Revision of the genus *Camptotylidea* (Heteroptera: Miridae)

F.V. Konstantinov

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A key and descriptions are given for all 28 species of this genus, including 9 new ones: *Camptotylidea kanduli* sp. n. (Mongolia), *C. ceratoides* sp. n. (Kazakhstan, Mongolia), *C. obscurata* sp. n. (Kazakhstan, Mongolia), *C. ephedrae* sp. n. (Kazakhstan, Turkmenistan), *C. salsosa* sp. n. (Uzbekistan, Kazakhstan), *C. perirata* sp. n. (Uzbekistan, Tajikistan), *C. bucharica* sp. n. (Uzbekistan), *C. striata* sp. n. (Kirgizia, Kazakhstan) and *C. incarnata* sp. n. (Kazakhstan, Uzbekistan). The following new synonymies are established: *C. albovittata* (Reuter) = *C. astragalii* (Linnavuori), *C. fuscomaculata* (Reuter) = *C. punctulata* (Nonnaizab & Yang). The interrelationships between *Camptotylidea* and the closely related genus *Taeniophorus* are discussed.

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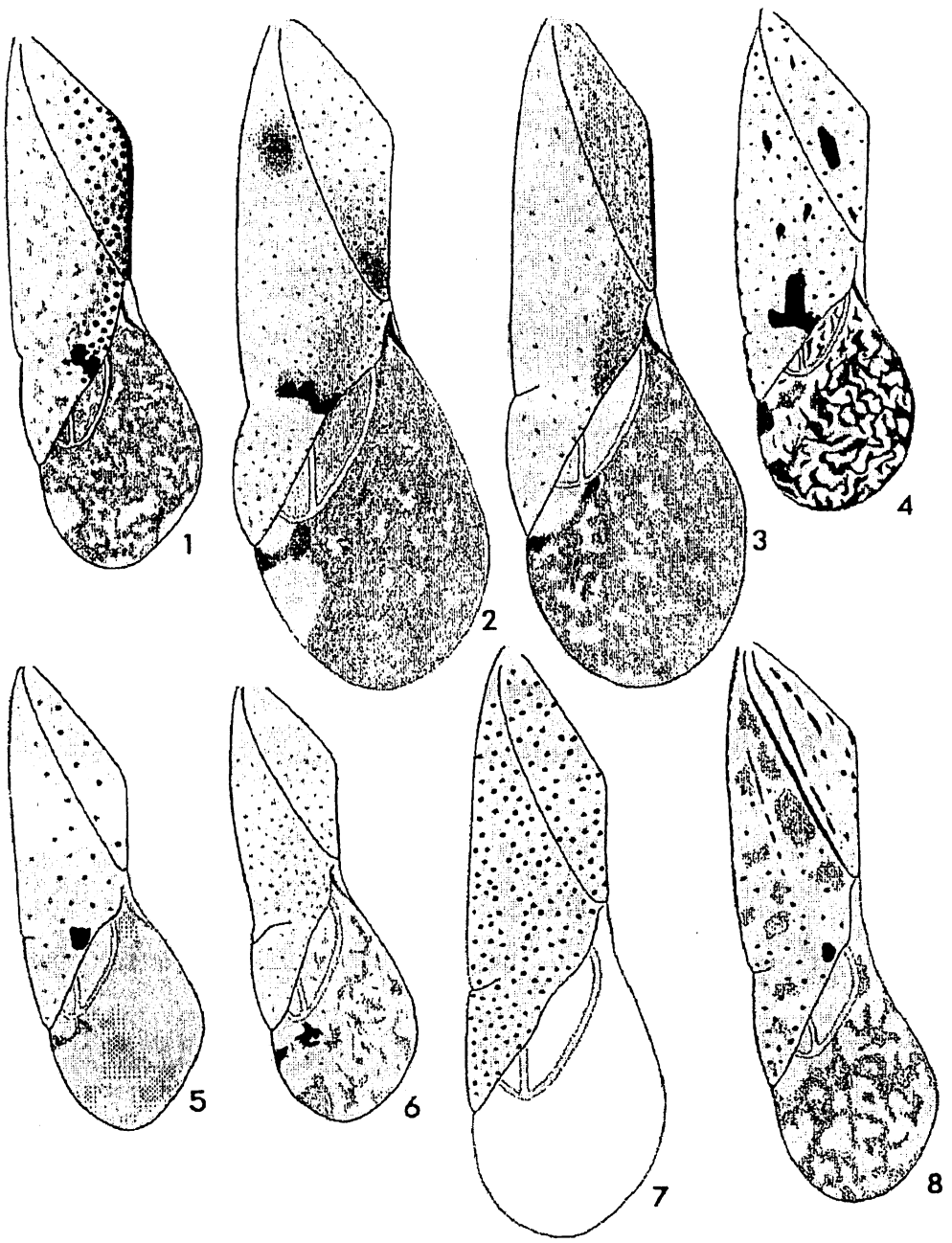
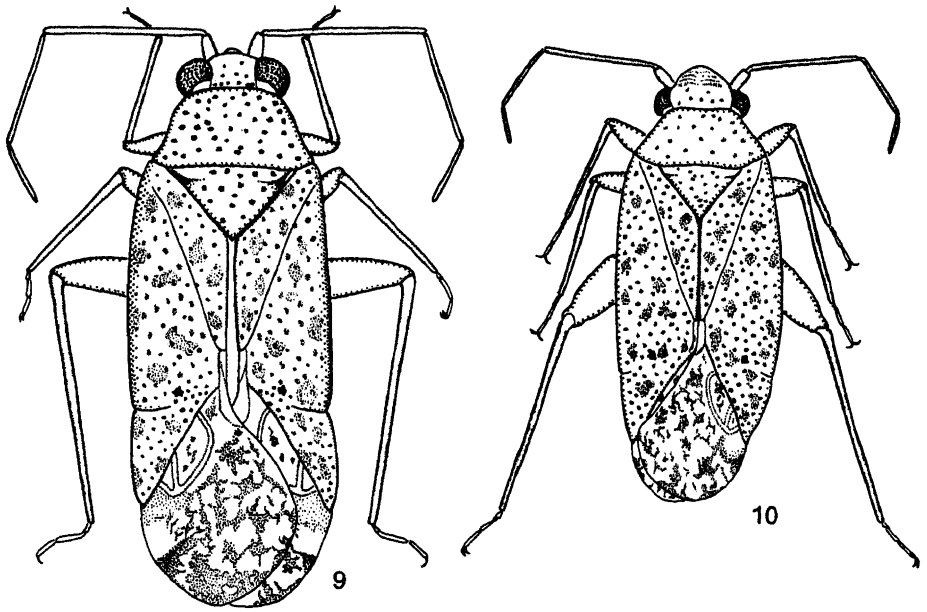
Introduction

The genus *Camptotylidea* has been recently revised (Linnavuori, 1990), but after the revision 2 new species were described by Linnavuori (1993, 1998), 4 species transferred to the genus from *Compsidolon* (Linnavuori, 1997, 1998) and *Atomophora* (Kerzhner, 1997) and 9 new species described in this paper. That is why it is useful to update the key to species of the genus. The identification of species in this genus is difficult due to high variability. Brief morphological descriptions with notes on distribution and host plants are given for each species. It was shown by Linnavuori (1990) that *Camptotylidea* together with the monotypical genus *Taeniophorus* and the genus *Atomophora* forms a group of closely related genera which was named by him *Atomophora* complex and characterized by small sizes, maculate pattern, tibiae with distinct dark dots and short and pale spines, simple and pale hair cover, short and broad head and prominent pulvilli. He correctly pointed out that *Taeniophorus* is an undoubted derivative of *Camptotylidea* having the following diagnostic features: (1) dark dots on upper surface usually absent; (2) head in lateral view longer than high; (3) hind tarsus short and incrassate; apex of second segment bluntly oblique; (4) pulvilli very broad, extending to near apex of claw.

My investigation shows that these characters cannot be used as diagnostic ones. In most examined specimens of *T. hyalinus*, the dark dots on fore wing are present and the colour pattern is similar to that of *C. albovittata*, while the dots on the upper surface of *C. astarte*, with a few exceptions, are completely absent. The head of *T. hyalinus* is comparatively long (Figs 27-29) in lateral view, but there is no strong hiatus in this character between *Taeniophorus* and *Camptotylidea* (Figs 23-26, 30-39). The structure of hind tarsus in both mentioned genera is rather similar. *Taeniophorus* possesses an advanced structure of claw and pulvilli (Figs 42, 43) as compared to the majority of *Camptotylidea* species (Figs 48-61), but among the last genus there are at least 2 species (*C. alba, C. albovittata*) with pulvilli of *Taeniophorus*-type (Figs 44-46) and several species, such as *C. suturalis* (Fig. 47), *C. ceratoides* (Fig. 62), *C. bipunctata* (Fig. 68) and *C. incarnata* (Fig. 63), having pulvilli of intermediate shape. *C. alba* and *C. albovittata* are probably closest relatives of *T. hyalinus* sharing with it a complex of common features, such as diurnal activity (Kerzhner, personal communication), colour pattern which (if present) consists only of regularly distributed rounded fuscous dots, without any spots, and association with various Fabaceae as host plants. However, all indicated features occur sometimes in other



Figs 1-8. *Camptotylidea*, fore wings: **1**, *C. suturalis*; **2**, *C. fuscomaculata*; **3**, *C. flavida*; **4**, *C. sinaitica*; **5**, *C. bipunctata*; **6**, *C. bucharica*; **7**, *C. alba*; **8**, *C. lineata*.



Figs 9-10. *Camptotylidea ceratoides*, general view: **9**, ♂; **10**, ♀.

Camptotylidea. Thus, the border between these two genera becomes rather indistinct and further investigation is needed to re-analyse the interrelationships of *Camptotylidea*, *Taeniophorus* and related genera.

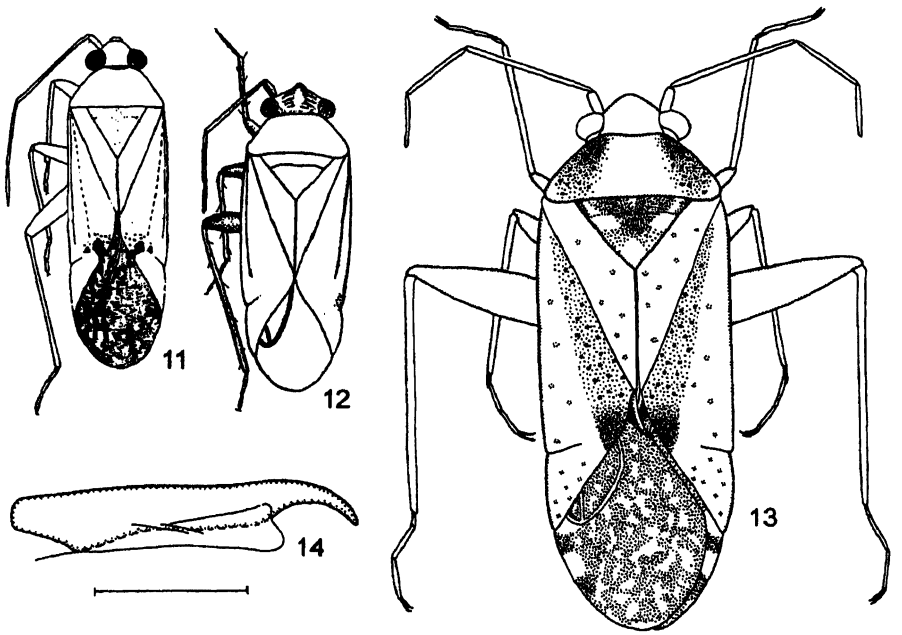
Most of the material used in this study, including type specimens of all new species, is kept in the collection of the Zoological Institute, St.Petersburg. All scale bars equal 0.05 mm.

Genus **Camptotylidea** Wagner, 1957

Type species *Camptotylidea persica* Wagner, 1957.

Description. Oblong-oval, small-sized bugs (2.5-4.2 mm). Body with simple, whitish, easily obliterated hairs. Head wider than high, with protruding frons and strongly prominent clypeus. Rostrum reaching or almost reaching hind coxae. Pronotum transverse, usually 2.0-2.5 times as wide as long, with indistinct calli. Wings well developed, only females of *C. obscurata* and *C. flavida* brachypterous. In *C. eremobia*, membrane slightly shortened, but always surpassing apex of cuneus. Tibial spines delicate, pale. Claw structure comparatively variable; generally, claws slender, with narrow base and narrow elongate pulvilli always extending beyond middle of claw or with rather broad base and broad elongate pulvilli extending to near apex of claw. Male genitalia of typical structure. Vesica S-shaped, rarely C-shaped, opening of secondary gonopore located near its apex and in species with thin vesica hardly visible.

Ground colour of upper surface greenish, yellowish or whitish, rarely (*C. ephedrae, C. obscurata*) in part brownish or brown. Under surface whitish, greenish or yellowish. Upper surface entirely or partly covered with fuscous brown, orangish or reddish dots, sometimes very faint or even completely absent (in *C. astarte*). Antennae pale, only first segment often with subapical ring or dot, entirely reddish in *C. rubropicta*. Second segment maculate in *C. lineata*. Pronotum sometimes with longitudinal bands or spots (*C. vitticollis, C. sinaitica, C. fuscomaculata*) or darkened lateral margins (*C. modesta, C. perirata*). Medioapical part of corium often with conspicuous darkened spot or irregularly shaped darkened area (except *C. alba, C. albovittata, C. astarte, C. pallescens, C. bucharica*). Dots in medioapical area of corium usually darker than elsewhere on hemelytra. Claval commisure or whole inner part of clavus and corium darkened in several species (*C. suturalis, C. flavida, C. kanduli, C. candida*). Membrane whitish, wholly transparent (*C. alba*) or with more or less developed colour pattern formed by fuscous or brown, irregular and frequently confluent spots. Femora pale (ex-



Figs 11-14. 11-13: *Camptotylidea*, general view: **11**, *C. flavescens*; **12**, *C. pallescens* (after Putshkov, 1976); **13**, *C. striata*, ♂; **14**, *C. striata*, claw, ♂.

cept *C. ephedrae*), sometimes with dark (*C. sinaitica, C. vitticollis, C. lineata, C. perirata, C. salsosa*) or reddish (*C. rubropicta*) markings. Tibiae pale, usually with fuscous or reddish dots.

Distribution and biology. Species of this genus inhabit deserts and semideserts of the Palaearctic Region. Most representatives are specialized feeders of Chenopodiaceae, some species feed on Fabaceae (*C. alba, C. albovittata* and *C. alhagii*), Boraginaceae (*C. lineata*), Asteraceae (*C. eremobia* and *C. flavida*), Ephedraceae (*C. ephedrae* and *C. candida*) and Polygonaceae (*C. rubropicta*). See Kaplin (1993) for detailed data on biology of the species from Turkmenistan.

Key to species

1(4). Pronotum and scutellum in males dark brown to black.

2(3). In males, small cell of membrane not darker than the larger cell, usually with brownish dots. Females brachypterous, membrane not reaching apex of cuneus. SE Kazakhstan, Mongolia. On *Anabasis* ..... **C. obscurata**

3(2). In males, small cell of membrane entirely brown, darker than the larger cell. Females macropterous. S Kazakhstan, Turkmenistan. On *Ephedra* ..... **C. ephedrae**

4(1). Upper body surface pale, rarely slightly fuscous.

5(6). Whole first antennal segment, clypeus and genae reddish. Upper and under surfaces of body covered with reddish dots and markings. Iran ... . **C. rubropicta**

6(5). First antennal segment pale, with subapical reddish or fuscous ring or without ring. Pronotum, scutellum and hemelytra usually with fuscous, brownish or orangish dots, spots and markings, rarely without colour pattern.

7(14). Upper body surface (hemelytra: Figs 6, 7) without spots, stripes and darkened areas, wholly or partly covered with fuscous concolourous dots, rarely without any colour pattern.

8(11). Pronotum and scutellum without dots.

9(10). Larger (3.0-3.4 mm). Ocular index in males 1.1-1.2. On *Haloxylon persicum* ..... **C. astarte**

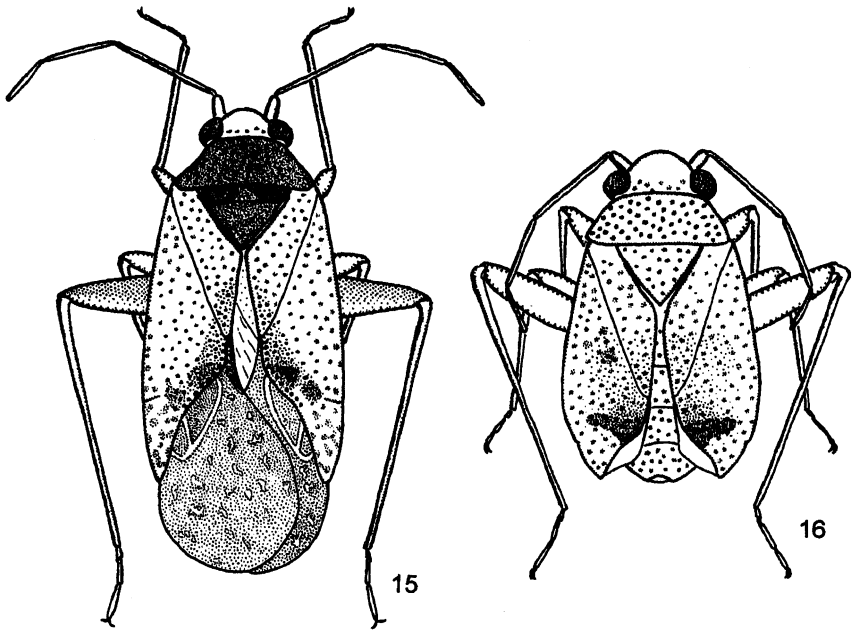
10(9). Smaller (2.5-2.8 mm). Ocular index in males 1.5-1.7. On *Salsola* sp. ..... **C. bucharica**

11(8). Pronotum and scutellum at least partly covered with fuscous dots.

12(13). Membrane with sometimes indistinct, but always visible pale fuscous colour pattern. Eyes in males smaller, ocular index 1.4-1.7. Body in males 3.6-4.0 times as long as width of pronotum .... **C. albovittata**

13(12). Membrane whitish, transparent, without any colour pattern. Eyes in males larger, ocular index 1.0-1.1. Body in males more robust, 3.0-3.1 times as long as width of pronotum ..... **C. alba**

14(7). Upper body surface in addition to dots with various spots, stripes or darkened inner parts of



Figs 15-16. *Camptotylidea obscurata*, general view: **15**, ♂; **16**, ♀.

hemelytra (Figs 1-5, 8, 19-22), at least with a single spot in medioapical area of corium, sometimes rather small, but always distinct, or if only with orange dots (*C. pallescens*), then the dots in medioapical area of corium are always darker.

15(18). Vesica very large and strongly sclerotized (Figs 106, 107), more than 0.5 mm.

16(17). Bright yellow, with orange tinge; basal part of pronotum covered with pale fuscous dots; clavus, corium and cuneus very densely covered with confluent orange dots. Medioapical area of corium with contrasting dark brown confluent dots. Iran, Saudi Arabia. On *Alhagi maurorum* ..... **C. alhagii**

17(16). Whitish or pale yellow (Fig. 19), covered with pale fuscous and pale orangish dots. Dots and spots in medioapical area of corium fuscous or pale brown. Kazakhstan, Uzbekistan ..... **C. incarnata**

18(15). Vesica 1.5-2 times smaller (less than 0.4 mm), of typical structure or very thin, with indistinct opening of secondary gonopore.

19(20). Entire endocorium, or with exception of its very base darkened, pale brownish (Fig. 13), with minute brown dots, while the rest of corium, entire clavus and cuneus uniformely pale, with faint orangish dotting ..... **C. striata**

20(19). Endocorium pale, usually with single medioapical spot or, if partly darkened, then clavus darkened as well, at least apically.

21(26). Inner margins of clavus and corium darkened, forming median fuscous stripe on hemelytra, sometimes (*C. kanduli*) almost whole hemelytra except very margins darkened. Dots along claval suture of hemelytra dark brown and those at lateral margins much paler.

22(23). Vesica well sclerotized, its structure typical of *Camptotylidea*. Medioapical area of corium with dark brown, irregularly shaped spot (Fig. 1). Pronotum without brown longitudinal stripes; scutellum without X-shaped figure. Median fuscous stripe on hemelytra not wider than scutellum. Widely distributed (from Tunisia to Mongolia and N China) ..... **C. suturalis**

23(22). Vesica very thin (Figs 96, 97, 99-101). Opening of secondary gonopore indistinct. Medioapical area of corium darkened, but without a spot (Figs 3, 20). Known only from Mongolia.

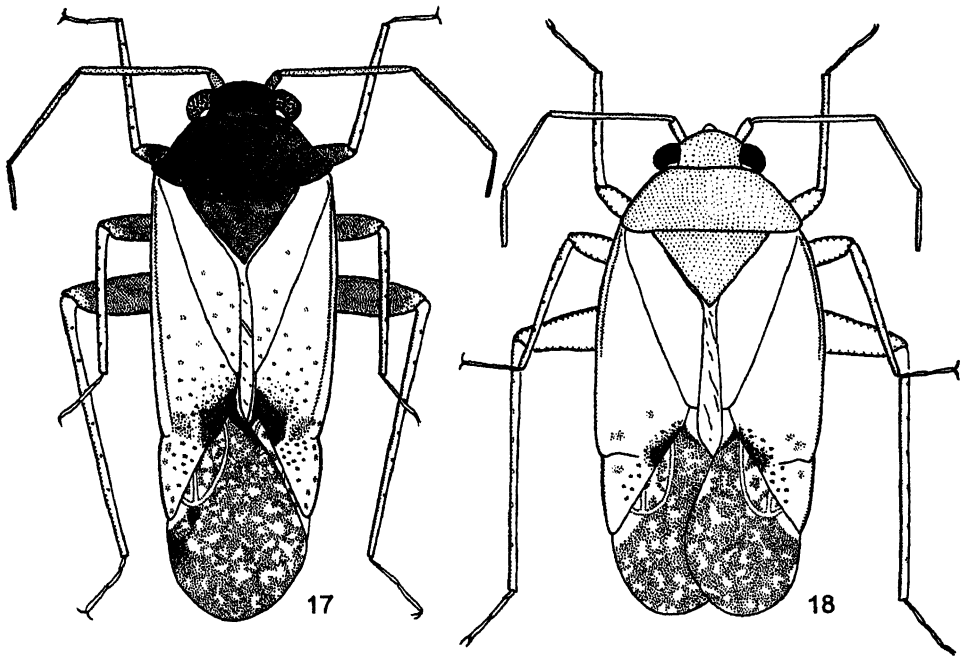
24(25). Larger, body length 3.5-4.3 mm. Pronotum with two brownish longitudinal stripes. Scutellum with X-shaped figure. Dark stripe on hemelytra occupies approximately 1/3 of their combined width ..... **C. flavida**

25(24). Smaller, body length 2.9-3.1 mm. Pronotum and scutellum without spots, covered only with fuscous dots. Dark stripe on hemelytra occupies approximately 2/3 of their combined width ..... **C. kanduli**

26(21). Hemelytra without median brownish stripe or (*C. candida*) with indistinct and hardly visible stripe. In the last case hemelytra with very few, minute and pale fuscous dots.

27(30). Upper body surface without spots, pronotum and hemelytra covered with rather pale dots.

28(29). Apical 2/3 of clavus and medioapical part of corium slightly darkened. Iraq. On *Ephedra* ..... **C. candida**



Figs 17-18. *Camptotylidea ephedrae*, general view: **17**, ♂; **18**, ♀.

29(28). Clavus and corium not darkened, yellowish or greenish, covered with orange or pink dots. Medioapical area of corium more densely covered with brownish dots. Uzbekistan, Turkmenistan. On *Haloxylon persicum* . . . . . **C. pallescens**

30(27). Hemelytra and sometimes pronotum with spots, at least a spot in medioapical area of corium always present.

31(34). Hind femora with distinct interrupted dark brown or black band (Figs. 40, 41) which consists of a large longitudinal spot near fore margin and smaller roundish spot near hind margin of femora.

32(33). Eyes in males larger, ocular index 1.1-1.3 . . . . . **C. vitticollis**

33(32). Eyes in males significantly smaller, ocular index 1.9-2.5 . . . . . **C. sinaitica**

34(31). Hind femora entirely pale or covered (sometimes significantly) with dark dots, but interrupted band near apex absent.

35(46). Medioapical area of corium with comparatively small (3-5 times as large as surrounding dots in diameter), bright, dark brown or black spot with distinct borders (as in Figs 8-10).

36(37). Second antennal segment with dark dots. Dots on clavus often fused forming longitudinal lines (Fig. 8) . . . . . **C. lineata**

37(36). Second antennal segment immaculate. Dots on clavus, if present, not fused with each other.

38(41). Clavus and corium in addition to dots and medioapical spot with very pale and irregularly shaped spots (Figs 9, 10). Pronotum and scutellum with dots and/or orange markings.

39(40). Paler. Spots on hemelytra pale orange, dots pale fuscous, rarely even yellowish. Females macropterous. Kazakhstan, Mongolia. On *Ceratoides papposa* . . . . . **C. ceratoides**

40(39). Darker. Spots on hemelytra of approximately the same colour with dots. Females brachypterous, membrane insignificantly surpassing apex of cuneus. On *Artemisia* . . . **C. eremobia**

41(38). Clavus and corium in addition to medioapical spot only with dots. Pronotum and scutellum uniformly pale, without any colour pattern.

42(43). Eyes in males large, ocular index 1.3-1.4. Dots on hemelytra became paler toward lateral margins . . . . . **C. bipunctata**

43(42). Eyes smaller. Clavus, corium and cuneus with distinct, rather densely distributed dots.

44(45). Body in males parallel-sided. Ocular index 1.6 . . . . . **C. persica**

45(44). Body robust, elongate-oval. Ocular index 1.9-2.0 . . . . . **C. bast**

46(35). Spot in medioapical area of corium larger, adjacent to inner margin of hemelytron, irregularly shaped and usually with indistinct borders.

47(52). Medioapical spot extends in transversal direction along the border between corium and clavus (Figs 21, 22).

48(49). Smaller (2.7-3.0 mm). Lateral parts of pronotum slightly darkened, pale brownish. Legs pale, without any spots or dots . . . . . **C. modesta**

49(48). Larger (2.9-3.5 mm). Lateral parts of pronotum significantly darkened, or with densely and irregularly distributed dots which make fusions, forming small spots and irregular stripes.

50(51). Lateral parts of pronotum brown, dots in this area dark brown. Dots in the middle part of pronotum significantly paler and sometimes absent. Apical part of hind femora darkened. Ocular index 1.9-2.5. . . . . **C. perirata**

51(50). Pronotum densely and irregularly covered with large dots. Femora and tibiae with large brownish dots. Ocular index 1.4 . . . . . **C. salsosa**

52(47). Medioapical spot insignificantly stretched out in transverse direction and subequal in length and width.

53(54). In addition to medioapical spot on corium, upper body surface with two longitudinal spots on pronotum, one spot on corium near base and usually one on clavus . . . . . **C. fuscomaculata**

54(53). Only medioapical spot on corium is present.

55(56). Eyes in males smaller, ocular index 1.8. Vesica of typical structure, with well developed opening of secondary gonopore (Fig. 75) . . . . . **C. fryne**

56(55). Eyes in males larger, ocular index 1.1-1.3. Vesica C-shaped (Fig. 84,) thin, with indistinct opening of secondary gonopore . . . . **C. flavescens**

Camptotylidea bipunctata (Reuter, 1901)
(Figs 5, 68)

Atomophora bipunctata Reuter, 1901: 179; *Camptotylidea bipunctata*: Linnavuori, 1990: 55.

Material examined: 4 ♂, 4 ♀ from Turkmenistan and Uzbekistan.

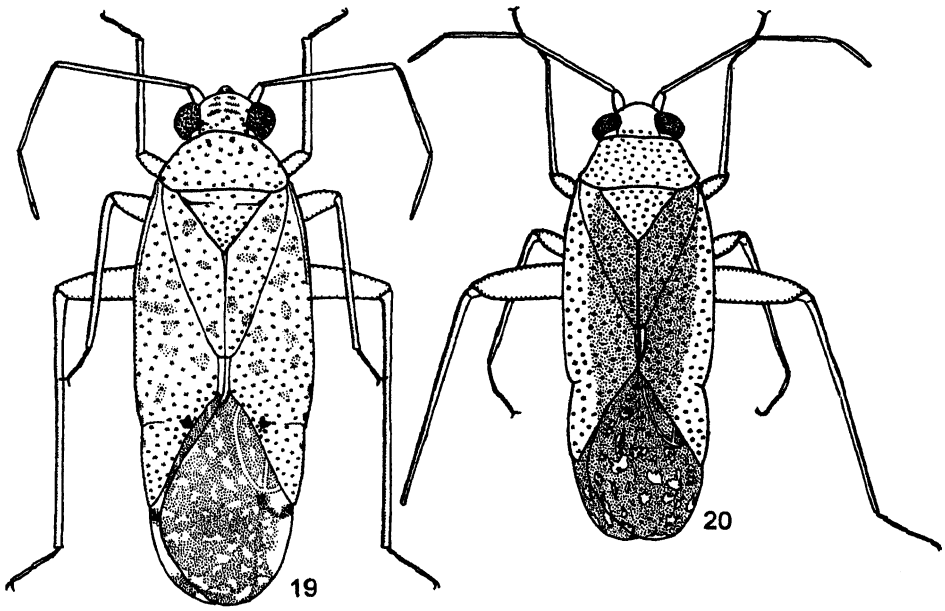
Description. Body yellowish or greenish. Head, antennae, pronotum and scutellum pale, without any spots or dots. Clavus, corium and scutellum with fuscous roundish dots. Usually these dots brighter and larger on clavus and median part of corium. Dots on lateral parts of corium and cuneus paler and smaller, almost absent (Fig. 5) in the palest specimens (1 ♀ from Repetek with nearly completely reduced dotting on hemelytra). Medioapical area of corium with compact, brown, roundish or slightly oblong spot (approximately 4 times as wide as dots on clavus in diameter). Membrane usually slightly embrowned, with pale areas near apex of corium and at middle of lateral margin separated from each other by two connected spots. Under surface pale. Femora pale; tibiae with minute, sometimes invisible fuscous dots. Claws as in Fig. 68. Ocular index 1.3-1.4 in males, 2.2-2.3 in females. Body length 2.5-2.6 mm in males, 2.7-3.0 mm in females.

Note. In addition to undoubted specimens of *C. bipunctata*, in the collection of Zoological Institute there are 6 specimens from Turkmenistan collected on *Kochia odontoptera* (Repetek, leg. Kaplin) and 1 ♂ from Uzbekistan (Kyzylkum desert, 5 km E Dzhangil'dy, leg. Danilovitsh). These specimens have smaller eyes in males (ocular index 1.7-2.0), longer legs, antennae (second antennal segment in males 1.7-1.9 times as long as width of head, 1.2-1.3 times as long as width of pronotum, while in *C. bipunctata* these ratios are 1.1-1.2 and 0.9 respectively) and rostrum significantly surpassing hind coxae. Clavus, corium and cuneus are more regularly and densely covered with dots (as in *C. bast*) which are elsewhere equal in diameter, shape and colour. In addition, several dots, sometimes indistinct, are present on pronotum. Thus, there are apparently two different species of *C. bipunctata*-group in Turkmenistan and Uzbekistan, but because of bad condition of most of the specimens mentioned and difficulties in distinguishing *C. bipunctata*, *C. bast* and *C. persica*, the series from *Kochia odontoptera* will not be described as a separate species in the present article.

Comparison. C. bipunctata, C. bast and *C. persica* form a group of species which are closely related and difficult to distinguish. These species (*C. bipunctata*-group), apart from small (3-4 times as wide as width of surrounding dots) distinct bright dark spot in medioapical area of corium, are characterized by the absence of dotting on pronotum and scutellum, more or less regular dotting on hemelytra, orange markings, and rather broad pulvilli (Figs 68, 69). Linnavuori (1990) in his revision wrote that *C. bipunctata* differs from two other species in the immaculate cuneus. Unfortunately, the syntype of this species is greatly damaged (Linnavuori, 1990), but it is clear from Reuter's description (1901) that the whole clavus, corium and cuneus (except very base) of *C. bipunctata* are covered with dots. In all examined specimens, dots on cuneus are present, but sometimes they are rather pale. There are some distinctions in the degree of development of eyes in males between these species (ocular index of *C. bipunctata* 1.3-1.4, while in *C. persica* 1.6 and in *C. bast* 1.9-2.0), dotting (see descriptions) and vesica structure.

Distribution. Turkmenistan, Uzbekistan, Iran (?) (Wagner, 1957).

Host plants. Horaninovia ulicina, Londesia eriantha, Kochia odontoptera (Kaplin, 1993), but records from the latter possibly refer to a separate species. Records from *Haloxylon aphyllum, H. persicum* and *Salsola kali* (Putshkov, 1975) are based on occasional findings or misidentifications of the host plant.



Figs. 19-20. *Camptotylidea*, general view: **19**, *C. incarnata*, ♂; **20**, *C. kanduli*, ♂.

Camptotylidea persica Wagner, 1957

Camptotylidea persica Wagner, 1957: 93-94.

Material examined: 1 specimen (paratype).

Description. Closer to the previous, but dots on cuneus distributed more densely than on corium and clavus. Central part of corium with a single faint pale orangish spot. Ocular index 1.6 (♂). Body length 2.5-3.0 mm.

Comparison. See *C. bipunctata.*

Distribution. Iran.

Host plant. Unknown.

Camptotylidea bast (Linnavuori, 1989) (Fig. 66)

Atomophora bast Linnavuori, 1989: 51-53; *Camptotylidea bast*: Linnavuori, 1990: 57.

Material examined: 2 specimens from Israel, including paratype.

Description. Closer to *C. bipunctata*, but dots comparatively smaller, more densely and regularly distributed. Central part of corium with two and apex of clavus with a single pale orange marking. Claws as in Fig. 66. Ocular index 1.9-2.0 in males, 2.2-2.4 in females. Body length 2.9-3.0 mm.

Comparison. See *C. bipunctata.*

Distribution. Israel.

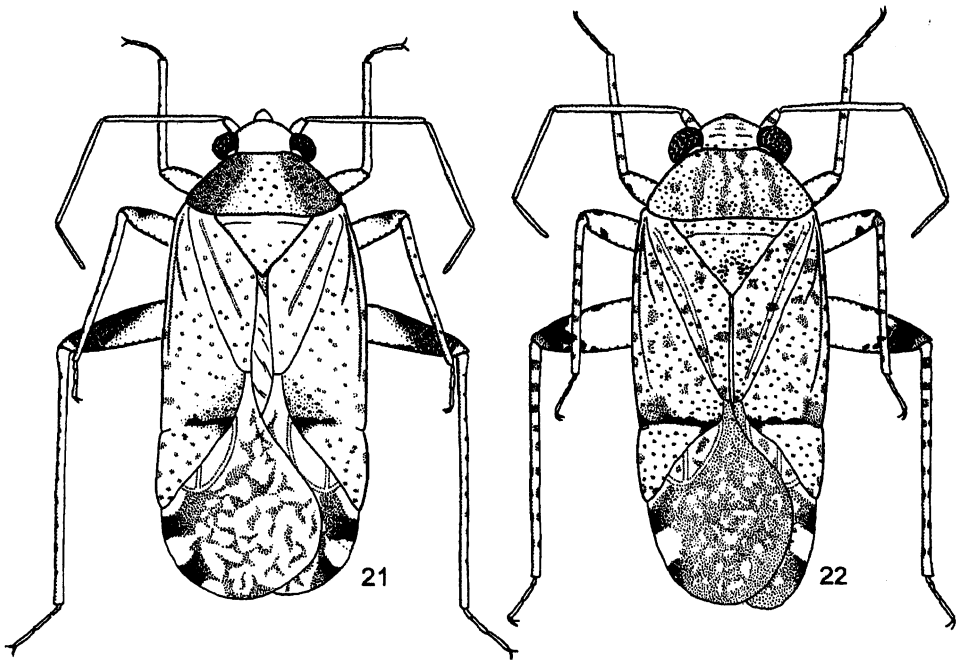
Host plant. Bassia muricata, Chenopodiaceae (Linnavuori, 1989).

Camptotylidea lineata (Reuter, 1901) (Figs 8, 50)

Atomophora lineata Reuter, 1901: 178; *Camptotylidea lineata*: Linnavuori, 1990: 58.

Material examined: 99 specimens from Uzbekistan and Turkmenistan.

Description. Body pale yellow or greenish. Antennae pale, first and second antennal segments with dark fuscous ring or spot near base, nearly whole second segment covered with minute dark fuscous dots, sometimes pale and hardly visible. Head with few minute dots. Pronotum and scutellum usually without any dots, but in some specimens pronotum with some pale dots near lateral margins. In the majority of specimens, a whitish narrow stripe extends along medial line of head pronotum and scutellum, pronotum of some specimens with two lateral whitish stripes aside from medial one. Clavus, corium and cuneus (Fig. 8) covered with fuscous dots often arranged in rows and fused on clavus into one or two longitudinal dark fuscous line. Claval suture dark fuscous or brown. Sometimes similar but always interrupted lines present also along *R+M* vein and medial fracture. Medioapical



Figs 21-22. *Camptotylidea*, general view: **21**, *C. perirata*, ♂; **22**, *C. salsosa*, ♂.

area of corium with compact, distinct, dark brown or black spot. In addition to dots, clavus and corium with pale fuscous irregularly shaped spots. Membrane whitish, with pale fuscous colour pattern. Under surface and hind margin of apical half of femora with dark fuscous dots slightly brighter and larger than those on hemelytra. Tibiae with numerous large and irregularly distributed dark fuscous dots. Claws as in Fig. 50. Ocular index 1.0-1.2 in males, 1.7-2.0 in females. Body length 2.7-3.2 mm in males, 2.7-2.8 mm in females.

Distribution. Kazakhstan (Popov, 1986 – Karatau Mts), Uzbekistan, Turkmenistan.

Host plant. From the end of April till the first part of May nymphs and adult specimens were found on the flowering at that time *Tournefortia sogdiana*. In June, when this plant dies off, the development is transferred to other sand-inhabiting representatives of Boraginaceae, especially *Heliotropium argurioides* and *H. turcomanica* (Putshkov, 1975).

Camptotylidea ceratoides sp. n.
(Figs 9, 10, 39, 62, 79, 80, 113, 119)

Holotype. ♂, **Kazakhstan**, *Dzhambul Prov.*, 65 km N of railway station Khantau, Karasay, 17.VI.1978 (Kerzhner).

Paratypes. **Kazakhstan**: *Dzhambul Prov.*: 3 ♂, 3 ♀, as holotype; *Mangyshlak Prov.*: 3 ♂, 1 ♀, 50 km NNW of Novy Uzen', 12.VI.1973 (Nartshuk); *Karaganda [now Dzhezkazgan] Prov.*: 1 ♀, near Dzhezkazgan, 6.VI.1961 (Emeljanov); *Taldy-Kurgan [now Alma-Ata] Prov.*: 2 ♀, Kushukzhal sands, 21.VI.1962 (Kerzhner); *Kzyl-Orda Prov.*: 2 ♂, 1 ♀, near Yany-Kurgan railway station, 30.V.1996 (Kerzhner). **Mongolia**: *Hovd Aimak*: 1 ♀, Bodonchin-Gol River, 12 km SW of Altai, 22.VII.1970 (Kerzhner); *Gobi-Altai Aimak*: 2 ♂, 45 ♀, Shargyn-Gobi, 40 km SW of Altai, 22-23.VIII.1967 (Kerzhner); *Bayan-Hongor Aimak*: 1 ♀, 35 km S of Bu-Tsagan, 10.VII.1970 (Kerzhner); 1 ♂, 70 km E of Herhero, 21.VIII.1967 (Kerzhner).

Description. Males (Fig. 9) gracile, females (Fig. 10) elongate-oval; hair covering rather poor. Antennae uniformly yellowish. Eyes fuscous-greenish or reddish. Head pale, without any spots except orangish dots on base of vertex. Pronotum and scutellum pale, with irregular minute orangish or pal fuscous dotting. Clavus, corium and cuneus whitish, covered with pale fuscous or even yellowish dots and usually with numerous faint orangish irregularly shaped fuscous spots. Medioapical area of corium with conspicuous, bright, nearly blackish spot 2-5 times as wide as diameter of surrounding dots. Membrane whitish, with fuscous brownish mottling. Under surface pale, sometimes with orangish dots on abdomen.

Females macropterous. Legs whitish, with very faint and minute fuscous dots or immaculate. Tarsus as in Fig. 113, claw as in Fig. 62. Vesica as in Figs 79, 80; left paramere as in Fig. 119.

In males, body 3.1-4.0 times as long as width of pronotum. Vertex 1.8-2.3 times as broad as eye. Second antennal segment 0.8 times as long as basal width of pronotum, 1.2-1.3 times as long as basal width of head. Pronotum 2.4-3.0 times as wide as long, 1.4-1.6 times as wide as head. Body length 3.0-3.9 mm.

In females, body 2.8-3.1 times as long as width of pronotum. Vertex 2.7-2.8 times as broad as eye. Ratio of antennal segments 15 : 52-55 : 29-31 : 20-25. Second segment 0.9-1.0 times as long as basal width of pronotum, 1.3-1.4 times as long as basal width of head. Pronotum 2.3-2.6 times as wide as long, 1.4-1.5 times as wide as head. Body length 2.5-3.1 mm.

Distribution. Kazakhstan, Mongolia.

Host plant. Ceratoides papposa (Chenopodiaceae).

Comparison. C. ceratoides, together with *C. eremobia*, is apparently related with the *C. bipunctata* group, but these two species differ in the presence of dotting on pronotum, details of vesica structure and peculiarities of hemelytra dotting. *C. ceratoides* resembles greatly *C. incarnata* in colour pattern but the last species has pale brownish and not so distinctly bordered medioapical spot and larger vesica. For the distinctions of *C. ceratoides* and *C. eremobia* see key.

Camptotylidea eremobia (Putshkov, 1977)

Compsidolon eremobium Putshkov, 1977: 460-461; *Camptotylidea eremobium*: Linnavuori, 1998: 28.

Material examined. 26 specimens, including 4 paratypes, from Kazakhstan, Turkmenistan and Iran.

Description. Whitish yellow. Head and especially vertex covered with reddish or fuscous dots. Antennae without any dots. Pronotum and scutellum irrorated with pale or dark fuscous (often reddish along apical margin of pronotum) dots. In specimens from Iran, dots on pronotum larger and distributed more densely than on hemelytra. Clavus, corium and cuneus regularly and densely covered with minute fuscous or brownish dots and, partly, with small irregularly shaped spots (2-4 times as large as surrounding dots in diameter) of the same colour or paler. Medioapical area of corium with comparatively small and usually roundish, distinct, dark brown or even black spot. Lateral margin of cuneus with pale orangish dots or without dots. Membrane in males with the common for the genus fuscous colour pattern, in females shortened, slightly surpassing apex of cuneus. Fore femora with sparse, minute fuscous dots or without dots; tibiae pale. Under body surface pale; in specimens from Iran, thorax slightly darkened. Vesica thin, with indistinct opening of secondary gonopore. Ocular index 1.1-1.5 in males, 2.0 in females. Body length 3.5-4.3 mm in males, 3.2 mm in females.

Distribution. Kazakhstan (new record: Shirykrabat ruins in NW Kyzylkum and Emel' River, 50 km SE of Makanchi), Turkmenistan, Iran (Khorasan).

Host plant. Artemisia santolina (Putshkov, 1977).

Camptotylidea alhagii (Linnavuori, 1986)

Atomophora alhagii Linnavuori, 1986: 155; *Camptotylidea alhagii*: Linnavuori, 1990: 58-59.

Material examined: 2 papatypes from Iraq and Saudi Arabia.

Description. Body brightly yellow. Antennae pale, dot near base of first antennal segment very pale or absent. Head sometimes with several orangish dots hardly visible on ground colour. Pronotum and scutellum orange, only median line and small markings whitish. Basal half of pronotum and usually apex of scutellum with minute pale fuscous dots. Clavus, corium and cuneus very densely irrorated with confluent orange dots. Medioapical area of corium with contrasting, large, dark brown, confluent dots sometimes forming comparatively large dark spot. Membrane with irregularly shaped, dark fuscous, confluent spots. Tibiae with minute reddish or pale fuscous dots. Ocular index 2.0 in males, 2.2-2.5 in females. Body length 3.3 mm in males, 2.9-3.1 mm in females.

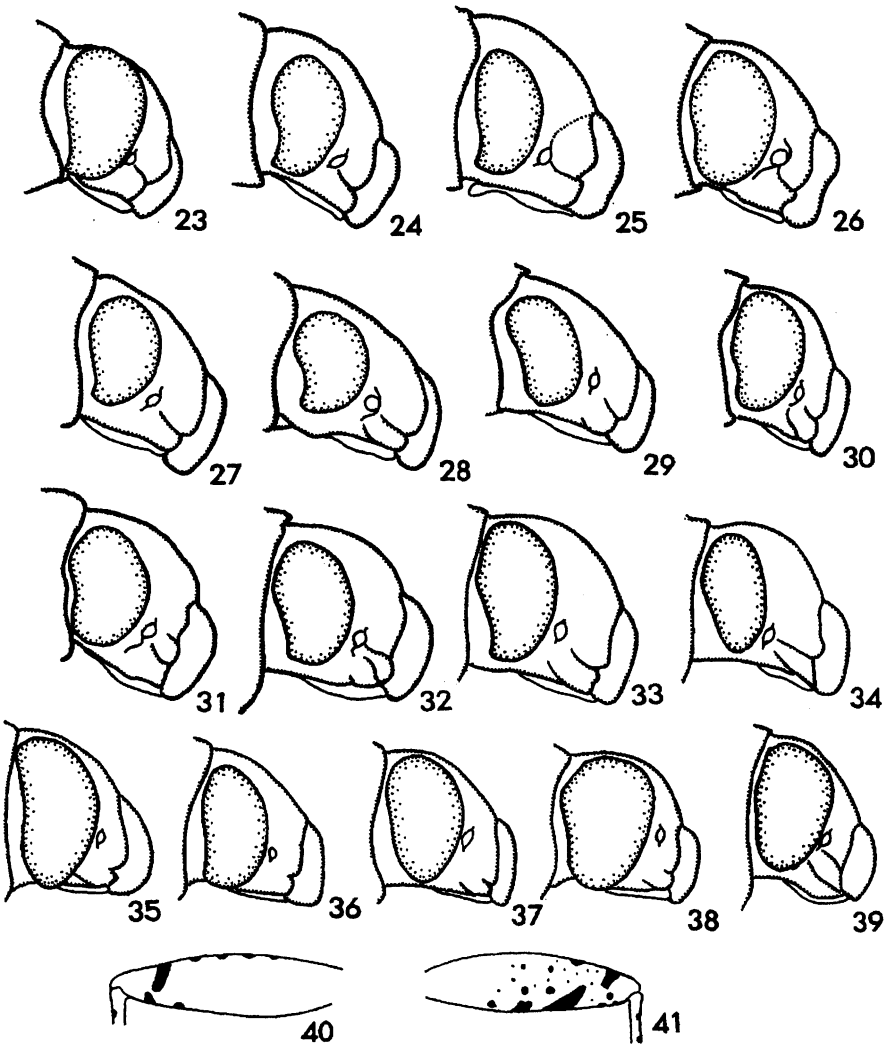
Comparison. See *C. incarnata*.

Distribution. Iraq, Saudi Arabia (Linnavuori, 1990).

Host plant. Alhagi maurorum (Fabaceae).

Camptotylidea incarnata sp. n.
(Figs 19, 38, 63, 106, 107, 114)

Holotype. ♂, **Kazakhstan**, *Chimkent Prov.*, Muyun-Kum sands, Kargaly-Kul Lake, 19.V.1910 (Kiritshenko).



Figs 23-41. 23-39, head in lateral view: **23**, *Camptotylidea alba*, ♂; **24**, *C. alba*, ♀; **25**, *C. albovittata*, ♀; **26**, *C. albovittata*, ♂; **27-28**, *Taeniophorus hyalinus*, ♀; **29**, *T. hyalinus*, ♂; **30**, *C. suturalis*, ♀; **31**, *C. vitticollis*, ♀; **32**, *C. astarte*, ♀; **33**, *C. kanduli*, ♂; **34**, *C. obscurata*, ♂; **35**, *C. salsosa*, ♂; **36**, *C. perirata*, ♂; **37**, *C. ephedrae*, ♂; **38**, *C. incarnata*, ♂; **39**, *C. ceratoides*, ♂; **40-41**, *C. vitticollis*, hind femora: **40**, upper surface; **41**, under surface.

Paratypes. **Kazakhstan**, *Chimkent Prov.*: 1 ♂, as holotype; 2 ♂, 40 km NW of Turkestan, Karatau mountain range, 29.V.1966 (Kerzhner); **Uzbekistan**: 1 ♂, 1 ♀, Kanimekh, NE of Bukhara, 19.V.1928 (Burachek).

Description. Body (Fig. 19) pale yellow. Head pale, with a series of reddish dots (often 6) at base of vertex and with usually confluent orange dots between eyes. Antennae pale; first antennal segment with few red dots near apex or without dots. Eyes brightly red. Pronotum and scutellum pale, covered with pale fuscous or orange dots. Orange dots mostly distributed at apical part of pronotum and sometimes at base of scutellum. Pale fuscous dots usually occupy scutellum and basal part of pronotum. Clavus and corium more regularly covered with faint pale fuscous dots and, in addition, with faint, irregularly shaped orange spots with indistinct borders. Medioapical area of corium with brownish dots and often with pale brownish spot which is 3-4 times as large as surrounding dots in diameter. Evidently, this

spot is composed by fusion of dots and basic colour of hemelytra is not darkened in this area. Membrane whitish, densely covered with irregularly shaped, frequently fused, brownish spots. Legs pale; under surface of hind legs with few small fuscous dots in apical part. Tibiae immaculate. Tarsus as in Fig. 114, claw as in Fig. 63. Under body surface pale, without dots or spots. Vesica (Figs 106, 107) very large (at least 1.5 times as large as in other species of *Camptotylidea*, except *C. alhagii*) and strongly sclerotized, with comparatively broad and short apical process and strongly curved base.

In males, body 3.6-3.8 times as long as width of pronotum. Ocular index 1.2-1.3. Second antennal segment 0.9-1.0 times as long as basal width of pronotum, 1.3-1.4 times as long as width of head. Pronotum 2.5 times as wide as long. Body length 3.3-3.6 mm.

In females, body 3.5 times as long as width of pronotum. Ocular index 2.0. Second antennal segment 0.9 times as long as basal width of pronotum, 1.4 times as long as width of head. Pronotum 2.4 times as wide as long. Body length 3.2 mm.

Comparison. The species is close to *C. flavescens*, these two species are hardly distinguishable by the external characters (colour pattern in *C. incarnata* is more bright, dots are more densely distributed and medioapical area often with pale brownish spot), but the vesica is extremely large (at least 3 times as large as in *C. flavescens*). *C. incarnata* has no distinctions in vesica structure from *C. alhagii*, but the bright orange colour pattern of the later allows separation of these species. See also *C. ceratoides*.

Distribution. Kazakhstan, Uzbekistan.

Host plant. 2 ♂ from Karatau were collected from *Halimodendron halodendron.*

Camptotylidea flavescens (Putshkov, 1976)
(Figs 11, 54, 55, 84)

Atomophora flavescens Putshkov, 1976: 654-656; *Camptotylidea flavescens*: Linnavuori, 1990: 56.

Material examined: 173 specimens, including 8 paratypes, from Uzbekistan, Turkmenistan and Mongolia.

Description. Body (Fig. 11) pale yellowish. Head without dots or with series of orange dots along basal margin. Antennae uniformly pale. Pronotum, scutellum, clavus, corium and cuneus with more or less regular, faint and minute, orange, rarely partly pale fuscous dotting. These dots, especially on corium and cuneus, confluent in some specimens. Medioapical area of corium with brown dots and one or two dark brown spots formed by fusion of dots. The palest specimens, only with dark spot and dotting in medioapical area of corium and hardly visible sparse dots on remainder of hemelytra. Membrane with dense colour pattern formed by numerous irregularly shaped and confluent dark brown spots. Femora and tibiae pale; apex of hind femora sometimes with several orangish dots. Claws as in Figs 54, 55. Vesica thin, C-shaped (Fig. 84). Ocular index 1.1-1.3 in males, 2.3-2.4 in females. Body length 3.1-3.7 mm in males, 2.6-3.0 mm in females.

Comparison. The species is close to *C. fryne* and *C. pallescens*, but differs from the first one in much larger eyes and thin C-shaped vesica. *C. pallescens* resembles greatly *C. flavescens* in the mentioned characters, but it is more robust (body 3.1-3.3 times as long as width of pronotum, vs 3.4-3.5 in *C. flavescens*), never has dark spot in medioapical area of corium and has shorter extremities (hind tibia 1.4-1.5 times as long as width of pronotum in *C. pallescens* and 1.7-2.0 times in *C. flavescens*).

Distribution: Uzbekistan (new record: several localities in Bukhara Prov.), Turkmenistan, Mongolia.

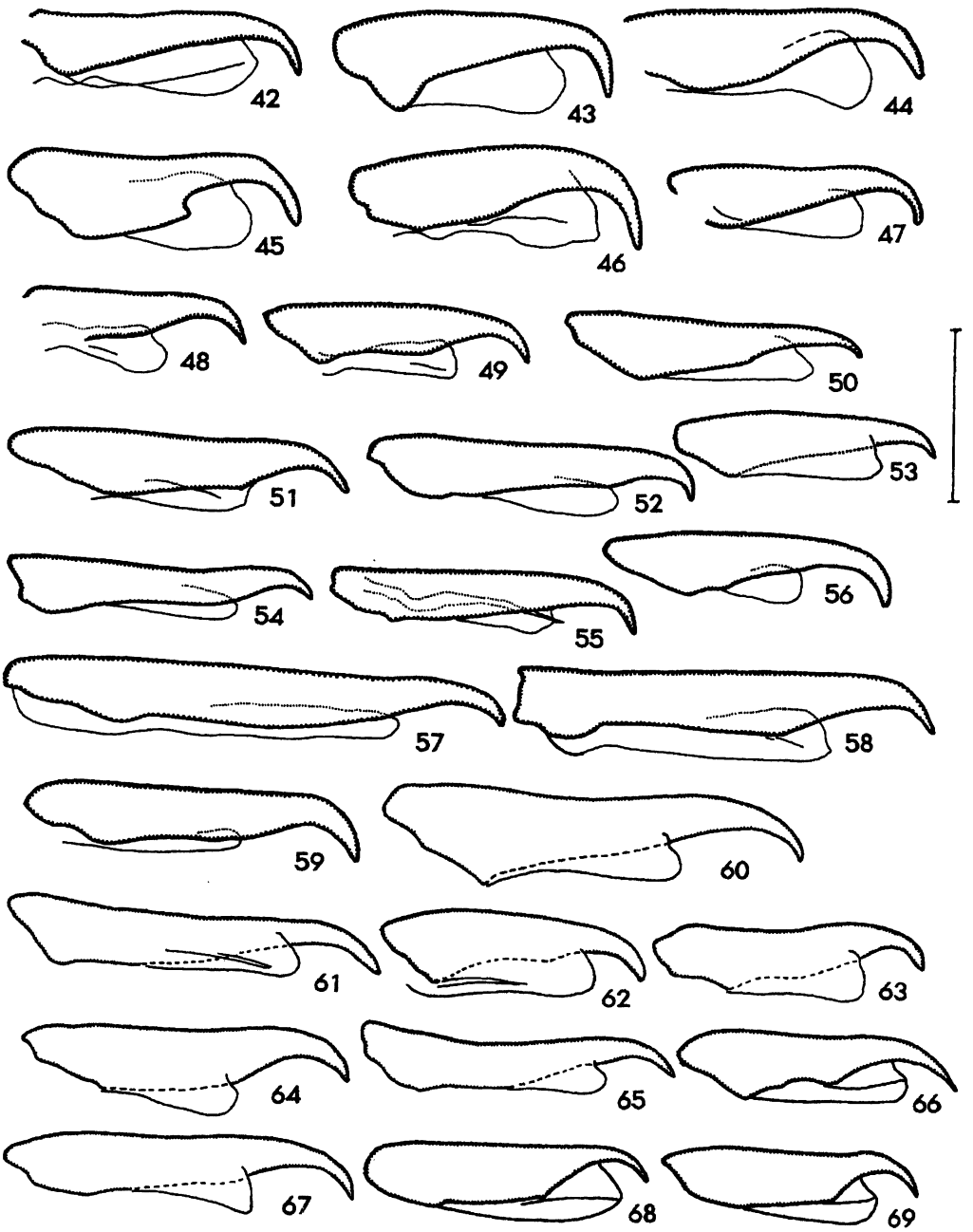
Host plant. Haloxylon aphyllum (Putshkov, 1976; Kaplin, 1993: from Repetek), *H. ammodendron* (Kaplin, 1993: from Transaltai Gobi).

Camptotylidea pallescens (Putshkov, 1976)
(Figs 12, 51, 52, 85)

Atomophora pallescens Putshkov, 1976: 653-654; *Camptotylidea pallescens*: Linnavuori, 1990: 60.

Material examined. 19 specimens from Turkmenistan, Uzbekistan and Kazakhstan, including 8 paratypes.

Description. Closer to previous, but paler and more robust (Fig. 12). Pronotum and scutellum with a few minute pale orange dots or without dots. Clavus, corium and cuneus with minute and very pale, sometimes confluent orange dots. Medioapical area of corium usually with pale fuscous dots, but without any spots. Claws as in Figs 51, 52. Vesica thin, C-shaped, as in Fig. 85. Ocular index 1.1-1.3 in males, 2.0-2.3 in females. Body length 2.8-3.2 mm in males, 2.9-3.2 mm in females.



Figs 42-69, claw structure: **42**, *Taeniophorus hyalinus*, ♂; **43**, *T. hyalinus*, ♀; **44**, *Camptotylidea albovittata*, ♀; **45**, *C. alba*, ♂; **46**, *C. alba*, ♀; **47**, *C. suturalis*, ♂; **48**, *C. vitticollis*, ♂; **49**, *C. vitticollis*, ♀; **50**, *C. lineata*, ♂; **51**, *C. pallescens*, ♀; **52**, *C. pallescens*, ♂; **53**, *C. bucharica*, ♂; **54**, *C. flavescens*, ♂; **55**, *C. flavescens*, ♀; **56**, *C. candida*, ♂; **57**, *C. fuscomaculata*, ♂; **58**, *C. fuscomaculata*, ♀; **59**, *C. astarte*, ♀; **60**, *C. obscurata*, ♂; **61**, *C. kanduli*, ♂; **62**, *C. ceratoides*, ♂; **63**, *C. incarnata*, ♂; **64**, *C. salsosa*, ♂; **65**, *C. ephedrae*, ♂; **66**, *C. bast*, ♂; **67**, *C. perirata*, ♂; **68**, *C. bipunctata*, ♂; **69**, "*C. bipunctata*" collected on *Kochia*.

Comparison. See *C. flavescens.*

Distribution. Kazakhstan (new record: Shirykrabat ruines in NW Kyzylkum), Uzbekistan (new record: several localities in Bukhara Prov.), Turkmenistan.

Host plant. Haloxylon persicum (Putshkov, 1976).

Camptotylidea fryne Linnavuori, 1993
(Fig. 75)

Camptotylidea fryne Linnavuori, 1993: 145-146.

Material examined: 1 ♂ (holotype).

Description. Body whitish ochraceous. Head with pale reddish markings on vertex near eyes. First antennal segment with pale reddish ring near apex. Lateral parts of pronotum covered with pale reddish dots especially well developed at lateral parts of calli. Scutellum, clavus and corium with few indistinct orangish dots. Medioapical area of corium slightly darkened, with fuscous dots. Membrane whitish, with distinct and very dense brownish colour pattern. Under surface pale, reddish stripe running laterally along thorax and abdomen. Legs pale, without spots or dots. Vesica as in Fig. 75. Ocular index 1.8 in male, 2.0 in female. Body length 3.5 mm in male, 3.3 mm in female.

Comparison. See *C. flavescens.*

Distribution. Algeria.

Host plant. Unknown.

Camptotylidea astarte (Linnavuori, 1971)
(Figs 32, 59, 78)

Atomophora astarte Linnavuori, 1971: 3; *Camptotylidea astarte*: Linnavuori, 1990: 60-61.
Taeniophorus grandoculus Linnavuori, 1984: 42 (syn. Linnavuori, 1990: 60).

Material examined. 26 specimens from Iraq, Saudi Arabia, Uzbekistan, Turkmenistan.

Description. Body pale yellowish. Head and antennae without any dots. Pronotum, scutellum, clavus, corium and cuneus without any spots or dots, rarely with very faint and hardly visible pale fuscous dots in medioapical area of corium. Membrane milky whitish, with indistinct, pale fuscous, confluent colour pattern. Legs pale, without any spots or dots. Claw as in Fig. 59. Vesica as in Fig. 78. Ocular index 1.1-1.2 in males, 2.0-2.3 in females. Body length 3.1-3.4 mm in males, 3.0-3.1 mm in females.

Note. In the collection of Zoological Institute there are two specimens from Uzbekistan, Bukhara Prov., ♂ and ♀, collected on *Salsola richteri.* These specimens are typical representatives of *C. astarte* judging by the sizes, body proportions and colour pattern, but the male has entirely different vesica structure (Figs 76, 77): it is much more robust and strongly sclerotized. Probably they represent a separate species.

Comparison. See *C. bucharica.*

Distribution. Israel, Saudi Arabia, Iraq (Linnavuori, 1990), Uzbekistan (new record: several localities in Bukhara Prov.), Turkmenistan (Repetek).

Host plant. Haloxylon persicum.

Camptotylidea bucharica sp. n.
(Figs 6, 53, 86, 115, 120)

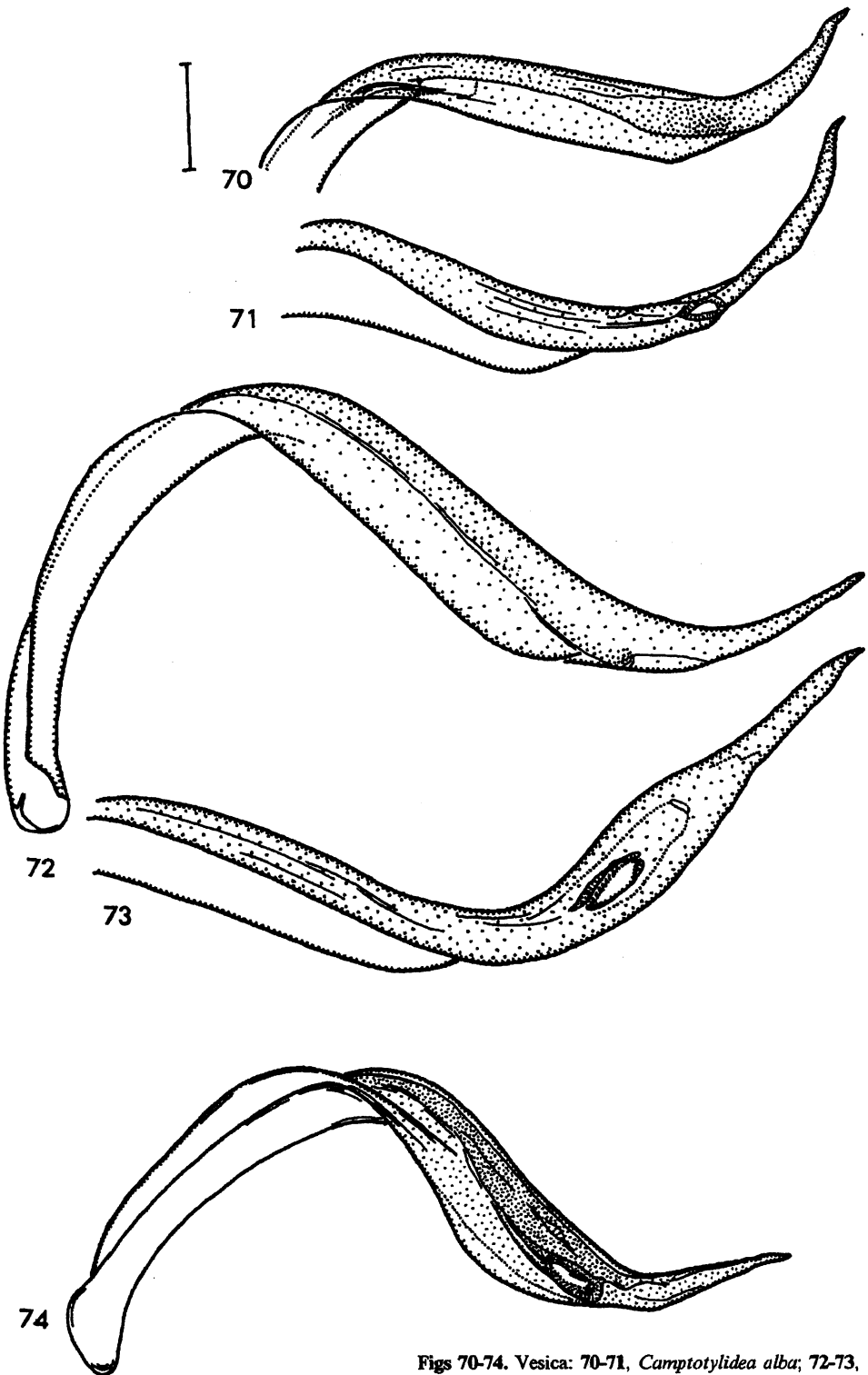
Holotype. ♂, **Uzbekistan**, *Bukhara Prov.*, 34 km SE of Ayakguzhumdy, 20.V.1965 (Kerzhner).

Paratypes. **Uzbekistan**, *Bukhara Prov.*: 4 ♂, 4 ♀, as holotype; 1 ♀, Gazli, 26.V.1965 (Emeljanov).

Description. Body greenish or slightly yellowish. Head, antennae, pronotum and scutellum uniformly pale, without any spots or dots, rarely apical part of scutellum covered with very faint pale fuscous dots. Colour pattern on hemelytra (Fig. 6), when present, represented by regular and extremely faint pale fuscous dotting, became practically invisible at base of wing. In the palest specimens, dotting reduced almost completely, except extremely pale and hardly visible dots on apical part of corium and sometimes also on apex of clavus and base of cuneus. Membrane whitish, with pale fuscous, irregularly shaped, confluent spots. Among them, spot behind cells and sometimes spot behind apex of cuneus darker than other ones, sometimes they are connected. Legs immaculate; hind femora robust. Hind tarsus as in Fig. 115, claw as in Fig. 53. Under surface uniformly pale. Vesica (Fig. 86) rather thin, with indistinct secondary gonopore opening. Left paramere as in Fig. 120.

In males, body 2.9-3.2 times as long as width of pronotum. Ocular index 1.5-1.7. Second antennal segment 0.8-1.0 times as long as basal width of pronotum, 1.0-1.3 times as long as width of head. Hind tibia 1.7-1.6 times as long as width of pronotum. Body length 2.5-2.8 mm.

In females, body 2.9-3.0 times as long as width of pronotum. Ocular index 2.1-2.4. Second antennal segment 0.8 times as long as basal width of pronotum, as long as width of head. Hind tibia 1.7 times as long as width of pronotum. Body length 2.5-2.8 mm.



Figs 70-74. Vesica: **70-71**, *Camptotylidea alba*; **72-73**, *C. albovittata*; **74**, *Taeniophorus hyalinus*.

Comparison. It is clear from peculiarities of the colour pattern, the claw and vesica structure, that *C. bucharica* is closely related with *C. astarte*, but *C. bucharica* is more robust, while its eyes and body length are significantly smaller. Also the host plants are different: *C. astarte* feeds on *Haloxylon persicum*, and *C. bucharica* on *Salsola* spp.

Distribution. Uzbekistan.

Host plant. Salsola rigida (Chenopodiaceae), 1 specimen from Gazli was collected from *S. arbuscula.*

Camptotylidea alba (Reuter, 1879)
(Figs 7, 23, 24, 45, 46, 70, 71)

Atomophora alba Reuter, 1879: 290; *Camptotylidea alba*: Linnavuori, 1990: 54.

Material examined: 289 specimens from Kazakhstan, Turkmenistan and Uzbekistan.

Description. Body pale greenish, in dry specimens often pale yellowish. Head pale, with several orangish dots on vertex in some specimens. Antennae pale, first segment uniformly pale or with few pale fuscous dots near apex. Pronotum pale, its basal half or two thirds and apex of scutellum covered with fuscous dots. Clavus, corium and cuneus with regular fuscous dotting (Fig. 7), dots on hemelytra usually larger than those on pronotum. Corium in majority of specimens with oblique narrow area without dots extending along medial fracture. Membrane whitish, transparent, without any spots. Femora in many and tibiae in all examined specimens with few minute pale fuscous dots. Claws as in Figs 45, 46. Vesica as in Figs 70, 71. Ocular index 1.0-1.1 in males, 1.6-2.0 in females. Body length 3.0-3.4 mm.

Distribution. South Kazakhstan, Turkmenistan, Uzbekistan. The record from Kirgizstan (Putshkov, 1975) is based on misinterpretation of the geographic position of the locality (Taldy-Kurgan is actually in Kazakhstan).

Host plants. Ammodendron conollyi, A. careli, and probably other species of this genus (Putshkov, 1975).

Camptotylidea albovittata (Reuter, 1904)
(Figs 25, 26, 44, 72, 73)

Atomophora albovittata Reuter, 1904: 14; *Camptotylidea albovittata*: Linnavuori, 1990: 55.

Atomophora astragalii Linnavuori, 1986: 155-156, **syn. n.**; *Camptotylidea astragalii*: Linnavuori, 1990: 55.

Material examined: 113 specimens including 3 paralectotypes (1 ♂, 2 ♀, Ashabad, Ahnger) and 4 paratypes of *C. astragalii.*

Description. Body pale yellow. Base of vertex usually with 3-4 minute and very pale orange dots. Basal part of pronotum and apex of scutellum covered with fuscous dots (dots on pronotum poorly developed in some specimens). Pronotum and scutellum usually with a narrow median pale whitish stripe. Clavus, corium and cuneus regularly covered with fuscous dots larger in diameter than those on pronotum and scutellum. Narrow oblique area extending along medial fracture without dots. Membrane whitish, with pale fuscous mottling and without any condensations. Femora and tibia ornamented with few minute fuscous dots. Claw as in Fig. 46. Under body surface pale. Vesica as in Figs 74, 75. Ocular index 1.5-1.7 in males, 2.1-2.4 in females. Body length: 3.3-4.1 mm in males, 3.3-3.5 mm in females.

Note. Judging by the peculiarities of colour pattern, measurements, data on host plants and vesica structure *C. astragalii* (Linnavuori, 1986) is conspecific with *C. albovittata* Reut. It was noted by Linnavuori (1986, 1990) that in *C. albovittata* body is comparatively thinner and longer (more than 4 mm) and there are some small distinctions in ocular index and length of second antennal segment. Our observations show that, really, specimens of *C. astragalii* are smaller on average but there is no hiatus in all mentioned characters between them and specimens of *C. albovittata.*

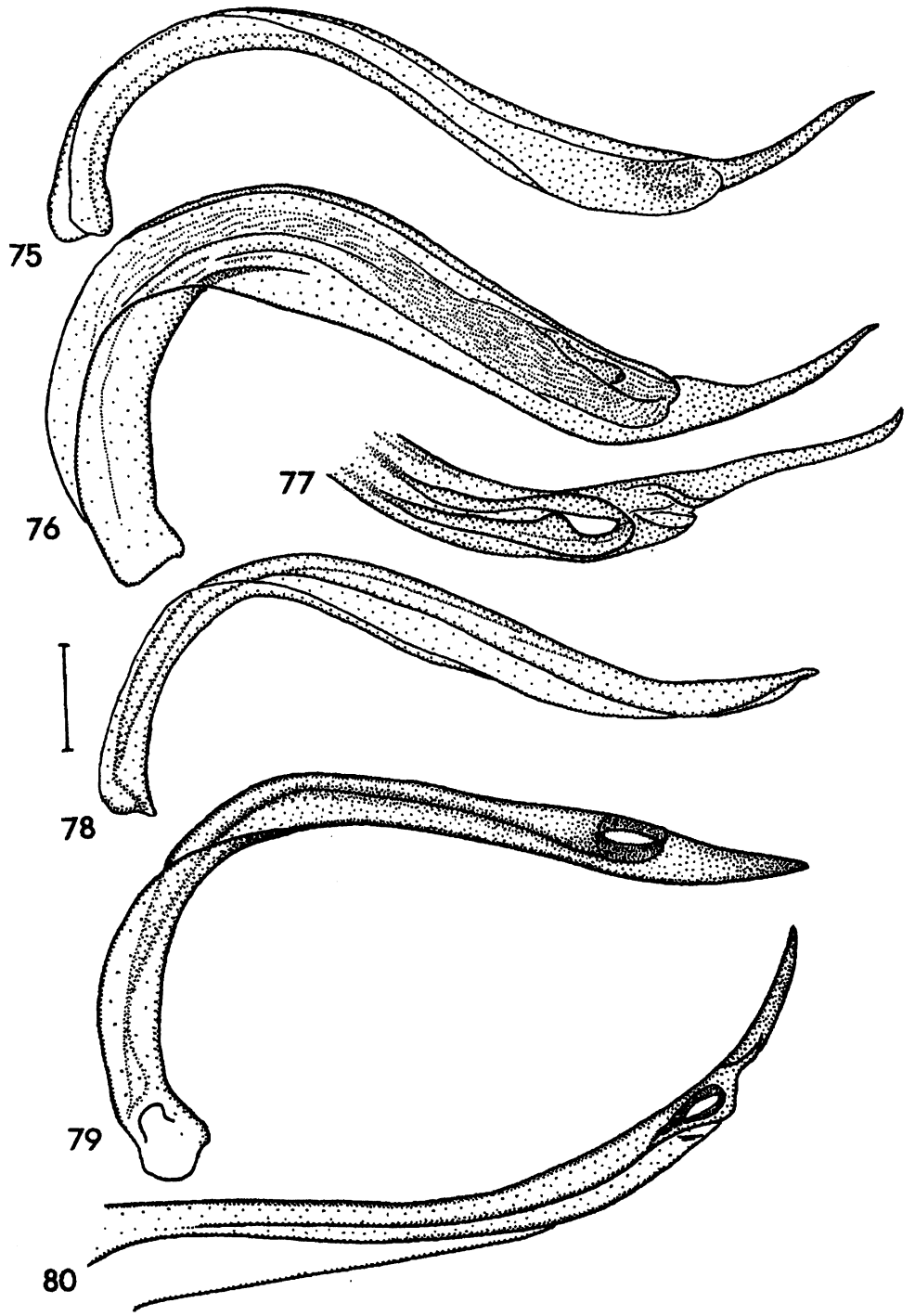
Distribution. Kazakhstan (new record: Sarytau-kum Sands on Ili River), Turkmenistan, Uzbekistan, Saudi Arabia (*C. astragalii*).

Host plants. Astragalus transcaspius, A. ammodendron, A. chivensis, A. nigriscens and other related species of Asiatic flora, rarely on *Smirnovia turkestanica* (Putshkov, 1975). *C. astragalii* was recorded from *A. spinosus* (Linnavuori, 1986).

Camptotylidea obscurata sp. n.
(Figs 15, 16, 34, 60, 87-92)

Holotype. ♂, **Kazakhstan**, *Dzhezkazgan Prov.*, 35 km E of Balkhash town, 22.VI.1978 (Kerzhner).

Paratypes. **Kazakhstan**: *Dzhezkazgan Prov.*: 6 ♂, 5 ♀, as holotype; *Dzhambul Prov.*: 4 ♂, 10 ♀, near western shore of Balkhash Lake, 15 km S of Mynaral, 19.VI.1978 (Kerzhner); 1 ♀, same locality and date (Nartshuk). **Mongolia**: *Gobi-Altai Aimak*: 1 ♂, 20 km WNW of Bidzh-Altai, 21.VII.1970 (Kozlov); 1 ♂, Shargyn-Gobi, 8 km E of Bayan, 17.VI.1980



Figs 75-80. Vesica: **75**, *Camptotylidea fryne*; **76-77**, *"C. astarte"* collected on *Salsola richteri*; **78**, *C. astarte*; **79-80**, *C. ceratoides*.

(Kerzhner); *Bayan-Hongor Aimak:* 1 ♂, Hatan-Sudlyn-Ula, 45 km E of Bayan-Leg, 7.9.1970 (Kerzhner); 1 ♂, Tsagan-Bogdo-Ula mount., 1500 m, 14.VIII.1969 (Zaitzev); *South Gobi Aimak*: 1 ♂, Dzemgin Gobi, 25 km SSW of Hailastyn-Huduk, 20.VI.1971 (Emeljanov & Kozlov); 1 ♂, Hara-Obo mount., 20 km EES of Bayan-Obo, 8.VIII.1971 (Kerzhner); 2 ♂, Bain-Dzag, 30 NNE Bulgan, 26-28.VII.1967 (Kerzhner); 2 ♂, 45 km SSE of Dalan-Dzadzagad, 10.VIII.1967 (Emeljanov); 6 ♂, Bordzon-Gobi, 80 km SSE of Nomgon, 5-8.VIII.1967 (Kerzhner).

Description. Body parallel-sided in males (Fig. 15), robust in females (Fig. 16), covered with light silver hairs. Antennae uniformly pale. Head pale yellow, or slightly darker, with darkened frontal lateral arcs in darkest specimens; vertex with fuscous or reddish dots. Eyes with brown-reddish facets. In male, pronotum and scutellum from dark brown to completely black, covered with dark fuscous regular dotting in pale specimens. In female, pronotum and scutellum yellowish or pale fuscous, with regular dotting; dots on apical part of pronotum usually pale reddish and fuscous on basal part of pronotum and scutellum. Hemelytra whitish or pale yellowish. In male, clavus and corium with rather faint pale fuscous dotting almost obsolete at base of wing. Lateral margin of corium and cuneus often with orangish dots. In female, clavus, corium and cuneus densely and regularly ornamented with fuscous orangish dotting. Medioapical area of corium in both sexes with irregularly shaped largish dark fuscous spot and dark dotting around it. In the palest examined male, this spot reduced strongly, but ground shade and dots in medioapical area slightly darkened. Membrane whitish, with abundant pale brownish mottling; small cell not darker than the larger cell. In male, ventral side of thorax darkened, in female under surface pale. Legs yellowish, immaculate. Tarsus as in Fig. 89. Claws as in Fig. 60. Females brachypterous, membrane greatly shortened, not reaching apex of cuneus. Vesica (Figs 87, 88) thin. Parameres as in Figs 90-92.

In males, body 3.3-3.9 times as long as width of pronotum. Vertex 1.8-2.3 times as wide as eye. Ratio of antennal segments 15-26: 60-78 : 35-45 : 25-32. Second segment 0.9-1.25 times as long as basal width of pronotum, 1.2-1.4 times as long as width of head. Pronotum 2.6-2.8 times as wide as long, 1.3-1.5 times as wide as head. Body length 3.4-4.1 mm.

In females, body 2.5-3.0 times as long as width of pronotum. Vertex 2.6-2.7 times as wide as eye. Ratio of antennal segments 14-16: 53-56 : 30-33 : 24-29. Second segment 0.8-0.9 times as long as basal width of pronotum, 1.1 times as long as width of head. Pronotum 2.5-2.7 times as wide as long, 1.2-1.3 times as wide as head. Body length 2.2-2.6 mm.

Comparison. This species can be easily distinguished by the darkened pronotum and brachypterous females, both features which are strictly atypical of other representatives of the genus (only *C. flavida* has brachypterous females, but with entirely different colour pattern on hemelytra, and *C. ephedrae* has a dark pronotum, but differs in the colour pattern of membrane).

Distribution. Kazakhstan, Mongolia.

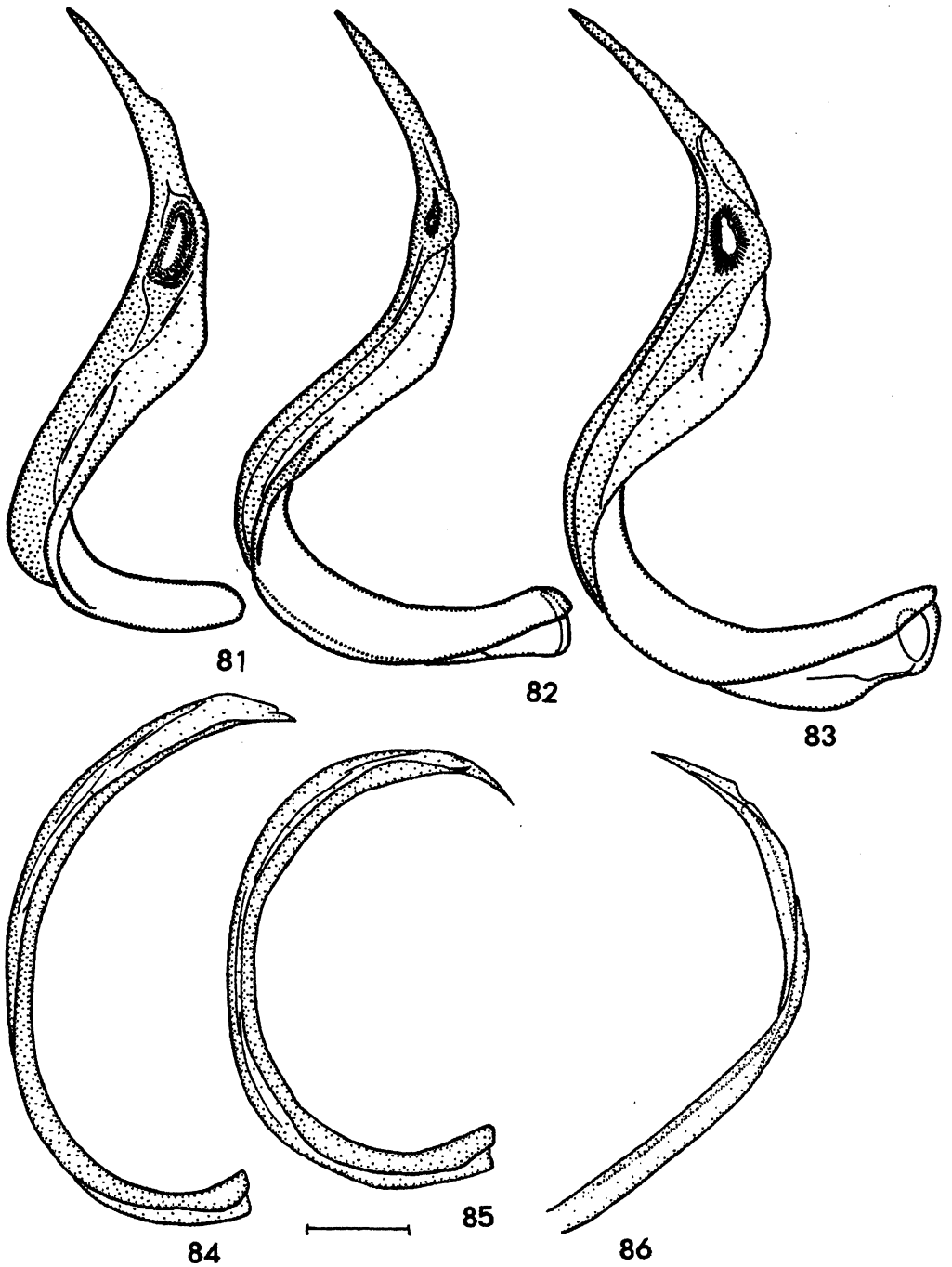
Host plant. Anabasis brevifolia (Mongolia), *A. salsa* (Kazakhstan).

Camptotylidea ephedrae sp. n.
(Figs 17, 18, 37, 65, 108, 118, 121)

Holotype. ♂, **Kazakhstan**, *Dzhezkazgan Prov.*, 10 km N of Kense, 28.V.1962 (Kerzhner).

Paratypes. 10 ♂ and 1 ♀, as holotype; **Turkmenistan**: 2 ♂, Repetek, 5-6.V.1978 (Danilovitsh); 1 ♂, Repetek, 6.V.1909 (A. Hohlbeck).

Description. Male. Body gracile (Fig. 17), darkened, from dark brown to almost black. Head in Kazakhstan specimens dark brown, often with a small, roundish, lightened area on vertex and slightly reddish inner margin of genae, in specimens from Repetek dirty yellow with brown markings. Eyes dark reddish. Antennae pale, often slightly darkened. First antennal segment with faint brownish subapical ring. Pronotum and scutellum in Kazakhstan specimens uniformly dark brown, in Repetek specimens brown with indistinct darker dots. Clavus and corium pale yellowish, almost whitish at base, densely covered with minute dots. Brightness of dots on clavus, corium and cuneus vary greatly, generally dotting distinct and fuscous near claval commissure and especially in medioapical area, becomes paler in lateral and basal direction. Dots near costal fracture absent or, if present, pale orangish. Medioapical area of corium with more or less darkened ground shade in form of irregular largish brown-fuscous spot. Area of cuneus adjacent to this spot with dark dotting; the remainder of cuneus covered with small orangish dots, rarely immaculate. Membrane densely covered with irregularly



Figs 81-86. Vesica: **81-82**, *C. salsosa*; **83**, *C. perirata*; **84**, *C. flavescens*; **85**, *C. pallescens*; **86**, *C bucharica*.

shaped, frequently confluent fuscous spots becoming darker behind transparent spot near apex of cuneus. Small cell of membrane entirely brownish, darker than the larger cell. Inner basal margin of membrane with oblique brown spot. Femora more or less darkened, upper surface of hind femora darkened except very apices; in Repetek specimens femora indistinctly darkened. Fore and middle tibiae usually slightly darkened; hind tibiae pale yellowish, covered with very small, sometimes hardly visible orange dots. Tarsus as in Fig. 118, claw as in Fig. 65. Underbody surface brownish or (in Repetek specimens) pale brownish, in several specimens with indistinct red lateral stripe. Vesica as in Fig. 108; left paramere as in Fig. 121.

Female. Body stumpy (Fig. 18), pale. Head pale, dirty yellow, with indistinct reddish markings near eyes and at median line of frons. Eyes reddish brown. Antennae pale; first antennal segment with pale fuscous subapical ring. Pronotum dirty yellow, partly with dirty reddish and dirty greenish shades, partly pale brown with a series of hardly visible fuscous dots along basal margin. Scutellum of the same colour, slightly darkened at middle, its base covered with dots as in pronotum. Clavus and corium whitish with hardly visible pale orangish dots. Medioapical area of corium with largish dark fuscous spot having indistinct borders. Adjoining to it part of cuneus covered with dark dotting. Membrane normally developed. Under body surface reddish fuscous, with greenish markings.

In males, body 2.9-3.2 times as long as width of pronotum. Ocular index 1.8-2.0. Second antennal segment 0.7-0.8 times as long as basal width of pronotum, 1.2 times as long as width of head. Pronotum 2.3-2.6 times as wide as long. Body length 3.5 mm.

In female, body 3.0 times as long as width of pronotum. Ocular index 2.3. Second antennal segment 0.7 times as long as basal width of pronotum, 1.1 times as long as width of head. Pronotum 2.4 times as wide as long. Body length 3.3 mm.

Comparison. The species is closely related to the previous one, but the males differ in the coloration of the membrane and Kazakhstan males differ easily in the dark brown head. Females of *C. ephedrae* could be distinguished by brownish shade of pronotum. All the other species of the genus are paler, whitish or yellowish.

Distribution. Kazakhstan, Turkmenistan.

Host plant. Ephedra ?distachya (Ephedraceae) in Kazakhstan, *E. strobilacea* in Turkmenistan.

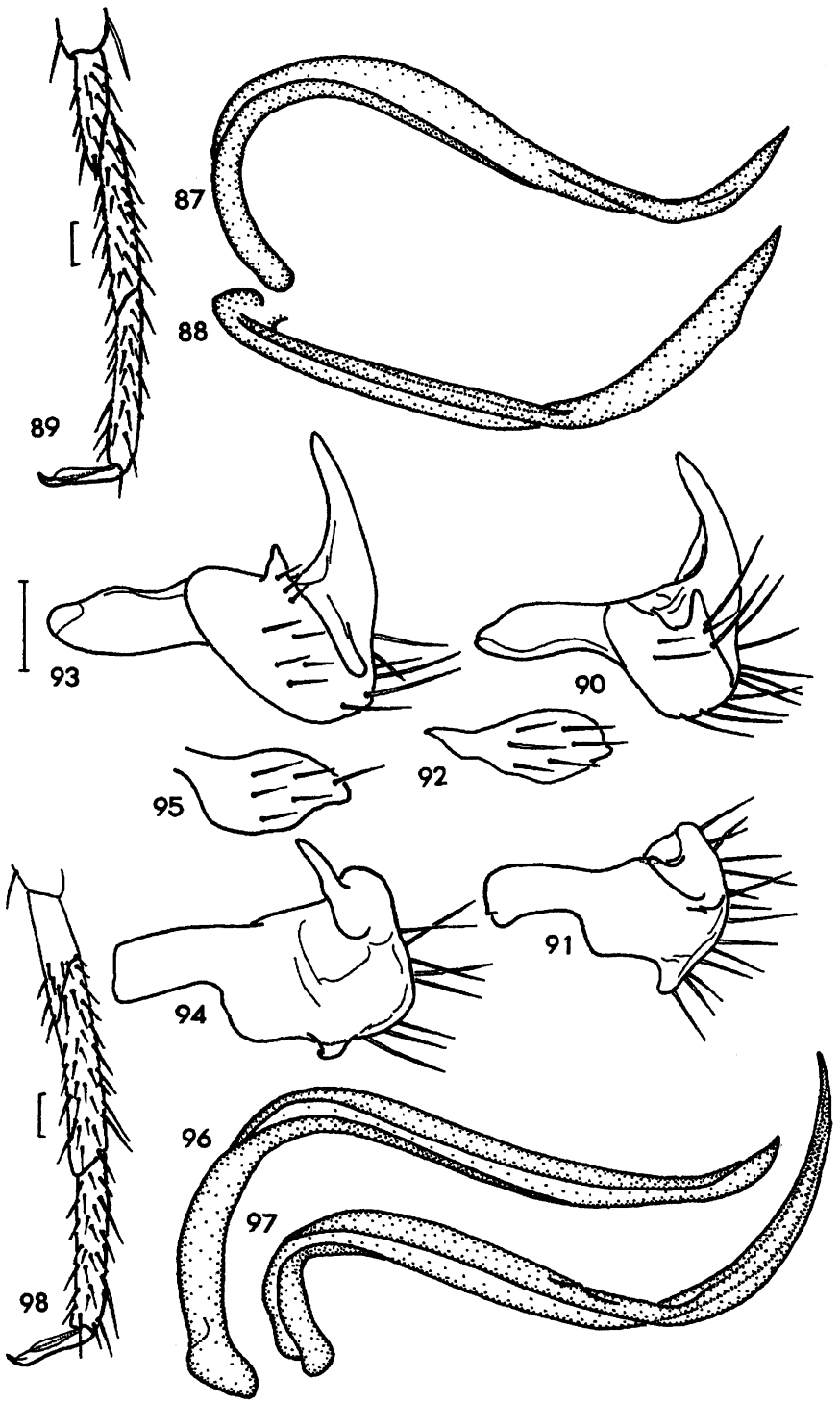
Camptotylidea fuscomaculata (Reuter, 1879) (Figs 2, 57, 58)

Atomophora fuscomaculata Reuter, 1879: 291; *Camptotylidea fuscomaculata*: Linnavuori, 1990: 62.
Atomophora punctulatus Nonnaizab & Yang, 1996: 19-20, **syn. n.**; *Camptotylidea punctulata*: Kerzhner, 1997: 246.

Material examined: 56 specimens, including lectotype, from Dagestan, Turkmenistan, Uzbekistan, Kazakhstan and Mongolia.

Description. Body yellowish. Head and antennae without any dots. Pronotum usually with two large irregularly shaped spots (degree of their development varies greatly: from distinct and contrasting dark brown to very faint, with indistinct borders; rarely whole central part of pronotum slightly darkened or the spots completely reduced) and usually irrorated with minute, extremely pale dotting, often orange in apical part and pale fuscous at base. Scutellum with pale fuscous dotting and dark fuscous, approximately X-shaped figure two hind maculae of which strongly darker, and two fore ones completely reduced in pale specimens. Hemelytra (Fig. 2) with large dark brown spots: slightly prolonged spot in middle part of corium and spot on its medioapical area. Inner margin of corium between these two spots usually slightly darkened. Apex of clavus in typical case also darkened, but sometimes this darkening poorly developed or absent, or vice versa, whole clavus darkened. Clavus and corium covered with pale dots, orange near lateral margins and pale fuscous near median line. Cuneus in all examined specimens covered with orange, sometimes reddish dots. Membrane almost completely (with exception of pale lateral area near apex of cuneus and, often, very apex of wing) embrowned. Femora and tibiae pale, without any dots. Apices of hind femora often reddish. Claws as in Figs 57, 58. Ocular index 1.1-1.3 in males, 1.9-2.1 in females. Body length 3.4-3.8 mm.

Note. Atomophora punctulata Nonnaizab & Yang described from Inner Mongolia and later transferred to *Camptotylidea* by Kerzhner (1997) is a undoubted synonym of *C. fuscomaculata*. Vesica structure, spot in inner part of corium, two spots on pronotum, darkened clavus and measurements are identical in both these "species".



Figs 87-98. 87-92, *Camptotylidea obscurata*: **87-88**, vesica; **89**, tarsus; **90-91**, left paramere; **92**, right paramere; **93-98**, *C. kanduli*: **93-94**, left paramere; **95**, right paramere; **96-97**, vesica; **98**, tarsus.

Distribution. Iran, Iraq, Saudi Arabia (Linnavuori, 1990), Russia (new record: Kumtorkala in Dagestan), Kazakhstan (new record: Kara-Chokat in the Malye Barsuki sands and Kingyr well in Chimkent Prov.), Turkmenistan, Uzbekistan (Linnavuori, 1990: Bukhara Prov.), Mongolia (new record: Bayan-Hongor and South Gobi Aimaks), NW China (Nonnaizab & Yang, 1996). Specimens from Israel provisionally referred by Linnavuori (1961) to this species were later described by him as *Atomophora astarte*.

Host plant. Haloxylon persicum (Linnavuori, 1990), in Mongolia (collection of Zoological Institute, St.Petersburg) collected from *Salsola arbuscula*.

Camptotylidea flavida (Nonnaizab & Yang, 1994)

(Figs 3, 99-105)

Atomophora flavidus Nonnaizab & Yang, 1994: 18-19; *Camptotylidea flavida*: Kerzhner, 1997: 246.

Material examined: 147 specimens from Mongolia.

Description. Body whitish yellow, densely covered with light silver hairs. Eyes protruding, with reddish brown facets. Antennae uniformly yellow. Head pale, usually without spots, with exception of sparse faint dotting on vertex. Pronotum, scutellum and hemelytra (Fig. 3) densely irrorated with small roundish dots often well developed only at dark areas. Pronotum usually slightly darkened with exception of its margins and medial line. Scutellum usually with X-shaped dark figure formed by dark fuscous dots. Only lateral corners of scutellum, its very apex and apical part of median line pale. Commisural margin of clavus darkened, otherwise with distinct dense dark fuscous dotting. Claval comissure dark brown. Medioapical part of corium with irregularly shaped, largish, darkened area and minute dark irroration. This area usually united with dark claval bands into a transverse dark stripe in the middle of body. Dots on cuneus and lateral parts of corium fuscous-orangish, pale fuscous in darkest specimens; ground colour pale yellow. Membrane whitish, with well developed, dense, brown-fuscous mottling. Legs immaculate, uniformly yellowish. Hind margin of very apices of fore femora sometimes reddish. Apices of tibiae usually darkened. Tarsus as in Fig. 105. Females brachypterous; membrane (from apex of cuneus to apex of membrane) 0.6 times as long as cuneus. Male genitalia as in Figs 99-104.

In males, body 3.7-4.1 times as long as width of pronotum. Vertex 1.1-1.5 times as wide as eye. Ratio of antennal segments 9-10 : 35-41 : 24-27 : 12-15; 2nd segment approximately equal in length to basal width of pronotum, 1.3 times as long as width of head. Pronotum 1.9-2.6 times as wide as long, 1.3 times as wide as head. Body length 3.5-4.3 mm.

In females, body 2.9 times as long as width of pronotum. Vertex twice as wide as eye. Pronotum 2.9 times as wide as long, 1.4 times as wide as head. Body length 3.2 mm.

Comparison. This species undoubtedly belongs to the genus *Camptotylidea* because of its colour pattern and special claw structure; it shows no obvious distinctions from *C. suturalis* Reuter in external characters. Nevertheless, it can be easily recognized by the vesica structure (Figs 99-101). The vesica of *C. suturalis* is much stouter, with well developed sculpture around secondary gonopore opening and with entirely different form of apex.

Distribution. Mongolia (new record: South Gobi Aimak, several localities) and NW China.

Host plant. Artemisia sp. (probably *A. arenaria*).

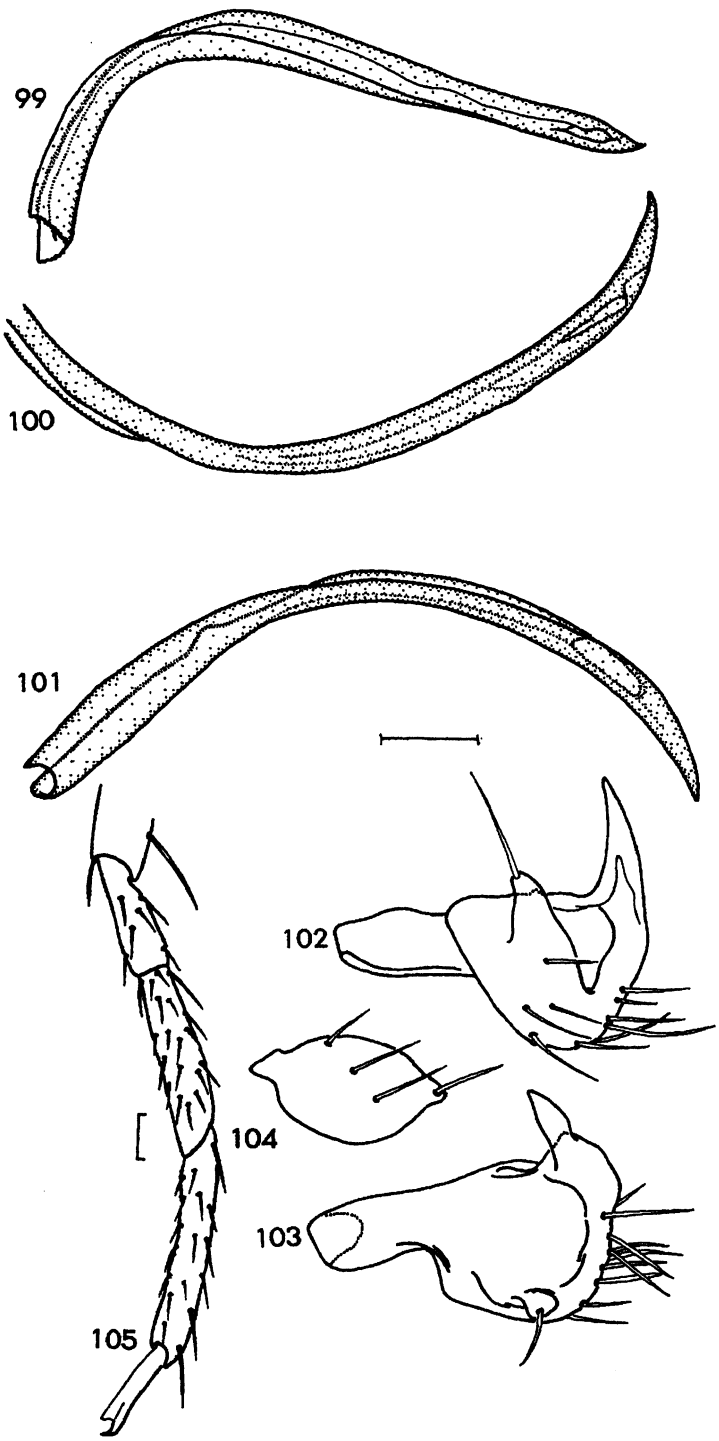
Camptotylidea suturalis (Reuter, 1904)

(Figs 1, 30, 47)

Atomophora suturalis Reuter, 1904: 13; *Camptotylidea suturalis*: Linnavuori, 1990: 58.

Material examined. 153 specimens from Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan, Iran and Mongolia, including 6 paralectotypes.

Description. Body pale yellowish. Head pale, with very pale and indistinct dots on vertex. First antennal segment with pale brownish subapical ring, sometimes reduced to several dots. Pronotum with minute and very pale orange or pale fuscous dots invisible in several specimens. Dots near basal margin of pronotum often darker. Scutellum pale, with pale fuscous dots or slightly darkened, with brownish dots and pale median line. Clavus and corium usually with darkened, pale brown stripe approximately as wide as width of scutellum at base (Fig. 1). This stripe covered with large brown dots. Claval commissure always darkened. Lateral parts of clavus and corium pale yellow, with pale and indistinct orange dots, sometimes



Figs 99-105. *Camptotylidea flavida*: **99-101**, vesica; **102-103**, left paramere; **104**, right paramere; **105**, tarsus.

without dots. Medioapical area of corium with rather large and irregularly shaped brown spot sometimes divided into two spots. Membrane whitish, with numerous, dense, confluent and irregularly shaped fuscous spots. Femora and tibiae immaculate. Claw as in Fig 47. Under body surface pale, in several specimens abdomen with few reddish dots. Ocular index 1.4-1.7 in males, 1.9-2.0 in females. Body length 3.0-3.5 mm in males, 2.9-3.3 mm in females.

Distribution. Tunisia (Carapezza, 1997), South Kazakhstan, Uzbekistan (recorded by Linnavuori, 1990 from Termez, found also in several localities in Bukhara Prov.), Tajikistan, Turkmenistan, Iran, Mongolia (new record: Hovd, Gobi-Altai, Bayan-Hongor and South Gobi Aimaks), North China: Dunhuang and Ningxia (Zhao, 1996), Inner Mongolia (Qi et al., 1995).

Host plant. In the collection of the Zoological Institute, St.Petersburg, different series were collected from the following plants: Mongolia – *Goebelia alopecuroides, Nitraria* sp., *Halimodendron halodendron* (?); Uzbekistan – one series from *Artemisia* sp. Kaplin (1993) recorded *C. suturalis* in Repetek from *Nitraria schoberi*. Evidently, these data should be verified.

Camptotylidea kanduli sp. n.
(Figs 20, 33, 61, 93-98)

Holotype. ♂, **Mongolia**, *South Gobi Aimak*, Bain-Dzag, 30 km NNE of Bulgan, 26.VII.1967 (Kerzhner).

Paratypes. **Mongolia**: *Gobi-Altai Aimak*: 4 ♂, Ushiyin-Bulak, 30 km NW of Beger, 22.VIII.1970 (Kerzhner); *Bayan-Hongor Aimak*: 1 ♂, 55 km SSW of Shine-Dzhinst, 28.VIII.1970 (Kerzhner); *South Gobi Aimak*: 9 ♂, Bain-Dzag, 30 NNE Bulgan, 26.VII.1967 (Kerzhner); 2 ♂, 20 km NE of Aguit-Ula mount., 24.VI.1971 (Kerzhner); 15 ♂, Hara-Obo mount., 20 km ESE of Bayan-Obo, 8.VIII.1971 (Kerzhner); 5 ♂, Hushu-Sair, 25 km SW of Hailastyn-Huduk, 21.VI.1971 (Kerzhner); 1 ♂, near Dund-Gol, 20.VIII.1969 (Kerzhner & Kozlov); 3 ♂, 20 km ENE of Bayan-Dalai, 31.VII.1967 (Kerzhner).

Description. Body (Fig. 20) yellowish, covered with light hairs. Eyes with reddish or dark reddish facets. Antennae uniformly pale. Head yellow, usually with series of faint red dots on vertex. Pronotum without dark spots or bands, densely covered with small dark fuscous dots and usually darkened in median part, its apical and lateral margins paler. Anterior margin of pronotum often with a series of pale reddish dots. Scutellum and hemelytra irrorated with distinct fuscous dots. Basic shade of scutellum darkened, completely pale fuscous or yellowish, with pale apex, lateral angles and thin median line. Hemelytral colour pattern vary greatly. Usually whole clavus and inner part of corium darkened, with distinct dark fuscous dots, while remainder of corium yellow, with pale fuscous (often red on cuneus) dots; sometimes nearly whole clavus and corium with distinct dark brown dotting, only very margins of corium and cuneus with pale fuscous, sometimes pale reddish dots. Dots and ground shade slightly darker in medioapical area of corium. Membrane whitish, with abundant brownish mottling. Brown, irregularly shaped, fuscous spot above cell apex very faint or practically absent. Legs immaculate. Tarsus as in Fig. 98. Vesica (Figs 96, 97) very thin; sculpture around secondary gonopore opening rather faint. Parameres as in Figs 93-95.

In males, body 3.0-3.4 as long as width of pronotum. Vertex 1.2-1.8 times as wide as eye. Ratio between antennal segments 15 : 55 : 28 : 24. Second antennal segment 0.8-0.9 times as long as basal width of pronotum, 1.1-1.2 times as long as width of head. Pronotum 2.5-2.7 times as wide as long, 1.3-1.4 times as wide as head. Body length 2.9-3.1 mm.

Females unknown.

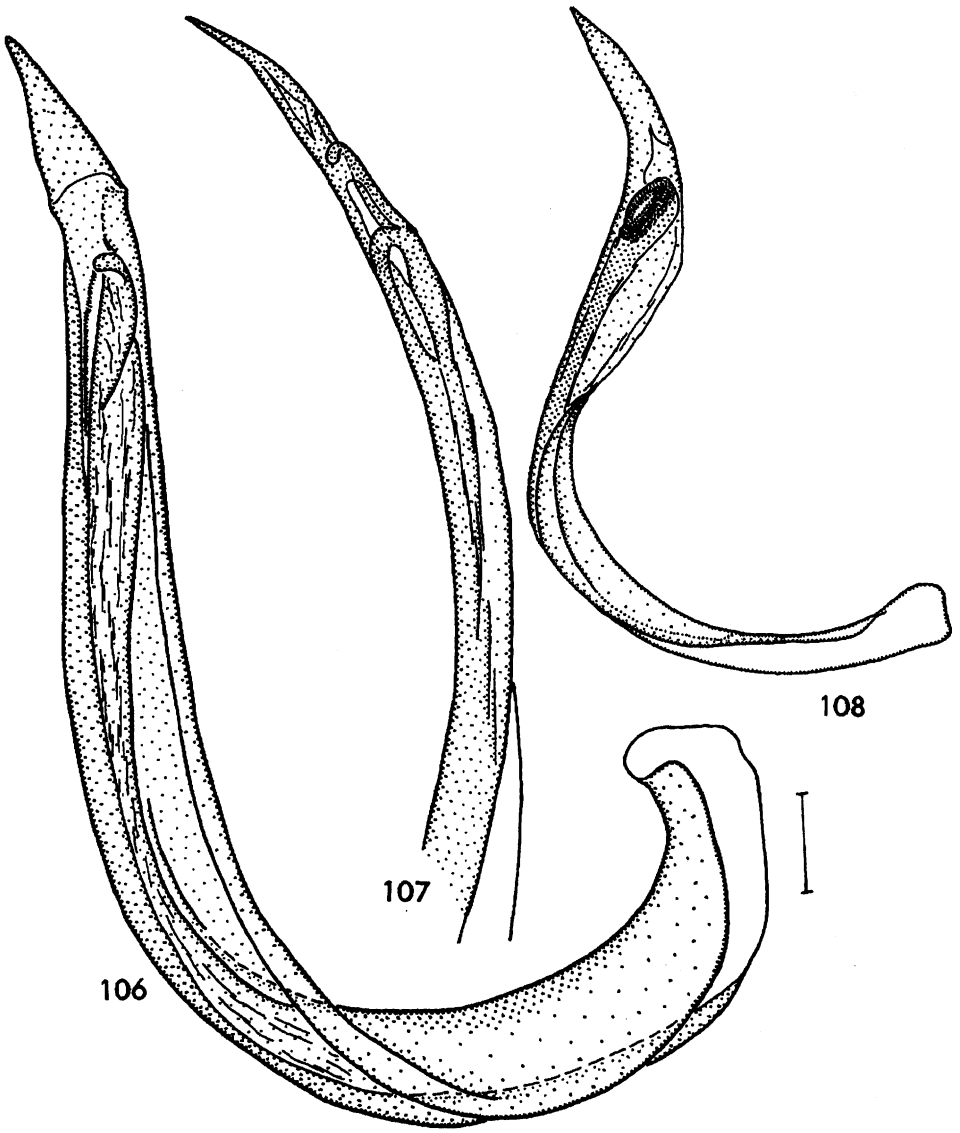
Comparison. The species is close to *C. flavida*, but there are some differences between these two species in sizes (body length of *C. flavida* 3.5-4.3 mm, of *C. canduli* 2.9-3.1 mm) and peculiarities of colour pattern (absence of dark bands on pronotum; entirely different figure on scutellum; commisural stripe on hemelytra much broader than in *C. flavida* and occupies nearly 2/3 of the corium width; fuscous-orangish dotting on cuneus and lateral parts of corium absent; brown-fuscous spot above cell apex rather faint or even absent). Vesica in both species quite similar. Both species were collected in the same places, but on different plants. *C. suturalis* which is similar with *C. flavida* in colour pattern and with *C. kanduli* in sizes differs greatly from both in vesica structure.

Distribution. Mongolia.

Host plant. Unknown.

Camptotylidea candida (Linnavuori, 1984)
(Fig. 56)

Atomophora candida Linnavuori, 1984: 40-41; *Camptotylidea candida*: Linnavuori, 1990: 59.



Figs 106-108. Vesica: **106-107**, *Camptotylidea incarnata*; **108**, *C. ephedrae*.

Material examined: 4 paratypes from Iraq.

Description. Body whitish yellow. Antennae without any dots. Apical two-thirds of clavus and medioapical part of corium slightly darkened. Inner apical angle of corium and inner basal part of cuneus with pale fuscous dots; in addition, corium and cuneus also with rows of pale orange dots. Medioapical area with a small pale brownish spot. Membrane milky whitish, with dense fuscous colour pattern, with pale area near apex of cuneus. Under body surface pale. Legs pale. Claw as in Fig. 56. Ocular index 1.6-1.7 in males, 2.3-2.5 in females. Body length 2.8-3.3 mm.

Distribution. Iraq (Linnavuori, 1986).

Host plant. *Ephedra foliata* (Linnavuori, 1986).

Camptotylidea modesta (Linnavuori, 1986)

Atomophora modesta Linnavuori, 1986: 157; *Camptotylidea modesta*: Linnavuori, 1990: 61-62.

Material examined. 3 paratypes from Saudi Arabia.

Description. Body whitish. Vertex with pale orange dots near eyes. Pronotum with extremely pale brownish lateral stripes and with sparse fuscous dots visible only at darkened areas. Median part of pronotum without dots, sometimes with two pale longitudinal orange stripes. Basal angles of scutellum pale orange, its middle part, with exception of pale median line, slightly darkened and covered with pale fuscous dots. Clavus, corium and cuneus densely irrorated with extremely pale fuscous (medially) and orange (laterally) dots, medioapical part of corium with more or less transverse brown spot. Clavus, except very base, and medial part of corium slightly darkened. Membrane fuscous, with pale mottling. Femora and tibiae pale, without spots or dots. Ocular index 1.2-1.5 in males, 2.2 in females. Body length 2.7-3.0 mm.

Distribution. Saudi Arabia.

Host plant. Unknown.

Camptotylidea salsosa sp. n.
(Figs 22, 35, 64, 81, 82, 116, 122)

Holotype. ♂, **Uzbekistan**, *Bukhara Prov.*, 34 km SO of Ayakguzhumdy, 20.V.1965 (Kerzhner).

Paratypes. **Uzbekistan**: 1 ♂, 2 ♀, as holotype. **Turkmenistan**: 1 ♂, Repetek, 3.V.1909 (Hohlbeck).

Description. Body (Fig. 22) whitish yellow. Head pale; vertex sometimes with several red dots. First antennal segment with reddish marking near apex; apical part of second and base of third segment often greenish. Eyes with reddish or pale greenish facets. Pronotum pale, densely and irregularly covered with fuscous dots. Fusing with others, these dots form insignificant condensations among which can be distinguished four indistinct and thin longitudinal stripes (two middle often hardly visible). Apical two-thirds of scutellum, with exception of very apex and median line, densely irrorated with dots. Clavus, corium and cuneus rather regularly covered with fuscous dots and two first, in addition, covered with irregularly shaped spots (3-4 times as wide as diameter of surrounding dots) of same colour. Very apex of cuneus with several large red dots; costal fracture with a series of similar dots, which become brownish near base of wing. Cuneal fracture darkened by a narrow, transverse, dark brown, sometimes nearly black stripe extending to medioapical area of corium. Hairs located on area of this stripe with brownish shade. Membrane covered with irregularly shaped, frequently confluent, brownish spots. Lateral margin of membrane with pale area at middle, bordered before and above with dark brownish spots. Apical part of upper and under surfaces of hind femora, except of very apices, densely irrorated with brown confluent dots, their density increases in apical part. Tibiae with large brown dots. Under surface of thorax greenish, that of abdomen yellowish, with red and brown dots at lateral margins. Vesica well sclerotized (Figs 81, 82), its structure typical of *Camptotylidea*. Tarsus as in Fig. 116; claw as in Fig. 64; left paramere as in Fig. 122.

In males, body 2.9-3.1 times as long as width of pronotum. Ocular index 1.4. Second antennal segment 0.8 times as long as basal width of pronotum, 1.0-1.1 times as long as width of head. Pronotum 2.3-2.5 times as wide as long. Body length 3.3-3.4 mm.

In females, body 3.0 times as long as width of pronotum. Ocular index 2.5. Second antennal segment 0.8 times as long as basal width of pronotum, 1.1-1.2 times as long as width of head. Pronotum 2.4 times as wide as long. Body length 3.1-3.2 mm.

Comparison. Apart from *C. salsosa*, only *C. modesta* and *C. perirata* have the medioapical spot of corium prolonged in transverse direction. *C. modesta* is considerably smaller (body length not more than 3.0 mm) and pale, without any spots or dots on the legs. *C. perirata* differs from *C. salsosa* in the ocular index, general body colour and peculiarities of the colour pattern of pronotum (darkened lateral margins) and hind femora (which are also darkened).

Distribution. Uzbekistan, Turkmenistan.

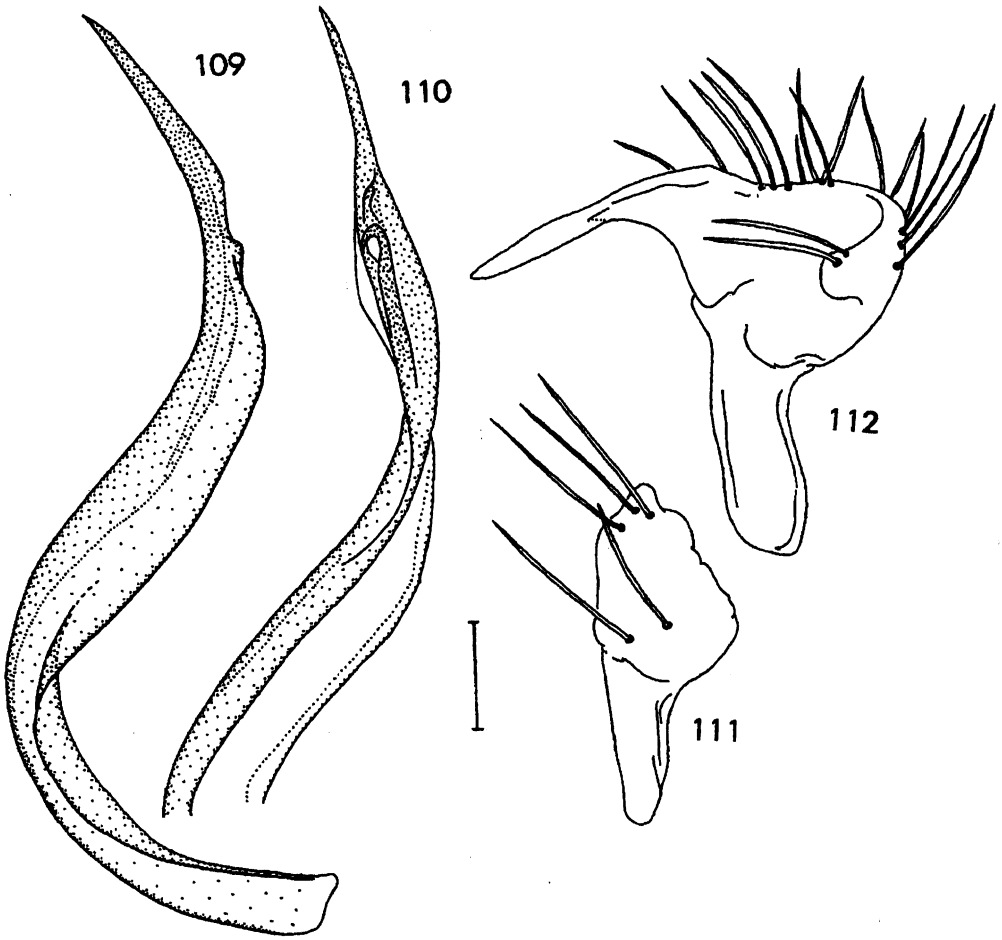
Host plant. Haloxylon sp.

Camptotylidea perirata sp. n.
(Figs 21, 36, 67, 83, 117, 123)

Holotype. ♂, **Uzbekistan**, Termez, 18.VI.1912 (Kiritshenko).

Paratypes. **Uzbekistan**: 1 ♂, 2 ♀, same locality, 18 and 24.VI.1912 (Kiritshenko). **Tajikistan**: 1 ♂, lower part of Kafirnigan River, 19.VI.1944 (Kiritshenko); 1 ♂, Tigrovaya Balka, 12.VI.1975 (Loginova).

Description. Body (Fig. 21) pale yellow. Head and antennae pale, without any spots. Eyes dark reddish. Pronotum pale, with darkened, brownish lateral margins, covered with minute dark dots noticeable at the darkened areas and sometimes almost absent in the middle. Scutellum entirely pale or with few very faint reddish dots. Clavus and



Figs 109-112. *Camptotylidea striata*: **109-110**, vesica; **111**, right paramere; **112**, left paramere.

corium with very pale dots practically invisible in some specimens. Series of dots on cuneal fracture and dots on cuneus more bright, slightly reddish. Cuneal fracture darkened as lateral margins of pronotum or more significantly, forming a transverse spot with indistinct borders and dark brown dots. Membrane covered with irregularly shaped, frequently fused, brownish spots. Lateral margin of membrane with pale area at middle bordered anteriorly and posteriorly with dark brownish spots. Under and upper surfaces of hind femora darkened in apical half, especially at hind margin. In the most pale specimens, apical part of femora comparatively densely covered with brown dots not forming continuous cover. Tibiae with small brown dots. Under surface of body pale, with reddish dots. Vesica as in Fig. 83, well sclerotized, its structure typical of *Camptotylidea*. Tarsus as in Fig. 117; claw as in Fig. 67; left paramere as in Fig. 123.

In males, body 3.3-3.5 times as long as width of pronotum. Ocular index 1.9-2.5. Second antennal segment 0.8-0.9 times as long as basal width of pronotum, 1.3-1.4 times as long as width of head. Pronotum 2.2-2.3 times as wide as long. Body length 3.1-3.5 mm.

In females, body 3.0-3.2 times as long as width of pronotum. Ocular index 3.0-3.2. Second antennal segment 0.8-0.9 times as long as basal width of pronotum, 1.3-1.4 times as long as width of head. Pronotum 2.4-2.5 times as wide as long. Body length 2.9-3.2 mm.

Note. 1 ♂ and 1 ♀ from Pamir (Ishkashim) probably belonging to this species have sig-

nificantly brighter colour pattern. Their heads are rather densely covered with red dots, pronotum, clavus and corium densely irrorated with pale fuscous and scutellum with reddish dots. In addition, there are an indistinct pale area at the membrane, red dots on tibiae, and poorly developed stripes at the lateral parts of pronotum.

Comparison. See previous discussion.

Distribution. Uzbekistan, Tajikistan.

Host plant. 1 ♂ and 1 ♀ from Iskhashim were collected on *Hammada wachanica.*

Camptotylidea striata sp. n.
(Figs 13, 14, 109-112)

Holotype: ♂, **Kirgizia**, Fergana Valley, Shekaftar (S of Sumsar), 19.VI.1966 (Kerzhner).

Paratype: ♂, **Kazakhstan**, Mangyshlak Peninsula, 130 km SE of Staryi Uzen', Saksarkum well, 23.VI.1973 (Nartshuk).

Description. Body (Fig. 13) pale yellow. Head and antennae uniformly pale, eyes with dark reddish facets. Pronotum pale; its lateral parts darkened, brownish and covered with minute dark dots. Central part of pronotum without any dotting. Scutellum pale, with well developed X-shaped brownish figure or almost entirely brown in darker specimen. Clavus and cuneus pale, covered with faint pale orange dots. Lateral parts of corium also pale, with dots similar to those on clavus; in lateroapical corner of corium, dots slightly brighter. Endocorium entirely or with exception of its very base pale brown and covered with brown dots. Medioapical area of corium darkened more intensely than the rest of endocorium. Membrane whitish, densely covered with irregularly shaped, frequently confluent brownish spots; lateral margin of membrane with pale central area bordered anteriorly and posteriorly with dark brown spots. Femora pale, their under surfaces with a few faint and minute brownish spots. Tibiae immaculate. Under surface pale of body. Vesica as in Figs 107-108; paramere as in Figs 109, 110; claw as in Fig. 14.

In ♂, body 3.1-3.2 times as long as width of pronotum. Ocular index: 1.7. Second antennal segment 0.7-0.8 times as long as basal width of pronotum, 1.1 times as long as width of head. Pronotum 2.3 times as wide as long. Body length: 3.2-3.4 mm.

Females unknown.

Comparison. The new species is the only species of *Camptotylidea* having darkened endocorium combined with uniformly pale clavus.

Distribution. Kirgizia, Kazakhstan.

Host plant. Unknown.

Camptotylidea vitticollis (Reuter, 1901)
(Figs 31, 40, 41, 48, 49)

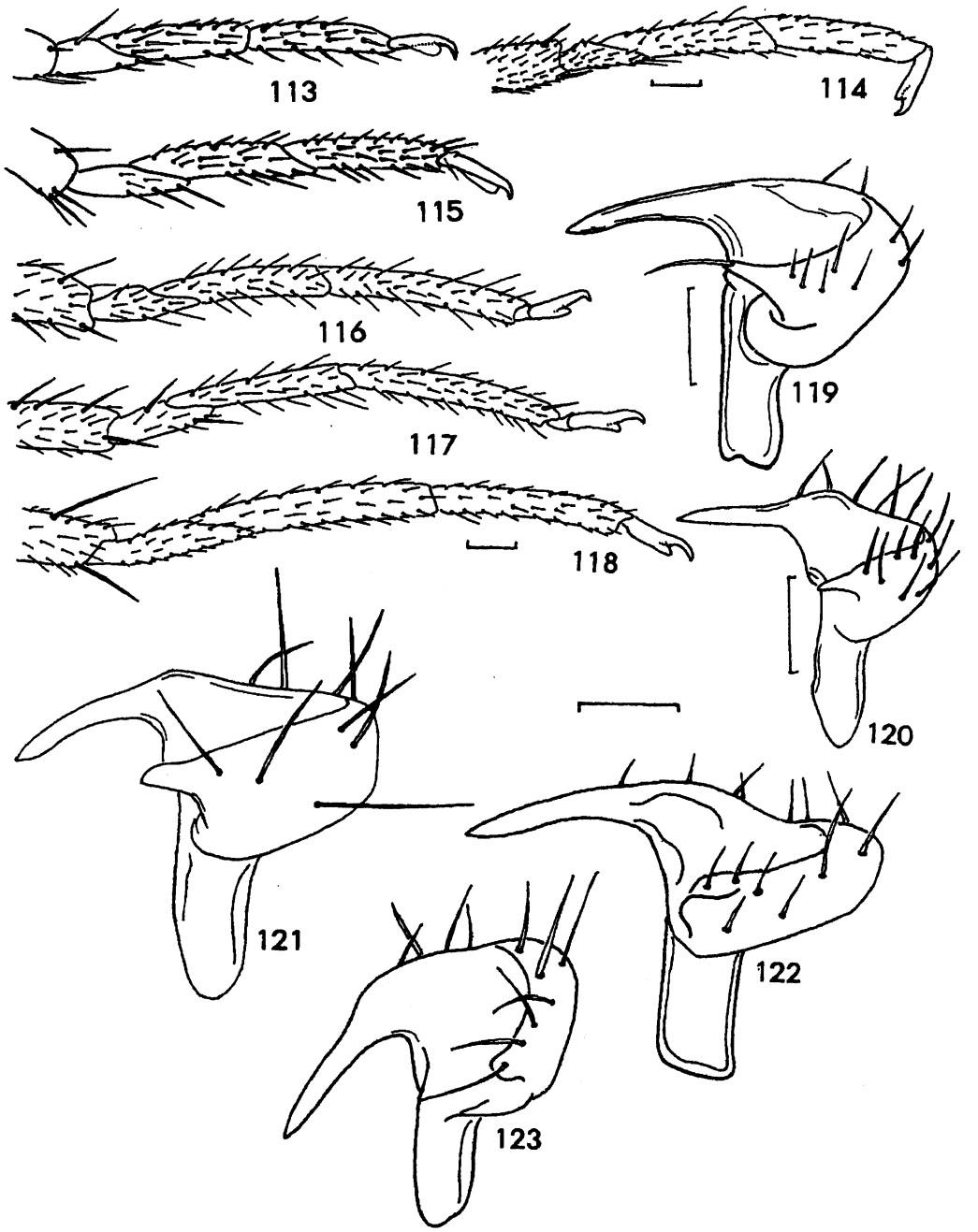
Atomophora vitticollis Reuter, 1901: 177; *Camptotylidea vitticollis*: Linnavuori, 1990: 62.

Material examined. 7 specimens from Turkmenistan and Uzbekistan.

Description. Body whitish or pale yellowish. Head with few reddish or fuscous dots on vertex. First antennal segment with large dot at middle part. Pronotum covered with dark brown dots of different shapes and sizes densely irrorating its basal two-thirds and lateral margins; calli and area between them with very few pale dots. Apical margin of pronotum with reddish dots or markings. In addition, lateral parts of pronotum with two rather dark longitudinal stripes or areas having usually indistinct borders. Scutellum pale with few very minute dots. Clavus and corium regularly covered with brown dots and spots of the same colour. Clavus usually with three small spots, middle one the largest. Corium with large T-shaped inverted spot in medioapical area, distribution and shape of other spots vary greatly. Costal fracture with a series of large pale reddish or orange dots especially well developed on cuneus. The remainder of cuneus with minute and very pale dots, sometimes without dots. Membrane with brownish confluent mottling and pale area beyond apex of cuneus. Hind femora with a series of large dots on fore margin and a interrupted band near apex (Figs 40, 41). Under surface of hind femora with a series of oblique touches. Colour pattern on hind and middle femora similar to that on fore femora, but more or less reduced. Tibiae with large fuscous or reddish dots. Under body surface with thin red interrupted stripe extending along margins of thorax and abdomen. Vesica well sclerotized, its structure typical of *Camptotylidea.* Claw as in Figs 48, 49. Ocular index 1.1-1.3 in males, 1.7-2.0 in females. Body length 3.3-3.5 mm in males, 2.9-3.7 mm in females.

Distribution. Turkmenistan, Uzbekistan (new record: 25 km N of Ayakguzhumdy, Bukhara Prov.).

Host plant. Haloxylon persicum and *H. aphyllum* were recorded by Kaplin (1993), but these data probably refer to the next spe-



Figs 113-123. 113-118, tarsi: **113,** *Camptotylidea ceratoides*; **114,** *C. incarnata*; **115,** *C. bucharica*; **116,** *C. salsosa*; **117,** *C. perirata*; **118,** *C. ephedrae*; **119-123,** left parameres: **119,** *C. ceratoides*; **120,** *C. bucharica*; **121,** *C. ephedrae*; **122,** *C. salsosa*; **123,** *C. perirata.*

cies. In Uzbekistan, the species was collected from *Salsola richteri*.

Camptotylidea sinaitica (Linnavuori, 1964) (Fig. 4)

Psallus (Compsidolon) sinaiticum Linnavuori, 1964: 331-332; *Psallus (Psallus) sinaiticus*: Wagner, 1975: 218-219. *Camptotylidea sinaitica*: Linnavuori, 1997: 343-345.

Material examined. 33 specimens from Iran, Turkmenistan and Uzbekistan.

Description. Close to *C. vitticollis*, but colour pattern (Fig. 4) greatly reduced in some specimens. In the palest specimens, stripes on pronotum poorly developed or absent and dark dots distributed more densely in apical part of pronotum. In one specimen from Iran pronotum greatly darkened, so that only its central part in form of inverted triangle remains pale. Inverted T-shaped spot in medioapical area of corium sometimes reduced to comparatively small spot above cuneal fracture. Corium in the palest specimens covered only with dots (without any spots) but central spot on clavus well developed in all examined specimens. Series of dots on fore margin of hind femora reduced in some specimens, but interrupted band always present. Dots on tibiae rather minute in pale specimens. Red stripe on under surface absent in pale specimens. Ocular index 1.9-2.5 in males, 1.7-2.0 in females. Body length 3.5-3.7 mm in males, 2.9-3.7 mm in females.

Distribution. Turkmenistan (new record: Repetek; Mirza-Chile well), Uzbekistan (new record: Termez and several localities in Bukhara Prov.), Egypt (Sinai), Iran.

Host plant. On *Haloxylon salicornicum* in Egypt, on *H. aphyllum* in Iran (Linnavuori, 1997). In Turkmenistan, on *H. aphyllum* and *H. persicum*; in Uzbekistan some specimens collected from *Salsola arbuscula*, *S. richteri* and *S. rigida*, but probably these records are occasional.

Camptotylidea rubropicta Linnavuori, 1998

Camptotylidea rubropicta Linnavuori, 1998: 26.

Material examined: 1 ♂ (paratype) from Iran (Fars).

Description. Body yellowish. Whole first antennal segment, genae and clypeus reddish. Second, third and fourth antennal segments uniformly pale; frons and vertex pale, with small reddish markings along eyes and basal margin of head. Pronotum pale, with numerous, irregularly shaped, confluent reddish dots especially densely distributed at apical corners. Base and central part of scutellum reddish, remainder of it pale. Clavus pale, nearly immaculate, with few faint minute reddish dots. Corium pale, reddish dots present only along its lateral margin and in medioapical area. Dots in this area brighter, dense and confluent, forming indistinct spot. Whole cuneus covered with confluent reddish dots. Membrane whitish, densely covered with dark brown colour pattern. Apical two-thirds of hind femora and basal two-thirds of tibiae reddish. Thorax ventrally reddish; coxae pale. Ocular index 1.8. Body length 2.7 mm.

Distribution. Iran.

Host plant. Pteropyrum aucheri (Polygonaceae).

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