PYRGOMORPHIDAE GENERA OF THE WORLD: KEY TO GENERA

by

RICARDO MARIÑO-PÉREZ AND HOJUN SONG

MISCELLANEOUS PUBLICATIONS
MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN, NO. 212

Ann Arbor, November 14, 2023
ISSN 0076-8405

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MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN NO. 212

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COVER PHOTO— *Maura lurida*, male dorsal view (Figure 34E).

PYRGOMORPHIDAE GENERA OF THE WORLD: KEY TO GENERA

by

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Preface

This University of Michigan Museum of Zoology publication greatly enhances the accessibility of taxonomic information for a fascinating group of organisms – Pyrgomorphid grasshoppers. The authors images and taxonomic descriptions, as well as keys, make this publication a key asset to anyone studying Pyrgomorphid grasshoppers, filling a gap in Orthopteran systematics.

L. Lacey Knowles
Editor, UMMZ Publications

Foreword

Because of its scope and global coverage, I do not believe there is another entomological work such as this one. The authors have visited all of the major collections of Pyrgomorphidae around the world to assemble an astonishing collection of excellent photographs covering the great majority of the world's genera, and many species within them. Prior to this work, attempts to identify members of this family was an insurmountable task, mainly because of the paucity of well-illustrated papers. Because a large number of the Pyrgomorphidae are so beautifully marked one need only page through this book to find a match with almost any genus, and very frequently with species. The labor put into this work is astounding.

The accompanying keys will also be a great aid in the determination of genera anywhere in the world.

Very many of the genera of Pyrgomorphidae can now be attacked by enterprising taxonomists in order to examine the diversity of species with them. That, of course, is a major challenge these days when systematic entomology is far less popular than it was a few decades ago. But, with respect to the Pyrgomorphidae, such an enterprise can be launched by a single student who is fortunate enough to find a copy of this book. One can never predict where the next pyrgomorphian spark will be lit.

There are already tantalizing tales about the origins of the group, especially the movement of a basically Old World group into the New World. Based on molecular work by the authors, we get glimpses of very ancient crossings of the Atlantic from Africa to South America. From these authors we can expect many discoveries in the future that will delight our science.

Daniel Otte
Academy of Natural Sciences of Philadelphia, USA.

Foreword

The colorful Pyrgomorphidae grasshopper family (Orthoptera: Caelifera) contains about 500 species occurring throughout Africa, Asia, and Australia, with a few representatives in the New World. Many pyrgomorphs are known for their aposematic coloration and feeding behavior on toxic plants. Some species have specialized abdominal glands to expel distasteful chemicals at predators. Several species are considered important agricultural pests, while others are used for human consumption. Recent studies led by the authors of this publication on the systematic and phylogeny of the family have updated the state of knowledge of this fascinating Orthoptera clade. However, illustrated keys to help in the identification of pyrgomorphs were lacking. This publication fills this gap on the knowledge of this family. Herein, the authors provide comprehensive keys to 148 pyrgomorphid genera. They have produced 12 regional keys that reflect these endemic biotas, providing information on the distribution of genera, as well as on the number of valid species found in different regions. Authors also provide a clear definition of the family, its taxonomic history, information on taxonomists who described the species of Pyrgomorphidae, and a section on the phylogenetic position of Pyrgomorphidae within Acridomorpha. Information on pest species, and their economic importance, as well as on edible pyrgomorphids are also provided in a clear and informative way. Most keys are based on male external morphology. For the great majority of cases, species are illustrated with high-resolution pictures of males and females from well-preserved specimens. Besides, brief diagnoses of the 148 genera with the most relevant references complement the information present in the keys.

María Marta Cigliano
División Entomología, Museo de La Plata, CEPAVE - CONICET (National Scientific and Technical Research Council), Argentina.

INTRODUCTION

Definition of Pyrgomorphidae

The family Pyrgomorphidae (Orthoptera: Caelifera) contains some of the most colorful grasshoppers in the world (which is why they are also known as gaudy grasshoppers). Currently, there are 488 valid species in 148 genera in this family. The family is distributed mainly in the Old World, but there are several genera known from Mexico and South America as well as Australia (fig. 1). Pyrgomorphs are easily diagnosable by the presence of a groove in the fastigium of vertex (Kevan & Akbar, 1964) and very distinctive phallic characteristics such as the cingulum extending around to the ventral side, the endophallic apodemes turned medially, and the ejaculatory sac open to the genital chamber (Eades & Kevan, 1974; Eades, 2000) (fig. 2).

Taxonomic history of Pyrgomorphidae

The name Pyrgomorphidae is taken from the type genus *Pyrgomorpha,* which means **πύργος**, tower; **μορφή**, form (Audinet-Serville, 1838), possibly referring to the prominent shape of fastigium. Kevan & Akbar (1964) and Kevan et al. (1969a, b) conducted a comprehensive review on the systematic history of Pyrgomorphidae and the syntheses of the nomenclatural acts are discussed below.

The earliest grouping of genera belonging to what is known as the family Pyrgomorphidae was made by Brullé (1835) who placed *Poekilocerus* Audinet-Serville 1831, *Phymateus* Thunberg 1815, *Petasia* Audinet-Serville 1831 [=

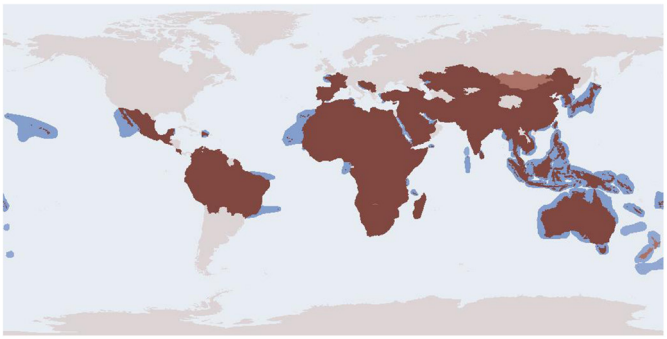

Figure 1. — Asserted distribution of Pyrgomorphidae based on Orthoptera Species File (Cigliano et al., 2022).

Dictyophorus Thunberg, 1815] and *Romalea* Audinet-Serville 1831 as divisions of the subgenus *Dictyophorus* Thunberg ("les *Dictyophores*"). Of these genera, the genus *Romalea* currently belongs to another family, Romaleidae, and the others now belong to the Pyrgomorphidae. However, the name of "*Dictyophores"* was vernacular and did not meet the conditions of the International Code of Zoological Nomenclature and it cannot be argued that "Dictyophoridae" is the earliest name for the family. The publication of Kirby's (1902a) catalogue was the first acceptable usage of a family-group name based on *Dictyophorus* became available (Dictyophorinae). Kevan and Akbar (1964) explained in detail the taxonomic history of *Dictyophorus*.

Audinet-Serville (1838) grouped *Phymateus* and *Petasia* [=*Dictyophorus*] together with some taxa that are now classified under Romaleidae and Pamphagidae in his division "Conophori". He placed *Poekilocerus* and *Truxalis* [subgenus] *Pyrgomorpha* in his division "Truxalides", and finally placed *Chrotogonus* in his subdivision "Mutici" of the

Figure 2. — Main morphological characteristics defining Pyrgomorphidae. **A.** Groove in the fastigium of vertex. **B.** Cingulum extending around the ventral side (right). Scale bar = 1 mm.

division "Acridites propiè dicti". The three divisions belong to the "Famille Acridites" which is equivalent to the present superfamily Acridoidea.

Burmeister (1840) transferred *Poekilocerus* to the Conophori within which he erected the "Unterabtheilungen" Poeciloceridae (more correctly Poekiloceridae), which included two "Sektionen": Pamphagidae and Phymatidae (more correctly Phymateidae). This was the original proposal of the family-group names based on *Poekilocerus* and *Phymateus*. The name "Phymatidae" is an objective synonym of "Poeciloceridae" since the type genus of the latter was included within it. The only other included taxa, *Phymateus* and *Petasia* [=*Dictyophorus*], were regarded as "Sektionen" [subgenera] of *Poecilocera* [=*Poekilocerus*].

The oldest available name for the family known as Pyrgomorphidae is Poekiloceridae Burmeister, 1840. However, the name remained unused for the family. Scudder (1868) and Thomas (1873) both used it but only in outlining previous classificatory systems. Bolívar (1884) introduced the family-group name "Poecilocerae" for a subordinate taxon "sub-tribu". On the other hand, the name Phymat[e]idae was used by Scudder (1868), Walker (1870a, b) [Acrididae: Phymat[e]idae], Thomas (1873) [Acridinae: Phymat[e]ini], and Girard (1876).

Stål (1873) completely revised the classification of "Familia Acridiodea" (superfamily Acridoidea) and introduced a new and more extensive concept of the group ("subfamilia Phymatidae"). Brunner von Wattenwyl (1874) split Stål's Phymat[e]idea in two: "Zunft der Pyrgomorphiden" and "Zunft der Phymat[e]iden". Brunner von Wattenwyl (1882) latinized the name of the former group to Pyrgomorphidae. He did not deal with the group that included *Phymateus* and its relatives.

Bolívar (1884) pointed out the apparent homonymy between Phymat[e]idae (Orthoptera) and Phymatidae (Hemiptera). Bolívar ignored Brunner's divisions and followed Stål's arrangement but adopted the name Pyrgomorphidae in place of Phymat[e]idea, which was soon omitted completely from the literature, except in some references. Kevan & Akbar (1964) pointed out other two reasons for the general adoption of the name Pyrgomorphidae: (i) Bolívar (1904, 1905 & 1909) continued to use Pyrgomorphidae; and (ii) The monograph of Brunner von Wattenwyl (1882), in which the latinized form of the name was established, was the standard European work on Orthoptera for a long time. Due to the fact that there were no generally accepted rules of priority at the time, the name became firmly established in the literature. Only Yakobson & Bianchi (1902) tried to return to Phymateidae, but their work left no impression on orthopterists because it was written in Russian, and due to its rarity, it was not available to the Western authors.

For some time, the group was recognized as a tribe of the family Acrididae (Brunner von Wattenwyl, 1882; Finot, 1883; Bolívar, 1884). At first, the suffix "-idae" was used (not meaning family status). Later, authors began to use the "subfamily Pyrgomorphinae" of the "family Acridiidae" or Acrididae (Bruner, 1900; Rehn, 1904, 1907). Others used the suffix "-inae" but referring to the group as a tribe. However, Karsch (1891, 1893), Griffini (1897), Yakobson and Bianchi (1902, as Phymateidae), Kirby (1902a, b), Burr (1910), Bolívar (1904, 1905) treated the group as a family using the present family ending (Griffiini used "-idi") and in occasions such as Bolívar, including subfamilies within it.

Bolívar (1909) reversed his previous classification (Bolívar, 1904, 1905) and treated the group as a subfamily (Acridiidae: Pyrgomorphinae) and Kirby (1910) endorsed this action. However, Chopard (1949) later restored the family status without providing any explanation. Dirsh (1956, 1961) also recognized the group as a family. However, there was no recognition of subfamilies.

Kevan & Akbar (1964) provided a provisional arrangement of tribes, subtribes and genera. This work is complemented with the classification in two groups (A and B) proposed by Kevan et al. (1969, 1970, 1971, 1972, 1974, 1975), which was the basis for the two subfamilies proposed by Otte (1994) that are currently in use.

Kevan (1952a) initially suggested a reversal to the prior name Phymateidae, but later he retracted this idea and recommended the recognition of the name Pyrgomorphidae. Later, Kevan (1964, 1969b) proposed to the International Commission on Zoological Nomenclature (ICZN) that Pyrgomorphidae, proposed as "Zunft der Pyrgomorphiden" by Brunner von Wattenwyl (1874) to be given precedence over Poekiloceridae Burmeister, 1840 and Phymateidae Burmeister, 1840. In the opinion 969 of the ICZN in 1971, the proposed changes were accepted, resulting in the family Pyrgomorphidae Brunner von Wattenwyl, 1874.

Kevan (1977b) provided the most updated catalogue of the family to date. It is a synthesis of all his previous works with a comprehensive literature review. In its more than 600 pages, the taxonomic history of each taxon (both valid and synonym) is provided (only 57 out of the 488 valid species have been described after 1977) (fig. 3). This work was the basis for the catalogue of Otte (1994), which subsequently became the Orthoptera Species File online (Cigliano et al., 2022).

Bolívar and Kevan were the most prolific taxonomists for Pyrgomorphidae with 84 and 97 species descriptions, respectively (counting species described with collaborators). Bolívar was active in the late 19th century and Kevan was active in the 20th century, but they were productive for similar durations (35 and 42 years, respectively) (fig. 4). The first three species in the family were described by Linnaeus in 1758 (*Phymateus morbillosus, Zonocerus variegatus* and *Aularches miliaris*) and the last eight species were described by Sanabria-Urbán et al. in 2017 (7) and Gupta et al. in 2020 (1). Other early naturalists who described some pyrgomorphids were Fabricius (6 spp.) and Thunberg (3 spp.) (Table 1).

Within Pyrgomorphidae, there is a high disparity in the number of species among the 148 genera. 70 genera are

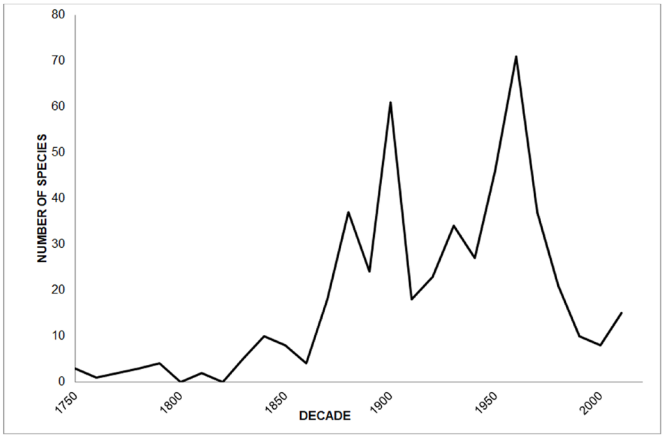

Figure 3. — Number of species described per decade (1758-2017). The two major peaks are due to descriptions made by Bolívar and Kevan respectively.

monotypic, 31 genera include two species, and 17 genera include three species. Eight genera (*Stenoscepa, Phymateus, Orthacris, Tagasta, Parasphena, Sphenarium, Desmopterella* and *Pyrgomorpha*) comprise between 11 and 20 species and only two genera include more than twenty species (*Atractomorpha* with 27 and *Caprorhinus* with 28). This situation is due to two historical factors. First, there had been a tendency to over-split the diversity in this group, mostly by Kevan, and second, several taxa were originally described in more speciose genera but later transferred to newly erected genera.

The phylogenetic position of Pyrgomorphidae within Acridomorpha

Above family level. The position of Pyrgomorphidae within Acridomorpha (a monophyletic group comprising seven superfamilies; Proscopioidea, Eumastacoidea, Tanaoceroidea, Pneumoroidea, Trigonopterygoidea, Pyrgomorphoidea and Acridoidea) has not been stable until recently. In a comparative study of male phallic complex, Roberts (1941) first placed the family Pyrgomorphidae close to Pamphagidae based on the form of the ejaculatory sac and associated phallic structures, and included both families within "Chasmosacci" *sensu* Roberts (1941). This "Chasmosacci" was defined by the ejaculatory sac that runs directly into the spermatophore sac, without a major constriction associated with ventral gonopore processes on the endophallic sclerites. In addition, the endophallic sclerites are in ventral or medial position with respect to the spermatophore sac. Dirsh (1956) and Amédégnato (1976) placed the family close to Lentulidae based on male genitalia (endophallic simple and non-fractured sclerites). Both Dirsh and Amédégnato placed Pyrgomorphidae within the superfamily Acridoidea. Dirsh (1975) raised "Chasmosacci" to the superfamily status as the Pamphagoidea, and Otte (1994) followed this arrangement.

The first application of modern cladistic methods in classifying Pyrgomorphidae was by Flook and Rowell (1997) who used 630 bp from mitochondrial ribosomal RNA genes of 32 caeliferan taxa (3 Pyrgomorphidae; *Prosphena scudderi*, *Atractomorpha acutipennis* and *Zonocerus elegans*) to build a phylogeny of Caelifera, but they did not recover a sister relationship between Pyrgomorphidae and Pamphagidae (fig. 5).

Flook et al. (1999, 2000) using 3,177 bp from three genes (12S, 16S and 18S) did not find support for the hypothesis of a close relationship between Pyrgomorphidae and Lentulidae (fig. 5) (Dirsh, 1956; Amédégnato 1976, 1993). The taxa of Pyrgomorphidae used were *Prosphena scudderi* and *Pyrgomorpha conica.* Based on this result, they proposed a new superfamily, the Pyrgomorphoidea (Flook et al., 1999). Eades (2000) hypothesized that Pyrgomorphoidea would be sister to Acridoidea based on his comparative study of male phallic complex.

Hong et al. (2003) using 480 bp from 16S rDNA from 13 taxa of Caelifera found Pyrgomorphidae (*Mekongiella kingdoni*, *Atractomorpha acutipennis* and *A. sinensis*) as a sister group of Acridoidea. They assigned *M. kingdoni* to family Chrotogonidae and both species of *Atractomorpha* to Pyrgomorphidae. Xu et al. (2003) conducted a phylogenetic analysis based on 21 morphological characters from one species of each of these 10 genera of Pyrgomorphidae (*Aularches*, *Phymateus*, *Pseudomorphacris*, *Tagasta*, *Yunnanites*, *Mekongiella*, *Mekongiana* and *Chrotogonus, Pyrgomorpha and Atractomorpha*). They assigned the first eight genera to the family Chrotogonidae and the last two genera to the family Pyrgomorphidae. They concluded that both families should be merged into one family because of the lack of support for the hypothesis of two families.

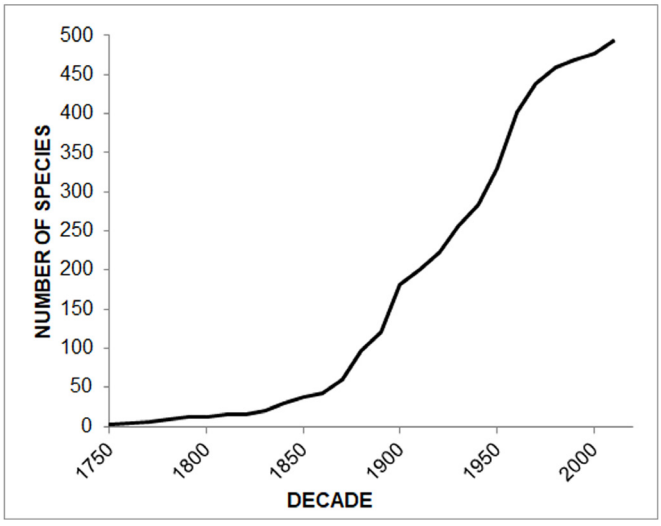

Figure 4. — Cumulative species curve, showing the pattern of species description in Pyrgomorphidae (1758-2020).

Table 1. — Taxonomists who described the species of Pyrgomorphidae arranged by the number of species described.

Author	Species described	Years of activity
Bolívar	84	1882-1917
Kevan	78	1948-1990
Uvarov	25	1921-1953
Wintrebert	20	1972
Karsch	19	1888-1896
Ramme	19	1929-1941
Rehn	19	1901-1953
Willemse	17	1922-1961
Dirsh	14	1951-1963
Sjöstedt	13	1910-1933
Descamps & Wintrebert	9	1966
Stål	9	1855-1877
Sanabria-Urbán, Song & Cueva del Castillo	8	2017-
Walker	8	1870-1871
Key	7	1937-1985
Blanchard	6	1836-1853
Fabricius	6	1775-1793
Kevan, Singh & Akbar	6	1964
Saussure	6	1859-1899
Brunner von Wattenwyl	5	1882-1906
Linnaeus	5	1758-1771
Bi & Xia	4	1981
Haan	4	1842
Kirby	4	1902-1914
Bruner	4	1906-1910
Bi	3	1981-1983
Carl	3	1916
Chopard	3	1921-1958
Gerstaecker	3	1869-1884
Kevan, Akbar & Singh	3	1964
Krauss	3	1877-1901
Miller	3	1934-1935
Singh & Kevan	3	1965
Thunberg	3	1787-1815
Werner	3	1908-1914
Yin	3	1984
Baccetti	2	1985
Burr	2	1898-1899
Fontana, Buzzetti, Mariño-Pérez & García García	2	2011-
Guérin-Méneville	2	1844-1849
Kevan & Akbar	2	1964
Kevan & Boyle	2	1978
Kevan & Chen	2	1969
Kevan, Akbar & Chang	2	1971
Liang	2	1988
Mao & Li	2	2015-
Perez-Gelabert, Dominici & Hierro	2	1995
Schaum	2	1853
Schmidt	2	1999-2004
Zheng	2	1992-2000
Balderson & Yin	1	1987
Charpentier	1	1842
Coquerel	1	1861
Dong & Wang	1	2012
Erichson	1	1842
Finot	1	1894
Gupta & Chandra	2	2016-
Hebard	1	1932
Hemp	1	2009-
Henry	1	1933
Huang	1	1990
Johnsen & Kevan	1	1984
Key & Kevan	1	1980
Klug	1	1832
Kuthy	1	1905
Mao & Yang	1	2003
Mao & Zheng	1	1999
Mason	1	1979
Mochulsky	1	1866
Montrouzier	1	1855
Olivier	1	1791
Reiche & Fairmaire	1	1849
Salfi	1	1939
Steinmann	1	1965
Storozhenko	1	2004
Tepper	1	1896
Wang, Xiangyu, He & Mu	1	1995
White	1	1845
Yin & Shi	1	2007
Yin, Ye & Yin	1	2009
Zheng, Huang & Zhou	1	2008
	488	

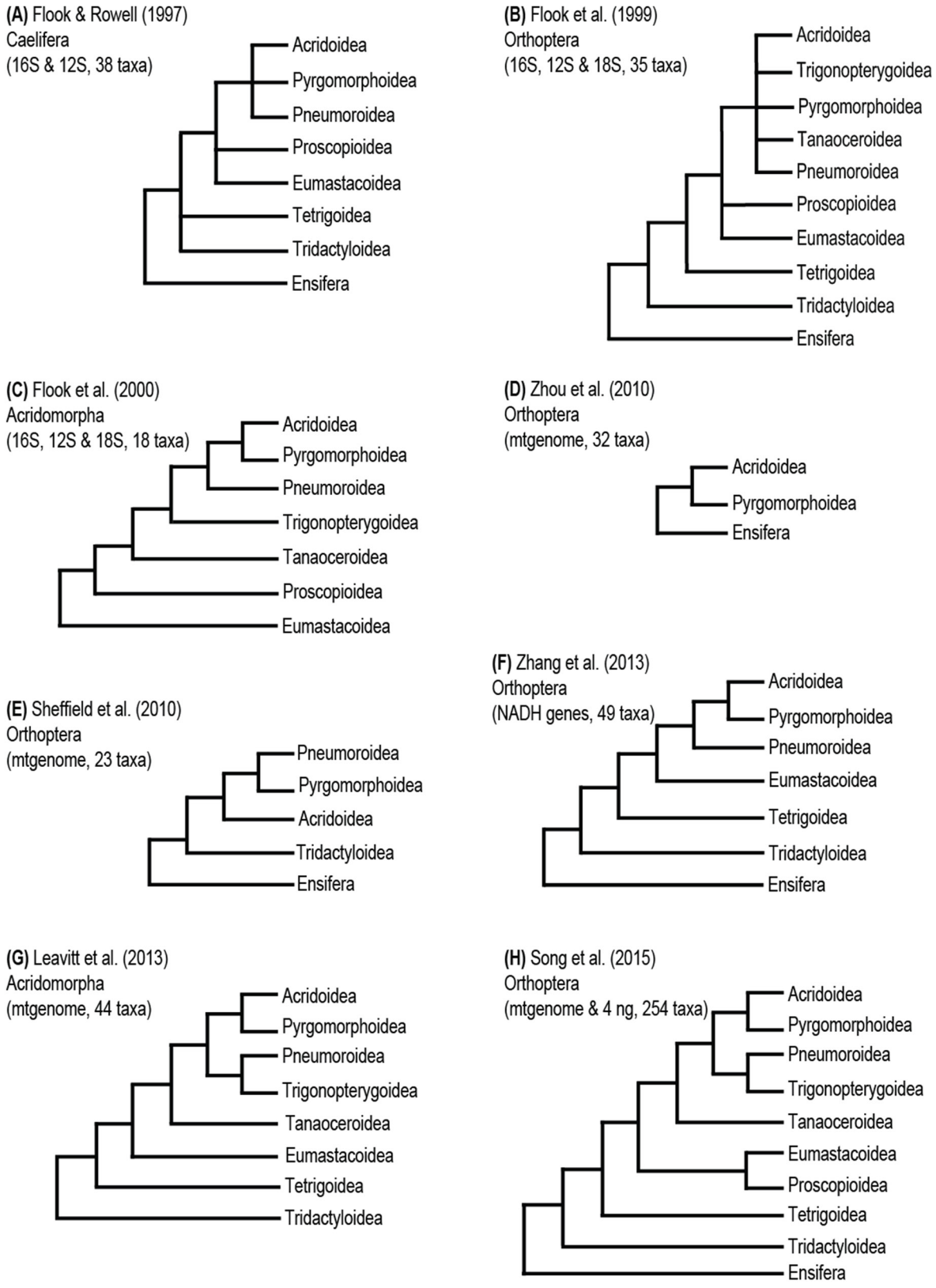

Figure 5. — Previous phylogenetic hypotheses of Orthoptera based on modern phylogenetic methods that included Pyrgomorphidae, the sole member of superfamily Pyrgomorphoidea.

Liu et al. (2005) using the male follicle morphology of 101 species of Acridoidea found relationships that are very different from what was generally accepted because they group Tetrigidae, an ancestral lineage within Caelifera, with Pyrgomorphidae (*Atractomorpha*) as a sister group to Pamphagidae and Chrotogonidae (*Aularches*, *Tagasta* and *Pseudomorphacris*).

Lu and Huang (2012) use the complete sequence of the mitochondrial COI gene of 56 species from Orthoptera. In their maximum likelihood tree, the only representative of Pneumoridae (*Physemacris variolosa*) appeared inside the Pyrgomorphidae (*Mekongiana xiangchengensis*, *Yunnanites coriacea*, *Mekongiella xizangensis*; treated as Chrotogonidae and *Atractomorpha sinensis*; treated as Pyrgomorphidae). This entire clade appeared as a sister group of the subfamily Oedipodinae in the family Acrididae (*Locusta migratoria*, *Oedalus decorus* and *Gastrimargus marmoratus*). In the Bayesian tree, the same topology appeared (Pneumoridae inside Pyrgomorphidae) but in this case, the sister group was Acridoidea, not Oedipodinae. This showed that COI gene was insufficient to resolve higher-level relationships.

Zhang et al. (2013) conducted several analyses using mitochondrial genomes and found that the concatenation of the seven NADH dehydrogenase units provided the best phylogenetic inference. In this analysis, Pyrgomorphidae (*Atractomorpha sinensis*, *Mekongiella xizangensis* and *Mekongiana xiangchengensis*) was recovered as a sister group of Acridoidea (fig. 5). When using exclusively combined ribosomal dataset, Pyrgomorphidae was recovered as a sister group to Pamphagidae (four species of Trinchinae).

Leavitt et al. (2013) using mitochondrial genome sequences of 34 species of Caelifera corroborated the relationship proposed by Eades (2000) (fig. 5), but included three pyrgomorphids as part of the taxon sampling because they were the only available mitochondrial genome sequences from GenBank, all of which were from temperate Asia (*Atractomorpha sinensis*, *Mekongiella xizangensis* and *Mekongiana xiangchengensis*). Song et al. (2015) also recovered Pyrgomorphoidea as sister to Acridoidea (fig. 5) using mitochondrial genome and 4 nuclear genes (11 taxa of Pyrgomorphidae; *Atractomorpha*, *Mekongiella*, *Mekongiana*, *Chrotogonus*, *Pyrgomorpha*, *Monistria*, *Desmoptera*, *Algete*, *Colemania* and *Phymateus*). Song et al. (2020) recovered again Pyrgomorphoidea as sister to Acridoidea using transcriptome data, thereby bolstering the phylogenetic position of Pyrgomorphoidea within Caelifera.

Below family level. There is strong evidence that the family Pyrgomorphidae is a monophyletic group. Externally the presence of a groove in the fastigium (Kevan & Akbar, 1964) coupled with very distinctive internal male genitalic structures such as the cingulum extending around to the ventral side, the endophallic apodemes turned medially, and the ejaculatory sac opening to the genital chamber are the characteristics defining the family, which are present in all of the described taxa (Eades & Kevan, 1974; Eades, 2000). In recent molecular studies (Zhang et al., 2013; Leavitt et al., 2013; Song et al., 2015, 2020, Mariño-Pérez & Song, 2019) as well as a morphological phylogenetic analysis (Mariño-Pérez & Song, 2018), Pyrgomorphidae was recovered as monophyletic with strong nodal support values.

Descamps in 1968 described a highly unusual monotypic genus from the island of Mauritius in the Indian Ocean and named *Pyrgacris* because it had somewhat intermediate characters between Pyrgomorphidae and Acrididae. While examining the phallic musculature of Pyrgomorphidae, Eades and Kevan (1974) examined *Pyrgacris*, and determined that, it would belong to Pyrgomorphidae and established a new subfamily Pyrgacrinae, noting its similarities with Acrididae. Later, Pyrgacridinae was included as a subfamily of Pyrgomorphidae in the works of Dirsh (1975), Kevan (1977, 1982a), Otte (1994), and Vickery (1997).

Dirsh (1975) published a controversial classification of Acridomorpha in which he created many subfamilies and families, which were not generally adopted by other authors. In this work, he divided Pyrgomorphidae into 13 subfamilies (Atractomorphinae, Chrotogoninae, Desmopterinae, Dictyophorinae, Fijipyrginae, Geloiinae, Nereniinae, Omurinae, Phymateinae, Psednurinae, Pyrgacrinae, Pyrgomorphinae and Zonocerinae), which partially overlapped with Kevan's (1969, 1970, 1971, 1972, 1974, 1975) proposal but left behind several genera. Dirsh (1975) indicated that his classification of Pyrgomorphidae was based mostly based on external characteristics because he argued that grouping on the basis of internal genitalia was particularly difficult for this group because of the diversity in the epiphallus and ectophallus in almost every genus. This classification was followed by Dirsh & Mason (1979), but not by others.

In his monumental catalogue of Pyrgomorphidae, Kevan (1977) divided the family into two subfamilies, Pyrgacridinae and Pyrgomorphinae, the latter following the previous classification of the same author (Kevan et al., 1969, 1970, 1971, 1972, 1974, 1975) of the groups A and B.

Chinese authors have followed a different classification scheme, which was originally proposed by Yin (1982, 1984) who placed pyrgomorphs within Acridoidea and divided it into two families with vague characters with multiple exceptions: Chrotogonidae, with four subfamilies (Taphronotinae, Chrotogoninae, Yunnanitinae and Mekongiellinae) and Pyrgormophidae, with two subfamilies (Pyrgormorphinae and Atractomorphinae). Xia et al. (1994) followed Yin's scheme and added two more subfamilies (Aularchinae and Tagastinae) to Chrotogonidae.

In the hard copy version of the Orthoptera Species File, Otte (1994) divided the family into three subfamilies: Pyrgacrinae (to accommodate the genus *Pyrgacris*), Orthacridinae (erected by Bolívar in 1905), and Pyrgomorphinae (type subfamily). The latter two corresponded to the groups A and B of Kevan et al. (1969, 1970, 1971, 1972, 1974, 1975). In addition, the

Table 2. — Tribes for each subfamily of Pyrgomorphidae. (taken from Orthoptera Species File) with their corresponding Group and Series (Kevan, 1976, Kevan et al., 1969, 1970, 1971, 1972, 1974, 1975).

Subfamily Orthacridinae	Kevan Group and Series	Subfamily Pyrgomorphinae**	Kevan Group and Series
Fijipyrgini Kevan, 1966	A/I	Desmopterini Bolívar, 1905	B/V
Verduliini Kevan & Akbar, 1964	A/I	Monistrini Kevan & Akbar, 1964	B/V
Brunniellini Kevan, 1963	A/I	Petasidini Key, 1985	B/V*
Psednurini Burr, 1904	A/I	Chlorizeinini Kevan & Akbar, 1964	B/VI
Mitricephalini Kevan & Akbar, 1964	A/I	Poekilocerini Burmeister, 1840	B/VI
Geloiini Bolívar, 1905	A/II	Phymateini Bolívar, 1884	B/VI
Sagittacridini Descamps & Wintrebert, 1966	A/II	Schulthessiini Kevan & Akbar, 1964	B/VII
Gymnohippini Kevan & Akbar, 1964	A/II	Taphronotini Bolívar, 1904**	B/VII
Malagasphenini Kevan & Akbar, 1964	A/II	Dictyophorini Kirby, 1902	B/VII
Chapmanacridini Kevan & Akbar, 1964	A/III	Tagastini Bolívar, 1905	B/VIII
Ichthiacridini Kevan, Singh & Akbar, 1964	A/III	Pseudomorphacridini Kevan & Akbar, 1964	B/VIII
Ichthyotettigini Kevan, Singh & Akbar, 1964	A/III	Atractomorphini Bolívar, 1905	B/VIII
Orthacridini Bolívar, 1905**	A/III	Sphenariini Bolívar, 1884	B/IX
Popoviini Kevan & Akbar, 1964	A/III	Omurini Kevan 1961	B/IX
Nereniini Kevan 1964	A/IV	Pyrgomorphini Brunner von Wattenwyl, 1882**	B/X
		Chrotogonini Bolívar, 1904	B/X

*Petasidini was included by Kevan (1974) in Monistrini, Key (1985) elevated to tribe level and Otte (1994) assigned to subfamily Pyrgomorphinae.

recently created tribe Petasidini (Key, 1985 transferred the genera *Petasida* and *Scutillya* from Monistriini) was included in the subfamily Pyrgomorphinae.

Vickery (1997) basically followed Otte (1994) and divided the family Pyrgomorphidae into three subfamilies: Pyrgacridinae, Orthacridinae, and Pyrgomorphinae. The latter two subfamilies basically followed Kevan's group A and B, respectively. The only difference was the addition of the tribe Petasidini to the subfamily Pyrgomorphinae.

Table 3. — Taxa removed from Pyrgomorphidae.

Family	Genera
Trigonopterygidae	*Borneacris, Trigonopteryx, Systella, Moultonia*
Xyronotidae	*Xyronotus*
Pyrgacrididae	*Pyrgacris*
Pamphagodidae	*Charilaus, Pamphagodes*
Ommexechidae	*Graea, Ommexecha, Clarazella*
Romaleidae	*Dracotettix, Legua*
Acrididae	*Aspidophyma*

Eades (2000) performed a comparative study of the phallic complex across Acridomorpha and discussed that there was enough evidence to elevate the subfamily Pyrgacridinae to a family level. Also, due to the differences in internal genitalia, which resemble Acridoidea more than Pyrgomorphoidea, he decided to place the family Pyrgacrididae in the superfamily Acridoidea. Leavitt et al. (2013) included Pyrgacrididae in the phylogeny of Acridomorpha based on mitochondrial genomes and found this family belong to Acridoidea, this placement was further supported by Song et al. (2015) and Song et al. (2020). Since then, the Orthoptera Species File online (Cigliano et al., 2022) has maintained the family Pyrgomorphidae divided into two subfamilies, Orthacridinae (15 tribes) and Pyrgomorphinae (16 tribes), while treating Pyrgacrididae as a separate family (Table 2). Mariño-Pérez & Song (2019), focusing on New World Pyrgomorphidae, recovered tribes Ichthiacridini and Ichtyotettigini as monophyletic groups.

Due to external morphological resemblance, some taxa of other families were initially classified as Pyrgomorphidae. As time passed, the family was better defined and some taxa were removed and transferred to different families. An account of the previous taxa once considered Pyrgomorphidae is given in Table 3.

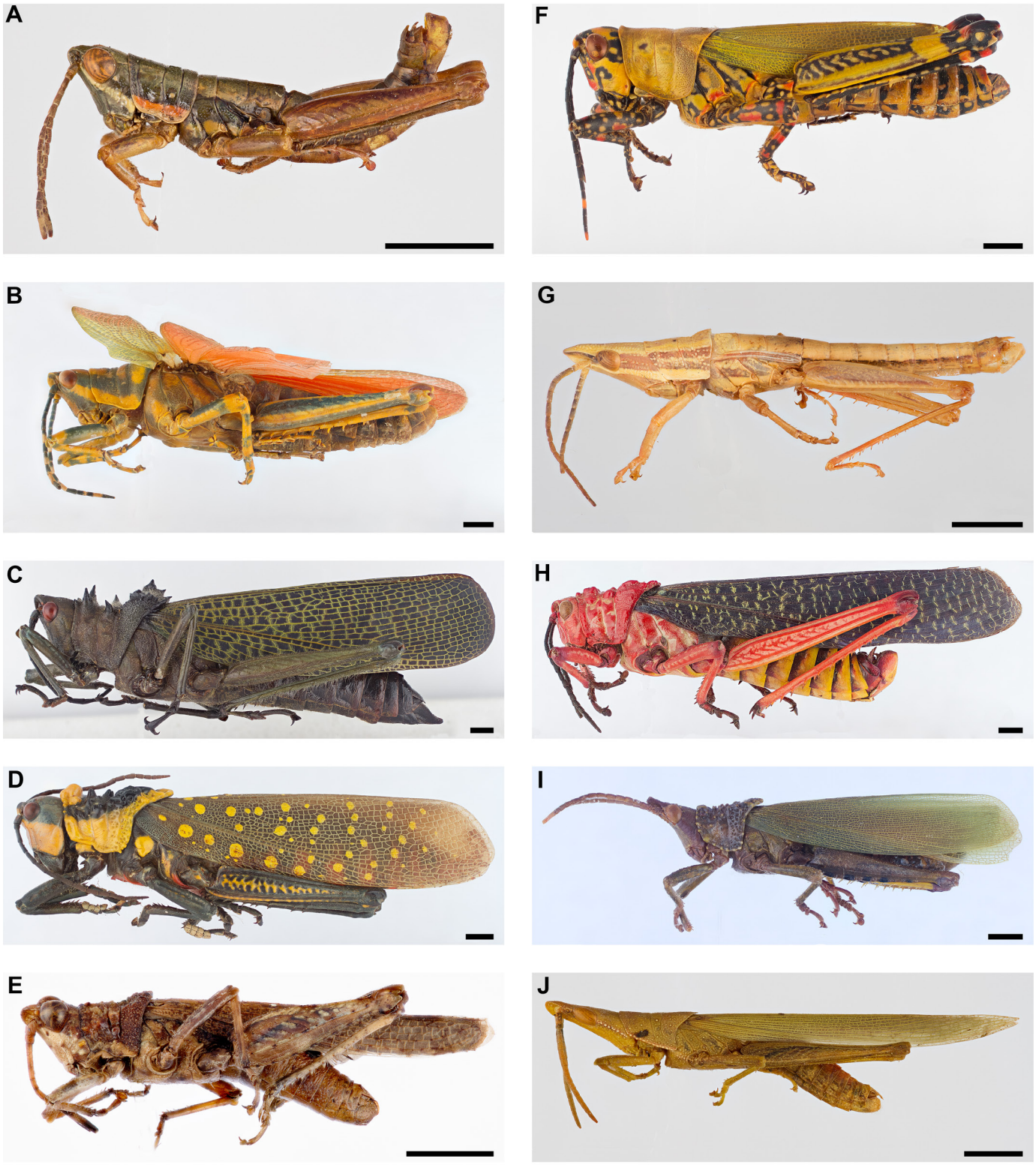

Figure 6. — Pyrgomorphidae of economic importance. **A.** *Orthacris incongruens* (India). **B.** *Poekilocerus pictus* (India). **C.** *Rutidoderes squarrosus* (Africa). **D.** *Aularches miliaris* (India). **E.** *Chrotogonus hemipterus* (Africa). **F.** *Zonocerus variegatus* (Africa). **G.** *Colemania sphenarioides* (India). **H.** *Phymateus morbillosus* (Africa). **I.** *Taphronota calliparea* (Africa). **J.** *Atractomorpha acutipennis* (Africa). Scale bar = 5 mm.

Pyrgomorphidae of economic importance

Pest species. In 1982, the Centre for Overseas Pest Research (COPR) published *The Locust and Grasshopper Agricultural Manual*. This book, worldwide in scope, was the basis for creating the table 4. There are 62 species of Pyrgomorphidae reported to have certain degrees of economic importance (fig. 6 and table 4). They are mainly distributed in Africa and India (COPR, 1982). The economic importance was classified from A to K as follows: A= Major pest of many crops; B= Major pest of few crops; C= Pest regularly of substantial importance (7 spp.); D= Pest occasionally of substantial importance (5 spp.); E= Pest occasionally of localized importance (11 spp.); F= A regular minor pest (3 spp.). G= An occasional minor pest (15 spp.); H= Of very minor importance at times (6 spp.); K= Few records of minor damage; negligible economic importance (12 spp.). Three species were not classified.

Recently, in the Encyclopedia of Pest Orthoptera of the World, Lecoq and Zhang (2019) reported four species of Pyrgomorphidae, *Phymateus viridipes, Sphenarium purpurascens, Zonocerus elegans* and *Z. variegatus*.

Edible Pyrgomorphidae. Interestingly, while some pyrgomorphs are considered economic pests, some are used for human consumption. This is the case for *Sphenarium purpurascens* in Mexico and *Zonocerus elegans* and *Z. variegatus* in Africa.

The indigenous people of central Mexico have consumed *Sphenarium purpurascens* for centuries (fig. 7). They were known as *xopanchapoli* which means "summer grasshoppers" and commonly called chapulines. Its local description is as follows: "They are big and thick. They do not fly, only crawl. They eat green beans. Some are black, others brown and others green. They are edible (Sahagún, 1577)". A common way of preparation is to leave them one day without food or feed them with paper in order to clean the gut, boil them, sun-dry them and season with salt and lemon or garlic juice. Finally, they are fried or grilled (fig. 7).

Regarding *Zonocerus variegatus*, a typical recipe is to place them first in boiling water to kill them and remove the head (with the gut), legs and wings. After salt is added, they are sun-dried. Finally they are roasted or fried (could be with a mixture of spices) or boiled again. Regular consumption may be responsible for liver poisoning in humans due to the presence of pyrrolizidine alkaloids in the mid-dorsal abdominal gland (Kekeunou & Tamesse, 2016).

A synthesis of the edible Pyrgomorphidae of the world is presented in Table 5. It is based on the work of Jongema (2017) with additional references and removal of synonyms. Sub-Saharan Africa and Mexico are the places with the majority of edible pyrgomorphs (fig. 8).

Figure 7. — *Sphenarium purpurascens.* **A.** Nymphs and adults. **B.** Typical chapulines display in a fresh market in Oaxaca, Mexico.

Table 4. — Pyrgomorphidae of economic importance (Based on COPR, 1982).

Species	Country	Economic importance	Crops damaged
Orthacris incongruens	India	G	Tea, tobacco
Orthacris robusta	India	G	Tea, dadap, coffee, citrus and *Grevillea* sp.
Orthacris ceylonica	Sri Lanka	K	Citrus, dadap and *Gliricidia* sp.
Orthacris filiformis	Sri Lanka	K	Citrus, mango
Orthacris spp.	India		Aubergine, bulrush millet, cabbage, finger millet, groundnut, maize, sorghum, tea, coffee, tobacco, dadap
Neorthacris simulans	India	E	*Rauwolfia serpentina*, aubergine, bulrush millet, cabbage, finger millet, foxtail millet, groundnut, lablab, safflower, sorghum, sunflower
Neorthacris acuticeps	India	G	Aubergine, indigo, mulberry, sandalwood, sweet potato
Neorthacris longicercata	India	H	Aubergine, bulrush millet, cabbage, finger millet, groundnut, sorghum
Neorthacris malabarensis	India	K	Tea, cinchona
Colemania sphenarioides	India	D	Bulrush millet, chilli, common millet, cotton, cowpea, finger millet, foxtail millet, groundnut, guinea corn, lablab, maize, millets, *Phaseolus* spp., pigeon pea, rice, sorghum, wheat
Desmopterella explicata	Papua New Guinea, Indonesia, Australia	K	Cacao, cassava, brussels sprouts, Chinese cabbage, potatoes
Desmopterella biroi	Papua New Guinea	K	Cacao, sweet potato, oil palms, rice
Chlorizeina feae	Thailand	E	Maize, *Eupatorium odoratum*, bamboo, castor, cucumber, rice, sorghum, soybean
Chlorizeina unicolor	India, Myanmar, Thailand, Laos	K	Teak
Chlorizeina togulata	Myanmar	K	Teak
Poekilocerus bufonius vittatus	Saudi Arabia, Yemen, Oman, Ethiopia, Djibouti, Somalia	G	Tomatoes, aubergines, tobacco
Poekilocerus pictus	Afghanistan, Pakistan, India	D	Aubergine, bamboo, banana, cabbage, canna, castor, chilli, citrus, *Clerodendrum* sp., cotton, cucurbits, grape vines, *Luffa acutangula*, mango, melon, okra, oleander, papaya, *Pinus longifolia*, potato, sorghum, sugar cane, tomato
Zonocerus elegans	Kenya, Uganda, Tanzania, Mozambique, Democratic Republic of the Congo, Rwanda, Malawi, Zambia, Angola, Zimbabwe, Madagascar, Namibia, Botswana, South Africa, Lesotho	C	Apple, apricot, banana, cabbage, camphor, cassava, castor, citrus, cocoa, coffee, cotton, cowpea, fig, grapes, groundnut, lettuce, lucerne, maize, melon, mulberry, onion, papaw, peach, pear, pigeon pea, pineapple, plum, potato, pumpkin, quince, rubber, sorghum, spineless cactus, sugar cane, sunflower, sweet potato, tobacco, tomato
Zonocerus variegatus	Africa south of the Sahara, including Ethiopia and as far as Angola, Democratic Republic of the Congo and Kenya	C	Annatto, apricot, avocado, banana, breadfruit, bulrush millet, cabbage, carrot, cashew, cassava, castor, citrus, cocoa, coconut, cocoyam, coffee, cotton, cucumber, cowpea, date palm, fig, finger millet, kidney bean, kola, lime, maize, mango, mint, oil palm, okra, onion, papaya, peach, *Pennisetum*, peppers, pineapple, potato, pumpkin, rie, rubber, sesame, sorghum, soybean, sugar cane, sunflower, sweet potato, teak, tobacco, tomato, water melon, yam
Rutidoderes squarrosus	Gambia, Sierra Leone, Guinea, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of the Congo, Tanzania	K	Orange, grapefruit, *Tephrosia candida*
Phyteumas purpurascens	Ethiopia, Kenya, Tanzania, Democratic Republic of the Congo, Uganda, Malawi	H	*Hibiscus* and *Thevetia*
Phymateus leprosus	Swaziland, South Africa, Lesotho, Namibia, Zimbabwe	E	Beans, lettuce, peas, peach, citrus, pumpkin, sunflower, oleander

Table 4. — Pyrgomorphidae of economic importance (Based on COPR, 1982). (cont.)

Species	Country	Economic importance	Crops damaged
Phymateus baccatus	South Africa, Namibia, Botswana, Angola, Zimbabwe	G	Crops
Phymateus aegrotus	Sudan, Ethiopia, Kenya, Somalia, Tanzania, Uganda	E	Cowpeas, cabbage, brassicas, lettuce, maize, potato, sorghum, spinach, sweet potato, tomato, various cereals, cucurbits, water melon
Phymateus pulcherrimus	Ethiopia, Somalia	H	Carrot, castor, lettuce, radish, *Tropaeolum*, finger millet
Phymateus morbillosus	South Africa, Zimbabwe	G	Crops
Phymateus saxosus	Madagascar	G	Coffee, rice, tobacco
Phymateus madagassus	Madagascar	G	Coffee, rice, tobacco
Phymateus viridipes	Sudan, Ethiopia, Kenya, Somalia, Tanzania, Uganda, Democratic Republic of the Congo, Angola, Zambia, Malawi, Mozambique, South Africa, Botswana, Rwanda	C	Vine, fig, all citrus species, cabbage, cassava, cassia, castor, coffee, cotton, *Eucalyptus*, *Euphorbia tirucalli*, fennel, finger millet, Gmelina, gourd, lavender, lettuce, loquat, lucerne, maize, mango, onion, papaya, pea, peach, pear, pepper, pomegranate, rice, sage, strawberry, sunflower, tobacco, tomato, beans, cashew, groundnuts, soya
Phymateus karschi	Mozambique, Tanzania	C	
Phymateus cinctus	Senegal to southwest Kenya	C	Peas, cotton, potato, *Thevetia*
Aularches miliaris	Pakistan, India, Nepal, Bangladesh, Sri Lanka, Myanmar, Thailand, Cambodia, Vietnam, Malaysia, Indonesia	D	Annatto, banana, beans, betel nut, breadfruit, cacao, cardamom, cashew, cassava, castor, chilli, cinchona, coconut, coffee, cotton, custard apple, dadap, date palm, durian, finger millet, guinea corn, guava, jackfruit, jute, longan, maize, mango, oil palm, pigeon pea, Pinus merkusii, plantain, rice, rubber, *Shorea robusta*, sesame, sugar cane, tea, teak, tobbacco, citrus
Taphronota calliparea dimidiata	Senegal, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Central African Republic, Sudan, Ethiopia, Equatorial Guinea, Gabon, Congo, Democratic Republic of the Congo, Burundi, Rwanda, Kenya, Uganda, Tanzania, Angola	E	Canna, cotton, granadilla, maize, pasture grasses, citrus, finger millet, sweet potato, *Mucuna stans*, *Bougainvillaea* sp., *Tecoma stans*, *Calodendron capense*, *Cupressus lindleyi*, *C. lusitanica*
Taphronota calliparea calliparea	Somalia, Kenya, Democratic Republic of the Congo, Tanzania, Angola, Zambia, Malawi, Mozambique, Zimbabwe, Botswana, Namibia, Lesotho, Swaziland, South Africa	E	As above
Taphronota ferruginea	Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Benin, Nigeria, Cameroon, Equatorial Guinea, Gabon, Central African Republic, Congo, D.R of the Congo, Uganda, Kenya, Tanzania	G	Citrus, coffee, cotton
Maura lurida	Sierra Leone, Ghana, Togo, Benin, Nigeria, Cameroon, Kenya, Uganda, Sudan, Ethiopia, Tanzania, Democratic Republic of the Congo, Rwanda, Malawi, South Africa, Angola, Mozambique	K	Farm crops
Maura bolivari	Democratic Republic of the Congo, Tanzania, Malawi	K	Tobacco, coffee
Dictyophorus griseus	Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Sudan, Ethiopia, Somalia, Democratic Republic of the Congo, Uganda, Kenya, Rwanda, Burundi, Tanzania, Mozambique, Angola, Zambia, Zimbabwe, Malawi, Namibia	H	Coffee, cotton, roses, tobacco
Dictyophorus spumans	South Africa		

Table 4. — Pyrgomorphidae of economic importance (Based on COPR, 1982). (cont.)

Species	Country	Economic importance	Crops damaged
Tagasta marginella	Thailand, Cambodia, Malaysia, Indonesia	K	Coconut, rice, sweet potato
Atractomorpha acutipennis	Sub-Saharan Africa, southwest Arabia Peninsula, Iran, Afghanistan, Pakistan	G	Cotton, legumes, lucerne, rice, spinach, sweet potato, tobacco, Torenia, aubergine
Atractomorpha angusta	Nepal, Bhutan, India, Bangladesh, Myanmar, Thailand, Cambodia, Laos, Vietnam, west Malaysia, Singapore, Indonesia	G	Aubergine, cotton, maize, rice, soya, tea, tobacco
Atractomorpha crenaticeps	Borneo, Philippines, Talaud, Moluccas, Admiralty, New Guinea, Bismarck, Solomon, Hawaiian Islands	H	Aubergine, cacao, coffee, coconut, cruciferous crops, rosella, sugar cane, sweet potato, tobacco
Atractomorpha crenulata	Maldives, Sri Lanka, India, Nepal, Bangladesh, Myanmar, Thailand, Cambodia, Laos, Vietnam	C	Tobacco, maize, *Acrocarpus fraxinifolius*, arrowroot, *Artocarpus hirsuta*, aubergine, barley, cabbage, castor, cauliflower, chillies, citrus, cotton, fenugreek, finger millet, gram, groundnut, jute, lucerne, mints, oats, pea, peach, radish, rice, sorghum, sugar cane, sunn hemp, sweet potato, wheat, *Zinnia*, opium
Atractomorpha burri	As above	C	As above
Atractomorpha lata	China, Korea, Japan	E	Aubergine, barley, beans, buckwheat, camphor tree, carrot, cherry, chrysanthemum, citrus, cotton, dahlia, foxtail, millet, hemp, maize, millet, mulberry, orange, radish, rice, *Rubus* spp., sesame, sugar bet, sugar cane, soybean, tomato, wheat
Atractomorpha psittacina	India, Bangladesh, Myanmar, China, Philippines, Cambodia, Thailand, Laos, Vietnam, Malaysia, Singapore, Indonesia.	G	Asparagus pea, aubergine, cabbage, cacao, coconut, cotton, groundnut, jute, kapok, kidney bean, lablab, legumes, lettuce, lima bean, maize, mulberry, mung bean, mustard, peas, pigeon pea, pse-tsai, radish, rice, sorghum, soybean, sugar cane, sweet potato, tobacco
Atractomorpha rhodoptera	Indonesia, Malaysia		Sugar cane
Atractomorpha similis	New Guinea Island, north and east Australia	K	Cruciferous crops, groundnuts, lettuce, sugar cane, rubber, sweet potato, cabbage, cotton
Atractomorpha sinensis	India, China, Vietnam Taiwan, Line, Mariana, Marshall, Hawaiian Islands	G	Apple, aubergine, barley, beans, camphor, carrots, Chinese cabbage, citrus, cotton, ginger, *Ipomoea aquatica*, millet, mulberry, mustard, New Zealand spinach, onion, parsley, pineapple, potato, rice, *Scaevola chamissoniana*, soybean, sugar beet, sugar cane, sweet potato, tomato
Rubellia nigrosignata	Madagascar	H	Rice
Sphenarium purpurascens	Mexico	D	Maize, barley, chilli, kidney beans, lucerne, orange, sorghum, soybean, sweet potato, tobacco, vine
Pyrgomorpha vignaudii	Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Mali, Niger, Sudan, Ethiopia, Ghana, Nigeria, Cameroon, Equatorial Guinea, Congo, Democratic Republic of the Congo, Uganda, Rwanda, Kenya, Tanzania, Malawi, Angola	G	Groundnut, cotton, potato, sorghum, tobacco turnips, cabbage, castor, maize, pumpkin, soya, tomato
Pyrgomorpha bispinosa	North, west and east Africa, except Somalia and north Kenya, Arabic Peninsula, southwest and central Asia eastwards to India, Sinkiang and Mongolia	E	Castor, cotton, cucumber, groundnut, lablab, lavender, lucerne, melon, pepper, potato, safflower, sesame, sorghum, squash,wheat
Pyrgomorpha conica	Upper half of Africa, Arabic Peninsula, Mediterranean and Iberian regions	E	As above
Pyrgomorpha cognata	From Mauritania, Senegal and Mali to Israel, Arabic Peninsula and Pakistan	E	As above
Pyrgomorpha guentheri	Syria, Israel and Turkey to Iran, the Caucasus and Turkmenistan		
Pyrgomorphella arachidis	Kenya, Tanzania, Malawi	E	Groundnut

Table 4. — Pyrgomorphidae of economic importance (Based on COPR, 1982). (cont.)

Species	Country	Economic importance	Crops damaged
Chrotogonus hemipterus	Angola, Democratic Republic of the Congo, Rwanda, Burundi, Tanzania, Kenya, Namibia, Zambia, Malawi, Zimbabwe, Mozambique, Botswana, Swaziland, South Africa	F	Cabbage, castor, coffee, cotton, groundnuts, *Hibiscus* sp., kidney bean, legumes, maize, melon, millet, *Pinus patula*, radish, tobacco, tomato, pigeon pea, sesame, soybeans
Chrotogonus homalodemus	Niger, Chad, Egypt, Sudan, Ethiopia, Kenya, Tanzania, Djibouti, Somalia, Yemen, Saudi Arabia, Israel, Oman, Iran, Pakistan	F	Beans, beets, bulrush millet, cereals, clover, cotton, date, guinea corn, maize, oil seeds, rice, tobacco, tomato, wheat
Chrotogonus oxypterus	Sri Lanka, India, Bangladesh	F	Blue gum, lemon scented gum, bulrush millet, coffee, cotton, finger millet, guinea corn, maize, rice, tobacco, wheat
Chrotogonus senegalensis	Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Mali, Niger, Nigeria, Chad, Sudan, Central African Republic, Ethiopia, Cameroon, Congo, Democratic Republic of the Congo, Burundi, Uganda, Rwanda, Kenya, Angola, Zambia	G	Cereals, coffee, cowpeas, finger millet, guinea corn, maize, millets, oil palm, potatoes, tobacco, *Zinnia*, bulrush millet, citrus, groundnuts, radish
Chrotogonus trachypterus	Afghanistan, Iran, Pakistan, Nepal, Bangladesh, India	D	Aubergine, barley, *Boerhavia repens*, bulrush millet, cabbage, calabash, carrot, castor bean, catjang, cauliflower, chick pea, cluster bean, cotton, cowpea, cucurbits, flax, groundnut, guinea corn, indigo, jute, lucerne, maize, melon, millet, mustard, oats, okra, opium poppy, pea, *Phaseolus* sp., *Pinus longifolia*, potato, rape seed, rice, *Robinia* sp., safflower, sesame, sugar cane, tobacco, tomato, vetch, wheat

Table 5. — Edible Pyrgomorphidae of the world.

Species	Distribution	References
Chrotogonus senegalensis	Cameroon	Seignobos et al., 1996
Occidentosphena uvarovi	Congo, Gabon,	Tchibozo, 2015; Tchibozo & Lecoq, 2017
Phymateus viridipes	Congo, South Africa, Zambia, Zimbabwe, Botswana, Mozambique, Namibia	Bergier, 1941; Kelemu et al., 2015; Malaisse, 1997
Pyrgomorpha cognata	Cameroon	Barreteau, 1999
Pyrgomorpha vignaudii	Central African Republic	Hoare, 2007
Zonocerus elegans	Mozambique, South Africa. Democratic Republic of the Congo	Quin, 1959 ; Tchibozo & Lecoq, 2017
Zonocerus variegatus	Benin, Burundi, Burkina Faso, Central African Republic, Niger, Nigeria, Democratic Republic of the Congo, Cameroon, Congo, Ivory Coast, São Tomé and Príncipe, Guinea, Ghana, Togo, Liberia, Guinea Bissau, Mali, Chad, Tanzania, Sierra Leone	Barreteau, 1999; Fasoranti & Ajiboye, 1993; Kekeunou & Tamesse, 2016; Kelemu et al., 2015; Tchibozo & Lecoq, 2017
Sphenarium borrei	Mexico	Ramos-Elorduy et al., 2012
Sphenarium macrophallicum	Mexico	Pino-Moreno et al., 2016
Sphenarium histrio	Mexico	Ramos-Elorduy et al., 1998; DeFoliart, 2002
Sphenarium mexicanum	Mexico	Ramos-Elorduy & Pino-Moreno, 2002
Sphenarium purpurascens	Mexico	Ramos-Elorduy, 2006; Ramos-Elorduy et al., 1998; De Foliart, 2002; Cerritos, 2009; Cerritos & Cano-Santana, 2008
Sphenarium rugosum	Mexico	Sanabria-Urbán pers. comm.
Atractomorpha psittacina	Malaysia	Chung et al., 2002

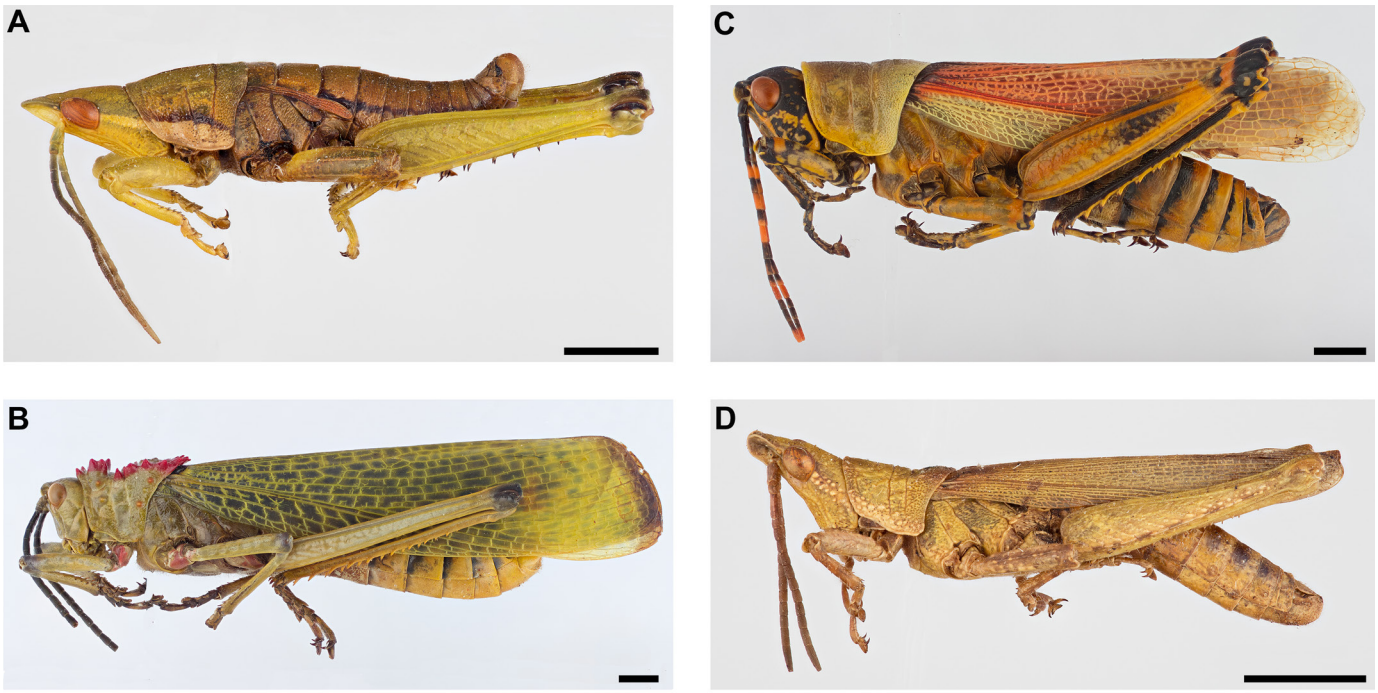

Figure 8. — Edible Pyrgomorphidae. **A.** *Sphenarium histrio* (Mexico). **B.** *Phymateus viridipes* (Africa). **C.** *Zonocerus elegans* (Africa). **D.** *Pyrgomorpha vignaudii* (Africa).

ILLUSTRATED KEYS TO PYRGOMORPHIDAE GENERA OF THE WORLD

Currently with 148 genera and 488 species, Pyrgomorphidae is widely distributed in the world. It is highly diverse in the Old Word (135 genera, 447 species) and less so in the New World (13 genera, 41 species).

Despite its worldwide distribution, only few genera truly show wide distribution (only 19 out of 148 genera are found in two or more keys). Because there is a high degree of endemicity at the genus level, we have created 12 regional keys that reflect these endemic biotas (fig. 9). For instance, the Africa key excludes Madagascar because this island has its own unique fauna (15/19 genera are endemic) and it is treated in a separate key, but it does include Socotra Island (part of the Arabian Peninsula country Yemen) because its biological affinities are African. At the beginning of each key, we designate the included areas to tell the user which key to use.

To increase the utility of the keys, we provide as much information as possible about the current distribution of the genus, as well as the number and names of valid species found in the region. There are 70 monotypic genera but we decided to use only the genus name in the keys because it is possible that new species can be added in the future. An asterisk next to the genus name indicates that the genus is endemic to that region and is will not be found in any other keys. Arrows in the images indicate the most important diagnostic characters mentioned in the key. The majority of the keys are based on male external morphology, unless specified otherwise. One exception is found in the couplet in the Indian subcontinent key composed of the genera *Orthacris* and *Neorthacris*, which requires examination of male internal genitalia. For the great majority of cases, we present a lateral and dorsal view of males and females from well-preserved specimens. We try to minimize the use of color as a diagnostic character because it is highly variable depending on collecting and preservation methods used. Most images used in these keys were photographed using the Visionary Digital imaging system equipped with a Canon EOS 6D DSLR camera, combined with a 100mm/65mm macro lens to take multiple images at different focal lengths. The resulting files were converted from RAW to TIFF format using Adobe Lightroom (v.4.4), stacked into a single composite image using Zerene Stacker (v.1.04), and then Adobe Photoshop CS6 Extended was used to add a scale bar and adjust light levels, background coloration, and sharpness as needed. For some genera, we were not able to obtain specimens and we present images of type material taken from various museums. Only in two cases, no image is presented.

Some available keys were outdated and published in different languages, such as French, German, Spanish, Portuguese, Russian and Chinese. We translated and modified them by adding new genera described after their publications. For other keys that were already in English, we updated and modified according to new nomenclatural arrangements. In some cases, the information for identifying genera was not presented in the form of a key, and therefore, we converted into contrasting characteristics that are adequate to be used in dichotomous keys.

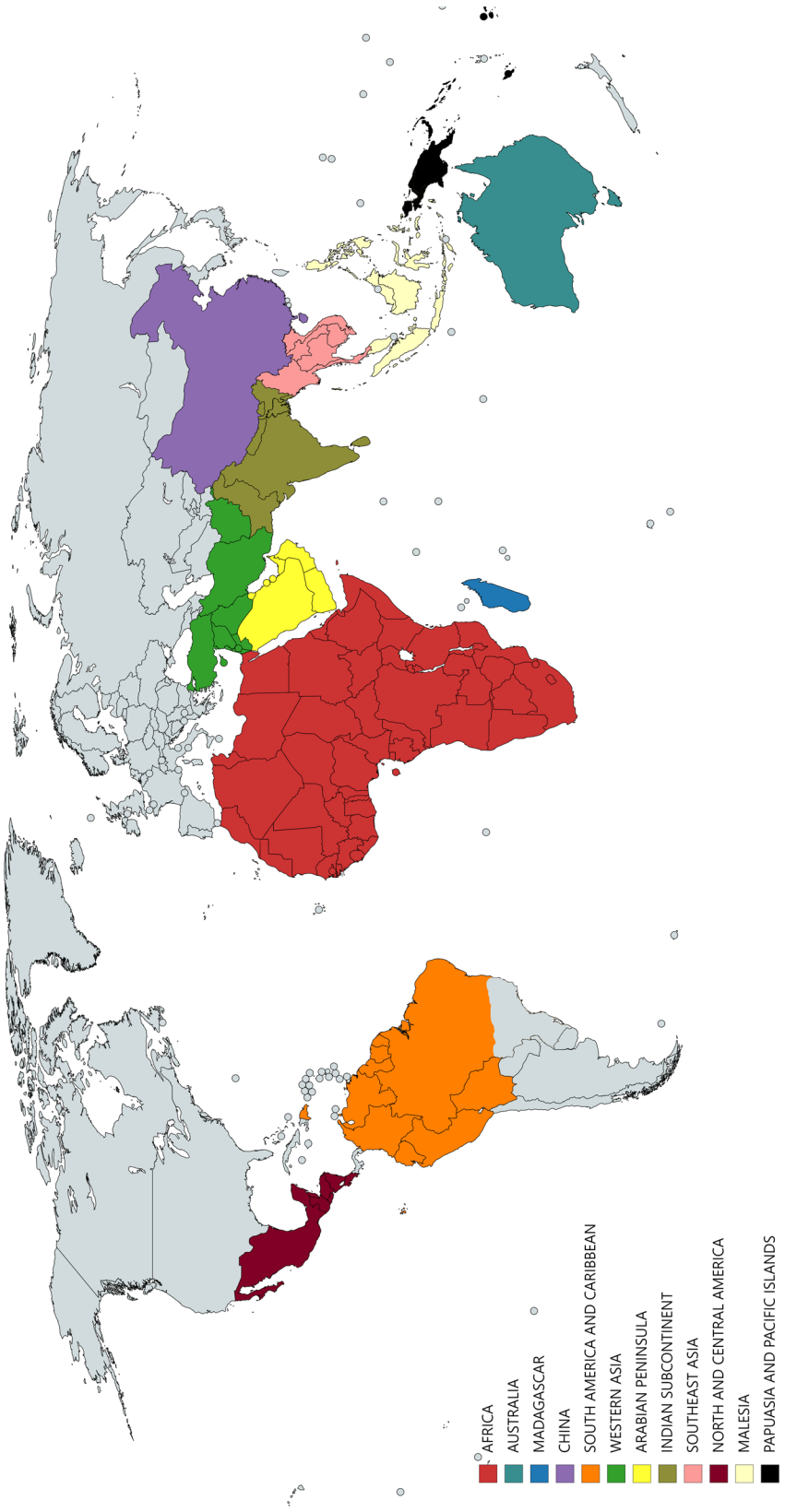

Figure 9. — The twelve regions used in the respective keys. Created with mapchart.net ©.

1. Key to Pyrgomorphidae genera of North and Central America

Modified from Kevan et al. (1964a).

This area includes nine genera – all endemic to the area.

1. Overall body robust, strongly fusiform; mesosternal interspace strongly transverse (fig. 10B) 2
1'. Overall body cylindrical to weakly fusiform and rather slender to strongly elongate; mesosternal interspace not or not strongly transverse (fig. 10A) 3

2. Fastigium of vertex considerably longer than its width and rather acute (fig. 11A-D); posterior margin of pronotal disc strongly sinuous and emarginated; tegmina vestigial and tongue-like (fig. 11A), distinctly widening towards the base. (Guatemala to Costa Rica) ..... *Prosphena** (1 sp.) (*P. scudderi*)
2'. Fastigium of vertex not much longer and often shorter than its width (fig. 11E-H); posterior margin of pronotal disc not strongly sinuous; tegmina vestigial and spatulate, narrowing towards the base (fig. 11E). (Mexico and Guatemala) .... *Sphenarium** (17 spp.) (*S. adelinae, S. borrei, S. crypticum, S. histrio, S. infernalis, S. macrophallicum, S.mexicanum, S. mínimum, S. miztecum, S. occidentalis, S. planum, S. purpurascens, S. rugosum, S. tarascum, S. totonacum, S. variabile, S. zapotecum*)

3. Body smooth, at most with a few isolated and scattered tubercles in the pronotum; apterous. 4
3'. Body rugose, longitudinally striated or with numerous small granular tubercles; micropterous or apterous. 7

4. Body cylindrical (less so in females); males with 10th abdominal tergum modified into a large, blunt process covering all or part of epiproct (figs. 12-13); females with ovipositor valves long, dorsal valves less than half as deep as the length from its widest point to the apex. 5
4'. Body cylindrical or somewhat fusiform; males with 10th abdominal tergum unspecialized as above (fig. 14); females with ovipositor valve shorter, dorsal valves more than half as deep as the length from its widest point to apex. 6

5. Head with frontal profile oblique (frontal angle less than 40°); males with cerci stouter, blunt apically and as long as (or only slightly shorter) than the posterior prolongation of 10th abdominal tergum (fig. 12A-B); females with postero-lateral margins of the 8th abdomen sternum modified into posteriorly directed, acutely angular processes (fig. 12C-D). (Central and Southern Mexico) ..... *Ichthyotettix** (3 spp.) (*I. inexpectatus, I. mexicanus, I. stricticaudatus*)
5'. Head with frontal profile oblique (frontal angle at least 40°); males with cerci slender, pointed apically and much shorter than the posterior prolongation of 10th abdominal tergum (fig. 12E-F & 13A-B); females with postero-lateral margins of the 8th abdominal sternum not produced as above (fig. 12G-H & 13C-D). (Southern Mexico) ..... *Piscacris** (2 spp.) (*P. affinis, P. robertsi*)

6. Body subfusiform (especially in females) (fig. 14A-D); Head with frontal profile oblique (frontal angle less than 40°); fastigium of vertex parabolic, not as broad as its length; mesosternal interspace about as wide as the mesosternal lobe (males) or wider (females). Posterior margin of tenth abdominal tergum with a wide excision. (Central Mexico) .... *Sphenotettix** (1 sp.) (*S. nobilis*)
6'. Body cylindrical (fig. 14E-H). Head with frontal profile oblique (frontal angle much more than 40°); Fastigium of vertex triangular, slightly broader than its length; mesosternal interspace narrower than the mesosternal lobe. Posterior margin of tenth abdominal tergum with distinct median excision. (Central and Southern Mexico) ..... *Pyrgotettix** (1 sp.) (*P. pueblensis*)

7. Granular and tuberculate all over the body (fig. 16). 8
7'. Not profusely granular; micropterous or apterous (fig. 15). (Northwestern Mexico) ..... *Ichthiacris** (8 spp.) (*I. aptera, I. californica, I. celata, I. costulata, I. elongata, I. parva, I. rehni, I. spinifera*)

8. With vestigial tegmina (fig. 16E-H). (West Central Mexico) ..... *Calamacris** (1 sp.) (*C. clendoni*)

8'. Apterous (fig. 16A-D). (East Central Mexico) ..... *Sphenacris** (1 sp.) (*S. crassicornis*)

Figure 10. — Ventral view of some Pyrgomorphidae. **A.** *Sphenacris crassicornis*. **B.** *Sphenarium histrio*. **C.** *Taphronota ferruginea*. **D.** *Phymella capensis*. **E.** *Chrotogonus oxypterus*.

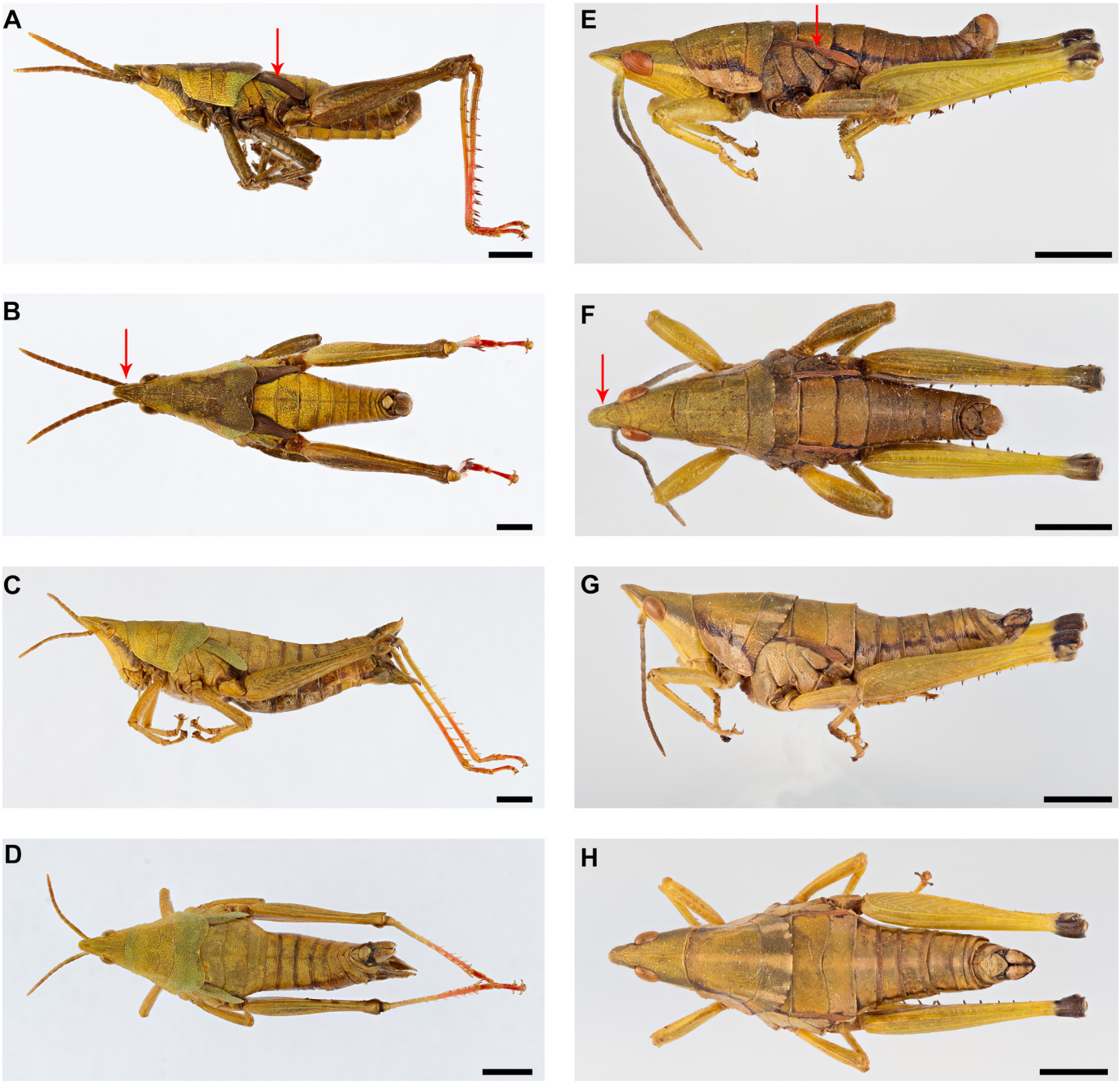

Figure 11. — North and Central America Pyrgomorphidae I. **A-D.** *Prosphena scudderi*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Sphenarium histrio*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

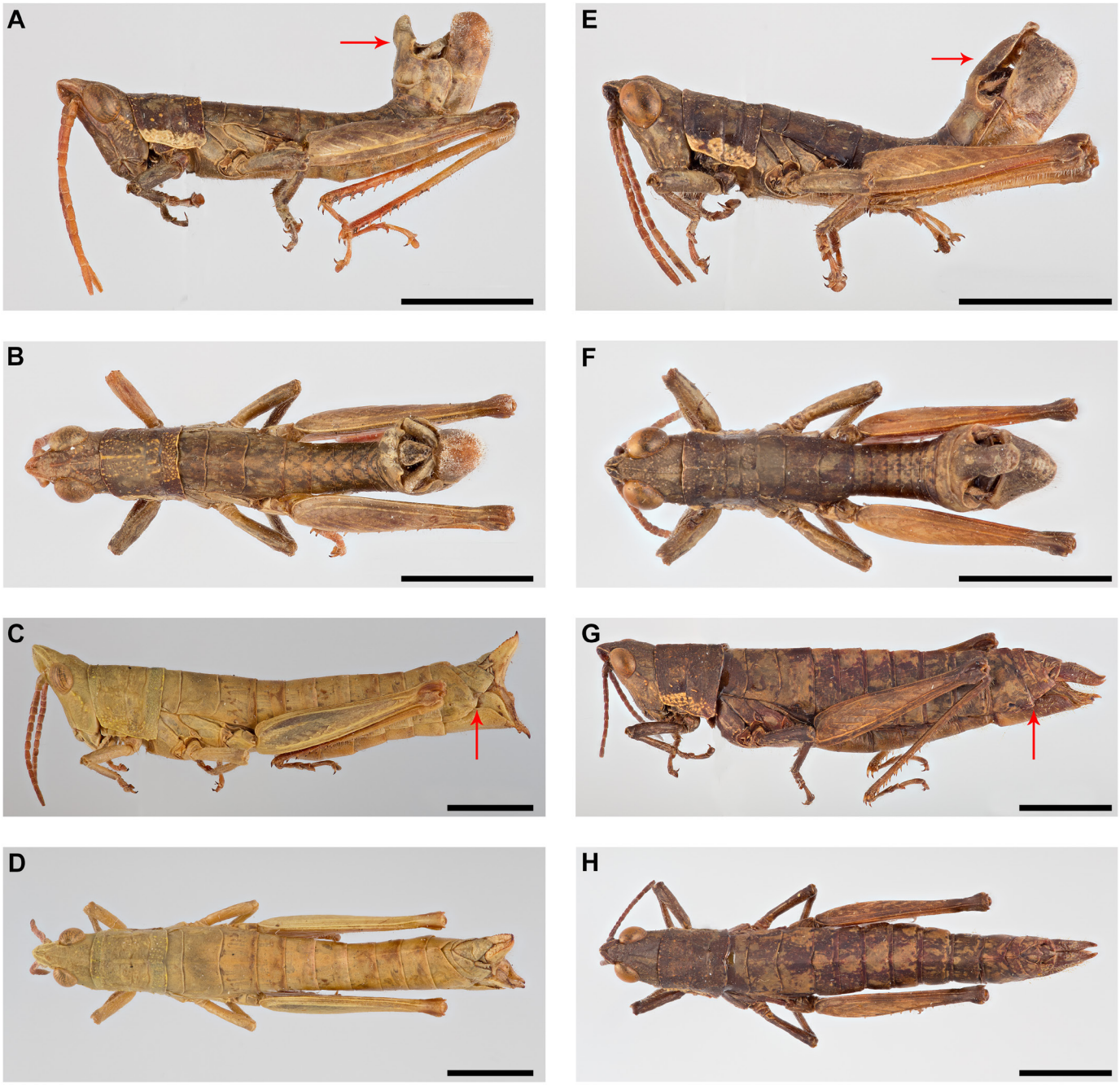

Figure 12. — North and Central America Pyrgomorphidae II. **A-D.** *Ichthyotettix mexicanus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Piscacris robertsi*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

Figure 13. — North and Central America Pyrgomorphidae III. **A-D.** *Piscacris affinis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

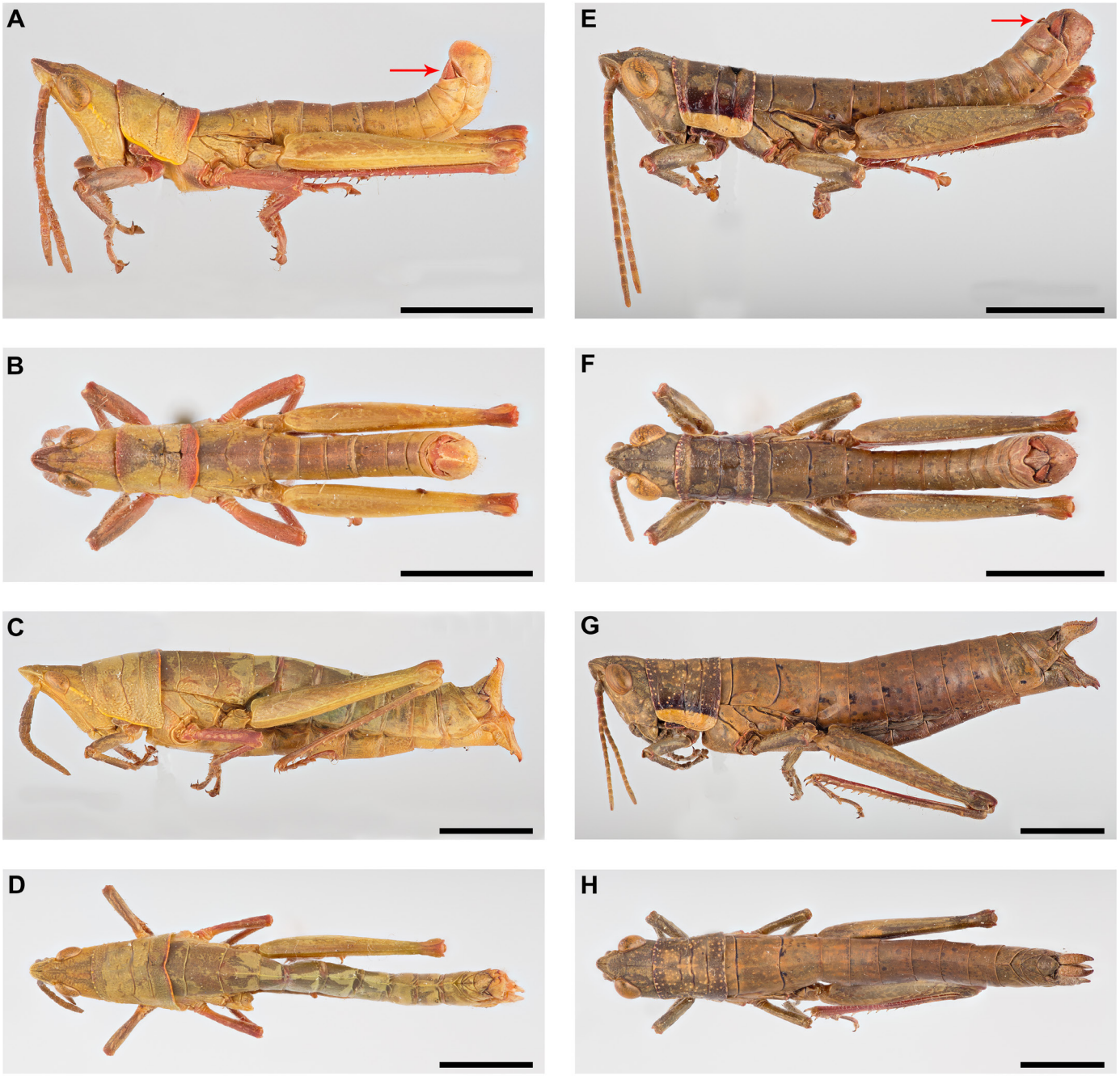

Figure 14. — North and Central America Pyrgomorphidae IV. **A-D.** *Sphenotettix nobilis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgotettix pueblensis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

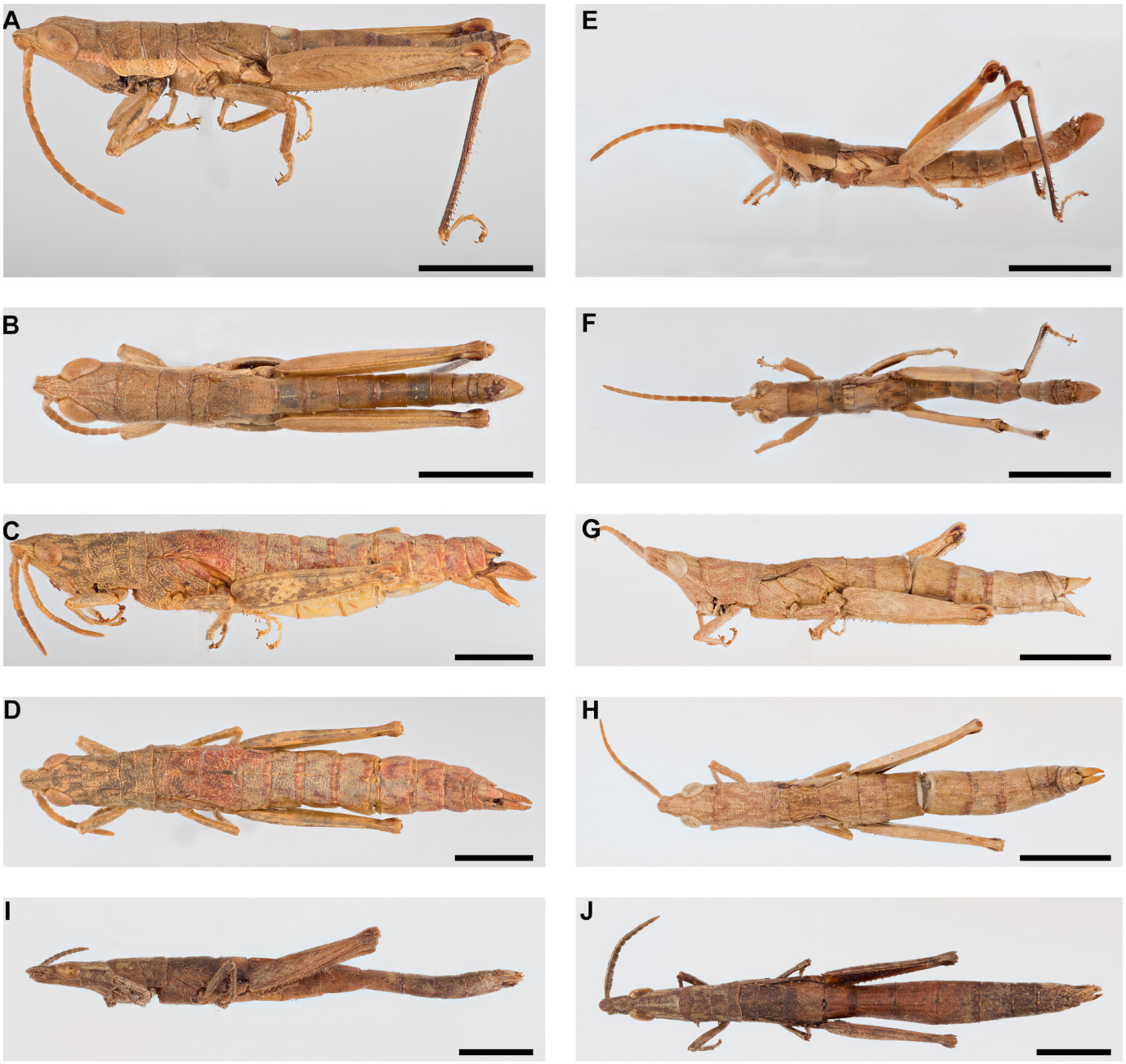

Figure 15. — North and Central America Pyrgomorphidae V. **A-D.** *Ichthiacris aptera*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Ichthiacris californica*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. **I-J.** *Ichthiacris elongata*. **I.** Female lateral view. **J.** Female dorsal view. Scale bar = 5 mm.

Figure 16. — North and Central America Pyrgomorphidae VI. **A-D.** *Sphenacris crassicornis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Calamacris clendoni*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

2. Key to Pyrgomorphidae genera of South America and the Caribbean

Based on information from Alves Dos Santos (2005) and Perez Gelabert et al. (1995).

This area includes four genera, all endemic to this region.

1. Apterous. 2
1'. Fully winged or micropterous. 3

2. Irregular integument; lower marginal area of hind femur approximately as wide as medial area (fig. 17A-D). (East and central upper half of South America) ..... *Omura** (1 sp.) (*O. congrua*)
2'. Striated and tuberculate integument through the body; lower marginal area of hind femur narrower than medial area (fig. 17E-H). (Eastern Brazil) ..... *Algete** (1 sp.) (*A. brunneri*)

3. Fully winged, in some cases tegmina reduced but always passing third coxae (fig. 18). (Colombia, Venezuela, Brazil [Goiás, Mato Grosso, Minas Gerais]) ..... *Minorissa** (2 spp.) (*M. pustulata, M. volxemi*)
3'. Vestigial tegmina, always smaller than eyes (fig. 19). (Dominican Republic) ..... *Jaragua** (2 spp.) (*J. oviedensis, J. serranus*)

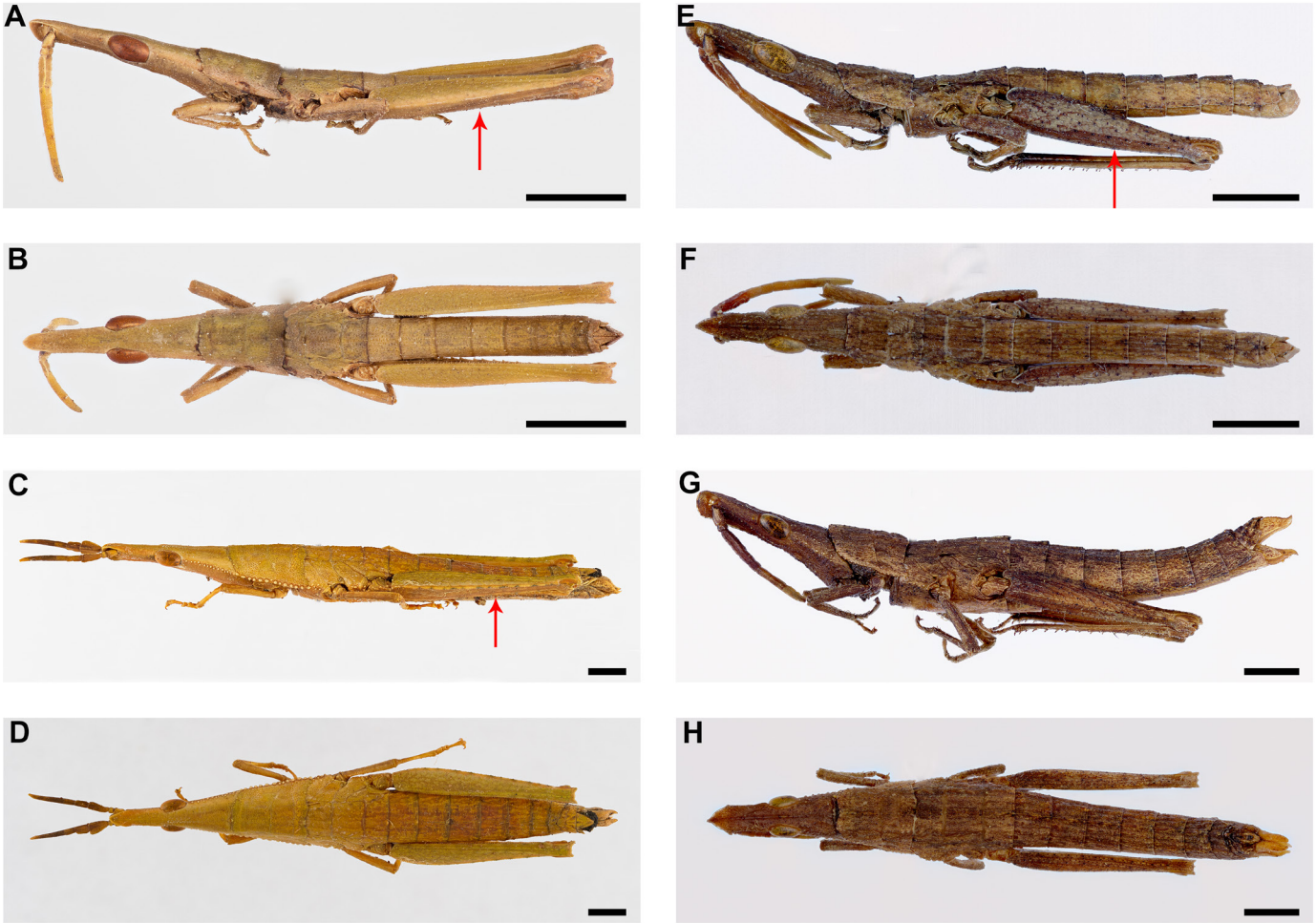

Figure 17. — South American and Caribbean Pyrgomorphidae I. **A-D.** *Omura congrua*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Algete brunneri*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

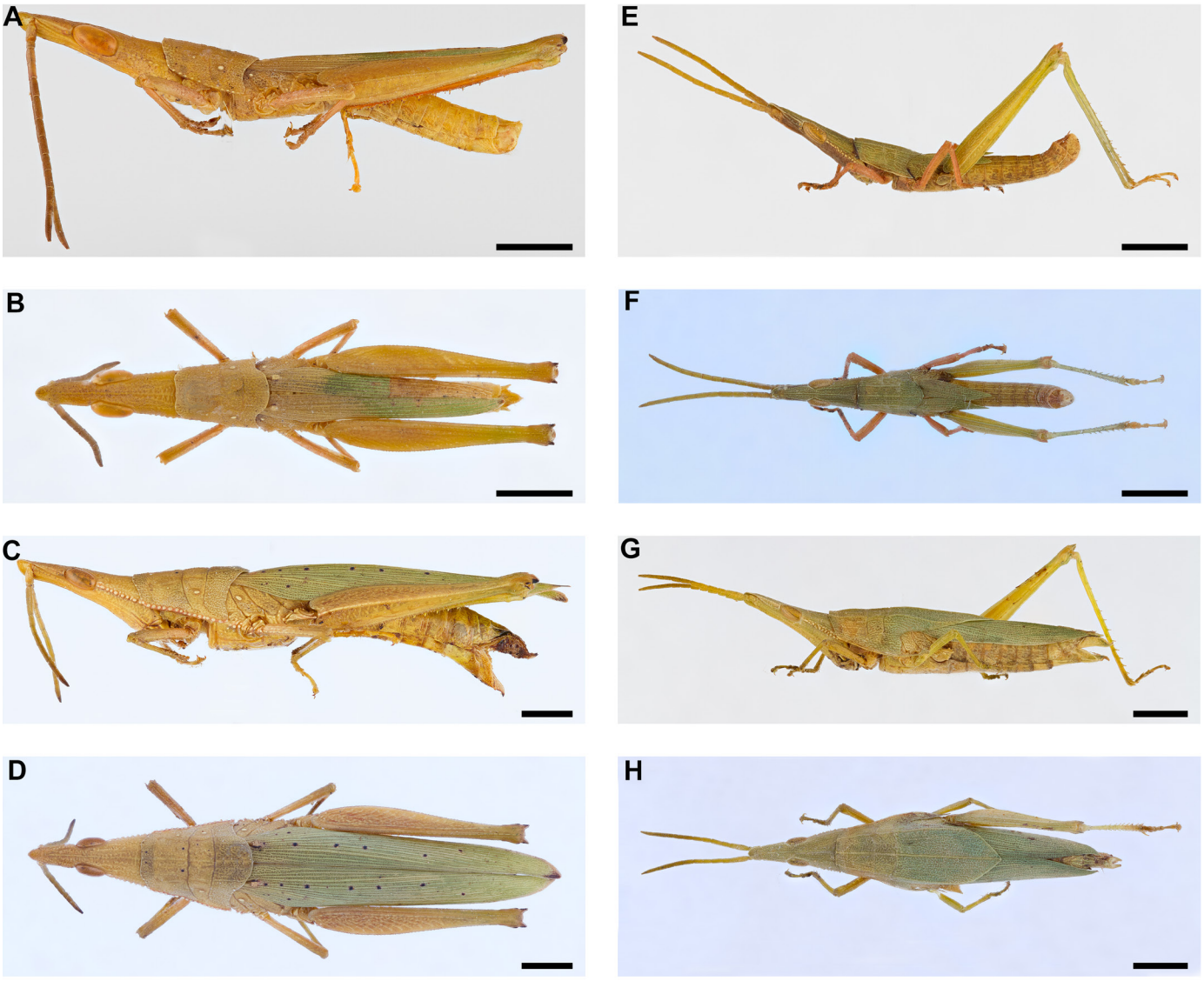

Figure 18. — South American and Caribbean Pyrgomorphidae II. **A-D.** *Minorissa pustulata*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Minorissa volxemi*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

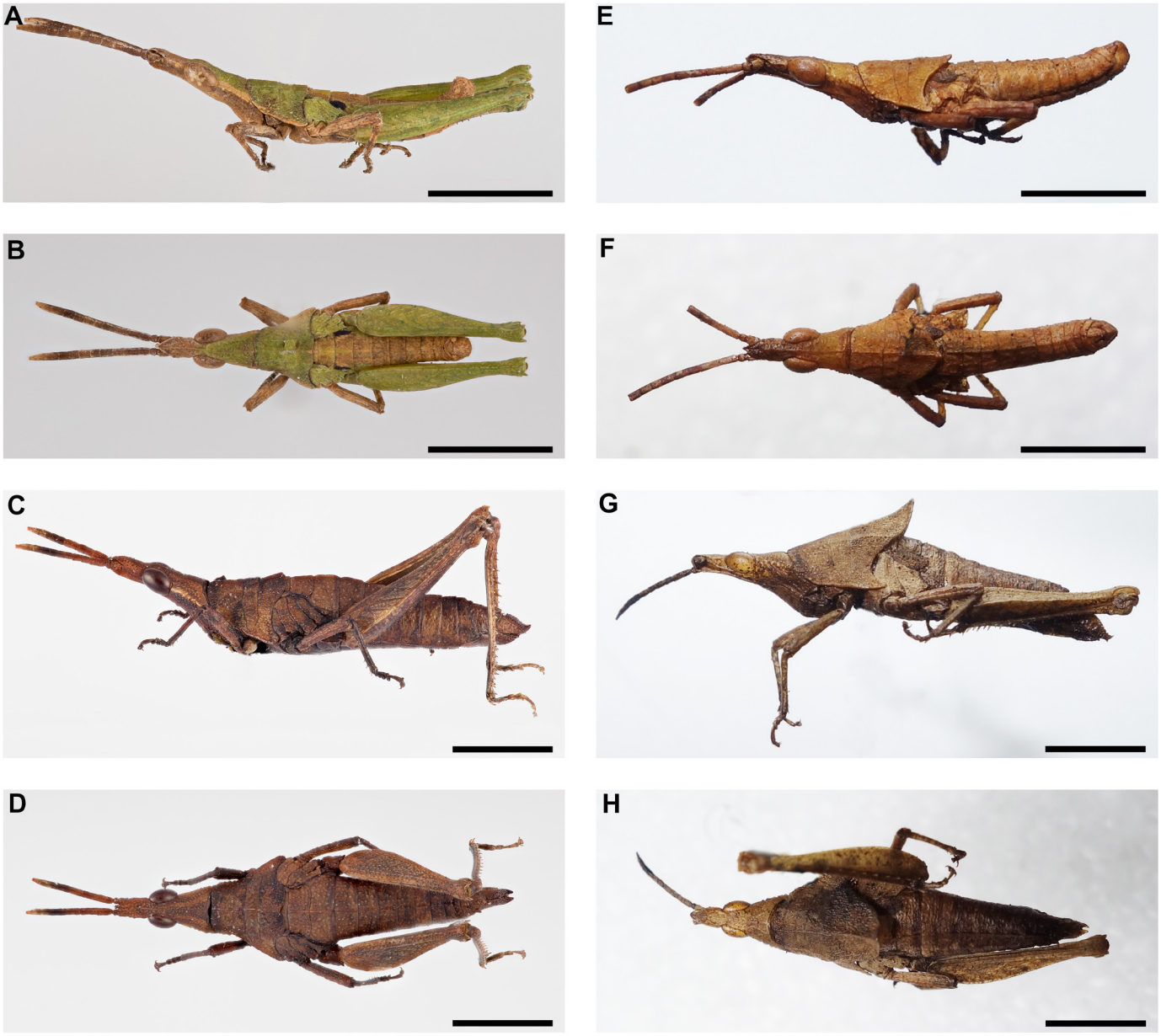

Figure 19. — South American and Caribbean Pyrgomorphidae III. **A-D.** *Jaragua oviedensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Jaragua serranus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

3. Key to Pyrgomorphidae genera of Africa (excluding Madagascar and including Socotra Island)

Modified from Dirsh (1965).

This area includes fifty-six genera, of which forty-five are endemic to the region. Of the eleven non-endemic genera *Macroleptea* is reported also in Israel and *Zonocerus* has been reported for Madagascar. *Pyrgomorphella* is recorded from Madagascar and Arabian Peninsula as well and *Parasphenula* is registered in Arabian Peninsula as well. *Plerisca* is also found in India but probably belongs to a new genus. *Chrotogonus*, *Tenuitarsus* and *Pyrgomorpha* show a broader distribution well into Asia Continent (*Pyrgomorpha* is also found in southern Europe). *Atractomorpha* is distributed even further, into Australia (introduced to Hawaiian archipelago since 1900). *Phymateus* is recorded also in Madagascar and Asia and *Poekilocerus* is also found in Arabian Peninsula, Continental Asia and Indonesia.

1. Antenna of variable shape, without strongly serrated edges, with well-separated basal segments of flagellum and with simple, not bilobate, apical segment. 2
1'. Antenna in cross section triangular, with strong irregularly serrated edges, fused basal segments (fig. 20A-B) and bilobate apex of apical segment. (São Tomé) ..... *Geloiodes** (1 sp.) (*G. cavifrons*)

2. Anterior margin of prosternum forming a wide collar, covering the posterior and lower part of the mouth (fig. 10E). 3
2'. Anterior margin of prosternum not covering the posterior and lower part of the mouth. 7

3. Macropterous, brachypterous or micropterous; external spur of inner side of hind tibia as long as or shorter than internal one..... 4
3'. Apterous; external spur of inner side of hind tibia longer than internal one. 6

4. Spurs of hind tibia longer than basal tarsal segment; middle femur thin and strongly elongated, as long as or longer than head and pronotum together (fig. 20C-D); lower basal lobe of hind femur shorter than upper one. (Upper half of Africa) ..... *Tenuitarsus* (2 spp.) (*T. angustus, T. sudanicus*)
4'. Spurs of hind tibia shorter than basal tarsal segment; middle femur short, much shorter than head and pronotum together; lower basal lobe of hind femur longer than the upper one. 5

5. Tegmina and hind wings present (fig. 20E-H), protruding from under pronotum even when vestigial. (Throughout Africa) ..... *Chrotogonus* (5 spp.) (*C. hemipterus, C. homalodemus, C. senegalensis, C. arenicola, C. tuberculatus*)
5'. Tegmina vestigial, covered by pronotum (fig. 21A-B). (Ethiopia) ..... *Shoacris** (1 sp.) (*S. bormansi*)

6. Meso- and metasternal interspaces close to one another, separated by suture; fastigium of vertex elongated (fig. 21C-D), apical fastigial areolae with well-developed marginal carinulae. (Angola) ..... *Caconda** (2 spp.) (*C. burri, C. fusca*)
6'. Meso- and metasternal interspaces partly fused; fastigium of vertex short (fig. 21E-H), apical fastigial areolae without posterior marginal carinulae. (Angola) ..... *Stibarosterna** (1 sp.) (*S. serrata*)

7. Antennal bases located in front of lateral ocelli. 8
7'. Antennal bases below and behind lateral ocelli. 11

8. Vestigial tegmina or apterous. 9
8'. Fully winged (figs. 22A-D, 77A-D). (Sub-Saharan Africa) ..... *Atractomorpha* (5 spp.) (*A. aberrans, A. acutipennis, A. occidentalis, A. orientalis, A. rufopunctata*)

9. Apterous. 10
9'. Vestigial tegmina (fig. 22E-H). (Ghana) ..... *Chapmanacris** (1 sp.) (*C. sylvatica*)

10. In lateral view, length of the space between eye and anterior margin of pronotum longer than the length of the eye (fig. 23A, F). (Somalia) ..... *Megalopyrga** (1 sp.)
(*M. monochroma*)

10'. In lateral view, length of the space between eye and anterior margin of pronotum shorter than the length of the eye (fig. 23B-E). (Socotra Island) ..... *Xenephias** (1 sp.)
(*X. socotranus*)

11. Dorsum and lateral margins of pronotum with large teeth, tubercles or large granules. 12

11'. Dorsum and lateral margins of pronotum smooth, granulose or with small tubercles and ridges. 17

12. Mesosternal interspace distant from metasternal one (fig. 10C). 13

12'. Mesosternal interspace close to metasternal, separated by suture only (fig. 10D & 23G-J). (South Africa) ..... *Phymella** (1 sp.)
(*P. capensis*)

13. Lateral margins of dorsum of pronotum, particularly in prozona, with large, obtuse, or subacute teeth and tubercles, or granulose. 14

13'. Lateral margins of dorsum of pronotum with acute teeth-like spines (fig. 24). (West, Central and East Africa) ..... *Rutidoderes** (3 spp.)
(*R. cinctus, R. concolor, R. squarrosus*)

14. Entire dorsum of pronotum covered with obtuse or subacute teeth and tubercles. 15

14'. Entire dorsum of pronotum strongly granulose (figs. 25-26). (Sub-Saharan Africa) ..... *Taphronota** (8 spp.)
(*T. cacuminata, T. stali, T. calliparea, T. ferruginea, T. grandis, T. merceti, T. occidentalis, T. verrucosa*)

15. Fully winged. 16

15'. Tegmina highly reduced (fig. 27). (Somalia) ..... *Paraphymateus** (1 sp.)
(*P. roffeyi*)

16. Hind wings with tessellated pattern and darker spots (figs. 29-32). (Sub-Saharan Africa) ..... *Phymateus* (10 spp.)
(*P. baccatus, P. leprosus, P. aegrotus, P. bolivari, P. cinctus, P. iris, P. karschi, P. morbillosus, P. pulcherrimus, P. viridipes*)

16'. Hind wings without tessellated pattern, blending into green at tip or anteriorly (fig. 28). (Sub-Saharan Africa) ..... *Phyteumas** (3 spp.)
(*P. olivaceus, P. purpurascens, P. whellani*)

17. Pronotum with low rounded tubercles, wrinkles and ridges, in front of the first sulcus with large median inflation; valves of ovipositor straight. 18

17'. Pronotum smooth or finely granulose, if pronotum tuberculate, then overall size is small, without median inflation; valves of ovipositor curved. 22

18. Median inflation in front of the first sulcus of pronotum low; entire pronotum covered with ridges and granules. 19

18'. Median inflation in front of first the sulcus high; entire pronotum tuberculate. 20

19. Entire pronotum covered with thick, irregular, longitudinal ridges (fig. 33), anterior and posterior margins slightly excised. (Western and Central Africa) ..... *Camoensia** (1 sp.)
(*C. insignis*)

19'. Entire pronotum roughly granulose (figs. 34-36), anterior and posterior margins not excised. (Sub-Saharan Africa) ..... *Maura** (4 spp.)
(*M. bolivari, M. lurida, M. marshalli, M. rubroornata*)

20. Hind tibia not widened; tegmina vestigial or shortened. 21

20'. Hind tibia in apical half widened (figs. 37-38); tegmina and hindwings fully developed or shortened. (Sub-Saharan Africa) ..... *Dictyophorus** (4 spp.)
(*D. cuisinieri, D. spumans, D. griseus, D. karschi*)

21. Tegmina vestigial or shortened. If shortened, cell size large, fastigium of vertex triangular, eyes small, hemispherical, prominent (fig. 39). (Nigeria, Cameroon, Gabon, Equatorial Guinea) ..... *Parapetasia** (2 spp.) (*P. femorata, P. rammei*)

21'. Tegmina shortened with cell size small, fastigium of vertex rounded apically, eyes of moderate size, ovate, not especially prominent (fig. 40). (Tanzania, Kenya) ..... *Loveridgacris** (1 sp.) (*L. impotens*)

22. First abdominal tergite with glandular tubercle (figs. 41 & 42A-D); tegmina fully developed or shortened. 23

22'. First abdominal tergite without glandular tubercle. 24

23. Tegmina fully developed or shortened and not overlapping at the base (fig. 41). (Sub-Saharan Africa) .... *Zonocerus* (2 spp.) (*Z. elegans, Z. variegatus*)

23'. Tegmina fully developed and overlapping at the base, but still showing the glandular tubercle (fig. 42A-D). (Socotra Island) ..... *Physemophorus** (1 sp.) (*P. sokotranus*)

24. Apterous or micropterous. 25

24'. Macropterous. 44

25. Apterous. 26

25'. Micropterous (not functional tegmina) or brachypterous (reduced but functional tegmina). 29

26. Hind femur comparatively wide, not reaching the tip of abdomen. 27

26'. Hind femur narrow and passing the tip of abdomen. 28

27. Dorsum of pronotum crossed by only one transverse sulcus (fig. 42E-F); mesosternal interspace inverse-triangular, mesosternal lobes almost connected. (Somalia) ..... *Parorthacris** (1 sp.) (*P. somalica*)

27'. Dorsum of pronotum crossed by two transverse sulci (fig. 42G-H); mesosternal interspace square, mesosternal lobes far apart. (Somalia) ..... *Vittisphena** (1 sp.) (*V. somalica*)

28. Fastigium of vertex acutely angular above (fig. 43). (Central Africa) ..... *Occidentosphena** (2 spp.) (*O. ruandensis, O. uvarovi*)

28'. Fastigium of vertex parabolic above (figs. 44-46). (Sudan, Uganda, Kenya, Tanzania) ..... *Parasphena** (17 spp.) (*P. campestris, P. cheranganica, P. chyuluensis, P. elgonensis, P. hanangensis, P. imatongensis, P. kaburu, P. keniensis, P. kinangopa, P. kulalensis, P. mauensis, P. meruensis, P. nairobiensis, P. naivashensis, P. ngongensis, P. pulchripes, P. teitensis*)

29. Fastigium of vertex two or three times as long as its width. 30

29'. Fastigium of vertex as long as or shorter than or slightly longer than its width. 31

30. Fastigium of vertex about twice as long as its width (fig. 47A-D); tegmina narrow; integument strongly, regularly granulose. (Zimbabwe, Mozambique) ..... *Chirindites** (1 sp.) (*C. odendaali*)

30'. Fastigium of vertex about three times as long as its width (fig. 47E-H); tegmina lobiform; integument smooth and shiny. (Tanzania) ..... *Sphenexia** (1 sp.) (*S. fusiformis*)

31. Antennae length equal or shorter than head and pronotum together. 34

31'. Antennae length longer than head and pronotum together. 32

32. Posterior part of male subgenital plate wide and flattened; cerci short, wide, compressed angular at apex (fig. 48). (Tanzania, Democratic Republic of the Congo) ..... *Cawendia** (1 sp.) (*C. glabrata*)

32'. Posterior part of male subgenital plate ridge-like, compressed; cerci long, incurved or straight and downcurved in apical part. 33

33. Male mesosternal interspace as long as or slightly longer than its width; cerci almost straight, in apical half downcurved (fig. 49). (Angola, Zambia, Zimbabwe, Malawi, Mozambique) ..... *Pezotagasta** (2 spp.) (*P. angolensis, P. bredoi*)

33'. Male mesosternal interspace twice as long as its width; cerci strongly incurved (fig. 50A-D). (Central Africa) ..... *Humpatella** (4 spp.) (*H. constricta, H. huambae, H. nigropicta, H. severini*)

34. Posterior margin of pronotum incurved, excised or straight. 35

34'. Posterior margin of pronotum excurved (fig. 50E-H). (South Africa) ..... *Plerisca* (2 spp.) (*P. peringueyi, P. rubripennulis*)

35. Tegmina reaching the second coxae in lateral view. 36

35'. Tegmina reaching the third coxae in lateral view. 40

36. Tegmina ovoidal. 37

36'. Tegmina elongate. 38

37. Head length equal or almost equal to the length of pronotum (fig. 51A-B, D-E). (Somalia) ..... *Somalopyrgus** (2 spp.) (*S. messanai, S. rotundipennis*)

37'. Head length shorter than the length of pronotum (fig. 51C, F). (Kenya). ..... *Marsabitacris** (1 sp.) (*M. citronota*)

38. Integument rugose, tubercles between eyes and pronotum in lateral view. 39

38'. Integument smooth, total body length less than 2 cm (fig. 52). (Northern Africa) ..... *Leptea** (2 spp.) (*L. albotaeniata, L. debilis*)

39. Cerci triangular; distance between eye and the lateral margin of pronotum equal or larger than the length of eye (fig. 53A-D). (South Africa) ..... *Afrosphenella** (2 spp.) (*A. capensis, A. senecionicola*)

39'. Cerci conical; distance between eye and the lateral margin of pronotum less than the length of eye (fig. 53E-F). (East Africa) ..... *Parasphenula* (2 spp.) (*P. abyssinica, P. boranensis*)

40. Posterior margin of pronotum bilobed. 41

40'. Posterior margin of pronotum not bilobed. 42

41. Well marked lateral carinae (fig. 53G-H). (East and Southern Africa) ..... *Parasphenella** (4 spp.) (*P. carinata, P. dubia, P. forchhammeri, P. meridionalis*)

41'. Not well marked lateral carinae (fig. 54E-F). (Northern South Africa, Zimbabwe and probably Mozambique) ..... *Punctisphena** (1 sp.) (*P. pustulata*)

42. Tegmina elongate. 43

42'. Tegmina lobiform (fig. 53I-J). (South Africa) ..... *Carinisphena** (1 sp.) (*C. producta*)

43. Tegmina narrow, with around 5 veins running parallel (fig. 54A-D). (Eastern and Southern Africa) ..... *Stenoscepa** (11 spp.)
(*S. fusiformis, S. gallae, S. gracilis, S. grandis, S. granulata, S. maxima, S. montana, S. obscura, S. picta, S. picticeps, S. rhodesiensis*)

43'. Tegmina broad, with around 8 veins running parallel (fig. 55). (Eastern Africa) ..... *Pyrgomorphella* (7 spp.)
(*P. albini, P. arachidis, P. carinulata, P. dicrostachyae, P. minuta, P. sphenarioides, P. tulearensis*)

44. A clear line of tubercles running from behind the eye to the lateral anterior margin of pronotum present. 49

44'. Such a line absent. 45

45. Distance between eye and pronotum in lateral view equal to the length of eye. 46

45'. Distance between eye and pronotum in lateral view twice as long as the length of eye (fig. 54G-H). (Somalia) ..... *Xiphipyrgus** (1 sp.)
(*X. tunstalli*)

46. Length of hind femur shorter than or equal to the length of abdomen. 47

46'. Length of hind femur longer than the length of abdomen (fig. 56). (Angola and Southern Africa) ..... *Ochrophlebia** (1 sp.)
(*O. cafra*)

47. Posterior margin of pronotum not reaching the second coxae. 48

47'. Posterior margin of pronotum reaching the second coxae (fig. 57). (Upper half of Africa) ..... *Poekilocerus* (2 spp.)
(*P. bufonius, P. calotropidis*)

48. A pair of sinuous lines of pustules present in the median area of vertex (fig. 59E-F). (Congo) ..... *Katangacris** (1 sp.)
(*K. enigmatica*)

48'. Such lines absent (fig. 58A-B). (Northern Africa and Israel) ..... *Macroleptea* (1 sp.)
(*M. laevigata*)

49. Posterior margin of pronotum reaching the second coxae. 50

49'. Posterior margin of pronotum not reaching the second coxae (fig. 58C-D). (Angola) ..... *Eilenbergia** (1 sp.)
(*E. sagitta*)

50. Parallel bands of light and dark colors absent through body. 51

50'. Parallel bands of light and dark colors present on through body (fig. 58E-H). (Southern Africa) ... *Ochrophlegma** (3 spp.)
(*O. pygmaea, O. violacea, O. vittifera*)

51. There are six genera that do not possess consistent characters to distinguish them from each other, even at internal genitalia level. A major revision is required to clearly define these genera. In general, the generic definitions are very vague with several indefinite and conditional characters (Rowell et al. 2015). The taxonomic history of the species in these genera is complex. For instance, *Laufferia chloronota* was described as *Ochrophlebia*, and three species of *Protanita* were described as *Tanita*. *Scabropyrgus scabrosus* was described as *Ochrophlebia* then transferred to *Tanita* and then back to *Ochrophlebia*. *Tanitella prasina* was described as *Ochrophlebia* and *Tanitella sanderi* was described as *Pyrgomorpha* (Cigliano et al., 2022). Kevan (1962) made the most important contribution up to date and provide detail descriptions and comparisons. The distribution could help to narrow down the options.

*Laufferia** (1 sp.). Angola (fig. 59A-D).
(*L. chloronota*)
*Protanita** (3 spp.). Middle third of Africa (fig. 60).
(*P. elongata, P. fusiformis, P. longiceps*)
Pyrgomorpha (14 spp.). All Africa (fig. 61).
(*P. angolensis, P. granulata, P. johnseni, P. rugosa, P. vignaudii, P. agarena, P. albotaeniata, P. bispinosa, P. cognata, P. conica, P. lepineyi, P, minuta, P. tricarinata, P vosseleri*)
*Scabropyrgus** (1 sp.). Angola (fig. 62A-D).
(*S. scabrosus*)
*Tanita** (9 spp.). Sub-Saharan Africa (figs. 63-64).
(*T. brachyptera, T. breviceps, T. lineaalba, T. loosi, T. parva, T. purpurea, T. rosea, T. stulta, T. subcylindrica*)
*Tanitella** (2 spp.). Southern Africa (fig. 62E-G).
(*T. prasina, T. sanderi*)

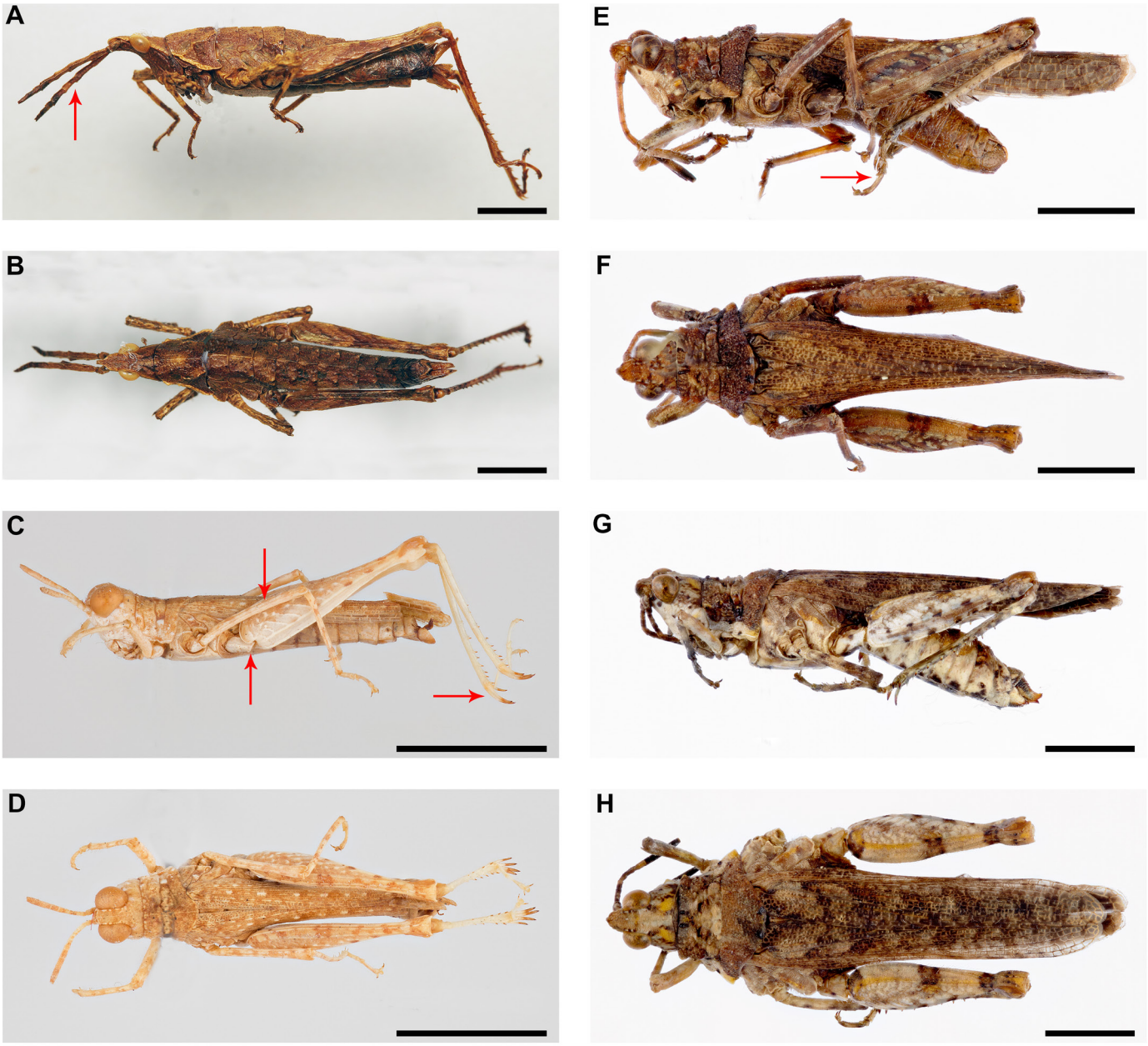

Figure 20. — African Pyrgomorphidae I. **A-B.** *Geloiodes cavifrons*. **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Tenuitarsus angustus*. **C.** Male lateral view. **D.** Male dorsal view. **E-H.** *Chrotogonus hemipterus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

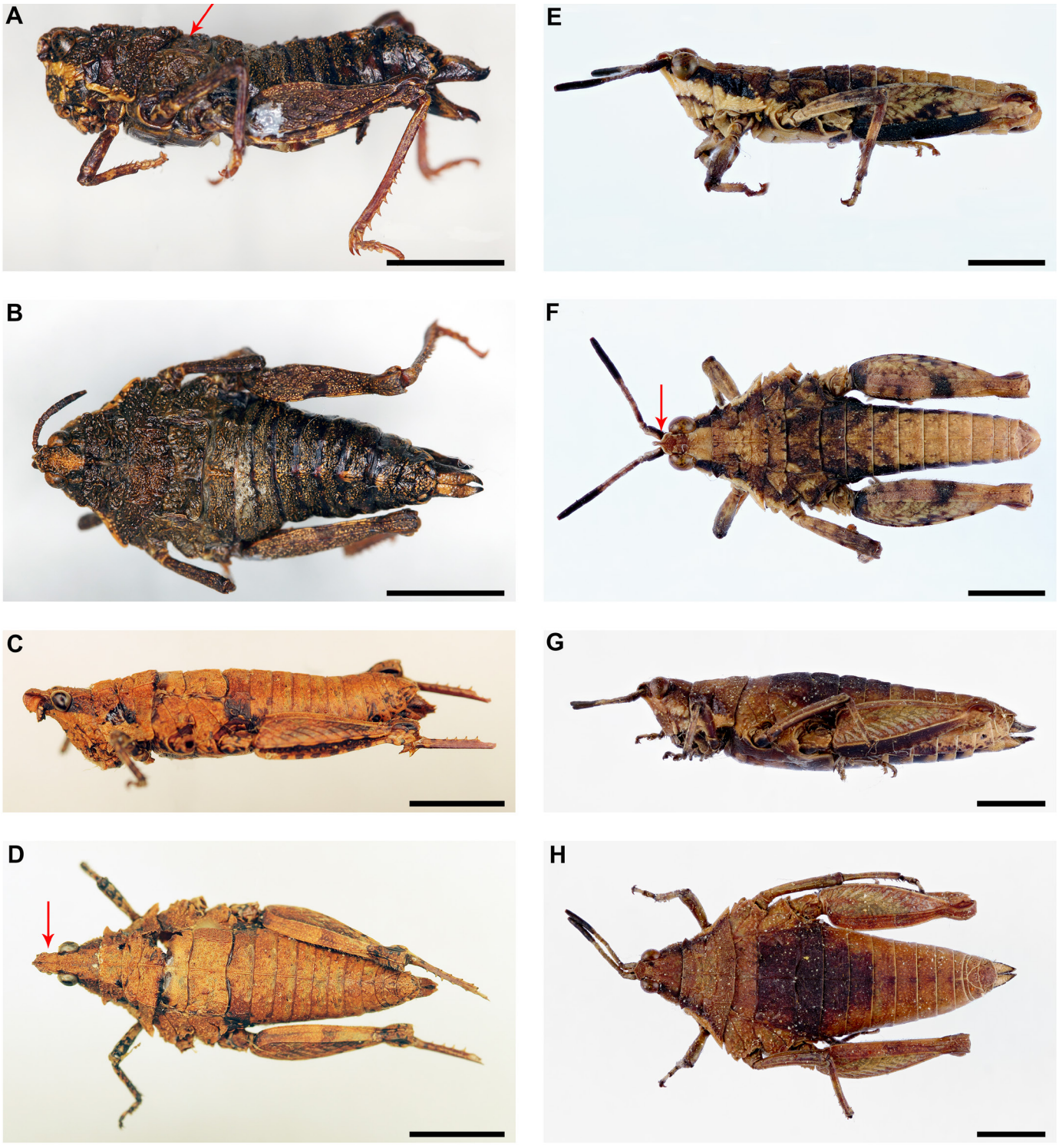

Figure 21. — African Pyrgomorphidae II. **A-B.** *Shoacris bormansi*. **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Caconda burri*. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Stibarosterna serrata*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

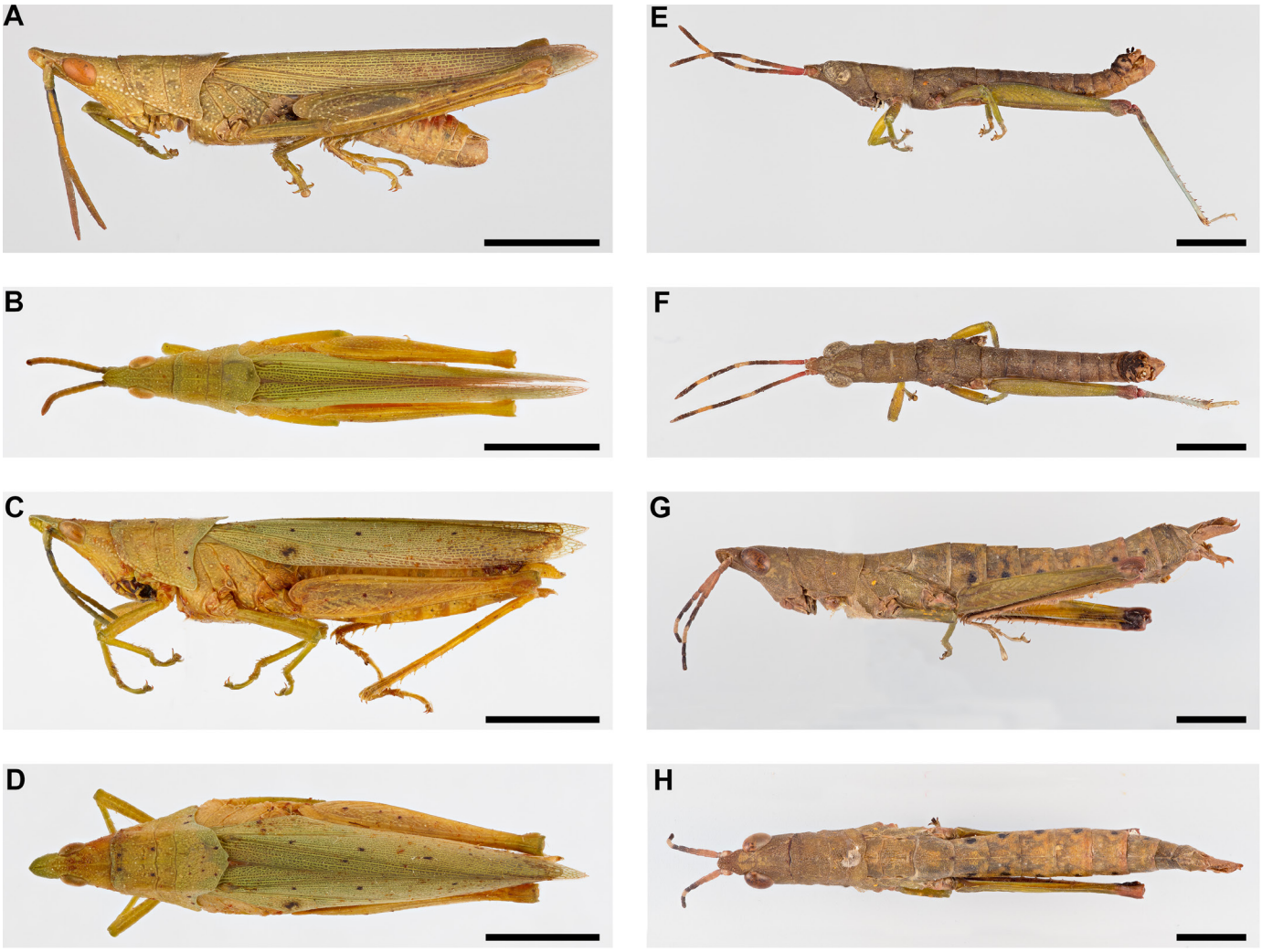

Figure 22. — African Pyrgomorphidae III. **A-D.** *Atractomorpha aberrans*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Chapmanacris sylvatica*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

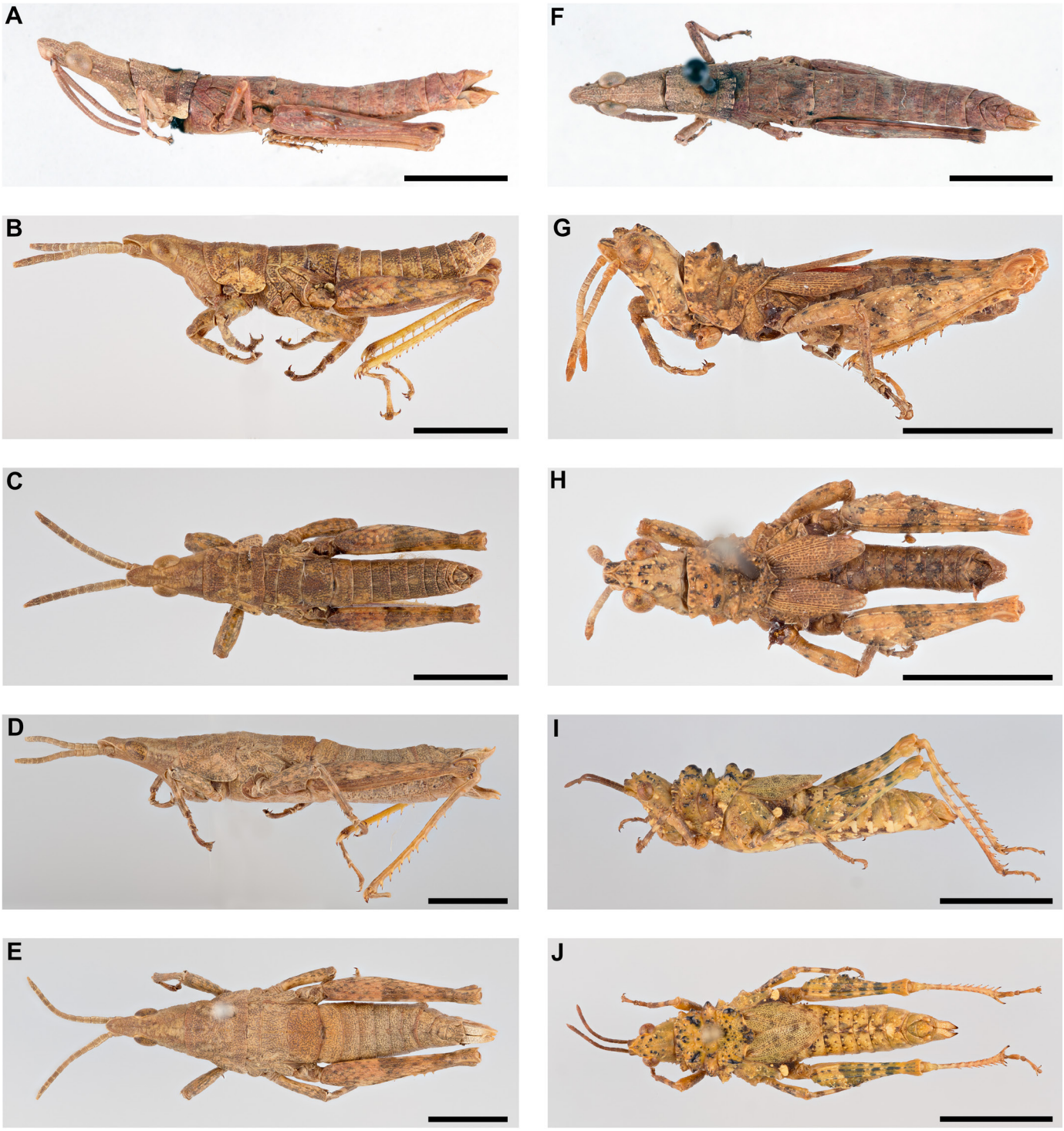

Figure 23. — African Pyrgomorphidae IV. **A, F.** *Megalopyrga monochroma*. **A.** Female lateral view. **F.** Female dorsal view. **B-E.** *Xenephias socotranus*. **B.** Male lateral view. **C.** Male dorsal view. **D.** Female lateral view. **E.** Female dorsal view **G-J.** *Phymella capensis*. **G.** Male lateral view. **H.** Male dorsal view. **I.** Female lateral view. **J.** Female dorsal view. Scale bar = 5 mm.

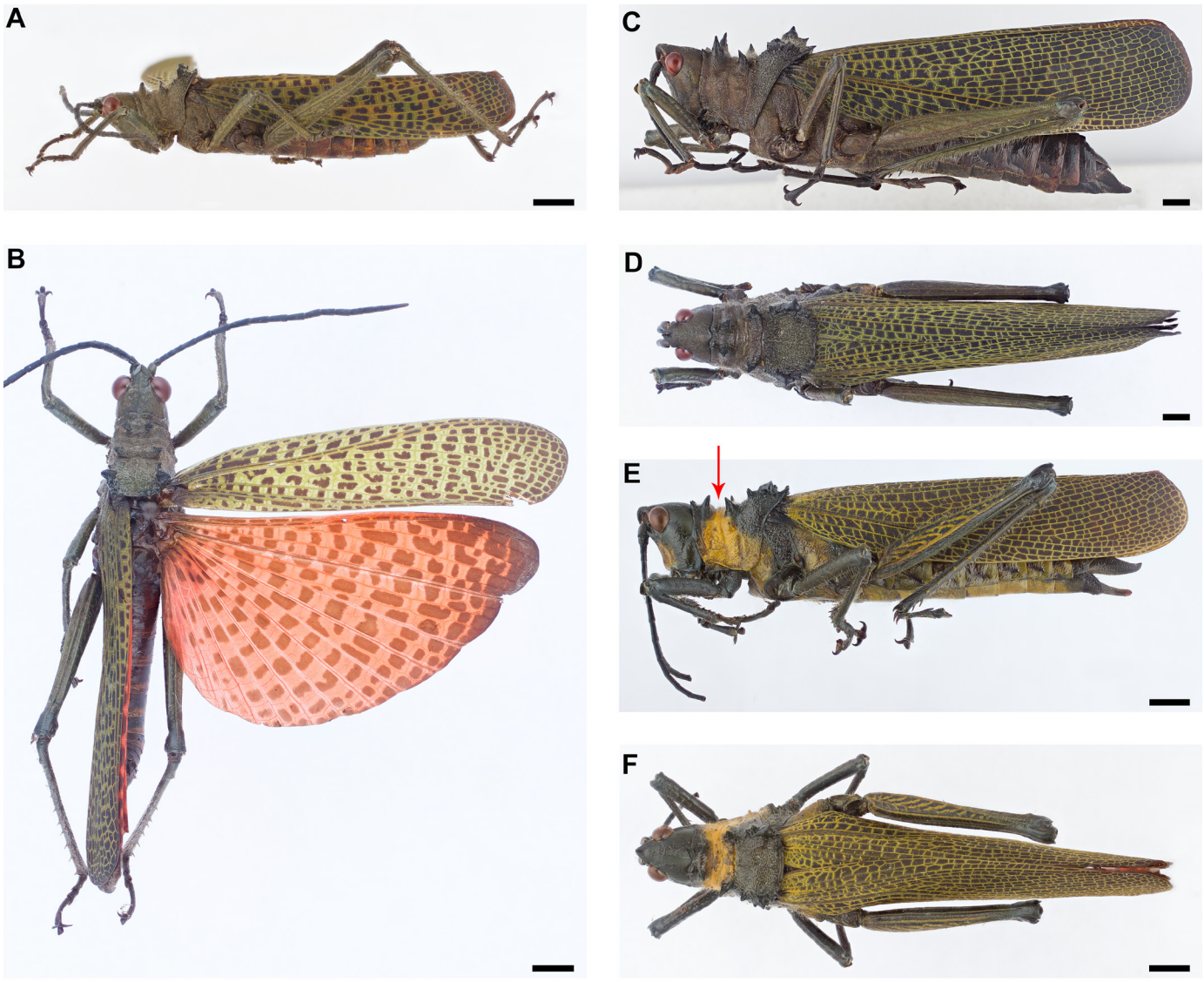

Figure 24. — African Pyrgomorphidae V. **A-D.** *Rutidoderes squarrosus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Rutidoderes cinctus*. **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

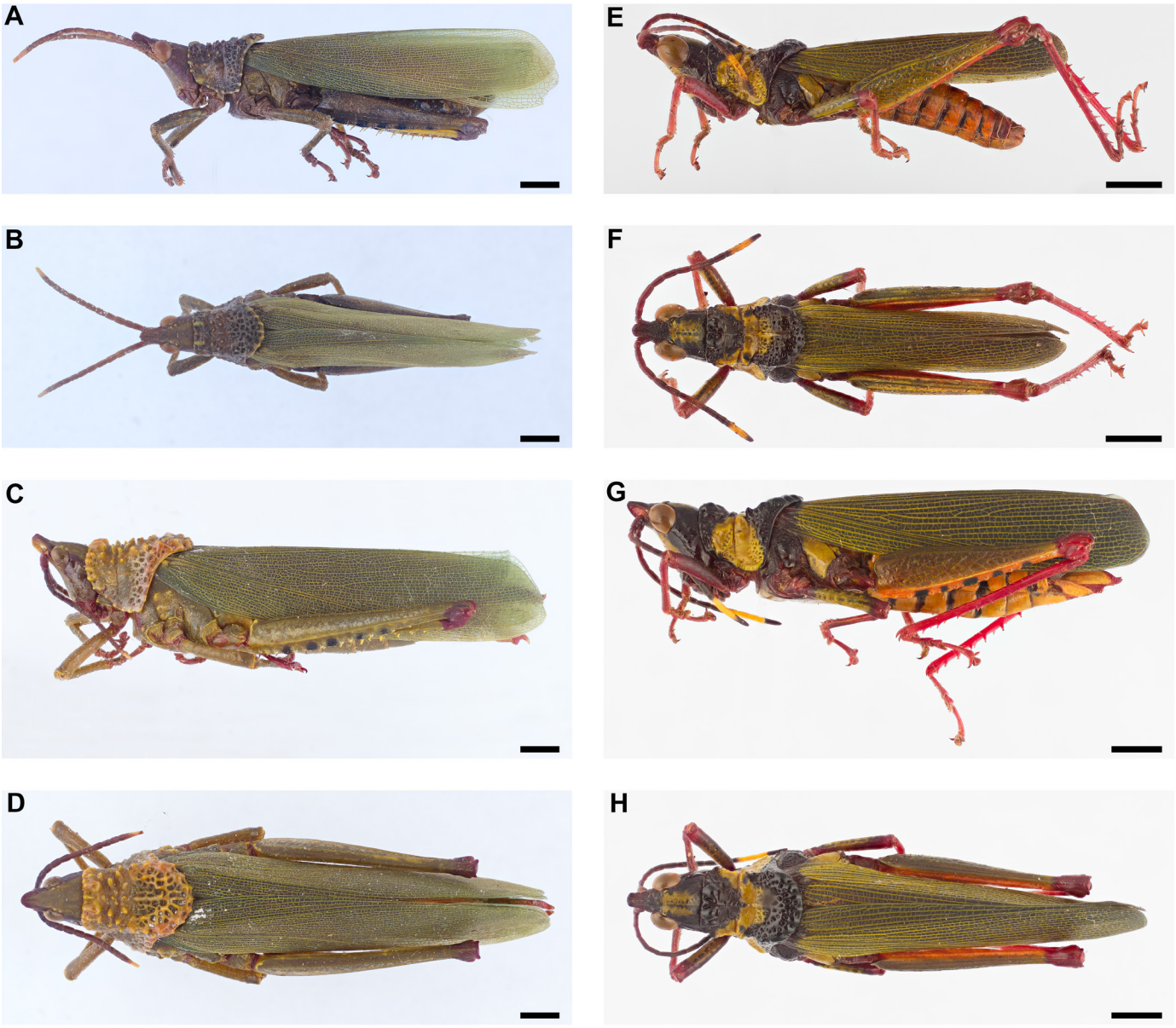

Figure 25. — African Pyrgomorphidae VI. **A-D.** *Taphronota calliparea*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Taphronota ferruginea*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

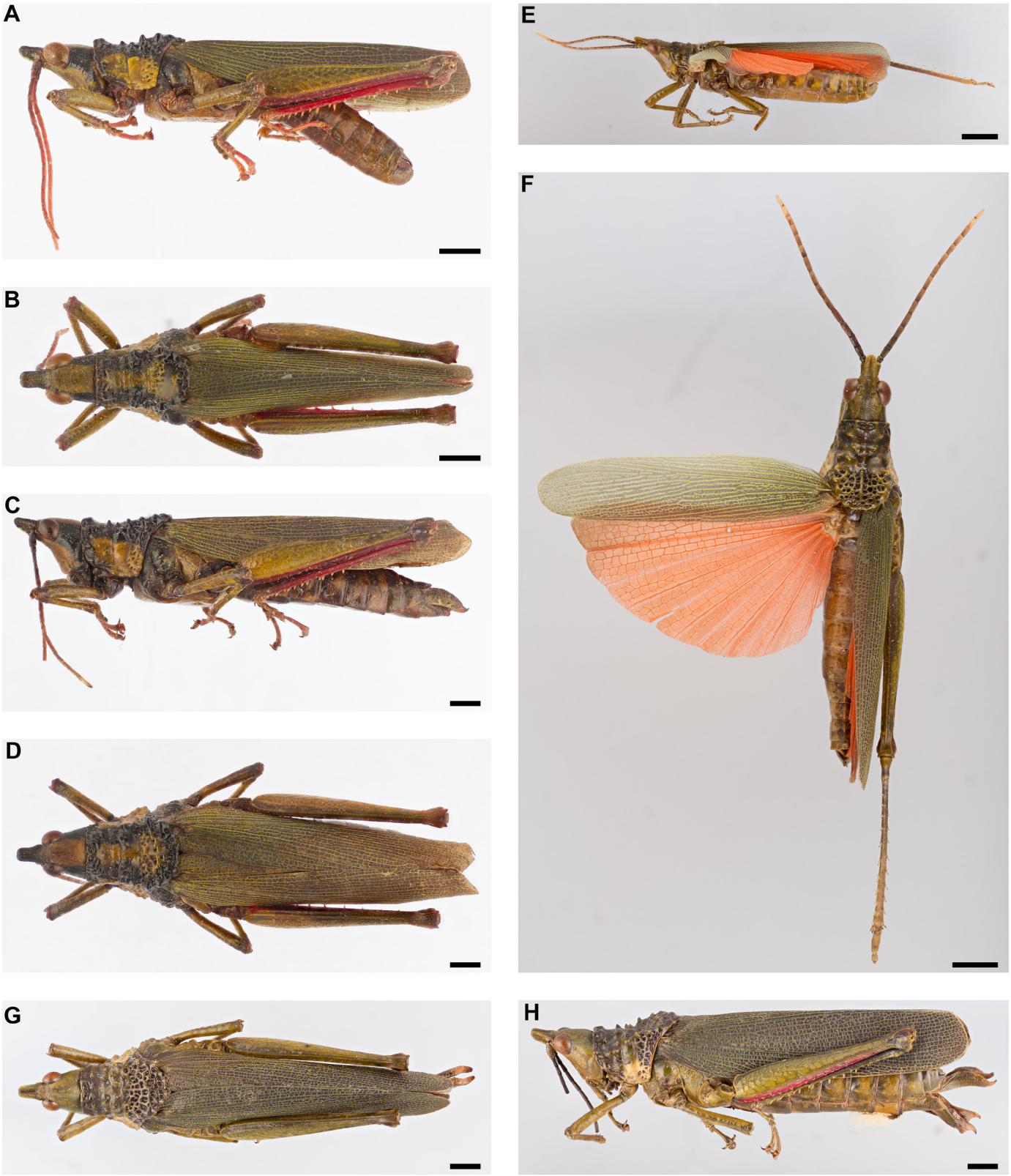

Figure 26. — African Pyrgomorphidae VII. **A-D.** *Taphronota merceti*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Taphronota occidentalis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female dorsal view. **H.** Female lateral view. Scale bar = 5 mm.

Figure 27. — African Pyrgomorphidae VIII. **A-D.** *Paraphymateus roffeyi*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

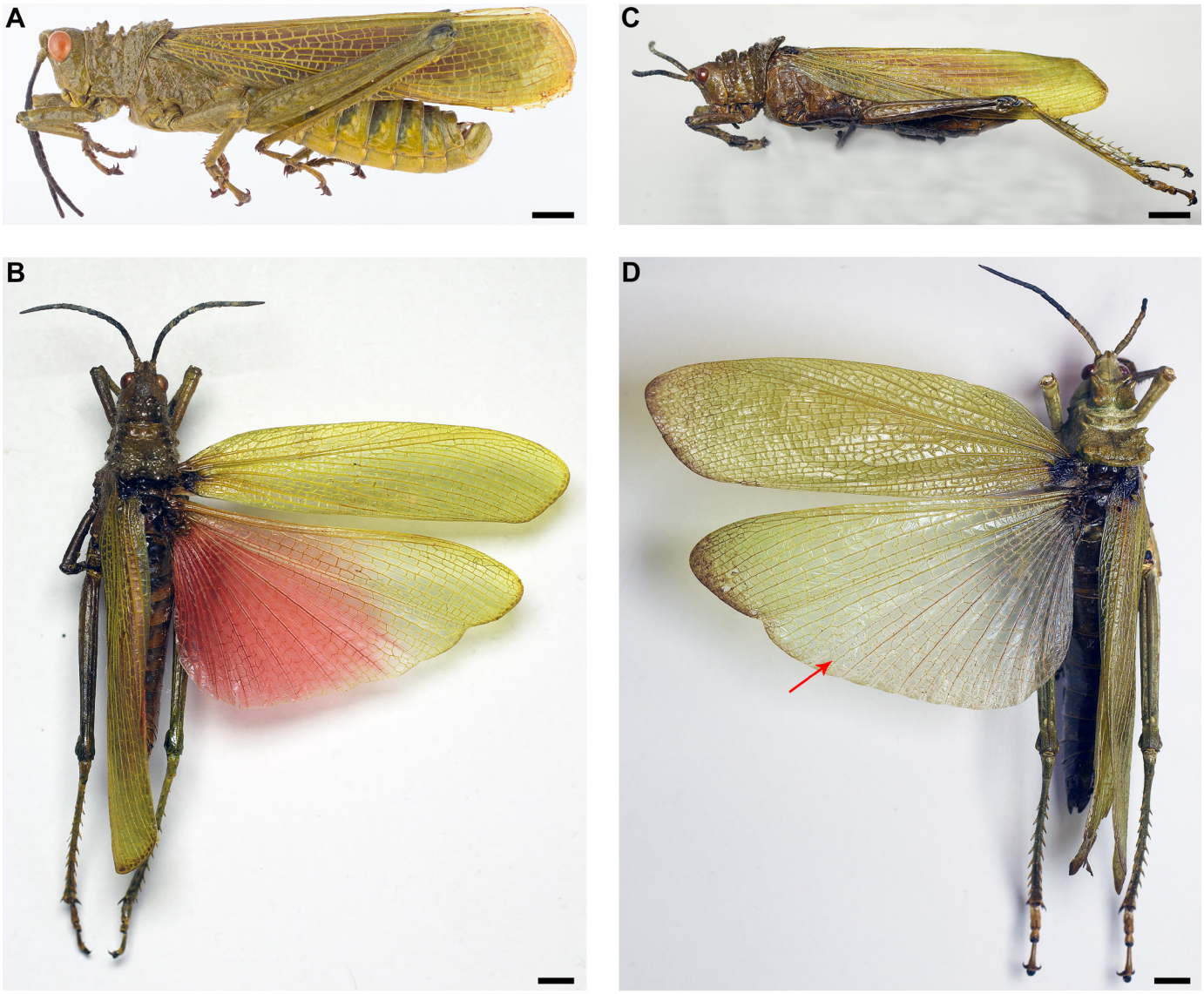

Figure 28. — African Pyrgomorphidae IX. **A-C.** *Phyteumas purpurascens*. **A.** Male lateral view. **B.** Female dorsal view. **C.** Female lateral view. **D.** *Phyteumas olivaceus*. **D.** Female dorsal view. Scale bar = 5 mm.

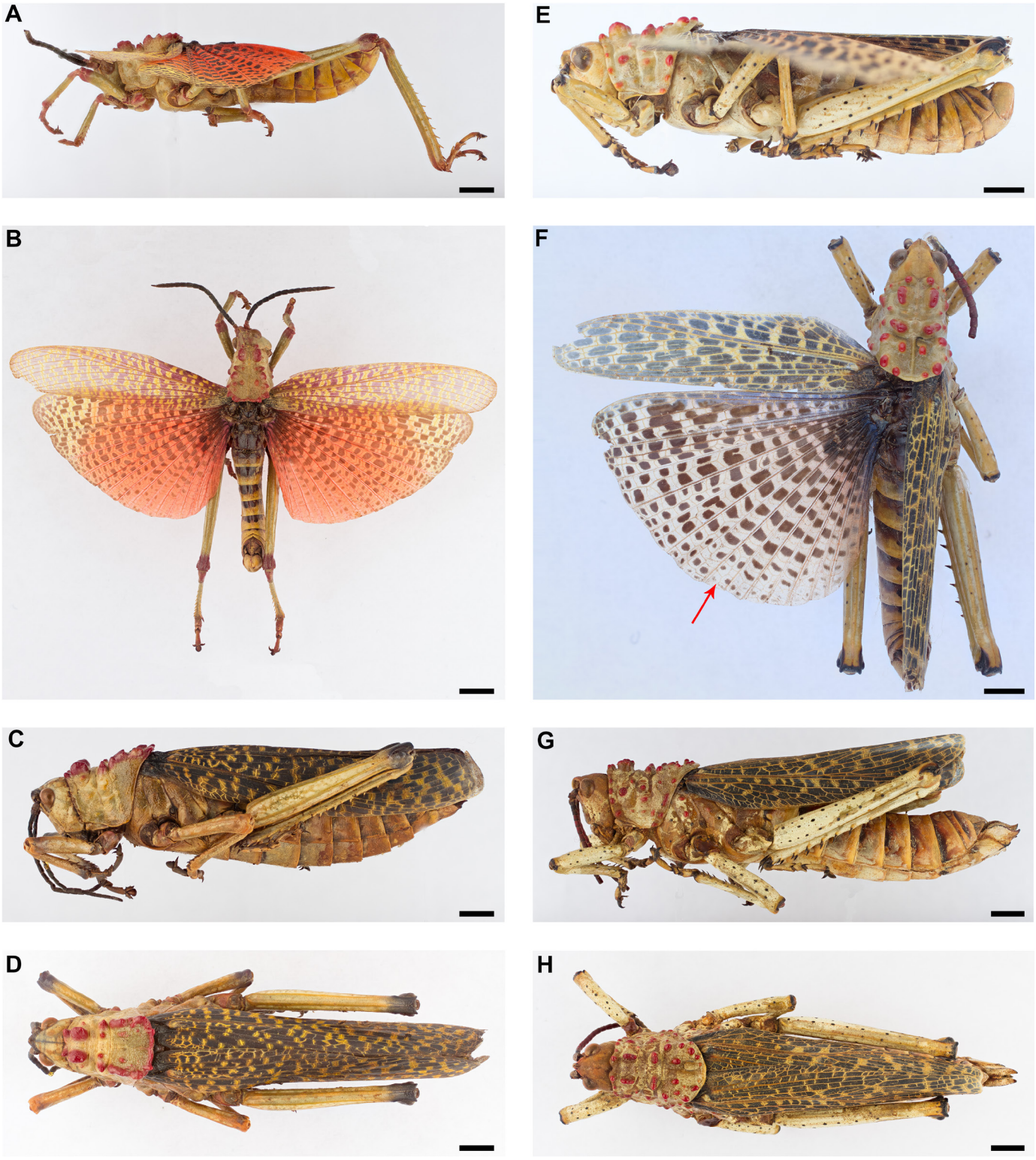

Figure 29. — African Pyrgomorphidae X. **A-D.** *Phymateus aegrotus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Phymateus baccatus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

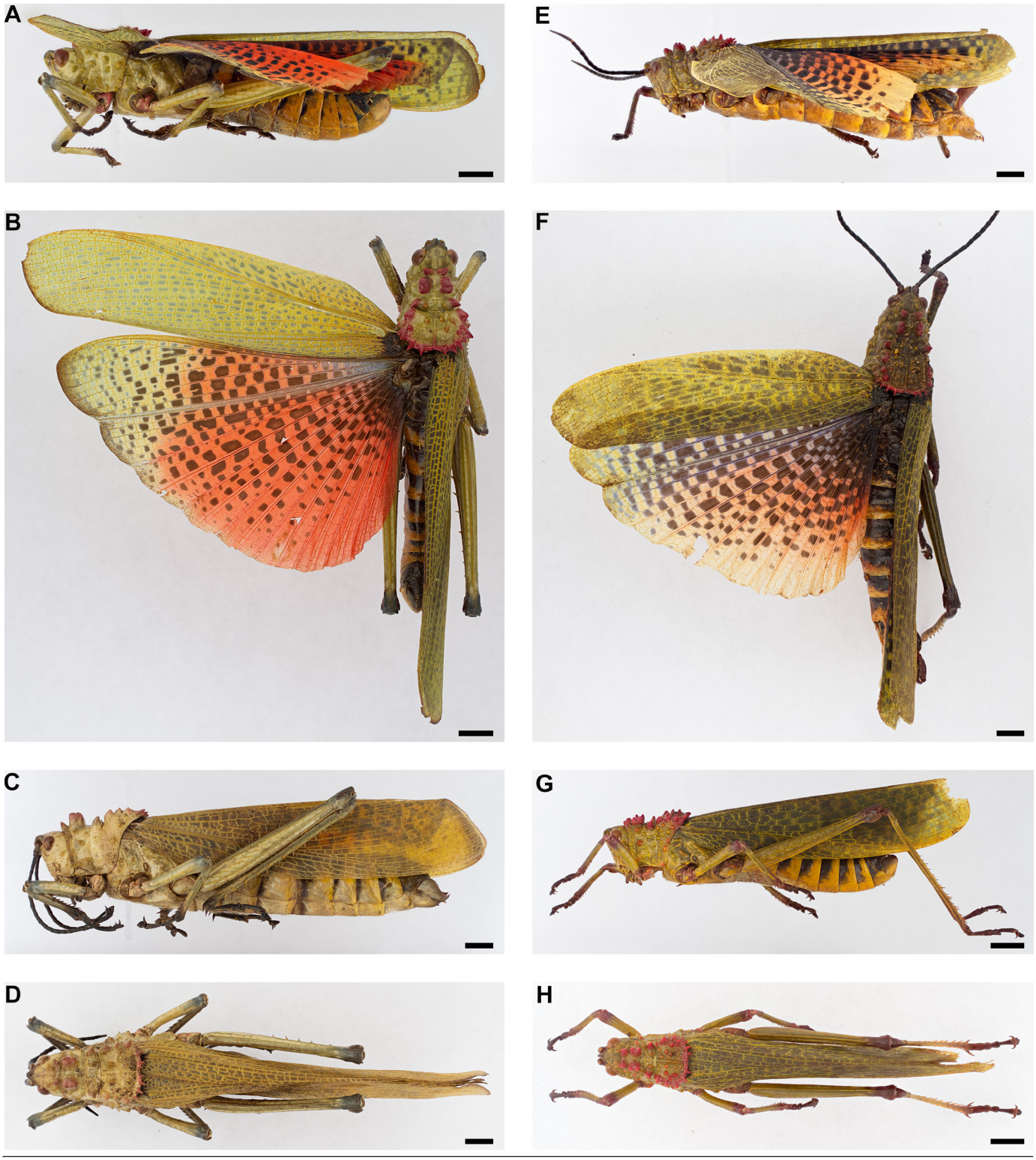

Figure 30. — African Pyrgomorphidae XI. **A-D.** *Phymateus cinctus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Phymateus iris*. **E.** Female lateral view. **F.** Female dorsal view. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

Figure 31. — African Pyrgomorphidae XII. **A-D.** *Phymateus leprosus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Phymateus morbillosus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

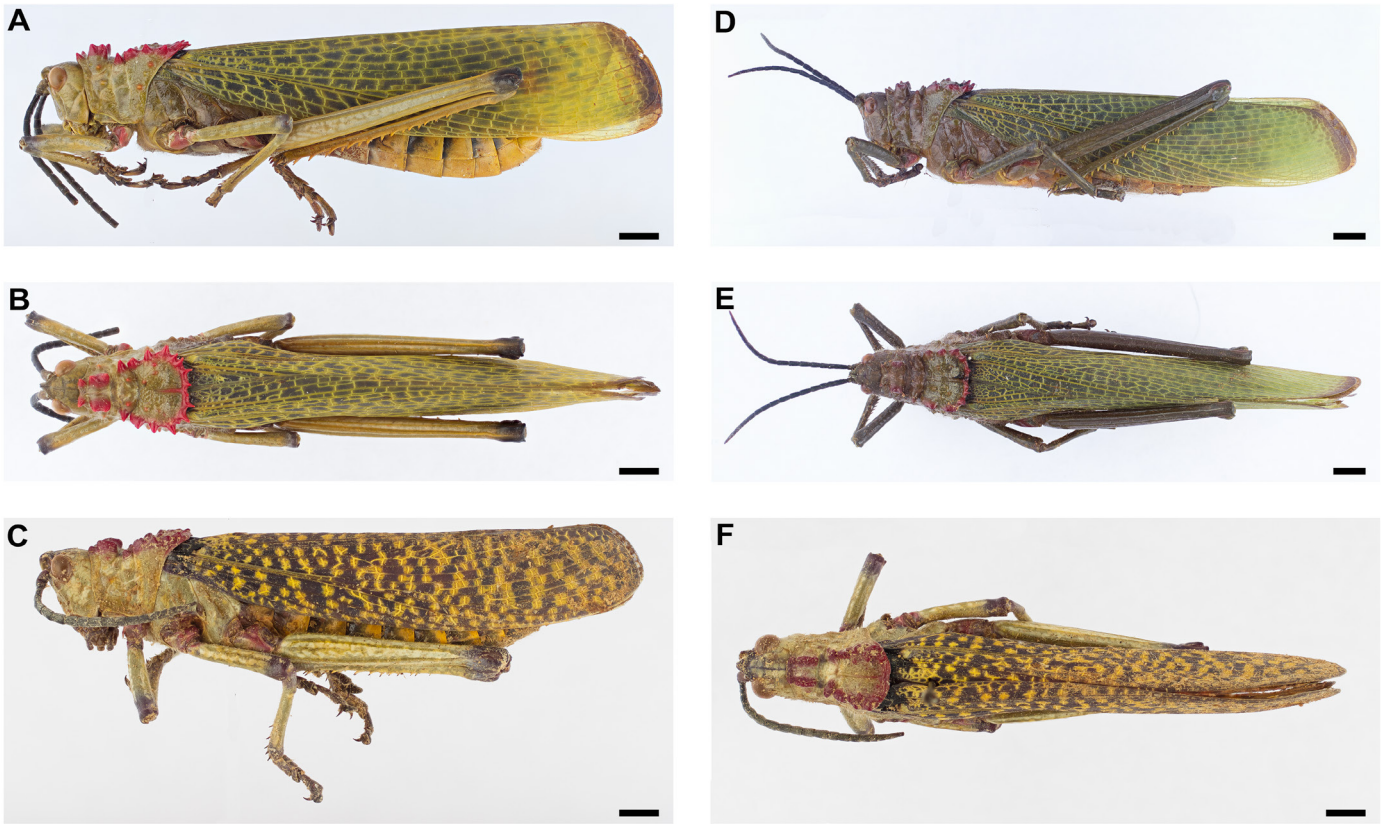

Figure 32. — African Pyrgomorphidae XIII. **A-B, D-E.** *Phymateus viridipes*. **A.** Male lateral view. **B.** Male dorsal view. **D.** Female lateral view. **E.** Female dorsal view. **C, F.** *Phymateus pulcherrimus*. **C.** Male lateral view. **F.** Male dorsal view. Scale bar = 5 mm.

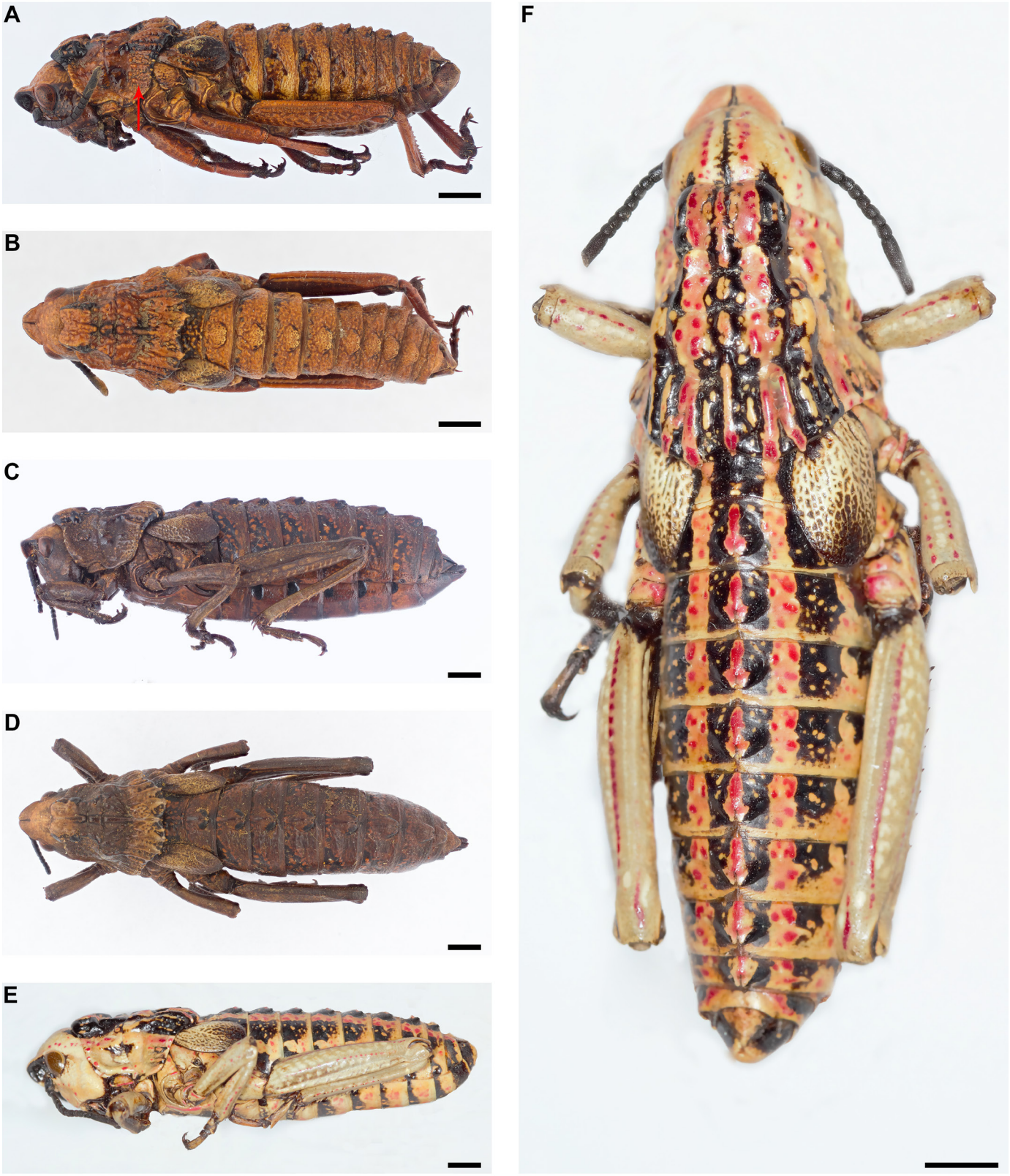

Figure 33. — African Pyrgomorphidae XIV. **A-F.** *Camoensia insignis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E.** Male lateral view. **F.** Male dorsal view. Scale bar = 5 mm.

Figure 34. — African Pyrgomorphidae XV. **A-C.** *Maura bolivari*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female dorsal view. **D-F.** *Maura lurida*. **D.** Male lateral view. **E.** Male dorsal view. **F.** Female lateral view. Scale bar = 5 mm.

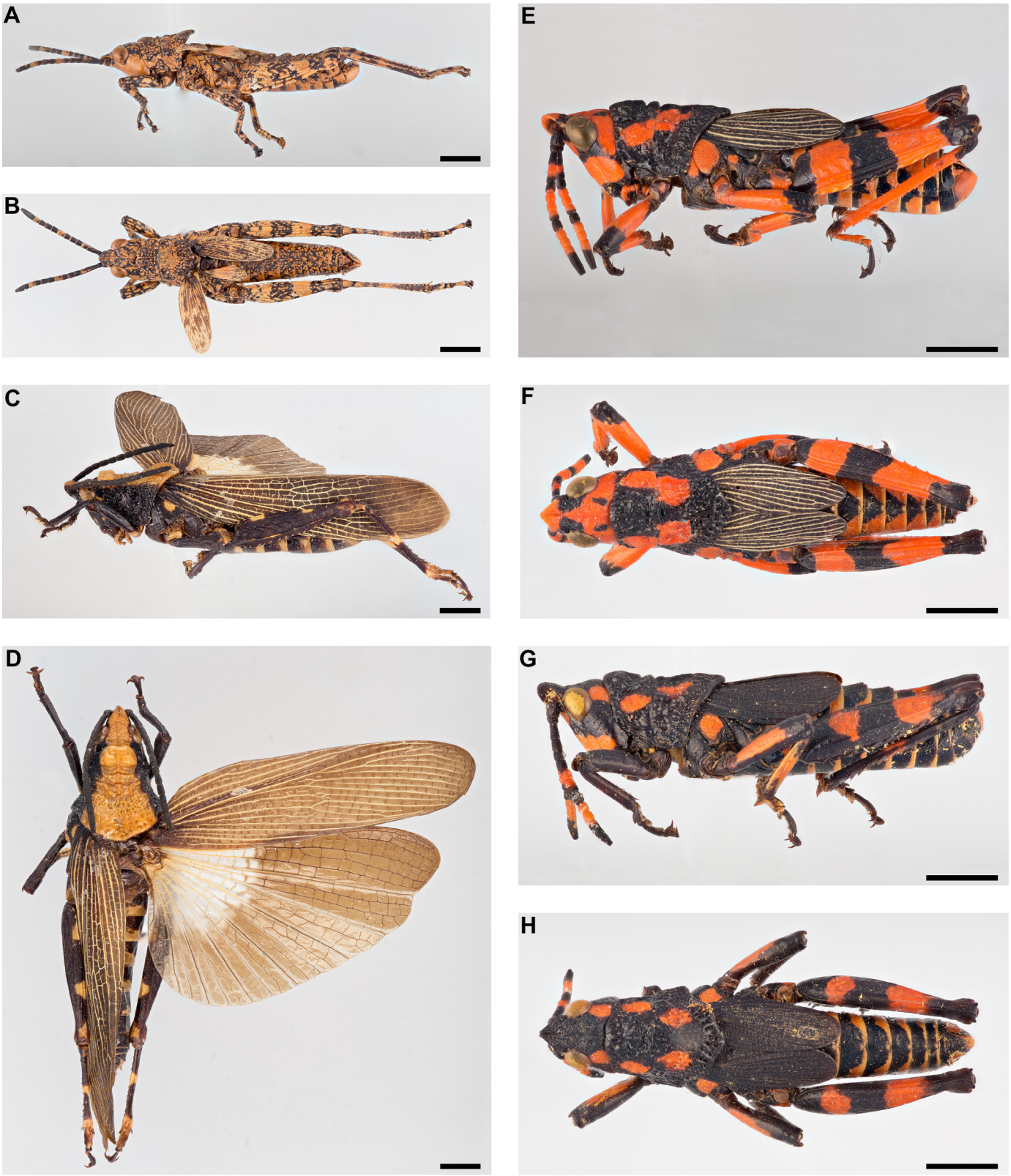

Figure 35. — African Pyrgomorphidae XVI. **A-D.** *Maura marshalli*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Maura rubroornata*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

Figure 36. — African Pyrgomorphidae XVII. **A-D.** *Maura rubroornata*. **A.** Female lateral view. **B.** Female dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

Figure 37. — African Pyrgomorphidae XVIII. **A-D.** *Dictyophorus griseus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Dictyophorus karschi*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

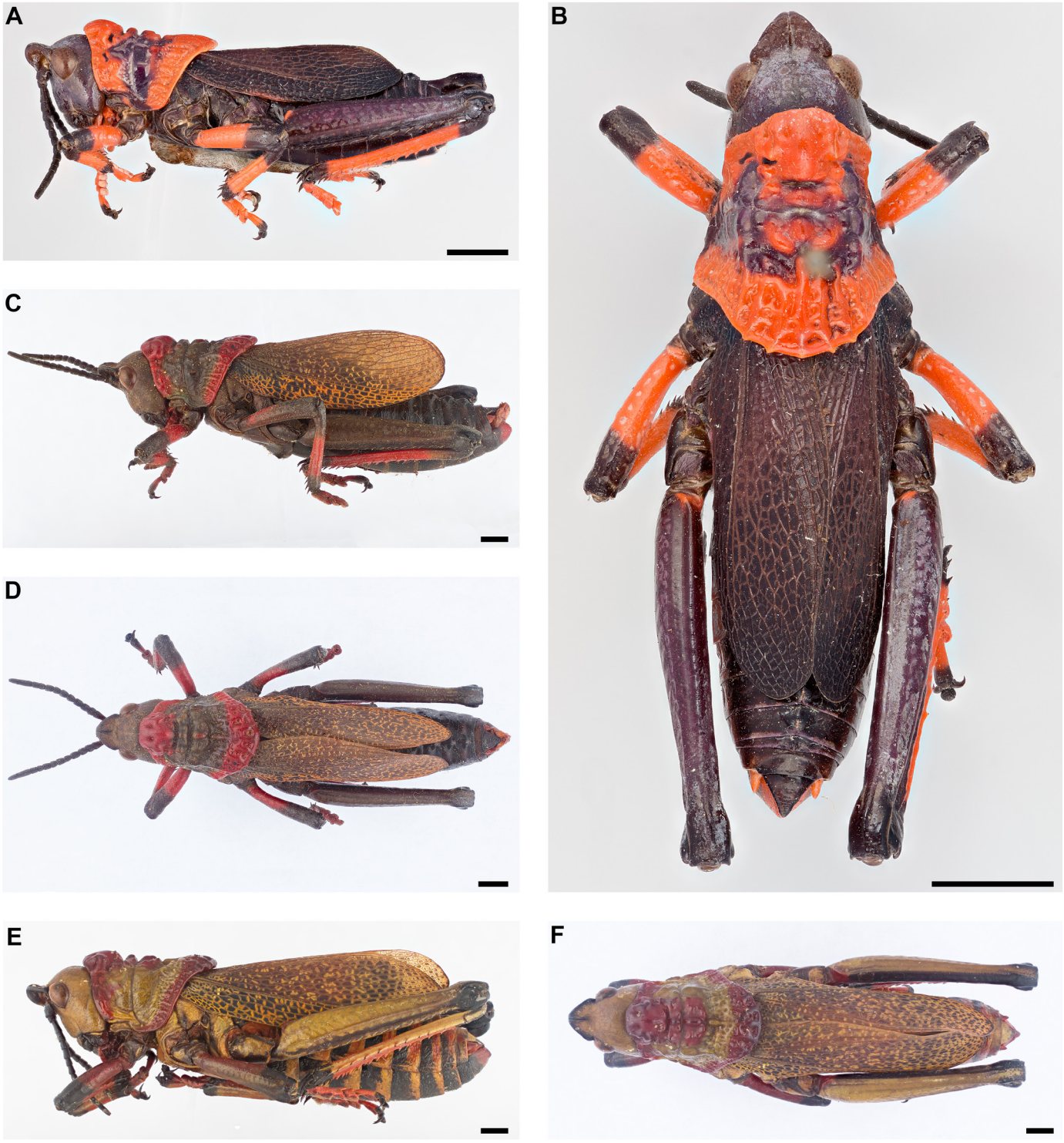

Figure 38. — African Pyrgomorphidae XIX. **A-F.** *Dictyophorus spumans*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Male lateral view. **D.** Male dorsal view. **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

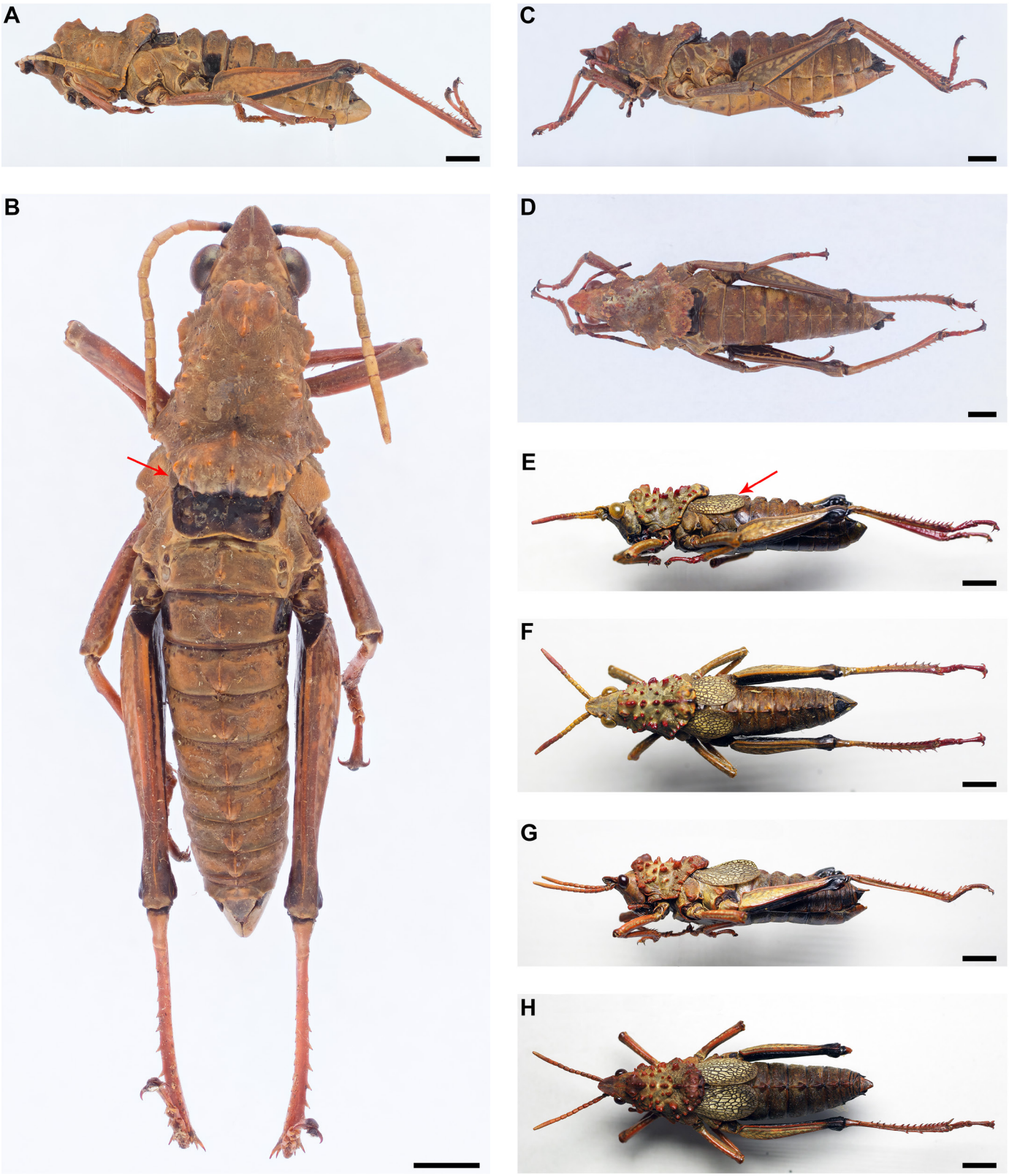

Figure 39. — African Pyrgomorphidae XX. **A-D.** *Parapetasia femorata* (vestigial tegmina). **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Parapetasia rammei* (brachypterous tegmina). **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

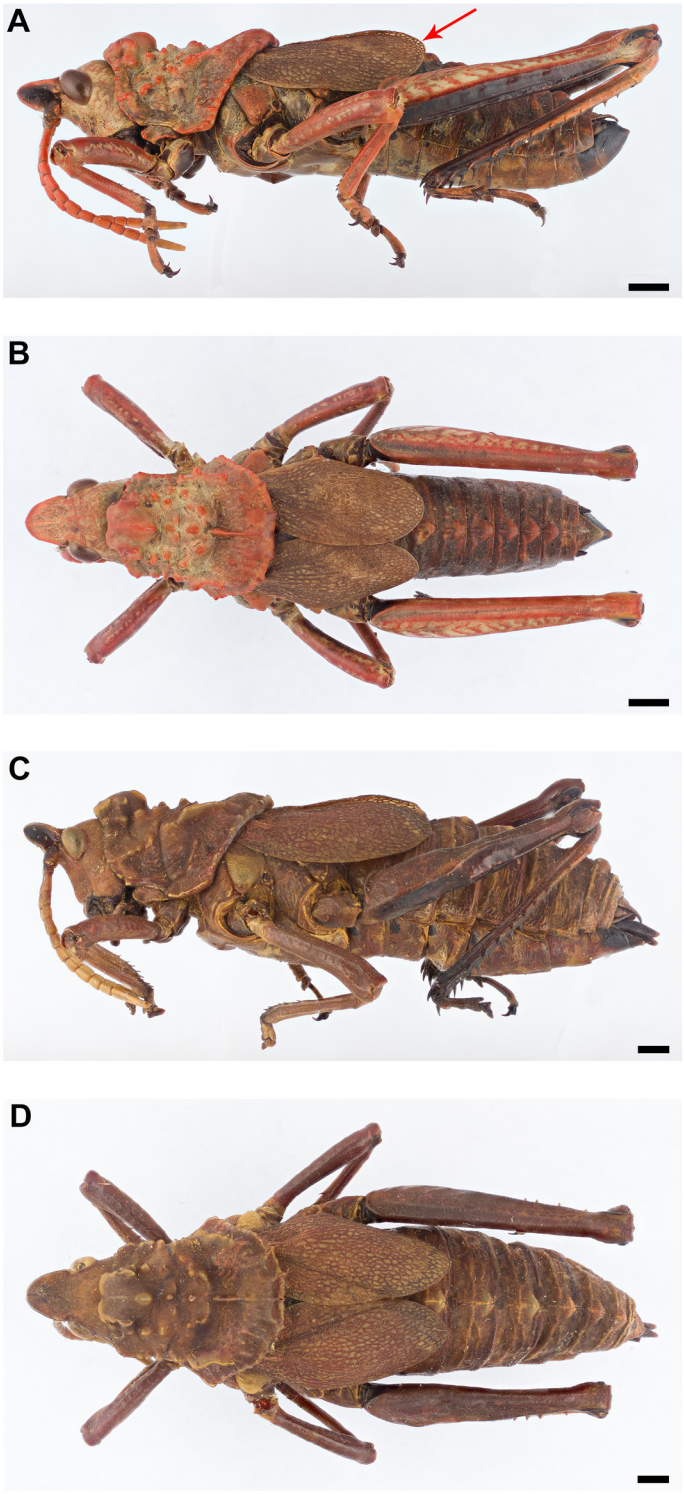

Figure 40. — African Pyrgomorphidae XXI. **A-D.** *Loveridgacris impotens*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

Figure 41. — African Pyrgomorphidae XXII. **A-D.** *Zonocerus elegans*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Zonocerus variegatus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

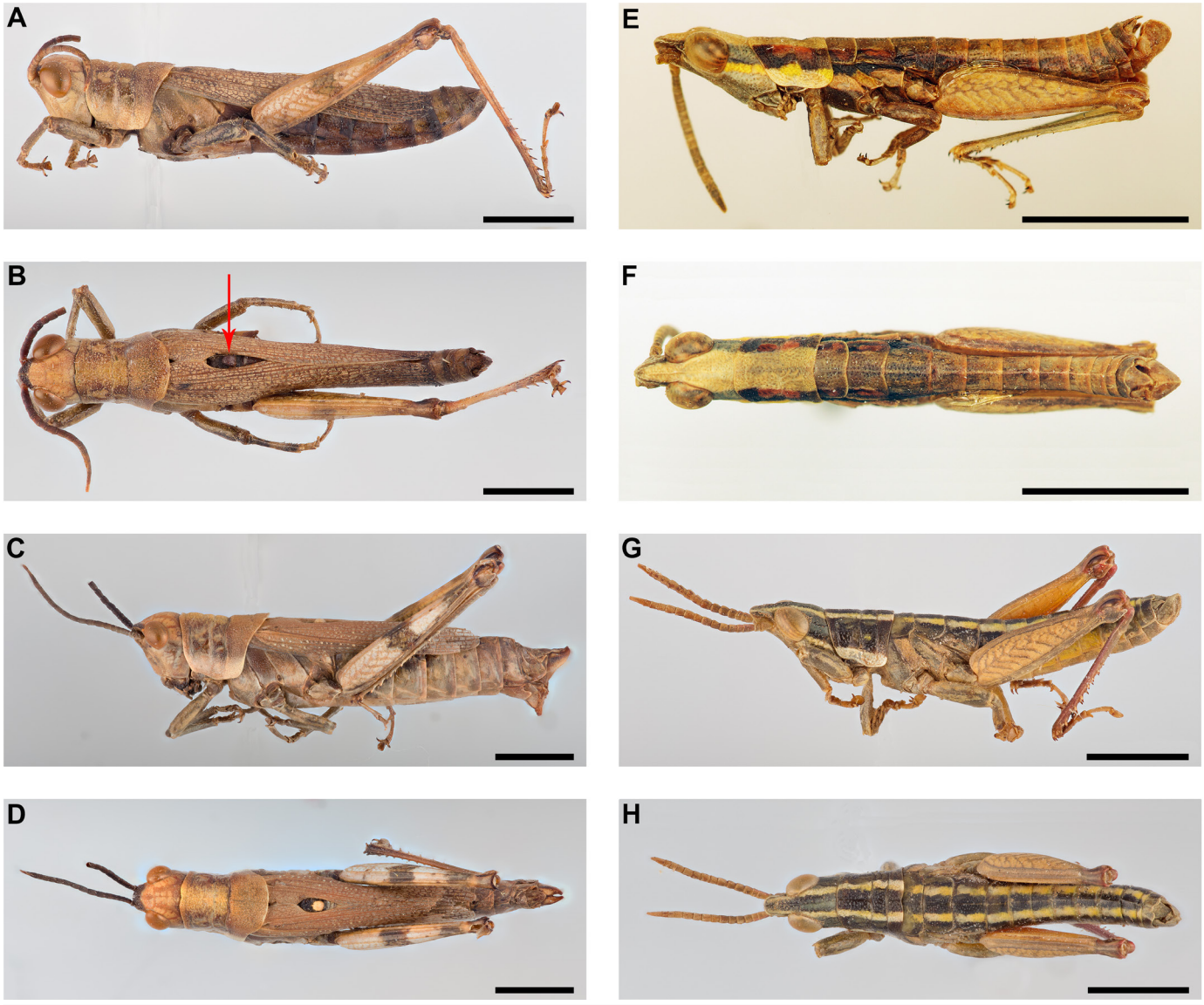

Figure 42. — African Pyrgomorphidae XXIII. **A-D.** *Physemophorus sokotranus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Parorthacris somalica*. **E.** Male lateral view. **F.** Male dorsal view. **G-H.** *Vittisphena somalica*. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

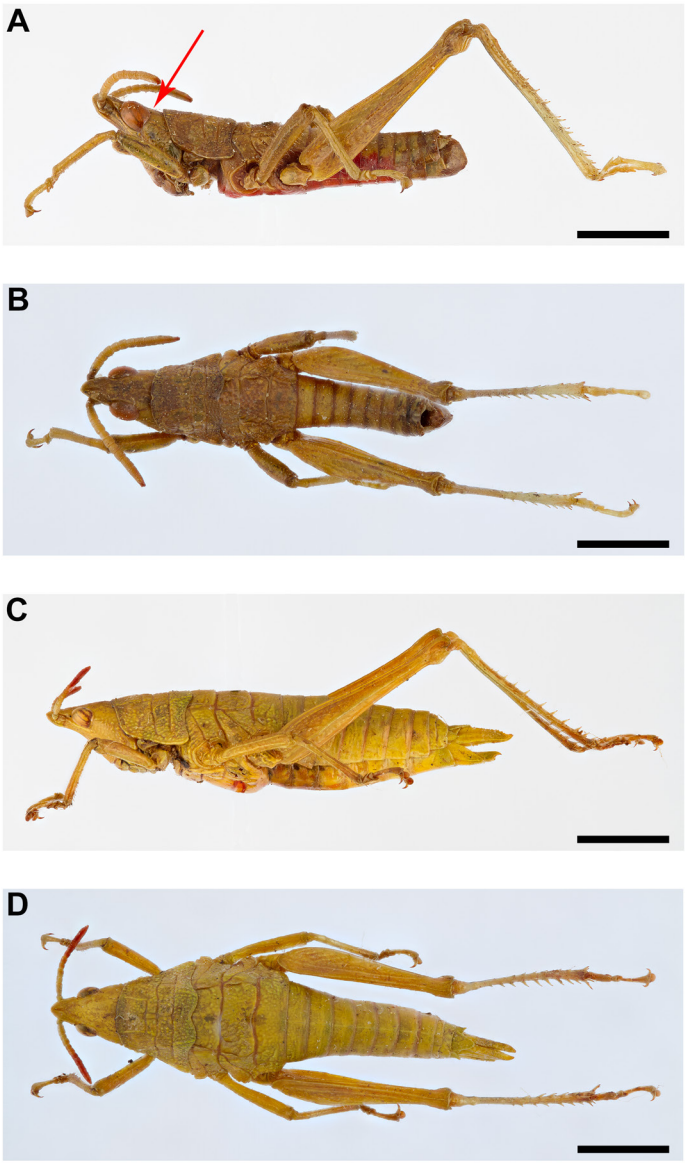

Figure 43. — African Pyrgomorphidae XXIV. **A-D.** *Occidentosphena ruandensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

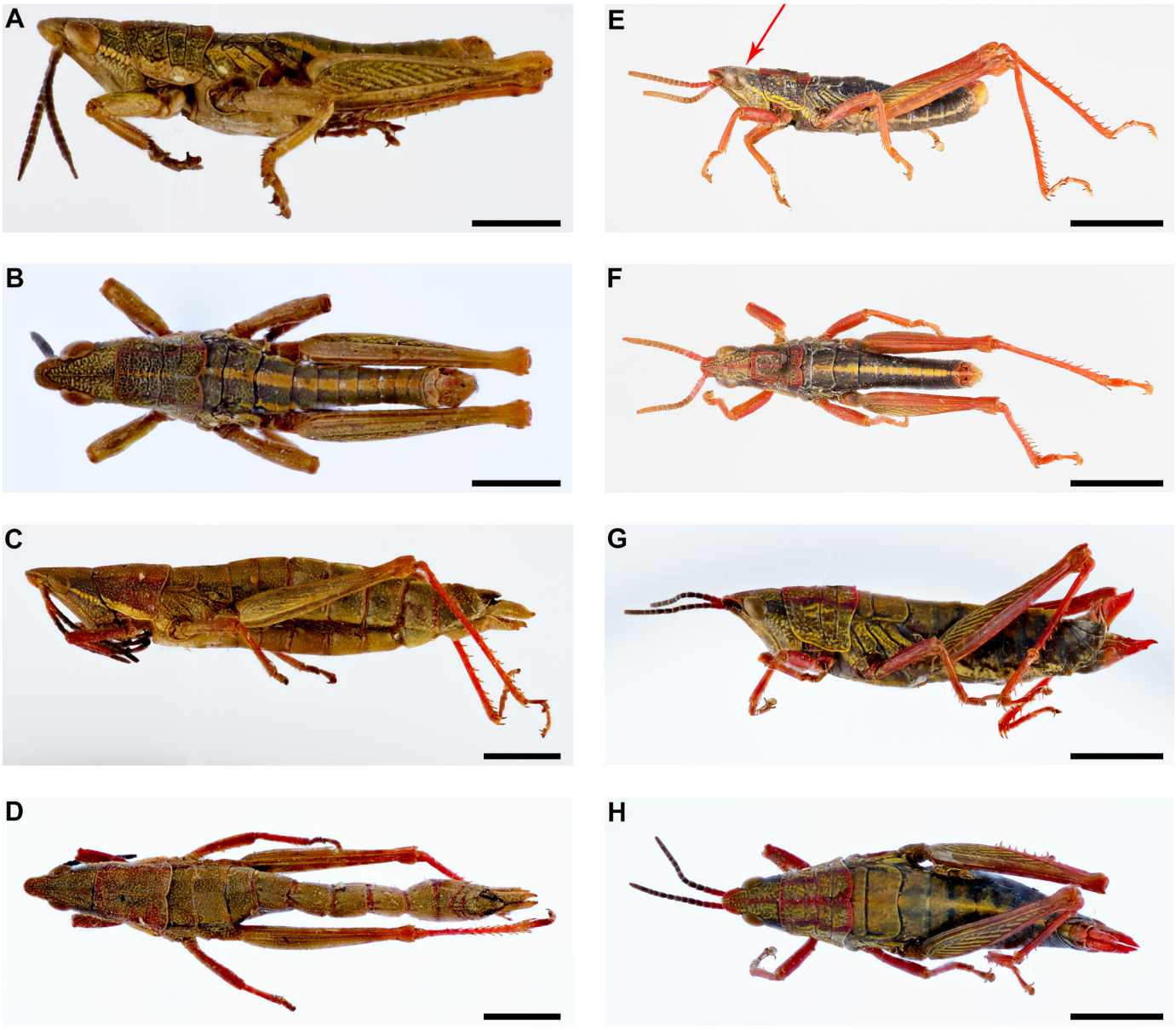

Figure 44. — African Pyrgomorphidae XXV. **A-D.** *Parasphena campestris*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Parasphena imatogensis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

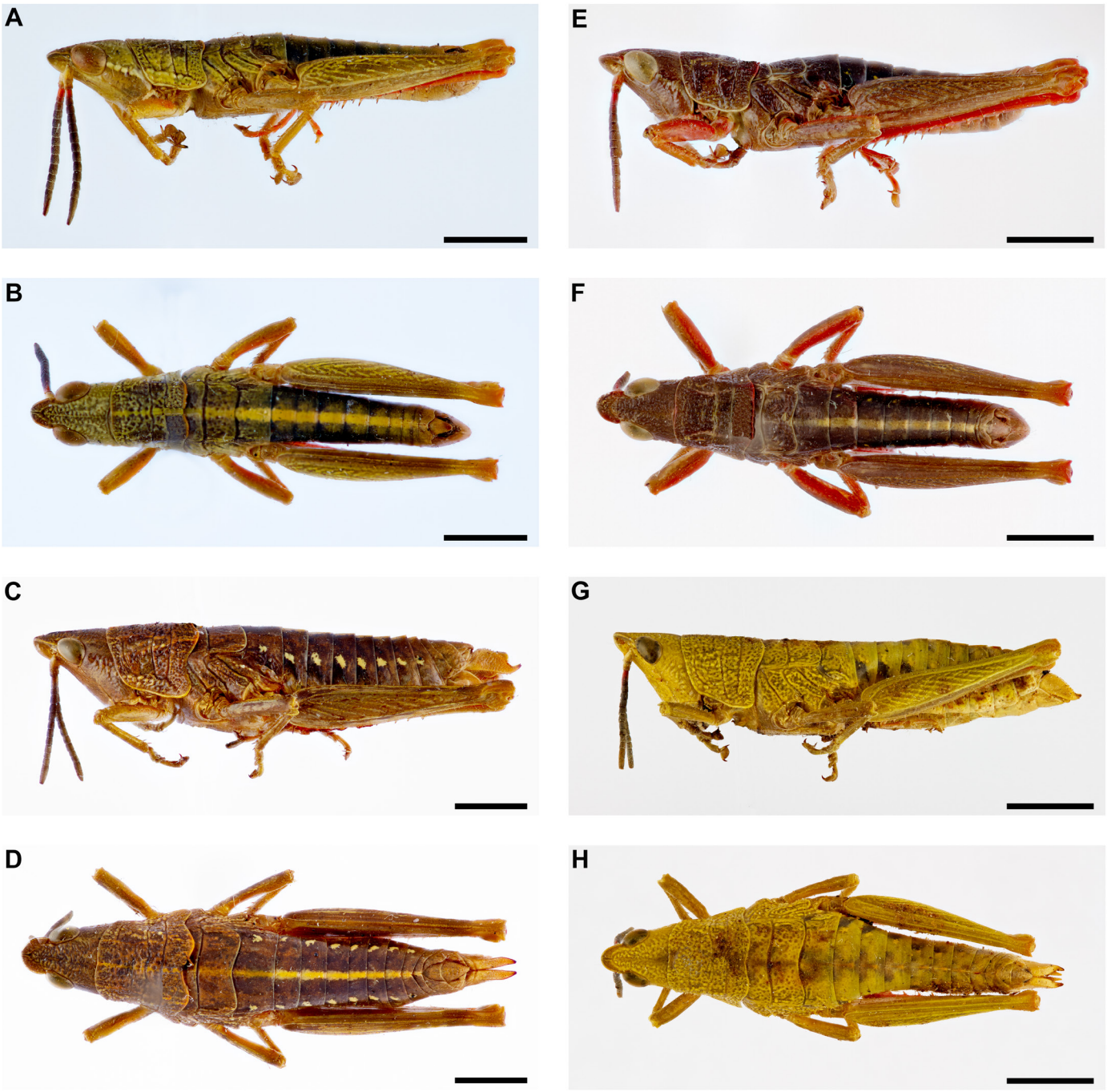

Figure 45. — African Pyrgomorphidae XXVI. **A-D.** *Parasphena keniensis keniensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Parasphena keniensis rehni*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

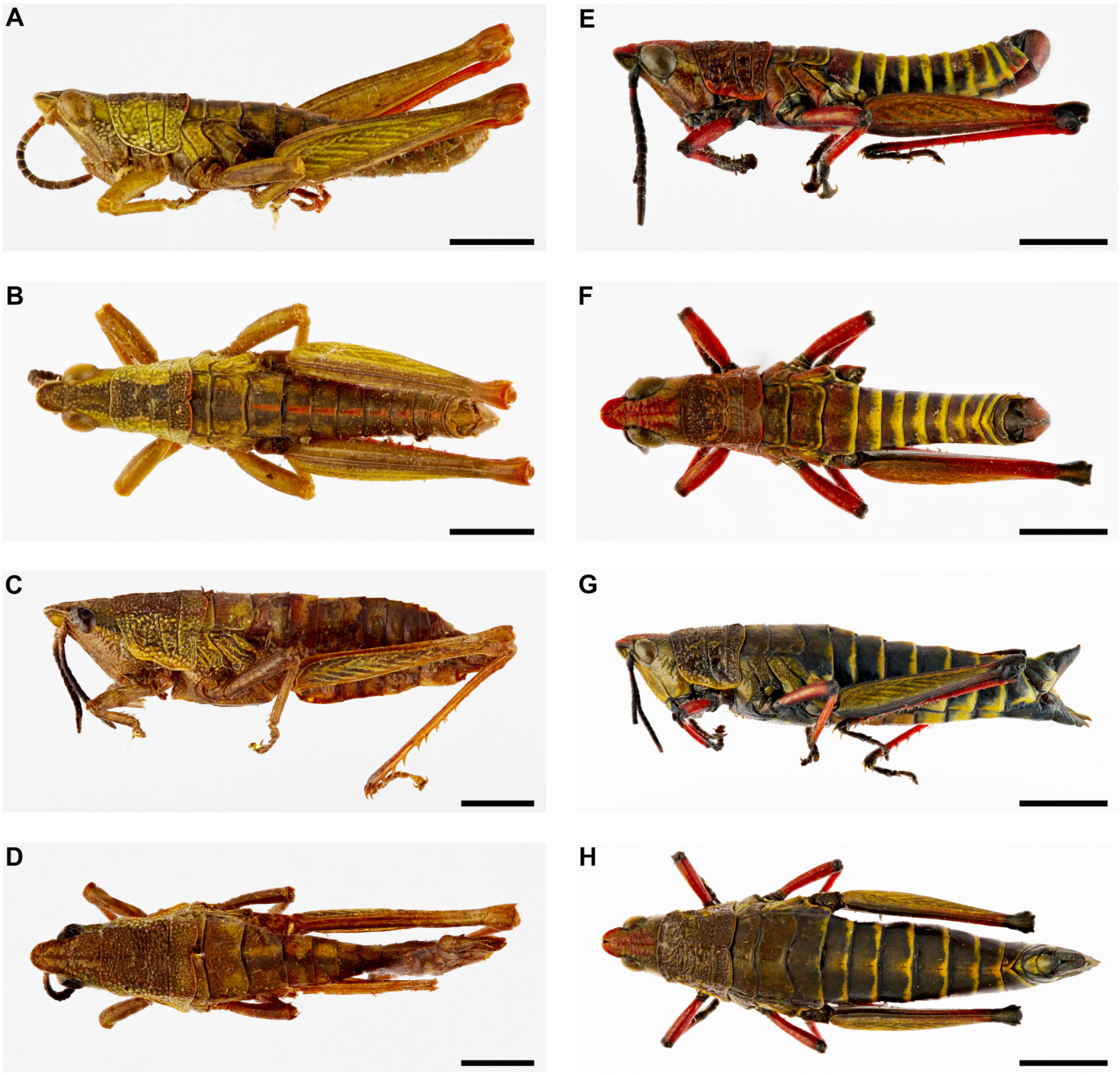

Figure 46. — African Pyrgomorphidae XXVII. **A-D.** *Parasphena meruensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Parasphena pulchripes*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

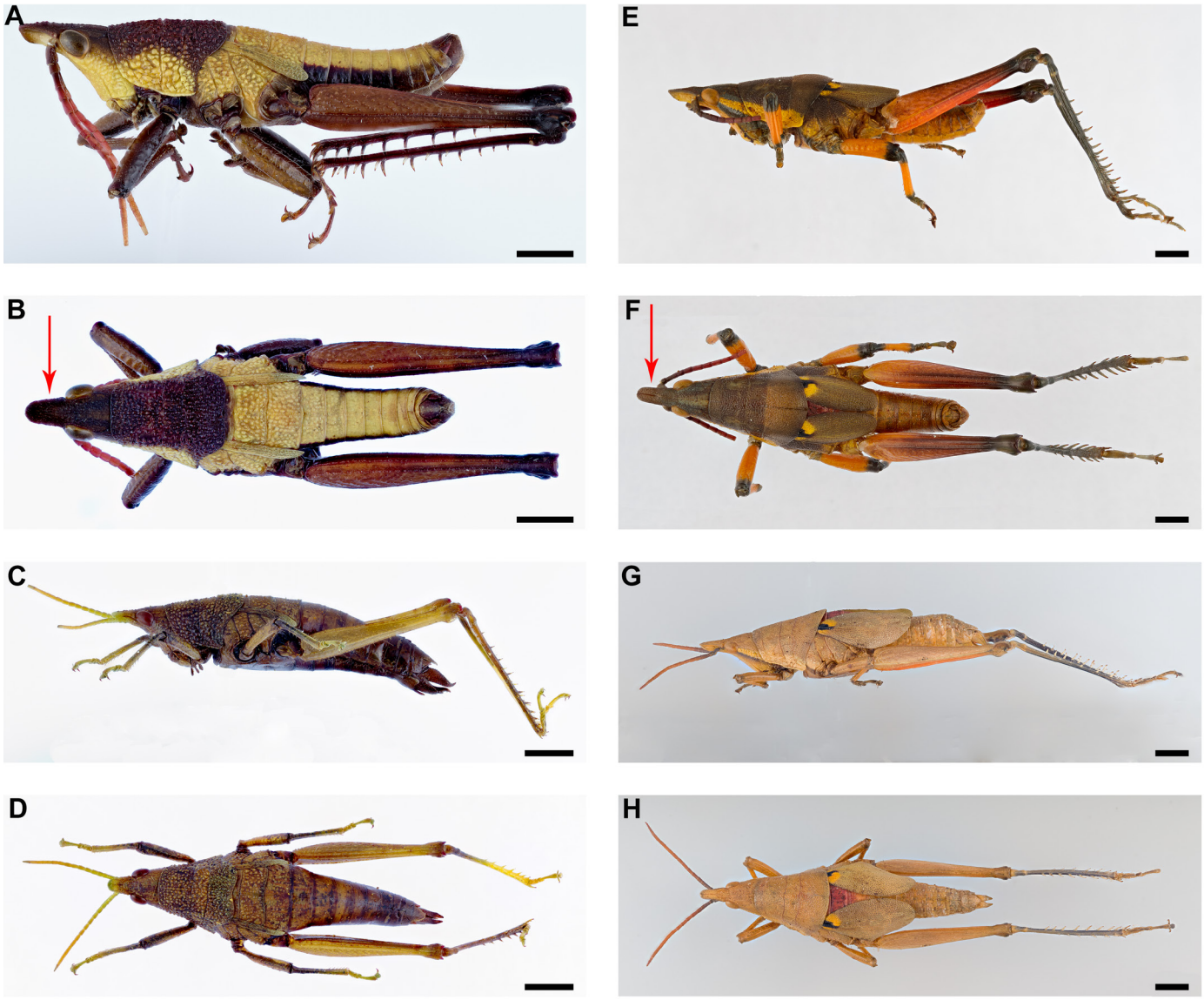

Figure 47. — African Pyrgomorphidae XXVIII. **A-D.** *Chirindites odendaali*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Sphenexia fusiformis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

Figure 48. — African Pyrgomorphidae XXIX. **A-D.** *Cawendia glabrata*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

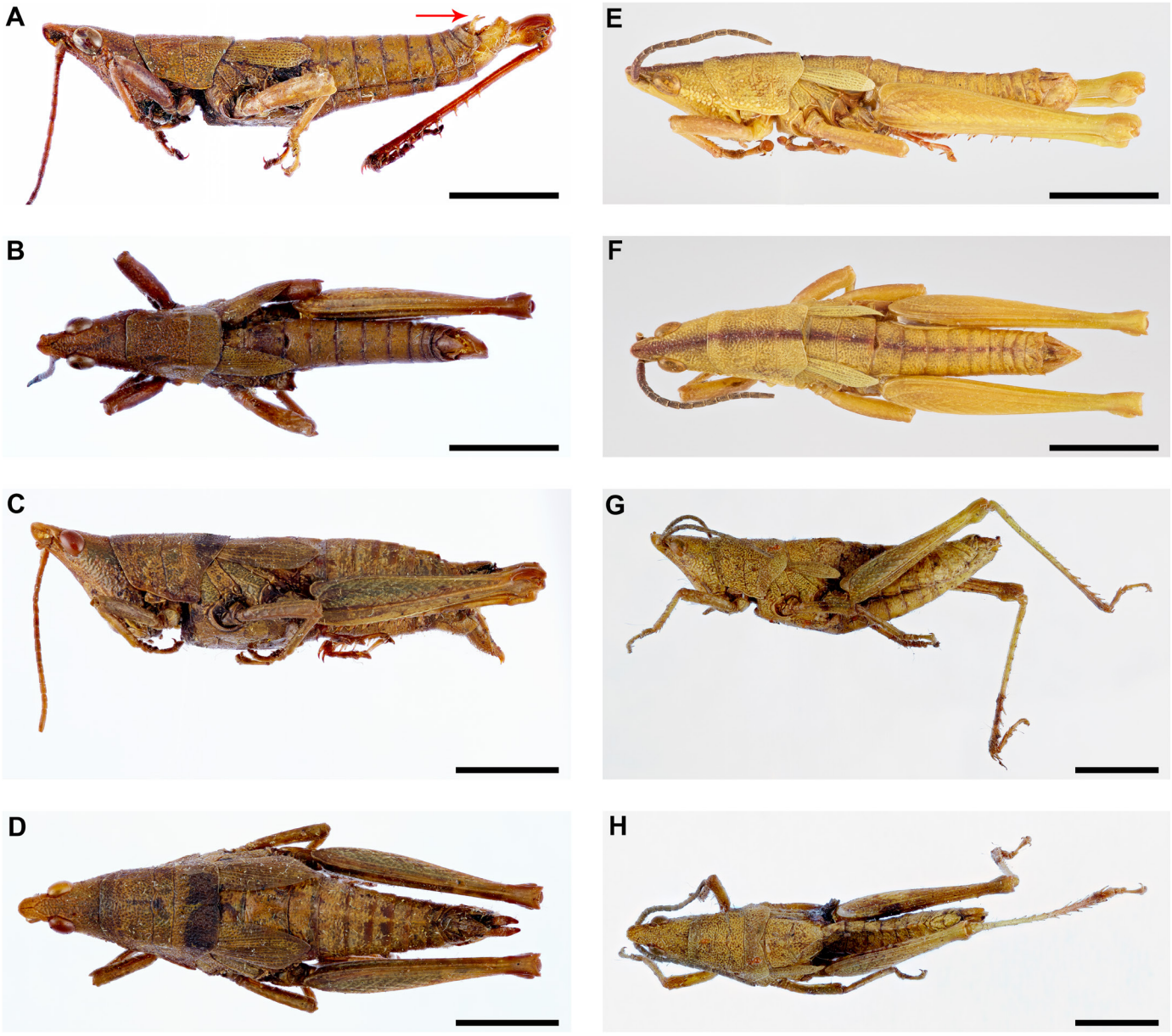

Figure 49. — African Pyrgomorphidae XXX. **A-D.** *Pezotagasta angolensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pezotagasta bredoi*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

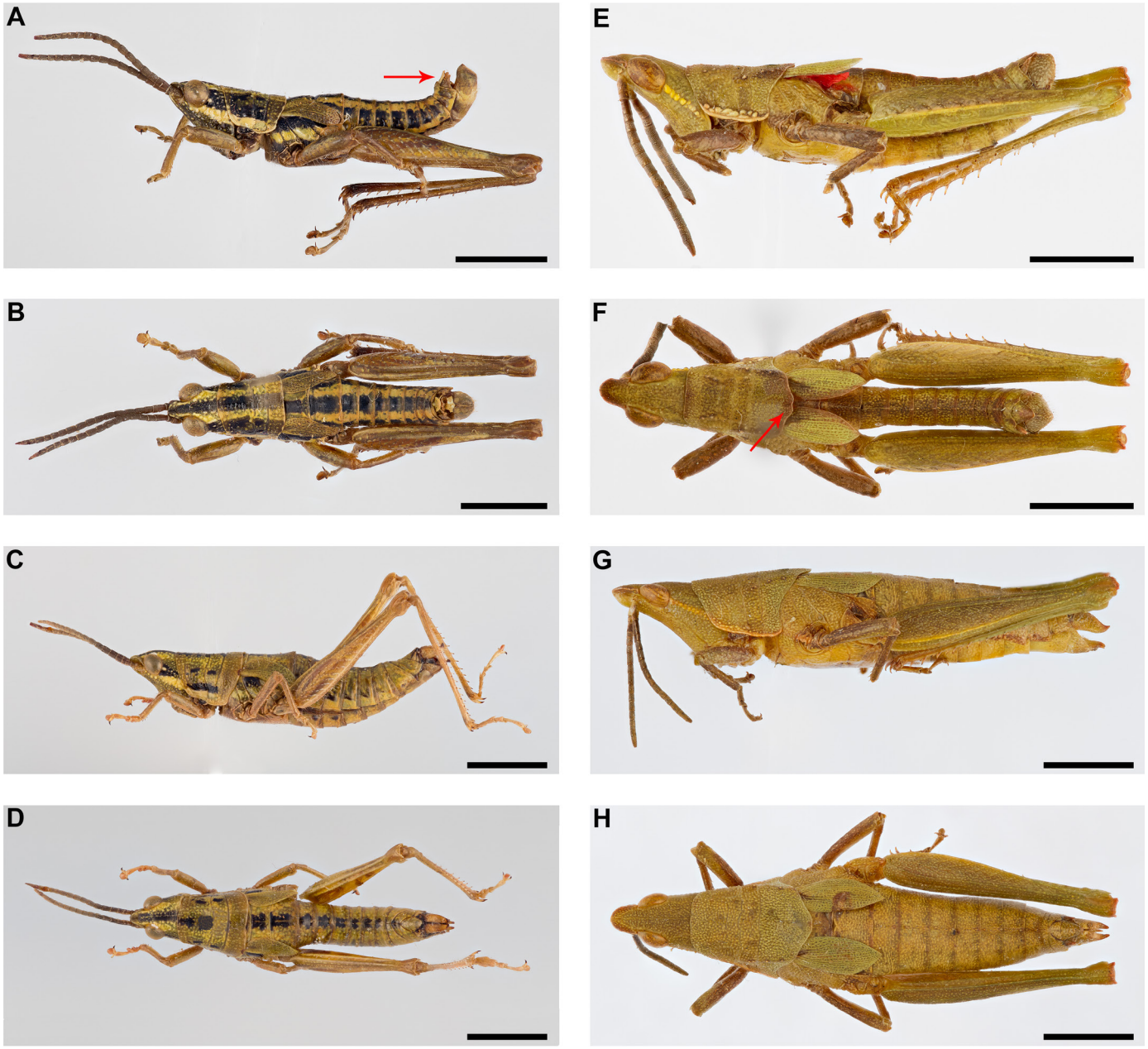

Figure 50. — African Pyrgomorphidae XXXI. **A-D.** *Humpatella huambae*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Plerisca rubripennulis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

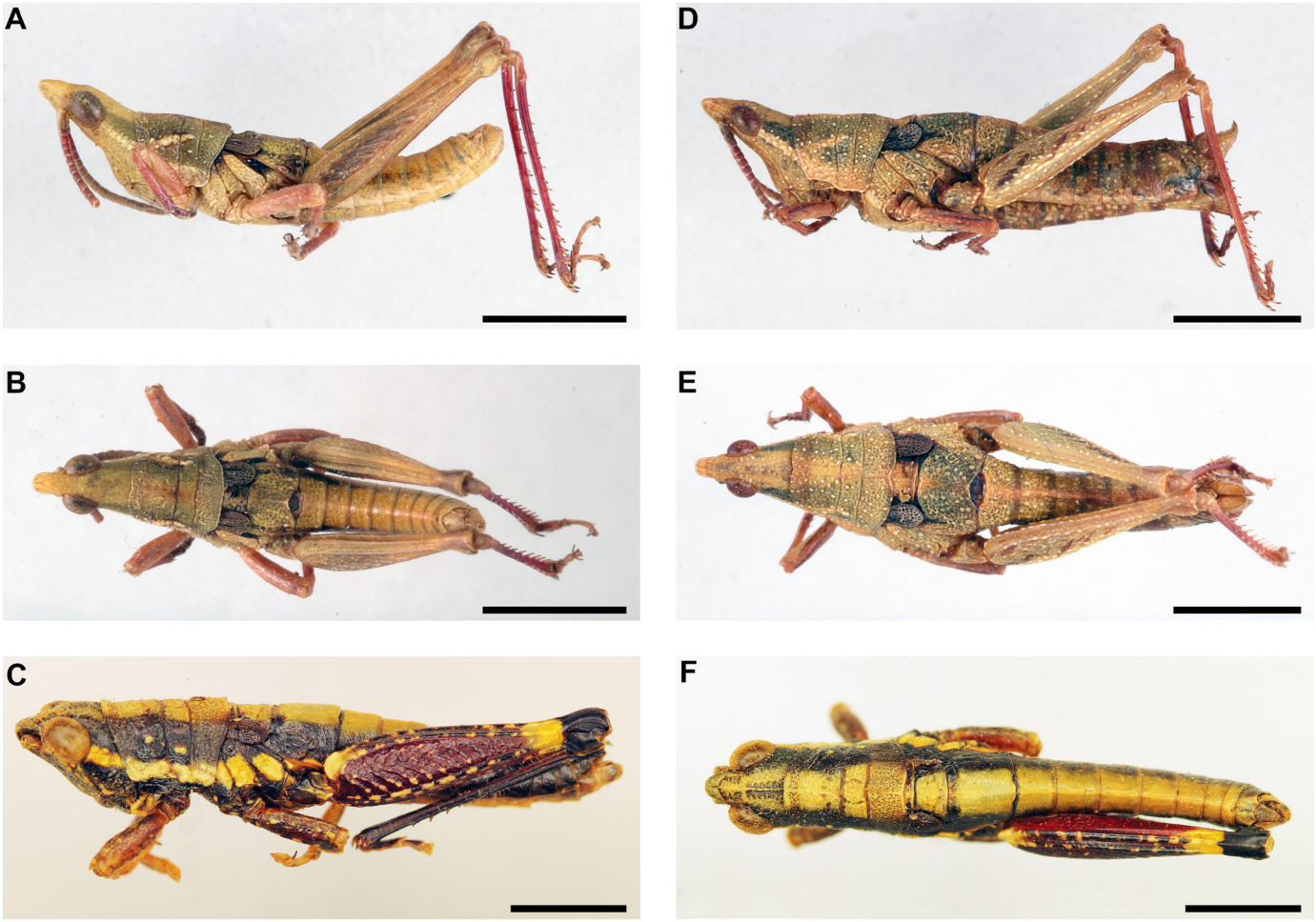

Figure 51. — African Pyrgomorphidae XXXII. **A-B, D-E.** *Somalopyrgus messanai*. **A.** Male lateral view. **B.** Male dorsal view. **D.** Female lateral view. **E.** Female dorsal view. **C, F.** *Marsabitacris citronota*. **C.** Male lateral view. **F.** Male dorsal view. Scale bar = 5 mm.

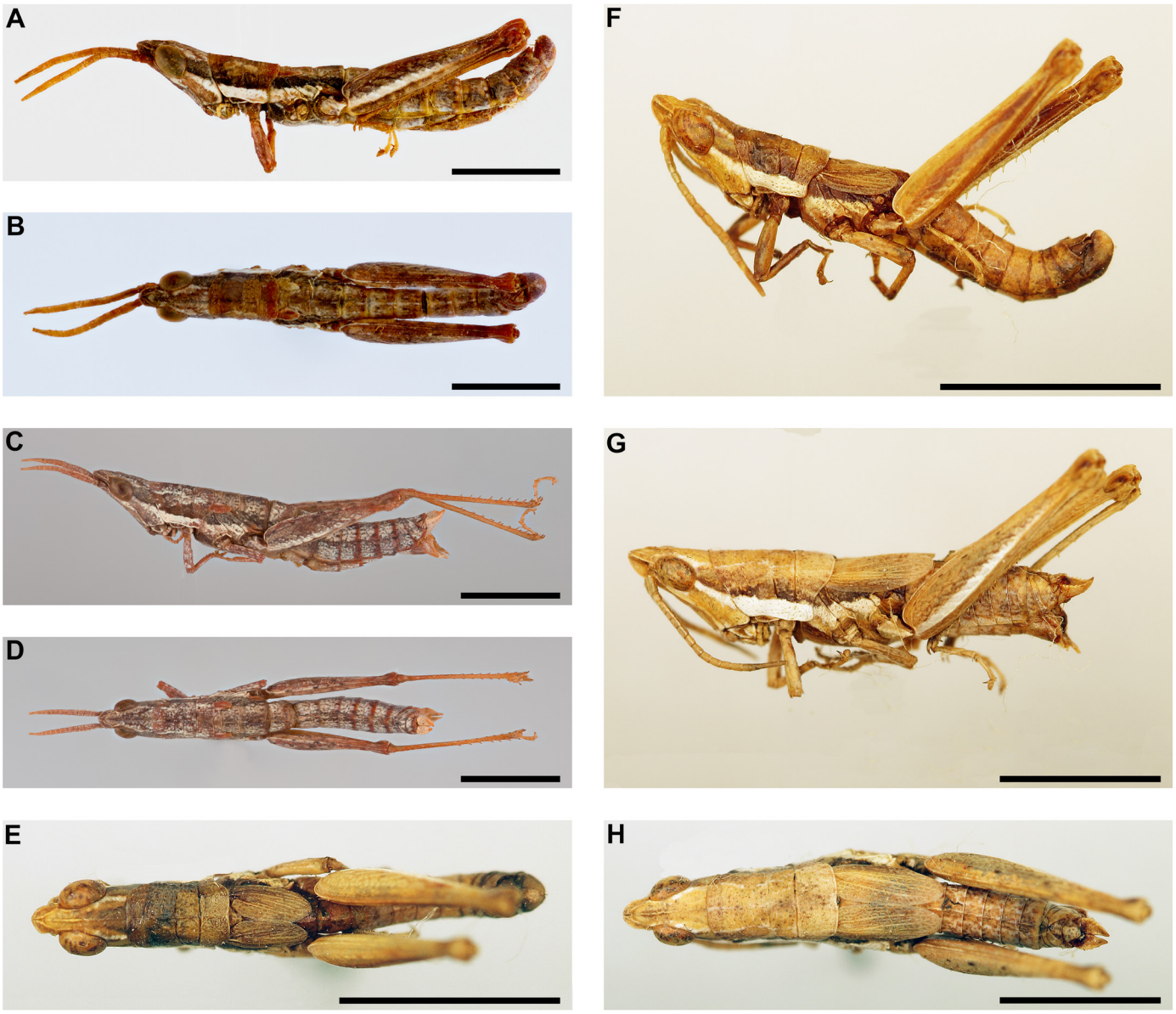

Figure 52. — African Pyrgomorphidae XXXIII. **A-D.** *Leptea debilis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Leptea albotaeniata*. **E.** Male dorsal view. **F.** Male lateral view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

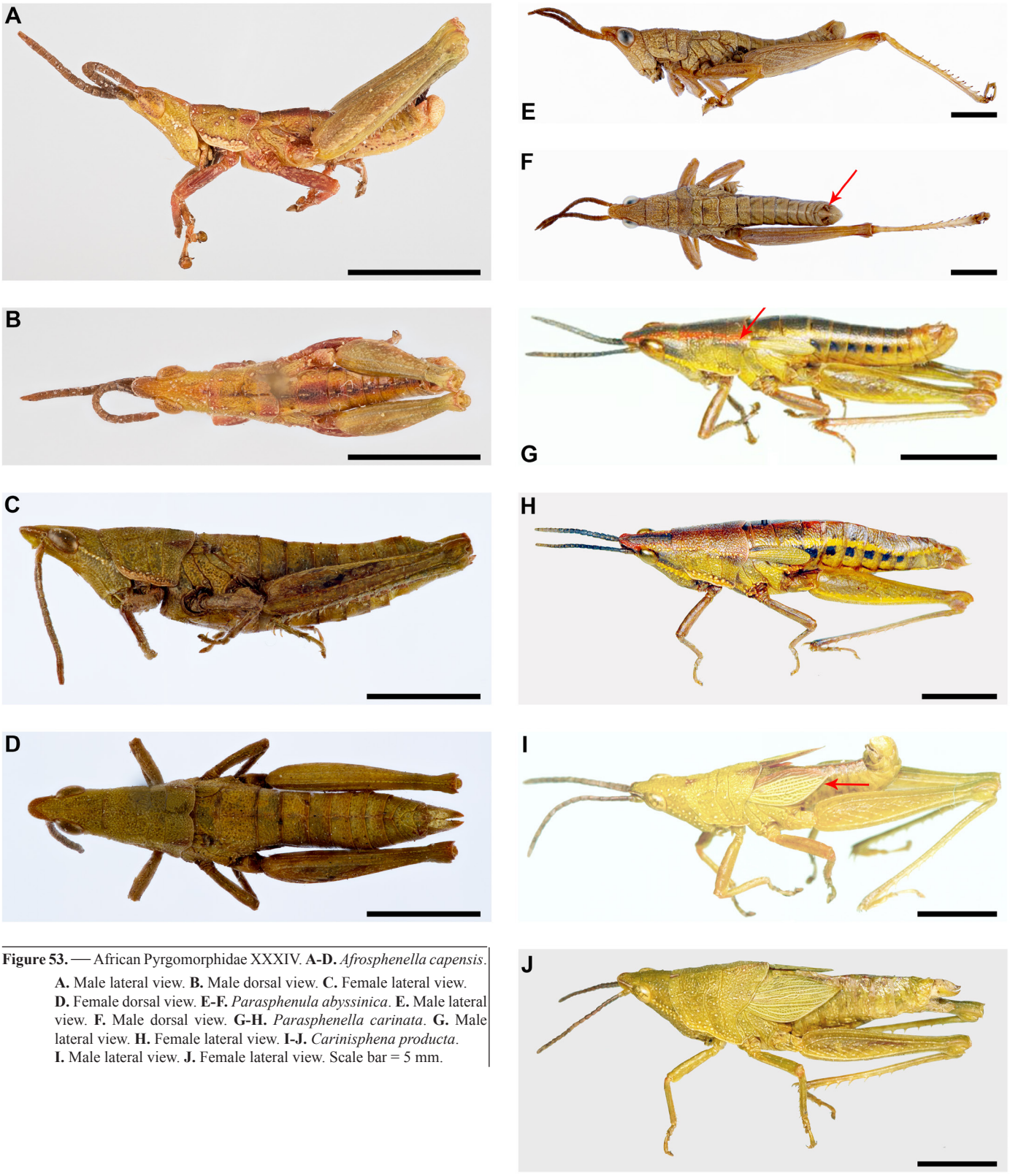

Figure 53. — African Pyrgomorphidae XXXIV. **A-D.** *Afrosphenella capensis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Parasphenula abyssinica*. **E.** Male lateral view. **F.** Male dorsal view. **G-H.** *Parasphenella carinata*. **G.** Male lateral view. **H.** Female lateral view. **I-J.** *Carinisphena producta*. **I.** Male lateral view. **J.** Female lateral view. Scale bar = 5 mm.

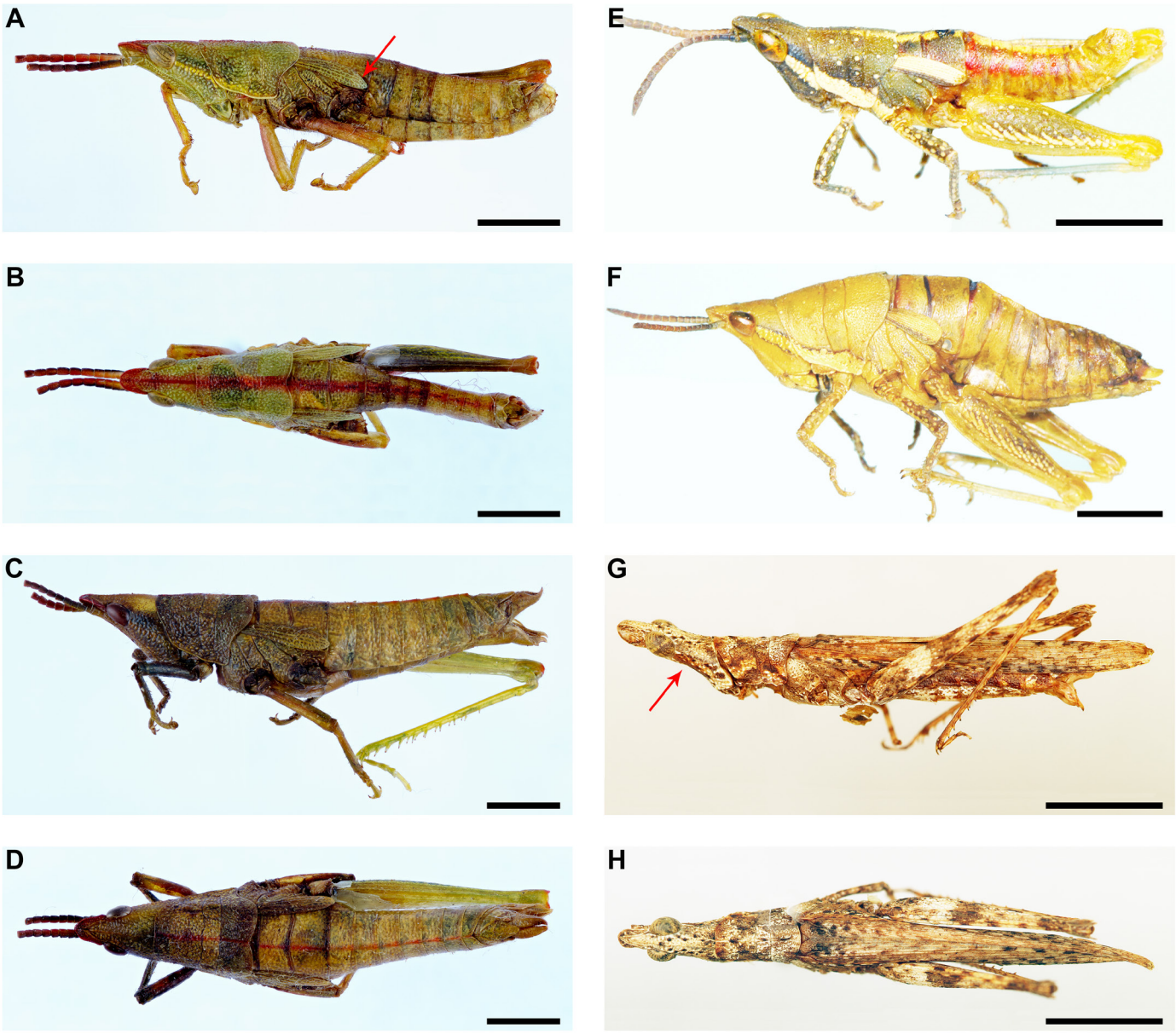

Figure 54. — African Pyrgomorphidae XXXV. **A-D.** *Stenoscepa gracilis*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Punctisphena pustulata*. **E.** Male lateral view. **F.** Female lateral view. **G-H.** *Xiphipyrgus tunstalli*. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

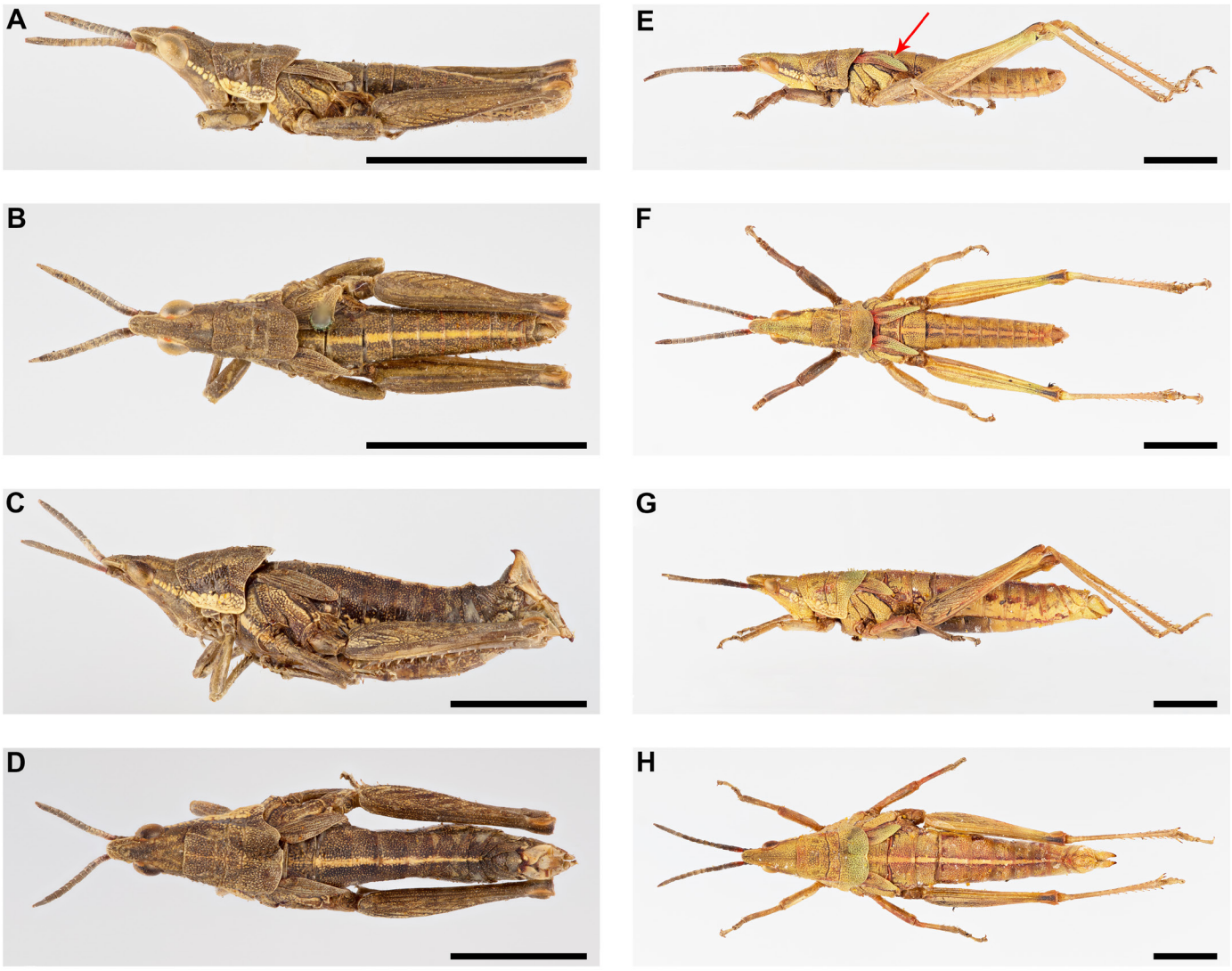

Figure 55. — African Pyrgomorphidae XXXVI. **A-D.** *Pyrgomorphella albini*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgomorphella arachidis*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

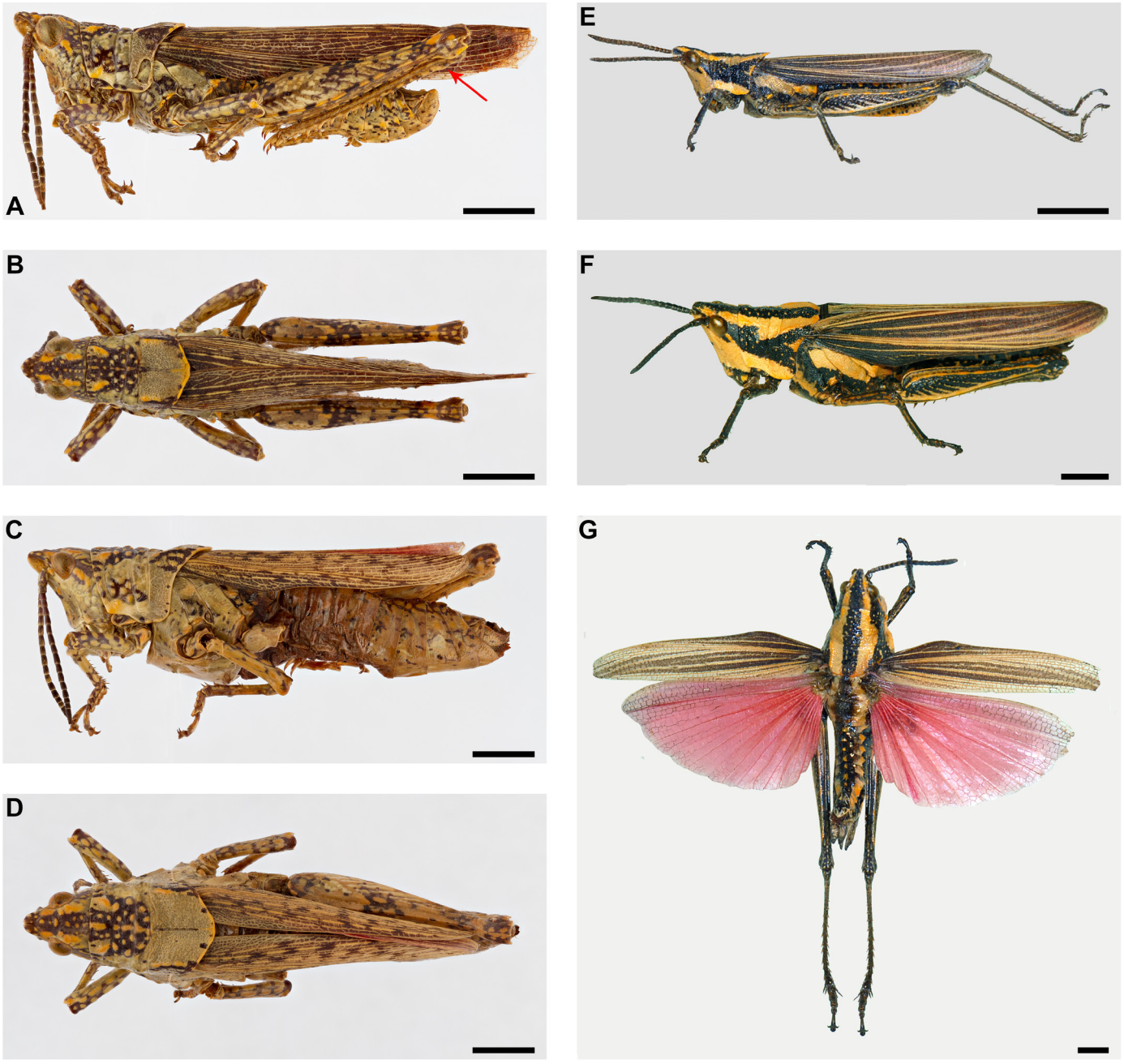

Figure 56. — African Pyrgomorphidae XXXVII. **A-D.** *Ochrophlebia cafra cafra*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-G.** *Ochrophlebia cafra ligneola*. **E.** Male lateral view. **F.** Female lateral view. **G.** Female dorsal view. Scale bar = 5 mm.

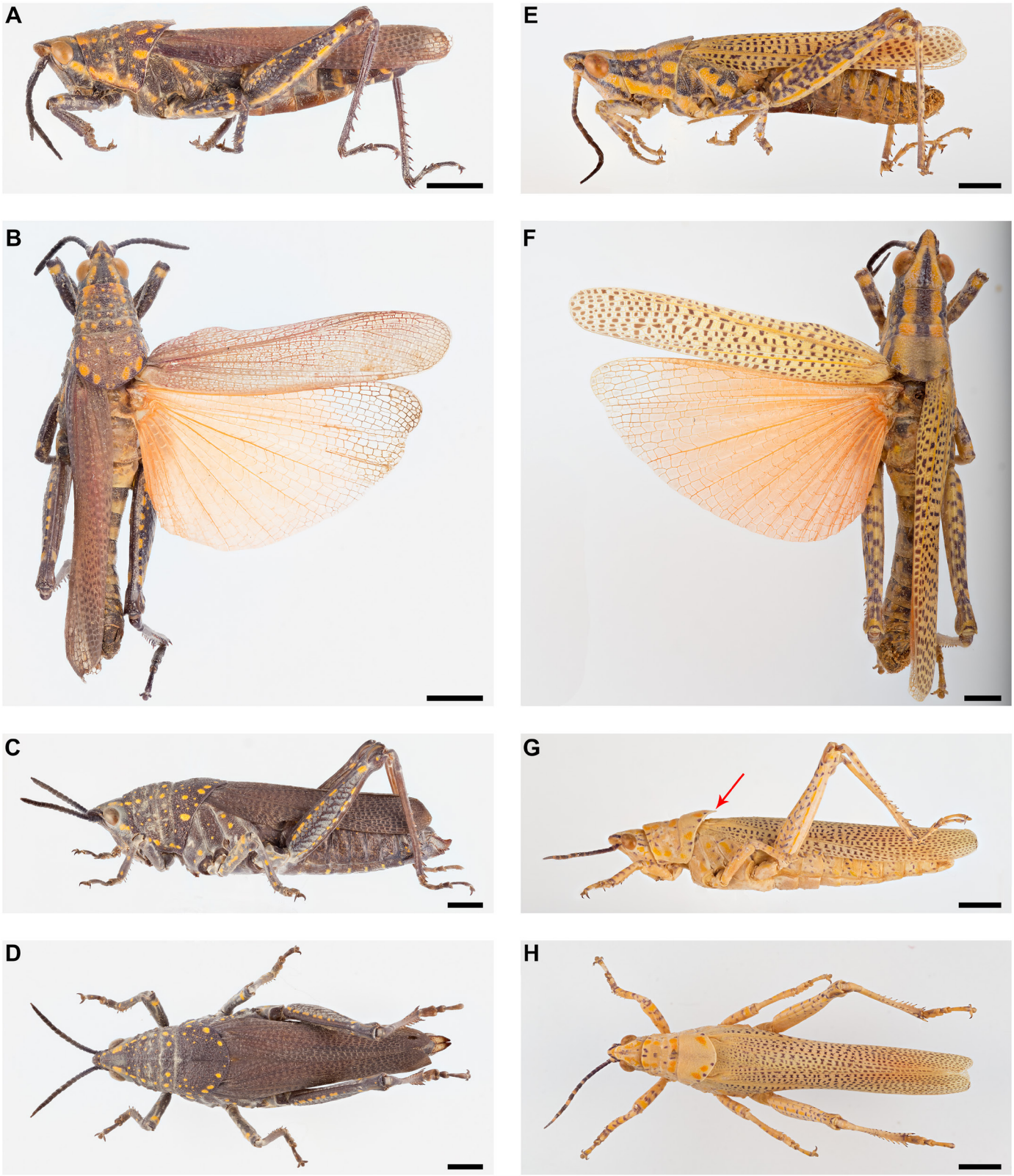

Figure 57. — African Pyrgomorphidae XXXVIII. **A-D.** *Poekilocerus bufonius bufonius*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Poekilocerus bufonius hieroglyphicus*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

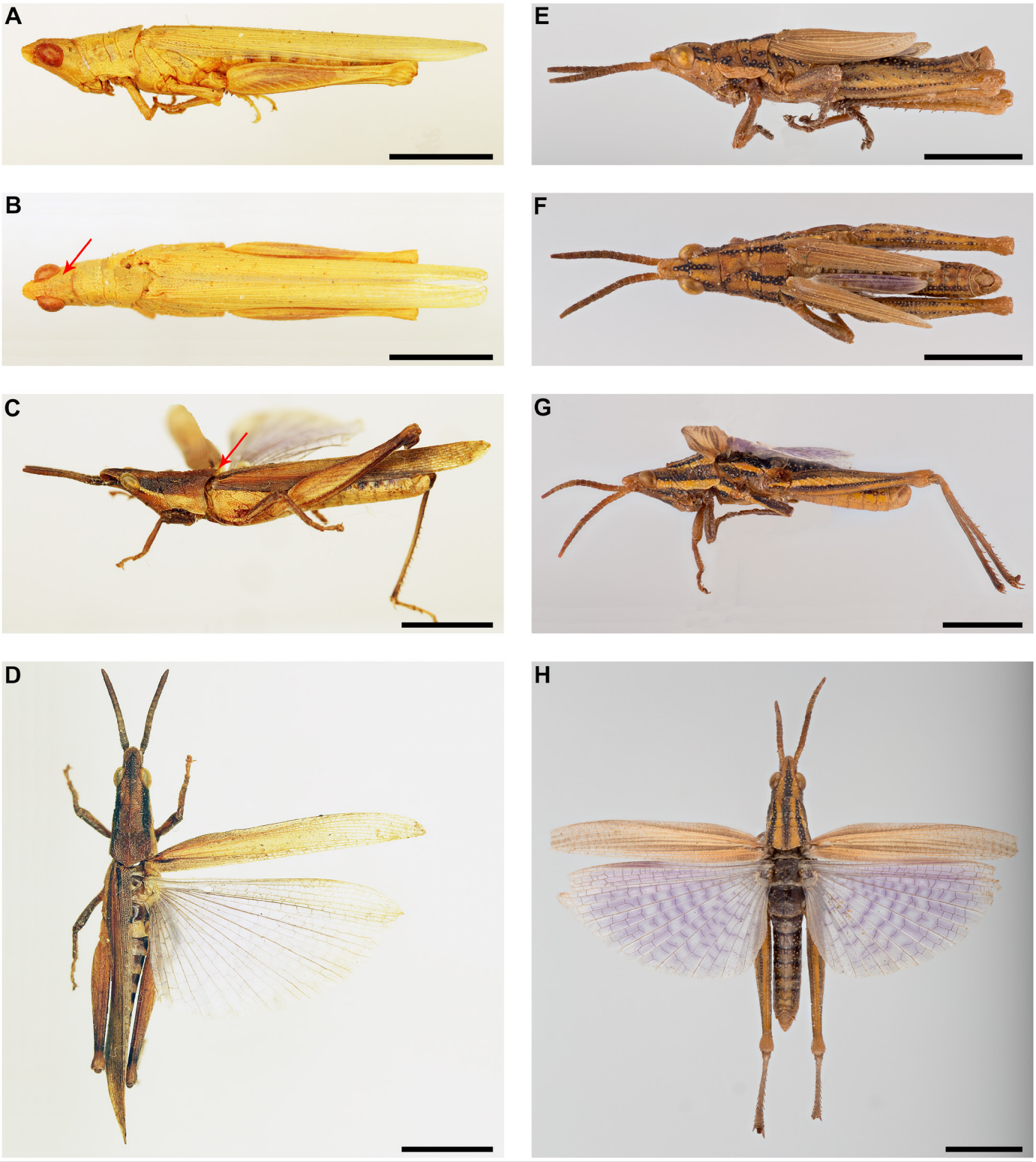

Figure 58. — African Pyrgomorphidae XXXIX. **A-B.** *Macroleptea laevigata*. **A.** Male lateral view. **B.** Male dorsal view. **C-D.** *Eilenbergia sagitta*. **C.** Male lateral view. **D.** Male dorsal view. **E-F.** *Ochrophlegma pygmaea*. **E.** Male lateral view. **F.** Male dorsal view. **G-H.** *Ochrophlegma violacea*. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

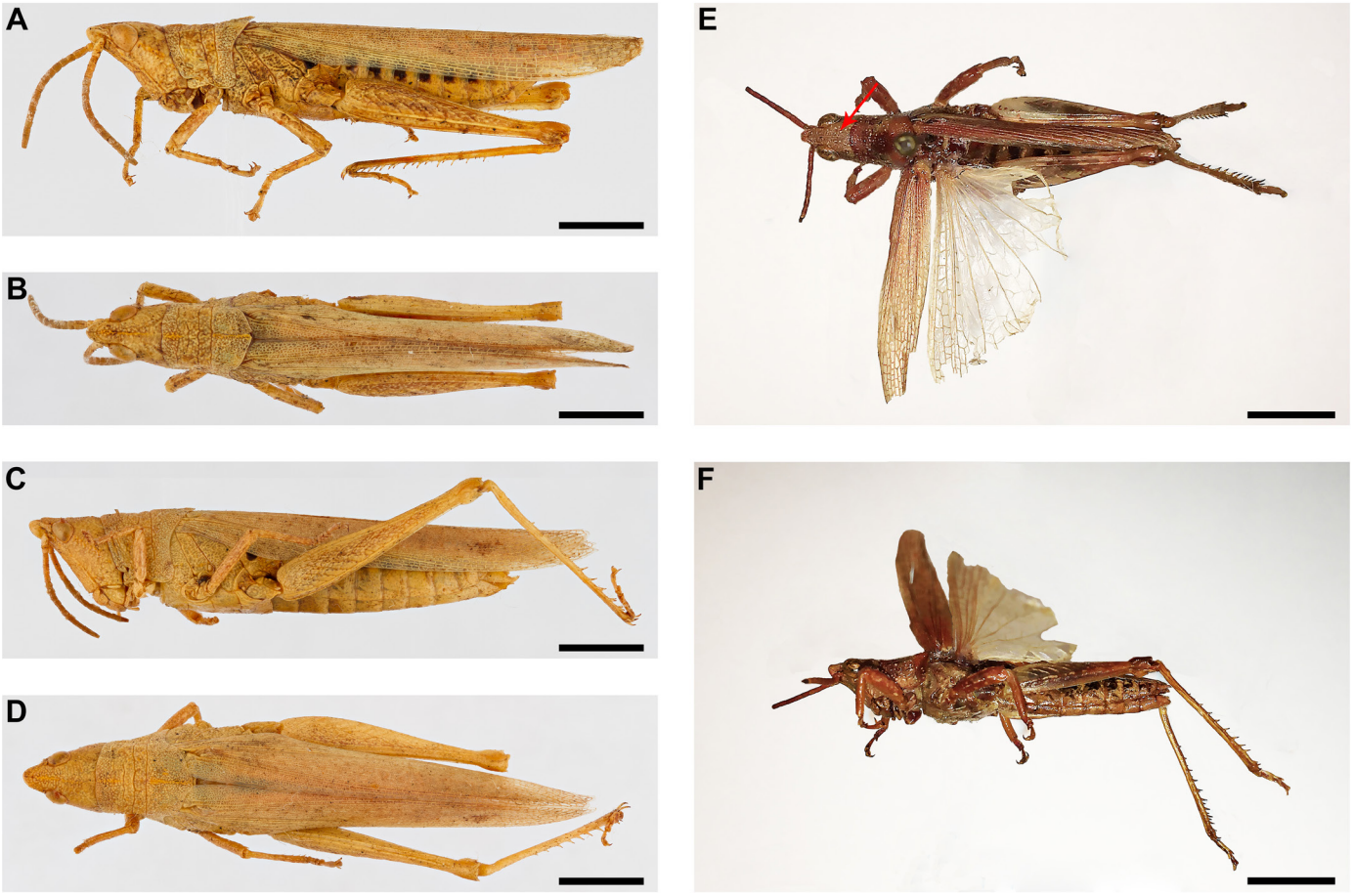

Figure 59. — African Pyrgomorphidae XL. **A-D.** *Laufferia chloronota*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Katangacris enigmatica*. **E.** Male dorsal. **F.** Male lateral. Scale bar = 5 mm.

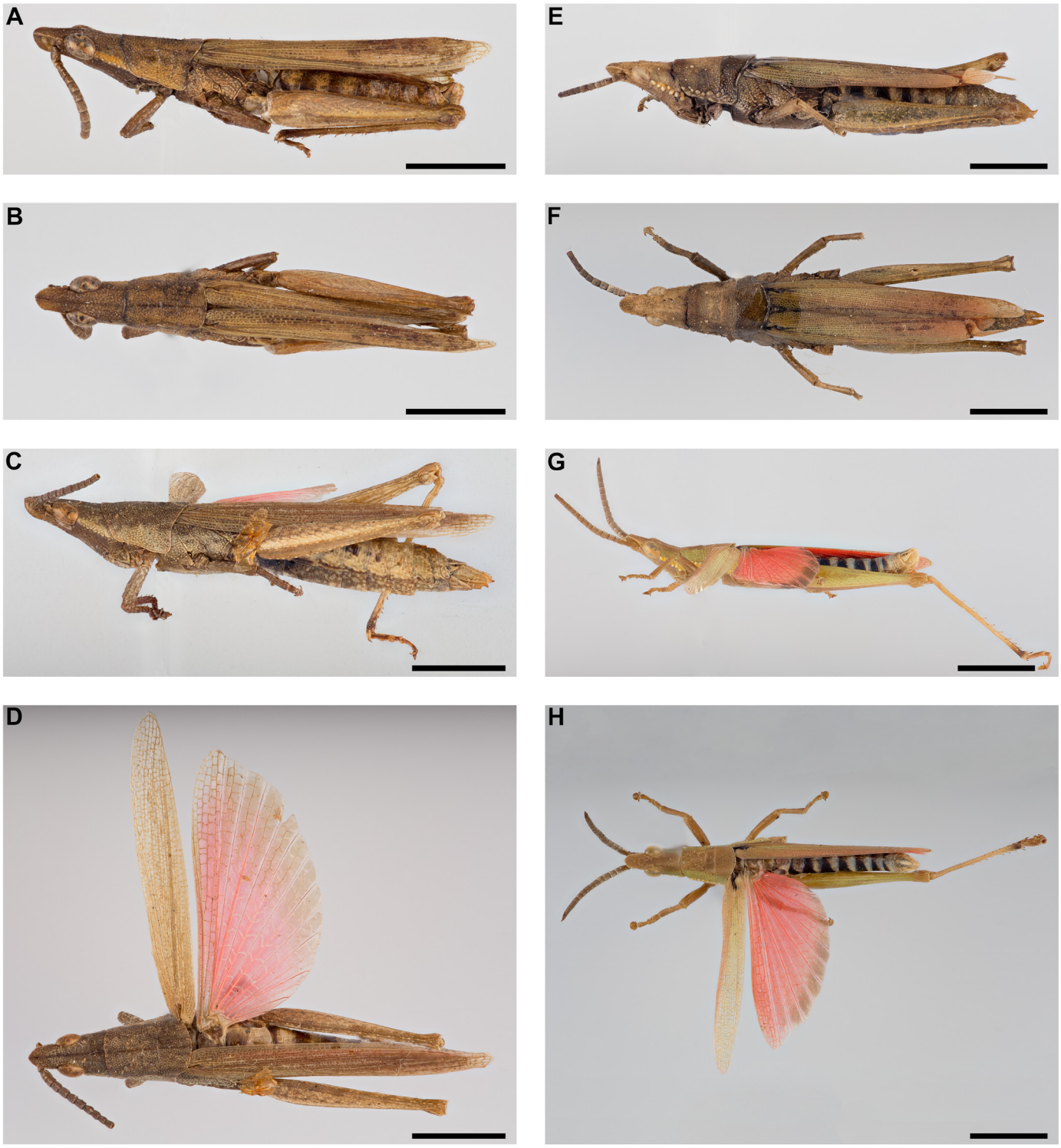

Figure 60. — African Pyrgomorphidae XLI. **A-D.** *Protanita elongata*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Protanita fusiformis*. **E.** Female lateral view. **F.** Female dorsal view. **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

Figure 61. — African Pyrgomorphidae XLII. **A-D.** *Pyrgomorpha vignaudii*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgomorpha minuta*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

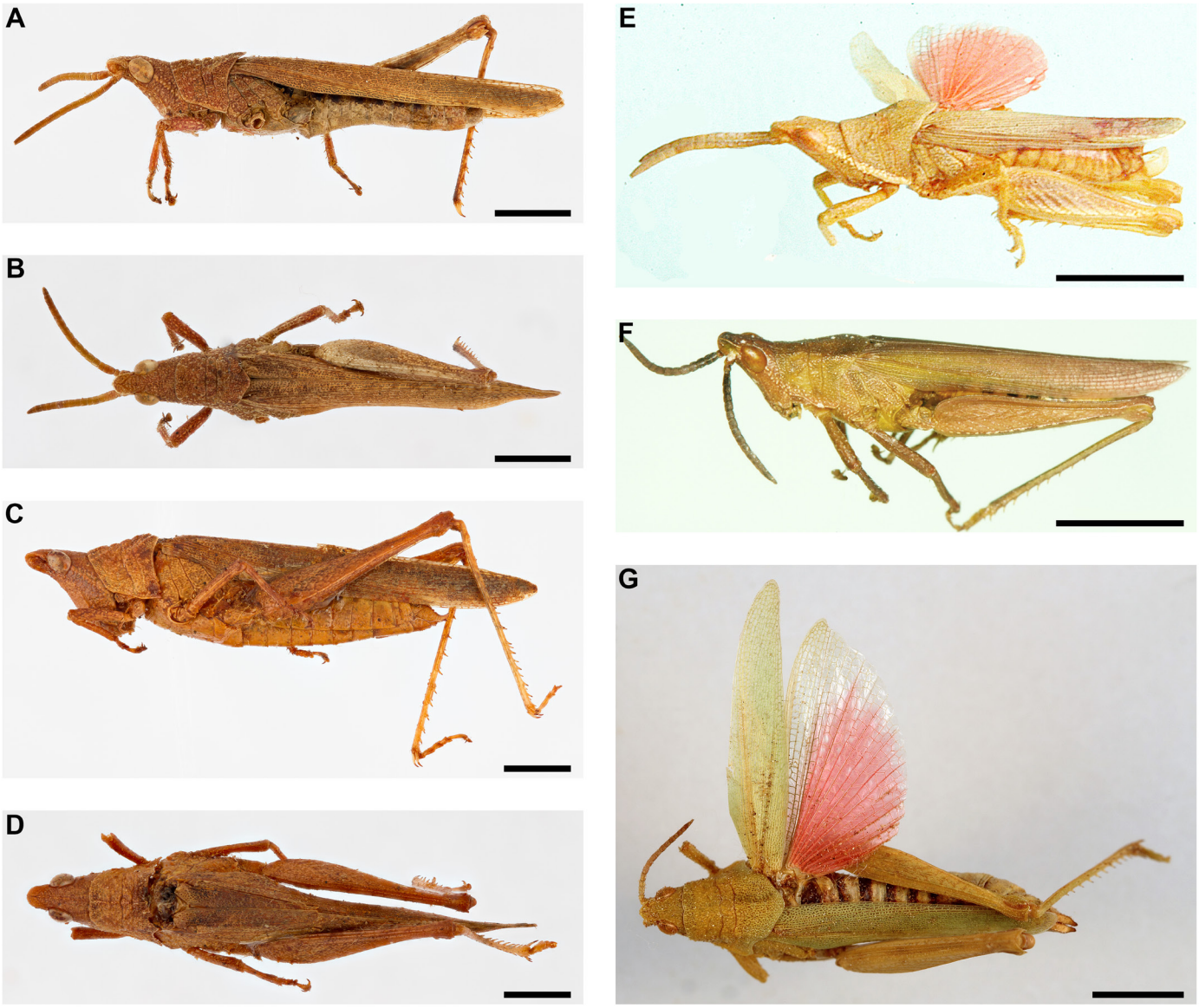

Figure 62. — African Pyrgomorphidae XLIII. **A-D.** *Scabropyrgus scabrosus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E.** *Tanitella sanderi*. **E.** Male lateral view. **F-G.** *Tanitella prasina*. **F.** Male lateral view. **G.** Female dorsal view. Scale bar = 5 mm.

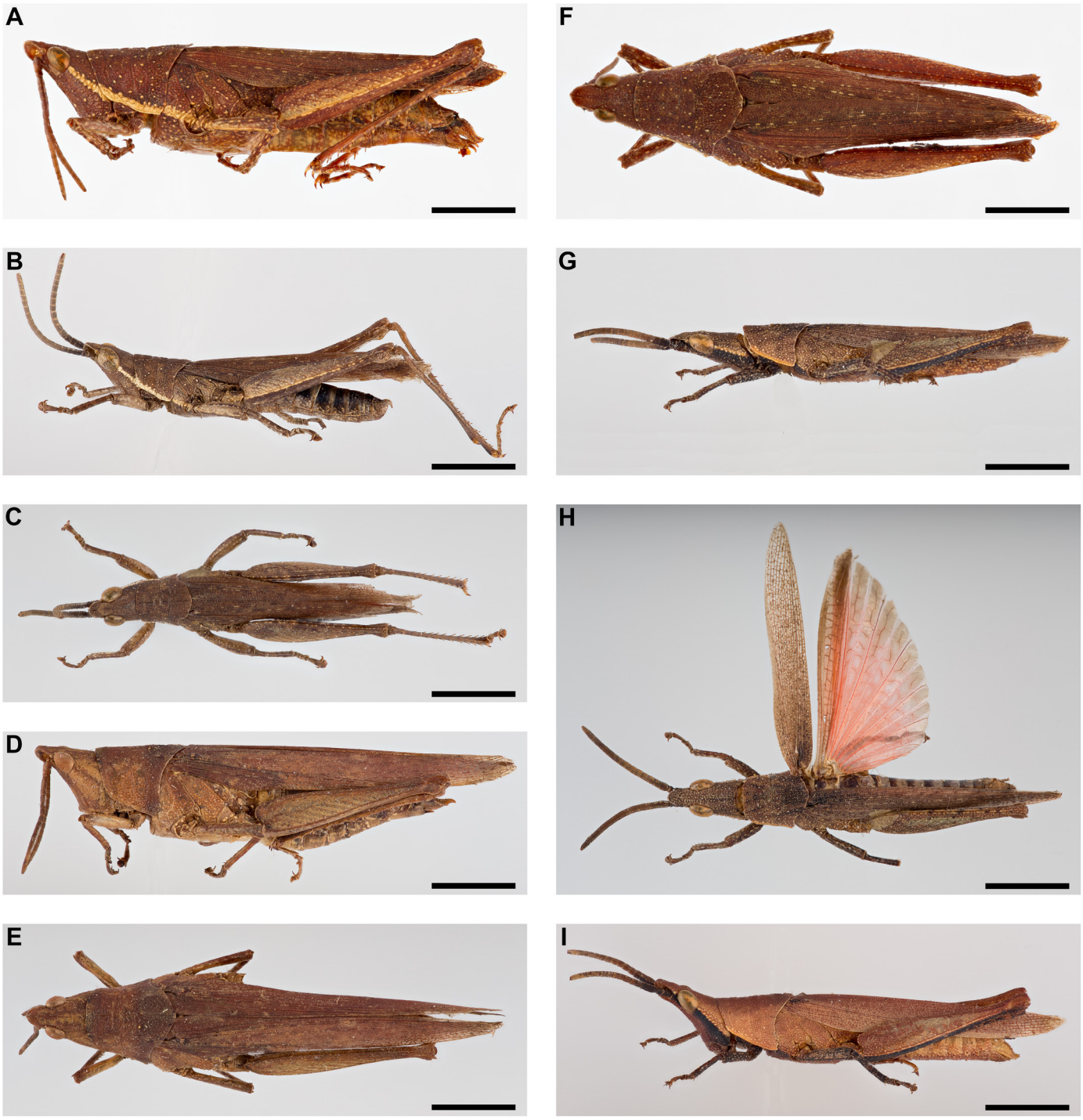

Figure 63. — African Pyrgomorphidae XLIV. **A, F.** *Tanita lineaalba*. **A.** Female lateral view. **F.** Female dorsal view. **B-E.** *Tanita loosi pulchra*. **B.** Male lateral view. **C.** Male dorsal view. **D.** Female lateral view. **E.** Female dorsal view. **G-I.** *Tanita parva parva*. **G.** Male lateral view. **H.** Male dorsal view. **I.** Female lateral. Scale bar = 5 mm.

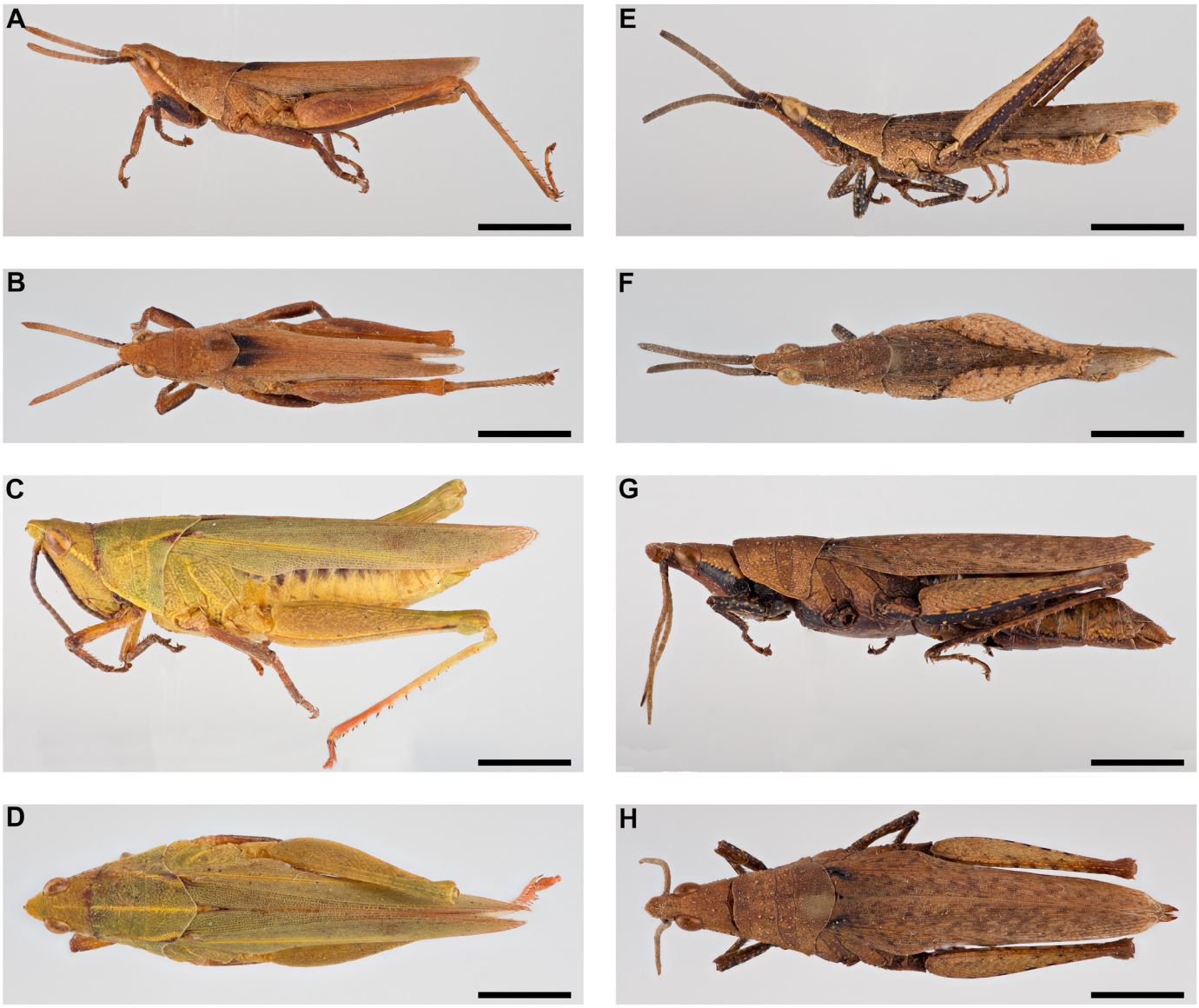

Figure 64. — African Pyrgomorphidae XLV. **A-D.** *Tanita stulta*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Tanita subcylindrica subcylindrica*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

4. Key to Pyrgomorphidae genera of Madagascar

Modified from Dirsh, (1963); Descamps & Wintrebert (1966) and Dirsh & Descamps, (1968).

This area include twenty genera, of which sixteen are endemic to Madagascar. The genus *Caprorhinus* consists of 27 species, with *C. squamipennis* endemic to Anjouan Island, Comoros.

Zonocerus elegans has been reported for Madagascar as the type locality of the synonym *Z. hova* by Saussure (1899) but no further observation has been recorded, and Hollier (2013) commented that a label with the locality "Madagascar" was in the cardbox including the specimen but not it the label attached to it. For these reasons, we decided to not include it in this key. This species would be unmistakable if it were really from Madagascar. *Buyssoniella madecassa* was described by Bolívar in 1905, based on a single female, but this specimen is lost and there is no other known specimen (Kevan, 1977). Consequently, it is also not included in this key or in the genera diagnosis section. *Phymateus* is also present in Africa and Asia. *Pyrgomorphella* in Eastern Africa and Arabian Peninsula and *Atractomorpha* is widely distributed from Africa to Australia.

1. Antennal base is located below the lateral ocelli (except in *Sagittacris*); marginal area of hind femur not displaced ventrally to the outer medial area (fig. 76A-D); typically with elongated body form, fully winged, brachypterous, micropterous or wingless. 2
1'. Antennal base is located in front of the lateral ocelli; marginal area of hind femur displaced ventrally to the outer medial area (very clear in *Uhagonia* and *Schulthessia*) (figs. 76E-H; 77A-H). 17

2. Pronotum strongly tuberculate and toothed; the metazona flattened; lateral lobes forming a right angle with the metazona (fig. 65). ..... *Phymateus* (2 spp.) (*P. madagassus, P. saxosus*)
2'. Pronotum not tuberculate or only with small tubercles, and not toothed; cylindrical or sub-cylindrical metazona. 3

3. Tip of head in lateral view without a process formed by the fastigium of vertex and the upper part of forehead (fig. 77A); if there is any doubt of the presence of such a process and the insect is wingless, then the male subgenital plate is never protruding. 4
3'. Tip of head in lateral view with a process formed by the fastigium of vertex and the upper part of forehead (fig. 75A); male subgenital plate in some cases protruding. 15

4. Tegmina present: either fully developed or reduced or vestigial. 5
4'. Tegmina completely absent. 9

5. Lateral carinae of the pronotum present (fig. 66). ..... *Pyrgomorphella* (4 spp.) (*P. dicrostachyae, P. madecassa. P. minuta, P. tulearensis*)
5'. Lateral carinae of the pronotum absent. 6

6. Tegmina reduced and touching dorsally or lobiform and covering the tympanum, sometimes fully developed (in the macropterous form). 7
6'. Vestigial tegmina not covering the tympanum (when present). 8

7. Strongly conical head; fastigium of vertex more than twice as long as its width; tegmina lobiform in lateral profile, or fully winged (fig. 67). ..... *Rubellia** (1 sp.) (*R. nigrosignata*)
7'. Head less clearly conical; fastigium of vertex just a little longer than its width; brachypterous or macropterous (fig. 68A-D). ..... *Pseudorubellia** (2 spp.) (*P. brancsiki, P. thoracica*)

8. Hind tarsi shorter than the half of the hind tibia; arolium larger or equal to the claws; tympanum present (fig. 68E-H). .... *Caprorhinus** (28 spp.)
(*C. ambahitae, C. andohahalensis, C. anivoranensis, C. betrokae, C. cadeti, C. dechappei, C. descampsi, C. donskoffi, C. fotadrevensis, C. fusiformis, C. inflatus, C. isoanalae, C. kevani, C. lavanonensis, C. mahabensis, C. major, C. malzyi, C. minor, C. monclari, C. pauliani, C. puerisalbis, C. ralinoroi, C. ranohirae, C. rostratus, C. seyrigi, C. squamipennis* (Comoros)*, C. tenikae, C. zolotarevskyi*)

8'. Hind tarsi almost half the length of the hind tibia; arolium smaller than the claws; tympanum absent (fig. 69). .... *Malagasphena** (1 sp.)
(*M. minor*)

9. Tip of head in profile, not indented before touching with the fastigium of vertex. 10

9'. Tip of head in profile, notched before touching with the fastigium of vertex. 14

10. Short head, conical or subconical; fastigium of vertex wider than its length; male cerci laterally compressed at the base. 11

10'. Elongated head, conical; fastigium of vertex longer than its width; male cerci simple, conical or subconical. 12

11. Male cerci exceeding the end of the subgenital plate, with the posterior half strongly thinning; posterior margin of pronotum in female straight (fig. 70A-D). ..... *Gymnohippus** (1 sp.)
(*G. marmoratus*)

11'. Male cerci not longer than its width at the base, triangular in profile; posterior margin of female pronotum at acute angle (fig. 70E-H). ..... *Acropyrgus** (1 sp.)
(*A. cadeti*)

12. Male subgenital plate simple, slightly compressed, with rounded apex in lateral view. 13

12'. Male subgenital plate trilobate in dorsal view, the lobes formed by 2 lateral carinae and 1 medial carinula (fig. 71). .... *Ambositracris** (2 spp.)
(*A. morati, A. ornata*)

13. Elongated and subcylindrical body in the male, slightly fusiform in the female; sides of the mesosternal space slightly curved or straight (fig. 72). ..... *Pseudosphena** (1 sp.)
(*P. dispar*)

13'. Cylindrical body and very elongated in both sexes; sides of the mesosternal space strongly curved (fig. 73). .... *Dyscolorhinus** (2 spp.)
(*D. squalinus, D. vittatus*)

14. Very thin, elongated, antennae inserted in front of lateral ocelli, cylindrical body; fastigium of the vertex strongly elongated, angular, more than twice as long as wide; antennae longer than head and pronotum combined (fig. 74E-F). .. .. *Sagittacris** (1 sp.)
(*S. malagassa*)

14'. Cylindrical or slightly fusiform body; fastigium of vertex parabolic, shorter or less than 2 times longer than its width; antennae shorter than head and pronotum combined (fig. 74A-D). ..... *Pyrgohippus** (2 spp.)
(*P. pallidus*, *P. productus*)

15. Hind tarsi at least equal to half the length of the hind tibia; fore femur of male widened and armed with a row of strong spines on the outer side; vestigial tegmina (fig. 75A-D). ..... *Acanthopyrgus** (2 spp.)
(*A. finoti, A. longicornis*)

15'. Posterior tarsi shorter than half of the corresponding tibia; fore femur of males not widened and unarmed. 16

16. Subgenital plate of male not protruding; micropterous (fig. 75E-I). ..... *Geloius** (3 spp.)
(*G. crassicornis, G. nasutus, G. tanalanensis*)

16'. Subgenital plate of males strongly dilated; wingless or micropterous (fig. 76A-D). ..... *Pseudogeloius** (5 spp.)
(*P. affinis, P. decorsei, P. fotadrevae, P. marolintae, P. relictus*)

17. Macropterous; tip of head in lateral view not projecting or notched at the apex. 18
17'. Micropterous or apterous; tip of head in lateral view compressed and protruding towards the middle, notched in profile, at the apex (fig. 76E-H). ..... *Uhagonia** (3 spp.)
(*U. depressa, U. sphenarioides, U. wintreberti*)

18. Marginal area of hind femur strongly enlarged and displaced ventrally towards the medial area (fig. 77E-H). .... *Schulthessia** (1 sp.)
(*S. biplagiata*)
18'. Marginal area of hind femur narrow, displaced little towards the external medial area (fig. 77A-D). .... *Atractomorpha* (1 sp.)
(*A. acutipennis*)

Figure 65. — Madagascar Pyrgomorphidae I. **A-D.** *Phymateus saxosus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

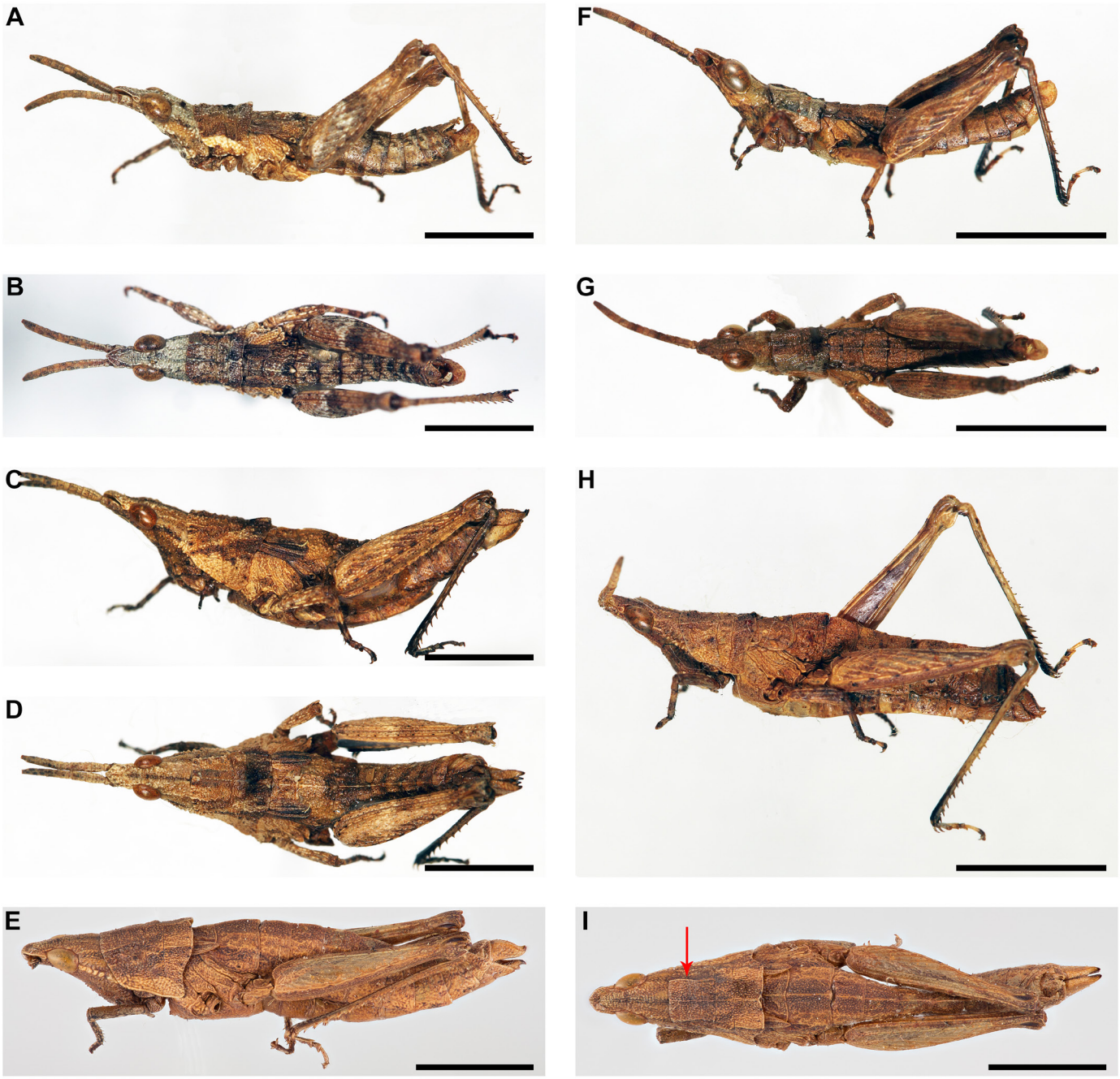

Figure 66. — Madagascar Pyrgomorphidae II. **A-D.** *Pyrgomorphella dicrostachyae.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E, I.** *Pyrgomorphella madecassa.* **E.** Female lateral view. **I.** Female dorsal view. **F-H.** *Pyrgomorphella minuta.* **F.** Male lateral view. **G.** Male dorsal view. **H.** Female lateral view. Scale bar = 5 mm.

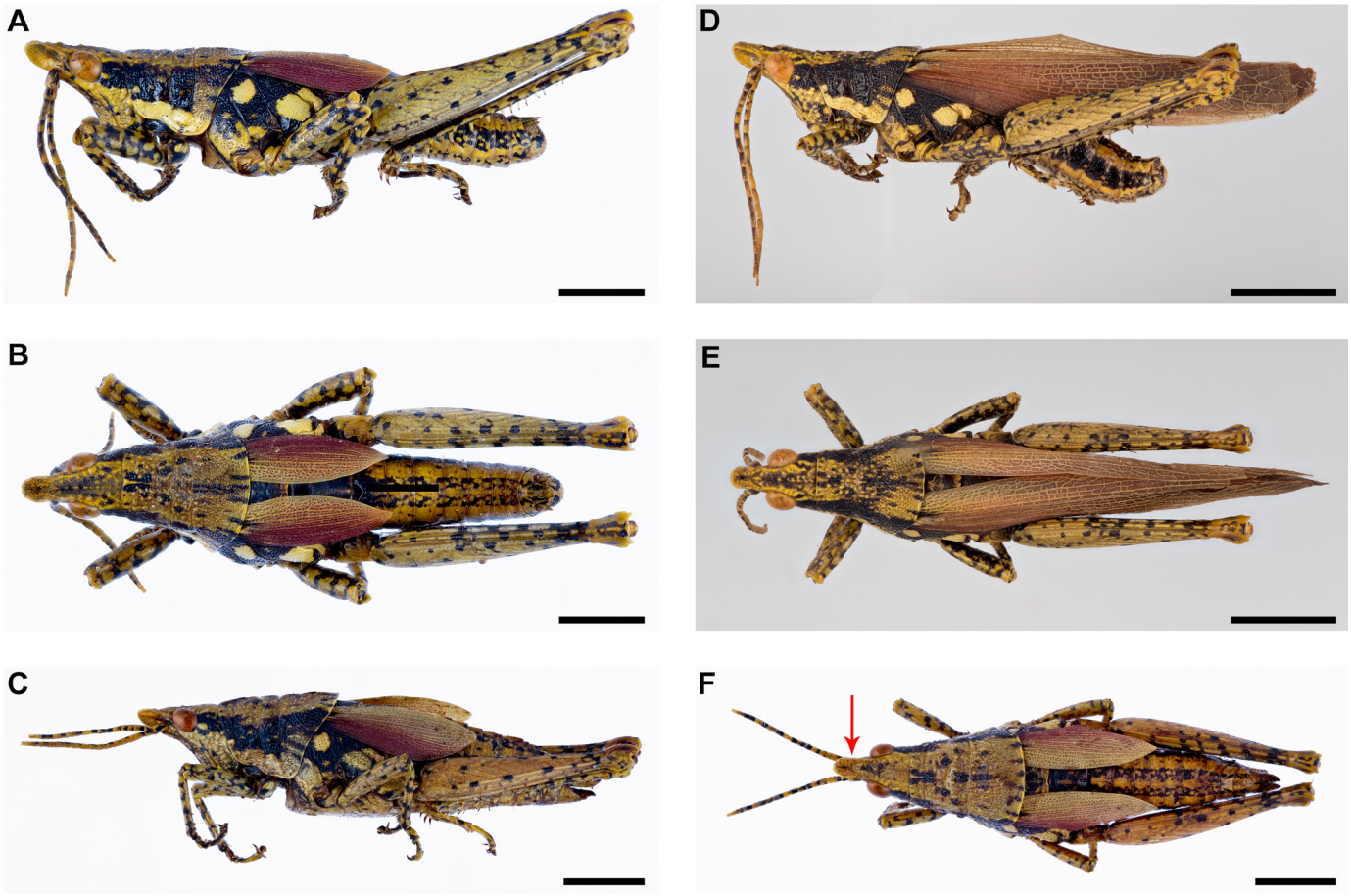

Figure 67. — Madagascar Pyrgomorphidae III. **A-F.** *Rubellia nigrosignata.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Male lateral view (macropterous form). **E.** Male dorsal view (macropterous form). **F.** Female dorsal view. Scale bar = 5 mm.

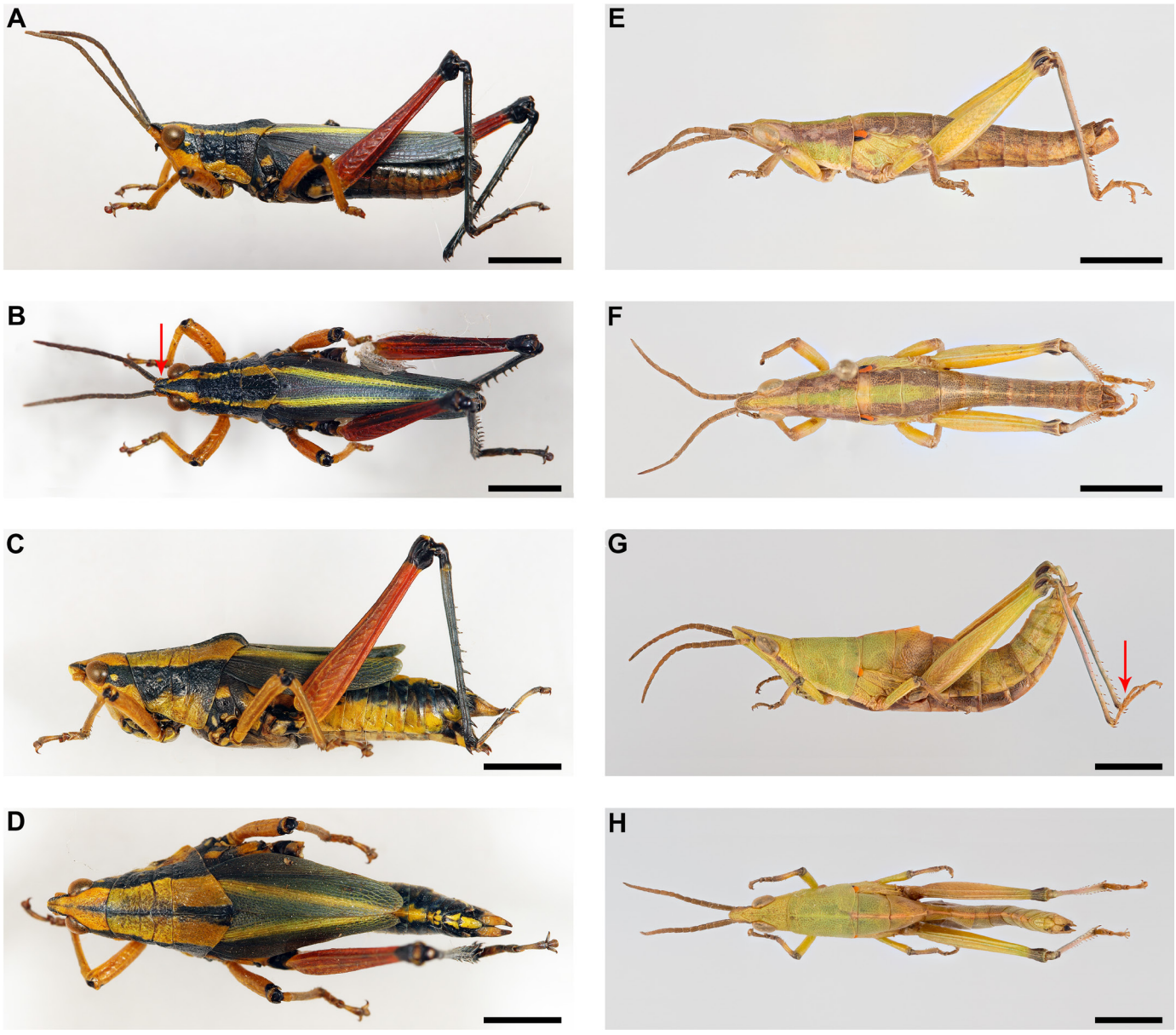

Figure 68. — Madagascar Pyrgomorphidae IV. **A-D.** *Pseudorubellia thoracica geniculata.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Caprorhinus kevani.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

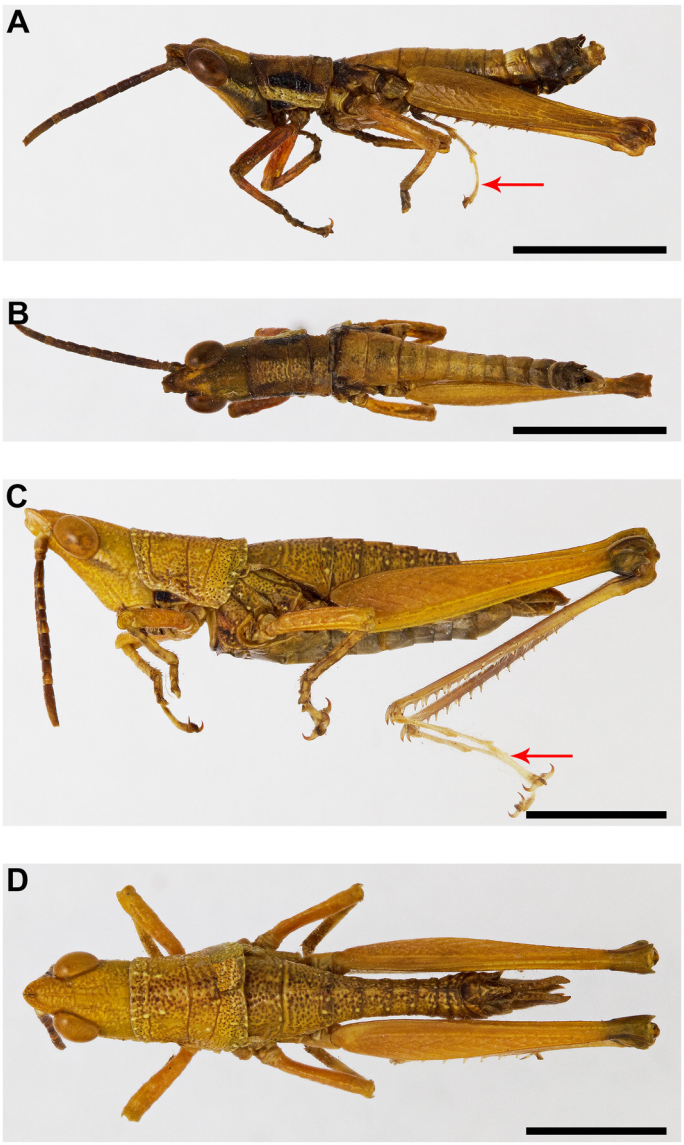

Figure 69. — Madagascar Pyrgomorphidae V. **A-D.** *Malagasphena minor.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

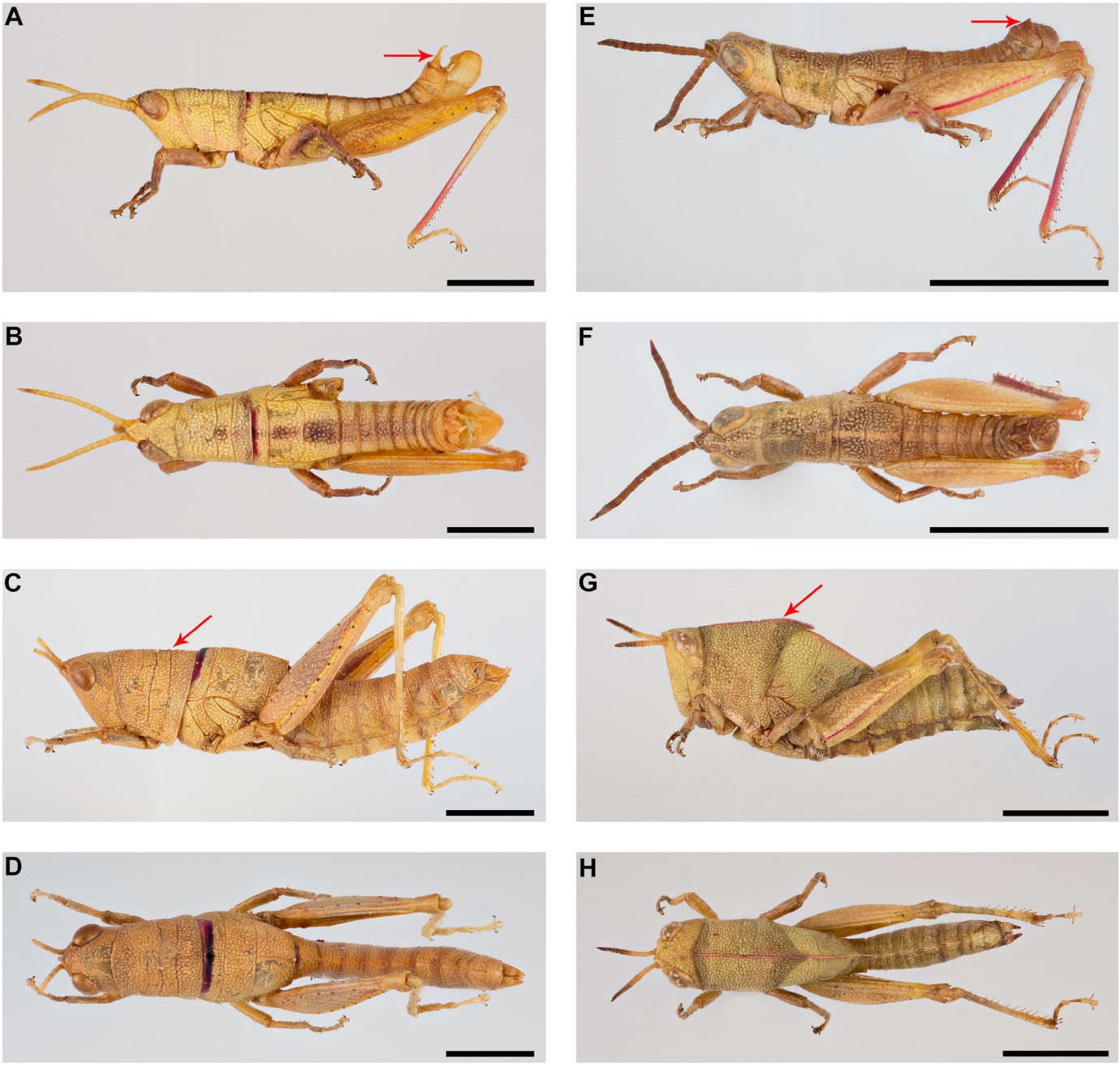

Figure 70. — Madagascar Pyrgomorphidae VI. **A-D.** *Gymnohippus marmoratus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Acropyrgus cadeti.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

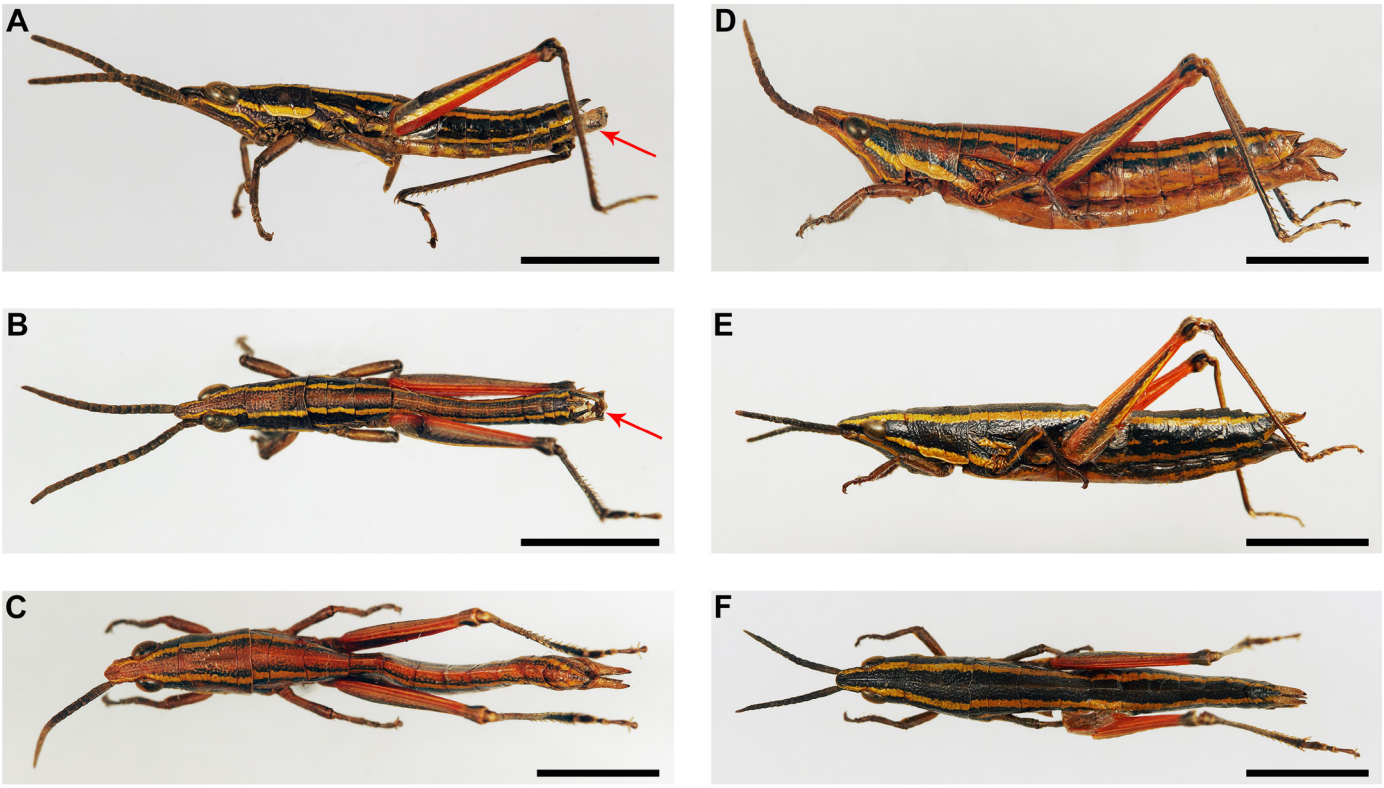

Figure 71. — Madagascar Pyrgomorphidae VII. **A-D.** *Ambositracris ornata.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female dorsal view. **D.** Female lateral view. **E-F.** *Ambositracris morati.* **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

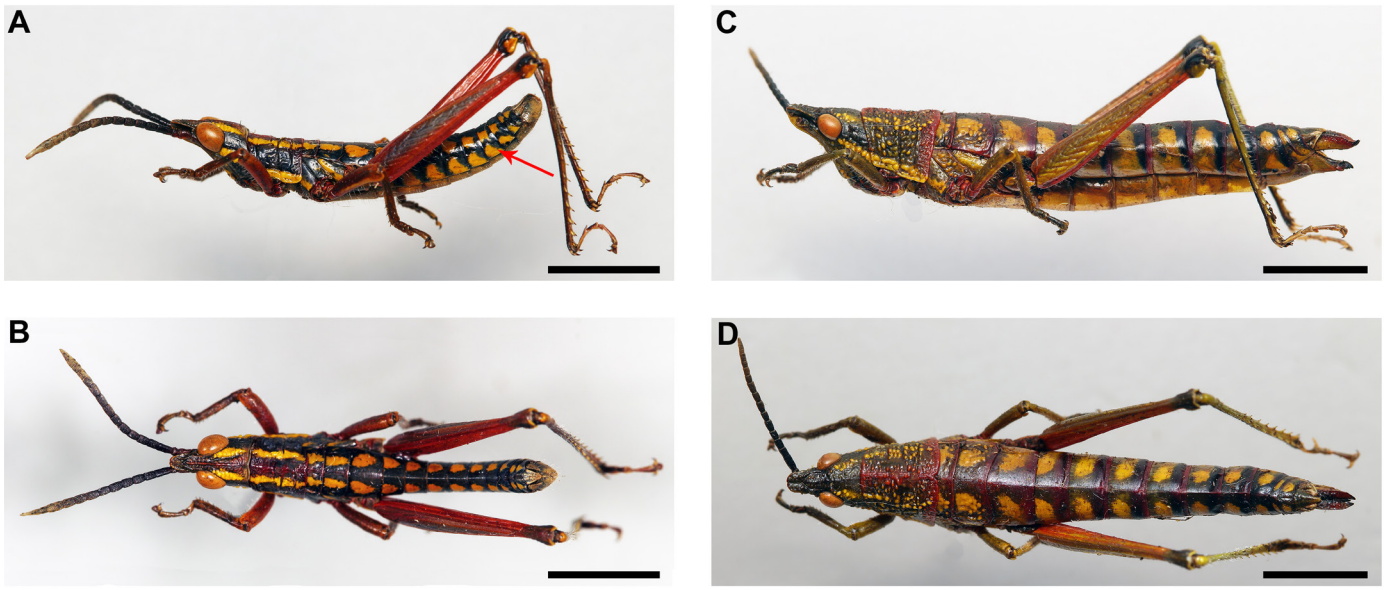

Figure 72. — Madagascar Pyrgomorphidae VIII. **A-D.** *Pseudosphena dispar.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

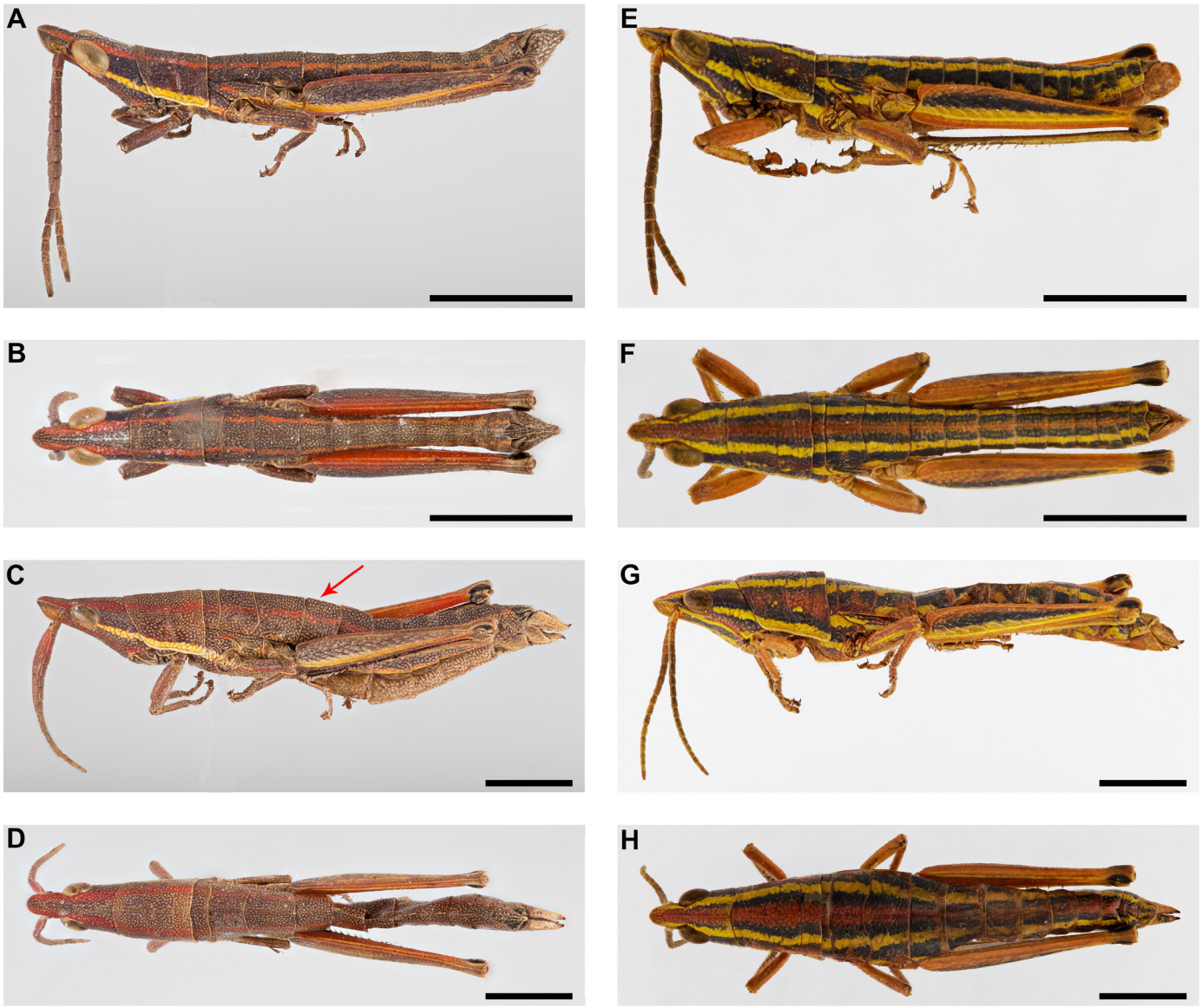

Figure 73. — Madagascar Pyrgomorphidae IX. **A-D.** *Dyscolorhinus squalinus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Dyscolorhinus vittatus.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

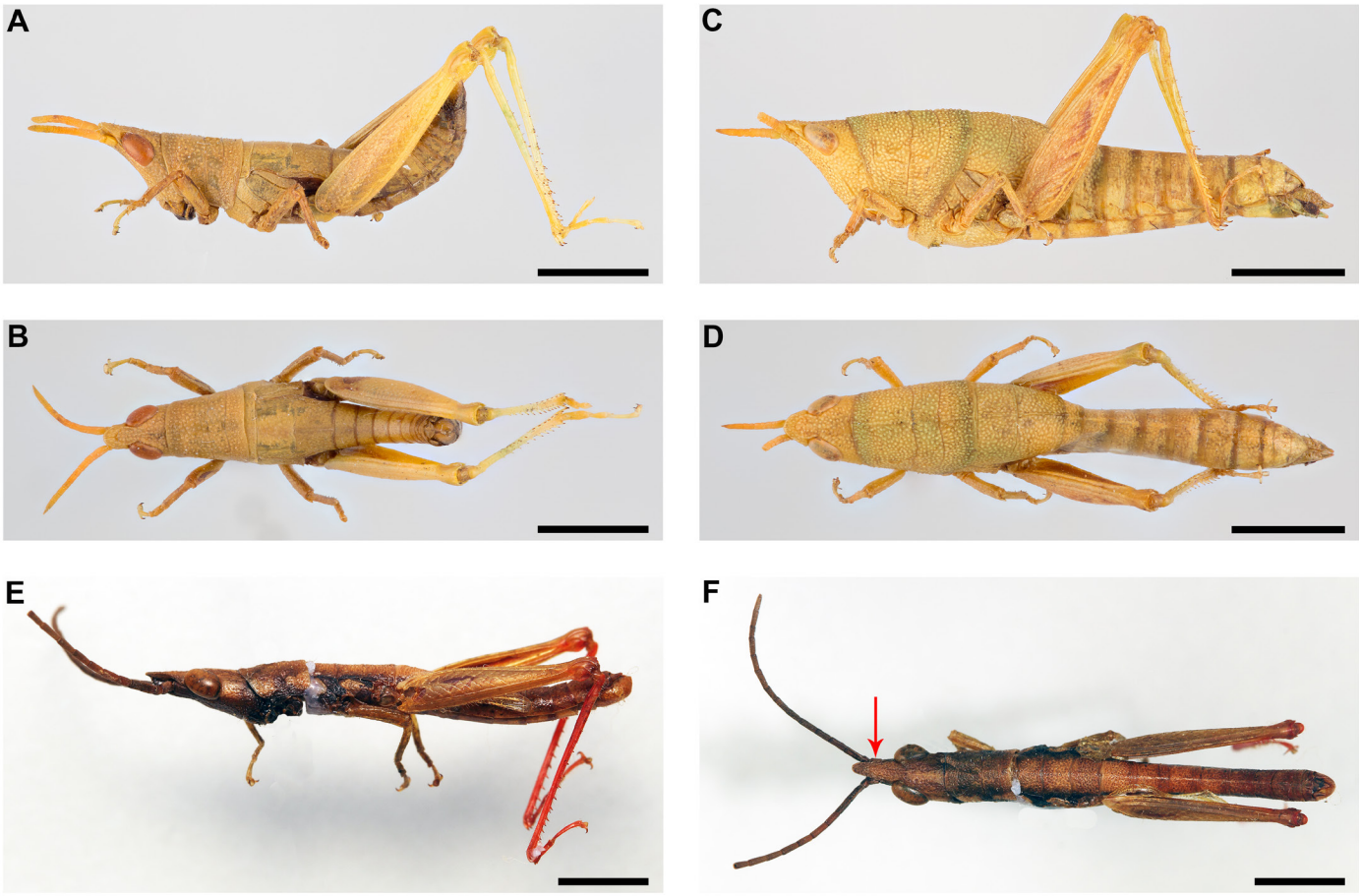

Figure 74. — Madagascar Pyrgomorphidae X. **A-D.** *Pyrgohippus pallidus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Sagittacris malagassa.* **E.** Male lateral view. **F.** Male dorsal view. Scale bar = 5 mm.

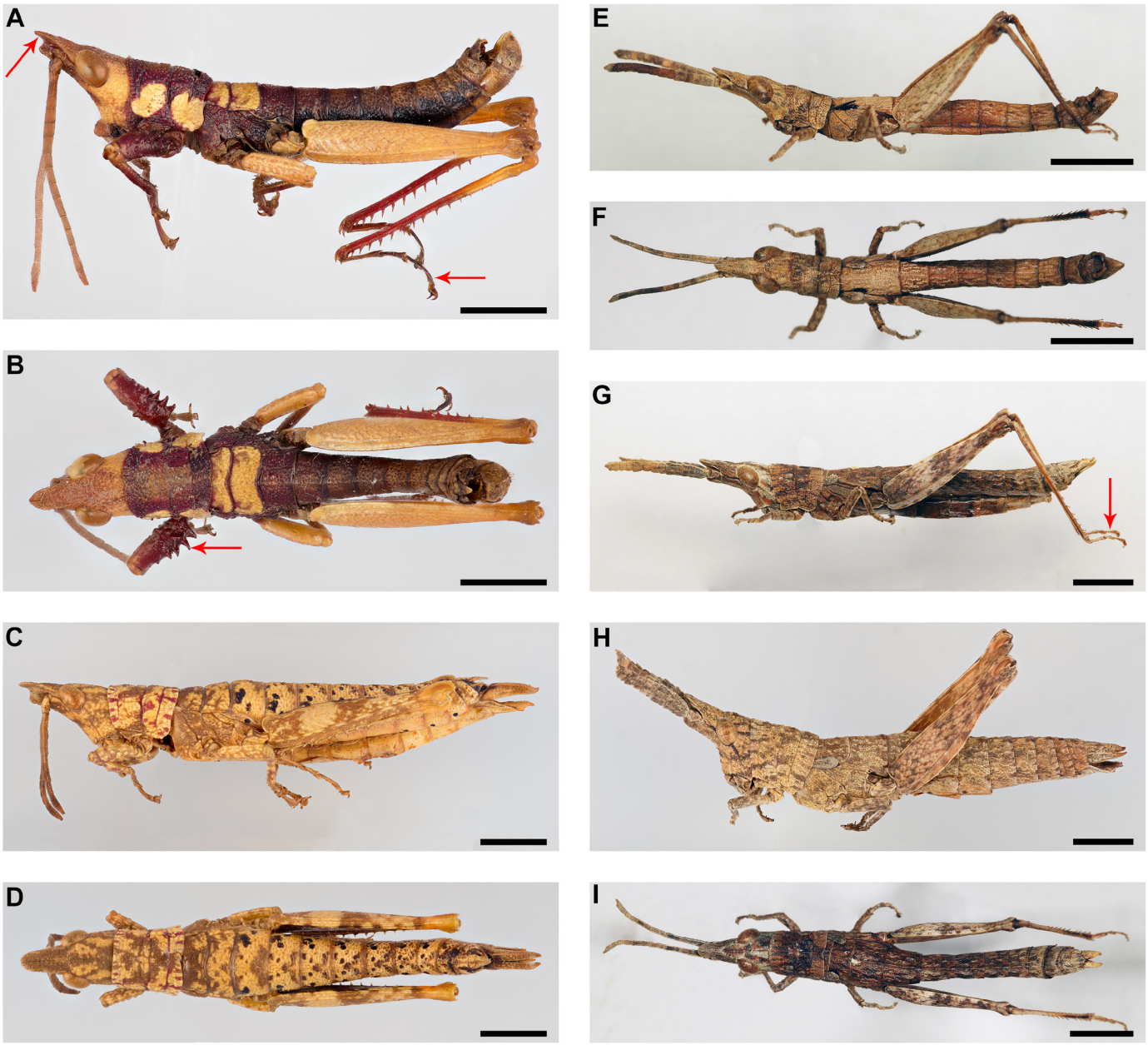

Figure 75. — Madagascar Pyrgomorphidae XI. **A-D.** *Acanthopyrgus finoti.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-G, I.** *Geloius tanalanensis.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **I.** Female dorsal view. **H.** *Geloius nasutus*. **H.** Female lateral view. Scale bar = 5 mm.

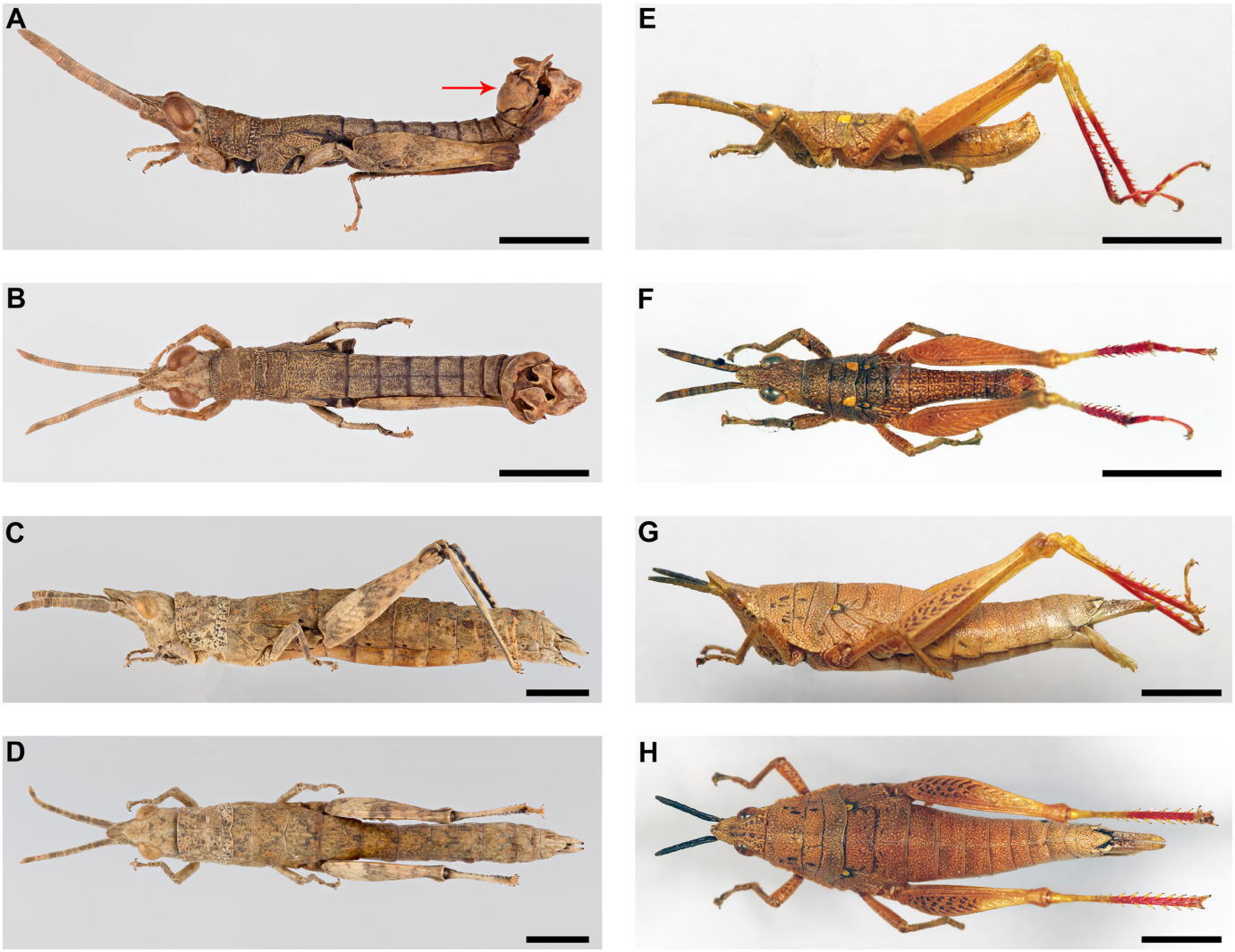

Figure 76. — Madagascar Pyrgomorphidae XII. **A-D.** *Pseudogeloius decorsei.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Uhagonia wintreberti.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

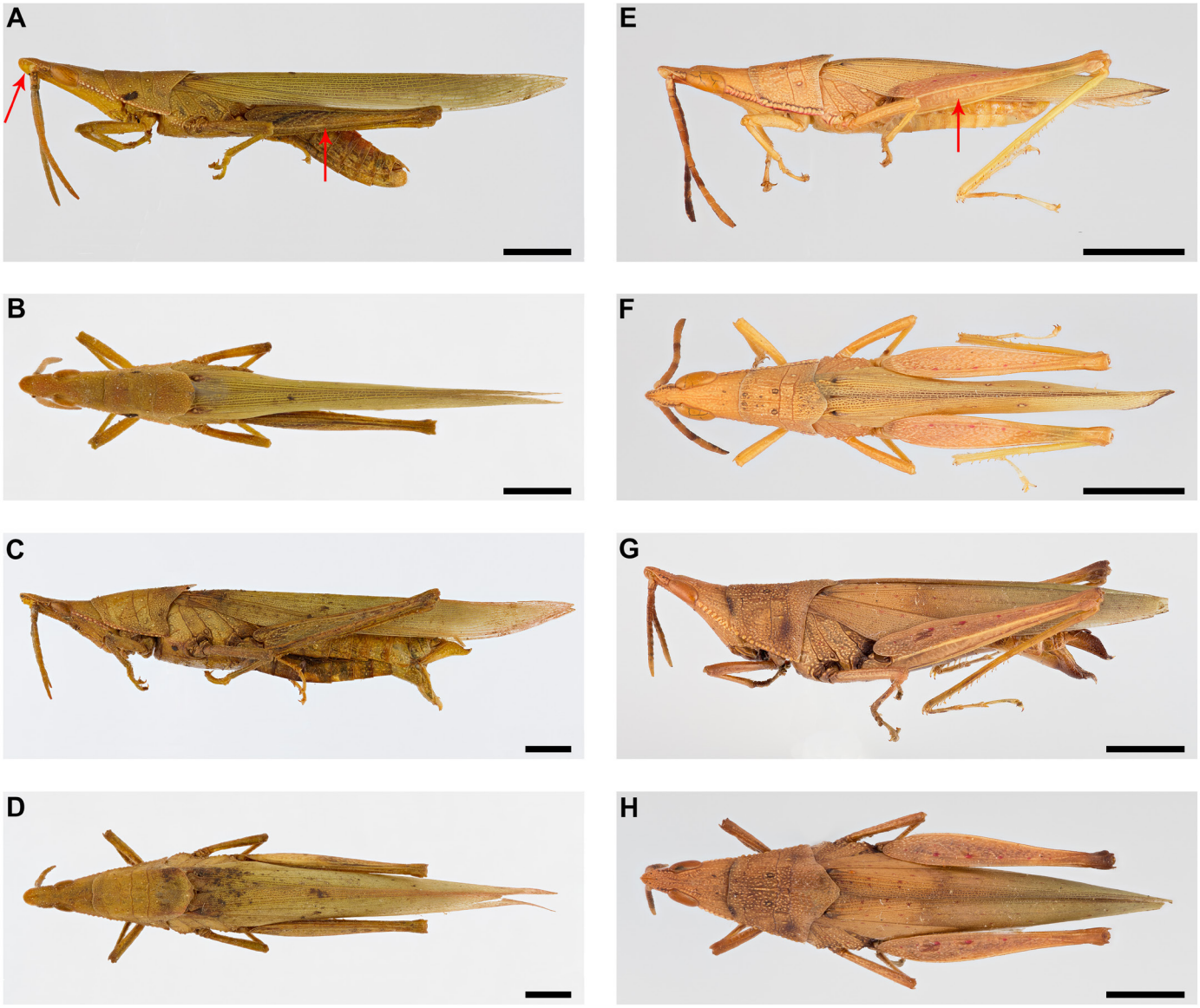

Figure 77. — Madagascar Pyrgomorphidae XIII. **A-D.** *Atractomorpha acutipennis.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Schulthessia biplagiata.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

5. Key to Pyrgomorphidae genera of the Arabian Peninsula

According to Orthoptera Species File (Cigliano et al., 2022) this area includes the Gulf States: Kuwait, Oman, Saudi Arabia and Yemen (excluding Socotra Island).

This area includes nine genera, of which two are endemic to the region. *Poekilocerus*, *Chrotogonus, Tenuitarsus, Atractomorpha* and *Pyrgomorpha* are wider distributed genera. *Parasphenula* is also found in Ethiopia and *Pyrgomorphella* is recorded in Eastern Africa and Madagascar as well.

1. Anterior margin of prosternum covering the posterior and lower part of the mouth (fig. 10E). 2
1'. Anterior margin of prosternum not covering the posterior and lower part of the mouth. 3

2. Spurs of hind tibia longer than the basal tarsal segment; middle femur thin and strongly elongated, as long as or longer than head and pronotum together; lower basal lobe of hind femur shorter than the upper one (fig. 20C-D). .... *Tenuitarsus* (1 sp.) (*T. angustus*)
2'. Spurs of hind tibia shorter than the basal tarsal segment; middle femur short, much shorter than head and pronotum together; lower basal lobe of hind femur longer than the upper one (fig. 78). ..... *Chrotogonus* (1 sp.) (*C. homalodemus*)

3. Fully winged. 4
3'. Tegmina vestigial. 6

4. Antennae base located below lateral ocelli. 5
4'. Antennae base located in front of lateral ocelli (fig. 77A-D). (Yemen) ..... *Atractomorpha* (1 sp.) (*A. acutipennis*)

5. Row of tubercles running from eye to the lateral anterior margin of pronotum (fig. 91A-D). ..... *Pyrgomorpha* (2 spp.) (*P. conica, P. hemiptera*)
5'. No row of tubercles running from eye to the lateral anterior margin of pronotum (fig. 79). ..... *Poekilocerus* (2 spp.) (*P. arabicus, P. bufonius*)

6. Body with rugose texture. 7
6'. Body with smooth texture (fig. 80A-D). (Yemen) ..... *Popovia** (1 sp.) (*P. salvadorae*)

7. Space between eye and lateral anterior margin of pronotum approximately the length of an eye. 8
7'. Space between eye and lateral anterior margin of pronotum less than the length of an eye (fig. 80E-H). (Yemen) .... *Pyrgomorphellula** (1 sp.) (*P. curtula*)

8. Tegmina vestigial with no veins visible (fig. 81A-D). (Yemen) ..... *Parasphenula* (2 spp.) (*P. tewfiki, P. yemenita*)
8'. Tegmina tongue-like (spatulate) with some veins present (fig. 81E-F). (Saudi Arabia) ..... *Pyrgomorphella* (1 sp.) (*P. rotundata*)

Figure 78. — Arabian Peninsula Pyrgomorphidae I. **A-D.** *Chrotogonus homalodemus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

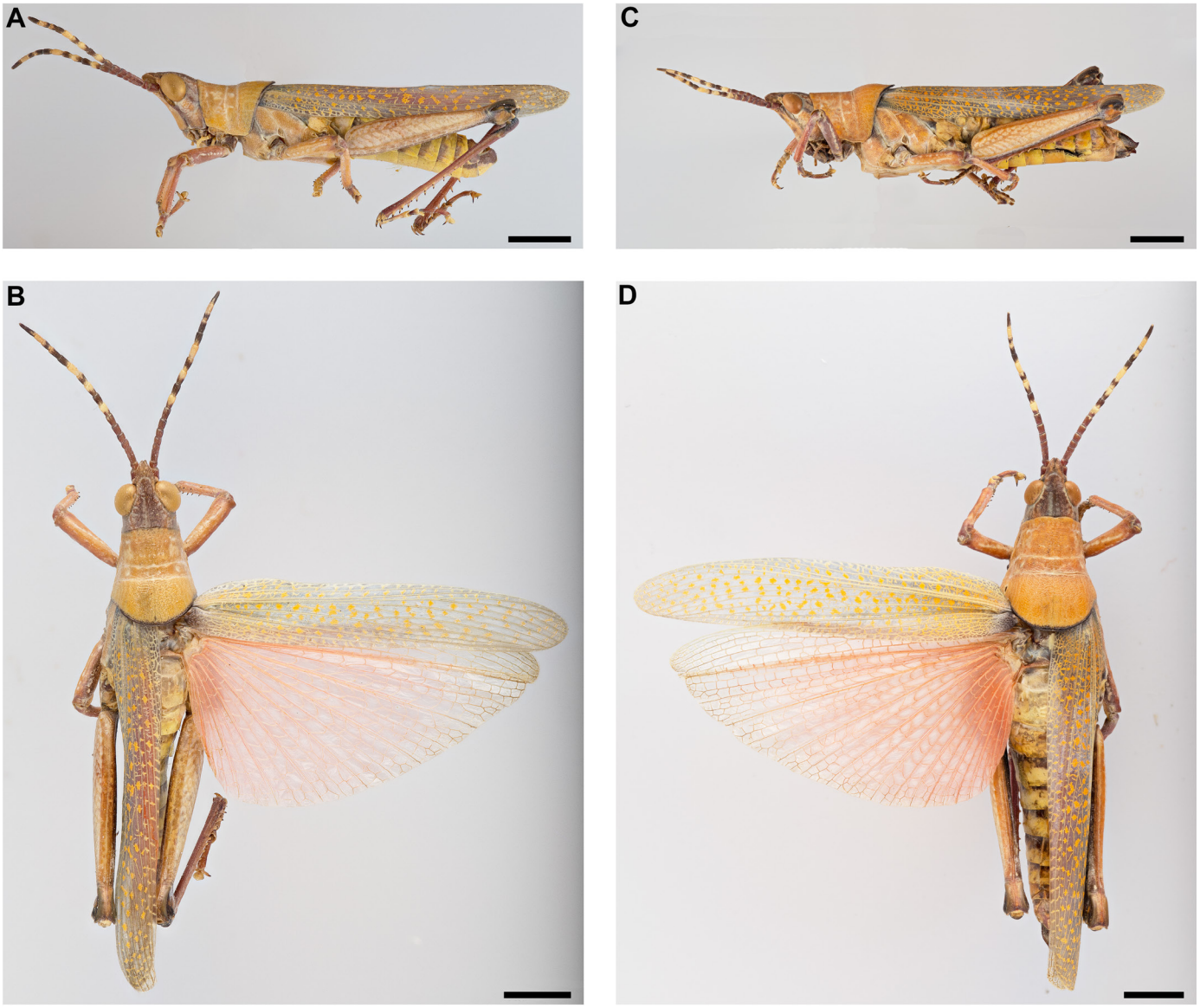

Figure 79. — Arabian Peninsula Pyrgomorphidae II. **A-D.** *Poekilocerus arabicus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

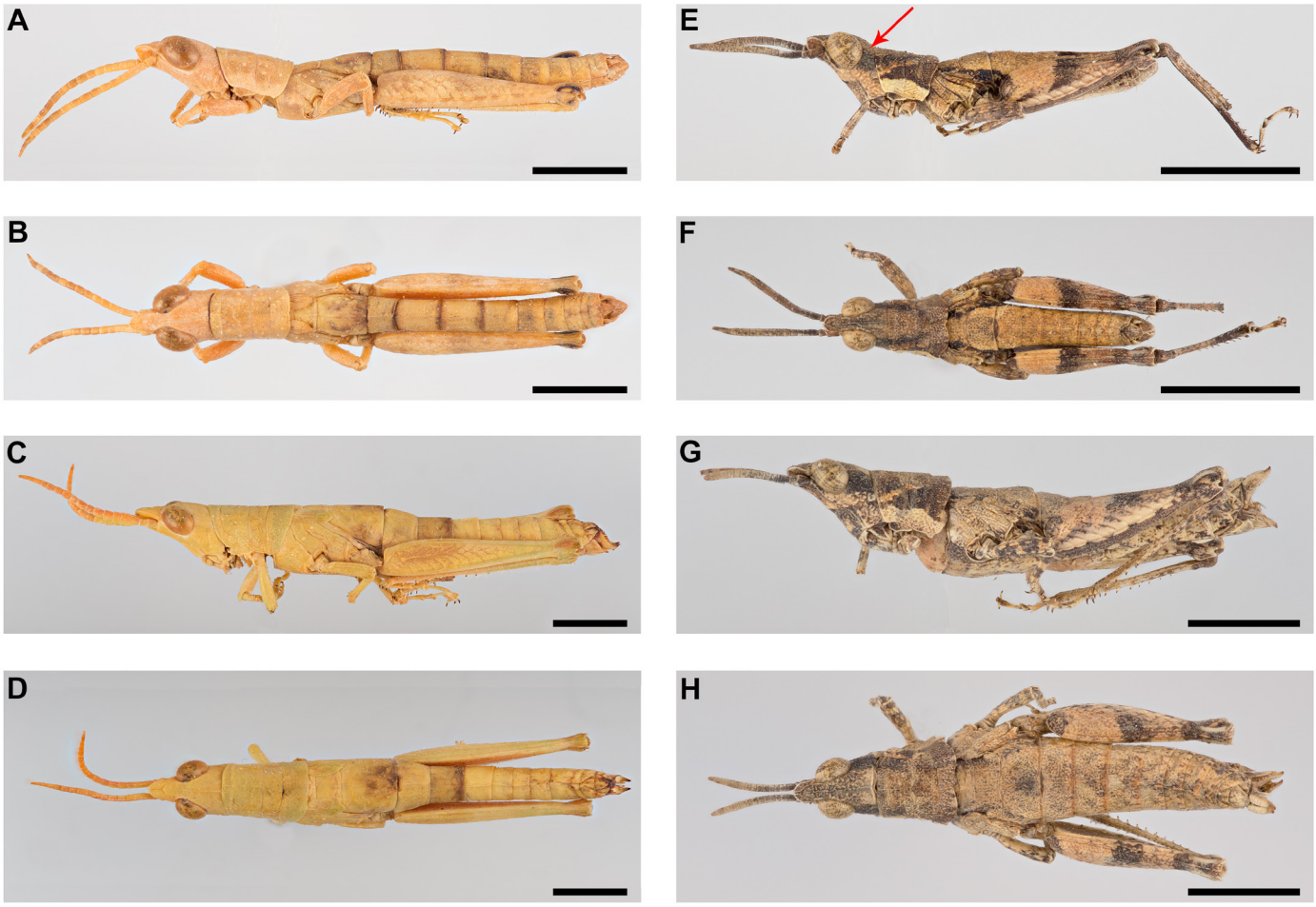

Figure 80. — Arabian Peninsula Pyrgomorphidae III. **A-D.** *Popovia salvadorae.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgomorphellula curtula.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

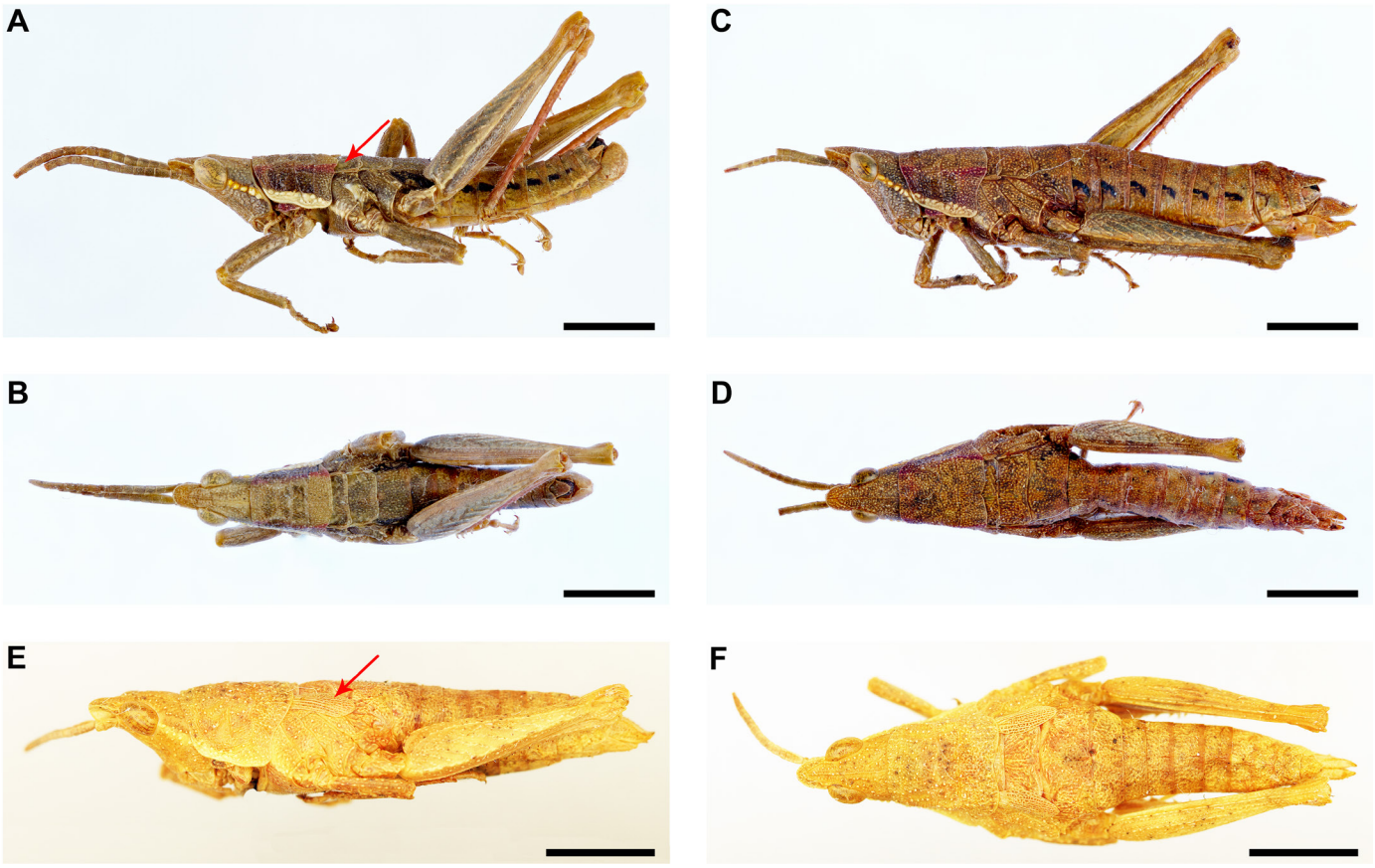

Figure 81. — Arabian Peninsula Pyrgomorphidae IV. **A-D.** *Parasphenula yemenita.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Pyrgomorphella rotundata.* **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

6. Key to Pyrgomorphidae genera of Western Asia

Following Orthoptera Species File (Cigliano et al., 2022), this area includes Afghanistan, Cyprus, Iran, Iraq, Lebanon, Syria, Palestine, Israel, Jordan and Turkey, which includes five genera, none of which are endemic to the area and of wider distribution. *Macroleptea* is found also in northern Africa. *Tenuitarsus* is distributed from the upper half of Africa through India. *Chrotogonus* is found in all of Africa to China. *Pyrgomorpha* is found in all of Africa and Southern Europe through China. *Atractomorpha* is found from Africa to Australia.

1. Anterior margin of prosternum covering the posterior and lower part of the mouth (fig. 10E). 2
1'. Anterior margin of prosternum not covering the posterior and lower part of the mouth. 3

2. Spurs of hind tibia longer than the basal tarsal segment; middle femur thin and strongly elongated, as long as or longer than head and pronotum together; lower basal lobe of hind femur shorter than the upper one (fig. 20C-D). ..... *Tenuitarsus* (1 sp.) (*T. angustus*)
2'. Spurs of hind tibia shorter than the basal tarsal segment; middle femur short, much shorter than head and pronotum together; lower basal lobe of hind femur longer than the upper one (fig. 82A-D). ..... *Chrotogonus* (1 sp.) (*C. trachypterus*)

3. Antennae base located below lateral ocelli (fig. 82E-H, 83). 4
3'. Antennae base located in front of lateral ocelli (fig. 77A-D). ..... *Atractomorpha* (1 sp.) (*A. acutipennis*)

4. Integument more rugose and pronotum less cylindrical (fig. 82E-H, 83). ..... *Pyrgomorpha* (6 spp.) (*P. bispinosa, P. cognata, P. conica, P. cypria, P. granosa, P. guentheri*)
4'. Integument smooth and pronotum more cylindrical (fig. 58A-B). ..... *Macroleptea* (1 sp.) (*M. laevigata*)

Figure 82. — Western Asia Pyrgomorphidae I. **A-D.** *Chrotogonus trachypterus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgomorpha granosa.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

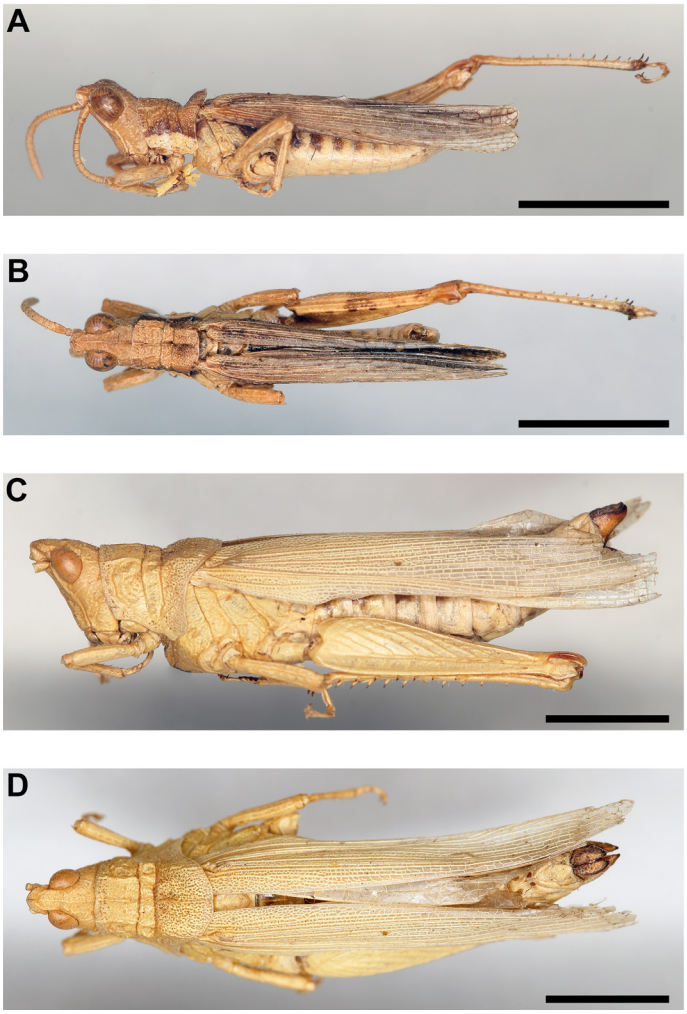

Figure 83. — Western Asia Pyrgomorphidae II. **A-D.** *Pyrgomorpha cypria.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

7. Key to Pyrgomorphidae genera of Indian Subcontinent

Information taken from Kevan & Singh (1964), Kevan (1968b), Schmidt (2004) and Shishodia et al. (2010).
According to Orthoptera Species File (Cigliano et al., 2022), this region includes Bangladesh, India, Nepal, Pakistan, Sri Lanka and Bhutan.

The region contains twenty-one genera, of which ten are endemic to the region. Regarding the eleven non-endemic genera *Poekilocerus, Tenuitarsus, Chrotogonus, Pyrgomorpha* and *Atractomorpha* have a wide distribution. *Aularches, Chlorizeina* and *Pseudomorphacris* are also found in China and Southeast Asia. *Tagasta* is reported from China, Southeast Asia and Malesia as well; and *Mekongiella* is also found in China. Regarding *Plerisca*, we highly doubt that *Plerisca subindica* from India belongs in the Southern Africa genus.

1. Anterior margin of prosternum covering the posterior and lower part of the mouth (fig. 10E). 2
1'. Anterior margin of prosternum not covering the posterior and lower part of the mouth. 3

2. Spurs of hind tibia longer than the basal tarsal segment; middle femur thin and strongly elongated, as long as or longer than head and pronotum together; lower basal lobe of hind femur shorter than the upper one (fig. 20C-D). ..... *Tenuitarsus* (1 sp.) (*T. orientalis*)
2'. Spurs of hind tibia shorter than the basal tarsal segment; middle femur short, much shorter than head and pronotum together; lower basal lobe of hind femur longer than the upper one (figs. 78, 82A-D). ..... *Chrotogonus* (4 spp.) (*C. brachypterus, C. homalodemus, C. oxypterus, C. trachypterus*)

3. Apterous. 4
3'. Micropterous, brachypterous or fully winged. 9

4. Spherical eyes, very prominent; hind leg, third tarsomere longer than first tarsomere (fig. 84A-D). (Sri Lanka) ..... *Rakwana** (1 sp.) (*R. ornata*)
4'. Rounded eyes but not prominent; hind leg, third tarsomere no longer than first tarsomere. 5

5. Body robust (fig. 92E-H). (Arunachal Pradesh) ..... *Mekongiella* (1 sp.) (*M. wardi*)
5'. Body slender. 6

6. Space between eye and anterior margin of pronotum in lateral view with a row of tubercles (fig. 84E-H). (Tamil Nadu) ..... *Anarchita** (1 sp.) (*A. aptera*)
6'. Space between eye and anterior margin of pronotum in lateral view without a row of tubercles. 7

7. Antennae longer than head and pronotum combined. 8
7'. Antennae shorter than head and pronotum combined (fig. 85A-D). (Tamil Nadu). ..... *Nilgiracris** (1 sp.) (*N. raoi*)

8. Body cylindrical; head slightly longer than its width; extremely elongate, whip-like aedegal sclerites (fig. 85E-H). (Andhra Pradesh, Tamil Nadu, Kerala) ..... *Neorthacris** (5 spp.) (*N. acuticeps, N. longicercata, N. malabarensis, N. palnensis, N. simulans*)
8'. Body varying from cylindrical to rather robust, subfusiform; head variable in form but frequently not longer than its width or shorter; aedeagal sclerites normal (fig. 86A-D). (Tamil Nadu, Sri Lanka) ..... *Orthacris** (13 spp.) (*O. ceylonica, O. comorensis, O. curvicerca, O. elongata, O. filiformis, O. gracilis, O. maindroni, O. major, O. elegans, O. incongruens, O. ramakrishnai. O. robusta, O ruficornis*)

9. Micropterous. 10
9'. Brachypterous or tegmina fully developed. 11

10. Lacking distinct lateral carinae, more elongate body, larger size (fig. 86E-H). (Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu) ..... *Colemania** (1 sp.)
(*C. sphenarioides*)

10'. Possessing distinct lateral carinae, less elongate body, smaller size (fig. 87A-D). (Karnataka) ..... *Ramakrishnaia** (2 spp.)
(*R. gracilis, R. notabilis*)

11. Brachypterous. 12

11'. Tegmina fully developed. 15

12. A row of tubercles running from eye to pronotum present in lateral view. 13

12'. Such a row of tubercles absent. 14

13. Tegmina reaching one third of hind femur from the base, (in Northern India, cases where tegmina fully macropterous). The length of a row of tubercles similar to the length of eye in lateral view (fig. 87E-H). (India) ..... *Zarytes** (1 sp.)
(*Z. squalinus*)

13'. Tegmina barely reaching hind femur. The length of a row of tubercles twice the length of eye in lateral view. (Tamil Nadu) ..... *Plerisca* (1 sp.)
(*P. sudindica*)

14. Body distinctly fusiform. Head distinctly conical, eyes not prominent, tegmina barely or not surpassing the bases of the hind femur (fig. 89C-D). (Goa, Karnataka, Maharashtra) ..... *Feacris** (2 spp.)
(*F. malabarensis, F. reducta*)

14'. Body subfusiform. Head conical, eyes rather prominent, tegmina reduced but extending beyond the bases of hind femur. (fig. 88A-D). (Assam, Manipur, Tripura, Sri Lanka). ..... *Chlorizeina* (1 sp.)
(*C. unicolor*)

15. Pronotum unarmed, without a bilobed tubercle nor spines in prozona. 16

15'. Pronotum with a bilobed tubercle and spines on prozona (fig. 90A-D). (India, Bangladesh, Nepal, Pakistan, Sri Lanka) ..... *Aularches* (1 sp.)
(*A. miliaris*)

16. Antennae base located in front of lateral ocelli. 17

16'. Antennae base located below lateral ocelli. 19

17. Marginal area of hind femur not expanded, narrower than medial area; cerci straight. 18

17'. Marginal area of hind femur expanded, as wide as medial area; cerci bent (fig. 91E-L). (India, Bangladesh) ..... *Pseudomorphacris* (1 sp.)
(*P. notata*)

18. Lateral margin of pronotum with a row of tubercles, continuing from head (fig. 77A-D). ..... *Atractomorpha* (7 spp.)
(*A. acutipennis, A. angusta, A. burri, A. crenulata, A. himalayica, A. psittacina, A. sinensis*)

18'. Lateral margin of pronotum without a row of tubercles (fig. 92A-D). (India, Buthan, Nepal) ..... *Tagasta* (4 spp.)
(*T. indica, T. longipenne, T. marginella, T. mizoramensis*)

19. A row of tubercles running from the eye to the pronotum absent in lateral view. 20

19'. A row of tubercles running from the eye to the pronotum present in lateral view (fig. 91A-D). ..... *Pyrgomorpha* (3 spp.)
(*P. bispinosa, P. conica, P. inaequalipennis*)

20. Radial sector in tegmina well developed. Large in size (5-6 cm) (fig. 88E-H). (India, Pakistan, Nepal) ..... *Poekilocerus* (2 spp.)
(*P. geniplanus, P. pictus*)

20'. Radial sector in tegmina poorly developed. Small in size (2-3 cm) (fig. 89A-B). (Bihar) ..... *Pterorthacris** (1 sp.)
(*P. subcallosa*)

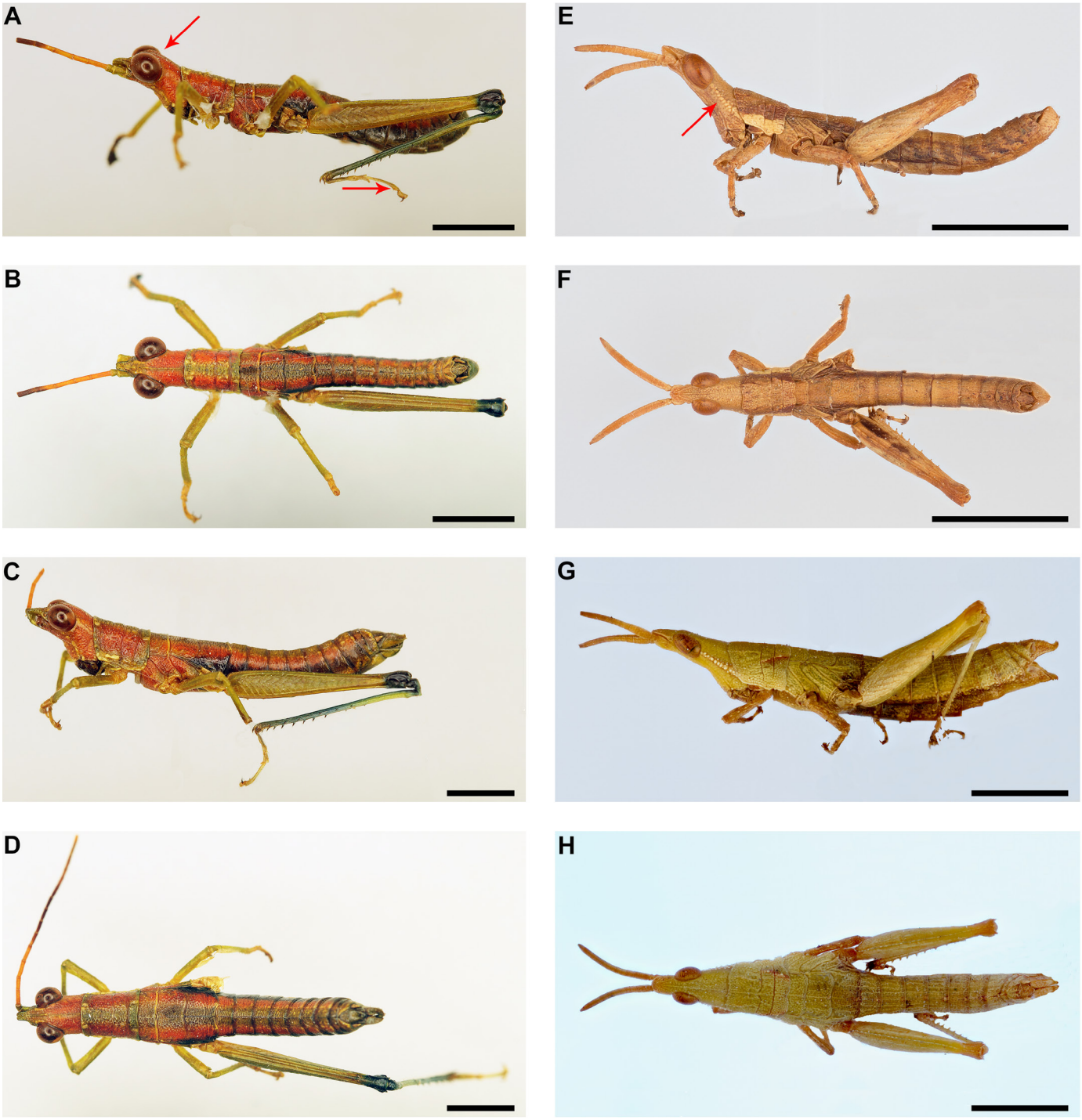

Figure 84. — Indian Subcontinent Pyrgomorphidae I. **A-D.** *Rakwana ornata.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Anarchita aptera.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

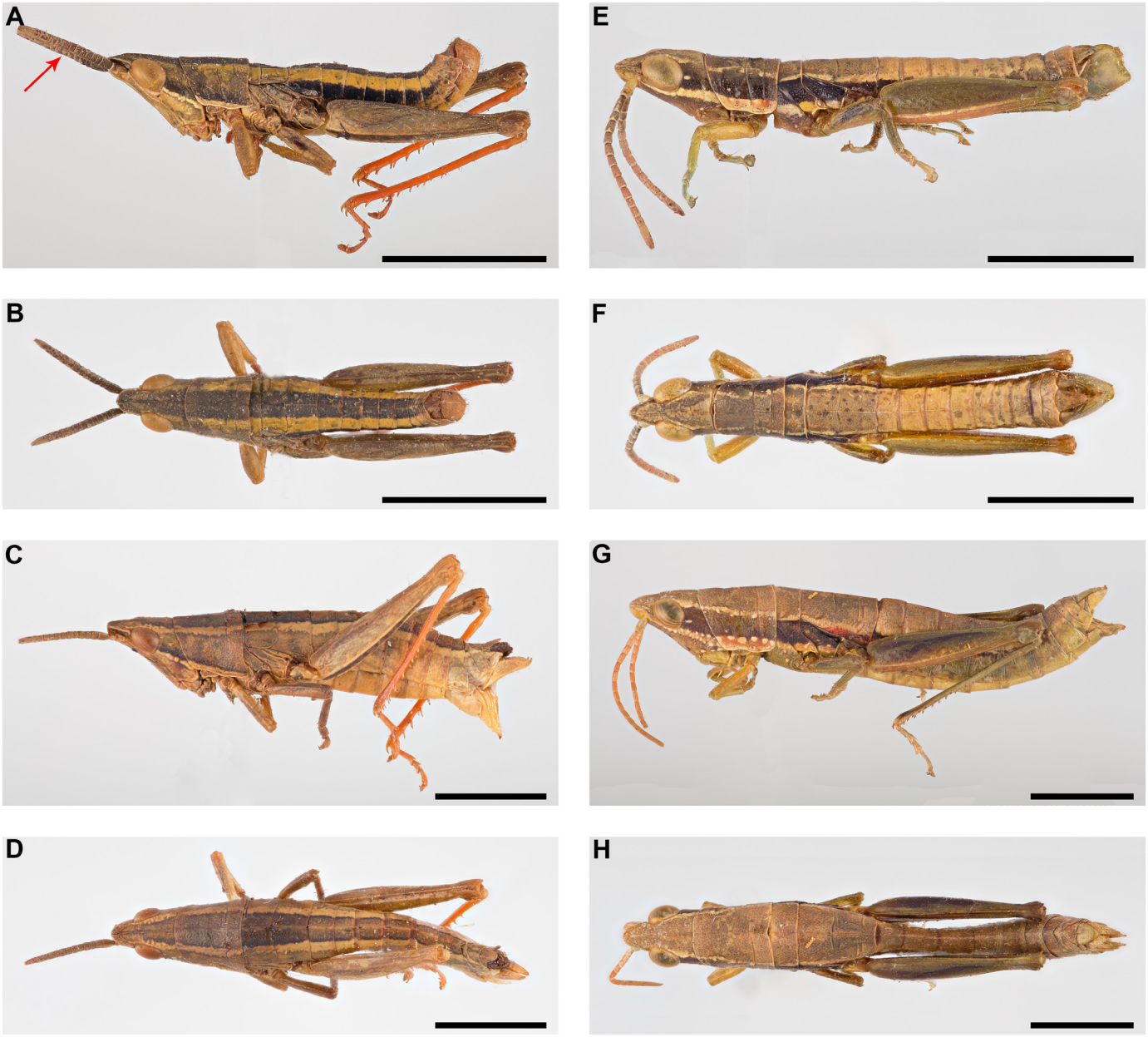

Figure 85. — Indian Subcontinent Pyrgomorphidae II. **A-D.** *Nilgiracris raoi.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Neorthacris acuticeps.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

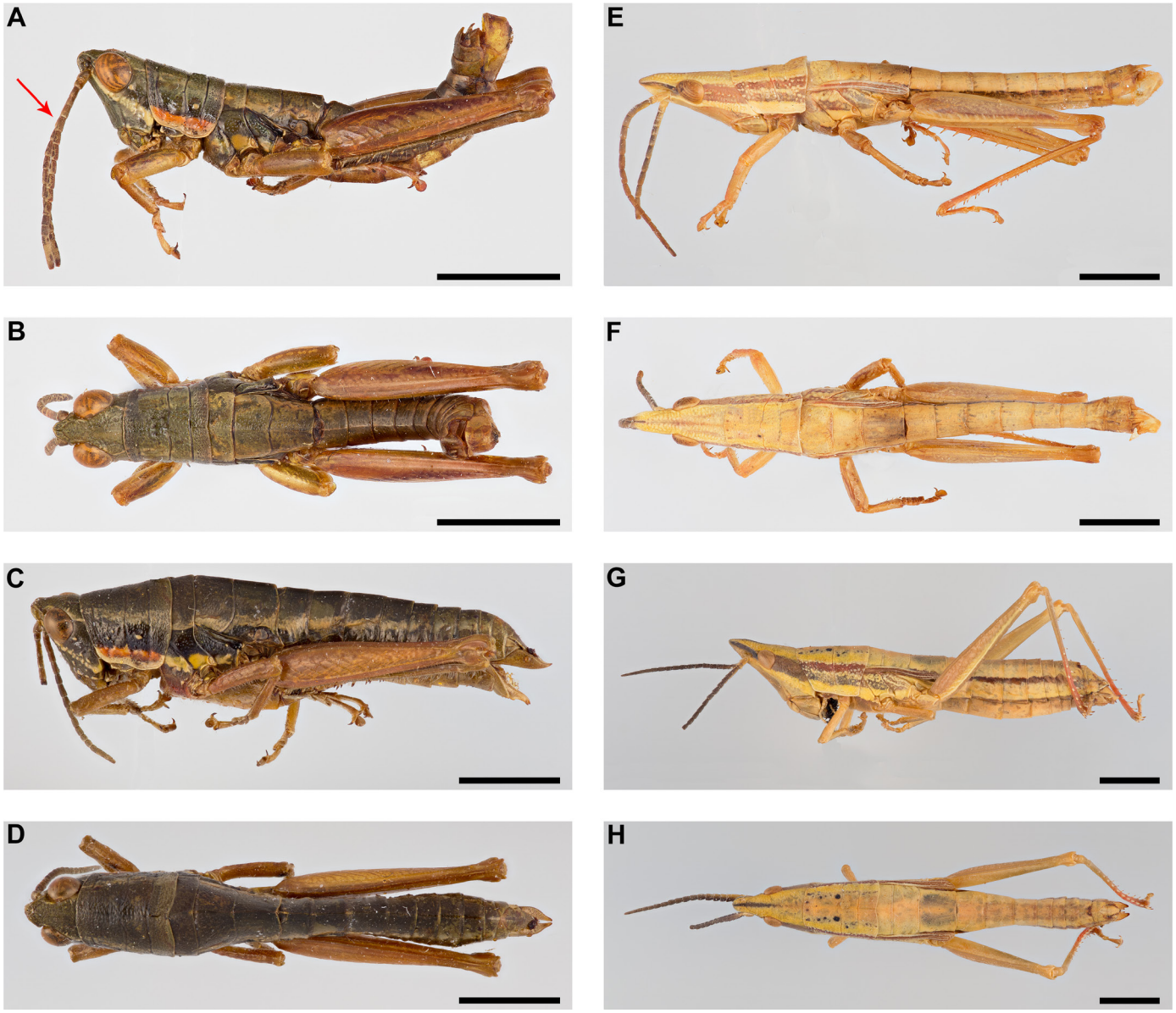

Figure 86. — Indian Subcontinent Pyrgomorphidae III. **A-D.** *Orthacris incongruens.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Colemania sphenarioides.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

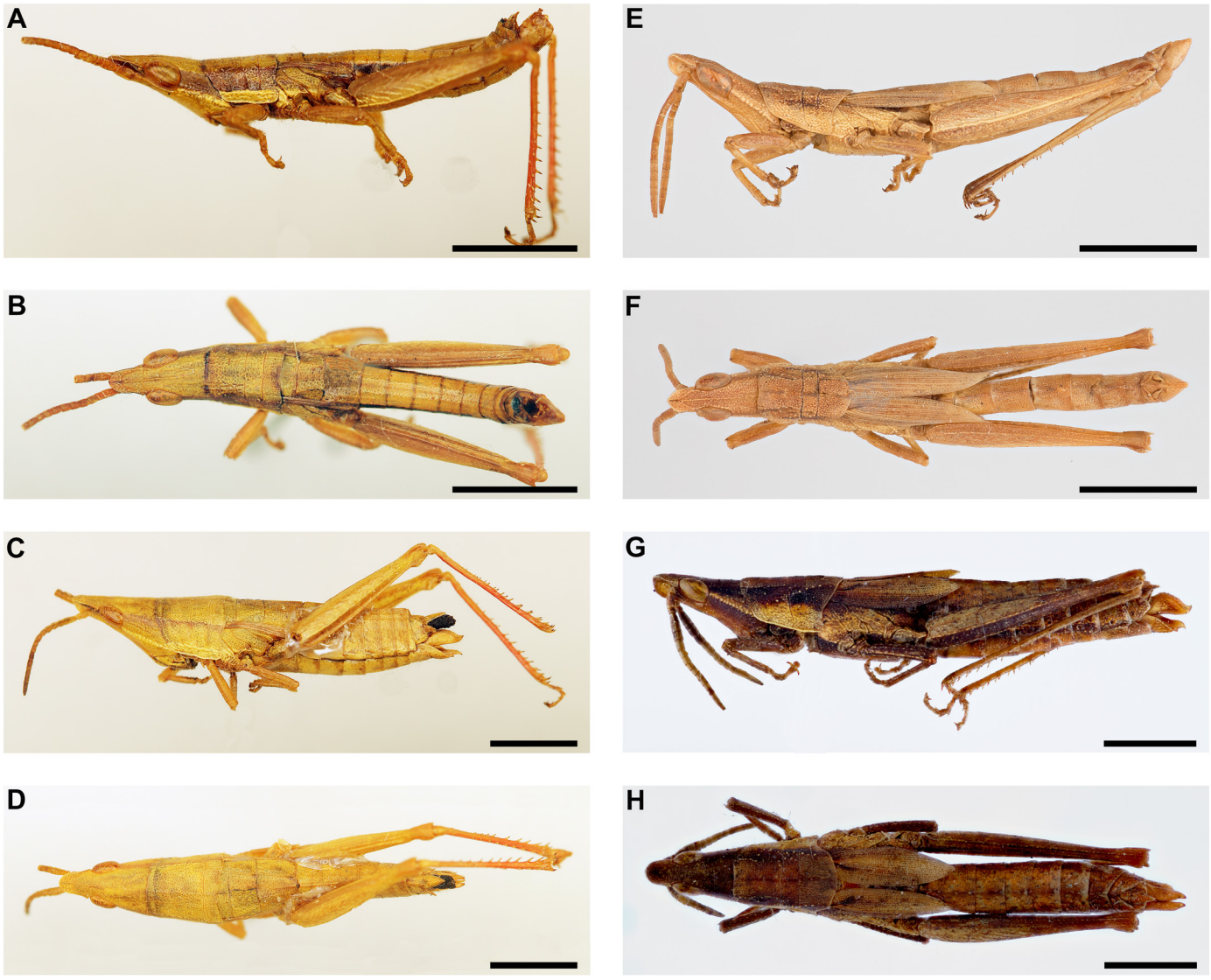

Figure 87. — Indian Subcontinent Pyrgomorphidae IV. **A-D.** *Ramakrishnaia gracilis.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Zarytes squalinus.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

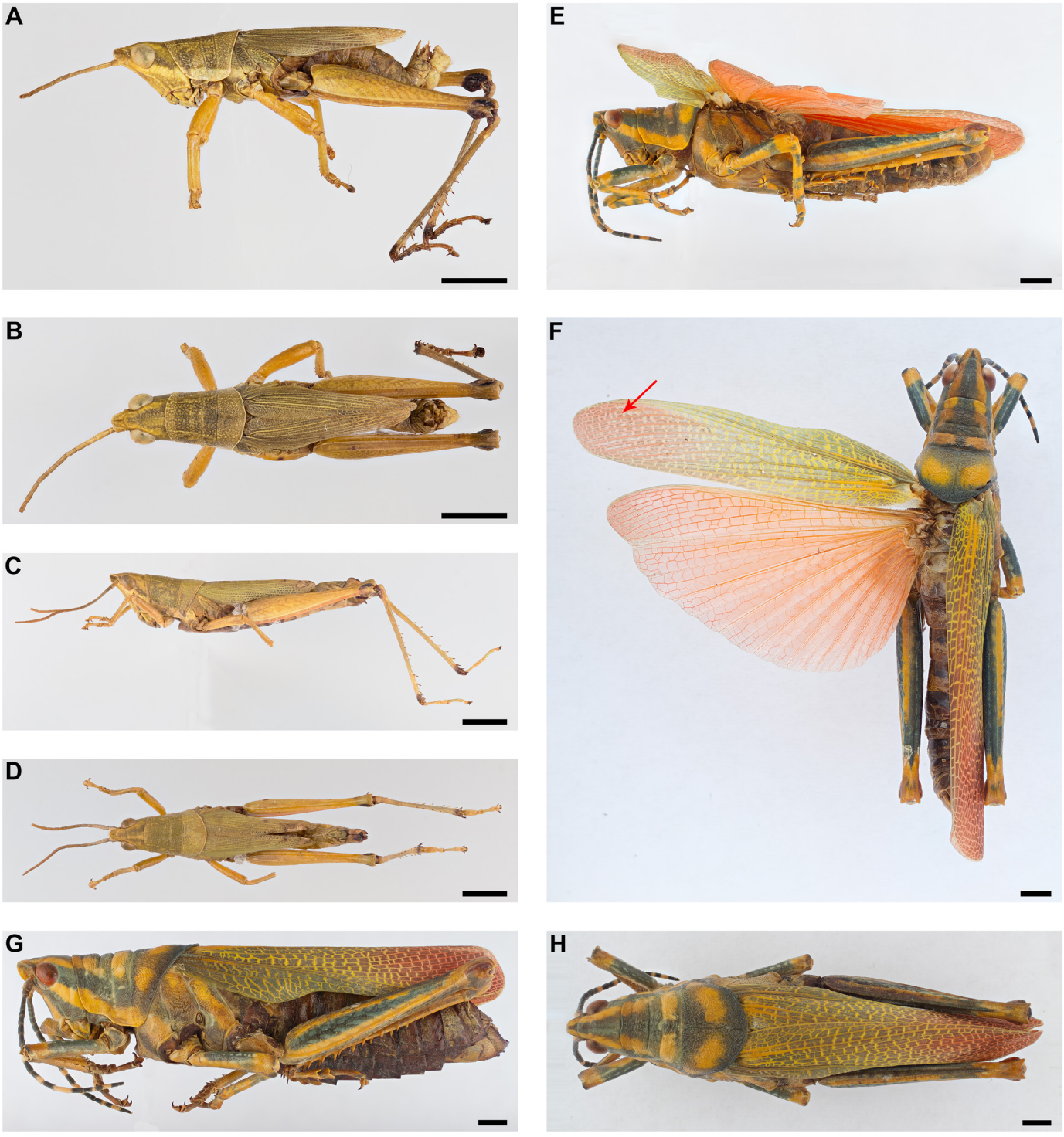

Figure 88. — Indian Subcontinent Pyrgomorphidae V. **A-D.** *Chlorizeina unicolor.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Poekilocerus pictus.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

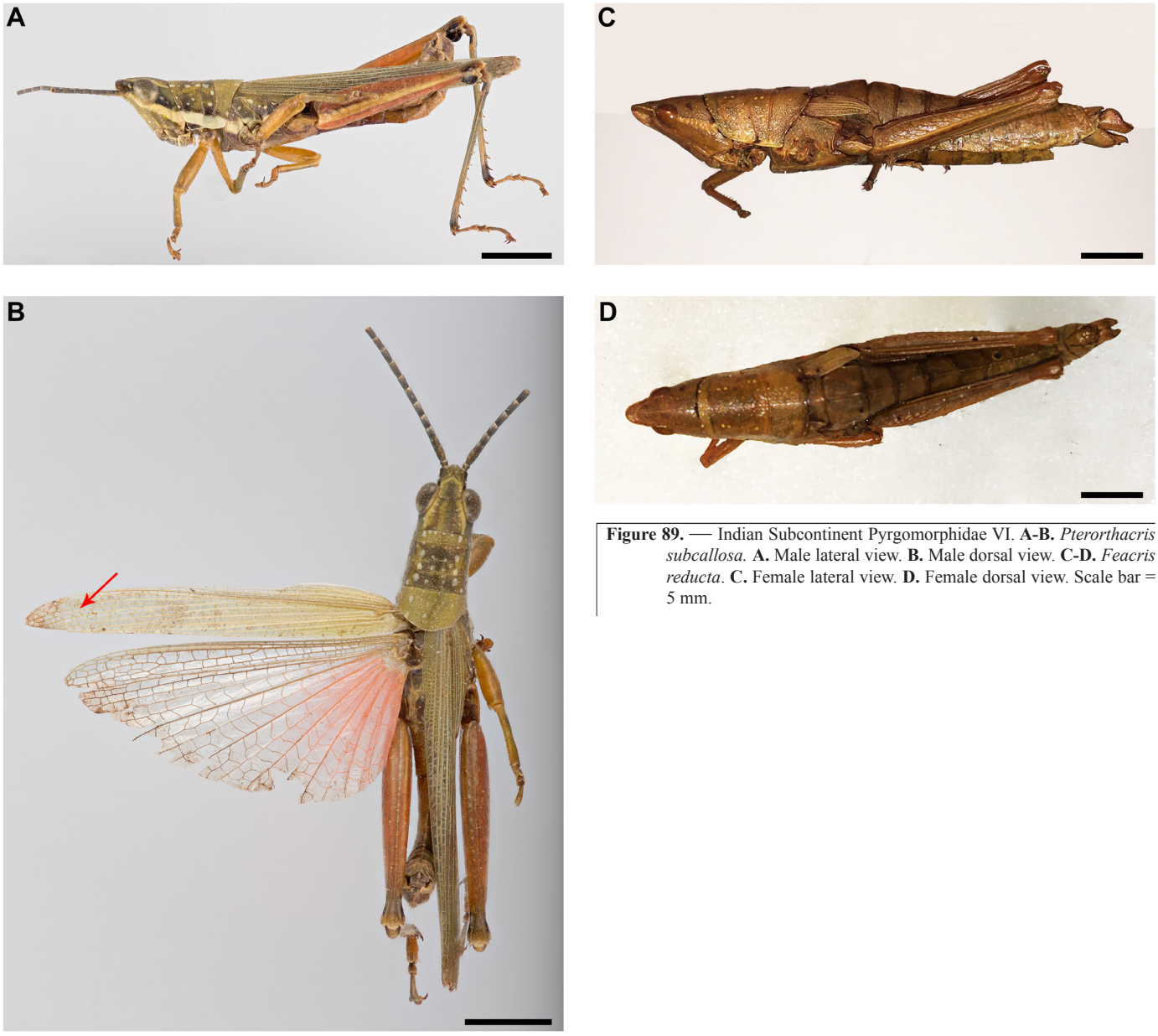

Figure 89. — Indian Subcontinent Pyrgomorphidae VI. **A-B.** *Pterorthacris subcallosa.* **A.** Male lateral view. **B.** Male dorsal view. **C-D.** *Feacris reducta*. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

8. Key to Pyrgomorphidae genera of China

Modified from Xia et al. (1994) with information from Huang (1990).

The region includes thirteen genera, of which four are endemic. Of the nine non-endemic genera *Phymateus, Chrotogonus, Pyrgomorpha* and *Atractomorpha* have a wide distribution. *Aularches, Chlorizeina* and *Pseudomorphacris* are also found in the India subcontinent and Southeast Asia. *Tagasta* is reported from the Indian subcontinent, Southeast Asia and Malesia as well and *Mekongiella* is also found in the Indian subcontinent.

1. Tegmina well developed (macropterous, brachypterous). 2
1'. Tegmina absent or highly reduced (micropterous). 9

2. Head in lateral view forming almost a right angle; pronotum with tubercles or spines. 3
2'. Head in lateral view forming an acute angle; pronotum lacking tubercles or spines. 4

3. Prozona with a large bilobed tubercle; tegmina frequently with spots; cells numerous with some pentagonal cells towards the posterior end (fig. 90A-D). (Southern China) ..... *Aularches* (1 sp.) (*A. miliaris*)
3'. Prozona with spines; tegmina without spots; cells less numerous and rectangular (fig. 32A-B, D-E). (Southern China) ..... *Phymateus* (1 sp.) (*P. viridipes*)

4. Anterior margin of prosternum forming a wide collar, covering the posterior and lower part of the mouth (fig. 10E & 90E-H). (Northwest, Central and Northeast China) ..... *Chrotogonus* (2 spp.) (*C. armatus, C. turanicus*)
4'. Anterior margin of prosternum not covering the posterior and lower part of the mouth. 5

5. The base of the antennae located in front of the lateral ocelli. 7
5'. The base of the antennae located below the lateral ocelli. 6

6. Tegmina fully developed; lateral carinae of pronotum well-marked (fig. 91A-D). (Northwestern China) ..... *Pyrgomorpha* (2 spp.) (*P. bispinosa, P. conica*)
6'. Tegmina shortened; lateral carinae of pronotum faintly present (fig. 88A-D). (Yunnan) ..... *Chlorizeina* (1 sp.) (*C. yunnana*)

7. Marginal area of hind femur expanded, as wide as medial area; cerci bent (fig. 91E-L). (Southern China) ..... *Pseudomorphacris* (1 sp.) (*P. hollisi*)
7'. Marginal area of hind femur not expanded, narrower than medial area; cerci straight. 8

8. The line of tubercles behind eyes not continuing to the lateral margin of pronotum (fig. 92A-D). (Southern China) ..... *Tagasta* (8 spp.) (*T. brachyptera, T. gui* (Taiwan)*, T. indica, T. marginella, T. nigritibia, T. rufomaculata, T. tonkinensis, T. yunnana*)
8'. The line of tubercles behind eyes continuing to the lateral margin of pronotum (figs. 22A-D & 77A-D). (East half of China, Himalaya) ..... *Atractomorpha* (15 spp.) (*A. burri, A. fuscipennis, A. heteroptera, A. himalayica, A. lata, A. melanostriga, A. micropenna, A. nigripennis, A. peregrina, A. psittacina, A. sagittaris, A. sinensis, A. suzhouensis, A. taiwanensis* (Taiwan), *A. yunnanensis*)

9. Tympanum present or atrophied. 10
9'. Tympanum absent (fig. 92E-H). (Tibet) ..... *Mekongiella* (5 spp.) (*M. kingdoni, M. pleurodilata, M. rufitibia, M. wardi, M. xizangensis*)

10. Tegmina present (micropterous). 11
10'. Tegmina absent. (Yunnan) ..... *Paramekongiella** (1 sp.)
(*P. zhongdianensis*)

11. Tegmina elongated; body with small tubercles; tympanum well developed (fig. 93A-E). (Yunnan) .....
..... *Yunnanites** (3 spp.)
(*Y. albomargina, Y. coriacea, Y. zhengi*)
11'. Tegmina reduced. 12

12. Body rugose; tympanum membrane highly reduced, almost closed (fig. 93F-I). (Yunnan) ..... *Mekongiana** (2 spp.)
(*M. gregoryi, M. xiangchengensis*)
12'. Body granular; tympanum membrane slightly developed. (Yunnan) ..... *Micropterus** (1 sp.)
(*M. yongshengensis*)

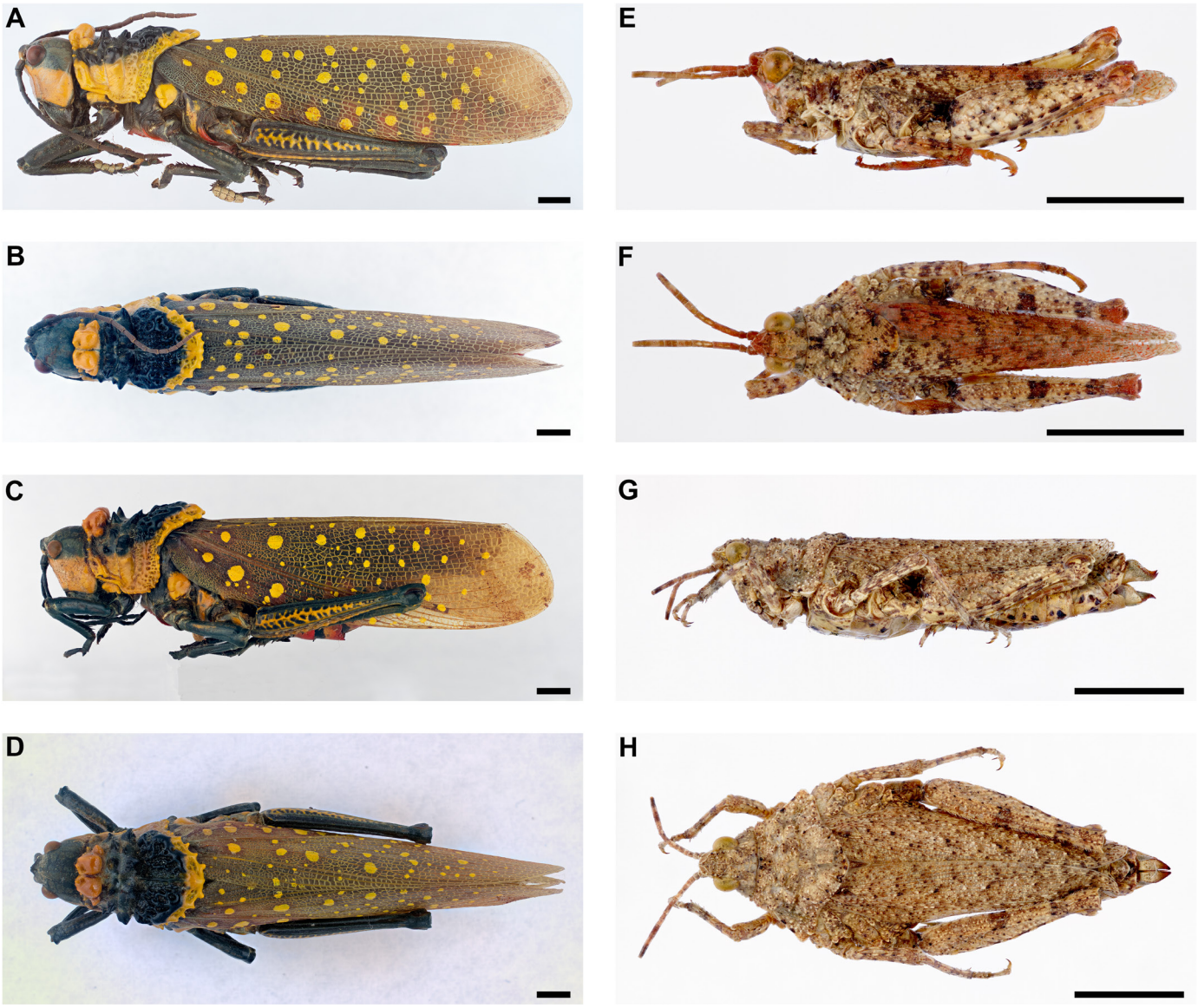

Figure 90. — China Pyrgomorphidae I. **A-D.** *Aularches miliaris.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Chrotogonus turanicus.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

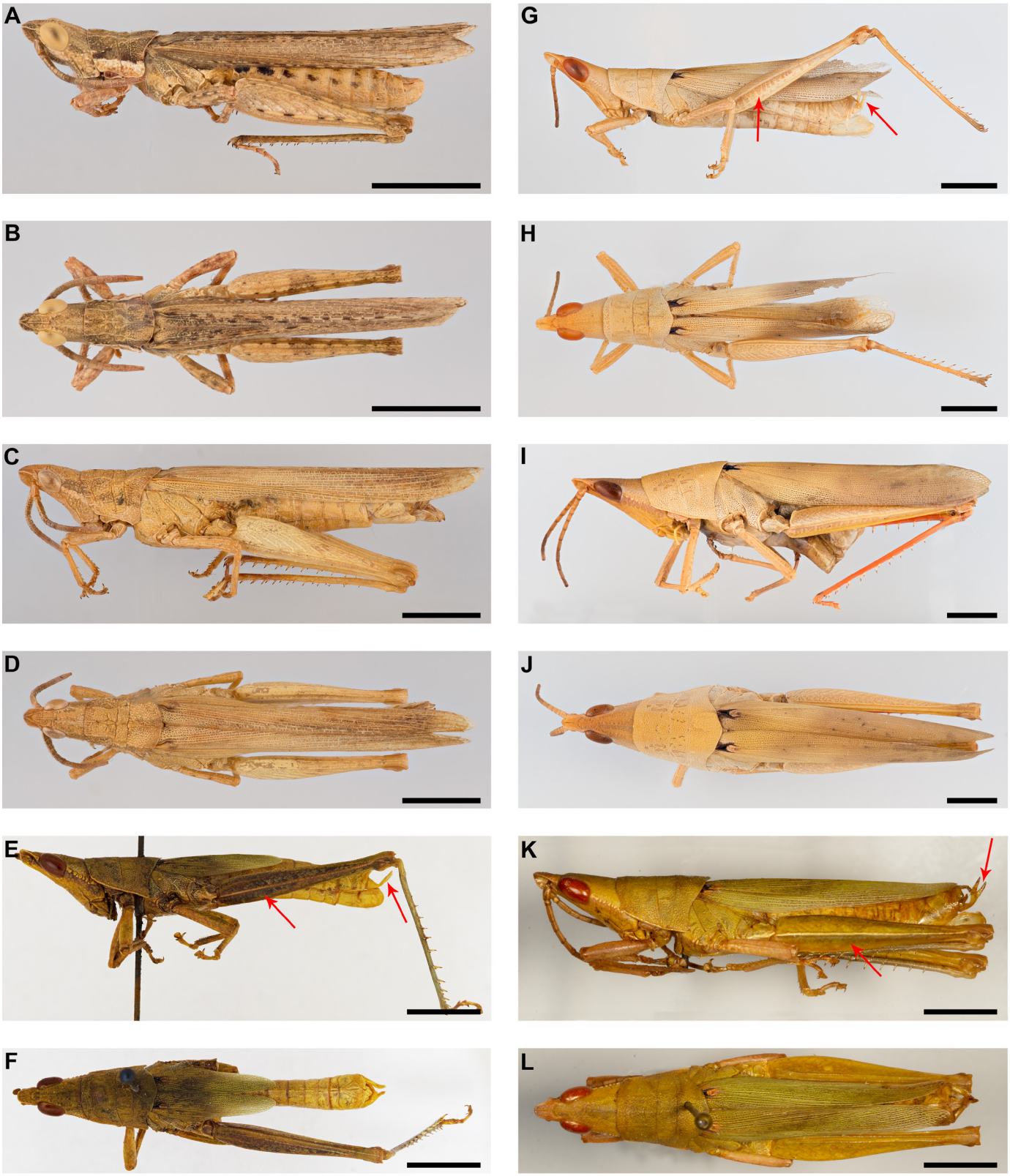

Figure 91. — China Pyrgomorphidae II. **A-D.** *Pyrgomorpha conica conica.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Pseudomorphacris brachyptera*. **E.** Male lateral view. **F.** Male dorsal view. **G-J.** *Pseudomorphacris notata.* **G.** Male lateral view. **H.** Male dorsal view. **I.** Female lateral view. **J.** Female dorsal view. **K-L.** *Pseudomorphacris hollisi*. **K.** Male lateral view. **L.** Male dorsal view. Scale bar = 5 mm.

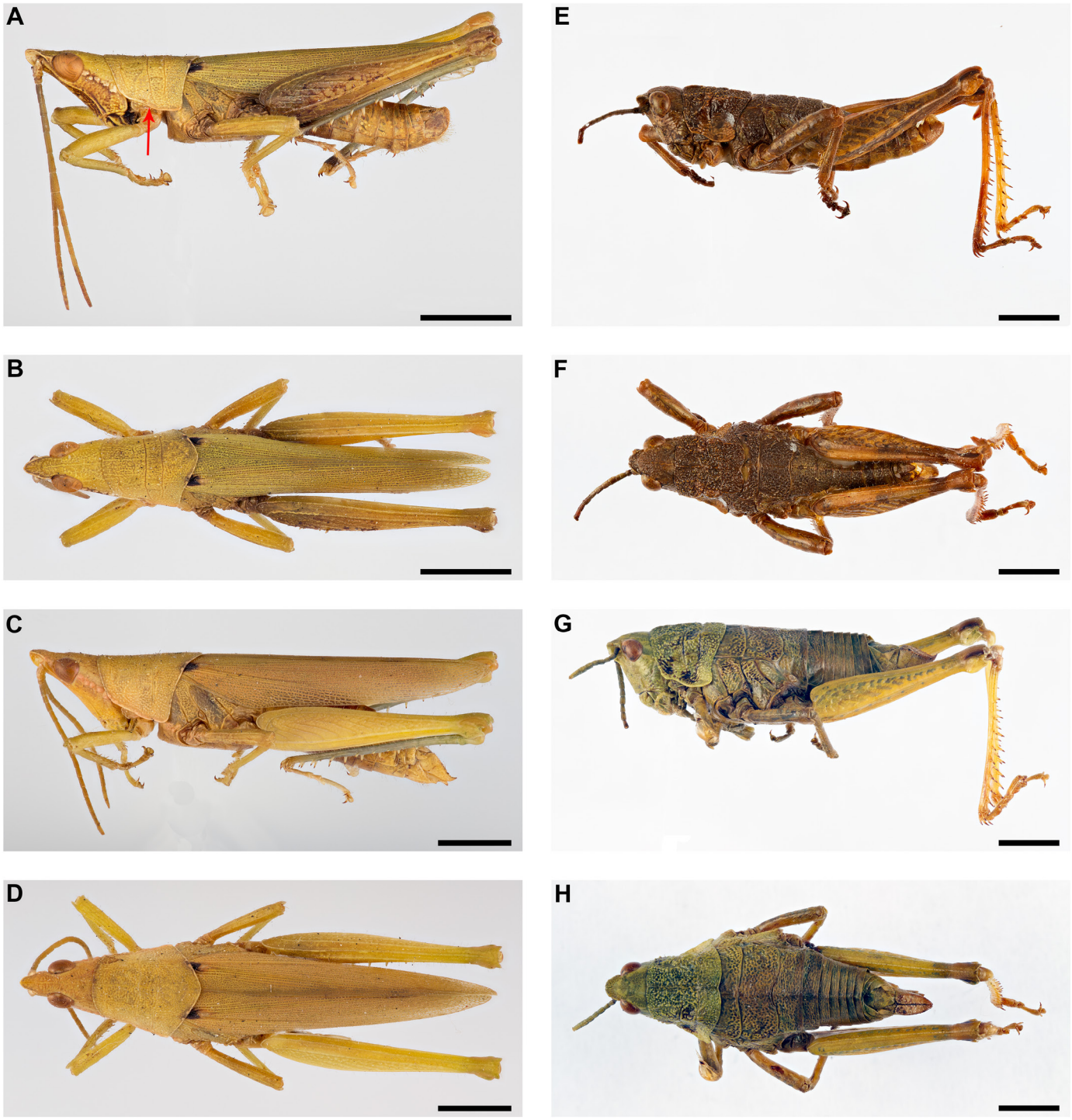

Figure 92. — China Pyrgomorphidae III. **A-D.** *Tagasta indica.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Mekongiella kingdoni.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

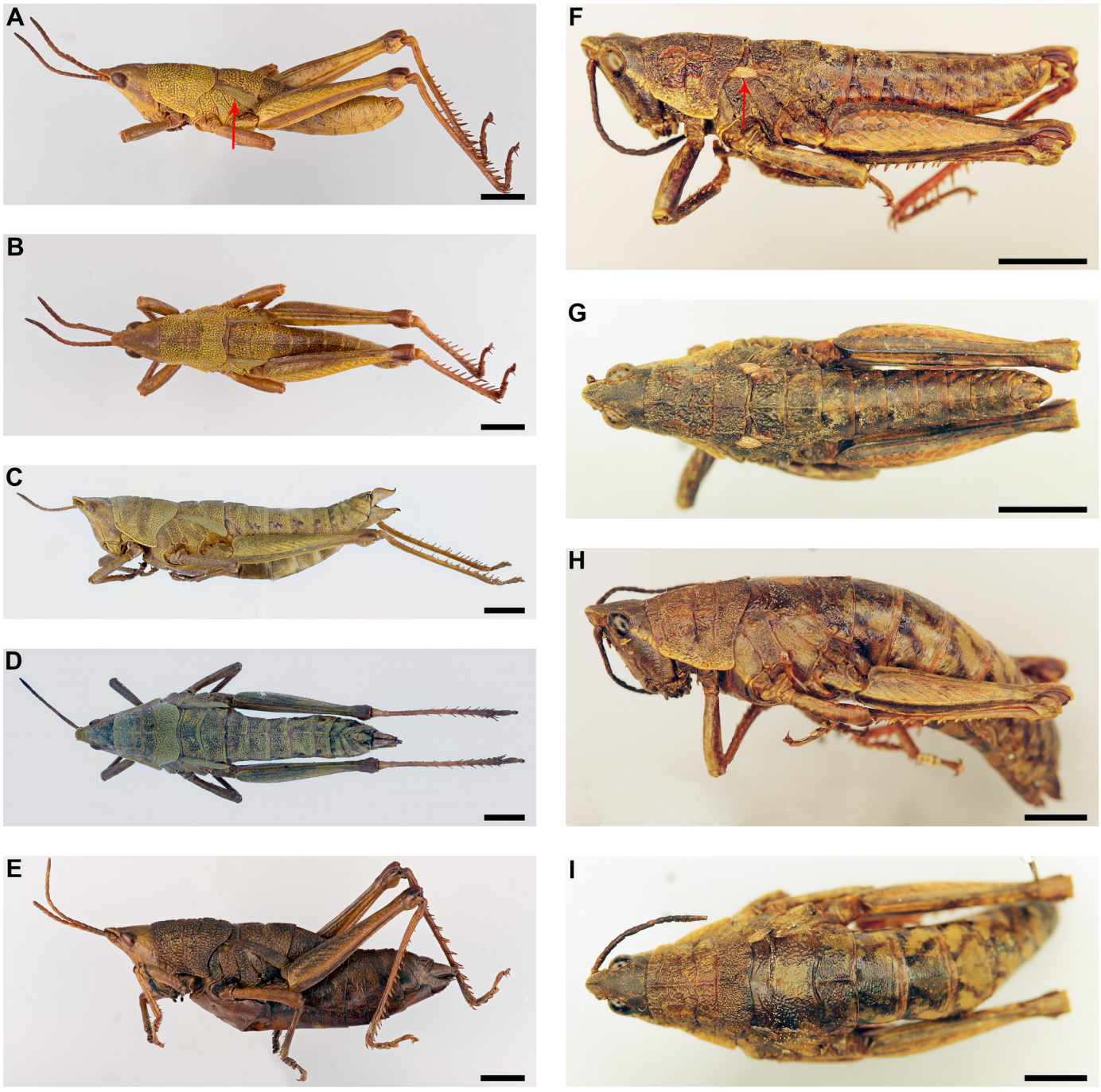

Figure 93. — China Pyrgomorphidae IV. **A-E.** *Yunnanites coriacea.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E.** Female lateral view. **F-I.** *Mekongiana gregoryi.* **F.** Male lateral view. **G.** Male dorsal view. **H.** Female lateral view. **I.** Female dorsal view. Scale bar = 5 mm.

9. Key to Pyrgomorphidae genera of Southeast Asia

According to Orthoptera Species File (Cigliano et al., 2022), this area includes Cambodia, Laos, Myanmar, Thailand and Vietnam.

This area includes nine genera, of which three are endemic to the region. Of the six non-endemic genera *Atractomorpha* has a wide distribution. *Aularches, Chlorizeina* and *Pseudomorphacris* are also found in the India subcontinent and China. *Tagasta* is reported from the Indian subcontinent, China and Malesia as well and *Kuantania* is also reported from Malaysia.

1. Apterous. 2
1'. Tegmina present. 3

2. Fastigium of vertex well developed; head elongated, antennae unusually very short (fig. 94A-B). (Cambodia) ..... *Arbuscula** (1 sp.) (*A. cambodjiana*)
2'. Fastigium of vertex poorly developed; head short (fig. 94C-D). (Vietnam) ..... *Kuantania* (1 sp.) (*K. aptera*)

3. Antennae base located below lateral ocelli. 4
3'. Antennae base located in front of lateral ocelli. 7

4. Pronotum with tubercles and spines (fig. 90A-D). ..... *Aularches* (1 sp.) (*A. miliaris*)
4'. Pronotum without tubercles and spines. 5

5. Tegmina brachypterous. 6
5'. Tegmina micropterous (fig. 95A-B). (Myanmar) ..... *Burmorthacris** (1 sp.)

6. Body subfusiform; hind femur longer than the length of abdomen (fig. 88A-D). ..... *Chlorizeina* (3 spp.) (*C. feae, C. togulata, C. unicolor*)
6'. Body cylindrical; hind femur shorter than the length of abdomen (fig. 94E-H). (Vietnam) ..... *Megradina** (1 sp.) (*M. festiva*)

7. Marginal area of hind femur not expanded, narrower than medial area; cerci straight. 8
7'. Marginal area of hind femur expanded, as wide as medial area; cerci bent (fig. 91E-L). ..... *Pseudomorphacris* (3 spp.) (*P. brachyptera, P. hollisi, P. notata*)

8. A row of tubercles from eye continuing to the lateral margin of pronotum (figs. 22A-D, 77A-D). ..... *Atractomorpha* (6 spp.) (*A. angusta, A. burri, A. crenulata, A. lata, A. psittacina, A. sinensis*)
8'. A row of tubercles from eye not continuing to the lateral margin of pronotum (fig. 92A-D). ..... *Tagasta* (3 spp.) (*T. indica, T. marginella, T. tonkinensis*)

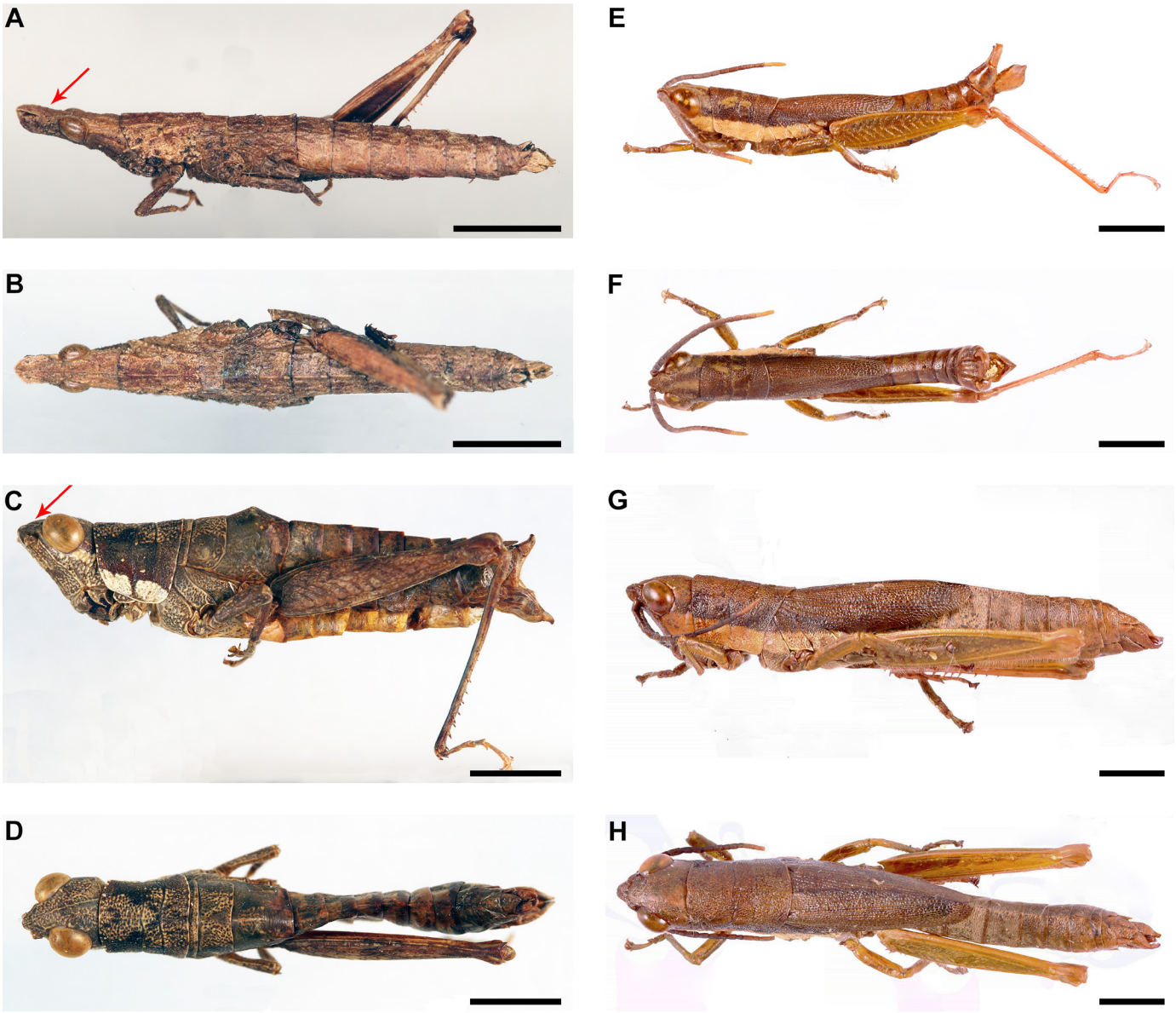

Figure 94. — Southeast Asia Pyrgomorphidae I. **A-B.** *Arbuscula cambodjiana.* **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Kuantania aptera*. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Megradina festiva.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

Figure 95. — Southeast Asia Pyrgomorphidae II. **A-B.** *Burmorthacris subaptera.* **A.** Male lateral view. **B.** Male dorsal view. Scale bar = 5 mm.

10. Key to Pyrgomorphidae genera of Malesia

With some information from Kevan (1963a).

According to Orthoptera Species File (Cigliano et al., 2022) this area includes Malaysia, Philippines, and Indonesia (except for New Guinea Island).

This area includes fourteen genera, of which eight are endemic to the region. Of the six non-endemic genera *Atractomorpha* is distributed from Africa to Australia. *Tagasta* is also found in the Indian subcontinent, China and Southeast Asia. *Verdulia* is also present in adjacent New Guinea Island (considered part of Papuasia and Pacific Islands according to Orthoptera Species File). *Desmoptera* and *Desmopterella* are also found in Papuasia and Pacific Islands and Australia and *Kuantania* is also reported from Vietnam.

1. Body laterally compressed. 2
1'. Body not laterally compressed. 5

2. Space between eye and pronotum in lateral approximately the length of eye. 3
2'. Space between eye and pronotum in lateral view twice the length of eye (fig. 96A-B). (Philippines) ..... *Brunniella** (1 sp.)
(*B. antistes*)

3. Tegmina with a distinct apical point about or in advance of the middle of the apical margin; one species brachypterous (fig. 96C-H). (Philippines) ..... *Apodesmoptera** (3 spp.)
(*A. curtipennis, A. mira, A. luzonica*)
3'. Tegmina with a distinct apical point distinctly nearer the posterior than the anterior margin of tegmina. 4

4. Tegmina not tapering from near the base, anterior margin usually curving rather abruptly into apical margin; medium size, more than 22 mm for males and 33 mm for females (fig. 97A-D). ..... *Desmoptera* (3 spp.)
(*D. judicata, D. novaeguineae, D. degenerata*)
4'. Tegmina often tapering gradually from near the base, anterior margin curving more gradually into the apical margin; small size, less than 22 mm for males and 35 for females (fig. 97E-H). ..... *Desmopterella* (2 spp.)
(*D. keyensis, D. sundaica*)

5. Tegmina present. 6
5'. Tegmina virtually absent (fig. 98A-D). (Philippines) ..... *Philippyrgus** (1 sp.)
(*P. subapterus*)

6. Micropterous. 7
6'. Brachypterous or macropterous. 8

7. Head smooth; antennae much longer than head and pronotum together (fig. 98E-H, 99-100). (Philippines) ..... *Meubelia** (7 spp.)
(*M. atriantennis, M. bakeri, M. bivittata, M. bruneri, M. gracilis, M. leytensis, M. schistacra*)
7'. Head foveolate; antennae around the length of head and pronotum together (fig. 101A-B). (Malaysia) ..... *Kuantania* (1 sp.)
(*K. squamipennis*)

8. Brachypterous. 9
8'. Macropterous. 11

9. Head normal; hind tarsomeres short, not as long as half the length of hind tibia; last abdominal segment protruding. 10
9'. Head short; hind tarsomeres as long as half the length of hind tibia; last abdominal segment not protruding (fig. 101C-H). (Philippines) ..... *Spinacris** (3 spp.)
(*S. elegans, S. inermis, S. viridis*)

10. Fastigium of vertex short, not longer than its width; last abdominal segment in males with broad, simple, subcircular or semicircular posterior excision; cerci simple, elongate, evenly curved inwards and acute apically (fig. 102A-D). (Malay Peninsula, Borneo Island) ..... *Mitricephaloides** (2 spp.)
(*M. rhodopterus, M. rubrosignatus*)

10'. Fastigum of vertex longer, at least as long as wide; last abdominal segment with a deep narrow, elongate, oblong or key-hole shape posterior excision having thickened lateral margins; cerci robust, flattened, rather abruptly curved inwards towards the apices, which are blunt or truncated (fig. 102E-F). (Malay Peninsula, Sumatra Island, Java Island) .... *Mitricephala** (5 spp.)
(*M. dohrni, M. javanica, M. milleri, M. vittata*)

11. A row of tubercles running from eye to pronotum in lateral view. 12

11'. Such a row of tubercles absent. 13

12. A row of tubercles from eye continuing to the lateral margin of pronotum (figs. 22A-D, 77A-D). .... *Atractomorpha* (5 spp.)
(*A. angusta, A. burri, A. psittacina, A. rhodoptera, A. similis*)

12'. A row of tubercles from eye not continuing to the lateral margin of pronotum (in some females the row continues partially but in an irregular pattern) (fig. 103). ..... *Tagasta* (7 spp.)
(*T. anoplosterna, T. celebesica, T. hoplosterna, T. inornata, T. insularis, T. marginella, T. striatipennis*)

13. Large spines on hind tibia, antennae filiform (fig. 104). (Malay Peninsula, Java Island) ..... *Annandalea** (2 spp.)
(*A. haematoptera, A. robinsoni*)

13'. Small spines on hind tibia, antennae serrated (fig. 105). (Borneo Island) ..... *Verdulia* (1 sp.)
(*V. subcycloidea*)

Figure 96. — Malesia Pyrgomorphidae I. **A-B.** *Brunniella antistes*. **A.** Male lateral view. **B.** Male dorsal view. **C-D.** *Apodesmoptera luzonica*. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Apodesmoptera mira*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

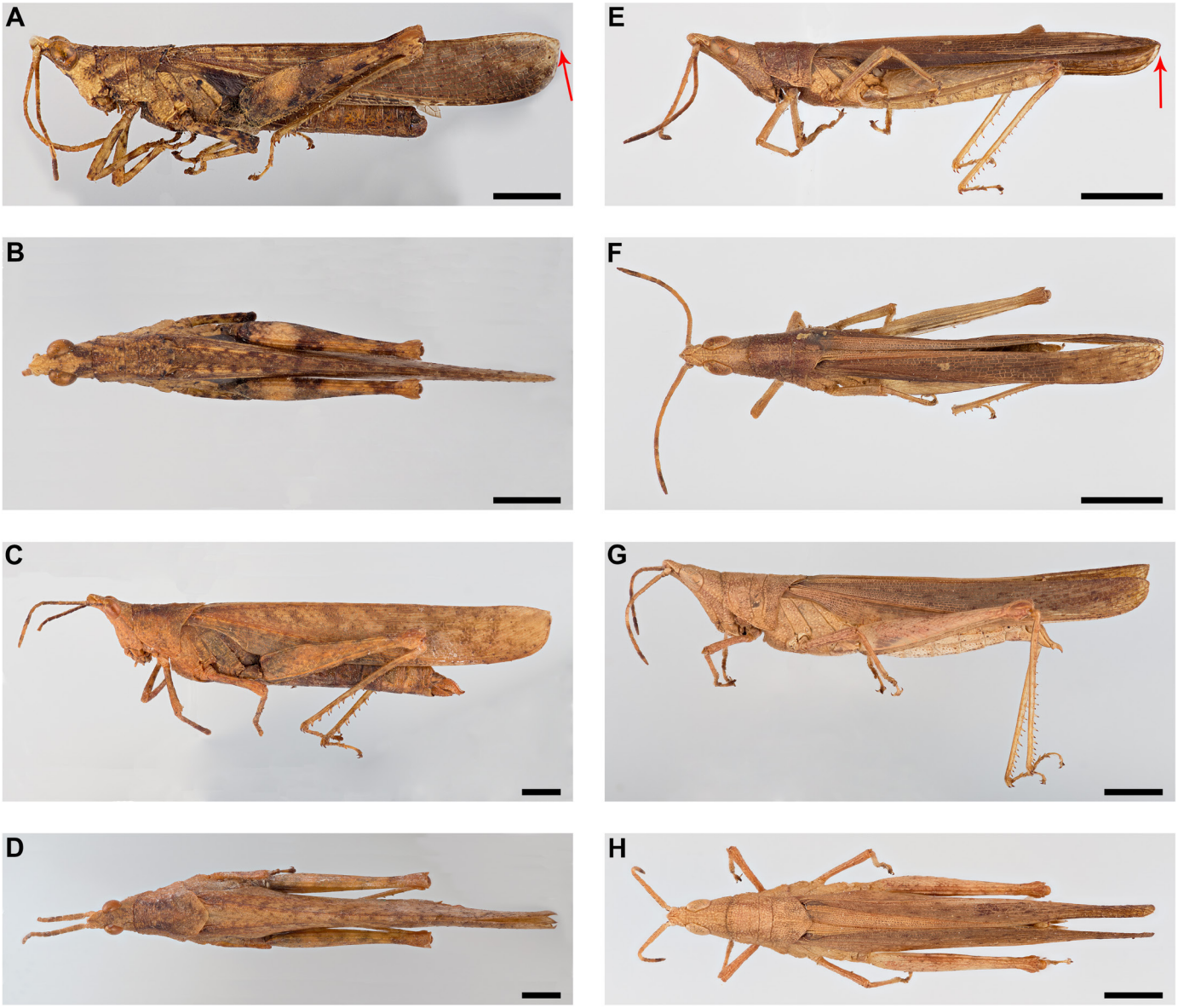

Figure 97. — Malesia Pyrgomorphidae II. **A-D.** *Desmoptera novaeguineae.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Desmopterella angustata.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

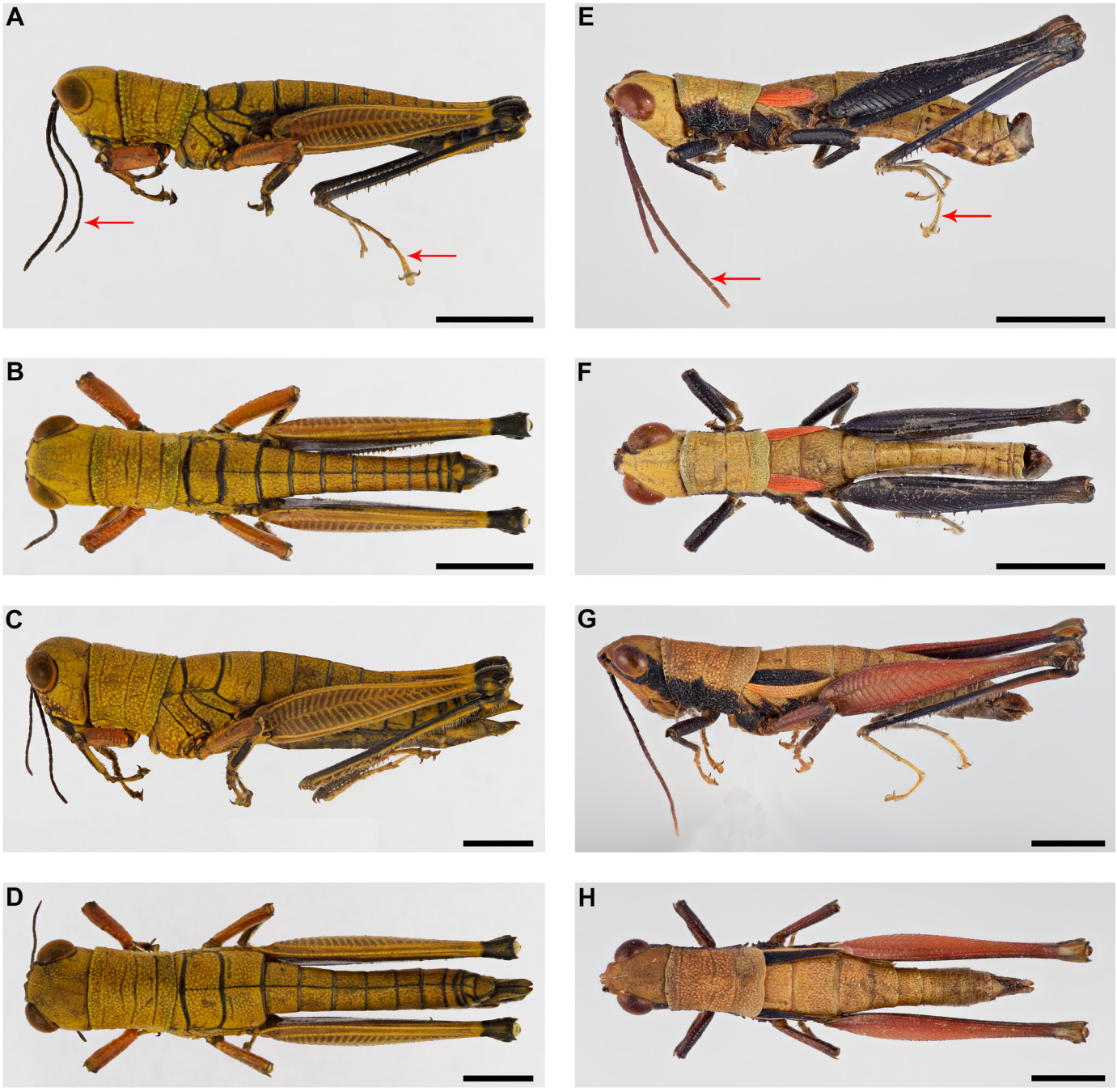

Figure 98. — Malesia Pyrgomorphidae III. **A-D.** *Philippyrgus subapterus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Meubelia leytensis.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

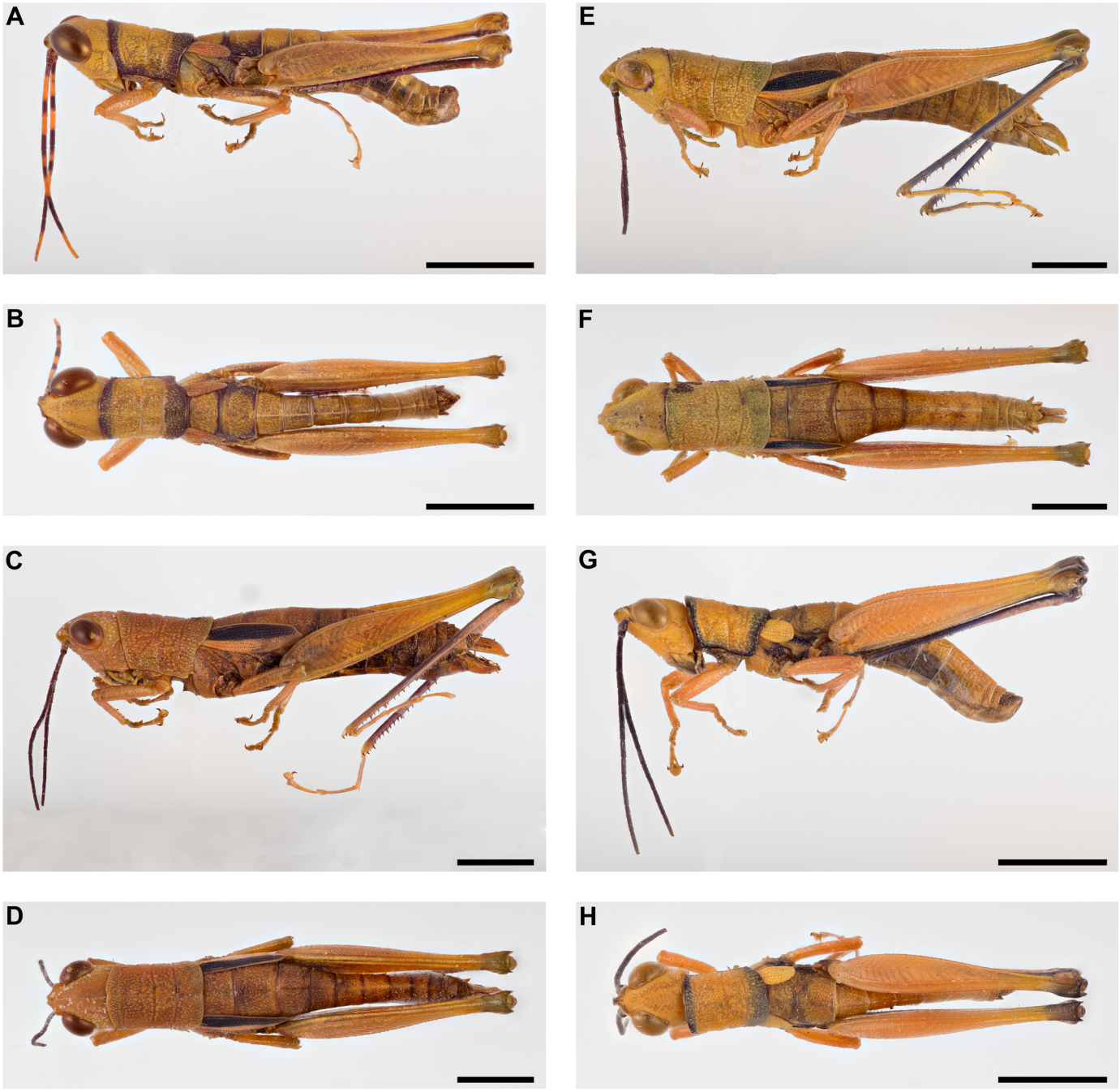

Figure 99. — Malesia Pyrgomorphidae IV. **A-D.** *Meubelia gracilis.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Meubelia bakeri.* **E.** Female lateral view. **F.** Female dorsal view. **G-H.** *Meubelia schistacra.* **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

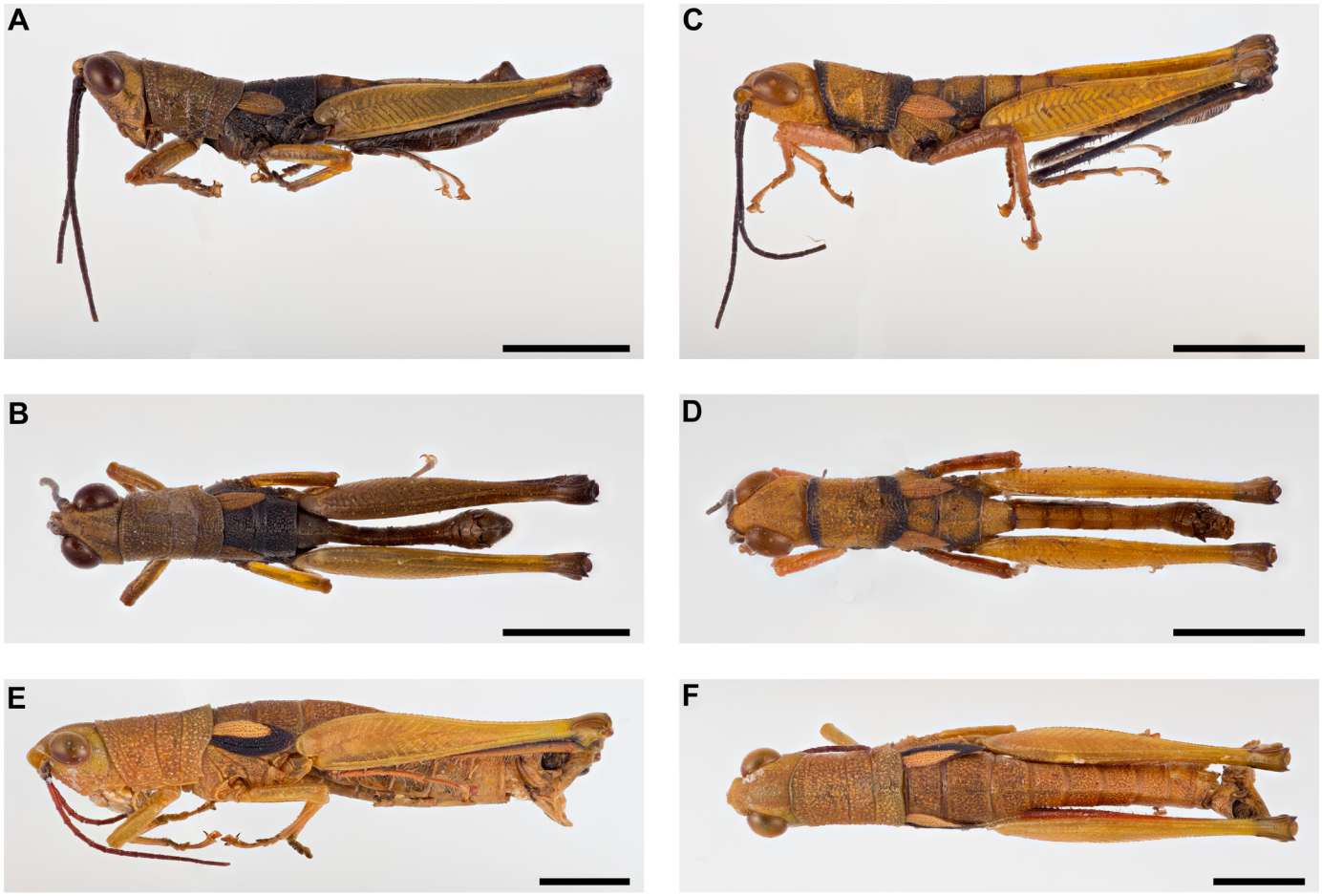

Figure 100. — Malesia Pyrgomorphidae V. **A-B.** *Meubelia atriantennis.* **A.** Male lateral view. **B.** Male dorsal view. **C-D.** *Meubelia bivittata.* **C.** Male lateral view. **D.** Male dorsal view. **E-F.** *Meubelia bruneri.* **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

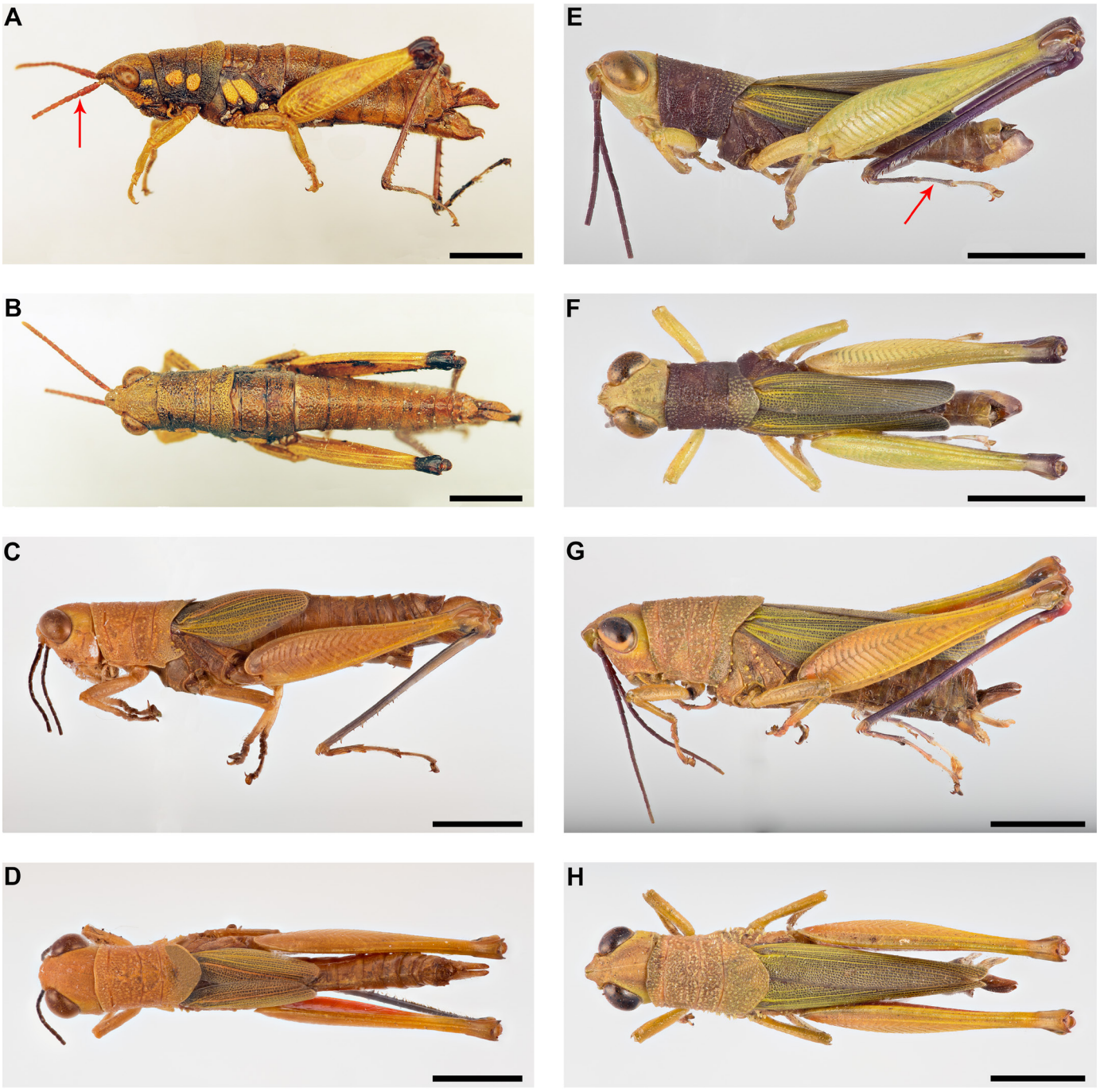

Figure 101. — Malesia Pyrgomorphidae VI. **A-B.** *Kuantania squamipennis.* **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Spinacris elegans.* **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Spinacris inermis.* **E.** Male lateral view. **F** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

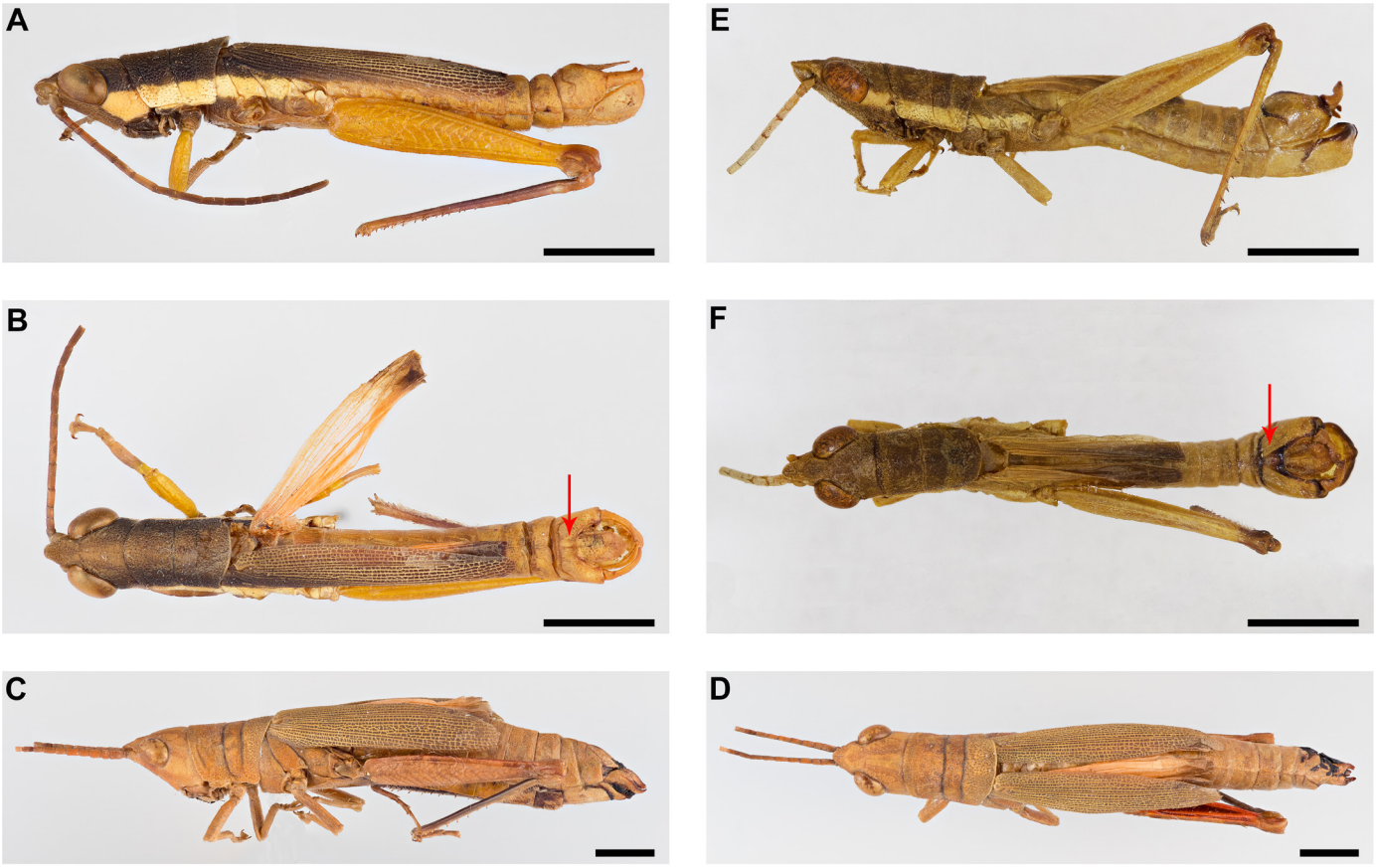

Figure 102. — Malesia Pyrgomorphidae VII. **A-D.** *Mitricephaloides rhodopterus.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Mitricephala javanica.* **E.** Male lateral view. **F.** Male dorsal view. Scale bar = 5 mm.

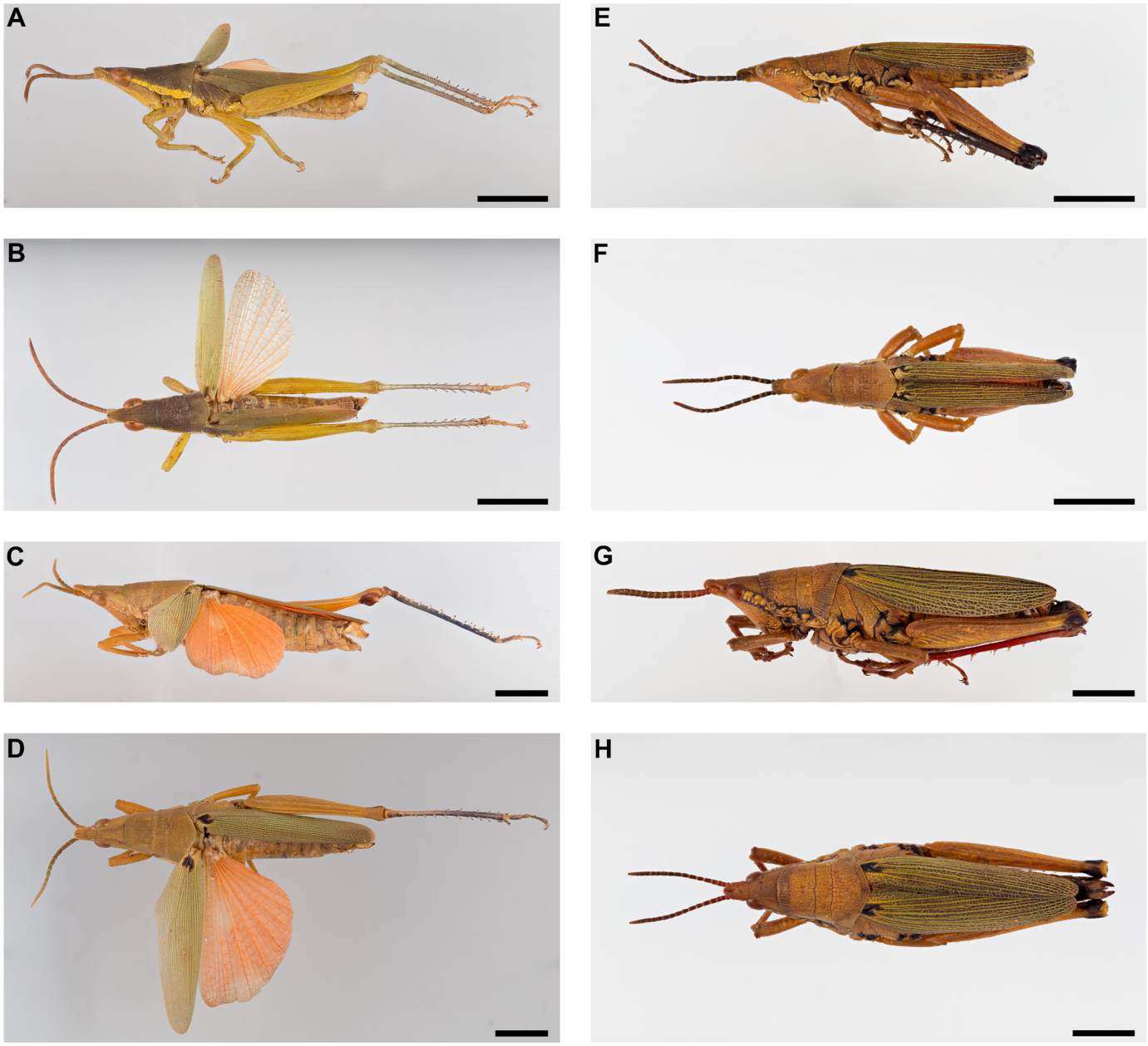

Figure 103. — Malesia Pyrgomorphidae VIII. **A-D.** *Tagasta celebesica.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Tagasta hoplosterna.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

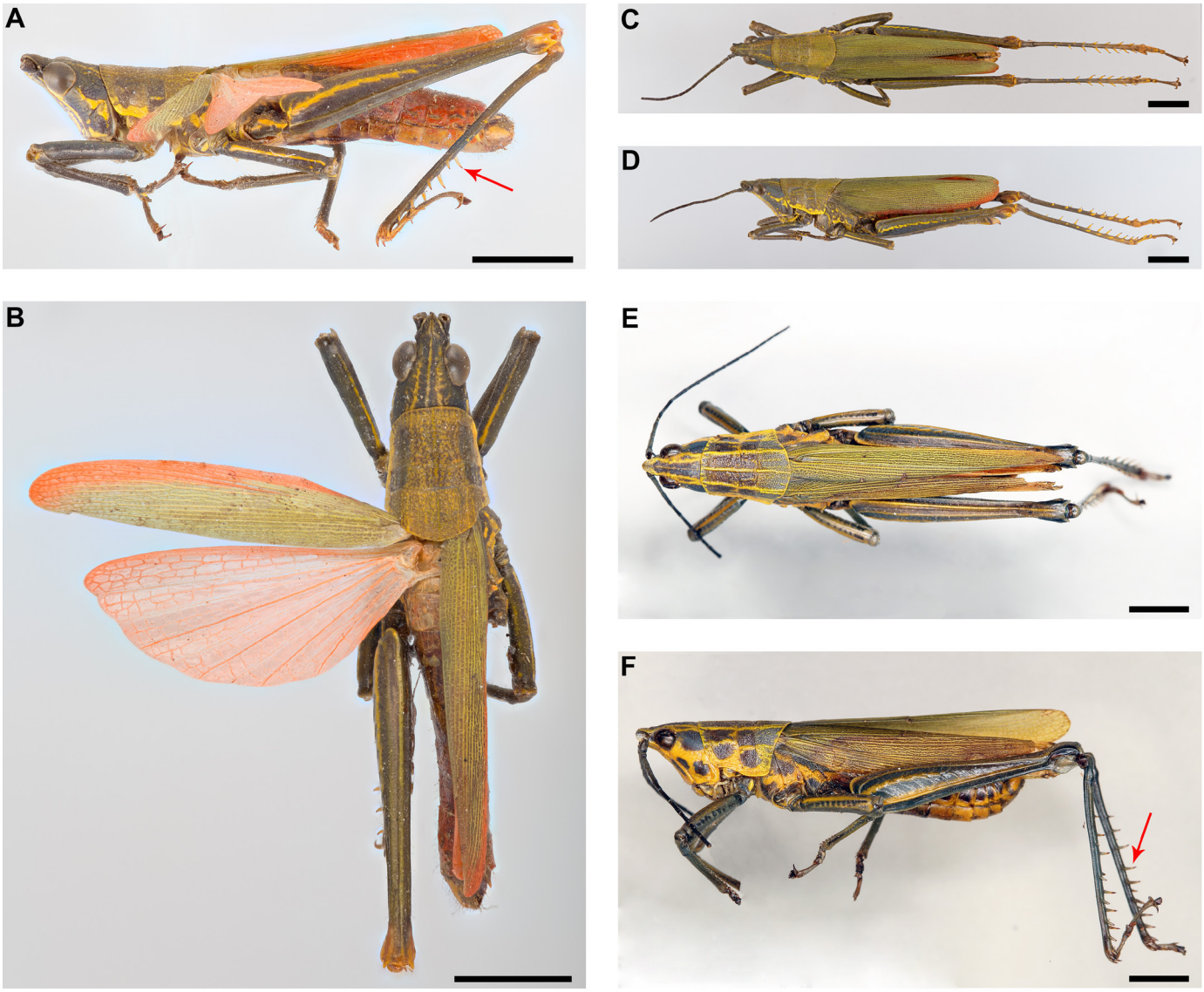

Figure 104. — Malesia Pyrgomorphidae IX. **A-D.** *Annandalea haematoptera.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female dorsal view. **D.** Female lateral view. **E-F.** *Annandalea robinsoni.* **E.** Male dorsal view. **F.** Male lateral view. Scale bar = 5 mm.

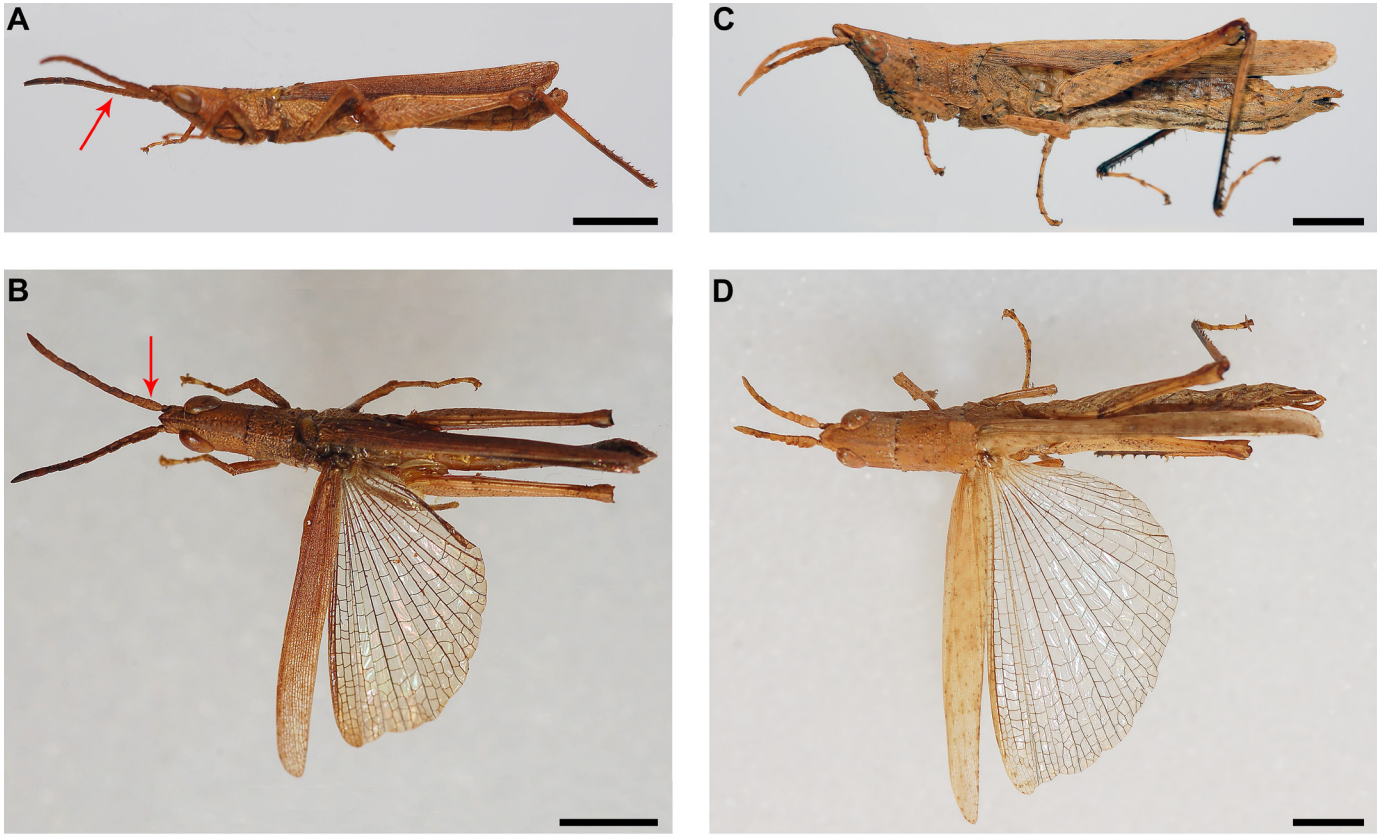

Figure 105. — Malesia Pyrgomorphidae X. **A-D.** *Verdulia subcycloidea.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

11. Key to Pyrgomorphidae genera of Papuasia and Pacific Islands

This region comprises New Guinea Island (western half is Indonesia, eastern half is Papua New Guinea), Solomon Islands, Bismarck Archipelago, New Caledonia and Fiji Islands.

This area includes twenty-one genera, of which seventeen are endemic to the region. *Atractomorpha sinensis* has been introduced in the Hawaiian Islands and Line Islands (Kevan, 1975) and *A. psittacina* has been introduced to Guam (Kevan, 1990b). Regarding the non-endemic genera *Atractomorpha* is distributed from Africa to Australia. *Verdulia* is also presented in adjacent Borneo Island (considered part of Malesia according to Orthoptera Species File). *Desmoptera* and *Desmopterella* are also found in Malesia and Australia.

Modified from Kevan (1963a, 1966e).

1. Body not laterally compressed. 2
1'. Body laterally compressed. 13

2. A row of tubercles running from eye to pronotum from lateral view absent. 3
2'. A row of tubercles running from eye to pronotum from lateral view present (figs. 22A-D, 77A-D). (New Guinea Island) ... . *Atractomorpha* (1 sp.) (*A. crenaticeps*)

3. Eyes small, covering less than half of total head length in lateral view. 4
3'. Eyes large, almost always covering more than half of total head length in lateral view. 5

4. Antennae serrated, shorter than head and thorax together (fig. 106A-B). (New Guinea Island) ..... *Verdulia* (1 sp.) (*V. cycloidea*)
4'. Antennae filiform, longer than head and thorax together (fig. 106E-F). (Fiji Islands) ..... *Fijipyrgus** (1 sp.) (*F. gracilis*)

5. Apterous. 6
5'. Tegmina and hind wings present (fig. 106C-D). (New Guinea Island) ..... *Megra** (2 spp.) (*M. flava, M. trimaculata*)

6. Second tarsal segment of hind tarsus subequal to or longer than third tarsal segment. 7
6'. Second tarsal segment of hind tarsus much shorter than third tarsal segment. 9

7. Head strongly depressed; head behind eyes distinctly wider than pronotum; male terminalia not elaborately specialized. 8
7'. Head not strongly depressed; head behind eyes not distinctly wider than pronotum; male terminalia very elaborated (fig. 106G-H). (New Guinea Island, Solomon Islands) ..... *Modernacris** (6 spp.) (*M. callosa, M. carpentieri, M. controversa, M. forcipata, M. guentheri, M. simplex*)

8. Head much broader than its length, much wider behind eyes than pronotum; subgenital plate not elongate (fig. 107A-D). (New Guinea Island) ..... *Paratarbaleus** (2 spp.) (*P. novaeguineae, P. spinosus*)
8'. Head not broader than its length, not so strongly narrowing toward pronotum; subgenital plate elongate (fig. 107E-F). (New Guinea Island, Bismarck Archipelago) ..... *Noonacris** (2 spp.) (*N. novahibernica, N. pusilla*)

9. Fastigium of vertex short and broad; male terminalia not bulbous. 10
9'. Fastigium of vertex prominent; male terminalia enlarged and bulbous (fig. 107G-J). (New Caledonia) .... *Nerenia** (1 sp.) (*N. francoisi*)

10. Antennal segments all or almost all distinctly longer than their width; posterior margin of lateral pronotal lobe not or not strongly excised. 11
10'. Antennal segments subquadrate or but little longer than their width; posterior margin of lateral pronotal lobe strongly and roundly excised (fig. 107K-L). (New Guinea Island) ..... *Buergersius** (1 sp.) (*B. olivaceus*)

11. Body not prominently tuberculate (except for meso-episterna and sometimes a pair of mid-dorsal lines of abdomen). 12
11'. Body beset with numerous prominent tubercles, especially on head and thorax; lower parts of thoracic meta-episterna (as well as of meso-episterna) with prominent tubercles visible from above (fig. 108A-D). (New Guinea Island) .... *Tarbaleopsis** (7 spp.) (*T. brunnea, T. hystrix, T. minor, T. proxima, T. stellae, T. tuberculata, T. willemsei*)

12. Head and fastigium of vertex narrower and head no wider than pronotum; eyes of males distinctly prominent (fig. 108E-H). (New Guinea Island) ..... *Fusiacris** (2 spp.) (*F. spinata, F. uniformis*)
12'. Head and fastigum of vertex wide and head wider than pronotum; both sexes with eyes prominent (fig. 109A-B). (New Guinea) ..... *Kapaoria** (3 spp.) (*K. flava, K. flavomaculata, K. novaeguineae*)

13. Tegmina with a distinct apical point about, or in advance of the middle of the apical margin; infero-posterior angle of lateral pronotal lobe distinctly acute or subacute. 14
13'. If tegmina and wings fully developed, tegmina with or without a distinct apical point. If distinct apical point present then, it is distinctly nearer the posterior margin rather than the anterior margin of the tegmina; infero-posterior angle of lateral pronotal lobe not distinctly acute, at most subacute. 15

14. Large body size (males at least 25 mm and females 35 mm); head very acute, frons very strongly oblique, subtending and angle of at most 25° with the vertex; tubercular ridge behind eye to inferior margin of pronotum strongly exaggerated, carina-like; infero-posterior angle of lateral pronotal lobe strongly acute (fig. 109C-F). (New Guinea Island) .... *Menesesia** (1 sp.) (*M. novaeguineae*)
14'. Small body size (males less than 25 mm and females less than 35 mm); head less acute, frons less oblique, subtending and angle of at least 30° with the vertex; tubercular ridge behind eye to inferior margin of pronotum less strong; infero-posterior angle of lateral pronotal lobe subacute (fig. 110A-D). (New Guinea Island) ..... *Menesesiella** (2 spp.) (*M. occulta, M. weylandi*)

15. Frons very strongly concave, rugose with the pair of tubercles or callous spots on either side of and slightly below median ocellus very strongly developed; pronotum strongly rugose, usually with a prominent, angular, oblique ridge running forward and downward from the upper part of the lateral lobe to near the infero-anterior angle. 16
15'. Frons and pronotum not as above. 19

16. Infero-posterior angle of pronotum strongly curved outwards; macropterous. 17
16'. Infero-posterior angle of pronotum not strongly curved outwards; tegmina and wings greatly reduced (fig. 110E-F). (New Guinea Island) ..... *Stenoxyphellus** (1 sp.) (*S. brachypterus*)

17. Tegmina with apices produced or obliquely truncated, or, if transversely truncated (females), then at most sinuous or slightly emarginated, not distinctly excised; hind wings narrower with apex produced into a short point. 18
17'. Tegmina tapering, with apices abruptly and transversely truncated and distinctly excised (especially in females); hind wings broad with apices rounded (fig. 110G-J). (New Guinea Island) ..... *Stenoxyphula** (2 spp.) (*S. excisa, S. microphallica*)

18. Tegmina strongly tapering from near the base (apices obliquely truncated and with a strong apical point); pronotum very rugose but the oblique ridge of the lateral lobe poorly developed and not forming a prominent point at the infero-anterior angle of the lobe (fig. 111A-B). (New Guinea Island) ..... *Paradoriaella** (1 sp.) (*P. tuberculata*)

18'. Tegmina, if tapering, then not strongly so; pronotum with the oblique, callous ridge of the lateral lobe well developed and forming a prominent point at the infero-anterior angle of the lobe (fig. 112). (New Guinea Island) .... *Stenoxyphus** (3 spp.) (*S. aurantiacus, S. expansus, S. variegatus*)

19. Tegmina with apices not strongly excised even if abruptly truncated and slightly emarginated; hind wings with apices rounded or bluntly pointed, not emarginated; ovipositor valves curved and hooked at apices; antennae not broadly expanded. 20

19'. Tegmina with apices abruptly truncated and normally strongly excised (especially in females); hind wings with apices angular and emarginated; ovipositor valves straight, serrated, but not hooked at apices; antennae sometimes broadly expanded (especially in females) (fig. 111C-D). (New Guinea Island) ..... *Doriaella** (2 spp.) (*D. cheesmanae, D. cinnabarina*)

20. Tegmina not tapering from near the base, anterior margin usually curving rather abruptly into apical margin; large body size, more than 22 mm for males and 33 mm for females (fig. 97A-D). (New Guinea) ..... *Desmoptera* (1 sp.) (*D. irianica*)

20'. Tegmina often tapering gradually from near the base, anterior margin curving more gradually into the apical margin; small body size, less than 22 mm for males and 35 for females (fig. 97E-H). (New Guinea Island, Bismarck Archipelago) .... *Desmopterella* (17 spp.) (*D. angustata, D. biroi, D. buergersi, D. cercata, D. circe, D. curvata, D. curvicercis, D. dahli, D. denticulata, D. esme, D. explicata, D. haani, D. marginata, D. prasina, D. sundaica, D. sylvatica, D. willemsei*)

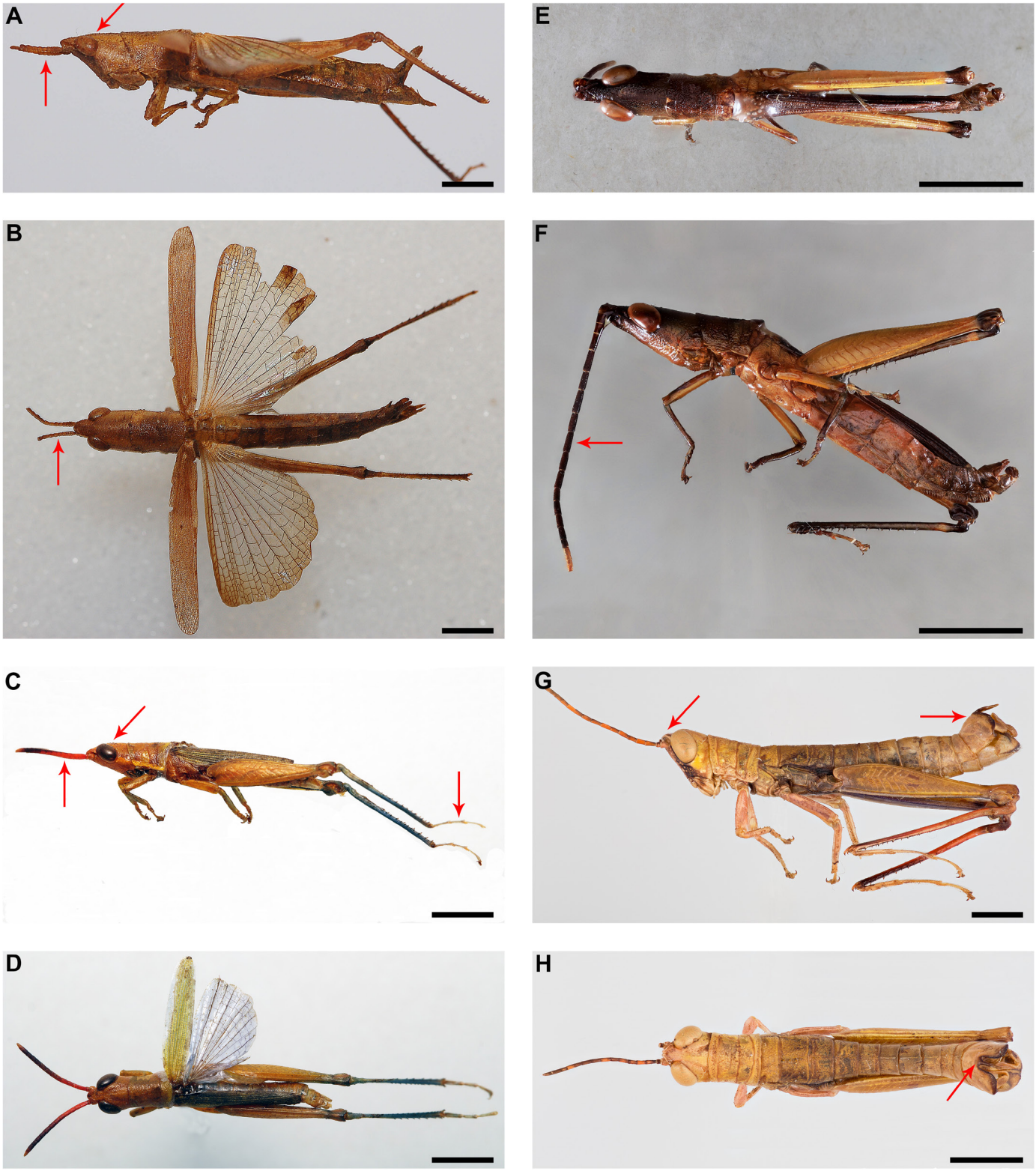

Figure 106. — Papuasia and Pacific Islands Pyrgomorphidae I. **A-B.** *Verdulia cycloidea.* **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Megra flava.* **C.** Male lateral view. **D.** Male dorsal view. **E-F.** *Fijipyrgus gracilis*. **E.** Male dorsal view. **F.** Male lateral view. **G-H.** *Modernacris controversa.* **G.** Male lateral view. **H.** Male dorsal view. Scale bar = 5 mm.

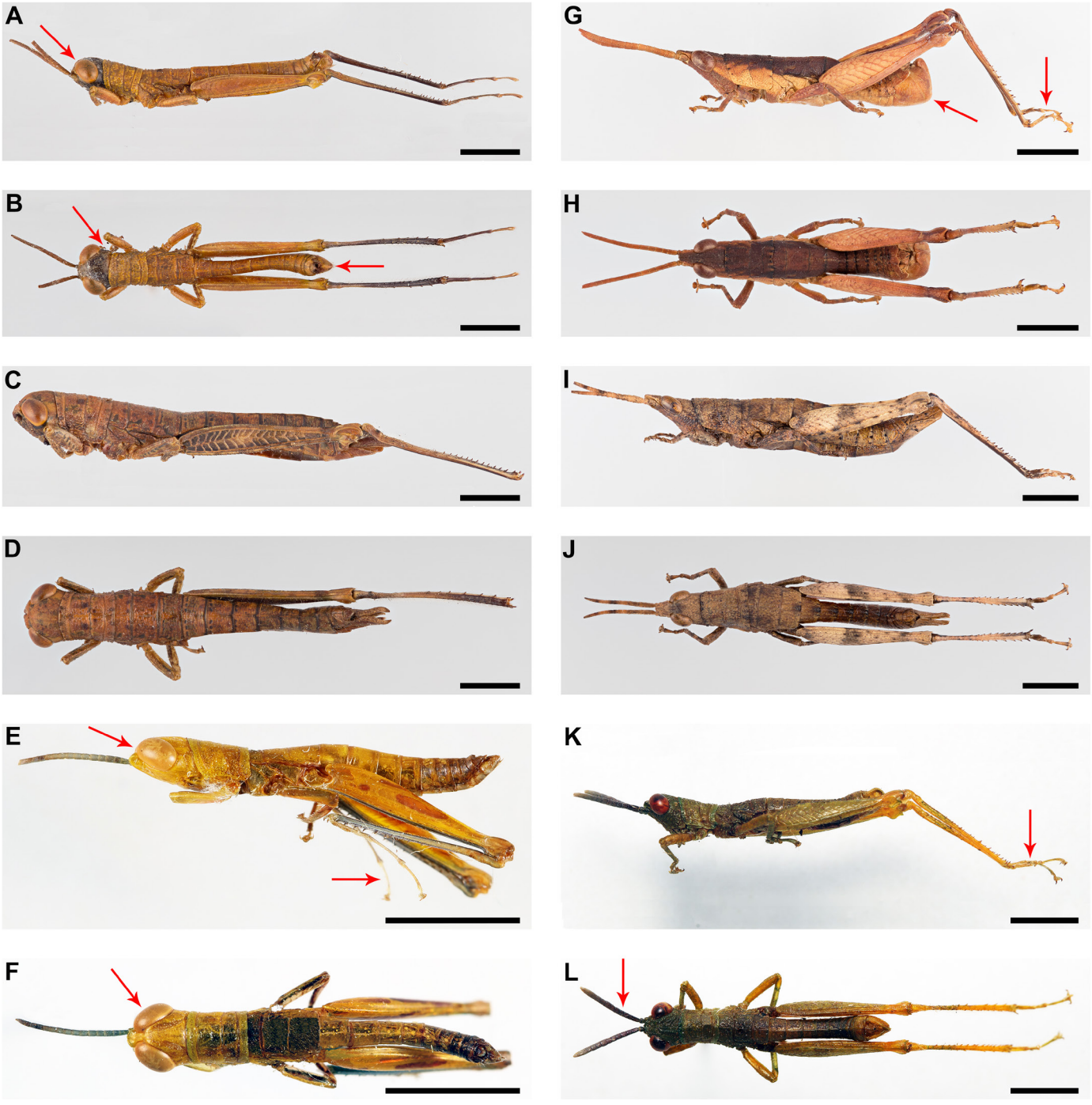

Figure 107. — Papuasia and Pacific Islands Pyrgomorphidae II. **A-D.** *Paratarbaleus novaeguineae.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Noonacris pusilla*. **E.** Male lateral view. **F.** Male dorsal view. **G-J.** *Nerenia francoisi.* **G.** Male lateral view. **H.** Male dorsal view. **I.** Female lateral view. **J.** Female dorsal view. **K-L.** *Buergersius olivaceus*. **K.** Male lateral view. **L.** Male dorsal view. Scale bar = 5 mm.

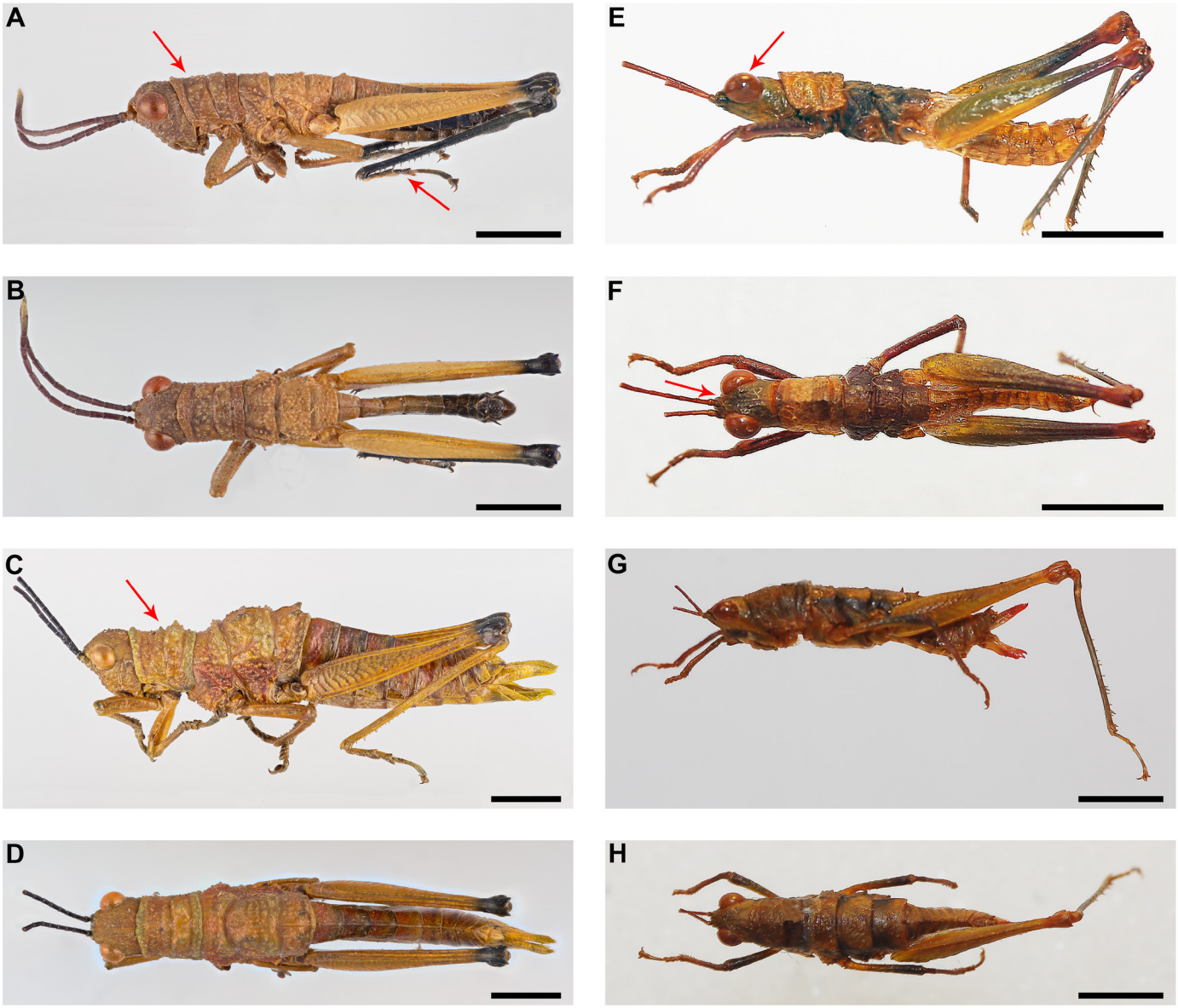

Figure 108. — Papuasia and Pacific Islands Pyrgomorphidae III. **A-D.** *Tarbaleopsis hystrix.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Fusiacris spinata.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

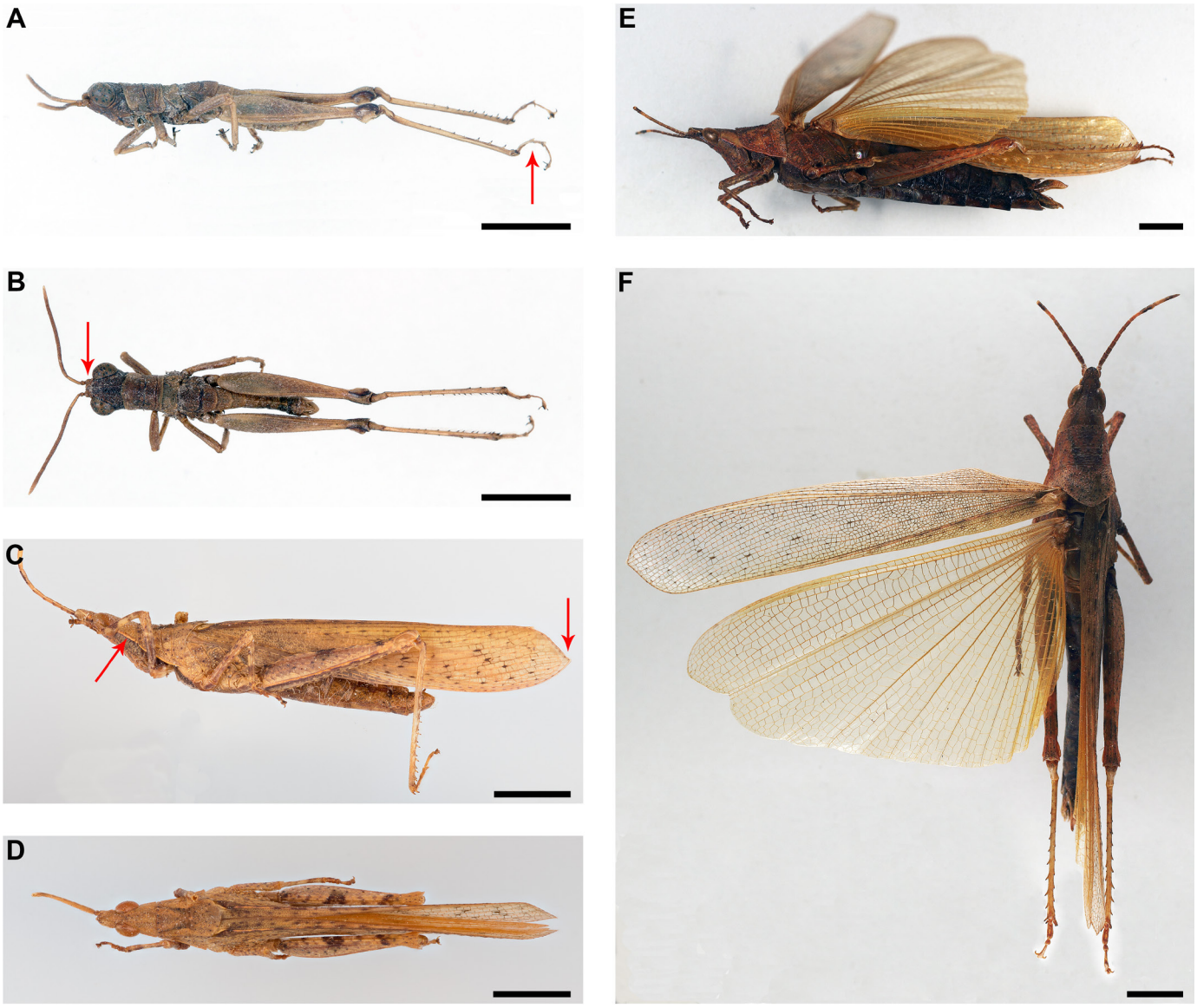

Figure 109. — Papuasia and Pacific Islands Pyrgomorphidae IV. **A-B.** *Kapaoria novaeguineae.* **A.** Male lateral view. **B.** Male dorsal view. **C-F.** *Menesesia novaeguineae.* **C.** Male lateral view. **D.** Male dorsal view. **E.** Female lateral view. **F.** Female dorsal view. Scale bar = 5 mm.

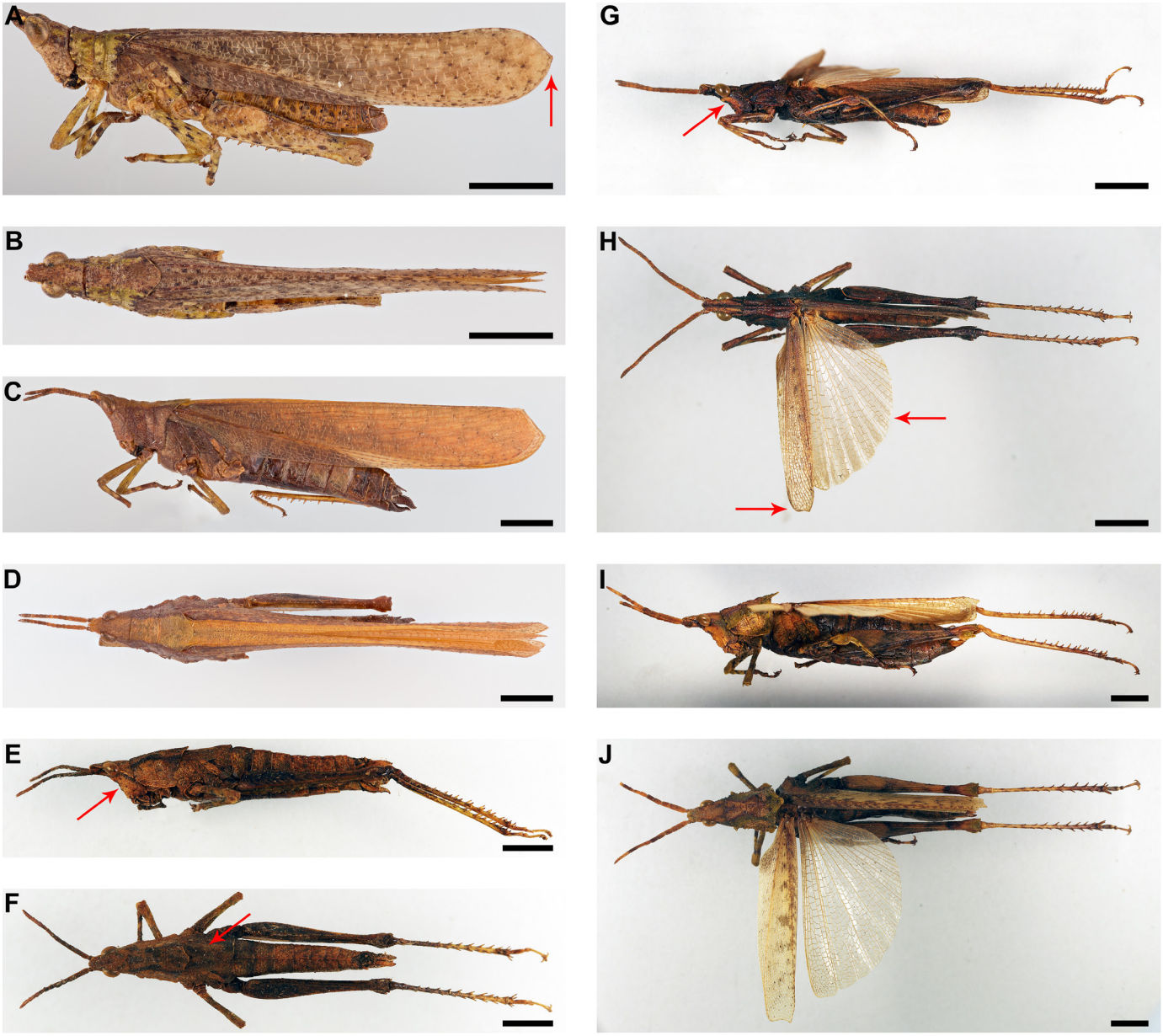

Figure 110. — Papuasia and Pacific Islands Pyrgomorphidae V. **A-D.** *Menesesiella occulta.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-F.** *Stenoxyphellus brachypterus.* **E.** Female lateral view. **F.** Female dorsal view. **G-J.** *Stenoxyphula excisa*. **G.** Male lateral view. **H.** Male dorsal view. **I.** Female lateral view. **J.** Female dorsal view. Scale bar = 5 mm.

Figure 111. — Papuasia and Pacific Islands Pyrgomorphidae VI. **A-B.** *Paradoriaella tuberculata.* **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Doriaella cinnabarina*. **C.** Male lateral view. **D.** Male dorsal view. Scale bar = 5 mm.

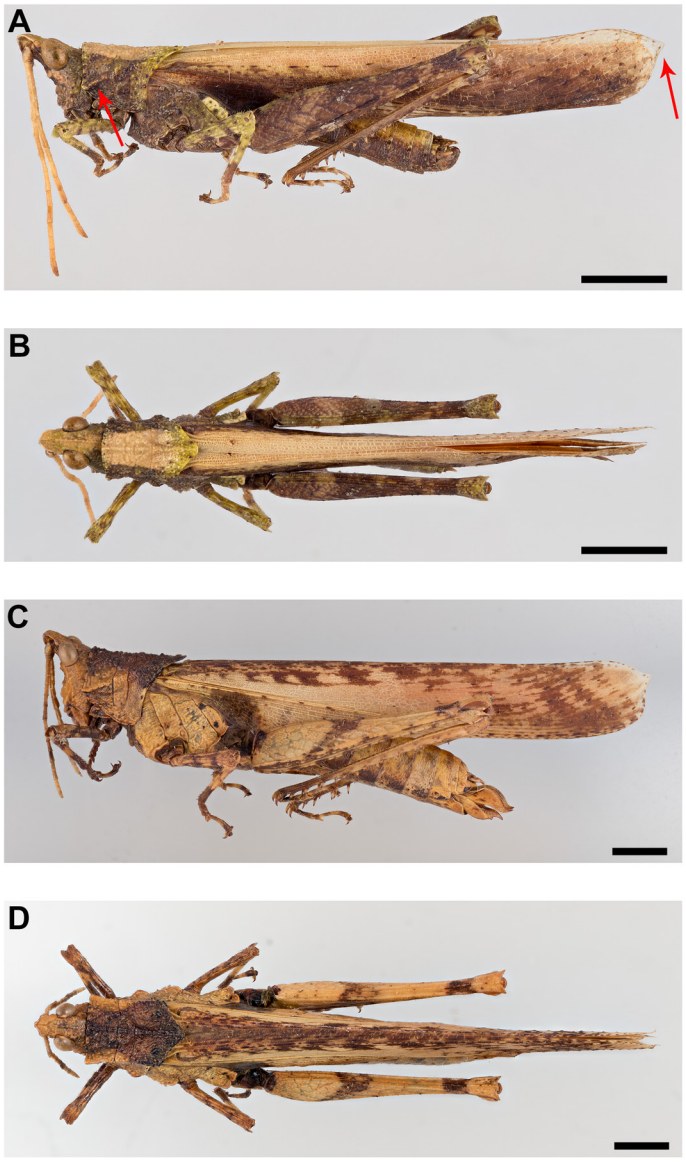

Figure 112. — Papuasia and Pacific Islands Pyrgomorphidae VII. **A-D.** *Stenoxyphus auranticus*. **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. Scale bar = 5 mm.

12. Key to Pyrgomorphidae genera of Australia

Modified from Key (1972, 1984) and with information from Rentz et al. (2003).

This region includes twelve genera, of which nine are endemic to Australia. Of the three non-endemic genera *Atractomorpha* is widely distributed from Australia to Africa and *Desmoptera* and *Desmopterella* are also found in Malesia, Papuasia and Pacific Islands.

1. Body extremely elongated with a long subgenital plate. 2
1'. Not as above. 4

2. Micropterous, the tegmina and hind wings dorsolateral in position, or macropterous. 3
2'. Essentially apterous, vestiges of tegmina and hind wings represented by slight thickenings or ventro-caudal projections of ventral margins of meso and metanota (fig. 113A-D, I-L). (East and Southeast Australia) ..... *Psednura** (3 spp.) (*P. longicornis, P. musgravei, P. pedestris*)

3. Apex of male cerci bent, galeae not extending onto clypeus, micropterous, very rare fully winged (fig. 113E-H). (Southern Australia) ..... *Psedna** (1 sp.) (*P. nana*)
3'. Apex of male cerci straight, galeae extending cephalad over at least part of clypeus, micropterous. (fig. 113M-P). (Southern Australia) ..... *Propsednura** (2 spp.) (*P. eyrei, P. peninsularis*)

4. Body laterally compressed. 5
4'. Body not laterally compressed. 6

5. Tegmina not tapering from near the base, anterior margin usually curving rather abruptly into apical margin; large body size, more than 22 mm for males and 33 mm for females (fig. 97A-D). (Northeast Australia) ..... *Desmoptera* (1 sp.) (*D. truncatipennis*)
5'. Tegmina often tapering gradually from near the base, anterior margin curving more gradually into the apical margin; small body size, less than 22 mm for males and 35 mm for females (fig. 97E-H). (Northeast Australia) ..... *Desmopterella* (1 sp.) (*D. explicata*)

6. A row of tubercles running from eye to anterior lateral margin of pronotum absent. 7
6'. A row of tubercles running from eye to anterior lateral margin of pronotum present (figs. 22A-D, 77A-D). (North and East Australia) ..... *Atractomorpha* (3 spp.) (*A. australis, A. hypoestes, A. similis*)

7. Tympanum present. 8
7'. Tympanum absent. 9

8. Pronotum with metazona of disk paraboloid, the lateral margins converging to a narrow, rounded or occasionally truncate or subemarginate caudal extremity (fig. 114A-D). (Southwestern Australia) ..... *Scutillya** (1 sp.) (*S. verrucosa*)
8'. Pronotum with metazona of disk having the lateral margins less converging, the caudal extremity broader and nearly always distinctly biconvex (fig. 115E-H). (Central part of Northern Australia) ..... *Petasida** (1 sp.) (*P. ephippigera*)

9. Cross veins on tegmina well developed, cells black. 10
9'. Cross veins weakly developed, cells not black (fig. 115A-D). (Southeast Australia) ..... *Yeelanna** (2 spp.) (*Y. argus, Y. pavonina*)

10. Cells on tegmina numerous. 11
10'. Few cells, two or more fairly strong and direct longitudinal veins (fig. 115E-J, 116E-H). (Throughout Australia except northern areas) ..... *Monistria** (8 spp.)
(*M. cicatricosa, M. concinna, M. consobrina, M. discrepans, M. latevittata, M. maculicornis, M. pustulifera, M. sulcata*)

11. Tegmina with small cells, non-granular (fig. 116A-D). (Central and Northern Australia) ..... *Greyacris** (2 spp.)
(*G. picta, G. profundesulcata*)
11'. Tegmina with large cells, minutely granular with a matt finish (fig. 117A-B). (Central part of Northern Australia) .... *Parastria** (1 sp.)
(*P. reticulata*)

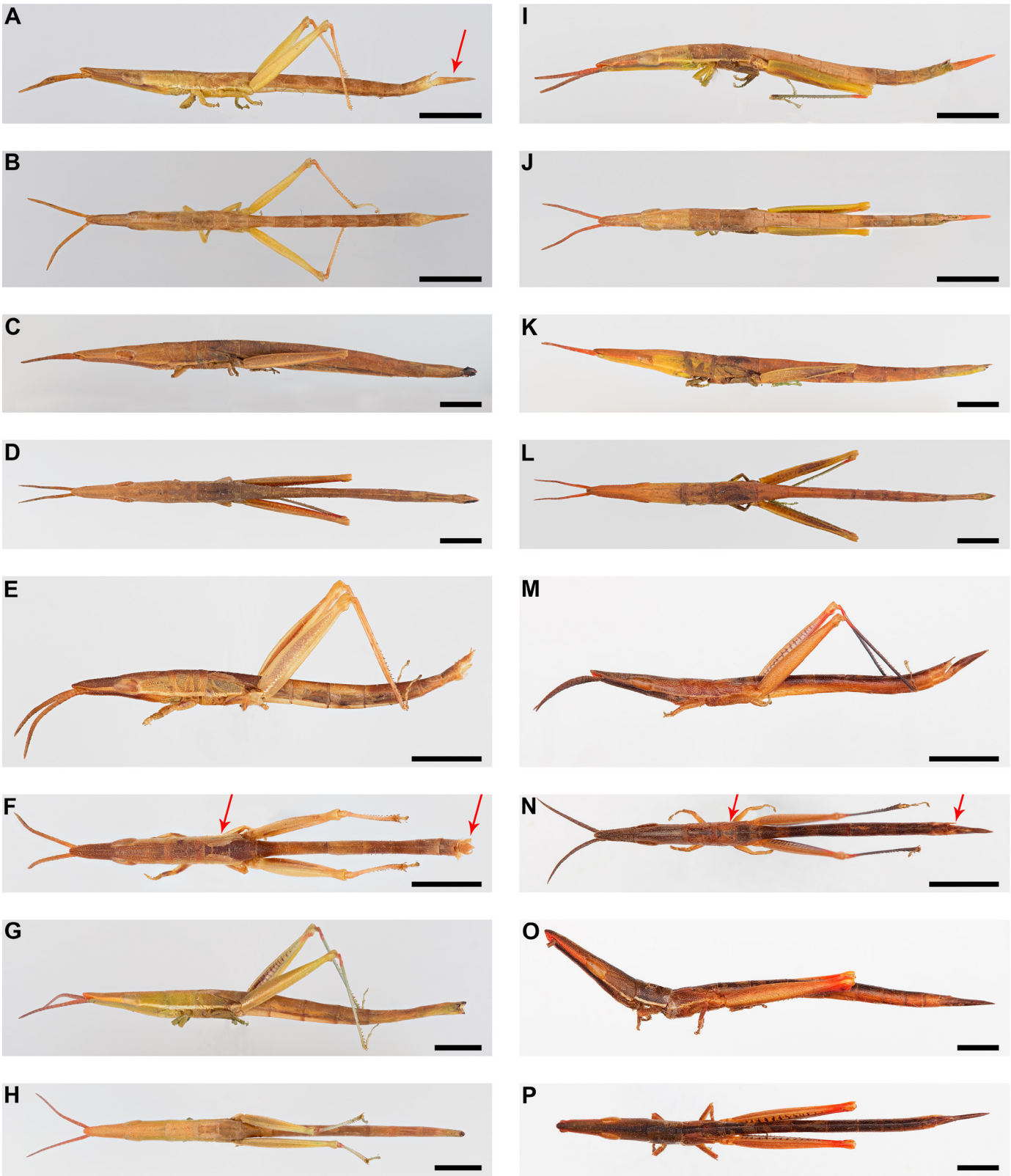

Figure 113. — Australia Pyrgomorphidae I. **A-D.** *Psednura musgravei.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Psedna nana.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. **I-L.** *Psednura pedestris.* **I.** Male lateral view. **J.** Male dorsal view. **K.** Female lateral view. **L.** Female dorsal view. **M-N.** *Propsednura peninsularis.* **M.** Male lateral view. **N.** Male dorsal view. **O-P.** *Propsednura eyrei.* **O.** Male lateral view. **P.** Male dorsal view. Scale bar = 5 mm.

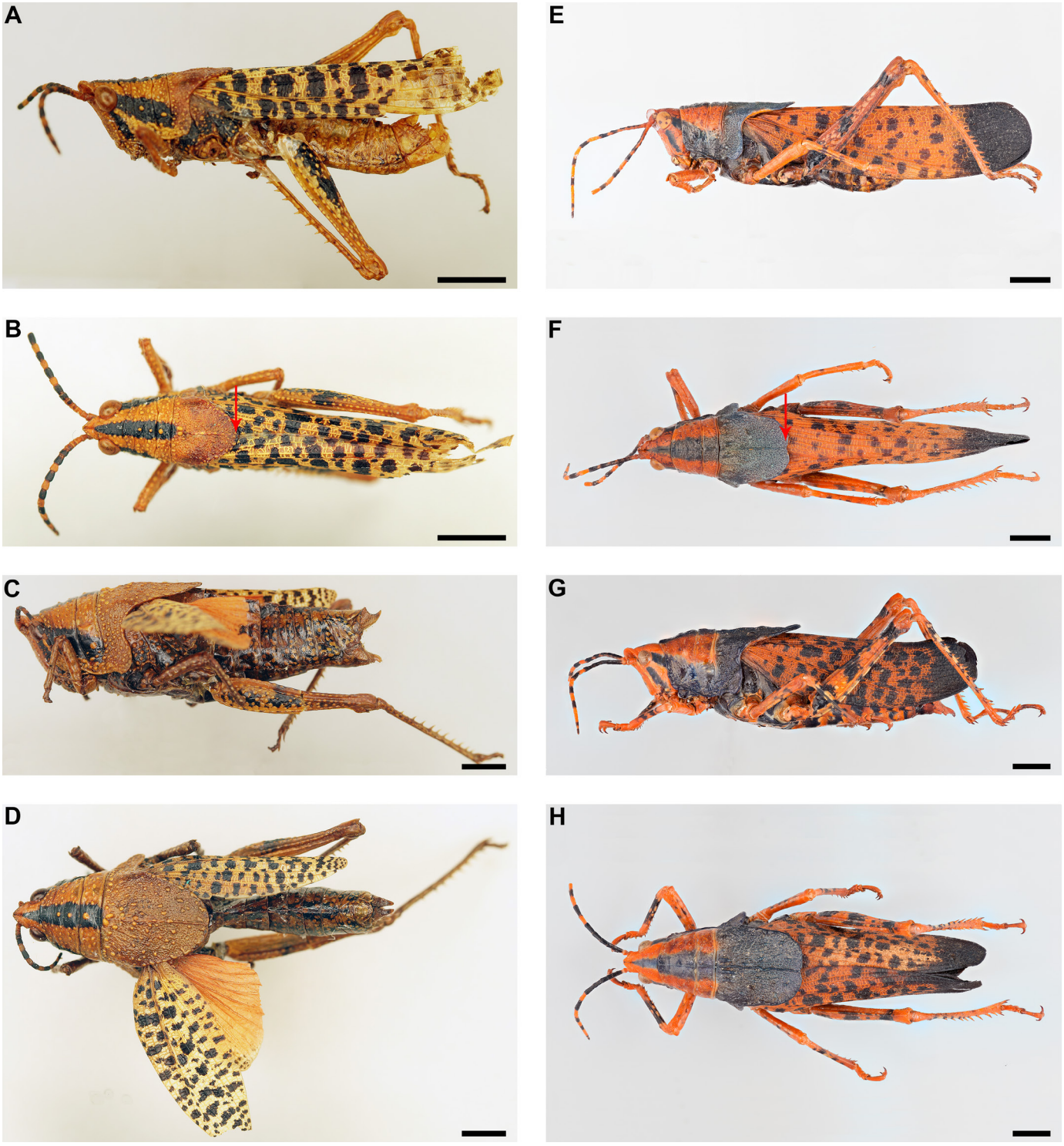

Figure 114. — Australia Pyrgomorphidae II. **A-D.** *Scutillya verrucosa.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Petasida ephippigera.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

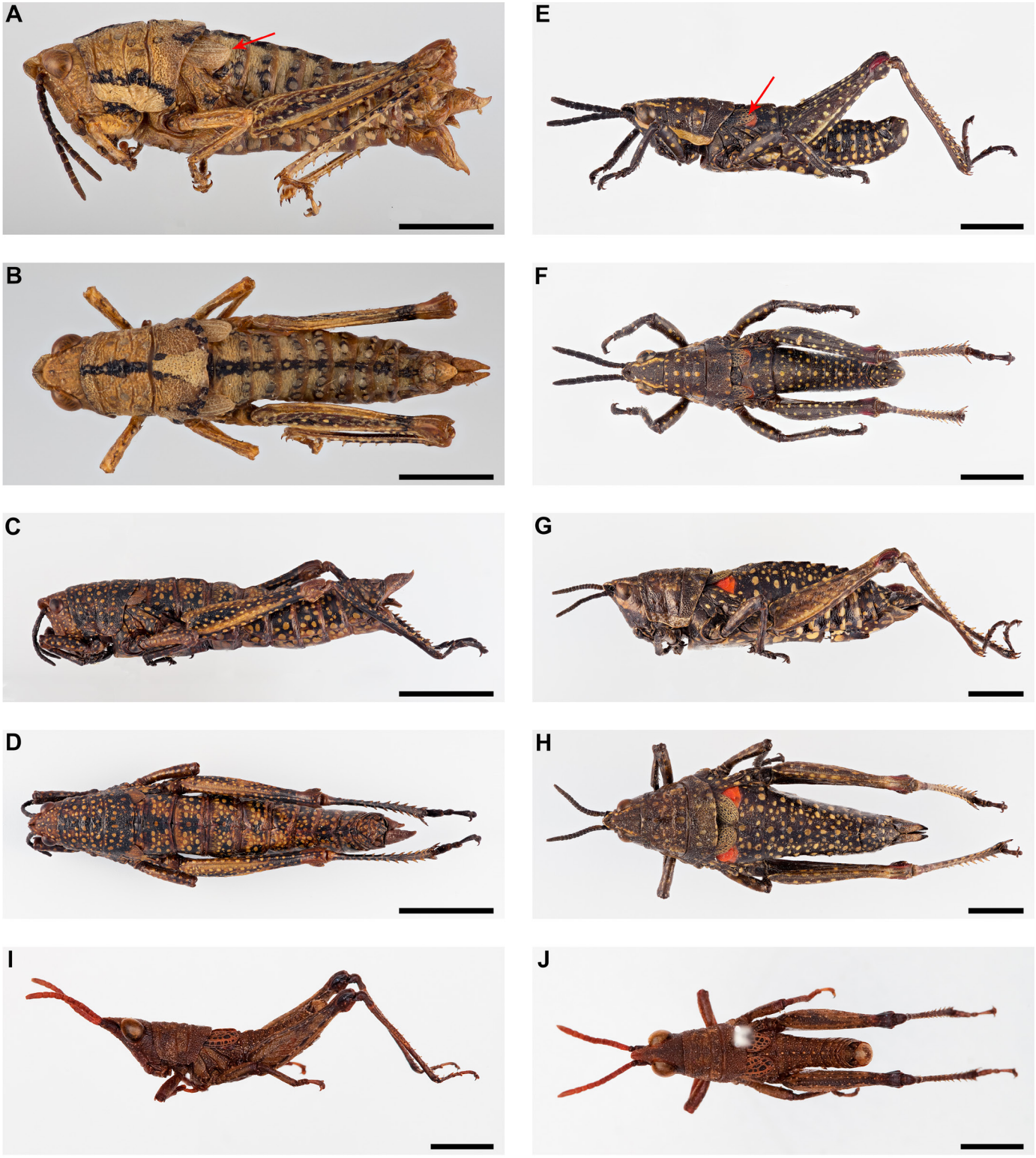

Figure 115. —Australia Pyrgomorphidae III. **A-B.** *Yeelanna argus*. **A.** Female lateral view. **B.** Female dorsal view. **C-D.** *Yeelanna pavonina*. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Monistria concinna*. **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. **I-J.** *Monistria consobrina*. **I.** Male lateral view. **J.** Male dorsal view. Scale bar = 5 mm.

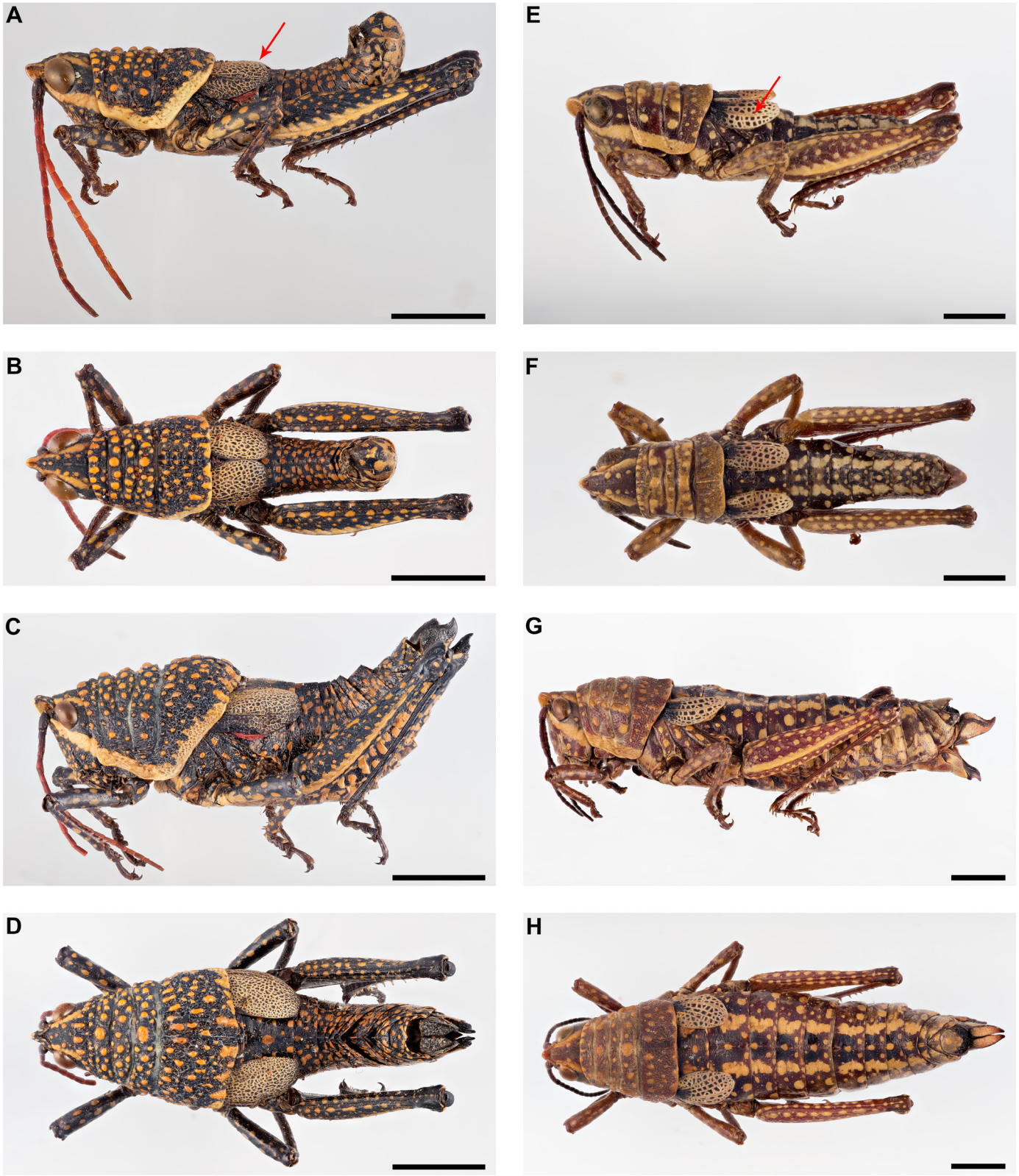

Figure 116. — Australia Pyrgomorphidae IV. **A-D.** *Greyacris picta.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Monistria pustulifera pustulifera.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

Figure 117. — Australia Pyrgomorphidae V. **A-B.** *Parastria reticulata.* **A.** Male lateral view. **B.** Male dorsal view. Scale bar = 5 mm.

13. Pyrgomorphidae genera of Europe (excluding Cyprus)

There are two species of Pyrgomorphidae from Europe. *Pyrgomorpha conica conica* (fig. 118A-D) with a distribution in the Mediterranean region and *Pyrgomorphula serbica* (fig. 118E-H), critically endangered, endemic to Mount Tara in Serbia (16 km^2) (Chobanov et al., 2016) and Varda Mountain in Bosnia and Herzegovina (Puskás & Szövényi, 2020).

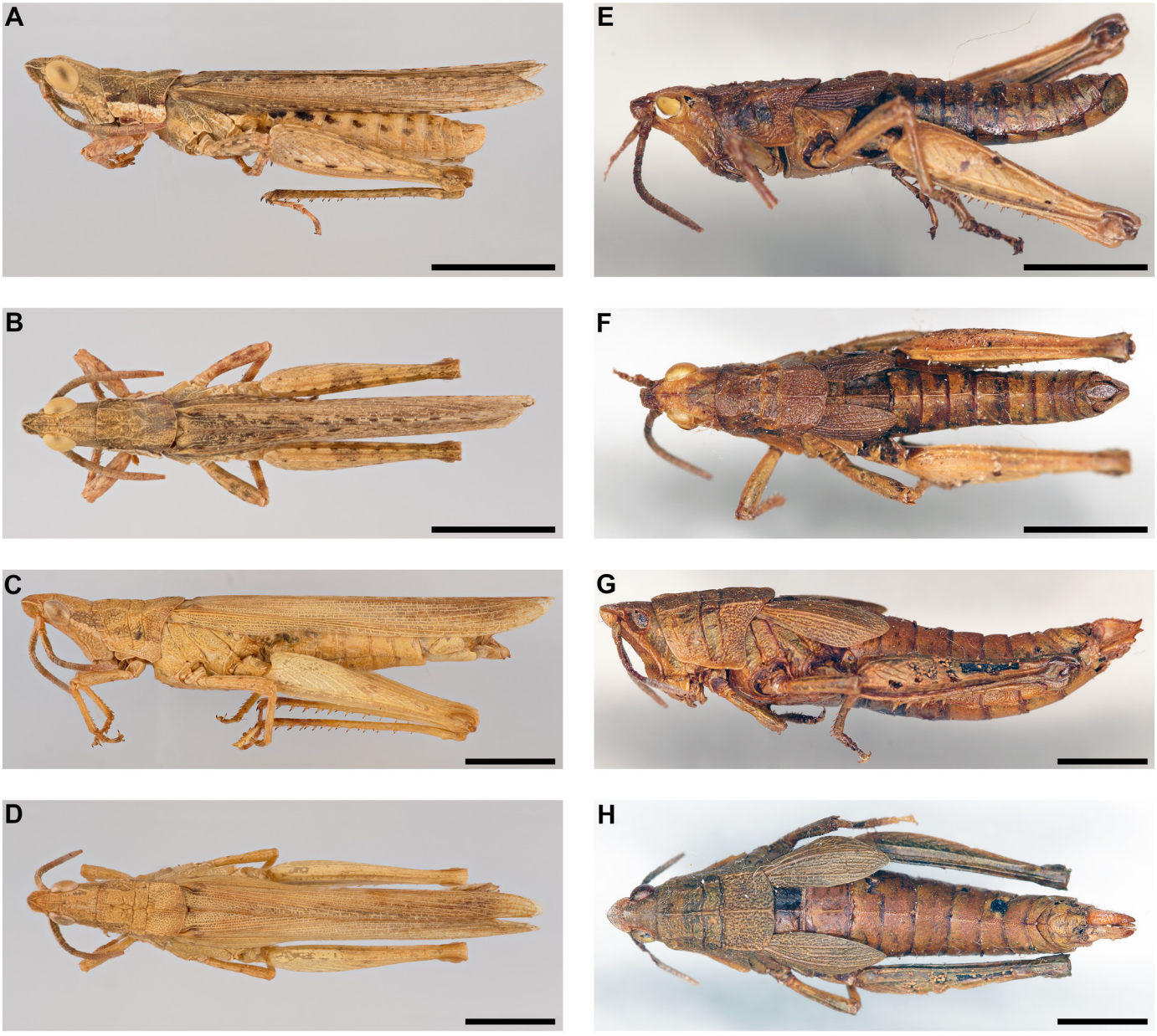

Figure 118. — Europe Pyrgomorphidae. **A-D.** *Pyrgomorpha conica conica.* **A.** Male lateral view. **B.** Male dorsal view. **C.** Female lateral view. **D.** Female dorsal view. **E-H.** *Pyrgomorphula serbica.* **E.** Male lateral view. **F.** Male dorsal view. **G.** Female lateral view. **H.** Female dorsal view. Scale bar = 5 mm.

14. Pyrgomorphidae genera from other areas not covered in the keys.

Korean Peninsula:	*Atractomorpha lata*, *A. sinensis*.
Japan:	*Atractomorpha angusta, A. lata*, *A. sinensis.*
Guam:	*Atractomorpha psittacina* (introduced at least in 1968)
Hawaii and Line Islands:	*Atractomorpha sinensis* (introduced shortly before 1900)
Mongolia:	*Pyrgomorpha bispinosa*.
Middle Asia (Kazakhstan, Kyrgyzstan, Tadzhikistan, Turkmenistan, Uzbekistan):	*Chrotogonus turanicus*, *Pyrgomorpha bispinosa*.
Armenia, Azerbaijan, Georgia and adjacent area of Russia:	*Pyrgomorpha guentheri*.

BRIEF DIAGNOSES OF GENERA

The purpose of these brief diagnoses of the 148 current recognized genera (taking into account the removal of *Buyssoniella*, see explanation in the Madagascar key) is to complement the information present in the keys and the images. The most important references are provided. For information at species level, consult Orthoptera Species File (Cigliano et al. 2022). Edible and pest species are included. Only 19 (12%) out of the 148 genera are present in two or more areas.

Acanthopyrgus Descamps & Wintrebert, 1966
(Fig. 75A-D)
MADAGASCAR

Size: males 2.0-2.6 cm and females 3.6-4.1 cm. Body form: subcylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: vestigial. Abdomen: cerci conical, female valvae very long. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Geloius* and *Pseudogeloius* by the fore femur of male being widened and being armed with a row of strong spines on the outer side.

Type species: *Geloius finoti* Bolívar, I., by original designation.

References: Dirsh & Descamps, 1968.

Acropyrgus Descamps & Wintrebert, 1966
(Fig. 70E-H)
MADAGASCAR

Size: males 1.0 cm and females 1.5 cm. Body form: subcylindrical to subfusiform. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide (in some females, even wider than long). Fastigium of vertex: approximately as long as wide (in females, wider than long). Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: female much stouter. Other remarks: This genus is separated from *Gymnohippus* by having shorter male cerci and by the posterior margin of pronotum with an acute angle in females (pronotum in females more inflated than in *Gymnohippus*). The inflated pronotum in females could be confused with those in *Pyrgohippus,* but in *Pyrgohippus,* the posterior margin of pronotum is straight. This genus can also be separated from *Pyrgohippus* by having the tip of head in profile, not indented before touching with the fastigium of vertex.

Type species: *Acropyrgus cadeti* Descamps & Wintrebert.

References: Dirsh & Descamps, 1968.

Afrosphenella Kevan & Akbar, 1963
(Fig. 53A-D)
AFRICA

Size: males 1.1-1.4 cm and females 1.5-2.0 cm. Body form: subfusiform, especially females. Antennae: slightly shorter than head and pronotum combined, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapeziform. Tegmina: vestigial to micropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its minute size, combined with vestigial to micropterous tegmina and pronotum shape, helps to separate it from other genera from the region, such as *Plerisca* and *Phymella*.

Type species: *Pyrgomorphella capensis* Key.

References: Key, 1937.

Algete Bolívar, 1905
(Fig. 17E-H)
SOUTH AMERICA

Size: males 2.0-2.7 cm and females 2.9-4.0 cm. Body form: subfusiform compressed dorso-ventrally. Antennae: approximately as long as the head, inserted in front ocelli. Shorter in females. Head: triangular from above and much longer than wide. Fastigium of vertex: much longer than wide. Pronotum: striated and tuberculated. Tegmina: absent. Abdomen: striated and tuberculated, cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Omura* by the striated and tuberculate integument through the body and the lower marginal area of hind femur narrower than medial area.

Type species: *Algete brunneri* Bolívar, by original monotypy.

References: Kevan, 1966g; Kevan, 1977a; Alves Dos Santos, 2005. Alves Dos Santos (2005) conducted a taxonomic revision of the South American Pyrgomorphidae.

Ambositracris Dirsh, 1963
(Fig. 71)
MADAGASCAR

Size: males 1.5 cm and females 2.0-2.3 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be easily diagnosed by its male subgenital plate trilobate in dorsal view, the lobes formed by two lateral carinae and one medial carinula.

Type species: *Ambositracris ornatus* Dirsh (= *ornata*), by monotypy and original designation.

References: Dirsh & Descamps, 1968.

Anarchita Bolívar, 1904
(Fig. 84E-H)
INDIAN SUBCONTINENT

Size: males 1.6-1.9 cm and females 2.2-2.8 cm. Body form: subcylindrical to subfusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head:

triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished by its aptery from other genera, such as *Zarytes* and *Pyrgomorpha*.

Type species: *Pyrgomorpha aptera* Bolívar, I., by original monotypy.

References: Kevan, 1970.

Annandalea Bolívar, 1905
(Fig. 104)
MALESIA

Size: males 2.5-3.5 cm and females 3.5-4.0 cm. Body form: subfusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapeziform. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Tagasta* by the lack of a row of tubercles running from the eye to anterior lateral margin of pronotum and by larger spines on hind tibia.

Type species: *Annandalea robinsoni* Bolívar, I., by subsequent designation; authority: Kirby, W.F. 1910.

References: Bolívar, 1905.

Apodesmoptera Rehn, 1951
(Fig. 96C-H)
MALESIA

Size: males 2.5-3.0 cm and females 4.2-4.6 cm. Body form: laterally compressed. Antennae: approximately as long as head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: brachypterous to macropterous. Abdomen: male cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other genera by the tegmina with a distinct apical point about or in advance of the middle of the apical margin as follows. It is distinguished from both *Menesesia* and *Menesesiella* by having narrower tegmina. In the case of brachypterous individuals, it can be separated from the other genera with brachypterous representatives by the tegmina length: in *Apodesmoptera (Brachydesmoptera) luzonica* the tegmina length passes the insertion of hind leg whereas in *Stenoxyphellus,* it barely reaches the insertion of hind leg.

Type species: *Apodesmoptera mira* Rehn, J.A.G., by original designation.

References: Rehn, 1951; Kevan, 1963a; Kevan, 1966a.

Arbuscula Bolívar, 1905
(Fig. 94A-B)
SOUTHEAST ASIA

Size: males 1.8 cm and females 2.5 cm. Body form: fusiform. Antennae: shorter than head, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: absent. Abdomen: female valvae visible. Sexual dimorphism: female stouter. Other remarks: The antennae, which are very short with the segments of the distal half almost completely fused (at least in the male), are unique and characteristic to this genus.

Type species: *Arbuscula cambodjiana* Bolívar, I., by original monotypy.

References: Bolívar, 1905; Kevan, 1968a.

Atractomorpha Saussure, 1862
(Figs. 22A-D, 77A-D)
AFRICA, MADAGASCAR, ARABIAN PENINSULA, WESTERN ASIA, INDIAN SUBCONTINENT, CHINA, SOUTHEAST ASIA, MALESIA, PAPUASIA AND PACIFIC ISLANDS, AUSTRALIA

Edible: *Atractomorpha psittacina*.

Pest: *Atractomorpha acutipennis, A. angustata, A. crenaticeps, A. crenulata, A. burri, A. lata, A. psittacina, A. rhodoptera, A. similis, A. sinensis*.

Size: males 1.8-2.5 cm and females 2.6-3.2 cm. Body form: slender to robust. Antennae: shorter than head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal, lateral margins with a line of tubercles. Tegmina: fully developed. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other similar genera by the line of tubercles behind eyes continuing to the lateral margin of pronotum (not in *Tagasta*) and the antennae inserted in front of ocelli (below in *Pyrgomorpha*).

Type species: *Truxalis crenulatus* Fabricius (= *Atractomorpha crenulata crenulata*), by subsequent designation.

References: Kevan & Chen, 1969; Kevan, 1971, 1975; COPR, 1982; Rowell et al., 2015.

Aularches Stål, 1873
(Fig. 90A-D)
INDIAN SUBCONTINENT, CHINA, SOUTHEAST ASIA

Pest: *Aularches miliaris*.

Size: males 3.7-5.5 cm and females 4.5-6.9 cm. Body form: moderately robust. Antennae: longer than head and pronotum together, inserted below ocelli. Head: concave to semicircular from above, approximately as long as wide. Fastigium of vertex: short, wider than long. Pronotum: armed with huge tubercles at anterior end followed by two lines of teeth, metazoan tuberculate or porose. Tegmina: macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its pronotum ornamentation makes its identification unmistakable.

Type species: *Gryllus miliaris* Linnaeus (= *Aularches miliaris miliaris*), by monotypy and original designation.

References: COPR, 1982.

Brunniella Bolívar, 1905
(Fig. 96A-B)
MALESIA

Size: males 3.0-3.2 cm and females 3.9 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorter in females, inserted in front of ocelli. Head: almost cylindrical from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other laterally compressed genera by the length of the space between eye and pronotum in lateral view (twice the length of eye). Also, its labrum is slightly asymmetrical and the galeae are unusual in that they are very elongate and seem to act in front of, and not behind, the labrum.

Type species: *Brunniella antistes* Bolívar, I., by original monotypy.

References: Bolívar, 1905; Kevan, 1957a; Kevan 1963 [1962].

Buergersius Ramme, 1930
(Fig. 107K-L)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.6-1.8 cm and females 2.4-2.6 cm. Body form: cylindrical. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci specialized and greatly attenuated, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other closer genera by its second tarsal segment of hind tarsus which is much shorter than third tarsal segment coupled with antennal segments subquadrated or slightly longer than wide and posterior margin of lateral pronotal lobe strongly and roundly excised.

Type species: *Buergersius olivaceus* Ramme, by original monotypy.

References: Kevan, 1966b.

Burmorthacris Kevan, Singh & Akbar, 1964
(Fig. 95)
SOUTHEAST ASIA

Size: males 2.4 cm and females 2.9 cm. Body form: subcylindrical to subfusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical to subcylindrical. Tegmina: micropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be separated from *Orthacris* by the presence of minute tegmina and hind wings, the pronotum slightly wider posteriorly, and the antennae having a short terminal segment.

Type species: *Burmorthacris subaptera* Kevan, D.K.M., A. Singh & Akbar.

References: Kevan et al., 1964b.

Caconda Bolívar, 1884
(Fig. 21C-D)
AFRICA

Size: males 1.6-2.0 cm and females 1.8-2.2 cm. Body form: depressed Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal shape from above with tubercles. Tegmina: absent. Abdomen: cerci triangular, female valve visible. Sexual dimorphism: not pronounced. Other remarks: A diagnostic character is the anterior margin of prosternum strongly expanded, collar-like, covering lower part of mouth. It can be separated from *Stibarosterna* by the elongated fastigium.

Type species: *Caconda fusca* Bolívar.

References: Kevan, 1952b; Dirsh, 1965.

Calamacris Rehn, 1904
(Fig. 16E-H)
NORTH AND CENTRAL AMERICA

Size: males 1.6-1.8 cm and females 2.0-2.3 cm. Body form: cylindrical to slightly subfusiform. Antennae: approximately as long as head and pronotum together, inserted somewhat in front and below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: Granular and tuberculate. Tegmina: micropterous. Abdomen: granular and tuberculate, female valvae visible. Sexual dimorphism: males cylindrical, females slightly subfusiform. Other remarks: This genus can be distinguished from *Sphenacris* by the presence of vestigial tegmina.

Type species: *Calamacris clendoni* Rehn, by monotypy and original designation.

References: Kevan et al., 1964a; Kevan, 1977a.

Camoensia Bolívar, 1882
(Fig. 33)
AFRICA

Size: males 3.2-3.6 cm and females 4.2-4.6 cm. Body form: robust. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: concave to semicircular from above, wider than long. Fastigium of vertex: large, wider than long. Pronotum: covered entirely with thick, irregular, longitudinal ridges, anterior and posterior margins slightly excised. Tegmina: brachypterous. Abdomen: tergites with dorsal, pre-apical tubercles, bilobed at apices, cerci triangular, female valvae very short and hard to see. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by the sculpture pattern of pronotum and tegmina size and shape.

Type species: *Camoensia insignis* Bolívar, (= *insignis insignis*).

References: Dirsh, 1965.

Caprorhinus Saussure, 1899
(Fig. 68E-H)
MADAGASCAR

Size: males 1.6-3.2 cm and females 2.5-5.4 cm. Body form: subfusiform. Antennae: approximately as long as the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be distinguished from *Malagasphena* by having the hind tarsi shorter than the half of the hind tibia.

Type species: *Caprorhinus fusiformis* Saussure, by original monotypy.

References: Dirsh & Descamps, 1968.

Carinisphena Kevan, 1966
(Fig. 53I-J)
AFRICA

Size: males 2.3 cm and females 2.7 cm. Body form: fusiform. Antennae: approximately the length of the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: brachypterous, wings reddish. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Punctisphena* by the size and shape of tegmina.

Type species: *Carinisphena producta* Kevan.

References: Kevan, 1966c.

Cawendia Karsch, 1888
(Fig. 48)
AFRICA

Size: males 2.2-2.8 cm and females 2.6-3.0 cm. Body form: slightly fusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical, slightly widening backwards. Tegmina: brachypterous, wider in the middle. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Pezotagasta* by the tegmina shape, and from *Humpatella* by the cerci shape.

Type species: *Cawendia glabrata* Karsch, by subsequent designation; authority: Karsch. 1896.

References: Kevan, 1956; Dirsh, 1965; Rowell et al., 2015.

Chapmanacris Dirsh, 1959
(Fig. 22E-H)
AFRICA

Size: males 2.1-2.3 cm and females 2.2-2.5 cm. Body form: strongly elongated, cylindrical. Antennae: longer than head and pronotum together, inserted in front ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: vestigial. Abdomen: male cerci robust with widened base, strongly incurved in apical half, with bifurcate apex, lower lobe of fork longer than upper, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its body and cerci shape help to separate this genus from other genera.

Type species: *Chapmanacris sylvatica* Dirsh.

References: Dirsh, 1959; 1965.

Chirindites Ramme, 1929
(Fig. 47A-D)
AFRICA

Size: males 2.2-3.2 cm and females 3.2 cm. Body form: fusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, larger than wider. Fastigium of vertex: larger than wider. Pronotum: trapezoidal, regularly granulose. Tegmina: vestigial and spatulate, narrowing towards the base. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its pronotum sculpture and tegmina shape are helpful to separate this genus from other genera.

Type species: *Chirindites oldendaali* Ramme (= *odendaali*).

References: Ramme, 1929; Dirsh, 1965.

Chlorizeina Brunner von Wattenwyl, 1893
(Fig. 88A-D)
INDIAN SUBCONTINENT, CHINA, SOUTHEAST ASIA

Pest species: *Chlorizeina feae, C. unicolor, C. togulata*.

Size: males 1.9-3.2 cm and females 2.6-3.8 cm. Body form: subfusiform. Antennae: longer than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: brachypterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Feacris* by its subfusiform and tegmina extending beyond the bases of the hind femur.

Type species: *Chlorizeina unicolor* Brunner von Wattenwyl (= *unicolor unicolor*), by original monotypy.

References: Kevan, 1969a.

Chrotogonus Serville, 1838
(Figs. 20E-H, 78, 82A-D, 90E-H)
AFRICA, ARABIAN PENINSULA, WESTERN ASIA, INDIAN SUBCONTINENT, CHINA

Edible: *Chrotogonus senegalensis*.

Pest: *Chrotogonus hemipterus, C. homalodemus, C. oxypterus, C. senegalensis, C. trachypterus*.

Size: males 1.0-1.6 cm and females 1.5-2.5 cm. Body form: depressed. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of

vertex: approximately as long as wide. Pronotum: trapezoidal shape from above with tubercles. Tegmina: macropterous, brachypterous and micropterous (vestigial). Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: A major diagnostic character is the anterior margin of prosternum strongly expanded, collar-like, covering lower part of mouth. This genus can be separated from other closer genera by the body form, and the presence of tegmina. In case of micropterous *Chrotogonus*, the tegmina protrude from under pronotum (not in *Shoacris*).

Type species: *Ommexecha lugubre* Blanchard, E. (= *Chrotogonus homalodemus homalodemus*), by original monotypy.

References: Dirsh, 1965; COPR, 1982; Rowell et al., 2015. Kevan (1952c, 1954a, b, 1957c, 1959, 1963d, 1968c, d) and Kevan & Knipper (1959) treated the genus extensively.

Colemania Bolívar, 1910
(Fig. 86E-H)
INDIAN SUBCONTINENT

Pest: *Colemania sphenarioides*.

Size: males 2.3-4.0 cm and females 2.5-4.0 cm. Body form: subfusiform. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: triangular from above, very much longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: micropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus differs from *Ramakrishnaia* in its larger size, more elongate body, and in lacking distinct lateral pronotal carinae.

Type species: *Colemania sphenarioides* Bolívar, I., by original monotypy.

References: Coleman, 1911; Kevan & Akbar, 1964; COPR 1982.

Desmoptera Bolívar, 1884
(Fig. 97A-D)
MALESIA, PAPUASIA AND PACIFIC ISLANDS, AUSTRALIA

Size: males 3.0-4.0 cm and females 4.0-4.6 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorted in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other close genera by its tegmina shape and frons not very strongly concave. Its tegmina not tapering from near the base and larger size could help to separated it from *Desmopterella*. The only single character that separates it from *Desmopterella* is the prosternal tubercle more pyramidal in males and less strongly transverse in females narrowing rapidly into a strong conical or thorn-like median process.

Type species: *Desmoptera judicata* Bolívar, I.

References: Kevan, 1963a.

Desmopterella Ramme, 1941
(Fig. 97E-H)
MALESIA, PAPUASIA AND PACIFIC ISLANDS, AUSTRALIA

Pest: *Desmopterella explicata, D. biroi*.

Size: males 1.8-2.2 cm and females 2.4-3.4 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorted in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other close genera by its tegmina shape and frons not very strongly concave. Its tegmina tapering from near the base and smaller size could help to separated it from *Desmoptera*. The only single character that separates it from *Desmoptera* is the prosternal tubercle more transverse (particularly in females), bearing a short median papilla which rises abruptly from the transverse crest of the tubercle (this papilla is seldom longer than its basal diameter and frequently shorter).

Type species: *Desmoptera biroi* Bolívar, I., by original designation.

References: Kevan, 1963a.

Dictyophorus Thunberg, 1815
(Figs. 37-38)
AFRICA

Pest: *Dictyophorus griseus, D. spumans*.

Size: males 3.0-5.5 cm and females 4.0-6.5 cm. Body form: robust. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: semicircular to triangular from above, approximately as long as wide. Fastigium of vertex: large, approximately as long as wide. Pronotum: median inflation in front of first the sulcus high; entire pronotum tuberculate. Tegmina: macropterous to brachypterous, wings may be brightly colored and bear a black band. Abdomen: tergites with small, dorsal, pre-apical tubercles, cerci triangular, female valvae very short and hard to see. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera, such as *Parapetasia* and *Loveridgacris,* by the sculpture pattern of pronotum and tegmina size and shape.

Type species: *Gryllus spumans* Thunberg (= *Dictyophorus spumans spumans*), by subsequent designation.

References: Dirsh, 1965; COPR, 1982; Rowell et al., 2015.

Doriaella Bolívar, 1898
(Fig. 111C-D)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.7-3.0 cm and females 3.4-3.6 cm. Body form: laterally compressed. Antennae: shorter than head and pronotum together, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual

dimorphism: not pronounced. Other remarks: This genus can be separated from *Paradoriaella* by the lack of tubercles and by its anterior area of hind wing at the top concavely excised. It can also be separated from *Stenoxyphula* by having the frons not very strongly concave.

Type species: *Doriaella cinnabarina* Bolívar, I., by original monotypy.

References: Kevan, 1963a; Kevan, 1966a.

Dyscolorhinus Saussure, 1899
(Fig. 73)
MADAGASCAR

Size: males 1.6-1.8 cm and females 2.5-3.8 cm. Body form: cylindrical to subfusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be distinguished from *Pseudosphena* by having the sides of the mesosternal space strongly curved.

Type species: *Dyscolorhinus squalinus* Saussure, by original monotypy.

References: Dirsh & Descamps, 1968.

Eilenbergia Mason, 1979
(Fig. 58C-D)
AFRICA

Size: males 1.8 cm and females 2.4 cm. Body form: subcylindrical. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subcylindrical. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is related to *Pyrgomorpha* and *Tanita,* but can be distinguished by the lateral carinae of pronotum that are sharply developed in the anterior half of the prozona. It is smaller and slender than *Laufferia*.

Type species: *Eilenbergia sagitta* Mason.

References: Mason, 1979[1977].

Feacris Kevan, 1969
(Fig. 89C-D)
INDIAN SUBCONTINENT

Size: males 3.6-3.8 cm and females 4.0-4.5 cm. Body form: fusiform. Antennae: longer than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: brachypterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Chlorizeina* by its fusiform body and tegmina barely or not surpassing the bases of hind femur.

Type species: *Chlorizeina malabarensis* Kevan, D.K.M., by original designation.

References: Kevan, 1953; Kevan, 1969a.

Fijipyrgus Kevan, 1966
(Fig. 106E-F)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.1-2.3 cm and females unknown. Body form: cylindrical. Antennae: longer than head and pronotum together, inserted below ocelli. Head: cylindrical from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci conical. Sexual dimorphism: unknown. Other remarks: Its distribution, body and tegmina shape can be used to distinguish it from other closer genera.

Type species: *Fijipyrgus gracilis* Kevan, D.K.M.

References: Kevan, 1966d; Kevan 1968a.

Fusiacris Willemse, 1955
(Fig. 108E-H)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.5-1.7 cm and females 1.8-2.2 cm. Body form: cylindrical to subcylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: subtriangular from above, longer than wide. Fastigium of vertex: wider than long. Pronotum: cylindrical to subcylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae very visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other closer genera by its second tarsal segment of hind tarsus much shorter than third tarsal segment coupled with body not prominently tuberculate. It can be separated from *Kapaoria* by its head and fastigium of vertex narrower and head no wider than pronotum.

Type species: *Fusiacris spinata* Willemse, C., by original designation.

References: Kevan, 1966e.

Geloiodes Chopard, 1958
(Fig. 20A-B)
AFRICA

Size: males unknown and females 2.5 cm. Body form: slightly compressed and slightly fusiform. Antennae: slightly shorter than head and pronotum together, inserted in front ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: slightly longer than wide. Pronotum: rugose. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: unknown. Other remarks: Diagnostic characters are antennomeres elongate, widened, except apical one, and partly fused.

Type species: *Geloiodes cavifrons* Chopard, by monotypy and original designation.

References: Chopard, 1958; Dirsh, 1965.

Geloius Saussure, 1899
(Fig. 75E-I)
MADAGASCAR

Size: males 2.2-3.0 cm and females 3.2-4.2 cm. Body form: cylindrical. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: micropterous. Abdomen: cerci cylindrical elaborated at the tip, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Acanthopyrgus* by having the fore femur without row of strong spines and from *Pseudogeloius* by not having the subgenital plate of males strongly dilated.

Type species: *Geloius nasutus* Saussure, by original monotypy.

References: Dirsh & Descamps, 1968.

Greyacris Rehn, 1953
(Fig. 116A-D)
AUSTRALIA

Size: males 1.8-2.2 cm and females 3.3-3.6 cm. Body form: fusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide to as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapeziform. Tegmina: brachypterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: females stouter. Other remarks: This genus can be separated from other closer genera by having numerous small black cells, non-granular on tegmina.

Type species: *Greyacris variolosa* Rehn, J.A.G. (= *picta*), by original designation.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Gymnohippus Bruner, 1910
(Fig. 70A-D)
MADAGASCAR

Size: males 1.4-1.9 cm and females 2.2-2.7 cm. Body form: subcylindrical. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide, in females wider than long. Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci conical, posterior half strongly thinning, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be separated from *Acropyrgus* by having longer male cerci, thinning at the posterior end and by the females with straight posterior margin of pronotum (pronotum in females not as inflated as in *Acropyrgus* or *Pyrgohippus*). It can be separated from *Pyrgohippus* by having the tip of head in profile, not indented before touching with the fastigium of vertex.

Type species: *Gymnohippus marmoratus* Bruner, L., by original designation.

References: Dirsh & Descamps, 1968.

Humpatella Karsch, 1896
(Fig. 50A-D)
AFRICA

Size: males 1.6-1.9 cm and females 1.9-2.2 cm. Body form: slightly fusiform. Antennae: longer than the length of head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical, slightly widening backwards. Tegmina: brachypterous, wider in the middle. Abdomen: cerci long and strongly incurved, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Pezotagasta* by the tegmina shape, and from *Cawendia* by the cerci shape.

Type species: *Humpatella constricta* Karsch.

References: Kevan, 1956; Dirsh, 1965.

Ichthiacris Bolívar, 1905
(Fig. 15)
NORTH AND CENTRAL AMERICA

Size: males 1.5-2.5 cm and females 2-4.5 cm. Body form: cylindrical to slightly subfusiform. Antennae: approximately as long as head and pronotum together, inserted somewhat in front and below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: not profusely granular. Tegmina: absent or micropterous. Abdomen: not profusely granular, female valvae visible. Sexual dimorphism: males cylindrical, females slightly subfusiform. Other remarks: This genus can be separated from *Calamacris* and *Sphenacris* by being not profusely granular.

Type species: *Ichthiacris rehni* Bolívar, by subsequent designation.

References: Kevan et al., 1964a; Kevan, 1977a; Kevan, 1990a. Kevan (1990a) provided a profuse taxonomic study.

Ichthyotettix Rehn, 1901
(Fig. 12A-D)
NORTH AND CENTRAL AMERICA

Size: males 1.5-1.8 cm and females 2.0-2.5 cm. Body form: cylindrical (less so in females). Antennae: longer than head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, slightly longer than wide. Fastigium of vertex: almost as long as wide. Pronotum: smooth, at most with a few isolated and scattered tubercles. Tegmina: absent. Abdomen: males with cerci stouter, blunt apically and as long as (or only slightly shorter) than the posterior prolongation of 10th abdominal tergum; females with postero-lateral margins of the 8th abdomen sternum modified into posteriorly directed, acutely angular processes, valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Piscacris* by male cerci being as long as or nearly as long as the posterior prolongation of 10th abdominal tergum.

Type species: *Ichthydion mexicanum* Saussure (= *Ichthyotettix mexicanus*), inherited from replaced name.

References: Kevan et al., 1964a; Kevan, 1977a; Fontana et al., 2011.

Jaragua Perez-Gelabert, Dominici & Hierro, 1995
(Fig. 19)
CARIBBEAN

Size: males.1.2-1.6 cm and females around 2.0 cm. Body form: subfusiform. Antennae: approximately around the size of head and pronotum together, inserted in front ocelli. Shorter in females. Head: triangular from above and much longer than wide. Fastigium of vertex: much longer than wide. Pronotum: expanded in posterior margin and posterior border of lateral margin. Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is currently the only genus reported for the Caribbean (Hispaniola Island).

Type species: *Jaragua serranus* Perez-Gelabert, Dominici & Hierro, by original designation.

References: Perez-Gelabert et al. (1995) described the genus with two species.

Kapaoria Bolívar, 1898
(Fig. 109A-B)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.6-1.8 cm and females 2.1-2.4 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae very visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other closer genera by its second tarsal segment of hind tarsus much shorter than third tarsal segment coupled with body not prominently tuberculate. It can be separated from *Fusiacris* by its head and fastigium of vertex wide and head wider than pronotum.

Type species: *Kapaoria novae guineae* Bolívar, I. (= *novaeguineae*), by original monotypy.

References: Kevan, 1966e.

Katangacris Kevan & Akbar, 1964
(Fig. 59E-F)
AFRICA

Size: males 2.3 cm and females unknown. Body form: subfusiform. Antennae: longer than head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: macropterous. Abdomen: cerci conical. Sexual dimorphism: unknown. Other remarks: This genus is known from a single male specimen.

Type species: *Katangacris enigmatica* Kevan & Akbar.

References: Kevan & Akbar, 1964.

Kuantania Miller, 1935
(Figs. 94C-D, 101A-B)
SOUTHEAST ASIA, MALESIA

Size: males unknown and females 2.3-2.7 cm. Body form: subcylindrical. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: subcylindrical. Tegmina: absent to micropterous. Abdomen: female valvae visible. Sexual dimorphism: probably not pronounced. Other remarks: This genus is known only from female specimens.

Type species: *Kuantania squamipennis* Miller, N.C.E., by original monotypy.

References: Kevan, 1963b.

Laufferia Bolívar, 1904
(Fig. 59A-D)
AFRICA

Size: males 2.7 cm and females 3.2 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: macropterous Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is larger and more robust than *Eilenbergia*.

Type species: *Ochrophlebia chloronota* Bolívar, by original monotypy.

References: Kevan, 1962; Dirsh, 1965.

Leptea Bolívar, 1904
(Fig. 52)
AFRICA

Size: males 1.1-1.5 cm and females 1.6-2.1 cm. Body form: cylindrical. Antennae: approximately the length of head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: vestigial to brachypterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other similar genera by its small size. Similar to *Macroleptea,* but this genus is macropterous.

Type species: *Pyrgomorpha debilis* Finot.

References: Finot, 1894; Dirsh, 1965; Kevan & Hsiung, 1990.

Loveridgacris Rehn, 1954
(Fig. 40)
AFRICA

Size: males 4.8-5.4 cm and females 5.4-6.0 cm. Body form: robust. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: semicircular to triangular from above, approximately as long as wide. Fastigium of vertex: large, approximately as long as wide. Pronotum: Median inflation in front of first the sulcus high; entire pronotum tuberculate. Tegmina: brachypterous with small cells. Abdomen: tergites with large, dorsal, pre-apical tubercles, cerci triangular, female valvae short. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated

from *Parapetasia* by the presence of vestigial tegmina, or if brachypterous, the cells are smaller, the size and shape of eyes (ovate and not prominent) and form of fastigium of vertex (rounded apically). The genus is in need of revision and there is a possibility that it can be included within *Parapetasia* where it was previously placed.

Type species: *Petasia impotens* Karsch, inherited from replaced name.

References: Akbar & Kevan, 1964; Dirsh, 1965; Rowell et al., 2015.

Macroleptea Kevan, 1962
(Fig. 58A-B)
AFRICA, WESTERN ASIA

Size: males 1.3-1.8cm and females 1.8-2.3 cm. Body form: cylindrical. Antennae: approximately the length of head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subcylindrical. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other similar genera by its small size. Similar to *Leptea,* but this genus has vestigial to brachypterous tegmina. It can also be separated from *Pyrgomorpha* by having a smoother integument and more cylindrical pronotum.

Type species: *Pyrgomorpha laevigata* Werner.

References: Kevan, 1962; Kevan & Hsiung, 1990.

Malagasphena Kevan, Akbar & Singh, 1964
(Fig. 69)
MADAGASCAR

Size: males 1.5 cm and females 1.8 cm. Body form: subcylindrical. Antennae: approximately as long as the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: vestigial. Abdomen: cerci conical, female valvae large. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Caprorhinus* by having the hind tarsi almost half the length of the hind tibia.

Type species: *Malagasphena minor* Kevan, D.K.M., Akbar & A. Singh.

References: Kevan et al., 1964; Dirsh & Descamps, 1968.

Marsabitacris Kevan, 1957
(Fig. 51C, F)
AFRICA

Size: males 2.4 cm and females unknown. Body form: cylindrical. Antennae: slightly shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: cylindrical. Tegmina: vestigial, reduced to small lobes. Abdomen: cerci triangular. Sexual dimorphism: unknown. Other remarks: This genus is only known from a single male specimen.

Type species: *Marsabitacris citronotus* Kevan, (= *citronota*), by original monotypy.

References: Kevan, 1957b; Dirsh, 1965; Rowell et al., 2015.

Maura Stål, 1873
(Figs. 34-36)
AFRICA

Pest: *Maura lurida, M. bolivari*.

Size: males 2.0-3.0 cm and females 3.0-4.0 cm. Body form: slightly robust. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: semicircular to triangular from above, approximately as long as wide. Fastigium of vertex: large, approximately as wide as long. Pronotum: entirely roughly granulose, anterior and posterior margins not excised. Tegmina: macropterous to brachypterous, wings with some reddish coloration. Abdomen: tergites with large, dorsal, pre-apical tubercles, cerci triangular, female valvae very short and hard to see. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by its smaller size and pronotum sculpture.

Type species: *Petasia rubroornata* Stål, by original designation.

References: Dirsh, 1965; Rowell et al., 2015.

Megalopyrga Baccetti, 1985
(Fig. 23A, F)
AFRICA

Size: males unknown and females 2.1 cm. Body form: slender, cylindrical. Antennae: shorter than head and pronotum together, inserted in front ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: absent. Abdomen: female valvae visible Sexual dimorphism: unknown. Other remarks: This genus is known only from the unique female holotype.

Type species: *Megalopyrga monochroma* Baccetti, by original monotypy.

References: Baccetti, 1985; Rowell et al., 2015.

Megra Campion, 1923
(Fig. 106C-D)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.8 cm and females 2.2-2.7 cm. Body form: cylindrical. Antennae: longer than wide, shorter in females, inserted below ocelli. Head: subcircular, longer than wide. Fastigium of vertex: wider than long Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Megradina* by the presence of temporal foveolae and by more number of hind tibia spines. It can be separated from other closer genera of the

region by the presence of tegmina.

Type species: *Brachycercus flavum* Willemse, C. (= *Megra flava*), inherited from replaced name

References: Kevan, 1966e; Storozhenko, 2004.

Megradina Storozhenko, 2004
(Fig. 94E-H)
SOUTHEAST ASIA

Size: males 2.4-2.6 cm and females 3.8-4.5 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci rectangular, bispinous at tip. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Megra* by the absence of temporal foveolae and by fewer number of hind tibia spines.

Type species: *Megradina festiva* Storozhenko, by monotypy and original designation.

References: Storozhenko, 2004.

Mekongiana Uvarov, 1940
(Fig. 93F-I)
CHINA

Size: males 2.5-2.9 cm and females 3.4-3.6 cm. Body form: fusiform. Antennae: approximately as long as head and pronotum together, females shorter, inserted below ocelli. Head: approximately as long as wide. Fastigium of vertex: slightly wider than long. Pronotum: trapezoidal Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Yunnanites* by its vestigial tegmina. It can also be separated from *Micropterus* by having an almost closed tympanum and the fastigium of vertex slightly wider than long.

Type species: *Mekongia gregoryi* Uvarov, inherited from replaced name.

References: Kevan, 1966f; Zheng et al., 2008.

Mekongiella Kevan, 1966
(Fig. 92E-H)
INDIAN SUBCONTINENT, CHINA

Size: males 1.7-2.2 cm and females 2.3-2.8 cm. Body form: fusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: wider than long. Fastigium of vertex: wider than long. Pronotum: trapeziform. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Paramekongiella* by the absence of tympanum and the fastigium of vertex clearly wider as long (slightly wider than long in *Paramekongiella*).

Type species: *Mekongia kingdoni* Uvarov, by original designation.

References: Kevan, 1966f.

Menesesia Willemse, 1922
(Fig. 109C-F)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.5-3.0 cm and females 3.5-4.7 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other genera by the tegmina with a distinct apical point about or in advance of the middle of the apical margin as follows. It can be distinguished from *Apodesmosptera* in having the wider tegmina, and from *Menesesiella* by its larger size.

Type species: *Menesesia novaeguineae* Willemse, C.

References: Willemse, 1922; Kevan, 1963a.

Menesesiella Kevan, 1963
(Fig. 110A-D)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.1-2.4 cm and females 3.0-3.3 cm. Body form: laterally compressed. Antennae: approximately the length of head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other genera by the tegmina with a distinct apical point about or in advance of the middle of the apical margin as follows. It can be distinguished from *Apodesmosptera* in having the wider tegmina, and from *Menesesia* by its smaller size.

Type species: *Desmopterina occulta* Rehn, J.A.G., by original designation.

References: Rehn, 1951; Kevan, 1963a.

Meubelia Willemse, 1932
(Figs. 98E-H, 99-100)
MALESIA

Size: males 1.8-2.0 cm and females 2.6-3.2 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: micropterous *sensu lato* (but because it has hind wings, it should be considered brachypterous). Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by the presence of small tegmina (virtually absent in *Philippyrgus* and well developed in *Spinacris*).

Type species: *Meubelia gracilis* Willemse, C., by original designation.

References: Kevan, 1974a.

Micropterus Dong & Wang, 2012
CHINA

Size: males 2.1-2.7 cm and females 3.5-4.6 cm. Body form: fusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: trapeziform. Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: nor pronounced. Other remarks: This genus can be separated from *Yunnanites* by its vestigial tegmina, and from *Mekongiana* by having a slightly developed tympanum and the fastigium of vertex clearly wider than long.

Type species: *Micropterus yongshengensis* Dong, D.-Z. & Yunzhen Wang, by original monotypy.

References: Dong & Wang, 2012.

Minorissa Walker, 1870
(Fig. 18)
SOUTH AMERICA

Size: males 2.0-3.0 cm and females 3.0-4.0 cm. Body form: subfusiform. Antennae: approximately around the size of head and pronotum together, inserted in front ocelli. Shorter in females. Head: triangular from above and much longer than wide. Fastigium of vertex: much longer than wide. Pronotum: rugose, sometimes with a line of tubercles in the lateral borders, posterior margin in females of *M. volxemi* extended and covering half of tegmina. Tegmina: fully developed, brachypterous in males of *M. volxemi*. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: pronounced in *M. volxemi*. Other remarks: This genus can be distinguished from *Omura* and *Algete* by the presence of tegmina.

Type species: *Minorissa pustulata* Walker, by original monotypy.

References: Kevan, 1966g; Kevan, 1977a; Alves Dos Santos, 2005. Alves Dos Santos (2005) conducted a taxonomic revision of the South American Pyrgomorphidae.

Mitricephala Bolívar, 1898
(Fig. 102E-F)
MALESIA

Size: males 2.5-3.2 cm and females 3.5-4.8 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide (sometimes as long as wide). Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci robust, flattened, rather abruptly curved inwards towards the apices, which are blunt or truncated, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Verdulia* by the presence of a distinct pale lateral stripe along the head, thorax and the first part of abdomen, and by the tegmina shorter, leaving several abdominal segments exposed. It can be separated from *Mitricephaloides* by the cerci abruptly curved inwards towards the apices and last abdominal segment with a deep narrow, elongate, oblong or keyhole shape posterior excision having thickened lateral margins.

Type species: *Mitricephala vittata* Bolívar, I., by original monotypy.

References: Kevan, 1963c.

Mitricephaloides Kevan, 1963
(Fig. 102A-D)
MALESIA

Size: males 2.5-3.2 cm and females 3.5-4.8 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci simple, elongate, evenly curved inwards and acute apically, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Verdulia* by the presence of a distinct pale lateral stripe along the head, thorax and first part of abdomen and by the tegmina shorter, leaving several abdominal segments exposed. It can be separated from *Mitricephala* by the cerci evenly curved and last abdominal segment in males with broad, simple, subcircular or semicircular posterior excision.

Type species: *Mitricephala rhodoptera* Miller, N.C.E. (= *Mitricephaloides rhodopterus*).

References: Kevan, 1963c.

Modernacris Willemse, 1931
(Fig. 106G-H)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.0-2.3 cm and females 2.6-3.2 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: last abdominal segment and cerci very specialized, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The second tarsal segment of hind tarsus subequal or longer than third tarsal segment coupled with male terminalia specialized separate *Modernacris* from other closer genera.

Type species: *Modernacris controversa* Willemse, C., by original designation.

References: Kevan, 1966e.

Monistria Stål, 1873
(Fig. 115E-J, 116E-H)
AUSTRALIA

Size: males 1.2-3.3 cm and females 2.3-4.0 cm. Body form: fusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, as long as wide to longer than wide. Fastigium of vertex: as long as wide to longer than wide. Pronotum: trapeziform.

Tegmina: brachypterous to macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by having few black cells and two or more fairly strong and direct longitudinal veins.

Type species: *Monistria pustulosa* Stål (= *pustulifera pustulifera*), by original monotypy.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Neorthacris Kevan & Singh, 1964
(Fig. 85E-H)
INDIAN SUBCONTINENT

Pest: *Neorthacris simulans, N. acuticeps, N. longicercata, N. malabarensis*.

Size: males 1.7-1.9 cm and females 2.4-2.7cm. Body form: cylindrical. Antennae: longer than head and pronotum together, smaller in females, inserted below ocelli. Head: triangular from above, slightly longer than its width. Fastigium of vertex: approximately as long as wide. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is difficult to separate from *Orthacris* (not possible in females), except by the whip-like aedeagal sclerites.

Type species: *Orthacris acuticeps* Bolívar, I. (= *Neorthacris acuticeps acuticeps*).

References: Kevan & Singh, 1964; COPR, 1982.

Nerenia Bolívar, 1905
(Fig. 107G-J)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.0-2.2 cm and females 2.4-2.6 cm. Body form: subcylindrical. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: absent. Abdomen: last segment pronounced, cerci conical, female valvae very visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other closer genera by its prominent fastigium of vertex and male terminalia enlarged and bulbous.

Type species: *Nerenia francoisi* Bolívar, I., by original monotypy.

References: Bolívar, 1905; Kevan, 1966e.

Nilgiracris Kevan, 1964
(Fig. 85A-D)
INDIAN SUBCONTINENT

Size: males 1.1-1.3 cm and females 1.5-1.7 cm. Body form: subcylindrical. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus differs from *Ramakrishnaia* in its smaller size, the lack of tegmina, and head no longer than pronotum.

Type species: *Ramakrishnaia raoi* Kevan, D.K.M., by monotypy and original designation.

References: Kevan, 1953 [1952]; Kevan & Akbar, 1964.

Noonacris Kevan, 1966
(Fig. 107E-F)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.2-1.4 cm and females 2.8-2.8 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: circular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The second tarsal segment of hind tarsus subequal or longer than third tarsal segment coupled with male terminalia not specialized and elongate subgenital plate separate *Noonacris* from other closer genera.

Type species: *Noonacris pusilla* Kevan, D.K.M.

References: Kevan, 1966e.

Occidentosphena Kevan, 1956
(Fig. 43)
AFRICA

Edible: *Occidentosphena uvarovi*.

Size: males 1.2-1.5 cm and females 1.8-2.4 cm. Body form: fusiform, especially females. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: absent. Abdomen: cerci triangular, female valvae large. Sexual dimorphism: slightly pronounced. Other remarks: This genus can be separated from *Parasphena* by having the fastigium of vertex acutely angular above. In fact, it was originally described within that genus.

Type species: *Parasphena ruandensis* Rehn, by original designation.

References: Kevan, 1956; Dirsh, 1965; Rowell, 2015.

Ochrophlebia Stål, 1873
(Fig. 56)
AFRICA

Size: males 1.8-2.6 cm and females 3-4.5 cm. Body form: subfusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: macropterous, wings reddish to purplish. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is more robust and larger, and frontal profile less oblique than *Ochrophlegma*.

Type species: *Poekilocerus ligneolus* Serville (= *Ochrophlebia cafra ligneola*), by subsequent designation; authority: Kirby, 1910.

References: Kevan, 1962; Dirsh, 1965.

Ochrophlegma Bolívar, 1904
(Fig. 58E-H)
AFRICA

Size: males 1.7-2.3 cm and females 2.4-3.6 cm. Body form: subfusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is more slender, smaller and frontal profile more oblique than *Ochrophlebia*.

Type species: *Ochrophlebia radiata* Stål (= *Ochrophlegma vittifera*).

References: Kevan, 1962; Dirsh, 1965.

Omura Walker, 1870
(Fig. 17A-D)
SOUTH AMERICA

Size: males 2.8-3.4 cm and females 4.6-5.3 cm. Body form: subfusiform compressed dorso-ventrally. Antennae: approximately around the size of the head, inserted in front ocelli. Shorter and ensiform in females. Head: triangular from above and much longer than wide. Fastigium of vertex: much longer than wide. Pronotum: sometimes with a line of tubercles in the lateral borders. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: females slightly more fusiform. Other remarks: This genus can be distinguished from *Algete* by the presence of irregular integument and the lower marginal area of hind femur approximately as wide as medial area.

Type species: *Omura congrua* Walker, by original monotypy.

References: Kevan, 1966g; Kevan, 1977a; Alves Dos Santos, 2005. Alves Dos Santos (2005) conducted a taxonomic revision of the South American Pyrgomorphidae.

Orthacris Bolívar, 1884
(Fig. 86A-D)
INDIAN SUBCONTINENT

Pest: *Orthacris incongruens, O. robusta, O. ceylonica, O. filiformis, O.* spp.

Size: males 1.7-1.9 cm and females 2.5-2.7cm. Body form: cylindrical to subfusiform. Antennae: longer than head and pronotum together, smaller in females, inserted below ocelli. Head: triangular from above, frequently not longer than its width or shorter. Fastigium of vertex: usually wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is difficult to separate from *Neorthacris* (not possible in females), except by the normal aedeagal sclerites.

Type species: *Orthacris filiformis* Bolívar, I., by original monotypy.

References: Kevan & Singh, 1964; COPR, 1982.

Paradoriaella Willemse, 1961
(Fig. 111A-B)
PAPUASIA AND PACIFIC ISLANDS

Size: males unknown; females 3.5 cm. Body form: laterally compressed. Antennae: approximately as long as head and pronotum together, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: female valvae visible. Sexual dimorphism: probably not pronounced. Other remarks: *Paradoriaella* is related to *Doriaella*, but differs in females in the form of antenna, the 3-8 basal joints in *Doriaella* being all dilated (not all in *Paradoriaella*); head, pronotum, and body not or scarcely tuberculate; frons seen in profile more regularly curved (in the *Paradoriaella* more angulately curved); anterior area of hind wing at the top concavely excised; tegmina also more elongate.

Type species: *Paradoriaella tuberculata* Willemse, C.

References: Willemse, 1961; Kevan, 1963a.

Paramekongiella Huang, 1990
CHINA

Size: males 3.2 cm and females 4.3 cm. Body form: fusiform. Antennae: longer than head and pronotum together, females shorter, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: slightly wider than long. Pronotum: trapeziform. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Mekongiella* by the presence of tympanum and the fastigium of vertex slightly wider as long (much wider than long in *Mekongiella*).

Type species: *Paramekongiella zhongdianensis* Huang, C., by monotypy and original designation.

References: Huang, 1990; Mao & Yang, 2003.

Parapetasia Bolívar, 1884
(Fig. 39)
AFRICA

Size: males 3.0-3.8 cm and females 3.8-4.4 cm. Body form: robust. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: semicircular to triangular from above, approximately as long as wide. Fastigium of vertex: large, approximately as long as wide. Pronotum: median inflation in front of first the sulcus high; entire pronotum tuberculate. Tegmina: vestigial or brachypterous with large cells. Abdomen: tergites with large, dorsal, pre-apical tubercles, cerci triangular, female valvae short. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Loveridgacris* by the presence of vestigial tegmina or if brachypterous, with larger cells, the size and shape of eyes (hemispherical and prominent) and form of fastigium of vertex (triangular). The genus is in need of revision and there is a possibility to re-include *Loveridgacris*, which was previously placed here.

Type species: *Parapetasia femorata* Bolívar.

References: Akbar & Kevan, 1964; Dirsh, 1965; Rowell et al., 2015.

Paraphymateus Dirsh, 1962
(Fig. 27)
AFRICA

Size: males 4.0 cm and females 5.0 cm. Body form: moderately robust. Antennae: slightly longer than head and pronotum together, inserted below ocelli. Head: concave to semicircular from above, wider than long. Fastigium of vertex: short, wider than long. Pronotum: ornamented with two pairs of large tubercles on disc. Tegmina: brachypterous with wings red in coloration. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is only known from four to five specimens.

Type species: *Paraphymateus roffeyi* Dirsh, by original monotypy.

References: Dirsh, 1962; Baccetti, 1984; Rowell et al., 2015.

Parasphena Bolívar, 1884
(Figs. 44-46)
AFRICA

Size: males 1.1-2.3 cm and females 1.7-3.0 cm. Body form: slightly fusiform, especially females. Antennae: approximately the length of head and pronotum together (in some cases slightly shorter, in others slightly longer) shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical to subcylindrical, slightly widening backwards. Tegmina: absent. Abdomen: cerci triangular, female valvae large. Sexual dimorphism: slightly pronounced. Other remarks: This genus can be separated from *Occidentosphena* by having the fastigium of vertex parabolic above, separated from *Parasphenella* by the absence of clear, entire, regular, lateral pronotal carinae, and from *Stenoscepa* by the absence of tegmina.

Type species: *Sphenarium pulchripes* Gerstaecker, by subsequent designation; authority: Kirby, 1910.

References: Kevan, 1956; Dirsh, 1965; Rowell et al., 2015. Rowell at al. (2015) provided the most updated key, descriptions, distribution maps, biology and ecology information, and alive pictures for all species.

Parasphenella Kevan, 1956
(Fig. 53G-H)
AFRICA

Size: males 1.8-2.0 cm and females 2.1-2.7 cm. Body form: fusiform. Antennae: approximately the length of the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Jago (in Rowell et al., 2015) considered that a revision of genus *Stenoscepa* is in need to fully understand whether the placement of the species currently assigned to *Parasphenella* is adequate.

Type species: *Pyrgomorphella carinata* Bolívar, by original designation.

References: Kevan, 1956; Dirsh, 1965; Rowell et al., 2015.

Parasphenula Kevan, 1956
(Figs. 53E-F, 81A-D)
AFRICA, ARABIAN PENINSULA

Size: males 1.8-2.7 cm and females 2.0-3.0 cm. Body form: fusiform. Antennae: approximately the length of the head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus was erected to accommodate some species closer to *Stenoscepa* but differing in details of coloration and the margins of the pronotal lobes. Jago (in Rowell et al., 2015) rejected this genus and placed both African species (*boranensis* and *abyssinica*) within *Stenoscepa*. Due to this, we recommend to use geographical data to narrow down possible genera and species.

Type species: *Parasphena boranensis* Salfi, by original designation.

References: Kevan, 1956; Rowell et al., 2015.

Parastria Key, 1985
(Fig. 117)
AUSTRALIA

Size: males 2.1-2.3 cm and females 3.6-4.0 cm. Body form: fusiform. Antennae: longer than head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as longer as wider. Fastigium of vertex: approximately as long as wide. Pronotum: trapeziform. Tegmina: brachypterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by having numerous large black cells, minutely granular with a matt finish on tegmina.

Type species: *Parastria reticulata* Key, by original designation.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Paratarbaleus Ramme, 1941
(Fig. 107A-D)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.2-2.4 cm and females 2.8-3.2 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: circular, wider than long. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The second tarsal segment of hind tarsus subequal or longer than third tarsal segment coupled with male terminalia

not specialized and head much wider behind eyes than pronotum separate *Paratarbaleus* from other closer genera.

Type species: *Tarbaleus novaeguineae* Ramme.

References: Kevan, 1966e.

Parorthacris Dirsh, 1958
(Fig. 42E-F)
AFRICA

Size: males 1.4 cm and females unknown. Body form: cylindrical. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: absent. Abdomen: cylindrical, cerci conical. Sexual dimorphism: unknown. Other remarks: This genus is known only from very few male specimens. It can be distinguished from *Vittisphena* by having the dorsum of pronotum crossed by only one transverse sulcus.

Type species: *Parorthacris somalica* Dirsh, by monotypy and original designation.

References: Dirsh, 1958[1957]; 1965; Rowell et al., 2015.

Petasida White, 1845
(Fig. 114E-H)
AUSTRALIA

Size: males 4.5-4.8 cm and females 5.8-6.2 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, wider than long. Fastigium of vertex: wider than long. Pronotum: trapeziform. Tegmina: macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Scutillya* by the shape of metazona of pronotum.

Type species: *Petasida ephippigera* White, A., by original monotypy.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Pezotagasta Uvarov, 1953
(Fig. 49)
AFRICA

Size: males 1.8-2.2 cm and females 2.2-2.4 cm. Body form: slightly fusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: brachypterous. Abdomen: cerci triangular, slightly incurved and downcurved, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera, such as *Cawendia* and *Humpatella,* by the tegmina shape and pronotum not as convex dorsally as in them.

Type species: *Pezotagasta crassipes* Uvarov (= *angolensis*).

References: Kevan, 1956; Dirsh, 1965.

Philippyrgus Kevan, 1974
(Fig. 98A-D)
MALESIA

Size: males 2.6-2.8 cm and females 3.3-3.5 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in female, inserted below ocelli. Head: almost quadrated, approximately as long as wide. Fastigium of vertex: much wider than long. Pronotum: cylindrical. Tegmina: virtually absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Meubelia* and *Spinacris* by the tegmina virtually absent and the fastigium of vertex extremely short and broad, scarcely at all protruding in advance of the eyes.

Type species: *Philippyrgus subapterus* Kevan, D.K.M., by monotypy and original designation.

References: Kevan, 1974a.

Phymateus Thunberg, 1815
(Figs. 29-32, 65)
AFRICA, MADAGASCAR, CHINA

Edible: *Phymateus viridipes*.

Pest: *Phymateus leprosus, P. baccatus, P. aegrotus, P. pulcherrimus, P. morbillosus, P. saxosus, P. madagassus, P. viridipes, P. karschi, P. cinctus*.

Size: males 4.0-6.0 cm and females 5.0-7.5 cm. Body form: moderately robust. Antennae: slightly longer than head and pronotum together, inserted below ocelli. Head: concave to semicircular from above, wider than long. Fastigium of vertex: short, wider than long. Pronotum: covered in strong tubercles and blunt teeth. Tegmina: macropterous with wings red (some cases blue and yellow) in coloration and tessellated in pattern. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Rutidoderes* by the blunt teeth in pronotum, and from *Phyteumas* by the tessellated pattern in wings.

Type species: *Gryllus morbillosus* Linnaeus (= *Phymateus morbillosus morbillosus*).

References: Dirsh, 1965; COPR, 1982; Rowell et al., 2015.

Phymella Uvarov, 1922
(Fig. 23G-J)
AFRICA

Size: males 1.3-1.7 cm and females 1.8-2.1 cm. Body form: slightly fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: strongly tuberculate. Tegmina: brachypterous, wings with reddish coloration. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The shape of head and pronotum is unique among the South African pyrgomorphs.

Type species: *Phymella capensis* Uvarov, by monotypy and original designation.

References: Dirsh, 1965.

Physemophorus Krauss, 1907
(Fig. 42A-D)
AFRICA

Size: males 2.0 cm and females 2.4 cm. Body form: slender. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: semicircular from above, approximately as long as wide. Fastigium of vertex: short, wider than long. Pronotum: subcylindrical, simple. Tegmina: macropterous, connected on dorsum but with an aperture. Abdomen: first abdominal tergite with dorsal gland, cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Zonocerus* by tegmina overlapping at the base and still showing the glandular tubercle.

Type species: *Poecilocerus sokotranus* Burr, by original monotypy.

References: Rowell et al., 2015.

Phyteumas Bolívar, 1904
(Fig. 28)
AFRICA

Pest: *Phyteumas purpurascens*.

Size: males 4.0-6.0 cm and females 5.5-8.0 cm. Body form: moderately robust. Antennae: slightly longer than head and pronotum together, inserted below ocelli. Head: concave to semicircular from above, wider than long. Fastigium of vertex: short, wider than long. Pronotum: covered in strong tubercles and blunt teeth. Tegmina: macropterous with wings red in coloration. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Rutidoderes* by the blunt teeth in pronotum, and from *Phymateus* by the absence of tessellated pattern in wings.

Type species: *Phymateus olivaceus* Karsch, by original designation.

References: Dirsh, 1965; COPR, 1982; Rowell et al., 2015.

Piscacris Kevan, Singh & Akbar, 1964
(Fig. 12E-H, 13)
NORTH AND CENTRAL AMERICA

Size: males 1.5-1.8 cm and females 1.9-2.2 cm. Body form: cylindrical (less so in females). Antennae: longer than head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, slightly longer than wide. Fastigium of vertex: almost as long as wide. Pronotum: smooth, at most with a few isolated and scattered tubercles. Tegmina: absent. Abdomen: males with cerci slender, pointed apically and much shorter than the posterior prolongation of 10th abdominal tergum; females with postero-lateral margins of the 8th abdominal sternum not produced, valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Ichthyotettix* by cerci shape being shorter than the posterior prolongation of 10th abdominal tergum.

Type species: *Piscacris robertsi* Kevan, Singh & Akbar, by original designation.

References: Kevan et al., 1964a; Kevan, 1977a.

Plerisca Bolívar, 1904
(Fig. 50E-H)
AFRICA, INDIAN SUBCONTINENT

Size: males 2.2-2.4 cm and females 2.4-2.8 cm. Body form: slightly fusiform. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal with posterior margin excurved. Tegmina: brachypterous, wings red. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: We highly doubt that *Plerisca subindica* from India belongs to this Southern Africa genus.

Type species: *Plerisca peringueyi* Bolívar, by original monotypy.

References: Dirsh, 1965.

Poekilocerus Serville, 1831
(Figs. 57, 79, 88E-H)
AFRICA, ARABIAN PENINSULA, INDIAN SUBCONTINENT

Pest: *Poekilocerus bufonius vittattus, P. pictus*.

Size: males 2.9-5.3 cm and females 4.5-7.3 cm. Body form: subfusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: subcylindrical to subtrapezoidal, slightly constricted in prozona. Tegmina: macropterous, wings colored bright orange, or more rarely pink. Abdomen: dorsal gland between first and second tergite, cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The pronotum shape and texture helps to separate this genus from other genera, such as *Phymateus* and *Aularches*.

Type species: *Gryllus pictus* Fabricius, by subsequent designation; authority: Kirby, 1910.

References: Dirsh, 1965; Popov & Kevan, 1979; COPR, 1982; Rowell et al., 2015. Popov and Kevan (1979) provided the most comprehensive taxonomic revision to date.

Popovia Uvarov, 1952
(Fig. 80A-D)
ARABIAN PENINSULA

Size: males 2.2-2.4 cm and females 2.8-3.2 cm. Body form: cylindrical. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: vestigial Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its body shape and smooth texture help separate it from other genera from the same region.

Type species: *Popovia salvadorae* Uvarov, by original monotypy.

References: Uvarov, 1952.

Propsednura Rehn, 1953
(Fig. 113M-P)
AUSTRALIA

Size: males 2.6-3.2 cm and females 4.7-5.1 cm. Body form: extremely elongated. Antennae: shorter than head, inserted below ocelli. Head: triangular from above, extremely longer than wide. Fastigium of vertex: much longer than wide. Pronotum: cylindrical. Tegmina: micropterous: Abdomen: subgenital plate long, cerci conical and straight, female valvae barely visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Psednura* by being micropterous. It can be separated from *Psedna* by the straight cerci.

Type species: *Propsednura eyrei* Rehn, J.A.G., by original designation.

References: Key, 1972; Rentz et al., 2003. Key (1972) conducted a thoughtful revision of the three current members of tribe Psednurini.

Prosphena Bolívar, 1884
(Fig. 11A-D)
NORTH AND CENTRAL AMERICA

Size: males 2.6-4.0 cm and females 3.0-4.0 cm. Body form: fusiform. Antennae: slightly shorter than head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: considerably longer than wide. Pronotum: rugose with posterior margin of pronotum strongly sinuous and emarginated. Tegmina: micropterous and tongue like, widening towards the base. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Sphenarium* by the tegmina shape.

Type species: *Prosphena scudderi* Bolívar, I., by original monotypy.

References: Kevan et al., 1964a: Kevan, 1977a; Rowell, 2013. The genus is in need of revision and it is plausible that more than one species is present.

Protanita Kevan, 1962
(Fig. 60)
AFRICA

Size: males 2.1 cm and females 2.5 cm. Body form: cylindrical or strongly cylindrical. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide (in males often as long as pronotum, in females nearly so). Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: females stouter than males. Other remarks: This genus can be distinguished from other closed related genera by its very elongate body.

Type species: *Tanita elongata* Bolívar, by original designation.

References: Kevan, 1962, Rowell et al., 2015.

Psedna Key, 1972
(Fig. 113E-H)
AUSTRALIA

Size: males 3.0-3.2 cm and females 4.3-4.7 cm. Body form: extremely elongated. Antennae: shorter than head, inserted below ocelli. Head: triangular from above, extremely longer than wide. Fastigium of vertex: much longer than wide. Pronotum: cylindrical. Tegmina: micropterous (very rarely fully winged). Abdomen: subgenital plate long, cerci conical and bent, female valvae barely visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Psednura* by being micropterous (rarely macropterous). It can be separated from *Propsednura* by the bent cerci.

Type species: *Propsednura hesperus nana* Rehn, J.A.G. (= *Psedna nana*), by original designation.

References: Key, 1972; Rentz et al., 2003. Key (1972) conducted a thoughtful revision of the three current members of tribe Psednurini.

Psednura Burr, 1904
(Fig. 113A-D, I-L)
AUSTRALIA

Size: males 3.2-3.5 cm and females 5.2-5.5 cm. Body form: extremely elongated. Antennae: shorter than head, inserted below ocelli. Head: triangular from above, extremely longer than wide. Fastigium of vertex: much longer than wide. Pronotum: cylindrical. Tegmina: essentially apterous (vestiges of tegmina and wings represented by slight thickenings or ventro-caudal projections of ventral margins of meso and metanota. Abdomen: subgenital plate long, cerci conical and bent, female valvae barely visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Psedna* and *Propsednura* by its essentially apterous condition.

Type species: *Mesops pedestris* Erichson, by subsequent designation; authority: Kirby, W.F. 1910.

References: Key, 1972; Rentz et al., 2003. Key (1972) conducted a thoughtful revision of the three current members of tribe Psednurini.

Pseudogeloius Dirsh, 1963
(Fig. 76A-D)
MADAGASCAR

Size: males 1.7-2.3 cm and females 2.7-3.3 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: cylindrical. Tegmina: absent to micropterous. Abdomen: complex cerci, subgenital plate of males strongly dilated, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Acanthopyrgus* by having the fore femur without row of strong spines and from *Geloius* by having the subgenital plate of males strongly dilated.

Type species: *Pseudogeloius relictus* Dirsh, by original designation.

References: Dirsh & Descamps, 1968.

Pseudomorphacris Carl, 1916
(Fig. 91E-L)
INDIAN SUBCONTINENT, CHINA, SOUTHEAST ASIA

Size: males 2.6-3.2 cm and females 3.8-4.4 cm. Body form: subfusiform to fusiform. Antennae: approximately as long as head and pronotum together, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapeziform. Tegmina: brachypterous to macropterous. Abdomen: cerci bent, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: The marginal area of hind femur expanded, as wide as medial area plus the cerci bent, are unique characteristics that can separate it from other genera.

Type species: *Mestra notata* Brunner von Wattenwyl.

References: Brunner von Wattenwyl, 1893; Carl, 1916; Kevan, 1968.

Pseudorubellia Dirsh, 1963
(Fig. 68A-D)
MADAGASCAR

Size: males 1.7-2.7 cm and females 2.5-3.0 cm. Body form: fusiform. Antennae: longer than the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapezoidal. Tegmina: brachypterous to macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Rubellia* by having a shorter fastigium of vertex.

Type species: *Rubellia brancsiki* Bolívar, I., by original designation.

References: Dirsh & Descamps, 1968.

Pseudosphena Kevan & Akbar, 1964
(Fig. 72)
MADAGASCAR

Size: males 1.7 cm and females 2.8-4.1 cm. Body form: subcylindrical to subfusiform. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical to trapezoidal. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female stouter. Other remarks: This genus can be distinguished from *Dyscolorhinus* by having the sides of the mesosternal space slightly curved or straight.

Type species: *Parasphena dispar* Dirsh.

References: Dirsh, 1963; Dirsh & Descamps, 1968.

Pterorthacris Uvarov, 1921
(Fig. 89A-B)
INDIAN SUBCONTINENT

Size: males 2.4-2.5 cm and females unknown. Body form: cylindrical. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subcylindrical. Tegmina: macropterous. Abdomen: cerci conical. Sexual dimorphism: probably not pronounced. Other remarks: This genus can be separated from other closer genera, such as *Feacris* and *Chlorizeina*, by its body and tegmina shapes.

Type species: *Pterorthacris subcallosa* Uvarov, by monotypy and original designation.

References: Kevan, 1969a.

Punctisphena Kevan, 1961
(Fig. 54E-F)
AFRICA

Size: males 1.7-1.9 cm and females 2.5-2.8 cm. Body form: fusiform, especially females. Antennae: approximately the length of the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: slightly pronounced. Other remarks: This genus can be separated from *Carinisphena* by the shape and size of tegmina, separated from South African *Parasphenella* by the not marked lateral carinae and tegmina shape.

Type species: *Punctisphena pustulata* Kevan.

References: Kevan, 1961; 1966c.

Pyrgohippus Dirsh, 1963
(Fig. 74A-D)
MADAGASCAR

Size: males 1.5-2.0 cm and females 2.2-2.6 cm. Body form: subfusiform. Antennae: shorter than head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapezoidal. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: female strongly stouter. Other remarks: This genus can be separated from *Gymnohippus* and *Acropyrgus* by having the tip of head in profile, notched before touching with the fastigium of vertex. It can also be separated from female *Acropyrgus* by having the posterior margin of pronotum straight.

Type species: *Pyrgohippus pallidus* Dirsh, by monotypy and original designation.

References: Dirsh & Descamps, 1968.

Pyrgomorpha Serville, 1838
(Figs. 61, 82E-H, 83, 91A-D, 118A-D)
AFRICA, EUROPE, ARABIAN PENINSULA, WESTERN ASIA, INDIAN SUBCONTINENT, CHINA

Edible. *Pyrgomorpha cognata, P. vignaudii*.

Pest: *Pyrgomorpha vignaudii, P, bispinosa, P. conica, P. cognata, P. guentheri*.

Size: males 1.2-2.8 cm and females 1.8-3.7 cm. Body form:

cylindrical to subfusiform. Antennae: usually shorter or as long than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide, it could be longer than wide. Pronotum: subtrapezoidal to trapezoidal. Tegmina: micropterous to brachypterous to macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: females could be quite larger than males. Other remarks: The genus is in need of full revision. For all the regional keys except Africa key, it is simple to separate it from other genera. In Africa, it could be confused with other closed related genera (see *Macroleptea*, *Scabropyrgus, Tanita, Tanitella*).

Type species: *Acrydium conicum* Olivier (= *Pyrgomorpha conica conica*).

References: Kevan, 1962; Dirsh, 1965; COPR, 1982. Kevan & Hsiung, 1985, 1988, 1989, 1990 treated African and Palearctic species of *Pyrgomorpha*.

Pyrgomorphella Bolívar, 1904
(Figs. 55, 66, 81E-F)
AFRICA, MADAGASCAR, ARABIAN PENINSULA

Pest: *Pyrgomorphella arachidis*.

Size: males 1.0-2.5 cm and females 1.6-3.0 cm. Body form: fusiform, especially females. Antennae: approximately the length of the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: micropterous to almost invisible. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is a taxonomic dumping ground and is in need of revision. There are five species in Africa, three in Madagascar, and one in Arabia Peninsula. It is probable that the Madagascar species are a separate group. The lobe-like tegmina with around 8 veins running parallel (versus around 5) is useful to separate this genus from *Stenoscepa* in Africa. It can also be separated from *Pyrgomorphula* by smaller, tongue-like or vestigial and divergent tegmina.

Type species: *Pyrgomorphella sphenarioides* Bolívar, I., by subsequent designation; authority: Kirby, 1910.

References: Kevan, 1956; Kevan & Akbar, 1963; Dirsh & Descamps, 1968; Rowell et al., 2015.

Pyrgomorphellula Kevan & Hsiung, 1988
(Fig. 80E-H)
ARABIAN PENINSULA

Size: males 1.2-1.3 cm and females 1.9-2.1 cm. Body form: subfusiform. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other genera of the region by its size and by the space between eye and anterior margin of pronotum less than the length of the eye.

Type species: *Pyrgomorphella curtula* Uvarov.

References: Kevan & Hsiung, 1988.

Pyrgomorphula Kevan & Akbar, 1963
(Fig. 118E-H)
EUROPE

Size: males 1.8-2.1 cm and females 2.8-3.1 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapeziform. Tegmina: brachypterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: females stouter. Other remarks: This genus can be separated from *Pyrgomorphella* by larger, ovate-lanceolate, subdorsal and not strongly divergent tegmina.

Type species: *Pyrgomorpha serbica* Pančić, by original designation.

References: Kevan & Akbar, 1963.

Pyrgotettix Kevan, Singh & Akbar, 1964
(Fig. 14E-H)
NORTH AND CENTRAL AMERICA

Size: males 1.6-1.8 cm and females 2.2-2.5 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, slightly longer than wide. Fastigium of vertex: slightly wider than long. Pronotum: smooth, at most with a few isolated and scattered tubercles. Tegmina: absent. Abdomen: Posterior margin of tenth abdominal tergum with distinct median excision, cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Sphenotettix* by having posterior margin of tenth abdominal tergum with distinct median excision.

Type species: *Pyrgotettix pueblensis* Kevan, Singh & Akbar, by monotypy and original designation.

References: Kevan et al., 1964a; Kevan, 1977a.

Rakwana Henry, 1933
(Fig. 84A-D)
INDIAN SUBCONTINENT

Size: males 2.2 cm and females 2.8-3.1 cm. Body form: cylindrical. Antennae: much longer than head and pronotum together, inserted below ocelli. Head: cylindrical, longer than wide. Fastigium of vertex: unique form like a bell, longer than wide. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other genera by its unique head shape, fastigium of vertex form and prominent eyes.

Type species: *Rakwana ornata* Henry, G.M.

References: Henry, 1933.

Ramakrishnaia Bolívar, 1917
(Fig. 87A-D)
INDIAN SUBCONTINENT

Size: males 1.5-2.0 cm and females 1.9-2.2 cm. Body form: subfusiform. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: micropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus differs from *Nilgiracris* in its larger size, the presence of tegmina and head longer than pronotum. It differs from *Colemania* in its smaller size, less elongate body, and in possessing distinct lateral pronotal carinae.

Type species: *Ramakrishnaia notabilis* Bolívar, I., by original monotypy.

References: Kevan & Akbar, 1964.

Rubellia Stål, 1875
(Fig. 67)
MADAGASCAR

Pest: *Rubellia nigrosignata*.

Size: males 1.7-2.5 cm and females 2.6-2.9 cm. Body form: fusiform. Antennae: approximately as long as the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: brachypterous to macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Pseudorubellia* by having a longer fastigium of vertex.

Type species: *Rubellia nigro-signata* Stål (= *nigrosignata*), by original monotypy.

References: Dirsh & Descamps, 1968.

Rutidoderes Westwood, 1837
(Fig. 24)
AFRICA

Pest: *Rutidoderes squarrosus*.

Size: males 2.8-4.1 cm and females 4.5-6.0 cm. Body form: slender. Antennae: larger than head and pronotum together, shorter in females, inserted below ocelli. Head: concave to semicircular from above, approximately as long as wide. Fastigium of vertex: short, wider than long. Pronotum: armed with large and acute lateral teeth. Tegmina: macropterous with wings reddish in colorations and tessellated in pattern. Abdomen: cerci triangular, female valvae large and very visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera, such as *Phymateus* and *Phyteumas,* by the presence of large and acute teeth in pronotum.

Type species: *Gryllus squarrosus* Linnaeus, by original monotypy.

References: Dirsh, 1965; 1970; COPR, 1982; Rowell et al., 2015.

Sagittacris Dirsh, 1963
(Fig. 74E-F)
MADAGASCAR

Size: males 2.4 cm and females unknown. Body form: cylindrical. Antennae: longer than head and pronotum together, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical. Sexual dimorphism: unknown. Other remarks: Its strongly elongated fastigium of the vertex is a diagnostic trait for the genus.

Type species: *Sagittacris malagassus* Dirsh (= *malagassa*), by monotypy and original designation.

References: Dirsh & Descamps, 1968.

Scabropyrgus Kevan, 1962
(Fig. 62A-D)
AFRICA

Size: males 1.5-2.3 cm and females 2.2-2.8 cm. Body form: subfusiform. Antennae: approximately the length of the head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: subtrapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: females stouter than males. Other remarks: *Scabropyrgus* differs from *Tanita* and agrees with *Pyrgomorpha* in the shape of the head, which in profile, is convex dorsally with a markedly concave frons, and in the presence of a raised diagonal ridge on the lateral pronotal lobe, the infero-posterior angle of which may be somewhat irregular, although not in all specimens. It agrees more with *Tanita* in the lack of distinct lateral pronotal carinae and in the straight inferior margin of the lateral pronotal lobe, but it differs from both genera in the very rugose or scabrous sculpturation of head and pronotum, in the irregular arrangement and strongly raised condition of some of the more prominent reticular veinlets of the tegmina. The hind wings also are usually lightly tessellated with blackish, a condition not seen in other closed related genera.

Type species: *Ochrophlebia scabrosus* Bolívar.

References: Kevan, 1962.

Schulthessia Bolívar, 1905
(Fig. 77E-H)
MADAGASCAR

Size: males 2.0-2.2 cm and females 3.0-3.8 cm. Body form: slender to robust. Antennae: approximately as long as head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal, lateral margins with a line of tubercles. Tegmina: fully developed. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Atractomorpha* by its marginal area of the hind femur strongly enlarged and displaced ventrally

towards the medial area.

Type species: *Schulthessia biplagiata* Bolívar, I., by original monotypy.

References: Dirsh & Descamps, 1968.

Scutillya Sjöstedt, 1921
(Fig. 114A-D)
AUSTRALIA

Size: males 3.2-3.4 cm and females 3.8-4.2 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Petasida* by the shape of metazona of pronotum.

Type species: *Scutillya verrucosa* Sjöstedt, by monotypy and original designation.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Shoacris Kevan, 1952
(Fig. 21A-B)
AFRICA

Size: males unknown and females 1.8 cm. Body form: depressed. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapezoidal shape from above with tubercles. Tegmina: vestigial, covered by pronotum. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: unknown. Other remarks: A diagnostic character is the anterior margin of prosternum strongly expanded, collar-like, covering lower part of mouth. It can be separated from *Chrotogonus* populations with vestigial tegmina by the fact these vestigial tegmina are covered by pronotum (not covered in *Chrotogonus*).

Type species: *Chrotogonus bormansi* Bolívar, by original monotypy.

References: Dirsh, 1965; Rowell et al., 2015.

Somalopyrgus Kevan & Akbar, 1964
(Fig. 51A-B, D-E)
AFRICA

Size: males 1.3-1.7 cm and females 1.7-2.0 cm. Body form: fusiform. Antennae: approximately as long as head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: brachypterous, very reduced and sub-circular, wing scales red. Abdomen: conspicuous, dorsal, glandular (?) area between the first and second tergites, cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Pyrgomorphella* by the tegmina shape and the conspicuous area between tergite 1 and 2.

Type species: *Somalopyrgus rotundipennis* Kevan & Akbar, by monotypy and original designation.

References: Kevan & Akbar, 1964; Baccetti, 1985; Rowell et al., 2015.

Sphenacris Bolívar, 1884
(Fig. 16A-D)
NORTH AND CENTRAL AMERICA

Size: males 1.6-1.8 cm and females 2.2-2.5 cm. Body form: cylindrical to slightly subfusiform. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: granular and tuberculate. Tegmina: absent. Abdomen: granular and tuberculate. Sexual dimorphism: males cylindrical, females slightly subfusiform. Other remarks: This genus can be distinguished from *Calamacris* by the absence of tegmina.

Type species: *Sphenacris crassicornis* Bolívar, by original monotypy.

References: Kevan et al., 1964a; Kevan, 1977a.

Sphenarium Charpentier, 1845
(Fig. 11E-H)
NORTH AND CENTRAL AMERICA

Edible: *Sphenarium borrei, S. macrophallicum, S. histrio, S. mexicanum, S. purpurascens, S. rugosum*.

Pest. *Sphenarium purpurascens*.

Size: males 1.6-4.2 cm and females 1.8-4.3 cm. Body form: fusiform. Antennae: approximately as long as head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: not much longer and often shorter than its width. Pronotum: rugose with posterior margin of pronotum not strongly sinuous. Tegmina: micropterous and spatulate, narrowing towards the base. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Prosphena* by the tegmina shape.

Type species: *Sphenarium purpurascens* Charpentier, by original monotypy.

References: Kevan et al., 1964a: Kevan, 1977a. Recently, Sanabria-Urban et al., 2015; 2017 conducted a fully phylogenetic and taxonomic revision of this genus.

Sphenexia Karsch, 1896
(Fig. 47E-H)
AFRICA

Size: males 2.6-3.5 cm and females 3.2-4.4 cm. Body form: fusiform. Antennae: approximately the length of head and pronotum together, inserted below ocelli. Head: triangular from above, larger than wider. Fastigium of vertex: extremely larger than wider. Pronotum: trapezoidal. Tegmina:

brachypterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other genera by its long fastigium of vertex and body shape.

Type species: *Sphenexia fusiformis* Karsch, by original monotypy.

References: Ramme, 1929; Dirsh, 1965; Rowell et al., 2015.

Sphenotettix Kevan, Singh & Akbar, 1964
(Fig. 14A-D)
NORTH AND CENTRAL AMERICA

Size: males 1.6-1.8 cm and females 2-2.3 cm. Body form: subfusiform. Antennae: longer than head and pronotum together, inserted below ocelli. Shorter in females. Head: triangular from above, longer than wide. Fastigium of vertex: almost as long as wide. Pronotum: smooth, at most with a few isolated and scattered tubercles. Tegmina: absent. Abdomen: Posterior margin of tenth abdominal tergum with a wide excision, cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Pyrgotettix* by having posterior margin of tenth abdominal tergum with a wide excision.

Type species: *Sphenotettix nobilis* Kevan, Singh & Akbar, by monotypy and original designation.

References: Kevan et al., 1964a; Kevan, 1977a.

Spinacris Willemse, 1933
(Fig. 101C-H)
MALESIA

Size: males 1.8-2.0 cm and females 2.3-3.0 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: brachypterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Some females possess spinose tubercles on the thorax. This genus can be separated from other closer genera by the presence of well-developed tegmina (virtually absent in *Philippyrgus* and small in *Meubelia*).

Type species: *Spinacris viridis* Willemse, C., by monotypy and original designation.

References: Kevan, 1974a.

Stenoscepa Karsch, 1896
(Fig. 54A-D)
AFRICA

Size: males 1.5-3.2 cm and females 1.5-4.4 cm Body form: fusiform, especially females. Antennae: approximately the length of the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: vestigial, tongue-like. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus is in need of revision, there are other closer genera that are perhaps part of *Stenoscepa,* such as *Parasphenula* and *Parasphenella*. It is separated from another common genus, *Parasphena* by the presence of vestigial tegmina. From the problematic *Pyrgomorphella* it could be separated by the presence of around five veins running parallel (versus around eight in African *Pyrgomorphella*). Some species of *Stenoscepa* are recorded as *Afrosphena* but here we decided to consider all the species of *Afrosphena* as part of *Stenoscepa*.

Type species: *Cawendia granulata* Karsch, by monotypy and original designation.

References: Kevan, 1956; Dirsh, 1965. Rowell et al., 2015.

Stenoxyphellus Ramme, 1941
(Fig. 110E-F)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.1 cm and females 3.0-3.2 cm. Body form: laterally compressed. Antennae: approximately as long as head and pronotum together, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: brachypterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from the other genera with brachypterous representatives by the tegmina length. In *Stenoxyphellus*, the tegmina barely reach the insertion of hind leg whereas in *Apodesmoptera (Brachydesmoptera) luzonica* the tegmina length passes the insertion of hind leg.

Type species: *Stenoxyphellus brachypterus* Ramme.

References: Ramme, 1941; Kevan, 1957a; Kevan, 1963a.

Stenoxyphula Kevan, 1963
(Fig. 110G-J)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.3-2.5 cm and females 3.4-4.2 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Doriaella* because its frons is very strongly concave. This genus was erected to include a single species *Stenoxyphula excisa* (Ramme, 1941), distinguishable from *Stenoxyphus*, Blanchard, 1853, chiefly based on the somewhat abbreviated tegmina which are "strongly excised" at the apex, and its broad, rounded hind wings which lack apical points. A second species of *Stenoxyphula*, resembling *Stenoxyphus* even more closely than does *Stenoxyphula excisa* in its external features, was found in 1966 *(Stenoxyphula microphallica*). It has phallic structures and somewhat abbreviated wings as in *S. excisa*, but

the tegmina, although strongly truncated, are only moderately, not strongly, excised apically. The generic definition should thus be slightly modified accordingly.

Type species: *Stenoxyphus excisus* Ramme (= *Stenoxyphula excisa*).

References: Ramme 1941; Kevan, 1963a; Kevan, 1966a.

Stenoxyphus Blanchard, 1853
(Fig. 112)
PAPUASIA AND PACIFIC ISLANDS

Size: males 2.6-3.0 cm and females 4.0-4.6 cm. Body form: laterally compressed. Antennae: longer than head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from other related genera by its pronotum with the oblique, callous ridge of the lateral lobe well developed and forming a prominent point at the infero-anterior angle of the lobe.

Type species: *Xiphicera variegata* Blanchard, E. (= *Stenoxyphus variegatus*).

References: Kevan, 1963a.

Stibarosterna Uvarov, 1953
(Fig. 21E-H)
AFRICA

Size: males 2.2-2.5 cm and females 2.2-2.7 cm. Body form: depressed. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: short, approximately as long as wide. Pronotum: trapezoidal shape from above with tubercles. Tegmina: absent. Abdomen: cerci triangular, female valve visible. Sexual dimorphism: not pronounced. Other remarks: A diagnostic character is the anterior margin of prosternum strongly expanded, collar-like, covering lower part of mouth. This genus can be separated from *Caconda* by the very short fastigium.

Type species: *Stibarosterna serrata* Uvarov.

References: Dirsh, 1965.

Tagasta Bolívar, 1905
(Figs. 92A-D, 103)
INDIAN SUBCONTINENT, CHINA, SOUTHEAST ASIA, MALESIA

Pest: *Tagasta marginella*.

Size: males 1.8-2.2 cm and females 2.9-3.2 cm. Body form: subfusiform. Antennae: longer than head and pronotum together, shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subtrapezoidal. Tegmina: brachypterous to macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Atractomorpha* by the line of tubercles behind eyes not continuing to the lateral margin of pronotum. It is separated from *Annandalea* by the presence of such a line of tubercles and by shorter spines on hind tibia (still large).

Type species: *Mestra hoplosterna* Stål, by subsequent designation; authority: Kirby, W.F. 1910.

References: COPR, 1982; Yin et al., 2009. Yin et al (2009) reviewed the genera for China.

Tanita Bolívar, 1904
(Figs. 63-64)
AFRICA

Size: males 1.4-2.1 cm and females 2.2-3.2 cm. Body form: fusiform to subfusiform. Antennae: approximately as long as the head and pronotum together, shorter in females, inserted below ocelli. Head: triangular from above, as long as wide to longer than wide. Fastigium of vertex: from as long as wide to longer than wide. Pronotum: subtrapezoidal to trapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: females stouter than males. Other remarks: This genus is different from *Pyrgomorpha* in the head profile. In *Pyrgomorpha,* this presents a rather convexo-concave aspect, due to the convexity of the vertex and the concavity of the frons, whereas in *Tanita* (as in *Tanitella*) the head is much less convex above and the frons, if notable concave, is much more regularly so and not more emarginated above than below the middle. In *Tanita* (and in *Protanita*, but not in *Tanitella*), the frons tends to be much more clearly marked from the rest of the head, by texture or color, than it does in *Pyrgomorpha*.

Type species: *Pyrgomorpha breviceps* Bolívar, by subsequent designation; authority: Kirby, 1910.

References: Kevan, 1962.

Tanitella Kevan, 1962
(Fig. 62E-G)
AFRICA

Size: males 1.6-1.8 cm and females 2.2-2.4 cm. Body form: subfusiform Antennae: approximately the length of the head and pronotum together, inserted below ocelli. Head: triangular from above, approximately as long as wide. Fastigium of vertex: no longer than wide. Pronotum: subtrapezoidal. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: females stouter than males. Other remarks: This genus closely resembles stouter members of *Tanita*. As in *Tanita*, it possesses the weak lateral pronotal carinae and the absence of marked "shoulders" in the metazoan of pronotum and of a diagonal ridge on the lateral pronotal lobes. The sinuous inferior margin and the less acute infero-posterior angle of the lateral pronotal lobe (although unreliable as generic characters) are, however, more like those of *Pyrgomorpha*.

Type species: *Ochrophlebia prasina* Karsch.

References: Kevan, 1962; Kevan 1979.

Taphronota Stål, 1873
(Figs. 25-26)
AFRICA

Pest: *Taphronota calliparea calliparea, T. c. dimidiata, T, ferruginea*.

Size: males 1.7-4.7 cm and females 3.0-5.0 cm. Body form: moderately slender. Antennae: slightly longer than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide: Pronotum: partially or wholly tuberculate or porose, particularly in pro and metazoan of disc. Tegmina: macropterous with wings red in coloration. Abdomen: cerci triangular, female valvae large and very visible. Sexual dimorphism: not pronounced. Other remarks: Its pronotum ornamentation distinguishes it from other closer genera.

Type species: *Poecilocerus porosus* Stål (= *Taphronota calliparea calliparea*), by original designation.

References: Dirsh, 1965; Kevan, 1974b; COPR, 1982; Rowell et al., 2015. Kevan (1974b) provided a comprehensive revision.

Tarbaleopsis Ramme, 1930
(Fig. 108A-D)
PAPUASIA AND PACIFIC ISLANDS

Size: males 1.8-2.3 cm and females 1.8-2.8 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: semicircular, approximately as long as wide. Fastigium of vertex: wider than long. Pronotum: cylindrical. Tegmina: absent. Abdomen: cerci conical, female valvae very visible. Sexual dimorphism: females stouter with first abdominal segments inflated. Other remarks: This genus can be distinguished from other closer genera by its second tarsal segment of hind tarsus much shorter than third tarsal segment coupled with body beset with numerous prominent tubercles, especially on head and thorax.

Type species: *Tarbaleopsis tuberculata* Ramme, by original monotypy.

References: Kevan, 1966e.

Tenuitarsus Bolívar, 1904
(Fig. 20C-D)
AFRICA, ARABIAN PENINSULA, WESTERN ASIA, INDIAN SUBCONTINENT

Size: males 0.9-1.2 cm and females 1.0-1.4 cm. Body form: slightly depressed. Antennae: thickened in apical half, approximately as long as the head and pronotum together, inserted below ocelli. Head: almost quadrate from above. Fastigium of vertex: very short, wider than long. Pronotum: subcylindrical with small tubercles. Tegmina: present, macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: A diagnostic character is the anterior margin of prosternum strongly expanded, collar-like, covering lower part of mouth. This genus can be separated from other closer genera, such as *Chrotogonus* and *Shoacris,* by the body form, the spurs of hind tibia longer than basal tarsal segment and the middle femur thin and strongly elongated, as long as or longer than head and pronotum together.

Type species: *Tenuitarsus revoili* Bolívar, I. (= *angustus*), by original monotypy.

References: Kevan, 1959; Dirsh, 1965; Rowell et al., 2015.

Uhagonia Bolívar, 1905
(Fig. 76E-H)
MADAGASCAR

Size: males 1.2-1.4 cm and females 2.3-3.0 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, even shorter in females, inserted in front of ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: trapezoidal. Tegmina: absent to micropterous. Abdomen: cerci triangular, female valvae very long. Sexual dimorphism: females stouter than males. Other remarks: Its fusiform body coupled with micropterous or absent condition and the marginal area of hind femur displaced ventrally to the outer medial area are unique characteristics of this genus.

Type species: *Uhagonia sphenarioides* Bolívar, I., by original monotypy.

References: Dirsh & Descamps, 1968.

Verdulia Bolívar, 1905
(Fig. 105, 106A-B)
MALESIA, PAPUASIA AND PACIFIC ISLANDS

Size: males 2.2-2.7 cm and females 3.0-3.7 cm. Body form: cylindrical. Antennae: longer than head and pronotum together, shorter in females, inserted below ocelli. Head: subtriangular from above, longer than wide. Fastigium of vertex: approximately as long as wide. Pronotum: cylindrical. Tegmina: macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Mitricephala* and *Mitricephaloides* by tegmina reaching or almost reaching the end of abdomen, cerci simple and not distinct pale lateral stripe along head and thorax.

Type species: *Acridium cycloideum* Haan (= *Verdulia cycloidea*), by subsequent designation; authority: Kirby, W.F. 1910.

References: Kevan, 1963c.

Vittisphena Kevan, 1956
(Fig. 42G-H)
AFRICA

Size: males 2.0 cm and females 2.2 cm. Body form: slightly fusiform. Antennae: approximately as long as the head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: with two clear transverse sulci. Tegmina: absent. Abdomen: cerci conical, female valvae visible. Sexual

dimorphism: not pronounced. Other remarks: This genus can be distinguished from *Parorthacris* by having the dorsum of pronotum crossed by two transverse sulci.

Type species: *Vittisphena somalica* Kevan, by monotypy and original designation.

References: Kevan, 1956; Dirsh, 1965; Rowell et al., 2015.

Xenephias Kevan, 1973
(Fig. 23B-E)
AFRICA

Size: males 1.8 cm and females 2.7 cm. Body form: depressed. Antennae: shorter than head and pronotum together, inserted in front ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: rugose. Tegmina: absent. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: Its body shape and distribution help separate it from other genera.

Type species: *Xenephias socotranus* Kevan, by original designation.

References: Kevan, 1973.

Xiphipyrgus Kevan, 1982
(Fig. 54G-H)
AFRICA

Size: males unknown and females 1.9-2.2 cm. Body form: slender. Antennae: approximately the length of the head, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical. Tegmina: macropterous. Abdomen: female valvae visible. Sexual dimorphism: unknown. Other remarks: This genus is related to *Pyrgomorpha* but slender. Males unknown.

Type species: *Xiphipyrgus tunstalli* Kevan, by monotypy and original designation.

References: Kevan, 1982b; Rowell et al., 2015.

Yeelanna Rehn, 1953
(Fig. 115A-D)
AUSTRALIA

Size: males 1.6-1.8 cm and females 2.4-4.3 cm. Body form: fusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, wider than long. Fastigium of vertex: wider than long. Pronotum: trapeziform. Tegmina: micropterous to macropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from other closer genera by the weakly development of cross veins and cells not black.

Type species: *Monistria insulana* Rehn, J.A.G. (= *Yeelanna argus*), by original designation.

References: Key, 1984; Rentz et al., 2003. Key (1984) made a comprehensive revision of the genus.

Yunnanites Uvarov, 1925
(Fig. 93A-E)
CHINA

Size: males 2.7-3.3 cm and females 3.8-4.2 cm. Body form: fusiform. Antennae: approximately as long has head and pronotum together, shorter in females, inserted below ocelli. Head: longer than wide. Fastigium of vertex: slightly wider than long. Pronotum: trapeziform. Tegmina: micropterous. Abdomen: cerci triangular, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: This genus can be separated from *Mekongiana* and *Micropterus* by having micropterous tegmina (not vestigial).

Type species: *Yunnanites coriacea* Uvarov, by original monotypy.

References: Kevan, 1966f; Mao & Zheng, 1999; Mao & Yang, 2003.

Zarytes Bolívar, 1904
(Fig. 87E-H)
INDIAN SUBCONTINENT

Size: males 1.7-2.1 cm and females 2.3-3.0 cm. Body form: subfusiform. Antennae: shorter than head and pronotum together, inserted below ocelli. Head: triangular from above, longer than wide. Fastigium of vertex: longer than wide. Pronotum: subcylindrical to subtrapezoidal. Tegmina: brachypterous to macropterous. Abdomen: cerci conical, female valvae visible. Sexual dimorphism: not pronounced. Other remarks: *Zarytes* differs from *Pyrgomorpha* in having the head somewhat less abruptly convex dorsally in lateral view, the frons less strongly concave, a more compressed pronotum with well developed, straight, dorsal carinae, less distinct oblique carinae on the lateral pronotal lobes, the lobes themselves being more rectangular with straighter inferior margins and the inferoposterior angles forming more or less regular right-angles (not rounded, obliquely truncated or with prominent points); the tegmina are lanceolate or strongly abbreviated, or (most typically) both.

Type species: *Pyrgomorpha squalina* Saussure (= *Zarytes squalinus squalinus*), by original monotypy.

References: Kevan, 1970.

Zonocerus Stål, 1873
(Fig. 41)
AFRICA, MADAGASCAR

Edible: *Zonocerus elegans, Z. variegatus*.
Pest: *Zonocerus elegans, Z. variegatus*.

Size: males 2.8-4.5 cm and females 3.3-5.1 cm. Body form: slightly robust. Antennae: longer than head and pronotum together, inserted below ocelli. Head: semicircular from above, approximately as long as wide. Fastigium of vertex: short, wider than long. Pronotum: subcylindrical, simple. Tegmina: macropterous or brachypterous, not connected on dorsum. Abdomen: first abdominal tergite with dorsal gland, cerci triangular, female valvae visible. Sexual dimorphism: not

pronounced. Other remarks: Distinguished from other genera by its striking coloration patterns and tegmina not connected on dorsum.

Type species: *Gryllus elegans* Thunberg (= *Zonocerus elegans elegans*), by original designation.

References: Dirsh, 1965; COPR, 1982; Rowell et al., 2015.

ACKNOWLEDGMENTS

This work was supported by the Orthoptera Species File Grant 'Enhancing digital content for Pyrgomorphidae (Orthoptera: Caelifera) in the Orthoptera Species File' to HS and RMP and a Supplement to Orthoptera Species File Grant. "Enhancing digital content for Pyrgomorphidae (Orthoptera: Caelifera) in the Orthoptera Species File to RMP. We would like to thank colleagues for collecting and sending materials and images, Tony Robillard, Daniel Perez-Gelabert, Sergey Storozhenko, Bert Foquet and Daniel Otte. We would also like to express thanks to curators of museums for their assistance in review and photograph type material and borrow non-type material: Daniel Otte, Jason Weintraub, Greg Cowper (The Academy of Natural Sciences of Drexel University, Philadelphia, USA), Sam Heads, Dmitry Dmitriev (Illinois Natural History Survey, Urbana-Champaign, USA), George Beccaloni, Judith Marshall (Natural History Museum, London, United Kingdom), Simon Poulain, Tony Robillard, Laure Desutter (Muséum national d'historie naturelle, Paris, France), Michael Ohl (Museum für Naturkunde, Berlin, Germany), Daniel Perez-Gelabert, Celeste Mir, Carlos Suriel (Museo de Historia Natural, Santo Domingo, Dominican Republic), Lacey Knowles, Mark O'Brien (University of Michigan Museum of Zoology, Ann Arbor, USA), Mercedes Paris (Museo Nacional de Ciencias Naturales, Madrid, Spain), Peter Schwendinger, John Hollier (Muséum d'Histoire Naturelle, Geneva, Switzerland), Rod Eastwood (Eidgenössische Technische Hochschule, Zurich, Switzerland), Sussane Randolf, Ulrike Aspöck (Naturhistorisches Museum, Vienna, Austria), Niklas Apelqvist (Naturhistoriska Riksmuseet, Stockholm, Sweden), Hans Mejlon (Museum of Uppsala University, Uppsala, Sweden), Henrik Engoff (Zoological Museum of the University of Copenhagen, Copenhagen, Denmark), Maria Tavano and Roberto Poggi (Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy), Stéphanie Boucher (The Lyman Entomological Museum, McGill University, Montreal Canada), Keith Arakaki (Bishop Museum, Honolulu, Hawaii, USA). RMP was supported by fellowship #409158 from CONACYT (the Mexican National Council for Science and Technology).

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(genera in *key*, figure, **diagnosis**, others)