

II. Genus *Tropidopola* St.
(Acrid.)

BY

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History of the genus.

The first species of *Tropidopola* was described by Marschall in 1836 under the name *Gryllus cylindricus* from Sicily. Three years later Serville (1839) described in his genus *Opsomala* ² an *O. sicula*

¹ The steady progress of orthopterology during the last few decades made all comprehensive monographs on Palaearctic Orthoptera completely out of date. At the same time, the group begins to attract more and more students, who are severely handicapped by scattered literature, while it may be confidently stated that their numbers would increase if an up-to-date revision of the fauna were available. A work of this kind, however, cannot be accomplished by a single specialist and even a group of them would find it very difficult to revise the whole of Palaearctic Orthoptera within a specified time. These considerations led a group of European orthopterists (Prof. I. Bolivar, Dr. C. Bolivar, Dr. L. Chopard, Prof. R. Ebner, Dr. W. Ramme, Dr. B. P. Uvarov formed the nucleus of the group, but further collaborators would be welcome) to devise a scheme for a gradual revision of Palaearctic Orthoptera, each specialist working out separate groups, or separate genera, just as his time and circumstances permit. The series will be published in EOS as independent articles, but under one general heading, and it was opened by Prof. I. Bolivar's paper on *Sciobiae* (EOS, I, pp. 375-440). No definite promises can be made at present as to when the work can be completed in this way, but if even only some portions of Palaearctic fauna will be worked out critically, this would be a great help for students of the group and would facilitate the appearance of a concise, but comprehensive, handbook on the whole fauna, which is so much needed.

² The correct synonymy and history of this genus, which is to be called *Opshomala* Serv. and dated 1831, see Hebard's paper on the Orthoptera of Colombia (Trans. Americ. Entom. Soc., XLIX, 1923, p. 246).

from Sardinia, which also belongs to *Tropidopola*; another species *O. pisciformis*, described by Serville in the same book from Java and Egypt and regarded by some later authors as synonymous with *cylindrica*, has nothing to do with the genus since it is stated to have «disque du prothorax... distinctement tricaréné»; it is possible that the specimen from Egypt which Serville mentions under *pisciformis* was actually a *Tropidopola*, but the description was obviously based on the specimen from Java.

The Sicilian species, already described by Marschall, received the name of *Opsomala fasciculata* from Charpentier (1841, 1841 a) who either did not know, or ignored, Marschall's work.

Fieber (1853) synonymized *fasciculata* Charp. and *sicula* Serv. with *cylindrica* March., and described a new species, *Opsomala longicornis* from Greece, while Fischer (1853) admitted *sicula* Serv. as an independent species, regarding *fasciculata* as a synonym of *cylindrica*.

Walker (1871) with some doubt referred to the genus *Opomala* a new species, *O. syrica* from the Dead Sea; this is undoubtedly a *Tropidopola*.

Stål was the first to appreciate generic differences between the European species of Servillean genus *Opshomala* and the American insects referred to it, while he erected the genus *Tropidopola* for *fasciculata* Charp. (1873, 1878). He was followed by I. Bolívar (1876) who also included in *Tropidopola* only one species, *cylindrica*, with *fasciculata* as its synonym. Brunner (1882), however, reverted to the use of Servillean name *Opomala* for European insect, with *Tropidopola* as its synonym, giving as a reason (1898) long usage of the name *Opomala* in that sense; he could not distinguish more than one European species which he called *cylindrica*, quoting *fasciculata* and *sicula* as its synonyms, and omitting *longicornis* Fieb. altogether.

Jacobson (1902-1905) obviously followed Brunner in the treatment of species, but he called the genus *Tropidopola*, and doubtfully referred to it also *Opomala syrica* Walk., *Opsomala bicolor* Haan and *Truxalis* (? *Opsomala*) *japonica* Motsch.; the first named species we already mentioned above, while two others clearly do not belong to the genus.

Kirby (1910) established correct synonymy of the genus, in which he included five species, viz. *cylindrica* (with *fasciculata* and *piscifor-*

mis as synonyms), *sicula*, *longicornis*, *syriaca* (an emendation of *syriaca*) and *japonica*; the generic position of the three last named species was queried.

All writers of faunistic papers, in which the genus was recorded, relied unreservedly on Brunner's authority and, assuming *a priori* the existence of only one species of *Tropidopola*, they never questioned the correctness of applying the name *cylindrica* to material from different countries.

In 1922 when studying some specimens of *Tropidopola* from Mesopotamia and Persia and comparing them with those from Greece and Macedonia, I was struck by considerable differences between the two series in the shape of the vertex. Believing the Greek specimens to represent true *cylindrica* Marsch. I described the other insect as a new species, *obtusa*, with a new var. *virescens*; an examination of some specimens from Algeria proved them to be very similar to the Mesopotamian ones, and I regarded them as a race of *obtusa* and named them subsp. *algeriana*. At the same time I endeavoured to collect some information about types of old species, and an examination of the type of true *cylindrica* Marsch. at once upset my conception of this species. It showed that true *cylindrica* is very near to my *obtusa*, while my *cylindrica* (1922), with the long, acute fastigium of vertex should be better called *longicornis* Fieb., originally described from Greece (Buxton and Uvarov, 1924). At the same time, it became clear that no further progress in the study of the genus can be made without a thorough critical examination of all existing types of old species and of long series of specimens from various countries.

Material.

My request for specimens of *Tropidopola* received a generous response from all institutions and persons possessing such material. As a result I have been able to study over 200 specimens of *Tropidopola* from different countries, which figure must be considered very high, the insects of this genus being usually somewhat scarce in collections. The only types in existence proved to be those of *cylindrica* Marsch. and *fasciculata* Charp., but good topotypic series of all others enabled

me to settle the questions of correct names and synonymy with certainty.

For the loan of specimens and for other assistance in my present work I am obliged to the following institutions and persons (abbreviations of names of Museums in brackets are given as they are used in the systematic part of the paper):

Naturhistorisches Staatsmuseum in Wien (V. M.); material from the general collection and from that of Brunner has been received through kind offices of Prof. R. Ebner and Dr. Zerny.

Zoologisches Museum der Universität zu Berlin (Ber. M.); material communicated by Dr. W. Ramme.

Museum d'Histoire Naturelle, Paris (P. M.); material sent by Dr. L. Berland and Dr. L. Chopard.

Museo Nacional de Ciencias Naturales, Madrid (M. M.); material communicated by Dr. Cándido Bolívar.

Turkestan Station for the protection of plants (T. St.); material sent by Mr. V. Plotnikov, and returned partly to the Zoological Museum of the Russian Academy of Sciences in Petrograd (Petr. M.), partly to the Station.

Material on *Tropidopola* in the British Museum (Brit. M.) accumulated during the period of work, in addition to few specimens in the old collection, has been also worked out.

Dr. Malcolm Burr's collection of Palaearctic Orthoptera, now property of the Oxford University Museum (O. M.) and put at my disposal by Prof. E. B. Poulton.

Prof. Dr. R. Ebner's private collection (Ebn. coll.).

I wish here to express my sincere thanks to all the above mentioned persons, and to the authorities of the respective museums for the ready support given to my work.

My special thanks are due to the editors of EOS for facilities in publishing and illustrating this paper. Figures 1 and 13 were executed by Mr. B. Jobling, others by myself.

All the specimens studied by me were returned to the respective Museums with my identification labels.

Gen. **Tropidopola** St. (fig. 1).

Body more or less cylindrical, slightly compressed laterally, elongate.

Antennae relatively thick not longer than twice the length of head.

Head conical. Face strongly oblique, rugose. Frontal ridge sulcate throughout, narrowed upwards. Fastigium of vertex horizontally produced in front of the eyes, parabolic or triangular, slightly impressed or flat, with a feeble median keel and with a transverse bow-shaped sulcus at the base; foveolae of vertex irregular, triangular, scarcely impressed. Eyes elongate, oblique.

Pronotum cylindrical, without any trace of lateral keels, punctured rugulose. Median keel represented only by a smooth, scarcely raised line, more distinct in metazona, often obsolescent in prozona. Transverse sulci fine; posterior sulcus well behind the middle. Hind margin more or less broadly rounded. Lateral lobes considerably longer than high, somewhat narrowed downwars;

anterior margin moderately oblique, practically straight, or slightly sinuated below; anterior angle right or slightly more; lower margin callous, practically straight, or very slightly sinuate; posterior angle

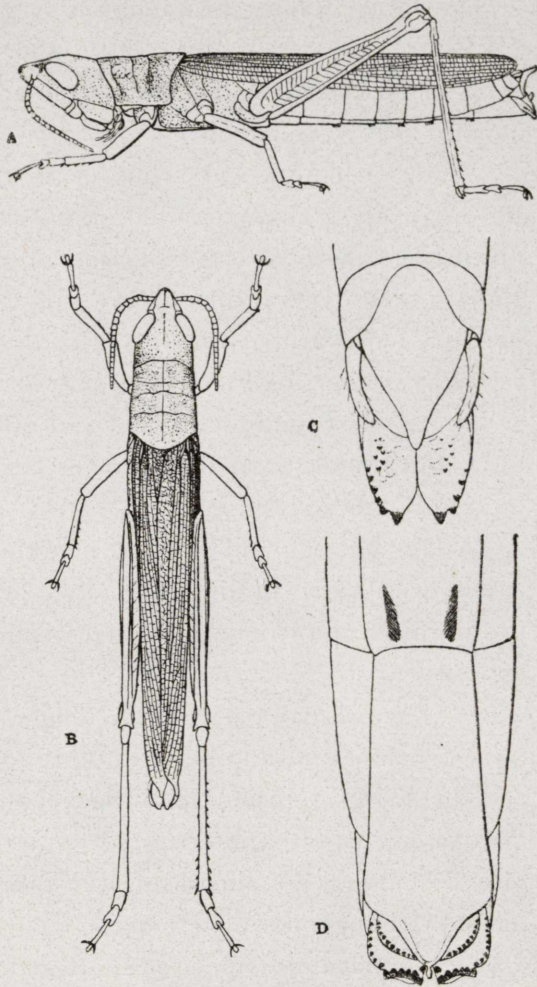


Fig. 1.—*Tropidopola turanica*, sp. n. ♀, paratype. Golodnaya Step, Turkestan. *A* and *B*, the whole insect; $\times 1,5$; *C*, end of abdomen from above; $\times 7$; *D*, do from below; $\times 7$.

a little more than right, rounded; posterior margin oblique, regularly concave.

Prosternal tubercle straight, incrassate at the apex, which is flat and strongly punctured. Sternum elongate, concave, punctured, especially near its margins. Mesosternal lobes connected along the middle (except in *T. daurica*). Metasternal lobes connected along a straight median line. Pleurae coarsely punctured-rugose.

Elytra narrow, usually a little shorter than abdomen, with false veins in the discoidal and the interulnar areas; apex rounded. Wings as long as elytra, narrow.

Anterior femora somewhat incrassate. Posterior femora narrow, but relatively plump, rounded; upper carina very low, smooth, often obsolescent in the basal half; knee-lobes rounded. Posterior tibiae shorter than femora, dilated towards the apex, with the margins expanded, acute, armed with 11-13 spines on each side, with an outer subapical spine. All tarsi with very large, oval pulvilli; posterior tarsi with the first joint depressed and dilated, second joint moderately thick and round, third joint longer than first, slender, but gradually incrassate apically.

Abdomen long and slender, punctured below. Sternites 5, 6 and 7 each with a pair of longitudinally placed tufts of soft hairs near the posterior margin (sometimes there is a short tuft at the 4th sternite, as well).

♂. Supraanal plate much longer than broad, somewhat constricted before the middle, with the apex long, attenuate and acute and the margins bisinuate; surface convex, smooth, with a shallow median sulcus, often interrupted. Cerci compressed laterally, moderately incurved, not surpassing the supraanal plate; apex more or less dilated. Subgenital plate narrowly-conical, somewhat recurved.

♀. Valvae of ovipositor short and thick; upper valvae each with an apical and 2-5 lateral teeth, and with some spinules, or granules, on the disc; lower valvae each with one apical, one pre-apical (this placed on the inner margin of the valva, just before the apex), 3-5 subapical, 4-7 lateral and a semicircular row of 5-12 discal teeth. Subgenital plate very long, with the apex acutely produced.

Coloration usually of various kind of brown and stramineous brown, ranging to bright green, or to olivaceous brown. Inner and

lower side of hind femora more or less extensively red; the inner area with a series of short black transverse fasciae, sometimes confluent, or obsolescent. Hind knees with a blackish dot at the base of lower knee lobes. Hind tibiae faintly bluish, or greenish above, blackish below and towards the apex. Wings colourless. Body and legs hairy.

Genotype: Opsomala fasciculata Charp. = *Tropidopola cylindrica* (March.).

Systematic position of the genus.

The genus *Tropidopola* stands absolutely isolated amongst the Palearctic genera of *Catantopinae*, but it is easily and naturally placed in the group of genera allied to *Ischnacrida*, *Ramphacrida*, *Leptacris*, *Carsula* and *Acanthoxia*. This group is represented by fairly numerous genera and species mainly in the drier parts of Tropical Africa, but some of the genera (*Leptacris*, for instance) range into India, as well, while *Carsula* is a genus known from India only, and namely from Silhet. This latter genus shows the nearest resemblance to *Tropidopola*, but is amply different from it by caracteres too numerous and too obvious to mention.

In none of the known genera of the group, however, the structure of ovipositor is in any degree similar to that in *Tropidopola*. While this is an adaptational character, its taxonomic value is beyond doubt, but, even apart from it, *Tropidopola* presents so many specialized structures that it is impossible to indicate its genuine affinity to any other particular genus.

A very striking resemblance may be seen between *Tropidopola* and the New World genus *Opshomala* Serv., in which nearly every character of *Tropidopola* is exactly repeated. This is, however, only a highly significant case of morphological parallelism, since *Opshomala* belongs to another large division of *Catantopinae*, differing by the absence of the outer subapical spine of hind tibiae. This latter character, though not always absolutely reliable, seems to me in this case to indicate that the two genera are actually of different origin.

Ecology and adaptational characters.

Exact observations on the ecology and habits of any species of *Tropidopola* are lacking, but some information scattered in literature is worth collecting together.

Brunner (1882) remarks about *Tropidopola* that it occurs in damp meadows.

Vosseler (1896) relates that near Ain-Sefra in Oran *T. cylindrica* has the same habits as *Platypterna*, with which it occurs together in clumps of *Stipa*, being extremely wary and difficult to catch. In describing the habitat of *Platypterna* he makes it clear that this is an arid place with scattered bunch-grasses.

Krauss (1902) says that he found *T. cylindrica* at Biskra, in Algeria on *Juncus* growing near and in the irrigation channels in the oases.

Werner (1905) found *T. longicornis* (called by him *cylindrica*) common in bunch near the barrage at Kalioub in Egypt, and easy to catch by a net, or even by hand.

I (Uvarov, 1912) have recorded a species of *Tropidopola* (probably, *T. turanica*) as rare in Transcaspia, because I collected only two females which flew to light at night.

I may here add also that all the localities, from which *T. turanica* is known (see below) are either irrigated oases, or otherwise well supplied with water places.

Buxton (1924) says that *T. longicornis* in Palestine is confined to beds of reeds and of *Cyperus*. When it is disturbed it jumps or flies to a fresh reed and takes up its position vertically and always on the side of the reed farthest from the collector.

Mr. Mavromoustakis, to whom I am obliged for many Orthoptera from Cyprus, sent me a series of *T. longicornis* from that island, with a note that it is common at the Zakaki (Chiflicoudia) meadow near Limassol, where it occurs on *Juncus* and reeds, as well as in the marshes of the salt lake of Limassol.

All this information seems to make clear, that the typical habitat of *Tropidopola* is in beds and clumps of reed, *Cyperus*, *Juncus* and similar plants, growing near and in the water in the desert, or semi-desert, localities. Observations on *T. cylindrica* occurring in Northern

Africa amongst bunch-grass in the desert itself stand somewhat isolated and I am inclined to ascribe the fact to a temporary shifting of insects from one habitat to another. This shifting is, however, very suggestive as regards the ecological history of the genus, which I will discuss later.

It is very interesting to follow to what a remarkable extent the external morphology of *Tropidopola* responds to the peculiar requirements of its habitat.

To begin with, the strongly elongated, cylindrical body is of the type which is common to a number of Orthoptera living in the habitats characterised by prevalence of grasses and other plants, similar to grasses in the general built. This ecological type is particularly well represented in the savannas of moderately dry regions of Africa, where a large number of genera of Orthoptera belong to it. Amongst Acrididae, all the genera immediately related to *Tropidopola* (*Oxyrrhypes*, *Rhamphacrida*, *Leptacris*, *Ischnacrida*, *Metapa*, *Acanthoxia*, a. o.), and others remote from it (*Brachycrotaphus*, *Platypterna*, *Mesopsis*, *Cannula*, a. o.) form a large and uniform group, but certain Tettigoniidae, like *Conocephalus* (*Xiphidion*), *Homorocoryphus* a. o., as well as *Mantidae* of the genera *Pyrgomantis* or *Galepsus* must be also included here. Practically all of these insects possess also a common type of coloration, in which various hues of drying and dry grasses predominate, while the pattern of the exposed parts, if any, consists usually of longitudinal stripes and lines.

Apart from this general agreement in the shape of body and in its coloration with the habitat, there are in *Tropidopola* some special features which are in a close accord with the habits of the insect.

Thus, it seems that the usual attitude of a *Tropidopola* is clinging to a stem of grass, in a vertical position, and the strongly developed tarsal pulvilli are necessary for support, while concave pectus enables the insect to cling to the stem very closely. We do not know, whether *Tropidopola* ever descends to the ground on its own accord, but its hind femora are too slender to be of much use in jumping; this type of femora may be observed in most of the climbing *Acrididae*. Hind tibiae, as well as the first joint of the hind tarsi are clearly adapted for swimming, just as they are, for instance, in *Oxya*. At the same time, the general type of structure of hind tarsi, with their strongly

elongated joints, is that of a climber, which leads us to assume that the adaptation of hind legs for swimming is a secondary modification of climbing legs.

Nothing at all is known on the oviposition of *Tropidopola*, while the structure of its ovipositor is highly peculiar. Indeed, it is obviously impossible to use it for digging holes in a soil in the least firm; still less is it adapted for laying eggs in the stems of plants, and I think it safe to conclude that *Tropidopola* lays its eggs in a very soft and moist soil, perhaps even in mud.

In what relation to the environment is the relatively strong hairiness of body, particularly, of its underside, it is impossible to say. Most of all puzzling is the significance of the paired dense brushes of hair on the abdominal sternites. A localisation of hairs tending to formation of the brushes may be seen also in *Leptacris*.

Geographical distribution (fig. 2).

The systematic and ecological affinities of *Tropidopola* prove that the genus had its origin as a member of the fauna of subtropical savannas of the Old World. This vegetational type is at present confined almost entirely to the African continent, but my studies of Orthoptera lead me to assume that the savanna type of fauna used to be much more widely distributed in Asia than it is at present. Thus, we find members of that fauna, like *Leptacris*, *Brachycrotaphus*, *Leva*, *Aulacobothrus* a. o. both in Africa and in India, eastwards to Silhet and upper Burma. It is highly probable that this fauna used to extend also farther north, which might have been before the extensive development of the Palaearctic deserts. Either that latter process, or else the influence of the glacial period, may have been responsible for the dying out of the savanna fauna in the Mediterranean latitudes where only few of its representatives survived in some special habitats. To this survivors belong, for instance, *Platypterna* and *Brachycrotaphus*, as well as *Tropidopola*; this latter genus proved to adapt itself to new conditions, while the isolation of its different colonies led to the development of several species and subspecies.

One fact does not find a ready place in the above scheme, and this is the occurrence of a species of *Tropidopola* in Dauria. Indeed,



Fig. 2.—Map of distribution of species and subspecies of the genus *Tropidopola* (except *T. daurica*).

we must either suppose that the savanna fauna extended very far eastwards, or that the genus *Tropidopola* is a member of the savanna fauna itself, but of some still earlier one, from which it originated. We know as yet too little about the fauna of Orthoptera of the south-eastern Siberia to speculate on this point.

When analyzing the distribution of various species and races of *Tropidopola*, one fact is very striking. This is the way how the area of distribution of the short-headed type of forms (*cylindrica* and its allies) extended from west to east, is cut into two by a narrow area of long-headed forms (*longicornis* and its subspecies) extending from Greece through Palestine, into Egypt. I do not venture at present to offer an explanation of this type of distribution, which, by the way, is not unique amongst Orthoptera.

Taxonomic characters and variation.

The exceedingly uniform general habitus of insects of the genus *Tropidopola* make their taxonomic studies very difficult. Indeed, it is only the structure of the head and antennae, as well as that of the male cerci and of the ovipositor which are of value for separating various forms.

The shape of fastigium and of the frontal ridge proved to be sufficiently reliable to consider them of specific value, together with the genitalia. Antennae, on the other hand, though presenting a very wide range of morphological differences are clearly of little value as specific characters, their variation being always associated with distribution; this makes possible to use the relative length of antennae and the shape of their joints as a character of geographical forms (subspecies).

Such a character, as the shape of fastigium being very difficult to appreciate without direct comparison with typical specimens, one must be very careful, especially when studying material from new localities.

Key to species and subspecies.

- 1 (6). Fastigium of vertex in ♀ distinctly shorter, in ♂ not longer, than broad, broadly rounded.
- 2 (3). Relatively robust. Mesosternal lobes in ♂ not touching each other, narrowly, but distinctly, separated (♀ unknown, but the lobes in it

- must be well separated). Fastigium as long as broad, broadly elliptic, with the sides distinctly arched outwards. Apical margin of ♂ cerci with a notch just above the middle, and the lower angle broad, triangular.—S. E. Siberia 1. **T. daurica**, sp. n.
- 3 (2). Slender. Mesosternal lobes touching each other in both sexes. Apex of ♂ cerci strongly rounded-expanded, lower angle small, acute, apical margin only with a shallow concavity, not a notch. Lower valvae of the ovipositor with 4 subapical and 7-8 discal teeth.
- 4 (5). Antennae in ♂ 1.5, in ♀ 1.3 of the length of head, their 8 th joint subquadrate, 11 th and 12 th scarcely longer than broad. Frontal ridge gradually narrowed upwards. Margins of fastigial disc incurved.—Sicily, Sardinia, S. Spain, Balearen, NW. Africa 2 a. **T. cylindrica cylindrica** (Marsch.).
- 5 (4). Antennae in ♂ twice, in ♀ 1.6 the length of head; all joints longer than broad, 11 th and 12 th very elongate. Frontal ridge broad, rather suddenly narrowed above. Margins of fastigial disc curved outwards.—Mesopotamia, S. Persia 2 b. **T. cylindrica obtusa** Uv.
- 6 (1). Fastigium at least as long as broad, in ♂ usually distinctly longer.
- 7 (8). Frontal ridge practically parallel-sided, but suddenly narrowed at fastigium; its sulcus shallow, with an irregular median carinula (or raised line) in its upper portion. Apex of ♂ cerci with the upper angle strongly expanded, almost parabolic and the lower angle not at all produced, obtuse. Upper valvae of ovipositor with an irregular group of 6-8 strong black spinules on the disc, without a submarginal furrow. Antennae in ♂ twice, in ♀ 1.6 the length of head; nearly all joints, except near the base, decidedly elongate.—Central Asia 3. **T. turanica**, sp. n.
- 8 (7). Frontal ridge gradually narrowed towards fastigium, deeply sulcate. Fastigium acutely angulate. Apex of ♂ cerci with the upper angle not strongly expanded, rounded-obtuse, and the lower angle attenuate, acute. Upper valvae of ovipositor with a single row of several small granules on the disc (sometimes obsolete) and with a submarginal furrow.
- 9 (10). Antennae in ♂ nearly, or quite, twice, in ♀ 1.5 the length of head, feebly compressed, most of the joints elongate even in ♀.—Egypt, Palestine 4 a. **T. longicornis longicornis** (Fill.).
- 10 (9). Antennae in ♂ half again as long, in ♀ scarcely longer than head, thick, distinctly compressed, all joints transverse, or very nearly so.—Macedonia, Greece, Asia Minor, Cyprus 4 b. **T. longicornis graeca**, sbsp. n.

1. *Tropidopola daurica* sp. n. (fig. 3).

♂. Somewhat more robustly built than other species of the genus.

Antennae in the type broken off.

Frontal ridge gradually and not strongly narrowed towards the fastigium, deeply sulcate. Fastigium of vertex shorten than broad, broadly rounded at the apex; its disc broadly elliptic, practically flat,

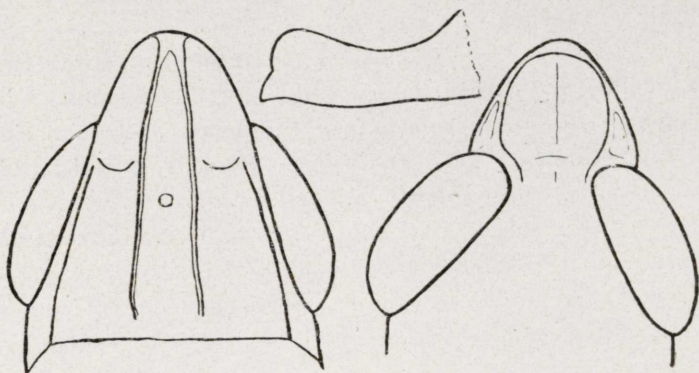


Fig. 3.—*Tropidopola daurica*, sp. n., ♂ type. Dauria.

with the margins scarcely raised; median keel low; arched sulcus feeble. Foveolae of vertex irregular, reaching to about the middle of the lateral margins of fastigium.

Pronotum relatively short and thick; its median carina scarcely perceptible, even in the metazona. Sternum practically smooth, scarcely punctured; mesosternal lobes somewhat longer than broad, with the inner margins strongly rounded, narrowly, but distinctly separated.

Male cerci relatively short, not reaching the apex of the supra-anal plate; their apex somewhat expanded, with its upper angle in the shape of a quarter of a circle, and the lower angle large, separated from the upper by a notch in the middle of the apical margin of the cercus. Subgenital plate relatively stout, scarcely recurved.

Total length, 34; pronotum, 5,5; elytra, 22,5; hind femur, 14,5 mm.

Type.—«Daouréa, 1872, Dybov.» ♂ (M. M.).

This remarkable new species differs from all others already by its relatively robust habitus, which finds its best expression in the unique structure of mesosternum, the lobes of which are separated

even in the male, while in all other species they are in both sexes connected along a straight line. The shape of the male cerci is not very aberrant from the general type, but is sufficiently peculiar to be of value in recognising the species. In the structure of the head, *T. daurica* is nearer to the *cylindrica*-group, but differs considerably from all known species. It is very unfortunate, that the only specimen in existence has lost its antennae, which might provide further characters of the species, while a study of the female sex may be of assistance in defining the relation of *T. daurica* to other species of the genus.

At present I would venture to suggest that *T. daurica* corresponds to an earlier stage in the evolution of the genus, than other species, which all became decidedly more slender, this being an obvious influence of the habitat.

In connection with the above considerations, highly significant is the distribution of *T. daurica*, which I have already discussed above, in the general part of the paper. I might here only state that «Daouréa» must mean Dauria, under which somewhat vague name was known the country south and east of the lac Baikal, *i. e.* Transbaicalia and the Amurland. The specimen was obviously taken by Dybowsky who was a well known naturalist collecting in Eastern Siberia. Further data on this exceedingly interesting species would be most valuable.

2. *Tropidopola cylindrica* (Marsch.)

Since this species splits up into two geographical races, each with its own characters, distribution and synonymy, it must be more convenient to describe and discuss each of the subspecies separately.

2 a. *T. cylindrica cylindrica* (Marsch.) (figs. 4, 5).

- * 1836. *Gryllus cylindricus*, Marschall, p. 210, pl. 18, fig. 2.
- 1839. *Opsomala sicula*, Serville, p. 594.
- * 1841. *Opsomala fasciculata*, Charpentier, p. 306.
- 1841 a. *Opsomala fasciculata*, Charpentier, pl. 14.
- * 1922. *Tropidopola obtusa* sbsp. *algeriana*, Uvarov, p. 366 (syn. nov.).

♂. Antennae half again as long as head, very slightly compressed; their joints short, 8th joint being subquadrate, 11th scarcely longer than broad.

Frontal ridge distinctly and gradually narrowed towards fastigium, deeply sulcate throughout. Fastigium of vertex slightly shorter than broad; apex broadly rounded-angulate; disc with its sides slightly incurved, surface feebly impressed; margins somewhat raised; median keel distinctly raised; arched sulcus practically straight,

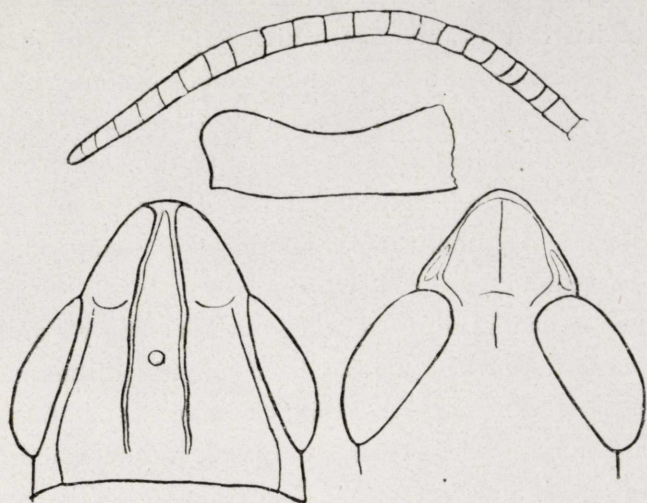


Fig. 4.—*Tropidopola cylindrica cylindrica* (Marsch.), ♂, Catania.

feebly, sometimes obsolete. Foveolae not (or just) reaching the middle of the lateral margin, irregular.

Pronotum slender; median keel very low, but perceptible, more so in metazona. Sternum and abdomen below punctured.

Cerci widened apically; upper apical angle distinctly flattened and expanded, rounded, but the apical margin of the cercus practically straight; lower angle attenuate, but short and not very acute.

♀. Antennae by one third longer than the head, more distinctly compressed, thick, narrowing both basally and apically; joints similar to the male sex. Frontal ridge broad, deeply sulcate, gradually narrowed upwards. Fastigium much shorter than broad.

Upper valvae of the ovipositor with 3-6 lateral teeth, and a single irregular median row of minute black granules, separated from the marginal row by a furrow. Lower valvae with 4 subapical, 4-5 lateral and 7-8 median teeth.

Total length ♂, 30-33; ♀, 33-39; pronotum ♂, 5-5.5; ♀, 6-8; elytra ♂, 18-22; ♀, 22-28; hind femur ♂, 12-14; ♀, 14-18 mm.

MATERIAL STUDIED. — Sicily, 1 ♀ (*type of Gryllus cylindricus*, Marschall. V. M.); Europa, 2 ♂♂ (*types of Opsomala fasciculata*, Charpentier, from Sicily; one of them, with the wings spread, is selected here as *the single type*; Ber. M.); Sicile, Brisout, 1 ♀ (O. M.); Sicily, Catania, 1 ♂ (V. M.); no date, 1 ♂, 1 ♀ (coll. Fieber coll. Br. W.; probably, Fieber's original specimens; V. M.); Sardinien, Gené, 2 ♂♂, 1 ♀ (probably, from the same series of the types of *O. sicula* Serv., which is lost; Ber. M.); Balearen, Mallorca, 2 ♂♂, 1 ♀ (Ebner coll.); Spain: Garrucha, 1 ♂, 1 ♀; Cádiz, 1 ♀; Tor-

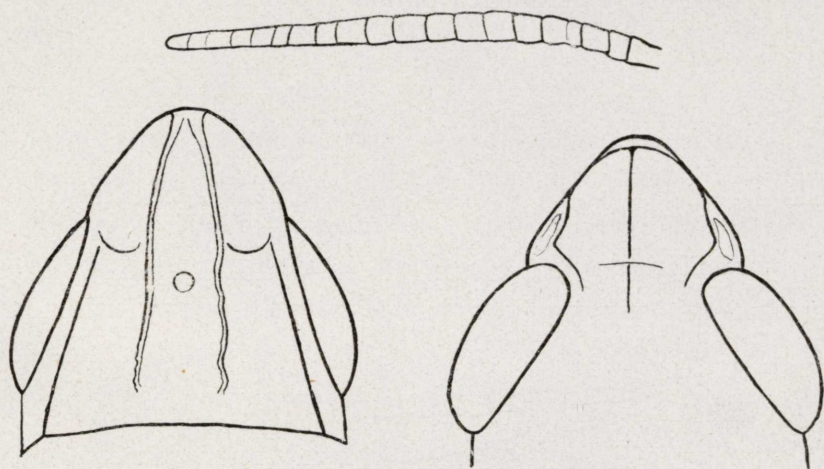


Fig. 5.—*Tropidopola cylindrica cylindrica* (Marsch.), ♀, type, Sicilien.

tosa, 1 ♂ (M. M.); Espagne: Aguilas, Murcie, 1 ♀ (O. M.); Algeria: Biskra, 2 ♂♂, 1 ♀ (O. M.); Algeria: Biskra, 2 ♂♂, 1 ♀ (*types of Tropidopola obtusa algeriana*, Uvarov. Brit. M.); Algérie: Biskra 1 ♂ (P. M.); Algerien: Mraier-Tuggurt, 1 ♂, 1 ♀ (Ber. M.); Algérie, 2 ♀♀ (P. M.); Algérie: Colom-Bechar, 1 ♀ (P. M.); Algérie: Maison Carrée, 1 ♀ (P. M.); Algérie: Oued Rirh, Moggar, 1 ♀ (P. M.); Sud Oranais, 10 ♂♂, 7 ♀♀ (P. M.); La Calle, 1 ♂, 1 ♀ (P. M.); Tunisie: Kebili, 1 ♂, 1 ♀ (M. M.); Fetuassa, 2 ♂♂, 1 ♀ (M. M.).

NOTES.—There is a slight variation in the shape of fastigium of this subspecies, it being slightly more elongate in the specimens from Northern Africa and Southern Spain, than in the typical ones from Sicily. The difference is, however, too small and not sufficiently constant to be considered as a reason for separating two races.

Coloration of all specimens studied by me is very constant, varying only from brownish-stramineous to brown, but never a tinge of green is observed. The typical coloration of the hind legs is generally very intense.

Area of distribution of this subspecies comprises Algeria, Tunisia, Sardinia, Sicily, Mallorca and the east and extreme south of Spain. It is not known, whether it occurs in Morocco, where it can be expected, while its discovery in the South of Italy would be also quite natural.

2b. *T. cylindrica obtusa* Uv. (figs. 6, 7).

1922. *Tropidopola obtusa*, Uvarov, p. 365, fig. B.

♂. Antennae twice as long as head, round; all joints longer than broad; those in the middle (II-15 th) about twice as long as broad.

Frontal ridge deeply sulcate; its margins practically parallel and rather suddenly convergent just under fastigium. Fastigium of vertex as long as broad; apex parabolic; disc feebly concave, with a feeble

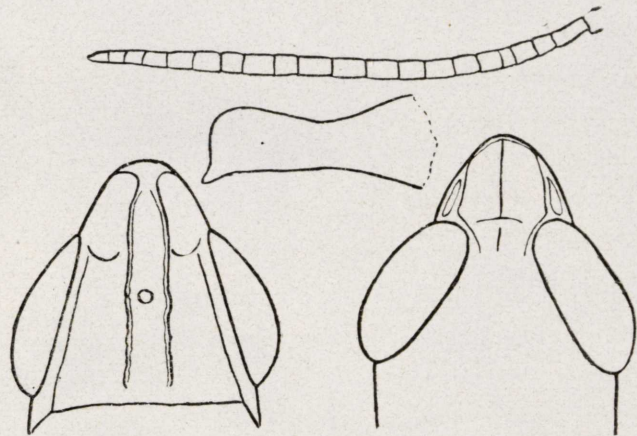


Fig. 6.—*Tropidopola cylindrica obtusa* Uv., ♂, Baghdad (Brit. M.)

median keel and the arched sulcus, and the margins slightly raised, distinctly curved outwards. Foveolae reaching beyond the middle of the lateral margins.

Pronotum slender, feebly, but distinctly, narrowed in the middle; median keel low, but perceptible. Sternum and abdomen below punctured.

Cerci very similar to those of *T. cylindrica cylindrica*, but with less expanded apical upper angle.

♀. Antennae slightly more than half again as long as head, very slightly compressed, equally broad throughout; all joints elongate.

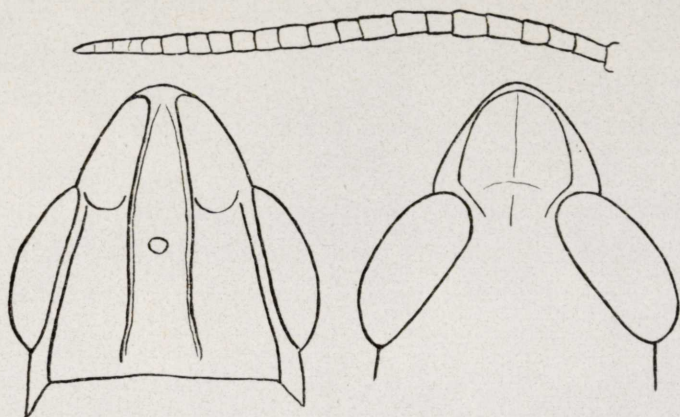


Fig. 7.—*Tropidopola cylindrica obtusa* Uv., ♀, paratype, Qalat-Salah, Mesopotamia (Brit. M.).

Frontal ridge very broad; its margins very slightly convergent upwards, more decidedly convergent just under fastigium. Fastigium of vertex slightly broader than long, otherwise as in the male.

Valvae of ovipositor as in *T. cylindrica cylindrica*.

Total length ♂ 28-32, ♀ 32-34; pronotum ♂ 4.5-5, ♀ 6-7; elytra ♂ 20-23, ♀ 26-28; hind femur ♂ 11-12, ♀ 14-15 mm.

MATERIAL STUDIED.—Mesopotamia: Qalat-Salah, 2 ♀♀ (one of them type of *T. obtusa* Uv., the other a paratype); Amara, 1 ♂, 3 ♀♀ (*paratypes*); Amara, 2 ♂♂, 1 ♀; Baghdad, 3 ♂♂, 1 ♀; Persia: River Karun, Mohamarra, 1 ♀ (*paratype*); Fao, 1 ♂, 2 ♀♀ (*paratypes*) (all Brit. M.); Bussorah (*i. e.* Basra), 2 ♀♀ (O. M.); Mohamarra, 1 ♀ (M. M.); Persia, Gotvend, 1 ♀; Disful, 1 ♂, 1 ♀ (M. M.); Suse, 2 ♂♂, 2 ♀♀ (P. M., *paratypes*).

NOTES.—The shape of antennae, vertex and frontal ridge gives quite sufficient characters to distinguish this insect from the typical *cylindrica*. The differences are, perhaps, sufficiently good to be considered of specific value, but I prefer not to separate *cylindrica* and *obtusa* altogether, if only in order to emphasize their relationship which is beyond doubt.

In the coloration all the specimens are of various hues of brown,

some with an ochraceous tinge, except two specimens, 1 ♂ from Basra and 1 ♀ from Amara (not included in the above list; Brit. M.) which are light green, being at the same time of larger size and with more elongate antennae. These two specimens were designated by me as the types of var. *virescens* Uv., and I am still in doubt as to the systematic value of their characters; more material is wanted to solve this problem.

As regards the coloration of the hind legs, *T. c. obtusa* differs from the typical form in the (generally, but not always) more pronounced development of the black pattern on the inside of the hind femora, while the red colour is usually less bright, and mainly restricted to the lower side of the femora. In the var. *virescens* both black and red colour are considerably reduced.

T. c. obtusa is known so far only from Mesopotamia and a few localities in Southern Persia.

3. **Tropidopola turanica** sp. n. (figs. 1, 8).

♂. Large, slenderly built.

Antennae twice as long as head (and even slightly longer than head and pronotum together), slightly compressed near the base, round in the rest, gently narrowed towards the apex; all joints, except those in the basal part, strongly elongate, those in the middle (11-15 th) being twice as long as broad.

Frontal ridge not deeply sulcate, with an irregular median carinula in its upper portion; margins low, practically parallel throughout, but suddenly convergent under fastigium, becoming irregular and obsolescent near clypeus. Fastigium of vertex a little longer than broad; parabolic; its disc flat, strongly rugulose, with the sides practically straight, not raised and irregular, and the median carinula very low, irregular. Foveolae irregular, reaching well beyond the middle of lateral margins.

Pronotum slender, slightly narrowed in the middle; median keel very feeble, but perceptible. Sternum and abdomen below in scattered punctures.

Cerci with the upper apical angle strongly expanded, almost para-

bolic, while the lower angle is not at all produced, obtuse, the apical margin being oblique.

♀. Very large.

Antennae a little more than half again as long as head, somewhat compressed in the basal half; their joints in the middle and beyond twice, or nearly twice, as long as broad.

Frontal ridge broad and low, with the median carinula in its upper portion well distinct, though irregular; margins low, almost parallel and very suddenly and strongly convergent under fastigium, obsoles-

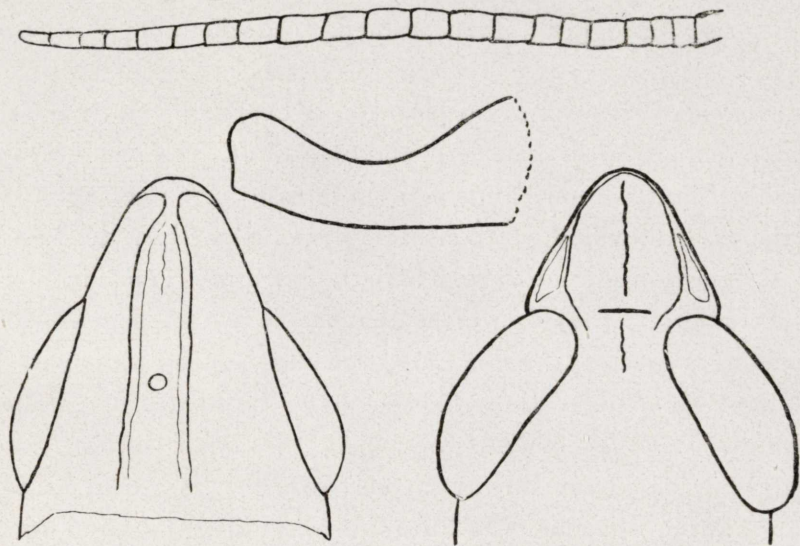


Fig. 8.—*Tropidopola turanica* sp. n., ♂, type Goloudnaya Step (Petr. Mus.)

cent near clypeus. Fastigium of vertex as long as broad, parabolic; its disc rugulose, very slightly tectiform; median keel very low; margins quite low and irregular.

Upper valvae of ovipositor with an elongate group of 6-8 strong black spinules on the disc, without a furrow between them and the margin, and with 3-4 large marginal teeth. Lower valvae with 5 sub-apical, 6-7 lateral and 11-12 median teeth, all very regular and forming regular semicircles.

Colour of both sexes pale and bright green; the female somewhat brownish. Inside of hind femora very bright red, black pattern reduced. Outer upper carina of the hind femora is never with blackish dots.

Total length ♂ 34.41, ♀ 39.50; pronotum ♂ 6.7, ♀ 7.95; elytra ♂ 22.27, ♀ 27.35; hind femur, ♂ 13.5-16, ♀ 16-20 mm. (the last figure in all measurements of the males refers to the type).

MATERIAL STUDIED.—Turkestan: Golodnaya step, Nadezhdinsky poselok, 29-V-1919, 1 ♂ (*type*), 20-V-1912, 1 ♀; Tashkent district, Osmanatinskaya volost, Komarov khutor, 17-V-1916, 1 ♀; Kokand province, 25-VI-1923; 1 ♀; Transcaspia: Bairam-Ali, 22-IV-1923, 1 ♀, 3-IX-1921, 1 ♀, 3-VI-1923, 1 ♂; Merv district, 31-V-1923, 1 ♂ (all *paratypes*; sent by the Turkestan Entomological Station; the type will be deposited in the Zoological Museum of the Russian Academy of Sciences, Petrograd); Transcaspian: Tedschen. 1 ♂ (*paratype* Ebner coll.).

NOTES.—A very striking species, amply characterized by the structure of antennae, head, male cerci and ovipositor. Its size is also very remarkable, but there are a male and a female in the collection, both from Bairam-Ali, which are considerably smaller than the rest (see the first figures in the measurements), though quite typical in all structural characters. It is noteworthy that those two specimens are also aberrant in their colour, being pale brownish, instead of bright green as the larger specimens are. This seems to be a case of parallelism in variation with *T. c. obtusa*, in which the small (typical) form is brown, while the large one (var. *virescens* Uv.) is green. Indeed, the large green specimens of *turanica* resemble the latter form in its general appearance very closely, but the structural differences always permit to separate the two insects regardless of colour or size.

As regards the distribution, there are in the literature a few records of *T. cylindrica* from Central Asia which very probably refer to *turanica* and certainly not to the true *cylindrica* (Marsch.) I have recorded *cylindrica* from Tashkent (Uvarov, 1912 *b*) this being the first record for Turkestan, while in another paper I have incorporated all records of its occurrence in Transcaspia (Uvarov, 1912 *a*) these being Askhabad, Tedshen, Bairam-Ali and the island Ogurtchinsky in the Caspian Sea; all these records fall within, or near, the area covered by the material studied in connection with the present paper.

In the British Museum collection there is, however, a female specimen from Kizilrabad in Mesopotamia which is certainly not *obtusa*,

occurring there commonly, but which resembles *turanica* very closely; it is large, but brown in colour. As the specimen is, however, badly damaged and without its antennae, I hesitate to identify it with *turanica* until more material is available.

4. **Tropidopola longicornis** (Fieb.).

As in the case of *T. cylindrica*, I find it more convenient to deal with each subspecies of *T. longicornis* separately.

4 a. **T. longicornis longicornis** (Fieb.) (figs. 9, 10).

1853. *Opsomala longicornis*, Fieber, p. 98 (*partim!*)

1871. *Opomala? syrica*, Walker, p. 51 (*syn. nov.*).

♂. Antennae twice, or nearly twice, as long as head, scarcely compressed, very slightly narrowed apically and basally; their joints beyond the basal third strongly (or, at least, distinctly) longer than broad.

Frontal ridge gradually and strongly narrowed towards fastigium, deeply sulcate. Fastigium of vertex distinctly longer than broad, acutely angulate, with the immediate apex rounded; its disc scarcely impressed; median carinula feeble. Foveolae of vertex irregular, not quite (or just) reaching the middle of the lateral margins.

Pronotum slender; median keel low, but perceptible at least in metazona. Sternum and abdomen below distinctly punctured.

Cerci only slightly widened apically; upper apical angle little expanded, rounded-obtuse; lower apical angle considerably attenuate, acute.

♀. Antennae about half again as long as head, somewhat compressed, distinctly narrowed basally and apically; their joints in the middle and beyond it considerably (or, at least, a little) longer than broad. Fastigium of vertex as long as broad. Foveolae as in the male.

Upper valvae of ovipositor narrow, with a submarginal furrow, with a single discal row of several small granules (often obsolete), with 2-4 lateral teeth. Lower valvae with 3-4 subapical, 4-5 lateral and 5-7 median teeth.

General coloration in both sexes brown, sometimes pale, nearly stramineous, seldom with an olivaceous tinge (in darker specimens). Red colour of the hind femora not bright, in most cases restricted to the underside only; outer side usually with distinct bluish-grey dots along carinae.

Total length ♂ 28-33, ♀ 39-43; pronotum ♂ 5-5.5, ♀ 7-8; elytra ♂ 19-22, ♀ 26-29; hind femur ♂ 11-12, ♀ 16-18 mm.

MATERIAL STUDIED.—Egypt: El Shiekh Fadel, 1 ♂ (Brit. M.); Barrage bei Kalioub, 2 ♂♂, 2 ♀♀ (V. M.); Suez, 1 ♀ (V. M.); Aegypt-

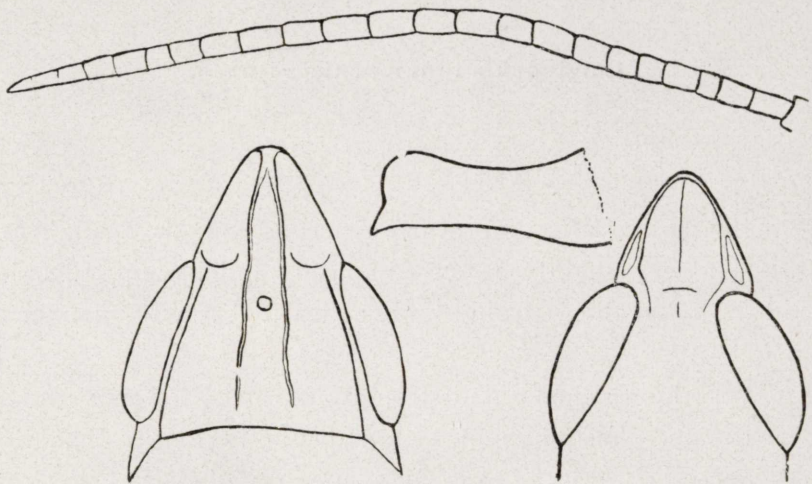


Fig. 9.—*Tropidopola longicornis longicornis* (Fieb.); ♂, El Shiekh-Fadel, Egypt.

ten, 1 ♂, 1 ♀; Assuan, 1 ♀; Alexandria, 1 ♀ (Ber. M.); Alexandria, 1 ♂, 1 ♀; Kairo, 1 ♀ (Ebn. coll.); Fayoum, 1 ♀ (M. M.); N. Sinai, between El-Arish and Mahamdiya, 1 ♀ (Brit. M.); Palestine: Haifa, 4 ♂♂, 4 ♀♀; Akka, 1 ♂; Beisan, 3 ♂♂, 2 ♀♀; Huleh, 2 ♂♂, 1 ♀; mouth of River Kiskon, 1 ♀; Khedeira, 1 ♂; Nuris, 1 ♂; Kaisarieh, 1 ♀ (Brit. M.); Wadi Ghuweo, 2 ♀♀ (Ber. M.); Syria: Beirut, 2 ♂♂, 3 ♀♀; Syrien, 1 ♀ (V. M.); Taurus Cilicicus, 2 ♀♀ (Ber. M.).

NOTES.—Since this subspecies differs from the next one only by the more slender and longer antennae and the areas of their distribution are not separated, certain forms from the intermediate zone present clearly transitional characters.

I take for the typical form of *longicornis* Fieb. that occurring in Egypt for the following reasons. Fieber's description of this insect

can be equally well applied to almost any species of *Tropidopola*, but he mentions the localities as follows: «Griechenland. Straube. Fieb. (Egypten. M. Ber.)»; this seem to imply that he regards Greece as the type locality. On the other hand, though not mentioning the antennae in his description, he calls the species *longicornis*, which name is the least fitting the Greek insect which has the antennae much shorter than any other species, while in the Egyptian form they are strikingly long and slender. Since no one ever attempted to restrict the application of the name *longicornis* to one of the forms concerned, I feel

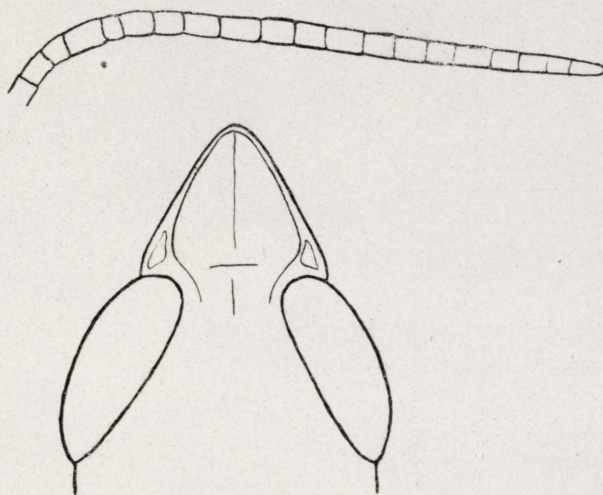


Fig. 10.—*Tropidopola longicornis longicornis* (Fieb.), ♀, Barrage bei Kalioub, Egypt.

myself at liberty to do so, and I think it more in accordance with Fieber's idea of the insect, which he called *longicornis* obviously for its unusually long antennae, if the name is restricted to the Egyptian subspecies.

A discussion of the distribution of both subspecies will be given below.

4 b. **T. longicornis graeca**, sbsp. n. (figs. 11, 12, 13).

1922. *Tropidopola cylindrica*, Uvarov (nec Marsch.!), p. 365, fig. 1 A.

♂. Antennae half again as long as head, thick, distinctly compressed, narrowed basally and apically; their joints transverse, or as long as broad.

♀. Antennae scarcely longer than head, very thick, strongly compressed and distinctly narrowed basally and apically; their joints all transverse, some very strongly so.

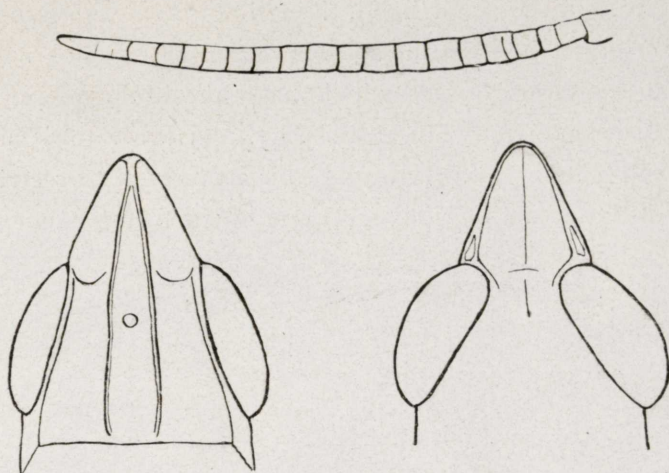


Fig. 11.—*Tropidopola longicornis graeca* sbsp. n., ♂ type, Attica.

General coloration often brownish-olivaceous. Outer side of femora usually without bluish-grey dots on the carinae.

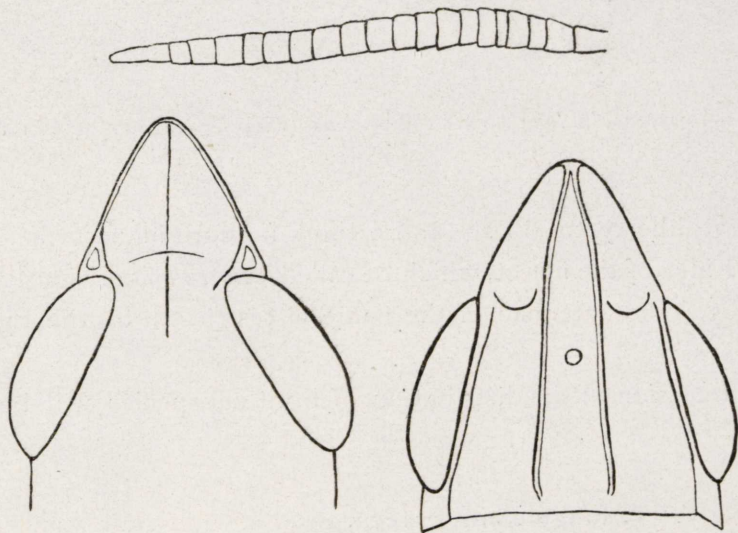


Fig. 12.—*Tropidopola longicornis graeca* sbsp. n., ♀, paratype, Attica.

In other respects, including the measurements, quite similar to the typical subspecies.

MATERIAL STUDIED (type and paratypes).—Macedonia: Vardar plain,

Tekeli to Kenlike, 2 ♂♂ (Brit. M.); Greece, 1 ♀ (Brit. M.); 1 ♂ (V. M.); 2 ♂♂, 3 ♀♀ (Ber. M.); Taygetes, 1 ♂, 1 ♀; Argostol, Cephalonia, 2 ♂♂, 1 ♀; Parnass, 3 ♂♂; Attica, 1 ♂ (*type*), 2 ♀♀; Morea, 1 ♀; Volo, 2 ♀♀ (V. M.); Kephalon, 1 ♀; Attica, 2 ♂♂, 1 ♀ (Ber. M.); Attica, 1 ♂, 1 ♀ (M. M.); Athenes, 1 ♂, 1 ♀ (M. M.); 1 ♂ (V. M.); Asia Minor, 1 ♂; Smyrna, 2 ♂♂; Kordelia, 2 ♂♂, 1 ♀ (V. M.); Akbes, 2 ♂♂, 1 ♀ (M. M.); Cyprus, Chifliccoudia, 7 ♂♂, 4 ♀♀; Zakaki, 1 ♂ (Brit. M.). All *paratypes*.

NOTES.—While there is an enormous difference in the shape of antennae between the typical *ongicornis* from Egypt and the western part of Asia Minor, specimens from Cyprus, though definitely approaching *graeca* have the antennae somewhat more slender than in the latter, while the specimens from Aidin (1 ♂, Ber. M.), Göksun (1 ♀, Ebn. coll.), Kousseir, Damas (1 ♀, M. M.), Homs (2 ♂♂, M. M.) and Alexandretta (1 ♀, M. M.) cannot be definitely referred to one or to the other subspecies. A long series of specimens from various localities in Palestine are referred by me to *longicornis*, but their antennae are not quite as long and slender as in the typical Egyptian form; if they are to be separated from the latter the name *syrica* should be applied to them.

The area of distribution of *T. longicornis*, with both its subspecies stretches very far from North to South, being at the same time relatively narrow (see map, p. 159).

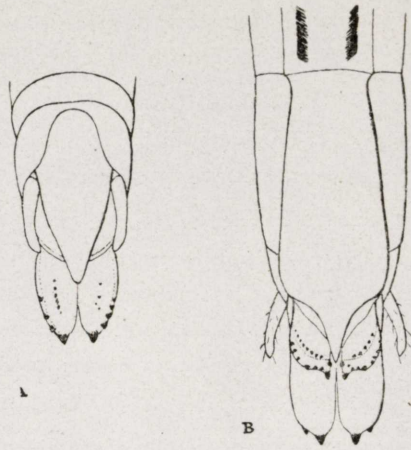


Fig. 13.—*Tropidopola longicornis graeca* sbsp. n. ♀, Griechenlad. End of abdomen, from above (A), from below (B); $\times 7$.

Literature cited.

BOLFVAR (I.)

1876.—Sinopsis de los Ortópteros de España y Portugal, p. 98.

BRUNNER VON WATTENWYL (C.)

1882.—Prodromus der europäischen Orthopteren, p. 232.

1898.—Revision du système des Orthoptères, p. 137.

BUXTON (P. A.) and UVAROV (B. P.)

1924.—A contribution to our knowledge of Orthoptera of Palestine.—Bull. Soc. Ent. Egypte [1923], p. 203.

CHARPENTIER (T.)

1841.—Einige Bemerkungen die Orthopteren betreffend, besonders in Bezug auf Burmeister's und Serville's Schriften über diese Insektenordnung.—Germar's Zeitschr. Entom., III, p. 306.

1841 a.—Orthoptera descripta et depicta. Tab. 14.

FIEBER (F. X.)

1853.—Synopsis der europäischen Orthopteren.—Lotos, III, p. 98.

JACOBSON (G. G.) et BIANKI (V. L.)

1902-1905.—Priamokrylya i lozhnosetchatokrylya Rossiiskoi Imperii, p. 306.

KIRBY (W. F.)

1910.—A Synonymic Catalogue of Orthoptera, III, pp. 403-404.

KRAUSS (H. A.)

1902.—Beitrag zur Kenntniss der Orthopteren. Fauna der Sahara.—Verh. Zool.-bot. Ges. Wien, LII, p. 248.

KRAUSS (H. A.) und VOSSELER (J.)

1896.—Beiträge zur Orthopteren. Fauna Orans (West-Algerien).—Zool. Jahrbüch., Syst. IX, p. 543.

MARSCHALL (A. F.)

1836.—Decas Orthopterorum novorum.—Ann. Wien. Museums Naturgesch., I, pp. 210-211.

SERVILLE (A.)

1839.—Histoire Naturelle des Insectes. Orthoptères, pp. 594-595.

STAL (C.)

1873.—Recensio Orthopterorum, I, pp. 42, 86.

1878.—Observations orthoptérologiques. Les genres des Acridiodées de la faune Européenne.—Bih. K. Sv. Vet.-Akad. Hand., núm. IV, 5, p. 19.

UVAROV (B.)

- 1912 *a.*—Ueber die Orthopteren fauna Transcaspiens.—Horae Soc. Ent. Ross., XL, núm. 3, p. 31.
 1912 *b.*—Contribution à la faune des Orthoptères du Turkestan.—Revue Russe d'Entom., XII, p. 213.
 1922.—Records and descriptions of Orthoptera from SW. Asia.—Journ. Bombay Nat. Hist. Soc., XXVIII, pp. 365-366.

WALKER (F.)

- 1871.—Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum. V, Suppl., p. 51.

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