THE GROUP PODISMÆ FROM CHINA

(ACRIDIDÆ, ORTHOPTERA)

BY

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It is the purpose of this paper to give a brief systematic revision of the group *Podismæ* of the Catantopid acridids known to occur in China, together with the description of 4 new species, one new subspecies, one new generic and one new subgeneric assignments. For the interest and the general information of students of entomology in this country, brief discussion of the distribution of the group in the world, the diagnostic characters of these insects and other aspects are also included. An attempt is also made to describe all genera here treated. The group Podismæ in China is very poorly known in comparison to the same in Siberia, Europe and America. CAUDELL'S *Catantops viridifemorata (Caudellacris viridifemorata),* RAMME'S *Indopodisma yunnaneus (Yunnanacris yunnaneus),* TINKHAM'S *Podisma lofaoshana (Indopodisma (Sinopodisma) lofaoshana,* and CHANG'S *Tonkinacris sinensis* are the only endemic species so far described. Without doubt many other endemic species of the same group will later be found to inhabit the isolated hills and montane regions of this vast country.

The diagnostic and general characteristics of the group

The group as a whole can be differentiated without much difficulty from other acridids in this country. The presence of a well formed prosternal tubercle and the fastigium of the vertex which passes insensibly into the frontal costa, the temporal areas of the head being very limited or practically absent would place them unmistakably in the subfamily *Catantopinæ* from the other subfamilies. In

making a key to the genera of Chinese Catantopids, I have found two characters of reliable diagnostic value and at the same time easily appreciated even by a layman to separate this group. They are namely, first, the absence of the external apical spine on the hind tibia, a character which is generally used, and secondly, the smooth (non-serrated) median dorsal keel of the hind femora. Some of the *Podismini* may resemble very closely such acridids like the genera in the group *Oxyæ* and the group *Conophymæ* which also have smooth dorsal keels of the hind femora and other general facies, but these others have the outer apical spine to their hind tibiæ. On the other hand they may resemble some other genera which possess the outer tibial spine, like *Catantops,* though less closely, but the smooth median dorsal keel of their hind femora would serve to identify them. Beside these two characters just mentioned, there are other morphological features of more comparative nature which make them *Podismini.* The antennæ are filiform. In most cases the eyes are subglobose, especially in the males. The fastigium of the vertex is more or less strongly declivent. The pronotum is generally cylindrical or subcylindrical or nearly flat to quite flattened above, the shoulders either broadly rounded and passing insensibly into the lateral lobes or somewhat to quite angular, the lateral keels are in the majority of cases absent, and if present (e. g. *Kingdonella)* they are not very strongly formed. The metazona except in the long wing forms are much shorter than the prozona, usually half of the length of the latter, almost always more or less densely punctate. In the majority of the genera, the median carina of the pronotal disc is very weakly or subobsoletely or obsoletely developed in the prozona, always weaker here than on the metazona. The fore and mesal femora generally incrassate and clublike in males, less so or normal in females. The body texture is generally more or less smooth and shiny, not so markedly reticulated as other Chinese Catantopid genera with the outer apical tibial spines.

The organs of flight are in the majority of the Old World Podismoid genera abbreviated, and greatly reduced, lobelike and incapable of flight or altogether absent, but in some genera they are fully developed as in *Eirenephilus, Ognevia, Caudellacris,* while in still others dimorphism obtains with brachypterous and macropterous forms as in the species *Podisma pedestris, P. sapporense, Melanoplus frigidus,* and *M. alpinus,* and in the New World in the genus *Dendrotettix,* which I had the personal experience of collecting in New Jersey in the summer of 1936 of all intermediate stages and even a few with elytra of one side long and the other side short, and in such species of *Melanoplus* as *M. dawsoni, M. marginatus, M. fasciatus* and *M. extremus.* Here it seems to be a problem of great interest for breeding and experimentation to find out the factors that control such dimorphism. For those with much atrophied and small lobe-like wings, reversion is imposible, but for the others facultive of both brachypterous and macropterous forms it would seem to be a matter of inner force to push the wing pads in the last molt to full length, and this may be connected with the function of some hormones in the blood which are in these forms normally lacking or deficient, or to other factors of genetic, environmental and nurture influences resembling that of the phases.

Associated with, and as a consequence of, the reduction of the organs of flight are certain morphological modifications, such as the shortening of the metazona of the pronotum and the progressive atrophy of the tympanal organs. The length of the metazona of these brachypterous forms is generally only half the length of the prozona as already pointed out, and its hind margin is subtruncate and not angularly produced. The progressive atrophy of the tympanal organs and the eventual loss in the completely apterous species is evidently a measure against injury of this tenderest spot in the whole body of the grasshopper which are normally covered over by the elytra, and one can prove this by witnessing the progressive increase of the size of the

tempanal organ in correlation to the increase of wing pads in the larval development of these forms.

The greater development of the fore and median legs would suggest that they are so developed in order to serve as more effective organs of locomotion as a compensation for the loss of the power of flight. But this supposition is unwarranted for in so far as locomotion by legs is concerned, it is the hind legs and not the others that are of vital importance, and as the hind legs are in no case abnormally developed and indeed sometimes quite slender, the incrassate development of the fore and middle legs cannot be a consequence of the loss of flight but due to quite a different cause or causes. It seems to me that this incrassate development is partly a response to the necessity of their being more powerful organs of clinging to the leaves as the blowing of strong winds is a certain element in the kind of habitat in which they live, and partly as a secondary sexual characteristic of the male for clinging to the female during copulation.

The haunts and distribution of the group.

These grasshoppers in the Old World especially have for their haunts for the most part the tundra and mesophilous steppes of the extreme northern boreal regions of eastern Europe and Siberia, and the rarified air and damp meadows of great alpine heights further west and south as isolated colonies in different mountain systems. Unlike most orthoptera which are essentially thermophilous, these peculiar creatures have acclamatized themselves to live in environments of comparatively severer climatic conditions. The species so far recorded from China in the North are from Manchuria, Tienshan and Altai, and none of them are endemic but have a wider or narrower northern Asiatic and European distribution. In contrast to the north, the species from the hills and mountains of central and southern China are entirely endemic and show a fairly wide range

of altitudinal distribution, extending from a couple thousand feet to as low as foothills and near sea level. The genera and species of the latter catagory are generic differentiations and specifications wrought within this zoogeographical province including Formosa and neighbouring islands, and this province is quite distinctive and has been quite active in evolution. It must be pointed out, however, that they are undoubtedly derivatives of a common ancestral stock and of the same origin as the Siberian and European forms. Speaking of their ancestory, they are descendants of the fauna of the erst-while or ancient East Temporate Continent, the so-called Angara Continent of Suess, which occupied northern China and Siberia. The elements of the rich Angarian fauna had spread widely either *before* or *during* the glacial and the interglacial periods of the Quartenary, a number of which had almost colonized the whole Holarctic regions of the Old and the New World. As examples, besides the group of insects we are here dealing, mention may be made of other acridids like *Chorthippus, Mecostethus, Gomphocerus, Bryodema, Aeropus, Chrysochraontes, Aeropedellus,* etc.

The isolated and interrupted distribution of the *Podismini* tell of their migration or migrations under the influence of the glaciers, and of the colonies they established in their exile in the alpine regions. When the ice retreated, they were stranded on these mountain systems, though some of them succeeded to return to their former homes. The same fauna had extended far down into China also, mainly through the west perhaps, along the gigantic mountain systems, and into the Himalayas and as far South-East as Assam in so far as our present knowledge goes. Mountains often serve as barriers to the spread of insects by their loftiness and coldness, as the Himalayas in the South which check the inroads of the Indo-oriental elements, but in a case like the one under consideration, they certainly serve on the contrary as high-roads of communication to aid the

distribution of montane and palæarctic genera and species. In this connection, China may rightly be called the land of mountains for her topographical features are so dominated by mazes of elevation of varying height. Practically all of the mountains systems run or have the tendency of running the course from west to east, that is to say from the Tibetan centre in the West towards the Pacific coast in the East, more or less drooping southward, and mostly decreasing in height as they extend eastward. Along these ranges the *Podismini* have spread and evolved as distant outposts of the ancient Angarian fauna. Incidentally when one talks of the insect distribution in China south of the Tsingling ranges, one must turn the map in such a way as to have the West facing North and the East facing south and give due consideration to the mountain systems and altitudinal distribution in order to arrive at a satisfactory and comprehensive understanding. More intensive collection will surely disclose many more species of the *Podismini* in China's hilly regions.

One other fact must be mentioned, and it is this that the tribe *Podismini* as a whole is predominatingly American. Think of the genera in the Nearctic region and the innumerable species of the genus *Melanoplus*. The group may indeed be rightly called *Melanopli* after the fashion of SCUDDER instead of *Podismini* of Old World authors.

The Group Podismæ in China.

Altogether eleven genera and seventeen species and one subspecies, inclusive of the new species described in this paper, occur in China. Two of the genera and species, namely *Podisma pedestris* and *Melanoplus frigidus* have a wide distribution in the northern Palearctic World. The genera *Eirenephilus, Miramella, Zubovskya* and *Prumna* are confined to Siberia and northern China and Korea. The genera *Caudellacris, Tonkinacris, Sinopodisma* and *Yunnanacris* are montane forms of China south of the great

divide of the Tsinling ranges, Formosa and other bordering regions like Tonkin, Assam, etc, and neighbouring islands like Hainan, Loochoo, etc. The genus *Caudellacris* has a more northern range and has extended even beyond the Tsinling ranges into Shansi. The genus *Kingdonella* is so far found only in the alpine regions of the far away Tibet. The latter is probably quite closely related to the Formosan genus *Niitakacris* recently described by TINKHAM.

It is difficult to trace the phylogeny of the genera that occur in China and impossible unless a study is made of the whole group in the world. Confining our discussion to the genera that occur in China, and not attempting to give a complete picture, it seems to me that from the ancient stock of the *Podismini,* rose two ofshoots in so far as our forms are concerned, one consisting of the genus *Podisma* and the other giving rise to *Melanoplus* of the New World and the arrested growth of the genus *Prumna* in the Old World. Then from the genus *Podisma* as one stock arose three branches, the first leading to *Miramella* and then to *Zubovskya,* the second to *Eirenephilus* and the third leading to the rest of the genera, with *Kingdonella* forming one oftshoot, while the genera *Caudellacris, Tonkinacris, Sinopodisma, Indopodisma* and *Yunnacris* are more closely related, but not in one direct line except the genera *Tonkinacris, Sinopodisma,* (Subgenus under *Indopodisma),* and *Indopodisma,* which seem to form one phylogenetic continuation.

Key to Chinese genera of Podismini.

1. — Cerci of *both sexes* elongate, styliform, thorn-like, sharply pointed at tip. Prozona somewhat laterally constricted, slightly but distinctly shorter than prozona; median carina present on the metazona only. Organs of flight fully developed ..... *Eirenephilus* IKONN.

— Cerci of *female* short, heavy conical, tapering but blunt at tip, never elongate styliform. Cerci of *male* either short heavy conical *or* elongate *or* any other shape but not elongate styliform and not sharp at tip (except *Miramella).*

Prozona not constricted, as long or longer than metazona, median carina present on metazona and at least on a portion of prozona. Organs of flight either fully developed *or* greatly reduced or apterous 2

2. — Median carina of pronotum situated near the middle, slightly in front or slightly behind the middle 3

— Median carina of pronotum situated considerably behind the middle, metazona *about* as long as *half* of the prozona 5

3. — Pronotal disc elongate, uniformly cylindrical, uniformly strongly rugose punctate, the shoulders uniformly terete throughout their lengths, the median carina broadly and conspicuously marked in a jet black stripe. *Tonkinacris* CARL.

— Pronotal disc relatively shorter but of normal length, more or less flattened as a whole and with the shoulders more or less angular throughout their lengths *or* the disc is cylindrical in prozona and more or less flattened in the metazona, with the shoulders broadly rounded in the former and comparatively more angular in the latter. Disc not uniformly rugosepunctate, either the whole disc somewhat smooth, *or* the prozona glazed and smooth and the metazona rugose-punctare. The median carina not broadly and conspicuously striped in a black stripe 4

4. — (Interorbital distance comparatively broad, in males as broad as or slightly broader than frontal costa between the antennæ, in females one and two-thirds to two times broader than the same). Fastigium* broad, subparallelsided, *or very* slightly broadened in front of the eyes. Lateral margins of the pronotum straight and divergent posteriorly, hind margin broadly arcuated, not produced. Cerci of both *males* and females conical, thick and very short. Hind margin of female subgenital plate with only one median triangular projection. Organs of flight strongly abbreviated, only *P. pedestris* with macropterous forms. *Podisma* LATR. s. s.

— (Inter-orbital distance narrower than to as broad as the frontal costa between the antennæ in both sexes). Fastigium parallel-sided or subparallel-sided, the portion in front of the eyes longer than broad, not broadened at all. Lateral margins of the pronotum subparallel-sided or slightly incurved in the middle and somewhat divergent both in front and behind, forming more or less angular shoulders or rarely apparent lateral carinæ. Hind margin of pronotum obtuse-angularly produced. Cerci of female short and conical; of male long, of very diverse shapes, lamellate, never conical and tapering, somewhat incurved. Hind

* Only the impressed area considered here as the confines fastigium.

margin of female subgenital plate with only one median triangular projection. Organs of flight fully developed or greatly abbreviated. (Old World species, *M. frigidus* abbreviated but macropterous form may occur though very rarely) ..... *Melanoplus* *

— (Inter-orbital distance slightly narrower than to as broad in females, distinctly narrower in male). Fastigium narrowly subparallel-sided between the eyes, distinctly though not much broadened in front of the eyes. The shoulders of prozona broadly rounded, slightly more angular in metazona, hind margin obtuse-angularly produced. Cerci of female short and conical, of male elongate, strongly compressed, with apex broadly and unsymmetrically clavate. Hind margin of female subgenital plate with a median and paired lateral triangular projections on each side. Organs of flight fully developed ..... *Caudellacris* REHN and REHN.

5. — (Pronotum of subequal width, the sides nearly parallel or weakly divergent). *The male subgenital plate normal* 6

— Pronotum conspicuously broadening posteriorly, more strongly so in females. *Male subgenital plate exceptionally hugely expanded, laterally tumid and elevated* ..... *Prumna* MOTSCHULSKY.

6. — Entirely apterous. Pronotum more or less flattened above and provided with comparatively distinct, thick and irregular lateral carinæ which are divergent posteriad ..... *Kingdonella* UVAROV.

— Entirely apterous or with atrophied lobe-like elytra. Pronotum cylindrical or subcylindrical, without lateral keels, the shoulders either parallelsided or very slightly and weakly divergent posteriad 7

7. — Pronotal disc either uniformly non-rugose and rather smooth *or* with prozona glazed and smooth and shiny, and metazona rugose punctate. Mesosternal interspace transverse in both sexes. Supra-anal plate of male with a blunt pre-apical shoulder on each side 8

— Pronotal disc with prozona and metazona subequally rugose-punctate, with no part glazed and shiny. Mesosternal interspace longer than broad by a greater or lesser degree, in females either slightly longer than broad or narrowly transverse. Male supra-anal plate without lateral pre-apical shoulders 9

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* The species of *Melanoplus* which occurs in China has red hind tibia which alone can differentiate it from species of either *Podisma* or *Caudellacris.*

8. — Completely apterous. Tympanal organ greatly reduced or absolutely absent *. Cerci of male elongate, tapering but with distal fourth compressed and widened, in shape subspatulate or obliquely truncate distad. Dorsal valves of ovipositor slender, dorso-lateral margins weakly sigmoid. Male subgenital plate bearing a short subapical tubercle..... *Zubovskya* DOVNAR.

— With lobate elytra. Tympanal organ distinct, decidedly functional. Cerci of male styliform, tip acuminate, not broadened at all. Dorsal valves of ovipositor deeper in lateral view, upper margin strongly sigmoid. Male subgenital plate bearing a strong and much produced subapical tubercle..... *Miramella* DOVNAR.

9. — Lateral lobes of pronotum with the oblique posterior margin joining the ventral margin by an obtuse angle. Male subgenital plate conical, with sides convex, upper margin with basal two-thirds reflected laterad, tip bearing a definite obtuse subapical tubercle..... *(Indopodisma)*.....10

— Lateral lobes of pronotum with posterior margin very oblique mergining into the ventral margin without forming any angular junction. Male subgenital plate with a straight vertical cone, converging to its acuminate tip which is not tubercular, sides not convex, the upper margins not reflected outwards ..... *Yunnanacris* gen. nov.

10. — Fastigium hardly widened in front of the eyes, the widest part scarcely broader than the frontal costa. Elytra minute or absent. Tympanal organ small and nonfunctional. Pronotum with the transverse sulci very deep and broad. Furculæ digitiform, well developed ..... Subgenus *Indopodisma* DOVNAR.

— Fastigium not much but distinctly widened in front of the eyes, the widest part distinctly broader than the frontal costa. Elytra lobe-like, linear or ovate, reaching at least to near the hind margin of the first abdominal segment. Tympanal organ smaller than normal but distinctly functional. Pronotum with transverse sulci shallowly impressed or subobsolete. Furculæ obsolete... Subgenus *Sinopodisma* nov.

Melanoplus STAL.

1875. *Melanoplus,* STAL, Rec. Orth., 1 : 79.

This is the largest of all acridid genera in the world. Practically all of the species of this large genus occur in

* In the Old World species so far known, the tympanal organs are altogether absent, only the spiracle present.

North America and Mexico. The only Old World genus that can compare with it in size is perhaps the genus *Catantops* but the latter is much smaller. SCUDDER in 1900 listed 146 species of *Melanoplus* from U. S. A. and Canada. Since 1900 numerous species have been described. KIRBY (1910) listed 202 species for the genus from North America including Mexico. More species must have been described since then, while a number must also have been placed into synonymy. It is very widely distributed in North America, and form by far the greatest proportion of all American acridids. The species are usually very similar in size and colour and the differentiating characters are based largely on cerci, subgenital plate, supra-anal plates and furculæ of the males; the females are quite often unidentifiable. Only two species occur in the Old World, namely, *M. frigidus* BOHEMAN and *M. alpinus* KOLLAR, the former has come to range into our outlying northern borders.

Generic Diagnosis:

Eyes erect oval or subelliptical, not roundish-globose, *interorbital distance* comparatively narrow, slightly narrower to 1 $\frac{1}{2}$ broader than the frontal costa between the antennæ. *Fastigium* more or less declivent, always more or less sulcate or with elevated lateral carinæ, subparallel-sided in front of the eyes (considering the depressed area as fastigium and the non-depressed sides as margins), not anteriorly broadened, linear and longer than broad. *Frontal costa* moderately prominent, generally sulcate below, usually more or less punctate. *Lateral facial carinæ* obtuse, generally slightly undulate above, near the antennæ.

Pronotum generally subcompressed, *disc* more or less flattened as a whole or somewhat transversely convex in prozona and plane on the metazona, parallel or subparallel sided, or regularly divergent from before to behind or more or less flaring out in metazona or more rarely flaring out both anteriorly and posteriorly, *lateral carinæ* more apparent than real, representing the more angular junction of

sides of disc with the lateral lobes or replaced by more rounded shoulders in prozona and somewhar angular shoulders in the metazona; the *fore* and *mesal sulci* distinct and cutting the median carina or very weak and not cutting the latter, never very deeply and broadly impressed; the *typical sulcus* always distinct; *median carina* always distinct on metazona, generally much less on prozona, often subobsolete between the sulci and never wholly wanting; *prozona* varying from slightly shorter (rarely) to one and half times longer than the metazona, average $1\frac{1}{2}-1\frac{1}{4}$ longer than the latter; anterior margin generally truncate or subtruncate, *hind margin* obtusely angulately produced. *Lateral lobes* vertical or subvertical, often feebly dilated above on the prozona. *Prosternal spine* very variable, but always prominent.

Mesosternal interspace generally longer or much longer than broad, rarely transverse. Metasternal lobes attingent or subattingent.

Elytra fully developed or abbreviated and atrophied or with dimorphic forms. *Tympanal organs* distinct, normal.

♂. *Furcula* usually developed and to a very variable extent, and with variable form. *Cerci* exceedingly variable in form, often enlarging apically, always lamellate, usually incurved and of about the length of the supra-anal plate. Subgenital plate of variable form, but always with the lateral margins ampliate at the base and with no distinct apical tubercle, though not infrequently apically produced or subtuberculate and frequently tumescent.

♀. Valves of the ovipositor fully exserted.

Genotype: *Acridium femur-rubrum* DE GEER, 1773.

Melanoplus Frigidus (BOHEMAN).

1846. *Gryllus frigidus,* BOHEMAN, Oefv. Vet. Akad. Forh., p. 80.

* except *M. nitidus* SCUDDER in which the prozona of the male is twice as long as metazona.

1910. *Podisma frigida,* KIRBY, Syn. Cat. Orth., 3: 538.

1922. *Podisma frigida,* CHOPARD, Faun. France, p. 171.

1927. *Podisma frigida,* CAUDELL, No. 2679, Proceedings U. S. Nat. Museum, vol. 71, art. 7, p. 4.

1927. *Podisma frigida,* UVAROV, Acrididæ from Central Asia, Tashkent, p. 191.

1929. *Podisma frigida,* BEY-BIENKO, Konowia, 8: 107.

1933. *Melanoplus frigidus,* DOVNAR, Travaux Inst. Zool. Acad. Sci. URSS, 1:

1933. *Melanoplus frigidus,* MIRAM, l. c., p. 40-41.

This species has been recorded by BEY-BIENKO (1930) from Manchuria in the macropterous form. BEY-BIENKO thought that his was the first macropterous form in record, but CAUDELL (1927) had recorded the same of a female collected from Amagu on the Kudia River in the maritime province of Siberia. It occurs also in northern Mongolia.

This species is widely distributed in the northern palearctic world, having been recorded from Scotland, Sweden, Lappland, Finland, Switzerland, South Tyrol to Grossglackner, Polar-Ural, Obdorsk, Akmolinks, Russian Altai, Irkutsk, Transbaikal, Kamtschatka, etc.

Prumna MOTSCHULSKY.

1859. *Prumna,* MOTSCHULSKY, Etudes Ent., 8: 11.

1898. *Eupodisma,* SCUDDER, Proc. U. S. Nat. Mus., 20: 12, 117.

This genus is confined to Siberia, northern China, and Korea. It includes four species, namely, *P. primnoa* F. W., *P. ussuriensis* TARBINSKY, *P. primnoides* IKONN., and *P. polaris* MIRAM. It is a peculiar genus easily recognized by the hugely developed apex of the male abdomen.

Generic Diagnosis:

Eyes subroundish, *interorbital distance* of vertex about as wide to one and one-third as broad as the frontal costa. *Dorsum of head* exclusive of fastigium smoothly convex. *Fastigium* strongly declivent, shallowly sulcate, distinctly

longer than broad, side borders obtuse, the temporal areas on each side above the lateral ocelli punctate. *Face* moderately receding, *Frontal costa* parallel- or subparallel-sided, shallowly sulcate, sparingly punctate, margins obtuse.

Pronotum with disc more flattened than convex, gradually broadening from before to behind, more so in females than in males; *anterior border* truncate, slightly incised in the middle, *posterior border* a thickened rim, weakly bilobate; lateral carinæ evident though decidedly not real, representing the angular junction of disc with lateral lobes; median keel practically obsolete on prozona, distinct but low on metazona; *typical sulcus* placed much behind the middle, *metazona* about one-third of total length of pronotal disc, subobsoletely rugose; *prozona* smooth. *Lateral lobes* distinctly longer than high, portion in front of typical sulcus shiny and smooth, anterior and posterior borders divergently oblique, joining with the ventral border by broad rounded angles. *Prosternal tubercle* low.

Elytra atrophied, narrow and linear, tip rounded. *Tympanal organs* distinct.

Mesosternal interspaces transverse, *metasternal interspace* transverse in females, squarish in males.

Fore and *middle femora* of males much swollen, normal in females. *Hind femora* not extending beyond the tip of abdomen in females, beyond in males.

♂. Tip of male abdomen extraordinarily hugely developed. *Supra-anal plate* sub-rectangular, apically bearing a triangular lobe, sides not perfectly straight, curled upwards, surface with three grooves, one in the middle and one on each side. *Furcula* rather short, subtriangular, base contiguous. *Cerci* broad, dorsi-ventrally compressed (due to changed position caused by excessive development of subgenital plate), base very broad, tapering beyond to truncate tip. *Subgenital plate* excessively tumid, very large and broad, with upper margins on each side very much thickened, apically broadened. Pallium dark, all wrinkled, rugose, pillose.

♀. *Supra-anal plate* triangular, sides smoothly flexed laterally, tip rounded, basal half with a broad shallow median groove. *Cerci* short, rather thick, tip blunt. *Ovipositor* not serrated.

Genotype: *Podisma primnoa* FISCHER, 1846.

Prumna Primnoa FISCHER DE WALDHEIM.

1846. *Podisma primnoa,* FISCHER, Orth. Ross., p. 248.

1859. *Prumna viridis,* MOTSCHULSKY, Etudes Ent., 8: 11.

1897. *Eupodisma primnoa,* SCUDDER, Proc. Amer. Acad. Arts. Sci., 32: 205.

1910. *Prumna primnoa,* KIRBY, Syn. Cat. Orth., 3: 503.

1911. *Podisma sachaliensis,* MATSUMURA, Journ. Coll. Agric. Tohuku Imp. Univ., Sapporo, p. 5, pl. 1, ff. 6-7 (not ff. 1, 2, as indicated in the text).

1929. *Prumna primnoa,* BEY-BIENKO, Konowia, 8: 107.

1933. *Prumna primnoa,* MIRAM, Les Orthoptères de Yakoutie, p. 41.

This species has been recorded by BEY-BIENKO (1929) from Hingan and Pogranitshnaya in Manchuria. It is further distributed in Irkulsk, Transbaikal, Primorskaja, Amurland and Korea.

Podisma LATREILLE (s, s.).

1829. *Podisma,* LATREILLE, in CUVIER, Règne Anim., 2 éd., V: 188.

1840. *Pezotettix,* BURMEISTER, in GERMAR, Zeitschr. Entom., 2: 51 *(partim).*

1910. *Podisma,* KIRBY, Syn. Cat. Orth., 3: 533 *(partim).*

1933. *Podisma,* DOVNAR, Travaux Inst. Zool. Acad. Sci., URSS, 1: 253-268.

1939. *Podisma,* REHN and REHN, Trans. Amer. Ent. Soc., 65: 61-96.

The genus *Podisma s. s.* has a wide distribution in the Palearctic regions and it is also found in western United States of the Nearctic region. Included in this genus, according to DOVNAR'S and REHN'S revisions, are the following species: *P. pedestris* (L.), *P. carpetana* (I. BOLIVAR) of

Spain, *P. emiliæ* RAMME of Italy, *P. uvarovi* RAMME of north-western Caucasus, *P. sapporensis* SHIRAKI of Japan, and *P. hesperus* (HEBARD) of the Cascade Mountains, Oregon in the United States of America.

Below is an attempt to describe the generic characteristics:

Generic Diagnosis:

Clumsy and rather robust forms. Organs of flightly greatly abbreviated.

Fastigium broad to very broad, sloping, shallowly sulcate, with broad and poorly marked margins. *Interorbital distance* comparatively broad, about between one and a third to two times as broad as the frontal costa between the antennæ. *Frontal costa* subparallel sided, dilated between the antennæ, sulcate.

Pronotum rather long, seen from above with disc gradually broadening from before to the hind margin, somewhat subcylindrical, more flattened on metazona; *lateral keels* replaced by shoulders; *anterior border* straight; *posterior border* not produced but very broadly convex; the *3 sulci* broad and deeply sulcate; the *typical sulcus* placed near the middle; the *median keel* very weak on prozona, distinct on metazona; *prozona* shiny and glosssy and transversely convex, *metazona* rugose-punctate or reticulated, more flattened. *Lateral lobes* slightly broader than long, hind margin strongly oblique. *Prosternal spine* conical, subacuminate.

Interspace between mesosternal lobes of both males and females transverse.

Elytra lobate, much reduced, only *P. pedestris* so far recorded with macropterous forms.

Legs rather stout and inflated. *Tympanal organs* normal.

♂: *Furcula* distinct, digitiform. *Cerci* short heavy conical, not reaching beyond the supra-anal plate.

Supra-anal plate with basal two-thirds of side borders straight, converging, at apical third constricted to form a smaller triangular apical lobe, apex rounded; surface with a distinct median groove and two lateral furrows or impressed areas, bearing two large lateral elevated convex tubercles at just inside of the side margins at the constriction just described above. *Subgenital plate* short, subconical, basal two-thirds of upper lateral edges reflected laterad, tip bearing a very low or hardly with an obtuse apical tubercle.

♀: *Supra-anal plate* triangular, very broad, as broad as long, tip right-angular, rounded, sides only very slightly flexed downwards, the transverse submedial ridge absent, median longitudinal groove very shallow, *Valves of ovipositor* short; dorsal valves with fine blunt serration; ventral valves with a subbasal lateral angular shoulder. *Cerci* short, triangular, not pointed. Subgenital plate with distal margin subconvex on the sides, mid-ventrally bearing a triangular projection.

Genotype: *Gryllus (Locusta) pedestris* LINNÆUS, 1758.

Podisma Pedestris (L.).

1758. *Gryllus (Locusta) pedestris,* LINNÆUS, Syst. Nat. (ed. x), p. 433, n. 59.

1773. *Acrydium apterum,* DE GEER, Mem. Ins., 3: 474, n. 4, Taf. 23, "bb. 8, 9.

1910. *Podisma pedestris,* KIRBY, Syn. Cat. Orth., 3: 537.

1917. *Podisma pedestris,* ZACHER, Geradfl. Deut. u. Verbr., p. 184.

1922. *Podisma pedestris,* CHOPARD, Faun. France, p. 170.

1927. *Podisma pedestris,* UVAROV, Acrididæ from Central Asia, Tashkent, p. 190.

1939. *Podisma pedestris,* REHN and REHN, Trans. Amer. Ent. Soc., 65: 85-86.

1933. *Podisma pedestris,* DOVNAR, Travaux Inst. Zool. Acad. Sci. URSS, 1: 253-268.

1933. *Podisma pedestris,* MIRAM, Les Orthoptères de Yakoutie, p. 40.

This species has been recorded from north-western Mongolia and Altai. It is one of the most widely distributed species of the *Podismini,* being distributed all over northern and central Europe, the mountains of southern Europe and in Russia in the Ural region, Turgai province, Akmolinsk, Tobolsk, Tomsk, Irkutsk, Altai, Jenisseisk, etc. Sometimes, though very rarely, machropterous forms occur.

Eirenephilus IKONNIKOV.

1912. *Eirenephilus,* IKONNIKOV, Ann. Mus. Zool. Acad. Imp. Sci. St. Petersbourg, 16 : 264, 265.

1933. *Eirenephilus,* DOVNAR, l. c., 256, 261, 263.

1939. *Eirenephilus,* REHN and REHN, l. c., 68, 79-82.

This genus is only known in the macropterous form. It is confined in its distribution to the north-eastern Asia from the Altai to the Russian Far East, Korea and Shakhalin, Yezo and Hondo in Japan, and in northern China, being recorded from North Mongolia, Manchuria, and Shansi. Three species have been described, namely, *E. debilis* IKONNIKOV (1912) from Asiatic mainland, *E. longipennis* (SHIRAKI, 1910) from Japan and *E. niphonus* (FURUKAWA) from Korea and Japan. These three species are so very closely related to each other that they would seem to me to be either entirely conspecific or geographic races.

Generic Diagnosis :

Size medium, *organs of flight* fully developed.

Eyes subroundish, horizontal width about the same as the infra-orbital distance, interorbital distance above a little more than one and a half times the width of the frontal costa between the antennæ. *Fastigium* moderately declivent, more strongly so in males than in females, shallowly impressed, side margins obtuse, anteriorly continuous by a rounded angle with the frontal costa. *Face* slightly or hardly receding, *frontal costa* parallel-sided, sulcate, margins obtuse but quite distinctly raised in the sulcate part.

Pronotum with *prozona* narrower and slightly constricted laterally, *anterior border* of disc truncate, *posterior border* obtuse-angularly produced, rounded; *prozona* slightly convex from side to side, smooth, the *shoulders* more gradually rounding over to the lateral lobes; *metazona* flat, rugose-punctate, laterally joining the lateral lobes here by comparatively more sharply angular shoulders; *median carina* entirely obsolete on prozona, distinctly formed on the metazona; the *3 transverse sulci* deep and rather broadly marked, continuous throughout, the *typical sulcus* placed distinctly, though very shortly before the middle. Lateral lobes longer than deep, anterior margin very slightly oblique, posterior margin decidedly oblique. *Prosternal spine* fairly long, conical, tip not sharp, slightly inclined posteriorly.

Mesosternal lobes in females transverse, inner margins divergent posteriad, interspace narrowly transverse; *mesosternal lobes* in males squarish, their inner margins rounded, divergent behind, interspace measured at the middle one-third longer than broad. *Metasternal interspace* transverse in females, longer than broad in males.

Elytra extending considerably beyond the hind knee, and tip of abdomen, not broad, rather narrow, subparallel-sided, tip rounded.

Fore and *median legs* with femora rather stout in males, normal in females. *Hind femora* normal, rather slender, all keels smooth, low and not sharply raised. Hind tibia with 9-10 outer and 10-11 inner spines, outer apical spine absent.

♂. *Furcalæ* distinct. *Supra-anal* plate subtriangular, the side margins converging to apical third and then obtuse-angularly constricted forming a smaller triangular apical loba, surface uneven, with a distinct median groove, which is bordered by rather well-formed margins, near the base with 2 low and smooth tuberosities. *Cerci* like a spine or a thorn, basally broader, symmetrically tapering to a sharp tip, not extending beyond the supra-anal plate. *Podical plate*

large. *Subgenital plate* moderately long, with a distinct sub-apical tubercle.

♀. *Supra-anal plate* triangular, sides flexed down, tip right-angular, rounded, surface with a fairly broad groove on basal half reaching to the transverse median ridge, beyond with a narrow groove. *Cerci* like a spine or a thorn, basally broader, symmetrically tapering to sharp tip, extending not beyond the supra-anal plate. *Podical plate* very broad and thick!, broadly rounded apically. *Valves of ovipositor* short, not serrated. *Subgenital plate* short, hind margin broadly rounded.

Genotype: *Eirenephilus debilis* IKONNIKOV, 1911.

√ Eirenephilus Debilis IKONNIKOV.

1911. *Eirenephilus debilis,* IKONNIKOV, Ann. Mus. Zool. Acad. Imp. Sci. St. Petersbourg, 16 : 265-267.

1930. *Eirenephilus debilis,* BEY-BIENKO, Ann. Mag. Nat. Hist. (10), 5 : 499.

1933. *Eirenephilus debilis,* DOVNAR, l. c., 1 : 263, fig. 1.

1927. *Eirenephilus debilis,* CAUDELL, n° 2679, Proceedings U. S. National Museum, vol. 71, art. 7, p. 4.

1933. *Eirenephilus debilis,* DOVNAR, l. c., 1 : 263, fig. 1.

1939. *Eirenephilus debilis,* REHN and REHN, Trans. Amer. Ent. Soc., 65 : 81-82.

This species has been recorded from Manchuria and Northern Mongolia by BEY-BIENKO (1930) and from Manchuria by REHN and REHN (1939). I have before two female specimens from Lao Yeling in Manchuria bearing the date August, 3, 1933, and one female specimen from Hoyepingchan in Shansi, bearing the date July 31, 1928; both records were collected by Dr. LICENT of the Hoang Ho Pei Ho Museum, Tiensin.

Miramella DOVNAR-ZAPOLSKIJ.

1933. *Miramella,* DOVNAR-ZAPOLSKIJ, Travaux. Inst. Zool. Acad. Sci.URSS, 1 : 255, 266.

This genus was erected by DOVNAR in his revision (1933) with *Podisma solitaria* IKONNIKOV as genotype, and he placed in this entity the following species: *Podisma dairisama* SCUDDER, *P. mikado* BOLIVAR, *P. formosana* SHIRAKI, *P. kadamæ* SHIRAKI, *? P. aberrans* IKONNIKOV, and *? P. sapporensis* (sic *sapporense)* SHIRAKI. Like REHN and REHN (Trans. Am. Ent. Soc., 62: 4) who spoke of the genus *Odontopodisma* as a hodge-podge of dissimilar species, I feel the same in regard to this genus *Miramella.* After a careful study, in as far as I can, I feel that all the other species except *Podisma aberrans* with a question (because I have no access to the description of this species) must be removed from the genus. I have before me one male and two female specimens of *P. mikado,* belonging to the Heude Museum. This species would seem to me to belong to the Podismoid Complex which REHN had recently treated, but as a separate generic entity. It appears to be related to *Miramella* but its pronotum, the mesosternal interspace, the hind femora, the male cerci, the female subgenital plate are quite different and besides, the furculæ are absent. I cannot say with assurance as to the relationship of the other Japanese species to *P. mikado* as I do not have specimens for examination. The species *P. dairisama* SCUDDER, *P. subaptera* HEBARD (the female sex not yet described) and *P. fauriei* I. BOLIVAR must be very closely related. The species *P. sapporense* has already been removed by REHN and REHN and placed in the genus *podisma s. s.* There seems to be considerable confusion about this species. SHIRAKI's original description would suggest its being a *Podisma s. s.* but the measurements given to its male cerci contradicts the description of the same. REHN and REHN have only examined the female sex.

I have the species *P. formosana* before me represented by a fair series. This insect together with *P. kawakamii, P. kodamæ, Miramella splendida* TINKHAM, *P. lofaoshana* TINKHAM, *Miramella shirakii* TINKHAM and the three species

here described from eastern China definitely belong to one entity whose affinity is with *Indopodisma* and not with *Miramella.* Reference will be made to this entity in connection with *Indopodisma.* Besides the genotype, one species of *Miramella* is here described from Manchuria.

The genus is distributed in the Maritime Russian Far East and in Manchuria.

Generic Diagnosis: (based on genotype and *M. sinense* nov. sp.).

Eyes oval to moderately globose, *infra-orbital* distance equal to the ocular horizontal width in male, considerably greater than the same in female, height one and one-fourth the width, the *infra-orbital* distance above narrow or broad, from almost as broad to nearly twice as broad as the frontal costa, broader in females than in males. *Fastigium* strongly declivent, sloping insensibly into the frons, shallowly depressed or medio-longitudinally furrowed; margins in front of the eyes very indistinctly or not marked at all and indistinguishable from the somewhat convex temporal areas above the lateral ocelli, margins obtusely raised between the eyes and a short distance in front of the same. The whole *face* glazed and smooth, non-punctate. Frontal costa parallel-sided. *Antennæ* filiform, longer than head and pronotum.

Pronotum moderately elongate, *prozona* of both disc and lateral lobes glazed and smooth, *metazona* also somewhat glazed but noticeably less so than prozona, due to shallow punctation. *Disc* slightly broadening posteriorly, subcylindrical with rounded shoulders, *prozona* comparatively more convex from side to side, the *metazona* comparatively slightly more flattened; *median carina* low, subequally distinct, except somewhat less so between the mesal and the hind sulci, the *three transverse sulci* deeply grooved in both sexes, deeply impressing in the median carina; *anterior margin* truncate, slightly broadly incised in the middle, *posterior margin* either broadly arcuate (genotype)

or weakly biconvex. Prosternal spine pyramidal, tapering to subacuminate tip, vertical.

Mesosternal lobes in males transverse or subsquarish, mesosternal *interspace* very transverse and broader than one of the lobes (genotype), or less broadly transverse and narrower than one of the lobes. *In females* the *mesosternal interspace* broadly transverse. *Metasternal interspace* not very narrow, about one and a half to two times longer than broad in males, in females transverse.

Elytra reduced and abbreviated, a small linear lobe or longer and broader.

Fore and *median femora* thicker than normal, incrassate. *Hind femora* slender, the pagina (externo-medial aspect) narrow, its upper and lower margins straight and converging distad, all keels smooth. Hind tibia with 8-9 outer and 10-11 inner spines, outer apical spine absent.

Abdomen laterally-compressed-subcylindrical, with low keel mid-dorso-longitudinally in males, in females more rounded above.

♂. *Furcula* developed, distinct, triangular (genotype) or digitiform, close together. *Supra-anal plate* subtriangular, side margins with preapical angulation, tip smoothly obtusely rounded, surface with the usual medio-longitudinal groove, side margins with a moderately (genotype) or subvertically *(M. sinense)* raised linear tubercle. *Cerci* digitiform, straight, slightly broader at base, symmetrically tapering to a subacuminate tip, reaching to near tip of supra-anal plate. *Subgenital plate* with upper margins reflected laterad, apical tubercle either a very much prolonged projection (genotype) or a very distinct but shorter tubercle.

♀. *Supra-anal plate* triangular, with transverse sulcus near but posteriad of middle, tip obtuse-angular, surface shallowly impressed medio-longitudinally. The *valves of the ovipositor* of median built, not slender nor very thick, tips bifurcate. *Dorsal valves* moderately thick in profile, moderately sigmoid, bearing very fine serrations, dorsal aspect

rather shallowly concave. *Ventral valves* finely serrate. *Subgenital plate* with distal margin subtruncate, weakly obliquely convergent to the distinct median projection.

Genotype: *Podisma solitaria,* IKONNIKOV, 1911.

Miramella sinense sp. nov.
(Text-plate, fig. 5, Pl. I, figs. 6, 8, Pl. II, figs. 5, 6, 7).

Type: ♂. Manchuria, T'oumenling, viii, 9, 1928 (Coll. Dr. LICENT, Hoang Ho Pai Ho Museum)

Size under medium, *form* subcylindrical, *body* pubescent with fine silky hairs especially on the ventron and the hind tibiæ.

Compound eyes erect oval, rather prominant, one and one fourth times higher than broad, the *infra-orbital distance* equal to the horizontal width of the eye. *Infra-orbital distance* of vertex about equal to the breadth of the frontal costa between the antennæ or very slightly less. *Fastigium* strongly declivent, centrally rather shallowly furrowed throughout its length, with no anterior margin but passing insensibly into the frons, side margins obtusely and lowly raised between the eyes, very broad in front of the eyes and indistinguishable from the temporal areas above the dorsal ocelli, smooth and shiny. *Face* glazed, smooth. *Frontal costa* parallel-sided, slightly narrower at the dorsal extremity where it joins the fastigium, smooth, evenly furrowed and the groove is dorsally continuous with that of the fastigium except being shallower at the junction. Lateral facial carinæ straight, obtuse.

Pronotum of moderate length, subcylindrical with rounded shoulders, *prozona* of both disc and lateral lobes glazed and shiny, *metazona* somewhat shiny but decidedly less than prozona, closely and shallowly reticulated. The *3 transverse sulci* very distinct and deeply impressed, deeply cutting the median carina; *median carina* very low and weak, equally distinct on the metazona and the anterior portion of the prozona in front of the first sulcus, weaker

in the section in between the fore and hind sulci; *anterior border* of the disc very slightly biconvex being very slightly concave medially, *hind margin* broadly and very shallowly concave medially; *metazona* as long as the section of prozona before the first sulcus. The *lateral lobes* decidely longer than deep, anterior border slightly oblique, posterior border strongly oblique, the anterio-ventral and posterio-ventral angles obtuse-angular, the former more rounded and the latter more angular, ventral border very broadly obtuse-angulate in the middle. The *prosternal tubercle* pyramidal, vertical, tip subaccuminate.

Mesosternal interspace transverse but only slightly broader than long, slightly narrower than one of the lobes. *Metasternal interspace* twice as long as broad.

Elytra very small, linear, slightly less than twice as long as broad, tip broadly parabolically rounded, extending only shortly beyond the hind margin of the metanotum, not covering the tympanal organ. *Tympanal organ* distinct, definitely functional.

Abdomen subcylindrical, only slightly keeled medio-longitudinally.

Fore and *middle legs* rather robust, with club-like femora. *Hind femora* comparatively slender, with pagina (externomedial area) narrow, very slightly convex, and the upper and lower borders straight, converging distally. *Hind tibia* with 9 outer and 10 inner spines.

Furcula very distinct, digitiform, black in colour, close together. *Supra-anal plate* subtriangular, longer than broad, with a distinct shallow median longitudinal groove, side margins slightly proximad of mid-length bearing a subvertical tubercle, pre-apically with an angular shoulder on each side. *Cerci* styliform with base moderately broader, symmetrically tapering to a subaccuminate tip which is more darkly coloured than the rest, reaching to the tip of the supra-anal plate. *Subgenital plate* short, conical, tip bearing a distinct prominent tubercle which turns upwards, side margin reflected laterad.

Colouration: General colouration dark olive-green. Antennæ with two basal segments yellowish and the rest dark olive green. The post-ocular bands distinct from behind the eyes to the hind border of the pronotum, straight from the eye to the mesal sulcus of the pronotal disc and then moderately divergent to the hind margin. Elytra reddish brown. Anterior and middle legs yellowish, their femora with an upper longitudinal olive-coloured band. Hind femora olive-coloured, knee black all around, knee lobes black except the posterior ventral angle which is olive green or yellowish. Hind tibiæ of the same colour as the hind femora, the spines with apical half black. Furcula black. Sides of supra-anal plate black to the pre-apical angulation. Subgenital plate except the ventral base of faded dark colour, subapical tubercle black.

Length of body	17.5 mm.
Length of pronotum	4.1
Length of elytra	2.0
Length of hind femora	11.0

This species is well differentiated from the genotype by its narrower interocular space of vertex, the narrower mesosternal interspace, the narrower and shorter elytra, and by its male supra-anal plate, and the shorter apical tubercle of the male subgenital plate. I cannot compare it with *Podisma aberrans* IKONNIKOV from the Russian Far East for the description of the latter is inaccessible to me in China, and unfortunately I forgot to copy it while I was in America.

Zubovskya DOVNAR-ZAPOLSKIJ.

1933. *Zubovskya,* DOVNAR. Travaux. Inst. Zool. Acad. Sci. URSS., 1 : 258, 262, 267.

1936. *Zubovskya,* REHN and REHN. Trans. Am. Ent. Soc., 62 : 5, 6-8.

This is one of the eleven genera formed out of the old *Podisma* in the broad sense, with *Podisma parvula* IKONN.

as genotype. It is completely apterous, distributed in the Altai, Jenisseisk, Irkutsk, Transbaikatien, Jakutiens, the Russian Far East, and Korea, and in China in north-western Mongolia and Manchuria. The same genus occurs also in the North America where they have a discontinuous distribution, and according to REHN and REHN, "with one stock, *Z. polita* (SCUDDER) occuring in Western Oregon, and the other *Z. glacialis* ranging from Minnesota eastward across Michigan, Ontario, Quebec to Prince Edward Island in portions of New York, Pennsylvanea and New England and southward in the Appalachians in western North Carolina". The genus appears to be very closely related to *Miramella.*

Generic Diagnosis: Completely apterous. *Tympanal organ* generally absent, (entirely absent in Old World species).

Eyes erect oval, height of eye not much greater than the infra-orbital distance, the latter greater than horizontal width of eye. *Inter-orbital distance* of the vertex $1\frac{1}{4}$ as broad as the frontal costa between the antennæ in males, and $1\frac{1}{2}$ to 1 2/3 in females. *Fastigium* shallowly to quite distinctly sulcate, strongly declivent, sloping into the frons, very weakly angulately expanded in the middle before the apex of the compound eyes, margins very broad and obtuse, poorly or not elevated.

Pronotum subcylindrical with moderately rounded shoulders, *disc* in females appreciably broadening posteriorly, not so in males, the *three transverse sulci* moderately deeply impressed and distinctly cutting the median carina in males, in females less so and generally not cutting the median carina; *median carina* very low, weak but percurrent, the *anterior* and *posterior margins* of pronotal disc truncate and shallowly emarginate medially, *metazona* one-third of the total length of pronotal disc in both sexes or even less. *Disc* quite uniformly non-rugose-punctate as a whole, or obsoletely punctate in metazona. *Lateral lobes* slightly longer than deep; anterior and posterior margins only

slightly oblique; ventral margin obtuse-angular. *Prosternal tubercle* acute pyramidal, slightly retrorse.

Mesosternal interspace transverse, but narrower than one of the lobes.

Abdomen on dorsum medio-longitudinally weakly (♂) to more (♀) carinate.

♂. *Furcula* moderately well developed. *Cerci* slightly surpassing apex of supra-anal plate, tapering with distal fourth compressed and more or less widened, in shape subspatulate or obliquely truncate distad with ventral caudal angle acute. Subgenital plate triangular, with lateral margins each furnished at proximal third with distinct or weaker dentate production, median ridge and sulcation with lateral marginning carinæ supplied preapically with a pair of weak to quite distinct fold-like tubercles. *Subgenital plate* short, tip bearing a blunt to subaccuminate tubercle, upper borders slightly flexed laterally.

♀. *Supra-anal plate* triangular. *Cerci* short, conical, tapering to a blunt tip. *Valves of ovipositor* slender, compressed, *dorsal valves* with dorsal aspect comparatively shallowly concave, in lateral view with dorso-lateral margins but weakly sigmoid, with fine subuniform serration. Ventral valves proximo-ventrad with a distinct lateral dentate shoulders, serrated. Subgenital plate meso-distally acute angularly produced.

Zubovskya parvula (IKONNIKOV).

1911. *Podisma parvula,* IKONNIKOV, Ann. Mus. Zool. Acad. Imp. Sci. St. Petersb., 16 : 260.

1927. *Podisma parvula,* CAUDELL, N° 2679 Proceedings U.S. Nat. Museum, vol. 71, art. 7, p. 4.

1929. *Podisma parvula,* BEY-BIENKO, Konowia, 8 : 107.

1933. *Zubovskya parvula,* DOVNAR, l. c., 1:

This species has been recorded from Manchuria by BEY-BIENKO (1929). I have one female specimen before me from Lao Yeling of the same region bearing the date August 3, 1933, collected by Dr. LICENT. It is further distributed in Russian Far East.

Zubovskya koeppeni (ZUBOVSKY).

1900. *Podisma koeppeni,* ZUBOVSKY, Hor. Soc. Ent. Ross., 34 : 20.

1910. *Podisma koeppeni,* KIRBY, Syn. Cat. Orth., 3 : 535.

1931. *Podisma koeppeni,* BEY-BIENKO, Bul. Soc. Espan. de Hist. Nat., 31 : 675. (from Northern Mongolia).

1933. *Zubovskya koeppeni,* DOVNAR, l. c., 1 : 255, 267.

1933. *Zubovskya koeppeni,* MIRAM, Les Orthoptères de Yakoutie, Leningrad, p. 42-43.

This species has been recorded by BEY-BIENKO (1931) from northern Mongolia, and this constitutes the only record of the species from China's outlying north-west. It is further distributed in Altai, Jenisseisk, Irkutsk, and Transbaikalien.

The above two species are very closely related to each other but may be differentiated from each other by the following comparative characteristics which are not easy to appreciate unless one has both kinds to compare with.

Z. Koeppeni	Z. Parvulus
1. Size larger.	1. Size smaller.
2. Metazona less than one-third of length of disc.	2. Metazona greater than one-third of total length of disc.
3. ♂ metazona measured at the middle as long as distance between the mesal and hind sulci.	3. ♂ metazona as long as distance between fore and hind sulci.
4. Prosternal spine conical, rather sharp in males, blunt in females.	4. Prosternal spine blunt in both sexes, in females very blunt, short and thick,
5. Hind femora slenderer and longer.	5. Hind femora thicker and shorter.
6. Male cerci different, see Pl. 3, figs. 13, and 16.	
7. Olive or greenish, not reddish.	7. Hind femora reddish on inner upper surface.

Caudellacris REHN and REHN.

1939. *Caudellacris,* REHN and REHN, Trans. Amer. Ent. Soc., 65: 67, 68, 69-71.

This is a good new genus recently erected by REHN and REHN for the species *Catantops viridifemoratus* CAUDELL (1921), *Melanoplus okinawaensis* SHIRAKI (1930) and *Caudellacris omei* REHN and REHN. The first and last species are endemic to China, and *okinawaensis* was described from Naha, Okinawa (Loochoo Islands). All 3 species are very closely related. A new subspecies is here described.

Generic Diagnosis:

Body of moderate size, *organs of flight* fully developed. *Eyes* large, globose, more prominent in males, *infraorbital* distance in males equal to two-thirds of horizontal width of one eye or half of vertical height of the same, in females equal to horizontal breadth. *Fastigium* strongly sloping, basally narrow between the eyes, appreciably though slightly transversely broadened in front of the eyes, more so in females than in males, margins obtuse and not sharply marked anteriorly, surface shallowly sulcate. *Interorbital distance* as broad as the frontal costa between the antennae in females, narrower in males. *Frontal costa* sulcate, subparallel-sided. *Lateral facial carinae* slightly but distinctly convexly bowed below the antennae.

Pronotum of normal length, seen from above subparallel-sided, subcylindrical but not uniformly so, since the disc is flattened on the metazona and the shoulders less broadly rounded in metazona than in prozona; *lateral keels* absent; *disc* with prozona cylindrical, slightly longer than the flattened *metazona,* the former rather smooth, only subobsoletely or obsoletely punctate, and the latter rugose-reticulate; *anterior border* straight, *posterior border* obtuse-angularly produced, rounded at tip; the *three transverse sulci* distinct, moderately impressed; *median carina* evident on prozona, more distinct on metazona. *Lateral lobes* longer

than broad, hind margin moderately oblique. *Prosternal spine* cylindrical, subacuminate.

Mesosternal lobes widely apart, slightly wider than long, inner margins broadly convex, interspace about as broad as long or slightly broader than long in females, longer than wide in males. *Metasternal interspace* transverse in females, almost contiguous in males.

Fore and *meso-femora* rather stout in males, normal in females. *Hind femora* nearly as long as abdomen, not extending beyond it, all keels smooth. *Hind tibia* with 11-12 spines in both inner and outer series.

Tympanal organs normal. *Elytra* and *wings* fully developed.

♂. *Supra-anal plate* triangular, with a median sulcation in basal third, and at least shallowly impressed on apical third, with paired paramedial longitudinal tubercles or obtuse ridges near distal end, near proximal third of lateral margins with a raised point, tip bluntly rounded. Furculae obsolete. *Male cerci* broad, laterally compressed, tip very much broadened, asymmetrically clavate. *Subgenital plate* short, with abrupt posteriorly projecting apical tubercle.

♀. *Valves of ovipositor* moderately long. *Dorsal valves* seen from above with moderately long basal nonsulcate peduncle, with one or two transverse ridges here, surface of distal half or more concave, whose lateral margins are convex, and inner margins strongly concave; seen on profile rather deep, the dorso-lateral margins strongly sigmoid. *Ventral valves* with a distinct sub-basal angular external shoulder, not dentate. *Subgenital plate* with posterior border bearing a median and two lateral triangular projections on each side, 5 projections altogether. *Cerci* short, triangular, tapering to a rounded tip.

Genotype: *Caudellacris omei* REHN and REHN, 1939.

Caudellacris viridifemorata (CAUDELL) (Pl. II, fig. 11),

1921. *Catantops viridifemoratus,* CAUDELL, Proc. Entom. Soc. Wash., 23 : 32, fig. 2.

1929. *Podisma viridifemorata,* TSAI, Journ. Coll. Agric. Imp. Univ. Tokyo, 10 : 143, text-figs. 3a-3g.

1933. *Podisma viridifemorata,* TSOU, Journ. Agric. Ass. China, no. 118, p. 64, 66.

1936. *Melanoplus viridifemoratus,* TINKHAM, Lingnan Sci. Journ., 15 : 211.

1939. *Caudellacris viridifemorata,* REHN and REHN, Trans. Amer. Ent. Soc., 65 : 74-75, text-figs. 2, 5.

This species was first described under the genus *Catantops* by CAUDELL in 1921 from Mokanshan in Chekiang province, belonging to the material sent to him by the late Prof. N. GIST GEE. TSAI's *Podisma viridifemorata* is strangely synonymous with the present from, but I feel that it is a case of coincidence without reference to CAUDELL'S *Catantops viridifemorata.* TINKHAM'S criticism (1936) that TSAI had redescribed CAUDELL'S species and gave it the same specific name seems to me not entirely unwarranted. It is quite possible for such a coincidence to occur. This species in well preserved specimens have vividly green hind femora, In the same paper (1929), another of TSAI'S new species, *Ceracris kiangsu,* was unfortunately also synonymous with CAUDELL'S *Geea conspicua,* also described in the same paper (1921) of the latter author. In both cases, it is CAUDELL'S fault in giving wrong genetic designations. *Geea* described by CAUDELL as a new genus is a pure synonym of *Ceracris* with which CAUDELL did not even compare. It is more than likely that when TSAI described his new species, he did not even think of looking up either *Catantops viridefemoratus* or *Geea conspicua* because they belonged to entirely different catagories. The fact that he had included these two species in his list appendixed at the end of his paper is no proof that he had made reference to CAUDELL'S article, for the list was drawn from both KIRBY'S Catalogue and the Zoological Record.

I have four male and seven female specimens (remnant of a longer series I had before) from Tienmushan and Soochow, both places are very near to the Mokanshan, the type locality of this species. Father PIEL'S collection contains one male and four females from Tienmushan also, bearing the date August 30, 1936.

This species has for its haunts shady places in rather tall vegetation of about 5 to 7 feet high, ranging from the foot of the hill to as high as 500 feet. TSOU (1933) gave an account of having collected this species in the neighbourhood of a temple in Chin-kiang near Nanking, in shady places and perching on pine trees and cedar trees, ranging in altitude from the plain to 200 feet high.

✓ **Caudellacris viridifemorata Kulinga** subsp. nov.
(Pl. II, fig. 10).

This subspecies agrees with the above in all characters, but is well differentiated by the characters of its male cerci. The male cercus of this subspecies differs from that of *C. viridifemorata* by its definitely smaller size in all proportions, the apical margin being generally angular slightly above the middle (sometimes, though rarely somewhat rounded), better shown by figures than description, and the outer surface of the clavate portion definitely less impressed and more roughened. I have found these characters to be constant throughout the long series without any variation, and I have found at the same time the characters for *viridifemorata* also constant! It will be most probably proved to be a different species altogether but for the time being I prefer to refer it as a subspecies of *C. viridifemorata* as I do not have long enough series of the latter to study its internal genital characters.

Including the type and allotype, I have before me for study 12 ♂♂ and 30 ♀♀, collected by Father PIEL and belonging to Musée Heude from Kuling, 3,000 ft, bearing the date July 20, 1935.

	♂	♀
Length of body	20.5—25 mm.	30—32 mm.
L. of pronotum	4.5— 5.5	6.3— 6.5
L. of elytra	14.0—16.5	17.0—19.0
L. of hind femora	10.5—12.5	14.5—15.0

Caudellacris omei REHN and REHN.

1939. *Caudellacris omei,* REHN and REHN, Trans. Amer. Ent. Soc., 65: 71-74, text-figs. 1, 3 and 4; pl. vi, fig. 2, pl. vii, figs. 7, 12 and 13.

This species is very recently described from Mt. Omei and also Kwanshien in Szechwan province with an altitudinal distribution of 2500-4500 ft. It is said to differ from *C. viridifemorata* by the following characters: 1. Slightly larger size, 2. the, as a rule, longer organs of flight which usually surpass the posterior femorata, 3. the narrower, particularly in the female, interocular area and the more definite margins of this area and of the fastigium, 4. the capitate portion of the male cercus with the apical margin almost evenly arcuate, its anterior portion more evenly rounded and the postero-apical angle more nearly rectangulate, 5. the lateral productions of the subgenital plate acuteangulate and at least as long as the median production.

Concerning the above points, one fact must be pointed out here and that is the variability of the length of the lateral productions of the female subgenital plate. In the specimens of *viridifemorata* from Tienmushan before me, the majority have the lateral productions about as long as the median tooth but a few have the paramedial ones worn down and low as illustrated by the text-figure 2, page 71, in REHN and REHN'S paper (1929). The measurements of this species are practically identical as *viridifemorata* represented in the series before me.

Caudellacris sp.

I have one male and two female specimens from Weitzeping in central Shensi before me, bearing the date 18,

August, 1916, collected by Father LICENT. This is the northernmost distribution of this genus so far known. The general coloration of and all other facies are practically identical with *C. viridifemorata* but differ from the latter in its smaller size and the shape of its male cerci. Since I have only one male and two females before me, I deem it unwise to name it either as a new species or as *viridifemorata.*

Tonkinacris CARL.

1916. *Tonkinacris,* CARL, Rev. Suisse Zool., 24: 485.

This genus was first described by CARL with the species *T. decoratus* from Tonkin as its genotype. CARL compared his new genus with both the *Melanopli* and the *Coptacrae* or the genus *Traulia* but its relation is undoubtedly with the former and not with the latter. It is very closely related to *Indopodisma* especially to the subgenus *Sinopodisma* nov., differing only in the pronotal characters and in its female subgenital plate. It has evidently more or less the same kind of distribution with the former. Only two species have been described.

Generic diagnosis: *Compound eyes* large, strongly bulging side-wise, subroundish, its vertical height not much less than twice the *infra-orbital distance, inter-orbital* space above narrow, about the width of the frontal costa between the antennae. *Dorsum of head* short, roundly convex behind. *Fastigium* very strongly sloping forwards, longer than broad, base between the eyes very narrow, furrowed, broad and rhomboidal in front of the eyes, sulcate, side margins raised but broad and obtuse. *Face* moderately receding. *Frontal costa* rather straight seen in profile, subparallel-sided, sulcate to a greater or lesser extent. *Lateral facial carinae* rather prominent, very slightly convex forwards.

Pronotum long, cylindrical, thickly punctate-reticulate; *disc* with three conspicuous black longitudinal stripes, one

median and the others lateral; *anterior margin* subtruncate, and *posterior margin* obtuse-angulately produced; *median carina* low, more distinct on metazona than on prozona; *typical sulcus* placed a little behind the middle, the *other sulci* also well impressed; *shoulders* broadly rounded merging the disc with the lateral lobes. *Lateral lobes* distinctly longer than high, both anterior and posterior margins oblique, the latter more strongly so. *Prosternal tubercle* conical, pointing somewhat backwards, tip subacuminate.

Elytra abbreviated, hardly reaching to the mid-length of hind femora, broader basally, attenuating to a rounded parabolic tip; anterior margin convex. *Wings* as long as elytra.

Fore and *middle femora* stout in males. *Hind femora* extending to a little beyond tip of abdomen; normal in shape; knee-lobes subroundly truncate apically. *Hind tibia* with 10-12 inner and 9-10 outer spines with fine light hair.

♂. *Supra-anal plate* triangular; longer than broad, with a distinct median groove, side margins with an oblique thickened tubercular ridge near the base, apical third or more of plate with sublateral longitudinal carinae, tip obtuse-angularly rounded. *Cerci* elongate, with distal third directed meso-caudad, ventral margin relatively straight to the beginning of distal third, then passing by a rounded angulation to the weakly concave or wavy distal third, tip rounded. *Subgenital plate* short, with the upper marging flaring out a little in the basal two-thirds, tip tuberculate pointing upwards.

♀. *Supra-anal* plate triangular, the sides flexed downwards, tip blunt, proximal third with a broad short longitudinal median groove, and a transverse ridge. *Cerci* triangular, tapering to a subacuminate rounded tip, not extending beyond the podical plate. *Valves of ovipositor* long, exserted; *dorsal valves* with broad short and blunt serrations; *ventral valves* with much finer serration or smooth,

with a basal ventral shoulder. *Subgenital plate* with a short, triangular projection on the sides of the ventral border, at the middle with a more prominent triangular projection.

Tonkinacris sinensis CHANG

1937. *Tonkinacris sinensis*, CHANG, Notes Ent. Chin., 4: 191-2, pl. 111, figs. 1-2. (December 7, 1937).

1937. *Tonkinacris omei*, JOHN W. H. REHN, Trans. Am. Ent. Soc., 63: 427-430, figs. 2, 3 and 5). (December 31, 1937).

This species has recently been described by me from mount Omei in Szechwan province. It is widely distributed in the high montane regions from 2000 feet to 11,000 feet in Szechwan, Kweichow and Yunnan. The species *T. omei* REHN is conspecific with this species.

Indopodisma DOVNAR.

1933. *Indopodisma*, DOVNAR, Travaux Inst. Zool. Acad. Sci., URSS., 1:

This is DOVNAR'S genus based on UVAROV'S *Podisma kingdoni* UVAROV from kahao, Assam. I do not have the species before me and so have to deduce from the rather brief description of the species and the outline sketch of its male genitalia. I feel that the species *Podisma formosana* SHIRAKI, *P. kodamae* SHIR. which DOVNAR placed in *Miramella*, together with *M. splendida* TINKHAM, *M. shirakii* TINKH., *P. kawakamii* SHIR., *P. lofaoshana* TINKH. and the three new species described below belong to one definite group, showing definitely closer affinity to *Indopodisma* than to *Miramella*. For the time being, I propose a new subgenus, namely *Sinopodisma*, under *Indopodisma* to cover these species. As a group they are different from *Podisma kingdoni*, the genotype of *Indopodisma* in so far as comparison with UVARVO'S description is concerned, by the following characteristics:

Indopodisma	Sinopodisma
1. Fastigium very little widened forward, the widest part scarcely wider than the frontal costa between the antennae.	1. Fastigium definitely though only moderately broadened in front of the eyes, broader than the frontal costa.
2. Metazona less than half of prozona.	2. Metazona slightly more than half to half the length of prozona.
3. The 3 transverse sulci of pronotum deep and broad.	3. The 3 transverse sulci weak, subobsolete, *or if well marked,* not deep and percurrent in ♂ only, obsolete or very weak in ♀,
4. Mesosternal interspace in ♂ somewhat narrower than one of the lobes.	4. Mesosternal interspace decidedly narrower than lobe.
5. Elytra minute and scale-like.	5. Elytra linear or lobate, extending to at least mid-length of lst abdominal tergite.
6. Tympanal organ small, apparently non-functional.	6. Tympanal organ somewhat smaller than normal, but definitely functional.
7. Furculae present, digitiform.	7. Furculae absent.

The genus is related rather closely to *Tonkinacris* CARL.

Sinopodisma Subgenus nov.

The characters which differentiate this subgenus from *Indopodisma* have been listed above. It is confined to China south of the Tsinling ranges and from Formosa whose faunal characteristics are closely linked with those of the part of China just mentioned above. For a better idea about the distribution and habitat of this group, a table may be of service. Information for the Formosan species is gathered mainly from TINKHAM'S paper on the group Podismae from Formosa.

	DISTRIBUTION			HABITAT
1.	*S. formosana*	1,000-1,500 ft.	Formosa.	In ferns bordering edge of rain forest and on tree ferns of the genus *Dicksonia*.
2.	*S. kodamae*	3,500-8,500 ft. (?).	Formosa.	Abundant in grass and low vegetation.
3.	*S. kawakamii*	7,000-10000 ft.	Formosa.	In short grass in mountain top or ferns and grass.
4.	*S. shirakii*	6,000-6,000 ft.	Formosa.	In dew drenched grasses, and ferns.
5.	*S. splendida*	About sea-livel.	Formosa.	In dense vegetation at foot of high mountains, in tangled mass of vegetation under banana plants
6.	*S. lofaoshana*	1,000-2,000 ft.	Kwangtung.	Tall rank grass bordering dense shrubs and trees.
7.	*S. tsaii*	50-1,500 ft.	Chekiang, Kiangsu.	Among tall grass near temples, and in humid places.
8.	*S. kellogii*	2,500-3,000 ft.	Fukien.	In tall rank grass bordering wooded regions.
9.	*S. pieli*	2,500-3,000 ft.	Kuling.	Among tall grass.

Subgeneric Diagnosis: *Size* medium to large, ***form*** cylindrical to heavy cylindrical. *Head* short and broad, *occiput* convex sloping to the vertex in front. *Eyes* large, subglobose, bulging prominently side-wise in males, oval in females, *infra-orbital distance* two-thirds of the horizontal width of eye. *Interorbital space* of the vertex narrow, narrower than the frontal costa between the antennae in males, and slightly broader in females. *Fastigium* very strongly sloping, almost subvertically declivent to the frons, shallowly furrowed or impressed, transversely expanded in front of the eyes to a degree about as wide as long and distinctly wider than the frontal costa between the antennae.

Frontal costa parallel- or subparallel-sided, sulcate to a greater or lesser degree. *Lateral facial carinae* straight and slightly oblique in ventral half, dorsal half situated slightly more posteriad and close to the compound eyes, the two parts joined by a slight undulation.

Pronotum moderately long, seen from above cylindrical with the shoulders uniformly and evenly broadly rounded, passing insensibly into the lateral lobes; *disc* subequally rugose punctate throughout its length or the *metazona* may be slightly more closely so; *anterior border* truncate or slightly concave medially, *posterior border* not produced at all, sub-biconvex-truncate; *fore* and *median sulci* shallowly and finely or generally indistinctly and subobsoletely or obsoletely impressed, the *hind sulcus* always more distinct and impressing the median carina; *prozona* almost twice as long as *metazona*. *Lateral lobes* rugose-punctate except limited smooth areas between sulci, considerably longer than deep, the oblique hind margin joining the sinuate ventral margin by an obtuse angle, surface with three distinct vertical sulci, namely the anterior accessory sulcus, the mesal and the hind sulci. *Prosternal tubercle* conical, acuminate.

Mesosternal interspace always narrower than long by a greater or lesser degree in both sexes. *Metasternal interspace* contiguous or subcontiguous in males, in females squarish to transverse.

Fore and *middle legs* with femora incrassate, club-like. *Hind femora* of medium size and built, of moderate length, all keels smooth, knee with a small superior median triangular tooth, knee-lobe with disto-ventral angle right-angularly rounded. *Hind tibia* with 9-10 outer and 10-11 inner spines, outer apical spine absent.

Abdomen with a slight median keel.

♂. *10th abdominal tergite* divided in the center, not forming furculae, at best with very low nodes. *Supra-anal plate* equillaterally triangular, with a medium furrow running

along the raised median part, distally margined by a pair of raised carinae, lateral margins with a short oblique carina or tubercle on each side near the base. *Cerci* laterally compressed, broad at base, gently curved inward in apical half, tip truncate, rounded, bifurcate or subbifurcate. Subgenital plate bearing a blunt and rather short but distinct conical tubercle, side margins narrowly reflected laterad.

♀. *Supra-anal plate* triangular, with the sides flexed down laterad, with a transverse fine ridge at basal two-fifths or posteriad of the middle, medio-longitudinally grooved posteriad of the transverse ridge, surface irregularly and weakly punctate. *Valves of ovipositor* exserted; *dorsal valves* distinctly sigmoid in profile, distinctly serrated, upper surface excavate; *ventral valves* more or less smooth, with very distinct sub-basal ventro-lateral angular shoulder. *Subgenital plate* with hind border convergent to the median triangular projection.

Subgenotype: *Indopodisma (Sinopodisma) pieli* nov. sp.

A key to the known species of this entity and the three new species to be described will be given below. A table of comparison of the morphological characters of the three new species and one of the Formosan species, namely *S. formosana* SHIRAKI, which I have in my possession, will also be appendixed after the key. In the description of the three new species, comparison with the other known forms is made unnecessary because of the key given and also because of the table of comparison.

The *penis* and *accessory organs* of the *male genitalia* are *strikingly different* in the four species I have dissected, namely *pieli, tsaii, kelloggii* and *formosana.* Four specimens are dissected in each case in order to ensure accuracy and to ascertain variation. Drawings of the three new Chinese species are given but that of *formosana* are not given due to the lack of space in the plates, and also due to this war-time economy. The *dorsal* and the *ventral lobes* that

form the *penis* are peculiarly diagnostic and constant. Different views of these organs are given in the figures, one representing the side view, another the anterior view of this subvertical structure, and a third showing the dorso-posterior view. One fact must be pointed out here and that is the name of these lobes. These lobes are so called in accordance to their *morphological position,* and this should not be confused with the position in which they appear to be, for in the latter case, i. e. their apparent position, what is morphologically ventral appears dorsal and vice versa, due to the general forward recoiling of the tip of the male abdomen. Other differences of less striking nature may be noted in the *basal rami* which are the more or less sclerotized arms that embrace the base of the penis, the *parapenal coria* that wrap the base of the penal lobes, the *pseudosternite,* etc. These structures and their characters of the three new species will not be described for I think that the figures given will give an adequate idea about them and serve perhaps better and more instructive purpose than lengthy descriptions.

Key to the species of the subgenus *Sinopodisma.*

1. — Post-ocular black stripes with oblique lobe-like ventral appendage on prozona of the lateral lobes of pronotum, *or* if these stripes are confined to the pronotum and indistinct, then the elytra are ovate in shape (Pl. III, figs. 14 and 15). Elytra reddish brown in colour. *Formosan species* 2

— Post-ocular black stripes with ventral margin straight, without downward extansion in the form of an oblique lobe. Elytra of all species narrow linear oblong (Pl. III, figs. 17, 18, 19, and 20) 2½ times to 3 times longer than broad. Elytra black or at least dark, never reddish brown. *Chinese species* 6

2. — Elytra ovate in outline, apical border oblique truncate, broadest width between half to slightly more than half the length. Male cerci more straight, with apical two-thirds of even width and not or hardly tapering, tip broadly rounded or subtruncate. Post-occular stripes distinct or indistinct but are confined to head and pronotum only, not continued on the abdomen 3

— Elytra narrowly linear oblong, 2½ to 3 times longer than broad, apical border parabolically rounded. Male cerci more recurved inwards, upper border more concave, tapering at the apical fourth to a rounded tip. Post-ocular stripes always distinct and are continued on the abdomen 4

3. — Size smaller (Body length of ♂, 15.7 mm., Pronotum 3.5 mm., Elytra, 3.0 mm., Hind femora, 9 mm). Post-ocular stripes well defined. Elytra obliquely oblong in outline ..... *S. kawakamii* (SHIRAKI). (Pl. III, figs. 10, 14).

— Size larger (Body length of ♂, 21.5 mm., Pronotum, 4.9 mm., Elytra, 4.4 mm., Hind femora, 12.0 mm.). Post-ocular stripes indistinct. Elytra ovate in outline ..... *S. kodamæ* (SHIRAKI). (Pl. III, figs. 11, 15.)

4. — Size of species comparatively larger (Body length, ♂. 22.5-32.8 mm., ♀. 33.5-40 mm.). Post-ocular stripes comparatively narrower on pronotum 5

— Size smaller (Body length, ♂. 16,8-19.5 mm., ♀. 24 mm.). Post-ocular stripes broader on pronotum ..... *S. shirakii* (TINKHAM) (Pl. III, figs. 12, 17).

5. — Mid-dorsal stripe of body narrow, bright yellow, the head and pronotum with the central area black outwardly edged with pale green which merges into the bright yellow bordering the black post-occular band thus producing a striking color pattern. Post-ocular band very broad, shining black and extending as an evenly defined band to the tip of the subgenital plate ..... *S. splendida* (TINKHAM).

— Mid-dorsal stripe of body broader, dark green with only a very fine line of black on the median carina of the pronotum, pattern not conspicuous. Postoccular band disappearing on the mid-abdominal pleurites ..... *S. formosana* (SHIRAKI). (Pl. III, figs. 9).

6. — Male cerci with apical margin sub-bifurcate or bifurcate 7

— Male cerci rounded at tip, showing not the least indication of bifurcation 8

7. — Male cerci strongly recurved, apical border concave, with a large blunt and longer projection above, and short angular protrusion below ..... *S. lofaoshana* (TINKHAM) (Pl. II, fig. 13).

— Male cerci less strongly recurved, apical border narrow, truncate, with a slight median concavity ..... *S. tsaii* sp. nov. (Pl. III, fig. 8).

8. — Elytra not reaching to hind margin of first abdominal segment, not even entirely covering the tympanal organs. Metanotum and first abdominal tergum strongly punctate. male cerci see Pl. III., fig, 7 ..... *S. kelloggii* sp. nov.

— Elytra extending always slightly beyond the first abdominal segment. Male metanotum and first abdominal tergum obsoletely punctate. Male cerci see Pl. II, fig. 12..... ..... *S. pieli* sp. nov.

Table of Comparison of *S. tsaii*, *S. kelloggi*, *S. pieli* and *S. formosana* (Shiraki).

	S. tsaii	*S. pieli*	*S. kelloggii*	*S. formosana*
1.	*Fastigium* shallowly impressed, margins very broad, punctate poorly marked, except at base.	1. Same as *tsaii*.	1. Same as *tsaii*.	1. More deeply and smoothly impressed, margins obtuse but distinctly marked.
2.	(*Frontal costa* sulcate from a short distance above median ocellus downwards, flat or very shallowly impressed between the antennæ and above).	2. Frontal costa shallowly sulcate throughout in males, females same as *tsaii*.	2. Same as *pieli*.	2. Frontal costa more deeply sulcate throughout its length in both sexes.
3.	*Prozona* strongly rugose.	3. Prozona less strongly rugose.	3. Strongly rugose.	3. Strongly rugose, and dilated.
4.	*Metanotum and 1rst abdominal tergum* strongly rugose-punctate in males.	4. Metanotum and 1rst abdominal tergum finely and shallowly rugose-punctate.	4. Same as *tsaii*.	4. Same as *tsaii*.
5.	*Elytra* longer, reaching beyond hind margin of 1rst abdominal segment.	5. Elytra reaching slightly beyond 1rst abdominal segment.	5. Not reaching to hind margin of 1rst abdominal segment, not entirely covering tympanal organs.	5. Same as *kelloggii*.
6.	The dark *postocular band* on pronotum forming no ventral lobe-like appendage.	6. Same as *tsaii*.	6. Same as *tsaii*.	6. The dark postocular band with ventral lobe-like extension.
7.	*Elytra* black or dark.	7. Same as *tsaii*.	7. Same as *tsaii*.	7. Elytra reddish-brown.
8.	Cerci of all four species different :			
	Pl. III, fig. 8.	Pl. II, fig. 12.	Pl. III, fig. 7.	Pl. III, fig. 9.

9. The Dorsal and ventral lobes of all four species diagnostically different.
Pl. III, fig. 3,A_3,B_3. Pl. III, fig. 1,A_1,B_1. Pl. III, fig. 2,A_2,B_2. Not given.

10. Note the parapenal corium:
Pl. III, fig. 3,A_3,B_3. Pl. III, fig. 1,A_1,B_1. Pl. III, fig. 2,A_2,B_2. Not given.

11. Note the basal rami:
Pl. III, fig. 3,A_3,B_3. Pl. III, fig. 1,A_1,B_1. Pl. III, fig. 2,A_2,B_2. Not given.

12. Note the pseudosternites:
Pl. III, fig. 4. Pl. III, fig. 5. Pl. III, fig. 6. Not given.

Indopodisma (Sinopodisma) tsaii* sp. nov.
(Pl. I, fig. 3, Pl.III, figs. 3, A_3, B_3, 8, 19).

Type: ♂. Chekiang province, Tien-mu Shan, viii, 30, 1936 (Coll. O. PIEL).

Eyes erect subglobose-oval, strongly bulging sidewise, close to each other above, the *interorbital space* of vertex slightly but distincly narrower than the width of the frontal costa between the antennæ, the *infra-orbital distance* about two-thirds the horizontal width of the eye. *Fastigium* of the vertex very strongly declivent, almost subvertically sloping into the frons, shallowly impressed, with a perceivable median longitudinal furrow, the portion between the eyes narrow and subparallel-sided, the portion in front of the eyes moderately but distinctly broadened, with the side margins slightly obtuse-angularly convexing outwards and then converging to the subtruncate anterior margin, the margins very obtuse and not raised except the portion between the compound eyes, the broadest portion of the fastigium about two times or somewhat less than two times broader than the narrowest basal portion between the eyes, broader than the frontal costa. The very narrow temporal area between the dorsal ocelli and the indistinct lateral margins of the fastigium strongly punctate. *Occiput* convex, without median carinula. *Frontal costa* with the portion above the median ocellus somewhat broader, rather, strongly punctate and flat or very slightly impressed, the portion below the

* Name given in honour of Prof. TSAI PAN HWA.

median ocellus slightly subparallelly narrower, more distinctly sulcate from a short distance above the median ocellus downwards, becoming flat and more distinctly punctate as it approaches nearer to th clypeus, the sulcate area more obsoletely punctate; side borders broad and obtuse, slightly constricted at the muscle impressions slightly below the median ocellus. *Lateral facial carinæ* obtuse but well formed, straight and slightly oblique in ventral half, dorsal half situated slightly more posteriad and close to the compound eyes. *Genal areas* and the antero-ventral angle of the genæ faintly rugose-punctate.

Pronotum cylindrical, of moderate length, very slightly broader posteriorly; *disc* rugose-punctate all over, though somewhat more distinctly and closely so in *metazona*. *anterior border* truncate, *posterior border* subtruncate and slightly concavely notched medially, *median carina* weak, more distinct on the metazona than on the prozona, hind or *typical sulcus* distinctly marked, interrupting the median carina, the *fore* and *mesal sulci* feeble, rather shallowly marked, *prozona* about twice as long as *metazona*. *Lateral lobes* of pronotum coarsely rugose-punctate, bearing three sulci, namely, the anterior accessory sulcus, the mesal and the hind sulci; the posterior margin strongly oblique, the posterior lower angle being about 130 degrees; the ventral margin with anterior half or more than half rising antero-dorsad by 45 degrees. *Prosternal tubercle* conical, acuminate.

Mesosternal lobes about 1 ¼ times as broad as long or slightly broader, inner margins convexly rounded; *interspace* about 1 ½ times longer than narrowest width. *Metasternal* interspace subobliterated. *Pteropleura* punctate.

Elytra narrow-linear, subparallel-sided, about 3 times longer than broad, tip rounded reaching slightly beyond first abdominal segment. Tympanal organ small, but very distinct, functional.

Wings a mere linear membranous fold, not projecting out.

Metanotum and the *terga of the basal three abdominal segments* distinctly and rather strongly rugose-punctate.

Fore and *middle legs* with femora stout, club-like. The *hind femora* with all keels smooth; knee with a superior-median triangular tooth, knee-lobe with disto-ventral angle right-angularly rounded. *Hind tibia* with 9-10 outer and 11 inner spines.

The *10th abdominal tergum* medially narrowly interrupted, with very slight and low nodes. *Supra-anal plate* broadly triangular, with a median longitudinal strip of area on a slightly higher plane than the sloping and shallowly furrowed lateral areas of the plate, the median longitudinal area just referred to bears a distinct groove of triangular shape on the basal half and a shallower broader trough on the distal portion which is bordered on each side by subparallal carinæ. Near the side margins at the base of the supra-anal plate is a short, oblique ridge on each side; tip of plate slightly less than 90 degrees, rounded. *Cerci* pointing upwards, laterally compressed, base broad, narrower beyond, the distal third more lamellate and more laterally compressed, slightly impressed laterally, tip slightly bilobed as shown in the figure. *Subgenital plate* with dorsal side margins slightly and narrowly but very distinctly reflected laterad on basal two-thirds, tip bearing a short, blunt, but distinct tubercle which points upward. For *genitalia characters* and *pseudosternite* note diagnostic features in plate III, figures 3, A_3 and B_3, and 4.!

Allotype: ♀. Locality same as type.

Essentially same as male. *Body form* stout, broad and heavy. *Fastigium* in front of the eyes more transversely dilated. The compound eyes less globose, infra-orbital distance about equal to the horizontal width of the eye.

Pronotal disc slightly broadening posteriad, the first and second sulci very feeble, almost subobliterate, margin of disc more distinctly bilobate.

Mesosternal interspace squarish to very narrowly transverse. *Metasternal interspace* transverse.

Metanotum and *basal abdominal terga* obsoletely rugose-punctate.

Supra-anal plate triangular, punctate, transverse ridge situated posteriad of the mid-length of plate, the ends of the ridge bending latero-posteriad to the posterior borders of the plate; very shallowly impressed medially posteriad of the transverse ridge, tip less than 90 degrees, rounded. *Cerci* short, triangular, tip narrowly rounded. *Dorsal valves* of the ovipositor distinctly sigmoid seen in profile, distinctly serrated with median-sized teeth on dorso-lateral borders, dorsal aspects distinctly concave. *Ventral valves* with outer ventral edges practically smooth, with very distinct sub-basal angular shoulders. *Subgenital plate* longer than broad, hind border smoothly convergent to the median triangular projection.

Coloration: General coloration varies from greenish to reddish brown, in the majority of females reddish brown. The post-ocular bands distinct in males on each side of head, continued posteriorly to the hind border of the pronotum and further continued through the meso and meta-pleura beneath the elytra into the end of the fifth segment of the abdomen. In the adult females before me these lateral stripes just described are absent, perhaps due to fading. Lateral lobes of the pronotum greenish yellow or lighter brown, more brownish in females. Fore and middle legs yellowish green or brown. Hind femora green with faint and discontinuous transverse bands of dark brown, one medial and one postmedial, on the dorsal aspect; these bands may be confined to the dorsal aspect only or the medial one may be faintly continued onto the mid-width of the outer aspect (pagina) and the post-medial to the ventral border of the same, but these bands may be faded. Hind knees black, more conspicuously so in males. Hind tibia bluish-green, with basal black ring, spines black from base to tip; tibial claws yellowish, tipped in black,

Hind tarsi very light bluish, the first segment with base black, the second segment with apical border black dorsally and laterally, the third segment with a dark linear mark near its base dorsally and dark on its posterior border; tarsal claws light bluish, tipped in black; pulvillus with borders broadly black.

♂	*Length of body*	*L. of pronotum*	*L. of elytra*	*L. of hind femora*
Tienmushan	22.5	5.5	4.5	13
Ihing	18 -20.05	4.5-4.8	3.0-3.5	11.5-12
Soochow	19.5-22	5.0-5.02	4.0-4.5	12.0-13
♀				
Tienmushan	26.0-29	6.9-7	4.5-5.25	17.0-17.5
Soochow	27-28	6.25-7	5 -5	16.0-17.5

Paratypic series:

Chekiang province: Tienmushan, viii, 5, 1933, 1 ♂, 2 ♀♀. (K. S. CHANG Coll.); 13 ♀♀, 2 ♂♂, VIII, 30, 1936 (O. PIEL Coll.).

Kiangsu province: Ihing, viii, 1, 1933, 2 ♂♂, 1 ♀ (Musée Heude, Coll. O. PIEL); Soochow, viii, 1935, 4 ♂♂, 3 ♀♀, 2 ♂♂ nymphs, 4 ♀♀ nymphs (K. S. CHANG Coll.).

Paratypic variations: The fore and mesal transverse sulci of the pronotum are somewhat variable, more so in males than in females. In most cases they are very feeble, and often fall short of reaching the median carina, thus not impressing the latter and the mesal sulcus may be represented only by two short dashes on the disc. In some cases, they are quite distinct, though never deeply impressed, and actually impress the median carina. Another feature of variation is the length-width ratio of the mesosternal interspace. In the males, it varies from slightly longer than broad (minority) to distinctly linear (majority), in other words, from subsquarish to slightly more than twice as long as the narrowest width. In the females, the same varies from slightly broader than long (narrowly transverse) to slightly longer than the narrowest width. The elytra are

also somewhat variable in length and width. Sometimes they only reach to the hind border of the tympanal organs, but in most cases project beyond the hind border of the first abdominal segment. Their tips are also somewhat variable from symmetrically parabolic to obliquely rounded-truncate. On the whole, the shape is constant.

Indopodisma (Sinopodisma) kelloggii * sp. nov.

(Pl. I, fig. 2, Pl. III, figs. 2, A_2, B_2, 6, 7, and 20).

Type: ♂. Kushan, near Foochow, Fukien Province, viii, 1, 1937. 2,500 ft. (Coll. K. S. CHANG).

Size medium, *form* cylindrical. *Compound eyes* subglobose oval, the *infra-orbital distance* about two-thirds the horizontal width of eye. *Antennæ* filiform, the segments very narrow and very much longer than wide, reaching to slightly beyond the tip of the elytra. *Fastigium* very strongly declivent, subvertically sloping, very narrow between the eyes, the width here distinctly, though not much, narrower than the width of the frontal costa between the antennæ, ampliated before the compound eyes with the side margins obtuse-angularly bulging laterad, and then converging to the rotundo-truncate anterior margin, shallowly sulcate, the margins broadly obtuse, not raised, except the basal portions between the eyes. The narrow temporal area above the lateral ocelli and bordering the fastigium punctate. *Frontal costa* subparallel-sided, very slightly broader above the median ocellus than below, slightly constricted at the muscle impressions (slightly below the median ocellus), sulcate throughout its length except the dorsal and ventral extremities, shallowly punctate. The rest of face subobsoletely punctate.

Pronotum moderately long, cyclindrical, rugose-punctate throughout, slightly more closely and finely so on

* Name given in honour of Prof. CLAUDE RUPERT KELLOGG, a well-known entomologist of South China, and a much loved teacher of biology by many of his students.

the metazona, the *shoulders* more or less parallel, very broadly rounded; *anterior margin* of disc truncate; *posterior margin* broadly biconvex; the *median carina* weak, more distinct on metazona than on prozona; the *fore* and *mesal sulci* very feebly impressed or subobliterate; the *hind sulcus* always distinct; the *metazona* about half the length of the prozona. *Lataral lobes* longer than broad, rugose-punctate, bearing three distinct sulci, namely the anterior accessory sulcus, the mesal and the hind sulci; the posterior margin strongly oblique, the hind lower angle being about 130 degrees; the ventral margin with the anterior half or more than half arising antero-dorsad by 45 degrees. *Prosternal spine,* conical, subacuminate.

The *mesosternal lobes* squarish, their interspace about $1\frac{1}{2}$ times longer than narrowest width. *Metasternal interspace* narrow.

Elytra narrow, subparallel-sided, linear, $2\frac{1}{2}$ times longer than broad, tip rounded, reaching near but not beyond the first abdominal segment.

Metanotum and the basal abdominal segments coarsely rugose punctate.

The *fore* and *middle legs* with femora thickened, club-shaped. The *hind femora* extending well beyond the tip of the abdomen, all keels smooth, the knee lobes with the disto-ventral angle right-angularly rounded. *Hind tibia* with 9-10 outer and 11 inner spines.

The *10th abdominal tergum* narrowly interrupted in the middle, forming no projections. *Supra-anal* plate broadly triangular, with a median longitudinal strip of area on a slightly higher plane than the sloping and shallowly depressed areas laterad of it; the median longitudinal area just referred to bears a distinct groove on basal half and a shallower and very broad groove on the distal portion, Near the side margins at the base of the supra-anal plate, is an oblique nodule on each side, and there is another pair of longitudinal carinæ paramedially near the tip, and these latter carinæ incidently form the side borders of the broad

distal groove. *Cerci* better shown by figures than description, curved inwards and upwards, laterally compressed, basal third broader, beyond narrower of even width, hardly tapering except at the extreme rounded tip where it is slightly narrower, apical third bent upwards, shallowly grooved on the outer aspect. *Subgenital plate* with dorsal side margins narrowly, but very distinctly reflected laterad on basal two-thirds, tip bearing a short blunt tubercle pointing upwards. For *genitalia* and *pseudosternite* characteristics note Plate III, figs. 2, A_2 and B_2. The basal rami are peculiar in bearing a distinctive tubercle on each side.

Allotype: ♀. Locality same as type.

Essentially the same as the male. *Body* moderately elongate, cylindrical, not thick and broad and heavy as *tsaii*. *Fastigium* in front of the eyes more transversely broadened. *Frontal costa* non-sulcate from near between the antennæ upwards, strongly punctate. The compound eyes less globose, infra-orbital distance about equal to the horizontal width of the eye.

Pronotal disc subparallel-sided as in the males, the *fore* and *mesal transverse* sulci subobsolete.

Mesosternal interspace distinctly longer than broad but by only a slight degree. *Metasternal interspace* transverse.

Metanotum and *basal abdominal terga* rugose-punctate, but not so strongly as in the males.

Elytra linear, subparallel-sided, two and a half times longer than broad, tip rounded, reaching to quite near the hind border of the tympanum, never reaching beyond the hind margin of the first abdominal segment.

Tympanal organ smaller than normal, but distinct and functional.

Supra-anal plate triangular, punctate, tip rounded, transverse ridge placed posteriad of its median length, the ends of ridge bending latero-posteriad to the posterior border of plate, shallowly grooved medially posteriad of transverse ridge. *Cerci* short, triangular, tip narrowly

rounded. *Dorsal valves* of ovipositor serrated, comparatively less strongly sigmoid in profile as *tsaii*. *Ventral valves* somewhat uneven, bearing a distinct sub-basal angular shoulder. *Subgenital plate* longer than broad, hind border convergent to the median triangular projection.

	♂	♀
Length of body	22.5 — 24.5 mm.	25.0 — 31 mm.
Length of pronotum	5.25 — 5.4	6.0 — 6.8
Length of elytra	3.5 — 4.2	4.0 — 4.6
Length of hind femora	13 — 13	15 — 17.5

Coloration: General coloration dark chocolate brown above, sides green or greenish-yellow, except the abdomen. Antennæ reddish brown, tip dark. The two dorso-lateral stripes (post-ocular bands) on the head behind the compound eyes, on the thorax and the sides of the abdomen very distinct, reaching to the end of the 10th abdominal pleura, at the base of cerci. Legs green. Hind femora green on every aspect, with a touch of yellow, the dorsal keels spotted with some fine black dashes; knee entirely black. Hind tibia greenish-blue, with a back basal ring and a yellowish ring beyond, spines black throughout their lengths. Elytra chocolate brown.

Paratypic series: Same locality as types, 7 ♂♂, 12 ♀♀ (K. S. CHANG Coll.).

Indopodisma (Sinopodisma) pieli * nov. sp.

(Pl. I, figs 1, 7, Pl. II, figs. 2, 5, 7, 8, 12, Pl. III, figs. 1, A_1, B_1, 5, 18).

Type: ♂. Kuling, Kiangsi Province, viii, 31, 1934.

Body size medium, *form* cylindrical, moderately elongate. The characters of the *compound eyes, fastigium* and *occiput* same as the above two species. *Frontal costa* practically parallel-sided, very slightly constricted at the

* Name given in honour of one of China's foremost entomologist, Dr. OCTAVE PIEL.

muscle impressions (just below the median ocellus), sulcate almost throughout its length except the extremities, shallowly punctate, side margins well formed, obtuse.

Pronotal characters also the same as the above two species except that the *three transverse sulci* are somewhat more distinctly, though not deeply, marked, due to the comparatively less rugose-punctate nature of the prozona,

The *metanotum* and the *terga of the basal three abdominal segments* obsoletely and very shallowly punctate.

Mesosternal interspace about 2 times as long as its narrowest width.

Elytra narrowly linear, subparallel-sided, tip parabolic, extending to slightly beyond the first abdominal segment, about 2 $\frac{1}{2}$ times as long as broad.

External genitalia characters same as the above two species, except the cerci which are characteristic as shown in the figures given. For *penal* and *accessory organs*, note diagnostic characters in Plate III, figs. 1, A_1 and B_1, and fig. 5.!

Allotype: ♀. Locality same as type.

Size medium, considerably slenderer than the female of *tsaii*. *Frontal costa* strongly punctate, sulcate from between the antennæ downwards, non-sulcate above the antennæ.

The *fore* and *mesal sulci* on the pronotal disc very feebly impressed, not impressing the median ocellus.

Coloration: More or less the same as *kelloggii* except that the dorso-lateral post-ocular stripes are more intense and distinct in both sexes.

	♂	♀
Length of body	17.5 — 20.06 mm.	25 — 32.0 mm.
Length of pronotum	4.5 — 5.25	6 — 6.7
Length of elytra	3.5 — 4	4.5 — 5.5
Length of hind femora	11.5 — 12.5	14 — 16.0

Paratypic series: Same locality as types, 11 ♂♂, 10 ♀♀. (Musee Heude; Coll. O. PIEL).

Indopodisma (Sinopodisma) lofaoshana TINKHAM.
(Pl. II, fig. 13).

1936. *Podisma lofaoshana,* TINKHAM, Lingnan Sci. Journ., 15 : 406-408, pl. 17, fig. 2, pl. 18, fig. 3, 4.

This species was collected by TINKHAM and described as new from tall rank grass bordering dense shrubs and trees that grew at the source of a small mountain stream near the peak of the famous Loh Fau Shan in Kwangtung province, at an altitude of about 1100 feet above the sea level to 4,000 ft. It is well differentiated from the other known species by its male cerci.

Yunnanacris gen. nov.

This new genus resembles very closely the genus *Indopodisma* but is very well differentiated from it by its male subgenital plate and its male cerci. The male subgenital plate is pyramidal, with its upper margins straight and not ampliated, and its tip is not tubercular. Its cerci is finer and digitiform. Another distinguishing character is the lateral lobes of the pronotum which have their posterior margins merging smoothly and continuously ventrad into the ventral margin without forming any angular break at all. The form and size of the body are also very much smaller. The new genus is based on Ramme's *Indopodisma yunnaneus* from Yunnan.

Generic diagnosis: Size small. *Compound* eyes subglobose oval, close together above, the *inter-orbital* distance slightly narrower than the frontal costa in males, slightly broader than the same in females. The *infra-orbital* distance about two thirds the horizontal width of eye in males, equal to the same in females. *Fastigium* strongly sloping anteriad, shallowly sulcate, narrow and subparallel-sided between the compound eyes, narrowly expanded in front of the eyes, margins quite distinct and fine. *Frontal costa* in side view straight; subparallel-sided, shallowly sulcate to a greater or lesser extent, punctate. Antennæ somewhat thick, the middle segments twice as long as broad.

Pronotum cylindrical, of moderate length, semi-uniformly rugose, with no lateral carinæ, the *shoulders* evenly rounded on each side, merging insensibly into the lateral lobes; *median carina* weak, indistinct on prozona, more distinct on metazona, the three transverse sulci shallowly impressed, the fore and hind sulci dividing the disc into 3 subequal parts; *posterior margin* of disc subtruncate, with a slight excision in the middle. *Lateral lobes* longer than high, rugose punctate, the anterior margin moderately oblique, the posterior margin very strongly oblique, obtusely and continuously merging into the ventral margin without forming any break, the whole ventral margin one convex curvature. The prosternal spine conical, tip rounded.

Elytra greatly abbreviated, a narrow and linear lobe. *Tympanal organs* somewhat smaller than normal, but definitely functional.

Mesosternal interspace in males subsquarish, slightly longer than broad, narrower than one of the lobes; in females, transverse. *Metasternal lobes* subcontiguous in males, narrowly transverse in females.

The *fore* and *middle legs* with femora incrassate. The *hind femora* thick, with short knee-peduncle, all keels smooth and obtuse, knee-lobes with hind ventral angle right-angular. *Hind tibia* with 9 outer (outer apical spine absent) and 10 inner spines.

Furculæ absent. The male *supra-anal* plate triangular, centrally grooved, tip slightly less than 90 degrees, rounded, bordered by a horse-shoe-shaped margin. The *male cerci* not extending beyond supra-anal plate, digitiform with base moderately broader, narrowing towards the mid-length, tip rotundo-truncate, slightly broadened. *Subgenital plate* a straight vertical pyramid, converging to an acuminate tip which is not tubercular, upper margins sharp and not ampliated nor reflected laterad. Female genital character similar to *Indopodisma.*

Genotype: *Indopodisma yunnaneus* RAMME.

Yunnamacris yunnaneus (RAMME).

(Pl. I, figs. 4, 5; Pl. II, figs. 1, 4 and 15.)

I have a pair of this very interesting species collected from Pi Shi Chsi, near Mengsi, 6,500-7,500 ft., in Yunnan, bearing the date Sept. 6, 1934, given to me by my friend and colleague Mr. E. R. TINKHAM. There is a pair, evidently paratypes, of the same species in the Academey of Natural Sciences of Philadelphia. Unfortunately I have been unable to locate RAMME's original description though I have searched all available references. It is not mentioned by the Zoological record. So I am redescribing the species below.

♂. *Size* small, *body* pubescent with fine silky hairs. *Compound eyes* subglobose oval, close together above, the *interorbital distance* of the vertex above slightly narrower than the frontal costa between the antennæ, the *infra-orbital distance* about two-thirds of the horizontal width of eye. *Occiput* of head convex. *Fastigium* of vertex strongly sloping anteriad, shallowly sulcate, narrow and subparallel-sided at the base between the eyes, slightly knob-shape broadened in front of the eyes, with the side margins very slightly obtuse-angularly produced laterad at the dorsal ocelli and then convergent to the subtruncate anterior margin, side margins fine and low but distinct. The *fastigium* obtuse-angularly joining with the frontal costa. *Frontal costa* moderately broad, sulcate and punctate throughout, shallower at the dorsal and ventral extremities, subparallel-sided, slightly broader between the antennæ, the side margins obtuse. The rest of *face* and the antero-lower angles of the genæ rugose-punctate. *Antennæ* reaching to near tip of elytra, filiform, middle segments twice as long as broad.

Pronotum cylindrical, of moderate length, semi-uniformly rugose, insensibly or hardly broader posteriad, the shoulders evenly rounded to merge into the lateral lobes; *disc* with *anterior border* truncate, very slightly concave in the middle, *posterior border* subtruncate, broadly concave

in the middle, the *median carina* very weak, hardly traceable and rugose on the prozona, comparatively more distinct and definite on metazona, the *fore* and the *hind* (i. e. typical) sulci dividing the disc into 3 equal parts, the *fore* and *mesal sulci* very shallowly and weakly impressed, the *hind sulcus* more deeply impressed and distinct, definitely intersecting the median carina. *Lateral lobes* longer than high, rugose punctate, with three distinct sulci, namely the anterior accessory, the mesal and the hind sulci, the anterior margin moderately oblique, the posterior margin very strongly oblique, obtusely and continuously merging into the ventral margin without forming the usual more or less angular postero-ventral angle as shown in the figures given, the whole ventral margin one convex curvature. The *prosternal spine* conical, tip rounded.

Elytra narrow, a linear lobe, subparallel-sided, slightly more than two times longer than broad, tip parabolic, extending a very short distance beyond the first abdominal segment. *Tympanal organs* rather normal definitely functional.

Pteropleura rugose-punctate. *Mesosternal lobes* narrowly transverse, slightly broader than long, interspace subsquarish, slightly longer than broad, narrower than one of the lobes. Metasternal lobes subcontiguous.

The *metanotum* and the *first abdominal tergum* strongly rugose-punctate.

The *fore* and the *middle legs* with femora incrassate. The *hind femora* thick, with short knee-peduncle, all keels smooth and obtuse, knee with a very small and short triangular tooth, knee-lobes with hind ventral angle right-angular. *Hind tibia* hairy, with 9 outer and 10 inner spines.

The *10th abdominal tergum* narrowly interrupted, forming no projections. *Supra-anal plate* triangular, with a distinct and fairly broad median groove which has well formed lateral margins in the basal half, area laterad of the median groove sloping to the sides, tip less than 90 degrees,

rounded, bordered by an arc-like margin. *Cerci* of moderate length, short of reaching the tip of the supra-anal plate by a small distance, finger-like with base moderately broader, narrowing towards the mid-length, tip rotundo-truncate, slightly broadened, shallowly furrowed in the lateral aspect. *Subgenital plate* a straight vertical cone, converging to an accuminate tip which is not tubercular, upper edges sharp and not reflected laterad.

♀. Essentially similar to the males. *Size* under medium, larger than males. *Eyes* erect oval, not subglobose, *infra-orbital distance* equal to the horizontal width of one eye, *inter-orbital* distance of vertex slightly broader than the frontal costa between the antennæ. *Antennæ* slightly longer than head and pronotum, filiform, rather thick, the middle segments twice as long as broad.

Mesosternal lobes transverse, *interspace* also definitely transverse. *Metasternal interspace* narrowly transverse.

Supra-anal plate triangular, with transverse ridge near its mid-length, very shallowly or hardly grooved medio-longitudinally. *Cerci* short, triangular in shape, not extending beyond hind margin of podical plate, tip narrowly rounded. *Valves of ovipositor* well exserted; the *upper valves* with upper edge hardly serrated, sigmoid in profile, dorsal surface concave; *ventral valves* smooth, with distinct subbasal angular shoulders. *Subgenital plate* longer than broad, hind margin convergent to the median egg-guide.

Coloration: General coloration sub-uniformly testaceous-olivaceous, with no dark longitudinal bands. Antennæ brown. Elytra reddish brown. Hind femora with pagina yellowish-green, with two very inconspicuous transverse bars, one medial and the other post-medial, the former continuous with a faint median longitudinal mark (these marks are faint!); ventral and upper aspects reddish, inner aspect ligher reddish green or yellow. Knee lobes yellowish, knee arculus black. Hind tlbia light coerulescent, with basal dark ring, the spines with apical two-thirds black.

	♂	♀
Length of body	14.5 mm.	20.05
Length of pronotum	3.25	4.4
Length of elytra	2.50	3.0
Length of hind femora	9.00	11.0

Kingdonella UVAROV.

1933. *Kingdonella,* UVAROV. Ann. Mag. Nat. Hist., ser. 10, 11 : 468-469.

This striking genus lives in the far away Tibetan region of China. It is well differentiated by its distinct lateral carinæ of the pronotum. Two species have been described by UVAROV, both occurring in Tibet.

Generic Diagnosis :

"Alied to *Podisma,* but differing in the pronotum flattened above and provided with distinct lateral keels.

Antennæ filiform. Face in profile moderately oblique in the male, vertical in female. Vertex sloping, distance between the eyes greater than the width of the frontal ridge. Pronotum short, flattened above; transverse sulci distinct, dividing the disc into three equal sections; median keel low, linear; lateral keels irregular, thick throughout, gradually divergent backwards. Prosternal tubercle low, conical. Mesonotum, metanotum, and the first abdominal segment in the female swollen. Tympanum very small, functionless. Elytra and wings absent. Front and middle femora incrassate. Last tergite of the male with a furcula; supra-anal plate triangular, with a pair of sublateral projections on the disc; cerci short, conical. Lower valvæ of the ovipositor short, curved, with a blunt basal tooth".

Genotype : *Kingdonella wardi,* 1933.

Kingdonella wardi UVAROV.

1933. *Kingdonella wardi,* UVAROV. l. c., p. 469-470.

This species was described from Tibet in the region of the sources of Irrawadi River, 10,000-12,000 ft.

Kingdonella pictipes UVAROV.

1935. *Kingdonella pictipes,* UVAROV. Ann. Mag. Nat. Hist., ser. 10, 16 : 195-196.

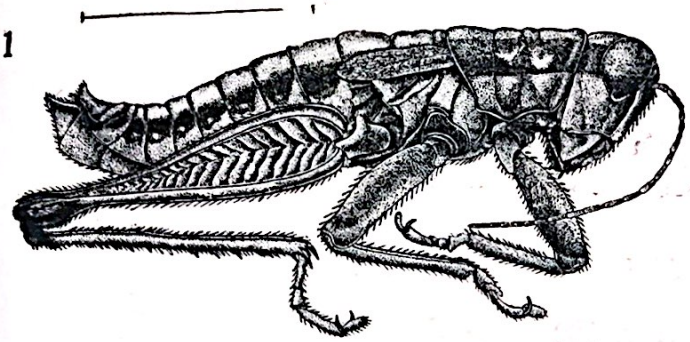
This species was described from South-eastern Tibet in the region of Nagon, Shugden Gompa, 14,000-15,000 ft.

Plate I.

1. Side view of *Indopodisma (Sinopodisma) pieli* sp. nov. (♂).
2. Side view of *I. (S.) kelloggii* sp. nov. (♂).
3. Side view of *I. (S.) tsaii* sp. nov. (♂).
4. Side view of *Yunnanacris yunnaneus* (RAMME), (♂).
5. Side view of same, (♀).
6. Side view of *Miramella sinense* sp. nov. (♂).
7. Dorsal view of Head and Pronotum of *I. (S.) pieli* sp. nov. (♂).
8. Dorsal view of Head and Pronotum of *Miramella sinense* sp. nov. (♂).

Plate I.

1



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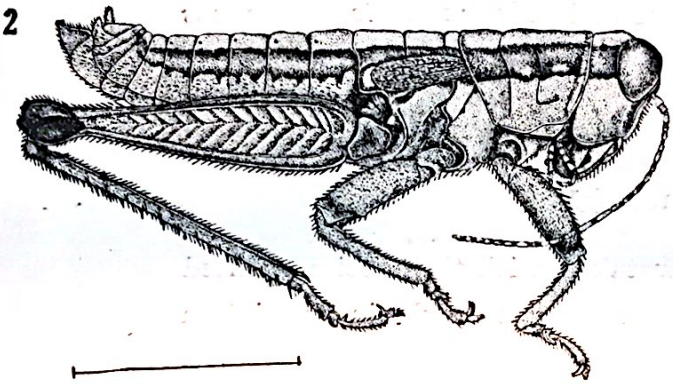

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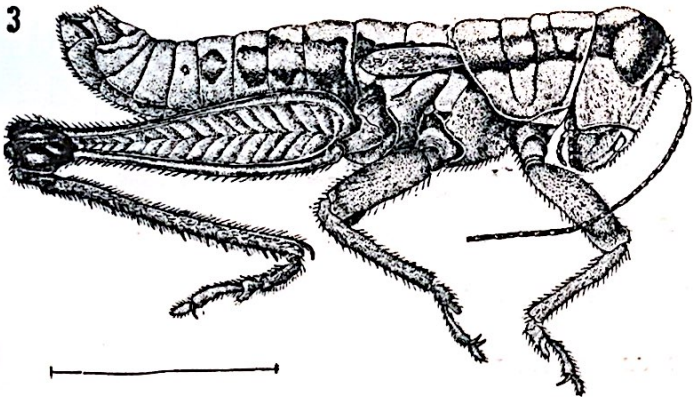

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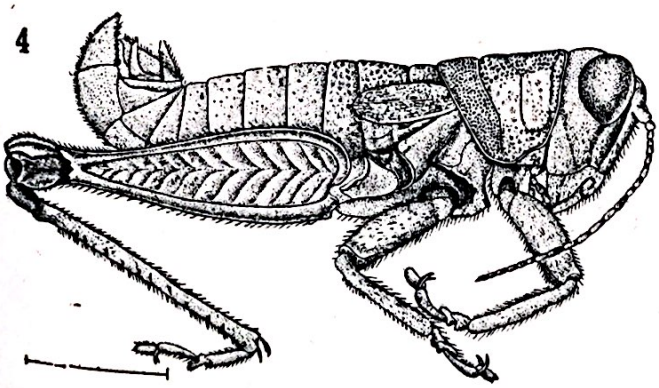

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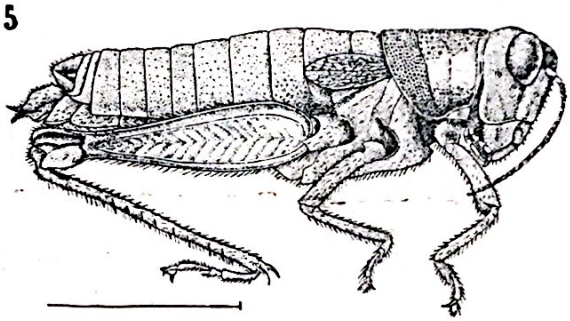

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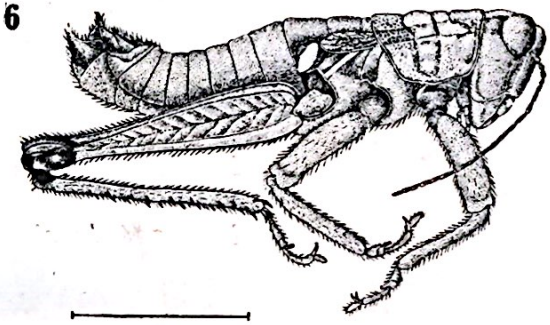

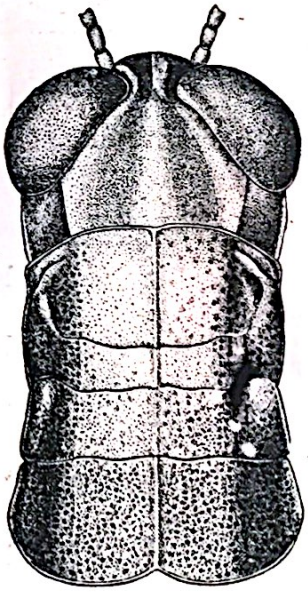

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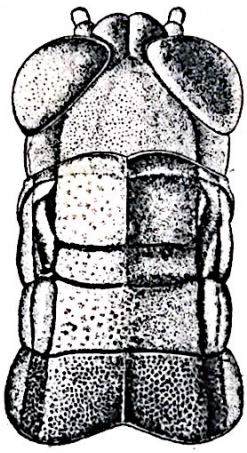


Plate II.

1. Dorsal view of tip of abdomen of *Yunnanacris yunnaneus* (RAMME), (♂).
2. Same of *Indopodisma (Sinopodisma) pieli* sp. nov. (♂).
3. Same of *Miramella sinense,* sp. nov. (♂).
4. Lateral view of tip of abdomen of male *Yunnanacris yunnaneus* (RAMME).
5. Same of *Indopodisma (Sinopodisma) pieli* sp. nov. (♂).
6. Same of *Miramella sinense,* sp. nov. (♂).
7. Fastigium of *I. (S.) pieli* ♀, view taken with the specimen tilted backwards so as to bring up the strongly sloping fastigium to aid drawing.
8. Same of *I. (S.) pieli* sp. nov. (♂).
9. Fastigium of *Miramella sinense,* ♂.
10. Cerci of male *Caudellacris viridifemorata kulinga,* subsp. nov.
11. Cerci of male *Caudellacris viridifemorata* (CAUDELLE).
12. Cerci of male *I. (S.) pieli* sp. nov.
13. Cerci of male *I. (S.) lofaoshana* (TINKHAM).
14. Cerci of male *Miramella sinense* sp. nov.
15. Cerci of male *Yunnanacris yunnaneus* (RAMME).

Plate II.

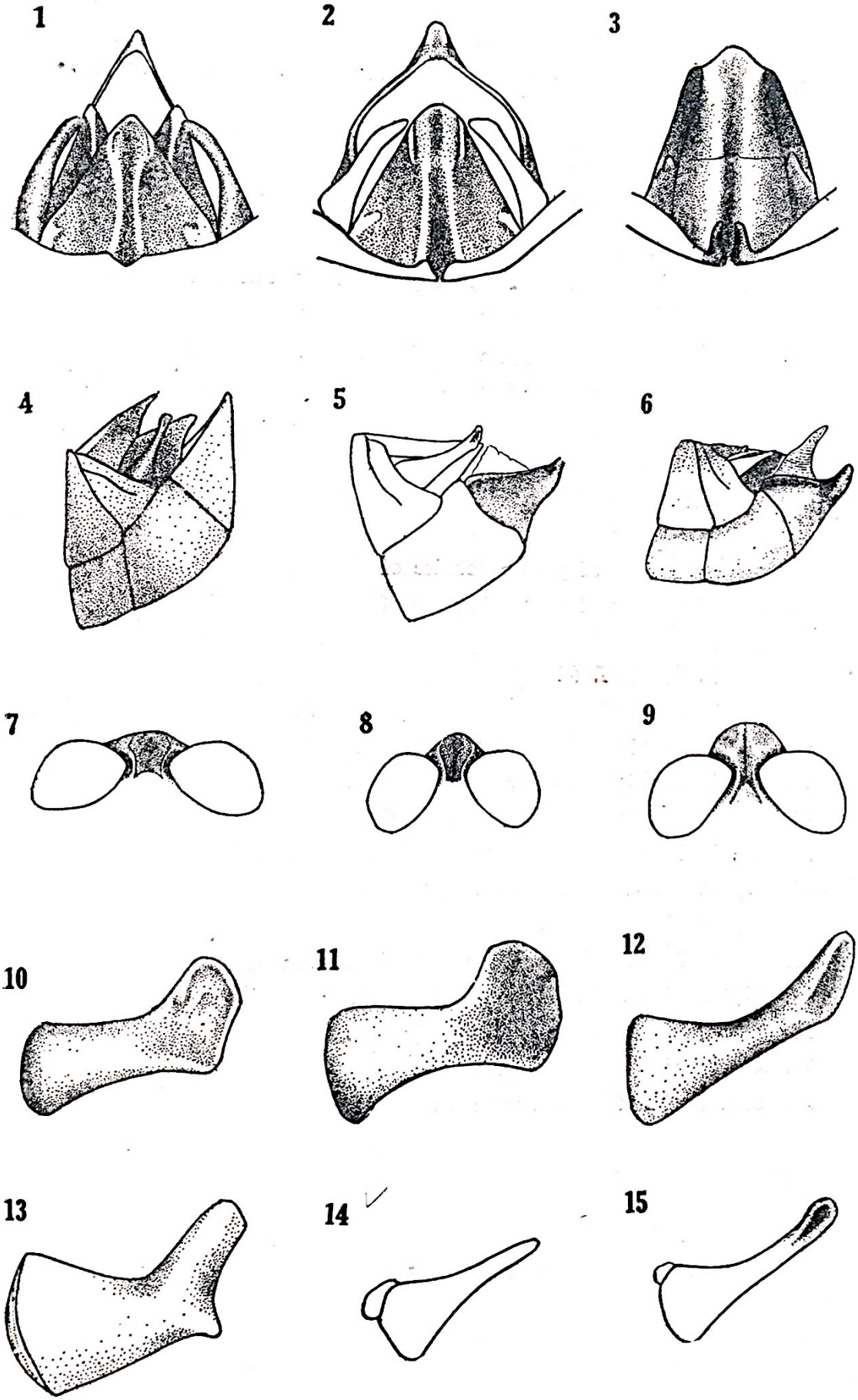


Plate III.

1. Side view of male genitalia of *Indopodisma (S.) pieli* sp. nov. showing:

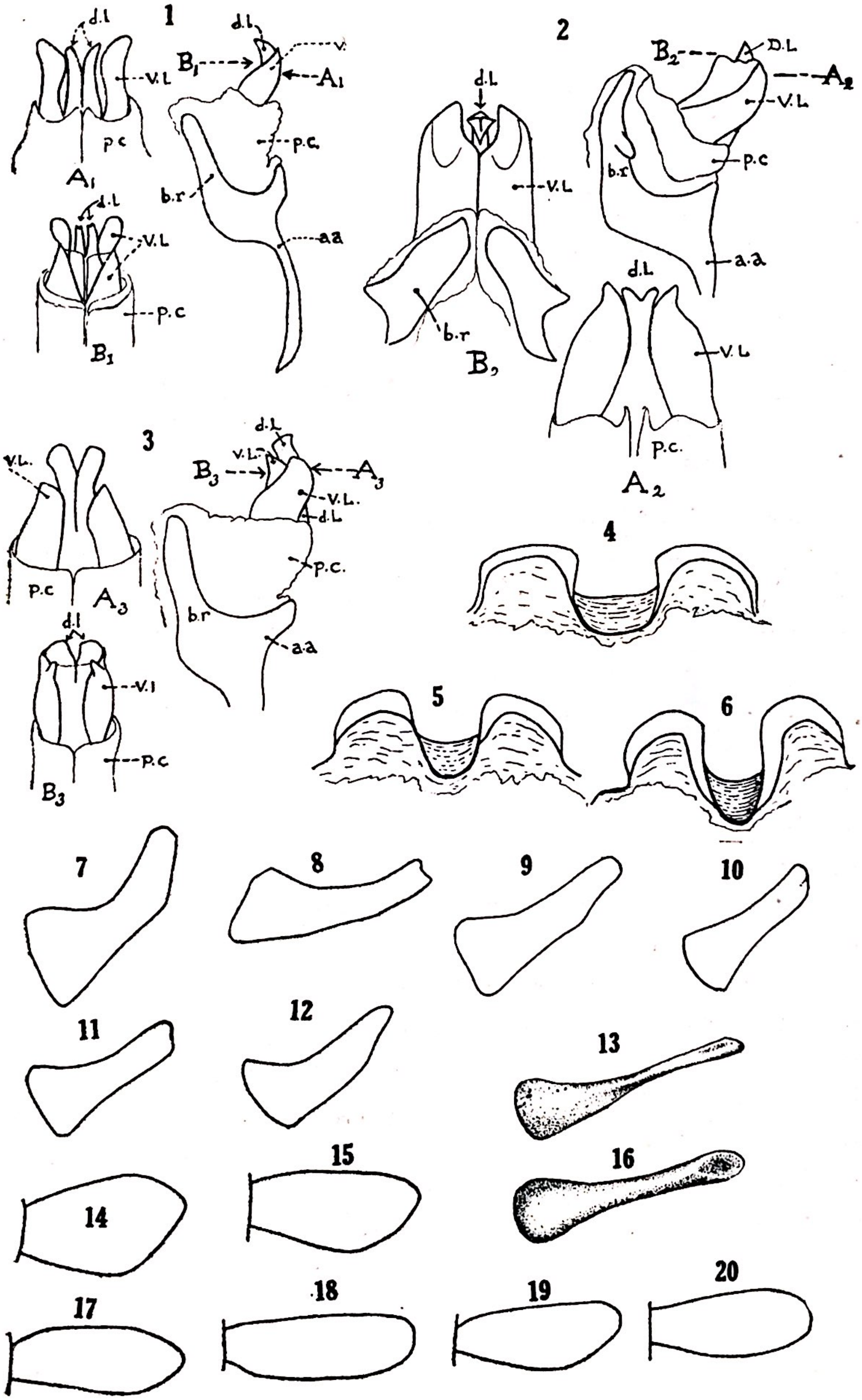
   v. l., Ventral lobe of penis,
   d. l., Dorsal lobe of penis,
   p. c., Parapenal coria
   b. r., Basal rami,
   a. a., Anterior arch.

   A_1, Anterior view of tip of penis, view taken from the direction as shown by the arrow labelled A_1 in side view.

   B_1, Posterior view of the tip of penis, view taken from the direction as shown by the arrow labelled B_1 in side view.

2. Same of *Indopodisma (S.) kelloggii* sp. nov.
3. Same of *Indopodisma (S.) tsaii* sp. nov.
4. Posterior view of pseudosternite of *I. (S.) tsaii* sp. nov.
5. Posterior view of pseudosternite of *I. (S.) pieli* sp. nov.
6. Posterior view of pseudosternite of *I. (S.) kelloggii* sp. nov.
7. Cerci of male *I. (S.) kelloggii* sp. nov.
8. Cerci of male *I. (S.) tsaii* sp. nov.
9. Cerci of male *I. (S.) formosana* (SHIRAKI).
10. Cerci of male *I. (S.) kawakamii* (SHIRAKI).
11. Cerci of male *I. (S.) kodamœ* (SHIRAKI).
12. Cerci of male *I. (S.) shirakii* (TINKHAM).
13. Cerci of male *Zubovskya parvula* (IKONNIKOV).
14. Elytra of *I. (S.) kawakamii* (SHIRAKI).
15. Elytra of *I. (S.) kodamœ* (SHIRAKI).
16. Cerci of male *Zubovskya koeppeni* (ZUBOVSKY).
17. Elytra of *I. (S.) shirakii* (TINKHAM).
18. Elytra of *I. (S.) pieli* sp. nov., (♀).
19. Elytra of *I. (S.) tsaii* sp. nov., (♀).
20. Elytra of *I. (S.) kelloggii* sp. nov., (♀).

Plate III.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