

A PRELIMINARY REVISION OF THE GENUS GLYPHOTMETHIS BEY-BIENKO (ORTHOPTERA: PAMPHAGIDAE)

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History of the Genus

The first species of *Glyphotmethis* was described by Brunner von Wattenwyl in 1882 under the name *Glyphanus (Eremobia) heldreichi* from Greece and Macedonia. A further two species, i. e. *escherichi* Krauss and *holtzi* Werner, were described from Turkey as representatives of the genus *Eremobia*.

In 1928 Uvarov described a new race *adaliae* from Turkey, and classified it as a subspecies of the micropterous species *heldreichi*, distributed in Greece. In 1934, the same author described several new forms (*ovipennis*, *inermis*, *dimorphus*) from Turkey, which he classified, incl. *escherichi* Krauss as subspecies of the species *Tmethis heldreichi* [all forms, with exception of *heldreichi*, exhibit red innersides to the posterior tibiae]. In this communication only "*holtzi*" (= *pulchripes*) is considered as a valid species, primarily in regard to its bluish posterior tibiae.

In 1943 Uvarov in his revision of the tribe Thrinchini erected a new genus *Asiotmethis* for a number of species classified prior to that time within the heterogenous genus *Tmethis* Fieber. In this excellent paper he described a further new species *A. pulchripes* and stated a presumption that the subspecies *dimorphus* was identical with *holtzi* (this erroneous idea was followed also by Bey-Bienko, 1951: 314). In this paper also *holtzi* is classified as a subspecies of *heldreichi* (this combination was unnatural and could not be tolerated).

In 1951 Ramme published his study on the Anatolian species of the genus *Asiotmethis* in which he described a further new species (*A. sevketi*) and three new subspecies (*A. escherichi elatior*, *A. dimorphus armenus* and *A. heldreichi rubrescens*). Ramme is correct in his opinion that the unnatural combination of the Anatolian forms with the Greek *heldreichi* cannot be tolerated; the forms *ovipennis* Uv., *inermis* Uv., *adaliae* Uv. and *dimorphus* Uv. he considers as independent species. In contradistinction to Uvarov (l. c. 1943) and Bey-Bienko (l. c. 1951) he does not consider *pulchripes* as an independent species, classifying it as a subspecies of *holtzi*.*) Ramme (l. c. 1951: 272) in the introductory part of

*) Pl. XXIX, fig. 1 and 3, contains some substantial confusions herewith corrected: Fig. 1. left ♂ *G. escherichi escherichi* (Krauss), right ♂ *G. escherichi elatior* Ramme. Fig. 3. *Glyphotmethis holtzi holtzi* (Werner) ♂, ♀.

his paper refers to the species *brevipes*, n. sp., which was not described within the latter paper, however. According to kind information of Dr. Kurt K. Günther in the collections of Zool. Mus. in Berlin there is no specimen marked as "*Asiotmethis brevipes*, sp. n."

Bey-Bienko in 1951 separated 3 Anatolian species and 1 Greek species from the genus *Asiotmethis* and quite competently erected a new genus, *Glyphotmethis*. Also Bey-Bienko separated the Anatolian forms, described by Uvarov, from the Greek *heldreichi* and classified them as subspecies of the Anatolian species *escherichi*. He also considers as independent species *heldreichi*, *escherichi*, *holtzi* and *pulchripes*; these species with exception of *pulchripes* fall into subspecies; two new subspecies were described in this paper of Bey-Bienko (*G. holtzi extimus*, *G. heldreichi macedonicus*).

In 1956 Karabağ (l. c. 1956: 127) described from the environs of Cihanbeyli a new form, *spinusus*, which he classified as a subspecies of *pulchripes* Uv.

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Material

Through the courtesy of the above mentioned specialists I received for study materials from their institutions as follows:

Naturhistorisches Museum, Vienna (Nat. Mus. Wien): Zoological Institute of the Academy of Sciences of U.S.S.R., Leningrad (Zool. Inst. Leningrad): Zoologisches Museum of the Humboldt-Universität, Berlin (Zool. Mus. Berlin): Naturhistoriska Riksmuseum, Stockholm (Nat. Mus. Stockholm): Zoologische Sammlung des Bayerischen Staates, Munich (Zool. Samml. München): Department of Entomology, National Museum, Prague (Nat. Mus. Prague): Department of Entomology, British Museum (Natural History), London (Brit. Mus. London): Deutsches Entomologisches Institut, Berlin (Dtsch. Ent. Inst. Berlin): Zoologisches Staatsinstitut und Zoologisches Museum, Hamburg (Zool. Mus. Hamburg).

Altogether nearly 180 specimens were made available for study. All the specimens studied by me were returned to the respective Museums and Universities.

Genus **Glyphotmethis** Bey-Bienko

Glyphotmethis Bey-Bienko, 1951, in Bey-Bienko and Mistshenko, Saranchevye Fauny USSR i sopredel'nykh stran, I: 313.

Type-species: *Eremobia escherichi* Krauss.

Body covered with dense, long hairs; the most striking vestiture is at posterior tibiae where the very apparent "brush" is developed. Elytra of ♂♂ are of a different degree of development — from microptery to hyperptery, elytra of ♀♀ strongly shortened, relatively wide, dorsolateral. Metazona of pronotum thin, narrow, with flat margins; posterior margin usually rounded (more rarely angled). Middle tibiae with a row of small tubercles along the upper margin (with exception of *G. ovipennis*). Abdomen, mainly in ♀♀ at posterior margins of tergites with strong processes forming 3 apparent longitudinal rows; processes of the middle row are acuteangled. Posterior tibiae moderately curved. Arolia of ♂♂ are large, rounded, longer than half of the claws; arolia of ♀♀ reach to a half of the claws.

The genus *Glyphotmethis* with the related genera *Asiotmethis* Uvarov, *Pezotmethis* Uvarov and *Glyphanus* Fieber belongs to the subfamily *Akicerinae* (conf. Dirsh, 1961: 376).

From the closely related genus *Asiotmethis* differs mainly by a large arolium in ♂ nearly equal in length to the claw, in ♀ reaching to the half of the length of claw.

Further differences are in the moderately bent posterior tibiae, relatively short metazona of pronotum (in ♀♀ is hardly longer than prozona) and strongly shortened dorsolateral elytra in all females.

In degree of development of the wings *Glyphotmethis* is closely related to *Pezotmethis* Uv., but differs by thin metazona, more dense vestiture of body (mainly of the extremities), shape and size of arolium of ♂♂, more strongly developed processes at posterior margins of tergites.

In degree of development of the arolium and in flat, posteriorly rounded metazona, *Glyphotmethis* runs closely to the genus *Glyphanus* Fieb., but differs by more developed, relatively wide, dorsolateral elytra, narrower triangular metazona of pronotum, wider vertex and bent posterior tibiae.

Glyphotmethis is related to *Asiotmethis* and *Pezotmethis* also in the shape of the tympanal organ and shape of the posterior femora.

Taxonomic characters and variation

The exceedingly uniform general habitus of specimens of the genus *Glyphotmethis*, especially in female sex, make their taxonomic study very difficult. A very important taxonomic character is the degree of the development of elytra in ♂♂ which lies not only in relative length and width of the elytra but primarily in its shape, which is for many species rather constant. Also the course of I. and II. vena axillaris in wing of ♂♂ is a good feature, in spite of a certain tendency to fusion in some specimens. Structure of pronotum is very characteristic for respective species and

subspecies (e.g. height and shape of the keel of prozona, lateral tubercle of mesozona, sculpture and shape of metazona etc.); proportion between prozona and metazona in ♂♂ is important. Also the colouring of the innerside of the posterior femur and tibia is an important taxonomic feature, as it is in species of the genus *Calliptamus*.

All remaining characters are subjected to strong individual variability; also the elytra in ♀♀ are more strongly variable than in ♂♂.

The male genitalia are not used for identification of taxons within the present paper as most of the male specimens deposited in Zool. Mus. Berlin are devoid of copulatory organs. These organs are also lacking, not only in types of *A. sevketi*, *A. dimorphus armenus*, *A. escherichi elatior* but also in holotype of *A. adaliae*, deposited in Dtsch. Ent. Inst. Berlin.

Geographical distribution

The area of geographical distribution of *Glyphotmethis* covers Asia Minor from Sivas (in the east) to Izmir (in the west) and the Southern Balkans (Greece, Macedonia). In Europe the utmost northern borderline runs through Plaús Planina in Macedonia.

Key to the species

Males

- 1/4 Elytra fully developed, reaching nearly to the posterior knees or distinctly extending beyond them.
- 2/3 Smaller insects (22.5—27.5 mm). Innerside of posterior femur from dark blue to black. Elytra shorter, reaching nearly to the posterior knees or only inconspicuously beyond them. *G. holtzi* (Werner)
- 3/2 Larger insects (27.5—30.5 mm). Innerside of posterior femur carmine-red, gradually turning to violaceous near the base. Elytra longer, reaching at least to 1/3 of posterior tibiae *G. dimorphus* (Uvarov)
- 4/1 Elytra shortened (on average reaching to 1/2 of posterior femur, exceptionally to 3/4 of posterior femur).
- 5/6 Innerside of posterior tibiae yellow. Innerside of posterior femur yellow, near base with pink, red or blue macula *G. heldreichi* (Br.-W.)
- 6/5 Innerside of posterior tibiae red. Innerside of posterior femur unicolorous red or near the base with larger or smaller blue to blue-violaceous macula.
- 7/8 Elytron distinctly shorter than pronotum; its maximum width in apical 1/4 (Fig. 24). Upper margin of middle tibia without small tubercles (Fig. 22). Innerside of posterior femur red, near the base with bluish-black macula *G. ovipennis* (Uvarov)
- 8/7 Elytron distinctly longer than pronotum; its maximum width closely in front of the centre, in the middle or in apical 1/3 (Figs. 25, 32, 39, 45, 55, 57). Middle tibia with a series of tubercles along upper margin (Fig. 33). Innerside of posterior femur unicolorous red or in basal half with a large dark violaceous macula with bluish borders.
- 9/12 Lateral tubercle of mesozona large, acute. Posterior margin of metazona angled (Fig. 36).
- 10/11 Larger insects (25—28.1 mm), with wider thorax. Metazona convex (or flat; in latter case in the basal 1/2 of posterior femur the large dark violaceous macula is developed), more slightly sculptured, 1.5—1.7× longer than prozona (Figs. 26, 31); I. and II. vena axillaris along its whole course distinctly separated (Figs. 27, 30). Elytron longer, extending beyond the half of posterior femur *G. escherichi* (Krauss)

- 11/10 Smaller insects (24.3 mm), with narrower thorax. Metazona flat, strongly sculptured, twice as long as prozona (Fig. 35). I. vena axillaris interrupted; the ends of interrupted parts are fused with II. vena axillaris (Fig. 34). Elytron shorter, not reaching to the half of posterior femur **G. sevketi** (Ramme)
- 12/9 Lateral tubercle of mesozona small, rounded (or practically absent). Posterior margin of metazona rounded (Figs. 56, 58, 89, 90, 91).
- 13/14 Elytron very narrow, nearly 3X as long as its width (Fig. 39), wing with dark brown band. Metazona very short, 1.5X wider than long **G. raggei**, n. sp.
- 14/13 Elytron wider, approximatively twice as long as their maximum width (Figs. 45, 55, 57), wing either pellucid or with isolated dark brown spots, mainly in area of the axillar veins. Metazona longer (than in preceding species), 1.1–1.3X wider than long.
- 15/16 Pronotum practically smooth. Elytra more than twice as long as their maximum width which is in the apical third (Fig. 45). Posterior femur and tibia sanguineous on the inner sides. Keel of prozona low (Fig. 43) **G. inermis** (Uvarov)
- 16/15 Pronotum with rounded tubercles. Elytra less than twice as long as their maximum width which is in the middle (Figs. 55, 57). Posterior femur and tibia carmine-red on the inner sides. Keel of prozona higher (Figs. 48, 50) **G. adaliae** (Uvarov)

Females

(Preliminary key enabling only the identification of typical specimens)

- 1/2 Posterior tibiae unicolorous yellow **G. heldreichi** (Br.-W.)
- 2/1 Posterior tibiae with gay colouring. Outer side yellow or ochraceous, inner side either unicolorous red or the basal part blue, apical part red or the whole inner side of posterior tibia black.
- 3/4 Inner side of posterior femur in basal 1/2 to 2/3 blue (metazona only inconspicuously longer than prozona, its posterior margin angled or narrowly rounded; then the inner sides of tibiae in basal part blue, in apical part red) or black. Inner side of posterior tibia red with blue upper edge or blue near the base, in apical part red, or the whole inner side of posterior tibia bluish black **G. holtzi** (Werner)
- 4/3 Inner side of posterior femur reddish (near the base often bearing an indistinct violaceous spot) or in basal half a large dark violaceous macula (reaching to 1/2 of femur) with bluish borders; in latter case the metazona is distinctly longer than prozona (1.6X), its posterior margin is broadly rounded (Fig. 81). Inner side of posterior tibia red.
- 5/6 Upper margin of middle tibia smooth (without small tubercles). Apex of elytron cut off nearly straight (Fig. 23) **G. ovipennis** (Uvarov)
- 6/5 Upper margin of middle tibia with small tubercles along the whole length or at least in basal part. Apex of elytron widely or narrowly rounded (Figs. 13, 15, 28).
- 7/12 Keel of prozona high (Figs. 11, 29), incisions between individual lobes deep (Figs. 11, 29).
- 8/11 Posterior margin of metazona rounded (Fig. 10).
- 9/10 Metazona with rougher sculpture (tubercles are larger, more sparse), elytron on average narrower, longer, apex of elytron narrowly rounded or the elytron is wide, anterior margin in basal part strongly convex, in apical part concave (Figs. 13, 15) **G. dimorphus** (Uvarov)
- 10/9 Metazona with finer sculpture (tubercles are smaller, more dense), elytron on average wider, shorter, apex of elytron bluntly rounded (Fig. 28) **G. escherichi** (Krauss)
- 11/8 Posterior margin of metazona angled (Figs. 37, 83) **G. sevketi** (Ramme)
- 12/7 Keel of prozona low, incisions between individual lobes small (Figs. 47, 60).
- 13/14 Metazona in lateral view moderately vaulted. Posterior margin moderately angled (Fig. 86), keel of prozona higher, sharp, lobes of prozona very conspicuous. Innerside of posterior femur unicolorous red. Body more robust **G. inermis** (Uvarov)

- 14/13 Metazona in lateral view straight. Posterior margin distinctly rounded (Figs. 91, 93), keel of prozona low, blunt, lobes of prozona nearly inconspicuous. Innerside of posterior femur red, near the base with violaceous macula. Body more slender **G. adaliae** (Uvarov)

***Glyphotmethis holtzi* (Werner), 1901**

Eremobia Holtzi Werner, 1901, Sitz. Ber. Akad. Wiss. Wien, mat.-nat. Cl., 110: 281.

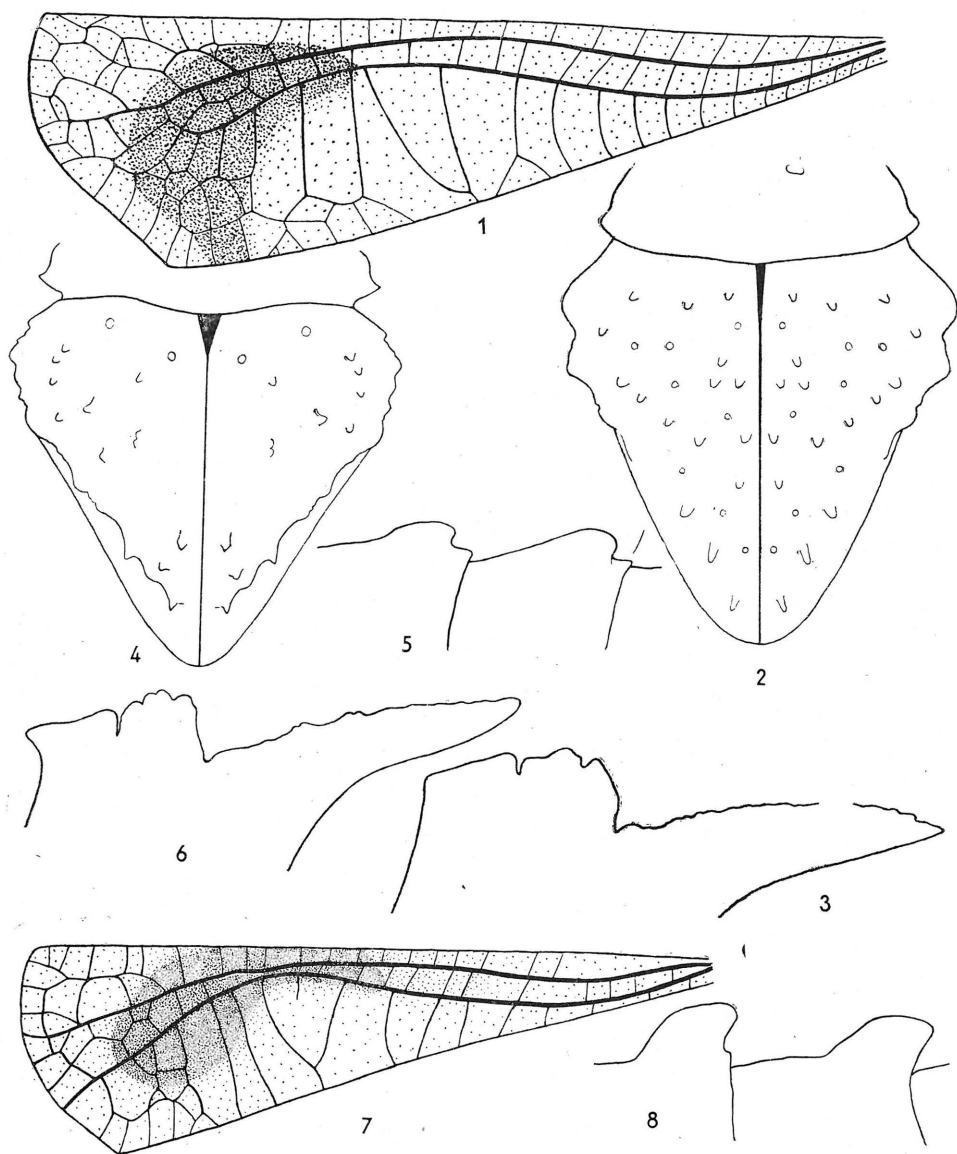
♂: Elytra fully developed, reaching nearly to the posterior knees or somewhat (inconspicuously) extending beyond. Wings normally developed with dispersed (i. e. indistinct) narrow black-brown band. I. and II. vena axillaris along their whole courses distinctly separated (Figs. 1, 7). Keel of prozona high, tridentate (in some specimens shown by more denticles), metazona thin or in front of its posterior margin thickened and triangular. Posterior part of metazona strongly narrowed, its posterior margin narrowly rounded (Figs. 2, 4). Middle tibiae with a series of tubercles along upper margin. Inner side of the posterior femur in basal part (to $1/2$ till $2/3$) dark blue or black. Inner side of the posterior tibiae carmine-red or at base blue, in apical part red, or the inner side of tibia is blue-black, or changing in apical $1/3$ to orange-red colour.

♀: Colouring of posterior extremities (i. e. femur and tibia) as in males. For differences in detail see the key to the subspecies.

From the closely related species *G. dimorphus* (Uv.) differs mainly in smaller size of the male sex, shorter elytra, narrower band on the wing, shape of the metazona (in *holtzi* in the posterior part being much narrower than in *dimorphus*, see figs. 62, 68) and in colouring of the posterior extremities. In female sex differs mainly in colouring of the innerside of the posterior femur.

Key to the subspecies

- 1/4 Inner side of posterior tibiae carmine-red.
- 2/3 Form of thorax more slender in both sexes. Elytra of ♂ and ♀ on the average shorter and narrower; in ♂ nearly reaching to posterior knees (or in a few specimens inconspicuously extending beyond); in ♀ elytron reaches a little over 1st abdominal tergite (maximally reaching beyond $1/2$ of second abdominal tergite). Upper edge of posterior tibia with distinct bluish tint, or wholly blue. Posterior femora and tibiae on the average shorter (see measurements, p. 458) **G. holtzi holtzi** (Werner)
- 3/2 Form of thorax broader in both sexes. Elytra of ♂ and ♀ on the average longer and wider; in ♂ distinctly reaching a little beyond posterior knees, in ♀ reaching nearly to the end of 2nd abdominal tergite or inconspicuously reaching beyond it. Upper edge of posterior tibia with indistinct blue tint. Posterior femora and tibiae on the average longer (see measurements, p. 459) . . . **G. holtzi extimus** Bey-Bienko
- 4/1 Inner side of posterior tibiae at base blue, in apical part red (*G. h. pulchripes*) or blue-black, changing in apical third into orange-red (*G. h. spinosus*).
- 5/6 Elytra of ♂ shorter, reaching nearly to the posterior knees (not overlapping beyond them). Posterior femur blue at inner side. In the general colouring the white-grey is dominant. Elytron (♂, ♀) nearly without pattern. Abdomen of ♀ in tergal part not wrinkled. Central set and two sublateral sets of blunt wrinkles less distinct; processes in central line are small, blunt, not extending beyond the posterior margin of tergite (Fig. 5) **G. h. pulchripes** (Uv.)



Glyphotmethis holtzi holtzi (Wern.): fig. 1. Part of left wing in ♂; fig. 2. Metazona of ♂ (dorsal view); fig. 3. Pronotum of ♂ (lateral view). *G. holtzi pulchripes* (Uv.): fig. 4. Metazona of ♂ (dorsal view); fig. 5. Processes of II. and III. abdominal tergites in ♀ (lateral view); fig. 6. Pronotum of ♂ (dorsal view); fig. 7. Part of left wing in ♂ (dorsal view). *G. holtzi spinosus* Karabağ: fig. 8. Processes of II. and III. abdominal tergites of ♀ (lateral view).

6/5 Elytra of ♂ longer, reaching beyond the posterior knees. Posterior femur at inner side black. In general colouring from dirty brown to black. Elytron (♂, ♀) with black pattern. Abdomen of ♀ in tergal part strongly wrinkled. Central set and two sublateral sets of sharp wrinkles are very distinct; processes in central line are large, extending beyond the posterior margin of tergite (Fig. 8).

G. h. spinosus Karabağ

Glyphotmethis holtzi holtzi (Werner), 1901

Eremobia Holtzi Werner, 1901, Sitz. Ber. Akad. Wiss. Wien, mat.-nat. Cl., 110: 281. Lectotype ♂, Asia Minor, Cilician Taurus (M. Holtz). In the collections of the Zoologisches Museum in Berlin.

Tmethis Holtzi; Kirby, 1910, Syn. Cat. Orth., 3: 287.

Asiotmethis heldreichi holtzi; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93:56.

Asiotmethis holtzi; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 274, 276, 410, 426.

Glyphotmethis holtzi holtzi; Bey-Bienko, 1951, Sar. Fauny USSR, 1: 314.

Glyphotmethis holtzi holtzi; Karabağ, 1958, Orth. F. Turkey: 110.

Material examined: 8 ♂♂, 7 ♀♀

♂ lectotype, 3 ♂♂ syntypes, Asia Minor, Cilician Taurus (M. Holtz) (coll. Zool. Mus. Berlin)

Asia Minor; Ulukisla, 17. and 22. VII. 1937, 2 ♂♂ and 4 ♀♀ (W. Ramme) (coll. Zool. Mus. Berlin); Ulukisla, 22. VII. 1937, ♂ (Ramme) (coll. Nat. Mus. Stockholm); Ulukisla, 17. and 22. VII. 1937, ♂, ♀ (Ramme) (coll. Brit. Mus. London); 2 ♀♀, no data (coll. Nat. Mus. Stockholm).

Elytra of ♂ reaching nearly to the posterior knees or only inconspicuously beyond them. Elytron of ♀ reaches inconspicuously beyond 1. abdominal tergite (maximally reaching beyond the half of the second abdominal tergite). Upper edge of the posterior tibia with distinct bluish tint or wholly blue. Inner side of the posterior tibiae carmine-red.

Measurements in mm

	min.	males max.	\bar{x}	min.	females max.	\bar{x}
Length of body	24.0	25.5	25.0	32.0	35.0	33.5
Length of pronotum	7.2	9.0	8.2	9.2	10.0	9.5
Length of prozona	2.9	4.0	3.3	4.1	4.5	4.2
Length of elytron	16.0	20.0	17.8	7.0	9.6	7.6
Length of posterior femur	12.2	14.0	13.0	16.0	16.6	16.1
Length of posterior tibia	10.8	12.0	11.1	12.2	13.6	13.0

From subspecies *pulchripes* Uv. and *spinosus* Karabağ differs mainly by colouring of the inner side of posterior tibiae; from *pulchripes* by longer elytra of ♂.

Classical locality is unknown. Werner described this species from "Cilician Taurus" upon a few ♂♂, deposited in Zoologisches Museum in Berlin. It is very probable that Werner did not mark the type. From Dr. K. K. Günther and Professor Dr. M. Beier I obtained information that the type is deposited neither in Zoolog. Museum in Berlin nor in Naturhistorisches Museum in Vienna. Ramme marked the original material, deposited until this time in Zool. Mus. Berlin inaccurately as "Paratypes", although perhaps they were the syntypes. Regarding this fact I selected and marked

a male lectotype from 4 syntypes (ex coll. Zool. Mus. Berlin); remaining 3 ♂♂ I assigned as the paralectotypes.

Distribution: Central and southern Anatolia.

***Glyphotmethis holtzi extimus* Bey-Bienko, 1951**

Glyphotmethis holtzi extimus Bey-Bienko, 1951, Sar. Fauny USSR, I: 314. Holotype ♂, Asia Minor, Ovacik (Canciri), N. of Ankara. In the coll. Zool. Inst. Leningrad.

Glyphotmethis holtzi extimus; Karabağ, 1958, Orth. F. Turkey: 111.

Material examined: 3 ♂♂, 3 ♀♀

♂ holotype, ♀ allotype, Asia Minor, Ovadjik, Cappadocia, 1904 (M. Holtz) (coll. Zool. Inst. Leningrad)

Asia Minor: Ovadjik, Cappadocia, no data, ♂, ♀ (coll. Nat. Mus. Stockholm); Ovadjik, Cappadocia, no data, ♂, ♀ (coll. Dtsch. Ent. Inst. Berlin).

Diagnosis see key to the subspecies (p. 456).

Measurements in mm

	males			females		
	min.	max.	\bar{x}	min.	max.	\bar{x}
Length of body	26.0	28.0	27.1	33.1	38.0	34.6
Length of pronotum	8.2	8.9	8.5	10.1	10.3	10.2
Length of prozona	3.1	3.5	3.2	4.2	4.4	4.3
Length of elytron	20.0	21.0	20.6	8.0	9.0	8.5
Length of posterior femur	14.0	15.0	14.4	17.0	18.0	17.3
Length of posterior tibia	12.2	12.5	12.3	14.1	15.1	14.8

Form closely related to the typical subspecies. It is not impossible that a mere local populations is in question. This can be solved only if studied on the basis of more extensive material from various localities.

Distribution: Known only from one locality: Ovacik (Cankiri), about 100 kms N. of Ankara.

***Glyphotmethis holtzi pulchripes* (Uvarov), 1943**

Tmethis holtzi; Uvarov, 1934, Eos, 10: 111 (nec Werner).

Asiotmethis pulchripes Uvarov, 1943, Trans. R. Ent. Soc. Lond., 98: 57. ♂ holotype, Asia Minor, between Ankara and Tuz-Goel (Tuzgölü). In the collections of Brit. Mus. London.

Asiotmethis holtzi pulchripes; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 275, 276, 426.

Glyphotmethis pulchripes; Bey-Bienko, 1951, Sar. Fauny USSR, I: 315.

Glyphotmethis pulchripes; Karabağ, 1958, Orth. F. Turkey: 111.

Material examined: 6 ♂♂, 6 ♀♀

Asia Minor: Ütsch Kapular Dag (near Niğde), 18. 21. and 23. VIII. 1937, 4 ♂♂, 4 ♀♀ (Ramme) (coll. Zool. Mus. Berlin); ♂, ♀, same data (coll. Nat. Mus. Stockholm); Nevsehir (Niğde), 20. VI. 1952, ♂, ♀ (P. H. Davis) (coll. A. Čejchan, ex coll. Brit. Mus. London).

Elytra of ♂ rarely reaching to the posterior knees, but never extending beyond them. Elytron of ♀ strongly reduced, dorsolateral, oval, reaching only slightly beyond the 1. abdominal tergite. Metazona triangular, in posterior part strongly narrowing (Fig. 4). Posterior tibiae at inner side near the base dark blue, in apical part carmine-red (relation of both tints is very variable).

	Measurements in mm					
	min.	males max.	\bar{x}	min.	females max.	\bar{x}
Length of body	20.0	24.0	22.5	26.0	32.0	29.6
Length of pronotum	5.8	8.1	7.1	8.0	10.0	9.2
Length of prozona	2.2	3.2	2.8	3.8	4.8	4.2
Length of elytron	10.6	15.6	14.4	4.8	7.0	5.7
Length of posterior femur	11.0	13.5	11.9	14.0	17.0	15.8
Length of posterior tibia	9.2	11.0	10.2	12.0	15.0	13.2

In comparison with nominate subspecies smaller, in general colouring the white-grey colour is dominant.

In agreement with Ramme (l. c. 1951: 275) I add this subspecies to *holtzi*, although it is not decided definitely whether the form is not an independent species. Final opinion on this problem will be formed by means of investigation of the geographical distribution of both forms.

Axillar veins in wings in most specimens are separated, in a few specimens I. and II. vena axillaris in the apical third are strongly narrowed or at one point fused together, however. In *pulchripes* there occurs also a considerable variability in colouring of the inner side of posterior tibia; in some specimens the red colouring is reduced to a mere narrow stripe in apical part. The "phenomenon" of the colouring of killed specimens, mentioned also by Ramme (l. c. 1951: 275) is a very remarkable one. This postmortem change to white in the typical subspecies does not occur. Consequently, the subspecific combination must be considered problematical.

The geographical distribution is so far insufficiently known, so that it cannot be stated with certainty whether a clean-cut geographical population or an independent variable species is in question.

Distribution: Centre of distribution in central Anatolia.

***Glyphotmethis holtzi spinosus* Karabağ, 1956**

Glyphotmethis pulchripes spinosus Karabağ, 1956, Eos, 32: 127. ♂ holotype, Asia Minor, Konya province: Cihanbeyli; Tuzgölü, Yavsan memlehasi. In the coll. Brit. Mus. London.

Glyphotmethis pulchripes spinosus; Karabağ, 1958, Orth. F. Turkey: 112.

Material examined: 1 ♀

♀ paratype, Asia Minor, Konya province: Cihanbeyli; Tuzgölü, Yavsan memlehasi (in Artemisia steppe), 900 m., 8. VI. 1952 (P. H. Davis) (coll. Brit. Mus. London)

After Karabağ (l. c. 1956: 127—128) ♂: Pronotum covered with acute dense tubercles; prozonal carina strongly raised, trilobate; upper edge of first lobe in profile almost straight; second lobe seen from above irregularly expanded, deeply concave; third lobe triangular in profile; metazona depressed near the median furrow, seen from above broadly triangular; median carina on metazona well developed; lateral carinae very distinct, with strong and acute tubercles. Elytra and wings fully developed, reaching beyond hind knees. Hind femur with the upper outer area covered with dense acute tubercles.

Hind femur black inside, with a light brown pregenicular fascia and a yellowish-brown patch on the lower inner knee lobe; hind tibia on the inside blackish-blue, gradually turning to orange-red in the apical third; hind tarsus yellowish.

♀: Pronotum covered with dense and irregular acute tubercles. Elytra lateral, scale like, oval, reaching first third of the second tergite (in some individuals much shorter, reaching only the last third of first tergite). Abdomen above strongly rugose, with a very distinct median and two sub-lateral series of sharp wrinkles.

Measurements in mm:

Length of body, ♂ 20.5 (holotype), ♀ 27.8–30.0; pronotum ♂ 7, ♀ 9.2–10.0; elytra ♂ 13.2, ♀ 5.5–6.5; hind femur ♂ 11.4, ♀ 16.2–16.4 mm (After Karabağ, l. c. 1956: 128).

This subspecies differs from *pulchripes* (Uv.) by the more rugulose head, pronotum and abdomen; longer elytra of the male and colouring of posterior femur.

It is not impossible that this is an independent species. This statement will be possible on the basis of investigation of more extensive material from various localities. For the present I classify preliminarily this form as a subspecies of *holtzi*.

Distribution: This subspecies is known only from one locality in Central Anatolia (Cihanbeyli; Tuzgölü).

Glyphotmethis dimorphus (Uvarov), 1934

Tmethis heldreichi dimorphus Uvarov; 1934, Eos, 10: 108, 109.

♂: Elytra fully developed, distinctly reaching beyond the posterior kness (in typical subspecies reaching to $\frac{1}{3}$ of posterior tibiae, in subspecies *armenus* beyond $\frac{1}{2}$ of hind tibiae). Wing normally developed with dispersed black-brown band. I. and II. vena axillaris along their whole courses distinctly separated (Fig. 14). Pronotum with sharp, large tubercles. Keel of prozona high, tridentate; upper edge of anterior lobe in profile practically straight (moderately sloping downwards to the head), further two lobes irregularly convex. Metazona nearly flat, 1.8–2.5× longer than prozona. Posterior margin of metazona distinctly rounded (Fig. 9), with narrow light border. Metazona with numerous large tubercles. Lateral tubercle of mesozona large, sharp, triangular (Fig. 9).

Middle tibiae with a set of tubercles along the upper margin. Posterior femur inside carmine-red, gradually turning to violaceous near the base. Posterior tibiae at the inner side carmine-red.

Valid species. Closely related to *G. holtzi*, but differs from it in male sex by larger stature, longer and wider elytra, longer wings, longer metazona (in relation to prozona), by colouring of the inner side of posterior tibiae, broader band on wing. In the female sex differs mainly by colouring of the inner side of posterior femur and broadly rounded posterior margin of metazona.

Key to the subspecies

- 1/2 Elytra of ♂ shorter, reaching to 1/3 of posterior tibiae. Elytra of ♀ short, narrow, 1.8—2× longer than their maximum width. ***G. dimorphus dimorphus*** (Uvarov)
 2/1 Elytra of ♂ longer, reaching beyond 1/2 of posterior tibiae. Elytra of ♀ short, wide, 1.2× longer than their maximum width. ***G. dimorphus armenus*** (Ramme)

Glyphotmethis dimorphus dimorphus (Uvarov), 1934

Tmethis heldreichi dimorphus Uvarov, 1934, Eos, 10: 108, 109. ♂ holotype, Asia Minor, Afyonkarahisar. In the collections of Brit. Mus. London.

Asiotmethis heldreichi dimorphus; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93: 56.

Asiotmethis dimorphus; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 275, 426.

Glyphotmethis holtzi dimorphus; Bey-Bienko, 1951, Sar. Fauny USSR, I: 314.

Glyphotmethis holtzi dimorphus; Karabağ, 1958, Orth. F. Turkey: 111.

Material examined: 6 ♂♂, 8 ♀♀

♂, ♀ paratypes, Asia Minor, Afium (now Afyonkarahisar), 16. III. 1927 (Tockhorn) (coll. Zool. Mus. Berlin); ♂ paratype, no locality, 1928 (Sureya) (coll. Zool. Mus. Berlin); ♂ paratype, Ak-Chehir, 16.—28. VI. ? (Wagner) (coll. Brit. Mus. London). Asia Minor: Afium, 19. VI. 1927, ♂ — 19. V. 1927, ♂ — 16. III. 1927, ♀ (Tockhorn) (coll. Dtsch. Ent. Inst. Berlin); Kutheia, 28. VII. 1927, ♀ (Baumann) (coll. Dtsch. Ent. Inst. Berlin); Afium, 19. VI. 1927 (Tockhorn) ♂ (coll. Zool. Inst. Leningrad); Afium, 19. VI. 1927, ♀ (Tockhorn), 1. VI. 1927, 2 ♀♀ (Tockhorn) (coll. Dtsch. Ent. Inst. Berlin); Kutheia, 28. VII. 1927, ♀ (Baumann) (coll. Zool. Inst. Leningrad); Kutheia, 28. VII. 1927, ♀ (Tockhorn) (coll. Brit. Mus. London).

Elytra of ♂ fully developed, reaching to 1/3 of posterior tibiae. Elytra of ♀ short, narrow, 1.8—2× longer than their maximum width.

Distribution: Centre of distribution in the western part of Central Anatolia and sporadically in Southern Anatolia.

Measurements in mm

	males			females		
	min.	max.	\bar{x}	min.	max.	\bar{x}
Length of body	25.0	32.1	27.5	36.0	39.0	37.8
Length of pronotum	7.3	9.6	8.5	11.0	13.1	11.5
Length of prozona	2.6	3.5	3.0	4.1	5.2	4.3
Length of elytron	21.5	24.0	22.9	7.3	9.2	8.7
Length of posterior femur	13.2	15.8	14.6	18.0	21.0	19.4
Length of posterior tibia	11.8	13.1	12.1	15.2	17.0	15.8

Glyphotmethis dimorphus armenus (Ramme), 1951

Asiotmethis dimorphus armenus Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 276, 427.

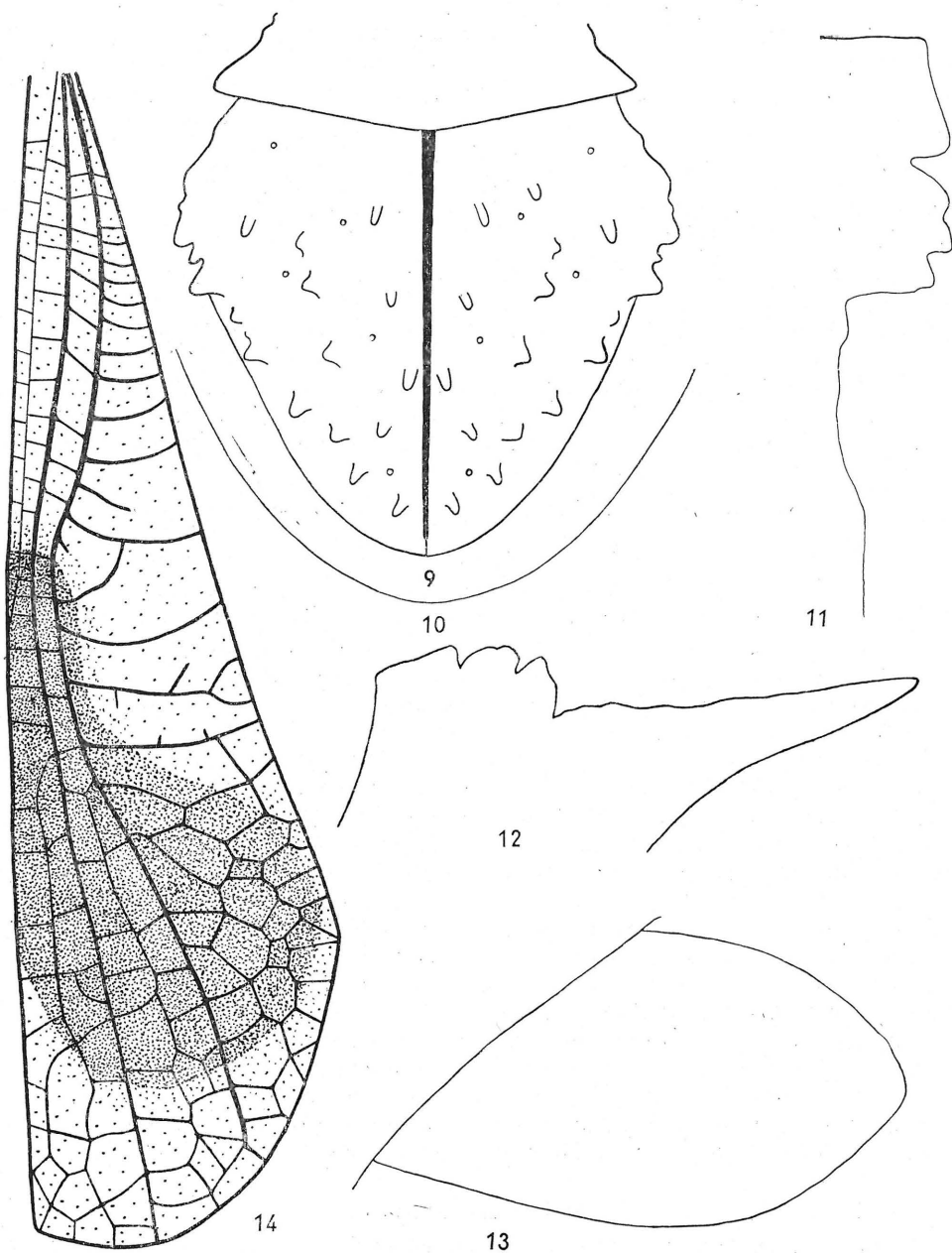
♂ holotype, Asia Minor, Sivas. In the collections of Zool. Mus. Berlin.

Glyphotmethis holtzi armenus; Karabağ, 1958, Orth. F. Turkey: 111.

Material examined: 3 ♂♂, 1 ♀

♂ holotype, Asia Minor, Sivas, VII. 1934 (Rosenbohm) (coll. Zool. Mus. Berlin); ♀ allotype, 2 ♂♂ paratypes, same data as holotype, also in the Zoologisches Museum in Berlin.

Elytra of ♂ reaching beyond 1/2 of posterior tibiae. Elytra of ♀ short, wide, 1.2× longer than their maximum width.



Glyphotmethis dimorphus dimorphus (Uv.): fig. 9. Metazona of ♂ (dorsal view); fig. 10. Part of posterior margin of metazona in ♀ (dorsal view); fig. 11. Part of pronotum of ♀ (lateral view); fig. 12. Pronotum of ♂ (lateral view); fig. 13. Left elytron of ♀ (dorsolateral view); fig. 14. Part of left wing in ♂ (dorsal view).

	Measurements in mm			female —
	min.	males max.	\bar{x}	
Length of body	30.0	31.0	30.5	36.0
Length of pronotum	8.9	10.1	9.8	12.4
Length of prozona	3.1	3.5	3.3	4.9
Length of elytron	26.2	30.5	28.5	10.1
Length of posterior femur	15.0	15.5*)	15.2	19.2
Length of posterior tibia	12.0	13.0	12.3	16.3

From the typical subspecies the male sex differs by longer wings, the female sex by wider elytra, reaching to the posterior margin of 2. abdominal tergite. Remaining characters agree with the typical form so that the subspecific combination is quite evident.

Distribution: Known only from one locality in eastern Anatolia: Sivas, about 360 kms E. of Ankara (At this locality is also the extreme eastern limit of the geographical distribution of the genus *Glyphotmethis* Bey-Bienko).

***Glyphotmethis heldreichi* (Brunner-Wattenwyl), 1882**

Glyphanus Heldreichi Brunner von Wattenwyl, 1882, Prodr. Europ. Orth.: 183, 184.

Elytra of ♂ as well as ♀ shortened; elytra of ♂ on average a little longer than pronotum, elytra of ♀ on average somewhat shorter than pronotum. In ♂♂ they do not reach a half of fourth abdominal tergite, in ♀♀ nearly reaching to the end of second abdominal tergite. Wing of ♂ is approximately about $\frac{1}{3}$ shorter than elytron, I. and II. vena axillaris along their whole courses distinctly separated (Fig. 20.).

Keel of prozona raised, tridentate: upper edge of first lobe in profile nearly straight, upper edges of further two lobes convex. Metazona nearly flat, scarcely sculptured, approximately of the same length as prozona or longer by only $\frac{1}{4}$. Lateral tubercle of mesozona broadly rounded. Posterior margin of metazona with narrow yellow border.

Middle tibiae with a series of small tubercles along the upper margin. Inner side of posterior femur yellow to yellow-brown, near the base with pink, red to purplish or blue macula. Inner sides of posterior tibiae vaguely yellow, outer sides ochraceous (in some specimens with only slight orange tint). Posterior tibiae near the base strongly narrowing, in comparison with other species more robust and horizontally wider and with much denser vestiture on the lower margins.

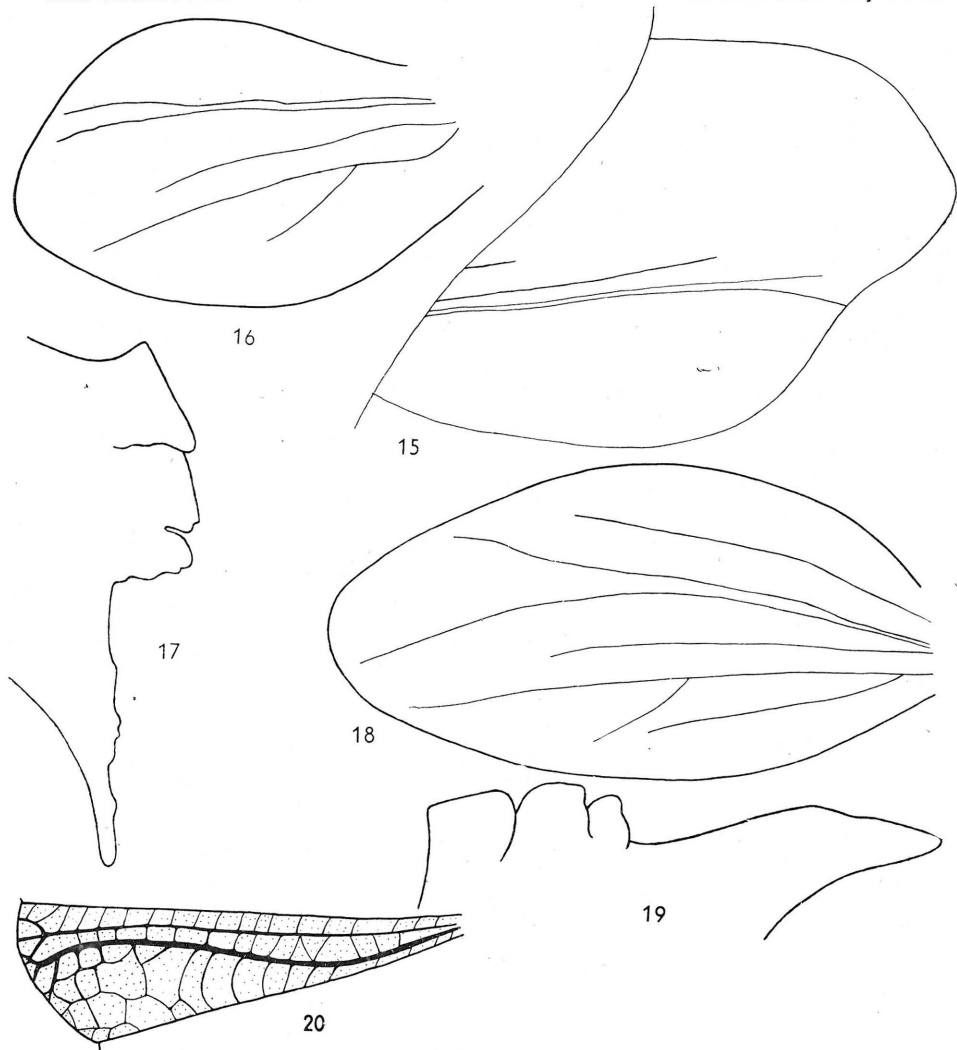
Glyphotmethis heldreichi (Br.-W.) distinctly differs from other species by the colouring of posterior legs, antennae on average being longer, more robust tibiae and much denser vestiture on the lower margins of tibiae.

Key to the subspecies

1/2 Metazona of ♂ short, flat, approximately equal to prozona or only slightly longer (Fig. 17). Elytra shorter, in ♂ reaching to posterior margin of 2nd abdominal tergite; their maximum width beyond the centre. In ♀ they reach maximally to half of 2nd

*) Measurements of the posterior femur of ♂♂ *G. d. armenus*, given by Ramme (cfr. fr. 1951: 276) are erroneous.

- abdominal tergite; maximum width in apical 1/4. Posterior femur at inner side near base with pink, red or purplish macula . . . **G. heldreichi heldreichi** (Br.-W.)
- 2/1 Metazona of ♂ distinctly longer than prozona (approximately by 1/4), in the centre more vaulted (Fig. 19). Elytra longer, in ♂ reaching to the end of 3rd abdominal tergite (in some specimens extending beyond it). Their maximum width in the middle; in ♀ reaching approximately to posterior margin of 2nd abdominal tergite, their maximum width is near the centre. Posterior femora at inner side near base with distinct blue macula . . . **G. heldreichi macedonicus** Bey-Bienko



Glyphotmethis dimorphus armenus (Rme): fig. 15. Left elytron in ♀ (dorso-lateral view). *Glyphotmethis h. heldreichi* (Br.-W.): Fig. 16. Left elytron in ♂ (dorsal view); fig. 17. Pronotum of ♂ (lateral view). *G. h. macedonicus* Bey-Bienko: fig. 18. Left elytron in ♂ (Holotype) (dorsal view); fig. 19. Pronotum of ♂ (Holotype) (lateral view); fig. 20. Part of left wing in ♂ (dorsal view).

***Glyphotmethis heldreichi heldreichi* (Brunner-Wattenwyl), 1882**

Glyphanus Heldreichi Brunner von Wattenwyl, 1882, Prodr. Europ. Orth: 183, 184. ♀ lectotype, Greece, Athens (coll. Brunner-Wattenwyl). In the coll. of Nat. Mus. Wien.

Asiotmethis heldreichi heldreichi; Uvarov, 1943, Trans. R. Ent. Soc., Lond., 93: 56.

Asiotmethis heldreichi rubrescens Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 271. ♂ holotype, Greece, Thessalia, Volo (Brunner-Wattenwyl) (coll. Zool. Mus. Berlin).

Syn. n.

Glyphotmethis heldreichi heldreichi; Bey-Bienko, 1951, Sar. Fauny USSR, I: 316.

Material examined: 7 ♂♂, 8 ♀♀

♀ lectotype, Greece, Athens (no data) (coll. Brunner-Wattenwyl) (coll. Nat. Mus. Wien); ♂ holotype, ♀ allotype (coll. Zool. Mus. Berlin) and ♂, 2 ♀♀ paratypes (♂, ♀ coll. Nat. Mus. Wien; ♀ coll. Nat. Mus. Stockholm) of *Asiotmethis heldreichi rubrescens* Ramme.

Greece: Thessalia, Volo, ♂ (no data) (coll. Zool. Inst. Leningrad); Thessalia, Ossa, (1884 ?), 2 ♂♂, ♀ (Stussiner) (coll. Nat. Mus. Wien); Thessalia, Volo, ♀ (no data) (coll. Nat. Mus. Wien); Kerkeni, Struna Valley, 24. VI. 1935, ♂, ♀ (Buxton) (coll. Brit. Mus. London). S. Macedonia: Gewgeli, 1.—2. VI. 1927, ♂, ♀ (Werner) (coll. Nat. Mus. Stockholm).

Diagnosis see key to the subspecies

Measurements in mm

	males			females		
	min.	max.	\bar{x}	min.	max.	\bar{x}
Length of body	26.0	36.0	30.5	33.0	48.0	41.4
Length of pronotum	7.5	9.1	8.1	10.1	12.6	11.2
Length of prozona	3.6	4.3	4.0	4.6	6.4	5.4
Length of elytron	7.5	9.0	8.3	7.5	10.6	9.4
Length of posterior femur	12.5	16.4	15.5	17.2	22.0	20.1
Length of posterior tibia	11.2	15.0	13.2	15.1	20.0	17.8

When Brunner von Wattenwyl in 1882 described a new species *heldreichi*, he had at his disposal the female material from Athens and Macedonia. This material contained, besides the nominate subspecies, also the subspecies *macedonicus*, described by Bey-Bienko in 1951. Athens must be considered without any doubt a typical locality of the nominate subspecies as the female specimen, deposited up to this time in the coll. Brunner von Wattenwyl in Naturhistorisches Museum in Vienna shows the best correspondence with the original description of the species. Besides that, Athens is in the original description, named first. According to a communication of Professor Dr. M. Beier in the collections of Naturh. Mus. Vienna there is no specimen designed as type. It is very probable that Brunner von Wattenwyl did not mark the type.

From the original material I marked a female from Athens (No. 2697) (ex coll. Brunner von Wattenwyl) as lectotype.

Investigations of the holotype of *Asiotmethis heldreichi rubrescens* Ramme and the more extensive material of typical subspecies resulted in finding no further substantial differences between the subspecies.

The subspecies *macedonicus* must be considered as a sharply limited geographical race differing from the typical subspecies by a number of substantial characters of colouring as well as structure.

Distribution: Greece (Athens, Thessalia), S. Macedonia, The northern limit of its geographical distribution is in Gewgeli (now Geogeli). Specimens from Kerkeni, Struna Valley forms the interstage to subsp. *macedonicus*.

***Glyphotmethis heldreichi macedonicus* Bey-Bienko, 1951**

Tmethis heldreichi heldreichi; Uvarov, 1934, Eos, 10: 108, 109.

Glyphotmethis heldreichi macedonicus Bey-Bienko, 1951, Sar. Fauny USSR, I: 316. ♂ holotype, N. Greece (Macedonia), Lembet. In the collections of Zoolog. Institute in Leningrad.

Material examined: 11 ♂♂, 11 ♀♀

♂ holotype, Macedonia, Lembet, VI. 1916 (M. Burr), ♀ paratype, Macedonia, Karaburun, 23. VIII. 1918 (M. Burr) (coll. Zool. Inst. Leningrad).

Macedonia: Lembet, VI. 1916, ♂ (coll. Brit. Mus. London); Struma, VI. 1917, ♀ (coll. Brit. Mus. London); Saloniki, 1908, ♀ (coll. Nat. Mus. Wien); Saloniki, 3—6. 1933, 3 ♂♂, 3 ♀♀ (Paduschin-Kattinger) (coll. Zool. Mus. Berlin); Kaluckova, 3. VIII. (?), ♂, 8. VI. 1917, ♀ (F. Doflein), 19. VI. 1917, ♂ (F. Doflein) (coll. Zool. Mus. Berlin); Hudova env., 17. VI. 1917, ♀ (Fehring) (coll. Zool. Mus. Berlin); Plaus, 15. VI. 1917, ♂ (coll. Zool. Samml. München); Kaluckova, 5. VI. 1917, ♂ (coll. Zool. Samml. München); Kalindria, 8. VII. 1943, 2 ♂♂ (Weidner) (coll. Zool. Mus. Hamburg); Strimonikon, 11. VII. 1944, ♀, 8. VI. 1944, ♀ (Weidner) (coll. Zool. Mus. Hamburg); Macedonia (no locality), 28. VI. 1869, ♀, (coll. Nat. Mus. Wien).

Diagnosis see key to the subspecies.

Measurements in mm

	males			females		
	min.	max.	\bar{x}	min.	max.	\bar{x}
Length of body	25.0	34.0	28.1	37.0	42.0	39.0
Length of pronotum	7.4	8.9	8.2	10.0	12.2	10.7
Length of prozona	3.2	4.0	3.5	4.1	5.5	4.7
Length of elytron	9.0	10.5	9.9	7.6	10.0	9.0
Length of posterior femur	13.5	16.5	14.8	17.0	22.0	18.6
Length of posterior tibia	12.2	15.0	13.1	16.0	18.5	16.6

Differs from the typical subspecies mainly by shape of pronotum, shape and size of elytra (mainly in ♂♂) and by colouring of the inner side of posterior femur.

Distribution: Macedonia (Saloniki). The extreme northern limit of the geographical distribution of this subspecies as well as of the genus *Glyphotmethis* in Europe runs through Plaus Planina in Macedonia. (S. Jugoslavia).

***Glyphotmethis ovipennis* (Uvarov), 1934**

Tmethis heldreichi ovipennis Uvarov, 1934, Eos, 10: 108, 109, 111. ♂ holotype, Asia Minor, Beypazari, 75 km N. W. of Ankara. In the coll. of Brit. Mus. London.

Asiotmethis heldreichi ovipennis; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93: 56.

Asiotmethis ovipennis; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 272, 426.

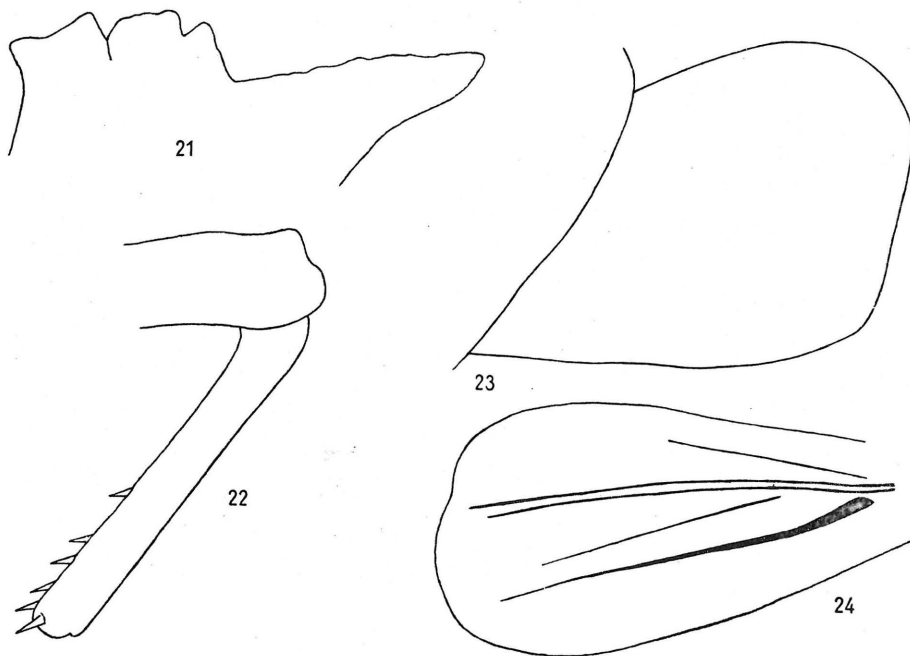
Glyphotmethis escherichi ovipennis; Bey-Bienko, 1951, Sar. Fauny USSR, I: 315.

Glyphotmethis escherichi ovipennis; Karabağ, 1958, Orth. F. Turkey: 113.

Material examined: 2 ♂♂, 2 ♀♀

♂ and ♀ paratypes, Asia Minor, Beypazari, 1930 (Sureya Bey) (coll. Zool. Mus. Berlin); ♂ and ♀ paratypes, the same locality and data (coll. A. Čejchan; ex coll. Brit. Mus. London).

♂: Elytra very strongly shortened, shorter than pronotum, 1.6X



Glyphotmethis ovipennis (Uv.): fig. 21. Pronotum of ♂ (lateral view); fig. 22. Left middle tibia in ♂ (lateral view); fig. 23. Left elytron in ♀ (dorso-lateral view); fig. 24. Left elytron in ♂ (dorsal view).

longer than their maximum width (Figs. 24, 72). Maximum width of elytron in apical $\frac{1}{4}$. Wings reduced to 4.3 mm.

Keel of prozona high, tridentate. Metazona short, flat, only 1.2X longer than prozona (Fig. 21.). Posterior margin of metazona rounded, with narrow yellow border. Lateral tubercle of mesozona large, sharp. Middle tibiae without small tubercles along the upper margin (Fig. 22). Inner side of the posterior femur red, in basal half with bluish-black macula. Inner sides of posterior tibiae red.

♀: Keel of prozona high, tridentate. Metazona short, flat. Posterior margin of metazona rounded, with narrow yellow border. Elytra short, wide, reaching to $\frac{1}{2}$ of 2nd abdominal tergite; apex of elytron cut off straight or in the centre moderately emarginate.

Middle tibiae without small tubercles along the upper margin. Inner side of posterior femur red, in basal half with bluish-black macula. Inner sides of posterior tibiae red.

Measurements in mm

	males		females	
	min.	max.	min.	max.
Length of body	25.5	26.5	36.0	36.2
Length of pronotum	8.5	8.7	10.5	11.3
Length of prozona	3.6	3.8	4.9	5.2
Length of elytron	6.8	7.0	7.0	7.1
Length of posterior femur	13.0	13.9	17.0	17.0
Length of posterior tibia	11.0	12.1	14.9	14.9

Differs from all species of the genus *Glyphotmethis* by smooth upper margin of the middle tibiae (small tubercles are not developed at all!). In the ♂♂ a very short metazona (only slightly longer than prozona) and strongly shortened elytra (distinctly shorter than pronotum) are the characteristic features. Keel of prozona in both sexes fairly high, distinctly vaulted.

Distribution: Known only from one locality: Beypazari, 75 kms W.-N.-W. of Ankara.

***Glyphotmethis escherichi* (Krauss), 1896**

Eremobia escherichi Krauss, 1896, Zool. Jahrb. Syst., 9: 565.

♂: Elytra shortened, spindle-shaped; widest near the centre (Figs. 25, 75—77), distinctly narrowing in the directions of base and apex (on average 1.9—2.6× longer than wide). In the typical subspecies they inconspicuously extend beyond the centre of the posterior femur, in the subsp. *coloripes* extending distinctly beyond the centres of the posterior femora, in the subspecies *elator* Rme. reaching to $\frac{3}{4}$ of posterior femur. Wing by $\frac{1}{4}$ shorter than the elytron. I. and II. vena axillaris along their whole courses are distinctly separated (Figs. 27, 30, 75—77). Keel of prozona fairly high, tridentate. Lateral tubercle of the mesozona large, acute. Metazona triangular, posterior margin acute angled (Figs. 75, 77). Metazona usually thickened, 1.5—1.7× longer than prozona. Posterior margin with light border (more distinctly in ♂ than in ♀).

Middle tibiae with a series of small tubercles along the upper margin. Inner side of the posterior femur in basal $\frac{1}{2}$ — $\frac{2}{3}$ with a purplish red or in basal $\frac{1}{2}$ with dark violaceous macula exhibiting bluish borders (subsp. *coloripes*). Inner sides of the posterior tibiae carmine-red.

♀: Keel of prozona high, incisions between individual lobes deep, posterior margin of metazona rounded. Colouring of inner side of the posterior femur and of the posterior tibia the same as in ♂.

G. escherichi is closely related to *G. sevketi* (for differences see page 475). From *G. adaliae* it differs by the more slender stature, angled-posterior margin of the metazona (in *adaliae* the posterior margin of metazona is broadly rounded), by the shape of elytra in ♂ (in *escherichi* the elytra are spindle-shaped, in *adaliae* broadly oval), by the course of the axillar veins (in *escherichi* I. and II. venae axillares are along their

whole courses widely separated, in *adaliae* in the apical part confluent or only slightly separated). Lateral tubercle of the mesozona in *escherichi* is larger and more sharp.

From *G. inermis* differs primarily by the pronotum exhibiting rougher sculpturation, by the shape of the elytron (see figs. 25, 45, 75—79, 85), higher keel of the prozona (Figs. 26, 31, 42, 43) and the angled posterior margin of metazona (in *inermis* the posterior margin is rounded). From *G. raggei*, n. sp. it differs by the features given on page).

Key to the subspecies

- 1/2 Smaller, more slender insects. Elytra of ♂ short (maximally 12.5 mm), reaching to the middle of posterior femur or inconspicuously extending beyond. Keel of prozona in ♂ lower (Fig. 26) ***G. escherichi escherichi*** (Krauss)
- 2/1 Larger, more robust insects. Elytra of ♂ longer (13.5—16.0 mm), reaching to 3/4 of posterior femur. Keel of prozona higher (Figs. 31, 42).
- 3/4 Inner side of posterior femur in both sexes to 1/2 dark violaceous. Elytron of ♂ shorter, reaching beyond middle of posterior femur; its hind margin in the middle part is strongly convex (Fig. 78). Elytron in both sexes with pattern from greyish blue to black. Metazona of ♂ (in lateral view) nearly straight (Fig. 42) ***G. escherichi coloripes***, subsp. n.
- 4/3 Inner side of posterior femur in both sexes purplish red (in some specimens in basal part with small indistinct purplish spot). Elytron of ♂ longer, reaching to 3/4 of posterior femur; hind margin of elytron in middle part nearly straight (Fig. 79). Elytron in both sexes without pattern or only indistinctly spotted. Metazona of ♂ (in lateral view) distinctly vaulted (Fig. 31) . . . ***G. escherichi elatior*** (Ramme)

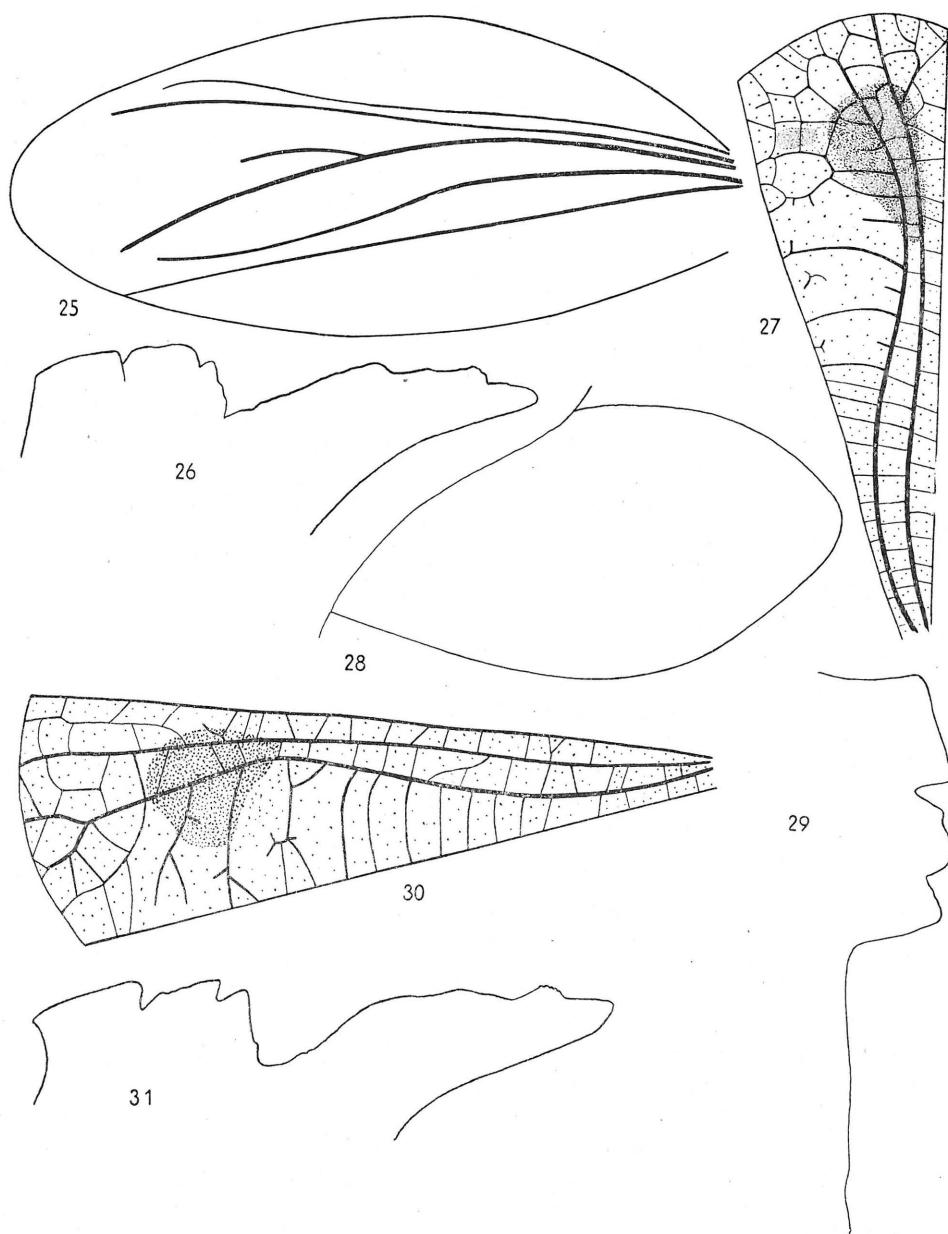
***Glyphotmethis escherichi escherichi* (Krauss), 1896**

Eremobia escherichi Krauss, 1896, Zool. Jahrb. Syst., 9: 565. Type material probable lost.
Tmethis Escherichi; Kirby, 1910, Syn. Cat. Orthop., 3: 287.
Tmethis heldreichi escherichi; Uvarov, 1934, Eos, 10: 108, 110.
Tmethis heldreichi escherichi; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93: 56.
Asiotmethis escherichi; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 274, 426.
Glyphotmethis e. escherichi; Bey-Bienko, 1951, Sar. Fauny USSR, I: 315.
Glyphotmethis e. escherichi; Karabağ, 1958, Orth. F. Turkey: 112.

Material examined: 11 ♂♂, 16 ♀♀

Asia Minor: Ankara, 1931 (Sureya), ♂ (coll. Zool. Mus. Berlin); Kavakli near Ankara, 1931, 2 ♂♂ (Sureya) (coll. Zool. Mus. Berlin); Tschibuk-Tal near Ankara, 7. VII. 1935, 1 ♀ (Fuss) (coll. Zool. Mus. Berlin); Ankara; 27. VI. 1928, 1 ♂ (coll. Zool. Inst. Leningrad); Ankara, no data, 1 ♀ (coll. Zool. Inst. Leningrad); Ankara, 1930, 1 ♂, 1 ♀ (Sureya Bey) (coll. A. Čejchan; ex coll. Brit. Mus. London); Angora, 1930, 3 ♂♂, 4 ♀♀ (Sureya Bey) (coll. Brit. Mus. London); Ankara, 18. VII. 1930, 1 ♀ (Sureya Bey) (coll. Brit. Mus. London); Ankara, 8. VII. 1939, 1 ♀, (coll. Brit. Mus. London); Beynam, 28. VI. 1947, 1 ♀ (Exped. Nat. Mus. ČSSR) (coll. Nat. Mus. Prague); Elma Dagh, 30. VII. 1930, 2 ♂♂, 4 ♀♀ (Sureya Bey) (coll. Brit. Mus. London); Kavakli-Dere, 1930, 1 ♀ (Sureya Bey) (coll. Brit. Mus. London); Kütahya, Angora Prov., 5. VII. 1930, 1 ♂, (Sureya Bey) (coll. Brit. Mus. London); — 1 ♀ no locality, no data (coll. Nat. Mus. Stockholm).

Diagnosis see key to the subspecies (p. 470).



Glyphotmethis escherichi escherichi (Kr.): fig. 25. Left elytron in ♂ (dorsal view); fig. 26. Pronotum of ♂ (lateral view); fig. 27. Part of left wing in ♂ (dorsal view); fig. 28. Left elytron in ♀ (dorso-lateral view); fig. 29. Part of pronotum in ♀ (lateral view); *G. e. elatior* (Rme) [Holotype]: fig. 30. Part of left wing in ♂ (dorsal view); fig. 31. Pronotum in ♂ (lateral view).

Measurements in mm

	min.	males max.	\bar{x}	min.	females max.	\bar{x}
Length of body	24.0	27.0	25.0	28.0	38.0	32.7
Length of pronotum	8.0	8.7	8.3	10.2	11.9	11.4
Length of prozona	3.1	3.5	3.3	4.5	4.9	4.6
Length of elytron	11.0	12.5	11.8	6.5	7.9	7.0
Length of posterior femur	13.0	14.0	13.6	16.5	17.0	16.8
Length of posterior tibia	11.0	12.0	11.2	14.0	15.9	14.9

The exact locality of the type material remains uncertain. Krauss (l. c. 1896: 565) described this species from 4 ♂♂ and 2 ♀♀ from "Angora" (now Ankara). The type very probable was not cited; I was not able to ascertain the place where the original material is deposited.*)

Uvarov (l. c. 1943: 56) delimited the immediate environments of Ankara as the type locality. Typical subspecies differs from *elator* primarily by shorter elytra of ♂, more slender stature, lower keel of the prozona and the less vaulted metazona (for further information see in key to the subspecies, p.). From subspecies *coloripes* it differs primarily by the colouring of the inner side of posterior femur, by smaller size and by elytra being on average shorter and without any pattern.

In the unidentified material ex coll. British Museum (Natural History) there is 1 ♂ from Kütahya (Ankara Prov.), differing from typical subspecies by shorter elytra and wings, thin I. vena axillaris in apical part of the wing confluent with II. vena axillaris and by pronotum being somewhat different. On the basis of a single specimen it cannot be stated whether a separate taxonomic category or a mere individual variability is in question.

Distribution: Northwestern, western and Central Anatolia.

***Glyphotmethis escherichi elator* (Ramme), 1951**

Asiotmethis escherichi elator Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 274, 426. ♂ holotype, Asia Minor, Eskisehir. In the collections of Zool. Mus. Berlin.

Glyphotmethis escherichi elator; Karabağ, 1958, Orth. F. Turkey: 114.

Material examined: 3 ♂♂, 3 ♀♀

♂ holotype, Asia Minor, Eskisehir, 3. IX. 1917 (La Baume) (Coll. Zool. Mus. Berlin); ♂ paratype, Eskisehir, 10. VI. 1935 (coll. Zool. Mus. Berlin); ♀ paratype, Eskisehir, 800 m (La Baume) (coll. Zool. Mus. Berlin); ♀ paratype, Usak, 2. VI. 1916 (Bauer) (coll. Zool. Mus. Berlin); ♂ paratype Eskisehir, VIII. 1900 (Werner) (coll. Nat. Mus. Stockholm); ♀ paratype, Eskisehir, VIII. 1900 (Werner) (coll. Nat. Mus. Stockholm).

Diagnosis see key to the subspecies.

*) I should greatly appreciate any information concerning the whereabouts of the original material of *Eremobia escherichi* Krauss.

	Measurements in mm					
	males			females		
	min.	max.	\bar{x}	min.	max.	\bar{x}
Length of body	25.5	33.0	28.1	34.0	38.5	36.1
Length of pronotum	9.0	9.7	9.4	11.0	12.7	11.8
Length of prozona	3.3	4.0	3.5	4.7	5.0	4.8
Length of elytron	13.5	16.3	14.8	6.0	9.3	7.4
Length of posterior femur	13.9	15.0	14.6	17.0	19.0	17.9
Length of posterior tibia	12.0	13.0	12.4	16.0	16.0	16.0

From typical subspecies differs by the larger average size, longer elytra of ♂, higher keel of prozona and more vaulted metazona. From subspecies *coloripes* differs primarily by the colouring of innerside of posterior femur and by vaulted metazona.

Distribution: Known only from two localities (Eskisehir and Usak) in more western part of Anatolia.

***Glyphotmethis escherichi coloripes*, subsp. n.**

Material examined: 1 ♂, 2 ♀♀

♂ holotype, ♀ allotype, Asia Minor, Ankara (Dikmen*), Alt. 3.000 ft., 30. VI.—5. VII. 1959 (K. M. Guichard). In the collection of the British Museum (Natural History) London.

1 ♀, Ankara (Dikmen), 7. VII. 1959, 3000 ft. (K. M. Guichard) (coll. Brit. Mus. London) — this female specimen forms the interstage to subsp. *elator*.

Holotype ♂: Larger (31.0 mm), more robust than the typical subspecies. Elytra with distinct greyish blue maculae, spindle-shaped, basis and apex narrowing (more distinctly than in *elator*), maximum width of elytron in the middle; elytron distinctly reaches beyond the middle of posterior femur. I. and II. vena axillaris along their whole courses distinctly separated. Keel of prozona high, lobes distinctly separated from each other, metazona flat, in lateral view moderately vaulted (Fig. 42). Lateral tubercle of mesozona large, sharp.

Middle tibia on the upper margin with a series of fine tubercles. Innerside of posterior femur to $\frac{1}{2}$ dark violaceous (borders bluish), lower margin of the innerside with narrow red border. Innerside of the posterior tibia red.

Allotype ♀: Elytre with gray-black maculae, reaching nearly to $\frac{1}{2}$ of the second abdominal tergite. Keel of prozona high, lobes distinctly separated, metazona long (2.6X longer than prozona); its posterior margin

*) Both typical specimens (holotype and allotype) have the not quite accurate designation "Ankara" on the locality labels. Dr. D. R. Ragge from the British Museum (Natural History) in a letter dated April 5th, 1963 sent me the following information: "Mr. Guichard tells me, that the *Glyphotmethis* labelled "Ankara" were collected at Dikmen".

It is clearly evident that the nominate form in the environment of Ankara is contiguous with the newly described subsp. *coloripes* but for the present their more exact geographical distribution cannot be stated.

broadly rounded (in the middle bordered by narrow yellow band). Lateral tubercle of mesozona large, sharp.

Inner side of posterior femur in basal half dark violaceous (borders bluish), lower margin of innerside with narrow red border. Inner side of posterior tibia red.

Measurements:

Length of body: ♂ 31.0, ♀ 37.0 mm; pronotum: ♂ 10.0, ♀ 12.9 mm; prozona: ♂ 4.4, ♀ 5.2 mm; elytron: ♂ 14.6, ♀ 7.9 mm; posterior femur: ♂ 15.7, ♀ 19.0 mm; posterior tibia: ♂ 14.0, ♀ 16.7 mm.

From the typical subspecies it differs by larger size (in both sexes), by longer elytra in ♂, higher keel of prozona and mainly by colouring of the posterior extremities. From the subspecies *elator* it differs, besides the colouring of posterior extremities, by shorter elytra in ♂ and by its shape and colouring. In further characters it differs also by nearly flat metazona (in subsp. *elator* the metazona is distinctly vaulted).

Distribution: Known only from one locality in Central Anatolia.

***Glyphotmethis sevketi* (Ramme), 1951**

Asiotmethis sevketi Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 273, 426. Holotype ♂, Asia Minor, Corum. In the collections of Zool. Mus. Berlin.

Glyphotmethis sevketi; Karabağ, 1958, Orth. F. Turkey: 114.

Material examined: ♂, ♀

♂ holotype, Asia Minor, Corum, 2. VIII. 1932*) (Ševket-Tuncok) (coll. Zool. Mus. Berlin); ♀ allotype, same data as holotype, also in the Zoologisches Museum in Berlin.

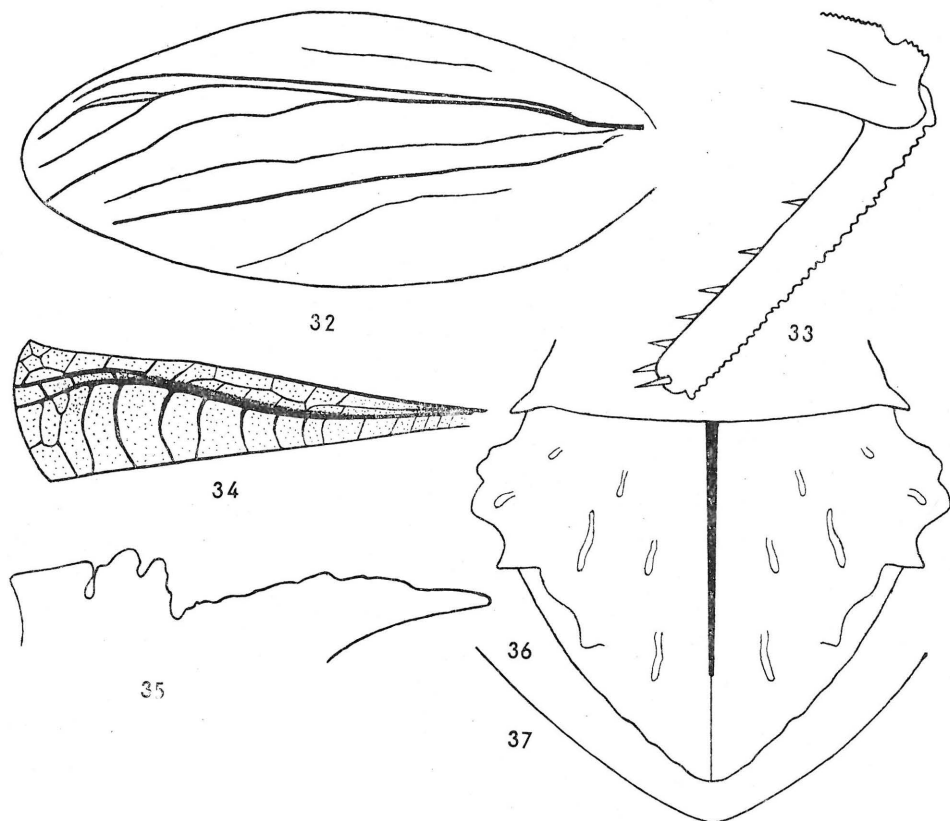
♂: Elytra shortened, elongate oval, distinctly longer than pronotum, 2X as long as their maximum width which is in the middle of elytron (Fig. 32). Wing is shortened to 8.4 mm, by one third shorter than elytron. I. vena axillaris in apical part interrupted; ends of interrupted parts are confluent with II. axillar vein (Fig. 34). Pronotum strongly sculptured. Keel of prozona strongly raised, tridentate; upper edge of the first lobe in profile straight, upper edges of further two lobes rounded. Metazona flat, twice as long as prozona, triangular (Fig. 36). Posterior margin of metazona angled. Lateral tubercles of mesozona large, sharp. Middle tibia with a series of tubercles along the upper margin (Fig. 33). Innersides of posterior femora and tibiae carmine-red.

♀: Posterior margin of metazona angled, elytra narrow, reaching to 1/2 of the 2. abdominal tergite. Keel of prozona high, lobes separated by deep incisions.

Measurements:

Length of body: ♂ 24.3, ♀ 34.4 mm; pronotum: ♂ 8.3, ♀ 11.0 mm; prozona: ♂ 3.0, ♀ 4.2; elytron: ♂ 10.3, ♀ 8.2 mm; posterior femur: ♂ 12.9, ♀ 16.8 mm; posterior tibia: ♂ 11.4, ♀ 14.9 mm.

*) Ramme (cfr. 1951: 274) gives erroneously the year 1931.



Glyphotmethis sevketi (Ramme) [Holotype et allotype]: fig. 32. Left elytron in ♂ (dorsal view); fig. 33. Left middle tibia on ♂ (lateral view); fig. 34. Part of left wing in ♂ (dorsal view); fig. 35. Pronotum in ♂ (lateral view); fig. 36. Metazona in ♂ (dorsal view); fig. 37. Part of posterior margin of metazona in ♀ (dorsal view).

This species is closely related to *G. escherichi* but differs from it by more slender stature, long metazona, shorter elytra and course of the axillar veins in the wing.

Very apparent characters are the enormous development of the "lateral keels" (see fig. 36) which greatly extend beyond the margin of metazona, and the pronotum being richly sculptured.

Distribution: Known only from the following locality: Corum, about 200 kms N. E. of Ankara.

***Glyphotmethis raggei*, n. sp.**

♂ Holotype: Elytra short, 1.29× longer than pronotum, spindle-shaped, their maximum width in front of the centre, distinctly narrowing in the directions of base and apex (Fig. 39), nearly three-times longer than wide. Wing is shortened to 7.6 mm. I. and II. vena axillaris along

their whole courses distinctly separated (Fig. 40). Maximal interspace between axillar veins is 2.5X wider than II. vena axillaris. Wing with distinct black-brown band. Pronotum very slightly sculptured. Keel of prozona low, transverse furrows slight (Fig. 38). Lateral tubercle of mesozona very small, blunt. Metazona short, triangular, 1.4X longer than prozona, very slightly sculptured (nearly virtually smooth), in apical half strongly thickened, in lateral aspect distinctly convex (Figs. 38, 87). Posterior margin of metazona rounded (Fig. 89), in centre with narrow yellow border. Longitudinal middle keel of metazona slight, low, more distinctly developed only in front of posterior margin of metazona. Middle tibia with a series of minute tubercles along the upper margin. Inner side of posterior femur purplish red, inner side of posterior tibia carmine-red. Processes at ends of the abdominal tergites in the median line very small, blunt (Fig. 41). Laterally they are nearly inconspicuous at tergites 4.—6.

♀: Unknown.

Material examined: Holotype ♂, Asia Minor (The exact locality unknown). In the collection of Brit. Mus. London.

Note: This male specimen was labelled with a quite illegible locality card (written with a pen), which I found indecipherable. I sent this locality card in a letter to Brit. Mus. London for identification, but, unfortunately, this undeciphered card was lost. On the card only the locality (short word beginning with a letter C), and no collector's name was given, so that the exact locality cannot be practically ascertained.

Measurements

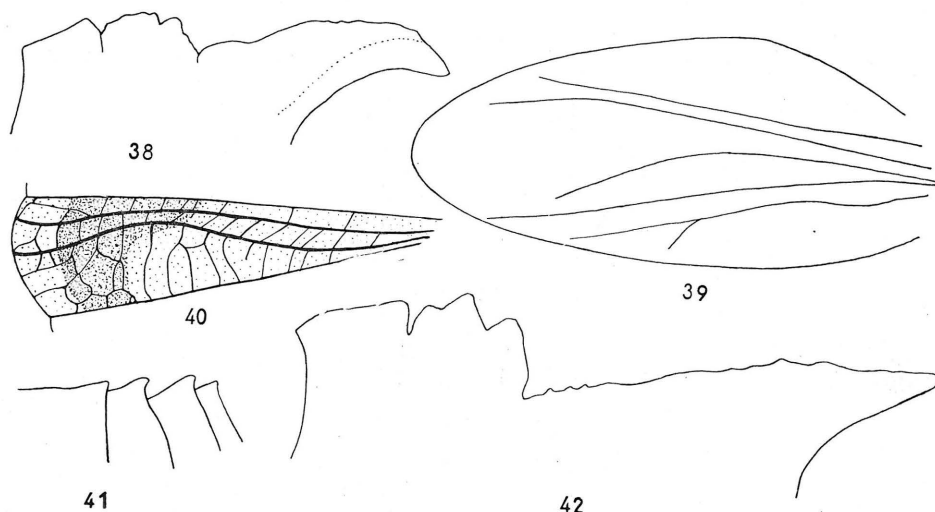
Length of body 26.0 mm; pronotum 7.2 mm; prozona 3.0 mm; elytron 9.3 mm; posterior femur 12.2 mm; posterior tibia 10.2 mm.

Condition of holotype: The anterior right leg, tarsus of left anterior leg, tarsus of right middle leg, posterior left leg, tarsus of posterior right leg, cerci, right antenna and a part of the left one lacking. Right elytron and wing in the apical part are damaged.

Glyphotmethis raggei, n. sp. belongs to the group of species *G. inermis*, *G. escherichi* and *G. sevketi*.

By the slightly sculptured pronotum, low keel of prozona, small and blunt tubercles of mesozona and small and blunt processes at ends of abdominal tergites, *G. raggei* is very closely related to *G. inermis* but differs from it by more slender stature, shape of the elytron, course of the axillar veins, thickened metazona and brown-black band of the wing.

To the following two species it is related by the shape of the elytron; from *G. escherichi* it differs substantially by its more slender stature, shorter and narrower elytra, shorter wings (I. and II. venae axillares are in both species along their whole courses distinctly separated), very slightly sculptured pronotum, small, blunt lateral tubercles of the mesozona, short metazona, low keel of the prozona, small and blunt processes at ends of the abdominal tergites. From *G. sevketi* the new species *G. raggei* differs by its more slender stature, shorter and narrower elytra,



Glyphotmethis raggei, n. sp. (Holotype ♂): fig. 38. Pronotum (lateral view); fig. 39: Left elytron (dorsal view); Fig. 40. Part of left wing (dorsal view); fig. 41. Processes of IV.—VII. abdominal tergites (lateral view); *G. escherichi coloripes*, subsp. n. (Holotype ♂): fig. 42. Pronotum.

shorter wings, course of I. and II. vena axillaris (in *G. sevketi* I. and II. vena axillaris are in the apical part confluent), very slightly sculptured pronotum, low keel of the prozona, small and blunt lateral processes at ends of the abdominal tergites.

From the species of nearly the same size, *G. ovipennis*, differs primarily by the small tubercles at the upper margin of middle tibia, shape of elytron and wing, low keel of the prozona, slightly sculptured pronotum, small and blunt tubercles of the mesozona.

I have much pleasure in dedicating this new species to Dr. David R. Ragge, in charge of Orthoptera at the British Museum (Natural History), London.

***Glyphotmethis inermis* (Uvarov), 1934**

Tmethis heldreichi inermis Uvarov, 1934, Eos, 10: 108, 110. Holotype ♂, Asia Minor,

Northern slope of Kai-Dagh north of Changri. In the coll. Brit. Mus. London.

Asiotmethis heldreichi inermis; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93: 56.

Asiotmethis inermis; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 273, 426.

Glyphotmethis escherichi inermis; Bey-Bienko, 1951, Sar. Fauny USSR, I: 315.

Glyphotmethis escherichi inermis; Karabağ, 1958, Orth. F. Turkey: 113.

Material examined: 2 ♂♂, 5 ♀♀.

♂ and ♀ paratypes, Asia Minor, between Ankara and Changri, 10. VIII. 1931 (Uvarov) (coll. Zool. Mus. Berlin); ♂ and 4 ♀♀ paratypes, between Ankara and Changri, 10. VIII. 1931 (Uvarov) (coll. Brit. Mus. London).

♂: Elytra short, a little longer than pronotum, twice as long as their maximum width (Fig. 45). Elytron is widest in apical 1/3. Wing pellucid, without black-brown band, shortened to 8 mm; it is by 1/3 shorter than

elytron. I. vena axillaris slight, discontinuous, coming very close to II. vena axillaris (Fig. 44) [or both veins along their whole courses distinctly separated but the space between them is in the apical half narrow, approximately as wide as II. vena axillaris]. Pronotum very slightly sculptured, nearly smooth [only with small sparse tubercles]. Prozona with low keel (Fig. 43). Metazona flat, 1.4X longer than prozona. Posterior margin of metazona moderately rounded, with a narrow yellow border. Lateral tubercle of mesozona small, blunt (or absent). Middle tibia with a series of tubercles along the upper margin. Posterior femora and tibiae sanguineous on the inner sides.

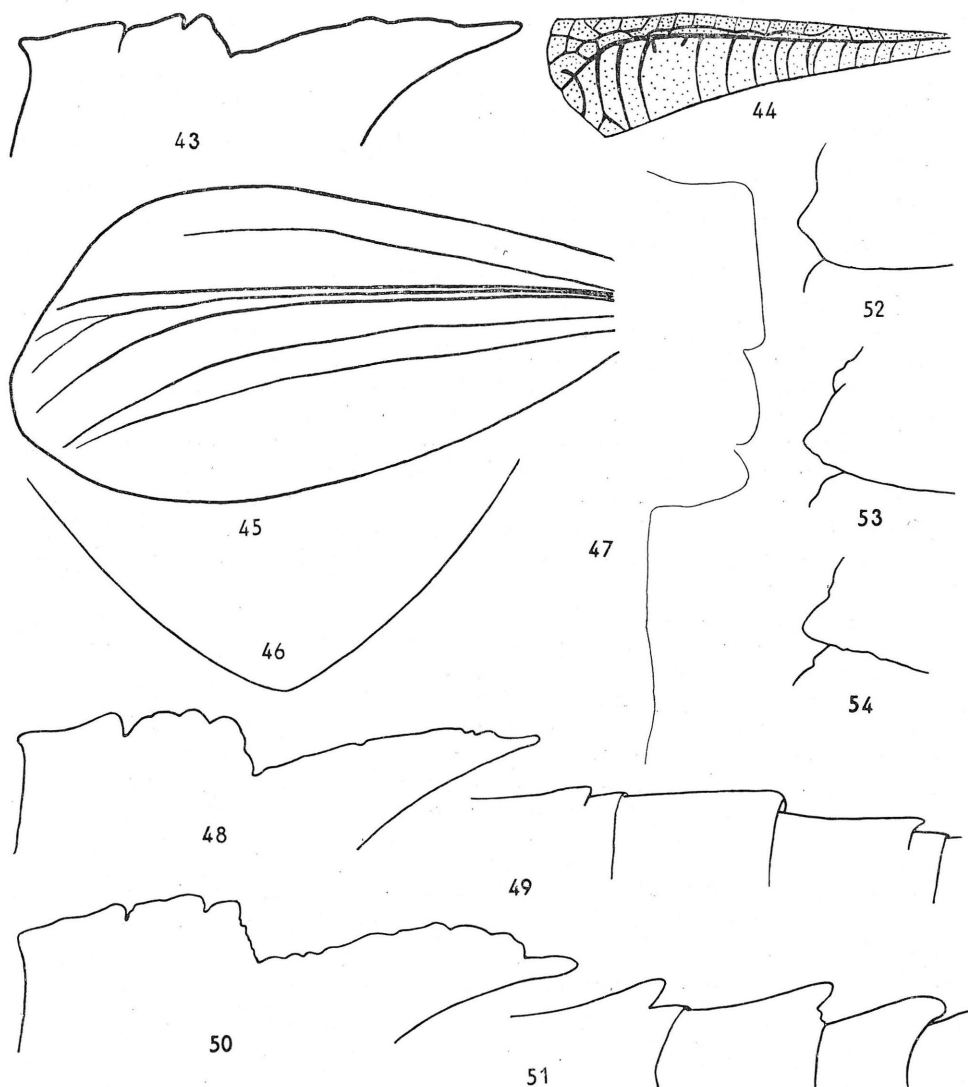
♀: Keel of prozona low, incisions between the individual lobes small (Fig. 47). Metazona in lateral view slightly vaulted, posterior femur unicolourous red. Innerside of the posterior tibia sanguineous.

Measurements in mm

	males		min.	females max.	\bar{x}
	min.	max.			
Length of body	30.0	30.2	38.0	43.5	39.9
Length of pronotum	8.2	8.6	11.4	14.2	12.5
Length of prozona	3.5	3.7	4.9	5.6	5.3
Length of elytron	8.0	9.0	8.0	9.2	8.6
Length of posterior femur	13.2	14.0	17.0	20.0	18.5
Length of posterior tibia	12.0	12.4	15.3	17.2	16.3

Glyphotmethis inermis was described from 3 ♂♂ (including the type) and 7 ♀♀ taken between Ankara and Changri. I have had the opportunity to study 2 ♂♂ paratypes between which I found considerable variability. In the paratype (I.) ex coll. Zool. Mus. Berlin the shape of elytron corresponds with the wording and picture in the original description (conf. Uvarov, 1934: 110); I. and II. vena axillaris are fused together. In the paratype (II.) ex coll. Brit. Mus. London the elytron is somewhat shorter and narrower (maximum width of elytron is near the middle); I. and II. vena axillaris along their whole courses distinctly separated.

Unfortunately I have had no opportunity to study the holotype, deposited in Brit. Mus. London. It may be supposed, however, that *G. inermis* also is rather variable. This supposition may be supported also on the basis of following fact: in the unidentified material from the collections of British Museum (Natural History), London I found, in a series of rather variable specimens of *Glyphotmethis* sp., collected in Kirikkale (correct name perhaps Kirikkale) 1 ♂, practically identical with paratype (II.) from coll. Brit. Mus. London. Further 2 ♂♂ resemble it in the shape of pronotum and elytron. Most of ♂♂ exhibit nearly totally smooth pronotum, blunt tubercles of the mesozona which are small and blunt or nearly inconspicuous. Further individuals have more or less sculptured pronotum; tubercles of the mesozona are very variable in size and shape. In some ♂♂ the metazona is thin, flat, in other ones the metazona is vaulted and in the posterior part thickened. Also elytra of ♂♂ are rather variable. The elytra are generally oval in shape with the maximum width near the middle but varying in size. Elytron reaches to the end of 3rd abdominal



Glyphotmethis inermis (Uvarov): fig. 43. Pronotum in ♂ (lateral view); fig. 44. Part of left wing in ♂ (dorsal view); fig. 45. Left elytron in ♂ (dorsal view); fig. 46. Part of posterior margin of metazona in ♀ (dorsal view); fig. 47. Part of pronotum in ♀ (lateral view). *Glyphotmethis adaliae adaliae* (Uv.): fig. 48. Pronotum in ♂ (lateral view); fig. 49. Processes of III. and IV. abdominal tergites in ♀ (lateral view). *Glyphotmethis adaliae angorensis* subsp. n.: fig. 50. Pronotum in ♂ (lateral view); fig. 51. Processes of III. and IV. abdominal tergites in ♀ (lateral view). *G. a. adaliae* (Uv.): fig. 52. Lateral tubercle of mesozona in ♂ (dorsal view). *G. a. angorensis* subsp. n.: fig. 53. Lateral tubercle of mesozona in ♂ (dorsal view); fig. 54. detto.

tergite, or also to 1/2 of 5. abdominal tergite. Size of the wings is also variable. In all ♂♂ collected 13 kms. W. of Kirikdale I. and II. vena axillaris are along their whole courses distinctly separated. In 2 ♂♂ collected in Yenihan, 39 kms. E. of Kirikdale, I. vena axillaris in the apical wing part is fused with II. vena axillaris. Colouring of the inner side of posterior femur and inner side of posterior tibia in all ♂♂ as well as ♀♀ is nearly uniform.

All ♀♀ (13 kms. W. of Kirakdale) are characterized, in contradistinction to ♀♀ from typical locality, by short and narrow elytra which reach to 1/4 of 2. abdominal tergite. Als shape of the pronotum is less variable than in ♂♂ in general. All ♀♀ from this locality are distinctly more slender than ♀♀ from the typical locality.

Regarding the considerable individual variability of ♂♂ from both above mentioned localities, the material from the wider environments of Kirikdale cannot be separated as an independent geographical race.

An explicit conclusion cannot be stated on the basis of above mentioned matter. It is very probable that the scale of variability of *G. inermis* is much wider than has been supposed until now. For the present, description of the species cannot be confidently amplified from the variable material from the environments of Kirikdale, as the holotype of *G. inermis* is not proved with certainty to be identical with the paratype II.

This problem could be solved definitely only after study of more abundant comparative material from the wider environments of Ankara*) and study of the holotype of *G. inermis*.

Diagnosis of *G. inermis* is elaborated upon the characters given by Uvarov (l. c. 1934) in the key after a short original description and upon the paratype (I.). It was proved that:

G. inermis differs from all species of the genus *Glyphotmethis* (with exception of *G. raggei*, n. sp.) by the very slightly sculptured pronotum, flat and nearly smooth metazona and relatively very low keel of the prozona and by small blunt lateral tubercles of the mesozona.

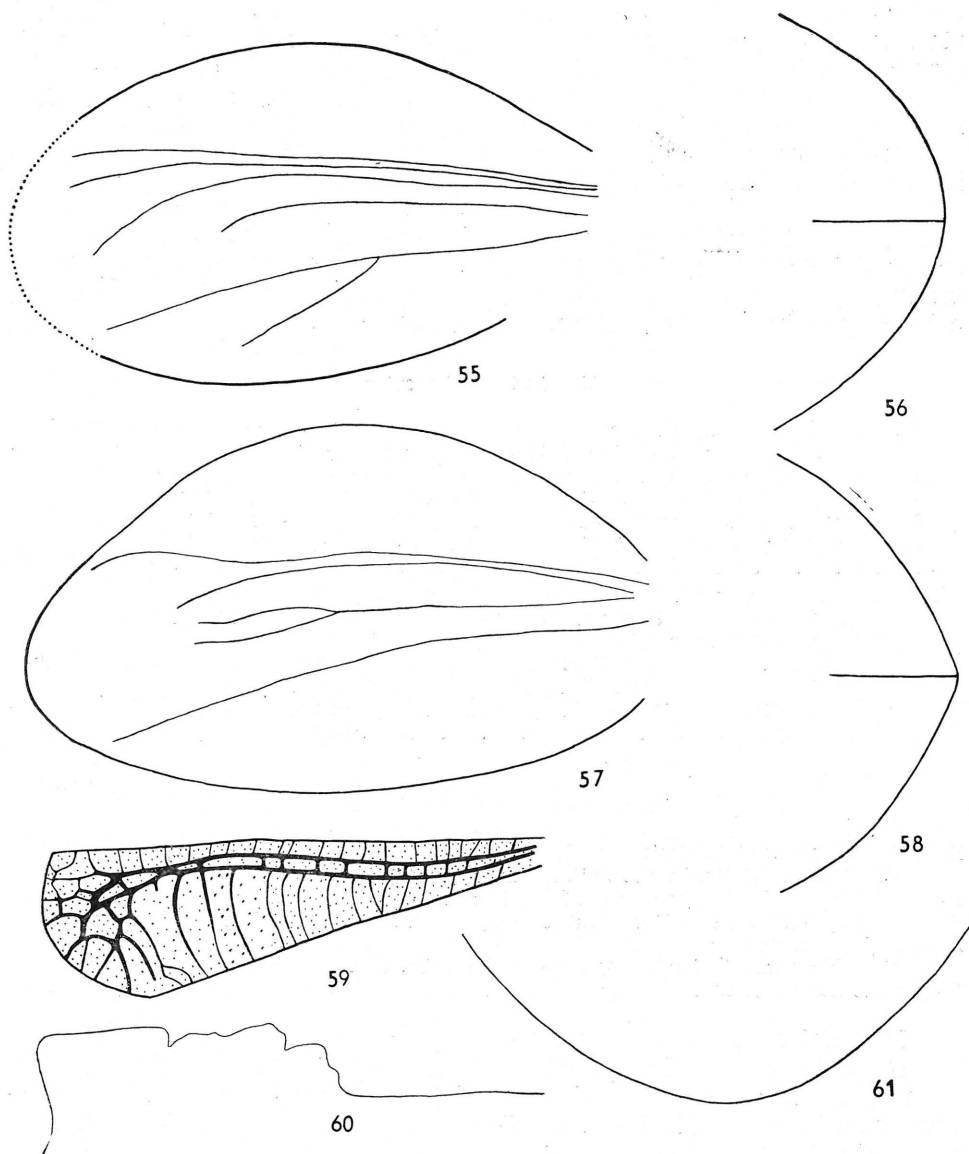
Distribution: Known only from the northern slope of Kai-Dagh north of Changri (and from the wider environments of Kirikdale??)

***Glyphotmethis adaliae* (Uvarov), 1928**

Tmethis (*Glyphanus*) *heldreichi adaliae* Uvarov, 1928, Entom. Mitt., 17: 176.

♂: Elytron broadly oval, anterior margin more convex than the posterior one, the maximum width in the middle (Fig. 55), reaching beyond 1/2 of third abdominal tergite. Wing by 1/3 shorter than elytron. Wing in the typical subspecies *pellucid*, in subspecies *angorensis* the darkened veins form an indistinct and inconspicuous band. I. and II. vena axillaris in typical subspecies along their whole courses distinctly separated; in subspecies *angorensis* the axillar veins are very close, in apical half fused together (Fig. 59).

*) Uvarov (l. c. 1934: 110) says: "Some specimens of *T. heldreichi* from the environs of Ankara exhibit a considerable resemblance to this subspecies." (i. e. *inermis*).



Glyphotmethis a. adaliae [Uv.]: fig. 55. Left elytron in ♂ (dorsal view); fig. 56. Part of posterior margin of metazona ♂ (dorsal view). *G. a. angorensis* subsp. n.: fig. 57. Left elytron in ♂ (dorsal view); fig. 58. Part of posterior margin of metazona in ♂ (dorsal view); fig. 59. Part of left wing in ♂ (dorsal view). *G. a. adaliae* [Uv.]: fig. 60. Part of pronotum in ♀ (lateral view); fig. 61. Part of posterior margin of metazona in ♀ (dorsal view).

Keel of prozona raised, tridentate (in some specimens exhibiting a larger number of denticles). Metazona flat, thin or thickened, in lateral view more vaulted (Figs. 48, 50). Its posterior margin rounded, with a narrow yellow border. Lateral tubercle of mesozona small.

Middle tibia with minute tubercles along the upper margin. Posterior femur and tibia carmine-red on the inner side.

♀: Keel of prozona low, incisions among individual lobes very small. Metazona in lateral view straight, posterior margin distinctly rounded. Inner side of the posterior femur red, near the base a purplish macula.

From *G. inermis* differs in the male sex by shape of the elytron, more sculptured pronotum, higher keel of prozona; in female sex differs from *inermis* by the more slender stature, lower keel of prozona and different colouring of inner side of the posterior femur.

Key to the subspecies

- 1/2 More slender form, with narrower thorax. Tubercle of mesozona small, blunt (Fig. 52). Metazona of ♂ thin, in lateral view nearly flat (Fig. 48), only slightly wider than long, with minute tubercles; posterior margin of metazona rounded (Fig. 56). I. and II. vena axillaris along their whole courses distinctly separated. Processes of the median line of III. and IV. abdominal tergites of ♀ are small, blunt and do not, or nearly do not, extend beyond the posterior margin of tergite (Fig. 49).
***G. adaliae adaliae* (Uv.)**
- 2/1 More robust form, with wider thorax. Tubercle of mesozona larger, sharper (Figs. 53, 54). Metazona of ♂ thickened, in lateral view vaulted (Fig. 50) distinctly wider than long, with larger tubercles; posterior margin of metazona somewhat angled (Fig. 58). I. and II. vena axillaris narrowly separated, in apical 1/2 fused together (or nearly confluent) (Fig. 59). Processes of the middle line of III. and IV. abdominal tergites of ♀ large, sharp, extending beyond the posterior margin of tergite (Fig. 51).
***G. adaliae angorensis*, subsp. n.**

Glyphotmethis adaliae adaliae (Uvarov), 1928

- Tmethis (Glyphanus) heldreichi adaliae* Uvarov, 1928, Entom. Mitt. 17: 176. Holotype ♂, Asia Minor, Adalia. In the coll. Dtsch. Ent. Inst. Berlin.
- Tmethis heldreichi adaliae*; Uvarov, 1934, Eos, 10: 108, 111.
- Asiotmethis heldreichi adaliae*; Uvarov, 1943, Trans. R. Ent. Soc. Lond., 93: 56.
- Asiotmethis adaliae*; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 273, 426.
- Glyphotmethis escherichi adaliae*; Bey-Bienko, 1951, Sar. Fauny USSR, I: 315.
- Glyphotmethis escherichi adaliae*; Karabağ, 1958, Orth. F. Turkey: 114.

Material examined: 2 ♂♂, 7 ♀♀.

♂ holotype, Asia Minor, Adalia (now Antalya), 15. VI. 1927 (Tockhorn) (coll. Dtsch. Ent. Inst. Berlin); 2 ♀♀ paratypes, same data as holotype, also in the Dtsch. Ent. Inst. Berlin; ♂ paratype, Asia Minor, Adalia, 15. VI. 1927 (Tockhorn) (coll. Brit. Mus. London).

Asia Minor, Antalya, Calbali Dag, 1700—1900 m, 13. VII. 1949, 5 ♀♀ (P. H. Davis) (coll. Brit. Mus. London).

♂: Pronotum slightly sculptured (tubercles are small, sparse). Metazona thin, nearly flat, only little wider than long, with minute sparse tubercles. Posterior margin of metazona rounded (Fig. 56). Lateral tubercle of mesozona small, blunt. Wing pellucid, I. and II. vena axillaris along

their whole courses distinctly widely separated (space between the veins $3.5\times$ wider than I. vena axillaris).

♂: Processes in the median line of III. and IV. abdominal tergites small, blunt, not extending or only little extending beyond the posterior margin of tergite (Fig. 49).

Measurements in mm

	males		min.	females max.	\bar{x}
	min.	max.			
Length of body	27.0	30.0	34.2	40.0	36.4
Length of pronotum	8.7	9.0	10.1	12.2	10.8
Length of prozona	3.8	4.8	4.2	5.3	4.6
Max. width of metazona	6.8	6.9	9.0	9.8	9.2
Length of elytron	8.5	9.6	7.0	9.0	8.0
Length of posterior femur	14.5	15.0	16.1	20.0	17.3
Length of posterior tibia	12.5	13.0	14.1	16.9	15.4

Investigation of the holotype, paratypes from Adalia (now Antalya) and the series of specimens from the environments of Ankara showed that the specimens from the environments of Ankara form an independent, well clean-cut geographical race, described below as *G. adaliae angorensis*.

Distribution: South-western Anatolia.

***Glyphotmethis adaliae angorensis*, subsp. n.**

Asiotmethis adaliae; Ramme, 1951, Mitt. Zool. Mus. Berl., 27: 273 (part.)

Material examined: 6 ♂♂, 4 ♀♀.

♂ holotype, Asia Minor, Ankara-Barai, 3.—4. VII. 1947 (exped. Nat. Mus. ČSSR), 2 ♂♂ paratypes, same data as holotype, all in the collections of Nat. Mus. Prague; ♀ allotype, Asia Minor, Çorum, VIII. 1931 (Sureya) (coll. Zool. Mus. Berlin); 2 ♂♂, and ♀ paratypes, Angora (now Ankara), 1931 (Sureya) (coll. Zool. Mus. Berlin); ♂ and ♀ paratypes, Emir Göl near Ankara, 22. VI. 1935 (Ramme) (coll. Zool. Mus. Berlin); Adana, 1926, ♀ (coll. Zool. Mus. Hamburg) — this female specimen forms the inter-stage to typical subspecies.

Form more robust, with wider thorax than in the typical subspecies.

♂: Pronotum more roughly sculptured than in the typical subspecies (tubercles are larger and on average more dense), metazona distinctly wider than long, in the hind half thickened, with large blunt tubercles. Posterior margin of metazona by comparison with the typical subspecies somewhat angled (Fig. 58). Lateral tubercle of mesozona larger and sharper than in the typical subspecies (Figs. 53, 54). Wing in the apical half with darkened veins forming an indistinct inconspicuous band. I. and II. vena axillaris narrowly separated, in apical half fused (or only indistinctly separated); space between the axillar veins very tight, approximately of the same width or a little narrower than I. vena axillaris.

♀: Processes in the median line of III.—IV. abdominal tergite large, sharp, reaching distinctly beyond the posterior margin of the tergite (Fig. 51).

	Measurements in mm					
	min.	males max.	\bar{x}	min.	females max.	\bar{x}
Length of body	28.0	31.0	29.8	34.0	36.0	35.0
Length of pronotum	9.1	10.0	9.4	12.2	13.0	12.7
Length of prozona	3.6	4.2	3.9	5.0	5.1	5.0
Max. width of metazona	8.1	9.2	8.4	10.2	11.0	10.5
Length of elytron	9.3	10.4	9.8	6.6	8.2	7.6
Length of posterior femur	15.0	16.0	15.2	18.0	20.0	19.0
Length of posterior tibia	13.0	14.0	13.5	15.3	17.0	16.1

The specimens from Yozgat [cfr. Ramme, 1951: 273] would probable belong to this subspecies.

Distribution: Central Anatolia.

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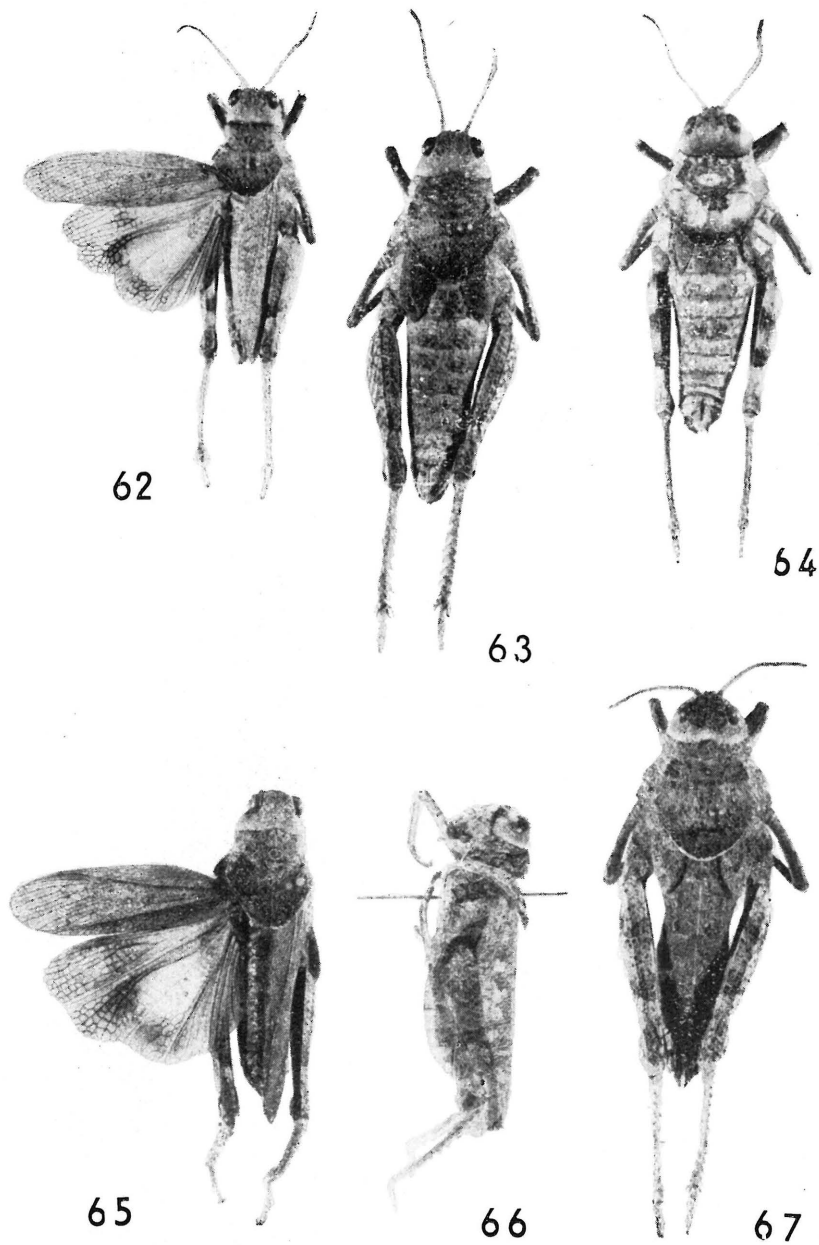


Fig. 62. *Glyptotmethis h. holtzi* ♂. Fig. 63. *G. h. holtzi* ♀.
 Fig. 64. *G. h. pulchripes* ♀. Fig. 65. *G. h. extimus* ♂. Fig. 66. *G. d. dimorphus* ♂. Fig. 67.
G. d. dimorphus ♀. (Figs. 62—93. Photo V. Máka.)

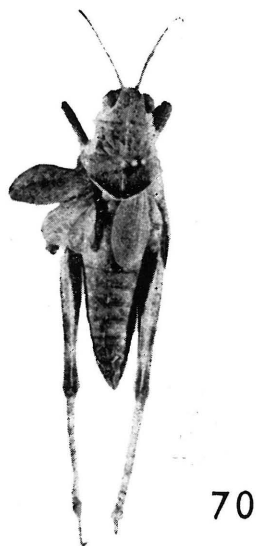
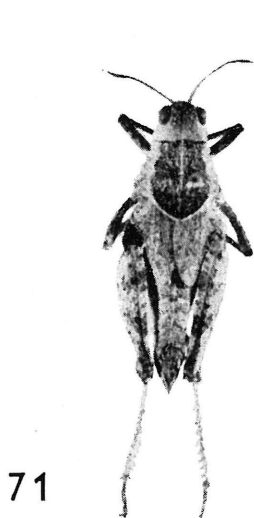
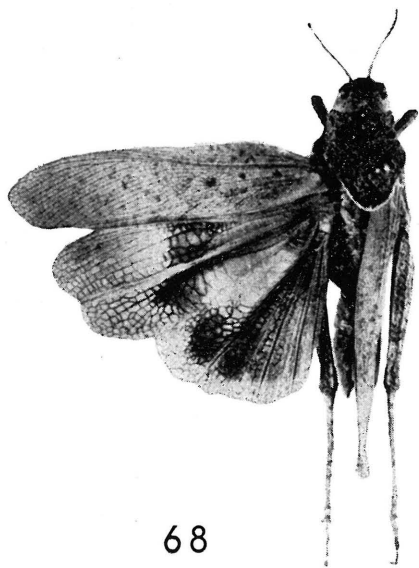


Fig. 68. *G. d. armenus* ♂ (Holotype). Fig. 69. *G. d. armenus* ♀ (Allotype). Fig. 70. *G. h. macedonicus* ♂. Fig. 71. *G. h. heldreichi* ♂.

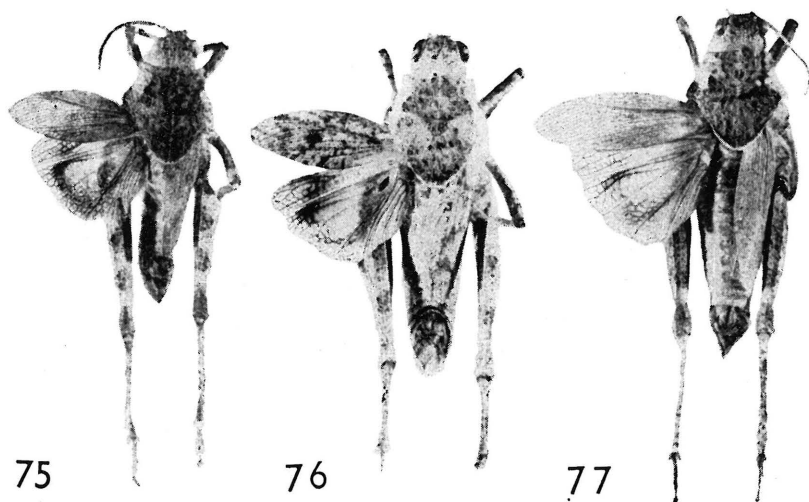
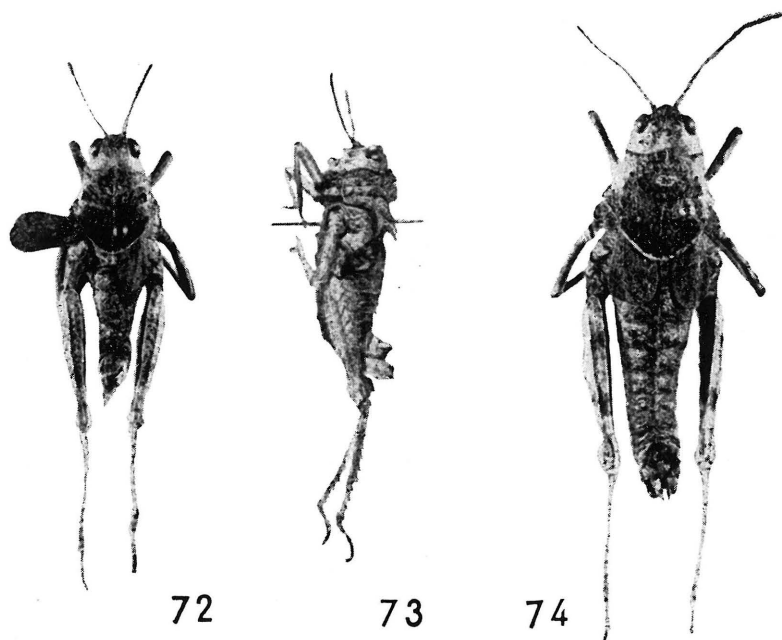


Fig. 72. *G. ovipennis* ♂ (paratype); fig. 73. *G. ovipennis* ♂ (paratype), lateral view.
 Fig. 74. *G. ovipennis* ♀ (paratype); fig. 75. *G. e. escherichi* ♂; fig. 76. *G. e. coloripes* ♂
 (Holotype); fig. 77. *G. e. elatior* ♂ (Holotype).

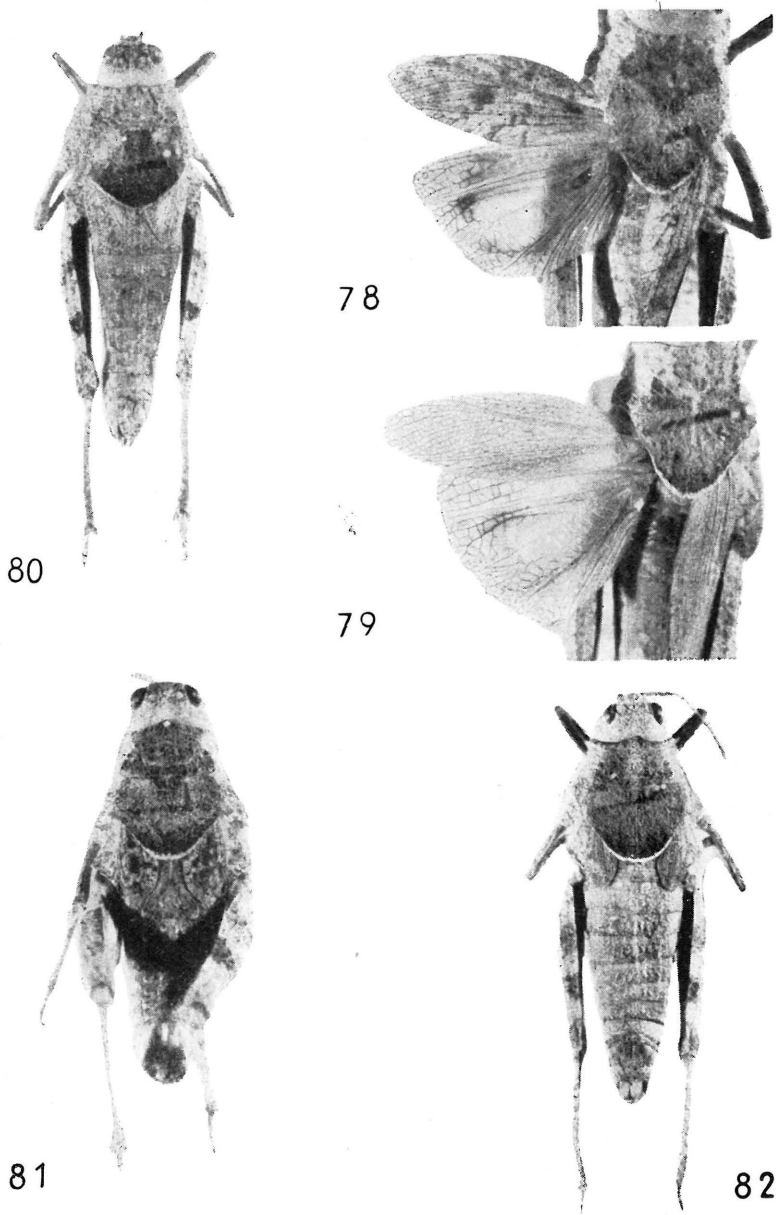


Fig. 78. *G. e. coloripes* ♂ (Holotype) — left elytron and wing; fig. 79. *G. e. elatior* ♂ (Holotype) — left elytron and wing; Fig. 80. *G. e. escherichi* ♀; fig. 81. *G. e. coloripes* ♀ (Allotype); fig. 82. *G. e. elatior* ♀ (Paratype).

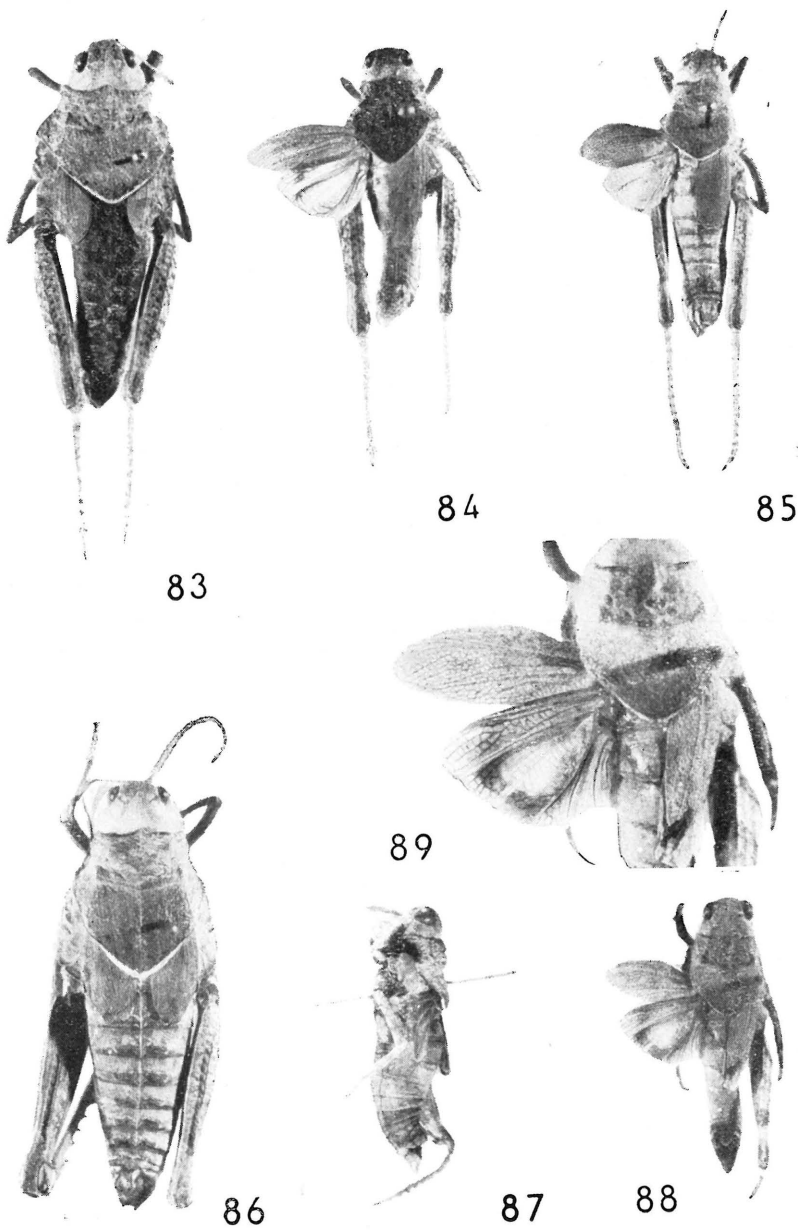
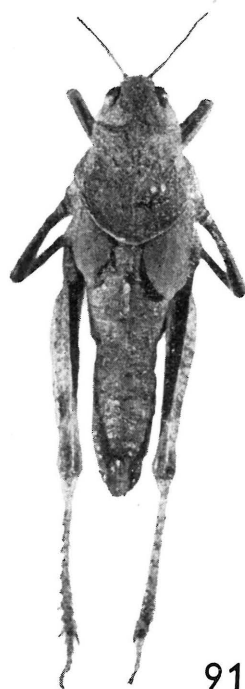


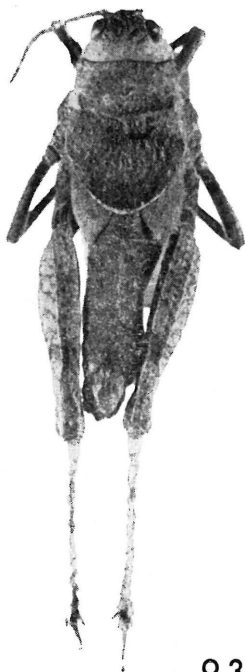
Fig. 83. *G. sevketi* ♀ [Paratype]; fig. 84. *G. sevketi* ♂ [Holotype]; fig. 85. *G. inermis* ♂ [Paratype I.]; fig. 86. *G. inermis* ♀ [Paratype]; fig. 89. *G. raggei*, sp. n. ♂ [Holotype] — left elytron and wing; fig. 87. *G. raggei*, sp. n. ♂ [Holotype], lateral view; fig. 88. *G. raggei*, sp. n. ♂ [Holotype].



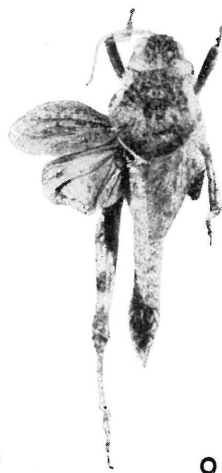
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Fig. 90. *G. a. adaliae* ♂ (Holotype); fig. 91. *G. a. adaliae* ♀ (Paratype); fig. 92. *G. a. angorensis* ♂ (Holotype); fig. 93. *G. a. angorensis* ♀ (Allotype).