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Revision of the sawfly genera *Asiarge* GUSSAKOVSKIJ, 1935 and *Kokujewia* KONOW, 1902

(Hymenoptera: Argidae)

With 7 figures

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Taxonomy, Argidae, *Asiarge* GUSSAKOVSKIJ 1935, *Kokujewia* KONOW 1902, revision, key, lectotype designations, synonymy, distribution, biology.

Summary

The genera *Asiarge* GUSSAKOVSKIJ, 1935 and *Kokujewia* KONOW, 1902 (Hymenoptera: Argidae) are revised and keyed, and a synopsis of the ecology and zoogeography of the species is presented. Lectotypes are designated for *Asiarge shnitnikovi* GUSSAKOVSKIJ, 1935 and *Kokujewia ectrapela* KONOW, 1902. *Kokujewia clementi* ZIRNGIEBL, 1949 and *K. palestina* BENSON, 1954 are resynonymized. The following new synonymies are established: *Asiarge fumipennis* GUSSAKOVSKIJ, 1935 syn. n. and *Kypharge djarkentica* MALAISE, 1935 syn. n. of *Asiarge regeli* GUSSAKOVSKIJ, 1935; *Kokujewia ectrapela* var. *clarescens* ZIRNGIEBL, 1949 syn. n. of *K. ectrapela* KONOW, 1902; *K. taschevi* VASSILEV, 1978 syn. n. of *K. clementi* ZIRNGIEBL, 1949.

Zusammenfassung

Die Gattungen *Asiarge* GUSSAKOVSKIJ, 1935 und *Kokujewia* KONOW, 1902 (Hymenoptera: Argidae) wurden revidiert, die Arten aufgeschlüsselt, und die zoogeographischen und ökologischen Daten zusammengefaßt. Für *Asiarge shnitnikovi* GUSSAKOVSKIJ, 1935 und *Kokujewia ectrapela* KONOW, 1902 werden Lectotypen festgelegt. *Kokujewia clementi* ZIRNGIEBL, 1949 und *K. palestina* BENSON, 1954 werden resynonymisiert. Folgende neue Synonymien konnten festgestellt werden: *Asiarge fumipennis* GUSSAKOVSKIJ, 1935 syn. n. und *Kypharge djarkentica* MALAISE, 1935 syn. n. von *Asiarge regeli* GUSSAKOVSKIJ, 1935; *Kokujewia ectrapela* var. *clarescens* ZIRNGIEBL, 1949 syn. n. von *K. ectrapela* KONOW, 1902; *K. taschevi* VASSILEV, 1978 syn. n. von *K. clementi* ZIRNGIEBL, 1949.

Introduction

The Palaearctic sawfly genera *Asiarge* GUSSAKOVSKIJ, 1935 and *Kokujewia* KONOW, 1902 comprise only few species. Hitherto, little material has been collected. Some nominal taxa were only known from the types. The high variability of coloration obviously stimulated former investigators to describe a number of taxa, some of which now prove to be synonyms. In the present investigation *Asiarge* and *Kokujewia* are revised and keyed. Additionally, a survey is given concerning ecology and zoogeography of the species.

K. ectrapela and *K. palestina* larvae are oligophagous on Polygonaceae. According to the literature checked, these are the only Arginae which have been found feeding on Polygonaceae. Other argids on Polygonaceae are Nearctic and Neotropical, distantly related species of *Sericoceros* (Erigleninae) on *Coccoloba* and *Sphacophilus invitus* (CRESSON, 1880) (Sterictiphorinae) on *Eriogonum* (SMITH, 1992 and personal communication). *Asiarge* and *Kokujewia* show separated distribution ranges. *Asiarge* species occur from Central Asia to Mongolia and north-western China, whereas *Kokujewia* species have been found in the north-eastern Mediterranean and Caucasian region. Specimens have been collected in dry regions, steppes, semi-desert and desert regions from the lowland to the mountains.

Asiarge and *Kokujewia* species are quite similar to certain species of *Arge* SCHRANK, 1802 in general shape and coloration. It might be expected that they are part of *Arge*, however, this decision should be subject of a detailed, phylogenetical revision of this species-rich group. According to GUSSAKOVSKI (1935) and MALAISE (1941) they are separated from other Argidae by the combination of the following characters:

1. Wing venation: costal cross-vein (Sc) present; radial cell of fore-wing and hind-wing with appendical cell (a vein [RS?]) is prolonged and almost reaches the wing margin); anal cell of fore-wing petiolate and without basal cell.
2. Head: about 0.7 times as broad as thorax; supra-clypeal area strongly protruding in lateral view; antennal flagellum of males undivided.
3. Legs: middle and hind tibiae without sub-apical spurs; claws without sub-apical teeth.

Material and methods

The material examined during this study is deposited in the following collections: cKraus - private collection of M. KRAUS, Nürnberg; DEI - Deutsches Entomologisches Institut, Eberswalde; NHM - Natural History Museum, London; NHMW - Naturhistorisches Museum, Vienna; NHRS - Naturhistoriska Riksmuseet, Stockholm; TAUI - Tel Aviv University, Department of Zoology; USNM - U.S. National Museum of Natural History, Washington, DC; ZMAS - Zoological Institute, St. Petersburg; ZMHB - Museum für Naturkunde, Institut für Systematische Zoologie, Berlin; ZSM - Zoologische Staatssammlung, Munich.

The presentation of label data is strictly verbatim for types but standardized for other material examined. Geographical names written in Cyrillic, Chinese, Arabic or Hebrew letters originally, are listed according to the Times Atlas. Otherwise the British standard is used for the transcription of Cyrillic letters. The distribution map includes data from material examined and from single records published by former authors. Dissected genitalia were glued to a piece of cardboard after examination and pinned below the specimen. Morphological terminology mainly follows GOULET (1986, 1992) and GOULET & HUBER (1993). For wing cells the following terms are used: radial cell of fore-wing = cell 2R1; radial cell of hind-wing = cell R1; anal cell of fore-wing petiolate and without basal cell = cell 2A completely surrounded by veins 1A and 2A+3A, the latter present as a short stub at the base of the fore-wing and not touching vein 1A apically; cubital cells of the fore-wing = sub-marginal cells (1R1, 1Rs, 2Rs, 3Rs).

Key to species of *Asiarge* and *Kokujewia*

- 1 Fore-wing with four cubital cells. Face ventral to antennal sockets (supra-clypeal area) protruding like a nose (Fig. 2; cf. MALAISE, 1935: 161, Fig. 1). Left mandible in lateral view strongly tapering apically, appearing slimmer (Fig. 2) *Asiarge* 2
- Fore-wing with three cubital cells (cross-vein 2r-m missing). Face ventral to antennal sockets (supra-clypeal area) roundly protruding (Fig. 3). Left mandible in lateral view less tapering apically, appearing stouter (Fig. 3) *Kokujewia* 6

- 2(1)

Females

3
- Males

4
- 3(2)

Ovipositor sheath blunt apically and interior faces more or less straight in dorsal view (Fig. 4). 1st and 2nd terga dark brown, 3rd, 4th, 6th and 7th terga each with a pair of brown spots, which may be found enlarged until the abdomen is predominantly dark above. Wings slightly darkened.
Distribution: South-eastern Kazakhstan, Kyrgyzstan, Mongolia, north-western China.
Asiarge regeli GUSSAKOVSKI, 1935 ♀

-

Ovipositor sheath narrowed apically and interior faces concave in dorsal view (Fig. 5). 1st and 2nd terga dark brown, 3rd tergum with a pair of brown spots, following terga red. Wings hyaline.
Distribution: South-eastern Kazakhstan.
Asiarge shnitnikovi GUSSAKOVSKI, 1935 ♀

4(2)

Small brown spots present both on dorsal and ventral parts of 3rd-7th terga, dorsal spots much closer to lateral margin of tergum than distance between the spots on this tergum, preapical dorsal spots smaller than twice the ocellar diameter. Clypeus not clearly separated from supra-antennal area by an angle. Antennal flagellum about 1.9 times as long as head behind eyes. Hypopygium rounded apically and indistinctly coloured red laterally. Body length: 13.5 mm. (Females not known.)
Distribution: Mongolia.
Asiarge centralis GUSSAKOVSKI, 1935 ♂

-

Ventral parts of terga without dark spots. Preapical terga either completely red dorsally or bearing spots, which are closer to each other and frequently larger than twice the ocellar diameter. Clypeus separated from supra-antennal area by an angle. Hypopygium truncate or slightly emarginate apically, laterally broadly red. Smaller species. Males of the following species are not clearly separated 5

5(4)

Antennal flagellum about 1.9 times as long as maximal width of head behind eyes. 3rd-7th terga bearing large spots. Body length: 10.5-12.5 mm.
Asiarge regeli GUSSAKOVSKI, 1935 ♂

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Antennal flagellum about 1.7-1.8 times as long as maximal width of head behind eyes. 3rd-7th terga bearing small spots or spots missing on several terga. Body length: 9.5-11.5 mm.
Asiarge shnitnikovi GUSSAKOVSKI, 1935 ♂

6(1)

Females

7

-

Males

9

7(6)

Ovipositor sheath broadly rounded behind (Fig. 6). Mesoscutum and mesoscutellum red, abdomen red apart from 1st tergum. (Males not known.)
Distribution: Israel.
Kokujewia palestina BENSON, 1954 ♀

-

Ovipositor sheath more acutely rounded behind (Fig. 7). Either mesoscutum partly coloured black, or mesoscutellum and basal two abdominal terga dark 8

8(7)

Mesoscutellum red, median lobes of the mesoscutum usually red and marked black medially, the abdomen red with only the first tergum brown.
Distribution: Bulgaria, Greece, western and central Turkey.
Kokujewia clementi ZIRNGIEBL, 1949 ♀

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- Mesoscutellum black, median lobes of the mesoscutellum completely red. Abdomen red with 1st and 2nd terga each with a large brown spot medially, frequently the following terga with smaller brown spots medially.

Distribution: Russia (Stavropol', North Ossetia), Georgia, Armenia, Azerbaijan ("Transcaucasia") and north-western Iran.

Kokujewia ectrapela KONOW, 1902 ♀

- 9(6) Abdomen red, the first and narrow anterior margin of the second tergum, rarely a medial spot on the second tergum brown.

Kokujewia clementi ZIRNGIEBL, 1949 ♂

- Abdomen red with the first and the greater part of the second tergum brown, and some of the following terga marked brown medially.

Kokujewia ectrapela KONOW, 1902 ♂

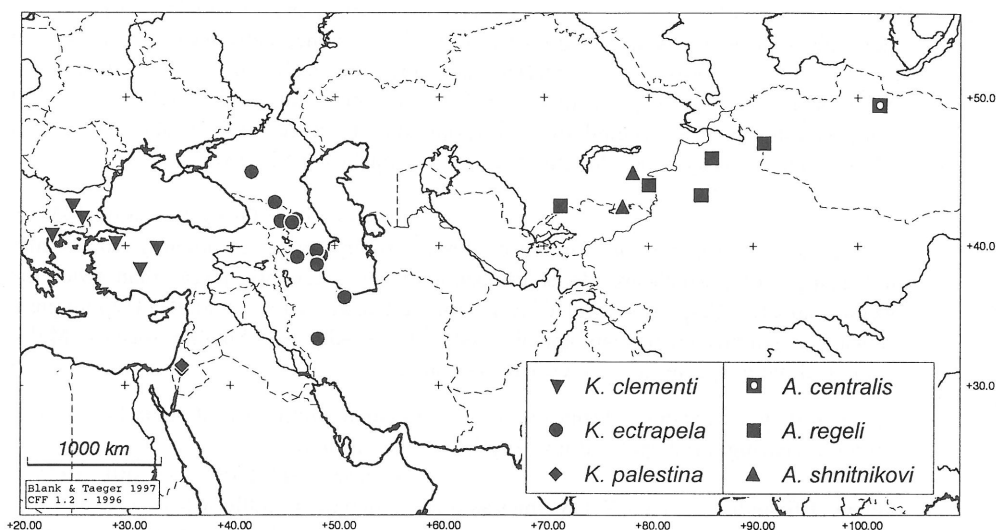


Fig. 1. Distribution of *Kokujewia* and *Asiarge* species. The distribution map includes data from material examined and from single records published by former authors.

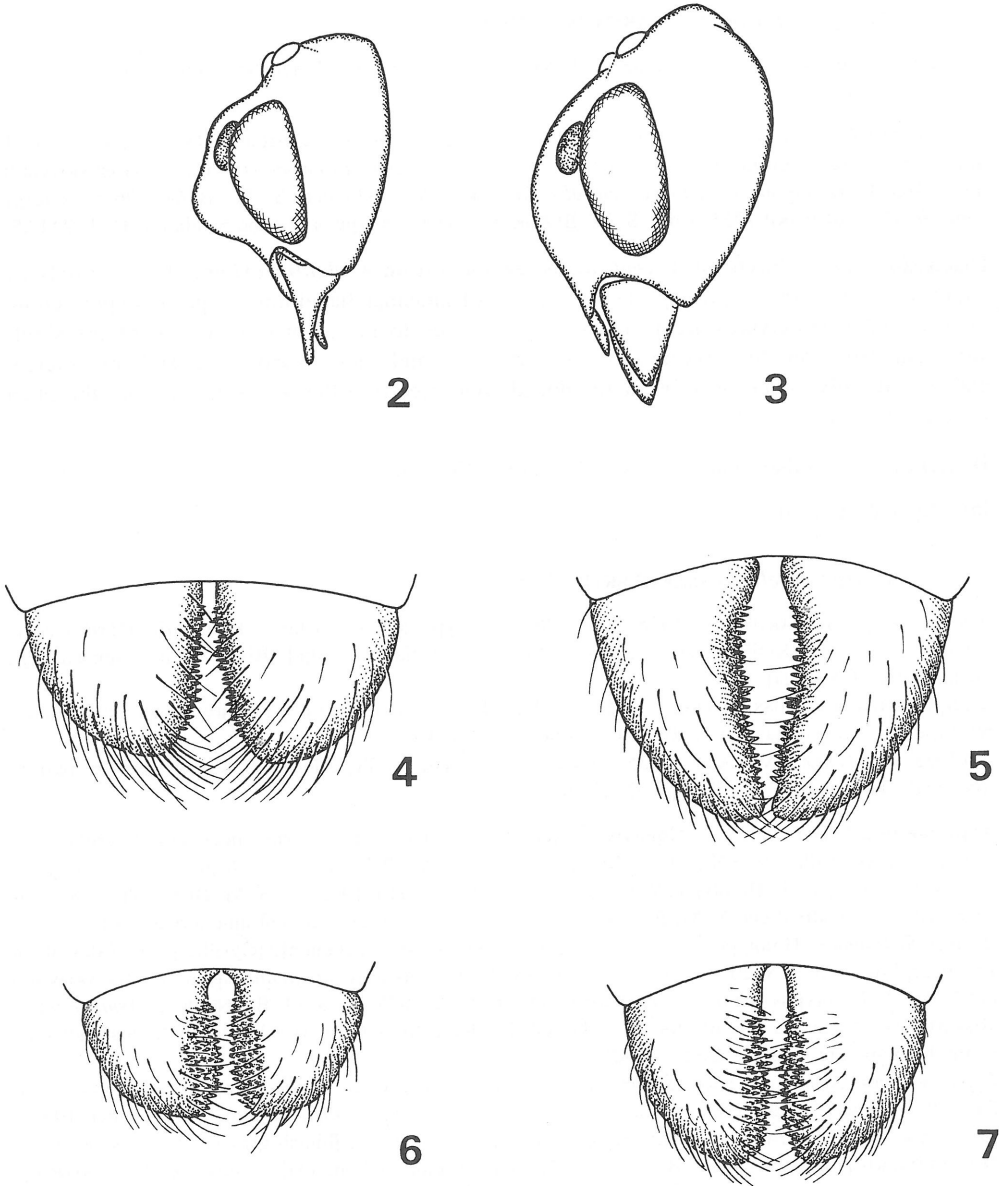
Genus *Asiarge* GUSSAKOVSKIJ, 1935

Asiarge GUSSAKOVSKIJ, 1935: 290, 427-428. Type species: *Asiarge shnitnikovi* GUSSAKOVSKIJ, 1935, by original designation.

Kypharge MALAISE, 1935: 160. Type species: *Kypharge djarkentica* MALAISE, 1935 [= *Asiarge regeli* GUSSAKOVSKIJ, 1935], by original designation.

The synonymy of *Asiarge* and *Kypharge* proposed by MALAISE (1941) can be confirmed, because *A. regeli* and *K. djarkentica* are conspecific (see below). The publication of GUSSAKOVSKIJ (1935) was printed in October 1935 (= 31.10.1935). According to the cover of this issue of the Ent. Tidskr., the generic name *Kypharge* MALAISE (1935) was published on 14.12.1935. Therefore, *Kypharge* is a junior synonym of *Asiarge*.

At present the genus *Asiarge* consists of three species regarded as valid: *A. centralis*, *A. regeli* and *A. shnitnikovi*.



Figs. 2-3. Head in lateral view. **Fig. 2.** *Asiarge regeli* GUSSAKOVSKI, 1935 ♀; **Fig. 3.** *Kokujewia ectrapela* KONOW, 1902 ♀. - **Figs. 4-7.** Ovipositor sheath in dorsal view. **Fig. 4.** *Asiarge regeli* GUSSAKOVSKI, 1935; **Fig. 5.** *Asiarge shnitnikovi* GUSSAKOVSKI, 1935; **Fig. 6.** *Kokujewia palestina* BENSON, 1954; **Fig. 7.** *Kokujewia ectrapela* KONOW, 1902.

Asiarge centralis GUSSAKOVSKIJ, 1935

Asiarge centralis GUSSAKOVSKIJ, 1935: 292, 430, ♂. Type locality: Mongolia, Ezsin-Gol [= Ezin-Gol, Egin-Gol, Egijn-Gol].

Type material: Holotype ♂: [circular, golden label, = type specimen]; [Cyrillic:] "Tsen. Mongoliya [...] Shartszan'-Sumè do Ètszin'-Gola P. KOZLOV' 14-15.V 09"; "*Asiarge centralis*, sp. n. ♂ GUSSAKOVSKIJ det."; [red:] "Holotypus ♂ *Asiarge centralis* GUSSAKOVSKIJ 1935 det. S. M. BLANK 96"; "*Asiarge centralis* GUSSAKOVSKIJ 1935 ♂ det. S. M. BLANK 96". The holotype is in good condition. Coll. ZMAS.

Discussion: The holotype of *A. centralis* is separated from *A. shnitnikovi* and *A. regeli* only by slight differences in morphology (e. g., length of antennal flagellum, shape of hypopygium, clypeus and supra-clypeal area). These might be due to the greater body size of the single specimen. However, the striking spots on both dorsal and ventral parts of the abdominal terga, and the strongly lateral position of the dorsal spots clearly differ *A. centralis* from the other *Asiarge* species.

Distribution: Northern part of central Mongolia (Fig. 1).

Investigated material: 1♂.

Asiarge regeli GUSSAKOVSKIJ, 1935

Asiarge regeli GUSSAKOVSKIJ, 1935: 293, 430, ♀. Type locality: China, Dzungaria ["Dzhungaria chinensi"], province Xinjiang Uygur Zizhiqu, Yining [= Kuldzha, Gulja], River Tallik, Eren Habirga Shan [= Iren-Chabirga].

Asiarge fumipennis GUSSAKOVSKIJ, 1935: 291-292, 429, ♀, **syn. n.** Type locality: Kyrgyzstan, Semi-retsch'je [= "Heptapotamien"], River Talass near Pokorovka.

Kypharge djarkentica MALAISE, 1935: 160-161, ♀♂, **syn. n.** Type locality: Kazakhstan [= part of historical "Turkestan"], Panfilov [= Djarkent].

Type material: *Asiarge regeli*. Holotype ♀: [circular, golden label, = type specimen]; [Cyrillic:] "r. [reka, = river] Tallik, Iren-Khabirga, Kul'dzh. r., 12.-13-V 79 REGEL"; "*Asiarge regeli* sp. n. ♀ V. GUSSAKOVSKIY"; [red:] "Holotypus ♀ *Asiarge regeli* GUSSAKOVSKIJ 1935 det. S. M. BLANK 96"; "*Asiarge regeli* GUSSAKOVSKIJ ♀ det. S. M. BLANK 97". The holotype is missing the left hind tarsus. Coll. ZMAS. *Asiarge fumipennis*. Holotype ♀: [circular, golden label, = type specimen]; [Cyrillic:] "B. Talas okolo [= near] Pokrovki 28/V-20"; [Cyrillic:] "N. KUZNETSOV"; "*Asiarge fumipennis* sp. n. ♀ GUSSAKOVSKIJ det."; [red:] "Holotypus ♀ *Asiarge fumipennis* GUSSAKOVSKIJ 1935 det. S. M. BLANK 96"; "*Asiarge regeli* GUSSAKOVSKIJ ♀ det. S. M. BLANK 97". The left flagellum, the left anterior leg and both posterior tarsi of the holotype are missing. Coll. ZMAS.

Kypharge djarkentica. 1♀ and 2♂ paratypes: "Djarkent, Turkestan, Ende April 1911. ROLLE vend. 29.1.1912"; [red:] "Paratypus"; [in ♀ and 1♂ only:] "*Kypharge djarkentica* paratype MALAISE det. 1935"; [in ♀ only, probably MALAISE's handwriting:] "*Asiarge djarkentica*"; [bluish grey label]; "*Asiarge regeli* GUSSAKOVSKIJ [♀/♂] det. S. M. BLANK 97". The left flagellum of one male is missing. Coll. NHRS.

Discussion: Females of *A. regeli* are separated from *A. shnitnikovi* by the shape of the ovipositor sheath with truncate apex and interior face straight (see Fig. 4 for *A. regeli* and Fig. 5 for *A. shnitnikovi*). Males of these species are not clearly separated. In the material studied they differ in the length of the flagellum and the coloration of the abdominal terga.

Female *A. regeli* vary highly in coloration. The small series studied shows a gradual decline of dark coloration which lead to the synonymy of *A. fumipennis* and *K. djarkentica* with *A. regeli*. The holotype of *Asiarge regeli* is very dark. Thorax black apart from the red pronotum. Abdomen predominantly black: only a medial line of terga (4th-5th-8th, a medial line and the lateral

parts of the sterna and the lateral (ventral) parts of the terga remain red. One female from Mongolia (province Hovd [= Chovd-Aimak], coll. ZMHB) shows an intermediate coloration between the dark type of *A. regeli* and the light type of *A. fumipennis*. Thorax black with pronotum red and extensive red coloration on the mesoscutum, which leaves the notauli black. Mesepisternum with an indistinct red spot dorsally. 1st, 2nd and almost complete dorsal part of the 3rd terga black, 4th-7th terga bearing a couple of black spots each (spots on 5th tergum smaller than those on the preceding and the following terga). First visible sternum completely and the following ones partly black. The female paratype of *K. djarkentica* shows a lighter colouration than the Mongolian specimen but a darker than the holotype of *A. fumipennis*. It has a red thorax with black on the posterior part of the medial mesoscutal lobes and the mesoscutellum, the ventral part of the mesepisterna and the pectus. 1st and 2nd tergites black, 3rd-7th tergites with large lateral spots. 1st visible sternum almost completely black, the 2nd with a pair of dark spots. The holotype of *A. fumipennis* represents the lightest form. The thorax is completely red apart from a small brown spot on the posterior part of the medial mesoscutal lobes, the black mesoscutellum and pectus. Abdomen with dorsal parts of 1st-2nd tergum almost dark and 3rd, 4th, 6th and 7th tergum bearing a couple of black spots. Basal sternum black.

The holotype of *Kypharge djarkentica* could not be found in the Zoological Museum of Hamburg. Probably it was destroyed during World War II (S. SCHMIDT, pers. comm.). We studied three paratypes of *K. djarkentica* (coll. NHRS). The female is quite similar to predominantly light forms of *A. regeli*. Thus the proposed synonymy of *K. djarkentica* MALAISE, 1935 is very likely (see above for dates of publication).

Distribution and ecology: South-eastern Kazakhstan, Kyrgyzstan, western Mongolia (province Hovd), north-western China (province Xinjiang Uygur Zizhiqu, Dzungarian Basin) (Fig. 1). The Mongolian specimen was caught in the desert 0.5 km distant from the gallery forest of the Bulgan Gol (F. KOCH, pers. comm.).

Investigated material: 5♀ 2♂.

Asiarge shnitnikovi GUSSAKOVSKIJ, 1935

Asiarge shnitnikovi GUSSAKOVSKIJ, 1935: 290-291, 428-429, ♀♂. Type locality: Kazakhstan, Semiretsh'je [= "Heptapotamien"], Karatal.

Type material: Lectotype ♂ (hereby designated): [circular, golden label, = type specimen]; [Cyrillic:] "Karatal 13.V.1908 SHNITNIKOV"; "*Asiarge shnitnikovi* sp. n. ♂ GUSSAKOVSKIJ det."; [red:] "Lectotypus ♂ *Asiarge shnitnikovi* GUSSAKOVSKIJ 1935 des. S. M. BLANK 96"; "*Asiarge shnitnikovi* GUSSAKOVSKIJ 1935 ♀ det. S. M. BLANK 96". The lectotype is missing the left fore tarsus. Paralectotypes 1♀ [Cyrillic:] "Karatal 1906 [sic!] Kuten-Berte - Dzhar-Tshogan." [backside of the label:] "Semir'ch'e, peski i ber. Karatakha [...] Kurab-Beruz [...] V. SHNITNIK. 2.-3.V.906" and 1♂ [Cyrillic:] "Semir'ch'e, [...] Karatakha, ur. Kurab'-Beruz - ur. Dzhar'-Tshogan' V. SHNITNIK. 2.V.06". Coll. ZMAS.

Discussion: GUSSAKOVSKIJ described *A. shnitnikovi* from one female and three males. One female and two males, which could be studied and which agree with the original description, were designated as lecto- and paralectotypes respectively. The dates of collection of the paralectotypes have erroneously been reported as 1908 instead of 1906 by GUSSAKOVSKIJ (1935).

Distribution: South-eastern Kazakhstan (cf. ZHELOCHOVTSEV, 1976; Fig. 1). One paratype was collected on the sandy banks of the river Karatal ("peski i ber. Karatach [...]).

Investigated material: 1♀ 2♂.

Genus *Kokujewia* KONOW, 1902

Kokujewia KONOW, 1902: 2-3. Type species: *Kokujewia ectrapela* KONOW, 1902, designation by monotypy.

Kokujewia comprises three valid species, *K. clementi*, *K. ectrapela* and *K. palestina*.

Kokujewia clementi ZIRNGIEBL, 1949

Kokujewia clementi ZIRNGIEBL, 1949: 284, ♂♀. Type locality: Turkey, Akşehir [= Ak-Chehir].

Kokujewia taschevi VASSILEV, 1978: 158-159, ♀, **syn. n.** Type locality: Bulgaria, Stara Planina.

Type material: *Kokujewia clementi*. Lectotype ♀ (designated by BLANK, 1996): "Anatolien Ak-Chehir 1900 KORB"; "CoTyp"; "*Kokujewia* sp. n. ♂ E. CLÉMENT det."; "*Kokujewia clementi* ZIRNG. ♀ det. ZIRNG."; [red:] "Lectotypus ♀ *Kokujewia clementi* ZIRNGIEBL 1949 des. S. M. BLANK (1991)"; "*Kokujewia clementi* ZIRNGIEBL 1949 ♀ det. S. M. BLANK 96". The left flagellum is missing. Paralectotype: 1♂ with identical collecting label. Coll. ZSM.

Kokujewia taschevi. The type material was not investigated.

Discussion: BENSON (1968) synonymized *K. clementi* and *K. ectrapela* considering the differences to be intraspecific. In view of the variability no unequivocal species specific morphological characters could be found (e. g., the shape of supra-clypeal area, antennae, ovipositor and ovipositor sheath), but there is no clear evidence due to the paucity of material available for examination. However, there are contrary trends of varying coloration which are related to different distribution areas. Therefore, we consider *K. clementi* and *K. ectrapela* as separate species at present.

Females, which run to *K. clementi*, have the mesoscutellum red, median lobes of the mesoscutum usually red and marked black medially, and the abdomen red with only the first tergum brown. Males have the abdomen red, and the first and narrow anterior margin of the second tergum, rarely a medial spot on the second tergum brown. Such specimens were collected in the southern Balkans and in Turkey. The general coloration of *K. ectrapela* is more darkened. Females have a dark mesoscutellum, the abdomen red with 1st and 2nd terga each with a large brown spot medially, frequently the following terga medially with smaller brown spots. In contrast with this darkened coloration, the median lobes of the mesoscutum are completely red. Males have the abdomen coloured red with the first tergum and the greater part of the second brown, and some of the following terga marked brown medially. Such specimens are known from the Caucasian area. Males tend to have a more or less truncate dorsal lobe of the penis valve in *K. clementi*, whereas it is more or less rounded in *K. ectrapela*. Due to its variability, this character appears ineligible for the differentiation of these species.

The original citation of *K. taschevi* is obscure. VASSILEV (1978: 158-159) listed "*Kokujewia taschevi* VASSILEV, 1975. VASSILEV, 1975, in litt." and mentioned a publication in "Comptes rendus de L'Acad. bulg. des Sciences 28, 8, 247-249" (p. 175). However, neither the part 8 nor the whole volume 28 of this journal contain any publication of I. B. VASSILEV concerning *Kokujewia*. There is no reference to *K. taschevi* within the Zoological Record. Thus the description of VASSILEV (1978: 158-159) is considered to be the original publication of *K. taschevi*. According to the description, the female has a black head with red spots between the antennal sockets and on the postocellar area. Pronotum, mesoscutum and mesoscutellum are red, the median lobe of the mesoscutum is spotted with black. The abdomen is red with the first tergum and the ovipositor sheath black (VASSILEV, 1978). Similarly light coloured specimens of *K. clementi* were collected in Harmanli (Bulgaria), in the vicinity of Thessaloniki (Greek Makedonia) and Akşehir (central Turkey). Despite extensive searching the type material of *K. taschevi* was not located. Most probably greater parts of VASSILEV's collection no longer exist. According to the colour characters mentioned, the proposed synonymy is likely.

Distribution and ecology: Bulgaria (VASSILEV, 1978), northern Greece (Macedonia), western and central Turkey (Fig. 1). Imagines were found from the lowlands (in the vicinity of Thessaloniki) up to 5,000 ft. (Elmadağ).

Investigated material: 4♀ 3♂.

Kokujewia ectrapela KONOW, 1902

Kokujewia ectrapela KONOW, 1902: 3, ♀♂. Type locality: Transcaucasia.

Kokujewia ectrapela var. *clarescens* ZIRNGIEBL, 1949: 284, ♀, syn. n. Type locality: Transcaucasia.

Type material: *Kokujewia ectrapela*. Lectotype ♀ (hereby designated): [red:] "Type"; [rose-coloured:] "N. KOKOUYEW"; "Transcauc."; "coll. KONOW"; "coll. DEI Eberswalde"; [red:] "Lectotypus ♀ *Kokujewia ectrapela* KONOW, 1902 des. S. M. BLANK 1992"; "*Kokujewia ectrapela* KNW. ♀ det. S. M. BLANK 92". The lectotype is missing four tarsomeres on both anterior and middle legs of the right body-side. Paralectotype 1♂ with identical labels. Coll. DEI.

Kokujewia ectrapela var. *clarescens*. Lectotype ♀ (designated by BLANK, 1996): "Transcauc."; [red:] "N. KOKOUYEW"; [handwriting of ENSLIN:] "*Kokujewia ectrapela* ♀"; "*Kokujewia ectrapella* [sic!] v. *clarescens* [sic!] m. ♀"; [red:] "Lectotypus ♀ *Kokujewia ectrapela* var. *clarescens* ZIRNGIEBL 1949 des. S. M. BLANK (1991)"; "*Kokujewia ectrapela* KONOW 1902 ♀ det. S. M. BLANK 96". Three apical tarsomeres of the right anterior leg are missing. Coll. ZSM.

Discussion: For the diagnosis of *K. ectrapela* and the discussion of its status see *K. clementi*. The lectotype of *K. ectrapela* var. *clarescens* bears the same collecting label as the lectotype of *K. ectrapela*. The British Museum preserves a female *K. ectrapela*, which was donated to BENSON by GUSSAKOVSKIJ (BENSON, 1954), which is labelled as "Paratype" and "Lagodechy Grusia MLOKOSIEVITSH" (labels not written by KONOW). These specimens were not taken into consideration when selecting the lectotype and the paralectotype of *K. ectrapela* due to differing in coloration and labelling from the original description.

Distribution and ecology: *K. ectrapela* might belong to the Caspian fauna according to the definition of DE LATTIN (1967). It was collected in Russia (Stavropol', DADURIAN, 1962; North Ossetia, GUSSAKOVSKIJ, 1935), Georgia, Armenia, Azerbaijan, "Transcaucasia" and north-western Iran (Fig. 1). Adults occur from the lowlands (e. g., Muganskaya Step') up to about 2,500 m NN (Elburz Mountains, Takht-i-Suleiman, Iran). The larvae were found living on *Rumex* spec. in Russia (Polygonaceae; GUSSAKOVSKIJ, 1935).

Investigated material: 6♀ 3♂ and two additional specimens from USNM (D. R. SMITH, personal communication).

Kokujewia palestina BENSON, 1954

Kokujewia palestina BENSON, 1954: 271, ♀. Type locality: Israel, Wadi Umm Beghak [= Nahal Boqeq, = Wadi Umbaghik, = Wadi Umbarrik].

Type material: *Kokujewia palestina*. Holotype ♀: [circular label:] "Type"; "Wadi Umbaghik PALESTINE e. l. III. 1945 leg. BYTINSKI-SALZ"; "*Kokujewia palestina* sp. n. BENSON 1954"; "BM.TYPE HYM. 1.672". The abdominal terga are shrunken, the cocoon is preserved on the pin. Coll. NHM.

Discussion: The holotype of *K. palestina* represents a very light form, which has a red mesoscutum and mesoscutellum and a red abdomen with only the first tergum coloured black. The head is completely black. The ovipositor sheath is broadly rounded behind (Fig. 6). BENSON (1968) considered the morphological characters of the holotype (shape of ovipositor

sheath and tarsi) to be artificial due to rearing and synonymized it with *K. ectrapela*. In the coll. TAUI there is a second specimen collected in En Gedi in Israel, which is very similar in general coloration and the structure of the ovipositor sheath. Therefore, we regard *K. palestina*, as a valid species differing from the other *Kokujewia* species.

The difference in spelling "Wadi Umbarrik" and "Wadi Umbaghik" (BENSON, 1954, 1955) most probably derives from the transliteration of the Arab name of the collection locality. Most likely it corresponds with Wadi Umm Beghak in Israel (Nahal Boqeq in Hebrew, 31.12° N 35.22° E; A. FREIDBERG, pers. comm.) due to similarity in sound and because it is close and similar in nature to En Gedi.

Distribution and ecology: Only known from the Jordan valley in Israel (Fig. 1). The larvae are oligophagous on Polygonaceae. *K. palestina* was reared from *Emex* spec. (BENSON, 1955) and from *Rumex rosea* (specimen from coll. TAUI). Development appears to take one year, because the specimen from En Gedi was collected on 25.3.1957 as a larva and the adult emerged on 26.3.1958. The locality En Gedi represents a desert area close to the Dead Sea.

Investigated material: 2♀.

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Besprechungen

The Flying Honeybees; Aspects of Energetics = Die fliegende Honigbiene: Aspekte der Energetik / NACHTIGALL, W. (Hrsg.). - Stuttgart: Fischer Verl., 1988. - 151 S. - (Biona report; 6). - 28.- DM

Honigbienen sind nach wie vor spannende Untersuchungsobjekte. Den grundlegenden Aussagen zur Kommunikation und Orientierung durch KARL VON FRISCH folgen heute immer detailliertere Ergebnisse. "The Flying Honeybee, Aspects of Energetics" faßt unter der Herausgeberschaft von WERNER NACHTIGALL neue Erkenntnisse über Stoffwechsel, Energiehaushalt und Thermoregulation während des Fluges zusammen, die auf zwei Symposien im November 1982 und Oktober 1987 vorgestellt wurden. Die Arbeitsgruppe um HERBERT HERAN befaßte sich mit thermobiologischen Fragen, Wasserhaushalt, Zuckerresorption und der Versorgung mit dem nötigen Reiseproviant für den Flug. GUDRUN KÖNIGER und STEFAN BERG untersuchten die Entwicklungsstufen der Flugmuskulatur auf biochemischer Basis. WOLFGANG EDRICH und ROBIN MORITZ berichten über die Orientierungsleistungen von Drohnen bei ihrem Hochzeitsflug und von Sammelbienen, die beim Trachtflug Umwege zurücklegen mußten. VOLKER NEESE stellte fest, daß hochempfindliche Spannungsrezeptoren in der Honigblasenwand, die aufgrund der Absorption des Reiseproviantes den Abfall der mechanischen Wandspannung messen, wohl als "Kilometerzähler" dienen.

Die beiden Symposien und die Herausgabe des vorliegenden Berichtes wurden von Bundes- und Länderministerien, durch die Stiftungen Volkswagenwerk und verschiedene Firmen unterstützt. Wie auch MARTIN LINDAUER in seinem Vorwort betont, sind die hier vorgestellten, umfassenden Ergebnisse nicht nur für die reine Grundlagenforschung sondern auch für die praktische Imkerei ein wichtiger Schritt.

S. M. BLANK