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Revision of the Family Tomiidae (Insecta: Grylloblattida)

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Abstract—New taxa of the family Tomiidae, *Paratomia pectinata* gen. et sp. nov., *Tomia antiqua* sp. nov., *T. cancellata* sp. nov., *T. ramosa* sp. nov., *T. sennikovi* sp. nov., and *T. dura* sp. nov., are described from the Upper Permian and Lower Triassic of Russia. The type species of the genus *Tomia*, *T. costalis*, is redescribed. A key to the species of Tomiidae is compiled. Tomiids are stratigraphically important, their dominance being characteristic of the lower half of the Triassic and possibly also the terminal Permian.

INTRODUCTION

The family Tomiidae was established by Martynov (1936) for *Tomia costalis* Mart. from the Maltsevo Formation of the Kuznetsk Basin (Babii Kamen' locality, Lower Triassic). Much later two more tomiid species were described from the Middle Triassic of China, *T. fuyuanensis* and *Nivopteria nanshenghuensis* (Lin, 1978). Subsequently, both these species were transferred to the genus *Shurabia* of the family Geinitziidae (Storozhenko, 1997); however, taking into account the presence of the M fork beyond the RS origin and simple CuA_1 (see below), they should be retained in the family Tomiidae. Since the illustrations to the original descriptions of both species were limited to photographs, it is useful to give drawings made after these photographs (Figs. 3c, 3d). In addition, there are two photographs of undescribed insects from the Middle Triassic of France that were assigned to the order Neuroptera (Gall *et al.*, 1996). The comparison of these photographs with tomiids shows that they represent one more species of *Tomia* (Figs. 3a, 3b).

In addition to the above four species, at least six new tomiid species from several localities in Russia have been found in the collections of the Paleontological Institute of the Russian Academy of Sciences (PIN). Described below are a monotypic genus and two *Tomia* species from the Lower Triassic of the Kemerovo Region (Babii Kamen' locality), one *Tomia* species from the uppermost Permian (Vyatkian Horizon) of the Vologda Region (Aristovo locality), one more species from the Bugarikta Formation of the Tunguska Basin (uppermost Permian or lowermost Triassic, Anakit and Tura localities), and one species from the base of the Triassic of the Vologda Region (lower Vokhma Formation, Nedubrovo locality) and the Lower Triassic of the Yaroslavl Region (Rybinsk Formation, Tikhvinskoe locality). Thus, at present the family Tomiidae comprises three genera with ten species (including one unnamed species from France), eight of which belong to the genus *Tomia*.

One cannot exclude that the genus *Tomia* is a junior synonym of the genus *Lemmatophoropsis*, created by Zalessky (1935). The type species of this monotypic genus (*L. sibirica* from the Babii Kamen' locality) is based on a forewing fragment (its anterior part) that is indistinguishable from the corresponding part of the *Tomia* wing, but the fragmentary nature of the holotype prevents this hypothesis from being validated or disproved.

One feature of tomiids is their low morphological diversity. It is partly explainable by the fact that the anterior branch of CuA (the branching pattern of which is diagnostically important in most Grylloblattida) is simple in Tomiidae, whereas the branching patterns of RS, MA, and MP of most Grylloblattida are subject to individual variation. Thus, the number of diagnostic characters is quite low in tomiids. As long as the material is not large and the limits of individual variation remain unknown, the characters that are most stable in the species of the related family Liomopteridae (sizes and characters of the anterior branches of SC and R) are taken as diagnostic at the species level. The differences between species of *Tomia* are considerably less than interspecific differences in other families and are comparable to individual variation in some liomopterids. In some localities tomiids are quite diverse taxonomically (two genera and four species are represented by five specimens in the Babii Kamen' locality).

The problem of the origin of tomiids is still an open question. Martynov (1936) pointed to the similarity between *T. costalis* and the genus *Kazanella* Mart., belonging to the family Liomopteridae. Storozhenko (1998) refrained from placing tomiids into any group of the suborder Grylloblattina and did not exclude even a possibility that they should be transferred to the suborder Protoperlina. The reasoning of the above authors was based on a single species, *T. costalis*; study of a larger body of material allows the most characteristic features of the family to be selected. These are the presence of a wide costal area crossed by simple (rarely

forked) SC branches, M that forked beyond the RS origin, simple and more or less S-shaped anterior branch of CuA, and the area between CuA and CuP that is not widened basally. Analysis of this set of character leaves no doubt in the family status of Tomiidae and in their close relationship to the family Liomopteridae. In fact, only one combination of these characters is absent in liomopterids, i.e., that of M forked beyond the RS origin with the simple anterior branch of CuA. Most probably, tomiids descended from some Upper Permian liomopterids, this is confirmed by the find of Liomopteridae with M forked beyond the RS origin and branched CuA_1 in the collection from the Kityak locality (Kirov Region, Malmyzh District, left bank of the Kityak River against the village of Bol'shoi Kityak within the Vyatka River basin; Upper Permian, Kazanian, Belebei Formation). One more transitional form is apparently *Kargalella subcostalis* Martynov, 1936 from the Kargala locality (Orenburg Region, Sakmara District, piles of Kargala copper mines; Upper Permian, lower Tatarian, Amanak Formation). Originally, Martynov (1936) described two species among Grylloblattida incertae sedis, *Kargalella subcostalis* and *Kargalodes incerta*. Sharov (1962) revised the order to include the first species in the family Tomiidae and to leave the second species as before. Subsequently, *K. incerta* was synonymized under *K. subcostalis*, which was assigned to Grylloblattida incertae sedis (Rasnitsyn, 1980; Storozhenko, 1998). The holotype of *K. subcostalis* has M forked beyond the RS origin, hairs on the wing membrane, and the wing pattern characteristic of tomiids. At the same time, in the holotype of *K. incerta* M is forked before the RS origin, and in both specimens MA is fused with RS for a short distance; both of these features are unknown in Tomiidae. The resolution of the issue of the position of *Kargalella* will have to await further material with preserved CuA_1.

The earliest tomiids have been recorded from the terminal Permian: one species is (represented by a single specimen) from the Aristovo locality, where other Grylloblattida are represented by numerous Liomopteridae. The terminal Permian or basal Triassic deposits of the Tunguska Basin contain a single species of *Tomia* discovered in two localities. There are three undoubtedly Lower Triassic localities of Tomiidae, which yielded five species of two genera of the family. Other Grylloblattida are very poorly represented in the Lower Triassic (two as yet undescribed species of Geinitziidae from the Babii Kamen' locality). Surely, the real diversity of the order was higher at that time, because four more families (Ideliidae, Megakhosaridae, Blattogryllidae, and Tunguscapteridae) crossed the Permian/Triassic boundary. In the Early Triassic they probably were rare, though already in the second half of the Triassic some of them demonstrated a diversity level comparable to that of the Permian. The last Tomiidae have been recorded from the Middle Triassic of China (two genera, including *Tomia*, with two species) and in the Anisian of France.[1] In the deposits of the second half of the Triassic (Ladinian or Carnian) of Central Asia, tomiids have not been found.

Thus, in contrast to their low morphologic diversity, tomiids possessed broad geographic and quite narrow stratigraphic ranges. This is not typical for other grylloblattid families, which show either a broad geographic range combined with a prolonged (for periods and more) existence (Liomopteridae, Blattogryllidae, etc.) or the combination of a narrow geographic with a narrow stratigraphic range (Tillyardembiidae, Euremiscidae, and many others). Tomiidae flourished in the Early Triassic, when they determined the character of the grylloblattid fauna, in which they dominated both taxonomically and numerically.

Tomiids represent a stratigraphically important insect group the dominance of which in local grylloblattid assemblages fairly reliably (to my knowledge) indicates that they belong to the first half of the Triassic and, possibly, to the uppermost Permian.

SYSTEMATIC PALEONTOLOGY

Order Grylloblattida

Suborder Grylloblattina

Family Tomiidae Martynov, 1936

Type genus. *Tomia* Martynov, 1936.

Diagnosis. Costal area at level of RS origin wider than subcostal area and crossed by simple (rarely forked) SC branches; M forked distad of RS origin; CuA_1 simple and more or less S-shaped; area between CuA and CuP not widened basally.

Composition. In addition to the type genus, *Paratomia* gen. nov. from the Lower Triassic of Russia and *Nivopteria* from the Middle Triassic of China.

Comparison. The family is most closely related to Liomopteridae but differs from them (and from all other grylloblattids) in the combination of M forked distad of the RS origin and simple CuA_1. From another closely related family, Geinitziidae, it differs additionally in having the R stem and RS branches directed toward the wing apex and posterior margin.

[1] Photographs of two *Tomia* specimens from the Middle Triassic (Anisian) of the Vosges, nos. 5541–5542 (Vilsberg, Moselle), 5551–5552 (Bust, Bas-Rhin) (Figs. 3a, 3b) have been published (Gall *et al.*, 1996). In these insects the anterior forewing margin is convex, the apex is broadly rounded, the costal area is two times wider than the subcostal area and is crossed by simple and straight SC branches. SC terminates in the distal one-third of the wing and is S-shaped. R has simple anterior branches and is arched forward both before and beyond the RS origin. MP, MA, and RS possess two branches each; the area between the CuA branches narrows distally; the area between CuA and CuP is very narrow at the base. The crossveins are simple. The forewing is 9.5–10.5 mm long. These specimens differ from the other known *Tomia* species in the S-shaped SC and obviously represent a separate species.

Key to the genera and species of Tomiidae based on the forewing

1 (2) CuA forked distad of RS origin, CuA fork narrow, and M pectinate

Paratomia pectinata gen. et sp. nov.

2 (1) CuA forked proximad of or level with RS origin, CuA fork wide, and M dichotomous

3 (4) Maximal width of the costal area four times that of the subcostal area; M with three branches; and forewing longer than 20 mm

Nivopteria nanshenghuensis

4 (3) Costal area at most three times as wide as the subcostal area; M with more than three branches; forewing shorter than 20 mm *Tomia*

5 (6) No double row of cells in the radial area; forewing no longer than 9 mm *T. sennikovi* sp. nov.

6 (5) At least a short double row of cells in the radial area; forewing longer than 9 mm

7 (12) Forewing no longer than 15 mm

8 (9) No double row of cells in the medial area

T. dura sp. nov.

9 (8) Crossveins forming a double row of cells in the medial area

10 (11) Some of the anterior R branches forked

T. cancellata sp. nov.

11 (10) Anterior R branches simple

T. antiqua sp. nov.

12 (7) Forewing longer than 15 mm

13 (14) Anterior branches of SC and R forked and connected by crossveins *T. ramosa* sp. nov.

14 (13) Anterior branches of SC and R simple, not connected by crossveins

15 (16) Costal area 1.5 times as wide as the subcostal area; CuA forked proximad of the RS origin; anterior wing margin straight *T. fuyuanensis*

16 (15) Costal area three times as wide as the subcostal area; CuA forked level with the RS origin; anterior wing margin weakly convex *T. costalis*

Genus *Tomia* Martynov, 1936

Type species. *T. costalis* Martynov, 1936

Diagnosis. Medium-sized to small insects (less than 20 mm). Forewing with anterior margin more or less convex; costal area two or three times as wide as subcostal area; anterior branches of SC and R simple or forked; RS origin distad of first CuA fork; M dichotomous, with more than three branches and MP branched; area between CuA branches relatively wide; crossveins simple or forming a double row of cells.

Composition. In addition to the type species, five new species from the terminal Permian and Lower Triassic of Russia, *T. fuyuanensis* from the Middle Triassic of China and one undescribed species from the Middle Triassic of France.

Tomia costalis Martynov, 1936

Plate 4, fig. 1

Holotype. PIN, no. 1062/2, fore- and hindwings folded in repose over the remains of the thorax; Kemerovo Region, Novokuznetsk District, right bank of the Tom' River 10 km downstream of Ust'-Naryk, Babii Kamen' locality; Lower Triassic, Maltsevo Formation.

Description (Fig. 1a). The forewing is membranous, not hairy, broadened toward the apex, with an anterior margin weakly convex and the apex subacute. The costal area is wide (nearly three times as wide as the subcostal area), crossed by the simple anterior SC branches, not connected by crossveins. SC terminates on C about the wing midlength; the SC branches are weakly curved, the distance between them increases toward the wing apex. R bears simple anterior branches not connected by crossveins; RS is two-branched and originates in the basal wing quarter. M is forked distad of the RS origin into the four-branched MA and two-branched MP. CuA is forked nearly level with the RS origin into CuA_1 and CuA_2; both its branches are simple and weakly S-shaped. CuP is straight and weak; the area between CuA and CuP does not broadened basally. A_1 is simple and nearly straight; A_2 bears three branches. The crossveins are mostly simple and form a double row of cells in the radial area.

The anterior margin of the hindwing is slightly concave basally and convex distally. The costal area gradually narrows toward the wing apex; SC terminates in the distal one-third of the wing. R bears several anterior branches, straight up to the RS origin, then arched forward. RS apparently bears two branches. MA is first forked about the wing midlength, probably into four branches; MP is simple. CuA is smoothly curved basally and terminates in two branches. The anal fan is small.

Measurements, mm. Forewing length 16.5, hindwing length 14.

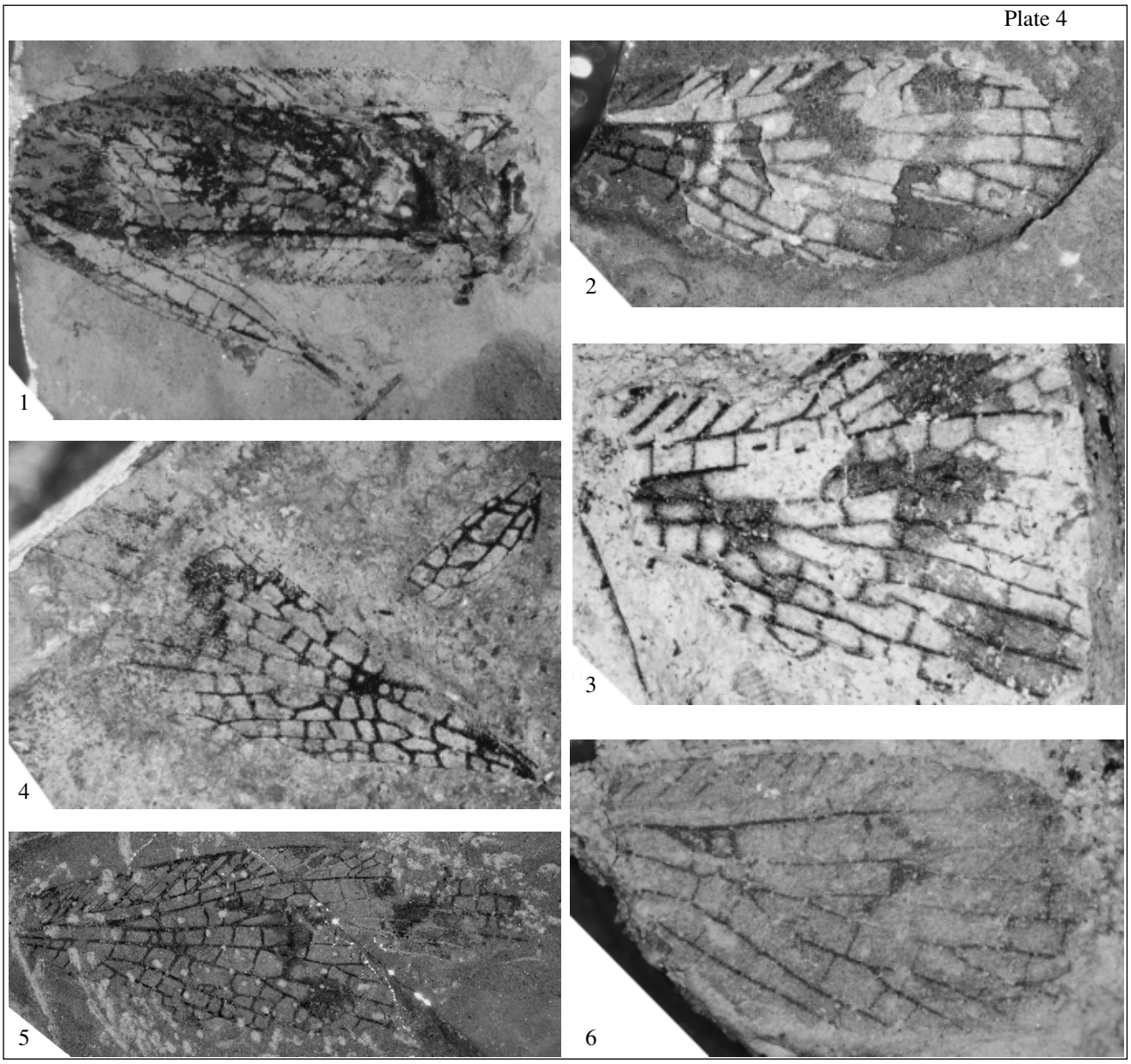
Remarks. In the original description Martynov (1936) did not describe the whole specimen, only the forewing and, separately, the hindwing fragment. The same drawing, slightly modified and without the hindwing fragment, was reproduced by Storozhenko (1998). The drawing is incorrect in several respects, e.g., the narrowing of the wing to the base and the curvature of CuA branches are not shown. Due to the latter error the curved anterior CuA branch was indicated in the description of *T. fuyuanensis* (Fig. 3c) as the main difference from the type species.

Material. Holotype.

Tomia fuyuanensis Lin, 1978

Holotype. FQ 36 no. 51619, forewing fragment (part and counterpart); China, Guizhou; Middle Triassic.

Description (Fig. 3c). The anterior margin near the forewing midlength is straight. The costal area is 1.5 times as wide as the subcostal area. The SC



Explanation of Plate 4

Fig. 1. *Tomia costalis* Mart., holotype PIN, no. 1062/2, ×4.1.
Fig. 2. *Paratomia pectinata* gen. et sp. nov., holotype PIN, no. 4887/29, ×11.
Fig. 3. *Tomia antiqua* sp. nov., holotype PIN, no. 3446/8, ×10.
Fig. 4. *Tomia cancellata* sp. nov., holotype PIN, no. 4887/7, ×7.2.
Fig. 5. *Tomia ramosa* sp. nov., holotype PIN, no. 4887/9, ×4.
Fig. 6. *Tomia sennikovi* sp. nov., holotype PIN, no. 4048/11, ×13.

branches are simple and straight. MA is forked beyond MP. CuA is forked proximad of the RS origin and terminates in the distal one-third of the wing. The preserved part of CuP is straight.

Measurements, mm. Forewing length about 16–18.

Remarks. In the original description two differences of *T. fuyuanensis* from the type species were listed, of which one was discarded (see above), and another was a pigment stripe at the wing base; the holotype of *T. costalis* could fail to preserve the latter feature.

Material. Holotype.

***Tomia antiqua* Aristov, sp. nov.**

Plate 4, fig. 3

Etymology. Latin *antiqua* (ancient).

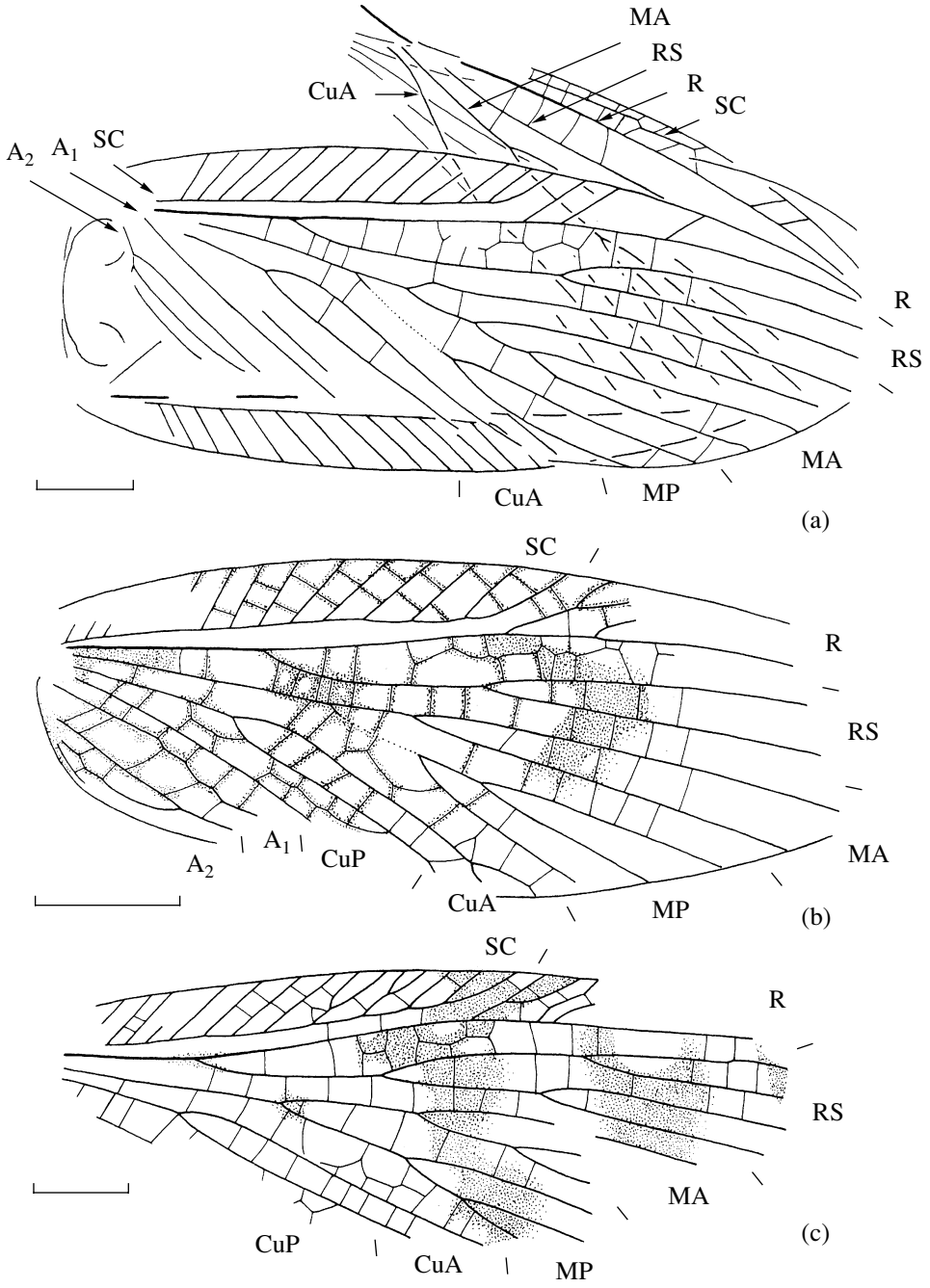


Fig. 1. Wings of *Tomia* spp.: (a) *T. costalis* Mart., holotype PIN, no. 1062/2; (b) *T. cancellata* sp. nov., holotype PIN, no. 4887/7; and (c) *T. ramosa* sp. nov., holotype PIN, no. 4887/9. Scale bar 2 mm in Figs. 1–3.

H o l o t y p e. PIN, no. 3446/8, positive impression of a forewing fragment; Vologda Region, right bank of the Northern Dvina River at Aristovo, Aristovo locality; Upper Permian, Tatarian, Vyatkian Horizon.

D e s c r i p t i o n (Fig. 2g). The anterior margin of the forewing is convex; the costal area is two times as wide as the subcostal area; the anterior branches of SC and R are simple and connected by crossveins. The radial area is wide; RS is three-branched. M is forked late into the three-branched MA and two-branched MP. The area between the CuA branches is narrow. The crossveins are simple or (in the radial and medial areas) form a double row of cells. The dark pattern consists of large spots.

M e a s u r e m e n t s, mm. Forewing length about 12.

M a t e r i a l. Holotype.

***Tomia cancellata* Aristov, sp. nov.**

Plate 4, fig. 4

E t y m o l o g y. Latin *cancellata* (latticed).

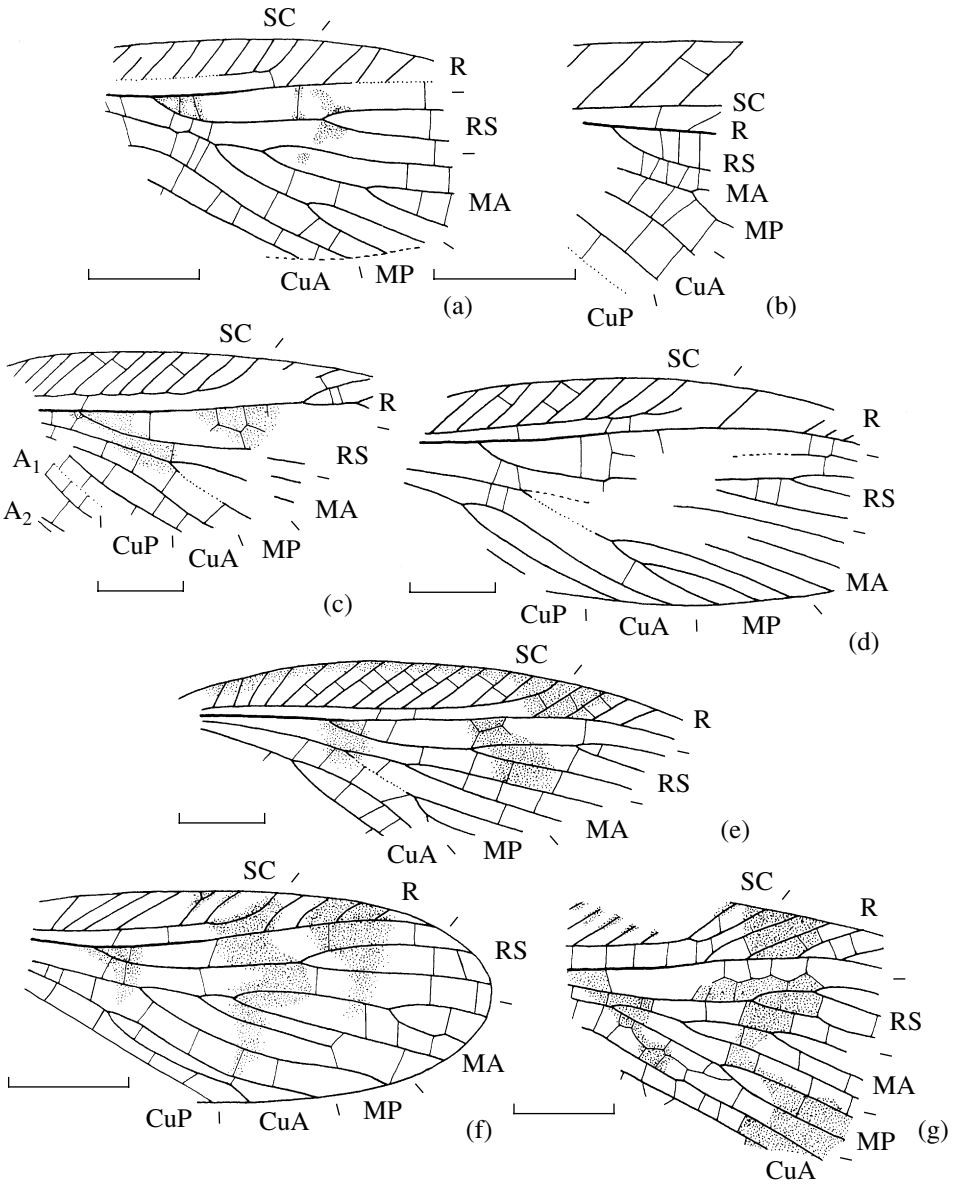


Fig. 2. Forewings of Tomiidae: (a, b) *T. sennikovi* sp. nov.: (a) holotype PIN, no. 4048/11; (b) specimen PIN, no. 4811/14; (c–e) *T. dura* sp. nov.: (c) paratype PIN, no. 3061/9; (d) holotype PIN, no. 2362/1; (e) paratype PIN, no. 3193/1; (f) *Paratomia pectinata* gen. et sp. nov., holotype PIN, no. 4887/29; and (g) *Tomia antiqua* sp. nov., holotype PIN, no. 3446/8.

H o l o t y p e. PIN, no. 4887/7, well-preserved forewing (part and counterpart); Kemerovo Region, Novokuznetsk District, right bank of the Tom' River 10 km downstream of Ust'-Naryk, Babii Kamen' locality; Lower Triassic, Maltsevo Formation.

D e s c r i p t i o n (Fig. 1b). The anterior margin of the forewing is convex. The costal area at the RS origin is three times as wide as the subcostal area. SC terminates in the distal one-third of the wing; the SC branches are simple, slightly curved, and connected by crossveins. The anterior branches of R are forked. RS is two-branched, originating at one-third of the wing length. MA bears two branches, MP two or three. CuA is forked level with the RS origin; CuA_1 is simple or with a very short terminal fork. CuP is weak and slightly curved. The crossveins are simple or (in the radial and medial areas and between CuA and CuP) form a double row of cells. A_1 is simple and zigzag bent; A_2 bears three branches, with the median branch anastomosing with the anterior branch. The dark pattern consists of spots and bands that run along some crossveins.

M e a s u r e m e n t s, mm. Forewing length 11.0–11.8.

M a t e r i a l. Holotype and paratype PIN, no. 4887/12.

***Tomia ramosa* Aristov, sp. nov.**

Plate 4, fig. 5

E t y m o l o g y. Latin *ramosa* (branched).

Holotype. PIN, no. 4887/9, well-preserved forewing (part and counterpart); Kemerovo Region, Novokuznetsk District, right bank of the Tom' River 10 km downstream of Ust'-Naryk, Babii Kamen' locality; Lower Triassic, Maltsevo Formation.

Description (Fig. 1c). The anterior margin of the forewing is weakly convex. The costal area is three times as wide as the subcostal area and is crossed by the simple or forked anterior SC branches connected by crossveins. SC terminates in the distal one-third of the wing. R is S-shaped; its anterior branches are simple or forked and connected by crossveins. RS originates in the basal one-quarter of the wing and is dichotomously four-branched. MA and MP bear three branches each. The CuA branches are parallel, CuA_1 being weakly curved at the base. The crossveins are mostly simple and form a double row of cells in the radial and medial areas. The dark pattern consists of spots and bands.

Measurements, mm. Forewing length about 17.

Material. Holotype.

Tomia sennikovi Aristov, sp. nov.

Plate 4, fig. 6

Etymology. In honor of paleontologist A.G. Sennikov who collected the holotype.

Holotype. PIN, no. 4048/11, reverse impression of a well-preserved forewing; Yaroslavl Region, Rybinsk District, right bank of the Volga River near Tikhvinskoe, Tikhvinskoe locality; Lower Triassic, Rybinsk Formation.

Description (Fig. 2a). The anterior margin of the forewing is weakly convex. The costal area is nearly two times as wide as the subcostal area. The anterior branches of SC and R are simple and slightly curved. SC is straight and terminates on C not far from the RS base. R is nearly straight; the radial area has no double rows of cells. RS bears two, MA three, and MP two branches. CuA is forked proximad of the RS origin; the area between the CuA branches narrows distally. The crossveins are simple. The dark pattern consists of small spots near the RS base and the RS fork. The wing membrane is densely covered with small hairs.

Measurements, mm. Forewing length about 9.

Material. In addition to the holotype, apparently also specimen PIN, no. 4811/14 (Fig. 2b) from the Nedubrovo locality (Vologda Region, Kichgorodetskii District, Kichmenga River at Nedubrovo; basal Triassic, Nedubrovo Member of the Vokhma Formation).

Tomia dura Aristov, sp. nov.

Etymology. Latin *dura* (rigid).

Holotype. PIN, no. 2362/1, obverse impression of a moderately preserved forewing; Krasnoyarsk Region, left bank of the Lower Tunguska River downstream of the mouth of the Anakit River, Anakit locality; terminal Permian or basal Triassic, Bugarikta Formation, Eksinskaya sequence.

Description (Figs. 2c–2e). The anterior margin of the forewing is convex. The costal area is three times as wide as the subcostal area. The anterior branches of SC and R are simple, straight, and connected by crossveins. SC terminates in the distal one-third of the wing. RS originates in the basal one-third of the wing and divides into four branches; MA and MP have three branches each. CuA is forked slightly proximad of the RS origin; the area between the CuA branches narrows distally. CuP is straight. A_1 is parallel to the posterior CuA branch; the area between A_1 and A_2 is wide; the A_2 branches are close set. The crossveins are simple or, only in the radial area, form a double row of cells. The dark pattern consists of a stripe along the costal margin and several spots.

Measurements, mm. Forewing length about 12–15.

Material. Holotype and paratypes PIN, no. 3193/1 from the same locality and no. 3061/9 from the Tura locality (Krasnoyarsk Region, Lower Tunguska River basin, 33 km southeast of Tura, left bank of the Nirungdakan River 10 km upstream from its mouth; terminal Permian or basal Triassic, Bugarikta Formation).

Genus *Nivopteria* Lin, 1978

Type species. *N. nanshenghuensis*.

Diagnosis. Forewing longer than 20 mm. Costal area four times as wide as subcostal area; anterior branches of SC and R simple and straight, those of R set less closely than those of SC; M forking late into only three branches on relatively large wing; CuA forking proximad of RS origin.

Composition. Type species.

Remarks. The generic status of *Nivopteria* is doubtful. The illustration to the original description is restricted to a single photograph that provides incomplete information about the specimen, and the characters listed in the above generic diagnosis (narrower subcostal area, less branched R and RS, two-branched MA, and simple MP) fit well within the range of differences between *Tomia* species. However, there is little sense in synonymizing this genus under *Tomia* before the holotype of *N. nanshenghuensis* is reexamined.

Nivopteria nanshenghuensis Lin, 1978

Holotype. FQ 36 no. 51620, forewing; China, Guizhou Province, Nanshenghu; Middle Triassic.

Description (Fig. 3d). The anterior margin of the forewing is weakly convex. SC terminates beyond the wing midlength. RS originates in the basal one-third of the wing, MA has two branches, MP is simple, and CuA_2 is straight.

Measurements, mm. Forewing length about 23–24.

Material. Holotype.

Genus *Paratomia* Aristov, gen. nov.

Etymology. From Latin *para* (equal) and genus *Tomia*.

Type species. *P. pectinata* sp. nov.

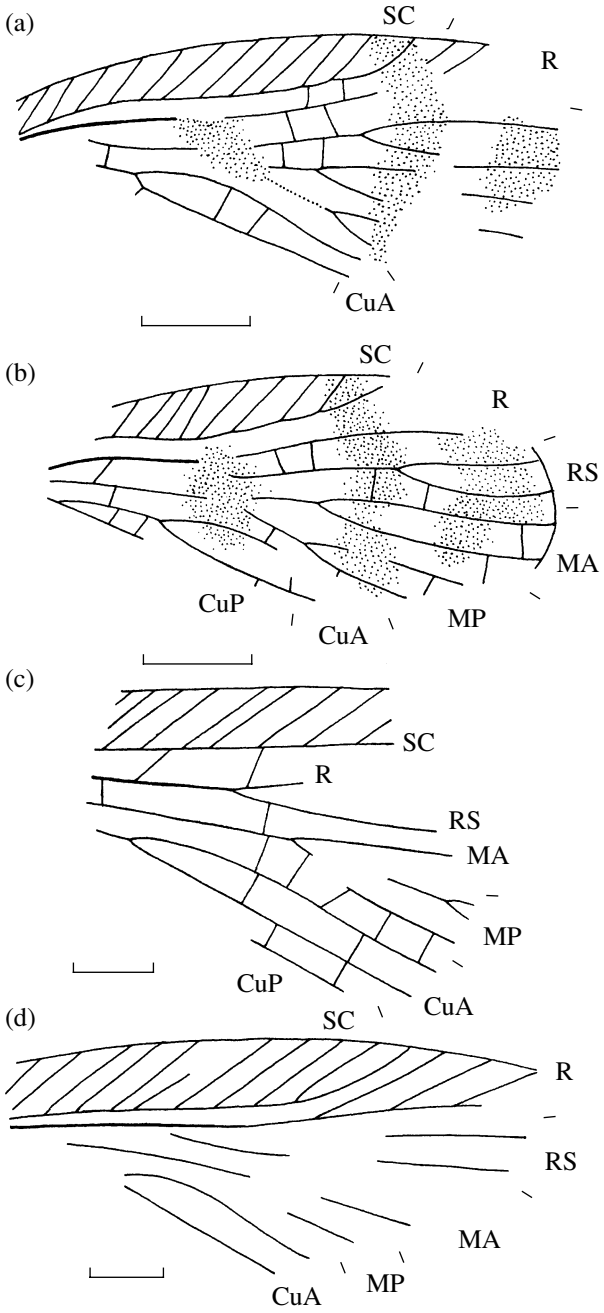


Fig. 3. Forewings of Tomiidae: (a, b) *Tomia* from the Middle Triassic of France (Vosges): (a) specimen no. 5541–5542 (Vilsberg, Moselle) (original drawing after the photograph in Gall *et al*., 1996, pl. 10, fig. 4), (b) specimen no. 5551–5552 (Bust, Bas-Rhin) (original drawing after the photograph in Gall *et al*., 1996, pl. 10, fig. 5); (c) *T. fuyuanensis* Lin, specimen FQ 36 no. 51619 (original drawing combined after the photographs in Lin, 1978, pl. 1, figs. 4, 6); and (d) *Nivopteria nanshenghuensis* Lin, specimen FQ 36 no. 51620 (original drawing after the photograph in Lin, 1978, pl. 1, fig. 5).

D i a g n o s i s. Small insects. Forewing with anterior margin nearly straight, posterior margin convex, and apex subacute; costal area two times as wide as subcostal area; anterior branches of SC simple or with short fork, those of R simple; R S-shaped; RS origin proximad of CuA fork; M pectinate, MP simple; area between CuA branches narrow; CuP simple; crossveins simple.

C o m p o s i t i o n. Type species.

***Paratomia pectinata* Aristov, sp. nov.**

Plate 4, fig. 2

E t y m o l o g y. Latin *pectinata* (pectinate).

H o l o t y p e. PIN, no. 4887/29, obverse impression of a well-preserved forewing; Kemerovo Region, Novokuznetsk District, right bank of the Tom' River 10 km downstream of Ust'-Naryk, Babii Kamen' locality; Lower Triassic, Maltsevo Formation.

D e s c r i p t i o n (Fig. 2f). The SC branches are straight and irregular, those of R are slightly curved. RS originates in the basal one-quarter of the wing and has two branches, its stem is subequal to the fork. MA has four branches, of which one does not reach the margin and terminates on a crossvein; MP is S-shaped. The area between CuA branches first narrows and then again widens toward the margin. The crossveins are sparse. The dark pattern consists of transverse bands.

M e a s u r e m e n t s, mm. Forewing length 7.5.

M a t e r i a l. Holotype.

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