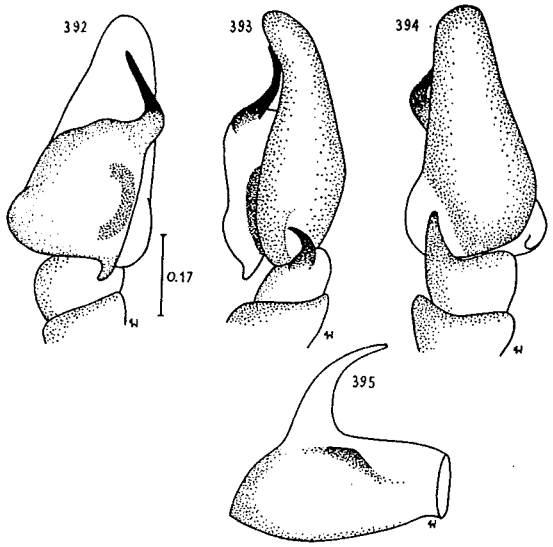
Figs. 376–379. *Heliophanus improcerus* sp. n., paratype (MRAC 130 144) – male: 376–378 – copulatory organ, ventral, lateral and dorsal views, 379 – femoral apophysis.



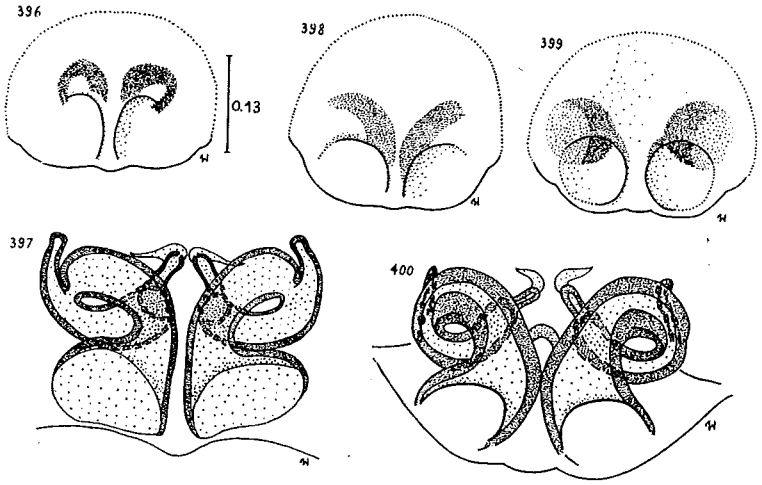
Figs. 380–383. *Heliophanus improcerus* sp. n. – female. Epigyne and its internal structures: 380–381 – paratype (MRAC 130 144), 382–383 – allotype.



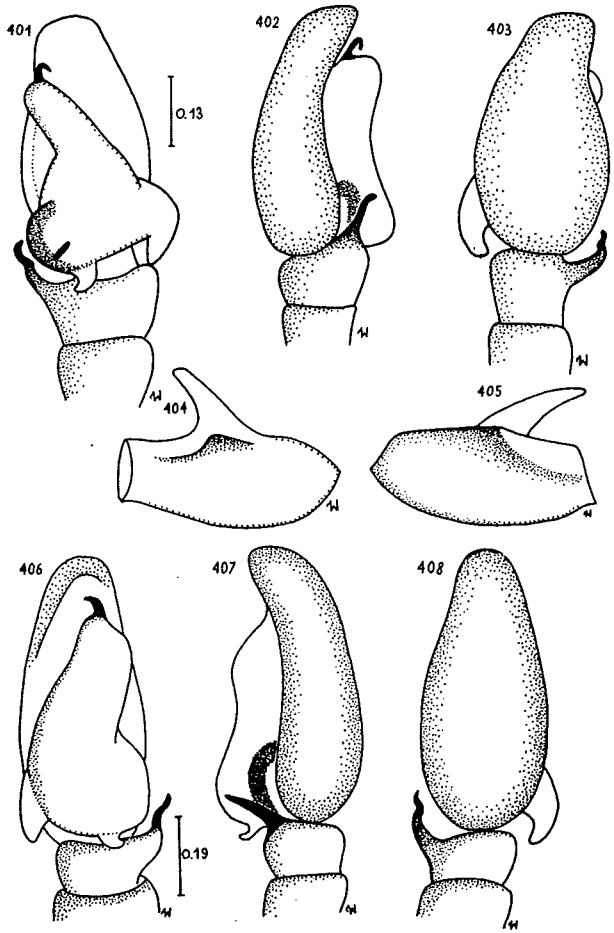
Figs. 384–391. *Heliophanus kankanensis* BERL. et MILL. – male. 384–387 – holotype: 384–386 – copulatory organ, ventral, lateral and dorsal views, 387 – femoral apophysis. 388–391 – MRAC 135 476: 388–390 – copulatory organ, ventral, lateral and dorsal views, 391 – femoral apophysis.



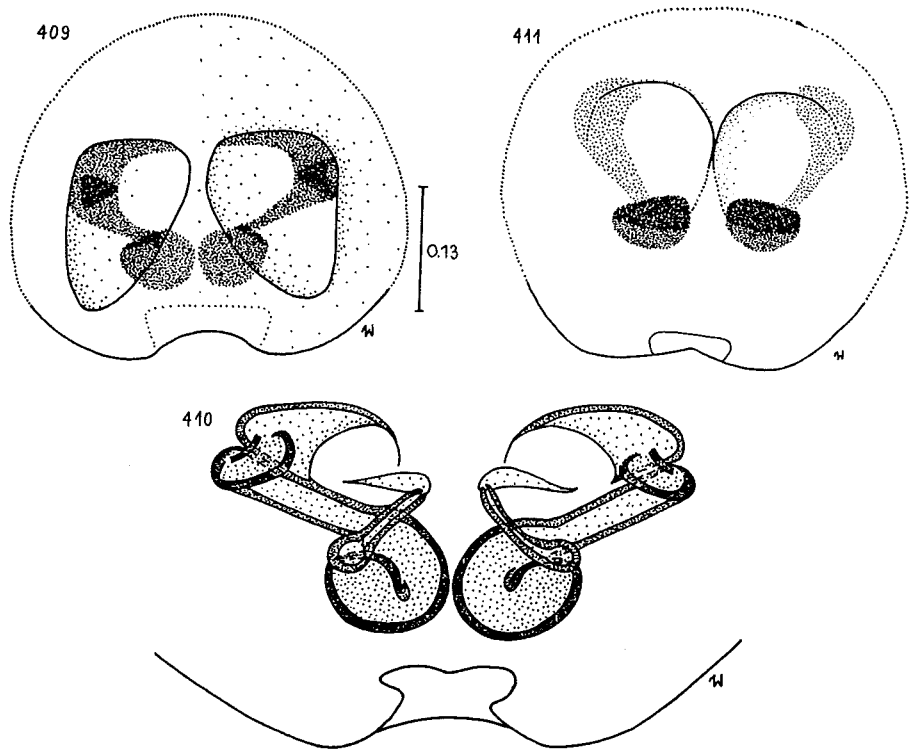
Figs. 392–395. *Heliophanus kankanensis* BERL. et MILL. – male (specimen from Angola): 392–394 – copulatory organ, ventral, lateral and dorsal views, 395 – femoral apophysis.



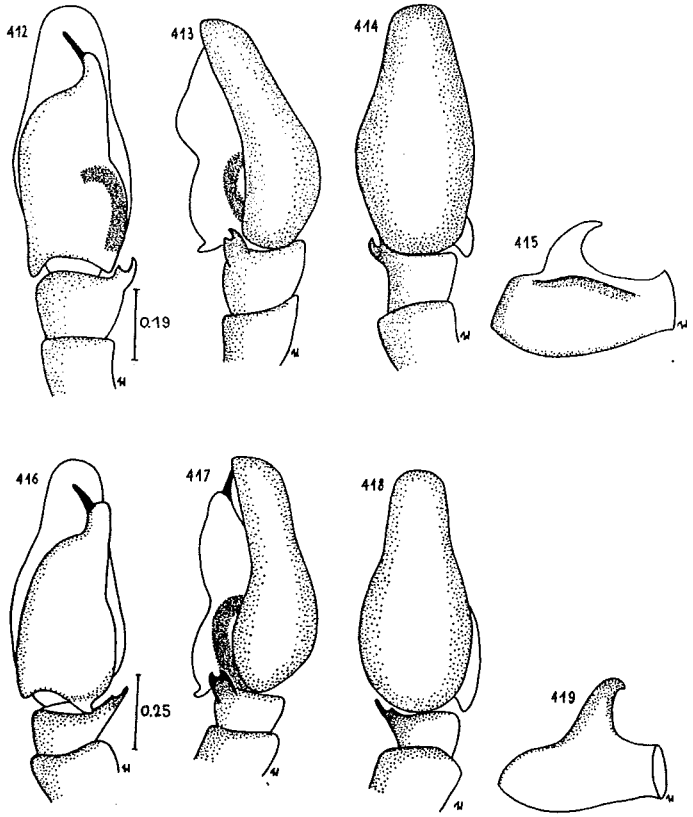
Figs. 396–400. *Heliophanus kankanensis* BERL. et MILL. – female. Epigyne and its internal structures: 396–397 – paratype, 398 – MRAC 135 534, 399–400 – MRAC 135 476.



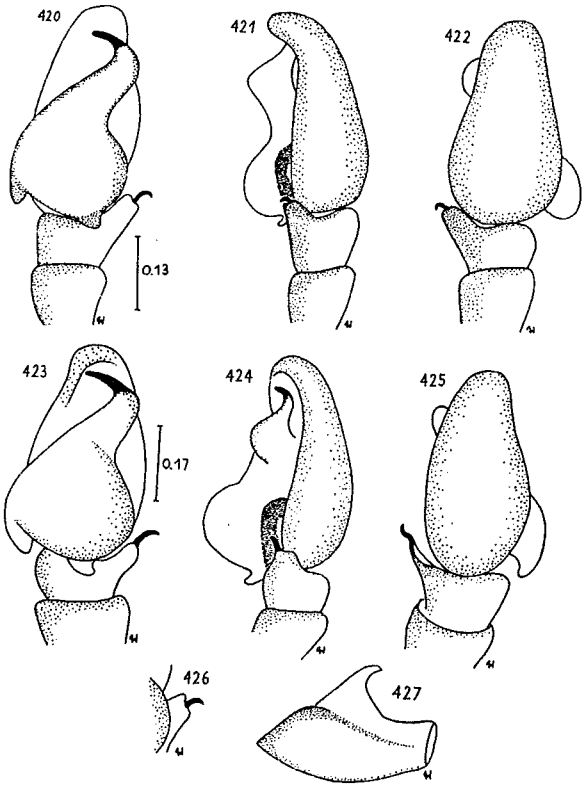
Figs. 401–408. *Heliophanus mauricianus* SIM. – male. 401–404 – lectotype: 401–403 – copulatory organ, ventral, lateral and dorsal views, 404 – femoral apophysis. 405–408 – MRAC 146 285: 405 – femoral apophysis, 406–408 – copulatory organ, ventral, lateral and dorsal views.



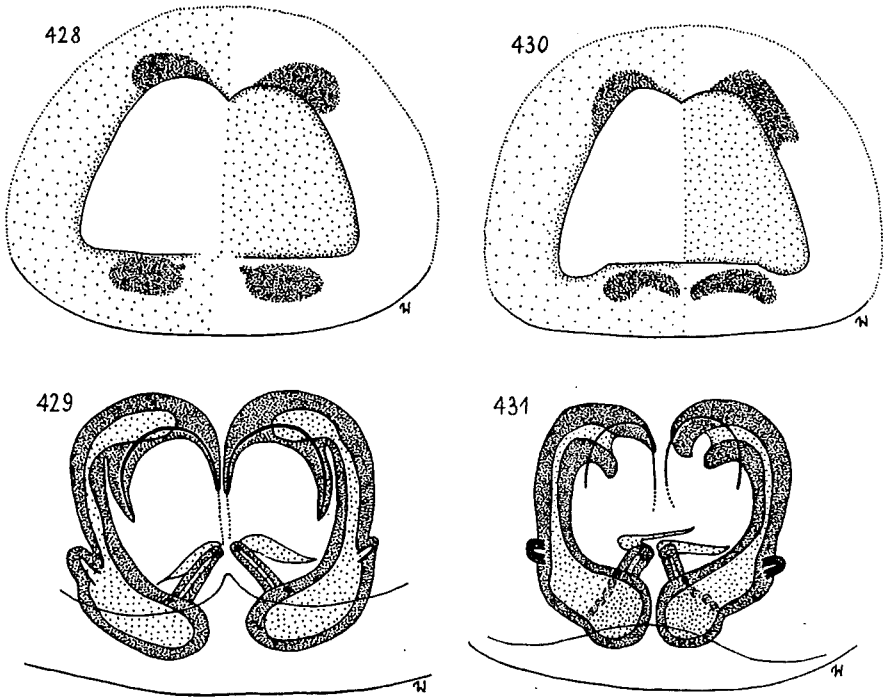
Figs. 409–411. *Heliophanus mauricianus* SIM. – female. Epigyne and its internal structures: 409–410 – specimen from Mauritius, 411 – specimen from Reunion.



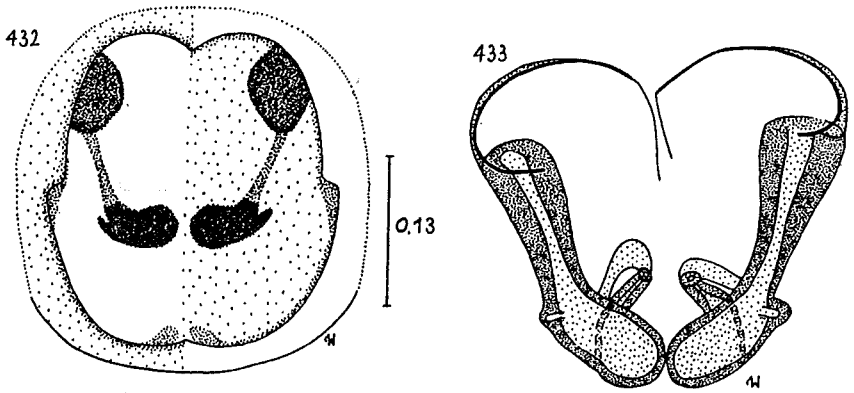
Figs. 412–419. *Heliophanus imerinensis* SIM. – male. 412–415 – lectotype: 412–414 – copulatory organ, ventral, lateral and dorsal views, 415 – femoral apophysis. 416–419 – MNHN 22 242: 416–418 – copulatory organ, ventral, lateral and dorsal views, 419 – femoral apophysis.



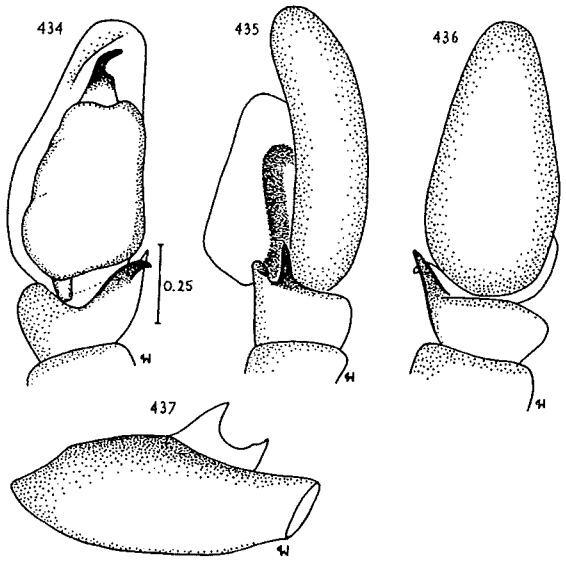
Figs. 420–427. *Heliophanus hamifer* SIM. – male. 420–422 – MNHN 1310, copulatory organ, ventral, lateral and dorsal views. 423–427 – MRAC 142 755, 423–425 – copulatory organ, ventral, lateral and dorsal views, 426 – details of tibial apophysis, 427 – femoral apophysis.



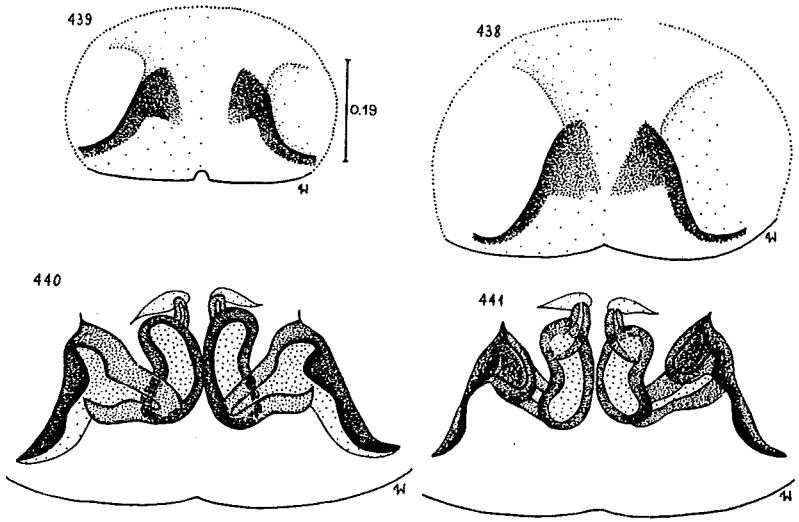
Figs. 428–431. *Heliophanus hamifer* SIM. – female (MNHN 7554 and 20 239). Epigyne and its internal structures.



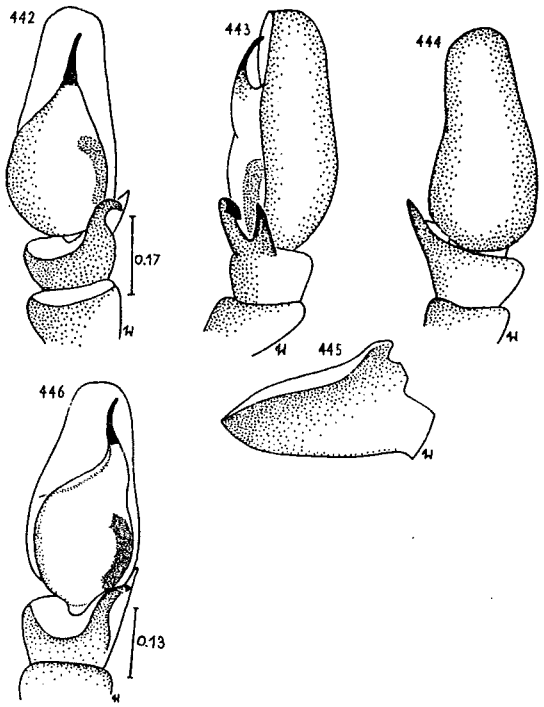
Figs. 432–433. *Heliophanus innominatus* sp. n., holotype – female. Epigyne and its internal structures.



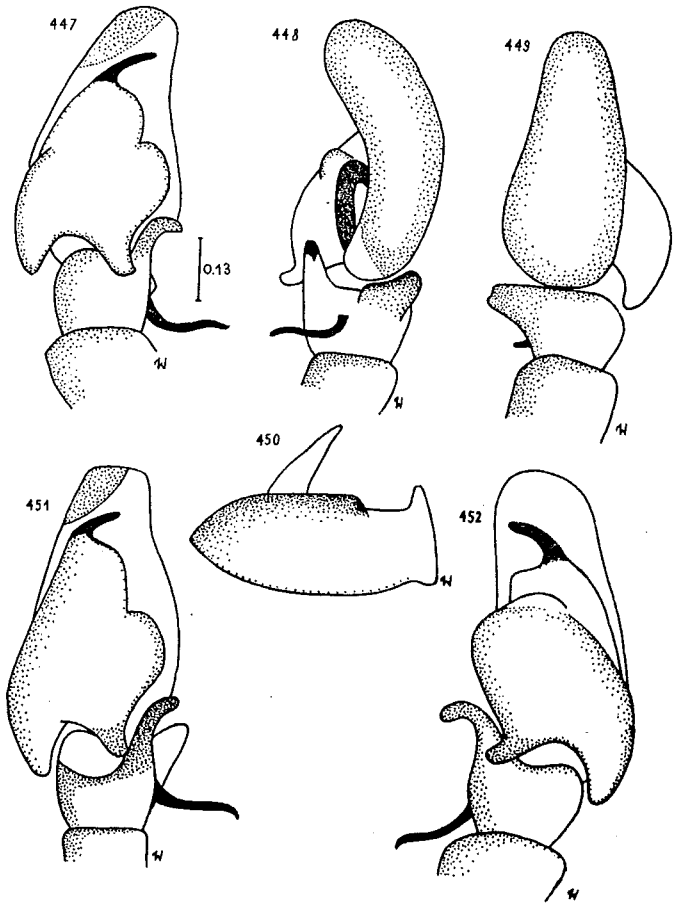
Figs. 434–437. *Heliophanus gladiator* sp. n., holotype – male: 434–436 – copulatory organ, ventral, lateral and dorsal views, 437 – femoral apophysis.



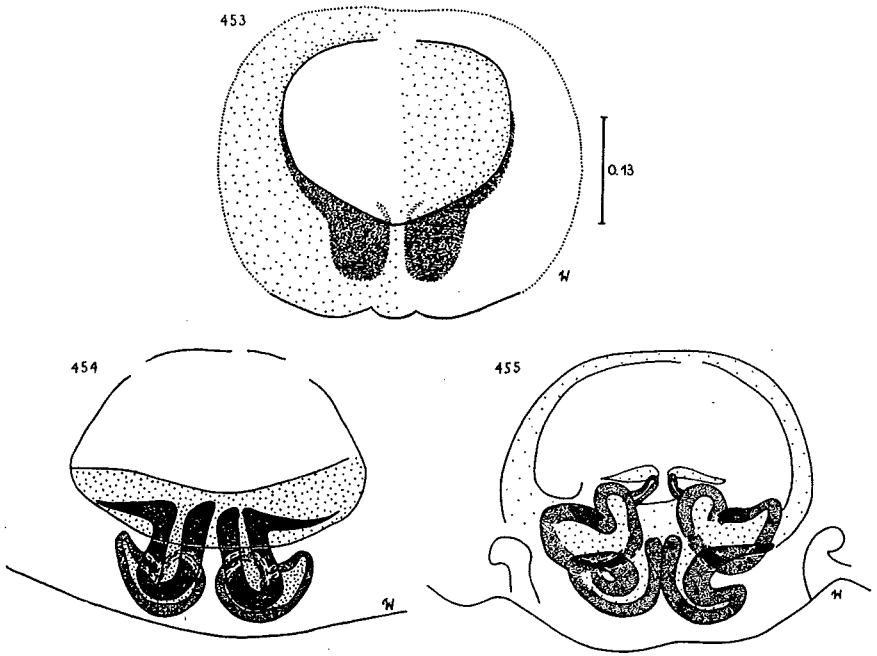
Figs. 438–441. *Heliophanus gladiator* sp. n., paratypes – female. Epigyne and its internal structures, ventral and dorsal views: 438 – ZIU 314, 439–441 – ZIU 168.



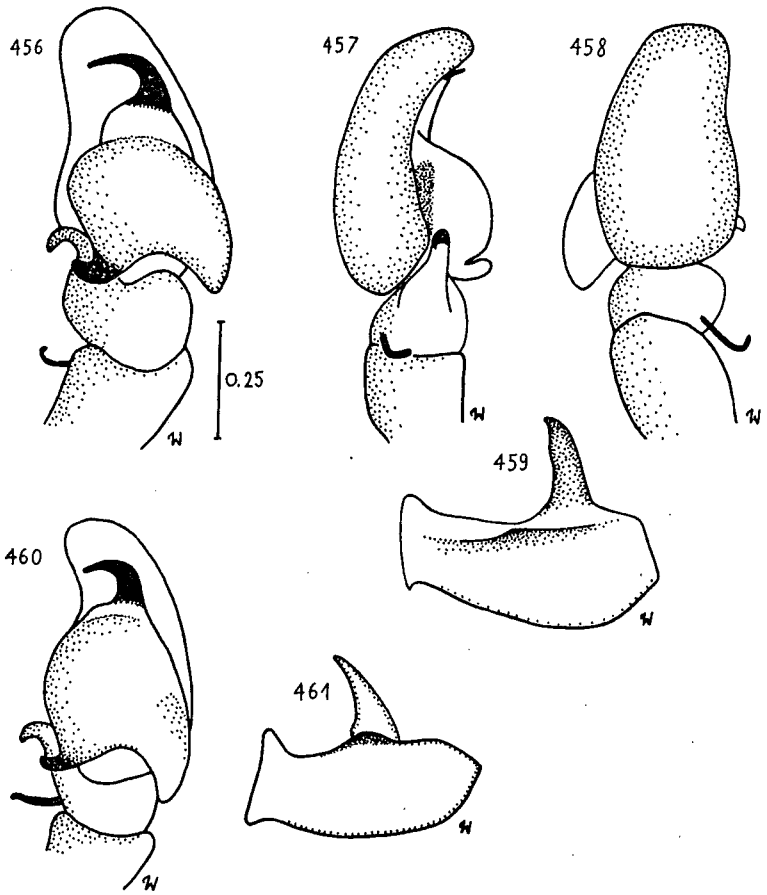
Figs. 442–446. *Heliophanus pratti* Pkh. et Pkh. – male. 442–445 – holotype: 442–444 – copulatory organ, ventral, lateral and dorsal views, 445 – femoral apophysis. 446 – SAM 427, copulatory organ, ventral view.



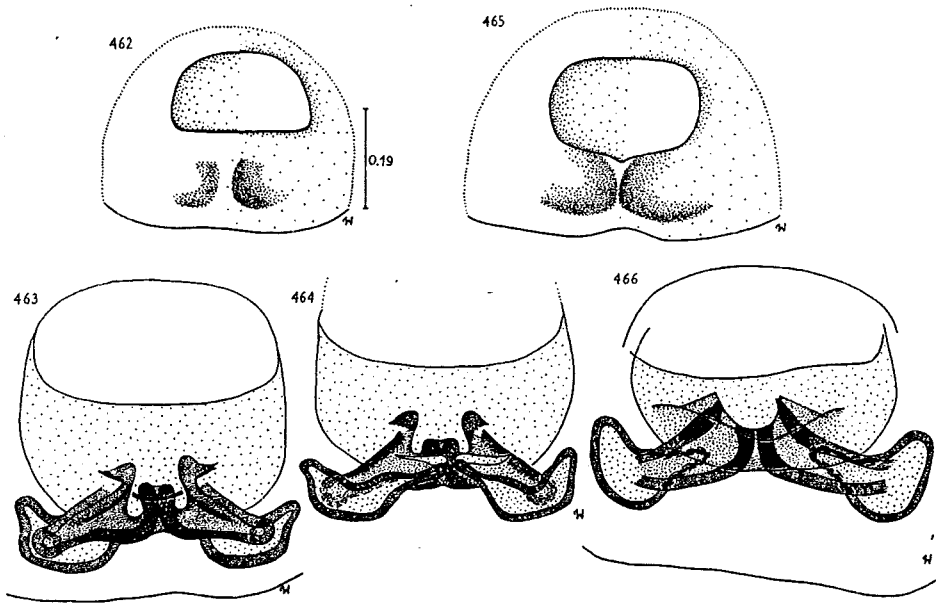
Figs. 447–452. *Heliophanus apiatus* Sim. – male. 447–450 – CRB specimen: 447–449 – copulatory organ, ventral, lateral and dorsal views, 450 – femoral apophysis. 451 – lectotype, copulatory organ, ventro-lateral view. 452 – specimen from Sardinia (CJW), copulatory organ, ventral view.



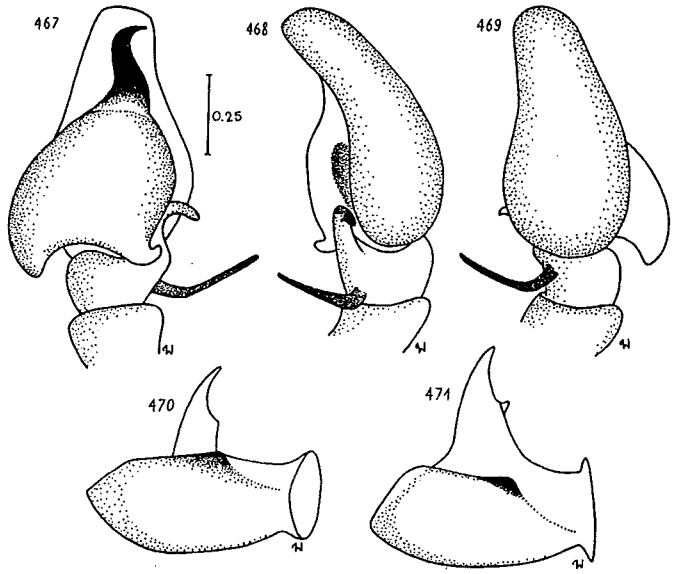
Figs. 453–455. *Heliophanus apiatus* SIM. – female. Epigyne and its internal structures: 453–454 – paralectotype, 455 – SMF 9328.



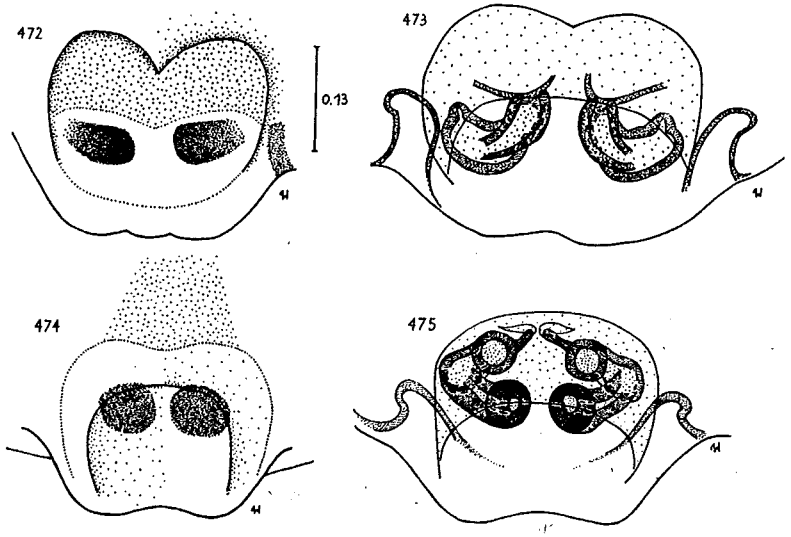
Figs. 456–461. *Heliophanus encifer* SIM. – male. 456–459 – syntype of *Salticus facetus* O. P.-CAMB.: 456–458 – copulatory organ, ventral, lateral and dorsal views, 459 – femoral apophysis. 460–461 – specimen from Cyprus: 460 – copulatory organ, ventral view, 461 – femoral apophysis.



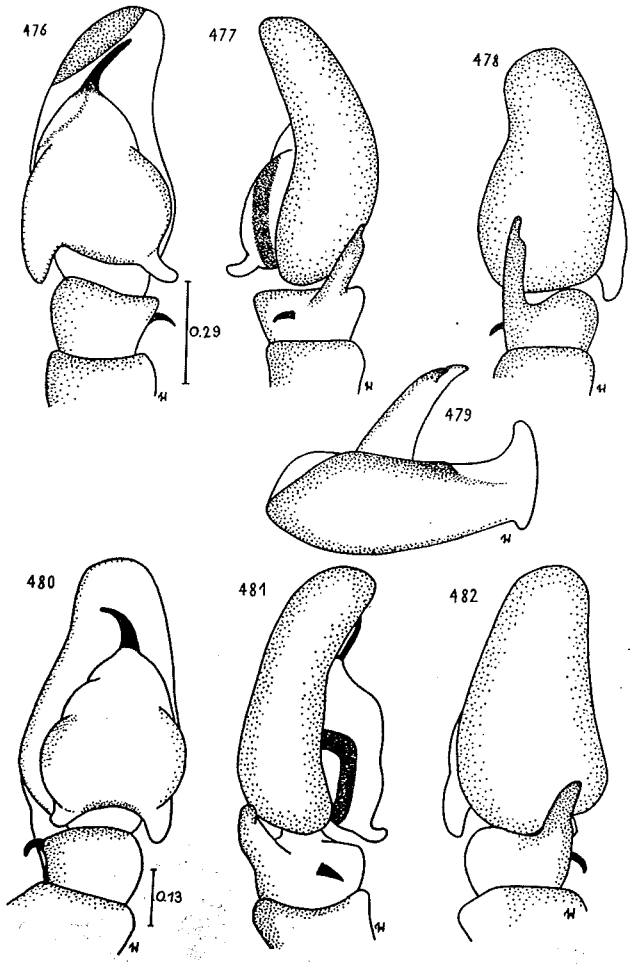
Figs. 462–466. *Heliophanus encifer* SIM. – female. Epigyne and its internal structures, ventral and dorsal views: 462–464 – specimen from Syria, 465–466 – syntype of *Salticus facetus* O.P.-CAMB.



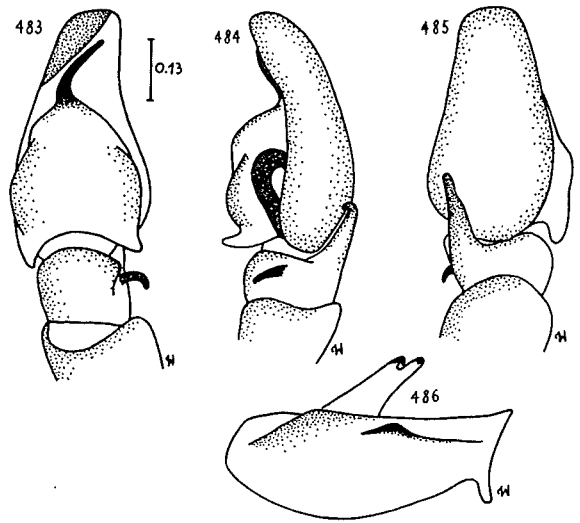
Figs. 467–471. *Heliophanus creticus* GILTAY – male. 467–470 – paratype: 467–469 – copulatory organ, ventral, lateral and dorsal views, 470 – femoral apophysis. 471 – CJW specimen, femoral apophysis.



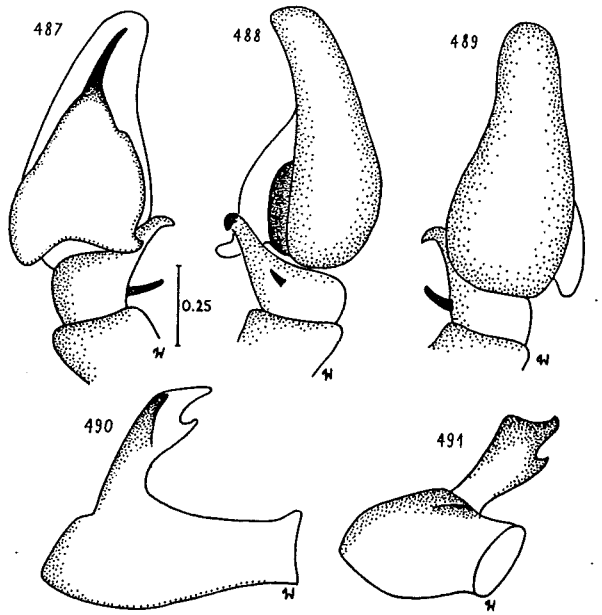
Figs. 472–475. *Heliophanus creticus* GILTAY – female (CJW). Epigyne and its internal structures. 473 – spermathecae in an unnatural position.



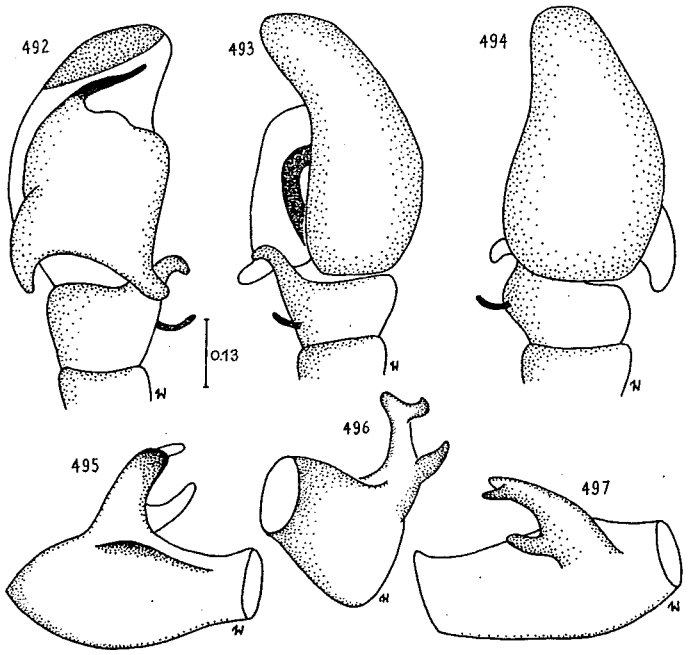
Figs. 476–482. *Heliophanus mordax* (O. P.-Camb.) – male. 476–479 – specimen from Afghanistan: 476–478 – copulatory organ, ventral, lateral and dorsal views, 479 – femoral apophysis. 480–482 – holotype, copulatory organ, ventral, lateral and dorsal views.



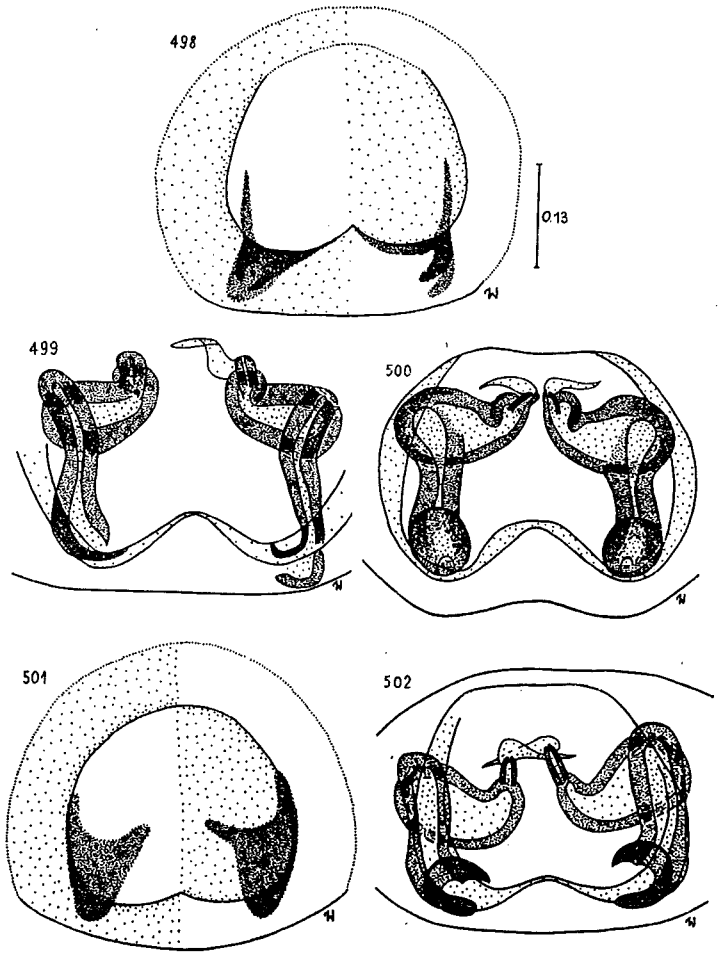
Figs. 483–486. *Heliophanus mordax* (O. P.-Camb.), syntype of *Salticus dentatidens* O. P.-Camb. – male: 483–485 – copulatory organ, ventral, lateral and dorsal views, 486 – femoral apophysis.



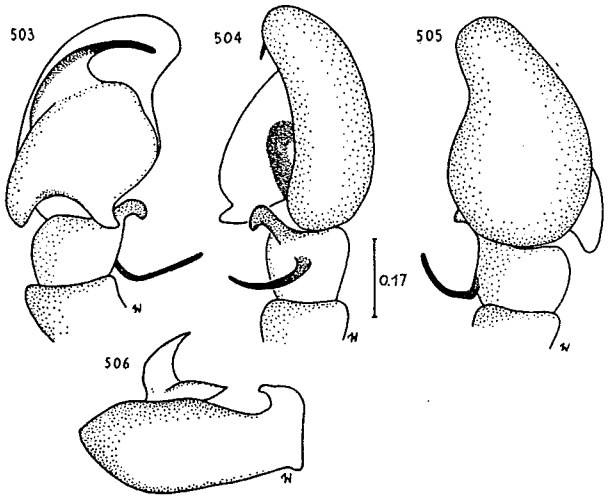
Figs. 487–491. *Heliophanus conspicuus* sp. n., holotype – male: 487–489 – copulatory organ, ventral, lateral and dorsal views, 490–491 – femoral apophysis, lateral inner and latero-ventral surface views.



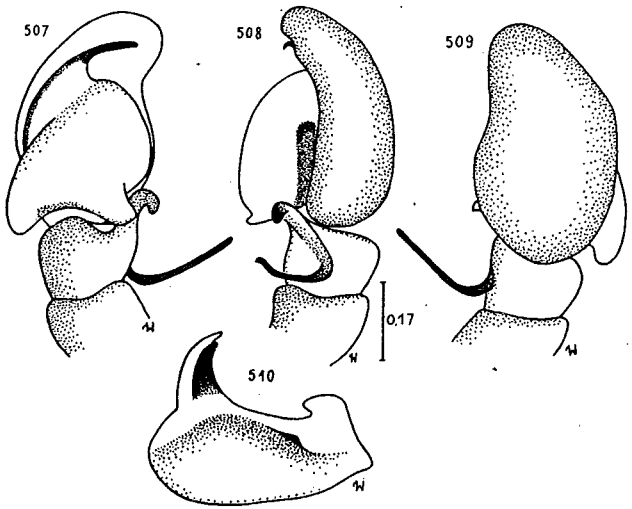
Figs. 492–497. *Heliophanus tribulosus* SIM. – male (MNHN 24 807): 492–494 – copulatory organ, ventral, lateral and dorsal views, 495–497 – femoral apophysis, lateral inner, ventral and outer surface views.



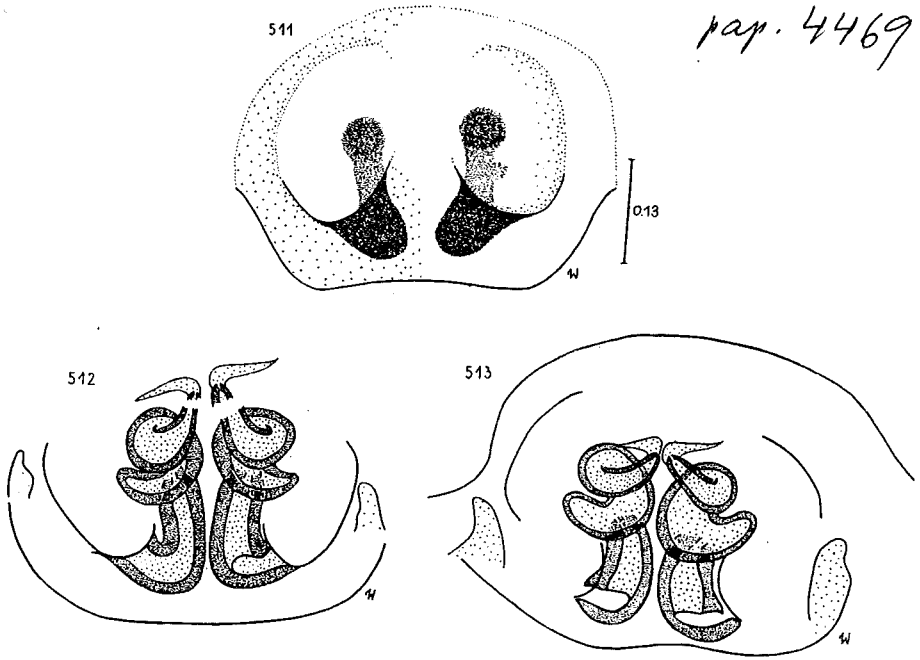
Figs. 498–502. *Heliophanus tribulosus* SIM. – female. Epigyne and its internal structures: 498–499 – syntype of *Heliophanus pubescens* DENIS, 500 – MNHN 477, 501–502 – specimen from Syria.



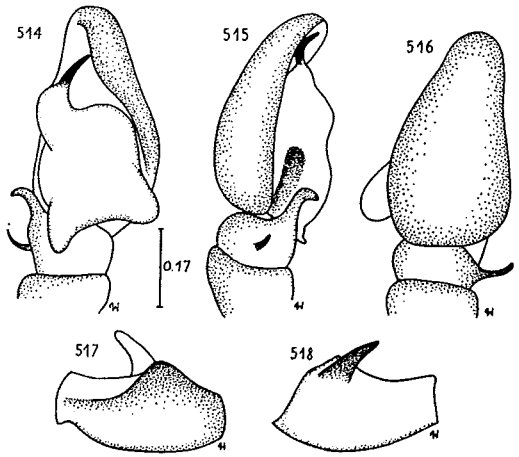
Figs. 503–506. *Heliophanus ramosus* sp. n., holotype – male: 503–505 – copulatory organ, ventral, lateral and dorsal views, 506 – femoral apophysis.



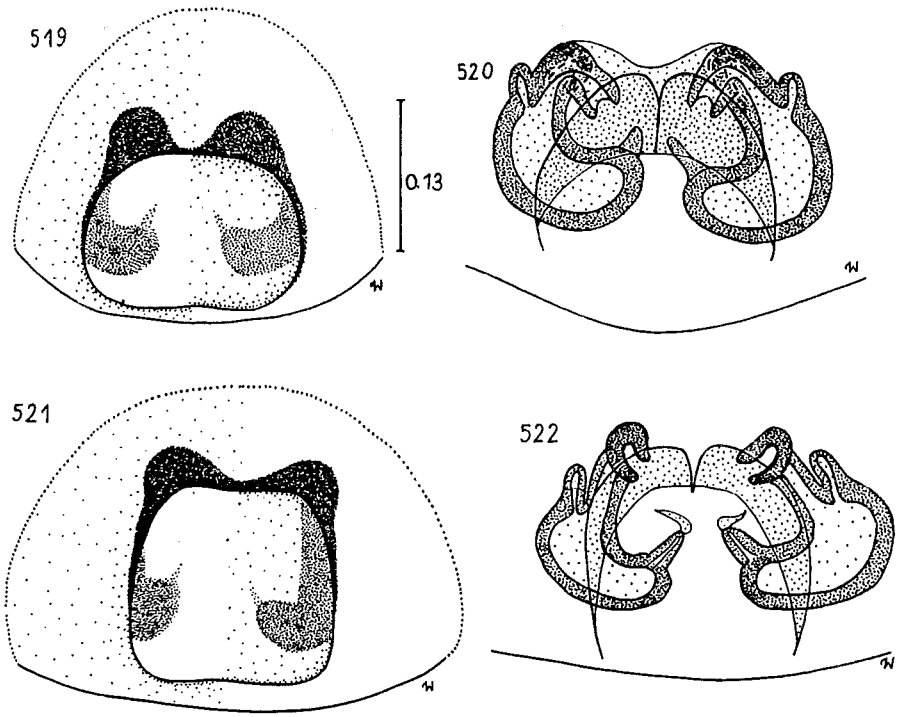
Figs. 507–510. *Heliophanus stylifer* SIM., holotype – male: 507–509 – copulatory organ, ventral, lateral and dorsal views, 510 – femoral apophysis.



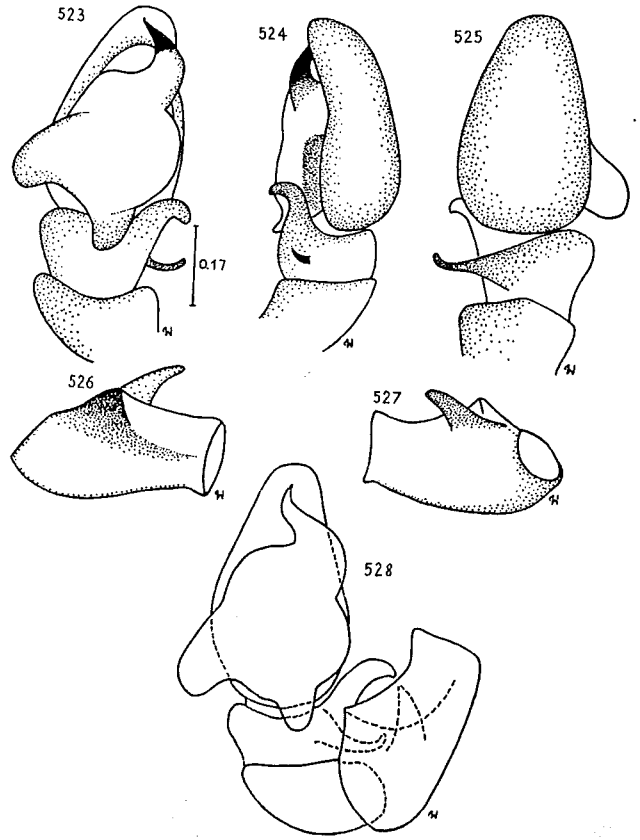
Figs. 511–513. *Heliophanus stylifer* SIM. – female. Epigyne and its internal structures: 511–512 – MNHN 879 (insignificantly damaged), 513 – MNHN 13 890.



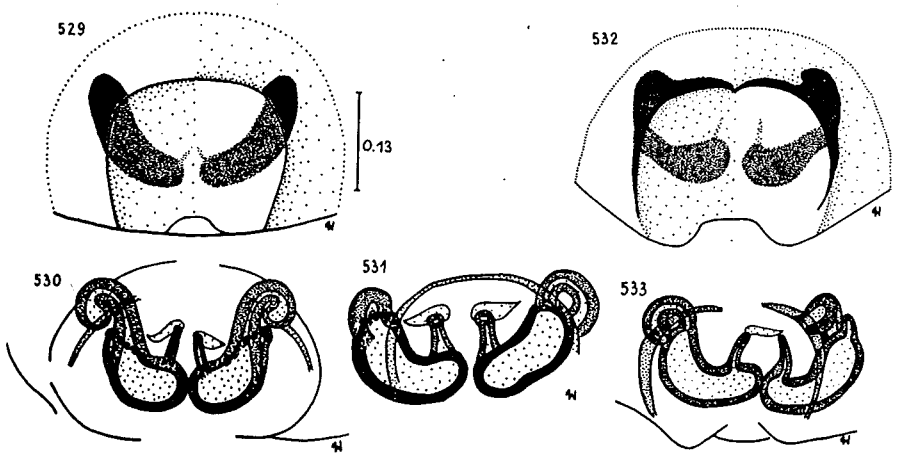
Figs. 514–518. *Heliophanus ussuricus* KULCZ. – male: 515–516 – copulatory organ, ventral, lateral and dorsal views, 517–518 – femoral apophysis, lateral inner and outer surface views.



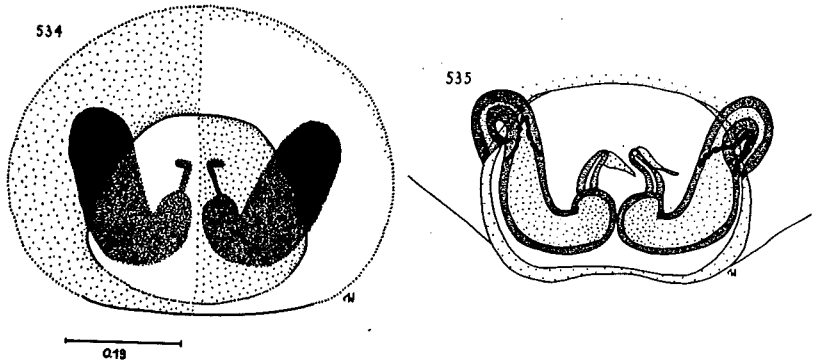
Figs. 519–522. *Heliophanus ussuricus* KULCZ. – female. Epigyne and its internal structures.



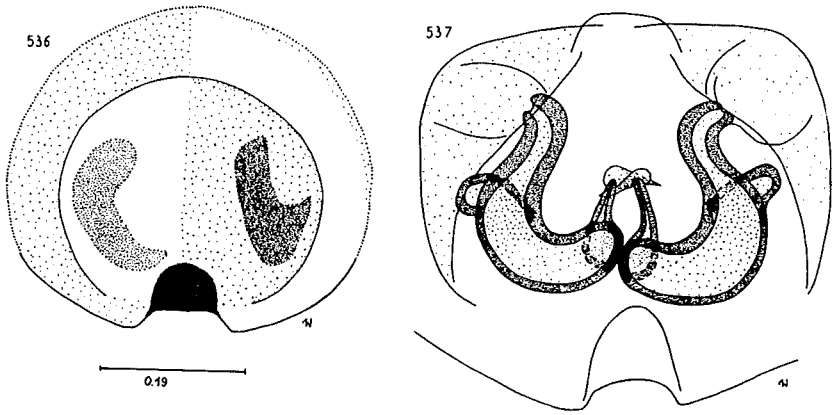
Figs. 523–528. *Heliophanus dampfi* SCHKL. – male. 523–527 – IRSN specimen: 523–525 – copulatory organ, ventral, lateral and dorsal views, 526–527 – femoral apophysis, lateral inner and outer surface views. 528 – MNHU 17 596 (prep. DAHL), ventral view of pedipalp.



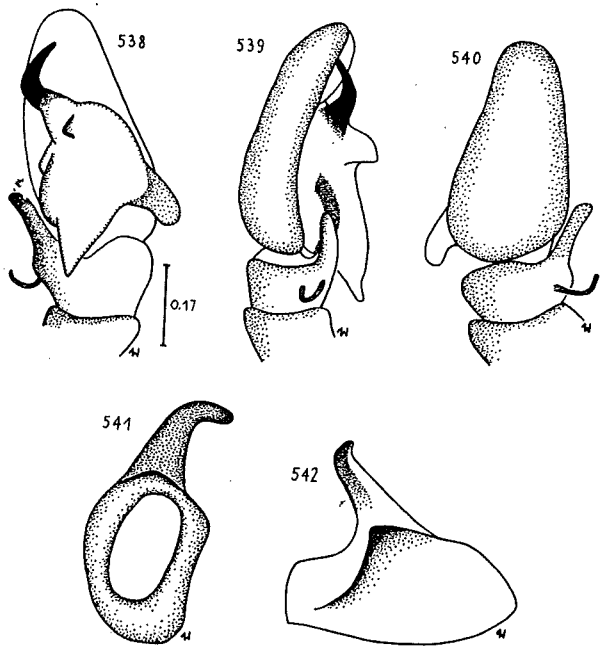
Figs. 529–533. *Heliophanus dampfi* SCHKL. – female. Epigyne and its internal structures: 529–530 – MNHU 11 469, 531 – syntype of *Heliophanus mariae* DAHL, 532–533 – NMB 2177d.



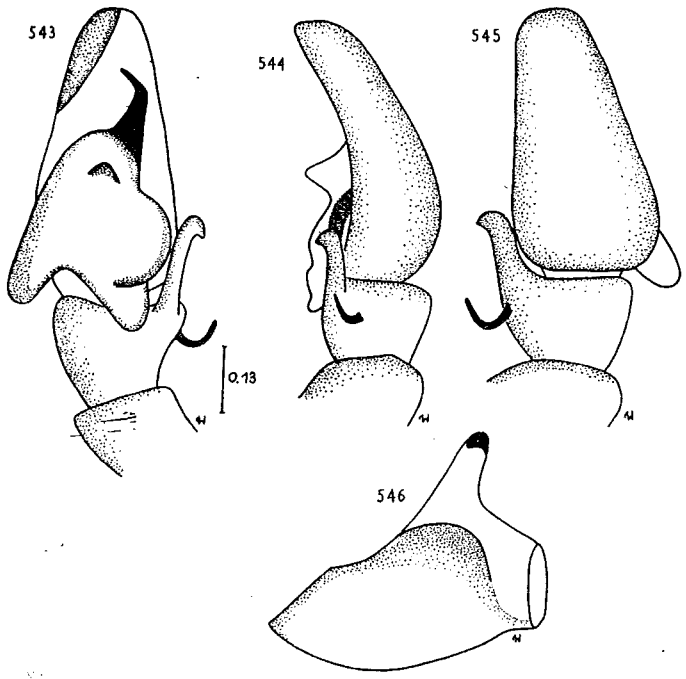
Figs. 534–535. *Heliophanus camtschadalicus* KULCZ., holotype – female. Epigyne and its internal structures.



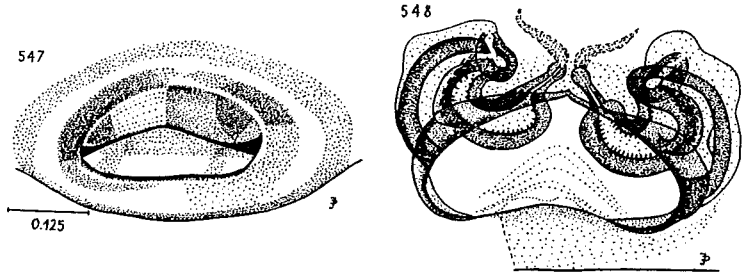
Figs. 536–537. *Heliophanus baicalensis* KULCZ., holotype – female. Epigyne and its internal structures.



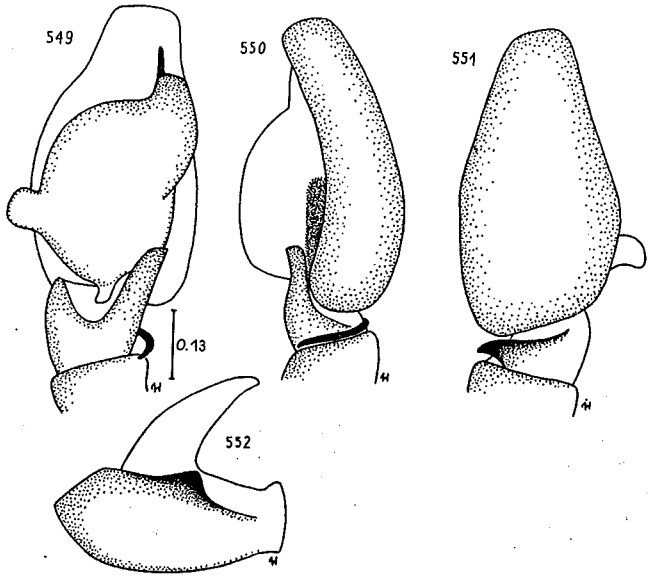
Figs. 538–542. *Heliophanus curvidens* (O. P.-CAMB.), holotype – male: 538–540 – copulatory organ, ventral, lateral and dorsal views, 541–542 – femoral apophysis, ventral and lateral inner surface views.



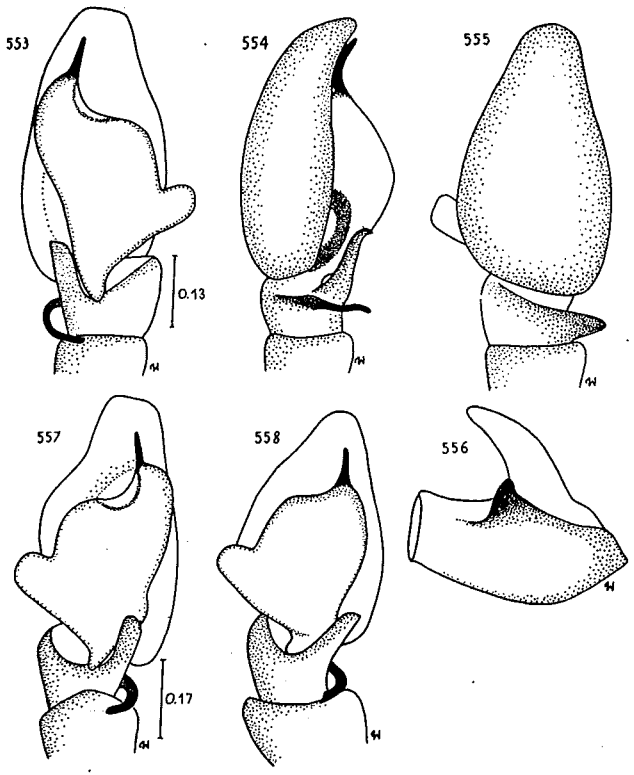
Figs. 543–546. *Heliophanus curvidens* (O. P.-CAMB.), holotype of *Heliophanus berlandi* SCHKL. – male: 543–545 – copulatory organ, ventral, lateral and dorsal views, 546 – femoral apophysis.



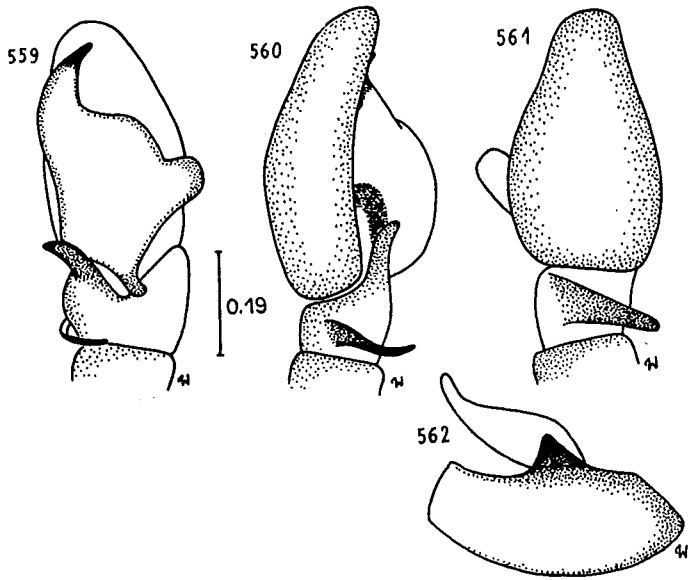
Figs. 547–548. *Heliophanus curvidens* (O. P.-CAMB.) – female. Epigyne and its internal structures (after PRÓSZYŃSKI 1982).



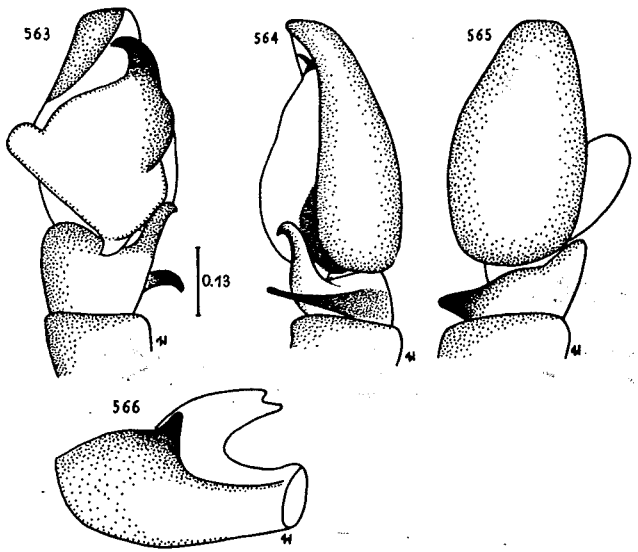
Figs. 549–552. *Heliophanus decoratus* L. KOCH – male (MNHN 12 193): 549–551 – copulatory organ, ventral, lateral and dorsal views, 552 – femoral apophysis.



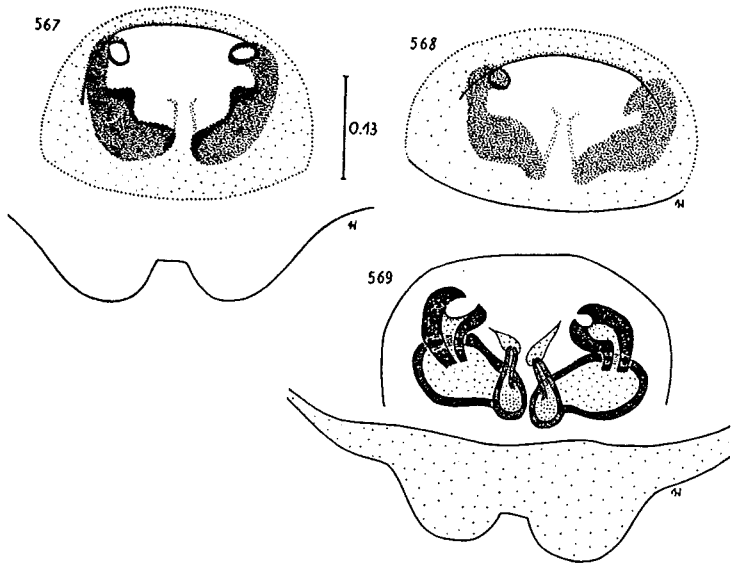
Figs. 553–558. *Heliophanus decoratus* L. Koch and *H. glaucus* Bös. et Lenz – males. 553–556 – *H. decoratus* (MNHN 1247): 553–555 – copulatory organ, ventral, lateral and dorsal views, 556 – femoral apophysis. 557 – *H. decoratus* (HDZ specimen), copulatory organ, ventral view. 558 – *H. glaucus*, syntype of *Heliophanus albescens* Denis, copulatory organ, ventral view.



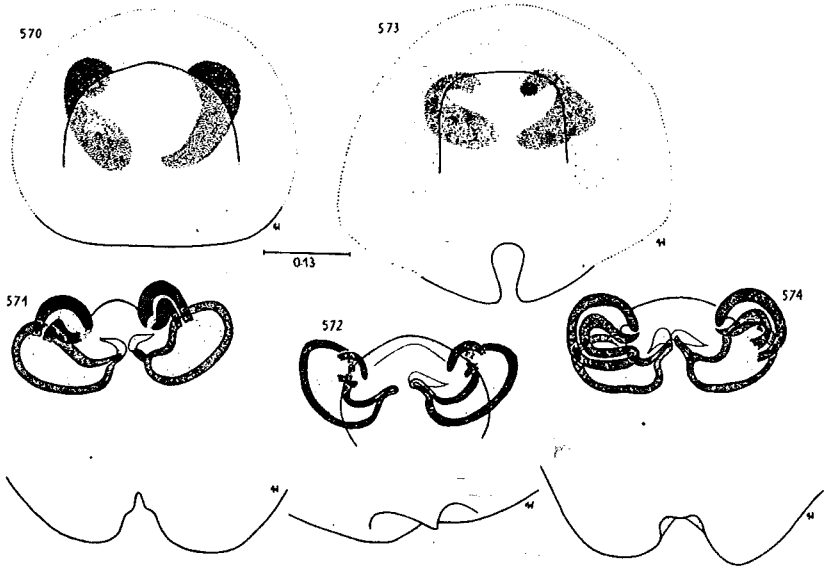
Figs. 559–562. *Heliophanus decoratus* L. Koch – male (MNHN 6140): 559–561 – copulatory organ, ventral, lateral and dorsal views, 562 – femoral apophysis.



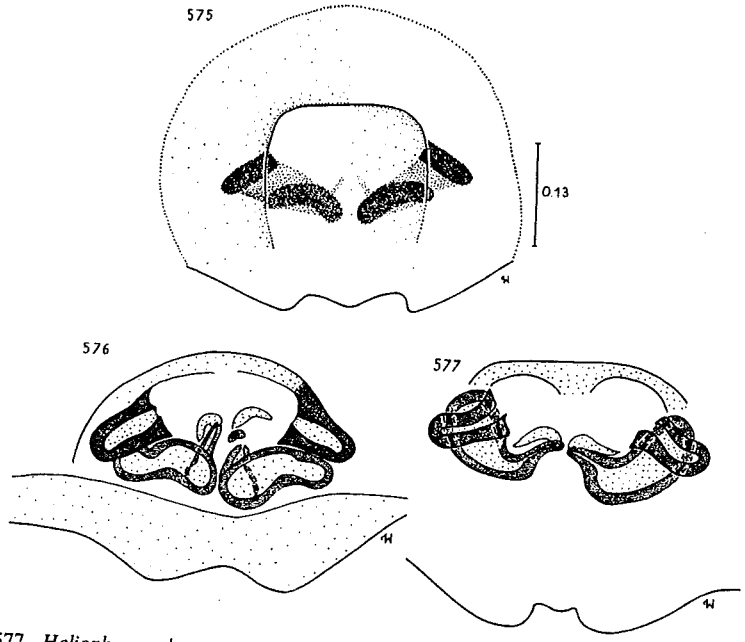
Figs. 563–566. *Heliophanus decoratus* L. Koch – male (specimen from Djibouti): 563–565 – copulatory organ, ventral, lateral and dorsal views, 566 – femoral apophysis.



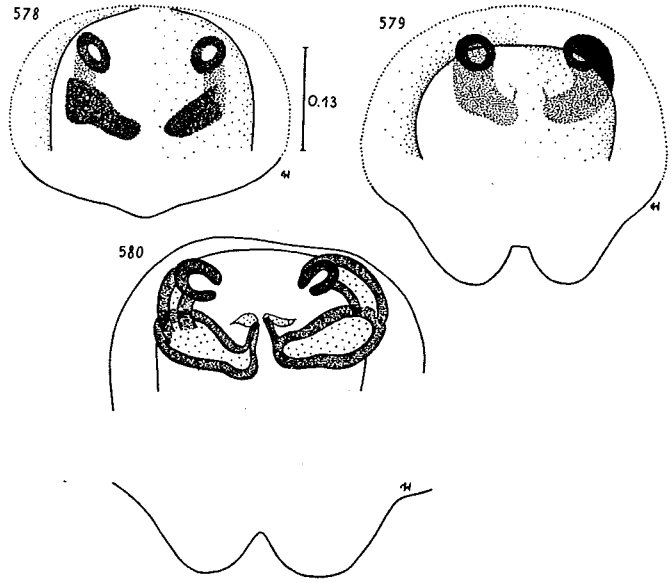
Figs. 567–569. *Heliophanus glaucus* Bös. et Lenz – female. Epigyne and its internal structures: 567 – holotype, 568–569 – syntype of *Heliophanus albescens* Denis.



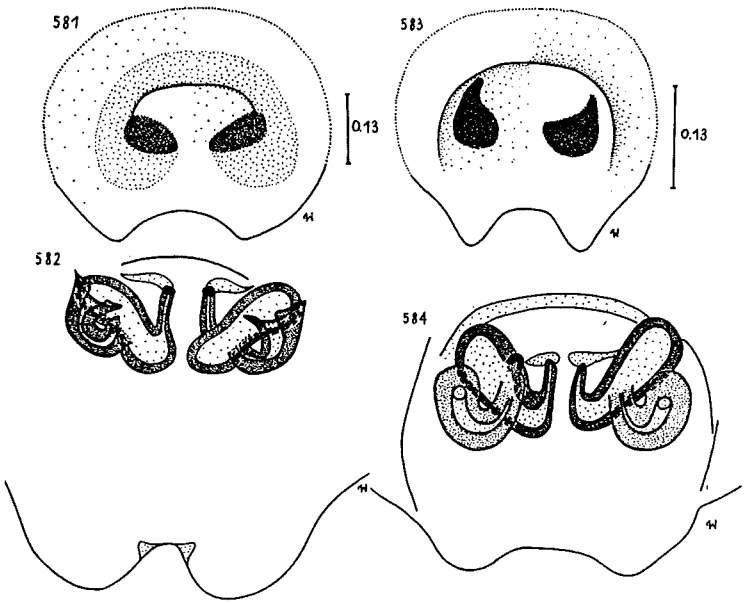
Figs. 570–574. *Heliophanus decoratus* L. Koch – female. Epigyne and its internal structures: 570–571 – MNHN 12 193, 572 – MNHN 19 963, 573–574 – MNHN 13 213.



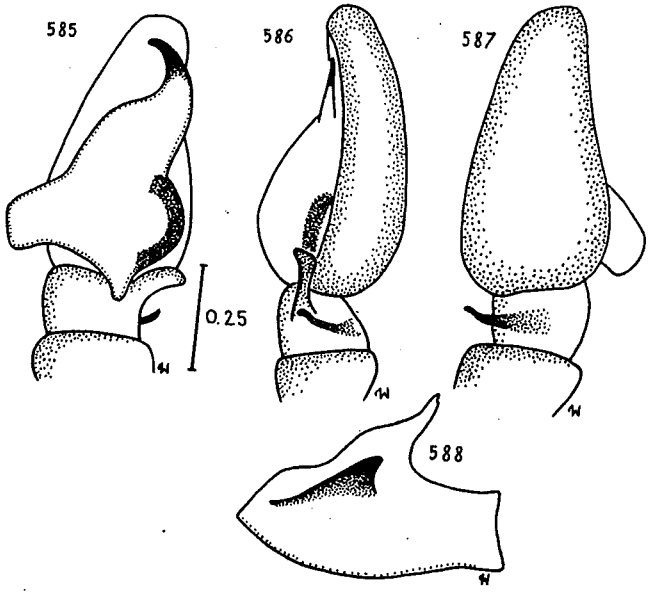
Figs. 575–577. *Heliophanus decoratus* L. Koch – female (MNHN 1247). Epigyne and its internal structures.



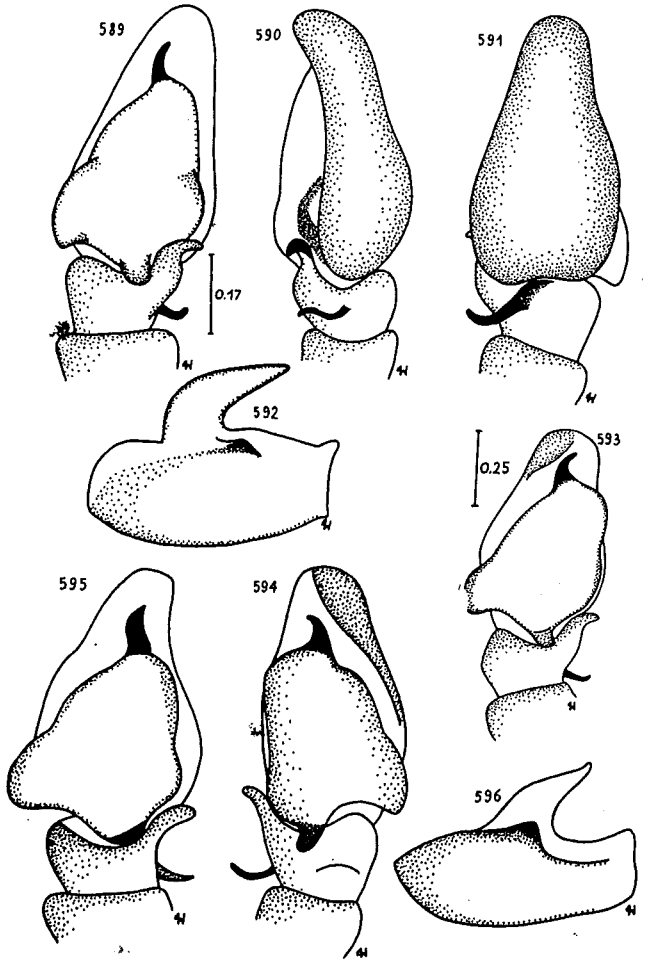
Figs. 578–580. *Heliophanus decoratus* L. Koch, holotype of *Heliophanus senussus* Cap. – female. Epigyne and its internal structures: 578–579 – the same epigyne, small change of inclination.



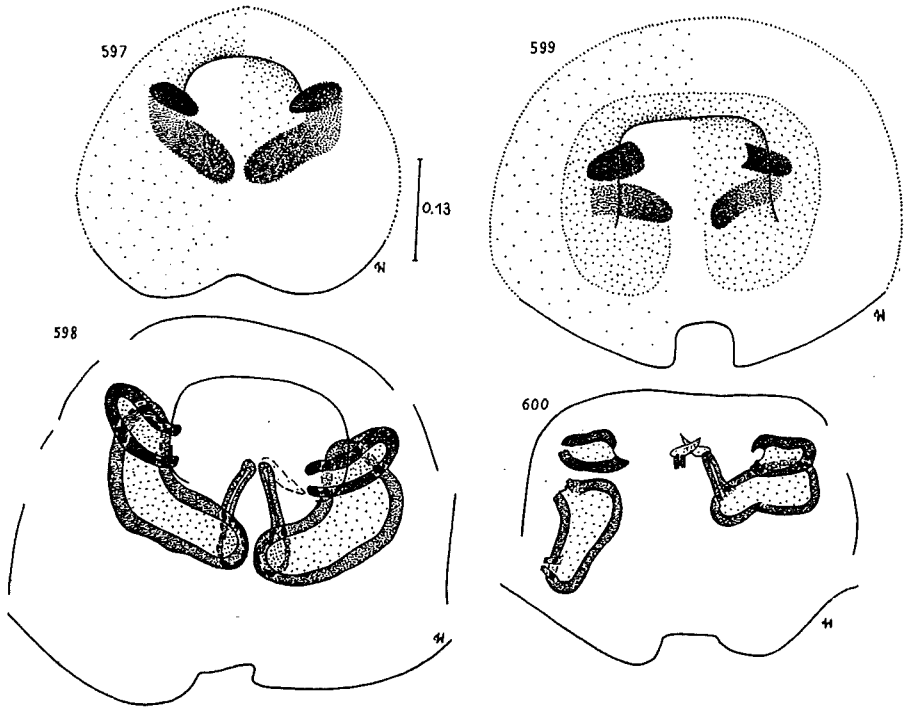
Figs. 581–584. *Heliophanus decoratus* L. Koch – female. Epigyne and its internal structures: 581–582 – MNHN 6140, 583–584 – MZS specimen.



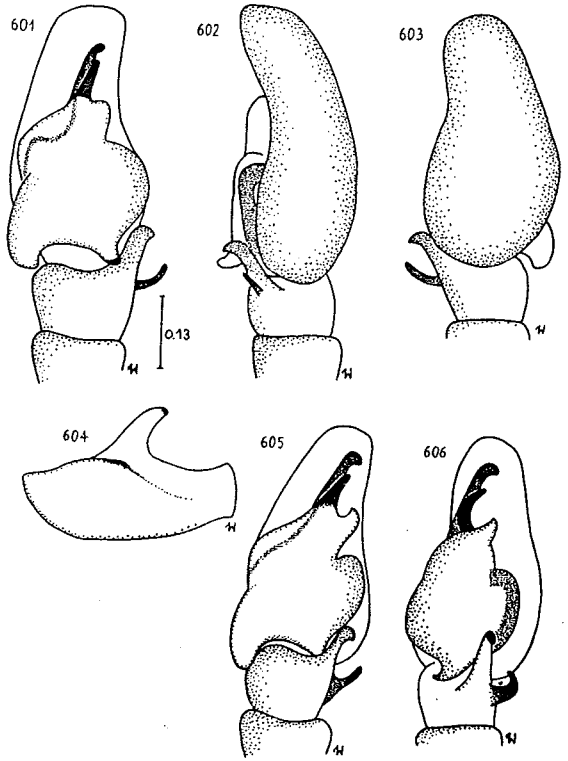
Figs. 585–588. *Heliophanus ibericus* sp. n., holotype – male: 585–587 – copulatory organ, ventral, lateral and dorsal views, 588 – femoral apophysis.



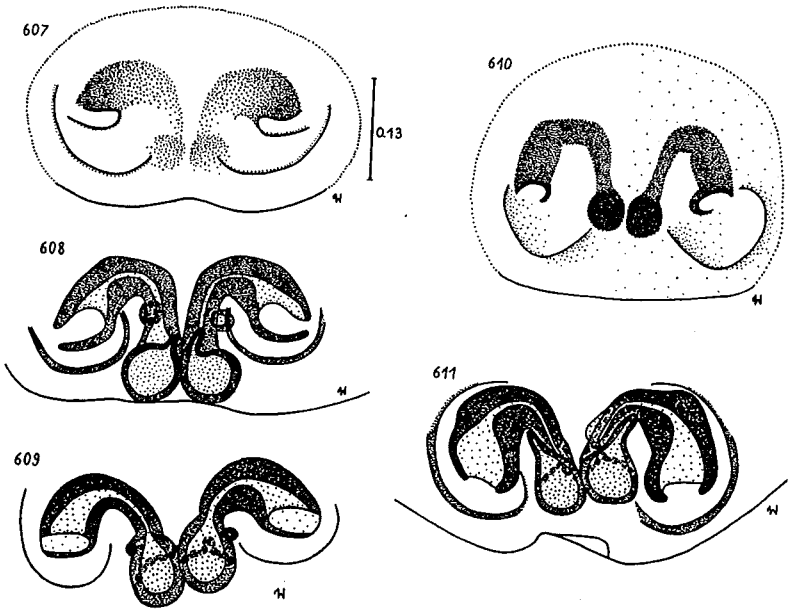
Figs. 589–596. *Heliophanus agricola* sp. n., paratypes – male. 589–592 – NR specimen: 589–591 – copulatory organ, ventral, lateral and dorsal views, 592 – femoral apophysis. 593 – IZ PAN specimen, copulatory organ, ventral view. 594 – MNHN 12 686, copulatory organ, ventral view. 595–596 – MNHN 22 599: 595 – copulatory organ, ventral view, 596 – femoral apophysis.



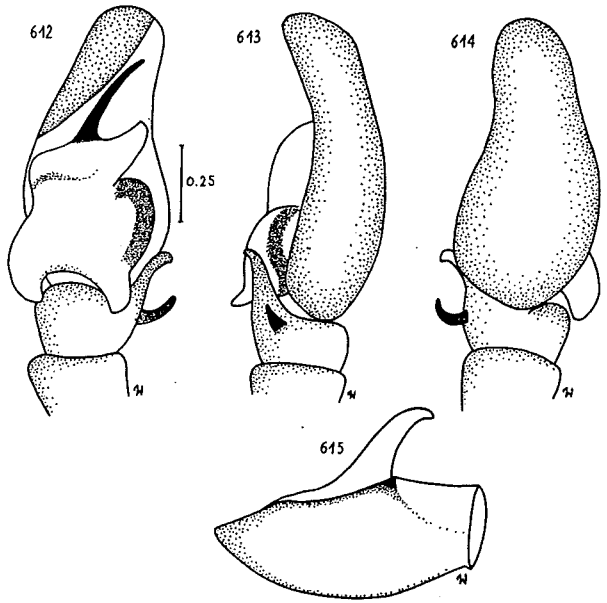
Figs. 597–600. *Heliophanus agricola* sp. n. – female. Epigyne and its internal structures: 597–598 – allotype, 599–600 – paratype from Algeria (partially damaged).



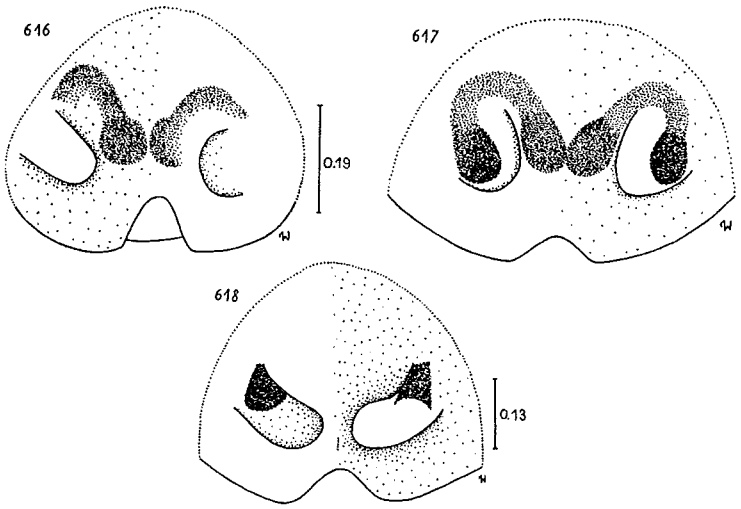
Figs. 601–606. *Heliophanus simplex* SIM. – male. 601–604 – specimen from Corfu: 601–603 – copulatory organ, ventral, lateral and dorsal views, 604 – femoral apophysis. 605–606 – specimen from Soviet Union, copulatory organ, ventral and ventro-lateral views.



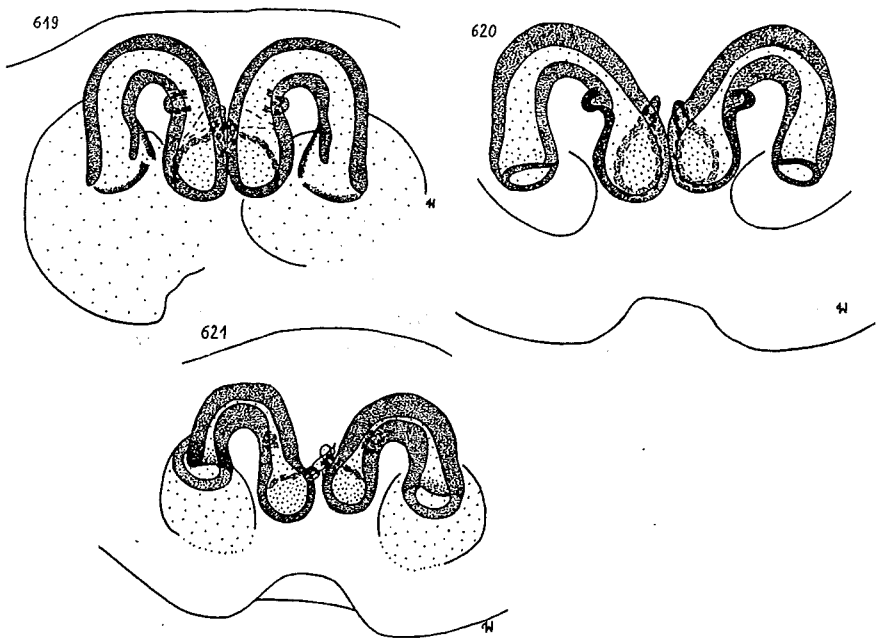
Figs. 607–611. *Heliophanus simplex* SIM. – female. Epigyne and its internal structures: 607–608 – NHMW specimen, 609 – specimen from Turkey, 610–611 – MNHN 2321.



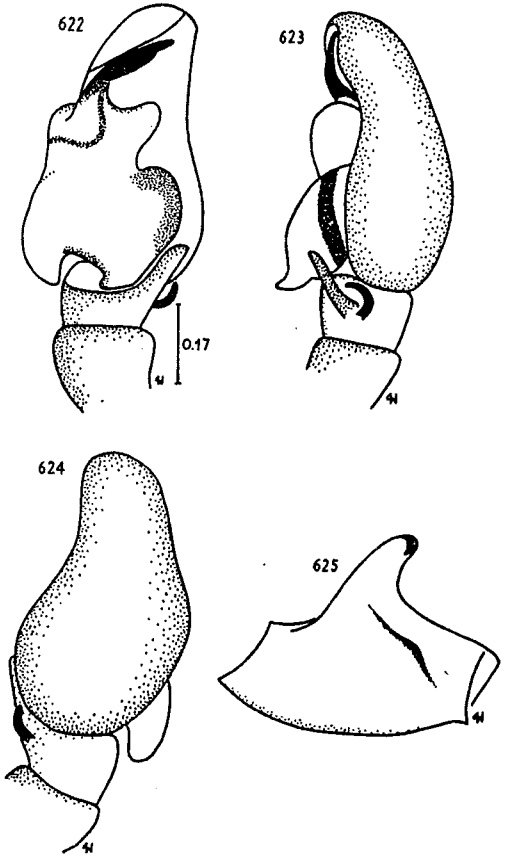
Figs. 612–615. *Heliophanus aeneus* (HAHN) – male (HDZ 1755 t. 42): 612–614 – ventral, lateral and dorsal views, 615 – femoral apophysis.



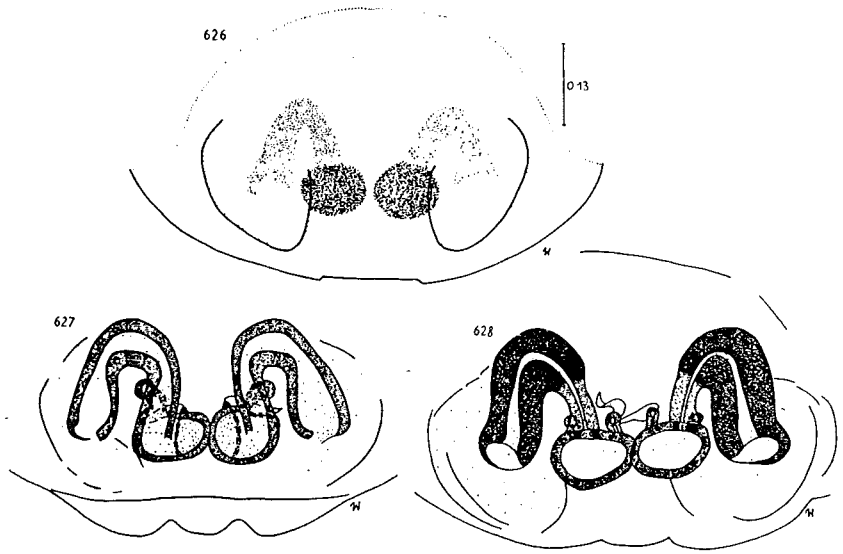
Figs. 616–618. *Heliophanus aeneus* (HAHN) – female. Epigyne: 616 – FMS specimen, 617 – ZMH specimen, 619 – specimen from France.



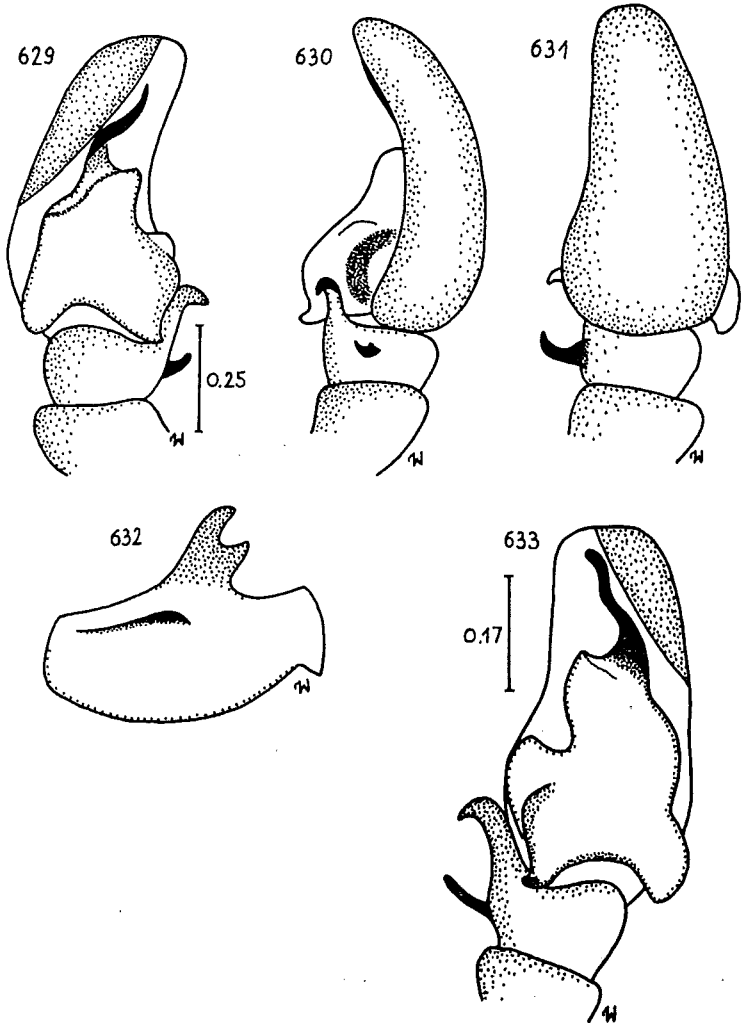
Figs. 619–621. *Heliophanus aeneus* (HAHN) – female. Internal structures of epigyne: 619 – specimen from France, 620 – FMS specimen, 621 – specimen from Spain.



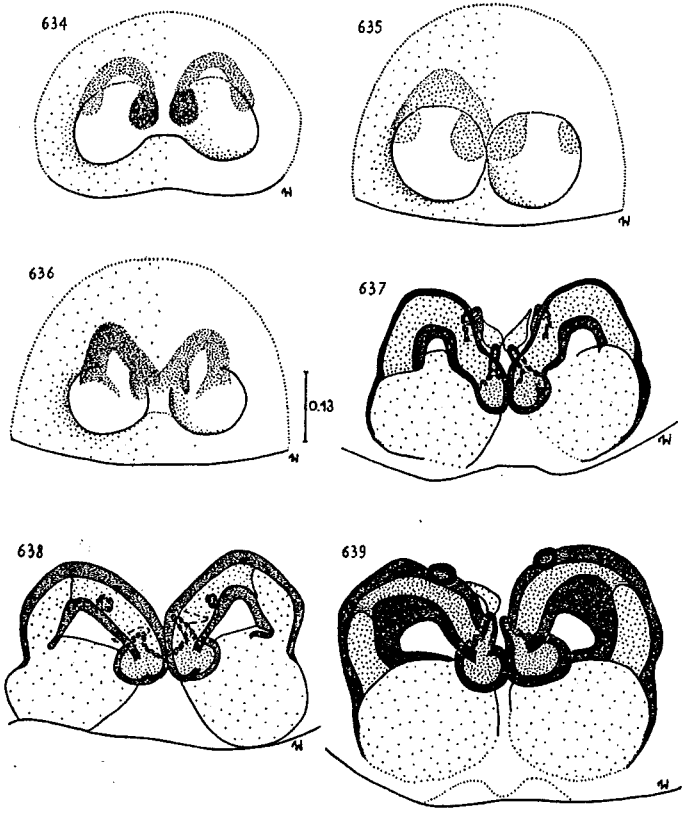
Figs. 622–625. *Heliophanus dubius* C. L. KOCH – male (specimen from Poland): 622–624 – copulatory organ, ventral, lateral and dorsal views, 625 – femoral apophysis.



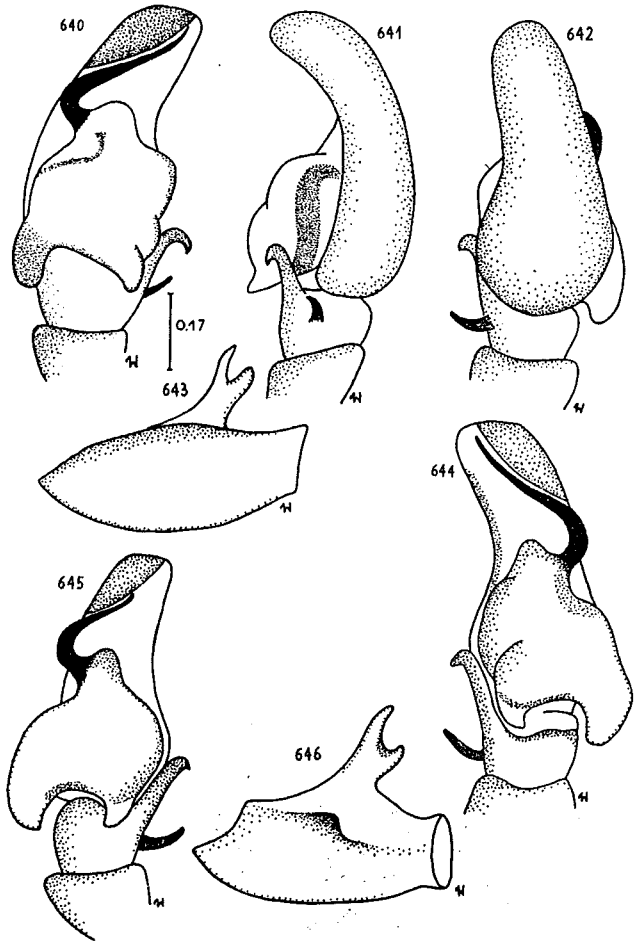
Figs. 626–628. *Heliophanus dubius* C. L. Koch – female. Epigyne and its internal structures: 626–627 – specimen from Poland, 628 – CRB specimen.



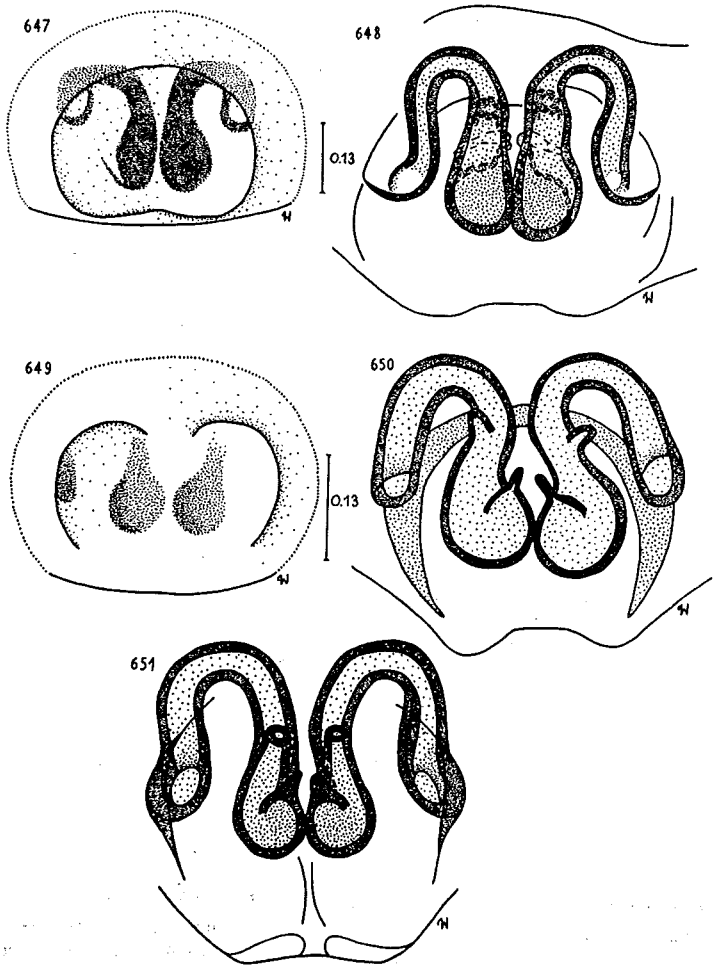
Figs. 629–633. *Heliophanus auratus* C. L. Koch – male. 629–632 – specimen from France (NR): 629–631 – copulatory organ, ventral, lateral and dorsal views, 632 – femoral apophysis. 633 – specimen from Switzerland (SMF 24592), copulatory organ, ventral view.



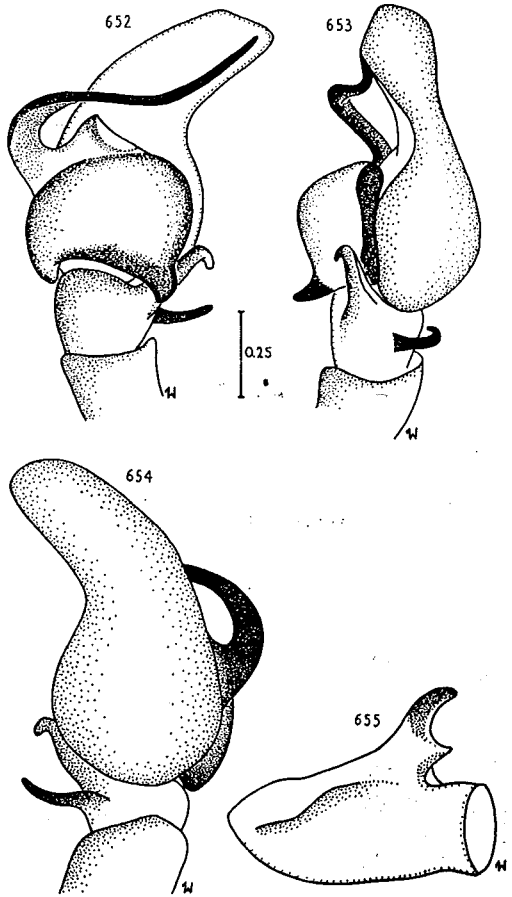
Figs. 634–639. *Heliophanus auratus* C. L. Koch – female. Epigyne and its internal structures: 634 – specimen from Belgium, 635 – specimen from Cyprus, 636–637 – NR 1649a, 638 – specimen from Italy, 639 – specimen from Euboea.



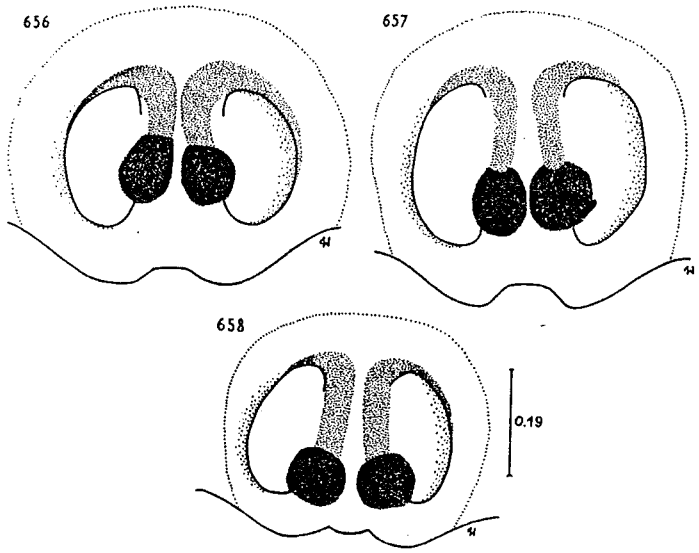
Figs. 640–646. *Heliophanus flavipes* (Hahn) – male. 640–643 – specimen from Holland: 640–642 – copulatory organ, ventral, lateral and dorsal views, 643 – femoral apophysis. 644 – holotype of *Heliophanus corsicus* Sim., copulatory organ, ventral view. 645–646 – BMNH specimen: 645 – copulatory organ, ventral view, 646 – femoral apophysis.



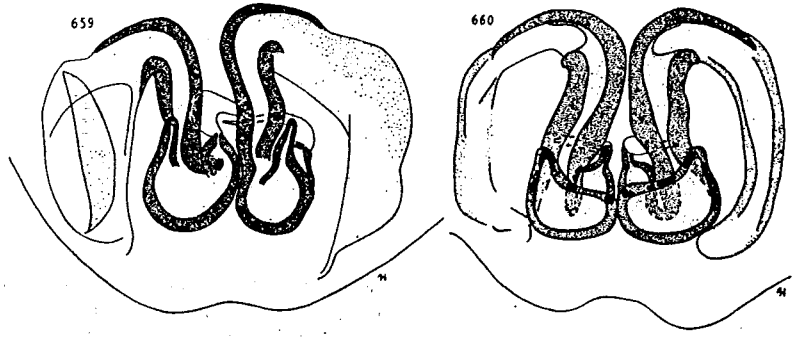
Figs. 647–651. *Heliophanus flavipes* (HAHN) – female. Epigyne and its internal structures: 647–648 – HDZ 1756 t. 240, 649–650 – BMNH specimen, 651 – MNHN 5946.



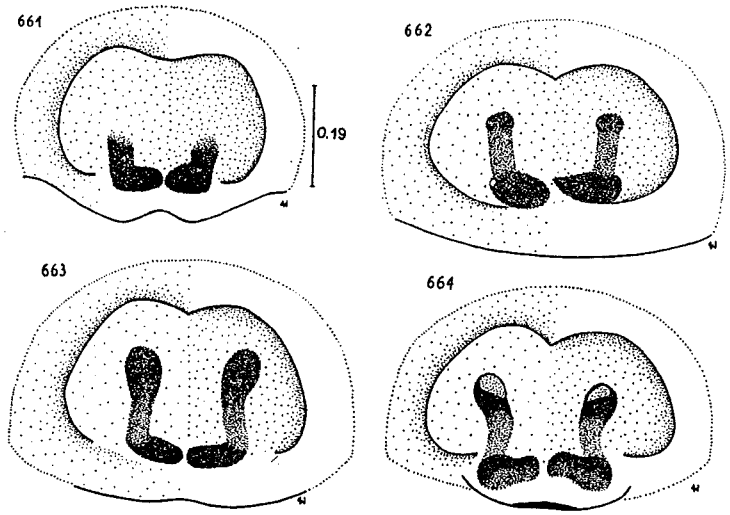
Figs. 652–655. *Heliophanus equester* L. KOCH – male (BMNH 1891.1.1.431): 652–654 – copulatory organ, ventral, lateral and dorsal views, 655 – femoral apophysis.



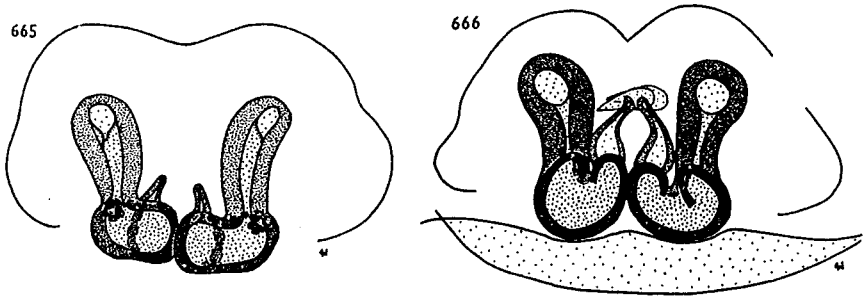
Figs. 656–658. *Heliophanus equester* L. Koch – female. Epigyne: 656 – NHMW specimen, 657–658 – MNHN 14 510 and 14 009.



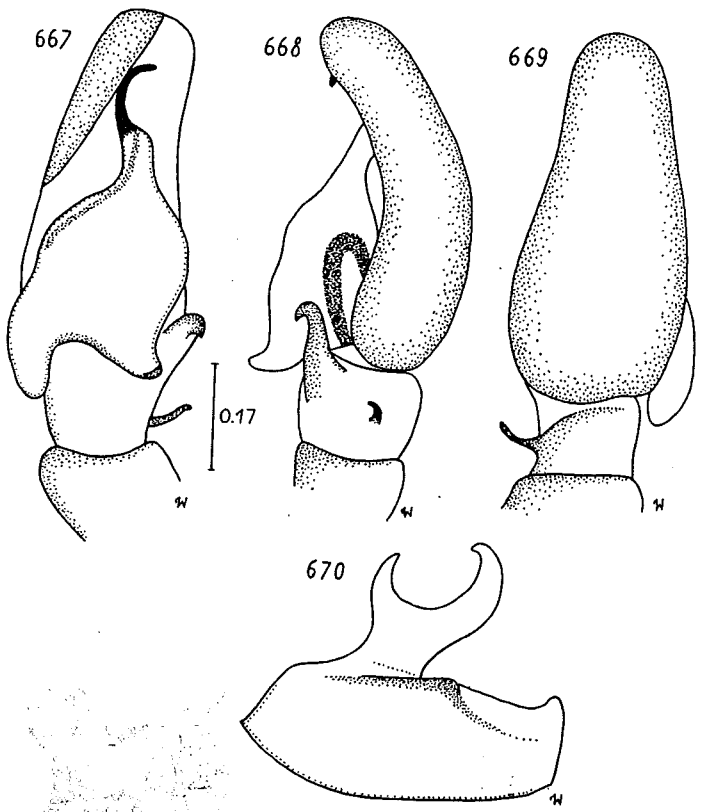
Figs. 659–660. *Heliophanus equester* L. Koch – female (MNHN 14 510 and 14 509). Internal structures of epigyne.



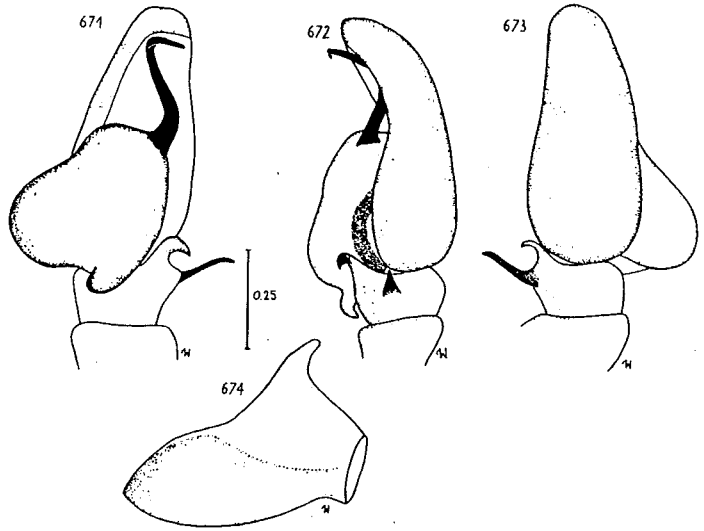
Figs. 661–664. *Heliophanus ignorabilis* sp. n. – female. Epigyne: 661 – holotype, 662 – paratype from Syria, 663 – paratype from Lebanon, 664 – paratype from Georgia.



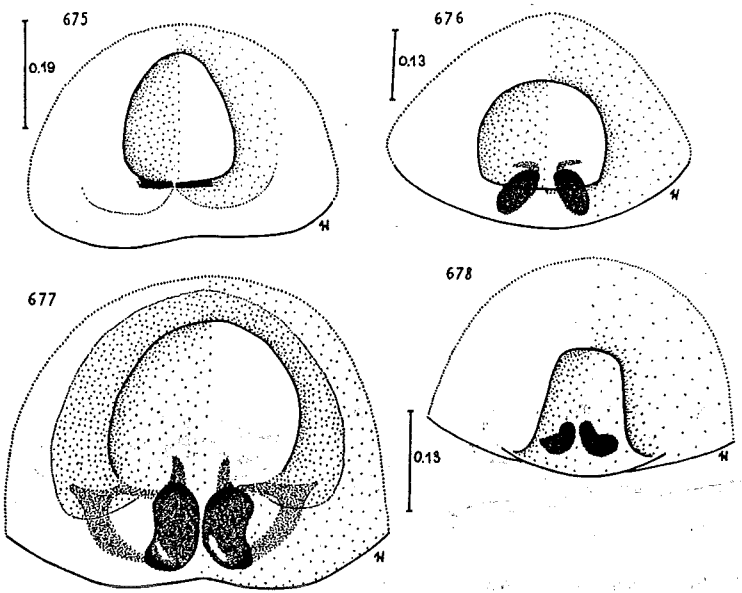
Figs. 665–666. *Heliophanus ignorabilis* sp. n. – female. Internal structures of epigyne: 665 – holotype, 666 – paratype from Syria.



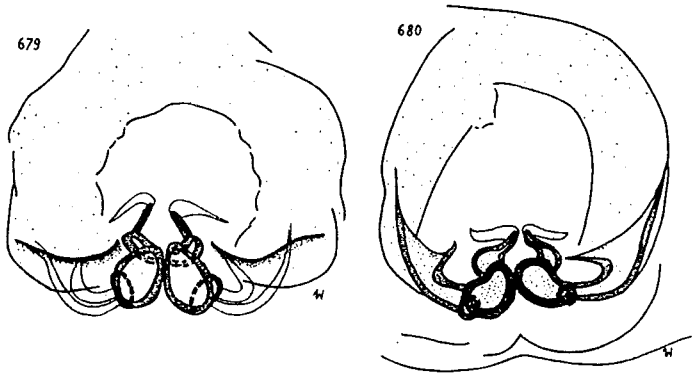
Figs. 667–670. *Heliophanus forcipifer* KULCZ., holotype – male: 667–669 – copulatory organ, ventral, lateral and dorsal views, 670 – femoral apophysis.



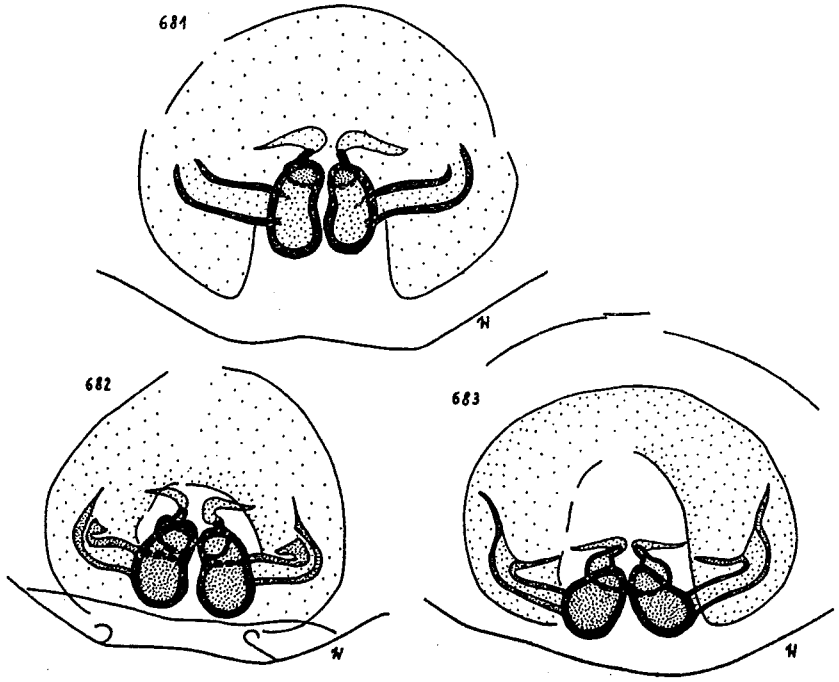
Figs. 671–674. *Heliophanus cupreus* (WALCK.), syntype of *Heliophanus globifer* SIM. – male: 671–673 – copulatory organ, ventral, lateral and dorsal views, 674 – femoral apophysis.



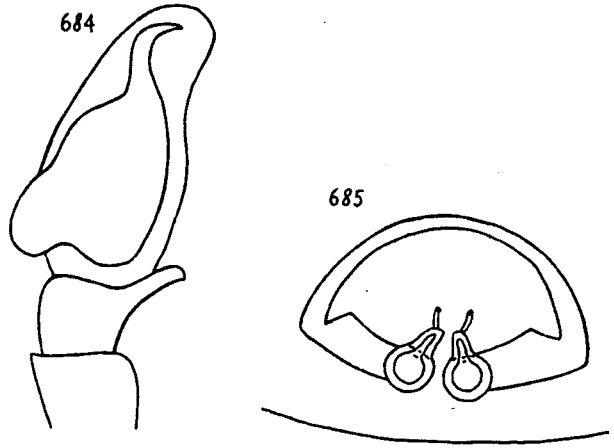
Figs. 675–678. *Heliophanus cupreus* (WALCK.) – female. Epigyne: 675 – CRB specimen, 676 – specimen from Corfu, 677 – specimen from Guernsey, 678 – specimen from West Germany.



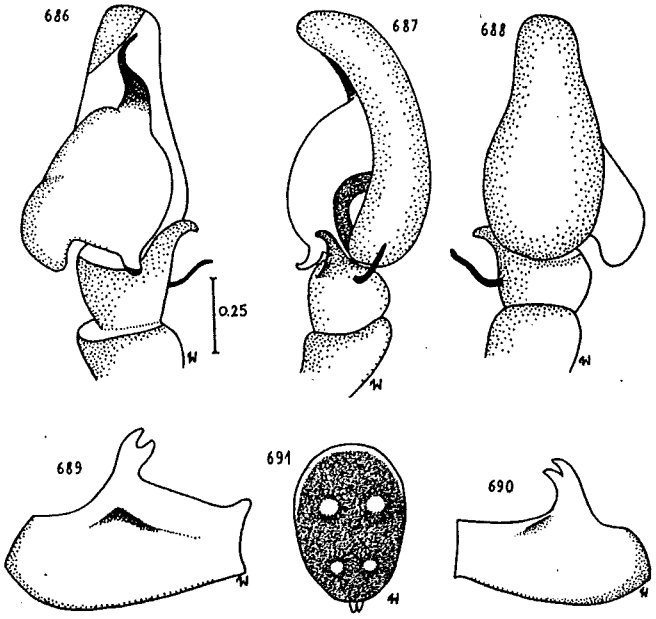
Figs. 679–680. *Heliophanus cupreus* (WALCK.) – female. Internal structures of epigyne: 679 – specimen from France (MNHN), 680 – specimen from Morocco.



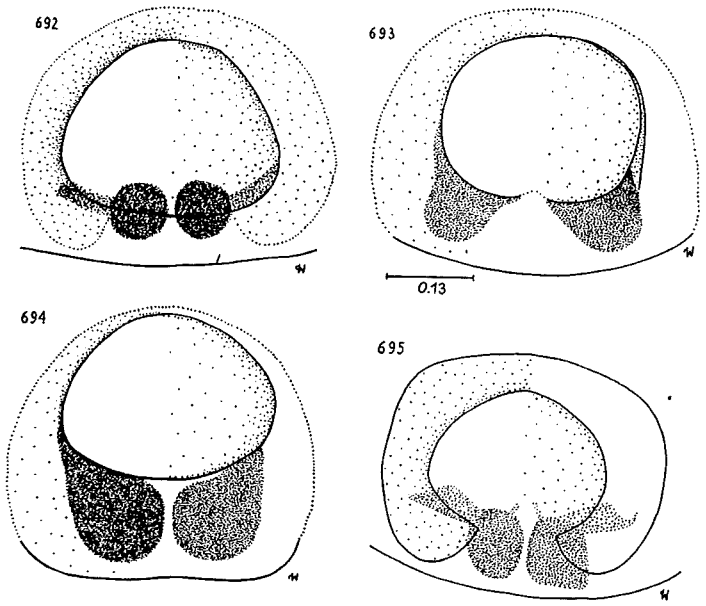
Figs. 681–683. *Heliophanus cupreus* (WALCK.) – female. Internal structures of epigyne: 681 – specimen from Guernsey, 682 – specimen from Corfu, 683 – specimen from West Germany.



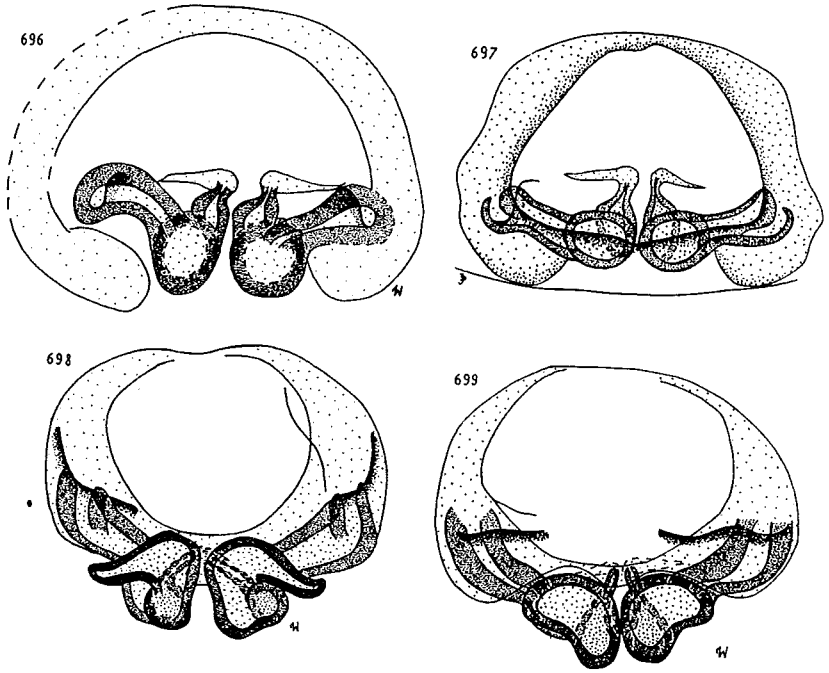
Figs. 684–685. *Heliophanus turanicus* CHAR. – male and female: 684 – male copulatory organ, ventral view, 685 – internal structures of epigyne (after CHARITONOV).



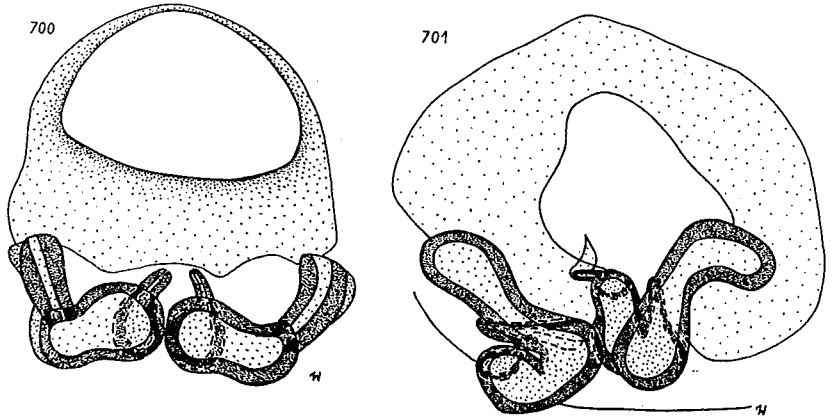
Figs. 686–691. *Heliophanus lineiventris* SIM. – male. 686–689 – NR specimen: 686–688 – copulatory organ, ventral, lateral and dorsal views, 689 – femoral apophysis. 690 – specimen from North Korea, femoral apophysis. 691 – abdominal pattern.



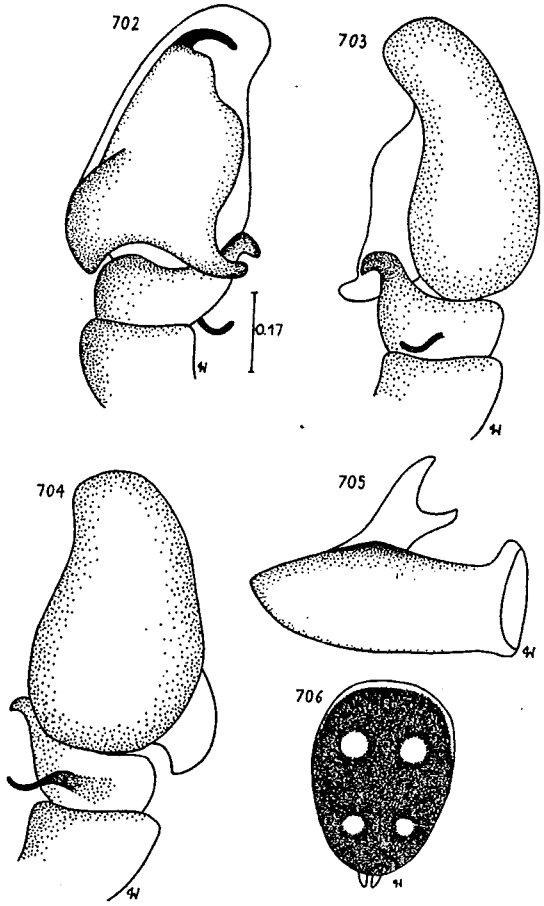
Figs. 692–695. *Heliophanus lineiventris* SIM. – female. Epigyne: 692 – specimen from North Korea, 693 – specimen from Tinos, 694 – syntype of *Heliophanus pouzdranensis* MILLER, 695 – MNHN 869.



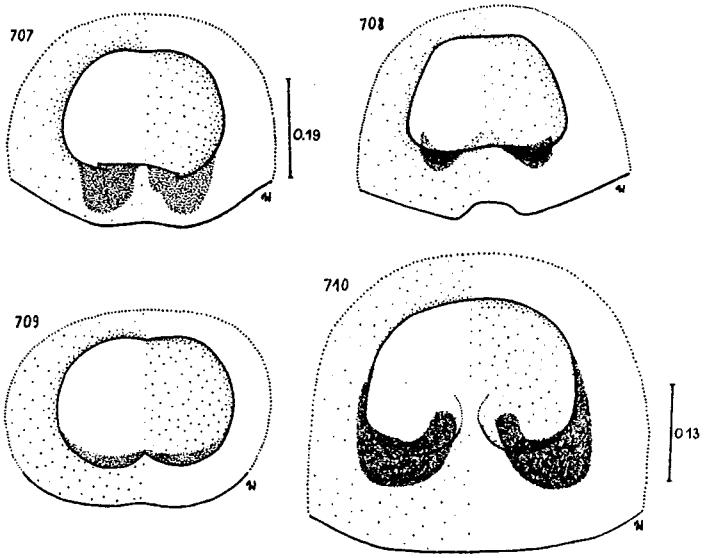
Figs. 696–699. *Heliophanus lineiventris* SIM. – female. Internal structures of epigyne: 696 – specimen from North Korea, 697 – specimen from Primore (after PRÓSZYŃSKI 1979), 698–699 – specimens from Tinos.



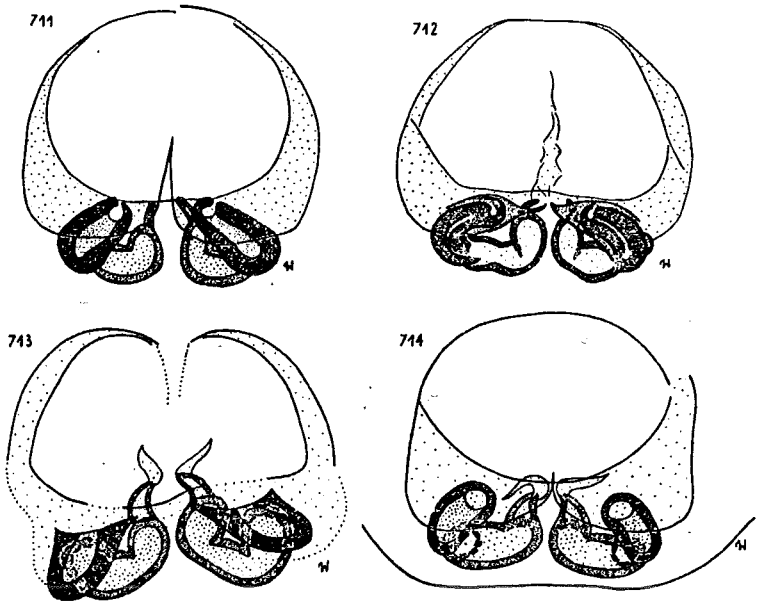
Figs. 700–701. *Heliophanus lineiventris* SIM. – female. Internal structures of epigyne – spermathece in an unnatural, twisted position: 700 – syntype of *Heliophanus pouzdranensis* MILLER, 701 – NR specimen.



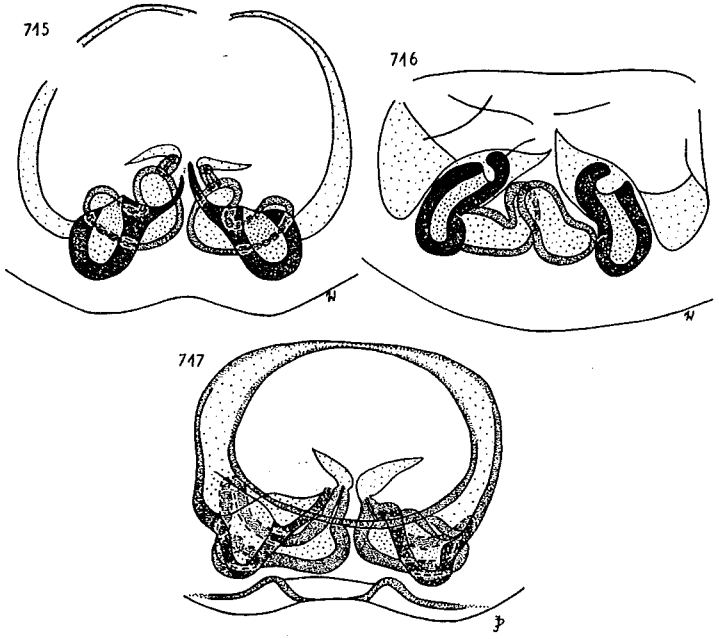
Figs. 702–706. *Heliophanus kochi* Sim. – male (NR specimen): 702–704 – copulatory organ, ventral, lateral and dorsal views, 705 – femoral apophysis, 706 – abdominal pattern.



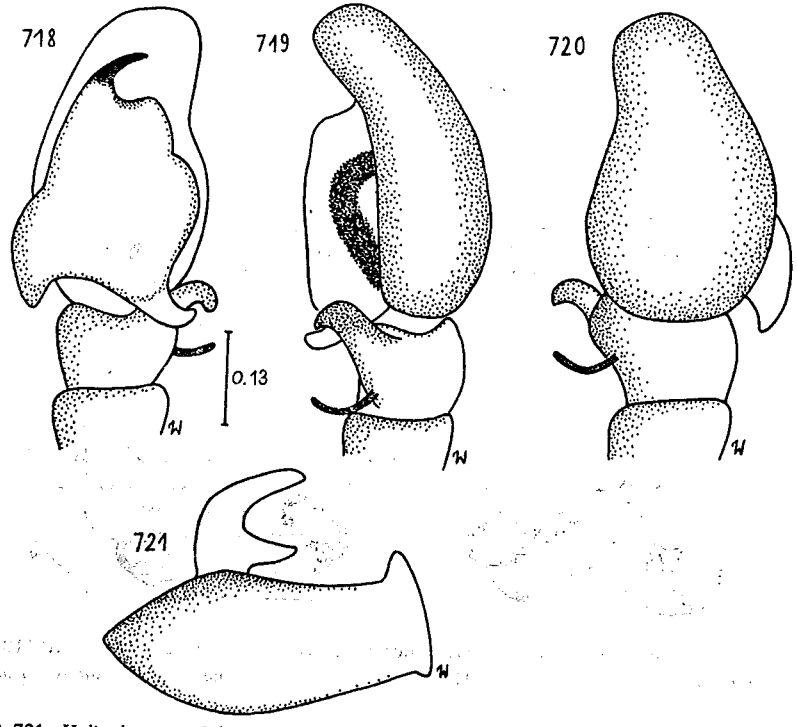
Figs. 707–710. *Heliophanus kochi* Sim. – female. Epigyne: 707 – CRB 1105, 708 – specimen from Switzerland, 709 – BMNH specimen, 710 – syntype of *Heliophanus cernuus* Sim.



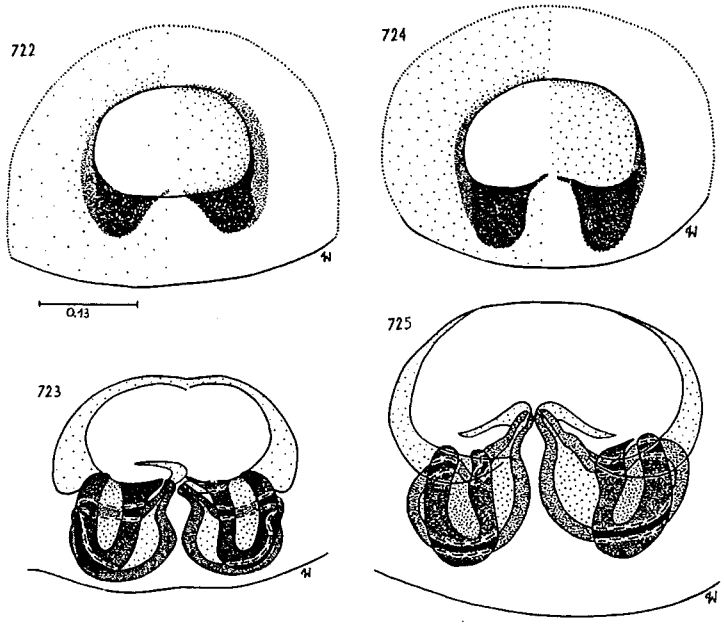
Figs. 711–714. *Heliophanus kochi* Sim. – female. Internal structures of epigyne: 711 – CRB 1105, 712 – specimen from Switzerland, 713 – BMNH specimen, 714 – syntype of *Heliophanus cernuus* Sim.



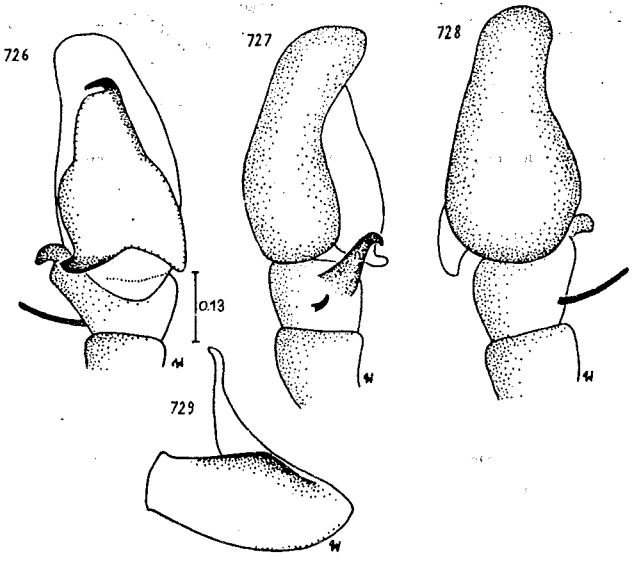
Figs. 715–717. *Heliophanus kochi* SIM. – female. Internal structures of epigyne: 715–716 – MNHN 24 450 and 2396, 717 – specimen from Czechoslovakia (after PRÓSZYŃSKI 1976).



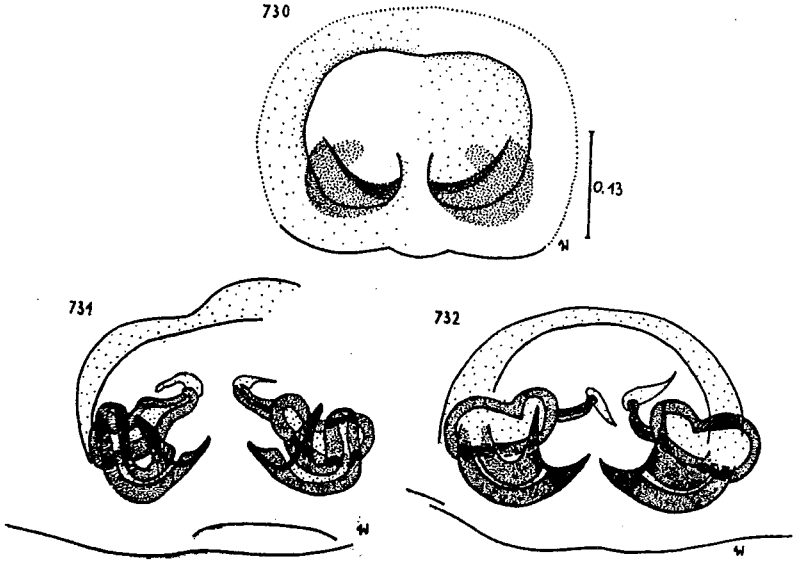
Figs. 718–721. *Heliophanus rufithorax* SIM., lectotype – male: 718–720 – copulatory organ, ventral, lateral and dorsal views, 721 – femoral apophysis.



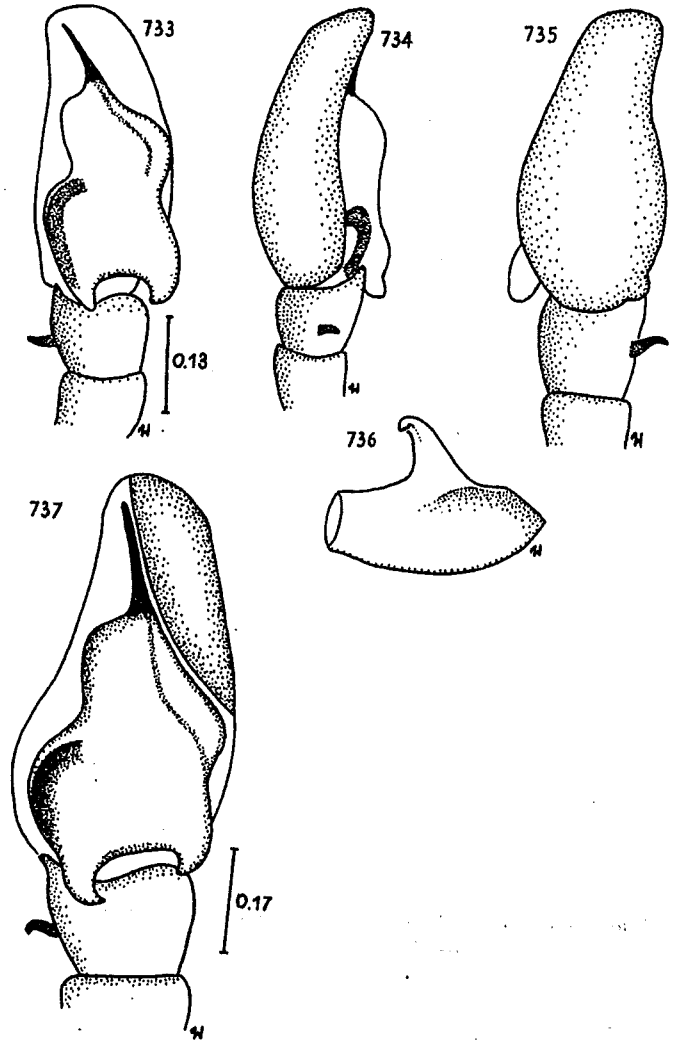
Figs. 722–725. *Heliophanus rufithorax* SIM. – female. Epigyne and its internal structures: 722–723 – IRSN specimen, 724–725 – paralectotype (MNHN).



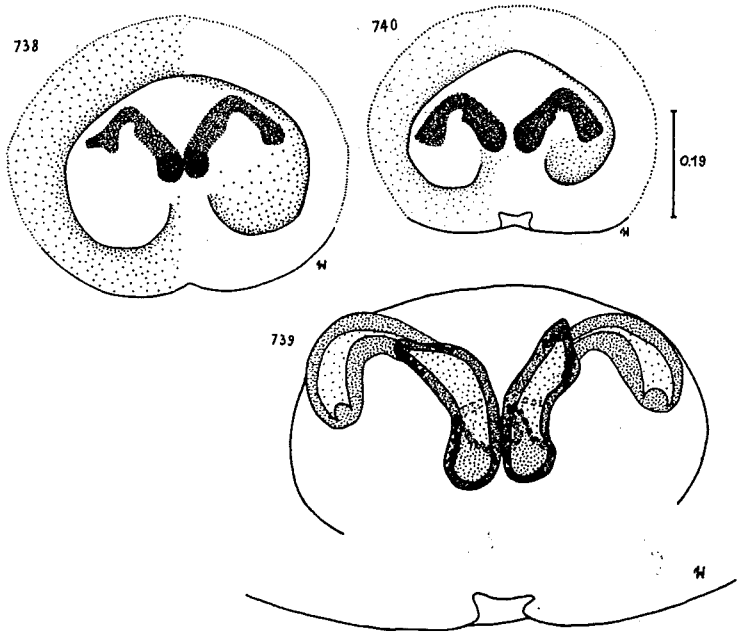
Figs. 726–729. *Heliophanus machaerodus* SIM., lectotype – male: 726–728 – copulatory organ, ventral, lateral and dorsal views, 729 – femoral apophysis.



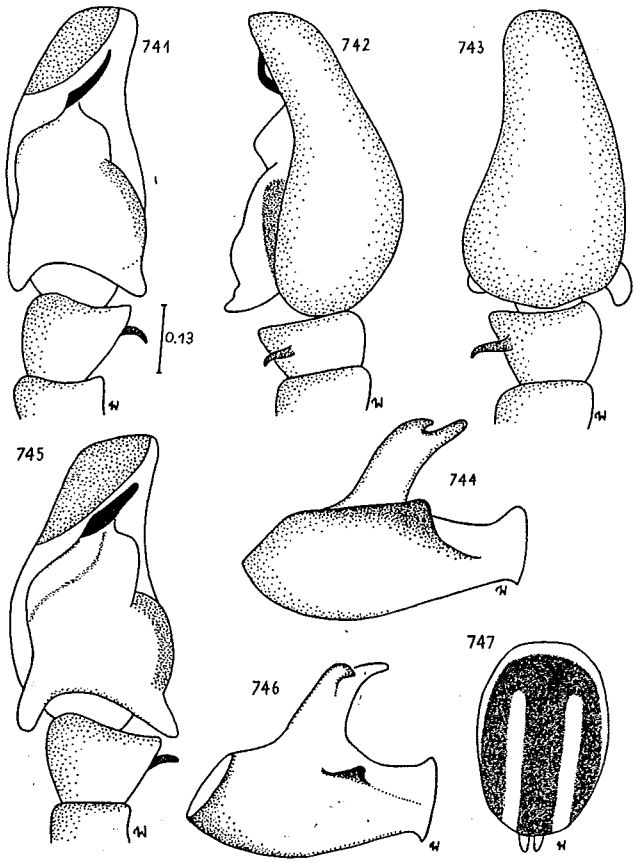
Figs. 730–732. *Heliophanus machaerodus* SIM. – female. Epigyne and its internal structures: 730–731 – MNHN 982, 732 – MNHN 13 253.



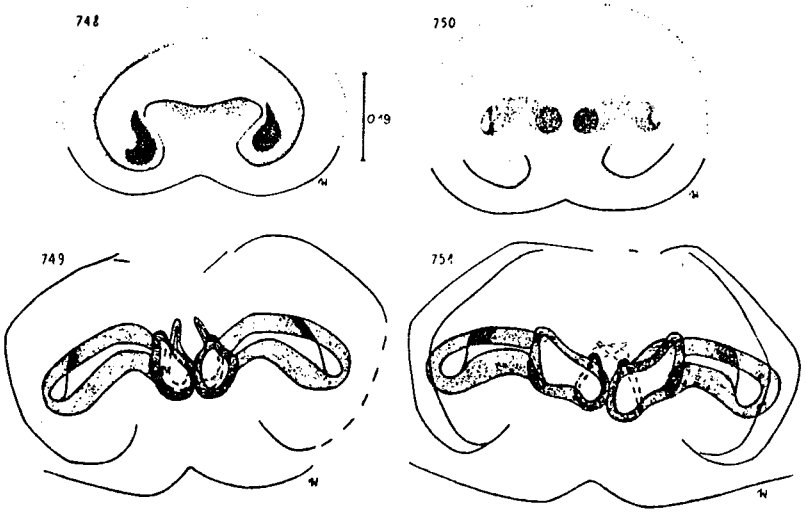
Figs. 733–737. *Heliophanus potanini* SCHKL. – male. 733–736 – lectotype: 733–735 – copulatory organ, ventral, lateral and dorsal views, 736 – femoral apophysis. 737 – specimen from Afghanistan, copulatory organ, ventral view.



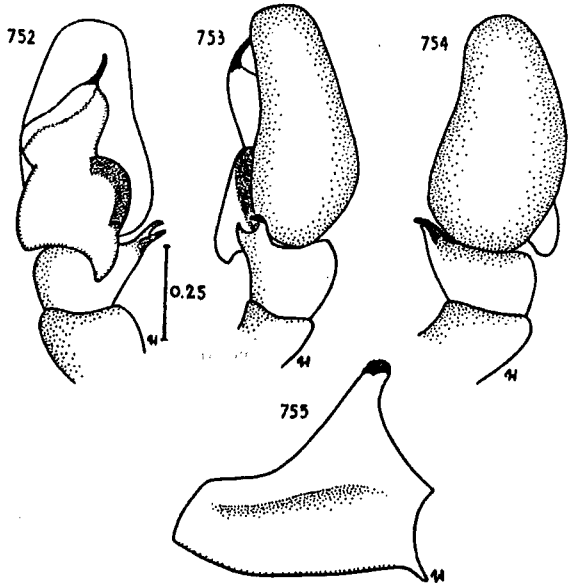
Figs. 738–740. *Heliophanus potanini* SCHKL. – female. Epigyne and its internal structures: 738–739 – paralectotype, 740 – NMB specimen.



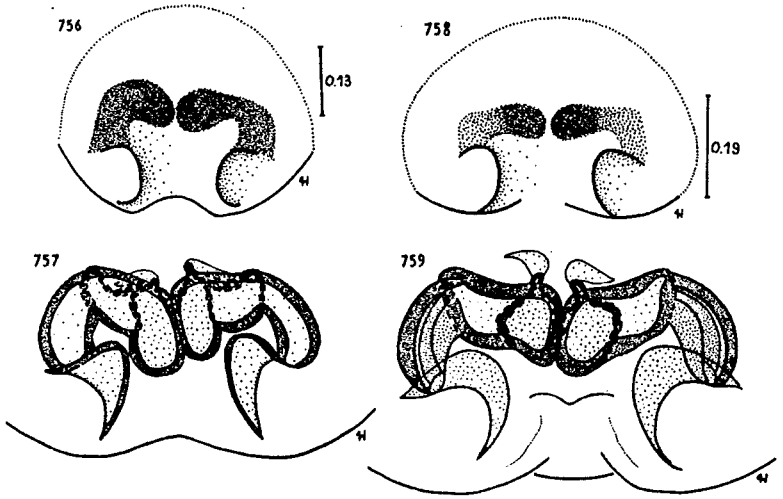
Figs. 741–747. *Heliophanus melinus* L. KOCH – male. 741–744 – specimen from France: 741–743 – copulatory organ, ventral, lateral and dorsal views, 744 – femoral apophysis. 745–747 – MNHN 862: 745 – copulatory organ, ventral view, 746 – femoral apophysis, 747 – abdominal pattern.



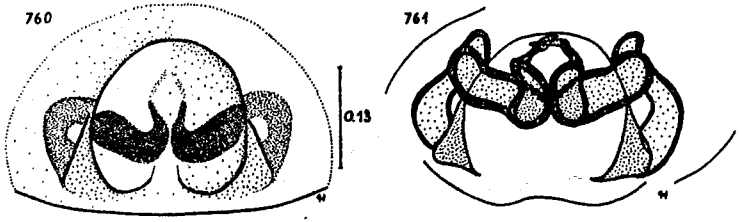
Figs. 748–751. *Heliophanus melinus* L. Koch – female (MNHN 860 and 862). Epigyne and its internal structures.



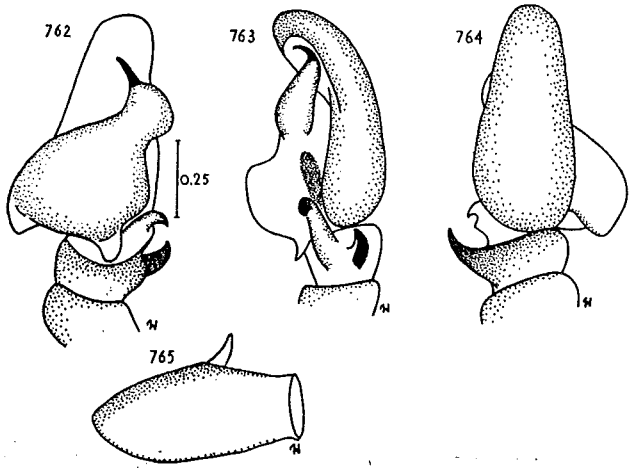
Figs. 752–755. *Heliophanus patagiatus* Thor. – male (specimen from France): 752–754 – copulatory organ, ventral, lateral and dorsal views, 755 – femoral apophysis.



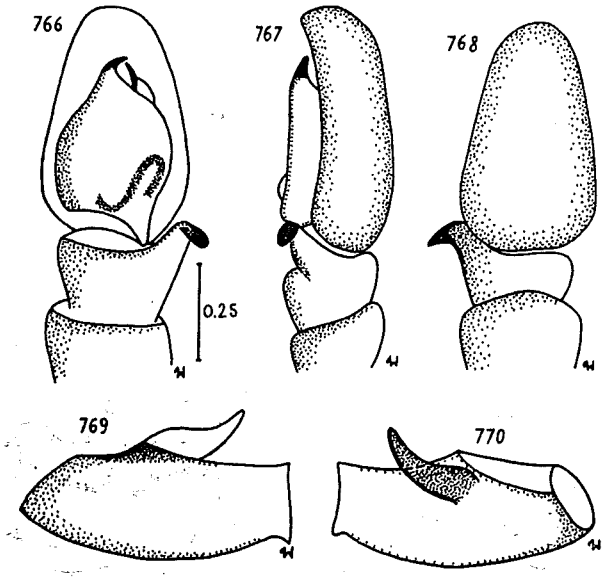
Figs. 756–759. *Heliophanus patagiatus* Thor. – female. Epigyne and its internal structures: 756–757 – specimen from France, 758–759 – specimen from Switzerland.



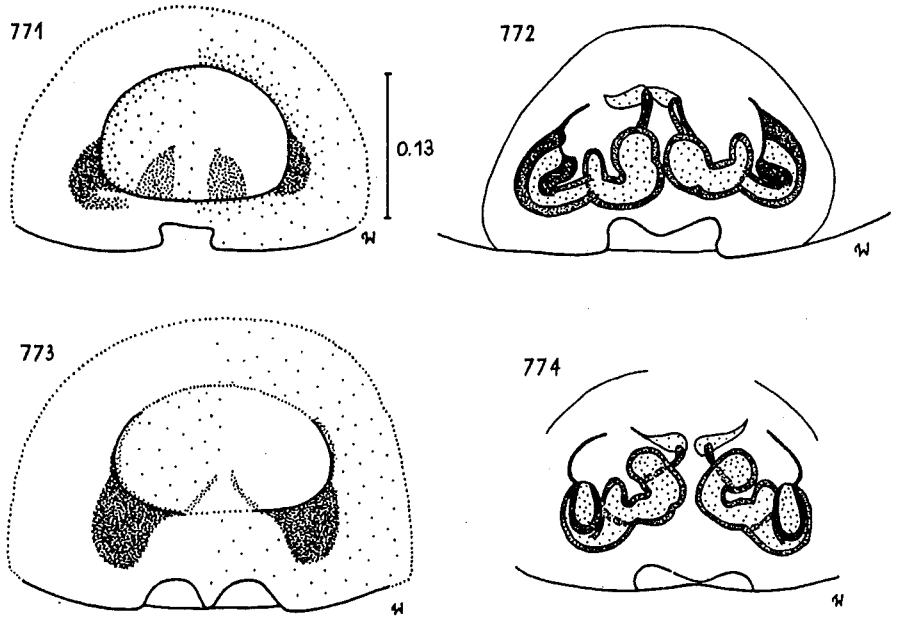
Figs. 760–761. *Heliophanus abditus* sp. n., holotype – female. Epigyne and its internal structures.



Figs. 762–765. *Heliophanus acutissimus* sp. n., holotype – male: 762–764 – copulatory organ, ventral, lateral and dorsal views, 765 – femoral apophysis.



Figs. 766–770. *Heliophanus canariensis* sp. n., holotype – male: 766–768 – copulatory organ, ventral, lateral and dorsal views, 769–770 – femoral apophysis, lateral inner and outer surface views.



Figs. 771–774. *Heliophanus canariensis* sp. n. – female. Epigyne and its internal structures: 771–772 – allotype, 773–774 – paratype.

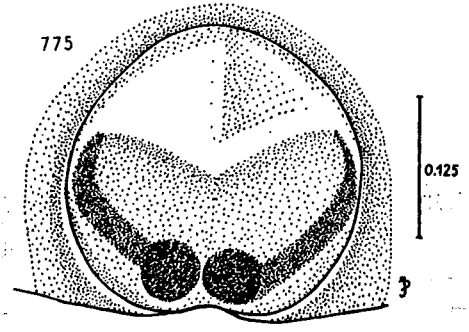
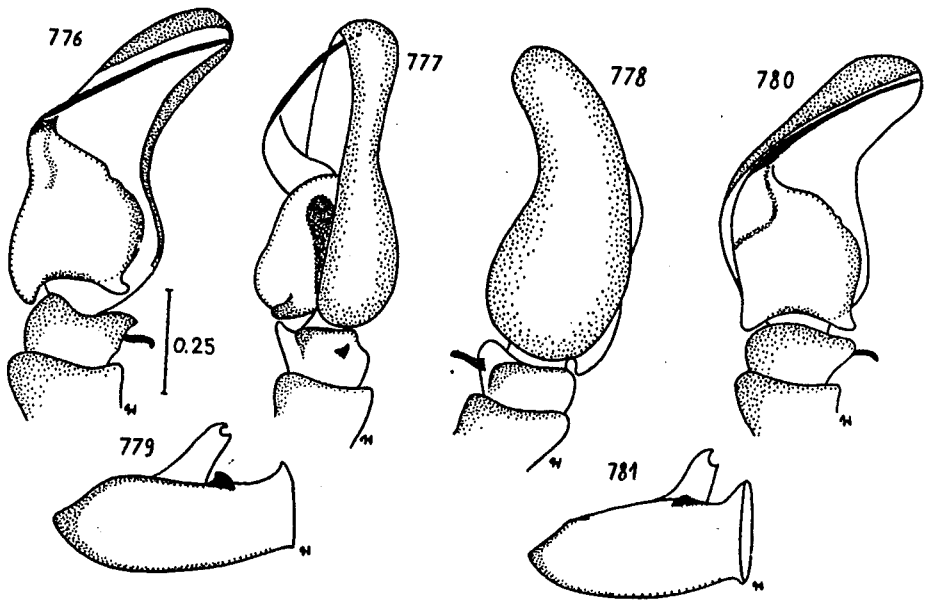
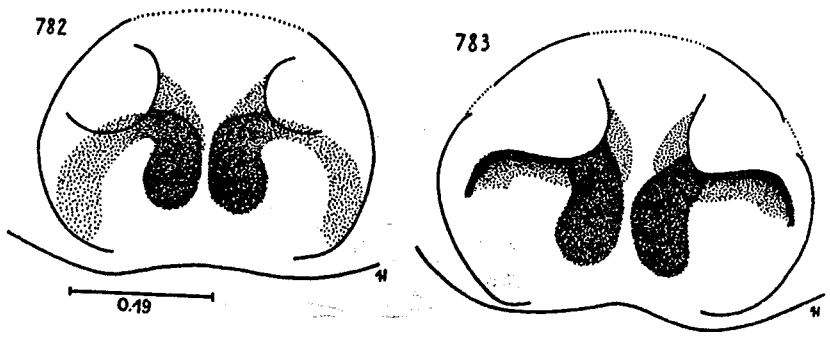


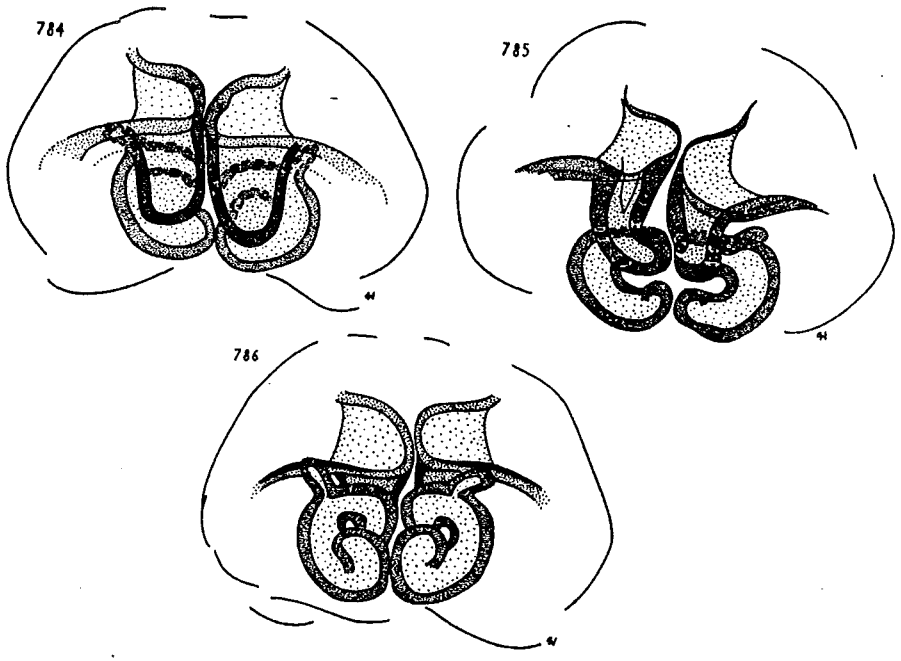
Fig. 775. *Heliophanus chovdensis* Prósz., holotype – female. Epigyne (after Prószyński 1982).



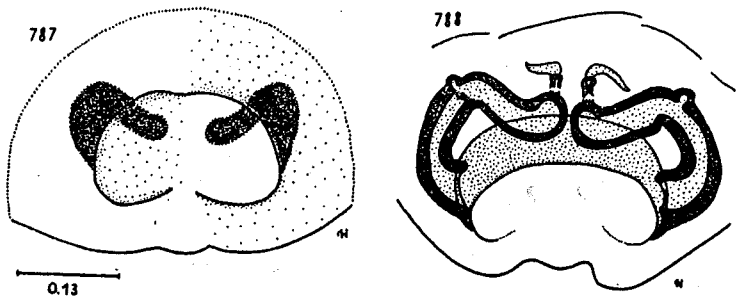
Figs. 776–781. *Heliophanus iranus* sp. n. – male. 776–779 – holotype: 776–778 – copulatory organ, ventral, lateral and dorsal views, 779 – femoral apophysis. 780–781 – paratype: 780 – copulatory organ, ventral view, 781 – femoral apophysis.



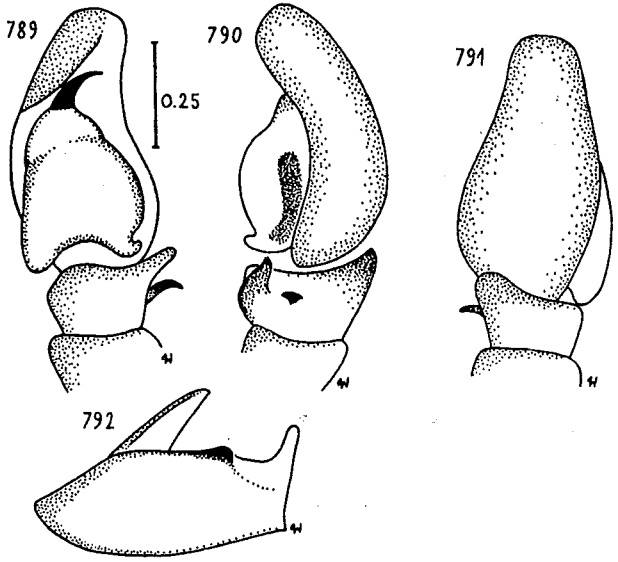
Figs. 782–783. *Heliophanus iranus* sp. n., paratypes – females. Epigyne.



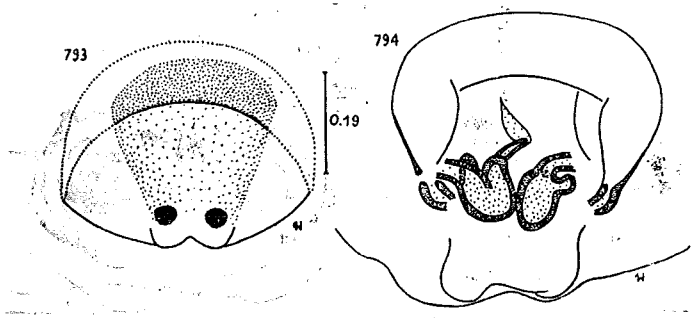
Figs. 784–786. *Heliophanus iranus* sp. n., paratypes – females. Internal structures of epigyne: 784–785 – ventral view, 786 – dorsal view.



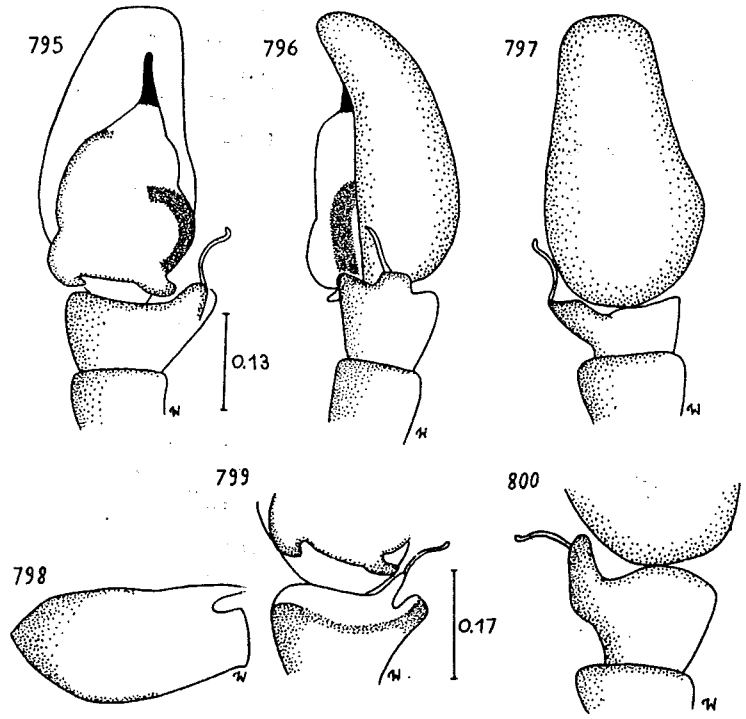
Figs. 787–788. *Heliophanus malus* sp. n., holotype – female. Epigyne and its internal structures.



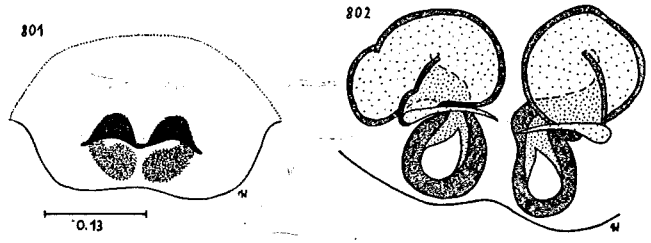
Figs. 789–792. *Heliophanus verus* sp. n., holotype – male: 789–791 – copulatory organ, ventral, lateral and dorsal views, 792 – femoral apophysis.



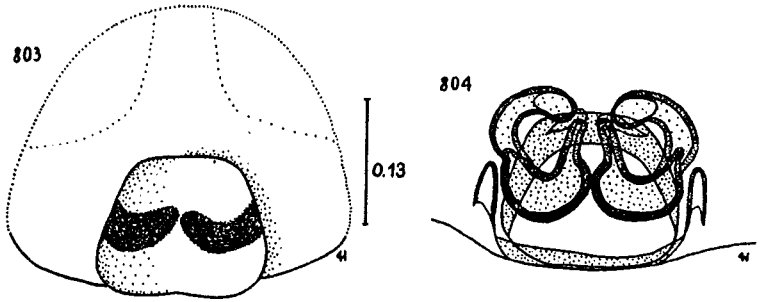
Figs. 793–794. *Heliophanus aberdarensis* sp. n., holotype – female. Epigyne and its internal structures (seriously damaged).



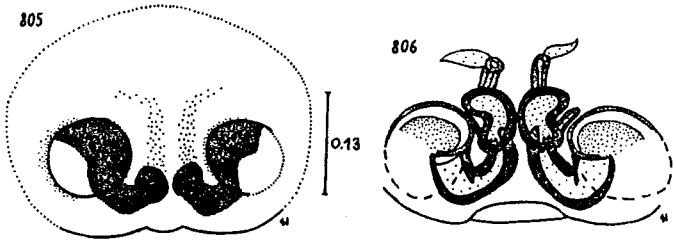
Figs. 795–800. *Heliophanus activus* (Black.) – male. 795–798 – MNHN specimen: 795–797 – copulatory organ, ventral, lateral and dorsal views, 798 – femoral apophysis. 799–800 – lectotype, ventral and dorsal views of the tibia.



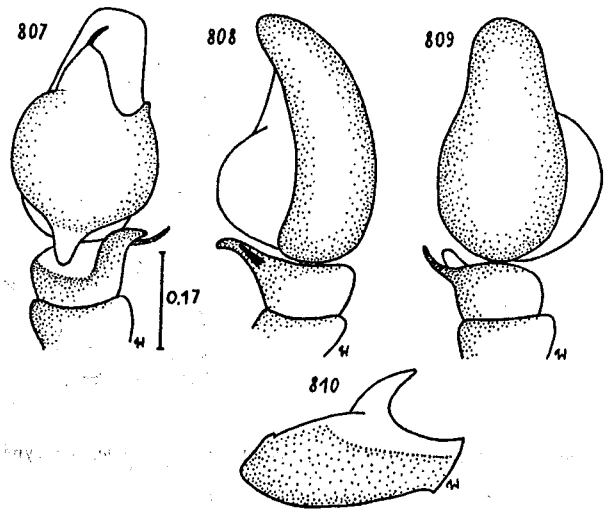
Figs. 801–802. *Heliophanus activus* (Black.), paralectotype – female. Epigyne and its internal structures.



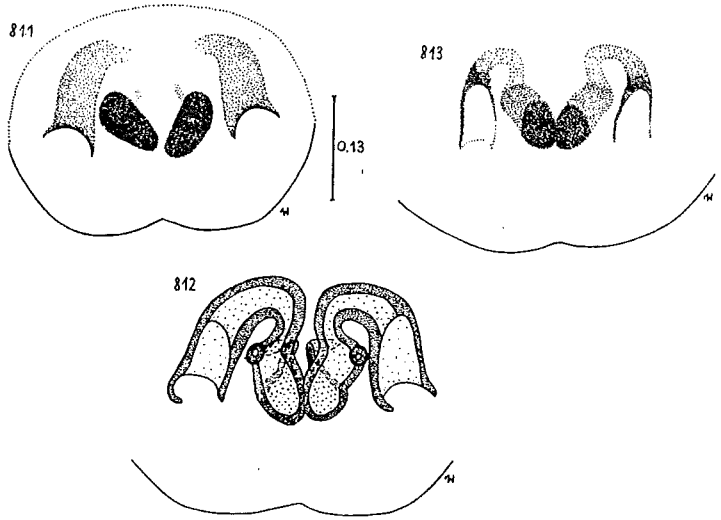
Figs. 803–804. *Heliophanus africanus* sp. n., holotype – female. Epigyne and its internal structures.



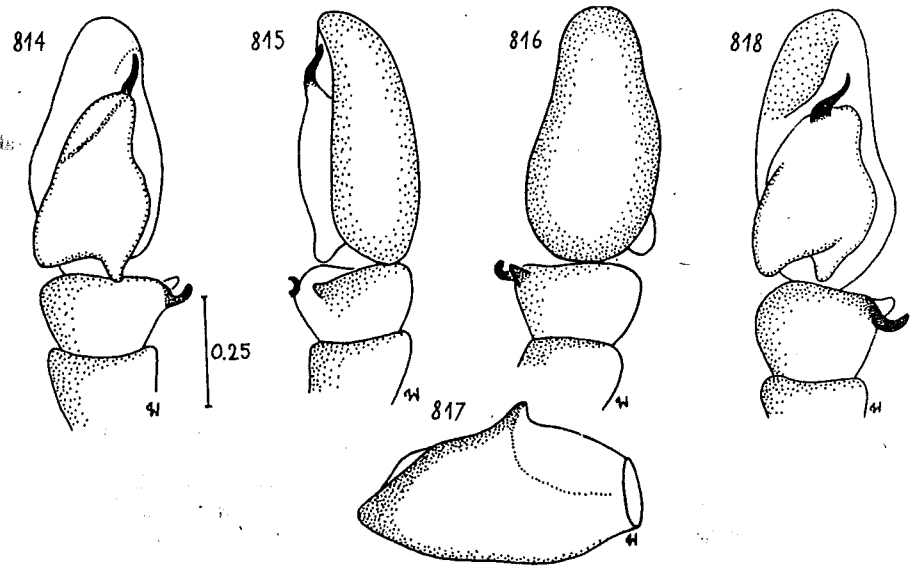
Figs. 805–806. *Heliophanus alienus* sp. n., holotype – female: Epigyne and its internal structures.



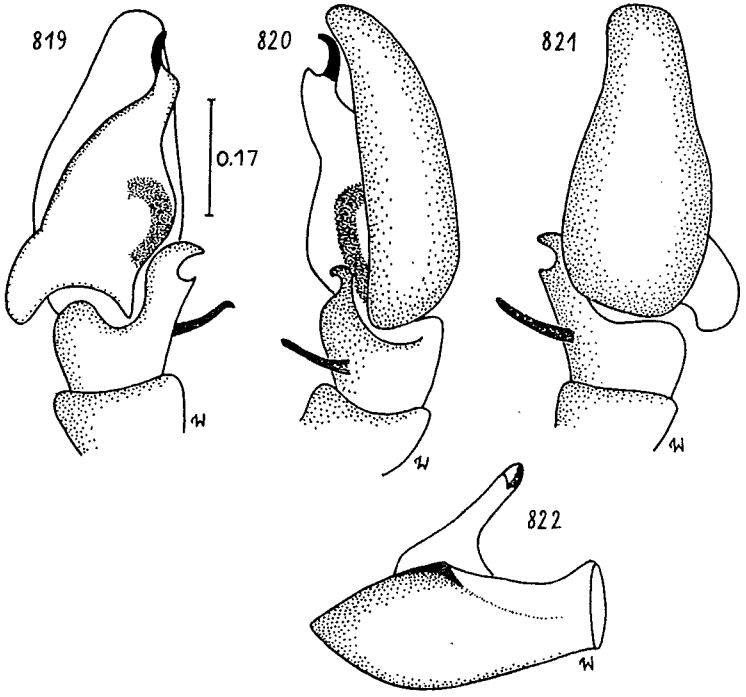
Figs. 807–810. *Heliophanus capicola* Sim., lectotype – male: 807–809 – copulatory organ, ventral, lateral and dorsal views, 810 – femoral apophysis.



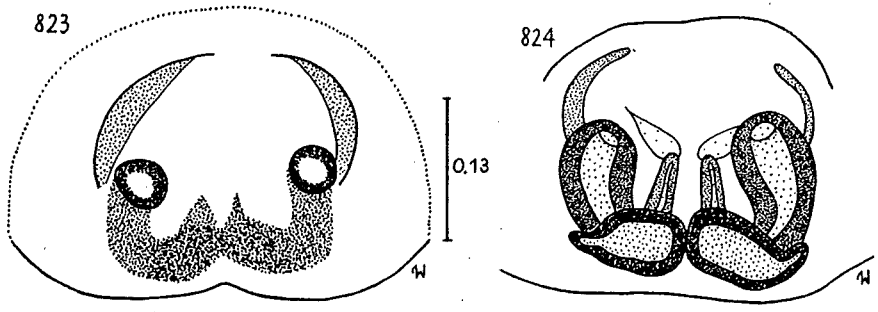
Figs. 811–813. *Heliophanus capicola* Sim. – female. Epigyne and its internal structures: 811–812 – paralectotype, 813 – SAM 429.



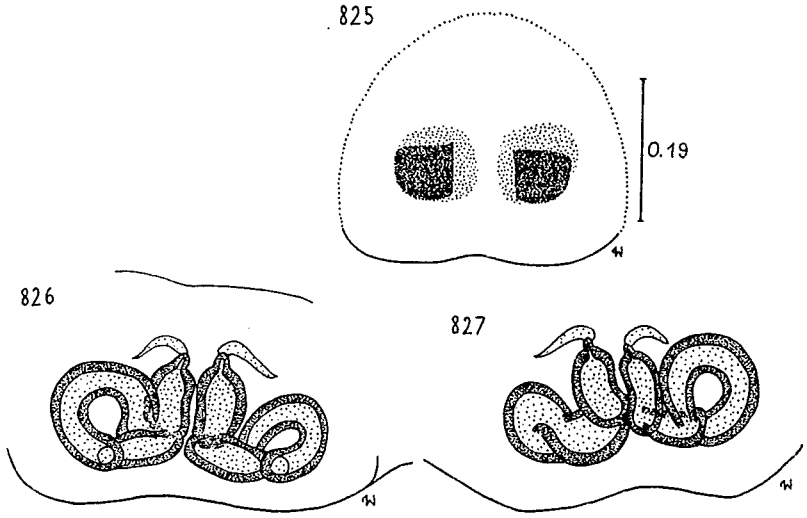
Figs. 814–818. *Heliophanus chikangawanus* sp. n. – male. 814–817 – paratype from Angola: 814–816 – copulatory organ, ventral, lateral and dorsal views, 817 – pedipalpal femur. 818 – holotype, copulatory organ, ventral view.



Figs. 819–822. *Heliophanus deformis* sp. n., holotype – male: 819–821 – copulatory organ, ventral, lateral and dorsal views, 822 – femoral apophysis.



Figs. 823–824. *Heliophanus deformis* sp. n., allotype – female. Epigyne and its internal structures.



Figs. 825–827. *Heliophanus difficilis* sp. n., holotype – female. Epigyne and its internal structures, ventral and dorsal views.

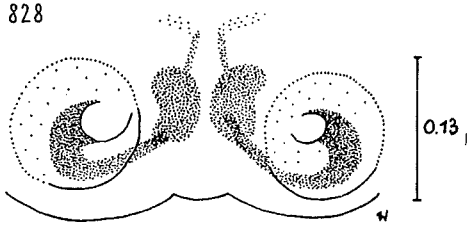
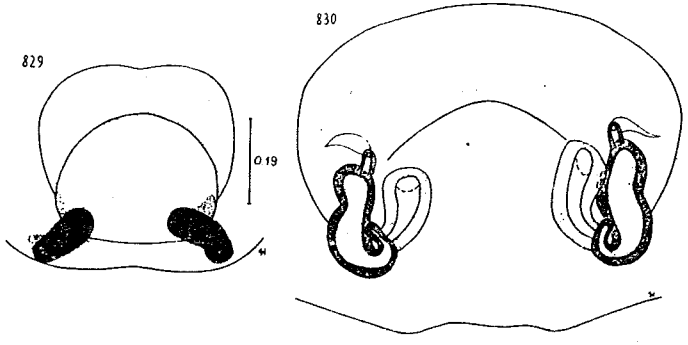
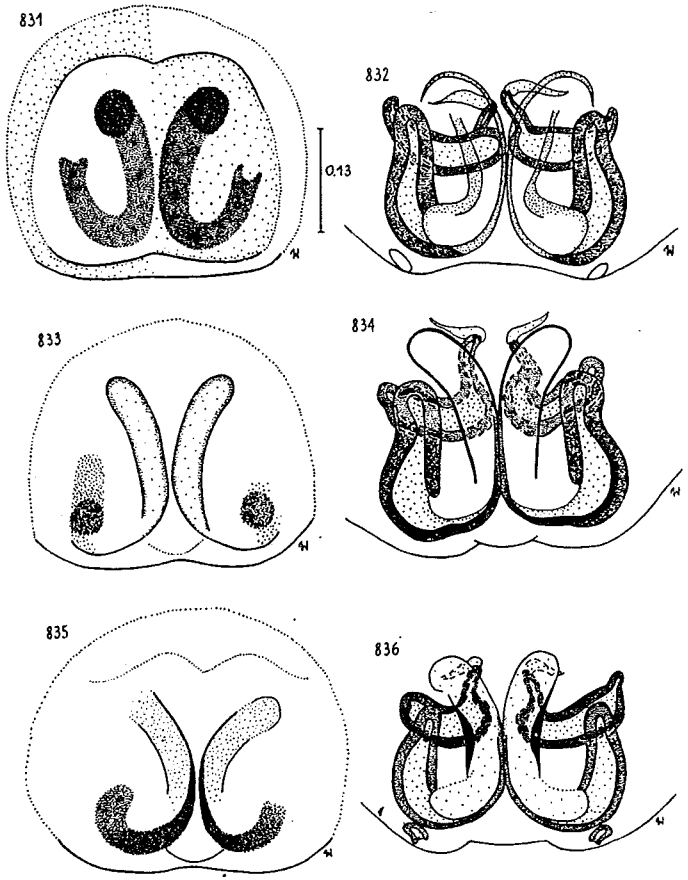


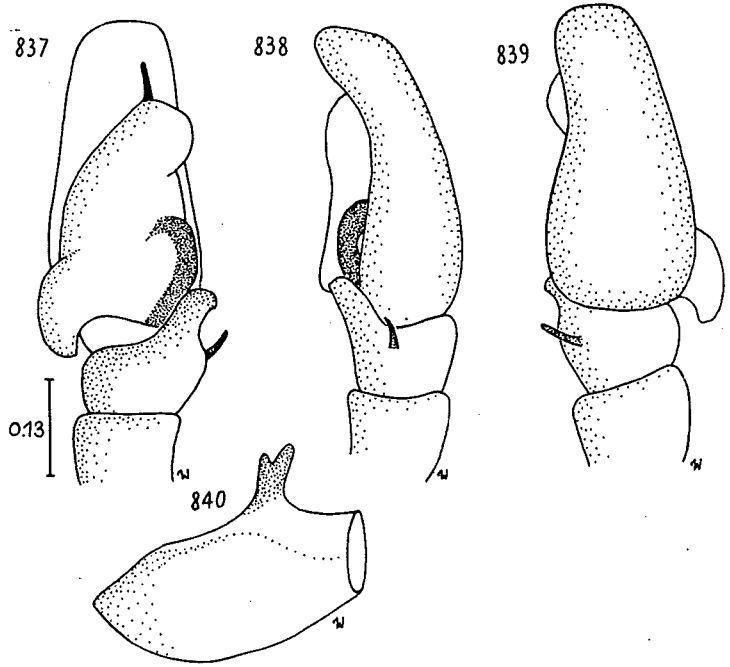
Fig. 828. *Heliophanus erythropleurus* KULCZ., holotype – female. Epigyne.



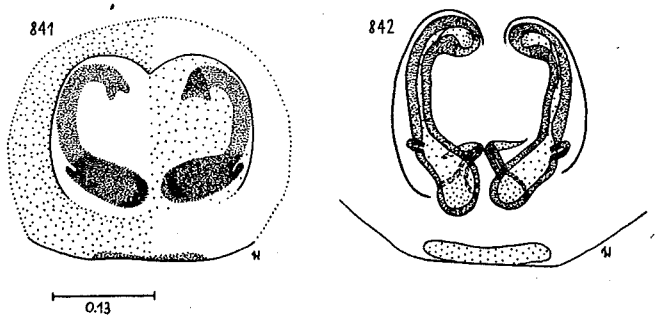
Figs. 829–830. *Heliophanus horrifer* sp. n., paratype – female. Epigyne and its internal structures (perhaps spermathecae in an unnatural position).



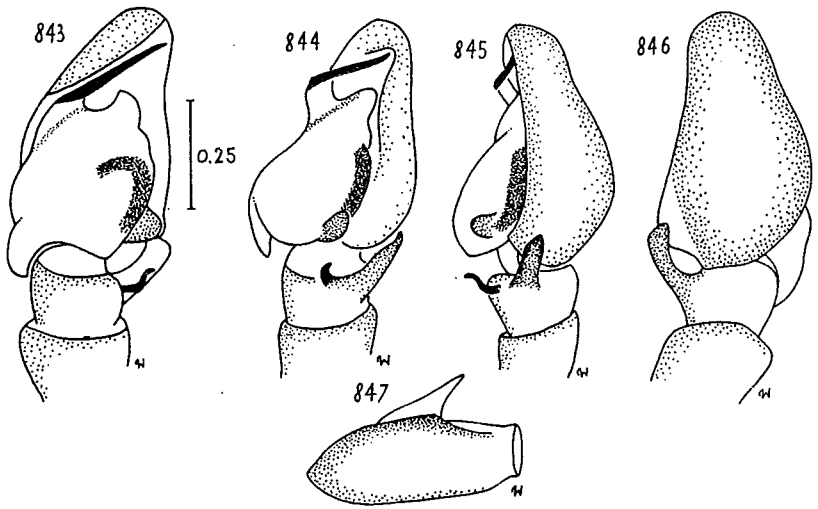
Figs. 831–836. *Heliophanus macentensis* BERL. et MILL. – female. Epigyne and its internal structures: 831–832 – holotype, 833–834 – specimen from Kenya, 835–836 – MRAC 134 545.



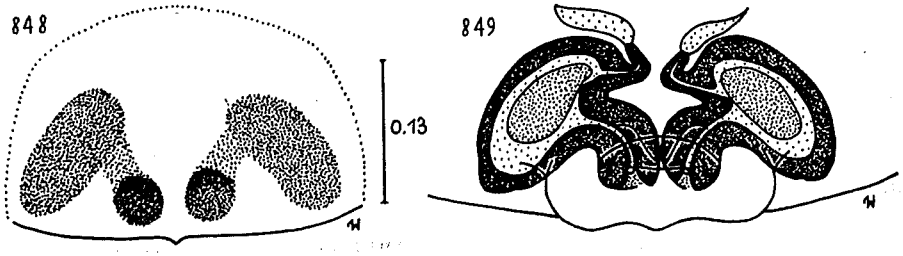
Figs. 837–840. *Heliophanus mucronatus* SIM., holotype – male: 837–839 – copulatory organ, ventral, lateral and dorsal views, 840 – femoral apophysis.



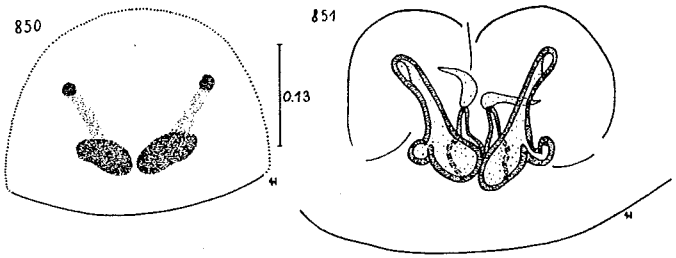
Figs. 841–842. *Heliophanus mucronatus* SIM. – female. Epigyne and its internal structures.



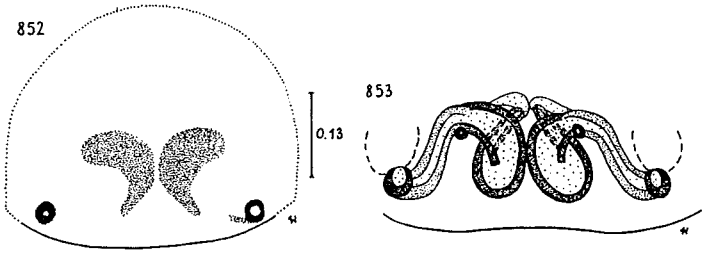
Figs. 843–847. *Heliophanus nobilis* sp. n., holotype – male: 843–846 – copulatory organ, ventral, ventro-lateral, lateral and dorsal views, 847 – femoral apophysis.



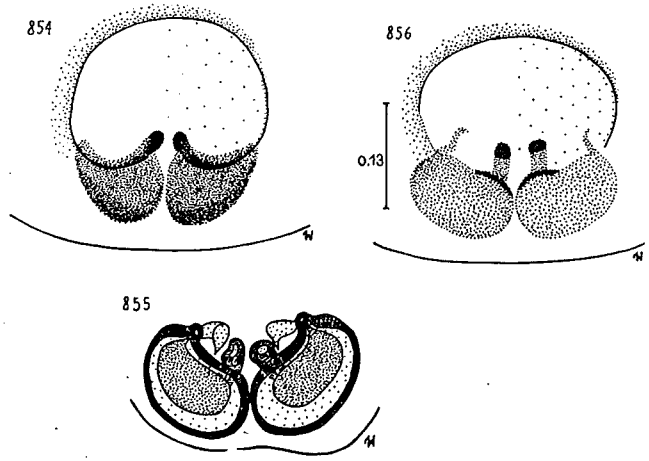
Figs. 848–849. *Heliophanus ochrichelis* STRAND, paratype – female. Epigyne and its internal structures.



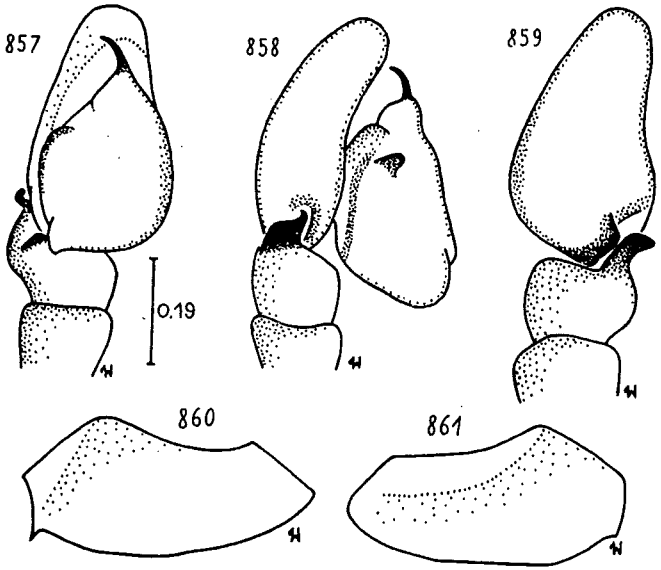
Figs. 850–851. *Heliophanus pauper* sp. n., holotype – female. Epigyne and its internal structures.



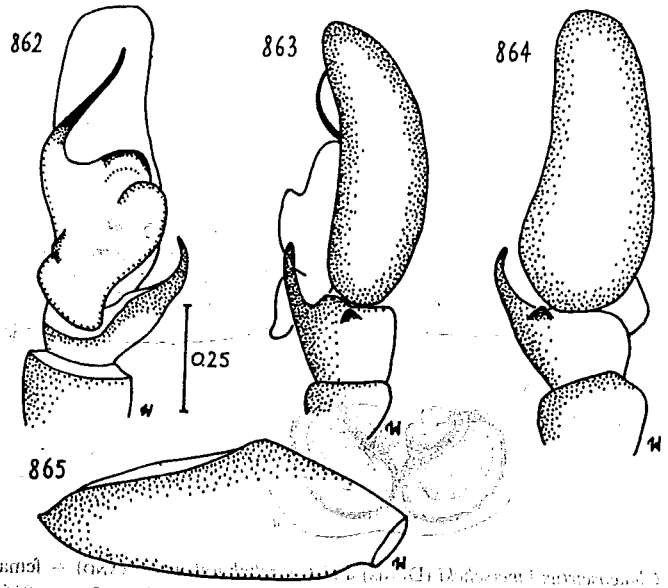
Figs. 852–853. *Heliophanus uvirensis* sp. n., holotype – female. Epigyne and its internal structures.



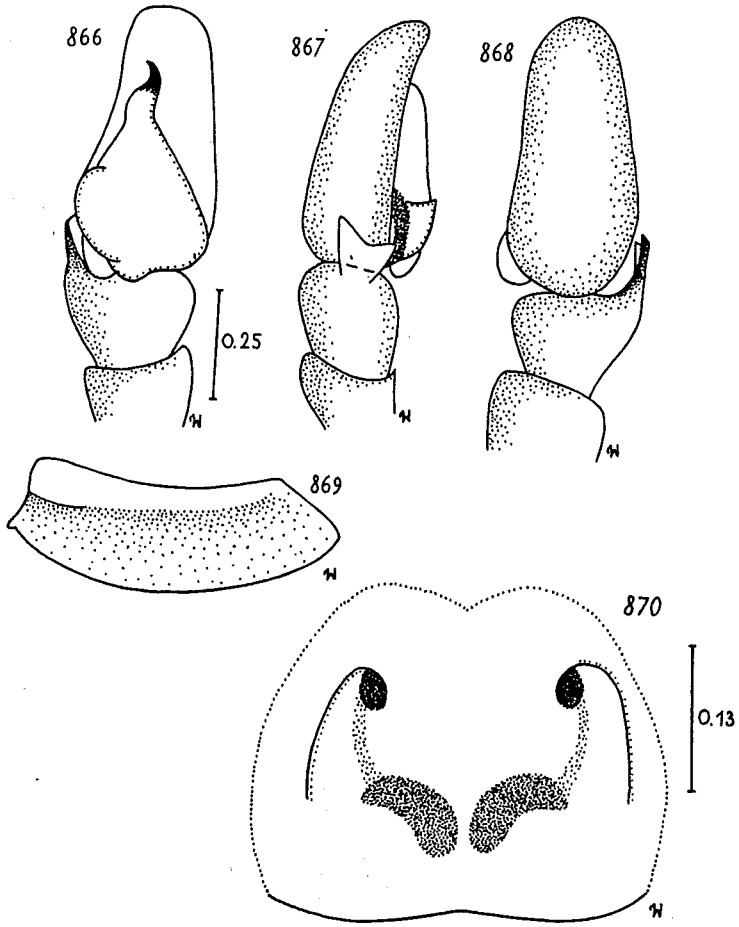
Figs. 854–856. *Chalcoscirtus janetscheki* (DENIS) and *Ch. rehobothicus* (STRAND) – females. Epigyne and its internal structures: 854–855 – holotype of *Heliophanus janetscheki* DENIS, 856 – holotype of *Heliophanus rehobothicus* STRAND.



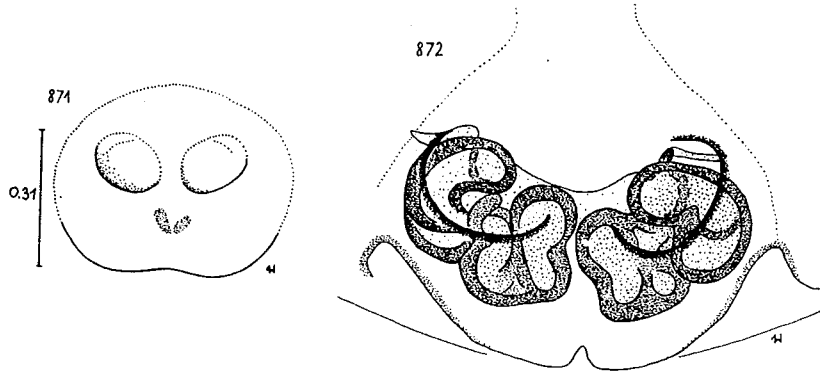
Figs. 857–861. *Pseudicius ghesquieri* (GILTAY), holotype, male: 857–859 – copulatory organ, ventral, lateral (bulbus turned) and dorsal views, 860–861 – pedipalpal femur, lateral inner and outer surface views.



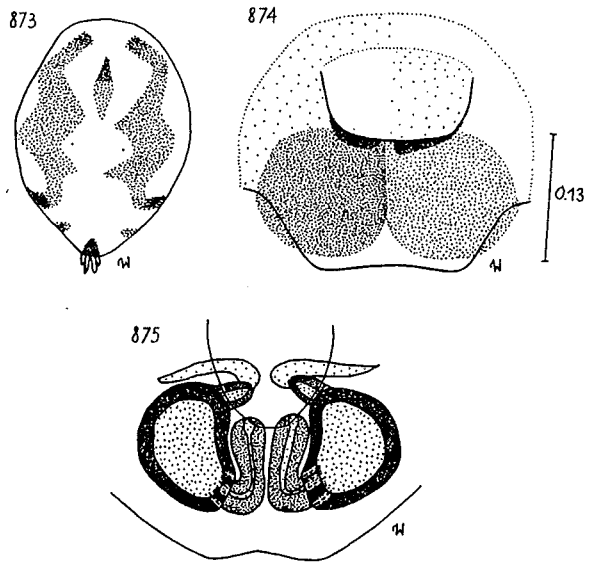
Figs. 862–865. *Pseudicius marshi* (PKH. et PKH.), holotype, male: 862–864 – copulatory organ, ventral, lateral and dorsal views, 865 – pedipalpal femur.



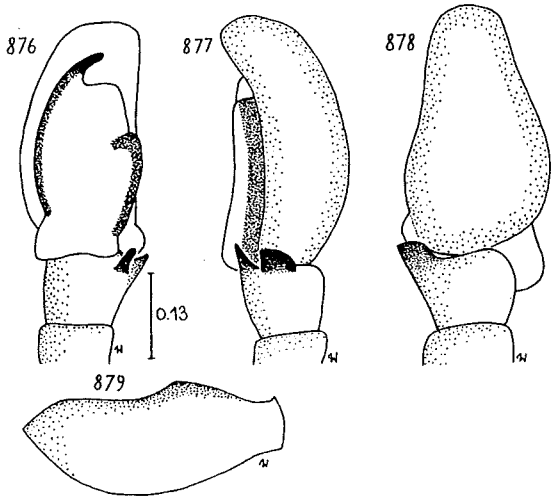
Figs. 866–870. "*Heliophanus*" *menemeriformis* STRAND, syntypes – male and female: 866–868 – male copulatory organ, ventral, lateral and dorsal views, 869 – male pedipalpal femur, 870 – epigyne.



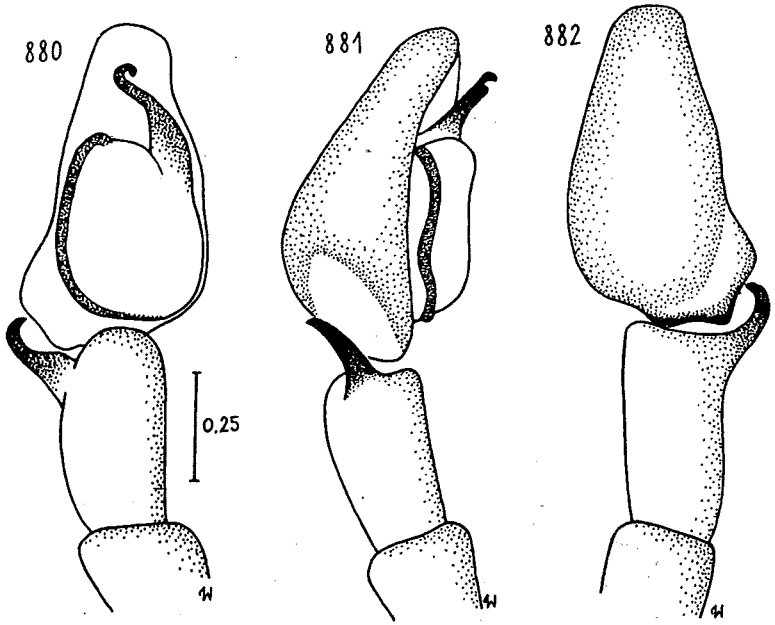
Figs. 871–872. "*Heliophanus*" *berlandi* LAWR., holotype – female. Epigyne and its internal structures.



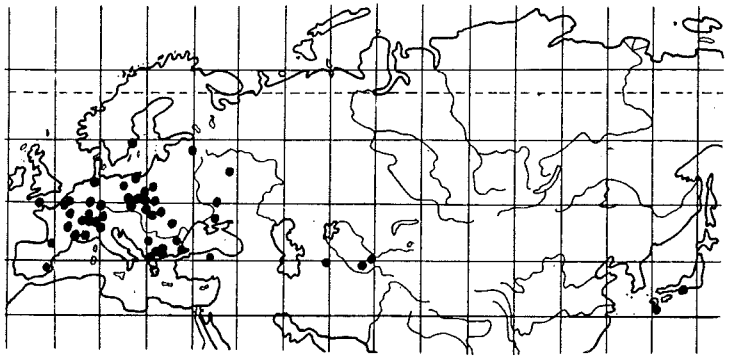
Figs. 873–875. "*Heliophanus*" *clarus* PKH. et PKH., syntype – female: 873 – abdominal pattern, 874–875 – epigyne and its internal structures.



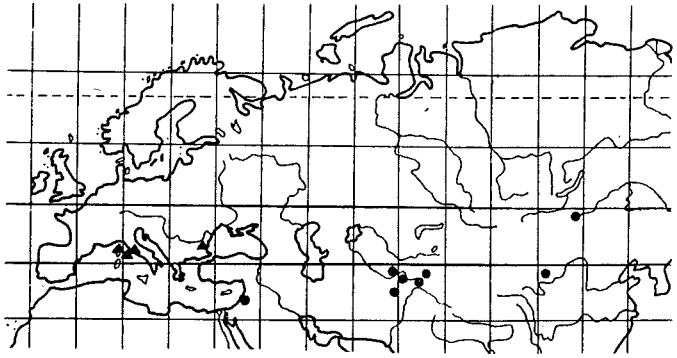
Figs. 876–879. *Pseudicius indicus* (SIM.), holotype (?), male: 876–878 – copulatory organ, ventral, lateral and dorsal views, 879 – pedipalpal femur.



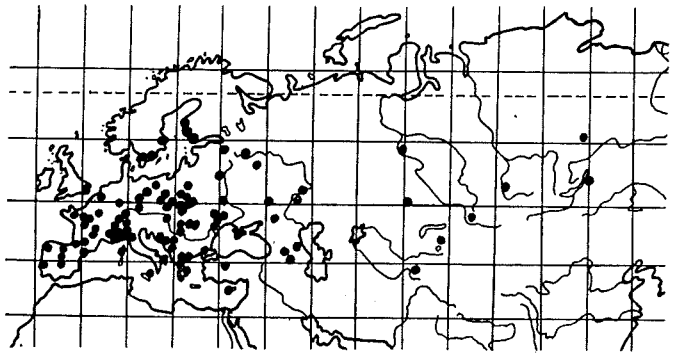
Figs. 880–882. "*Heliophanus*" *maculatus* KARSCH, holotype – male, copulatory organ, ventral, lateral and dorsal views.



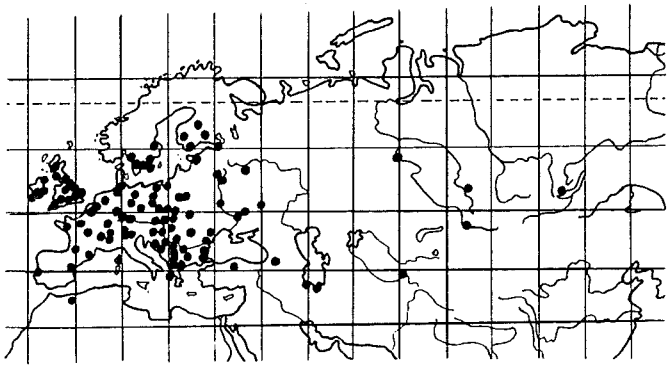
883 ● H. aeneus



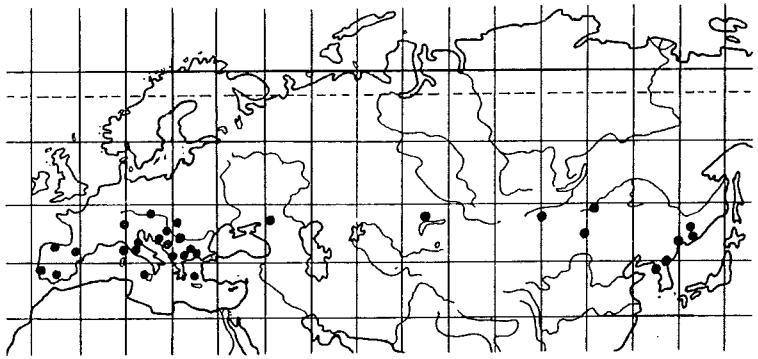
884 ● H. curvidens
▲ H. rufithorax



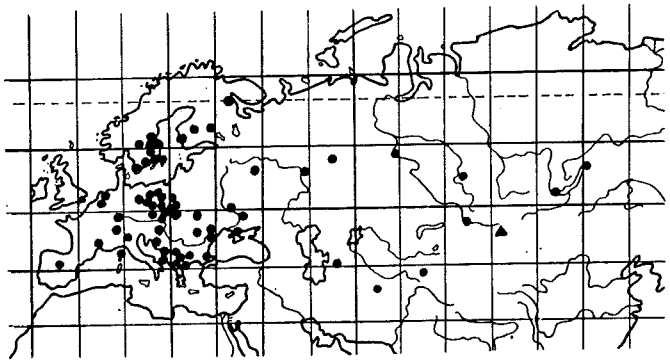
885 ● H. auratus



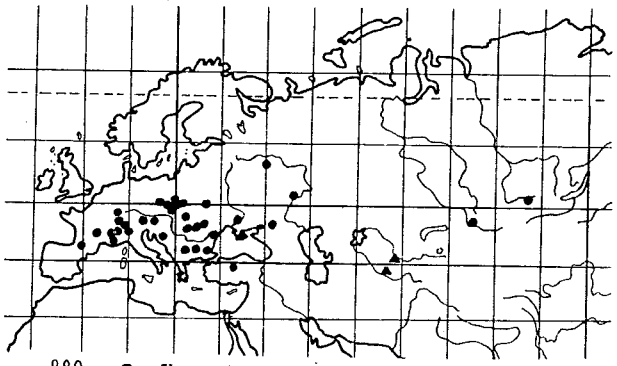
886 ● H. flavipes



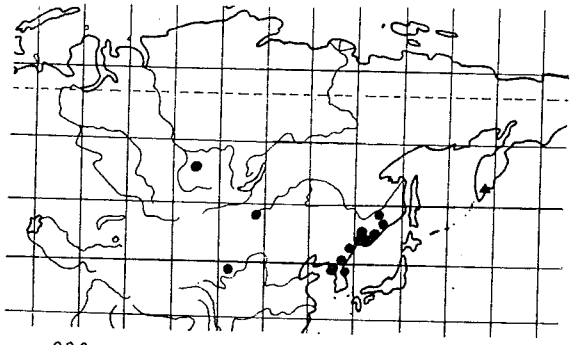
887 ● H. lineiventris



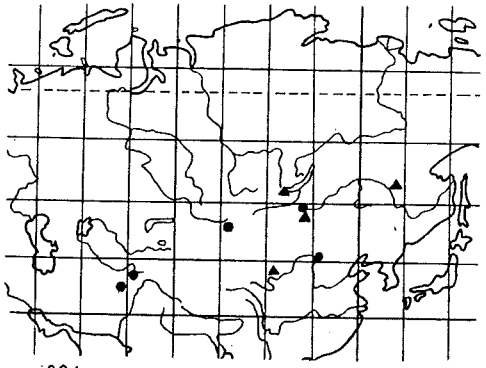
888 ● H. dubius
▲ H. chovdensis



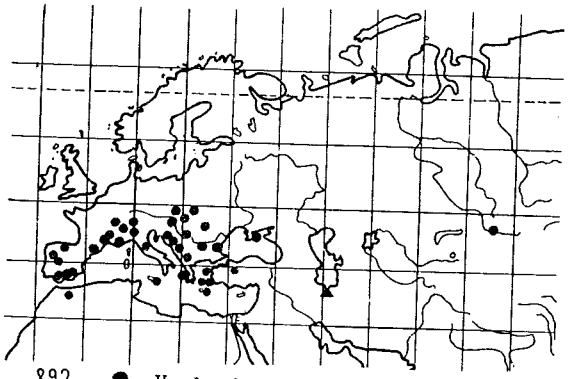
889 ● H. patagiatus
▲ H. turanicus



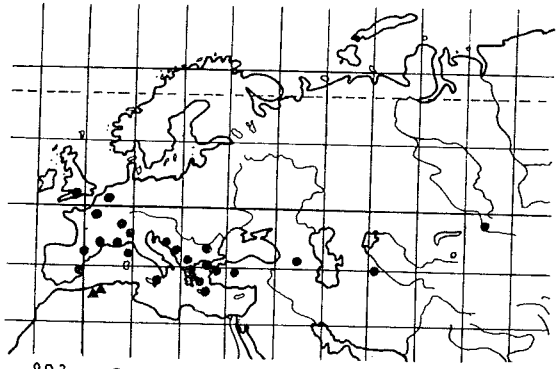
890 ● H. ussuricus
▲ H. camtschadalicus



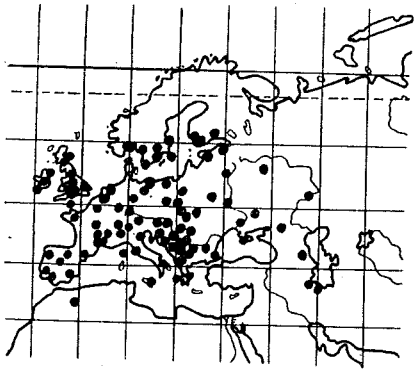
891 ● H. potanini
▲ H. baicalensis



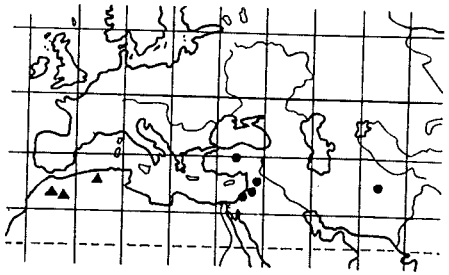
892 ● H. kochi
▲ H. verus



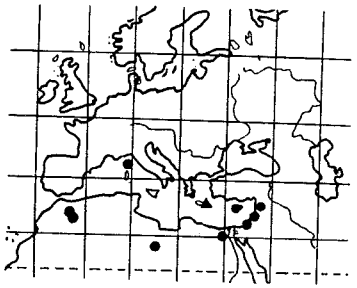
893 ● H. melinus
▲ H. acutissimus



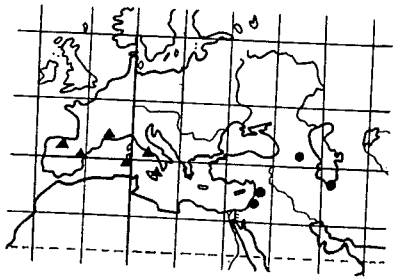
894 ● H. cupreus



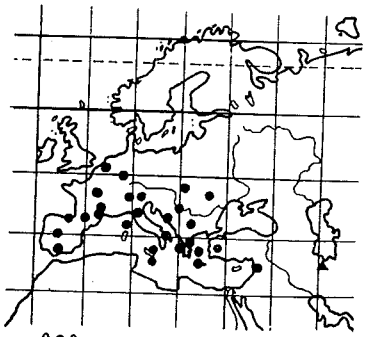
895 ● H. mordax
▲ H. stylifer



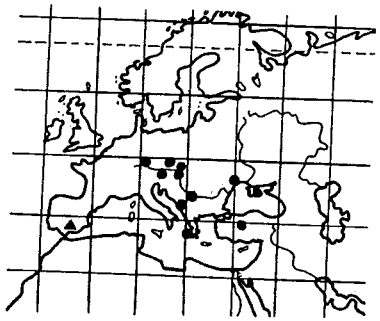
896 ● H. edentulus
▲ H. creticus



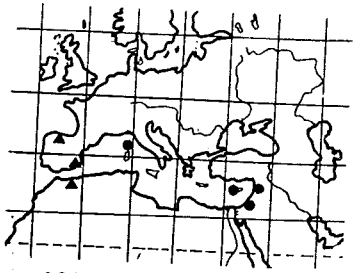
897 ● H. ignorabilis
▲ H. apiatus



898 ● H. tribulosus
▲ H. iranus

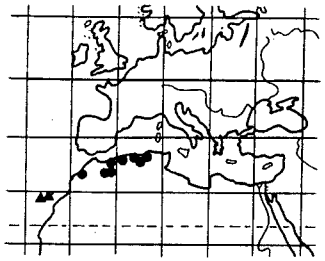


899 ● H. simplex
▲ H. ibericus

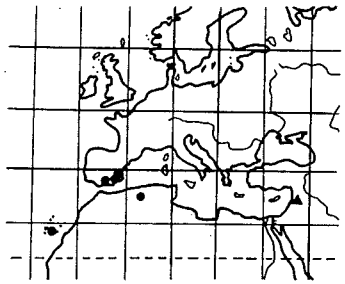


900 ● H. encifer
▲ H. ramosus

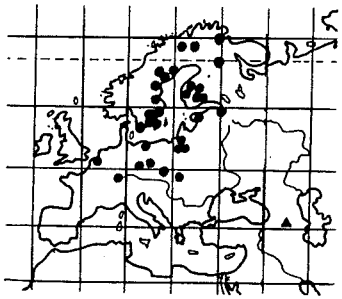
901 ● H. equester
▲ H. conspicuus



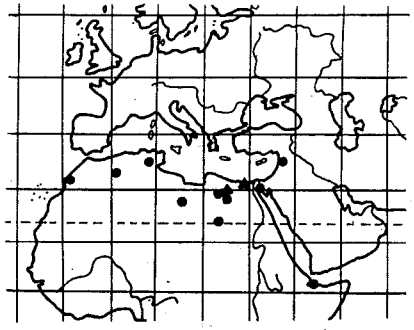
902 ● H. machaerodus
▲ H. canariensis



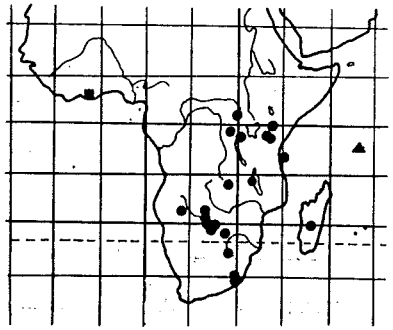
903 ● H. agricola
▲ H. malus



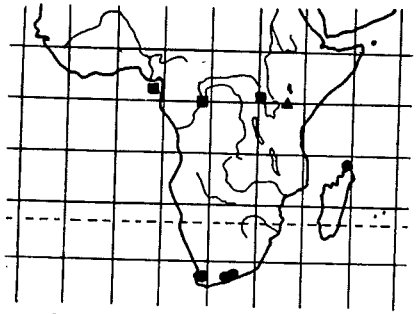
904 ● H. dampfi
▲ H. forcipifer



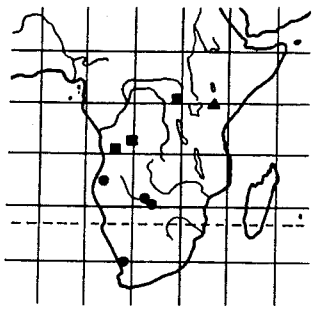
905 ● H. decoratus
▲ H. glaucus



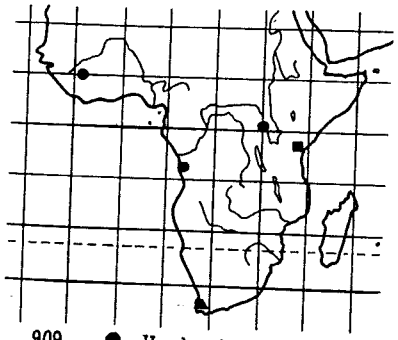
906 ● H. orchesta
▲ H. activus
■ H. eucharis



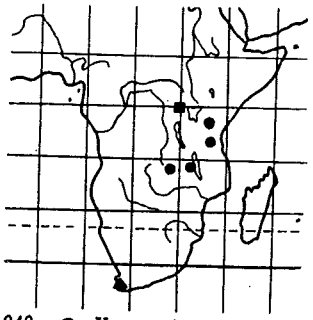
907 ● H. modicus
▲ H. validus
■ H. congolensis



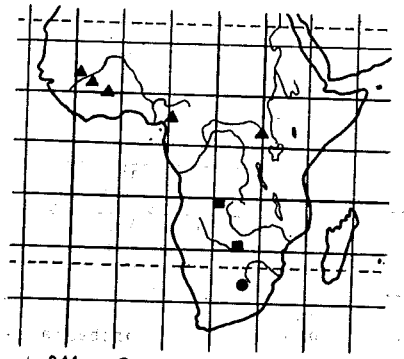
908 ● H. trepidus
▲ H. aberdarensis
■ H. falcatus



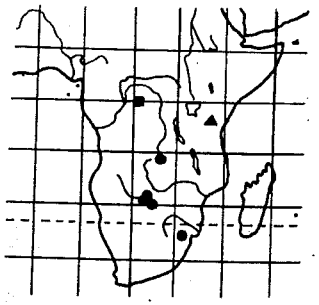
909 ● H. kankanensis
▲ H. horrifer
■ H. kilimanjaroensis



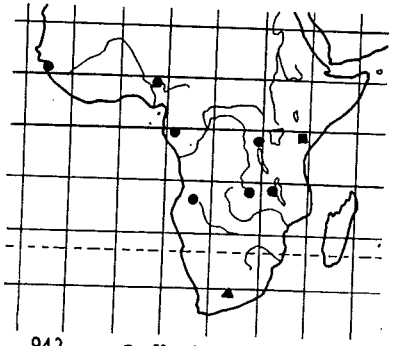
910 ● H. orchestioides
▲ H. bisulcus
■ H. difficilis



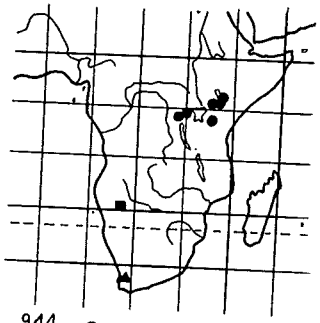
911 ● H. africanus
▲ H. aviculus
■ H. gloriosus



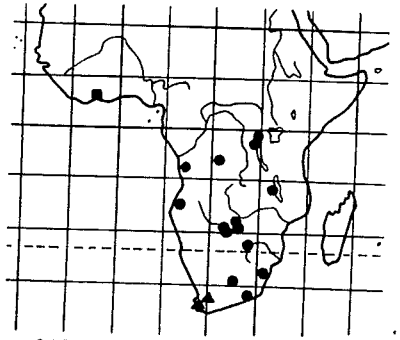
912 ● H. lesserti
▲ H. crudeni
■ H. nobilis



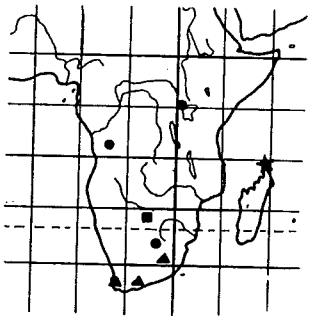
913 ● H. harpago
▲ H. deserticola
■ H. pauper



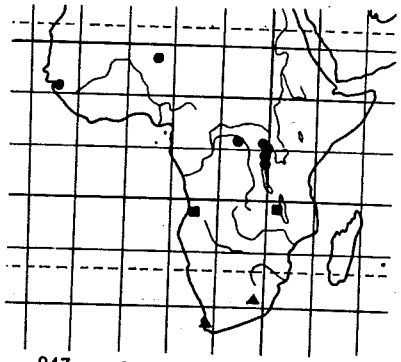
914 ● H. kenyaensis
▲ H. bellus
■ H semirasus



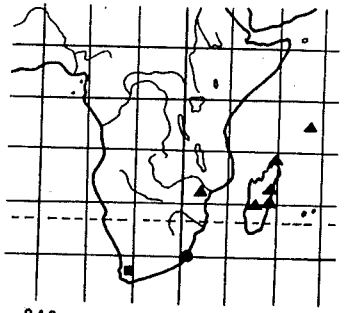
915 ● H. debilis
▲ H. capensis
■ H. robustus



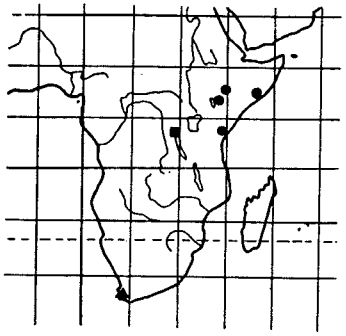
916 ● H. insperatus
▲ H. pratti
■ H. paulus
★ H. innominatus



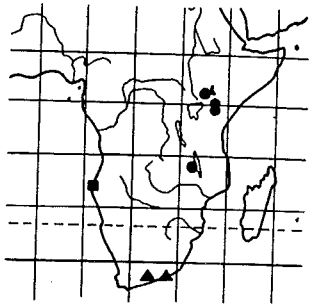
917 ● H. cassinicola
▲ H. capicola
■ H. chikangawanus



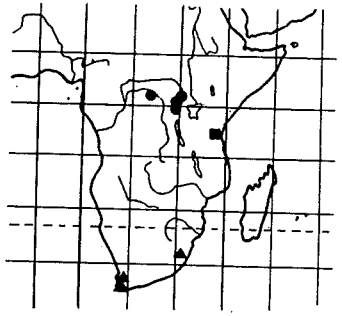
918 ● H. marshalli
▲ H. hamifer
■ H. mirabilis



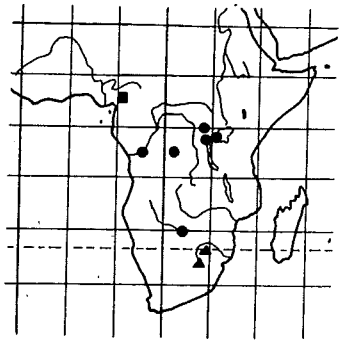
919 ● H. undecimmaculatus
▲ H. vilosus
■ H. uvirensis



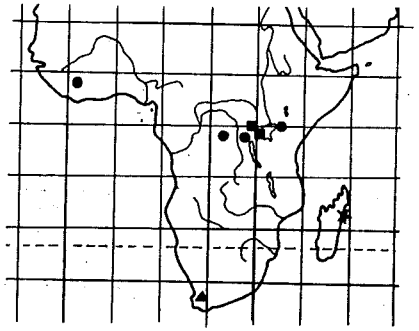
920 ● H. gladiator
▲ H. demonstrativus
■ H. deformis



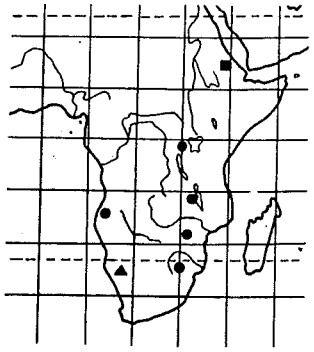
921 ● H. improcerus
▲ H. claviger
■ H. ochrichelis



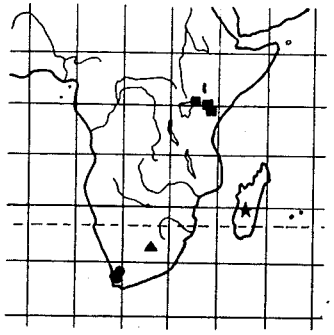
922 ● H. fascinatus
▲ H. transvaalicus
■ H. alienus



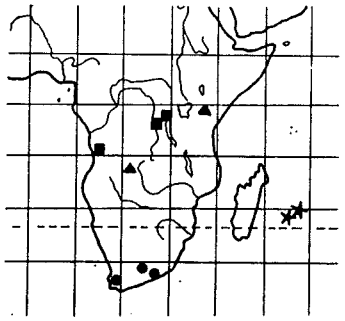
923 ● H. macentensis
▲ H. portentosus
■ H. butemboensis
★ H. mucronatus



924 ● H. deamatus
▲ H. redimitus
■ H. erythropleurus



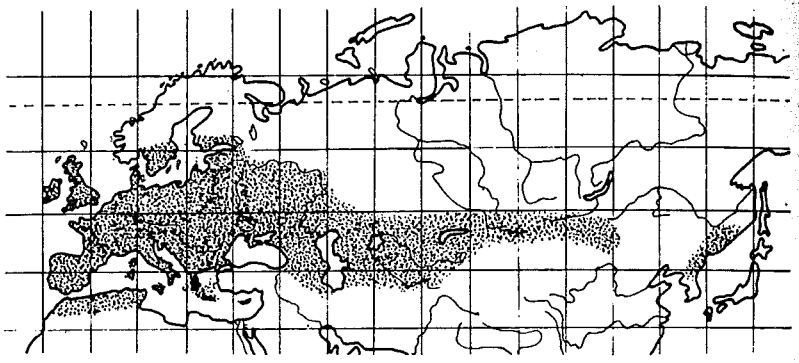
925 ● H. peckhami
▲ H. hastatus
■ H. imperator
★ H. imerinensis



926 ● H. patellaris
▲ H. giltayi
■ H. lawrencei
★ H. mauricianus

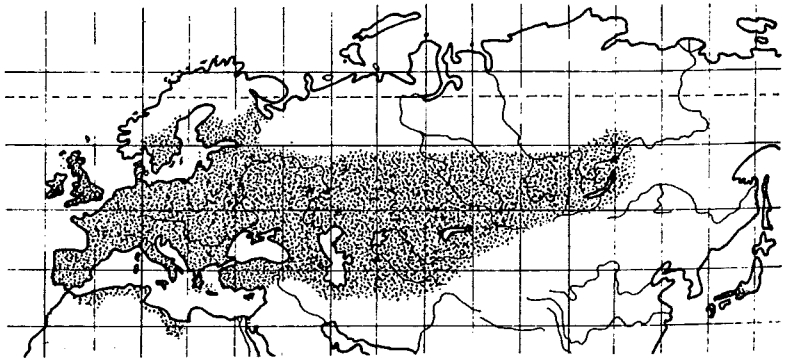
Figs. 883–926. Distribution of *Heliophanus* spp.

927



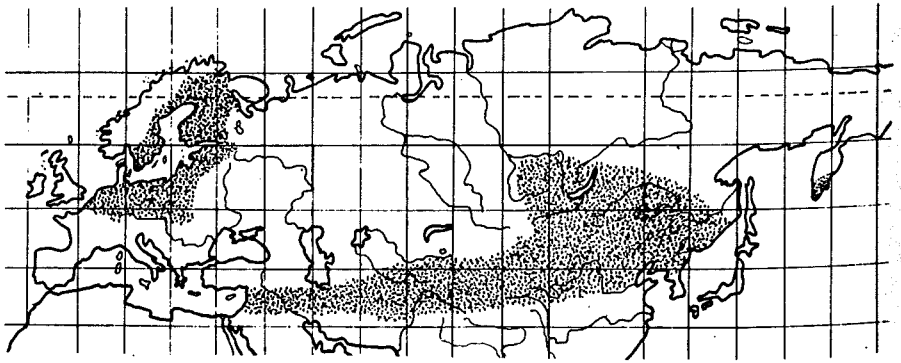
THE CUPREUS-GROUP

928



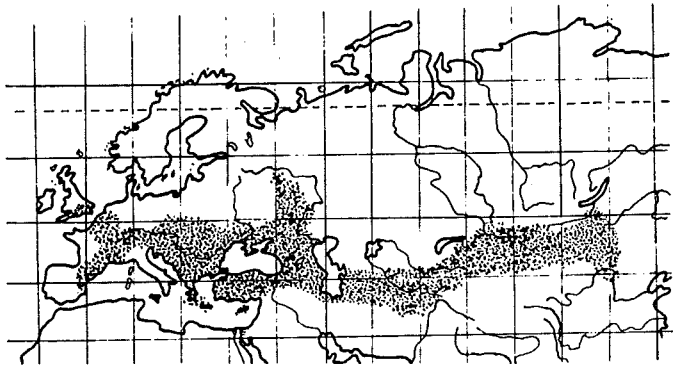
THE AURATUS-GROUP

929



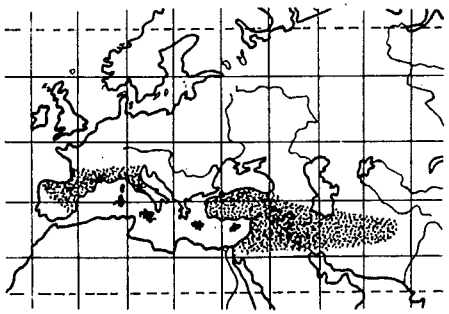
THE USSURICUS-GROUP

930



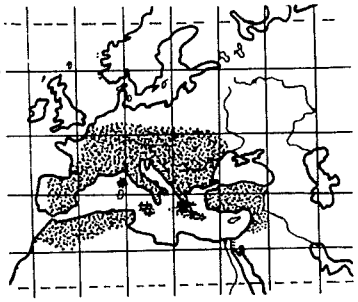
THE POTANINI-GROUP

931



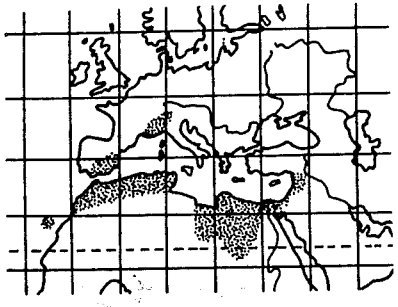
THE APIATUS-GROUP

932



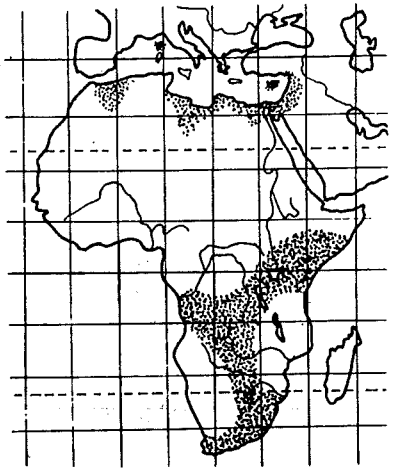
THE STYLIFER-GROUP

933

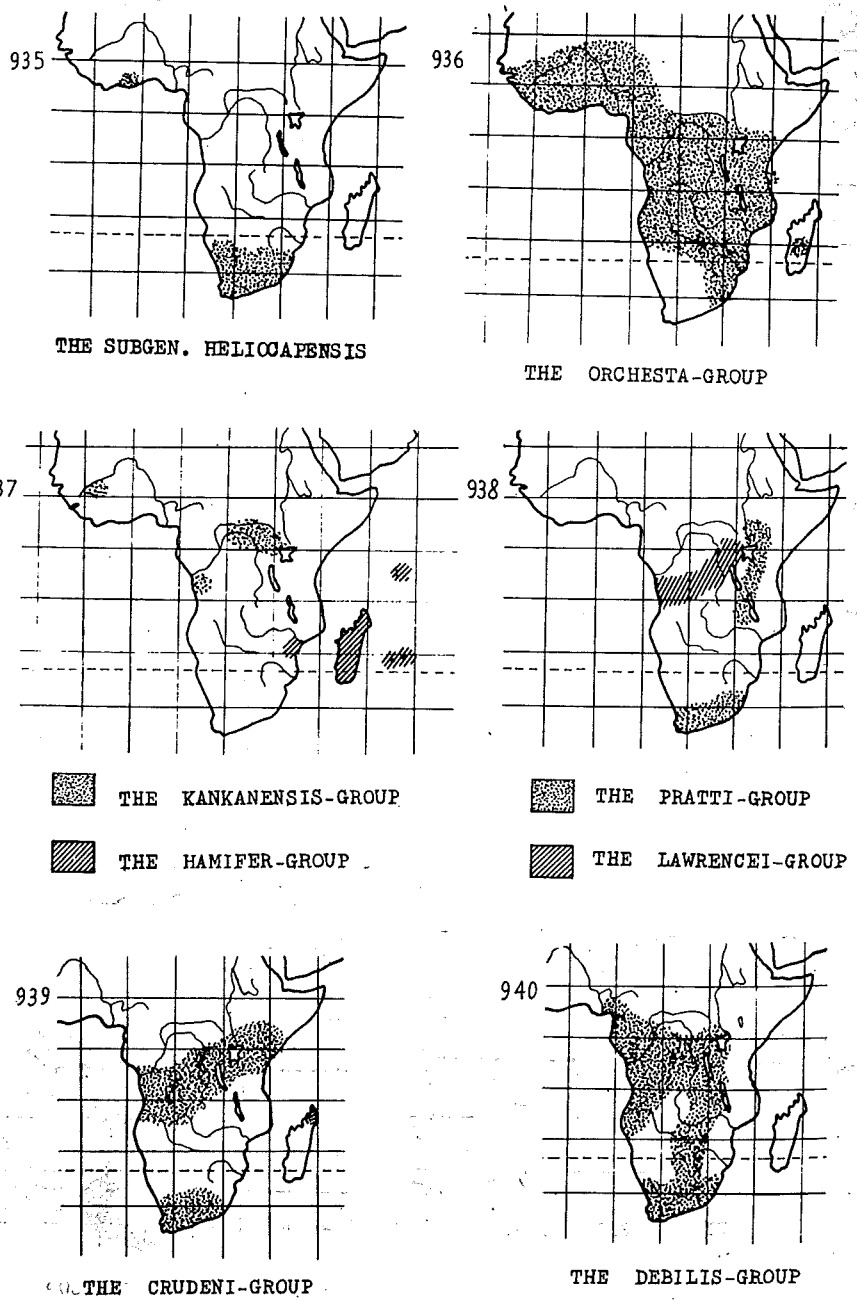


THE DECORATUS-GROUP

934



THE MARSHALLI-GROUP



Figs. 927–940. Distribution of the species-groups.

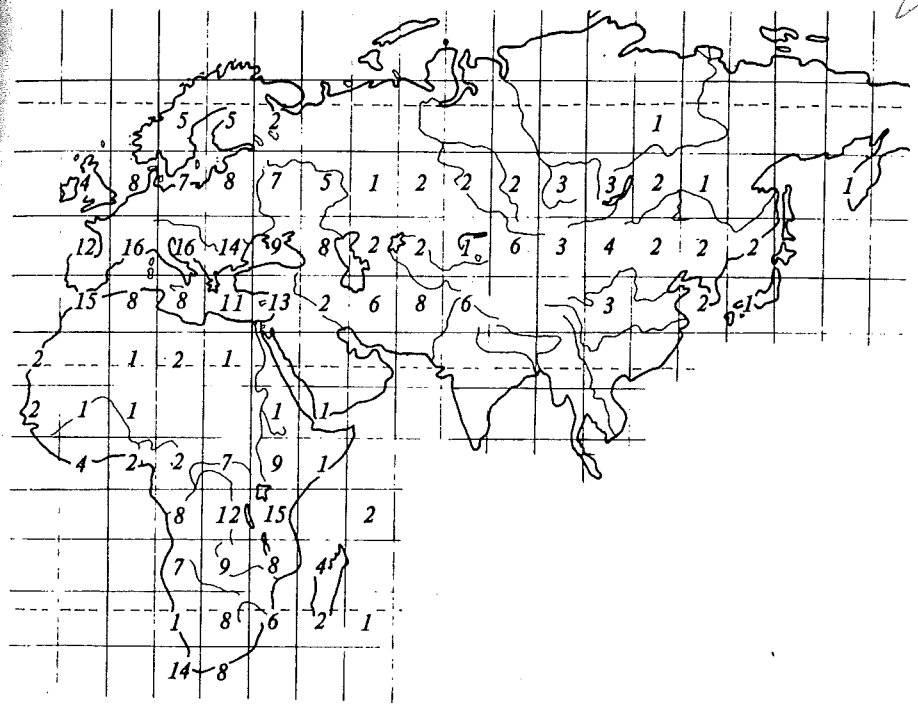


Fig. 941. Number of the *Heliophanus* species known to occur in different areas.

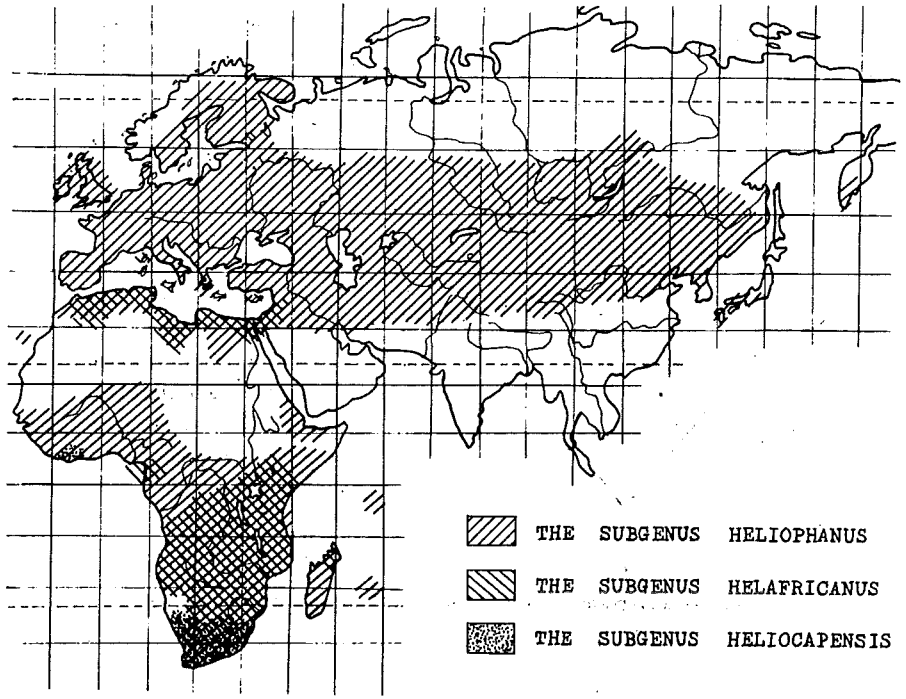


Fig. 942. Range of the genus *Heliophanus*.

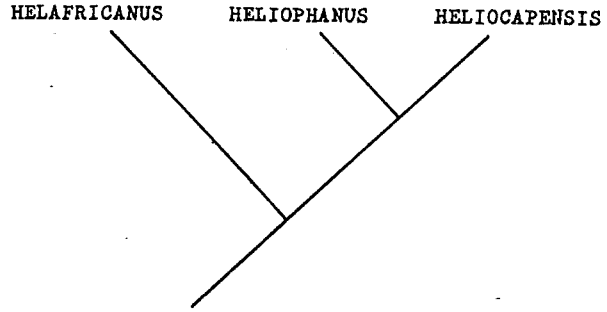
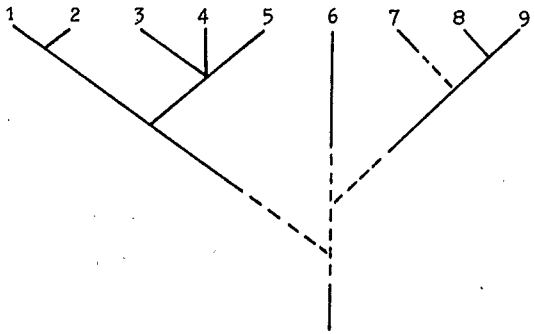
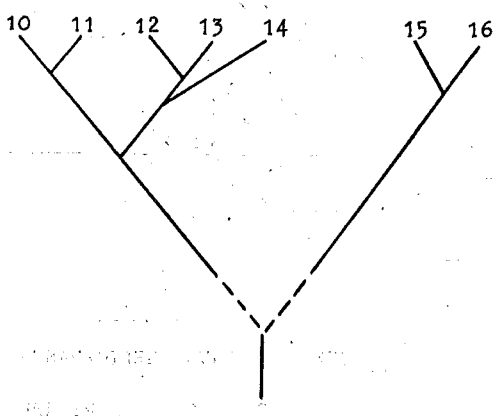


Fig. 943. Probable evolutionary sequence of separation of the subgenera.



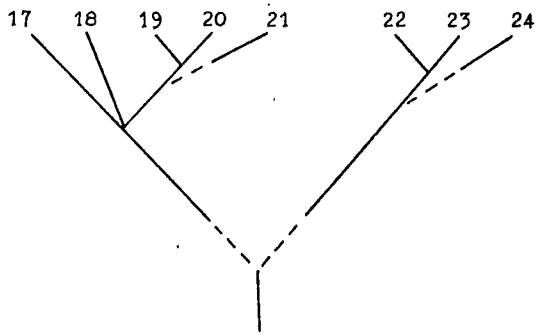
1. H. deserticola
2. H. redimitus
3. H. capensis
4. H. peckhami
5. H. bellus
6. H. portentosus
7. H. mirabilis
8. H. claviger
9. H. eucharis

Fig. 944. Hypothetical phylogenetic tree of the subgenus *Heliocapensis*.



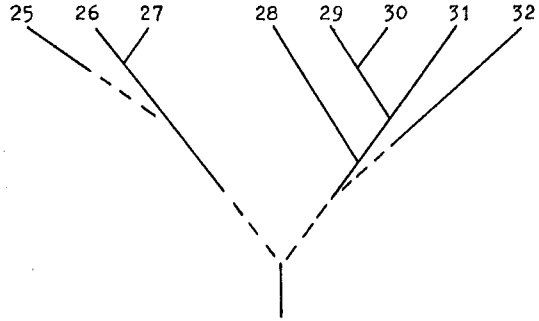
10. H. bisulcus
11. H. marshalli
12. H. gloriosus
13. H. insperatus
14. H. edentulus
15. H. undecimmaculatus
16. H. demonstrativus

Fig. 945. Hypothetical phylogenetic tree of the *marshalli* group.



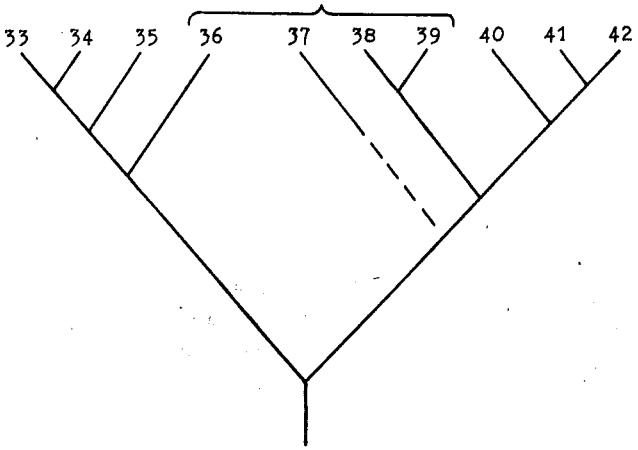
17. H. congolensis
18. H. trepidus
19. H. debilis
20. H. patellaris
21. H. villosus
22. H. paulus
23. H. fascinatus
24. H. butemboensis

Fig. 946. Hypothetical phylogenetic tree of the *debilis* group.



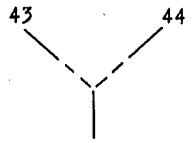
25. H. giltayi
26. H. hastatus
27. H. modicus
28. H. imperator
29. H. crudeni
30. H. kenyaensis
31. H. validus
32. H. kilimanjaroensis

Fig. 947. Hypothetical phylogenetic tree of the *crudeni* group.



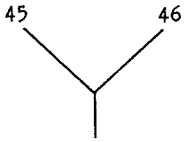
33. H. cassinicola
34. H. aviculus
35. H. robustus
36. H. orchesta
37. H. deamatus
38. H. lesserti
39. H. orchestioides
40. H. harpago
41. H. transvaalicus
42. H. semirasus

Fig. 948. Hypothetical phylogenetic tree of the *orchesta* group.



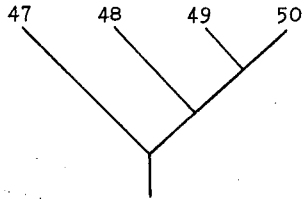
43. H. lawrencei
44. H. falcatus

Fig. 949. Hypothetical phylogenetic tree of the *lawrencei* group.



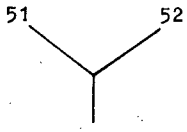
45. H. improcerus
46. H. kankanensis

Fig. 950. Hypothetical phylogenetic tree of the *kankanensis* group.



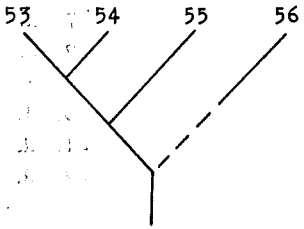
47. H. mauricianus
48. H. imerinensis
49. H. hamifer
50. H. innominatus

Fig. 951. Hypothetical phylogenetic tree of the *hamifer* group.



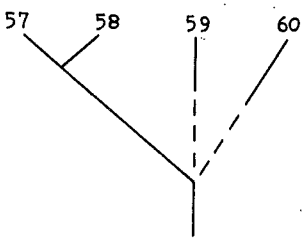
51. H. gladiator
52. H. pratti

Fig. 952. Hypothetical phylogenetic tree of the *pratti* group.



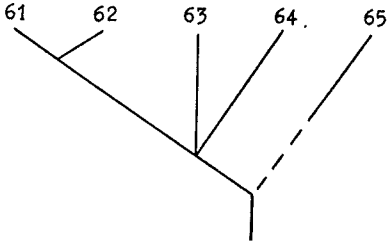
53. H. apiatus
54. H. encifer
55. H. creticus
56. H. mordax

Fig. 953. Hypothetical phylogenetic tree of the *apiatus* group.



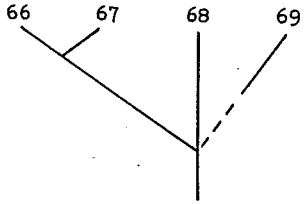
57. H. conspicuus
58. H. tribulosus
59. H. ramosus
60. H. stylifer

Fig. 954. Hypothetical phylogenetic tree of the *stylifer* group.



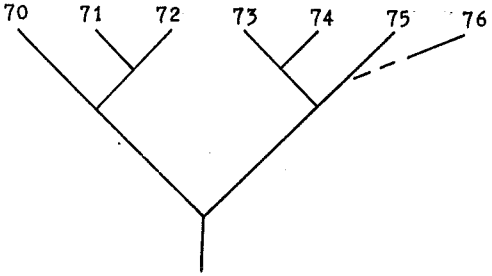
61. H. ussuricus
62. H. dampfi
63. H. camtschadalicus
64. H. baicalensis
65. H. curvidens

Fig. 955. Hypothetical phylogenetic tree of the *ussuricus* group.



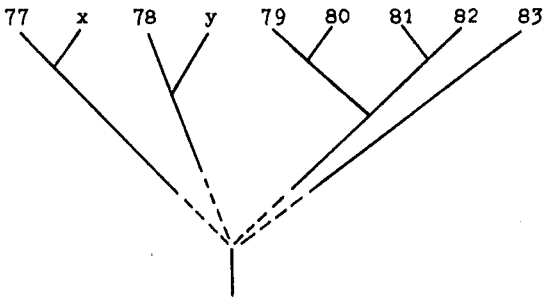
66. H. glaucus
67. H. decoratus
68. H. ibericus
69. H. agricola

Fig. 956. Hypothetical phylogenetic tree of the *decoratus* group.



70. H. simplex
71. H. aeneus
72. H. dubius
73. H. auratus
74. H. flavipes
75. H. equester
76. H. ignorabilis

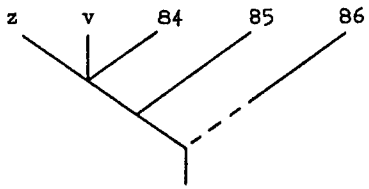
Fig. 957. Hypothetical phylogenetic tree of the *auratus* group.



77. H. forcipifer
78. H. cupreus
79. H. turanicus
80. H. lineiventris
81. H. kochi
82. H. rufithorax
83. H. machaerodus

x, y - with letters are denoted two undescribed yet species from Pamir /Andreeva in prep./

Fig. 958. Hypothetical phylogenetic tree of the *cupreus* group.



84. H. potanini
85. H. melinus
86. H. patagiatus

z, v - with letters are denoted two undescribed yet species from Pamir /Andreeva in prep./

Fig. 959. Hypothetical phylogenetic tree of the *potanini* group.

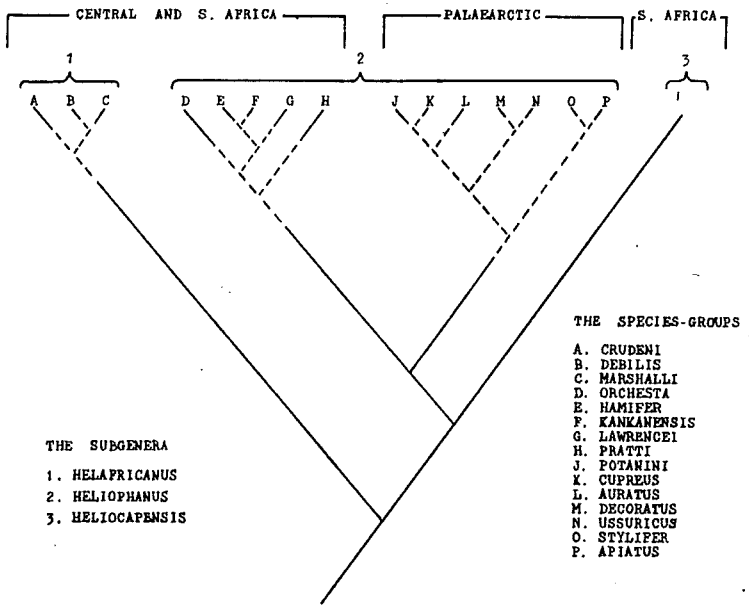


Fig. 960. Hypothetical phylogenetic tree of the genus *Heliophanus*.

Heliophanus glaucus Bösenberg et Lenz, 1894

(figs. 558, 567–569, 905)

Heliophanus albescens Denis, 1947, **syn. n.**

Material. Egypt: Siwa [Oasis], 9.VIII.1935, leg. Orner et Cooper – 7 ♂♂, 3 ♀♀ (syntypes of *H. albescens*, BMNH 1936.2.12.403.410); Alexandria, 9.III.1888, leg. F. Stuhlmann – 1 ♀ (holotype, ZMH); Libya: Ramli [Er] – 1 ♀ (MNHN 5972).

Male. Cephalothorax dark brown or black, anterior eyes sparsely fringed with long brown setae, thoracic part clothed with single white hairs. Abdomen whitish-yellow dorsally, light ventrally. Sternum light brown. Legs whitish-yellow. Pedipalp light brown with large femoral apophysis and horizontal tibial apophysis, adhering to tibia (fig. 558). Dimensions: a 1.5–2.2, b 1.6–1.9, c 0.6–0.9, d 0.8–1.1, e 1.1–1.2.

Female. Coloration like in male. Epigyne more or less oval, with indistinct depression (figs. 567–568); internal structures as in fig. 569. Dimensions: a 1.6–2.1, b 1.7–3.8, c 0.7–1.0, d 0.9–1.1, e 1.0–1.2.

The species differs from *H. decoratus* only in coloration, may be they are conspecific.

Heliophanus decoratus L. Koch, 1875

(figs. 549–557, 559–566, 570–584, 905)

Heliophanus senussus Caporiacco, 1928, **syn. n.**,
Heliophanus melinus: Prószyński 1976 (part.: ♀), nec. L. Koch, 1867.

Material. Algeria: 2 ♂♂, 4 ♀♀ (MNHN 1247), 1 ♂, 1 ♀ (MNHN 6140); Djibouti, det. E. Simon – 1 ♂ (MNHN 20 089); Egypt: 1 ♂ (HDZ 1832 t. 96); Suez, 1889, det. E. Simon – 2 ♂♂, 3 ♀♀ (MNHN 12 193); Siwa [Oasis] near Tamarish, 26.IV.1935, leg. Armstrong, det. J. Denis – 1 ♂, 2 juv. (BMNH 1936.2.12.1066–1069); Libya: Cufra [Oasis], El Hauuari, VI.1931 – 1 ♀ (MZS); Giarabub [Oasis], XII.1926–III.1927, leg. L. Caporiacco – 1 ♀, 1 juv. (♀ – holotype of *H. senussus*, MCSND); Morocco: Agadir, leg. K. Harms – 1 ♂, 1 juv. (CJW); Syria: leg. B. Camboué – 1 ♂, 2 juv. (MNHN 881); (Syria?) Kurrucke – 1 ♀ (MNHN 19 963); Tunisia: Nefzas, leg. Vibert – 1 ♂ (MNHN 22 511); locality unknown: 1 ♂, 2 ♀♀, 4 juv. (MNHN 13 213).

Male. Cephalothorax dark brown or black, anterior eyes sparsely fringed with long brown setae, thoracic part clothed with single white hairs. Abdomen black, with narrow white band at anterior margin and two pairs of marks composed of scales, in some specimens abdomen uniformly brown without marks. Sternum brown. Legs brown or yellow. Pedipalp dark, femoral apophysis large (figs. 552, 556, 562 and 566), horizontal apophysis thin, strictly adhering to tibia (figs. 549, 553, 557, 559 and 563), external margin of cymbium fringed with white scales. Dimensions: a 1.5–2.2, b 1.5–1.9, c 0.6–0.9, d 0.8–1.1, e 1.0–1.2.

Female. Coloration as in male, in many specimens abdomen slightly lighter, greyish-brown, without light marks. Sternum brown or yellow. Epigyne more or less oval, with single depression (figs. 570, 573, 575, 578–579, 581 and 583), posterior margin of epigyne with median notch discernible sometimes only after removal of epigyne. Seminal ducts arched, spermathecae oval (figs. 571–572, 574, 576–577, 580, 582 and 584). Dimensions: a 1.6–2.2, b 1.7–4.1, c 0.7–1.0, d 0.9–1.1, e 1.0–1.2.

The species differs from *H. albescens* only in coloration. The male of *H. decoratus* resembles *H. ibericus*, may be distinguished by the shape of bulbus. The female of *H. decoratus* is very difficult to separate from *H. agricola* but the arrangement of seminal ducts is different.

A fairly large individual variation both in the structure of male pedipalp (cf. figs. 549–552, and 553–558, and 559–562, and 563–566) and arrangement of seminal ducts in females (cf. figs. 571–572, 574, and 576–577, and 580, and 582, 584) detectable. This combined with the pattern of *H. decoratus* distribution – it occurrs in oases, thus individual populations are probably isolated – suggests that actually we may deal with a group of closely related species. This problem clearly deserves a further, more detailed study.

Heliophanus ibericus sp. n.

(figs. 585–588, 899)

Material. Spain: Pozuelo de Calatrava – 1 ♂ (holotype, MNHN 24 191).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown, with indistinct trace of lighter band at anterior margin and two pairs of indistinct lighter marks; ventrally light. Sternum light brown. Legs I light brown, remaining legs yellow. Whole body clothed with sparse brown hairs, slightly denser at anterior margin of abdomen. Pedipalp dark, femoral apopysis sharply ended (fig. 588), horizontal tibial apophysis adherent to tibia (fig. 585). Dimensions: a 1.8, b 1.6, c 0.9, d 1.0, e 1.1.

Female. Unknown.

The species resembles *H. decoratus* but may be distinguished by the shape of bulbus (fig. 585).

Heliophanus agricola sp. n.

(figs. 589–600, 903)

Material. Algeria: 1 ♂, 1 juv. (♂ – paratype, IZ PAN); Boghari – 1 ♀ (paratype, MNHN 5414); Spain: leg. Westring – 1 ♂ (paratype, NR 1661); Cartagena – 3 ♂♂, 2 ♀♀ (larger ♂ – holotype, larger ♀ – allotype, another – paratypes, MNHN 1269); Murcia Province – 1 ♂ (paratype, MNHN 12 686), leg. K. Harms – 1 ♂ (paratype, CJW); Almeria Province, leg. K. Harms – 1 ♂, 1 ♀, 1 juv. (paratypes, CJW); Gran Canaria – 2 ♂♂ (paratypes, MNHN 22 599).

Male. Cephalothorax brown or black. Abdomen brown or black, with light band at anterior margin and one or two pairs of white marks, in some specimens abdomen uniformly brown without marks. Sternum brown. Legs brown, in some individuals legs I black with small marks composed of white scales at bases of segments. Pedipalp black, femoral apophysis large, curved (figs. 592 and 596), outer margin of cymbium fringed with white scales. Dimensions: a 1.3–1.8, b 1.5–1.9, c 0.7–0.8, d 1.0, e 1.1–1.2.

Female. Coloration like in male. Abdomen generally slightly lighter, greyish-yellow, without marks. Epigyne large, with single depression (figs. 597 and 599); internal structures as in figs. 598 and 600. Dimensions: a 2.0, b 3.3, c 0.9, d 1.1, e 1.2.

The male readily distinguished from other species of the *decoratus* group by the structure of pedipalp (figs. 589–596). The female difficult to separate from *H. decoratus* but may be distinguished by the slightly larger epigyne and internal structures of genitalia (figs. 597–600).

The specimens from Cartagena have been labelled "*H. agricola*" by E. SIMON but never described.

THE *AURATUS* GROUP

Heliophanus simplex SIMON, 1868

(figs. 601–611, 899)

Heliophanus simplex: SIMON 1878, DAHL 1926, HARM 1971, MILLER 1971, PRÓSZYŃSKI 1976 (part.: fig. 395), 1979,
Heliophanus cupreus simplex: SIMON 1937, ROEWER 1954.

Material. Austria: det. W. KULCZYŃSKI – 1 ♂, 1 ♀ (MNHN 364), det. W. KULCZYŃSKI – 2 ♂♂, 5 ♀♀, 15 juv. (IZ PAN); Czechoslovakia, Slovakia: Šturovo, 16.VI.1956, leg. et det. F. MILLER – 4 ♂♂, 2 ♀♀, 1 juv. (IZ PAN); Greece, Corfu: leg. E. KEYSERLING, det. E. SIMON – 2 ♂♂, 1 ♀ (MNHN 2321), det. E. REIMOSER – 1 ♀ (NHMW); Hungary: Budapest, det. W. KULCZYŃSKI – 3 ♀♀, 1 juv. (IZ PAN); Roumania: Orsova near Timişoara, det. W. KULCZYŃSKI – 1 ♂, 1 ♀ (IZ PAN); Soviet Union [S Russia]: leg. A. NORMANN – 1 ♂ (NR 1658d): Turkey: Amasya – 2 ♀♀ (MNHN 12 869).

Male. Cephalothorax light brown, dark brown or black, eye field darker, eyes surrounded with black. Abdomen yellow, light brown or dark brown, clothed with dense light hairs, thus appears lighter; in some specimens (more frequently juveniles) indistinct leaf-like pattern of light hairs. Sternum brown. Legs yellow or light brown. Pedipalp light brown, diagnostic bifid embolus (figs. 601 and 605–606). Dimensions: a 1.5–1.6, b 1.7, c 0.7–0.8, d 0.9, e 0.9–1.0.

Female. Coloration as in male. Epigyne oval, with two shallow depressions (figs. 607 and 610). Seminal ducts arched, with broader initial sections, spermathecae more or less spherical (figs. 608–609 and 611). Dimensions: a 1.9–2.0, b 2.7–3.0, c 0.9, d 1.1, e 1.2.

H. simplex is a distinctive species, readily distinguished from other species of the *auratus* group by the bifid embolus (figs. 601 and 605–606) and form of epigyne (figs. 607 and 610).

The original description is too superficial to make the correct identification possible. However, later SIMON (1878) specified his description noting that *H. simplex* had bifid embolus. This remark underlines the most important identification character of the species. Later suggestion of SIMON (1937) repeated by ROEWER (1954) that *H. simplex* belongs to *H. cupreus* is unwarranted.

Heliophanus aeneus (HAHN, 1831)

(figs. 612–621, 883)

? *Aranea muscorum* WALCKENAER, 1802,
Salticus aeneus HAHN, 1831,
Heliophanus truncorum C. L. KOCH, 1835,
Heliophanus muscorum: SIMON 1864, DAHL 1926, ROEWER 1954, HARM 1971,
Heliophanus aeneus: TULLGREN 1944, KEKENBOSCH 1961, MILLER 1971.

Material. France: Alps, det. T. THORELL – 1 ♂, 1 ♀ (NR 1659d); Great Britain, Guernsey: 2 ♂♂ (HDZ 1750); Spain: l'Artiga de Lin, 30.VIII.1975, leg. J. BARRIENTOS – 1 ♀ (CRB 2010); Switzerland: Alps, Simplon Pass – 3 ♂♂ (HDZ 1753 t. 4 and 5); Tessin, VIII.1927, det. C. ROEWER – 2 ♀♀ (SMF R II 1989/2); 1 ♂, 1 juv. (HDZ 1755 t. 42); Turkey: Amasia – 3 ♀♀ (MNHN 12 869); West Germany: Pforzheim, det. W. BÖSENBERG – 6 ♂♂, 10 ♀♀ (ZMH 195); vicinity of Hamburg – 1 ♂, 1 ♀ (ZMH).

Male. Cephalothorax dark brown or black with a metallic sheen, a few white scales in the vicinity of anterior eyes. Abdomen black, with white band at anterior margin, in some specimens one pair of white marks posteriorly. Sternum dark brown. Legs dark brown. Whole body clothed with sparse long brown hairs. Pedipalp dark, femoral apophysis large, sharply ended (fig. 615), at the base of embolus a large protuberance (fig. 612). Dimensions: a 2.3–2.9, b 2.5–3.6, c 0.9–1.1, d 1.2–1.4, e 1.3–1.6.

Female. Coloration as in male but abdominal marks smaller or abdomen uniformly brown without marks. Legs light brown or yellow. Epigyne oval, with two small depressions (figs. 616–618); internal structures as in figs. 619–621. Dimensions: a 2.3–2.6, b 3.0–4.0, c 1.0, d 1.3–1.4, e 1.3–1.5.

The male resembles *H. dubius* but may be distinguished by the much larger size and more slender embolus (cf. figs. 612 and 622). The female slightly resembles *H. dubius* and *H. auratus*, can be separated by the size and position of epigynal openings (cf. figs. 616–618 and 626 and 634–636).

Heliophanus dubius C. L. KOCH, 1835

(figs. 622–628, 888)

Heliophanus Karpinskii SIMON, 1868,
Heliophanus dubius: DAHL 1926, PALMGREN 1943, TULLGREN 1944, ROEWER 1954, HARM 1971, MILLER 1971.

Material. Albania: "Nordalbanien", 1914, leg. PENTHER – 1 ♀ (NHMW); France, Corsica: 1200 m.a.s.l., 7.V.1976 – 1 ♂, 1 ♀ (CJW); Poland: Kraków – 1 ♂, 1 ♀ (NR); Spain: la Granja, VI.1908 – 1 ♂, 1 ♀ (MNHN 24 450), 26.VI.1971, leg. J. BARRIENTOS – 1 ♀ (CRB 110); Switzerland: Uri Canton, Ursern Tal, between Andermatt and Furca Pass, alpine grassland near Realp, 1538 m.a.s.l., among stones, 26.VII.1966, leg. J. PRÓSZYŃSKI – 18 ♂♂, 4 ♀♀ (IZ PAN); locality unknown: det. W. BÖSENBERG – 1 ♀ (ZMH 156), 2 ♂♂ (BMNH 1919.9.18.3054–73.).

Male. Cephalothorax dark brown or black with a metallic sheen, white scales in vicinity of anterior eyes, in some specimens lateral margins with single white hairs. Abdomen dark brown or black dorsally, dark ventrally. Sternum brown. Legs brown. A few brown setae scattered over the body. Pedipalp brown, embolus broad, in vicinity of its base a large protuberance (fig. 622). Dimensions: a 1.5–1.8, b 1.6–2.0, c 0.6–0.8, d 0.9, e 1.0.

Female. Coloration like in male. Legs light brown or yellow. Epigyne oval, heavily sclerotized, with two far removed openings (fig. 626); internal structures as in figs. 627–628. Dimensions: a 2.0–2.1, b 2.3–3.7, c 0.7–0.9, d 1.1, e 1.2.

The species resembles *H. aeneus*. The male may be distinguished by the smaller size and broader embolus (cf. figs. 622 and 612), the female may be separated by the more removed position of epigynal openings (cf. figs. 626 and 616–618).

Heliophanus auratus C. L. Koch, 1835

(figs. 629–639, 885)

Heliophanus Branickii Simon, 1868,
Heliophanus exultans L. Koch in Simon, 1868, **syn. n.**,
Heliophanus varians Simon, 1868 (part.: ♀), **syn. n.**,
Heliophanus nigriceps Kulczyński, 1895b, **syn. n.**,
Heliophanus auratus: Dahl 1926, Palmgren 1943, Tullgren 1944, Locket and Millidge 1951, Kekenbosch 1961, Harm 1971, Miller 1971, Locket, Millidge and Merrett 1974, Prószyński 1979 (part.: figs. 89–94), Flanczewska 1981,
Heliophanus varians: Prószyński 1971d (part.: ♀).

Material. Albania: "Nordalbanien", 1914, leg. Penther – 3 ♀♀ (NHMW); Austria: Tirol, Altzwang, 1931, det. C. Roewer – 1 ♂, 1 ♀ (SMF R II 2567/2); Belgium: Huy, 13.V.1971, leg. T. Cods, det. J. Kekenbosch – 1 ♂, 2 ♀♀ (IRSN); Cyprus: Pendayia, leg. H. Malicky – 1 ♂ (CJW); France: Provence, det. E. Simon – 1 ♂ (NR 16 490); [S France] det. O. P.-Cambridge – 2 ♂♂ (HDZ 1754); Greece: Kaira, leg. H. Malicky – 1 ♀ (CJW); Alepochorion, 5.V.1976, leg. H. Malicky – 1 ♂ (CJW); Euboea, leg. H. Malicky – 2 ♀♀, 1 juv. (CJW); Italy: Veglia – 3 ♀♀ (NHMW); Jugoslavia: Dalmatia, Krivošije, 1902, det. E. Reimoser – 8 ♂♂, 1 ♀, 10 juv. (NHMW); Herzegovina, Jablanica, 1902 – 1 ♀, 1 juv. (NHMW); Poland: 1 ♀ (paralectotype of *H. varians*, NMHN 2321); Soviet Union: Nikopol – 3 ♂♂ (NR 1649a); Ekaterinoslav – 3 ♀♀ (NR 1649a); Armenia, Erevan, leg. G. Horváth – 1 ♂ (holotype of *H. nigriceps*, IZ PAN); Sarepta – 2 ♀♀ (MNHU 17606); Spain: Pozuelo de Calatrava, de la Fuente – 4 ♂♂ (MNHN 24 244); la Granja – 1 ♂ (MNHN 21 809); Burgos Province, Gumiel de Hizán, 28.VI.1976, leg. M. Rambla – 1 ♂, 3 juv. (CRB); Switzerland: Bodensee [Constance Lake], 1953, leg. A. Zilch, det. M. Harm – 2 ♂♂, 3 ♀♀ (SMF 24 592/4); Tessin, leg. Pavesi, det. T. Thorell – 5 ♂♂, 4 juv. (NR 1653), Rovio, 18.VII.1918, leg. Masarey – 4 ♂♂ (NMB 830a); West Germany: Kaiserstuhl, Rhein-Aue, 2.5 km W from Niederrotweil, 28.IV.1965, leg. O. Kraus – 1 ♂, 1 ♀ (SMF 17 469/2); Kühkopf, Rhein-Aue, 26.III.1960, leg. O. Kraus – 1 ♂ (SMF 11 396/1); Pforzheim – 1 ♀ (ZMH 233); locality unknown: 2 ♂♂, 1 juv. (MNHN 15 076), 1 ♂ (MNHN 6559).

Male. Cephalothorax dark brown or black with a metallic sheen, long brown setae, in some specimens also single white scales, in vicinity of anterior eyes. Abdomen brown or black with narrow white band at anterior margin and one or two pairs of white marks composed of white scales; ventrally dark. In some individuals abdomen uniformly brown. Sternum brown. Legs yellow, in some specimens with brown longitudinal stripes. Pedipalp dark, femoral apophysis shallowly bifurcated (fig. 632), embolus most frequently undulating (fig. 633), sometimes it is difficult to notice (fig. 629). Dimensions: a 1.6–2.1, b 1.8–2.2, c 0.9–1.0, d 1.0–1.1, e 1.1–1.2.

Female. Coloration as in male. Pedipalps yellow. Epigyne oval, with two openings, sometimes partially communicating (figs. 634–636); internal structures as in figs. 637–639. Dimensions: a 1.9–2.1, b 2.3–3.1, c 0.7–0.9, d 1.1–1.2, e 1.2–1.3.

The male resembles *H. flavipes*, best distinguished by the position and shape of embolus (cf. figs. 633 and 640, 644–645). The female slightly resembles *H. aeneus*, can be separated by the shape of epigynal openings and almost straight posterior margin of epigyne (notched in *H. aeneus* – cf. figs. 634–636 and 616–618).

Heliophanus flavipes Hahn, 1831.

(figs. 640–651, 886)

? *Aranea ritteri* Scopoli, 1763,
Salticus aeneus Hahn, 1831,
Heliophanus hecticus Simon, 1868,
Heliophanus varians Simon, 1868 (part.: ♂),
Heliophanus fulvignathus Simon, 1871,
Heliophanus corsicus Simon, 1871, **syn. n.**,
Heliophanus ritteri: Dahl 1926, Palmgren 1943, Roewer 1954,
Heliophanus flavipes: Tullgren 1944, Locket and Millidge 1951, Kekenbosch 1961, Harm 1971, Miller 1971,
Heliophanus corsicus: Kraus 1955,
Heliophanus varians: Prószyński 1971d (part.: ♂).

Material. Algeria: Tlemcen – 4 ♂♂, 1 ♀ (MNHN 5946); Aumale – 1 ♂ (MNHN 12 970); Belgium, Auby, 9.VII.1964, leg. E. Derenne, det. J. Kekenbosch – 3 ♀♀ (IRSN); Mt St Pierre, 22.V.1964, leg. et det. J. Kekenbosch – 1 ♂ (IRSN); France, Corsica: 1 ♂ (holotype of *H. corsicus*, MNHN 859); Biguglia, 28.IV.1952, leg. Kahmann, det. O. Kraus – 1 ♂ (SMF 8898/1); Greece: Salonika, leg. P. Deniec – 1 ♂ (MNHN 24 780); Holland: 1 ♂ (HDZ 1752 t. 16); Iran, Azerbaijan: Arasbaran Wildlife Refuge, Makidi, 1650–1800 m.a.s.l., 10.–15.VI.1978, leg. J. Martens et M. Pieper – 1 ♂ (SMF), Kalan, 2450–2650 m.a.s.l., mountain grassland, 6.–10.VI.1978, leg. J. Martens et M. Pieper – 1 ♀ (SMF); Elburs, Masandaran, Kojur, S from Alamdeh, 1540 m.a.s.l., 30.V.1978, leg. J. Martens et M. Pieper – 1 ♀ (SMF), Fasham, N from Tehran, 2350–2500 m.a.s.l., 5.VII.1978, leg. J. Martens et M. Pieper – 1 ♂ (SMF); Poland: 1 ♂ (lectotype of *H. varians*, MNHN 2321); Portugal: Lisbon – 3 ♀♀ (HDZ 1746); Soviet Union: Krasnojarsk, det. E. Strand – 1 ♂ (MNHN 499); Estonia, Märli Moor, leg. A. Dampf – 1 ♀ (NMB 2181b); Latvia, Rossiten [Rēzekne], leg. A. Dampf – 1 ♀ (NMB 2181a); Spain: leg. K. Harms – 1 ♂ (CJW); Rosas – 1 ♀ (MNHN); West Germany: 1960, det. P. Jacobi – 1 ♀, 1 juv. (ZMH); Dortebuch-Tal, Mosel, 28.VII.1951, leg. P. Jacobi – 1 ♀ (ZMH); Pforzheim, 1900, det. W. Bösenberg – 2 ♂♂ (ZMH 233); Kaiserstuhl, 1.–7.VI.1952, det. E. Tretzel – 1 ♀ (ZMH); Nürnberg – 2 ♂♂, 1 ♀ (HDZ 1756 t. 240); locality unknown: 6 ♂♂, 13 ♀♀ (BMNH 1919.9.18.3054–73); 1 ♂ (MNHN 16 189); det. L. Becker – 1 ♂, 1 juv. (IRSN).

Male. Cephalothorax brown or black with a metallic sheen, a few white scales in vicinity of anterior eyes, in some individuals single small white scales at lateral margins. Abdomen dark brown, with narrow white band at anterior margin. Sternum brown. Legs yellow or brown. Whole body clothed with short brown hairs. Pedipalp dark, femoral apophysis shallowly bifurcated (figs. 643 and 646), embolus long (figs. 640 and 644–645). Dimensions: a 1.4–1.7, b 1.2–1.7, c 0.6–0.7, d 0.7–0.8, e 0.9.

Female. Coloration as in male. Pedipalps yellow. Epigyne with large shallow central depression (figs. 647 and 649), sometimes partially plugged with waxy secretion; internal structures as in figs. 648 and 650–651. Dimensions: a 1.9–2.0, b 2.9–3.7, c 0.9–1.0, d 1.2, e 1.2.

The male resembles *H. auratus* but may be distinguished by the shape of embolus (cf. figs. 640, 644–645 and 629, 633). The female readily distinguished from other species of the *auratus* group by the form of epigyne (figs. 647 and 649).

Heliophanus equester L. Koch, 1867

(figs. 652–660, 901)

Heliophanus lacteus L. Koch in Simon, 1868, **syn. n.**,
Heliophanus equester: Cantarella 1974,
Heliophanus calcarifer: Prószyński 1976 (part.: ♂), nec Simon, 1868,
Heliophanus simplex: Prószyński 1976 (part.: fig. 394), nec Simon, 1868.

Material. Greece: Volos – 1 ♀ (MNHN 14 009), 2 ♂♂, 1 juv. (MNHN 13 799); Andros, leg. H. Malicky – 1 ♀ (CJW); Tinos – 1 ♂ (holotype, BMNH 1919.9.18.3074); Corfu – 1 ♀ (MNHU); Crete – 3 ♂♂ (CJW), Meskla, 26.IV.1930, det. C. Roewer – 1 ♀ (SMF R II 1990/1); Libya: Ramli [Er] – 1 ♂ (MNHN 6115); Turkey: Smyrna [Izmir], 1901, leg. F. Werner, det. W. Kulczyński – 3 ♀♀ (MHMW); Constantinopolo [Stamboul], leg. Mercke – 1 ♂, 1 juv. (MNHN 12 808); locality unknown: det. E. Keyserling – 1 ♂ (BMNH 1891.1.1.431.).

Male. Cephalothorax dark brown or black with a metallic sheen, a few long brown setae in vicinity of anterior eyes, thoracic part clothed with scattered white scales. Abdomen brown dorsally; ventrally dark, with two light marks near spinnerets. Sternum dark brown or black. Legs yellow with brown femora, in some individuals with dark longitudinal stripes along the segments. Whole body clothed with grey hairs. Pedipalp almost black, femoral apophysis shalowly bifurcated (fig. 655), embolus very long (fig. 652), strongly protruding beyond outside margin of cymbium (fig. 654), a large protuberance at its base. Dimensions: a 1.8–2.1, b 1.7–3.1, c 0.8–0.9, d 1.0–1.1, e 1.1–1.3.

Female. Coloration as in male, in some specimens abdomen slightly lighter, light brown. Epigyne large, with two depressions (figs. 656–658); internal structures as in figs. 659–660. Introductory sections of seminal ducts weakly sclerotized. Dimensions: a 2.1–2.3, b 3.4–4.4, c 0.8–1.0, d 1.1–1.3, e 1.2–1.4.

H. equester is a distinctive species readily distinguished from other species of the *auratus* group by the structure of pedipalp (figs. 652–655) and form of epigyne (figs. 656–658).

Kulczyński (1895b) has suggested that the description of *H. lacteus* has been based on bleached individuals of *H. equester*. As the two species, besides colour of abdomen, differ in no structural details, it seems that his suggestion is justified. The fact that, in spite of intensification of collecting in Southern Europe, *H. lacteus* is known only in few individuals, speaks also in favour of this explanation.

Heliophanus ignorabilis sp. n.

(figs. 661–666, 897)

Heliophanus melinus: Kulczyński 1895b, 1911, nec L. Koch, 1867.

Material. Iran, Elburs: Masandaran, 25 km S from Amol, westerly dale from Heraz, 490–560 m.a.s.l., 29.VI.1978, leg. J. Martens et M. Pieper – 1 ♀ (holotype, SMF), N from Tehran, nearby Polour Pass, 2350 m.a.s.l., 30.VI.1978, leg. J. Martens et M. Pieper – 1 ♀ (paratype, SMF); Lebanon: Beirut, leg. P. Bovier-Lapierre, det. W. Kulczyński – 4 ♀♀ (paratypes, IZ PAN); Soviet Union, Georgia: Tiflis [Tbilisi], leg. G. Horváth, det. W. Kulczyński – 1 ♀ (paratype, IZ PAN); Syria: 5 ♀♀ (paratypes, MNHN 882).

Male. Unknown.

Female. Cephalothorax brown or black, with single white hairs scattered over lateral sides. Abdomen brown or black, with lighter anterior margin. In some specimens abdomen with traces of two lighter longitudinal bands, frequently clothed with dense light hairs; ventrally dark. Sternum brown. Legs and pedipalps yellow. Epigyne large, with large oval, opening (figs. 661–664). Seminal ducts more or less straight, spermathecae oval (figs. 665–666). Dimensions: a 1.9–2.3, b 2.2–4.1, c 0.7–0.9, d 1.0–1.2, e 1.1–1.4.

H. ignorabilis is a distinctive species distinguished from other species of the *auratus* group by the form of epigyne (figs. 661–664).

THE *CUPREUS* GROUP

Heliophanus forcipifer Kulczyński, 1895b

(figs. 667–670, 904)

Material. Soviet Union, Armenia: Aralich, leg. G. Horváth – 1 ♂ (holotype, IZ PAN).

Male. Cephalothorax brown, eye field darker, eyes surrounded with black, anterior eyes fringed with long brown setae. Abdomen dorsally dark brown, almost black; ventrally dark with two small light marks in vicinity of spinnerets. Sternum brown. Legs I and II brown, remaining legs yellow. Pedipalp light brown, diagnostic large pincers-shaped femoral apophysis (fig. 670). Dimensions: a 1.6, b 1.6, c 0.6, d 0.9, e 1.0.

Female. Unknown.

H. forcipifer is a distinctive species readily distinguished from other species of the *cupreus* group by the diagnostic pincers-shaped femoral apophysis (fig. 670).

Heliophanus cupreus (Walckenaer, 1802)

(figs. 671–683, 894)

Aranea cuprea Walckenaer, 1802,
Heliophanus chalybeus C. L. Koch, 1837,
Heliophanus metallicus C. L. Koch, 1848,
Heliophanus cuprescens Simon, 1868,
Heliophanus globifer Simon, 1868,
Heliophanus cupreus: Dahl 1926, Palmgren 1943, Tullgren 1944, Locket and Millidge 1951, Kekenbosch 1961, Harm 1971, Miller 1971, Cantarella 1974, Flanczewska 1981.

Material. France: Sussargues, 14 km N from Montpellier, 26.IX.1969 – 2 ♀♀ (BMNH); Banyuls – 1 ♀ (MNHN); Corsica – 1 ♀ (CJW); Great Britain, Guernsey – 4 ♂♂, 12 ♀♀ (HDZ 2097), 2 ♀♀ (HDZ 1750); Greece, Corfu: leg. E. Keyserling – 1 ♀ (MNHN 2391); Euboea, leg. H. Malicky – 5 ♀♀, 1 juv. (CJW); Holland: 2 ♂♂ (HDZ 1752 t. 15); Iran, Azerbaijan: Arasbaran Wildlife Refuge, Makidi, 1650–1800 m.a.s.l., 10.–15.VI.1978, leg. J. Martens et M. Pieper – 2 ♂♂ (SMF); Elburs, Masandaran, 25 km S from Amol, westerly dale from Heraz, 490–560 m.a.s.l., 29.VI.1978, leg. J. Martens et M. Pieper – 3 ♀♀ (SMF); Italy: Padova, leg. G. Canestrini, det. T. Thorell – 2 ♀♀ (NR 1662b); Garda Lake, leg. K. Harms – 1 ♂, 1 ♀ (CJW); Piertacamla – 4 ♀♀ (CJW); Altamira – 1 ♀ (CJW); Ischia – 2 ♂♂ (syntypes of *H. globifer*, HDZ 1747 t. 7 and 12); Morocco: Ain Sefra, leg. Vibert – 2 ♀♀ (MNHN 23 639); Poland: 1 ♂ (MNHN 2321); Portugal: Lisbon – 1 ♂ (HDZ 1756 t. 241); Spain: la Granja – 1 ♂ (MNHN 6052), 2 ♂♂, 1 ♀ (MNHN 21 809), VI.1908 – 16 ♂♂, 22 ♀♀ (MNHN 24 450); Monsagro – 2 ♀♀ (MNHN 6040); "Catalogne" – 2 ♂♂, 2 ♀♀, 7 juv. (syntypes of *H. cuprescens*, MNHN 874); Cádiz, leg. K. Harms – 1 ♂ (CJW); Huesca Province – 1 ♀ (MNHN); Marchagaz, ruins of convent, 6.V.1972, leg. J. Barrientos – 1 ♀ (CRB 351); Pla de S. Tiers, 20.VIII.1973, leg. J. Barrientos – 1 ♂ (CRB 1086); Navalperal de Tornes, 14.VI.1971, leg. J. Barrientos – 1 ♂ (CRB 147); Central del Chorro, port, 3.VI.1973, leg. J. Barrientos – 1 ♂ (CRB 431); Bejar, 10.VII.1972, leg. J. Barrientos – 1 ♂ (CRB 574); Montserrat, 18.VII.1973, leg. J. Barrientos – 1 ♀ (CRB 1023); el Payo, 11.VI.1972, leg. J. Barrientos – 1 ♀ (CRB 564); West Germany: Nürnberg – 1 ♂, 1 ♀ (HDZ 1756 t. 241).

Male. Cephalothorax dark brown or black with a metallic sheen, a few long brown setae in vicinity of anterior eyes, sparse white scales at lateral margins. Abdomen dark brown or black, with narrow white band at anterior margin. Sternum dark brown. Legs yellow, in some specimens femora with dark longitudinal stripes. Whole body clothed with scatered dark shiny hairs. Pedipalp

brown, single femoral apophysis (fig. 674), embolus long (fig. 671). Dimensions: a 1.8–2.0, b 1.8–2.1, c 0.8–0.9, d 1.1, e 1.2.

Female. Coloration like in male, in some specimens abdomen with one or two pairs of lighter round marks. Epigyne with one large central depression (figs. 675–678), frequently plugged with waxy secretion; the plug protruding outside forms a long "process". Seminal ducts weakly sclerotized, spermathecae more or less follicled. Dimensions: a 1.8–2.0, b 2.1–2.7, c 0.8–0.9, d 1.1–1.2, e 1.2.

Small change of epigyne inclination causes considerable changes in appearance of introductory section of seminal ducts (cf. figs. 679–680 and 681–683).

The male distinguished from all other species of the *cupreus* group by the structure of pedipalp (figs. 671–674). [A species collected by ANDREEVA (in preparation) in Pamir closely resembles *H. cupreus*. The structure of male pedipalp of this species slightly differs from *H. cupreus* by the shape of femoral apophysis.] The female is difficult to separate from other species with one large, frequently plugged, epigynal depressions (*H. tribulosus*, *H. flavipes*, *H. turanicus*, *H. lineiventris*, *H. kochi* and *H. rufithorax*) but internal structure of epigyne is distinctive (figs. 679–683).

Heliophanus turanicus CHARITONOV, 1969

(figs. 684–685, 889)

Unfortunately a loaning of the type materials has appeared impossible. The male closely resembles *H. lineiventris* but may be separated by the diminutive horizontal tibial apophysis. Epigyne of the female with one large central depression; internal structure of genitalia resembles very much *H. cupreus* but seminal ducts are considerably broader. Detailed description of *H. turanicus* supplemented with drawings is given in ANDREEVA (in preparation).

Heliophanus lineiventris SIMON, 1868

(figs. 686–701, 887)

Heliophanus miles SIMON, 1878, **syn. n.**,
Heliophanus lineiventris: KRAUS 1955, CANTARELLA 1974, PRÓSZYŃSKI 1979, 1982, FLANCZEWSKA 1981, WESOŁOWSKA 1981b,
Heliophanus pouzdřanensis MILLER, 1958, **syn. n.**,
Heliophanus albonotatus DENIS, 1962, **syn. n.**,
Heliophanus semipullatus DENIS, 1963, **syn. n.**,
Heliophanus semipullatus var. *steineri* DENIS, 1963, **syn. n.**,
Heliophanus albonotatus: DENIS 1964,
Heliophanus pouzdranensis: MILLER 1971.

Material. Czechoslovakia, Moravia: Pouzdřany near Brno, leg. F. MILLER – 2 ♂♂, 3 ♀♀ (syntypes of *H. pouzdřanensis*, IZ PAN); France: 1 ♀ (HDZ 1740 t. 9); "Galia", det. E. SIMON – 17 ♂♂, 19 ♀♀ (MNHN 869); Pyrenees, det. E. SIMON – 1 ♂, 1 ♀ (NR 1657), Corune Estrete Pass, 2764 m.a.s.l., 17.VII.1954, leg. J. DENIS – 1 ♂ (holotype of *H. semipullatus*, MNHN), Lake d'Angles, VII.1961, leg. et det. J. DENIS – 1 ♂ (MNHN), Veleta, leg. J. DENIS – 1 ♂ (MNHN); Greece, Corfu: 1 ♂ (MNHN 870); Tinos, 2 ♀♀ (MNHN 1410); Italy, Sicily – 1 ♂ (MNHN 870); North Korea: Čhŏngdžin, 5.IX.1970, leg. R. BIELAWSKI et M. MROCZKOWSKI – 1 ♂ (IZ PAN); Hamgjŏng-pukto Province, Onpho-ri, 14.–20.VIII.1959, leg. B. PISARSKI et J. PRÓSZYŃSKI – 2 ♀♀ (IZ PAN); Portugal: Lisbon – 1 ♂ (HDZ 1749 t. 50); Soviet Union: Sarepta, leg. E. KEYSERLING – 1 ♂ (holotype of *H. miles*, MNHN 2398); Lake Balchaš, bank, 15.VIII.1903 – 1 ♂ (MNHN 3699); Spain: el Escorial – 1 ♂ (MNHN 24 192); Marchagaz, ruins of convent, 6.V.1972, leg. J. BARRIENTOS – 1 ♂ (CRB 374).

Male. Cephalothorax dark brown or black with a metallic sheen, single white scales in vicinity of anterior eyes. Abdomen dark brown or black, with white narrow band at anterior margin and one or two pairs of white marks dorsally (fig. 691); ventrally dark. Sternum brown or black. Legs brown or black. Pedipalp black, femoral apophysis shallowly bifurcated (figs. 689–690), horizontal tibial apophysis heavily sclerotized, long and slender (figs. 686–688), external margins of cymbium and tibia fringed with white scales. Dimensions: a 1.8–2.3, b 1.8–2.2, c 0.8–1.0, d 1.0–1.1, e 1.1–1.3.

Female. Coloration as in male, frequently abdomen uniformly brown, without white marks. Epigyne oval, with one large, deep central depression (figs. 692–695), in all studied specimens plugged with waxy secretion; internal structures as in figs. 696–701. Dimensions: a 2.0–2.7, b 3.6–4.6, c 0.8–1.2, d 1.1–1.3, e 1.3–1.5.

The differences in arrangement of seminal ducts and spermathecae result from slightly different angles of observation as well as from variable pressure of cover glass.

The male closely resembles *H. kochi* and *H. rufithorax* but may be distinguished by the shape of embolus (cf. figs. 686 and 702 and 718). The female difficult to separate from other species with large epigynal depression, plugged with waxy secretion (*H. tribulosus*, *H. flavipes*, *H. cupreus*, *H. turanicus*, *H. kochi*, *H. rufithorax*); from most similar *H. kochi* best distinguished by the different course of seminal ducts (cf. figs. 696–699 and 711–717).

Heliophanus kochi SIMON, 1868

(figs. 702–717, 892)

Heliophanus albo-signatus L. KOCH, 1867, **syn. n.**,
Heliophanus Kochii SIMON, 1868,
Heliophanus armatus SIMON, 1868,
Heliophanus cernuus SIMON, 1868, **syn. n.**,
Heliophanus calcarifer SIMON, 1868, **syn. n.**,
Salticus furcatus O. P.-CAMBRIDGE, 1872, **syn. n.**,
Heliophanus kochi: MILLER 1971, PRÓSZYŃSKI 1976, 1979,
Heliophanus calcarifer: PRÓSZYŃSKI 1976 (part.: ♀), FLANCZEWSKA 1981.

Material. France: Menton, 1934, det. E. SCHENKEL – 9 ♀♀, 4 juv. (NMB 199e); Banyuls, det. E. SIMON – 2 ♂♂ (MNHN); Greece: Naxos, IX.1976, leg. H. MALICKY – 1 ♂, 1 ♀ (CJW); Santorin [Thĕra], Paleokaimani – 1 ♂, 1 ♀ (CJW); Karpathos, det. F. DAHL – 1 ♀ (MNHU); Corfu, det. E. SIMON – 1 ♀ (MNHN 870), 1 ♂ (holotype of *H. calcarifer* HDZ 1774 t. 21); Crete, leg. H. MALICKY – 1 ♀ (CJW); Lesbos, leg. H. MALICKY – 1 ♂ (CJW); Samos, Marathokampos, det. F. DAHL – 1 ♀, 1 juv. (MNHU 17 593); Syra – 2 ♀♀ (syntypes of *H. albosignatus*, NHMW 1884.I.45); Italy: Teramo, leg. N. STOCKLNI, det. E. SCHENKEL – 2 ♀♀, 1 juv. (NMB 199b); Florenz [Firence], 1893, leg. N. STOCKLNI, det. E. SCHENKEL – 3 ♂♂, 1 juv. (NMB 199c); Sicily – 1 ♂ (MNHN 880); Jugoslavia, Herzegovina: Jablanica, 1902 – 1 ♂ (NHMW); Dalmatia, leg. E. KEYSERLING, det. E. SIMON – 2 ♂♂, 3 ♀♀ (MNHN 2396); Spain: Malaga Province, leg. K. HARMS – 2 ♂♂ (CJW); Almeria Province, leg. K. HARMS – 1 ♂, 3 ♀♀ (CJW); Murcia Province, leg. K. HARMS – 1 ♂ (CJW); Arseguell, 20.VII.1973, leg. J. BARRIENTOS – 1 ♀ (CRB 1005); Puente sobre el Huebra, 16.V.1971, leg. J. BARRIENTOS – 1 ♂, 1 ♀

(CRB 3 and 7); Hurdes, convent de los Angeles, 29.IV.1972, leg. J. Barrientos – 1 ♂ (CRB 317); Gata, 11.VI.1972, leg. J. Barrientos – 1 ♀ (CRB 557); Candeleda, 4.VI.1971, leg. J. Barrientos – 1 ♀ (CRB 516); Alcover, 28.IV.1973, leg. J. Barrientos – 2 ♂♂ (CRB 924); la Granja, 26.VI.1971, leg. J. Barrientos – 1 ♀ (CRB 138), 2 ♂♂, 3 ♀♀ (MNHN 24 450); Pozuelo de Calatrava – 1 ♂ (MNHN 19 860); Monsagro, det. E. Simon – 2 ♂♂ (MNHN 6040); Alicante, det. E. Simon – 1 ♂ (MNHN 6040); "Catalogne", det. E. Simon – 2 ♂♂, 1 ♀ (MNHN 13 377); "Catalogne" – 1 ♂, 1 ♀ (syntypes of *H. cernuus*, MNHN 876); el Escorial – 1 ♂ (MNHN 13 475), det. L. Koch – 2 ♀♀ (BMNH 1919.9.18.2996.97.); Switzerland, Claro, det. E. Schenkel – 3 ♂♂, 7 ♀♀ (MNB 199d); locality unknown: 1 ♂ (holotype of *S. furcatus* HDZ 1756 t. 54), det. T. Thorell – 1 ♂, 1 ♀ (NR 1656a).

Male. Cephalothorax dark brown or black with a metallic sheen, single white scales in vicinity of anterior eyes, some specimens with small spots composed of the same scales posteriorly to posterior eyes. Abdomen dark brown, with narrow white band at anterior margin and one or two pairs of white marks dorsally (fig. 706); dark ventrally. In some specimens abdomen uniformly brown, without marks. Sternum dark brown. Legs brown or black, in some individuals with small spots composed of white scales at bases of segments. Whole body clothed with short sparse dark hairs. Pedipalp very dark, femoral apophysis bifurcated (fig. 705), embolus strongly bent towards bulbus (fig. 702), external margin of cymbium clothed with white scales. Dimensions: a 1.6–1.8, b 1.7–2.0, c 0.7–0.9, d 1.0–1.2, e 1.1–1.3.

Female. Coloration as in male, in some specimens legs slightly lighter, yellowish-brown. Epigyne with single large central depression (figs. 707–710), in most specimens plugged with waxy secretion; internal structures as in figs. 711–717. Dimensions: a 1.6–2.3, b 2.0–4.0, c 0.7–0.8, d 1.1–1.3, e 1.3–1.5.

H. kochi clearly shows affinities with *H. lineiventris* and *H. rufithorax*. From *H. lineiventris* is easily distinguished by the shape of embolus (cf. figs. 702 and 718) and different course of seminal ducts (cf. figs. 711–717 and 696–699). From *H. rufithorax* separated by the generally darker coloration, the shape of femoral apophysis (cf. figs. 705 and 721) and relation of size of spermathecae and seminal ducts to that of epigynal depressions (cf. figs. 711–717 and 723, 725).

The name *H. kochi* is a younger synonym of *H. albosignatus*. However, this species is known under *H. kochi* and the name *H. albosignatus* has not been used. Hence, following the rules of the International Code of Zoological Nomenclature (art. 23b), it is proposed to retain the younger synonym *H. kochi* as the valid name.

Heliophanus rufithorax Simon, 1868

(figs. 718–725, 884)

Heliophanus rufithorax: Kraus 1955.

Material. France, Corsica: 1 ♂, 1 ♀ (♂ – lectotype, ♀ – paralectotype, MNHN 866), 1 ♂, 1 ♀ (paralectotypes, NR), det. L. Becker – 6 ♂♂, 5 ♀♀, 1 juv. (IRSN), leg. K. Harms – 1 ♀ (CJW); Italy, Tuscan Archipelago: Biarrif – 1 ♀ (CJW).

Male. Cephalothorax light brown, eye field slightly darker, eyes surrounded with black. Abdomen light brown. Sternum light brown or yellow. Legs brown. Whole body clothed with scattered brown hairs. Pedipalps brown, femoral apophysis bifurcated (fig. 721), embolus short (fig. 718). Dimensions: a 1.5–1.6, b 1.5, c 0.7, d 0.9–1.0, e 1.0–1.1.

Female. Coloration like in male, in some individuals abdomen dorsally with one pair of indistinctly lighter marks near posterior margin. Legs yellow. Epigyne oval, with one depression (figs. 722 and 724), in some specimens plugged with waxy secretion; internal structures as in figs. 723 and 725. Dimensions: a 1.7, b 2.2–2.7, c 0.7–0.9, d 1.0, e 1.1.

H. rufithorax shows clearly affinities with *H. kochi* but is easily distinguished by the generally lighter coloration, shape of femoral apophysis (cf. figs. 721 and 705) and relation of size of spermathecae and seminal ducts to that of epigynal depression (cf. figs. 723, 725 and 711–717).

Heliophanus machaerodus Simon, 1909

(figs. 726–732, 902)

Heliophanus machaerodes [sic!]: Reimoser 1919, Roewer 1954.

Material. Algeria: 1 ♂, 1 ♀ (MNHN 982); Algier – 2 ♂♂, 1 juv. (MNHN 14 292); Bône [El Annaba] – 1 ♂ (MNHN 14 298); Tenes – 1 ♂ (MNHN 12 720); [Djebel] Dough – 1 ♂, 1 ♀ (MNHN 13 890); Nemours – 1 ♂ (MNHN 11 948); El Kseur – 1 ♂, 2 juv. (MNHN 13 311); Tlemcen – 3 ♀♀, 2 juv. MNHN 13 253: Morocco: Mogador, leg. M. Escalera – 2 ♂♂ (larger – lectotype, another – paralectotype, MNHN 23 907): locality unknown: 1 ♂, 1 juv. (MNHN 12 995).

Male. Cephalothorax black, with single white hairs in vicinity of anterior eyes. Abdomen black dorsally, dark ventrally. Sternum black. Legs black with lighter metatarsi and tarsi. Whole body clothed with short, dark, shiny hairs. Pedipalp black, femoral apophysis very long and slender, sharply ended (fig. 729), horizontal tibial apophysis long and slender, embolus short, bent towards bulbus (fig. 726), external margins of cymbium and tibia fringed with white scales. Dimensions: a 1.5–1.9, b 1.7–2.0, c 0.8, d 1.0–1.1, e 1.1–1.2.

Female. Coloration as in male. Epigyne oval, with large depression, posteriorly partially divided by a median septum (fig. 730), in some individuals partially plugged with waxy secretion; internal structures as in figs. 731–732. Dimensions: a 2.0, b 3.3, c 0.8, d 1.1, e 1.2.

The species best distinguished from other species of the *cupreus* group by the shape of femoral apophysis (fig. 729) and form of epigyne (fig. 730).

THE *POTANINI* GROUP

Heliophanus potanini Schenkel, 1963

(figs. 733–740, 891)

Menemerus fagei Schenkel, 1963, nec Berland et Millot, 1941,
Heliophanus potanini: Wesołowska 1981a, Prószyński 1982.

Material. Afghanistan: Pagman, 2300 m.a.s.l., 27.V.1965, leg. O. Jakeš – 3 ♂♂ (MM 23); China, Inner Mongolia: "Grenze Chara-su-cha [...], Etsingol", 23.–29.VII.1886, leg. Potanin – 1 ♂, 1 ♀ (♂ – lectotype, ♀ – paralectotype, MNHN), Suwanko, Su Suchow, 1.–5.VI.1886 – 1 ♀ ("cotype", NMB 2180a); leg. Potanin – 1 ♀ (holotype of *M. fagei*, MNHN).

Male. Cephalothorax brown, eye field black, with a few long brown setae in

vicinity of anterior eyes. Abdomen dorsally brown, clothed with short brown hairs; ventrally light brown. Sternum brown. Legs light brown or dark brown. Pedipalp brown, femoral apophysis single, distally truncated (fig. 736), single small tibial apophysis (figs. 733–735 and 737). Dimensions: a 1.4, b 1.5, c 0.8, d 0.8, e 0.9.

Female. Markedly larger than male. Coloration as in male, in some specimens slightly lighter. Sometimes abdomen irregularly spotted. Sternum yellow. Legs and pedipalps yellow. Epigyne oval, with central depression, posteriorly partially divided by median septum (figs. 738 and 740): internal structures as in fig. 739. Dimensions: a 1.8–2.1, b 3.1–3.4, c 0.9, d 1.0–1.1, e 1.1–1.2.

The male distinguished from other species of the *potanini* group by the structure of pedipalp (figs. 733–737). [A new species collected by ANDREEVA (in preparation) in Pamir closely resembles *H. potanini* but generally coloration of this species is more lighter, whitish-yellow, and size slightly smaller.] The female related to *H. melinus* but can be separated by the coloration of abdomen and course of seminal ducts (cf. figs. 739 and 748, 750).

Heliophanus melinus L. KOCH, 1867

(figs. 741–751, 893)

Heliophanus grammicus SIMON, 1868,
Heliophanus expers SIMON, 1868,
Heliophanus viriatus SIMON, 1868,
Heliophanus expers: LOCKET and MILLIDGE 1951,
Heliophanus melinus: CANTARELLA 1974, PRÓSZYŃSKI 1976 (part.: ♂),
Heliophanus viriatus: FLANCZEWSKA 1981.

Material. France: "Galia", det. E. SIMON – 1 ♂, 4 ♀♀ (MNHN 868); Banyuls, VII.1909, det. E. SIMON – 2 ♂♂, 3 ♀♀ (MNHN); Greece: Volos – 1 ♀ (MNHN 13 799); Syra – 1 ♂, 2 ♀♀ (♂ – lectotype, ♀♀ – paralectotypes, MNHN 868), det. E. REIMOSER – 1 ♂, 1 ♀ (NHMW); Crete – 8 ♂♂, 3 ♀♀ (CJW); Naxos, IX.1976, leg. H. MALICKY – 1 ♂ (CJW); Italy, Sicily: 2 ♂♂ (MNHN 870); Jugoslavia, Dalmatia: 2 ♂♂ (MNHN 7466), Zadar, det. W. KULCZYŃSKI – 1 ♂, 20 juv. (IZ PAN); Spain: Sadernas, 26.IV.1975, leg. J. BARRIENTOS – 1 ♂, 1 juv. (CRB 1828); Turkey: Magnesia [Manisa], leg. F. WERNER, det. W. KULCZYŃSKI – 2 ♀♀ (NHMW); Amasya – 1 ♂ (MNHN 14 766); locality unknown: 2 ♀♀ (MNHN 21 474), det. E. SIMON – 1 ♂, 2 ♀♀ (MNHN 862), leg. L. BERLAND – 2 ♀♀ (MNHN 860).

Male. Cephalothorax dark brown or black with a metallic sheen, some specimens with a few white scales in vicinity of anterior eyes. Abdomen black, exceptionally brown, with white band at anterior margin and two longitudinal white stripes dorsally (fig. 747), infrequently white stripes reduced to small spots; ventrally dark. Sternum dark brown. Legs I light brown, remaining legs yellow. Whole body clothed with short dark shiny hairs. Pedipalp brown, femoral apophysis shallowly bifurcated (figs. 744 and 746), single small tibial apophysis (figs. 741–743 and 745), external margin of cymbium fringed with white scales. Dimensions: a 1.9–2.3, b 2.1–2.5, c 0.8–0.9, d 1.1–1.2, e 1.2–1.3.

Female. Coloration as in male. Epigyne large oval, with large depression, posteriorly partially divided by broad median septum (figs. 748 and 750). Seminal ducts almost straight, spermathecae slightly elongated (fig. 749). Dimensions: a 2.2–2.3, b 2.9, c 0.9–1.0, d 1.2, e 1.3.

The differences in arrangement of spermathecae (cf. figs. 749 and 751) result from slightly different angles of observation.

The male may be distinguished from other species of the *potanini* group by the structure of pedipalp (figs. 741–746). The female closely related to *H. potanini* but can be separated by the abdominal pattern (fig. 747) and course of seminal ducts (cf. figs. 748, 750 and 739).

Heliophanus patagiatus THORELL, 1875

(figs. 752–759, 889)

Heliophanus metallicus OHLERT, 1867, nec C. L. KOCH, 1848.
Heliophanus patagiatus: DAHL 1926, HARM 1971, MILLER 1971.

Material. France: Alps, det. E. SIMON – 1 ♂, 1 ♀ (NR 1658b); Soviet Union: Nikopol, leg. A. NORMANN – 2 ♂♂, (larger – lectotype, another – paralectotype, NR 1658c); Sarepta, leg. A. NORMANN – 3 ♀♀ (paralectotypes, NR 1658c): Switzerland: environs of Basel, 1949, det. E. SCHENKEL – 7 ♂♂, 16 ♀♀, 8 juv. (NMB 806a and b); Claro, 1949, det. E. SCHENKEL – 1 ♀ (NMB 806c).

Male. Cephalothorax dark brown or black with a metallic sheen. Abdomen black dorsally, light brown ventrally. Sternum brown. Legs brown. Whole body clothed with short, dark, shiny hairs. Pedipalp brown, femoral apophysis large, slightly curved distally (fig. 755), tibial apophysis bifurcated (figs. 752–754). Dimensions: a 2.1–2.2, b 2.2–2.5, c 0.8–1.0, d 1.1–1.2, e 1.2–1.3.

Female. Coloration like in male. In some specimens abdomen with very narrow white band at anterior margin and two very small white marks dorsally near posterior margin; ventrally with two light marks near the base of spinnerets. Legs light brown. Epigyne oval, with two depression (figs. 756 and 758); internal structures as in figs. 757 and 759, copulatory openings hidden in "pouches". Dimensions: a 2.2–2.5, b 2.4–3.2, c 0.9–1.0, d 1.1–1.2, e 1.3.

H. patagiatus is a distinctive species distinguished from other species of the *potanini* group by the structure of pedipalp (figs. 752–755) and form of epigyne (figs. 756 and 758).

SPECIES WITH UNCLEAR AFFINITIES WITHIN THE SUBGENUS

Heliophanus abditus sp. n.

(figs. 760–761)

Material. Syria(?): Kurrucke – 1 (holotype, MNHN 19 963).

Male. Unknown.

Female. Cephalothorax light brown, eye field darker, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown, middorsally with one pair of white marks; ventrally dark. Sternum orange. Legs yellow. Epigyne oval, with large central depression (fig. 760); copulatory openings hidden in "pouches", seminal ducts weakly sclerotized (fig. 761). Dimensions: a 1.6, b 2.3, c 0.6, d 0.7, e 1.1.

H. abditus is a species of uncertain affinities but the internal structure of epigyne is distinctive (fig. 761).

Heliophanus acutissimus sp. n.

(figs. 762–765, 893)

Material. Algeria: Boghari – 1 ♂ (paratype, MNHN 5414); Tlemcen – 2 ♂♂ (larger – holotype, another – paratype, MNHN 5946).

Male. Cephalothorax black with a metallic sheen, a few long brown setae in vicinity of anterior eyes. Abdomen black dorsally; dark ventrally. Sternum dark brown or black. Legs dark brown or black. Pedipalp black, femoral apophysis very small, sharply ended (fig. 765), two well developed tibial apophyses (figs. 762–764). Dimensions: a 2.0–2.1, b 2.2, c 0.8–0.9, d 1.1, e 1.2.

Female. Unknown.

H. acutissimus is a distinctive species readily distinguished from other species the genus *Heliophanus* by the structure of pedipalp (figs. 762–765).

The specimen from Boghari has been labelled "*Heliophanus acutissimus*" by E. SIMON but never described.

Heliophanus canariensis sp. n.

(figs. 766–774, 902)

Material. Spain: Gran Canaria, Am Parador – 1 ♂, 1 ♀ (♂ – holotype, ♀ – allotype, CJW); Tenerife, leg. C. ALLUAUD – 1 ♂ (paratype, MNHN 22 606).

Male. Cephalothorax dark brown, eyes surrounded with black. Abdomen dorsally dark brown, with narrow light band at anterior margin; ventrally dark. Sternum dark brown. Legs brown. Pedipalp small, brown, femoral apophysis somewhat shifted dorsally, pointed distally (figs. 769–770), embolus small, single tibial apophysis (figs. 766–768). Dimensions: a 1.6, b 1.6, c 0.8, d 1.0, e 1.1.

Female. Cephalothorax dark brown, eye field clothed with single scattered white hairs. Abdomen dark brown, with narrow white band at anterior margin extending partially into lateral sides; ventrally dark, with three lighter longitudinal bands. Sternum brown with yellow centre. Legs and pedipalps yellow. Body clothed with sparse short hairs, slightly longer and denser at anterior margin of abdomen. Epigyne small, weakly sclerotized, with small central shallow depression (figs. 771 and 773); internal structures as in figs. 772 and 774. Dimensions: a 1.8, b 3.1, c 0.8, d 1.1, e 1.2.

H. canariensis is a species of uncertain affinities but structures of genitalia are distinctive (figs. 766–774).

Heliophanus chovdensis PRÓSZYŃSKI, 1982

(figs. 775, 888)

Male. Unknown.

Female (after PRÓSZYŃSKI 1982). Cephalothorax brown with upper part of thorax slightly lighter brown, gleaming. Abdomen uniformly blackish-grey. Sternum black. Legs yellowish with longitudinal brown stripes. Pedipalps yellow. Round depressed epigyne (fig. 775) with openings located apparently in mid-length just near the rim. Dimensions: a 1.9, b 2.8.

H. chovdensis is a species of uncertain affinities but depressed epigyne is distinctive (fig. 775).

Heliophanus iranus sp. n.

(figs. 776–786, 898)

Material. Iran, Elburs: N from Tehran, Fasham Valley, 2350–2500 m.a.s.l., 5.VII.1978, leg. J. MARTENS et M. PIEPER – 1 ♂, 1 juv. (♂ – holotype, SMF), Shemshak, 2650–2900 m.a.s.l., 17.–25.VI.1978, leg. J. MARTENS et M. PIEPER – 1 ♂, 3 ♀♀, 2 juv. (larger ♀ – allotype, another – paratypes, SMF).

Male. Cephalothorax brown or black with a metallic sheen, thoracic part clothed with single scattered white hairs. Abdomen dark brown, with narrow white band composed of scales at anterior margin; ventrally dark, with two lighter patches in vicinity of spinnerets. Sternum dark brown. Legs dark brown with lighter metatarsi and tarsi. Whole body clothed with short brown hairs. Pedipalp dark, femoral apophysis with small notch distally (figs. 779 and 781), single small tibial apophysis, embolus long and slender (figs. 776 and 780), cymbium slender and elongated (fig. 778), outer margin of cymbium fringed with white scales. Dimensions: a 1.7–1.9, b 1.9–2.0, c 0.6–0.9, d 1.0–1.1, e 1.1.

Female. Coloration as in male, eye field clothed sparsely with long brown hairs. Whole body clothed with dense, white hairs, contrasting with dark background, only central part of abdomen without hairs. Legs and pedipalps yellow. Epigyne more or less round with two depressions (figs. 782–783); internal structures as in figs. 784–786. Dimensions: a 1.9–2.2, b 2.2–4.4, c 0.9–1.0, d 1.1–1.2, e 1.2–1.3.

H. iranus is a distinctive species distinguished from all other species of the genus *Heliophanus* by the structure of genitalia (figs. 776–786).

Heliophanus malus sp. n.

(figs. 787–788, 903)

Material. Syria: 3 ♀♀ (larger – holotype, another – paratypes, MNHN 881).

Male. Unknown.

Female. Cephalothorax dark brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen dark brown, clothed with short dense hairs, with inconspicuous trace of light band at anterior margin and (in one specimen) with traces of two lighter marks near anterior margin; ventrally dark. Sternum brown. Legs light brown. Epigyne oval, with single depression (fig. 787) plugged with waxy secretion; internal structures as in fig. 788. Dimensions: a 1.8, b 3.1, c 0.8, d 1.0, e 1.1.

The arrangement of seminal ducts and spermathecae probably slightly deformed due to too strong pressure of cover glass.

The species slightly resembles *H. decoratus* but internal structures of epigyne are different (cf. figs. 788 and 571–572, 574, 576–577).

Heliophanus verus sp. n.

(figs. 789–792, 892)

Material. Iran, Elburs: N from Tehran, Dasth-Nazir, 1000–1300 m.a.s.l., 26.V.1978, leg. J. MARTENS et M. PIEPER – 1 ♂ (holotype, SMF).

Male. Cephalothorax dark brown, eye field black with a metallic sheen, a few

long brown setae in vicinity of anterior eyes. Abdomen dark brown with a few white hairs at anterior margin; ventrally dark. Sternum dark brown. Legs dark brown. Pedipalp dark, single femoral apophysis (fig. 792), two poorly developed tibial apophyses (figs. 789–790). Dimensions: a 1.9, b 1.9, c 0.6, d 1.0, e 1.2.

Female. Unknown.

H. verus is a species of uncertain affinities but the structure of pedipalp is distinctive (figs. 789–792).

Heliophanus aberdarensis sp. n.

(figs. 793–794, 908)

Material. Kenya: Aberdare, 15 km N from Kinangop, 3070 m.a.s.l., in fern on bank of rivulet, 20.VII.1948, leg. Å. Holm – 1 ♀ (holotype, ZIU 301).

Male. Unknown.

Female. Cephalothorax brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen dorsally brown, clothed with scattered single light hairs; ventrally dark. Sternum brown. Legs yellow. Epigyne oval, weakly sclerotized (fig. 793); internal structures as in fig. 794 (the epigyne damaged during preparation). Dimensions: a 1.6, b 2.6, c 0.7, d 0.9, e 1.0.

H. aberdarensis is a species of uncertain affinities, separated by the form of epigyne (fig. 793).

Heliophanus activus (Blackwall, 1877)

(figs. 795–802, 906)

Salticus activus Blackwall, 1877.
Heliophanus activus: Simon 1901b.

Material. Seychelles: 1 ♂, 1 ♀ (♂ – lectotype, ♀ – paralectotype, HDZ 1778 t. 3), leg. C. Alluaud, det. E. Simon – 2 ♂♂ (MNHN 5228).

Male. Cephalothorax brown, eyes surrounded with black. Abdomen yellow with indistinct darker pattern. Sternum yellow. Legs yellow, long. Pedipalp brown, femoral apophysis small and placed considerably more proximally than in the other species (fig. 798), tibial apophysis with long and slender process (figs. 795–797 and 799–800). Dimensions: a 1.4, b 1.4, c 0.7, d 1.0, e 1.1.

Female. Coloration as in male. Epigyne very small, weakly sclerotized (fig. 801); internal structures as in fig. 802. Dimensions: a 1.7, b 2.5, c 0.8, d 1.1, e 1.2.

H. activus is a distinctive species readily separated from other species of the genus *Heliophanus* by the tibial apophysis (figs. 795–797 and 799–800) and form of epigyne (fig. 801).

Heliophanus africanus sp. n.

(figs. 803–804, 911)

Material. South Africa: Melville Koppies, ground laying stones, leg. F. Wanless et A. Russel-Smith – 1 ♀ (holotype, BMNH).

Male. Unknown.

Female. Cephalothorax black, with single white hairs posteriorly to posterior eyes. Abdomen dark brown, with indistinct trace of light band at anterior margin and almost invisible traces of two lighter marks. Sternum black. Legs yellow with

brown femora and dark stripes along the remaining segments. Epigyne with single deep depression (fig. 803); internal structures as in fig. 804. Dimensions: a 1.5, b 3.7, c 0.6, d 0.9, e 1.0.

H. africanus is a species of uncertain affinities, separated by the form of epigyne and its internal structures (figs. 803–804).

Heliophanus alienus sp. n.

(figs. 805–806, 922)

Material. Cameroon: Kounden, 26.XII.1975, leg. F. Puylaert – 1 ♀ (holotype, MRAC 148 318).

Male. Unknown.

Female. Cephalothorax dark brown, eyes surrounded with black. Abdomen beige with light leaf-like pattern dorsally; light ventrally. Sternum light brown. Legs and pedipalps yellow. Whole body clothed with short light hairs, longer and denser at anterior margin. Epigyne oval, with two openings (fig. 805); internal structures as in fig. 806. Dimensions: a 1.7, b 2.4, c 0.7, d 1.1, e 1.1.

The species is very closely related to *H. erythropleurus* from Ethiopia (cf. figs. 805–806 and 828), may be they are conspecific.

Heliophanus capicola Simon, 1901b

(figs. 807–813, 917)

Material. South Africa: "Cape Colony" – 1 ♂, 4 ♀♀ (♂ – lectotype, ♀♀ – paralectotypes, BMNH 20 145); Cape Peninsula, 1896–1900, leg. W. Purcell, R. Lightfoot et Treleaven – 2 ♀♀ (SAM 429); Bergvillet River, XII.1889, leg. W. Purcell – 1 ♂ (SAM 472).

Male. Cephalothorax brown, eyes surrounded with black. Abdomen light brown or dark brown. Sternum brown. Legs brown, legs I slightly larger than remaining. Pedipalp dark, femoral apophysis pointed distally (fig. 810), two tibial apophyses, embolus short and thin (figs. 807–809). Dimensions: a 1.1–1.4, b 1.2–1.3, c 0.6–0.7, d 0.7–0.8, e 0.8–0.9.

Female. Coloration as in male. Legs yellow or brown. Pedipalps yellow. Epigyne oval (figs. 811–812); internal structures as in fig. 813. Dimensions: a 1.7, b 2.6, c 0.7, d 0.9, e 1.1.

H. capicola is a distinctive species readily distinguished from all other species of the genus *Heliophanus* by the structure of pedipalp (figs. 807–810) and form of epigyne (figs. 811–812).

Heliophanus chikangawanus sp. n.

(figs. 814–818, 917)

Material. Angola: Serra do Moko, Luimbale, among stones, foot of the mountains, 10.IX.1949, leg. A. Machado – 1 ♂ (paratype, BMNH Ang. 1825.11.); Malawi: Viphya Mts, Chikangawa, on young spruces, III.–IV.1978, leg. R. Jocqué – 1 ♂ (holotype, MRAC 153 606), 1 ♂ (paratype, MRAC 153 169), on old pine plantation, X.–XII.1978, leg. R. Jocqué – 2 ♂♂ (paratypes, MRAC 153 757).

Male. Cephalothorax light brown or dark brown, eyes surrounded with black. Abdomen brown. Cephalothorax and abdomen clothed with short brown hairs, cephalothorax with scattered single white hairs additionaly. Sternum brown. Legs I slightly larger than remaining, brown or at least with brown femora, legs II–IV yellow. Pedipalp dark, small, femoral apophysis very small (fig. 817), two small

tibial apophyses (figs. 814–816 and 818). Dimensions: a 1.7–2.0, b 1.8–2.1, c 0.7–0.9, d 1.0–1.1, e 1.1–1.2.

Female. Unknown.

H. chikangawanus is a species of uncertain affinities, may be distinguished from other species of the genus *Heliophanus* by the structure of pedipalp (figs. 814–818).

Heliophanus deformis sp. n.

(figs. 819–824, 920)

Material. Angola: Fazenda Vasco Ferreira, 110 km SE from Moçamedes, leg. A. MACHADO – 1 ♂, 1 ♀ (♂ – holotype, ♀ – allotype, BMNH Ang. 1955.3.).

Male. Cephalothorax brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen yellow dorsally, light ventrally. Sternum brown. Legs brown. Pedipalp brown, femoral apophysis single, distally curved (fig. 822), two tibial apophyses, one of them pincers-shaped (fig. 819). Dimensions: a 1.2, b 1.2, c 0.6, d 0.7, e 0.9.

Female. Cephalothorax brown, clothed with scattered single white hairs, eyes surrounded with black. Abdomen dorsally beige with one pair of white marks and transverse white band near posterior margin; ventrally light. Sternum light brown. Legs light brown. Epigyne oval, with shallow depression (fig. 823) plugged with waxy secretion. Spermathecae oval, seminal ducts almost straight (fig. 824). Dimensions: a 1.4, b 2.1, c 0.6, d 0.7, e 0.8.

H. deformis is a distinctive species, can be distinguished from other species of the genus *Heliophanus* by the structure of pedipalp (figs. 819–822) and form of epigyne (fig. 823).

Heliophanus difficilis sp. n.

(figs. 825–827, 910)

Material. Zaire: Ruwenzori, Bundibugo, 850 m.a.s.l., 16.IV.1948, leg. Å. HOLM – 1 ♀ (holotype, ZIU 101).

Male. Unknown.

Female. Cephalothorax brown, eyes surrounded with black, two small marks composed of white scales posteriorly to posterior eyes. Abdomen light brown with white band at anterior margin and two white spots in black surrounds near posterior margin. Sternum light brown. Legs light brown. Whole body clothed with sparse short hairs. Epigyne rounded (fig. 825). Seminal ducts and spermathecae heavily sclerotized, their course difficult to discern (figs. 826–827 – ventral and dorsal views). Dimensions: a 1.4, b 2.3, c 0.8, d 1.1, e 1.2.

H. difficilis is a species of uncertain affinities distinguished by the structures of genitalia (figs. 826–827).

Heliophanus erythropleurus KULCZYŃSKI, 1901

(figs. 828, 924)

Material. Ethiopia, Eritrea: Ghinda, leg. K. LEVANDER – 1 ♀ (holotype, ZMF).

Male. Unknown.

Female. Cephalothorax brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Cephalothorax clothed with scattered white hairs, slightly denser on thoracic part. Abdomen yellowish-beige dorsally, light ventrally. Sternum light brown. Legs light yellow. Epigyne small, weakly sclerotized, with two openings (fig. 828). Dimensions: a 1.7, b 2.7, c 0.7, d 1.0, e 1.1.

The species is very closely related to *H. alienus* from Cameroon (cf. figs. 828 and 805–806), may be they are conspecific.

Heliophanus horrifer sp. n.

(figs. 829–830, 909)

Material. South Africa: "Cape Colony", leg. C. MARTIN – 4 ♀♀ (larger – holotype, another – paratypes, BMNH 20 128).

Male. Unknown.

Female. Cephalothorax brown, eyes surrounded with black, long brown setae in vicinity of anterior eyes. Abdomen brown with three–four pairs of irregular light patches; ventrally light. In one specimen abdomen uniformly light yellow (bleached?). Sternum brown. Legs yellow. Whole body clothed with dense light hairs, longer at anterior margin of abdomen. Epigyne large with oval depression (fig. 829) plugged with waxy secretion; internal structures as in fig. 830. Dimensions: a 2.5, b 2.8, c 1.1, d 1.3, e 1.5.

The arrangement of seminal ducts and spermathecae may be distorted during preparation.

H. horrifer is a distinctive species, separated by the form of epigyne (fig. 829).

Heliophanus macentensis BERLAND et MILLOT, 1941

(figs. 831–836, 923)

Material. Ivory Coast: Macenta, VIII.1937, leg. J. MILLOT – 1 ♀ (holotype, MNHN); Kenya: Kakamega Forest, Kisieni, 1600 m.a.s.l., 19.–21.I.1969, leg. Å. HOLM – 1 ♀ (ZIU 140); Zaire: Tshuapa, X.1969, leg. J. HAUWAERTS – 2 ♀♀ (MRAC 137 821); Rutshuru, Rwankwi, 1948, leg. J. LEROY – 2 ♀♀ (MRAC 134 545).

Male. Unknown.

Female. Cephalothorax dark brown or black. Abdomen dark brown or black dorsally, dark ventrally. Sternum brown. Legs yellow, in some specimens legs III–IV brown. Epigyne more or less round (figs. 831, 833 and 835); internal structures as in figs. 832, 834 and 836. To copulatory openings lead long "corridors" formed by the chitinous ledges. When these "corridors" are filled in with tiny artifacts they appear like showing through internal structures what gives a deceptive picture of arrangement of seminal ducts and spermathecae (cf. figs. 831 and 832). Dimensions: a 1.6–1.8, b 2.3–2.6, c 0.7–0.8, d 1.0–1.1, e 1.1–1.2.

H. macentensis is a distinctive species distinguished from other species of the genus *Heliophanus* by the form of epigyne (figs. 831, 833 and 835).

Heliophanus mucronatus SIMON, 1901b

(figs. 837–842, 923)

Material. Madagascar: St Marie, leg. A. MOCQUERIES – 1 ♂, 1 ♀ (♂ – holotype, MNHN 19 995); Diego-[Suarez], leg. C. ALLUAUD – 2 ♀♀ (MNHN 18 800); Tamatave, leg. B. CAMBOUÉ – 2 ♀♀ (MNHN 9975).

Male. Cephalothorax dark brown with a few white hairs in vicinity of anterior eyes. Abdomen dark brown dorsally, dark ventrally. Sternum brown. Legs I brown with yellow metatarsi and tarsi, remaining legs yellow. Pedipalp brown, femoral

apophysis shallowly bifurcated (fig. 840), embolus short, straight (fig. 837). Dimensions: a 1.7, b ? (abdomen slightly disfigured), c 0.8, d 1.0, e 1.1.

Female. Cephalothorax dark brown, eyes surrounded with black. Abdomen brown, with traces of two pairs of lighter marks at lateral margins; one specimen with yellowish-grey (bleached?) abdomen. Sternum brown. Legs brown or yellow. Epigyne more or less round, with shallow central depression (fig. 841); internal structures as in fig. 842. Dimensions: a 1.4–1.5, b 1.9–2.1, c 0.8–0.9, d 0.9–1.0, e 1.1–1.2.

H. mucronatus is species of uncertain affinities (may be related to the *hamifer* group), separated from other species by the distinctive femoral apophysis (fig. 840) and form of epigyne (fig. 841).

Identity of data on the label of the examined male with those given by SIMON (1901b) suggests that this specimen is the holotype; the female has not been included in the original description.

Heliophanus nobilis sp. n.

(figs. 843–847, 912)

Material. Zaire: Tshuapa, Boende, X.1969, leg. J. HAUWAERTS – 1 ♂ (holotype, MRAC 136 149).

Male. Cephalothorax brown, with a few long brown setae in vicinity of anterior eyes. Abdomen dorsally yellow, with two irregular black patches (likely bleached); light ventrally. Sternum brown. Legs yellow with brown femora. Whole body clothed with short brown hairs. Pedipalp brown, femoral apophysis sharply ended (fig. 847), two tibial apophyses (figs. 843–845), slightly flattened part of cymbium opposite to tibial apophyses (fig. 846). Dimensions: a 1.6, b 1.4, c 0.6, d 1.0, e 1.0.

Female. Unknown.

H. nobilis is a species of uncertain affinities distinguished from other species of the genus *Heliophanus* by the structure of pedipalp (figs. 843–847).

Heliophanus ochrichelis STRAND, 1907a

(figs. 848–849, 921)

Heliophanus ochrochelis [sic!]: BONNET 1957.

Material. Tanzania: Amani, III.1905, leg. VOSSELER – 1 ♀ (paratype, MNHU 17 599).

Male. Unknown.

Female. Cephalothorax dark brown with a metallic sheen, eyes surrounded with black. Abdomen dark brown dorsally, dark ventrally, relatively more elongated than in the other species. Sternum brown. Legs yellow. Epigyne small, oval (fig. 848); internal structures as in fig. 849. Dimensions: a 2.2, b 2.4, c 0.9, d 1.2, e 1.4.

H. ochrichelis is a species of uncertain affinities distinguished from other species of the genus *Heliophanus* by the structure of genitalia (fig. 849).

Heliophanus pauper sp. n.

(figs. 850–851, 913)

Material. Kenya: Nairobi, Athi River, 1950 m.a.s.l., 5.I.1969, leg. Å. HOLM – 2 ♀♀, 1 juv. (larger – holotype, another – paratype, ZIU 126).

Male. Unknown.

Female. Cephalothorax dark brown, eye field black, a few white hairs on thoracic part. Abdomen dark brown dorsally, dark ventrally. Sternum brown. Legs orange. Whole body clothed with short brown hairs. Epigyne more or less round, weakly sclerotized (fig. 850). Seminal ducts straight, spermathecae follicular (fig. 851). Dimensions: a 1.6, b 2.0, c 0.8, d 1.0, e 1.2.

H. pauper is a species of uncertain affinities distinguished from other species of the genus *Heliophanus* by the internal structure of genitalia (fig. 851).

Heliophanus uvirensis sp. n.

(figs. 852–853, 919)

Material. Zaire: Kivu, Uvira, S bank on Lunguce Lake. 2750 m.a.s.l., III.1953, leg. N. LELEUP et MARLIER – 1 ♀ (holotype, MRAC 74 335).

Male. Unknown.

Female. Cephalothorax dark brown, eye field black, a few long brown setae in vicinity of anterior eyes. Abdomen dark brown dorsally, light ventrally. Sternum brown. Legs yellow. Whole body clothed with short brown hairs. Epigyne oval, weakly sclerotized (fig. 852); internal structures as in fig. 853. Dimensions: a 1.7, b 2.2, c 0.7, d 1.0, e 1.1.

H. uvirensis is a species of uncertain affinities separated from other species of the genus *Heliophanus* by the internal structure of genitalia (fig. 853).

Species excluded from the genus

Chalcoscirtus janetscheki (DENIS, 1957), comb. n.

(figs. 854–855)

Heliophanus janetscheki DENIS, 1957.

Material. Spain: Sierra Nevada, Veleta, 2440 m.a.s.l., leg. H. JANETSCHEK – 1 ♀ (holotype, MNHN).

Male. Unknown.

Female. Cephalothorax black with characteristic sheen, a few long dark hairs in vicinity of anterior eyes. Abdomen dorsally black with sheen, ventrally dark. Sternum black. Legs yellow. Epigyne small, oval, with shallow depression (fig. 854). Seminal ducts very short, spermathecae follicular (fig. 855). Dimensions: a 1.2, b 1.8, c 0.5, d 0.8, e 0.9.

Chalcoscirtus rehobothicus (STRAND, 1915), comb. n.

(fig. 856)

Heliophanus rehobothicus STRAND, 1915.

Material. Israel: Jaffa-Rehoboth, 1913, leg. J. AHARONI – 2 ♀♀ (syntypes, SMF 2273/2).

Male. Unknown.

Female. Cephalothorax dark brown with characteristic sheen, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Abdomen brown with sheen dorsally, dark ventrally. Sternum brown. Legs light yellow. Epigyne small, weakly sclerotized, with shallow depression (fig. 856). Dimensions: a 1.4, b 1.6, c 0.4, d 0.8, e 0.8.

Pseudicius lucipeta (SIMON, 1890), comb. n.

Heliophanus lucipeta SIMON, 1890.

Material. South Yemen: Aden – 1 ♂, 1 ♀ (♀ – holotype, MNHN 10 777).

Detailed description of the species supplemented with drawings are given in WESOŁOWSKA (in press).

Pseudicius suedicola (SIMON, 1901), comb. n.

Heliophanus suedicola SIMON, 1901b.

Material. South Yemen: Aden – 1 ♂, 1 ♀ (♂ – holotype, MNHN 20 086).

Detailed description of the species supplemented with drawings are given in WESOŁOWSKA (in press).

Pseudicius ghesquieri (GILTAY, 1935), comb. n.

(figs. 857–861)

Heliophanus ghesquieri GILTAY, 1935.

Material. Zaire: Eala, XI.1935, leg. T. GHESQUIÈRE – 1 ♂ (holotype, MRAC 10 482).

Male. Cephalothorax dark brown, eyes surrounded with black, a few long brown setae in vicinity of anterior eyes. Eye field very short and broad. Abdomen elongated, yellow. Sternum yellowish-brown. Legs yellow. Pedipalp brown, femur with broad base (figs. 860–861), bulbus rounded (fig. 857), part of cymbium facing tibial apophysis with depression (figs. 858–859). Dimensions: a 1.7, b 1.9, c 0.8, d 1.1, e 1.1.

Female. Unknown.

Pseudicius marshi (PECKHAM et PECKHAM, 1903), comb. n.

(figs. 862–865)

Heliophanus Marshii PECKHAM et PECKHAM, 1903.

Material. South Africa: Cape Peninsula, Camps Bay, leg. TRELEAVEN – 1 ♂ (holotype, MCZ 242).

Male. Cephalothorax brown, eyes surrounded with black, anterior eyes fringed with single white hairs. Abdomen dark brown with two small white marks. Sternum brown. Legs yellow. Pedipalp dark brown, femur with small protuberance (fig. 865), embolus long (fig. 862). Dimensions: a 2.0, b 1.9, c 1.1, d 1.2, e 1.4.

Female. Unknown.

"*Heliophanus*" *menemeriformis* STRAND, 1907a

(figs. 866–870)

Material. Tanzania: Amani, 7.IV.1905 – 1 ♂ (syntype, MNHU 17 597), 30.II.1903 – 1 ♀ (syntype, MNHU 17 598).

Male. Cephalothorax brown, eyes surrounded with black. Abdomen brown. Sternum brown. Legs I brown, considerably longer than remaining legs. Legs II–IV yellow. Pedipalp brown, tibial apophysis shallowly bifurcated (fig. 867). Dimensions: a 1.5, b 1.4, c 0.8, d 0.9, e 0.9.

Female. Cephalothorax brown, eye field dark brown. Abdomen yellow with irregular brown patches. Sternum brown. Legs yellow. Epigyne more or less round, weakly sclerotized (fig. 870). Dimensions: a 1.4, b 2.3, c 0.7, d 1.0, e 1.0.

"*Heliophanus*" *berlandi* LAWRENCE, 1937

(figs. 871–872)

Material. South Africa: Zululand, Kosi Bay – 1 ♀ (holotype, NM).

Male. Unknown.

Female. Cephalothorax brown, eye field dark brown, a few long brown hairs in vicinity of anterior eyes. Thoracic part of cephalothorax clothed with single white hairs. Abdomen rounded, broadest in the middle, dark brown with narrow yellowish band at anterior margin and two pairs of light diagonal marks dorsally; dark ventrally. Sternum brown. Legs brown. Epigyne round with two openings (fig. 871); internal structures as in fig. 872. Dimensions: a 3.3, b 3.3, c 1.4, d 1.6, e 1.8.

"*Heliophanus*" *clarus* PECKHAM et PECKHAM, 1903

(figs. 873–875)

Material. Zimbabwe: Mashonaland, Salisbury, leg. Marshall – 2 ♀♀ (syntypes, MCZ).

Male. Unknown.

Female. Cephalothorax dark brown, eyes surrounded with black, thoracic part clothed with scattered single white hairs. Abdomen yellow with brown pattern (fig. 873 – in one specimens pattern indistinct). Sternum brown. Legs yellow. Epigyne round with single depression and heavily sclerotized posterior part (fig. 874). Seminal ducts more or less straight, spermathecae follicular, heavily sclerotized (fig. 875). Dimensions: a 1.7, b 2.9, c 0.9, d 1.1, e 1.1.

Pseudicius indicus (SIMON, 1901), comb. n.

(figs. 876–879)

Heliophanus indicus SIMON, 1901c.

Material. India: Trichinopoly [Tiruchirapalli] – 2 ♂♂ (syntypes?, MNHN 18 904).

Male. Cephalothorax light brown, eyes surrounded with black, eye field with two dark patches. Abdomen light yellow. Sternum yellow. Legs light yellow. Pedipalp light brown, femur with a small protuberance (fig. 879), tibial apophysis bilobate (fig. 877), embolus short (fig. 876). Dimensions: a 1.6, b 1.7, c 0.8, d 1.0, e 1.1.

Female. Unknown.

SIMON (1901c) gives "Indo-China, Saigon" as a collecting place of *H. indicus*, however, in SIMON's collection there are only two males collected in Southern India.

"*Heliophanus*" *maculatus* KARSCH, 1878

(figs. 880–882)

Material. Australia, New South Wales: 1 ♂ (holotype, MNHU).

Male. Cephalothorax dark brown, eye field clothed with a few long brown hairs. Anterior eyes fringed with small orange scales, small marks composed of

white hairs posteriorly to eyes II. Abdomen black with white patch at anterior margin, similar patch at posterior margin, two white crescent-shaped marks in the middle, transverse rusty-yellow band near anterior margin. Legs dark brown with yellow metatarsi and tarsi, a few white hairs at bases of segments. Pedipalp dark brown, cymbium and tibia white haired, single tibial apophysis, bulbus more or less rounded (fig. 880), posterior margin of cymbium, from the side of tibial apophysis, elongated into a flat process (fig. 882). Dimensions: a 2.1, b 2.4, c 1.2, d 1.9, e 1.6.

Female. Unknown.

KARSCH (1878) gives "1 ♀, holotype" – the identity of the data on the label of the examined male suggests, however, that this specimen is the holotype.

"*Heliophanus*" *extinctus* BERLAND, 1939

Fossil species from the Baltic amber included by BERLAND into the genus on the basis of its size and shape.

Nomina dubia

Heliophanus anomalus CAPORIACCO, 1947 – the description based on immature individuals.

Heliophanus cognatus SIMON, 1868 – the type-specimens lost, the original description is inadequate for its certain identity.

Heliophanus didieri SIMON, 1904 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus dilutus DENIS, 1937 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus dubourgi SIMON, 1904 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus flavimaxillis BÖSENBERG et STRAND, 1906 – the description based on immature specimens.

Heliophanus furcillatus SIMON, 1868 – the type-specimen lost, the original description is inadequate for its certain identity.

Heliophanus inornatus SIMON, 1868 – the type-specimens lost, the original description is inadequate for its certain identity.

Heliophanus kashmiricus CAPORIACCO, 1935 – the description based on immature specimen.

Heliophanus maestus (LUCAS, 1846) – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus micans C. L. KOCH, 1837 – the type-specimens lost, the original description is inadequate for its certain identity.

Heliophanus minutissimus SIMON, 1871 – the description based on immature individuals.

Heliophanus mongolicus SCHENKEL, 1953 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus nitens C. L. KOCH, 1848 – the type-specimens lost, the original description is inadequate for its certain; SIMON (1876) treats this species as dubious.

Heliophanus nitidus (LUCAS, 1846) – the type-specimen lost, the original description insufficient to identify the species; SIMON (1876) treats this species as dubious; CANTARELLA (1974) judging by the dimensions given in original description suggests that the description has been based on immature specimen.

Heliophanus niveivestis SIMON, 1889 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus nivosus (WALCKENAER, 1805) – the type-specimens lost, the original description insufficient to identify the species.

Heliophanus nossibeensis STRAND, 1907b – the type-specimens have been destroyed during World War II in museum in Lübeck; the original description inadequate for its identity.

Heliophanus pulverulentus (WALCKENAER, 1805) – the type-specimens lost, the original description inadequate for its identity.

Heliophanus recurvus SIMON, 1868 – the type-specimes lost, the original description insufficient to identity the species.

Heliophanus riedeli SCHMIDT, 1959 – the type-specimen lost, the original description insufficient to identify the species.

Heliophanus soudanicus BERLAND et MILLOT, 1941 – the type-specimen lost, the original description insufficient to its identity.

Heliophanus tessalensis STRAND, 1906 – the type-specimens have been destroyed during World War II in museum in Stuttgart, the original description inadequate for its identity.

Heliophanus tricinctus C. L. KOCH, 1837 – the type-specimens lost, the original description is inadequate for its certain identity.

Heliophanus uncinatus SIMON, 1868 – the original description insufficient to identify the species, the type from MNHN devoid of diagnostic characters (without pedipalps).

Heliophanus viridimanus (DOLESCHALL, 1852) – the type-specimens lost, the original description insufficient to identify the species.

Heliophanus vittatus DENIS, 1958 – the type-specimens lost, the original description is inadequate for its certain identity.

Nomina nuda

Heliophanus flavocinctus KEYSERLING in AUSSERER, 1867,
Heliophanus filiolus SIMON, 1901a,
Heliophanus japonicus KISHIDA, 1910,
Heliophanus okinawensis KISHIDA in OKADA, 1959.

Analysis of species distribution

The species of the genus *Heliophanus* inhabit the Palaearctic and Ethiopian Regions. An analysis of their distributional patterns is made difficult by the very unequal distribution of collecting effort. Whithin the area of fairly well studied Europe, many of the species are known from numerous localities, what suggests that they have continuous ranges there. On the contrary the knowledge of distribution of particular species in the Middle and Eastern Palaearctic, as well as in the Ethiopian Region is highly unsatisfactory, many of the species are known only from one–two places. In some cases, the known localities of a species are so far removed, that it is almost impossible to decide if they are parts of its continuous range or the range is actually disjunct. The currently known data on distribution of the *Heliophanus* spiders are presented in maps (figs. 883–926).

All but one species in the Palaearctic Region belong to *Heliophanus* s. str. The only exception is *H. edentulus*, inhabiting the Mediterranean area, which belongs to *Helafricanus*. In the Palaearctic Region *Heliophanus* is distributed from the British Isles and Iberian Peninsula to Japan and Kamtchatka but the number of species decreases strongly eastwards (fig. 941). This trend in species richness is presumably real, and does not constitute only a reflection of inadequate sampling in the Central and Eastern Palaearctic. The number of species decreases from the South to the North as well, a trend which parallels changes in climatic conditions. The majority of the *Heliophanus* species is thermophilous. The only exception is *H. dampfi* which occurs in Fennoscandia North to the Arctic Circle, and in Central Europe it has a very specialized habitat requirements, it inhabits only raised peat-bogs.

Among the Palaearctic species several distributional patterns are discernible. A relatively numerous group constitute broadly distributed Western Palaearctic species, occurring generally in whole Europe and penetrating deep into the East Palaearctic (the *cupreus* and *auratus* species-groups – figs. 927 and 928). The Eastern Palaearctic species are relatively few, and their ranges are generally small (*H. baicalensis*, *H. ussuricus* and *H. camtschadalicus* – figs. 891 and 890). An area especially species-rich is the Mediterranean area. The Mediterranean species possess continuous ranges and, as a rule, are distributed over whole Southern Europe, the Middle East, Maghreb and Mediterranean islands (the *apiatus* and *stylifer* species-groups – figs. 931 and 932), though there are also some species whose ranges are limited to smaller parts of this region. The Central Asiatic belt of steppes and deserts is very inadequately studied. So far only two species are known to occur in the Saharan oases and along outskirts of this desert (*H. decoratus* and *H. glaucus* – fig. 905, cf. also remarks on pp. 208 and 209).

The Ethiopian Region is characterized by the great number of species and their high diversity. Many of the Ethiopian species are widely distributed, their ranges cover sizeable parts of the region (the *marshalli*, *orchesta* and *debilis* species-groups

– figs. 934, 936 and 940). The areas round the Gulf of Guinea and the northern belt of savannas are inadequately known. The Congo River basin is inhabited by the numerous species dependent on tropical forests. Another species-rich area are the mountains of East Africa. Numerous montane species have small ranges limited to isolated ecological "islands" (e.g. *H. crudeni* – found only in the Kilimanjaro Massif). The spiders of South African deserts are poorly known. Numerous species are distributed in the Cape Province. Within this area ranges of the three subgenera overlap (fig. 942). The subgenus *Heliocapensis* occurs almost exclusively there (fig. 935), only one species – *H. eucharis* has been reported from the Gulf of Guinea area (fig. 906).

The further development of studies on distribution of *Heliophanus* would permit of more detailed areographic analysis in the future.

Remarks on species affinities

One of the basic tasks of systematics is an arrangement of organisms according to their real affinities. An achievement of this task demands a looking out of similarities and differences among the organisms as well as an evaluation which of those similarities have originated by common descent and which are only adaptations for living in similar habitats. The similarities and differences among the organisms reflect, to large extent, their phylogenetical relationships. The species showing similarities in homologous characters are the closely related ones (Mayr 1974a, Batko 1974).

The *Salticidae* are a group well suited to a comparative analysis of characters (Prószyński 1976); copulatory organs in this group are relatively simply built, they show considerable similarities in closely related groups (especially in males), and it is often possible to arrange them in morphological sequences. This in turn could form a basis for consideration of proximity of phylogenetical affinities. Additionally the *Salticidae* are an ecologically compact group and specialized forms, which usually cause remarkable problems in such analyses, are rare.

A provisional phylogenetic tree of *Heliophanus*, founded on an analysis of recorded similarities and correlations is proposed here (fig. 960). Some species have had to be omitted in the considerations presented below as it has been very difficult to evaluate their affinities. The informations on many of those species are very fragmentary, e.g. they are known only in one sex. Only future studies could fill these gaps.

With no fossil forms known an evaluation of the role played by the regressive evolution in group developement is also difficult, it is hard to decide to what extent simplicity of construction reflects a primitive state of a character and complication its more advanced state.

A model proposed here out of necessity has only a partial character, and the time limits accepted are based wholly on conjectures. A full reconstruction of a phylogenetic tree with an application of only neontological data is impossible, as

there is to much room for an arbitrary interpretation (BATKO 1974). The model reflects the supposed species affinities on the premise that the species closely morphologically resembling one another and having connected ranges are descendants of a common ancestor.

Out of the three subgenera distinguished (pp. 7,8) the species belonging to *Heliocapensis* and *Heliophanus* s. str. resemble closer each other in general body proportions, coloration and structure of genitalia than the species forming *Helafricanus*. Thus, it seems justified to suppose that the former two subgenera are closer related and their divergence occurred later than the separation of *Helafricanus* (fig. 943).

The subgenus *Heliocapensis*

Most probably the species forming this subgenus resemble most closely the ancestral forms. Within the subgenus a strongly marked tendency towards waning of bifurcated tibial apophysis of male pedipalps is discernible. Similar apophyses are found in the primitive *Salticidae* known from the Eocen amber (e.g. the genus *Eolinus* PETRUNKEVITCH, 1942). The species found in the Baltic amber resemble the recent tropical *Salticidae* from Eastern Africa and South-Eastern Asia (PRÓSZYŃSKI and ŻABKA 1980). Among recent species related to the amber *Salticidae*, the bifurcated tibial apophyses are recorded in the genera *Cyrba* SIMON, 1876 and *Portia* KARSCH, 1878.

Parallelly to the above mentioned trend, there is a tendency towards development of a femoral apophysis within the subgenus. In majority of species it has only a rudimental form but it is relatively well developed in *H. eucharis* (the only member of the subgenus recorded outside South Africa). Also in other characters (the shape and arrangement of tibial apophyses) this species is peculiar and of all the *Heliocapensis* species mostly resembling *Heliophanus* s. str. The subgenus consists of single group of closely related species.

The species within this group (fig. 944) are arranged in such a way that the tendency towards waning of bifurcated tibial apophysis of male pedipalp increases centrifugally, the tendency towards development of femoral apophysis increases from the left to the right; the species with triangularly expanded posterior margin of female epigyne are grouped in the left-hand part of the diagram, the species with single large opening (1 and 2) are placed far left, while the species with two epigynal openings (3 and 4) more centrally; the species placed at the far right show a tendency to bending of seminal ducts (8 and 9).

The subgenus *Helafricanus*

The species forming this subgenus differ from the other subgenera in the structure of genitalia and abdominal pattern. These characters, as well as the pattern of distribution may indicate a relatively early separation of this group from the other subgenera. Within the *Helafricanus* one can distinguish three groups of closely related species.

The *marshalli* group

Male pedipalp with distinctively shaped bulbus (fig. 96), three horizontal tibial apophyses and small patellar apophysis. In the dendrogram (fig. 945) the species are arranged so that the tendency to the coiling of embolus increases to the right, reaching its extremum in *H. undecimmaculatus* and *H. demonstrativus* (15 and 16); and the size of patellar apophysis increases to the left. Two epigynal openings in all the species.

The *debilis* group

Male pedipalp with only two tibial apophyses. A tendency towards development of dorsal tibial apophysis relatively weakly expressed in the species placed in the left-hand part of the dendrogram (fig. 946: 17 and 18), it increases to the right; the size of patellar apophysis increases to the right. The females in the species grouped in the left-hand part of the diagram (17–21) possess two epigynal openings, those placed in the right-hand part (22–24) only the single one.

The *crudeni* group

Male pedipalp with a huge patellar apophysis and two horizontal tibial apophyses. The species shown in the diagram (fig. 947) are grouped in such a way that a tendency toward enlargement of the protuberance near the base of embolus, as well as the convexity of bulbus increases from the right to the left. The species inhabiting East African mountains are placed in the right-hand part of the diagram (28–32), the males of these species are strongly built and have especially huge pedipalpal apophyses.

The subgenus *Heliophanus* s. str.

The majority of the *Heliophanus* species belongs to this subgenus. They are distributed both in the Palaearctic and the Ethiopian Regions but the Palaearctic species differ in so many respects from the Ethiopian ones, that, presumably, they are not closely related. The subgenus, besides several species-groups, consists also of numerous species solo, i.e. the species which affinities within the subgenus remain unclear.

The *orchesta* group

Relatively large *Heliophanus*, the male pedipalp with a single, fairly large femoral apophysis. The species placed in the left-hand part of the dendrogram (fig. 948: 34–36) have the embolus set at the side of bulbus opposite to that found in the species grouped in the right part of the dendrogram (37–42). A tendency towards development of a large protuberance near the embolus base visible in the species forming the right branch of the dendrogram (38–42). The dorsal tibial apophysis of male pedipalp in the bracketed species (36–39) very flattened and transformed into bilobated forceps (fig. 297). The females with posterior margin of epigyne medially elongated, forming a large ligulate process (fig. 339), the size of process decreases to the left.

The *lawrencei* group

Male pedipalp with huge femoral apophysis, very small tibial apophysis, short falciform embolus and small protuberance near the embolus base. The margin of cymbium facing the tibial apophysis flattened. Structure of female genitalia in both the species very similar. The species (fig. 949) inhabit the Congo River basin (fig. 938).

The *kankanensis* group

Male pedipalp with single slender femoral apophysis, single tibial apophysis extending dorsally into a furrow in the cymbium and small embolus. An arrangement and shape of seminal ducts and spermathecae in both species (fig. 950) similar.

The *hamifer* group

The species included here (fig. 951), as suggested by close resemblances in structure of their genitalia, are probably very closely related. Male pedipalp with single, slightly curved femoral apophysis and short embolus. Internal structure of female genitalia relatively simple, seminal ducts straight, spermathecae folliculate. The group consists of species distributed in Mozambique, Madagascar and a few smaller islands in the west part of the Indian Ocean (fig. 937).

The *pratti* group

Male pedipalp with distinctive bicuspid femoral apophysis, considerably shifted towards the base; two tibial apophyses, unlike the other species, situated in the same plane; and almost spherical bulbus. Such considerable morphological distinctiveness may suggest a relatively early separation from the other species (fig. 952).

The *apiatus* group

Male pedipalp with single femoral apophysis showing weakly pronounced tendency towards bifurcation. The species in a dendrogram (fig. 953) are arranged so, that a tendency towards bifurcation increases to the right (femoral apophysis shallowly bifurcated in *H. mordax* – 56). Horizontal tibial apophysis slender and elongated, bulbus strongly convex. Epigyne with single large depression, shallower in the species placed in left part of the dendrogram. The species in this group have small ranges around the Mediterranean Sea, only *H. mordax* has a larger range, reaching along the steppe zone far to the East of the Palaearctic Region (fig. 931).

The *stylifer* group

Male pedipalp with large femoral apophysis, divided into two–three lobes, a tendency towards segmentation of femoral apophysis increases from the right to the left side of the dendrogram (fig. 954), two tibial apophyses, the horizontal one slender and very long. Epigyne with single large depression, seminal ducts directed forward, spermathecae show slight tendency towards coiling. All the species have small ranges in the Mediterranean area (fig. 932).

The *ussuricus* group

This group (fig. 955) is characterized by male pedipalp with single femoral apophysis, shifted dorsally in comparison to other species, and two tibial apophyses. Epigyne with single large central depression, its internal structure similar in all the species. Distributed in the Eastern Palaearctic, except of *H. dampfi*, which inhabits Europe (fig. 929).

The *decoratus* group

Male pedipalp with vertical femoral apophysis and strongly flattened, horizontal tibial apophysis, adhering to the tibia. Epigyne with oval central depression. The internal structure of female genitalia of different species difficult to tell apart. The resemblances in internal structures of genitalia, as well as in coloration found within the group are very large, this most probably indicates close affinities among the species forming the group (fig. 956).

The *auratus* group

Male pedipalp with a fairly large protuberance at the base of embolus. The tendency towards elongation of embolus increases from the left to the right side of dendrogram (fig. 957). The species with single femoral apophysis (70–72) are placed in the left part of the diagram, the species with bifurcated femoral apophysis (73–75) in the right part. Epigyne with two openings (one in *H. flavipes* and *H. ignorabilis* – 75 and 76), seminal ducts and spermathecae similarly arranged in all the species and distinctive for the group. A whole array of resemblances in the structure of genitalia indicates the close affinities of the species included here. All the species show a great deal of morphological uniformity and have vast geographical ranges.

The *cupreus* group

The species included here (fig. 958) are morphologically rather diversified, their ranges differ in size as well. Epigyne with single large depression. Structure of copulatory organs (especially that of the females) indicates that species within the group are related but finding the closer affinities between the species is very difficult. This suggests a long period of development of the group.

The *potanini* group

In this group (fig. 959) male pedipalp with single small tibial apophysis, oriented horizontally in all the species (except *H. patagiatus* – 86), single, bluntly ended (bifurcated in *H. melinus* – 85) femoral apophysis. Epigyne with single large depression, posteriorly partially divided by the median septum; seminal ducts short, spermathecae elongated.

There are numerous species solo within the genus. In some cases such species are not known well enough to allow an attempt of analysing their affinities. In

many other instances, however, the species are so distinct morphologically that it is difficult to reconstruct their relationships.

A hypothetical phylogenetic tree of the genus *Heliophanus* is shown in fig. 960.

History of the genus range development

Attempts to reconstruct the history of *Heliophanus* range, similarly as in majority of other genera of the *Salticidae* face many difficulties, resulting from complete absence of any fossils (*H. extinctus* from Baltic amber recorded in Alsace has been included in *Heliophanus* only on the account of its body size and proportions, thus its attachment to this genus is highly dubious). In the following discussion an attempt is being made to substitute the lacking palaeontological data by inferences made from analyses of distribution of the recent species, as well as their mutual relationships. Some attempts to reconstruct the phylogeny of a taxon based solely on the analysis of neontological data have been already undertaken in various groups of animals, among others in the *Salticidae* for the genus *Sitticus* SIMON, 1901 (PRÓSZYŃSKI 1983).

The genus *Heliophanus* has originated most probably in Africa. In support of this thesis speaks the joint occurrence of all three subgenera in South Africa (fig. 942), among them *Heliocapensis* considered of being the most primitive one (cf. p. 236), as well as occurrence of majority of species (above 60%) on this continent.

It is difficult to give an exact time of origin of the taxon. As the *Heliophanus* species do not occur in any of the southern continents except Africa, one should assume that this event had to take place after Africa had been isolated from the other continents. The process of getting isolated by the African continent was very long lasting, it was finished only on the turn of the Cretaceous and Tertiary periods (BARRON et al. 1981), hence one can conjecture that the genus is not older than that, i.e. the genus is under 70 mln years old. It seems probable, however, that the genus is younger. The reason allowing one to suggest a relatively short history of this taxon is its great morphological homogeneity and a sizeable number of species, the features characterizing usually young, evolutionary dynamic taxa. We can suppose, however, that the genus originated before the Miocene in which period especially favourable conditions for colonization of the Palaearctic Region existed (cf. p. 242) and settlement of this area by *Heliophanus* probably begun. The Palaearctic Region has been colonized only by the members of the youngest phylogenetically subgenus – *Heliophanus* s. str. (cf. p. 236), thus one can suppose that the groups included presently in three different subgenera were already separated in the Miocene period. All these premises allow one to suggest that the genus originated in the first half of the Tertiary period and is between 25 and 60 mln years old.

Fairly uniform climatic conditions prevailing in Africa in the early Tertiary period (warm and wet climate, extensive areas covered with forests) did not favour rapid differentiation (HOŁYŃSKI 1979). Conditions for acceleration of the

differentiation rate appeared only by the end of Miocene, when large areas of South and East Africa were uplifted above 1200 m.a.s.l. Savannas started to develop in Africa on the turn of the Miocene and Pliocene periods. The Pleistocene climatic changes (LIVINGSTONE 1975) had considerable impact on differentiation of the African fauna. During the dry interpluvial periods forest-covered areas receeded to three small refugia in which forests occurred only along rivers; vast areas of the continent were covered with dry savannas (GROVE 1958, CARCASSON 1964, CROWE 1978, FLOHN and NICHOLSON 1980). The climatic changes affected also significantly the proportions of lowland and montane habitats. At the peaks of the pluvial periods a lower limit of the montane habitats was at 600 m.a.s.l., the warming up of climate during interpluvials caused a retreat of the alpine habitats to the height of over 1900 m.a.s.l. (GROVE 1958, CROWE 1978). According to UDVARDY (1978) the processes of speciation induced by changes in position of altitudinal vegetation zones were particularly intensive in the tropical mountains. High richness and diversity of the *Heliophanus* species found recently in Africa may be, apart from the initial Miocene differentiation, to large extent the result of these Quaternary climatic changes.

It seems probable, that the primitive subgenus (*Heliocapensis*) distributed now only in the South of the continent was once more broadly distributed in Africa, but the above described dramatic changes of climate and vegetation wiped it out from majority of formerly occupied areas, and that present distribution of the subgenus has a relic character. South Africa seems to have favourable conditions to play a role of such refugium because of its stable climate and unvarying, since the period, geological conditions (MOREAU 1952).

The subgenus *Helafricanus* is characterized by its considerable morphological distinctiveness (pp. 7 and 236), what might suggest its early separation from the main trunk of the phylogenetic tree of the group. Also the difficulties one has when trying to settle affinities among the groups of closely related species within the subgenus testify the long history of its development. The *Helafricanus* species occur in Africa to the South of the Sahara Desert and only *H. edentulus* (fig. 896) lives in the Mediterranean area. Such pattern of distribution suggests that species belonging to this subgenus were once distributed all over Africa and were ousted from the North of the continent by development of the Sahara Desert. The occurrence of *H. edentulus* in the Mediterranean area has most probably a relic character. The development of the Sahara Desert was connected with the Pleistocene glaciations in the Northern Hemisphere. During the pluvial periods the areas now occupied by the desert were covered by savannas, while during the interpluvials the desert was much bigger and reached the latitude 10°N (MOREAU 1963, CARCASSON 1964, CROWE 1978, FLOHN and NICHOLSON 1980). During the Holocen period the area of present Sahara Desert was twice covered by savannas (the last time about 5000–6000 years ago). When the whole area of North Africa was covered by savannas there was also a chain of big lakes situated along the present southern border of the Sahara Desert – the Chad Lake constitutes a remnant of this chain (FLOHN and NICHOLSON 1980).

Distribution of *H. decoratus*, belonging to *Heliophanus* s. str., which is found both in Saharan oases and along the outskirts of the desert, suggests that this species had formerly, under milder climatic conditions, much more extensive continuous range within the area covered now by the Sahara, and only later the developing desert fragmented its range and limited the species to several refugia. Considerable differences in structure of copulatory organs (cf. figs. 549–566 and 571–584) found between spiders collected in different oases suggest that these populations have undergone some genetical differentiation during the period of their isolation and, perhaps, we deal now with species in statu nascendi. The data at hand are too scarce, however, to allow reaching any firmer conclusions.

The species belonging to *Heliophanus* s. str. living to the South of the Sahara Desert are split into several groups showing considerable distinctiveness. Finding out the closer affinites among these species-groups is faced with great difficulties. This, together with presence of numerous species solo, suggests a long period of independent evolution within this area.

The Palaearctic and Ethiopian Regions show striking distinctiveness of their *Heliophanus*. There in no one species in common for them, moreover, with one exception, there is no species-group in common for both regions. This highly unique species composition, as well as relatively great differences in structure of copulatory organs between the Ethiopian and Palaearctic species indicate a long period of independent evolution within these regions.

The *Heliophanus* spiders originating from Africa probably colonized first the Mediterranean area, from where in turn, colonization of the rest of the Palaearctic Region could have started. During the almost whole Palaeogen period Africa was separated from Eurasia by the Thetis Sea which constituted an enormous barrier to dispersal. Though it is impossible to rule out a possibility that *Heliophanus* reached Europe by means of passive dispersal (e.g. air threads, flowing debris) at that time, it seems however, more plausible to accept a view that especially good conditions for colonization of Europe came only after appearance of direct land connections between the two continents. The geological and palaeontological data demonstrate that during the Miocene period there were several periods when Europe was directly connected with Africa by land bridges. The occurrence of several land connections going accross the present Mediterranean Sea the late Miocene salinity crisis belongs to the best documented cases (Adams et al. 1977, Hsü et al. 1977, Azzaroli and Guazonne 1980). Collision of the African continental plate with Europe resulted in formation of a shallow, closed, rapidly drying out sea. Its lowering water level allowed the emergence of extensive land connections between the two continents. At the same time very dry climate led to the development of savannas in Europe (Hołyński 1979), what could further enhance possibilities for *Heliophanus* expansion. From the Mediterranean area, via intermediate zones, the spiders colonized the North and East of the Palaearctic Region. As the climate of Asia in the early Neogene was fairly warm, and the vast expanses were covered by savannas with gallery forests along rivers (Sinicyn 1965) the species which colonized Europe could penetrate deep into East of the

Palaearctic Region. Only by the end of Tertiary period, on the turn of the Miocene and Pliocene periods, due to orogenesis of the Himalayas and uplifting of the Tibetan Plateau, the climate of Central Asia was turning to more continental type, the former savannas were replaced by steppes and deserts started to appear. Thus the species living then in Central Asia had to adapt to the continental climate. This climate change could also seriously hinder possibilities to penetrate this area by new Western Palaearctic forms.

As the climate and geological conditions in Central Asia were not changing substantially during the Quaternary period, one can conjecture that there are numerous Tertiary elements among the species living at present within this area.

The current coexistence in the Palaearctic Region of numerous species belonging to different species-groups, which are rather remotely related, suggests that the recent species are derived from a number of species, survivors of the Ice Age. This allows one to suppose that already by the end of Tertiary period *Heliophanus* in the Palaearctic Region was represented by numerous species with diversified environmental requirements. This fauna was probably mostly destroyed by the Pleistocene glaciations. A rapid cooling down of the climate during the Pleistocene period led to several periods of glaciations interspersed by warmer intervals. At the peak of Mindel glaciation almost whole area of Central Europe, Western Siberia, as well as, considerable parts of Central Siberia were covered with ice. The forelands of glaciers were covered by treeless tundras and cool steppes. Forests were limited to the Mediterranean area, Asia Minor and Transcaucasia (Grodziński 1958). The Western Palaearctic species forced out by Scandinavian glacier, as well as the Alpine glaciers partially went extinct, and partially retreated to refugia in the South. Though the easternmost parts of the Palaearctic Region were not affected by the Scandinavian glacier, nevertheless the species living there were also forced out, mainly by a general cooling down of the climate and developement of glaciers in the local mountains. It seems that refugia of the Eastern Palaearctic species had to be situated South-East to the Baikal Lake, somewhere in present Manchuria or Korea.

None of the *Heliophanus* species managed to colonize the Nearctic region via land connection across the Strait of Bering existing during the Pleistocene period (Hopkins 1959). Severe climate and inhospitable habitats of this area constituted probably an impassable barrier to their dispersal.

During the warmer interglacial periods dispersers from the refugia could recolonize the remaining parts of the region, going as far North as conditions permitted. The successive coolings down of the climate led again to extinction of some species and retreat of the others to the refugia. The Holocene warming up was followed by colonization of the Palaearctic Region from the Southern refugia. The Western Palaearctic species were much more dynamic in this process. This is demonstrated by present distribution of different species. The Western Palaearctic species (the species which have numerous closely related species in the Western and South-Western parts of the Palaearctic Region) have as a rule very extensive

ranges, reaching far to the East of the region. On the other hand ranges of the Eastern Palaearctic species are usually relatively small.

The Mediterranean area constituted an especially important refugium for the Tertiary species. Currently ranges of the greatest number of species overlap within this area (fig. 941) and all, but clearly Eastern Palaearctic *ussuricus*, species-groups have their representatives there; consequently the species living in the Mediterranean area represent a full spectrum of evolutionary tendencies recorded in the Palaearctic *Heliophanus* species. Thus, it seems that the Mediterranean area fulfills the criteria of so called center of speciation (Prószyński 1979). According to Udvardy (1978) an area from which a species started an expansion which resulted in occupation of its present range constitutes its center of dispersion. As a considerable number of species begun their postglacial recolonization of the Palaearctic Region from the Mediterranean refugium, hence this area constitutes the Palaearctic dispersion center of *Heliophanus*.

Among species living recently in the Palaearctic Region one can distinguish:

1. An old, Tertiary element, the species which survived in refugia and recolonized the region during the Holocen climatic amelioration (the *potanini* and *cupreus* species-groups). These species are fairly diversified morphologically, their affinities are relatively remoted, sometimes difficult to derive. The difficulties in arranging them stem from the absence of closely related species, what probably reflects a long period of evolution of these groups.

2. The postglacial element (the *auratus* and *ussuricus* species-groups). The *auratus* group is morphologically very uniform. The species belonging to this group have most extensive ranges of all the *Heliophanus* species (e.g. *H. aeneus* range spans from Channel Islands to Japan – fig. 883). Most likely they are young, expansive species, showing a high degree of ecological plasticity. Two of the species belonging to the *ussuricus* group (*H. dampfi* and *H. ussuricus*) are in all probability geographical vicariants. They very strongly resemble each other morphologically (the males are impossible to tell apart, the females differ in structure of their genitalia – cf. figs. 515–522 and 523–533). *H. dampfi* lives in raised peat-bogs of North and Central Europe (fig. 904), while *H. ussuricus* in Korea, Primore and in vicinities of the Baikal Lake (fig. 890). Their origin is most probably due to isolation of the Western and Eastern populations in different refugia during the Pleistocene glaciations. During the period of isolation these populations diverged to such extent that nowadays they form two separate species.

Absence of *Heliophanus* in the Oriental Region is quite puzzling. A possible reason could be a very sharp contrast between habitats in the two regions. The Central Asiatic *Heliophanus* living in poor and unfavourable habitats could find too many competitors in tropical habitats South to the Himalayas.

Among the *Heliophanus* species inhabiting islands one can distinguish three groups differing in the degree of their relation to the mainland species. The first group is composed of species so peculiar morphologically that finding of their close relatives among the mainland species is impossible. Their distinctiveness

suggests that they became isolated very long time ago, i.e. that they are old island endemics. There are two such species: *H. canariensis* from the Canary Islands and *H. activus* from Seychelles. The second group consists of island endemics too but these species have closely related species on the mainland, thus they became isolated from the mainland forms relatively later than the species from the former group. To this group belong *H. creticus* and *H. rufithorax* from the islands in the Mediterranean Sea, *H. imerinensis* and *H. innominatus* from the Madagascar as well as *H. mauricianus* from the Reunion and Mauritius Islands. The third and the most numerous group (over 20 species) is composed of species distributed both on islands and the neighbouring mainland. Not infrequently such species have extensive ranges on the mainland. It seems that such species colonized the islands relatively recently, most probably by means of passive dispersal.

Mountain chains can be looked at as archipelagos of ecological islands. Distribution of *Heliophanus* in the Palaearctic mountains is very inadequately known. The spiders collected in the mountains of Europe belong to the same species as the lowland ones. There are two endemic species in the Elburs Mts – *H. verus* and *H. iranus*, they are strongly morphologically differentiated from the other Palaearctic species, thus it seems that their isolation has been relatively long lasting. As the Elburs Mts played most probably a role of glacial refugium it seems possible that these species are relics of the Tertiary period. The data of Andreeva (in preparation) show that there are some endemic *Heliophanus* species in the Pamir Mts. As the major parts of these mountains were covered with ice during glaciations (though there were always some ice-free enclaves in which the spiders could survive) and the Pamir species have closely related species with extensive ranges in the other parts of the region, one can infer that colonization of the Pamir Mts and isolation of these forms are relatively recent, most probably they are the results of climatic changes during the Ice Age.

The mountains of East Africa are inhabited by three *Heliophanus* s. str. and five *Helafricanus* species. Two of the species belonging to the nominative subgenus (*H. difficilis* and *H. aberdarensis*) are known only from single female individuals, hence it is impossible to tell anything on pattern of their distribution. The third one – *H. gladiator* has its only closely related species in South Africa. Such distribution of these species, as well as their considerable morphological separation from other known *Heliophanus* indicate the long history of the group; perhaps then *H. gladiator* was living in the mountains for a long time (the end of Miocene–Pliocene?). The *Helafricanus* species from the mountains of East Africa (*H. kilimanjaroensis*, *H. validus*, *H. kenyaensis*, *H. crudeni* and *H. imperator*) are all closely related (p. 237) and most probably are derived from the common ancestor who colonized the mountains. The later isolation of different populations could led to their differentiation into several species.

The data on the distribution of *Heliophanus* in the mountains are so incomplete that it precludes any more detailed interpretation of the origin of montane species.

To sum up:

1. The genus *Heliophanus* appeared most probably in Africa in the first half of the Tertiary period and already before the Miocene period diverged into three groups forming the present subgenera.

2. The recent species richness and diversity of *Heliophanus* in Africa is to large extent the result of climatic changes during the Quaternary period.

3. The Palaearctic Region has been colonized only by one subgenus – *Heliophanus* s. str., most probably the colonization of Europe took place during the Miocene period, already by the end of Miocene the subgenus was differentiated into numerous and diverse species.

4. The recent pattern of distribution of the Palaearctic species originated under the impact of the Ice Age.

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STRESZCZENIE

[Tytuł: Rewizja rodzaju *Heliophanus* C. L. Koch, 1833 (*Aranei*: *Salticidae*)]

Praca zawiera rewizję rodzaju *Heliophanus* C.L.K. Zamieszczono charakterystyki morfologiczne wszystkich 109 gatunków, w tym 44 nowych dla nauki, uzupełnione szczegółowymi rysunkami oraz mapkami rozmieszczenia. Zsynonimizowano 1 nazwę rodzajową i 26 nazw gatunkowych, wyznaczono 23 nowe lektotypy. Na podstawie budowy narządów rozrodczych wyróżniono 3 podrodzaje, obejmujące 16 grup gatunków blisko spokrewnionych i 23 gatunki pojedyncze. Zaproponowano prowizoryczne drzewo filogenetyczne rodzaju. Praca przedstawia próbę odtworzenia historii rozwoju zasięgu rodzaju na podstawie rozmieszczenia gatunków współczesnych i ich pokrewieństw. Autorka przypuszcza, że rodzaj powstał w pierwszej połowie trzeciorzędu w Afryce, skąd w miocenie jeden z podrodzajów przez strefę śródziemnomorską skolonizował Palearktykę. Współczesne bogactwo i różnorodność gatunków etiopskich wynika prawdopodobnie w znacznej mierze z czwartorzędowych zmian klimatycznych. Dzisiejszy obraz rozmieszczenia gatunków w Palearktyce powstał pod wpływem epoki lodowej.

РЕЗЮМЕ

[Заглавие: Ревизия рода *Heliophanus* C. L. Koch, 1833 (*Aranei: Salticidae*)]

Работа представляет собой ревизию рода *Heliophanus* C. L. K. Содержит морфологическую характеристику 109 видов, из них 44 вида новые для науки снабжены подробными рисунками и картами распространения. Выделено 23 новых лектотипа. На основании структуры копулятивных аппаратов выделено 3 подрода, включающие 16 групп близких видов и 23 вида не включенных в эти группы. Предложено генеалогическое дерево рода. Работа представляет собой попытку реконструкции истории развития рода на основании анализа ареалов современных видов и их родственных связей. Автор предполагает, что род этот сформировался в первой половине третичного периода в Африке, откуда в миоцене один из подродов через Средиземноморье проник в Палеарктику. Современное богатство и разнообразие эфиопских видов в значительной степени результат климатических изменений в четвертичном периоде, а ареалы палеарктических видов сформировались под влиянием эпохи оледенения.

Redaktor pracy — doc. dr W. Staręga