

**Additions to the knowledge of the genus  
*Epacanthaclisis* Okamoto, 1910  
(Neuroptera: Myrmeleontidae)**

V. A. Krivokhatsky

Zoological Institute, Russian Academy of Sciences  
Universitetskaya nab. 1, St. Petersburg 199034, Russia  
E-mail: kva@zisp.spb.su

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**SUMMARY**

Five new species of the genus *Epacanthaclisis* (*E. kuldurguch*, *E. alaicus*, *E. banksi*, *E. hamatus*, *E. samarkandicus* spp. n.) from Central Asia are described. The description includes male and female genitalia of *E. moiwanus* (Okamoto, 1906) and *E. continentalis* Esben-Petersen, 1935. A key to the species of the genus is prepared. Three species of the genus *Epacanthaclisis* (*E. continentalis*, *E. hamatus*, *E. samarkandicus*) have a males with a pair of abdominal brushes of hairs on the IV tergite with probably pheromone dispersing function. *E. moiwanus* has no these brushes, and *E. banksi* has ones, much reduced.

**INTRODUCTION**

There are two described species - *E. moiwanus* (Okam.) (East Asia) and *E. continentalis* E.-P. (Central Asia) which have been included in the genus *Epacanthaclisis* Okamoto, 1910 (Dendroleontini) till now. No other species have been referred to it. Both species were described on female material, then some males were also cited, but male and female genitalia as well as a very interesting organ of the male's abdomen in *E. continentalis* were not examined. This organ looks like a pair of brushes of hairs, placed somewhat basal of the middle of the IV tergite.

As defined here, 7 Palaearctic species belong to this genus, 5 of them are described as new. Some Central Palaearctic species (*E. kuldurguch* and *E. alaicus* spp. n.) are known by the females only. Others Central Palaearctic species (*E. continentalis*, *E. hamatus* sp. n. and *E. samarkandicus* sp. n.) have a males with a pair of abdominal brushes of hairs on the IV tergite with probably pheromone dispersing function. Eastern Palaearctic *E. moiwanus* has no these brushes, and intermediated Palaearctic *E. banksi* sp. n. has ones, much reduced.

## MATERIAL

Nearly all material examined is kept in the collection of the Zoological Institute of the Russian Academy of Sciences, Sanct-Petersburg, Russia (ZISP), other depositories mentioned separately are: Smithsonian Institution National Museum of Natural History, Washington, USA (USNM); Finnish Museum of Natural History, Helsinki, Finland (FMNH); Zoological Museum of the Institute of Systematics and Ecology of Animals, Sibirian branch of the Russian Academy of Sciences, Novosibirsk, Russia (ISEA).

The names of the natural subdivisions and specific ranges were taken from the Palaearctic zoogeographical arrangement proposed by EMELJANOV (1974).

## DESCRIPTIONS

*Epacanthaclisis* Okamoto, 1910

*Epacanthaclisis* Okamoto, 1910:285 (type species *Acanthaclisis moiwanus* [Okamoto, 1906:115]).

Taxonomy: MARKL, 1954:231 (in *Acanthaclisini*); HÖLZEL, 1972:9 (in *Dendroleontini*); STANGE, 1976:275 (in *Dendroleontina* in *Dendroleontini*).

Description:

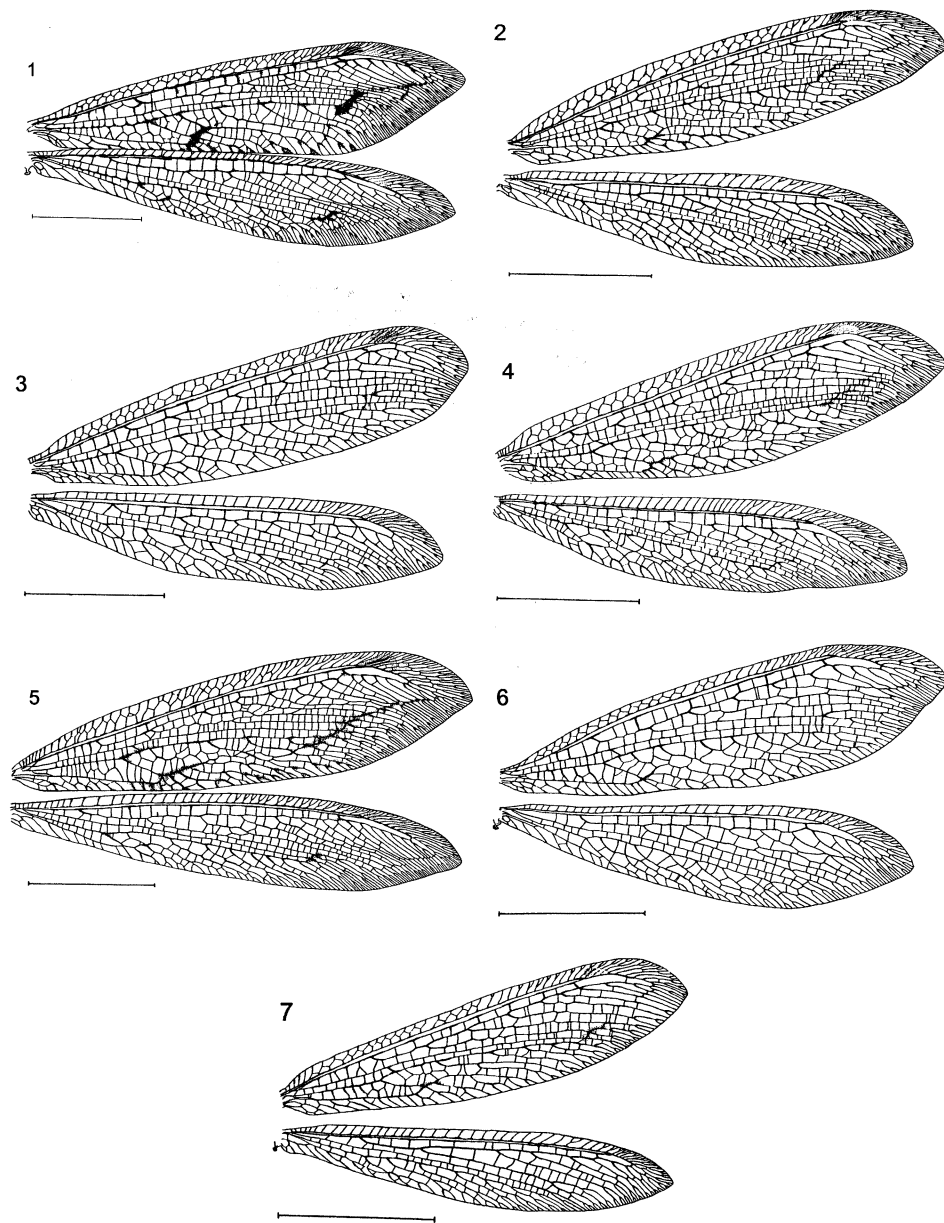
The genus can be characterized by the following features:

Costal field of forewing biareolate; R-sector of forewing close to or much before cubital fork; The presectoral field of hindwing with one or two crossveins; Forefemur with 1-5, middlefemur with 1-3 long sense hairs (sensilla trichoidea), hindfemora with one without such long hairs, short sense hairs sometime present; Spurs well developed; Distance between antennae not larger than the diameter of scapus; Axillar plates in male are present; Male ectoproct oval, without postventral lobe; Male genitalia with mediuncus situated between paired parameres; Female spermatheca looks like curved tube.

The other generic features cited by OKAMOTO (1910) and STANGE (1976) can be attributed to single species, not to the genus.

The males of some species have abdominal hooked brushes (figs. 20, 42, 47) which were not listed in the review of the male epidermal glands in the order Neuroptera (GÜSTEN, 1996). This organ has no homology within Myrmeleontidae and differs from the other three types of abdominal glands (analogy) due to the placement on the middle of the tergite, not on the pleura. There are two possible functions of this organ: stridulation or sex pheromone volatilization. The first one should be rejected as some species have brushes with long and soft hairs (fig. 42) unsuitable for stridulation. The pheromone dispersing function is confirmed by the presence of hardened filamentous material clutting the hairs, probably residues of the secretion, which were found in one male of *E. continentalis* in precopulatory condition (fig. 20).

Distribution: Palaearctic (not Oriental) Central and Eastern Asia: Sethian desert and Orthrian evergreen Regions.



**Figs. 1-7.** The wings of *Epacanthaclisis* spp. (M: 10 mm): 1 - *E. moiwanus* (Okam.); 2 - *E. continentalis* E.-P.; 3 - *E. kuldurguch* sp. n.; 4 - *E. alaicus* sp. n.; 5 - *E. banksi* sp. n.; 6 - *E. hamatus* sp. n.; 7 - *E. samarkandicus* sp. n.

*Epacanthaclisis moiwanus* Okamoto, 1906 (figs. 1, 8-15, 51)

*Acanthaclisis moiwanus* Okamoto, 1906:115

*Epacanthaclisis moiwasana* (Okamoto) - OKAMOTO, 1910:286; ESBEN-PETERSEN, 1935:234;

*Epacanthaclisis moiwanus* (Okamoto) - KUWAYAMA, 1962:390; HÖLZEL, 1972:10; STANGE, 1976:297.

Material examined: JAPAN, Honshu: 5 ♀♀, Karuizawa [138°36' E; 36°23' N], 24.VII.1949; 3.VIII.1949; 25.VIII.1949; 28.VIII.1949; 14.VIII.1953, P. Savolainen, FMNH; 1 ♂, Karuizawa, 13.VIII.1953, P. Savolainen, ZISP (anonym det. as *E. moiwasana* Okamoto); 1 ♀, Odaira [137°37' E; 35°30' N], 9.VIII.1954, P. Savolainen, FMNH.

Distribution: JAPAN (Hokkaido, Honshu, Shikoku). Southern Japanese mountain province of the Orthrian evergreen Region. Southjapanese range.

Additions to the original description:

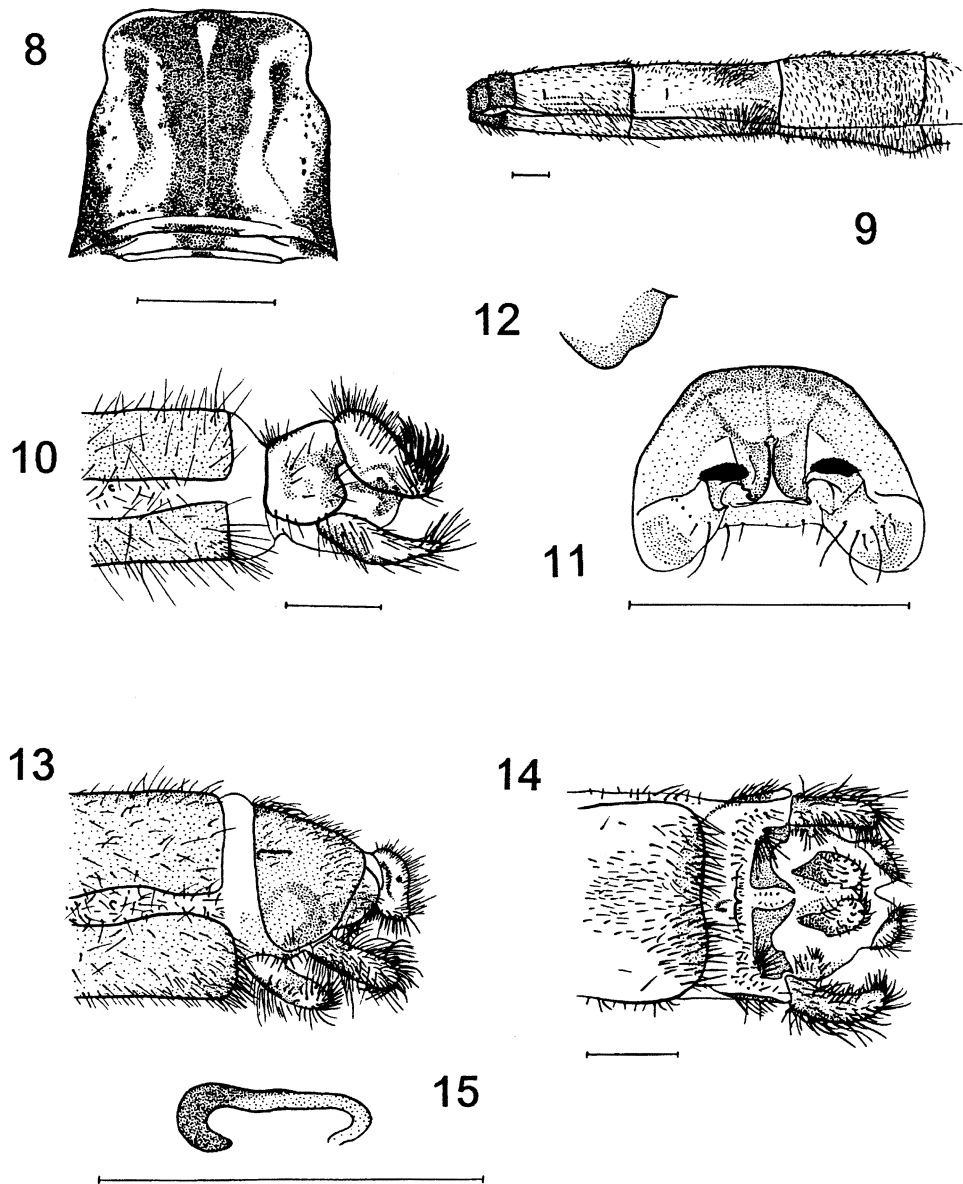
The original description of *A. moiwanus* in Japanese language (OKAMOTO, 1906) was incomplete. The redescription of this species (OKAMOTO, 1910) was more careful and was accompanied by total drawing of the female with indistinct wing venation. A photo of the male was published by KUWAYAMA (1962:380, fig. 26), but there was no description of male and female genitalia. Our specimens correspond well to the redescription. The length of the forewings in the series examined: 40 mm in male, and 41-45 mm in females (holotype - 41 mm).

There are some important features not shown in the published descriptions and characteristic of both sexes:

Head without setae closed the eyes; Tibial spurs as long as 3-4 tarsomeres in hind legs, and as 3 tarsomeres in fore- and middle legs; Base of forefemora with 4 long sense hairs, base of middle-femora with 2, and hindfemora with 1 such hair.

The assertion that costal field of the hindwings particularly with two rows of cells in females (OKAMOTO, 1910), and with one simple row in males (ESBEN-PETERSEN, 1935) is not correct. In our specimens examined in both sexes many costal crossveins in hindwings are bifurcate, but the complimentary veins between these crossveins near the stigma are present in the largest females (3 of 6 females examined). The male has 2 such complimentary veins on the left hindwing. The IV tergite of the male abdomen has no the brushes of dense hairs (fig. 9), but has two fields with dense modified hairs. Male genitalia consist of oval ectoprocts, tongue-shaped IX sternite (fig. 10), compact gonarcus-paramere complex (fig. 11), and wavy-shaped hypandrium internum (fig. 12).

The female genitalia (fig. 13,14) can be characterized by the long posterior gonapophyses. Anterior gonapophyses small, look like cuticular hillocks with hairs. Spermatheca (fig. 15) and genital plate (fig. 14) well sclerotized.



**Figs. 8-15.** *E. moiwanus* (Okam.) (Japan) (M: 1 mm): 8 - pronotum; 9-12 - male: basal segments of abdomen from the side (9); the end of abdomen (10); gonarcus-paramer complex (11); hypandrium internum (12); 13-15 - female genitalia: the end of abdomen from the side (13); from below (14); spermatheca (15).

*Epacanthaclisis continentalis* Esben-Petersen, 1935 (figs. 2, 16-24, 51)

*Epacanthaclisis continentalis* ESBEN-PETERSEN, 1935:233; LUPPOVA, 1961:208 (partim); HÖLZEL, 1972:10, STANGE, 1976:297;

*Epacanthaclisis* (sic) *continentalis* Esben-Petersen-BANKS, 1940:194 (misidentification, see *E. banksi* sp.n.); YANG, 1988:206.

Material examined: TADZHIKISTAN: 1 ♀, Kondara [South slope of Hissar Mt., 68°47' E; 38°36' N], 30 km N of Dushanbe, 15.VIII.1957, A. Muratova, ZISP (Luppova det.); 1 ♀, the same place, 5.IX.1962, V. Zaitzev, ZISP; 3 ♂♂, 11 ♀♀, the same place, at light, 11-25.IX.1991, P. Ustuzhanin, ZISP, USNM, ISEA; 1 ♀, Hissar Mt., Takob [69°00' E; 38°40' N], h - 1700 m; 28.VII.1984, I. Kharitonova, ISEA; 1 ♂ (without abdomen), Ramid [Ramit: 69°19' E; 38°42' N], Kafirnigan River, 28.VII.1939, A. Romanov, ZISP; 1 ♀, Iskander-Kul' Lake [North slope of Hissar Mt., 68°25' E; 39°04' N], 12.VII.1959, S. Saidaliev, ZISP (Luppova det.).

Distribution: INDIA (Kashmir), CHINA (Xizang, cit. by YANG, 1988), AFGHANISTAN (cit. by HÖLZEL, 1972), TADZHIKISTAN.

Described from Karakorum (Kataklik, Shyok Valley, Kashmir; 78°10' E, 34°12' N); cited from Hissar Mt., Turkestan Mt., Khosreti-Sho Mt. by LUPPOVA (1961); from Gyndukush Mt. and Paropamis (Safed Koh) Mt. by HÖLZEL (1972); from Tibet by YANG (1988).

Turkestanian-Tibetan mountain species living in Afghanian, Turkestanian, Pamirian and Tibetan provinces of Sethian desert Region.

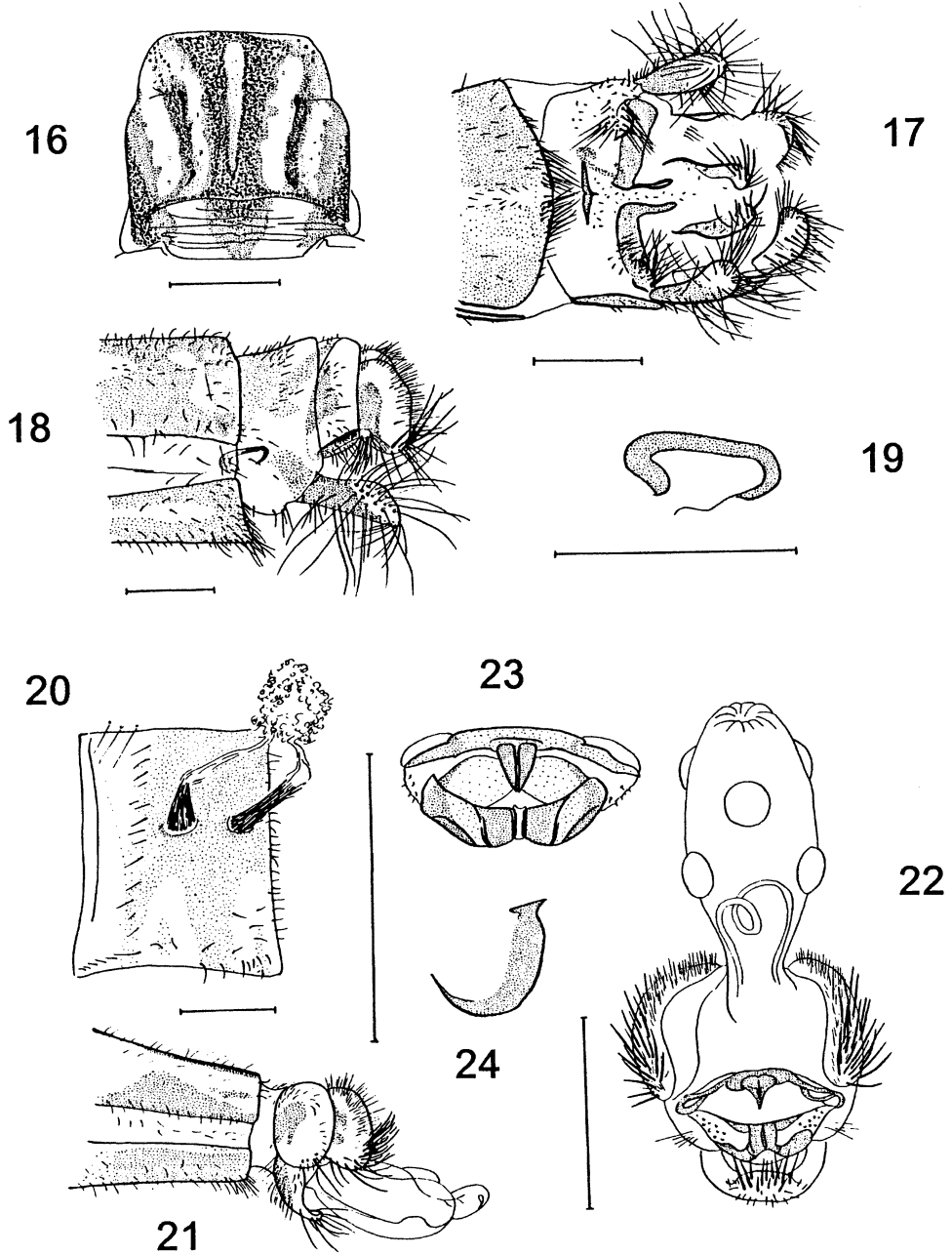
Notes: One specimen, determined and listed by LUPPOVA (1961) belongs to *E. samarkandicus* sp. n. (see later); other localities, published by this author (material from Turkestan Mt. and Khosreti-Sho Mt. not found) are in need of confirmation. The specimens listed by BANKS (1940) from Sichuan belong to *E. banksi* sp. n. described below.

Additions to the original description:

The original description of this species is careful and is accompanied by a photo of the holotype (female). Our specimens correspond well to this description, except one point. ESBEN-PETERSEN (1935:234) wrote: "In the hindwings the venation is paler [than in forewings], and the dark streaks are mostly found in the front part". On the photo of the holotype (p. 233), and in all material examined by me, RS and its branches in the hindwings are absolutely dark. The length of the forewings in the series examined: 28-32 mm in males, and 30-34 mm in females (holotype - 32 mm).

There are some important features not shown in the published descriptions and characteristic of both sexes: – eyes with 2-3 closed white bristles; Tibial spurs as long as two tarsomeres in hind legs, or as 3 tarsomeres in fore- and middle legs; Base of forefemora with 2-3 long sense hairs, base of middlefemora with two such hairs.

Some features mentioned for the holotype are variable: presectoral field of hindwings with 1-2 crossveins (two in the holotype); All legs with 2nd - 4th tarsomeres black on the tips at least.



**Figs. 16-24.** *E. continentalis* E.-P. (Tadzhikistan, Khorog) (M: 1 mm): 16 - pronotum; 17-19 - female genitalia: the end of abdomen from below (17); from the side (18); spermatheca (19); 20-24 - male: IV tergite of abdomen with the brushes of hairs (20); the end of abdomen with the membranose bladder from the side (21); from behind (22); gonarcus-paramer complex (23); hypandrium internum (24).

The IV tergite of the male abdomen has the brushes of dense hairs with probably pheromone dispersing function. One male from Khorog, which was sent me fresh in precopulatory condition, has a hardened filamentous material clutting the hairs (fig. 20).

Male genitalia consist of oval ectoprocts, tongue-shaped IX sternite (fig. 21), compact gonarcus-paramere complex (fig. 23) with distinct mediuncus, and sickle-shaped hypandrium internum (fig. 24). The membranes between VIII and IX segments and around the anus well developed and movable in precopulatory condition (figs. 21, 22).

The female genitalia (fig. 17, 18) can be characterized by the long posterior gonapophyses, longer than in other species described below. Anterior gonapophyses small, look like cuticular hillocks with hairs. Spermatheca (fig. 19) and genital plate well sclerotized.

*Epacanthaclisis kuldurguch* Krivokhatsky sp. n. (figs. 3, 25-27, 51)

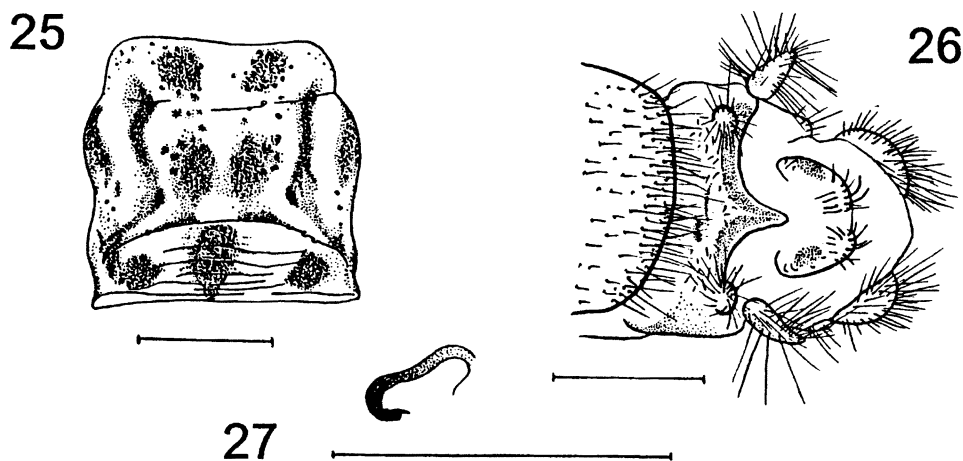
Holotype: ♀, TADZHIKISTAN: Mogyion [Magian; 67°40'E; 39°17' N], S from Pendzhikent, W Hissar Mt., 1800 m, 5-10.VII.1994, V. Lukhtanov, ZISP.

Paratypes: 2 ♀♀, Mogyion S from Pendzhikent, W Hissar Mt., 1800 m, 5-10.VII.1994, V. Lukhtanov, ZISP, USNM; 1 ♀, Dasht [68°55' E; 39°15' N], 40-50 km E of Ainy, Zeravshan Valley, 2600 m, 18.VII.1994, V. Lukhtanov, ZISP; 1 ♀, Savron [69°19'E; 39°15' N] near Novobad, Zeravshan Mt., 1600 m, 6.VII.1994, V. Mikhailov, ZISP.

Description: Large motley species. Forewings 34 mm (paratypes - 33-36), hindwings 30 (31-34), abdomen 22 (22-24) mm. Face brown with nestled white setae, clypeus and labrum pale with dark hairs. Frons convex, yellow with a large brown spot in the middle. Eyes convex, closed with 4-6 long white bristles. Antennae clavate, yellow with brown rings at the first half of flagellum, scapus light. Palpi light, last segment of labial palpi slightly fusiform.

Notum yellow with brown markings and white bristles. Pronotum (fig. 25) wider than long, with 4 medial and 2 lateral spots, and 2 submedial brown lines. Meso- and postnotum with more extensive brown markings. Legs light fulvous with black stripes and halfrings and with black and white hairs and bristles. Forecoxae with long white bristles. Bases of forefemora with a row of 3-5 sense hairs (first of them long); middle femora with 1-2 long sense hairs each. The base of hindfemora with a very short sense hair. Spurs pale red, slightly curved, as long as hind basitarsus, or as 1st and 2nd segments of fore- and middle tarsi combined. All tarsomeres light fulvous with pale brown tips. Membrane of the wings hyaline; both wings without pronounced pattern (Fig. 3). All longitudinal veins pale with brown strikes. Forewing: Branching of RS opposite cubital fork. Presectoral field with 6 crossveins, connected with complimentary veins. Apical field with gradates. Both Banksian lines weakly expressed. Stigma white with pale brown spot. Hindwing. Venation simpler, stigma, Banksian lines weakly expressed. Presectoral field with 2 crossveins.





Figs. 25-27. *E. kuldurguch* sp. n. (holotype, paratype, females) (M: 1 mm); 25 - pronotum; 26 - the end of abdomen; 27 - spermatheca.

Abdomen pale brown, female genitalia with a short posterior gonapophyses (fig. 26). Spermatheca strongly sclerotized at the top (fig. 27). Male unknown. Paratypes similar to the holotype. Details of connectives and furcations in wing venation vary from left to right wings.

Discussion: *E. kuldurguch* differs from the other species by the yellowish colour of the body, by the pattern of the pronotum, by the absence of a distinct pattern on the wings, and by all *Banksian* lines weakly expressed.

Ethymology: The specific name was formed from the spelling of the zeravshanian native name of antlion's larvae - "kul'-dur-gutsh".

Distribution: TADZHIKISTAN. Turkestanian mountain province of the Sethian desert Region.

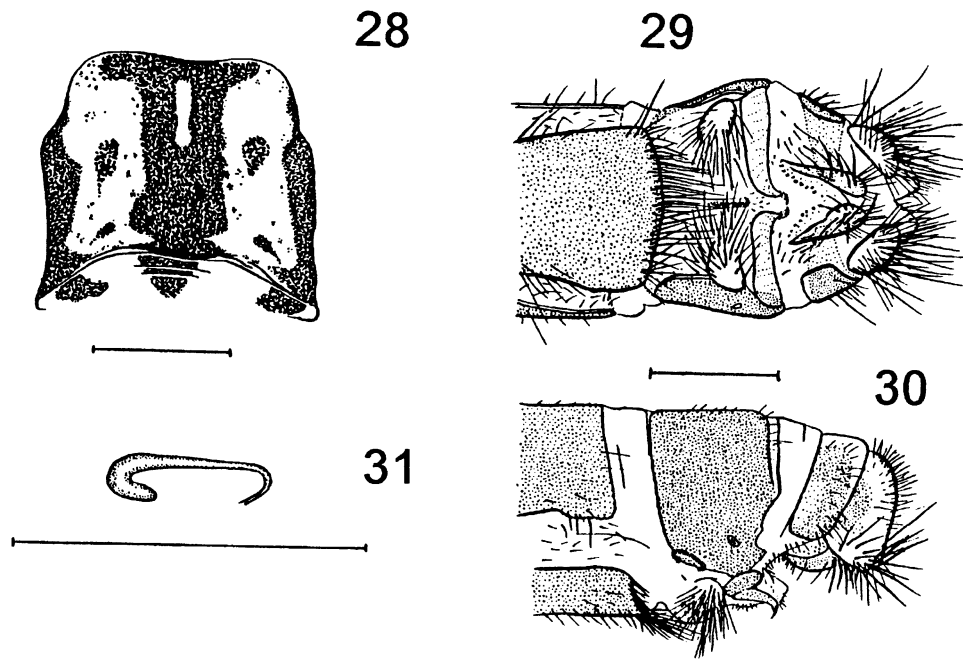
*Epacanthaclisis alaiicus* Krivokhatsky, sp. n. (figs. 4, 28-31, 51).

Holotype: ♀, KIRGHIZSTAN: Daraut-Kurghan [72°11'E; 39°32' N], Alay-Kette, 2800 m, 18.VII.1993, V. & A. Lukhtanovs, ZISP.

Description: Large greyish species. Forewings 35 mm, hindwings 31, abdomen 21 mm.

Head yellow, with two dark brown connected spots below antennae, and large black spot at frons and vertex. Long pale brown hairs on clypeus; white appressed setae between and above antennae. Frons convex. Eyes convex, closed with 5 white bristles each. Antennae clavate, dark brown, each joint of flagellum with pale ring. Palpi light, with black hairs; last segment of labial palpi slightly fusiform, with darker spot around sense pit. The base of labium with long white setae.

Notum yellowish with brown markings and long white bristles. Pronotum (Fig. 28) wider than long, with two medial and two lateral longitudinal blackish-



Figs. 28-31. *E. alaicus* sp. n. (holotype, female) (M: 1 mm): 28 - pronotum; 29, 30 - the end of abdomen from below and from side; 31 - spermatheca.

brown lines, and with 2 pairs of brown spots between them. Meso- and postnotum with more extensive brown markings and long white bristles. Legs light fulvous with brown lines and halfrings, and with black and white hairs and bristles. Forecoxae densely covered with long white bristles. Bases of forefemora with a row of few (3, 5 in different legs) sense hairs; middle femora with 2 long sense hairs. 1st segment of all tarsi as long as 2nd-3rd segments combined; 5th tarsomere approximately as long as 1st-2nd in hind tarsi and 1st-3rd in fore- and middle tarsi. Spurs pale red, slightly curved, as long as hind basitarsus, and as 1st and 2nd segments of fore- and middle tarsi combined. Membrane of wings hyaline; forewing with pale brown pattern (fig. 4). Forewing: Branching of RS much before cubital fork. Costal field with two rows of cells. Presectoral field with a few connected crossveins, apical field with gradates. Both Banksian lines expressed. Stigma white. All longitudinal veins pale with dark streaks. Membrane around cubital fork, place of CuA and CuP+1A anastomosis, and area from rhexma to apex of wing with brown stripes. Hindwing: Venation simpler and paler, membrane without brown dots. RS and its branches pale with dark streaks. Stigma white, Banksian lines expressed. Presectoral field with 2 crossveins.

Abdomen black, margins of last tergites slightly brown. Female genitalia as in other *Epacanthaclisis*, but there are no posterior gonapophyses (figs. 29, 30), which are undoubtedly not broken. Spermatheca slightly enlarged to the end (fig. 31).

Male unknown.

Discussion: From the other species, *E. alaicus* differs by the absence of posterior gonapophyses in the female.

Ethymology: The species was named after the type locality - Alay Mountain.

Distribution: KIRGHIZSTAN. Alay Mountain - Tian-Shanian province of the Sethian desert Region.

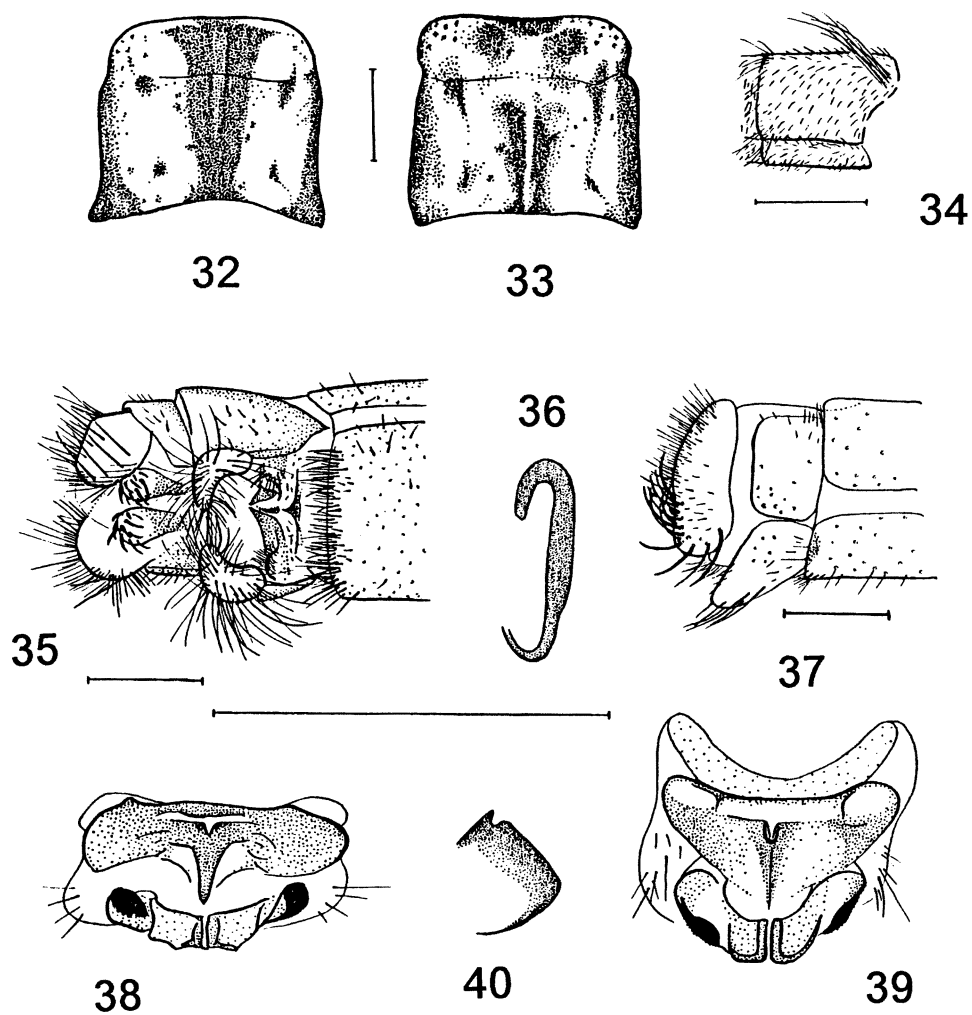
*Epacanthaclisis banksi* Krivokhatsky, sp. n. (figs 5, 32-40, 51)

Holotype: ♀, CHINA: Szechwan [Sichuan], Ts' Ao Po, 16.VIII.1938, D.C. Graham, USNM, with a label by Hölzel, 1971, "*Epacanthaclisis* sp.?".

Paratypes: 1 ♂ (without left forewing), Szechwan, Beh Luh Din, 20 mi N. Chengtu [Changdu] [104°05' E; 30°40' N], 24.VIII.1938, D.C. Graham, USNM, determined and published by BANKS (1940:194) as "*Epicanthaclisis* [sic!] *continentalis* Peters.", then (1971) determined by Hölzel as "*Epacanthaclisis* sp.?"; 1 ♀, Szechwan, Ts' Ao Po, 26.VIII.1938, D.C. Graham, ZISP.

Description: Brownish species. Forewings 35 mm, hindwings 35, abdomen 22 mm. Face pale brown; dark brown band around antennae, dark brown frons and vertex with two pairs of yellowish spots. Long brown hairs at the face; white appressed setae between and above antennae. Frons convex. Eyes convex, closed with a few short white setae (a long setae probably broken). Antennae clavate, pale brown. Palpi pale, with black hairs; last segment of labial palpi slightly fusiform. The base of labium with long white setae.

Notum yellowish with brown markings and long white and few brown bristles. Pronotum (fig. 32) as long as wide, with medial V-shaped spot and two lateral longitudinal blackish-brown lines, and with 2 pairs of brown stripes between them. Meso- and postnotum with more extensive brown markings. Legs light fulvous with brown lines and bands, with black and white hairs and bristles. Forecoxae densely covered with long white bristles. Bases of forefemora with 2 and middlefemora with 3 long sense hairs each. 1st segment of all tarsi as long as 2nd-3rd segments combined; 5th tarsomere approximately as long as 1st-2nd in hind tarsi and 1st-3rd in fore and middle tarsi. Spurs pale red, slightly curved, as long as 1st-3rd tarsi in hind legs, and as 1st-4th segments of fore and middle tarsi combined. 1st, 2nd and 5th tarsomeres pale with brown tips; 3rd and 4th completely brown. Membrane of wings hyaline; forewing with distinct pale brown pattern (fig. 5). Forewing: The furcation of RS much before cubital fork. Costal field with two rows of cells. The width of the costal field more than twice as large as width of the row of cells between R and RS veins. Presectoral field with 5 crossveins, apical field with gradates. Both Banksian lines expressed. Stigma white with darkness at the base. All longitudinal veins pale with dark streaks. Membrane with distinct brown stripes at the place of CuA and CuP+1A anastomosis and across the rhexma to apex of wing; some shades along the endings of veins near the hindmargin of wing. Hindwing: Venation simpler and paler, membrane without brown dots. Costal field with one row of cells, crossveins forked apically. Presectoral field with two crossveins. Radial sector



**Figs. 32-40.** *E. banksi* sp. n. (holotype, paratypes) (M: 1 mm): 32, 33 - pronotum of holotype (32) and paratype (33); 34 - IV segment of abdomen of male, paratype, with the brushe of hairs; 35 - the end of abdomen of female, holotype, from below; 36 - spermatheca; 37-39 - the male genitalia, paratype: the end of abdomen from the side (37); gonarcus-paramer complex from behind (38); from above (39); hypandrium internum (40).

much before MP fork. All longitudinal veins pale with brown stripes. Stigma white, indistinct. Banksian lines expressed.

Abdomen pale brown with darker medial and two lateral longitudinal lines and with long hairs, which white basally and black apically. Female terminalia (fig. 35) similar to such of *E. continentalis*, but the bristles of lateral gonapophyses much stronger. Spermatheca (fig. 36) abruptly extended at the first part. Another female similar to the holotype in appearance, but differs by the pattern of pronotum (fig. 33) and by size: forewing - 37 mm, hindwing - 37, abdomen - 24 mm. The male forewing 32 mm, hindwing - 32, abdomen (broken) - 24 mm approximately. Axillar plates present. IV tergite with sparse long black hairs (fig. 34). The end of abdomen (fig. 37) and genitalia (Figs 38, 39) closely similar to those of *E. moiwanus*, but hypandrium internum (fig. 40) abruptly curved.

Discussion: New species close to *E. moiwanus* (Okam.), but distinctly differs by details in genital construction in male (the form of hypandrium internum) and in female (the form of spermatheca), by smaller size and by the longitudinal brown streak in the forewing.

Ethymology: The species was named after the famous neuropterologist Nathan BANKS.

Distribution: CHINA, Sichuan, Chinese-Tibetan Mt. Other specimen(s), listed by BANKS (1940), as *E. continentalis* from O-Er, 26 miles N of Li Fan, Szochwan [currently Lisjan, Chinese-Tibetan Mt., 103°43' E; 31°25' N] were not found, but can be attributed to the same species, as collected in the same sichuanese range. Himalayan mountain province of the Orthrian evergreen Region.

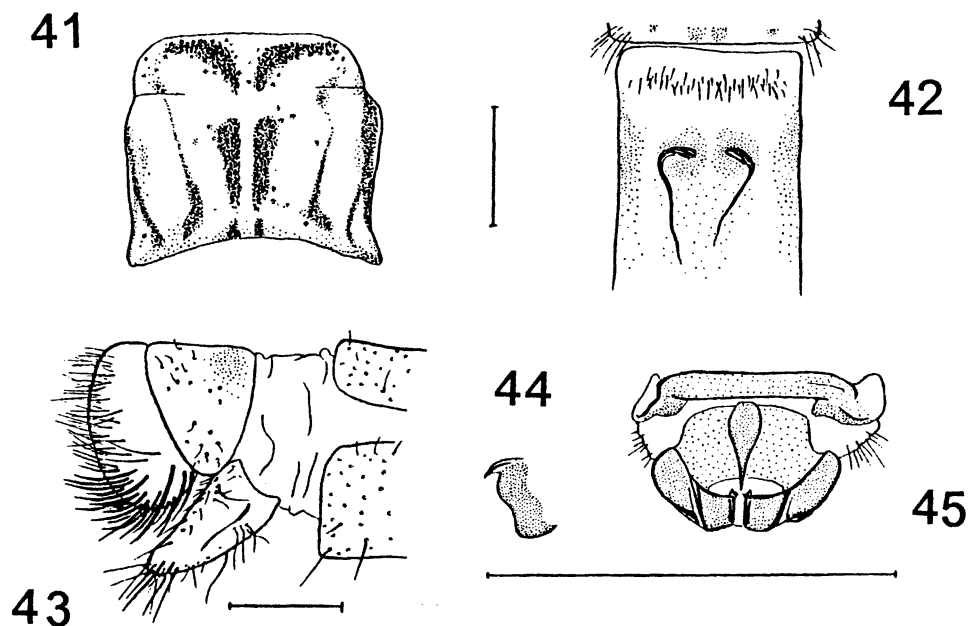
*Epacanthaclisis hamatus* Krivokhatsky sp. n. (figs. 6, 41-45, 51)

Holotype: ♂, KAZAKHSTAN: Aksu River, [Aksu-Dzhabagly Nat. Res.], Kara-Alma [70°35' E; 42°38' N], Tallas Alatau Mt., 19.VIII.1935, Shulgin, ZISP (front part of the left hindwing and antennae are broken).

Description: Greyish yellow species. Fore wings 30 mm, hindwings 27, abdomen 22 mm.

Head yellow, with a black triangular spot between antennae, and two small brown spots at the vertex. White nestled setae between and above antennae are present. Frons convex. Eyes convex closed with a few white setae. Palpi yellow, with dark hairs; last segment of labial palpi slightly fusiform. Base of labium with long white setae.

Notum yellow with pale brown markings and long white bristles, especially at the margins. Pronotum (fig. 41) wider than long, with two interrupted at the middle medial, and two pairs of longitudinal lateral pale brown lines. Meso- and postnotum with more extensive brown markings and long white bristles. Legs light fulvous with brown rings at the tibia, with black and white hairs and bristles. Forecoxae densely covered with long white bristles. Bases of fore- and middlefemora with 2 long sense hairs each. 1st segment of all tarsi as long as 2nd-3rd segments combined; 5th tarsomere approximately as long as 1st-2nd in hind tarsi and 1st-3rd



Figs. 41-45. *E. hamatus* sp. n. (holotype, male) (M: 1 mm): 41 - pronotum; 42 - IV segment of abdomen with the brushes of hairs; 43 - the end of abdomen; 44 - hypandrium internum; 45 - gonarcus-paramer complex.

in fore and middle tarsi. All tarsomeres yellow, only 5th one yellow with pale brown tip. Spurs pale red, slightly curved, as long as 1st - 3rd segments combined at the fore- and middle tarsi, and as 1st-2nd ones at the hindlegs. Membrane of wings muddy. Wing without distinct pattern (fig. 6). Forewing: The furcation of RS somewhat before cubital fork. Costal field with two rows of cells. The wide of costal field is equal with the wide of the field between R and RS veins. Presectoral field with 5 crossveins, apical field with gradates. Both Banksian lines expressed. Stigma white. All longitudinal veins pale with dark streaks. Hindwing: Venation simpler and paler. RS pale with dark streaks. Stigma white, Banksian lines expressed. Axillary plates pale. Presectoral field with two crossveins.

Abdomen yellow with pale brown pattern, with a pair of hooked brushes of long soft dense black hairs on the IV tergite (fig. 42). Ectoproct (fig. 43) and gonarcus-paramers-mediuncus complex (fig. 45) are typical for the genus. Hypandrium internum (fig. 44) with sinusoidal edge. Female unknown.

Discussion: From the other species *E. hamatus* differs by the narrow costal field, by long soft brushes on the IV tergite in male, and by the absence of a distinct pattern on the wing membrane.

Ethymology: *Hamatus* (Lat.) - hooked. The species was named for the hooked brushes on IV tergite of abdomen.

Distribution: KAZAKHSTAN, Tallas Alatoo Mountain. Alatavian province of Sethian Region.

*Epacanthaclisis samarkandicus* Krivokhatsky, sp. n. (figs. 7, 46-51).

Holotype: ♂ UZBEKISTAN: Takhta-Karachar [W part of Zeravshan Mt., 66°56' E; 39°17' N], S of Samarkand, 3-7.VII.1896, Verygin, ZISP, determined and published by LUPPOVA (1961:208) as "*E. continentalis* E.-P."

Description: Pale brown species. Fore wings 27 mm, hindwings 26, abdomen 22 mm.

Head yellow, with brown band below antennae and large black spot in the middle of frons and vertex. Clypeus with long white hairs. White nestled setae between and above antennae. Frons convex. Eyes convex, closed with a few white setae. Antennae clavate, pale brown. Palpi pale, with black hairs; last segment of labial palpi slightly fusiform, with darker spot around sense pit. Base of labium with long white setae.

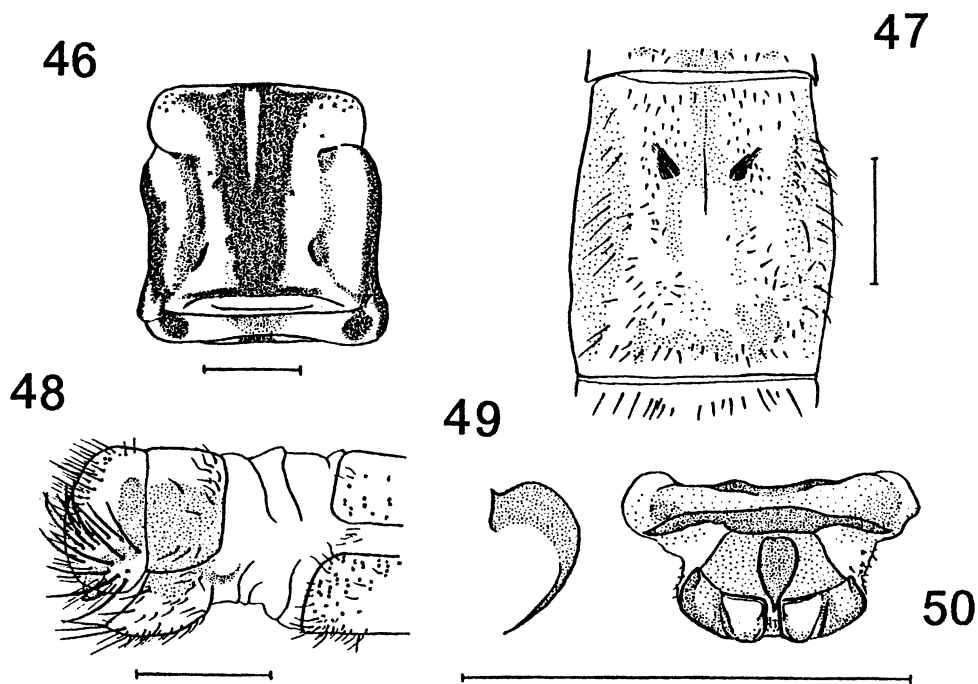
Notum yellowish with brown markings and long white and a few brown bristles. Pronotum (fig. 46) longer than wide, with medial V-shaped figure and two lateral longitudinal blackish-brown lines, with 2 pairs of brown stripes between them. Meso- and postnotum with more extensive brown markings. Legs light fulvous with brown lines and halfrings, with black and white hairs and bristles. Forecoxae densely covered with long white bristles. Bases of fore- and middlefemora with 1 long sense hair. 1st segment of all tarsi as long as 2nd-3rd segments combined; 5th tarsomere approximately as long as 1st-2nd in hind tarsi and 1st-3rd in fore- and middle tarsi. Spurs pale red, slightly curved, as long as hind basitarsus, and as 1st and 2nd segments of fore- and middle tarsi combined. All tarsomeres pale with pale brown tips. Membrane of wings hyaline; forewing with indistinct pale brown pattern (fig. 7). Forewing: The furcation of RS much before cubital fork at the right wing and some after at the left one. Costal field with two rows of cells. The width of the costal field slightly larger than the width of the field between R and RS veins. Presectoral field with 5 crossveins, apical field with gradates. Both Banksian lines expressed. Stigma white with darkness at the base. All longitudinal veins pale with dark streaks. Brown stripes on membrane at the place of CuA and CuP+1A anastomosis, and from rhexma to apex of wing. Hindwing: Venation simpler and paler, membrane without brown dots. RS completely dark, other longitudinal veins pale with brown stripes. Stigma white, Banksian lines expressed. Axillar plates present. Presectoral field with two crossveins.

Abdomen pale brown with darker variable pattern. IV tergite (fig. 47) with two brushes of short dense black hairs. The end of abdomen (fig. 48) and male genitalia (figs 49, 50) very similar with such of *E. continentalis*. Female unknown.

Discussion: The new species is close to *E. continentalis*, but differs in smaller size and shorter spurs in all legs.

Ethymology: The species was named after the type locality in Samarkand Region.

Distribution: UZBEKISTAN, Zeravshan Mountain. Turkestanian province of the Sethian desert Region.



Figs. 46-50. *E. samarkandicus* sp. n. (holotype, male) (M: 1 mm): 46 - pronotum; 47 - IV segment of abdomen with the brushes of hairs; 48 - the end of abdomen; 49 - hypandrium internum; 50 - gonarcus-paramer complex.

## DISCUSSION

The differences between all known species of the genus *Epacanthaclisis* may be characterized by the following features:

1. Hind tibial spurs as long as basitarsus .....2  
 – Hind tibial spurs as long as, or longer than two segments of tarsi .....4
2. Larger, forewing about 35 mm, all veins pale with dark stripes .....3  
 – Smaller, forewing 27 mm, with dark streak, RS of hindwing almost completely dark .....*samarkandicus* sp.n.
3. Dark greyish species, forewing with dark streak from rhexma to apical field. Pronotum with longitudinal lines ..... *alaicus* sp.n.  
 – Yellowish species, wings without distinct dark pattern. Pronotum with dark spots ..... *kuldurguch* sp.n.
4. Hind tibial spurs as long as or longer than three segments of tarsi .....5  
 – Hind tibial spurs as long as two segments of tarsi .....6



- 5. Larger, forewings longer than 40 mm. Brown streak from rhegma to the apex of forewing long and narrow ..... *moiwanus* Okam.
- Smaller, forewings less than 37 mm. Streak from rhegma to apex of forewing short and broad ..... *banksi* sp.n.
  
- 6. RS of hindwing completely dark. The width of costal area in forewing twice larger than distance between R and RS veins..... *continentalis* E.-P.
- RS of hindwing pale with dark streaks. The width of costal area in forewing and the distance between R and RS are equal..... *hamatus* sp.n.

**ZOOGEOGRAPHY** (fig. 51)

The species of the genus *Epacanthaclisis* are known from the Orthrian subtropical evergreen and Sethian desert zoogeographic Regions of the Palaearctic (fig. 42). In the Orthrian Region one species (*E. moiwanus*) inhabits the Southjapanese province, another one (*E. banksi*) exists in the Himalayan province. There are five species distributed in the Sethian Region; all of them occur in the mountain provinces only, and avoid the desert planes: *E. samarkandicus* and *E. kuldurguch* - in Turkestanian province; *E. hamatus* - in Alatavia; *E. alaicus* - in Tian-Shanian; *E. continentalis* - in Afghanian, Turkestanian, Pamirian and Tibetan provinces.

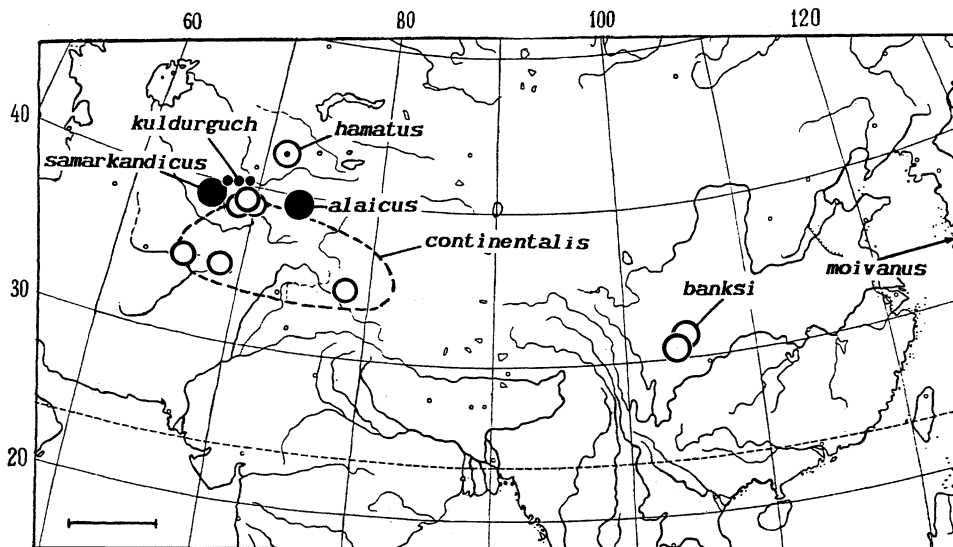


Fig. 51. The distribution of the *Epacanthaclisis* spp. in the Palaearctic Asia (M: 500 km).

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