
진주의 바퀴벌레
Jinju cockroaches

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2025

Vršanský P, Lee SB, Sohn J-C, Vršanská L, Jang J-H, Nam GS (2025)
Jinju cockroaches. *Amba projekty* 15, 1, 1-151. Bratislava.
ISSN 2644-5840

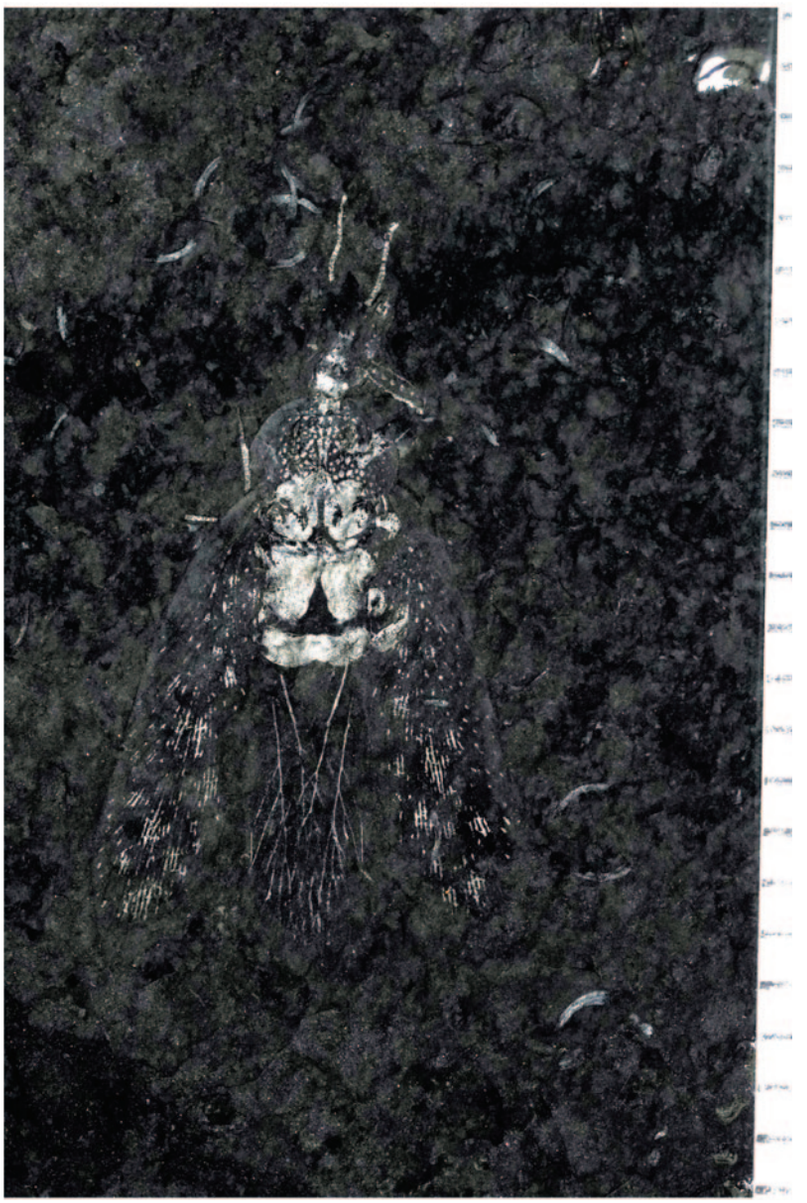
Text layout, font selection and layout assistence: Martin Česanek
Revised: Dr Jan Hinkelman (Croatian Geological Survey, Zagreb),
Martin Česanek (Slovak Entomological Society)
Linguistically revised except technical descriptions: Dr. Štefánia Dugovičová
(Comenius University, Bratislava)
Release: First 512 specimens
Price: 115€ including airmail delivery outside EU
Publisher: *Amba projekty*
Published: 2025-05-15
Photographs: 356
Charts: 4
Tables: 9
References: 129
Outlines: 50
Illustrations: 27

Subscription:
Amba projects (International) – under the auspices of UNESCO since 1993
Tichá 4, 811 02 Bratislava
Slovakia geolvrsa@savba.sk

Front cover: GNUE/J/213331: *Asioblatta jeongchonensis* sp.n. l= 15 mm

If you try the same thing 15,000 times, you will succeed. **Let's restore the global forest.**

According to quantum logic, information cannot be definitively lost.
So by gaining knowledge of the past, we construct the future.



고기는 씹을 수록 맛이나고 책은 읽을수록 맛이난다 Sejong The Great (1397-1450)

"Meat tastes better the more you chew it, and books taste better the more you read them."

Jinju Cockroaches

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PV, SBL, LV, J-CS, J-HJ and GSN are equal authors

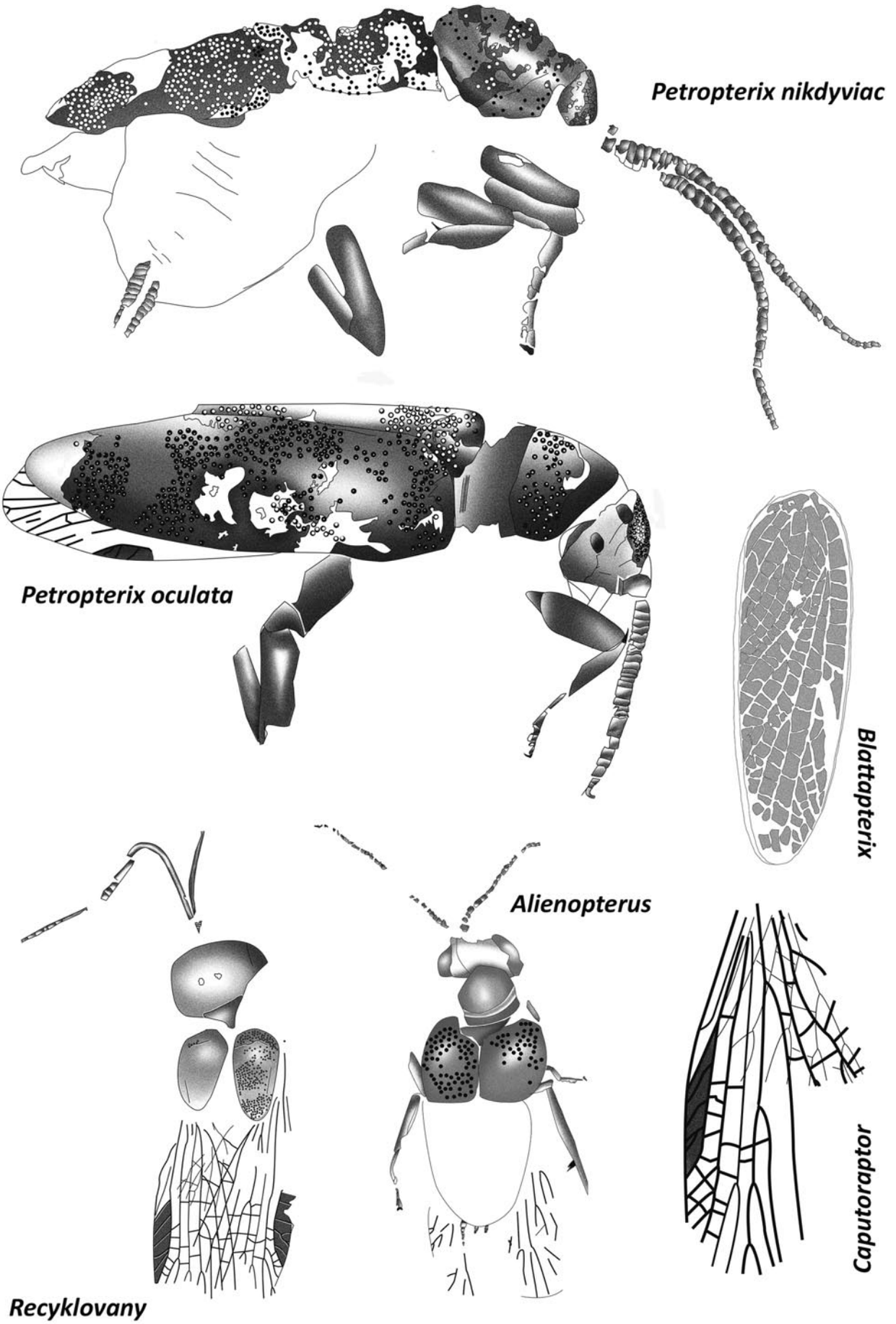
Worldwide, more than a hundred thousand cockroaches have been fossilised, but only Crato (Brazil), Montsec (Spain) and Bon Tsagaan (Mongolia) have been extensively studied among Cretaceous sediments. We present the fourth Lagerstätte, the Albian Jinju of Korea (327 classified cockroaches; 38 spp.n; 7.4% of insects; forewing 5-17, ave= 10.34 mm), with predominantly completely preserved specimens (with traces of predation and gut contents) and no taxonomic difference between the three main localities - Jeongchon, Sacheon and Gunwi (which differ taphonomically). They include the earliest and only records of Laurasian myrmecomorph Alienopteridae and umenocoleid pollinators with structural colours. Indexes (SW/Hulbert 2.518/0.848; evenness 0.3182) reveal the highest diversity in history and the ´golden age´ of cockroaches, during which they provided important decomposition, predation and pollination services. A balanced ecosystem is also indicated by one of the lowest mutation rates ever recorded at 2.44%. The variability of the eudominant *Elisama baeki* sp.n. showed statistically significant values (9.04/9.96% FW/HW) and at the same time proved a single assemblage. The cockroach fauna is congruent with the burmite, which contains mostly the same genera and numerous sister species complexes. Thus, the diversity of burmite is independently validated and provides unparalleled evidence for the most diverse conifer forests ever recorded, with a structure comparable to, and in some specific differences exceeding, modern rainforests.

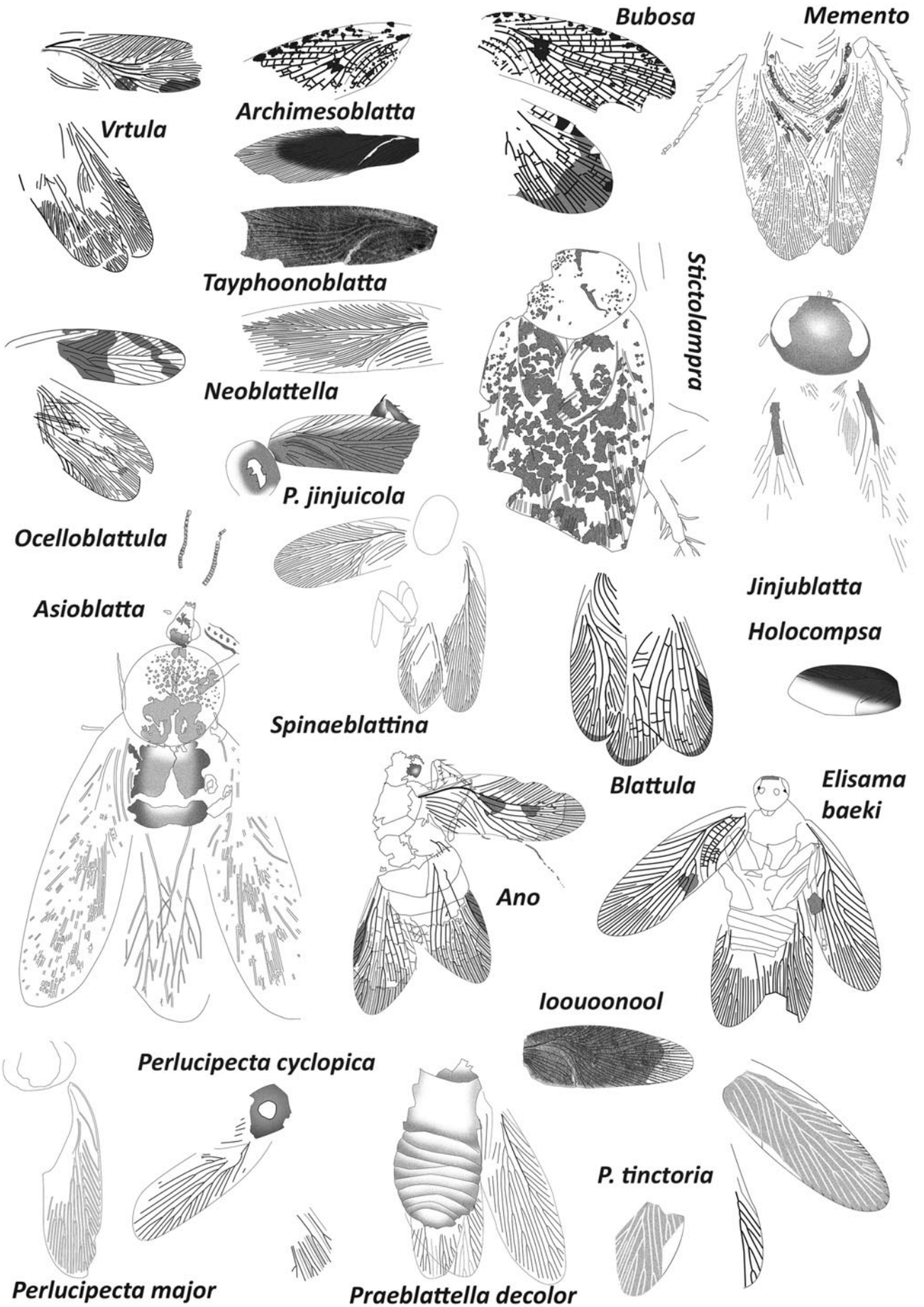
Keywords: Fossil insect, burmite, Cretaceous sediments, Mantodea, new species

Press Release: Jinju insects document the most diverse conifer forest in history, highly complementary to the richest Myanmar amber, confirming its structure. 170 complete individuals in color-reversed sediments make it the third most important and complexly evaluated site in the world (after Karatau and Daohugou). Unique are cockroach pollen consumption and pollination, earliest insect-insect (ant) mimicry and structural colors. The study aims at global forest restoration.

Taxa (if unmarked J – Jeongchon; S – Sacheon; G – Gunwi):

Jinju *Alienopterus imposter* sp.n. (Alienopteridae) **(FOD-Cenomanian GCFT3)** (n= 1)
58D6383A-D887-423C-8587-D655BFEF84DA
Jinju *Ano ale* sp.n. (Liberiblattinidae) **(Middle Jurassic-LOD; J, S)** (n= 44)
7B7C60D2-9D8D-4B78-B326-48A11624009E
Jinju *Archimesoblatta basopicta* sp.n. (Mesoblattinidae) **(earliest Jurassic-Turonian)** (n= 15)
C501655E-8A57-41CA-978F-825C392B6D20
Jinju *Asioblatta jeongchonensis* sp.n. (Raphidiomimidae) **(Kimmeridgian -LOD)** (n= 1)
B09E86B8-B9D4-4BA5-A49C-C3843E5DC66B
Jinju *Blattapterx reticulata* sp.n. (Umenocoleidae) **(Barremian-LOD)** (n= 2) **(i)**
1DA9F33A-CC90-426D-9D06-BAA7B008908D
Jinju *Blattula pessimusestfinis* sp.n. (Blattulidae) **(J1-Santonian)** (n= 12)
DCA4EAC9-2CDB-4DA9-9D22-3A402BC0585B
Jinju *Brutalista masivny* gen. et sp.n. (Liberiblattinidae) **(i, J, S GCFT3)** (n= 44)
0E34B597-D3F8-4B5B-9A78-BB6D9AA1FFDD
Jinju *Bubosa petrarosa* sp.n. (Blattidae) **(FOD-Cenomanian GCFT3)** (n= 2)
5F8F60F6-11D9-4D25-9ECE-8B5409541ACF
Jinju *Caputoraptor ganggu* sp.n. (Alienopteridae) **(FOD-Cenomanian; S GCFT3)** (n= 1)
426C3CF6-D363-47DD-9149-2EAA7F2DDAC3
Jinju *Cameloblatta immaculata* sp.n. (Raphidiomimidae) **(Kimmeridgian-Cenomanian)** (n= 1)
DEA62118-F530-4AE7-A22B-2ED88A0F27D8
Jinju *Cretophotina smidovae* sp.n. *(Cretophotina)* **(Aptian-Cenomanian; GCFT2-3)** (n= 3)
426C3CF6-D363-47DD-9149-2EAA7F2DDAC3
Jinju *Elisama baeki* sp.n. (Blattulidae) **(Kimmeridgian-Turonian; J, S, G)** (n= 108)
0DF3E7C4-E61F-4840-B11C-84334F917394
Jinju *Elisama simplex* sp.n. (Blattulidae) **(Kimmeridgian-Turonian)** (n= 3)
C3A0D33F-C93F-4C83-91B0-77C23643098B
Jinju *Holocompsa scleroptera* sp.n. (Corydiidae) **(FOD- living))** (n= 1)
9774B845-0FF6-4BF5-9AC8-C891C5CA5758
Jinju *loouoonool taktobybolo* sp.n. (Corydiidae) **(i; J, S, G)** (n= 12)
4B726EF2-137A-4E59-9915-B2ADE8C1502A
Jinju *Jinjublatta cascadaerrorum* sp.n. (Mesoblattinidae) **(i)** (n= 1)
290F14F6-76F3-4BD7-AD1C-7752EE193C70
Jinju *Juramantis jinjuensis* sp.n. (Juramantidae) **(Tithonian-Cenomanian; GCFT1-3)** (n= 3)
426C3CF6-D363-47DD-9149-2EAA7F2DDAC3
Jinju *Juramantis geongonrigam* sp.n. (Juramantidae) **(Tithonian-Cenomanian; GCFT1-3)** (n= 1)
426C3CF6-D363-47DD-9149-2EAA7F2DDAC3
Jinju *Memento futuri* sp.n. (Caloblattinidae) **(Kimmeridgian-LOD)** (n= 4)
5DE31678-105A-4AA6-9D14-4386063901E2
Jinju *Mongolblatta koreanensis* sp.n. (Mesoblattinidae) **(Aptian-Cenomanian; GCFT2-3)** (n= 4)
319B12D4-48C8-47C9-BB8F-4D1C1682D255
Jinju *Neoblattella cookrock* sp.n. (Ectobiidae) **(Barremian-extant; GCFT2-4; J, G)** (n= 13)
3AB2CDD4-43D2-464A-BF6A-75190A0FADF1
Jinju *Spinaeblattina varilabilitta* sp.n. (Mesoblattinidae) **(Barremian-Cenomanian GCFT2-3)** (n= 7)
63C36B8E-07D5-4D3D-A5C4-BF7FD1F959C5
Jinju *Stictolampra baqueuii* sp.n. (Blaberidae) **(Aptian-extant)** (n= 1)
966E6126-1363-4CC5-9826-14AE3A809BE5


Petropterix nikdyviac
Petropterix oculata
Blattapterix
Alienopterus
Caputoraptor
Recyklovany


Bubosa
Memento
Archimesoblatta
Vrtula
Tayphoonoblatta
Stictolampra
Neoblattella
P. jinjuicola
Ocelloblattula
Asioblatta
Jinjublatta
Holocompsa
Spinaeblattina
Blattula
Elisama baeki
Ano
Ioouoonool
Perlucipecta cyclopica
P. tinctoria
Perlucipecta major
Praeblattella decolor

Jinju *Ocelloblattulla gyongsangensis* sp.n. (Blattulidae) **(Barremian-Cenomanian; GCFT2-3)** (n= 3)
1B6CA4F8-36FC-4CF7-9429-0D768483ABAB
Jinju *Perlucipecta jinjuicola* sp.n. (Mesoblattinidae) **(Middle Jurassic-Cenomanian; J, S)** (n= 8)
0166719C-4629-413E-9BFC-E9FC2B4EBFCC
Jinju *Perlucipecta major* sp.n. (Mesoblattinidae) **(Middle Jurassic-Cenomanian)** (n= 2)
2D496435-8B53-454E-8461-3D3A6639405F
Jinju *Perlucipecta cyclopica* sp.n. (Mesoblattinidae) **(Middle Jurassic-Cenomanian)** (n= 2)
21090F99-150B-49E7-9D0E-D01BE2783517
Jinju *Praeblattella tinctoria* sp.n. (Mesoblattinidae) **(Middle Jurassic-Santonian GCFT1-4)** (n= 4)
B4794D6C-E624-4330-9F4A-001F5FD33F0C
Jinju *Praeblattella decolor* sp.n. (Mesoblattinidae) **(Middle Jurassic-Santonian GCFT1-4)** (n= 1)
AC777BEA-7BB5-4AED-AAC9-67F25D856816
Jinju *Recyklovany kolotoc* gen. et sp.n. (Alienopteridae) **(i)** (n= 1)
D31D6188-0FB8-48DD-A59E-023B67EF9A86
Jinju *Pseudoblattapterix weoni* Lee et al. 2025 (Umenocoleidae) **(i)** (n= 1)
Jinju *Petropterix koreaensis* Lee et al. 2025 (Umenocoleidae) **(Barremian-LOD; GCFT2-3)** (n= 2)
Jinju *Petropterix nikdyviac* sp.n. (Umenocoleidae) **(Barremian-LOD; GCFT2-3)** (n= 1)
6E42472F-6A59-44FA-B1C0-DC9A864EFA27
Jinju *Petropterix oculata* sp.n. (Umenocoleidae) **(Barremian-LOD; GCFT2-3)** (n= 1)
88B89508-4F3E-4125-B2C0-EFB3073ECD4C
Jinju *Sclerotermes samsiki* Joault et Nam, 2023 (Isoptera) **(i)** (n= 1)
Jinju *Tayphoonoblattta correntini* gen. et sp.n. (Raphidiomimidae) **(i; J, G)** (n= 6)
7E8EACD9-E287-476A-BA09-C4024062032A
Jinju *Umenocoleus minimus* Lee et al. 2025 (Umenocoleidae) **(Albian; GCFT2-3)** (n= 2)
Jinju *Vrtula jinjuensis* sp.n. (Blattulidae) **(Berrriasian-Cenomanian; J, S GCFT1-3)** (n= 10)
057215DD-2FC1-44CD-AE2B-69ABE0977621
Jinju IS (n= 1)
Jinju IS2 (n= 1)

Contents

Sacheon

Gunwi

Introduction to monograph

This is an accompanying monograph to the main paper *(P Vršanský, SB Lee, L Vršanská, J Sohn, P Barna, J-H Jang, GS Nam submitted)****, which provides a detailed introduction to the subject.***

The present work only provides an update of the systematic revisions made in the last two years, as an introduction to the Karatau cockroaches has recently been published.

In addition to the species described in 2023 (Sendi et al. 2023ab, see also Vršanský and Kazimírová 2023; Anisyutkin and Perkovski 2023; Zhang et al. 2023; Barna et al. 2023; Majtaník and Kotulová 2023; Kováčová 2023; Kováčová et al. 2023; Liang et al. 2023; Estrada-Álvarez et al. 2023; So and Won 2023), 74 species from Karabastau and 17 from Arctic polar regions, and *Ectobius* from Baltic and Danish amber (Vršanský 2024, Vršanský et al. 2024a,b; Anisyutkin et al. 2024); *Maculosala, Nigropterix, Vitisma, Praeblattella*, *Vrtula* from burmite (Xia et al. 2024; Sendi 2024a,b; Šmídová et al. 2024; Vršanský and Sendi 2024); *Clypeblattula* from Layiang (Zhang et al. 2024); *Perspicuus* from Hungarian aikaite (Szabó et al. 2024); and a *Liassic* cockroach from Whitby Mudstone (Swaby et al. Ross 2024) were formalised. Some termites have also appeared: *Angustitermes* (Jiang et al. 2024); *Hodotermopsella, Tyranotermes* (Engel & Jouault 2024); *Mastotermes reticulatus* (Jiang et al. 2024).

The first three species from Jinju were also erected in 2025 (Lee et al. 2025).

In early 2025, species from burmite (Vršanský 2025, Sendi 2025), Swiss Triassic (Montagna et al. 2025), French Permian (Garrouste et al. 2025) and Chinese Carboniferous (Santos et al. 2025) appeared.

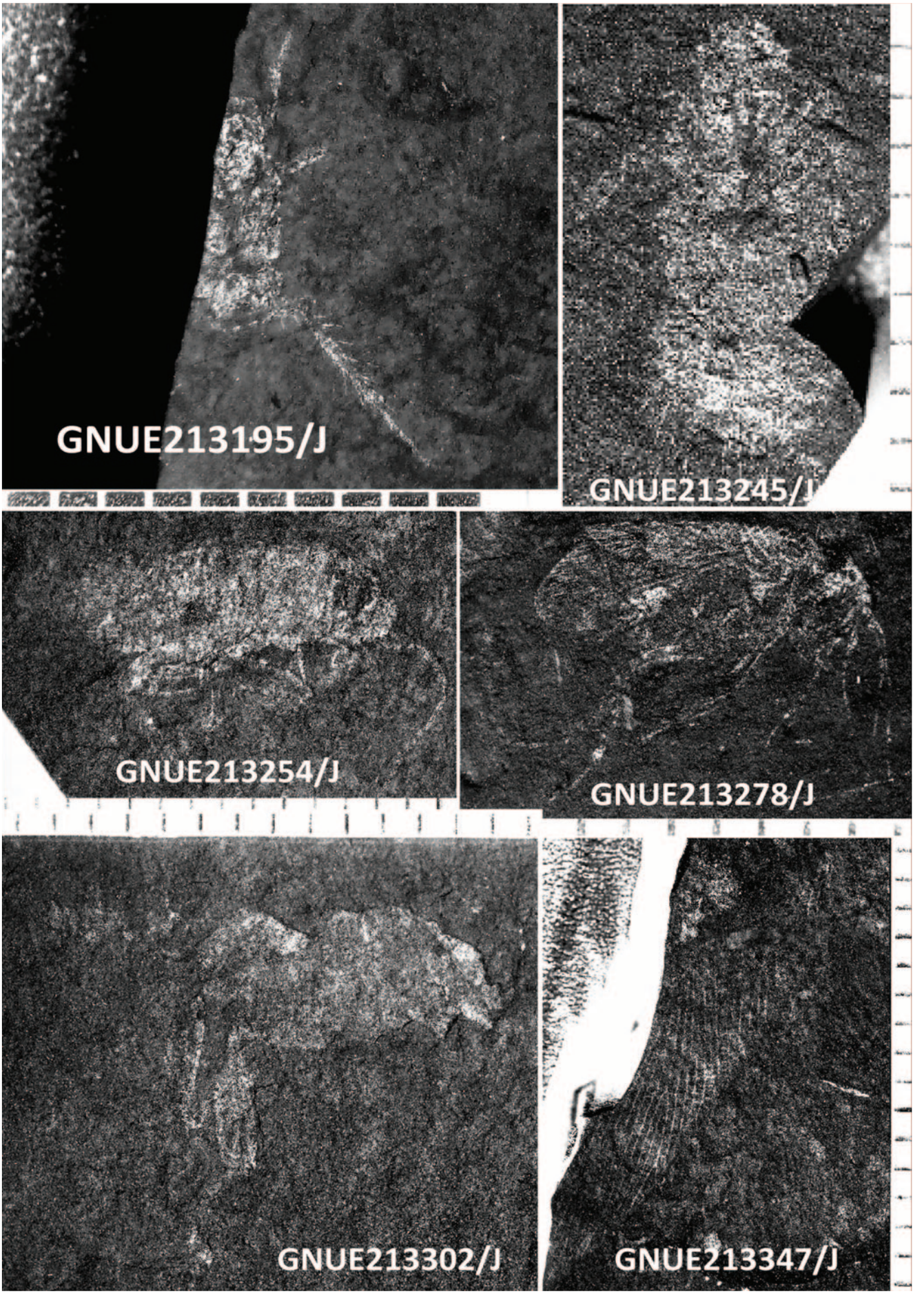
Despite this tremendous progress in the field, the major Mesozoic reservoirs are still largely unexplored. The aim of this work is to thoroughly evaluate only the fourth Cretaceous *Lagerstätte*, Jinju of Korea, which surprisingly turned out to be the most diverse sedimentary site in history, comparable only to Karatau and (unevaluated) highly analogous burmite amber.

Methods for the study of fossil cockroaches

All materials discussed in this study are deposited at the Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea, and are managed by Professor Gi-Soo Nam. Other materials than those marked as GNUE are after Baek and Yang (2004).

Geological Settings

The Early Cretaceous Jinju Formation (112.4 (±) 1.3 to 106.5 Ma, Early Aptian) (Chae et al., 2020) in southeastern South Korea consists mainly of organic-rich black shale interbedded with grey sandstone and shale. The paleoenvironment of the Jinju Formation is mostly interpreted as a lacustrine environment (see faunal context). All the materials discussed in this study are from three different sections of the Early Cretaceous Jinju Formation. First, the Jeongchon section (35° 07 45 N, 128° 06 09 E) of Jinju City, Gyeongsangnamdo (Park et al., 2013), second, the Sacheon section (35° 03 53 N, 128° 04 10 E) of Sacheon City, Gyeongsangnamdo (Park et al, 2012) and third, the Gunwi section (36° 15 02 N, 128° 37 50 E) of Daegu Metropolitan City (Park et al., 2013).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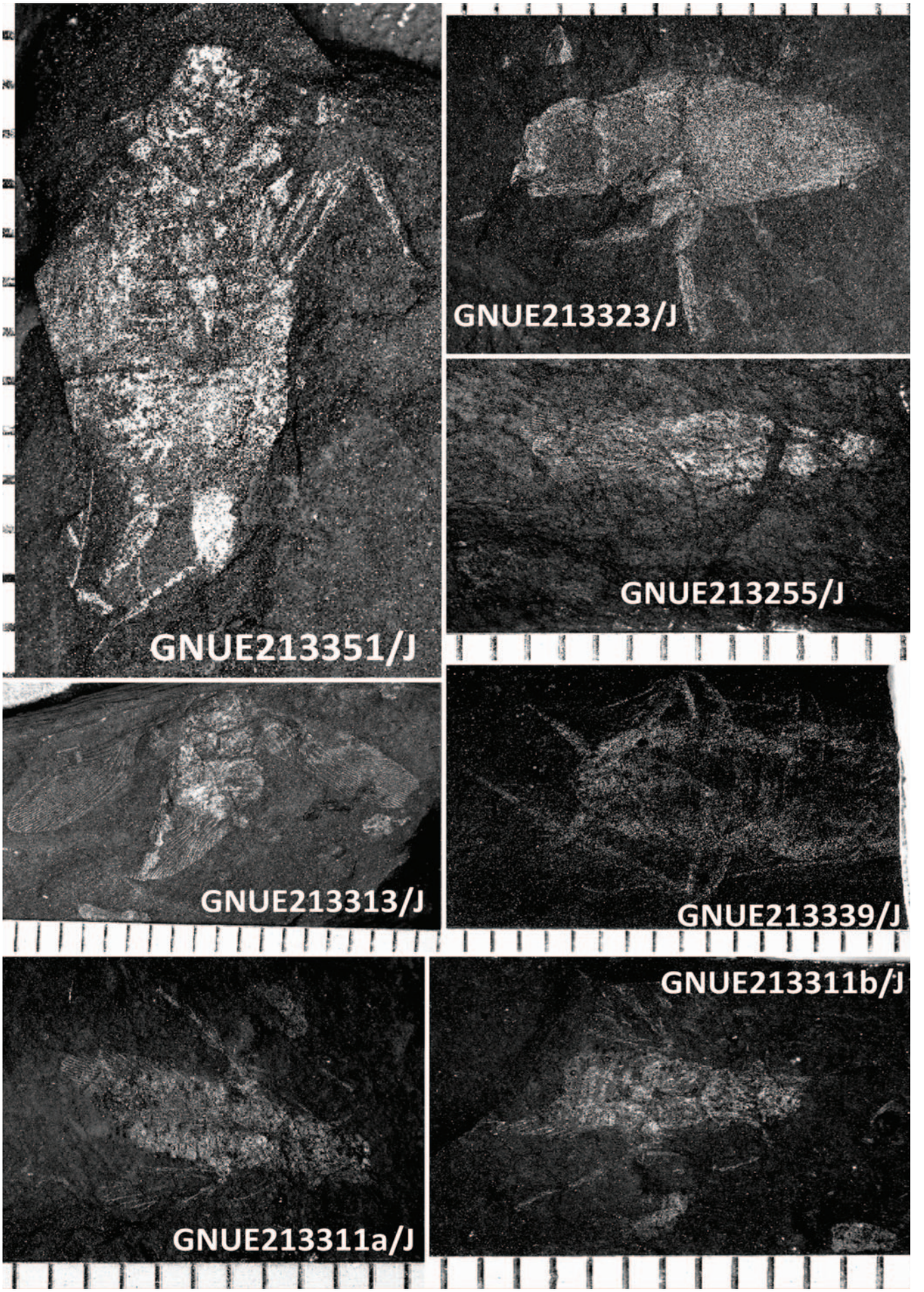
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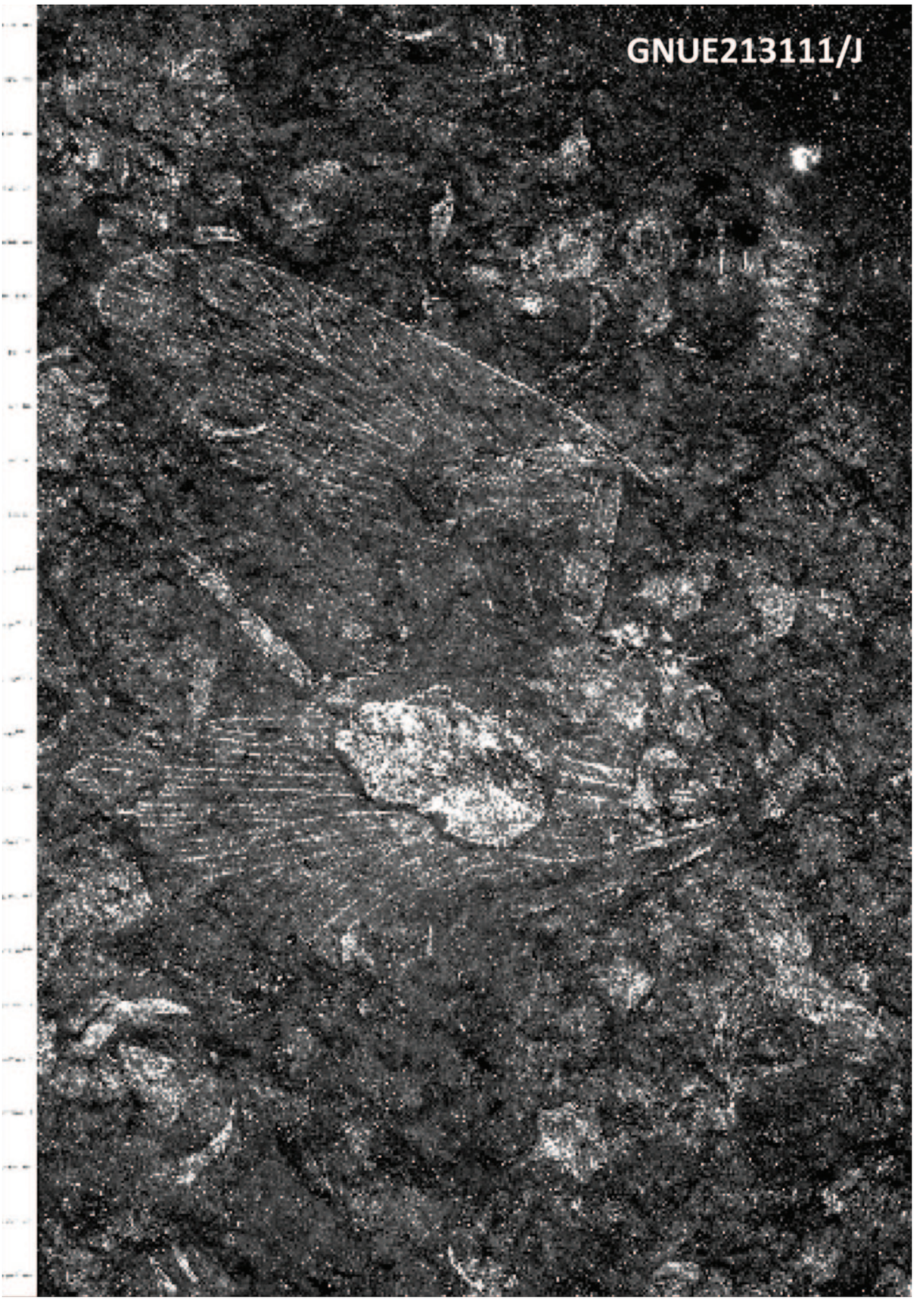
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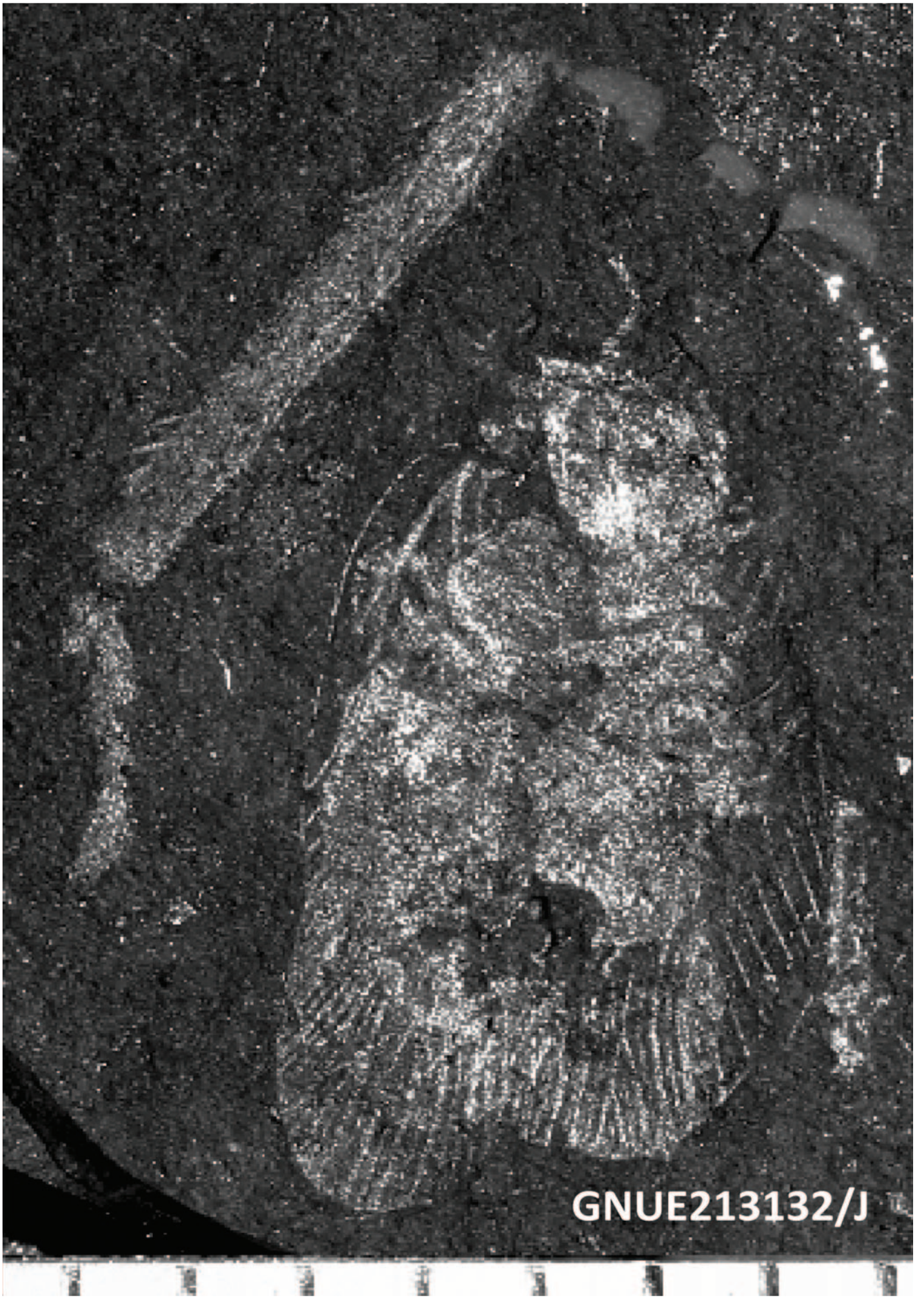
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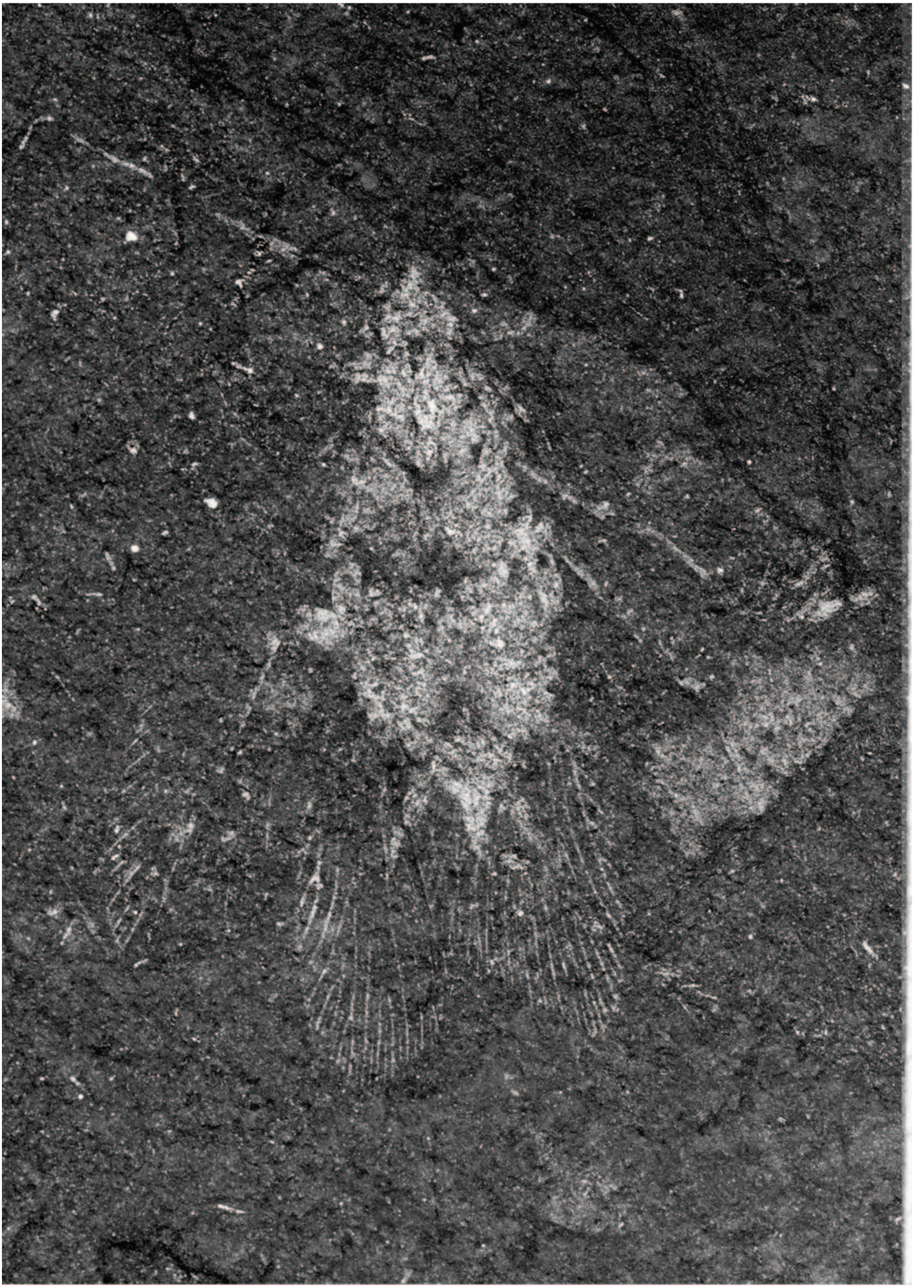



GNUE213241a/J


GNUE213241b/J

Results

Systematics

Incertae sedis specimens (FigurePs 10-15): The contrasting preservation pattern results only in very few undetermined specimens. Among them, at least 5 other new species occur, while it is risky to formalise or even classify them. No immature individuals occur among them: GNUE/J/213195, 213224=213237, 213241=213275, 213245, 213249, 213254, 213255, 213278, 213311, 213323, 213339, 213351, DGOO3; GNUE/S/213132 (complete specimens); GNUE/J/213302 (body).

Order Mantides Latreille, 1802

sensu Vršanský et al. (2023), Vršanský (2024) (containing cockroaches s.s. with umenocoleoids inclusive, mantodeans, termites, and chresmodids)

Suborder Mantodea Latreille, 1802

(paradoxically subordinated under cockroaches of the superfamily Raphidiomimoidea)

Genus: *Cretophotina* Gratshev et Zherikhin, 1993

Type species: *C. tristriata* Gratshev et Zherikhin, 1993
Type locality: Baissa, Siberia
Type horizon: Aptian Zaza Formation

Composition: *C. mongolica* Gratshev et Zherikhin, 1993 (Lower Cretaceous, Mongolia); *C. serotina* Gratshev et Zherikhin, 1993 (Upper Cretaceous, Kazakhstan), *C. selenginesis* Vršansky, 2002 (Lower Cretaceous, Mongolia) and *C. santanensis* Lee, 2016 (Lower Cretaceous, Brazil).

Geographical range: cosmopolitan
Stratigraphic range: Barremian-Turonian

Diagnosis: *Cretophotina* Gratshev et Zherikhin, 1993 has a branched Sc as opposed to *Arvernineura* Piton, 1940, extant *Chaeteessa* Burmeister, 1838. *Chaeteessa* and *Arvernineura* R+RS is more reduced compared to the new species and *Chaeteessa* has CuA with less branches. *Chaeteessa* also has a very short A1 vein as opposed to *Cretophotina*. Pseudovein, present in *Cretophotina*, is absent in *Baissomantis* Gratshev et Zherikhin, 1993. Pseudovein is less curved in *Arvernineura*. Compared to *Lithophotina* Cockerell, 1908 Sc is rich in veins, R1 is branched (simple in *Lithophotina*). *Cretophotina* differs from *Kazakhophotina* Gratshev et Zherikhin, 1993 by having intercalaries between Sc and R (missing in *Kazakhophotina*). It lacks extensive dark wing patterns seen in *Vitimophotina* Gratshev & Zherikhin, 1993 as well as having 7 branches in CuA (6 in *Vitimophotina*). *Cretophotina* has long spines on ventral side of femora compared to *Chaeteessites* which lacks these spines but has 3 fine setae Gratshev et Zherikhin, 1993.

***Cretophotina smidovae* sp.n.**

Holotype: GNUE212004=5 (±). A completely articulated (with clavus) forewing. A positive and negative imprints. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, South Korea
Type horizon: Jinju Formation

Additional material: A completely articulated (with clavus) forewing GNUE213085=213365, 213088=213089.

Differential diagnosis: Differs from congeners in more sophisticated and more extensive coloration.
Autapomorphy: *Eye*-like coloration
Description: Forewing elongated, 21/6.3 mm long/wide. Membrane transparent, with coloration forming a wave, perhaps a complete eye. Shape with parallel margins and somewhat widened in the center. Pseudovein present, expanding from approx. half of the clavus towards the M joining it in approx. half of the wing length. Veins and intercalaries wide (width is fluctuating), intercalaries slightly thinner. Sc long, straight, reaching 2/3 of the wing length, branching 6-7 times, some branches dichotomized.

System of cross-veins forming a mosaic pattern in the costal area. R branching 5 times, the fifth branch dichotomized. Each R vein has intercalary vein. Cross-veins in R area present. M (2-3) arising from R, simply branched in approx. 1/2 of the wing length. CuA regularly branched, running parellely to each other, each vein has intercalary vein and cross-veins are present throughout whole CuA area, and with 7-8 veins at margin. CuP fluent. A veins strong, simple (4-5) more or less parallel to each other with curvy crossveins and reticualations.
Derivation of name: The etymology doesn't fit with its name..
Character of preservation: 3 completely articulated forewings
Taphonomy: Fully articulated (with clavus) forewings suggest no or short pre-depositional transport.
Remarks: The new taxon can be categorised within crown Mantodea on the basis of pseudovein and within *Cretophotina* Gratchev et Zherikhin, 1993 on the basis of complex venation. It differs from *C. santanensis* Lee, 2014 (f= 23 mm) in having not anterior margin extensively colored and in more extensive and sophisticated coloration of the rest of the membrane. *C. mongolica* Gratchev et Zherikhin, 1993 (f= 21.5 mm) and *C. serotina* Gratchev et Zherikhin, 1993 (f= 19.5 mm) have transparent membrane. *C. selenginensis* is similarly (but not identically) colored near base with wider stripe. It is unclear, due to fragmentary preservation of *C. selenginensis* Vršanský, 2002 (f= ca. 20 mm) if it also have colored apex, but the rest of the membrane seems transparent. *C. tristriata* Gratchev et Zherikhin, 1993 (f= 31 mm) posses row of three longitudinal stripes. Otherwise venation within this genus was highly conservative.
Size of the new species (f= 19.5 mm) is comparable to already known species (see above).
The more extensive coloration might suggest more humid and/or warm ecosystem, which is supported with more southern localisation of the past Korea (compared to Mongolia and Russia where this genus frequently occurrs). Species from tropical Crato in Brazil is more extensively but more simply (and not in all surface) coloured.

Family Juramantidae Vršanský, 2002
Genus *Juramantis* Vršanský, 2002

Type species: *Juramantis initialis* Vršanský, 2002
Type locality: Shar-Teg, Mongolia
Type horiyon: Tithonian

Remarks: as for family (there is no recorded difference among *Juramantis* and *"Burmantis" zherikhini)*.

***Juramantis jinjuensis* sp.n.**

Holotype: GNUE213079. A near-complete specimens. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, South Korea
Type horizon: Jinju Formation

Additional material: GNUE213082=213372, 213347. Complete specimens with articulated head, pronotum and legs.

Differential diagnosis: Differs from congeners in possessing coloration expressed as an *Eye* pattern and in having forewing widest at apex.
Autapomorphy: *Eye* pattern
Symplesiomorphy: unspecialised forewing shape, veins of identical constant width, small eyes and only moderately specialised forelegs
Description: Head hypognathous, somewhat directed forewards, compound eyes dichoptic, small, not protruding from the outline of the head. Antenna robust, 0.33 mm wide, filliform. The pronotum with two portions. The anterior portion rectangular, wider than its length, the posterior portion subtrapezoidal. Forewing elongate (15/4 mm), with subparallel margins, widest near apex, pseudovein formed by fusion M and R stems, even thicker than thick main veins and intercalaries (very wide). Crossveins present in clavus and anterior portion of cubital area. A numerous (ca. 7). Some A veins branched. CuP fluent. CuA diverging from area around pseudovein, with ca. 5 branches. M with around 4 branches. R regular. Base of clavus colored dark.
Forelegs slightly specialised, thin, forecoxa short and robust; forefemur (3.6/0.7 mm), with short posterior spurs, terminal femoral spur absent; foretibia short (2.8/0.5 mm), with few (2 visible) short terminal spurs 0.2 mm long. Tarsi 5-segmented, 0.3 mm wide (1.2/0.5/0.3/0.2/0.5 mm), 3 pulvilli present in terminal tarsomeres, claw symmetrical, very long (0.5 mm) and narrow, large suboval arolium present. Midcoxa short and robust (2.3/1.6 mm), midfemur long and thin (4.3/0.5 mm), terminal femoral spur unpreserved; midtibia very long and thin (4.6/0.4 mm) with 7 terminal massve spurs up to 0.7 mm long; midtarsus very long (4-segmented in GNUE213082: 1.7/0.7/0.5/0.8 mm) and ith at least 3 pulvilli, symmetrical claw (0.3 mm) and massive round arolium (0.3 mm in diameter).
Derivation of name: after Jinju Formation.
Character of preservation: Three complete specimens with head, antenna and legs (but one with disarticulated clavi).
Taphonomy: Fully articulated (with clavus) forewings and complete specimens, especially with articulated fine

structures such as antenna suggest no or short pre-depositional transport.
Remarks: The present species can be categorised within Mantodea on the basis of presence of pseudovein. It can be, on the basis of liberiblattinid cockroach symplesiomorphy, namely the original state of venation within clavus, with numerous standardly branched veins, and presence of wide intercalaries, categorised within the family Juramantidae (unique symplesiomorphy lost in all other mantodeans).
The species can be discriminated from *J. initialis* Vršanský, 2002 and *"Burmantis" zherikhini* (= possible synonym of "*Jersimantis" burmiticus* Grimaldi, 2003) on the basis of colored clavus base.
The species is imporant in evidencing retained liberiblattid state of venation with wide intercalaries similarly as in *B. zherikhini*. The more important in this most primitive mantodeans are body structures with very small head projected somewhat forewards as in *B. zherikhini*, but with smaller eyes. Also forelegs, although apparently specialised and with the posterior femoral spurs, the spurs are not strong and the raptorial specialisation was minimal.
The structure of the pseudovein, which fuses the M and R stems, is also important, similarly to what is seen in more advanced Chaeteessidae, such as the Paleocene (Selandian) Arvernineura Piton, 1940, from the Menat Formation in France.
Remarkable is very wide antenna, like in Raphidiomimidae, Caloblattinidae and Phyloblattoidea, unlike in basal Corydioidea and Manipulatoridae.

***Juramantis geongonrigam* sp.n.**

Holotype: GNUE213005. A completely articulated (with clavus) forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, South Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from congeners in smaller size and lack of coloration.
Autapomorphy: none
Symplesiomorphy: lack of coloration and any modification (wing not widest at apex)
Description: Forewing short and wide (13-14/5.2 mm), with parallel margins, pseudovein formed by fusion M and R stems, thicker than other veins. Main veins thicks as well as intercalaries (very wide). Cross-veins present in clavus and anterior portion of cubital area. A numerous (ca. 7). Some A veins branched. CuP fluent. CuA diverging from area around pseudovein, with ca. 5 branches. M with around 4 branches. R regular.
Derivation of name: after four trigrams.
Character of preservation: One completely articulated forewing (with clavus)
Taphonomy: Fully articulated (with clavus) forewing suggest short pre-depositional transport.

Suborder Termitina Latreille, 1802
(paradoxically subordinated under cockroaches of the superfamily Corydioidea)

Genus *Sclerotermes* Joault et Nam, 2022

Type species: *Sclerotermes samsiki* Joault et Nam, 2022 and by monotypy.

***Sclerotermes samsiki* Joault et Nam, 2022**

Holotype: GNUE218001. A forewing.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Remark: status confirmed, taxon related to Pabuonquedidae Vršanský et al., 2019

Suborder Blattaria Latreille, 1810
(paradoxically taxonomically subordinated under their descendants)

Family Blattidae Latreille, 1810

Composition (after Šmídová 2020): *Afrostylopyga* Anisyutkin, 2014, *Apterisca* Princis,1963, *Blatta* Linnaeus, 1758, Brinckella Princis, 1963, *Cartoblatta* Shelford, 1910, *Celatoblatta* Johns, 1966, *Deropeltis* Burmeister, 1838, *Distylopyga* Bey-Bienko, 1965, *Dorylaea* Stål, 1877, *Duchailluia* Rehn, 1933, *Eumethana* Princis, 1951, *Hebardina* Bey-Bienko, 1938, *Henicotyle* Rehn et Hebard, 1927, *Homalosilpha* Stål, 1874, *Macrostylopyga* Anisyutkin, Anichkin et Thinh, 2013, *Maoriblatta* Princis, 1966, *Mimosilpha* Bey-Bienko, 1957, *Miostylopyga* Princis, 1966, *Neostylopyga* Shelford, 1911, *Pelmatosilpha* Dohrn, 1887, *Periplaneta* Burmeister, 1838, *Pseudoderopeltis* Krauss, 1890, *Scabinopsis* Bey-Bienko, 1969, *Shelfordella* Adelung, 1910, *Thyrsocera* Burmeister, 1838.
Fossil taxa: *Balatronis* Šmídová et Lei, 2016 (burmite, lebanite)
Stratigraphic range: Lower Cretaceous to Present
Geographic range: Circum-subtropical

Bubosa Šmídová, 2020

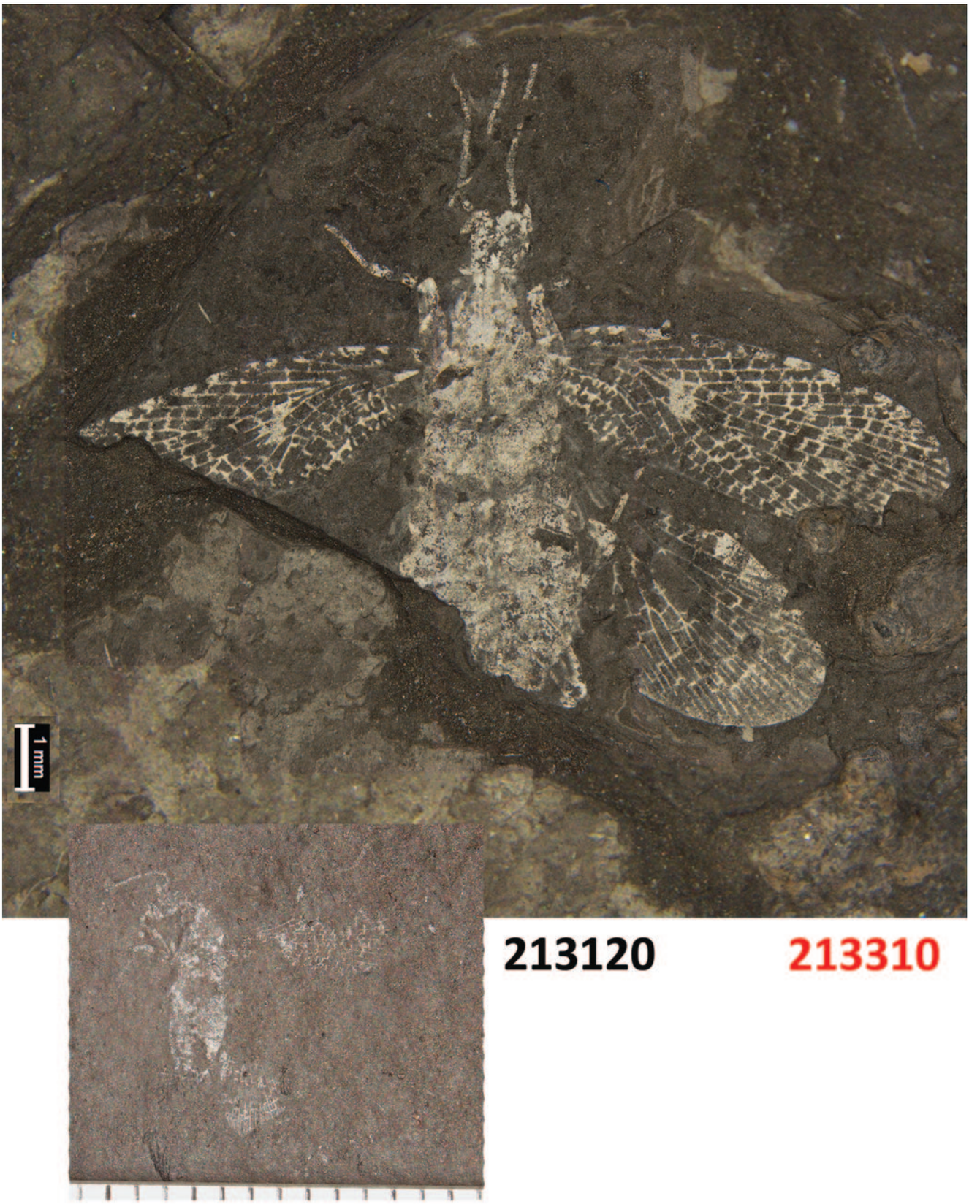
Type species: *Bubosa poinari* Šmídova, 2020, and by monotypy (burmite).

Diagnosis (after Šmídová 2020)**:** The new genus differs from its Cretaceous relative *Balatronis* in smaller size and narrower and shorter pronotum. Most living representatives of the subfamily Blattinae have significantly wider pronota. Narrow pronotum with reduced paranotalia is a unique trait only seen in extant *Eroblatta borneensis* Shelford, 1908. However, the body of *E. borneensis* is entirely narrow, while the posteriorpart of *B. poinari* is shaped regularly. Unique for any extinct taxon is the long unstructured clavus of *B. poinari*, that can be seen in living *Hyporhicnoda ultima* Grandcolas, 1993 of the family Blaberidae, however, it has different morphology and blaberoid terminalia.

Bubosa petrarosa sp.n. (FigureP 20)

Holotype: GNUE310. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213120 (complete specimen). The same locality as the type.
Differential diagnosis: Differs from the type species in sophisticated unique double *Eye* pattern.
Autapomorphies: Two colored and parallel big maculas in addition to (cryptic) bark coloration is an unparallel character within cockroaches.
Description: Head subquadrate, possibly movable to prognathous position. Antenna looks standard (not thin) and long (basal 3.7 mm preserved).
Legs short, with short forefemur (/0.4 mm), tibia (0.8/0.2 mm) and tarsus (1/0.1 mm), hindfemora more robust but also short.
Forewing elongate (6.8/2.5 mm), semitransparent, with entirely pale central dot surrounded with dark coloration near descend of M and CuA, and the same centroapically - forming a double *Eye* pattern. Colored is also a short basal stripe of CuP and a series of maculas tracking the ends of each vein in an anterior margin. Intercalaries distinct between CuA and CuP, and in clavus, where they form a coloration pattern along with widened cross-veins. Costa indistinct, SC simply dichotomised (2). R straight, differentiated into R1 (6-8) and RS (1-2). M nearly straight with 3-6 branches, anteriormost vein simple, long; CuA last vein follows posterior branches, simlified (4). CuP fluent, A simplified to 3-5 veins (1 branched).
Hindwing shorter than forewing (ca. 6 mm), membrane transparent, apex possibly softly colored, distinct pterostigma small, limited to area among SC-RS. Intercalaries wide, more or less straight wide and colored cross-veins present. Some additional colored small area present in posterior margin, near apex and in centromedial part. Costa indistinct, SC simple, slightly arcuate. R1 and RS differentiated (1 plus 6). M nearly straight (3). CuA expanded, secondarily branched, with 7 veins at margin. Externally protruding ovipositor indicated, but not differentiated.
Coloration: Total area not caculated.
Derivation of name: *petrarosa* is Latin for rockroses - a wordplay resembling cockroaches
Character of preservation: Two complete specimens
Taphonomy: Complete specimens suggest a rarity in the actuocenosis under the coeval approximity with the depositional body of water.


1 mm
213120
213310

Family Ectobiidae Brunner von Wattenwyl, 1865
Subfamily Pseudophyllodromiinae Hebard, 1929

Composition: *Afrobalta* Princis, 1969; *Afroneura* Princis, 1963; *Aglaopteryx* Hebard, 1917; *Agmoblatta* Gurney et Roth, 1966; *Allacta* Saussure et Zehntner, 1895; *Amazonina* Hebard, 1929; *Apteroblatta* Shelford, 1910; *Arawakina* Hebard, 1926; *Asemoblattana* Strand, 1929; *Balta* Tepper, 1893; *Cariblatta* Hebard, 1916; *Cariblattella* Lopes et Oliveira, 2007; *Cariblattoides* Rehn et Hebard, 1927; *Ceratinoptera* Brunner von Wattenwyl, 1865; *Chorisoblatta* Shelford, 1911; *Chorisomaculata* Lopes et Oliveira, 2010; *Chorisoneura* Brunner von Wattenwyl, 1865; *Chorisoneurodes* Princis, 1962; *Chorisoserrata* Roth, 1998; *Delosia* Bolivar, 1924; *Dendroblatta* Rehn, 1916; *Desmosia* Bolivar, 1895; *Doradoblatta* Bruijning, 1959; *Ellipsidion* Saussure, 1863; *Epibalta* Princis, 1974; *Euphyllodromia* Shelford, 1908; *Euthlastoblatta* Hebard, 1917; *Helgaia* Rocha et Silva et Gurney, 1963; *Hypnornoides* Rehn, 1917; *Imblattella* Bruijning, 1959; *Isoldaia* Gurney et Roth, 1966; *Latiblattella* Hebard, 1917; *Leuropeltis* Hebard, 1921; *Lophoblatta* Hebard, 1929; *Lupparia* Walker, 1868; *Macrophyllodromia* Saussure et Zehntner, 1893; *Margattea* Shelford, 1911; *Margatteoidea* Princis, 1959; *Matabelina* Princis, 1955; *Mediastinia* Hebard, 1943; *Megamareta* Hebard, 1943; *Nahublattella* Bruijning, 1959; *Neoblattella* Shelford, 1911; *Pachnepteryx* Brunner von Wattenwyl, 1865; *Paranocticola* Bonfils, 1977; *Phidon* Rehn, 1933; *Plectoptera* Saussure, 1864; *Prosoplecta* Saussure, 1864; *Pseudectobia* Saussure, 1869; *Pseudobalta* Roth, 1997; *Pseudophyllodromia* Brunner von Wattenwyl, 1865; *Pseudosymploce* Rehn et Hebard, 1927; *Rhytidometopum* Hebard, 1920; *Riatia* Walker, 1868; *Shelfordina* Hebard, 1929; *Sliferia* Roth, 1989; *Squamoptera* Komatsu et al., 2021.
Fossil taxa: *Latiblattella karlgruberi* Sendi, 2021 (burmite—Cenomanian); *Amazonina purperae* Pinto, 1991 (Brazil—Pleistocene); *Cariblatta* sp. (Domican amber—Miocene), *Cariblattoides labandeirae* Vršansky et al., 2012 (USA, Green River—Early Eocene); *Euthlastoblatta* sp. (Domican amber—Miocene); *Latiblattella avita* Grenwalt et Vidlička, 2015 (USA, Kishenehn—Middle Eocene); *Plectoptera* sp. (Dominican amber—Miocene); *Plectoptera electrina* Gorokhov et Anisyutkin, 2007 Unlabelled specimen from Lebanese amber, (Haitian amber—Miocene); *Pseudosymploce* sp. (Dominican amber—Miocene); *Supella miocenica* Vršansky et al., 2011 (Chiapas amber—Miocene); *Supella dominicana* Poinar, 2022 (Dominican amber—Miocene). *Palaeosymploce* Anisyutkin et Perkovski, 2023 (Symplocini) aff. *Latiblattella* was described from Eocene Ukraine amber (Anisyutkin and Perkovski 2023); *Gutierrezina vrsanskyi* Estrada-Álvarez et al., 2023; *Cariblatta simojovelensis* Estrada-Álvarez et al., 2023; *C. amfivola* Estrada-Álvarez et al., 2023; *C. uchbena* Estrada-Álvarez et al., 2023 (Chiapas amber; Estrada-Álvarez et al., 2023).
Stratigraphic range. Lower Barremian Lower Cretaceous – present.
Geographic range. Cosmopolitan; extant species in Central and South America.
Diagnosis (after Roth 2003). Males have the genital hook on the right side while females do not rotate the oothecae prior to deposition. Venation is regular.

***Neoblattella* Shelford, 1911**

Type species: *Blatta adspersicollis* Stal, 1860.
Composition: *Neoblattella adspersicollis* Stal, 1860; *Neoblattella adusta* Caudell, 1905; *Neoblattella amazonensis* Lopes et Khouri, 2009; *Neoblattella binodosa* Hebard, 1926; *Neoblattella borinquenensis* Rehn et Hebard, 1927; *Neoblattella carcinus* Rehn et Hebard, 1927; *Neoblattella carrikeri* Hebard, 1919; *Neoblattella carvalhoi* Rocha et Silva et Lopes, 1976; *Neoblattella celeripes* Rehn et Hebard, 1927; *Neoblattella detersa* Walker, 1868; *Neoblattella dryas* Rehn et Hebard, 1927; *Neoblattella elegantula* Rocha et Silva, 1964; *Neoblattella eurydice* Rehn et Hebard, 1927; *Neoblattella festae* Giglio-Tos, 1898; *Neoblattella grossbecki* Rehn et Hebard, 1927; *Neoblattella guadeloupensis* Bonfils, 1969; *Neoblattella guanayara* Gurney, 1942; *Neoblattella guianae* Hebard, 1929; *Neoblattella infausta* Rehn et Hebard, 1927; *Neoblattella longior* Hebard, 1926; *Neoblattella lucubrans* Rehn et Hebard, 1927; *Neoblattella maculiventris* Shelford, 1909; *Neoblattella mista* Lopes et Khouri, 2011; *Neoblattella nodipennis* Hebard, 1926; *Neoblattella paulista* Rocha et Silva et Gurney, 1963; *Neoblattella perdentata* Bonfils, 1969; *Neoblattella picta* Rocha e Silva et Gurney, 1962; *Neoblattella poecilopensis* Lopes et Khouri, 2009; *Neoblattella poecilops* Hebard, 1926; *Neoblattella proserpina* Rehn et Hebard, 1927; *Neoblattella puerilis* Rehn, 1915; *Neoblattella semota* Rehn et Hebard, 1927; *Neoblattella sucina* Rehn, 1932; *Neoblattella tapenagae* Hebard, 1921; *Neoblattella titania* Rehn, 1903; *Neoblattella tridens* Rehn et Hebard, 1927; *Neoblattella unifascia* Hebard, 1926; *Neoblattella vatia* Rehn et Hebard, 1927; *Neoblattella vomer* Rehn et Hebard, 1927; **fossil** *N. nechapetomu* Vršanský, Sendi et Azar in Sendi et al. 2023 (lebanite); undescribed species in burmite, Nenjiang and Spanish amber.
Stratigraphic range. Lower Barremian – present.
Geographic range. Cosmopolitan; extant in Central and South America.
Diagnosis (after Vršansky et al. 2021c). Head more or less standard (less than 1.2 times longer than wide).

Pronotum disc-like, somewhat circular with or without colouration. Terminal palpomere of standard shape (not cup-like) and elongated. Forewing with colouration, indistinct costal margin, RS distinct and/or terminally branched, M + CuA with over 10 branches. Hindwing monochromatic, pale.

***Neoblattella cookrock* sp.n. (FigurePs 23-29)**

Holotype: GNUE213023. A completely articulated forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE/J/213290, 213056, 213232 (complte specimens); GNUE213039=213007, 213172 (predation traces), 213043, 213148FF, 213199, 213370, 213141, 213182=213213, 213032=213054; KC001; DG0016, KS5403; GNUE/G/213152 (completely articulated forewings). The same locality and horizon as type.

Differential diagnosis: Differs from alll congeners in restriction of intercalaries in the central forewing membrane.
Autapomorphies: Distinct intercalaries restricted to central part of the forewing.
Description: Forewing 16-18/6.3 mm, with margins subparallel, membrane transparent, veins narrow, intercalaries discinct in central part, cross-veins indistinct. SC branched basally and terminally (3). Straight R1 and RS differentiated (14-18 plus 5-7). M expanded (11-13), CuA reduced to 3-5 short veins, clavus long, CuP terminally cut, A simple or simply dichotomised (7).
Coloration: Total area caculated 54.89 mm^2 (none dark)
Derivation of name: After cook and the rock - a wordplay resembling cockroach.
Character of preservation: 3 complete specimens, 10 (9 completely articulated with clavus) forewings.
Taphonomy: Articulated forewings with clavus suggest short pre-depositional transport.
Remarks: Reduction of intercalaries suggests a trend further expressed in ancient lineages of ectobiids to reduce the intercalaries (such as in *Piniblattella*). Generally a very plesiomorphic taxon resembling *Archimesoblatta*, but with parallel margins and simplified SC.

Family Mesoblattinidae Handlirsch, 1906

Type genus and species: *Mesoblattina protypa* Geinitz, 1880. Dobbertin, Germany; Early Jurassic.
Diagnosis (after Vršanský and Ansorge 2007): Medium sized cockroaches, plesiomorphically with short external ovipositor, with generally reduced and regular venation (with the exception of area between bases of M and R) without branchlets, and with dense venation present in apical parts of R and M in forewing. Forewings with more or less parallel borders, without distinct intercalaries. A without numerous reticulations; venation of Cu and M, with exception of the first stem, regular; R straight; Sc two to four branched. Hindwing with simple Sc; R1 and RS differentiated; M with up to 5 branches; CuA secondarily branched and with additional blind branches; CuP simple.

Composition: *Mesoblattina* Geinitz, 1880; *Hispanoblatta* Martínez Delclós, 1993; *Archimesoblatta* Vršanský, 2003; *Breviblattina* Vršanský, 2004a; *Mongolblatta* Vršanský, 2004a; *Gondwablatta* Vršanský, 2004b; *Nymphoblatta* Vršanský et Grimaldi in Vršanský, 2004b; *Sivis* Vršanský, 2009; *Perlucipecta* Wei et Ren, 2013; *Raptoblatta* Dittmann et al., 2015; *Spinaeblattina* Hinkelman, 2019; *Mesoblatta* Hinkelman, 2020; *Cuniculoblatta* Hinkelman, 2021, and an undescribed genus from Orapa.
Stratigraphic range: Earliest Jurassic – terminal Cretaceous

Geographic range: Cosmopolitan

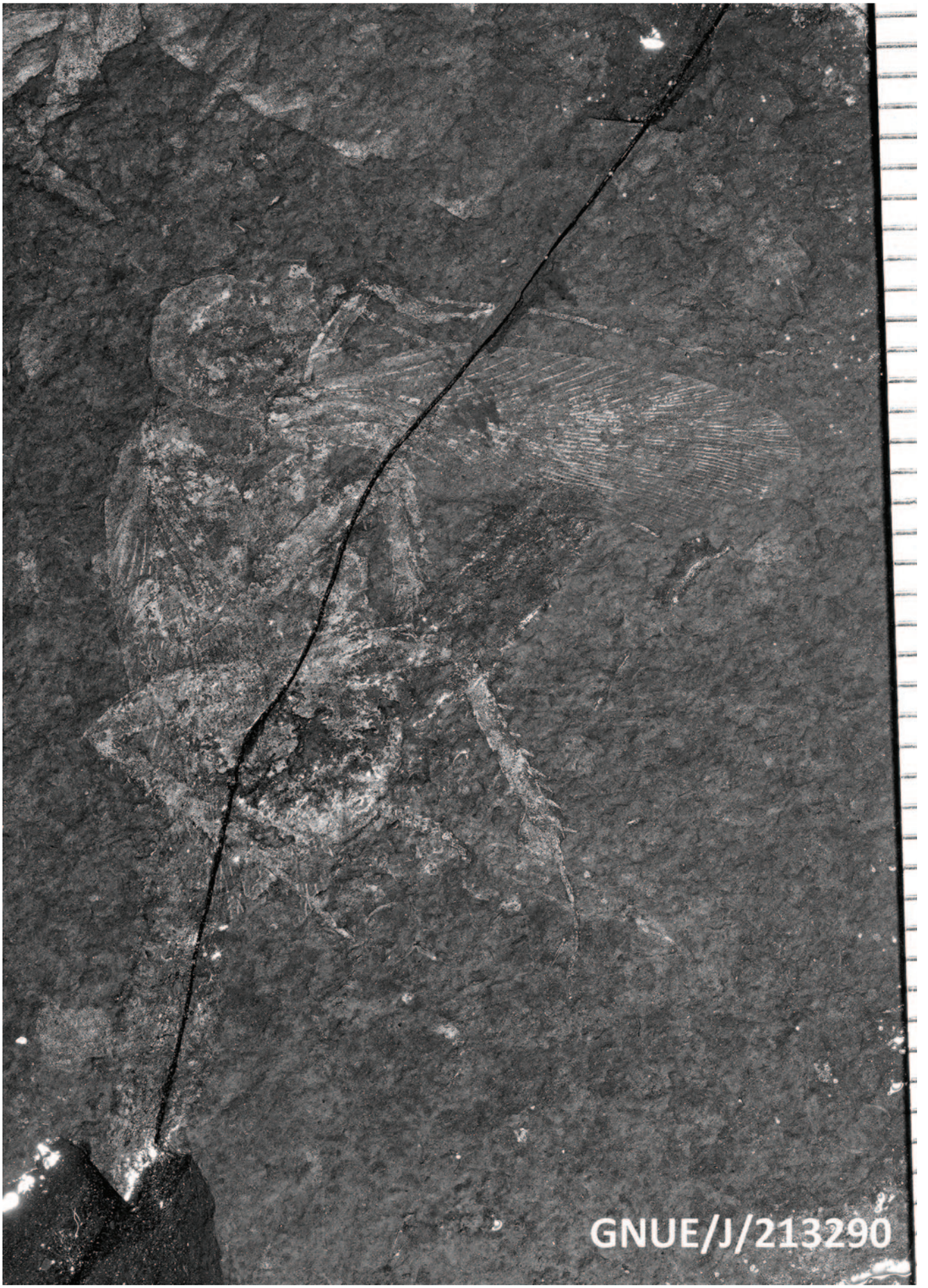
Genus *Perlucipecta* Wei et Ren, 2013

Type species: *P. aurea* Wei et Ren, 2013. Yixian, China. Early Cretaceous (see also So et al. 2021; Sinuiju).

Composition. Besides the type species, *P. vrsanskyi* Wei et Ren, 2013 (Yixian), *P. santanensis* Lee, 2016 (Crato); *P. lacrima* Vršanský et Sendi, 2022 (burmite); *P. liangiae* Vršanský, 2024 (Karabastau).

Diagnosis (after Wei and Ren 2013): Assigned to the family Mesoblattinidiae based on the following features: branched forewing Sc; hindwing simple Sc, Rs differentiated, simplified M, CuA with secondarily branched veins and blind rami. It differs from all the other representatives of the family by the following features: expanded venation with retained intercalaries and distinct cross veins; large size; facultative simplification of hindwing M.

Geographic range: cosmopolitan (Wei and Ren 2013; Lee 2016; Vršanský 2020)
Stratigraphic range: Middle Jurassic – Santonian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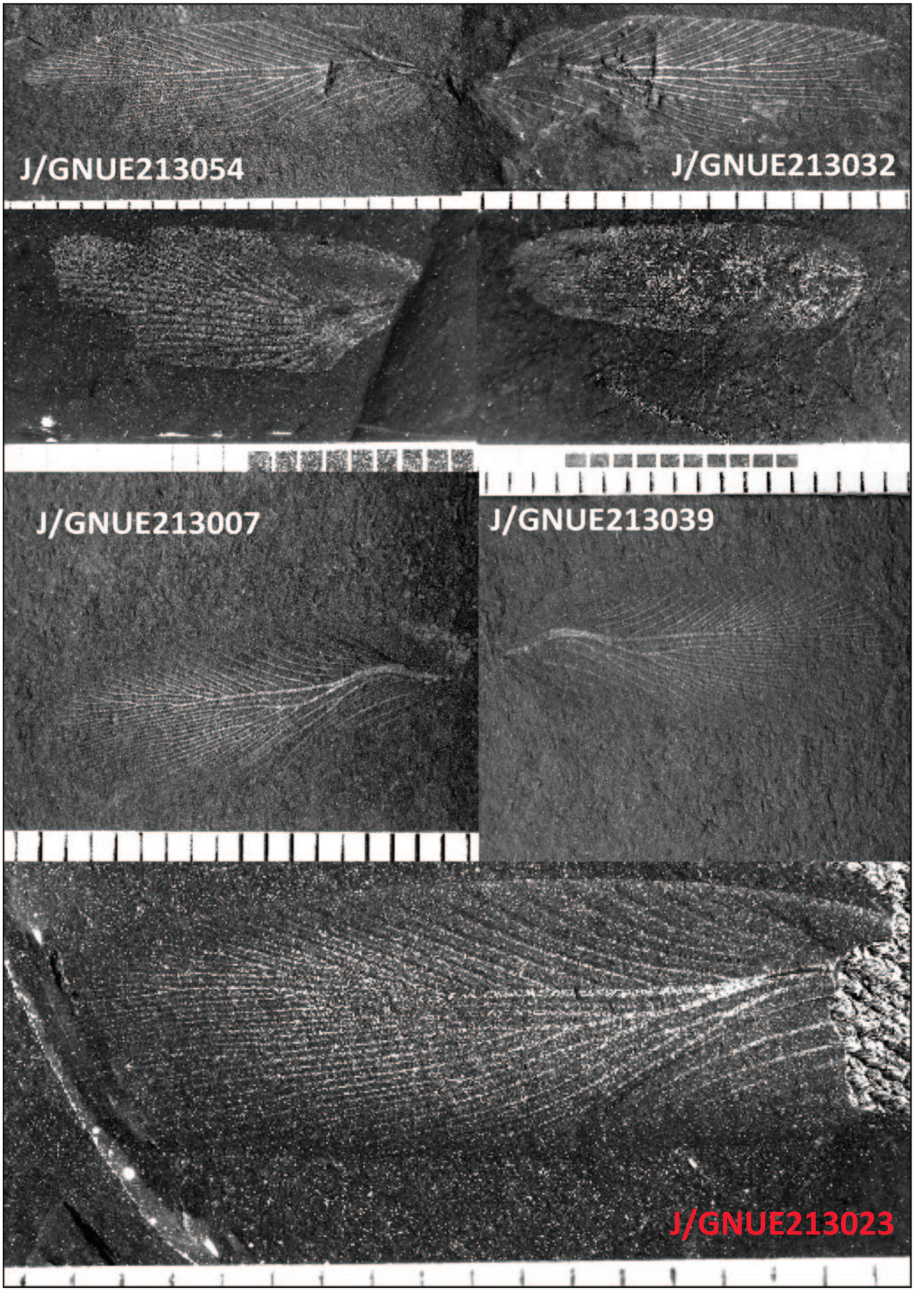
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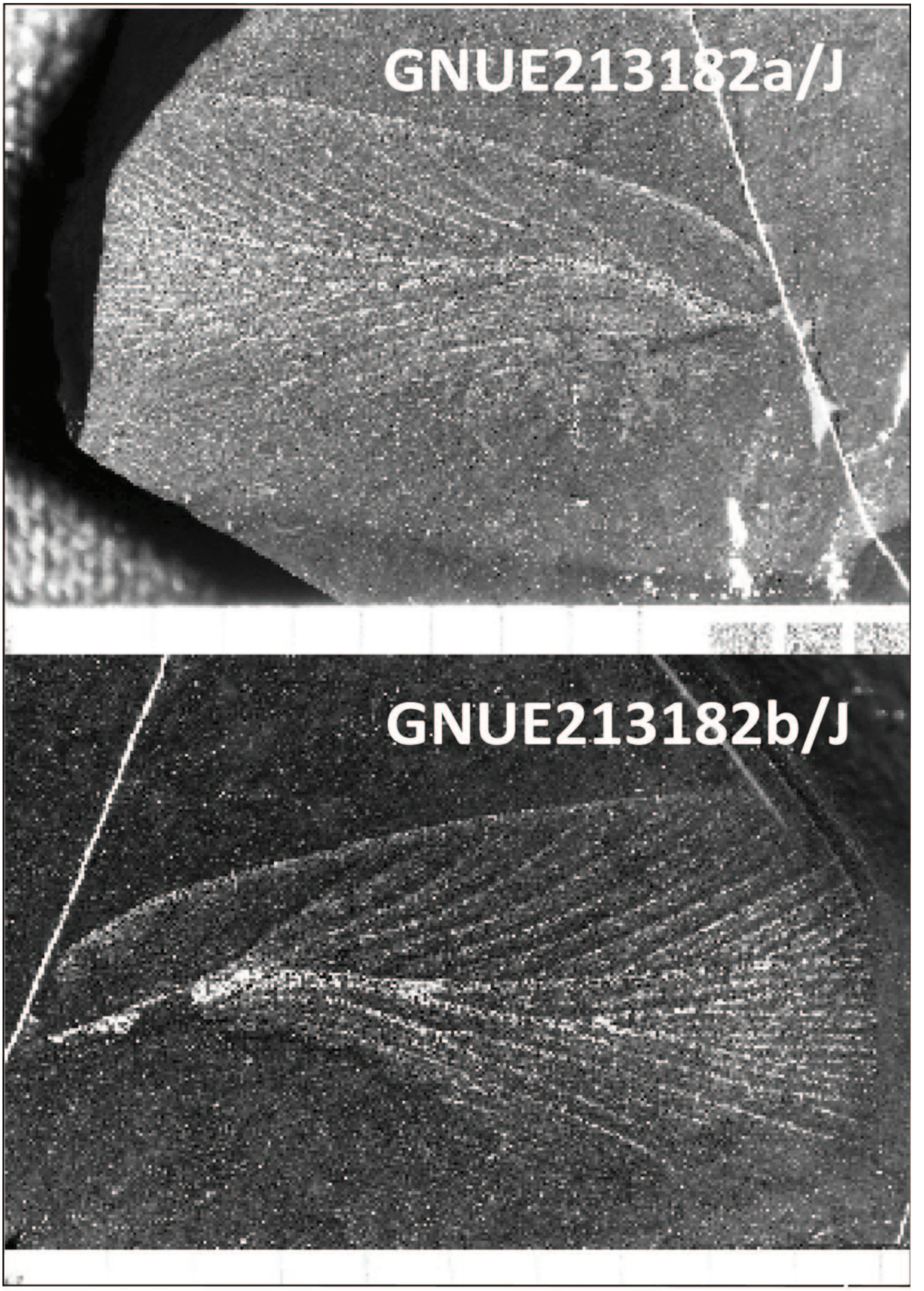
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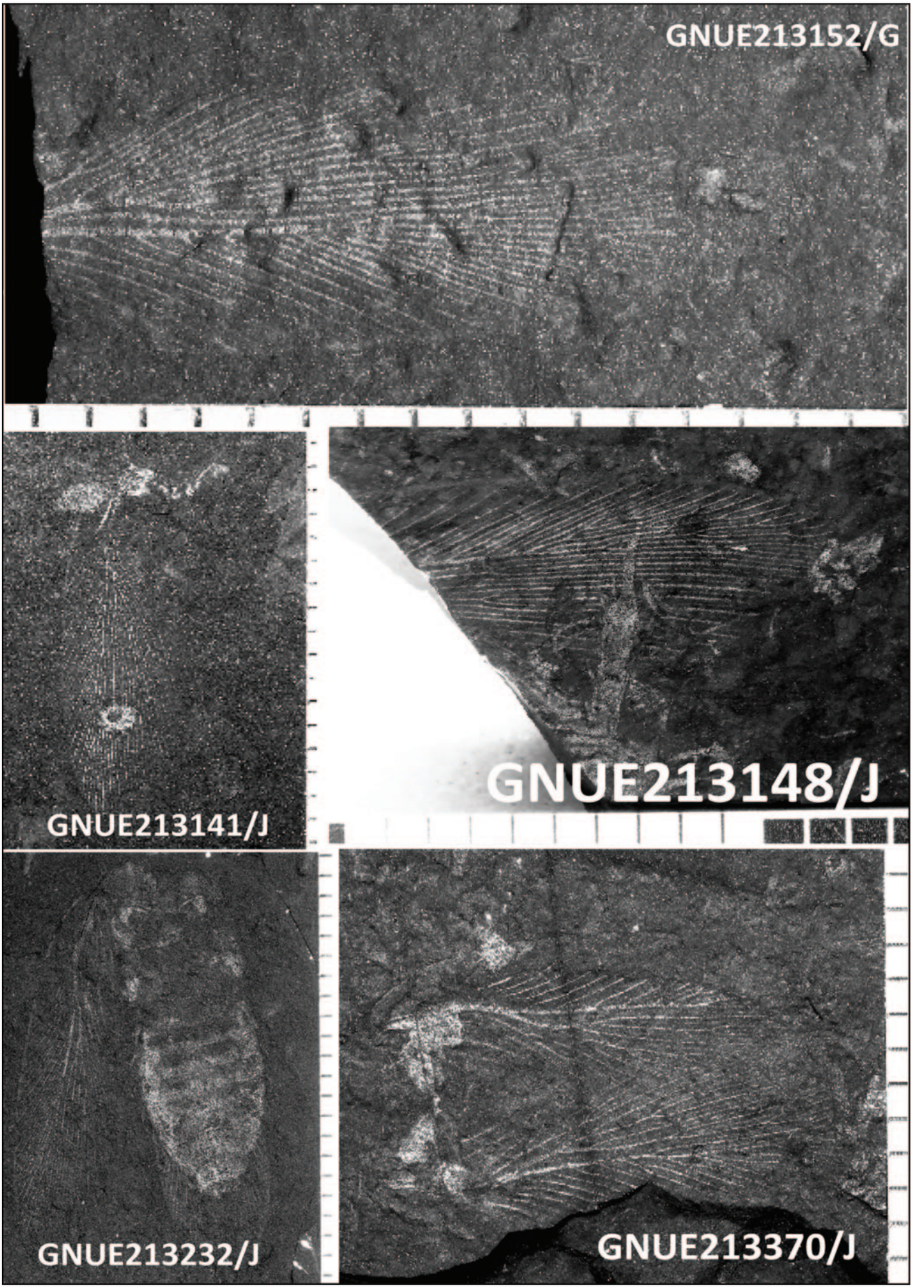
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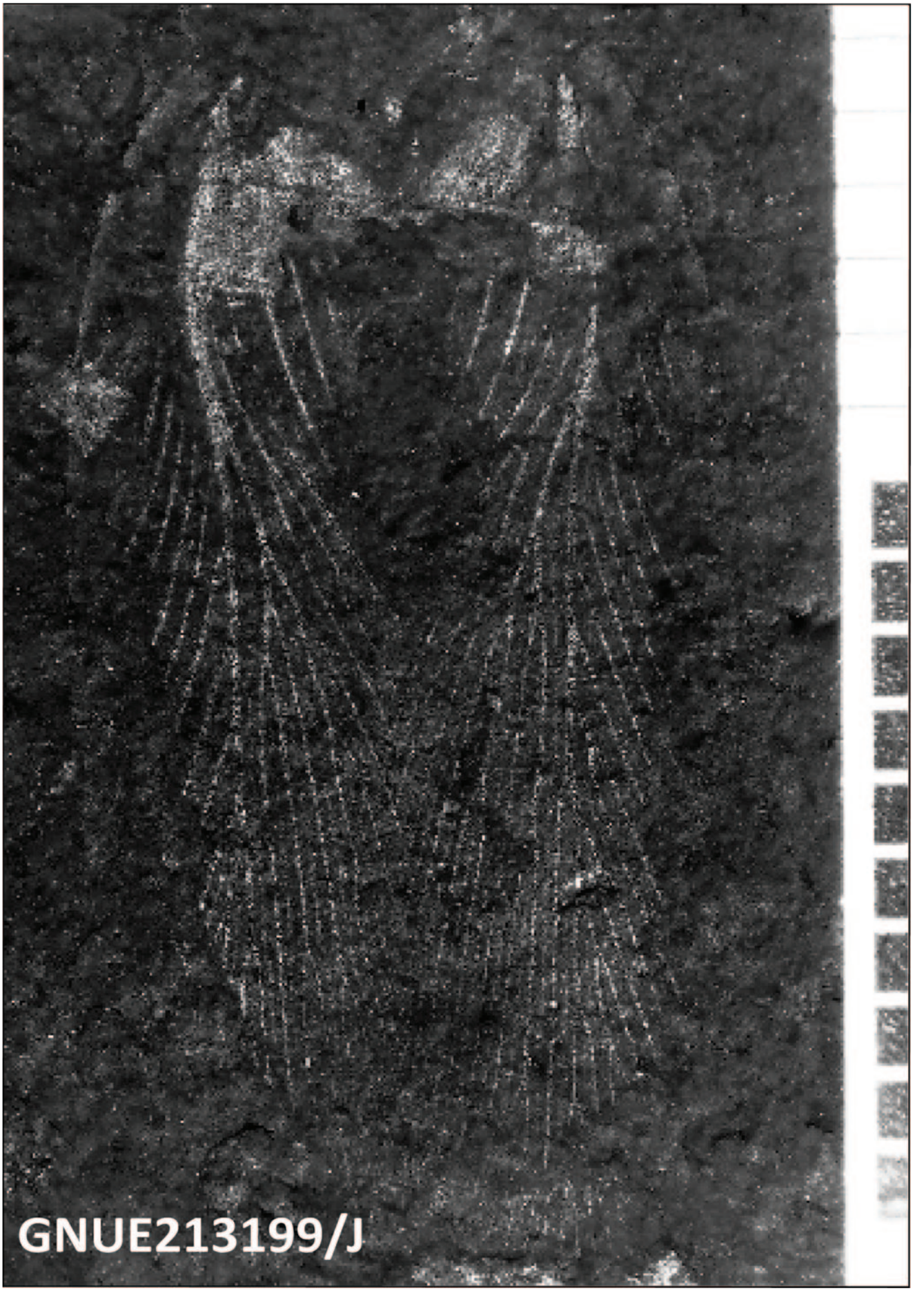
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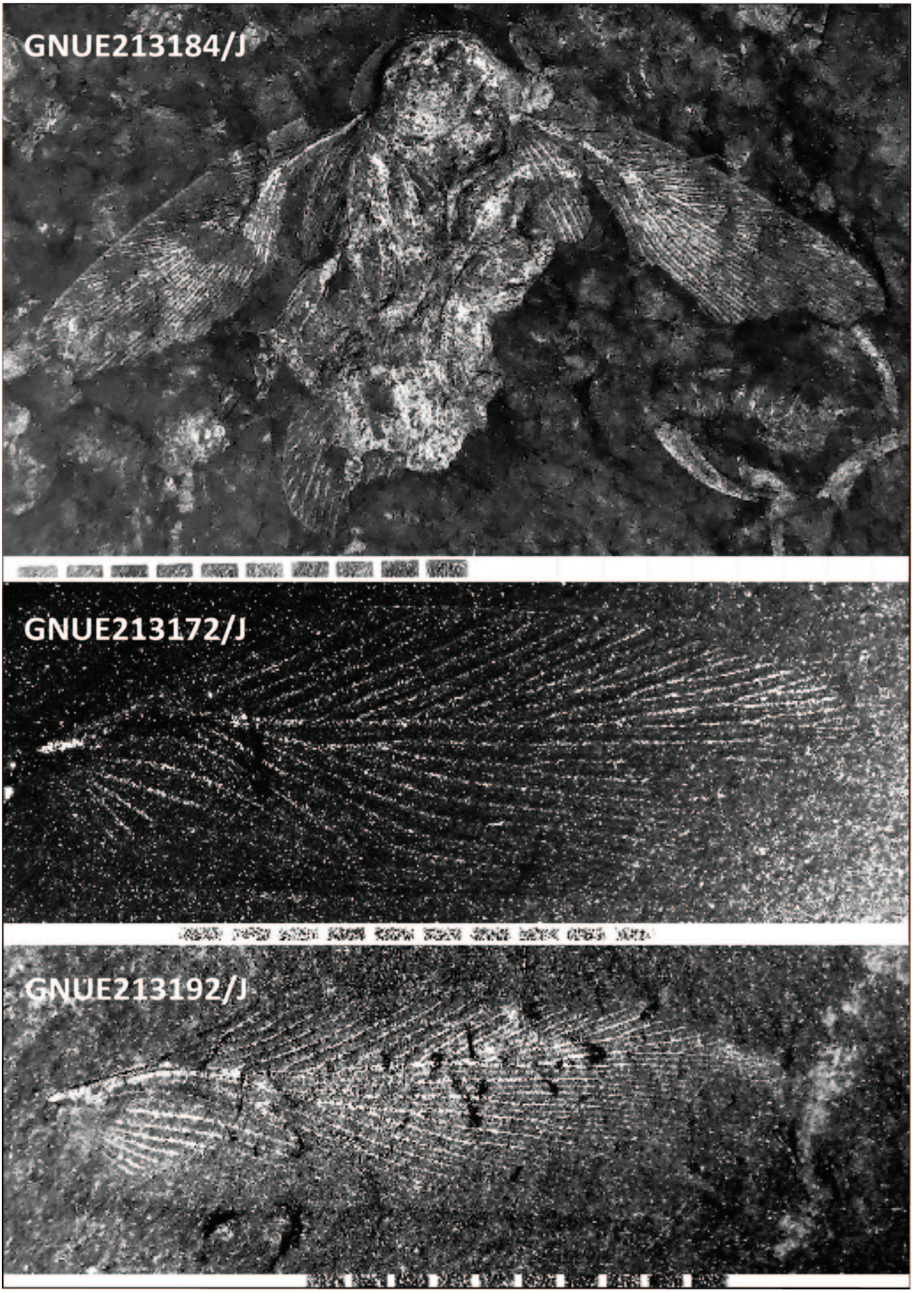
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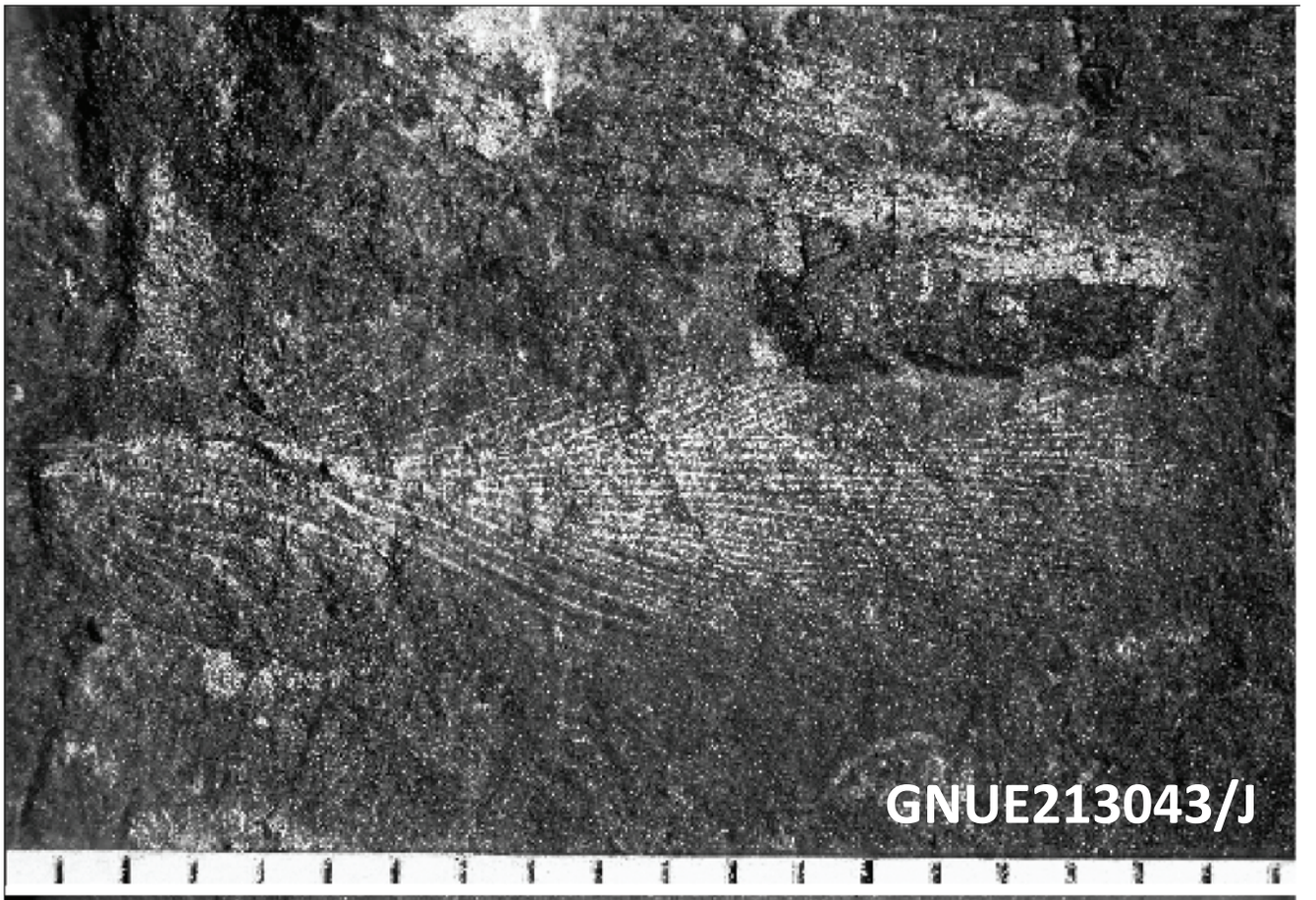
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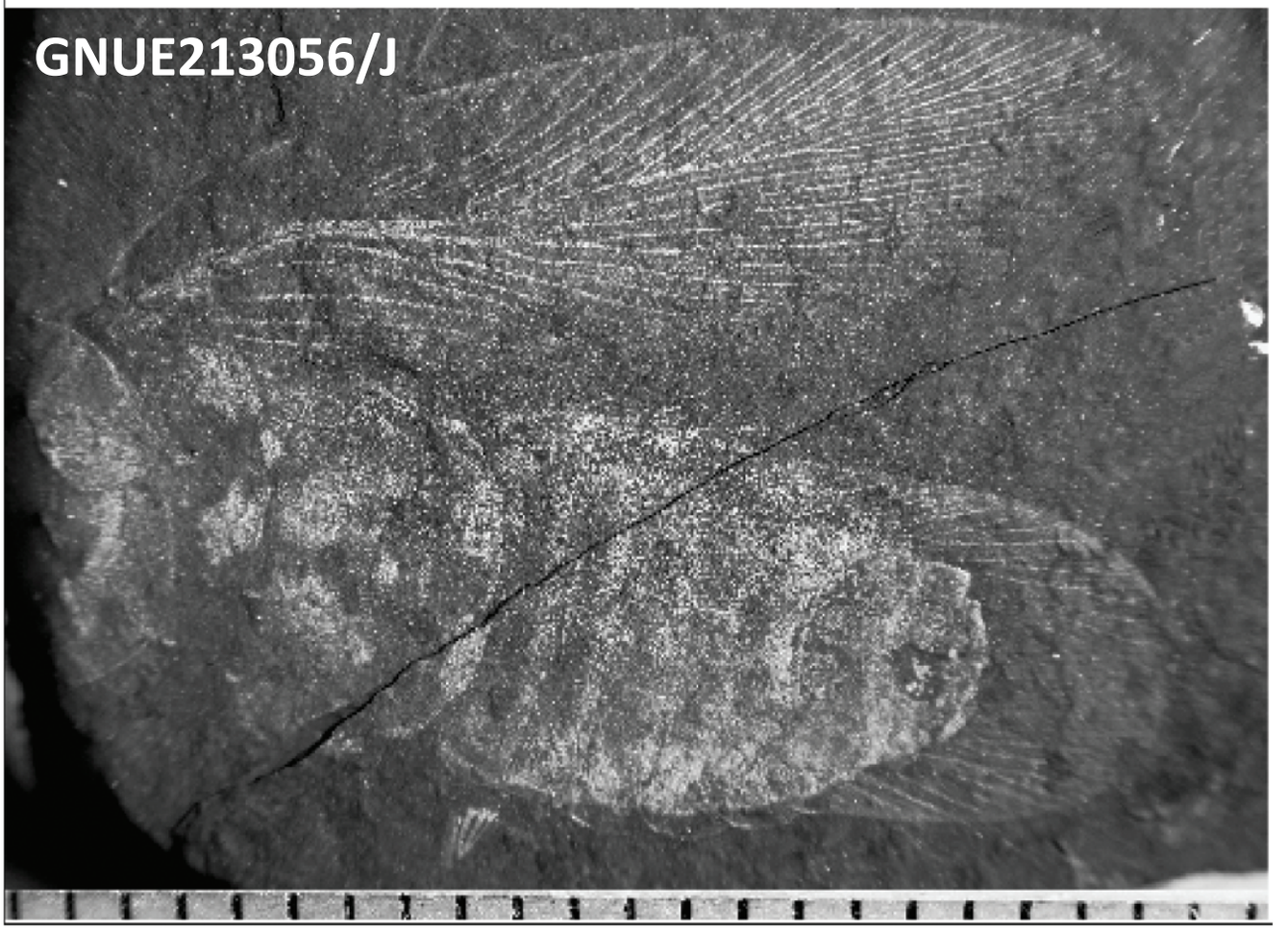
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***Perlucipecta jinjuicola* sp.n. (FigurePs 31-32)**

Holotype: GNUE319. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE/J/323, GNUE213115=213160, GNUE213200, GNUE213307. The same locality as type. GNUE/S/213133, 213134 Sacheon. (Complete specimens.)

Differential diagnosis: Differs from most related species possessing the same pronotal coloration with pale central aperture (*aurea, vrsanskyi, liangiae, santanensis*) in having posterior forewing coloration reaching apex.
Autapomorphies: Coloration seems autapomorhic as in Jurassic species coloration was more restricted
Description. Pronotum oval, transverse with characteristic coloration with darker center and pale aperture within it, and also with pale lateral margins. Legs robust. Forewing rather wide, 7 mm long, with characteristic dark posterior coloration, which reaches apex and also apical anterior coloration. SC simple, R1 with 3 branches, R and RS straight (16 plus 3 or more); M nearly straight with 9 vein meeting margin, stem are anteriorly and posteriorly branched; CuA simplified, straight (5). CuP cut, long, A branched (ca. 10). Intercalaries present all along the surface, cross-veins unpreserved. Hindfemora robust with terminal femoral spur, other spines unpreserved. Tibial spurs numerous, some are broken, some are apparently missing.
Coloration: Total area caculated 18.47 mm^2 (8.4 mm^2 dark)
Derivation of name: The species epithet is a combination of the type locality "Jinju" and a Latin ending 'cola' meaning "dwell"
Character of preservation: 8 complete winged adults
Taphonomy: Exclusively complete specimens with articulated spines suggest no pre-depositional transport. Some spines are broken and some are missing suggesting the holotype was an experienced adult. Generally preservation of legs is blurred suggesting interchange of molecules among specimen and sediment after burial.

***Perlucipecta cyclopica* sp.n. (FigureP 33)**

Holotype: GNUE213104. A pronotum with a forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from all species in more restricted ccoloration and from all species except *santanensis* in having circular simple and pale pronotal aperture.
Autapomorphies: Possibly restriction of coloration
Description: Pronotum oval, transverse with characteristic coloration with darker center and pale curcular aperture within it. Forewing rather wide, 7.6/2 mm long, with transparent membrane and possibly with characteristic dark posterior coloration. SC 3-4, R and RS straight (10 plus 5); M nearly straight with 9 veins meeting margin, stem are anteriorly and posteriorly branched; CuA straight (3). CuP cut, long, A branched. Intercalaries indistinct, cross-veins unpreserved. Hindwing CuA secondarily branched.
Coloration: Total area caculated 13.27 mm^2 (none dark)
Derivation of name: This species is named after a one-eyed giant in Greek mythology and refers to its resemblance of the pronotal pattern.
Character of preservation: 1 complete winged adult
Taphonomy: Complete specimen suggest short pre-depositional transport and rarity in the actuocenosis.

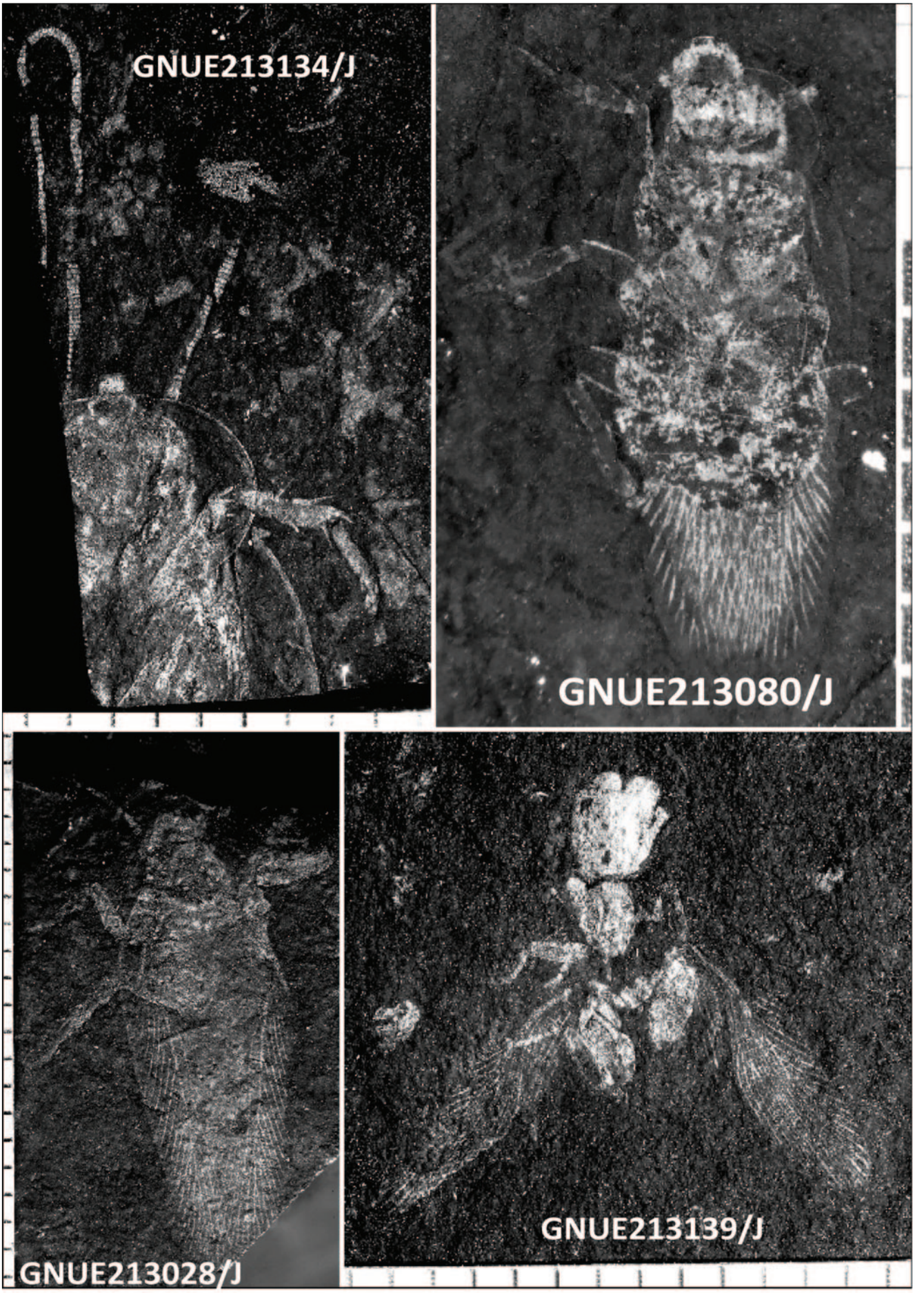
***Perlucipecta major* sp.n. (FigurePs 32-33)**

Holotype: GNUE213363. A complete specimen (preserved forewing and pronotum with head, other parts broken during collection). Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213139. The same locality as type.

Differential diagnosis: Differs from all species in being significantly larger and in lacking central pale coloration (like in *vrsanskyi*, which is much smaller).
Autapomorphies: Coloration seems synapomorhic with *vrsanskyi*, size appears also an autapomorphy.
Description (on the basis of the holotype): Pronotum oval, transverse (/4.8 mm) with colored disc. Forewing rather wide, 13.5/5 mm, with characteristic dark posterior coloration. SC simple, R and RS straight (13 plus 5); M nearly straight with 8 vein meeting margin, stem are anteriorly and posteriorly branched; CuA straight (11). CuP cut, long, A branched (ca. 8). Intercalaries present, cross-veins unpreserved.
Coloration: Total area caculated 44.77 mm^2 (none dark)
Derivation of name: The species epithet is a Latin comparative adjective 'major' meaning "larger" and refers to the body size of the new species.


GNUE213307/S
GNUE213076/J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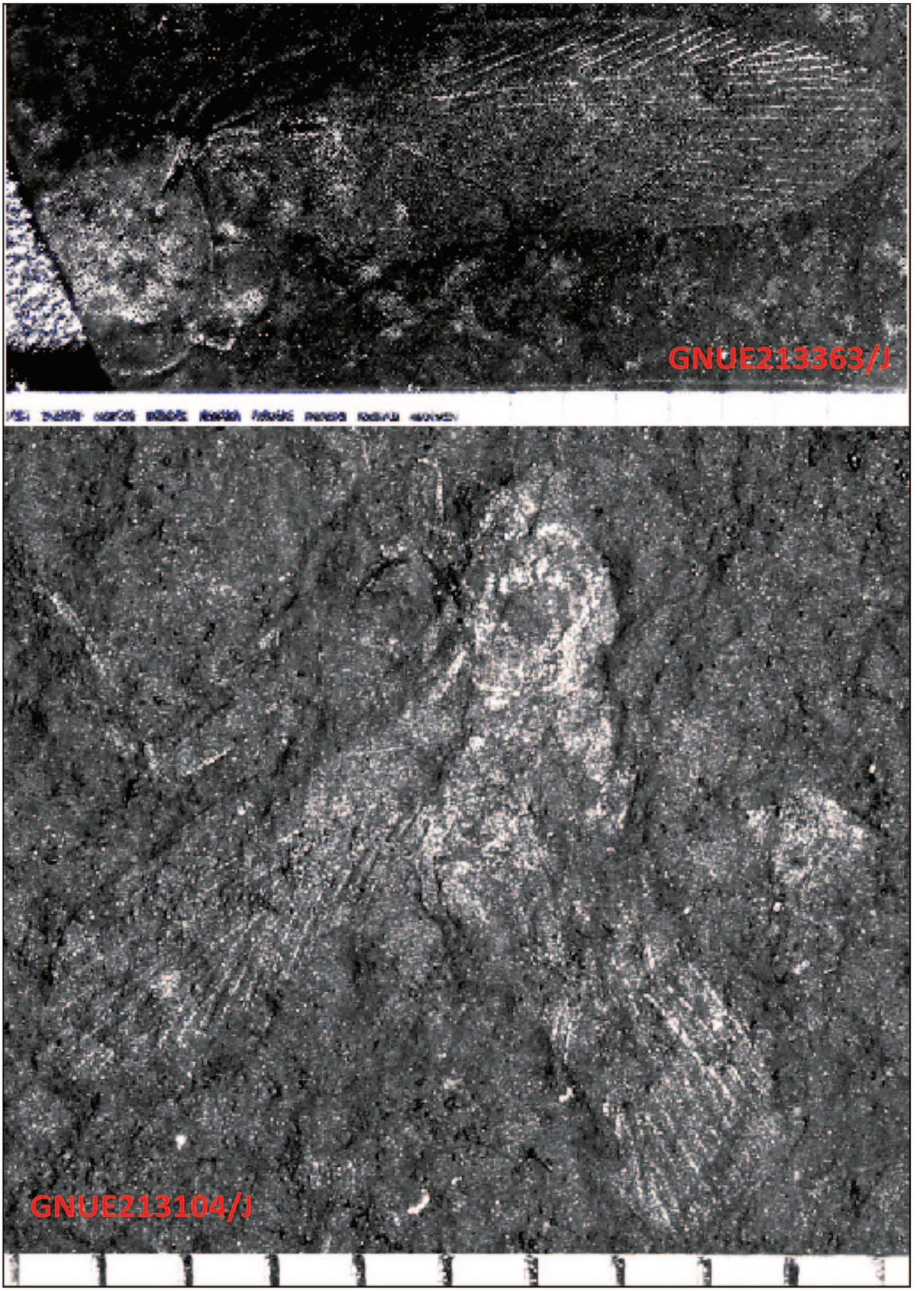

GNUE213363/J
GNUE213104/J

Character of preservation: 2 complete winged adults
Taphonomy: Complete specimens suggest short pre-depositional transport.

Genus *Praeblattella* Vršanský, 2003

Type species: *P. ponomarenkoi* Vršanský, 2003

Diagnosis (after Vršanský 2003b): Small to medium-sized cockroaches. Forewing with parallel wing margins; 2–4 branched Sc; RS may be differentiated within R; R is straight; M comparatively rich with 4–5 branches or more; Cu branched, with 3 veins or more.

Composition: *P. dichotoma* Vršanský, 2003; *P. elegans* Vršanský, 2003; *P. zrnko* Vršanský, 2003 (all Lower Cretaceous, Bon Tsagaan Nuur, Mongolia); *P. jurassica* Vršanský, 2020 (Middle or Upper Jurassic, Bakhar, Mongolia); *P. inexpecta* Oyama, Yukawa et Imai, 2021; *P. arcuata* Oyama, Yukawa et Imai, 2021 (both Lower Cretaceous, Fukui, Japan); *P. sola* Majtaník, 2020 (Lower Cretaceous, Tasgorosay, Kazakhstan); *P. patrickmuelleri* Šmídová, 2024, *P. continuosa* Šmídová, 2024 (both North Myanmar amber); *P. borealis* (Viliyui, Russian Federation), undescribed species is known from the New Jersey amber.
Stratigrapic range: Middle Jurassic – Upper Cretaceous.
Geographic range: Cosmopolitan.

Praeblattella tinctoria sp.n. (FigurePs 35-37)

Holotype. GNUE213020. A complete specimen without head and extremities. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

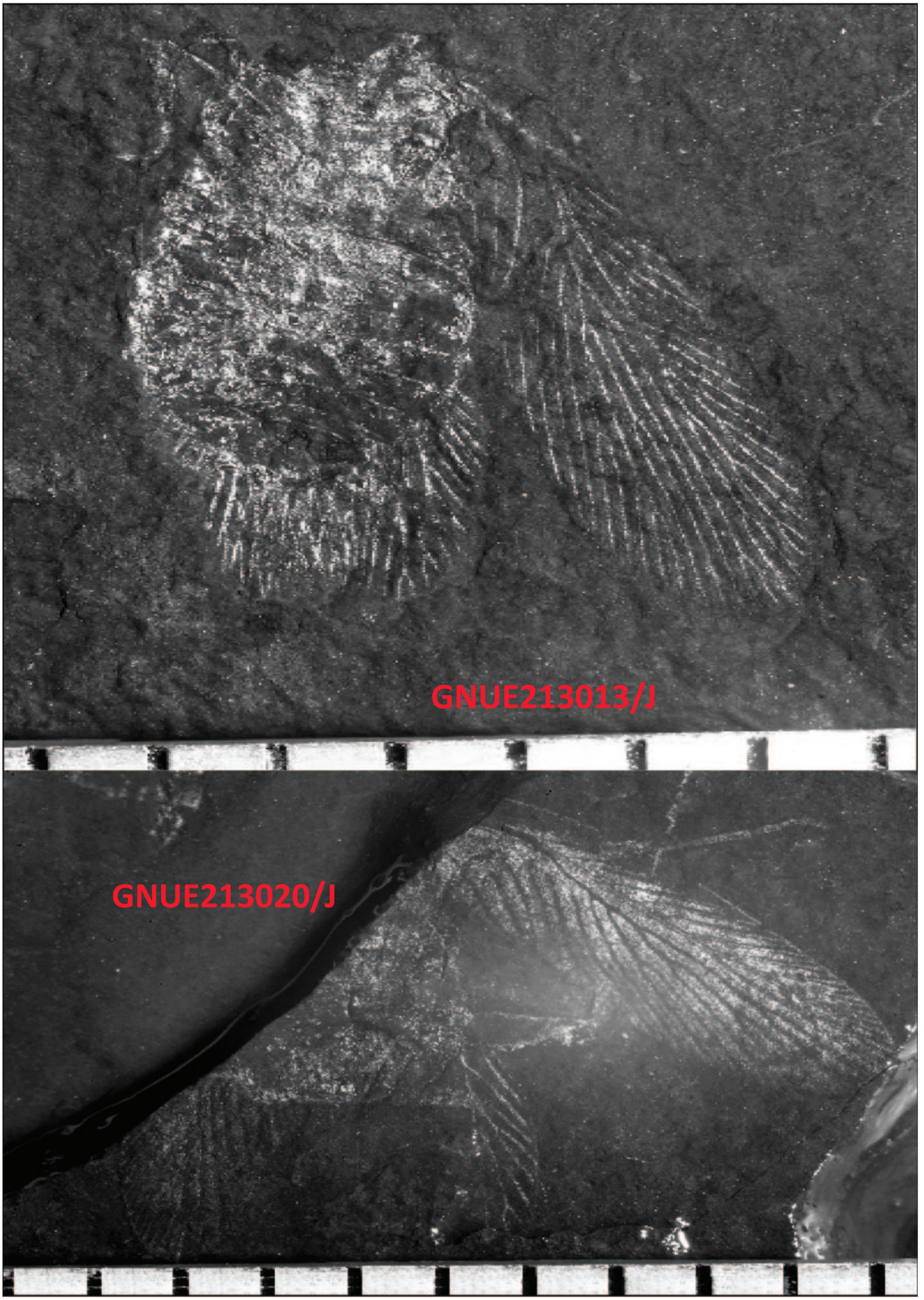
Additional material**:** DG0013, GNUE213146, GNUE213333 (complete specimens).

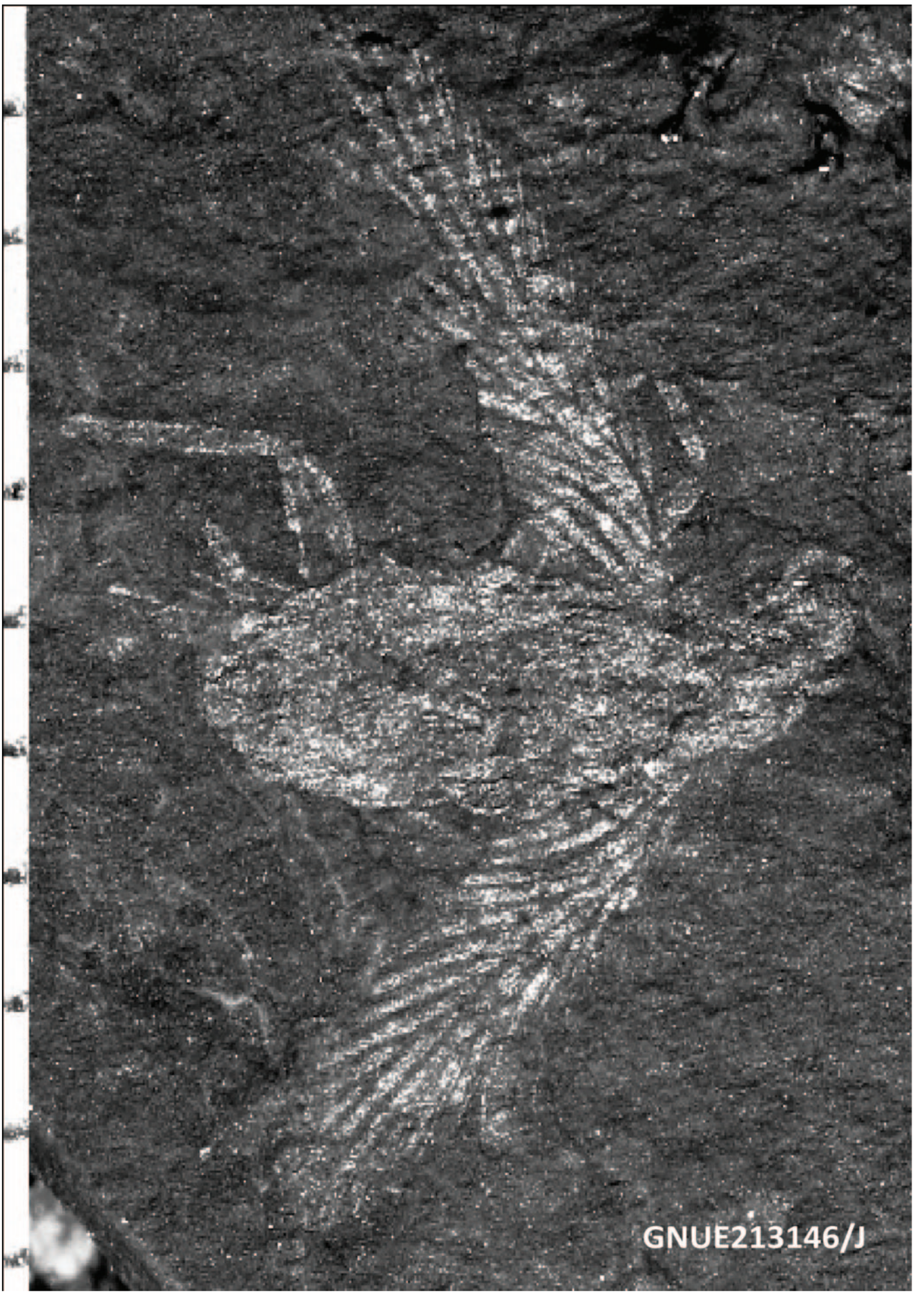
Differential diagnosis: Differs from most species in having intercalary coloration, more extensive than in the type species, *elegans*, undescribed species from riparite, *patrickmuelleri* and *continuosa*.
Autapomorphies: High degree of coloration, intercalaries reduced to apical parts of forewing
Description: Forewing length/width 6.4/2.4 mm. SC simple or with 2 simple branches. R straight, with simply branched R1 and RS differentiated (10 plus 2). M expanded (9-11), CuA reduced to 2 straight veins not following margin. CuP fluent, A branched, simple, reduced in number (3). Intercalaries distinct in forewing apex, cross-veins indistinct. Hindwing possibly with undifferentiated RS (8).
Coloration: Total area not calculated.
Derivation of name: The species epithet is derived from a Latin adjective 'tinctorius' meaning "of dyeing) and refers to the high-degree coloration of its forewings.
Mutation: 213333 has A-A mutual fusion.
Character of preservation: Three complete specimens without extremities, one complete forewing.
Taphonomy: Disarticulated extremities combined with articulated hindwings and forewing clavus suggest short pre-depositional transport.

Praeblattella decolor sp.n. (FigureP 35)

Holotype: GNUE213013. A complete specimen without head and extremities. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from most species in entirely lacking coloration. From *dichotoma, inexpecta* and *jurassica* it difffers in lacking sophisticated branching patterns, *zrnko* is much smaller and miniaturised. *arcuata* differ in being significantly larger and in having wider distance among basal R veins.
Autapomorphies: None because of highly plesiomorphic appearance.
Description: Forewing length 7 mm. SC simple or with 2 simple branches. R straight, with simply branched R1 and RS differentiated (11 plus 5). M expanded (12), CuA reduced to 3 straight veins not following margin. CuP fluent, A branched, but mostly simple. No intercalaries or cross-veins distinct. Hindwing with differentiated RS (6) and branched M (5). Body with nearly parallel tergal margins, subgenital plate differentiated, carved, probably contained two short styli.
Coloration: Total area caculated 6.05 mm^2 (none dark)
Remarks: Plesiomorphic states combined with parallel margin suggest a possibility of this genus (and related species) representing the stem for *Piniblattella* (alternative stem is *Archimesoblatta*).
Derivation of name: The species epithet 'decolor' in Latin means "discolored" and indicates the coloration of the new species.
Character of preservation: One complete specimen without extremities.
Taphonomy: Disarticulated extremities combined with


GNUE213013/J
GNUE213020/J


GNUE213146/J


GNUE213333/J

articulated hindwings and forewing clavus suggest short pre-depositional transport.

Genus *Mongolblatta* Vršanský, 2004

Type species: *Mongolblatta accurata* Vršanský, 2004
Type locality: Shar-Teg, Mongolia
Type horizon: Tithonian Upper Jurassic

Composition: *Mongolblatta sanguinea* Barna, 2014 (Chernovskie Kopi); *Mongolblatta sendii* Hinkelman, 2021 (burmite).

Stratigraphic range: Tithonian-Cenomanian (145– 98 Ma)

Geographic range: Upper Jurassic/Lower Cretaceous of Shar-Teg (Mongolia), Chernovskie Kopi (Russia) and burmite (Myanmar).

Diagnosis (after Hinkelman 2021): Forewing leatherous, colored forewings with parallel margins. Venation is regular and overall reduced with unequal distance among some veins, a branched and short Sc, differentiated RS, richly branched M and poorly branched CuA. Anal veins are mostly simple and contain punctuated intercalaries. Pronotum bears a unique coloration.

***Mongolblatta koreanensis* sp.n. (FigurePs 39-41)**

Holotype: GNUE213053. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213026, 213051, 213114 Complete specimens. The same locality as type.

Differential diagnosis: Differs from congeners in larger size (*acurrata* 10 mm; *sanguinea* 8 mm; *sendii* 9 mm).
Autapomorphies: None detected, bigger size is possibly a plesiomorphy
Description: Antenna standard (not thin, not wide). Legs robust. Forewing monochromatically colored, 11.3-11.8 mm long.
Coloration: Total area not calculated.
Derivation of name: Derived from the name of Korea.
Character of preservation: 4 completely preserved adults.

Taphonomy: Completely preserved adults with antenna suggest none pre-depositional transport. Preservation is very weak, blurred, suggesting element transport among sediment and insect sample.

Genus *Archimesoblatta* Vršanský, 2003

Type species: *Archimesoblatta altera* Vršanský, 2003
Type locality: Bon Tsagaan, Mongolia
Type horizon: Aptian Lower Cretaceous

Composition: *A. altera* Vršanský, 2003 (Baissa), *A. shiva* Engel et Fuente, 2012 (Kota), *A. kopi* Barna, 2014 (Chernovskie Kopi).

Stratigraphic range: Tithonian-Cenomanian (148– 98 Ma)

Geographic range: Cosmopolitan

Diagnosis (after Vršanský 2003b): Elongate roaches generally with less parallel wing margins, with strongly curved and secondarily branched veins and less curved margin of the pronotum.
Remarks. The form and venation of forewing generally resemble that of early "Blattellidae" (*Piniblattella*), and *Hispanoblatta* Martínez-Delclós, 1993, but has less parallel wing margins (similar to *Praeblattella*). From all genera of Mesoblattinidae except *Brachymesoblatta,* it differs in having veins generally less straight. *Brachymesoblatta* differ in that A branches end in the basal third of clavus. The new genus is closely related to an undescribed genus from the Barremian of Europe ("*Artitocoblatta*" *colominasi* (Meunier, 1914)). For difference of advanced Mesoblattinidae and early Blattellidae on *Praeblattella*.

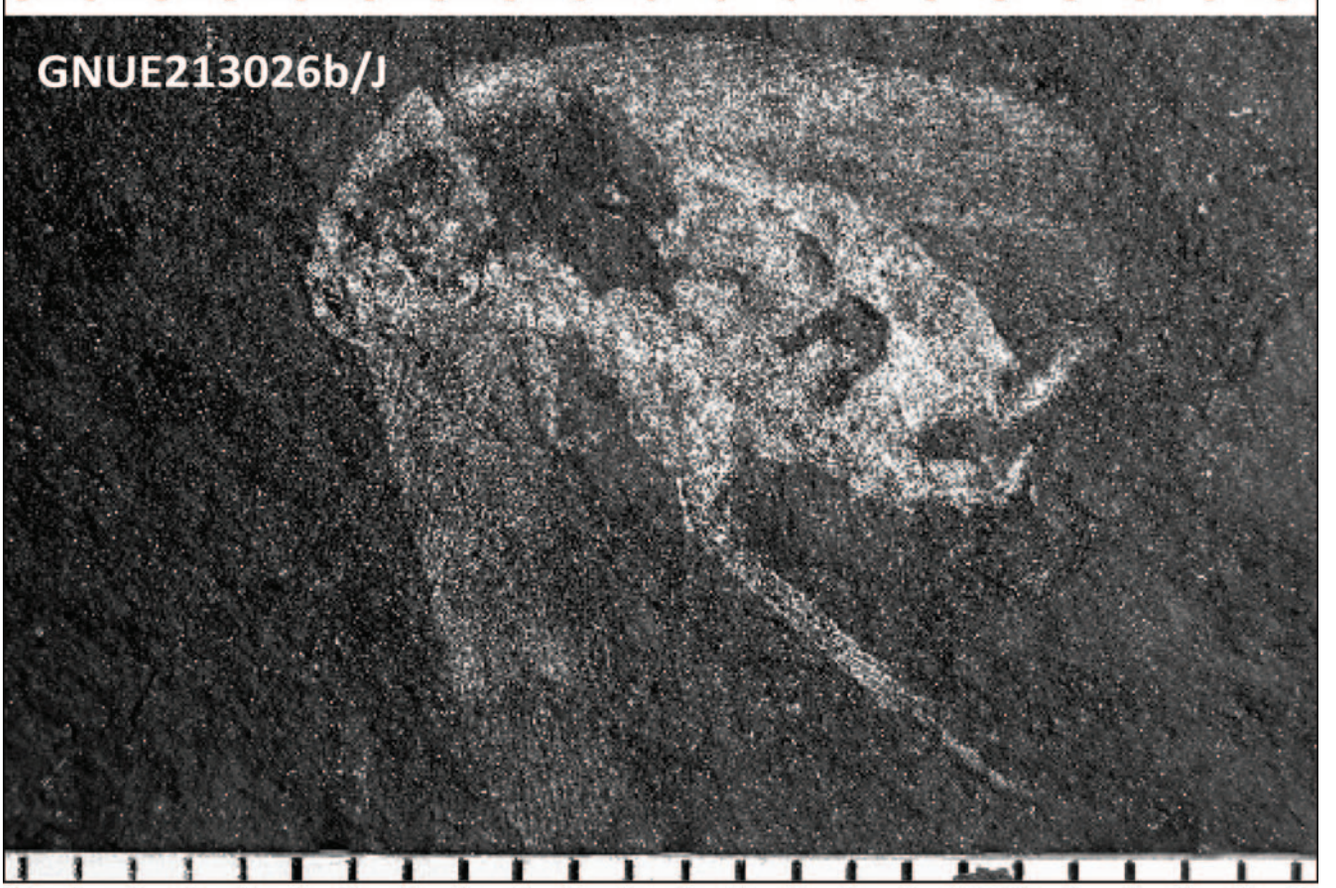
***Archimesoblatta basopicta* sp.n. (FigurePs 42-46)**

Holotype. GNUE213014=213021. A completely articulated forewing (with clavus). Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213234=213326, GNUE213256, GNUE/J/213268=213319 (complete specimens). GNUE/J/213030FF, GNUE213100, GNUE213103, GNUE213106 (containing loonoouool 213112 forewings), GNUE213123=213187, GNUE213124, GNUE213125, GNUE213137FF, GNUE213176, GNUE213178, GNUE213366 (forewings). The same locality as the type.
Differential diagnosis: Differs from all reresentatives of


GNUE213053/J


GNUE213026a/J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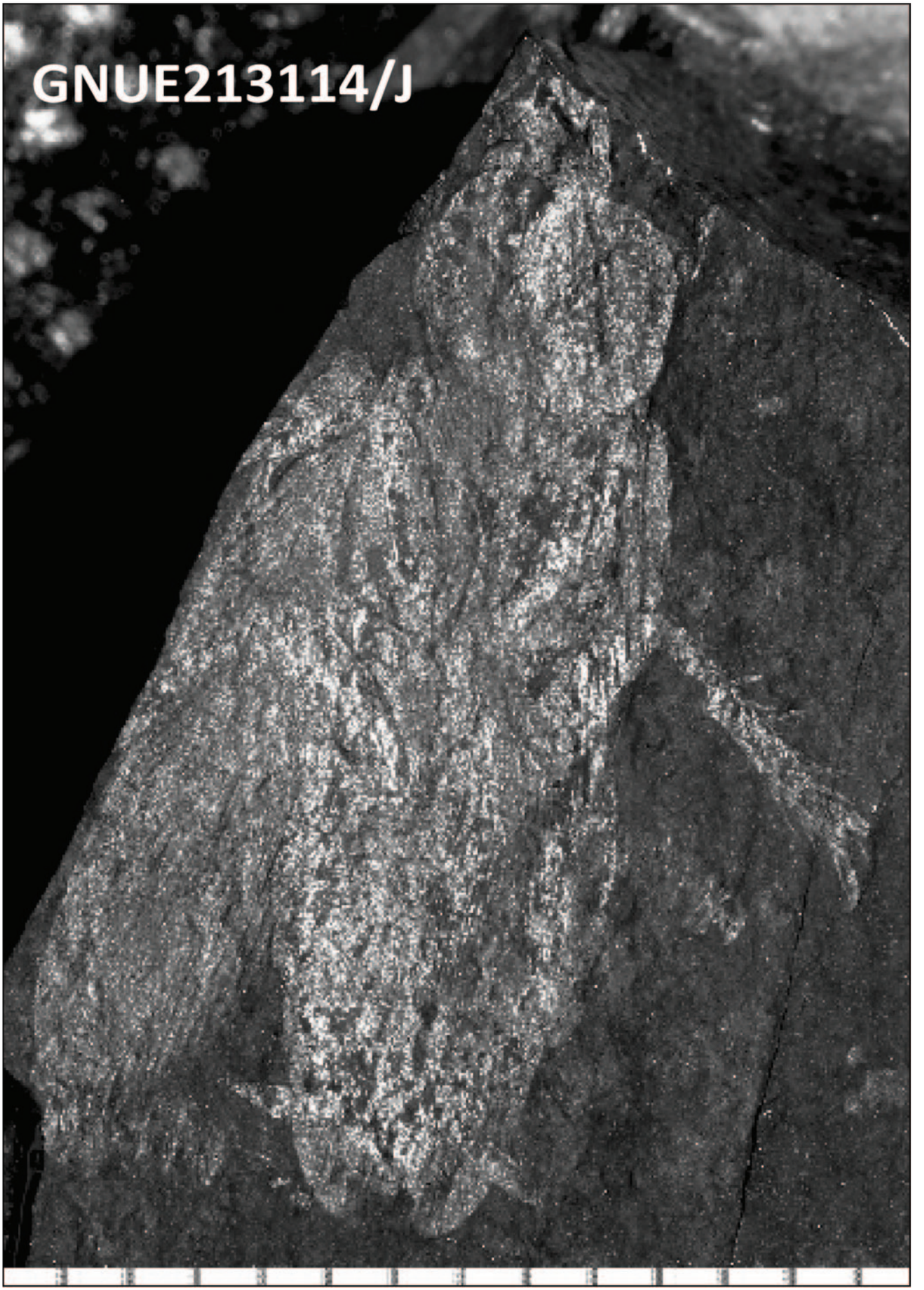
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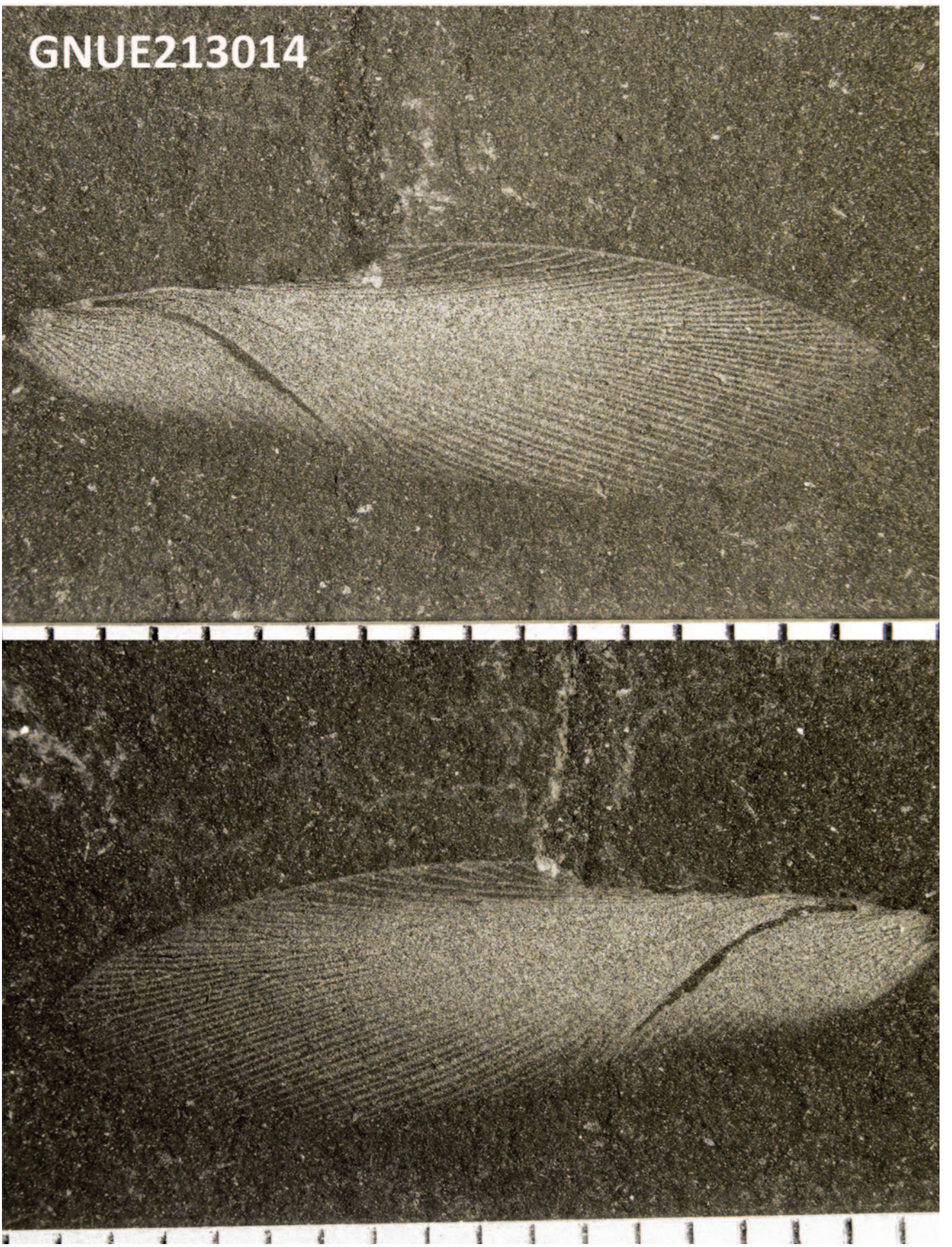
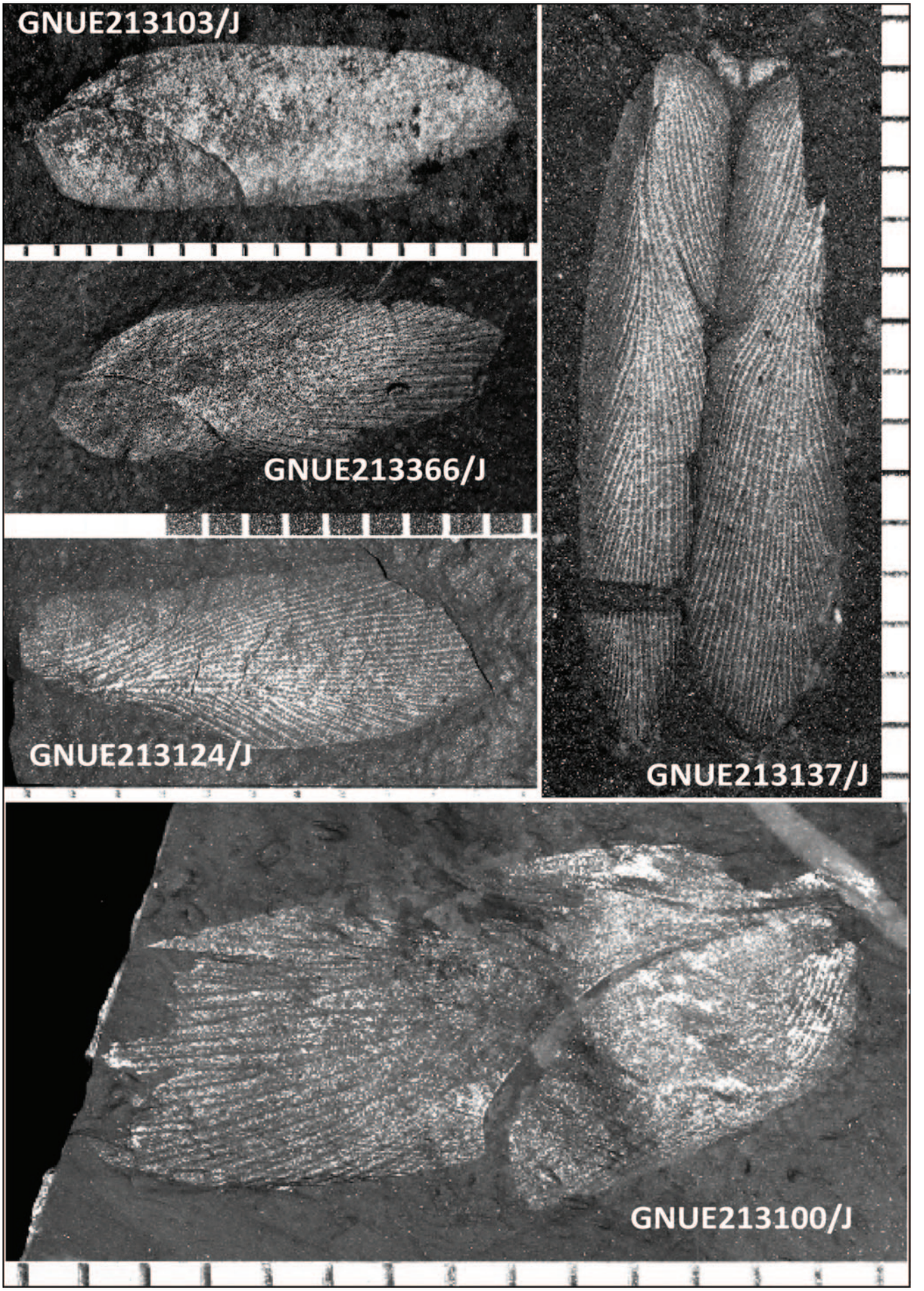

GNUE213021
GNUE213014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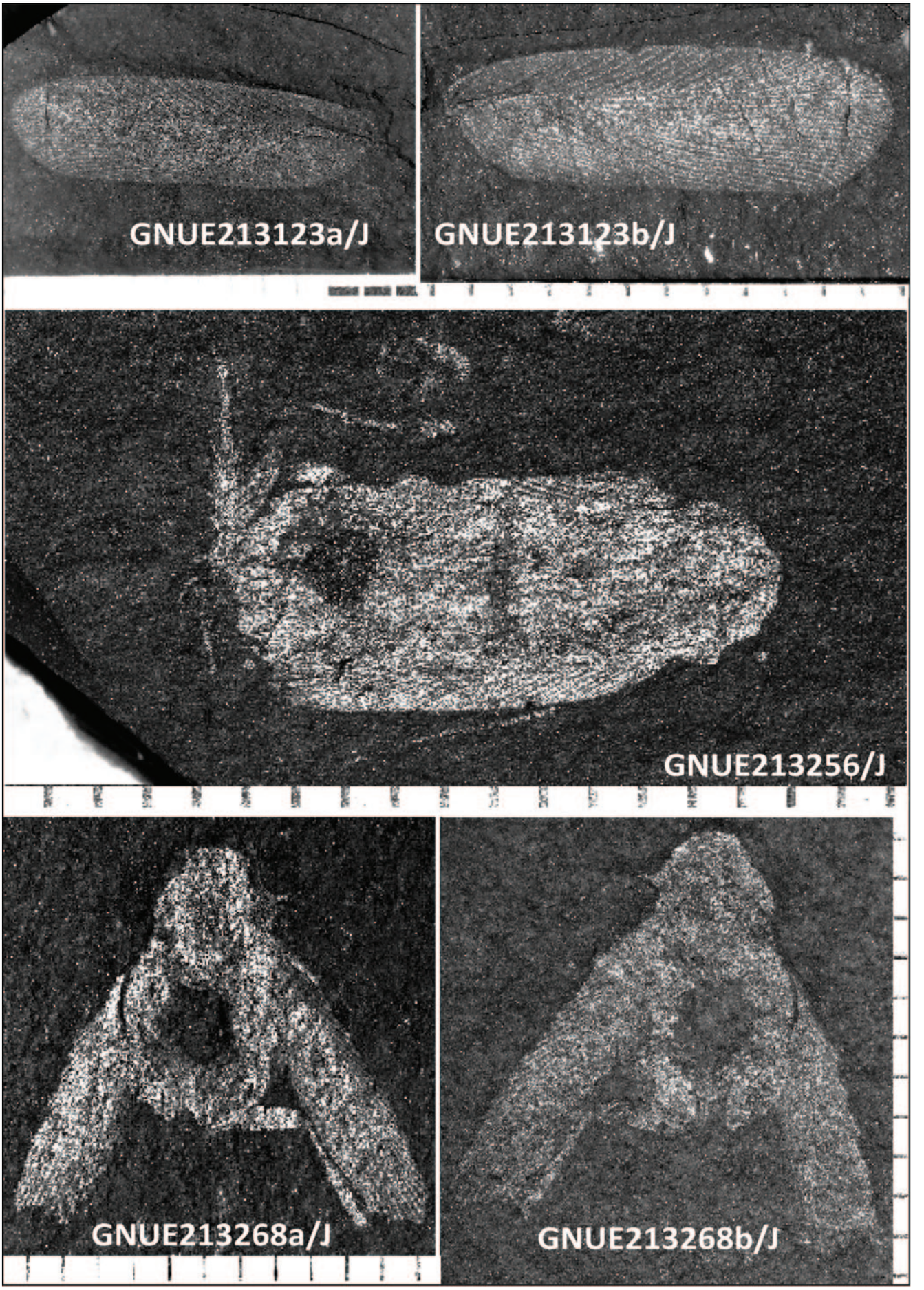
GNUE213124/J
GNUE213137/J
GNUE213100/J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GNUE213256/J
GNUE213268a/J
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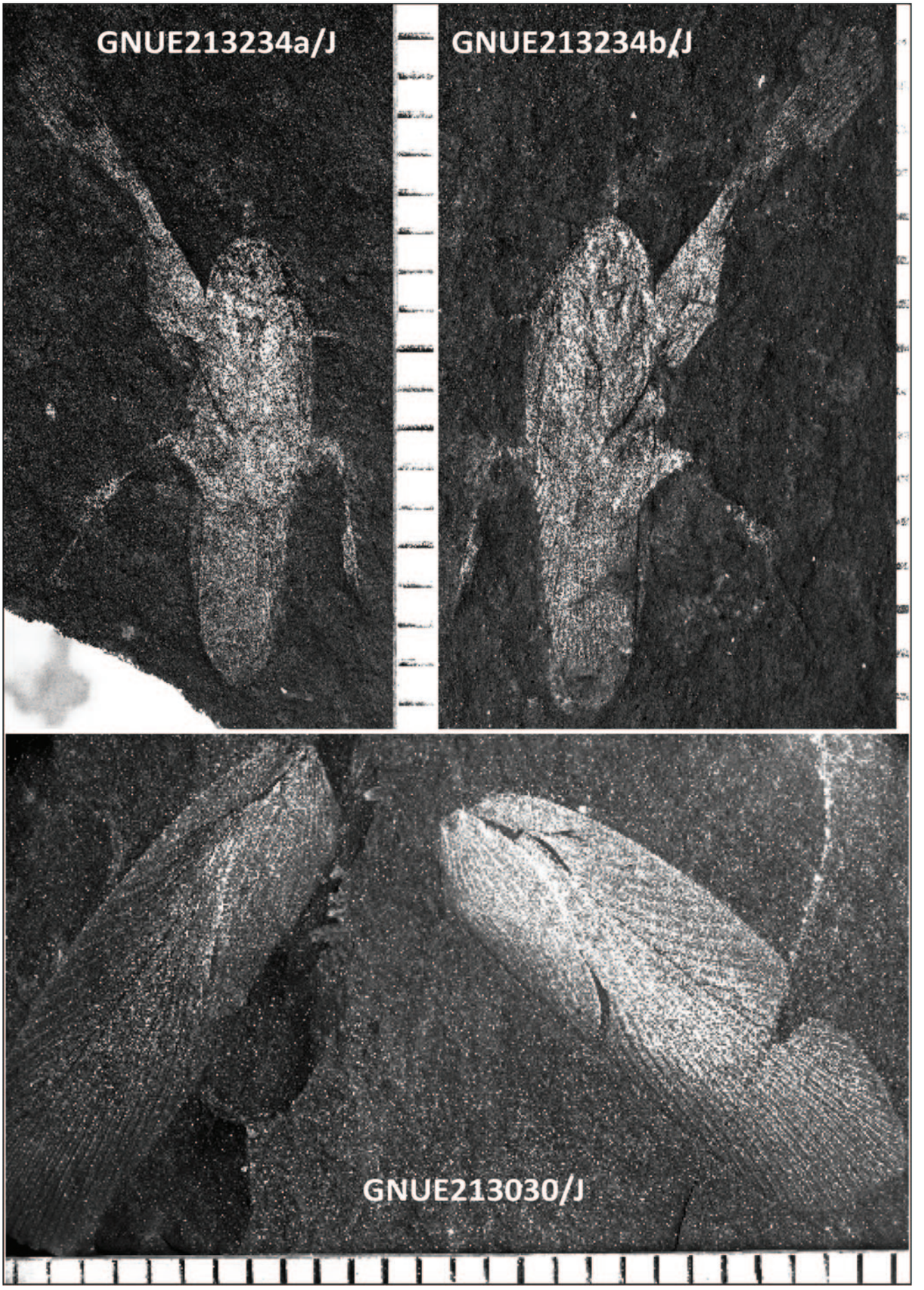
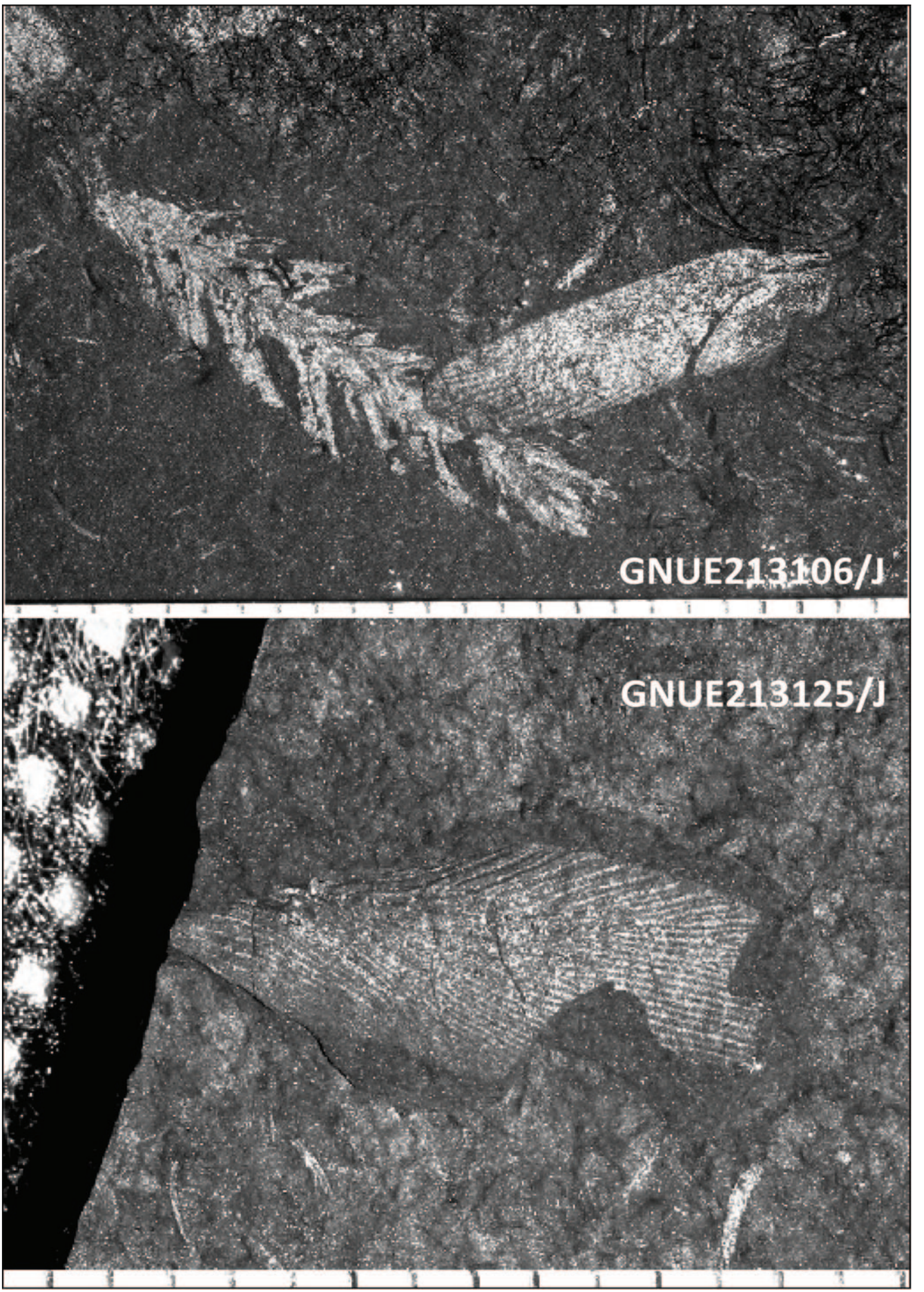

GNUE213234a/J
GNUE213234b/J
GNUE213030/J


GNUE213106/J
GNUE213125/J

the genus in having colored basal area of the forewing.
Autapomorphies: Membrane coloration.
Description: Forewing with subparallel margins (12-17-18/3.4-6 mm), membrane transparent, hardly colored basally. Intercalaries distinct all along the surface, cross-vein indistinct. Sc with 3-6 branches (GNUE213030). R straight, with 12-13 secondary dichotomised veins at margin, long, RS (3) differentiated. M straight (10-12); CuA nearly straight, with 7-12 veins at margin. CuP simple, fluent, A dichotomised (8-10).
Coloration: Total area caculated 58.09 mm^2.
Derivation of name:. The species epithet is derived from two Latin words 'base' and 'pictus', meaning "base" and "paint", and refers to the colored base of its forewings.
Character of preservation: 3 complete**,** 2 both articulated forewings, 10 isolated articulated forewing (with clavus)**.**
Taphonomy: Association of both forewings and an isolated forewing suggest short pre-depositional transport.
Remarks: This taxon is classified within genus on the basis of plesiomorphic characters with expanded venation. Genus is otherwise strongly conservative, thus no relationships were traced.

Genus *Spinaeblattina* Hinkelman, 2019

Type species: *Spinaeblattina myanmarensis* Hinkelman, 2019.
Type locality: Hukawng, North Myanmar
Type horizon: Cenomanian Lower Cretaceous

Composition: *Spinaeblattina baekthoensis* So et Won, 2021 (Sinuiju); *S. yixianensis* (Gao et al., 2018); Barremian, (Yixian, China); *S. tuanwangensis* Zhang, Chen et Luo, 2024 (Layiang).
Geographic range: Cosmopolitan
Stratigraphic range: Barremian-Cenomanian

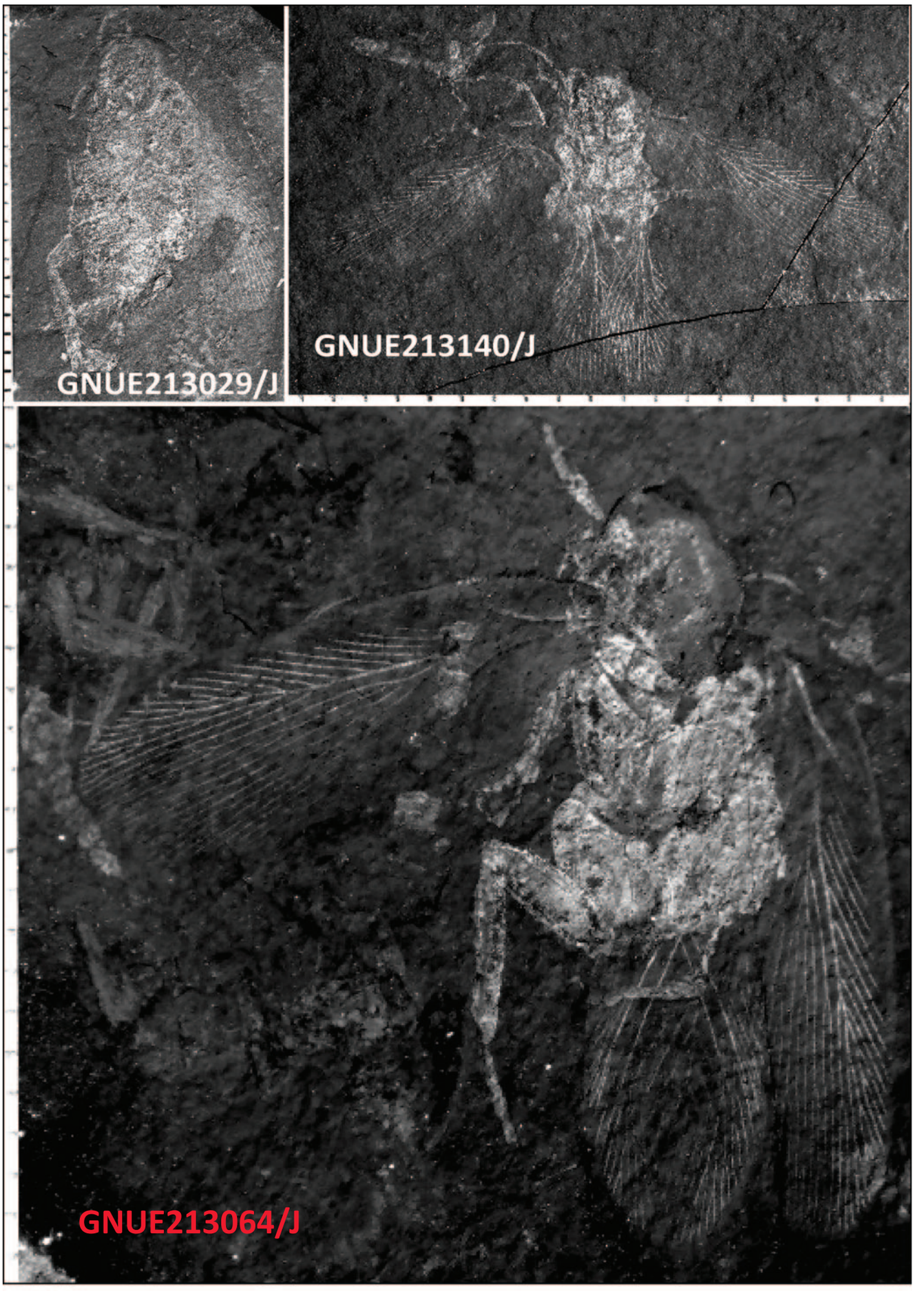
Diagnosis (after Hinkelman 2019): Autapomorphic in straight long simple branches, which do not occur in any earlier than Cretaceous taxon, venation regular throughout the surface, no intercalaries present in ancestral Phyloblattidae, costal field extremely narrow if compared to any other taxon in this lineage (and also than any Cretaceous taxon).

Spinaeblattina varilabilitta sp.n. (FigurePs 48-49)

Holotype: GNUE213064. A complete winged adult. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material**:** GNUE308, GNUE213028, GNUE213029, GNUE213135, GNUE213140, DGOO1. Complete specimens. The same locality as the type.

Differential diagnosis: Differs from all species except from *S. tuanwangensis,* its sister species, in having simple pronotal coloration consisting of a simple aperture and lacking "face". Its sister species from Layiang is smaller.
Autapomorphies: None as simple pronotal coloration appears plesiomorphic
Description: Pronotum transverse, pale, with dark disc and pale transverse aperture inside it. Forewing elongate, with parallel margins (12/3 mm). Sc simply dichotomised (2). R straight, R1 and RS differentiated (13-16, 3-7; in holotype RS2 it is also differentiated (2)); M expanded to several stems, with 14-15 veins at margin. CuA reduced to 3 longitudinally running branches. CuP sharpy cut, A simple or simply branched (7 or more).
Hindwing with simple SC, R1 and RS differentiated (4, 6-7), both connected with 2-3 short blind connections. M simplified to 2 branches at margin. CuA expanded, with 15 veins, CuP simple. Vannus folding weer-like.
Foretarsus very long (2.3 mm), with small arolium. Midlegs robust, femur robust with terminal femoral spur. Tibia 1.6 mm long and 0.3 mm wide, heavily carinated with spurs (ca. 10). Hindfemur robust (3/0.8 mm), hindtibia also robust (3.2/0.5 mm) and heavily carinated with 13 spurs up to 0.5 mm long.
Coloration: Total area caculated 53.56 mm^2 (none dark)
Mutations: Mutual M-M fusion is asymmetrically present in holotype specimen. Also the differentiiated "second" RS is very unusual and might represent a mutation.
Derivation of name: Name after deformed variability and lability.
Character of preservation: 7 competely articulated winged adults.
Taphonomy: Completely winged individuals suggest no pre-depositional transport. Some spurs are apparently missing suggesting a damage during life and thus experienced individuals (308).
Remarks: Forewings are indiscernible from *Piniblattella*, explaining the earlier categorisation of *S. yixianensis* withing the genus *Piniblattella*. Furthermore, blind connections of hindwing R1 with RS are diagnostic for *Piniblattella vitimica* Vishniakova, 1968 and thought to represent a diagnostic character of this species. Moreover, close relation is revealed for *Perlucipecta* with identical pronotal coloration and highly similar venation scheme just with more expanded SC and colored posterior forewing halve. This relation is further exemplified


GNUE213029/J
GNUE213140/J
GNUE213064/J


GNUE213135/J

with *S. baekthoensis,* which has "face" pronotal pattern and at the same time coloration identical with *Perlucipecta*.

Genus *Jinjublatta* gen.n.

Type species: *Jinjublatta cascadaerrorum* sp.n., and by monotypy.

Differential diagnosis: Differs from all Mesoblattinidae in having colored intercalary space (synapomorphic with *Praeblattella*). From *Praeblattella* it differs in having colored R stem and in lacking intercalary coloration in most of the forewing (species of *Praeblattella* either do not have IC coloration at all or have it throughout the forewings), and in unique aposematic pronotum.
Autapomorphies: Interrupted coloration of veins, dot on pronotum and strongly colored R stem.
Description: as for species.
Remarks: Presence of colored intercalaries under lack of strong specialisations suggests derivation from *Praeblattella*. The aposematic coloration suggest rather tropical than subtropical environment (see Hinkelman 2023).
Derivation of name: after Jinju and genus name *Blatta*.

***Jinjublatta cascadaerrorum* gen. et sp.n. (FigureP 51)**

Holotype: GNUE(235= 213315)=213067. Pronotum with head particles and both partially preserved forewings. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Description: Palp short, terminal segmented elongated. Pronotum oval, simple, transverse 4.8/5.8 mm. Forewing elongate, ca. 12.8 mm long. Sc dichotomised, R nearly straight, base stem heavily sclerotised and colored. CuP fluent, A simply dichotomised.
Coloration: Total area caculated not calculated.
Derivation of name: After Latin for cascades of errors - alluding to difficult determination process.
Character of preservation: One partially preserved articulated individual.
Taphonomy: Preservation of fine head extremities suggest short duration of stay in water, possibly cobined with predation as suggested with stirred ends of forewings.


GNUE/J/213315
GNUE/J/213235
1 mm

Superfamily Blaberoidea Saussure, 1864

Family Blaberidae Saussure, 1864
Tribe Morphnini McKittrick, 1964

Genus Stictolampra Hanitsch, 1930

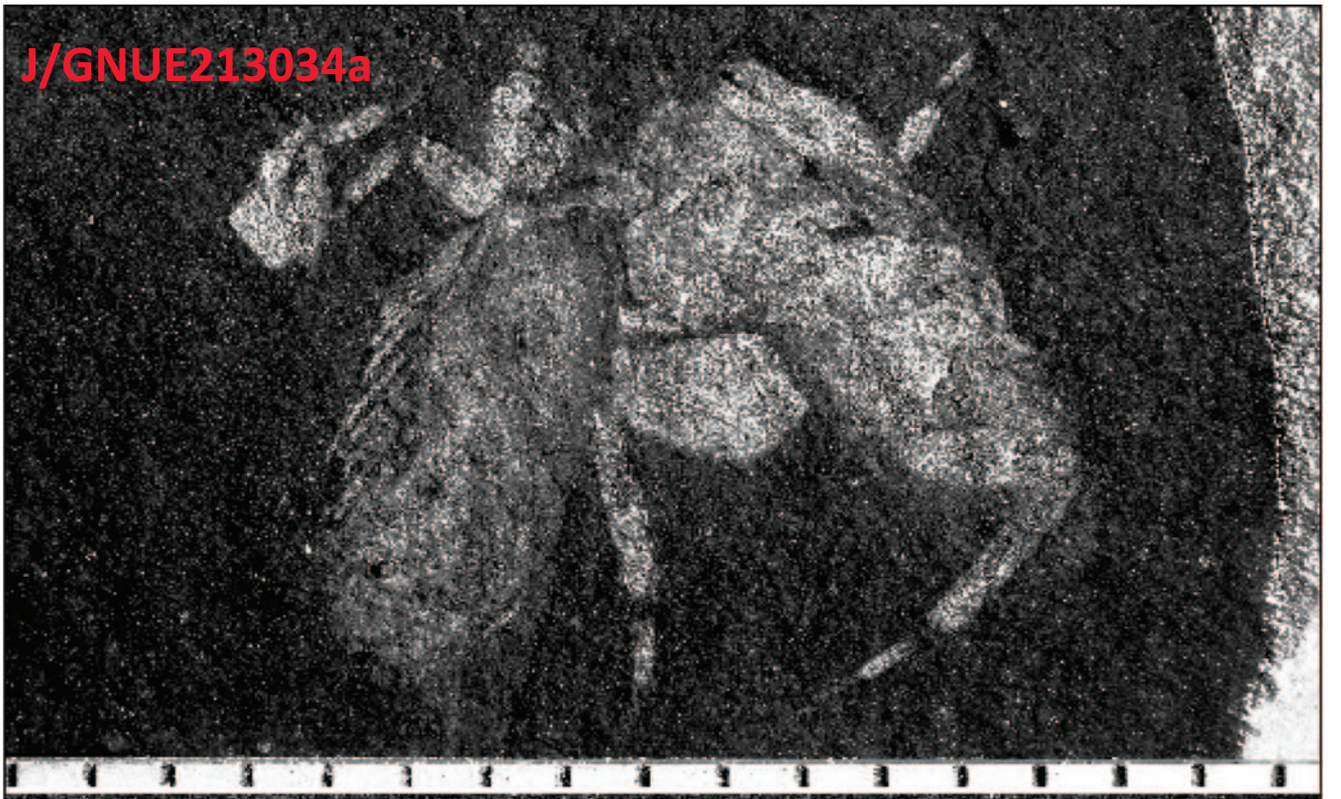
Type species: *Epilampra lurida* Burmeister, 1838, living, Thailand; Malaysia (Malacca state); Indonesia (Sumatra); Indonesia (Java Island); Borneo Island; Indonesia (Sulawesi); New Guinea Island.
Composition: *S. brevipennis* Hanitsch, 1930; *S. buqueti* (Serville, 1838) = *S. pfeiferae* (Brunner von Wattenwyl, 1865); *S. castanea* (Hanitsch, 1936); *S. concinnula* (Walker, 1869); *S. emarginata* (Hanitsch, 1923); *S. funebris* (Hanitsch, 1923); *S. lurida* (Burmeister, 1838) = *S. cribricollis* (Serville, 1838); *S. miranda* (Shelford, 1906); *S. mjoebergi* (Hanitsch, 1925) = *S. mjöbergi* (Hanitsch, 1925); *S. moultoni* (Hanitsch, 1923); *S. pallida* (Kirby, 1903) = *S. kirbyi* (Princis, 1947); *S. parvicollis* (Walker, 1869); *S. pascoei* Hanitsch, 1931; *S. pertruncata* (Hanitsch, 1936); *S. plicata* (Navás, 1904); *S. punctata* (Brunner von Wattenwyl, 1865); *S. stali* (Kirby, 1903) = *S. puncticollis* (Stål, 1877); *S. trilineata* Hanitsch, 1930. All extant. **Fossil:** *S. ochotensis* Vršanský, Vidlička et Kováčová in Vršanský et al. (2025) (Cretaceous of Khetana).
Stratigraphic range: Upper Cretaceous – Recent (extant).
Geographic range: Modern: South East Asia (including Sri Lanka and South India) tropical forests; **fossil:** Laurasia.

***Stictolampra baqueuii* sp.n. (FigureP 53)**

Holotype. GNUE213264. A complete individual. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from known Cretaceous species in having wider wings (possible plesiomorphy).
Description (on the basis of holotype). Pronotum unmodified, oval, transverse, anterior margin involuted (5/6 mm), with dotted coloration pattern. Forewing wide (ca. 17/5.8 mm), widest in the middle, margins unparallel, membrane with exception of dark dots transparent. SC strongly posteriorly curved, with a branched (2), curved anterior offshoot. CuP fluent, with 9 dichotomised A.
Derivation of name: The species epithet is derived from the Korean term 'baqui', meaning "roach."
Coloration: Total area caculated not calculated.
Character of preservation: 1 complete specimen.
Taphonomy: Complete specimen suggest short pre-depositional transport.
Remarks. Presence of complete specimen in absence of non-flying individuals in Jinju explains why namely this geus was preserved in various Creataceous sites among this weakly flying group.


GNIUE/J/213264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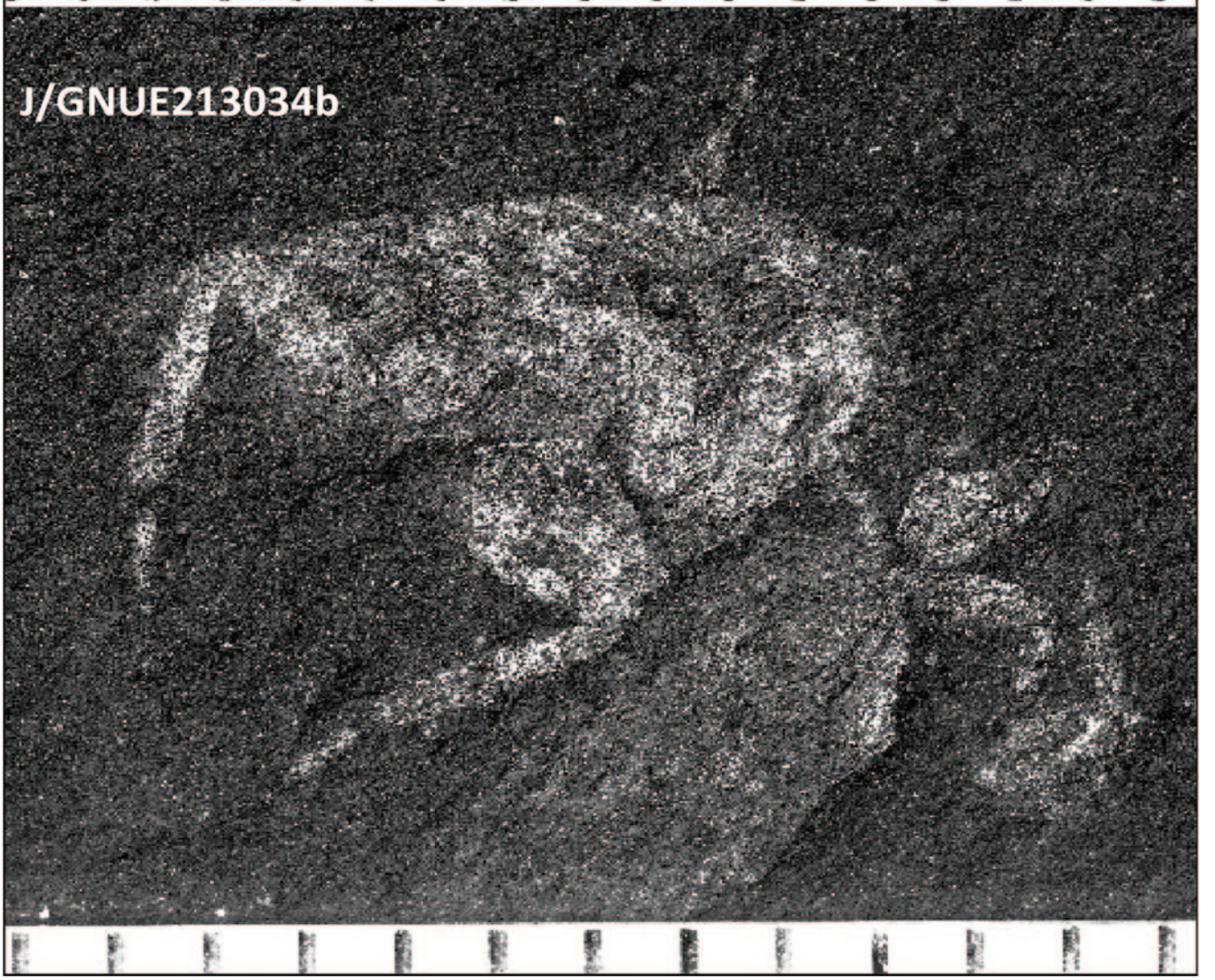
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Superfamily Corydioidea Saussure, 1864

Family Corydiidae Saussure, 1864
= Polyphagidae Saussure, 1864 (sensu Walker 1868)

Genus *Holocompsa* Burmeister, 1838

Type species. *Blatta nitidula* Fabricius, 1781 (extant)
= *Holocompsa capsoides* Shelford, 1911
= *Corydia collaris* Burmeister, 1838

Composition: *Holocompsa azteca* Saussure, 1862= *Euthyrrapha mordelloides* Walker, 1868 (Mexico, U.S.A.); *Holocompsa binotata* Saussure et Zehntner, 1894 (Gutemala); *Holocompsa cyanea* Burmeister, 1838= *Holocompsa metallica* Rehn et Hebard, 1927 (Haiti, St. Thomas island, U.S.A.); *Holocompsa debilis* Walker, 1868= *Holocompsa debilia* Walker, 1868= *Pseudoholocampsa formosana* Shiraki, 1931 (Borneo, China, Indonesia, Java, Sumatra, New Guinea, Philippines, Sri Lanka); *Holocompsa palaciosi* Estrada-Alvarez et Sormani, 2023 (Mexico); *Holocompsa panamae* Hebard, 1920 (Panama); *Holocompsa pusilla* Bolívar, 1924 (Seychelles); *Holocompsa scotaea* Hebard, 1922 (Mexico); *Holocompsa tolteca* Saussure et Zehntner, 1894 (Guatemala, Mexico); *Holocompsa zapoteca* Saussure et Zehntner, 1894 (Guatemala); *Holocompsa zhangi* Qiu, Wang et Che, 2020 (Yunnan, China).
Fossil composition: *Holocompsa fossilis* Shelford, 1910 (Eocene Baltic amber, Russia) and an undescribed species from burmite.

Statigraphic range: FOD-Cenomanian-extant
Geographic range: Americas, SE Asia, Oceania

Holocompsa scleroptera sp.n. (FigureP 54)

Holotype: GNUE213233=213034. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea.
Type horizon: Jinju Formation

Differential diagnosis: Differs from all species (expect those undescribed from burmite) in having more comlete sclerotisation of the forewing.
Description (on the basis of holotype). Forewing short (7.8/3.3 mm), sclerotised in the basal anterior area.
Derivation of name: The species epithet is derived from two Greek words 'skleros' and 'pteron' meaning "hard" and "wing" respectively, and refers to the sclerotized forewings of the new species.

Coloration: Total area caculated 18.32 mm^2.
Character of preservation: 1 complete specimen
Taphonomy: Somewhat articulated specimen combined with articulated (and very rigid) forewings suggest short pre-depositional transport.
Remarks: The species is classified within this genus due to high congruence with an undescribed fossil from burmite (in preparation).

Genus *Ioouoonool* gen.n.

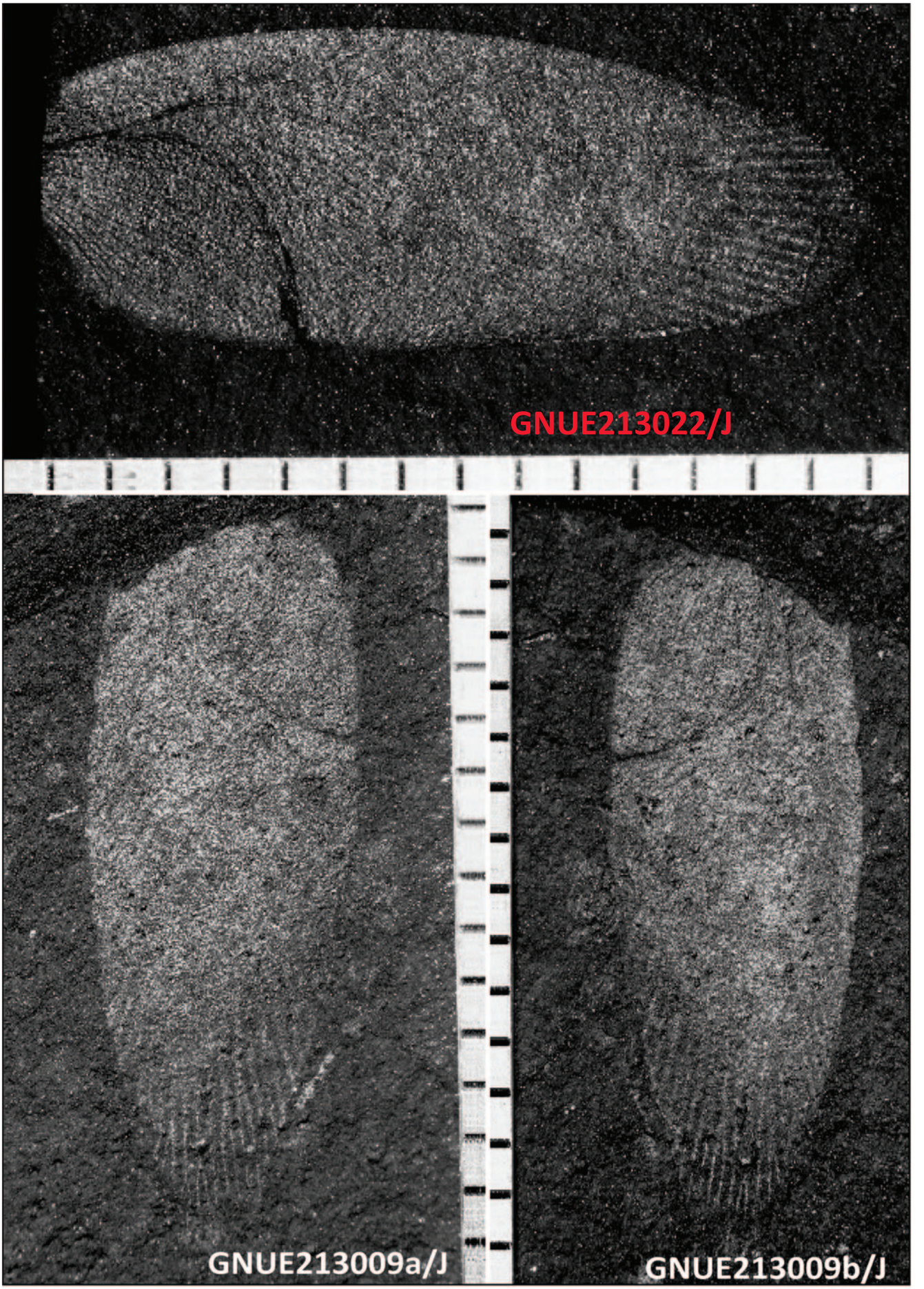
Type species: *Ioouoonool taktobybolo* sp.n., and by monotypy.

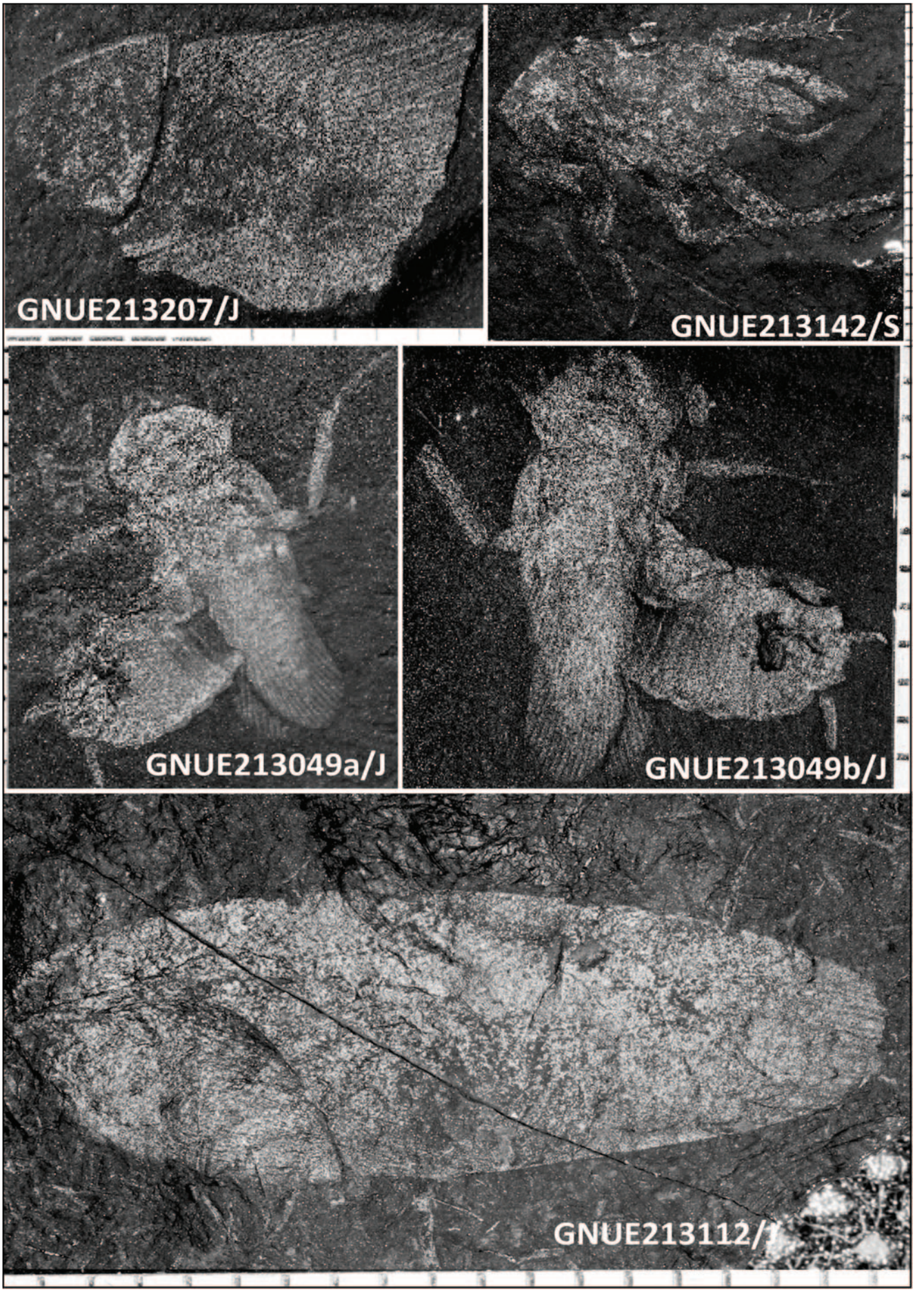
Differential diagnosis: Differs from all corydiids in anterior SC offshoots, rather standard venation with modified R1 and RS differentiation and with a wide area among them.
Autapomorphies: Anterior offshoots of SC rather characteristic for Blaberidae, possibly suggesting an indirect relation. Original state of pronotum is plesiomorphic.
Derivation of name: *Ioouoonool* is a stochastical combination of letters allowing reading in both views the same sound.
Description: As for species.
Remarks: The genus can be classified within Corydiidae on the basis of sharphly cut short clavus and high degree of forewing sclerotisation and reticulations common in Cretaceous corydiids. Further categorisation was impossible due to combination of characters present in Euthyrraphinae Handlirsch, 1925 (*Holocompsa scotaea* Hebard, 1922; Tiviini Rehn, 1951) as well as in basal *Latindia* Stal, 1821. Anterior offshoots are normally a blaberid character, but relation with corydiids (inlcuding strong carination) combined with unmodified pronotum lead us to leave the taxon within Corydiidae.

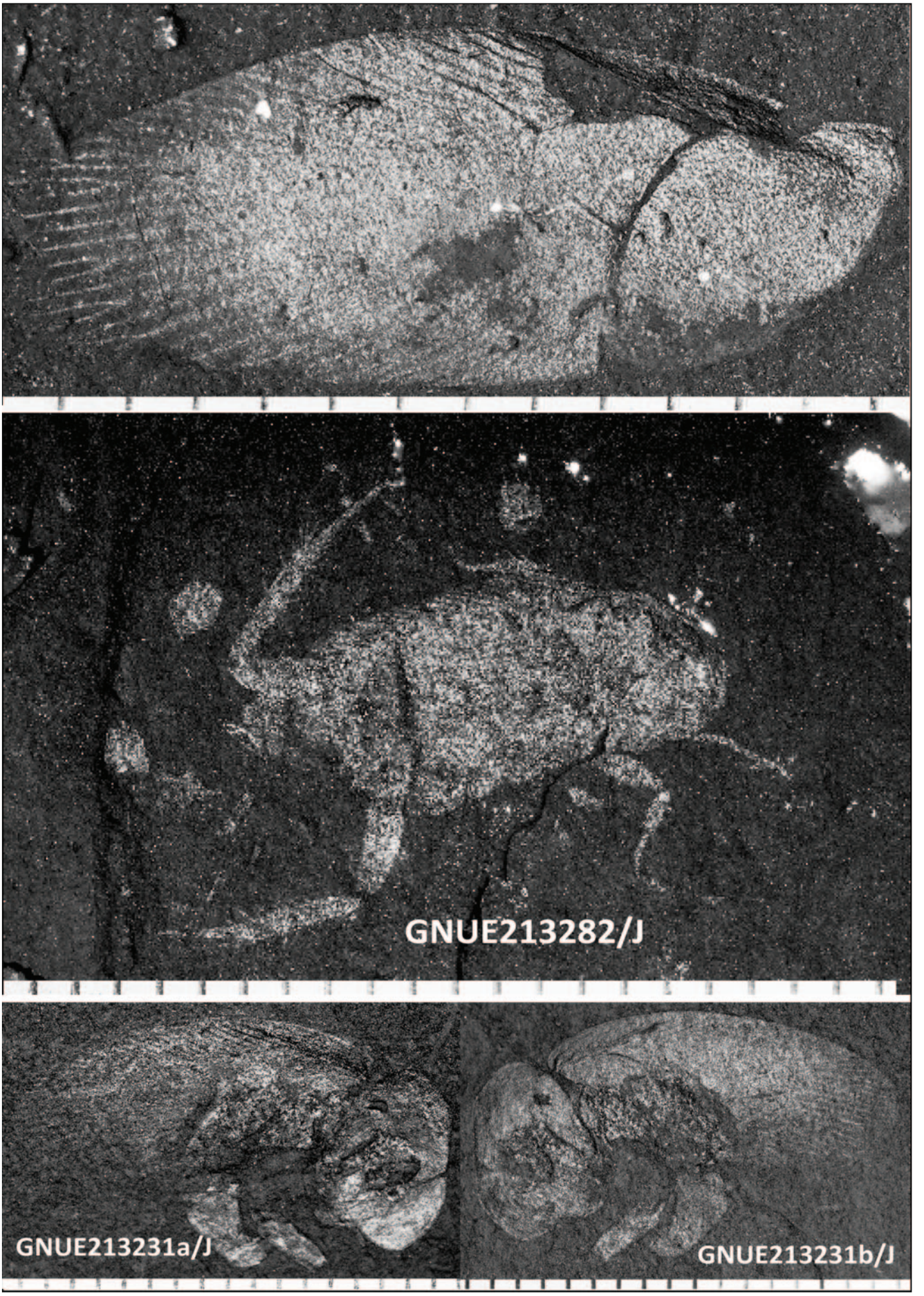
Ioouoonool taktobybolo sp.n. (FigureP 56-59)

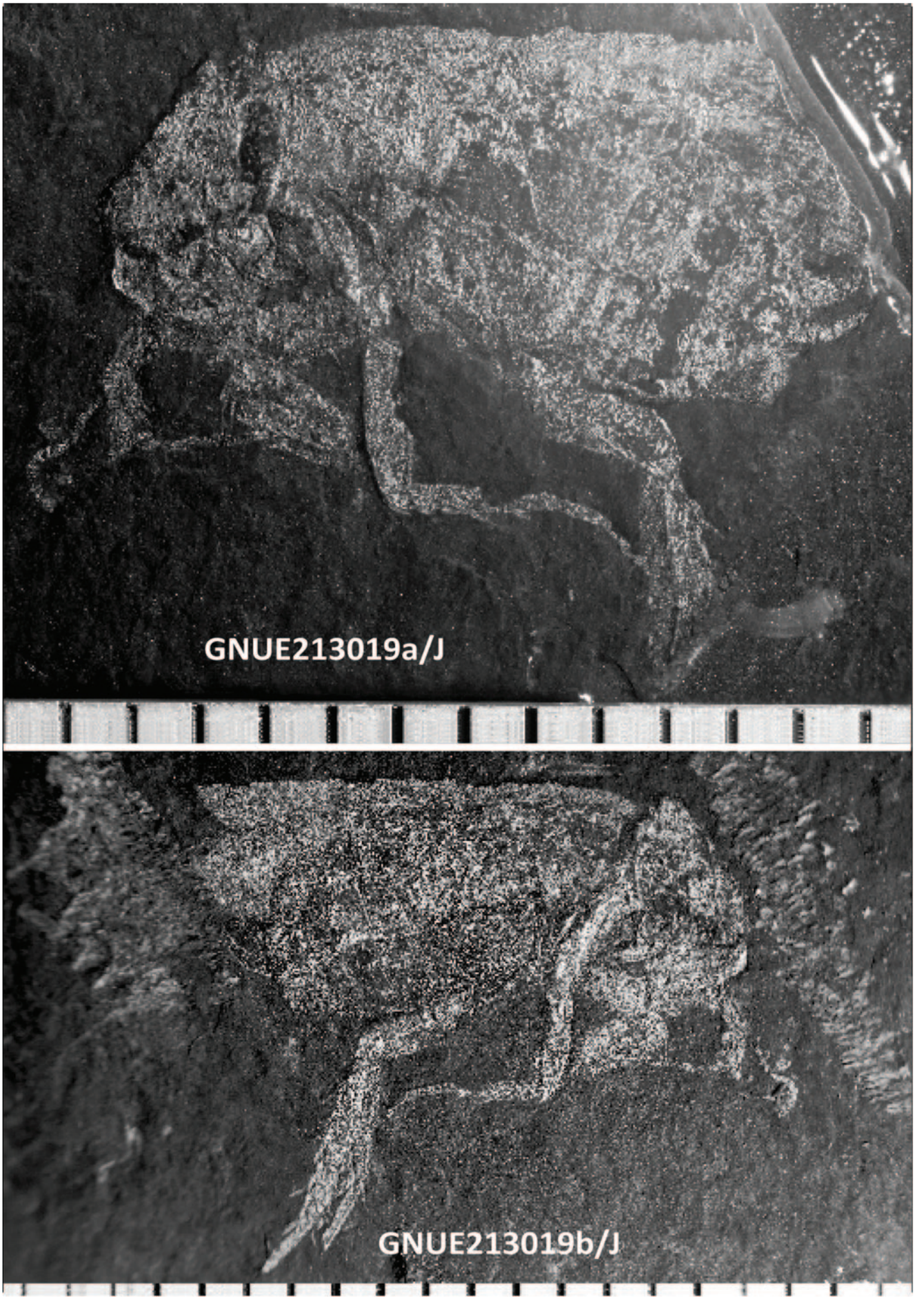
Holotype. GNUE213022. A completely articulated forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213231=213243, GNUE/J/213282 (complete specimens). GNUE213009=213040, GNUE213049=213325, GNUE213062=213019, GNUE213112, GNUE213291, DG0020 (isolated forewings). The same locality as type. GNUE/G/213207 Gunwi (forewing);


GNUE213022/J
GNUE213009a/J
GNUE213009b/J


GNUE213207/J
GNUE213142/S
GNUE213049a/J
GNUE213049b/J
GNUE213112/J


GNUE213282/J
GNUE213231a/J
GNUE213231b/J


GNUE213019a/J
GNUE213019b/J

GNUE/S/213142 Sacheon (forewing).
Description (on the basis of holotype). Pronotum unmodified, oval, transverse, anterior margin involuted (2.1/3.1 mm: GNUE213049**).** Forewing short (14/5.4 mm), widest in the middle, margins unparallel, membrane with exception of transparent apex strongly leatherous with umerous reticulations expressesed all along the surface. It is not clear whether intercalaries were present as some veins have uncertain classification. SC strongly posteriorly curved, with a branched (3) , curved anterior offshoot. R1 strongly sigmoidal, modified, wide, with only 12 veins at margin (some are secondarily branched). RS is unusually separated with wide vein-free area. RS then widely overlaps apex, with tertiary branched stems (14 - this count might include few intercalaries). CuA straight and short, but expanded in number of veins at margin (8). An obscure vein or intercalary occurs among two entiformly expanded veins. CuP simple, fluent, and cavus very short. Anal veins simple (8), A1 fuses with A2.
Midtibia heavily carinated, with at least 8 spurs on anterior margin.
Mutations. Holotype includes a mutual A1-A2 fusion.
Derivation of name: *Tak to by bolo* is Slavic for "so was it"
Coloration: Total area caculated 60.43 mm^2 (47.09 mm^2 dark).
Character of preservation: 3 complete specimens, 9 completely isolated articulated forewings (with clavus).
Taphonomy: Complete specimens combined with articulated (and very rigid) forewings suggest short pre-depositional transport.

Superfamily Umenocoleoidea Chen et T'an, 1973

Family Umenocoleidae Chen et T'an, 1973

Type genus: *Umenocoleus* Chen et T'an, 1973

Composition. *Blattapterix* Vršansky, 2003; *Compunctiotypus* Kaddumi, 2005*; Cratovitisma* Bechly, 2007*; Elytropterix* Vršansky, 2003*; Jantaropterix* Vršansky et Grimaldi in Vršansky (2003a)*; Petropterix* Vršansky, 2003*; Ponopterix* Vršansky et Grimaldi in Vršansky (1999)*; Umenocoleus* Chen et T'an, 1973*; Umenopterix* Lee, 2016*; Vitisma* Vršansky, 1999*; Perspicuus* Koubová in Koubová and Mlynský (2020); *Antophiloblatta* Sendi in Sendi et al. (2020a); *Lepidopterix* Sendi in Sendi et al. (2020a); *Enervipraeala* Luo, Xu et Jarzembowski, 2021; *Laticephalana* Luo, Beutel et Xu, 2021; *Vzrkadlenie* Vršanský in Sendi et al. (2020); *Alienopterix* Mlynský in Vršanský et al. 2021; Nadveruzenie Vršanský et Hinkelman in Vršanský et al. 2021; *Trapezionotum* Sendi et al. 2023; *Nlgropterix* Sendi et al. 2023; *Archaeospinapteryx* Sendi et al. 2023.

Stratigraphic range. Lower Barremian Lower Cretaceous–Turonian Upper Cretaceous.
Geographic range. Cosmopolitan, both Laurasia and Gondwana (Brazil, China, Jordan, Kazakhstan (unpublished), France, Mongolia, Russia, Myanmar, Lebanon, Spain, Hungary).

Diagnosis (after Vršansky 2003a; Lee 2016). Head transverse–cylindrical, orthognathous; compound eyes large, oval; antenna with numerous wide segments and very long seta in transverse rows; pronotum subdivided by transverse supracoxal furrow; forewings sclerotized, covered by cup-shaped punctures ("*bunky*"); venation simplified or sometimes indistinct, adsutural line present; distal part of hindwings distinctly projected beyond forewing apex; stem R reduced, with few branches, possibly with pterostigma; stem M branched; stem CuA with many branches; stem CuP simple; cerci with long seta and few segments; females with short external ovipositor.

Genus *Umenocoleus* Chen et T'an, 1973

Type species: *Umenocoleus sinuatus* Chen et Tan, 1973.
Type locality: Jiuquan, Yumen City, China
Type Horizon: Zhonggou Formation

Diagnosis (see also Luo et al. 2021): Head transverse–cylindrical, orthognathous; compound eyes large, oval; antennae with numerous wide segments and very long setae in transverse rows; pronotum subdivided by transverse supracoxal furrow; forewings sclerotized, covered by cup-shaped punctures ("bunky"); venation simplified or sometimes indistinct, adsutural line present.

Composition: *U. nervosus* Zhang, 1997 (Zhanggou).

Umenocoleus minimus Lee et al. 2025 (FigureP 61)

Holotype: KNUL-1131-26 (two forewing in living position, with mesothoracic scutum and scutellum), stored in Kyungbook National University in Sangjusi, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation


GNUE213228

Additional material designated here: GNUE213228. A complete specimen. Jeongchon.

Remarks: Status confirmed.
Coloration: Total area caculated 6.18 mm^2 (none dark).

Genus *Petropterix* Vršanský, 2003

Type species: *Petropterix mirabilis* Vršanský, 2003
Type locality: Bon Tsagaan Nuur, Mongolia
Type Horizon: Aptian Dzunbayaan Formation

Diagnosis (after Vršanský 2003a): Not robust. Forewing (possibly with an exception of apical part) well sclerotised and dark-colored with pale maculas and numerous hair on the whole surface. Most of the veins are not distinct. Hindwing R with 2 apparent veins, without pterostigma. Cross-veins present.

Composition: *P. sibirix* (Baissa); *P. alexeevi* (Bon Tsagaan); *P. kukalovae* (Zhonggou); *P. fukuiensis* (Fukui).
Geographic range: Laurasia-Asian part only
Stratigraphic range: Barremian-Albian LOD

***Petropterix koreaensis* Lee et al., 2025 (FigureP 63)**

Holotype: Holotype KNUL-1131-46 (a complete forewing, partly deteriorated in middle), stored in Kyungbook National University in Sangjusi, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material designated here: GNUE/J/213236. A complete specimen. The same locality as the type.

Remarks: Status confirmed
Additional characters: 213236 is a complete specimen, which has preserved hindwing. Remarkably this hindwing resembles other *Petropterix* from this same site, and also *Recyklovany*, which means a slightly sigmoidal R1 and pterostigma reaching from SC to whole R1 and locally up to next intercalary.
Coloration: Total area not calculated.

***Petropterix nikdyviac* sp.n. (FigureP 64)**

Holotype: GNUE213226. A complete winged adult. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from all species in having pronotal posterior but also anteriorpronotal ridge. Generally simlar to species from Baissa and Bon Tsagaan rather then species from Jinju with coloration.
Autpomorphies: Anterior pronotal ridge
Description. Head huge with huge protruding eyes, with color pattern. Antenna short and very wide (6.1/0.4 mm as preserved) basally, thinning apically, with about 27 antennomeres. Scape possiby extremely wide (0.5 mm), first 7 antennomeres with lateral extensions. Pronotum massive (2.3 mm long)with anterior and posterior ridge**.** Forecoxa long, legs free, forefemora large (1.8/0.5 mm), tarsi massive, with pulvilli and a huge arolium. Forewing short (6.9 mm), membrane with exception of 3 colored maculas pale and strongly melanised with bunky present near possibly membraneous apex. Body wide. Cercus very long (fragent preserved 1.0 mm).
Derivation of name: After nikdy viac (Slavic for nevermore) - alluding to extinction of this whole clade.
Coloration: Total area not calculated.
Character of preservation: 1 completely articulated winged adult individual.
Taphonomy: Body with articulated antenna suggest none pre-depositional transport.
Systematical remark. This is an extraordinary example of complete preservation of this abundant Cretaceous taxon (preserved mainly by forewings) revealing huge head with huge eyes as in advanced umenocoleoids. Remarkable is also a modified antenna.
Ecological remark: Specimen appears covered by pollen. Patterned eye is known only in *Vzrkadlenie* and suggest a diurnal habits.
Measurement remarks: We do not generally provide detailed measurements of tiny structures like antennomeres due to migration of elements and blurred margins. In bigger structures, this flaw is indistinct.
Remark: Lateral extensions of antennomeres are unique to the directly unrelated lineages Corydiidae and Olidae in burmite (Chen et al. 2021, Vršanský and Wang 2017, Šmídová 2022) and now also in entirely unrelated Umenocoleidae - a putative Ecosystem fashion and horizontal transfer evidence.

***Petropterix oculata* sp.n. (FigureP 65)**

Holotype: GNUE213216. A complete winged adult. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation


GNUE/J/213236


GNUE/J/213226


GNUE/J/213216

Differential diagnosis: Differs from all species in having wide antenna and in having sophisticated *Eye* coloration pattern of forewing, and terminally modified, curved terminal antennomere.
Autpomorphies: Wide antenna (possibly synapomorphic with *Blattapterix gansu*), *Eye* coloration pattern.
Description. Head extremely large, eyes huge, protruding beyond head outline, facets huge. Antenna modified, widened, scape huge, pedicel indistinctly differentiated, antennomeres (25-28 in total) significantly differing in size from extremely short up to up to 3x longer than wide, some possibly even carved. Terminal antennomere terminally curved (hooked). Dense setation preserved in several segments. Pronotum with posterior ridge and deep puncturation. Forewing short (9/3.2 mm), widest in the middle, margins parallel, colored, with *Eye* pattern and elytrised, with bunky present near apex (membraneous terminally). Hindwing with rich venation, R1 (5 or more) with pterostigma, M terminally branched (3), CuA expanded (6). Legs robust, short, without carination. Forecoxa free, Foretarsus as long as foretibia (ca. 1.7 mm). Segments differrentiated, pulvilli and arolium huge,terminal claw large, likely asymmetrical.
Derivation of name: The species epithet is derived from a Latin word ′oculatus′, meaning ″having eyes″ and refers to the eye-patterned forewings of the new species.
Coloration: Total area caculated 22.6 mm^2 (all dark)
Character of preservation: 1 completely articulated winged adult individual.
Taphonomy: Body with articulated antenna suggest none pre-depositional transport.
Remarks: Huge facets suggest crepuscular or even nocturnal habitats which might contradict its aposematic coloration - nevertheless aposematically colored nocturnal mantodeans are known. Modified terminal antennomere might suggest myrmecomorphy similarly as in *Recyklovany*.

Genus *Blattapterix* Vršanský, 2003

Type species: *Blattapterix gansu* Vršanský, 2003, and possibly by monotypy.
Type locality: Gansu, China
Type Horizon: Aptian

Differential diagnosis: reticulate structure of forewings.

Remarks: We follow this original classification, although it cannot be definitely ruled out that it is a senior synonym of very similarly looking *Alienopterix*, preserved in a different medium. Also it might be a senior synonym of *Pseudoblattapterix*, but there is not enough data to perform any of these synonimisations.

***Blattapterix reticulata* sp.n. (FigureP 67)**

Holotype: GNUE213222. A completely articulated forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea.
Type Horizon: Jinju Formation

Additional material: GNUE213225 (body with possible pollen). The same locality as type.

Differential diagnosis: Differs from all species in distinct all-membrane coloration (similar to some *Alienopterix* species from burmite).
Description (on the basis of holotype). Forewing short (8.2/2.3 mm), widest in the middle, margins unparallel, membrane with exception of uncolored main veins apex colored and strongly melanised with numerous reticulations expressed all along the surface. Posterior ridge present. SC long and branched.R nearly straight, overlapping apex (7) M 4, CuA 3 (both diverging from R at the same point), CuP fluent, A secondarily branched (5)**.**
Mutations. Holotype includes a mutual A1-A2 fusion.
Remarks: specimen is covered by pollen
Derivation of name: The species epithet is a Latin word ′reticulatus′ meaning ″netted″ and refers to the reticulate forewings of the new species.
Coloration: Total area caculated 17.48 mm^2 (all dark)
Character of preservation: 1 completely articulated forewing, one body.
Taphonomy: Body with articulated forewing suggest significant pre-depositional transport.
Remark: Secondarily branched A suggest its liberiblattinid origin and excludes more derived liberiblattinids such as Stavba, and also blattulids from the stem.

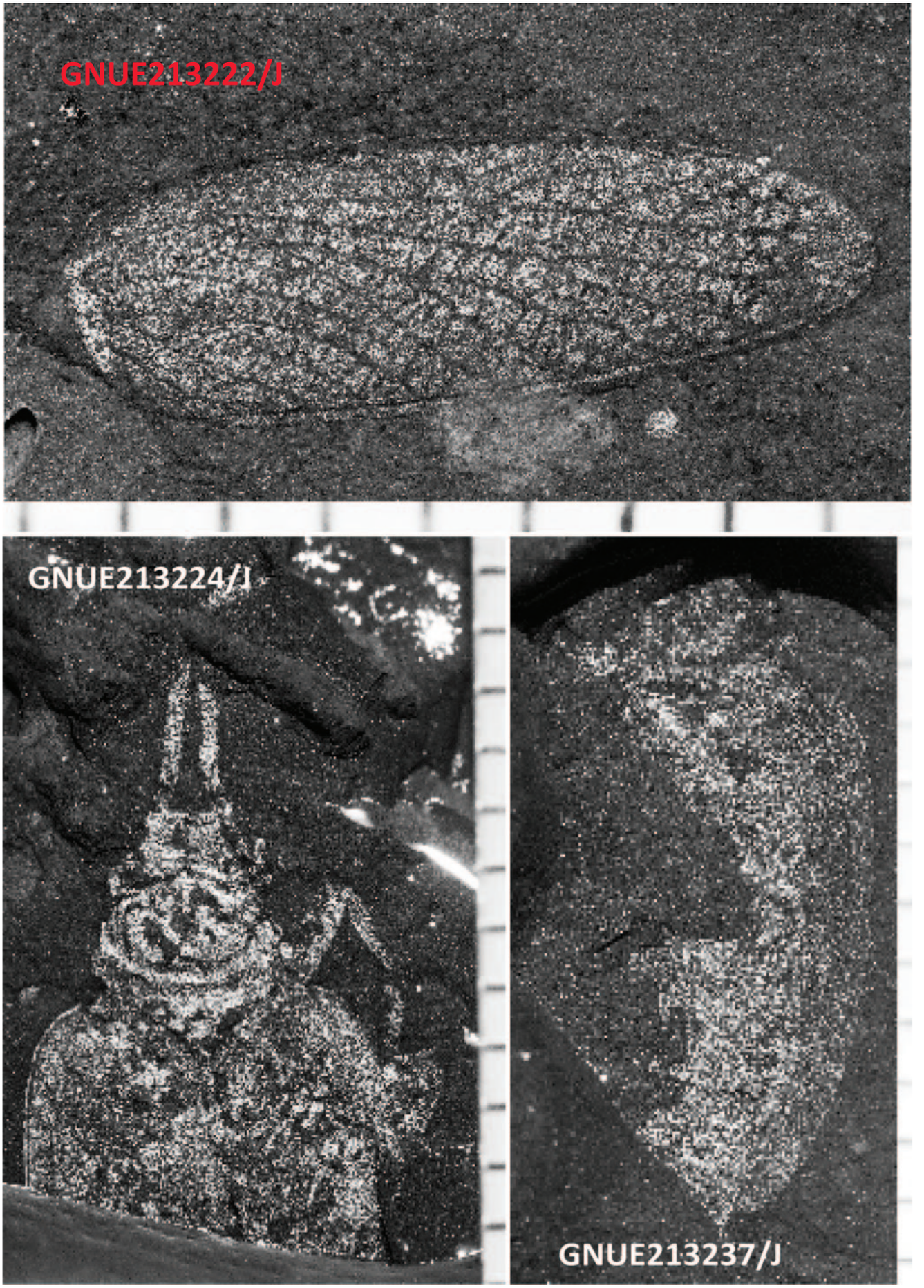
Genus *Pseudoblattapterix* Lee et al., 2025

Type species: *Pseudoblattapterix weoni* Lee et al. 2025 and by monotypy.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Diagnosis (after Lee et al. 2025): Forewing not sclerotized; a net of distinct crossveins all over wing; RP with five branches; M with four branches.

***Pseudoblattapterix weoni* Lee et al. 2025**

Holotype: KNUL-1131-49 (a nearly complete forewing), stored in Kyungbook National University in Sangjusi, South Korea.


GNUE213222/J
GNUE213224/J
GNUE213237/J

Type locality: Jeongchon, Korea
Type horizon: Jinju Formation
Remarks: Status confirmed, but its synonymi with *Blattapterix* and *Alienopterix* cannot be excluded.
Coloration: Total area not calculated.

Family Alienopteridae Bai et al., 2016
Subfamily Alienopterinae Bai et al., 2016
Genus *Alienopterus* Bai et al., 2016

Type species: *Alienopterus brachyelytrus* Bai et al., 2016
Stratigraphic range: Albian—Santonian
Geographic range: North Myanmar amber

Differential diagnosis: Pronotum campaniform, with posterior ridge.

Composition of the whole family. *Aethiocarenus* Poinar et Brown, 2016; *Alienopterella* Kočárek, 2018; *Alienopterus* Bai *et al*., 2016; *Apiblatta* Barna & Bigalk in Vršanský et al. (2018); *Caputoraptor* Bai *et al*., 2018; *Chimaeroblattina* Barna in Vršanský et al. (2018); *Formicamendax* Hinkelman, 2019; *Grant* Aristov Vršanský et al. (2018); *Meilia* Vršanský et Wang Vršanský et al. (2018); *Teyia* Vršanský *et al*. Vršanský et al. (2018); *Vcelesvab* Vršanský et al. in Vršanský et al. (2018).

***Alienopterus imposter* sp.n. (FigureP 69)**

Holotype: GNUE213261**.** A complete winged adult. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis. Bigger than the type species, antenna wider.
Autapomorphies: None detected besides slightly bigger size. Wider antenna and longer forewing are plesiomorphic traits.
Description. Head large, transverse (/ 1.8 mm). Antenna probably short and wide (4.5/0.2 mm as preserved). Pronotum with wide posterior ridge. Forewing 1.9 mm long and apparently containing bunky. Hindwing long, with short dichotomies. Legs thin, without spurs.
Derivation of name: The species epithet alludes to a presumable myrmecomorphocous habits.
Character pof preservation: One complete adult.
Taphonomy: A single well-preserved specimen with articulated antenna and legs suggest none pre-depositional transport and rarity in the ecosystem (and/or combined with unfrequent flight)
Remarks: In Jinju, larvae are entirely missing as well as non-flying cockroaches, which suggest that Alienopteridae were flying well and this is the first (indirect) proof for this.

Genus *Recyklovany* gen.n.

Type species: *Recyklovany kolotoc* sp.n. described below, and by monotypy.

Differential diagnosis: Differs from all species in having a small pronotum.
Autapomorphies: Minute pronotum. More developed (than any other known alienopterid) branchypterous forewings are plesiomorphic.
Description: As for species.
Derivation of name: After recycled - alluding to the preservation overworking.
Remarks: Very similar to its siter taxon *Teyia* (identical hindwing). Huge monstrous head and widened hindwing SC and R1 are synapomorphic with *Maloval*, and broken antenna is synapomorphic with *Formicamendax* (both suggests myrmecomorphy). Preserved distinct bunky, R approaching apex, coloration with stripes, clavus standard, not sinoidal and lack of reticulations suggest this taxon (and all Alienopteridae) were derived from *Maloval* or unknown *Petropterix* (synapomorhic is membraneous apex), while all the rest known umenocoleoids are excluded from the stem.

***Recyklovany kolotoc* sp.n. (FigureP 71)**

Holotype: GNUE213299**.** A completely winged adult individual. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Description: Head sophistically colored. Antenna short (6 mm as preserved), modified, with central antennomeres widened and elongated. Pronotum only partially preserved, but apparently very small. Forewing rather long (2/1 mm), bunky distinct. Hindwing long (6-7 mm) with pterostigma formed among simple SC and R1 (5-6). RS and M simplified (3, 2). CuA and CuP simplfied too (5 plus 1). A1 (3) in remigium distinct. A distinct in vannus with at least 3 veins. Cross veins numerous, curved.
Derivation of name: After *kolotoc* is Slavic for Marry-go-round- alluding to unbelievable preservation of this group.


213261

Character pof preservation: One complete adult.
Taphonomy: A single well-preserved specimen with articulated antenna and legs suggest none pre-depositional transport and rarity in the ecosystem (and/or combined with infrequent flight).
Remarks: It seems that head loog globular and not wide due to incomplete preservation, but it cannot be excluded that the head was round - nevertheless in Jinju head is frequently preserved only partially, unlike in other sites. A2-4 in vannus is reported for the first time in this family.

Genus *Caputoraptor* Bai et al., 2018

Type species: *Caputoraptor elegans* Bai et al., 2018
Stratigraphic range: Albian—Santonian
Geographic range: North Myanmar amber

Composition: *C. vidit* Vršanský et al. (2018) (burmite).

Differential diagnosis: Hindwing simple with straight R1.

***Caputoraptor ganggu* sp.n. (FigureP 71)**

Holotype: GNUE213186/S. A complete hindwing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Sacheon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from congeners in being much larger.
Description: Hindwing long (9 mm) with pterostigma formed among simple SC and straight R1 (6). RS and M simplified (4, 2). CuA and CuP simplfied too (5 plus 1). A1 (4) in remigium distinct, strongly sigmoidal. A2 distinct in vannus with at least 8 veins. Cross veins numerous, unstraight, extremely rich.
Derivation of name: The species epithet 'ganggu' refers to the Korean traditional term of roaches.
Character pof preservation: One complete hindwing.
Taphonomy: A single well-preserved isolated hindwing suggest pre-depositional transport and rarity in the ecosystem (and/or combined with infrequent flight).


GNUE/J/213299
GNUE/S/213186

Superfamily Raphidiomimoidea Vishniakova, 1973

Composition: Raphidiomimidae Vishniakova, 1973; Phyloblattidae Schneider, 1983; Liberiblattinidae Vršanský, 2002; Skokidae Vršanský, 2007; Manipulatoridae Vršanský et Bechly, 2015; Latiblattidae Vršanský, 2024; order Mantida Latreille, 1802.

Family Raphidiomimidae Vishniakova, 1973

Type genus: *Raphidiomima* Vishniakova, 1971
Type locality: Karatau, Kazakhstan
Type horizon: Kimmeridgian Karabastau Formation

Diagnosis: Predatory (mostly pursuit) elongated cockroaches with prognathous head, usually with eye divided by apodema, rarely globular, rarely with raptorial forelegs, usually legs were unspecialized.

Composition: *Asioblatta* Vishniakova, 1968; *Cameloblatta* Vishniakova, 1971; *Divocina* Liang et al., 2012; *Falcatusiblatta* Liang et al., 2018; *Fortiblatta* Liang et al., 2008; *Graciliblatta* Liang et al., 2012; *Liadoblattina* Handlirsch, 1906; *Raphidiomimula* Grimaldi et Ross, 2004; *Rhipidoblattina* Handlirsch, 1906, *Chuanblatta* Liang et al. 2022; *Olzmasg* Vršnský, 2024.

Stratigraphic range: Lowermost Jurassic (Dobbertin) – uppermost Cretaceous (probably Maastrichtian, LOD is Cenomanian burmite)
Geographic range: Cosmopolitan

Genus *Asioblatta* Vishniakova, 1968

Type species: *Asioblatta punctata* Vishniakova, 1968, by monotypy.
Type locality: Karatau, Kazakhstan
Type horizon: Karabastau Formation

Differential diagnosis (after Vršanský 2024): Differs from all known representatives of the family in having (small) dotted habitus and this coloration regards head, pronotum and also wings. It also has autapomorphically acascending anterior SC branches.

Asioblatta jeongchonensis sp.n. (FigureP 73)

Holotype: GNUE213331. A complete winged adult individual. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from the type species in significantly more elongated forewings.
Description: Head elongate, preserved in prognathous position. Pronotum nearly globular (2.9/ 2.9 mm) with small-dotted coloration pattern. Forewing elongate, 9.4/2.3-2.4 mm. Membrane transparent, coloration restricted to patches on some veins and adjacent intercalaries. Costa indistinct, not strong, costal area narrow, base not cut, SC simplified, branched basally. R nearly straight; CuP simple, fluent, A simplified, branched, wth some 5-6 veins at margin. Total number of veins ca. 39L-40R.
Hindwing transparent, with SC and R1 indistinct. RS unspecialised with 6-7 veins at margin. M simplified to a single terminally dichotimised vein. CuA with only 5 branches at margin (one dichotomised) and additional blind branches. CuP simple.
Derivation of name: The species epithet refers to the district name of the type locality of the new species.
Character of preservation: 1 adult
Taphonomy: Presence of bodies with extremities suggest short pre-depositional transport and rarity in the actuocenosis.

Genus *Cameloblatta* Vishniakova, 1973

Type species. *Cameloblatta variegata* Vishniakova, 1973
Stratigraphic range: Upper Jurassic – Upper Cretaceous
Geographic range: Laurasian (and burmite)

Diagnosis (after Vishniakova 1973): Head basally widely rounded, eyes lateral, palp shorter that head. Anterior branch of forewing M dichotomized at the same level as M2. CuA1 more weakly branched than CuA2. Length/width ratio largetr than 3.5. Forefemora basally widened with frequent posterior short spurs.

Composition: *C. stress* Vršanský, 2024 (Karabastau); undescribed species from burmite.

Stratigraphic range: Kimmeridgian-Cenomanian
Geographic range: Laurasia and burmite

Asioblatta jeongchonensis 73

***Cameloblatta immaculata* sp.n. (FigureP 75)**

Holotype: GNUE213128. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Diffferntial diagnosis: Differs from its siter species *C. stress* in lacking the pale dot among the dark coloration.
Autapomorphies: None because of plesiomorphic coloration compared with *C. stress*.
Description: Very small species, with forewing elongate, ca. 5.6 mm. Membrane transparent, anteroapically dark colored as well as hindwing. Main veins consistently colored (in both areas, colored and uncolored), intercalaries distinct, cross-veins distinct.
Derivation of name: The species epithet is a Latin adjective 'immaculatus' meaning "unspotted" and refers to the immaculate wings of the new species.
Character of preservation: 1 adult body, partially disarticulated.
Taphonomy: Presence of bodies with extremities suggest short pre-depositional transport.

Genus *Tayphoonoblatta* gen.n.

Type species: *Tayphoonoblatta correntini* sp.n., and by monotypy.

Differential diagnosis: Differs from all raphidiomimids in simplified A and sophisticated coloration pattern limited to intercalaries. SC was also simplified. If preserved bodies correspond to this taxon, then the ovipositor was longest amongst the family.
Autapomorphies: Simplified A, sophisticated intercalary coloration
Description: As for species.
Derivation of name: After Tayphoon.
Remarks: Representatives of this family were generaly very rare in the Cretaceous, but occurred also in the burmite. This taxon is categorised withn this family on the basis of elongated habitus. Similar habitus is present also in *Pseudomantina* (Blattulidae), but Blattulidae have much longer R, which is a characteristic of certain Liberiblattinidae and Raphidiomimidae. Elongated Liberiblattinidae were unknown, and the more, the present genus has narrow veins and intercalaries, which excludes Liberiblattinidae (and also Blattulidae). Such reduced A are known also in undescribed raphidiomimids from burmite. Intercalary coloration does not seems to be inherited from *Memento*, as that taxon is highly plesiomorpic and does not even have elongated forewings.

***Tayphoonoblatta correntini* sp.n. (FigureP 76-78)**

Holotype: GNUE213017. A completely articulated forewing (with clavus). Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

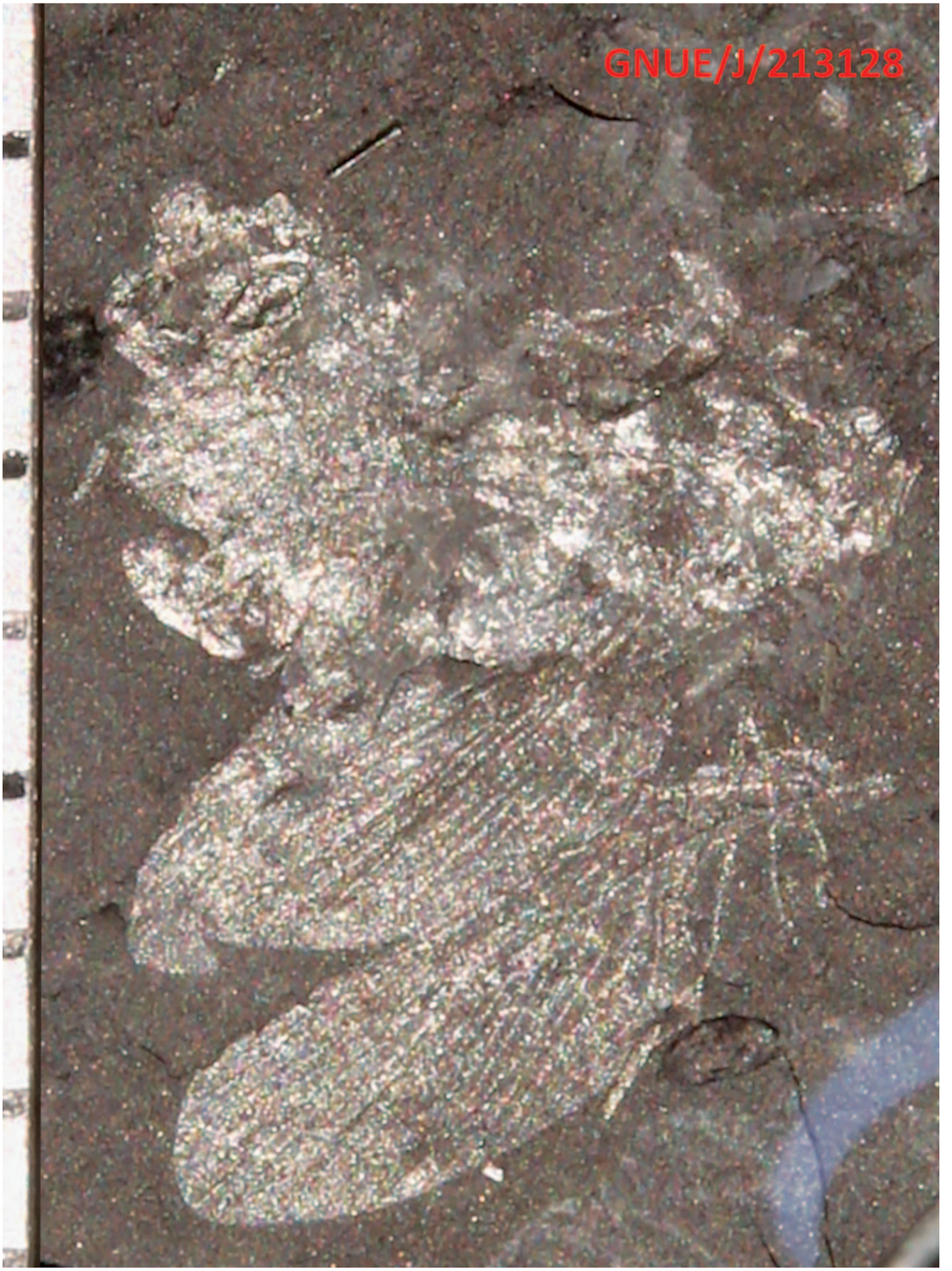
Additional material: GNUE213048, GNUE213128, GNUE213238, GNUE328 (bodies of adult females with long ovipositors). The same locality as the type. GNUE213179/G Gunwi (forewing).

Description: Forewing elongate, ca. 17/4.5 mm. Membrane transparent apically, basally colored except areas surrounding main veins. Main veins consistently colored (in both areas, colored and uncolored), intercalaries distinct, cross-veins indistinct. Costa distinct, not strong, costal area narrow, base not cut, SC simplified. R slighly sigmoidal, short, R1 and RS differentiated 11 plus 2 or more. M sigmoidal (5); CuA sigmoidal, with branches running parallel to margin (3). CuP simple, fluent, A simlified (5).
Derivation of name: After Correntin Joault, an excellent palaeoentomologist.
Remarks: Species might not be as rare in the actuocenosis as two additional possible bodies suggest.
Character of preservation: 4 adult bodies, two completely articulated forewings.
Taphonomy: Presence of bodies with extremities suggest short pre-depositional transport supported with isolated articulated forewing with clavus.

Family Liberiblattinidae Vršanský, 2002

Type genus and species: *Liberiblattina ihringovae* Vršanský, 2002. Karatau.
Stratigraphic range: Early Jurassic terminal Cretaceous
Geographic range: cosmopolitan

Composition: *Aktassoblatta* Vishniakova, 1971; *Brachyblatta* Vršanský, 2002; *Cryptoblatta* Sendi et Azar in Vršanský et al. (2019); *Elisamoides* Vršanský, 2004; *Entropia* Vršanský, Liang et Ren, 2012; *Gurvanoblatta* Vishniakova, 1986; *Hydrokhoohydra* Vršanský in Vršanský et al. (2019); *Kazachiblattina* Vršanský, 2002, *Kurablattina* Martin, 2010; *Leptolythica* Vršanský, 2008; *Liberiblattina* Vršanský, 2002; *Spongistoma* Hinkelman in Sendi et al. (2020), *Miniblattina* Sendi, 2021; *Stavba* Vršanská et Vršanský in Vršanský et al. (2019); *Makacka* Vršanský, 2024; *Memento* Vršanský, 2024; *Akinisia* Vršanský, 2024;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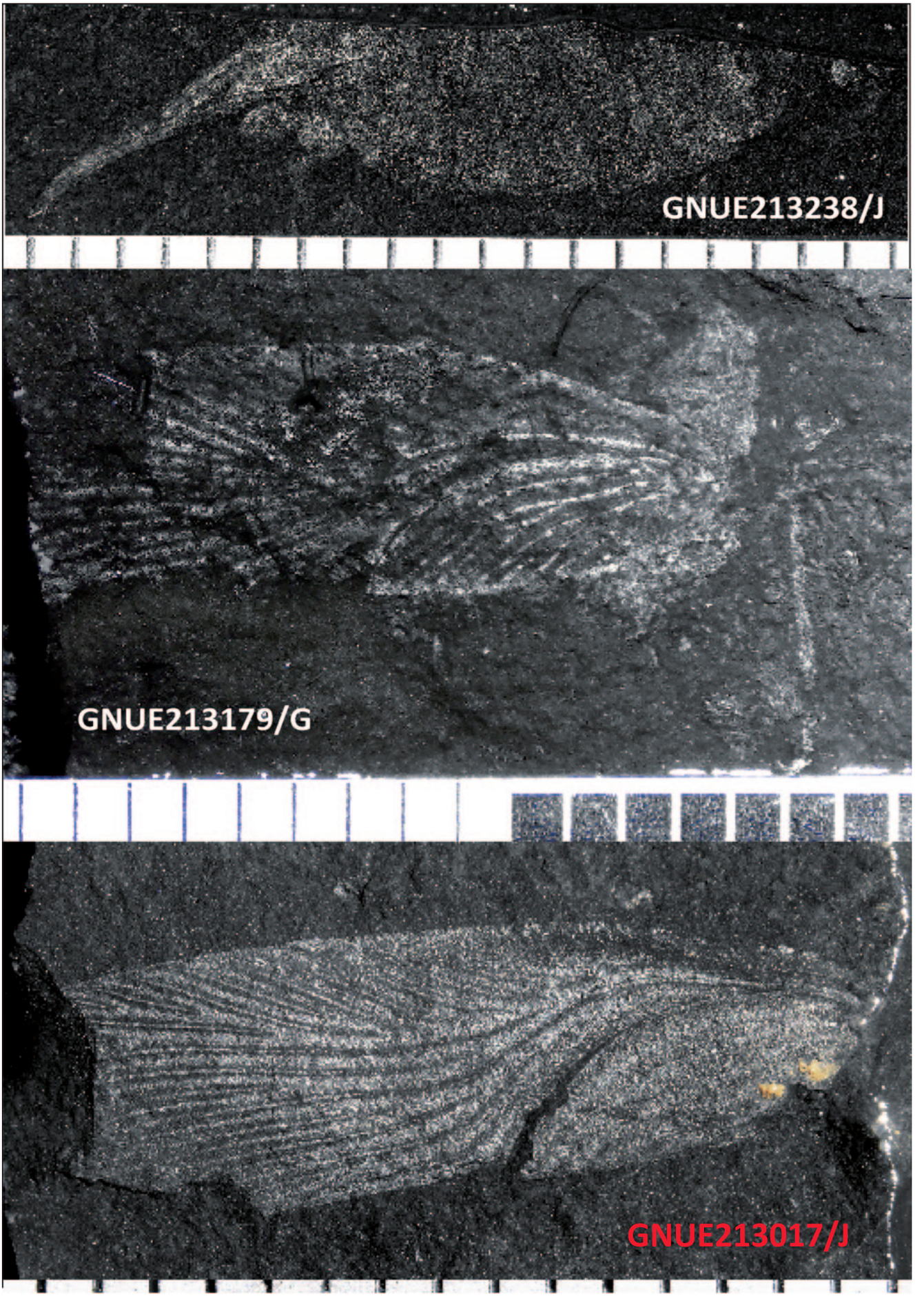
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GNUE213179/G
GNUE213017/J


GNUE213081/J


GNUE213218/J

Compostus Vršanský, 2025.

Diagnosis (after Vršanský 2002): Forewing with regular venation with terminal dichotomisation limited to the clavus. Costal field narrow with Sc long and branched. R field narrow with R ending prior to wing apex. M and Cu sigmoidal, M reaching wing apex. CuP strongly curved, two of them. Due to differences in venation, different forms within a same species were excluded. Species within this genus having non parallel margins reveal traces of derivation from the genus *Ano*. Anal veins branched mostly in apical third. Hindwing with fan like pleating with possible reduction of number of pleating veins, with R differentiated into R1 and RS, possibly with precursors of pterostigma; M richly branched; CuA with 5 or more branches. Female with short external ovipositor.

Genus *Ano* Vršanský, 2020

Type species: *Ano da* Vršanský, 2020. Middle Jurassic Bakhar, Mongolia.

Composition: *Ano net* Vršanský, 2020; *Ano nym* Vršanský, 2020 (Middle Jurassic Bakhar, Mongolia); *Ano mal* Vršanský, 2024; *Ano ona* Vršanský, 2024; *Ano naslosa* Vršanský, 2024; *Ano palindrom* Vršanský, 2024; *Ano si* Vršanský, 2024; *Ano tak* Vršanský, 2024 (Upper Jurassic Karabastau, Kazakhstan).
Stratigraphic range: Middle Jurassic - LOD
Geographic range: Laurasia

Differential diagnosis (after Vršanský 2020). *Ano* is a highly variable taxon, differing from other representatives of the family in distinct rather simple coloration forming a simple single dot pattern (other representatives of the family are either without coloration like *Stavba,* with simple macula like *Elisamoides* or with more sophisticated patterns like *Liberiblattina*). Differences occur in the unparallel margins of rather short and wide forewings with distinct pseudovein (see labelled fig. 13i; characteristic for mantodeans). Venation is usually characterised with a basally branched rather short Sc, but sometimes terminal branchelets are present or Sc can be rarely even simple; R slightly sigmoidal with R rarely secondarily branched, RS might be differentiated; M curved, not sigmoidal; CuA with basally differentiated 2 main stems, A branched, sometimes terminally; CuP fluent.

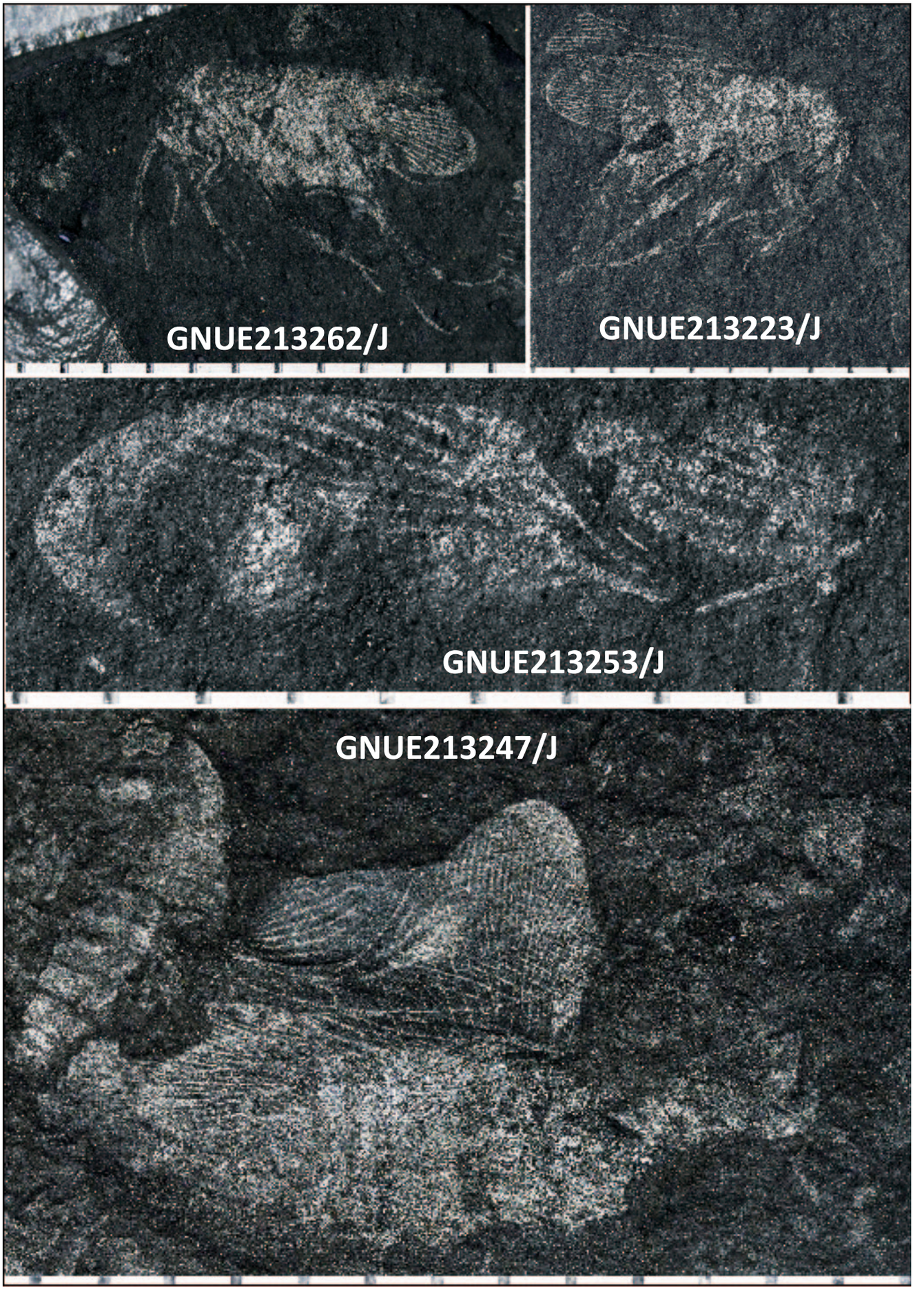
***Ano ale* sp.n. (FigurePs 80-89)**

Holotype: GNUE(309= 213292)=213070. A complete winged adult female. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213059, GNUE213072, GNUE213093, GNUE213113, GNUE213136, GNUE213158, GNUE213193, GNUE213194HH, GNUE213206, GNUE213214, GNUE213220, GNUE213223, GNUE213244, GNUE213247, GNUE213262, GNUE213272, GNUE213273, GNUE213280, GNUE213284, GNUE213286, GNUE213288HH, GNUE213295, GNUE213296HH, GNUE213300, GNUE213328, GNUE213334, GNUE213334AFFH, GNUE213337, GNUE213352, (complete specimens). GNUE213084, GNUE213098FF, GNUE213107, GNUE213143FF, GNUE213147, GNUE/J/213171, GNUE213253, DG0017 (forewings). GNUE213012HH, GNUE213095, GNUE/J/213154, GNUE213287, GNUE213356HH (hindwings). The same locality as the type. GNUE/S/213096, 213202FP Sacheon (complete specimens).

Additional specimens not included in statistics: GNUE213011, 213008, 213031, 213027, 213279=213050, KS5036, KS5026, KS5404 (complete specimens).

Differential diagnosis: Differs from its sister species (forewing length 8.5-9.3 mm) *Ano ona* in size and in presence of distinct pterostigma. *Ano tak* is similar in having symplesiomorphically large pronotum. Widened body is synapomorphical with undescribed Cretaceous species.
Autapomorphies: None, double *Eye* pattern was unique, but synapomorphic with *Ano ona*.
Description (on the basis of holotype; variability is given in TableP 90-91): Head very large, probably triangular, with huge eye (0.5/0.5. mm) strongly protruding beyond the head outline. Antenna standard (not thin although possibly a slightly more thinner, but not wide). Pronotum very large. Body narrow at base, then widened in the centre.
Foreleg apparently raptorial, with undifferentiated forefemoral spines, but with terminal femoral spur (0.25 mm). Forefemur robust and short (1/0.5 mm), foretibia very short (1.1/0.25 mm), foretarsus long.
Forewing elongate (5.8/2.2 mm), with distinct costa, with transparent membrane and softly colored apex; intercalaries distinct, cross-veins, unlike in hindwing, indistinct. SC simple or simply branched. R wide, sigmoidal, short, with R1 (13) and RS limited to a single vein. M sigmoidal (4); CuA sigmoidal, with branches limited to posterior offshoots (6). CuP simple fluent, A dichotomised, with 7 veins at margin.
Hindwing shorter (5.6 mm), with simple straight SC in a very narrow costal field and colored apex. Comb-like R1 with pterostigma and RS differentiated (3 plus 7, symmetrically). M straight (2, symmetrically); Cu (6-7 plus 1); A1 in remigium, sigmoidal, with 2-3 blind branches.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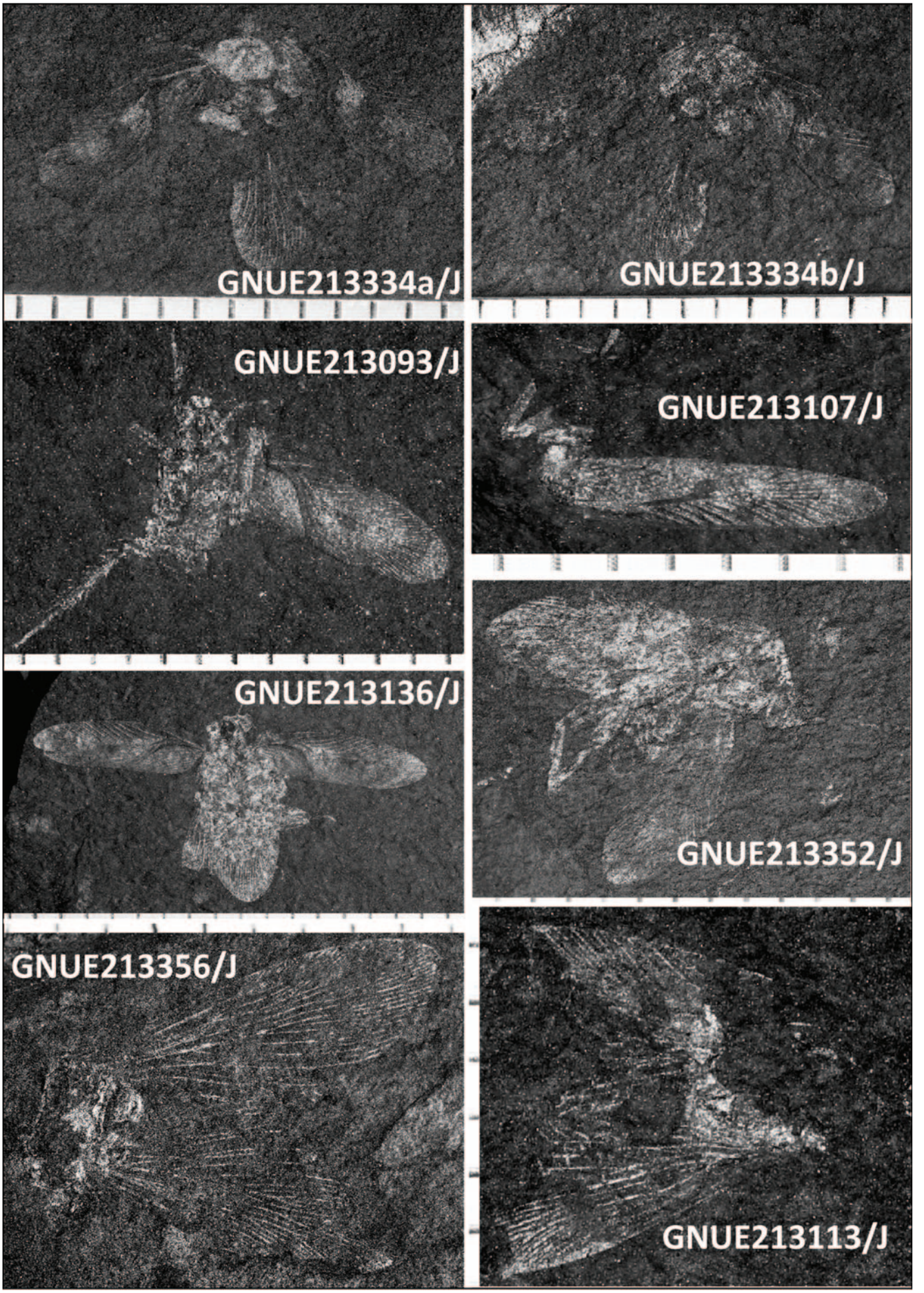
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GNUE213158/J
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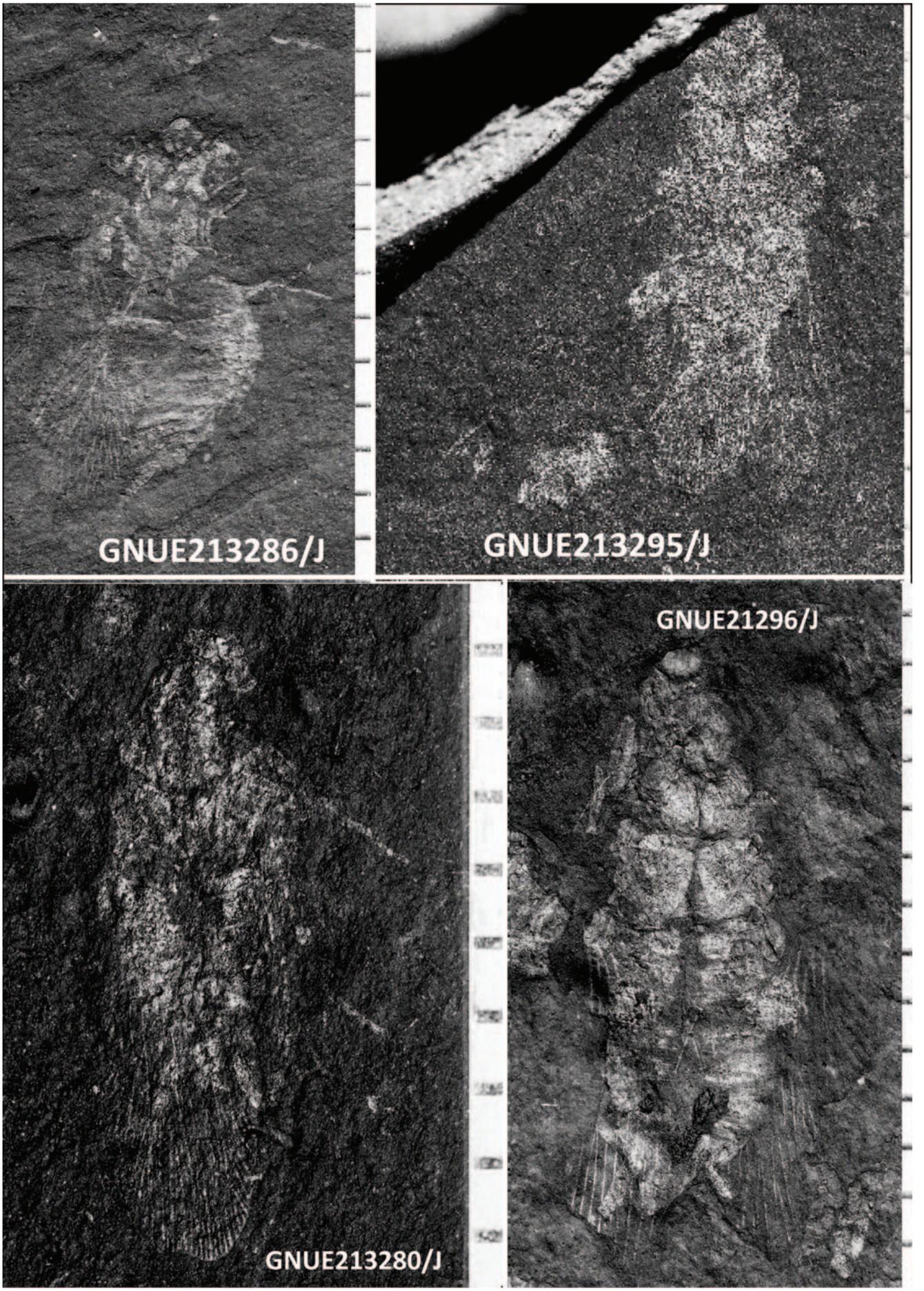
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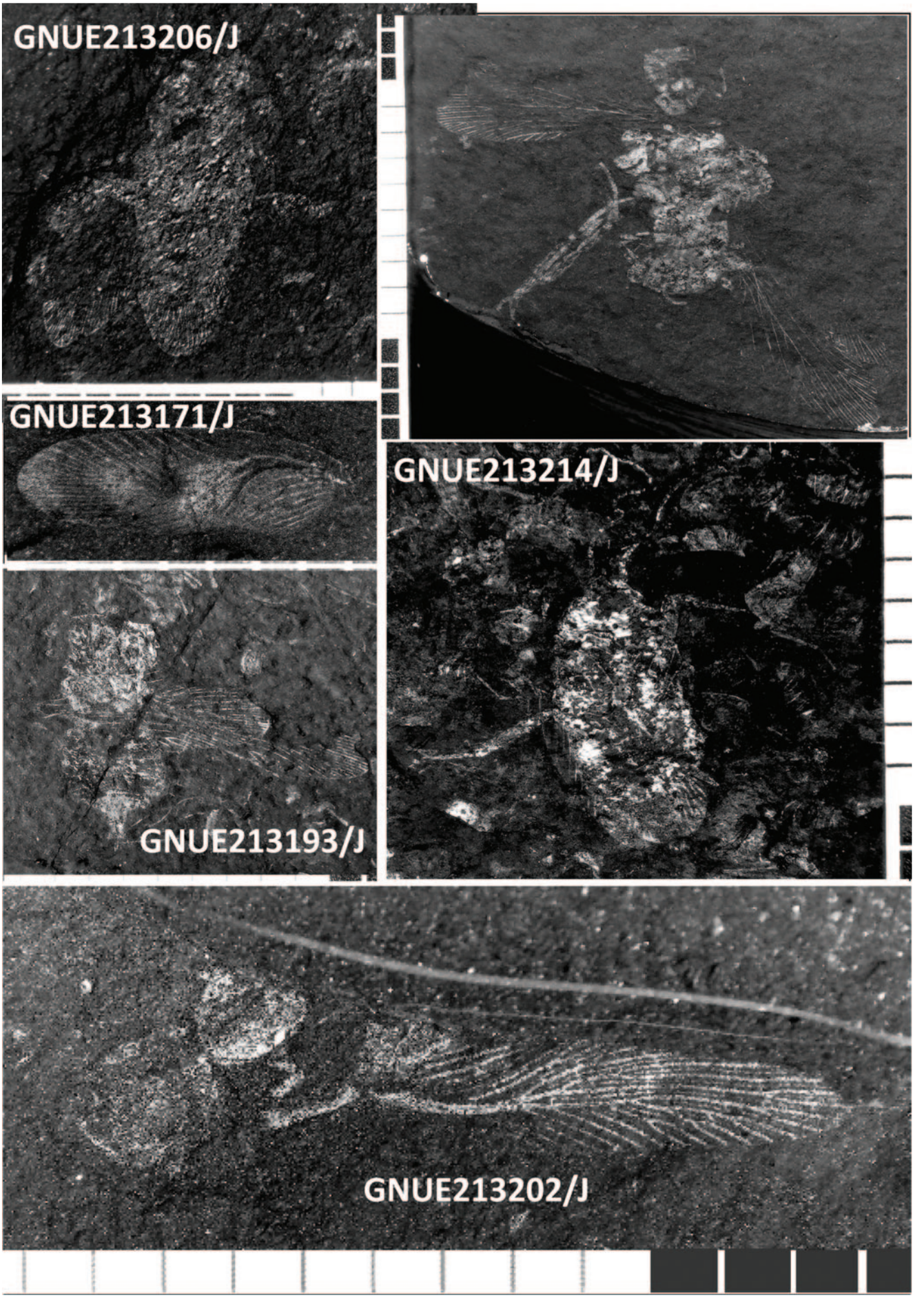
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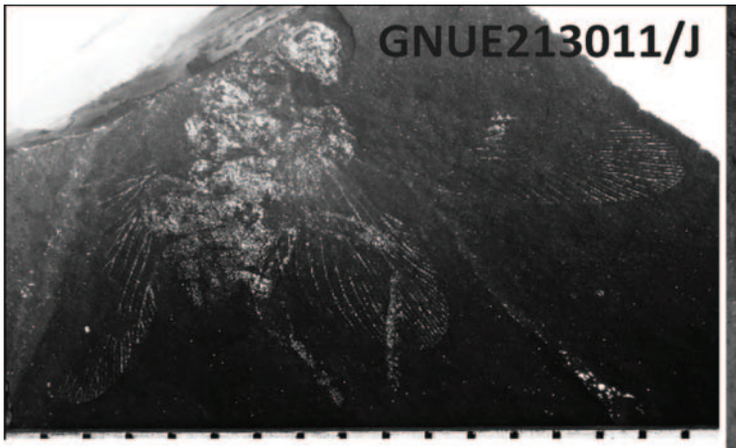
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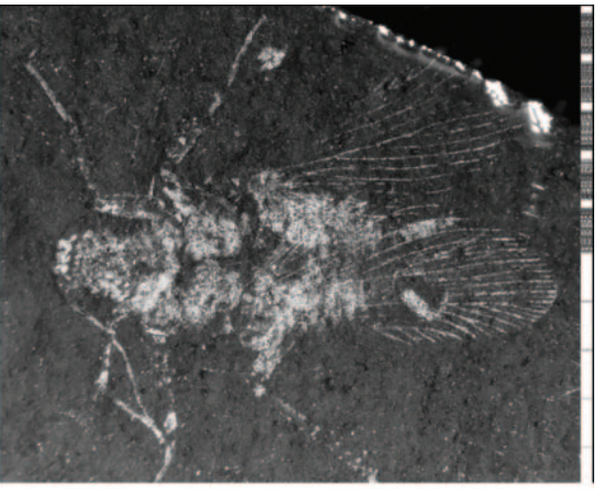

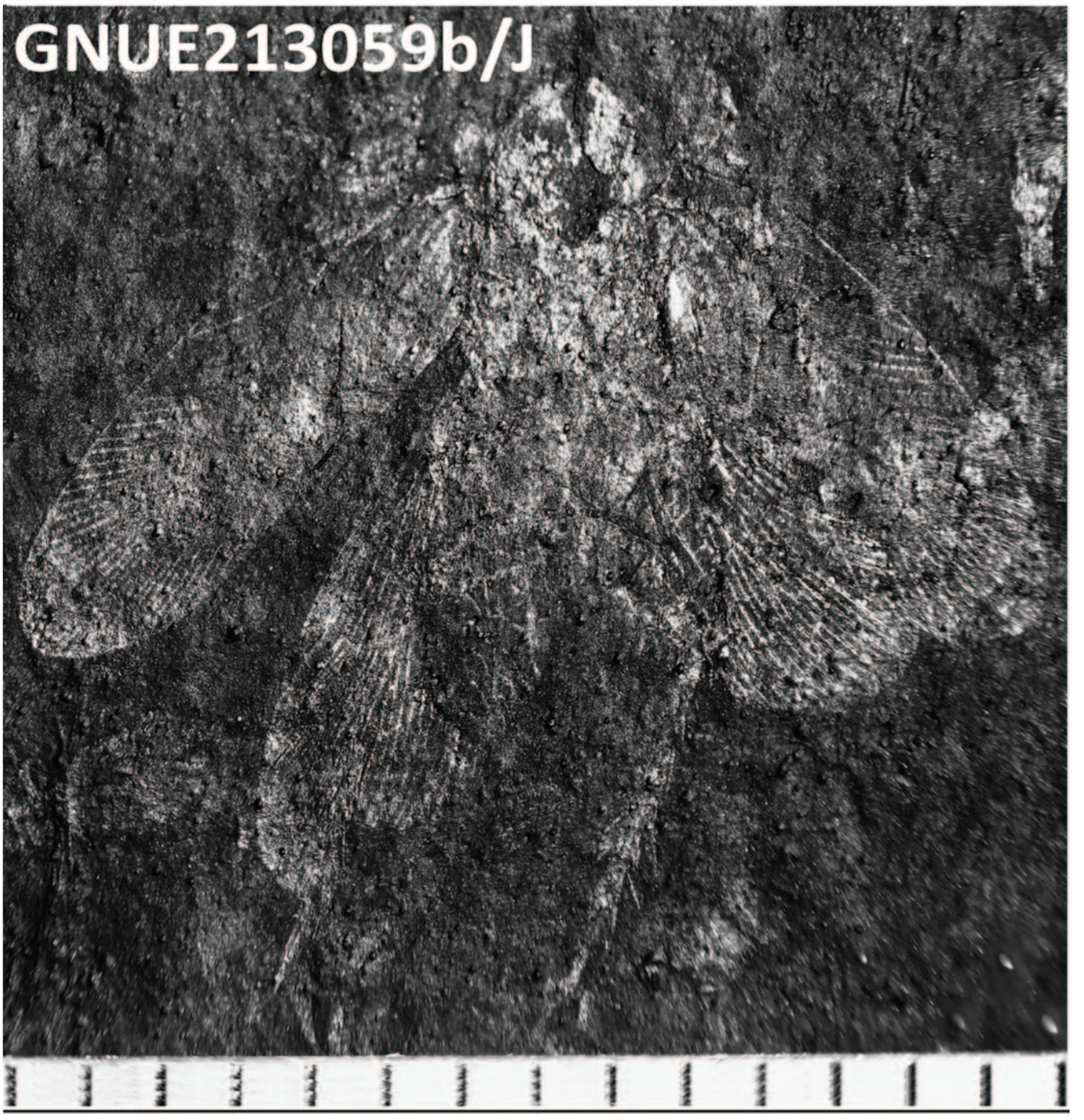
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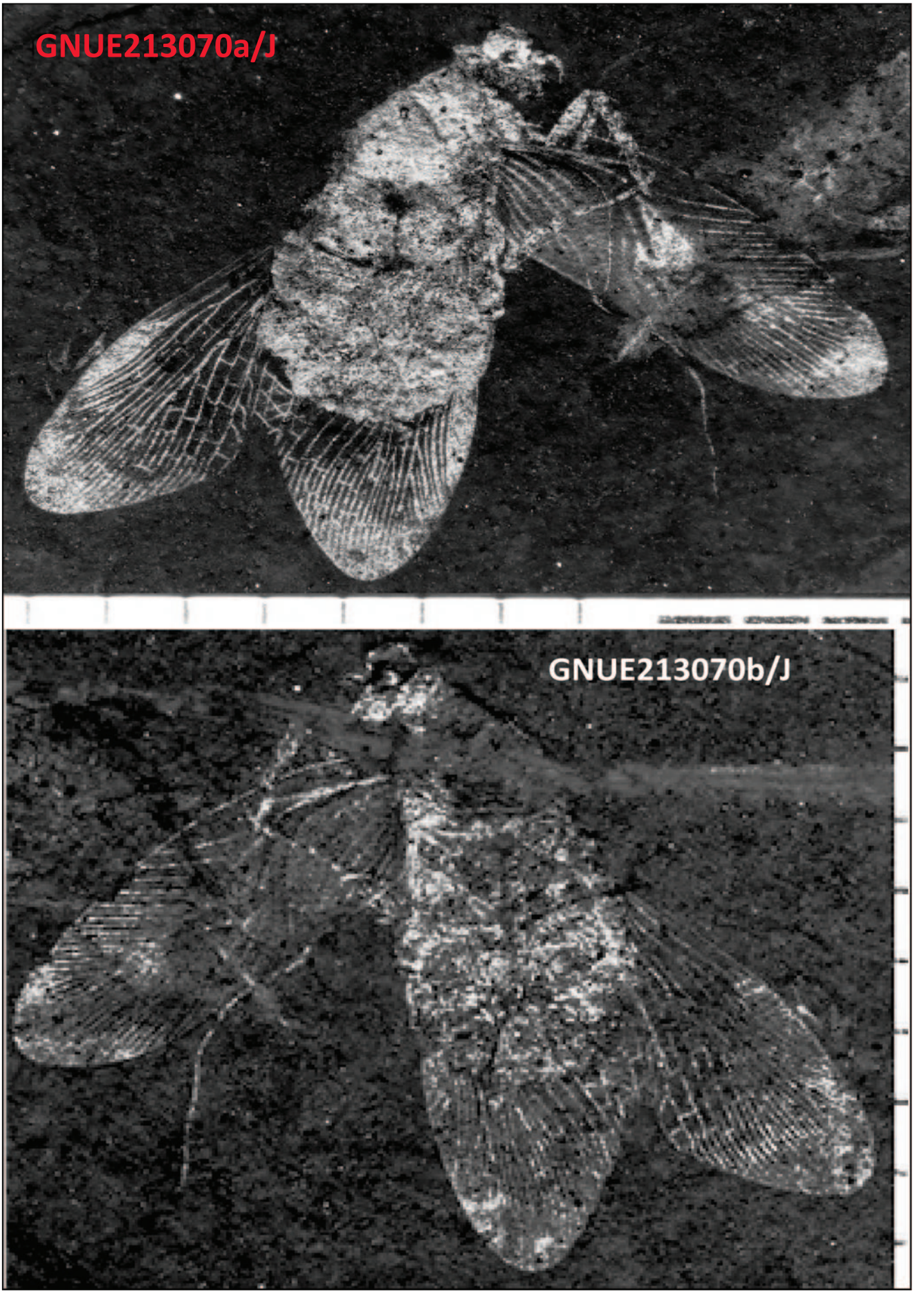
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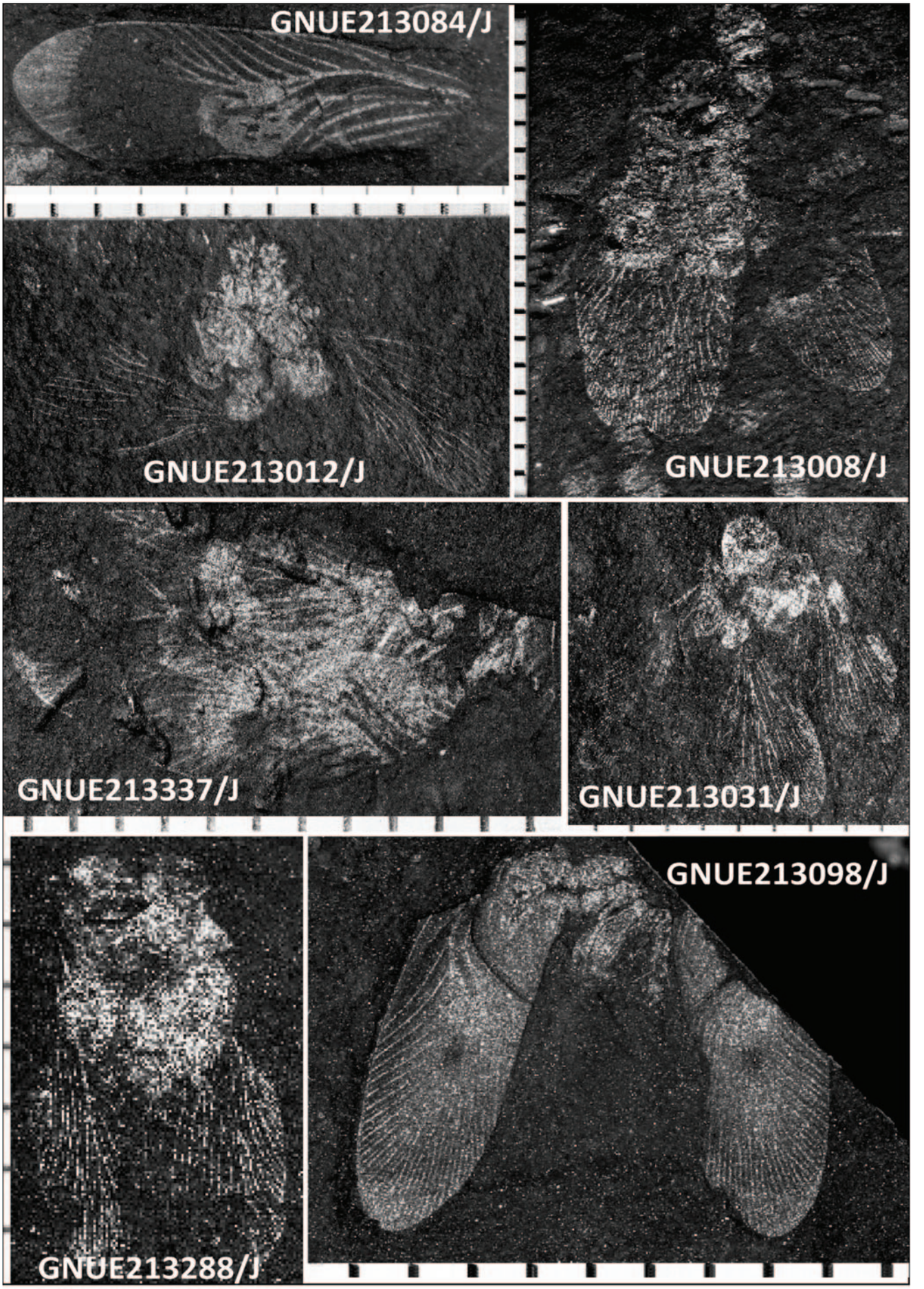
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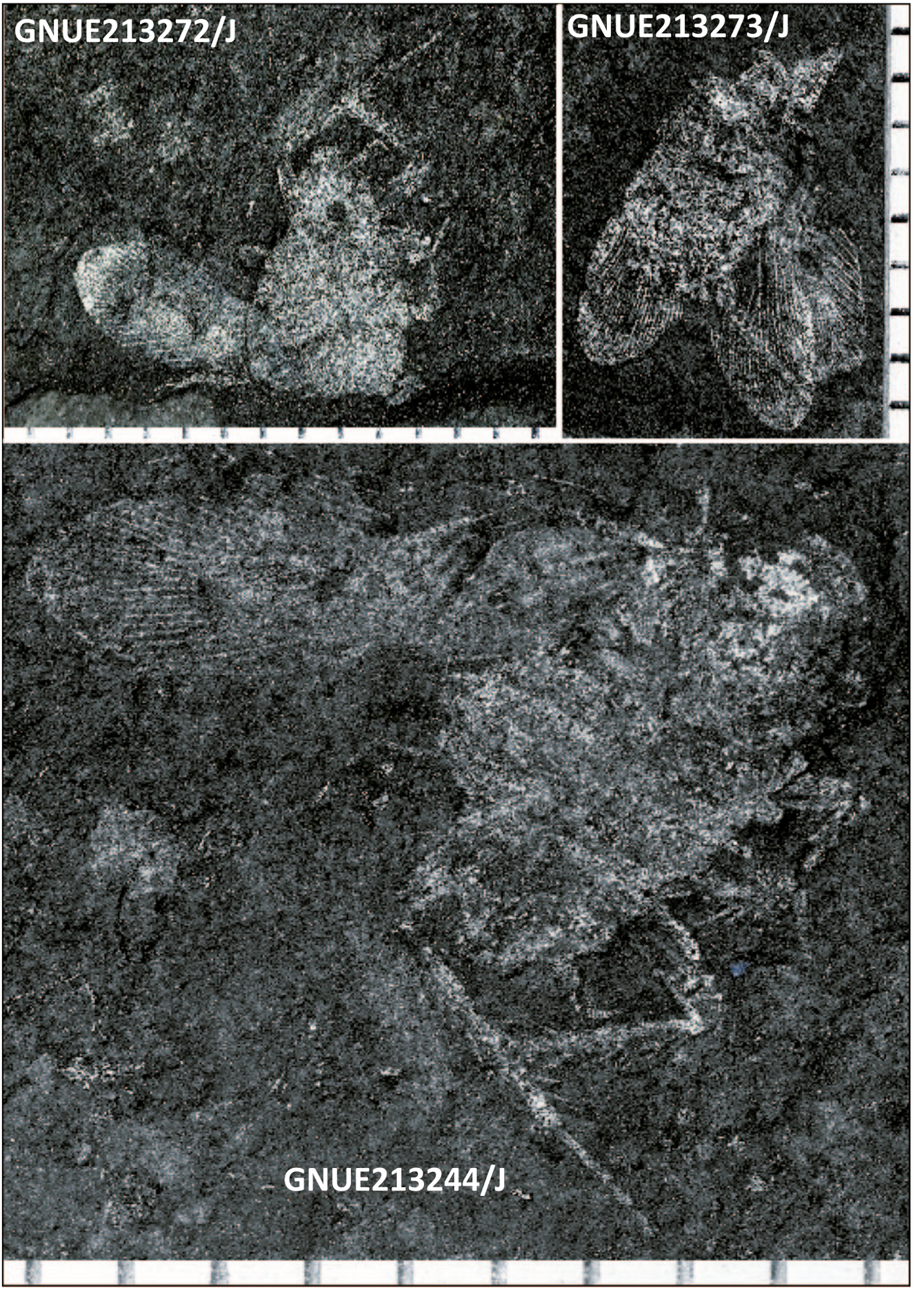
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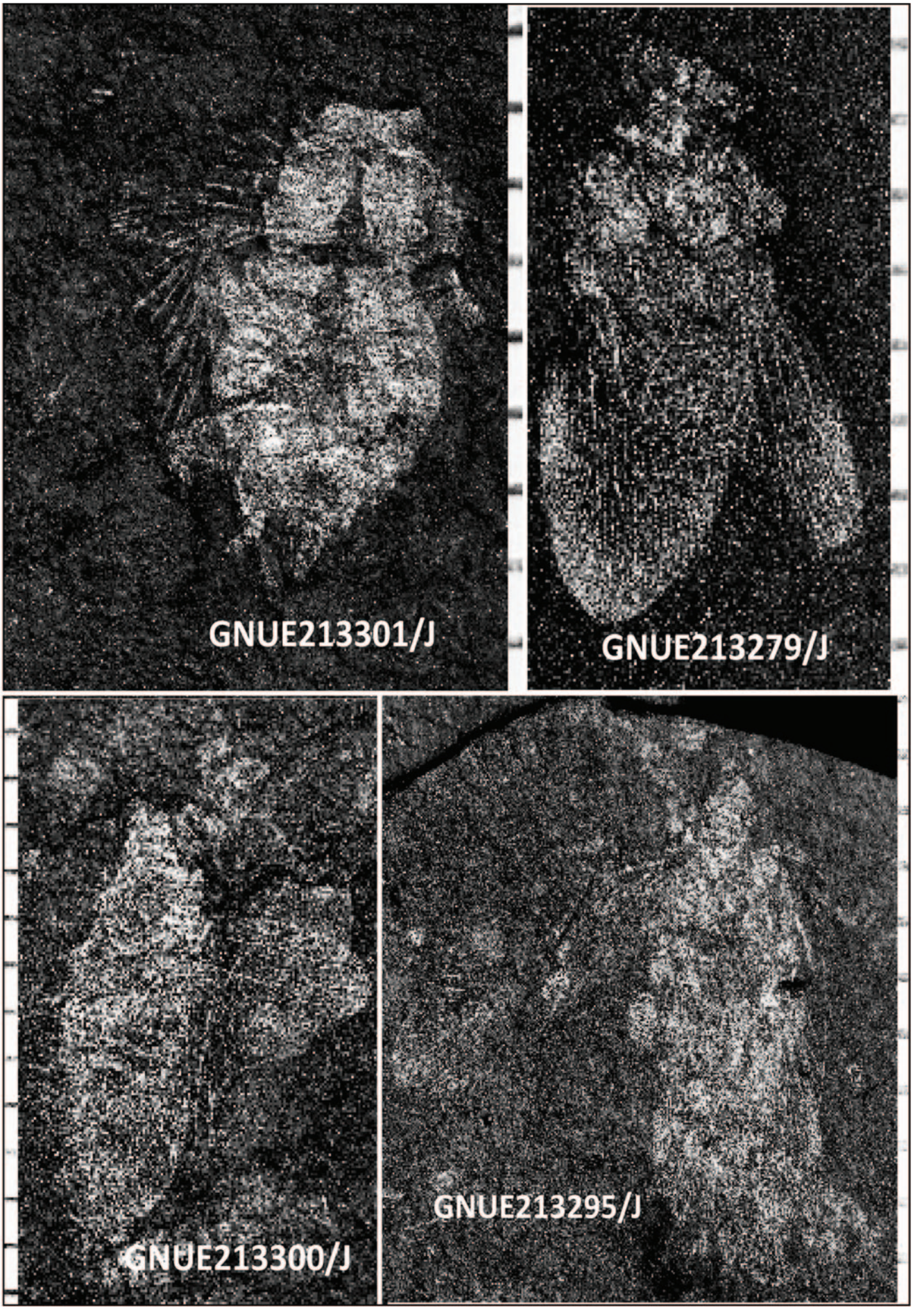
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GNUE213279/J
GNUE213300/J
GNUE213295/J

Derivation of name: *ale* is Slavic for "but".
Coloration: Total area caculated 11.72 mm^2 (1.63 mm^2 dark)
Character of preservation: 40 complete specimens, 1 isolated hindwing with articulations; 3 isolated forewings.
Taphonomy: Numerous complete specimens combined with absence of forewings which lack clavus suggest this species lived and was dominant near the lake banks and did not live up on the stream. Suprisingly also *Ano ona* from Karatau has more preserved hindwings than forewings, which is a reverse ratio to the standard.
Variability. This might be the first case of sexual dimorphism as hindwing sizes (fig. ====) are distributed (insignificantly) in two packs. Interestingly, also the only one sufficiently known representatives of the genus *Ano ona* also seems to have 2 size groups (one rare).
Venation variabilities reveal two differing values (10.3% forewing, 7.47% for hindwings), among which hindwing data are statistically significant. Nevertheless, decline of forewing variability such deep down seems highly unlikely in the significant set as drop from 22 to 30 sample size never before were higher than 2%. Lower hindwing variability is apparenty caused with its extreme simplification (result of miniaturisation bottleneck of ancestral *Ano*).
Mutations: Holotype possessed mutual A-A fusion (uncounted due to protective nature of this deformity). Additionally, specimen GNUE/J/213389 has a serious forewing modification, narrowed costal area combined with deformity of SC and R1. This serious forewing modification was also present in *Stavba* specimen in the market, and also in *Ano mal* (Vršanský 2024: PIN 2784/889), all three within the same family, suggesting a common mutation and/or a similar developmental error. Interesting is specimen GNUE/J/213288, which reveals M fused with CuA, by non-mutational way - simply M fused with CuA basally and ascends back as anterior offshoot.
Remarks: Colored hindwing apex is due to its incomplete covering by forewings. The hindwing M ascending from CuA stem is a synapomorphy with *Brutalista* and has no analogue. As both taxa were preserved with both sexes, their conspecific is excluded. Neverthess, *Brutalista* appears descendant from *Ano ale*. These taxa also reveal that *"Elisama" americana* belongs to this genus.

Ano FW

specimen	length	Width (mm)	SC	R	M	CuA	CuP	A	RM	RCuA	MCuA	SUM	Without A
309	5,8	2,2	1	14	4	6	1	7	18	20	10	33	26
GNUE213059L	7,4	2,3	1	12	4	5	1	4	16	17	9	27	23
GNUE213059R	7,4	2,4	1	12	4	5	1	4	16	17	9	27	23
GNUE213027	6,8	2,1	2	12	5	3	1	5	17	15	8	28	23
GNUE213011	9,3	2,9	1	13	5	6	1	4	18	19	11	30	26
213098	7,7	2,4	2	16	4	7	1	7	20	23	11	37	30
389	9,1	2,6	1	12	4	6	1	4	16	18	10	28	24
GNUE213031	6,7	1,8	2	15	3	6	1		18	21	9		27
KS5036	7,5	2,6	1	11	6	6	1	6	17	17	12	31	25
213253	9,3		2	11	11	2	1	4	22	13	13	31	27
DG0017	8,7	2,7	1	12	10	4	1	4	22	16	14	32	28
213171	6,7	2,4	2	10	8	3	1	8	18	13	11	32	24
213300	6,8	2,3	2	15	6	7	1	7	21	22	13	38	31
213244	7,2	2,6	2	9	3	7	1	5	12	16	10	27	22
213093	7,2	2,4	1	15	4	4	1	6	19	19	8	31	25
213107	6,1	1,4	3	12	4	2	1	5	16	14	6	27	22
213158 L			2	12	5	4	1	4	17	16	9	28	24
213158R	8,6	2,9	2	14	5	5	1	5	19	19	10	32	27
213136 L	6,7	2,2	2	13	3	5	1	8	16	18	8	32	24
213136R	7	2,2	1	12	5	2	1	7	17	14	7	28	21
213096L	7,3	2,1	1	13	5	4	1	7	18	17	9	31	24
213096R	6,6	2,3	1	11	5	5	1	7	16	16	10	30	23
n	21	21	22	22	22	22	22	21	22	22	22	22	22
min	5,8	1,4	1	9	3	2	1	4	12	13	6	27	21
max	9,3	2,9	3	16	11	7	1	8	22	23	14	38	31
ave	7,42	2,34	1,55	12,55	5,14	4,73	1	5,62	17,68	17,27	9,86	30,48	24,95
dev	1,016319222	0,350037592	0,5958006	1,738287957	2,076981659	1,608957609	0	1,465475707	2,275885252	2,728715347	1,983154163	3,07602093	2,572330289
CV	13,7	14,96	38,44	13,85	40,4	34,02	0	26,08	12,87	15,8	20,11	10,09	10,3

Ano HW

specimen	l			SC	R1	RS	M	CuA		CuP	R	RM	RCuA	MCuA	SUM
309L	5,6			1	3	7	2	6		1	10	12	16	8	20
309R	5,6			1	3	7	2	7		1	10	12	17	9	21
GNUE213059L	7,2			1	3	7	4	4		1	10	14	14	8	20
GNUE213027	6,1			1	5	6	2	6		1	11	13	17	8	21
312	6,4			1	4	7	3	5		1	11	14	16	8	21
317				1	4	6	2	5		1	10	12	15	7	20
GNUE213011	6,7			1	4	7	3	6		1	11	14	17	9	22
GNUE213031	5,6			1	4	2	5	5		1	6	11	11	10	18
GNUE213012	5,7			1	5	6	3	5		1	11	14	16	8	21
KS5036L	7,5			1	5	5	3	7		1	10	13	17	10	22
KS5036R	7,5	sym		1	6	6	3	3	plus	1	12	15	15	6	20
KS5026 R	8,3			1	5	6	3	5		1	11	14	16	8	21
KS5026 L	8,3	sym		1	4	7	3	5		1	11	14	16	8	21
KS5404 a	7,3			1	6	6	0	9		1	12	12	21	9	23
KS5404 b	7,3	sym		1	4	4	3	6		1	8	11	14	9	19
213193				1	4	3	2	7		1	7	9	14	9	18
213279	5			1	4	7	3	7		1	11	14	18	10	23
213300	6,4			1	6	7	2	6		1	13	15	19	8	23
213288L	5,5	blind CuA		1	4	6	3	5		1	10	13	15	8	20
213288R	5,5	M fused to CuA - not deformity, ascending	sym	1	5	7	0	7		1	12	12	19	7	21
213287	10			1	5	7	3	6		1	12	15	18	9	23
213154	7			1	4	6	2	6		1	10	12	18	8	20
213273L	5,3			1	4	4	2	7		1	8	10	15	9	19
213273R	5,3	Dich CuA	sym	1	4	6	2	8		1	10	12	18	10	22
213220	6,5			1	5	6	3	6		1	11	14	17	9	22
213247				1	5	7	2	7		1	12	14	19	9	23
213158				1	4	5	2	5		1	9	11	14	7	18
213095	6,4			1	7	6	2	6		1	13	15	19	8	23
213356	8,4			1	6	6	4	6		1	12	16	18	10	24
213096L	6,5			1	5	7	3	5		1	12	15	17	8	22
213096 R	6,5		sym	1	5	5	4	5		1	10	14	15	9	21
KS5026 R	8,3			1	5	6	3	5		1	11	14	16	8	21
KS5026 L	8,3		sym	1	4	7	3	5		1	11	14	16	8	21
n	29			33	33	33	33	33		33	33	33	33	33	33
min	5			1	3	2	0	3		1	6	9	11	6	18
max	10			1	7	7	5	9		1	13	16	21	10	24
ave	6,76			1	4,58	5,97	2,61	5,85		1	10,55	13,15	16,45	8,45	21,03
dev	1,214941869			0	0,936426153	1,237054174	0,998104264	1,175829817		0	1,582934559	1,62252142	1,985744651	0,971175483	1,57092426
CV	17,97			0	20,45	20,72	38,24	20,1		0	15	12,34	12,07	11,49	7,47

Genus *Brutalista* gen.n.

Type species: *Brutalista masivny* sp.n. , and by monotypy.

Differential diagnosis: Differs from all representatives of the family except *Akinisia* in having elongated forewings. It also differs in having strongly predatory adaptations of the forelegs and in having shorter ovipositor.
Autapomorphies: Free long raptorial forelegs.
Description: As for species.
Derivation of name: After brutal.
Remarks: Categorised within Liberiblattinidae on the basis of forewing and hindwing characterists, although having strong modification which includes modifictions of hindwing. Relation to true Mantodea is exluded by absence of pseudovein and differnetly structured SC.

***Brutalista masivny* sp.n. (FigurePs 94-104)**

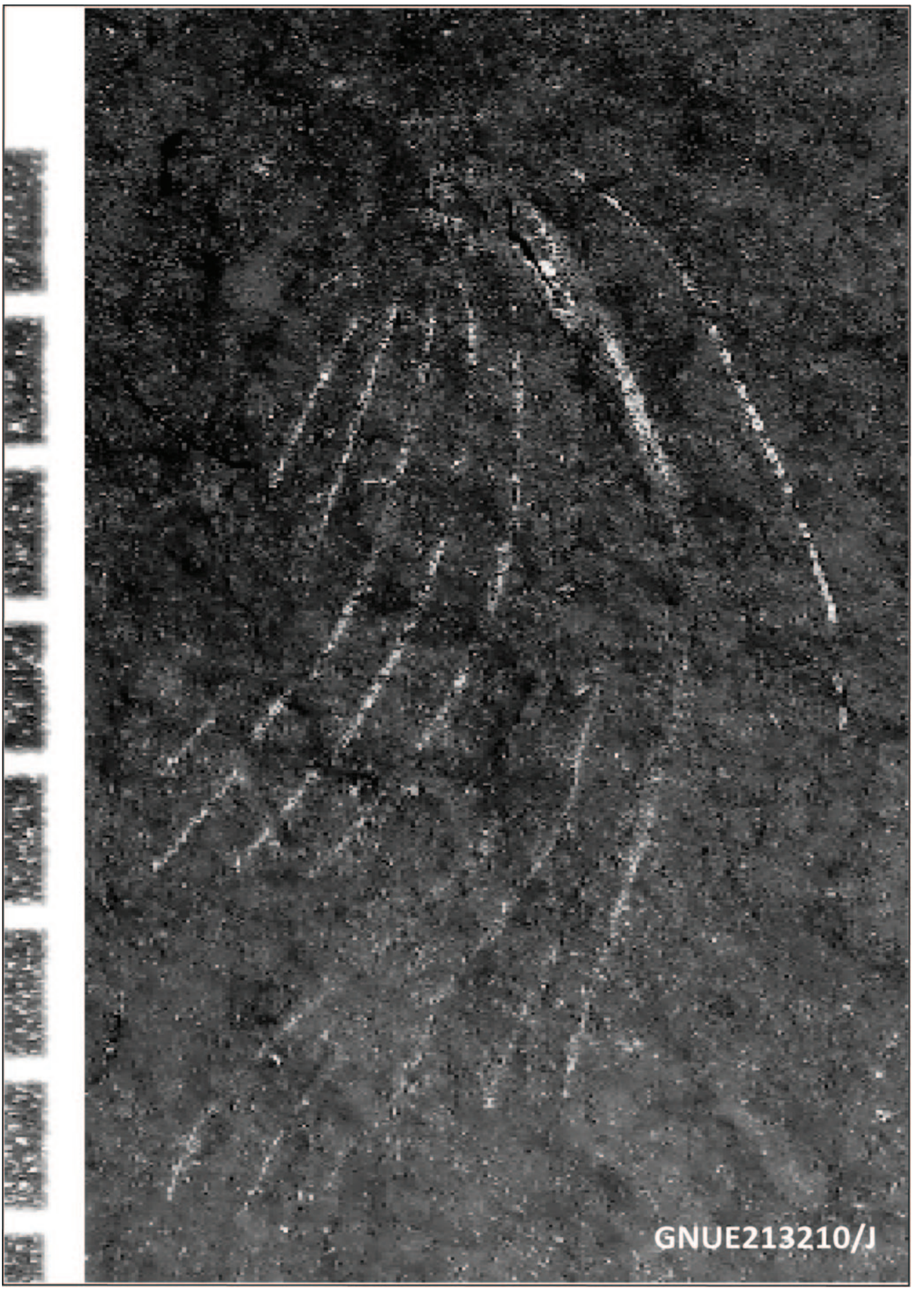
Holotype: GNUE/J/213090**.** A complete winged adult individual. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213044, GNUE213055, GNUE213087, GNUE213168, GNUE213221, GNUE213227=213327, GNUE213230, GNUE213239, GNUE213240, GNUE213246, GNUE213248, GNUE213250, GNUE213251FH, GNUE213283, GNUE213293=GNUE213312, GNUE213335 (complete specimens). GNUE213041FF, GNUE213045FF, GNUE213175, GNUE213210, GNUE213260, GNUE213285 (predation marks), GNUE213362 (predation marks) (forewings); GNUE304, GNUE306, GNUE314, GNUE213006HH, GNUE213035, GNUE213038HH, GNUE213119, GNUE213235HHB, GNUE213257, GNUE213270, GNUE213294HH, GNUE213297, GNUE213298HH, GNUE213314HP, GNUE213321HP, GNUE213332HHP, GNUE213353, DG0015 (hindwings). The same locality as the type. GNUE/S/213189 (complete specimen); 213091 Sacheon (forewings).

Description (on the basis of holotype, variability is given in the TableP 93): Head huge, hypognathous, possibly partially triagular, but with oval shapes. Antenna thin, probably short (11 mm as preserved, 65 and much more antennomeres), multisegmented. Palp rather long (213293: ?/1/1.5/0.6 mm). Forewing strongly elongate, with subparallel margins. Membrane transparent, coloration restricted to small maculas near descend of M and a terminal central pale round dot (213260: 1.9 mm in diameter). R strongly sigmoidal (in spite of narrow wing), short, not reaching apex, RS differentiated (6 in 213175). M and CuA long and strongly sigmoidal. CuP fluent. A simple.
Metanotum dark, preserved with characteristic pale aperture. Hindwing remigium narrow, elongate, strongly overlapping forewings in repose (213044). SC simple, long, slightly curved, reaching about a half of the wings length. R1 (ocassionally wildly secondarily and even tertiary branched) and RS differentiated. M simplified, often ascending from the central part o CuA, apparently fused prior to that. CuA rather simple, mostly without secondarily branches, rarely also with blind branches. CuP simple. A1 in remigium rather straight. Vannus with long simple arched A2-.
Body rather narrow (5.5 mm, 213055). Cercus oligomerised (9), standard (3.3/0.4 mm). Ovipositor (213283) long and narrow (2/0.8 mm), with distinct two external valves.
Legs very long, coxae free, femora with terminal spur. Forefemora long (213180: 1.9/0.4 mm), colored dark with two longitudinal narrow pale stripes. Foretibia long, 1.75 mm and heavily carinated with at least 10 spurs up to 0.3 mm long. Tarsus extremely developed (2.2 mm). Hindtibia with tarsus over 8.5 mm long.
Derivation of name: After massive.
Variability. 9.32% hindwing variability (CV) is highly consistent with data from directly unrelated *Elisama* from the same site.
Character of preservation: 24 complete specimens, 6 forewings, 14 hindwings (some with P)
Taphonomy: Complete specimens combined with partially preserved isolated fore and hindwing suggests habitats near waterbody as well as up the stream.
Remarks: It is remarkable how this strong predator modified its venation homoplasically as in Mantodea. Specially remarkable are fusion of veins, namely hindwing M ascending frequently from CuA in the middle, apparently fused prior to that (and the same character rarely occurs in *Ano ona*). Extremely long legs are homoplasic with manipulators.

Brutalista HW

specimen			SC	R1	RS	M	CuA	CuP	R	RM	RCuA	MCuA	Total
GNUE213035L	11,9		1	4	6	3	6	1	10	13	16	9	21
314			1	8	7	3	6	1	15	18	21	9	26
GNUE213038L	13,8		1	6	8	3	5	1	14	17	19	8	24
GNUE213038 R	13,8	sym	1	7	6	4	5	1	13	17	18	9	24
304L	11,1		1	6	6	3	7	1	12	15	19	10	24
304R	11,1	sym	1	4	8	2	7	1	12	14	19	9	23
306L			1	3	5	3	6	1	8	11	14	9	19
306R			1	3	7	3	8	1	9	12	17	11	23
GNUE213006L	13,5		1	6	7	3	7	1	13	16	20	10	25
GNUE213006 R	13,5	sym	1	5	7	3	7	1	12	15	19	10	24
DG0015	12	Blind CuA	1	2	10	2	13	1	12	14	25	15	29
S 213091L	15,1		1	8	8	2	6	1	16	18	22	8	26
S 213091R	15,1	sym	1	5	6	4	6	1	11	15	17	10	23
213287	10		1	5	7	3	6	1	12	15	18	9	23
213294L	11,5		1	4	6	4	9	1	10	14	19	13	25
213294LR	11,5	Bracnhed CuA, sym	1	4	6	4	7	1	10	14	17	11	23
213297	12,5	Again zero M	1	7	8	0	7	1	15	15	22	7	24
213246			1	5	5	2	5	1	10	12	15	7	19
213257L	10,3	Again zero M	1	6	10	0	6	1	16	16	22	6	24
213353	15		1	6	7	3	6	1	13	16	19	9	24
213314	13,6		1	5	7	4	5	1	12	16	17	9	23
n	17		21	21	21	21	21	21	21	21	21	21	21
min	10		1	2	5	0	5	1	8	11	14	6	19
max	15,1		1	8	10	4	13	1	16	18	25	15	29
ave	12,66		1	5,19	7	2,76	6,67	1	12,14	14,9	18,8	9,43	23,62
dev	1,649219958		0	1,600595127	1,341640786	1,135991281	1,770122406	0	2,22003861	1,89485519	2,600366275	1,989256861	2,201730921
CV	13,03		0	30,84	19,17	41,16	26,54	0	18,29	12,72	13,83	21,09	9,32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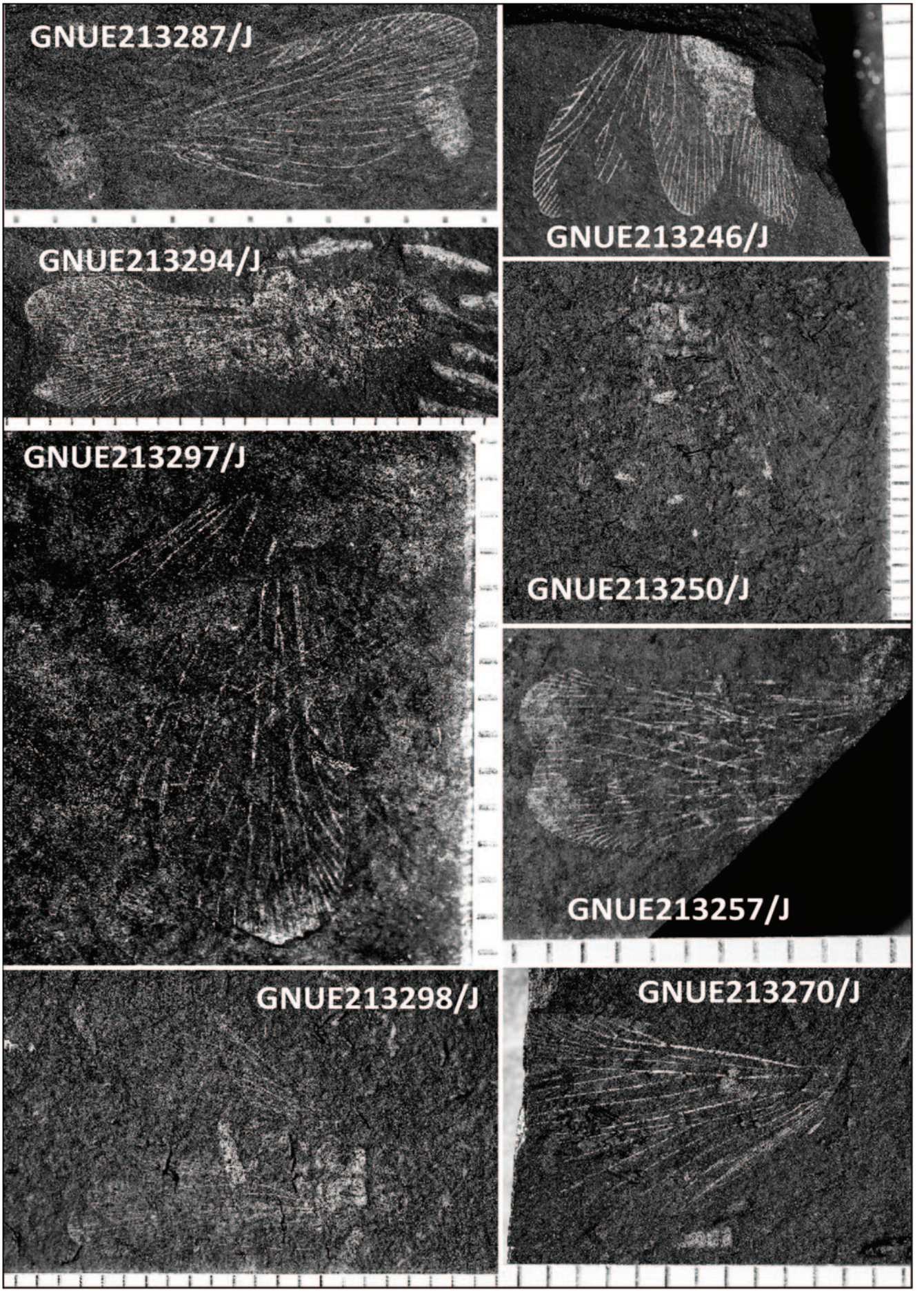
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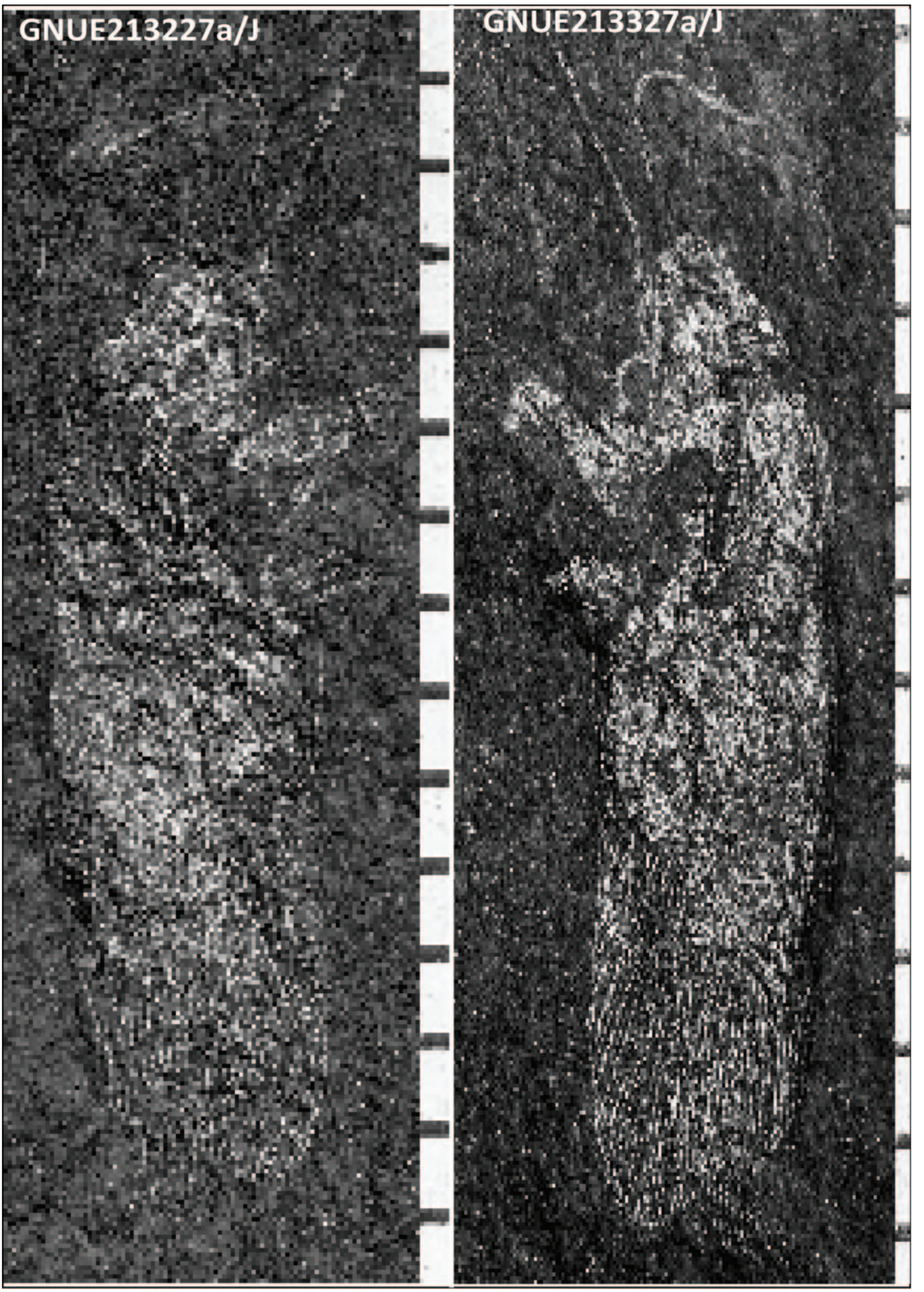
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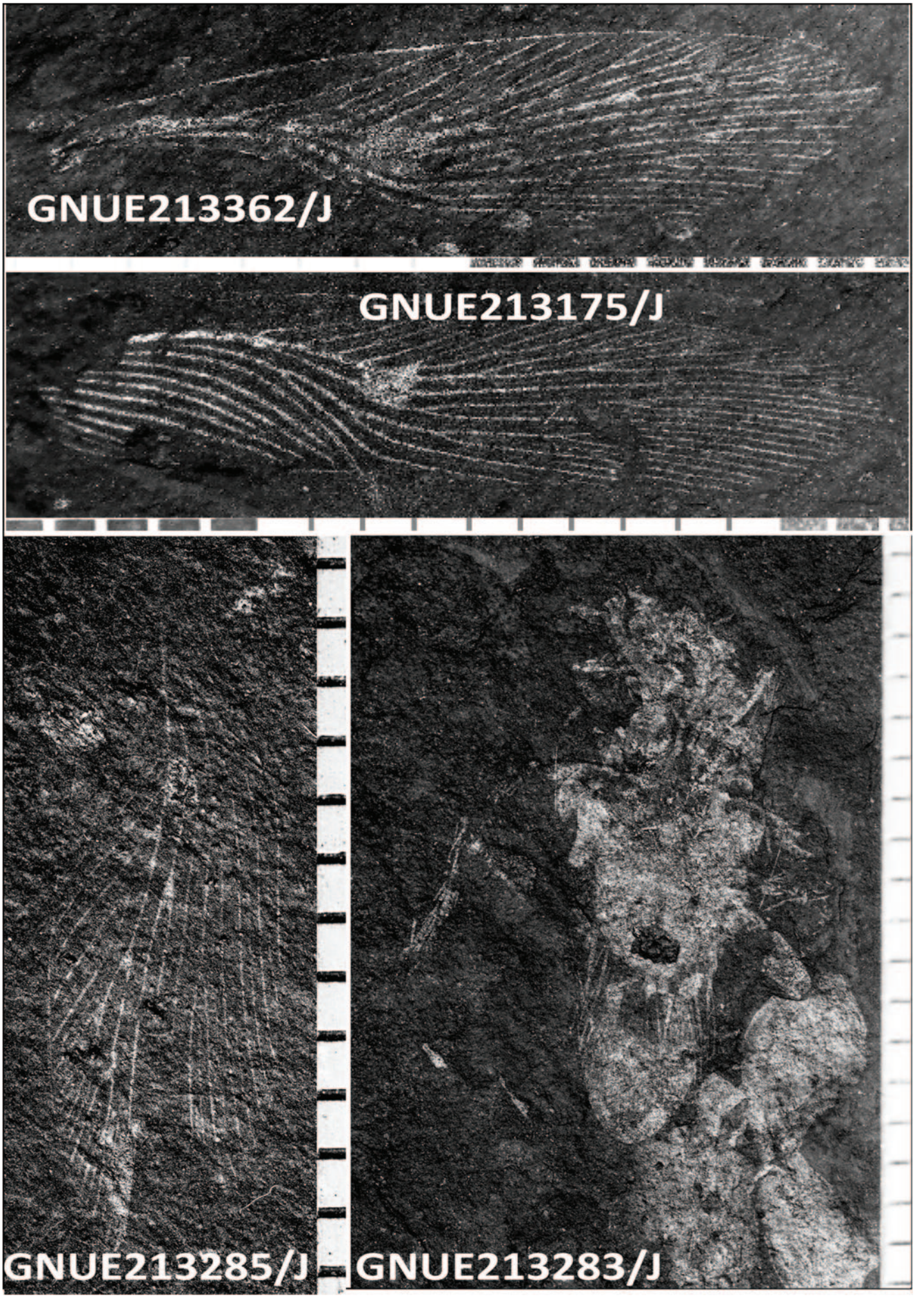
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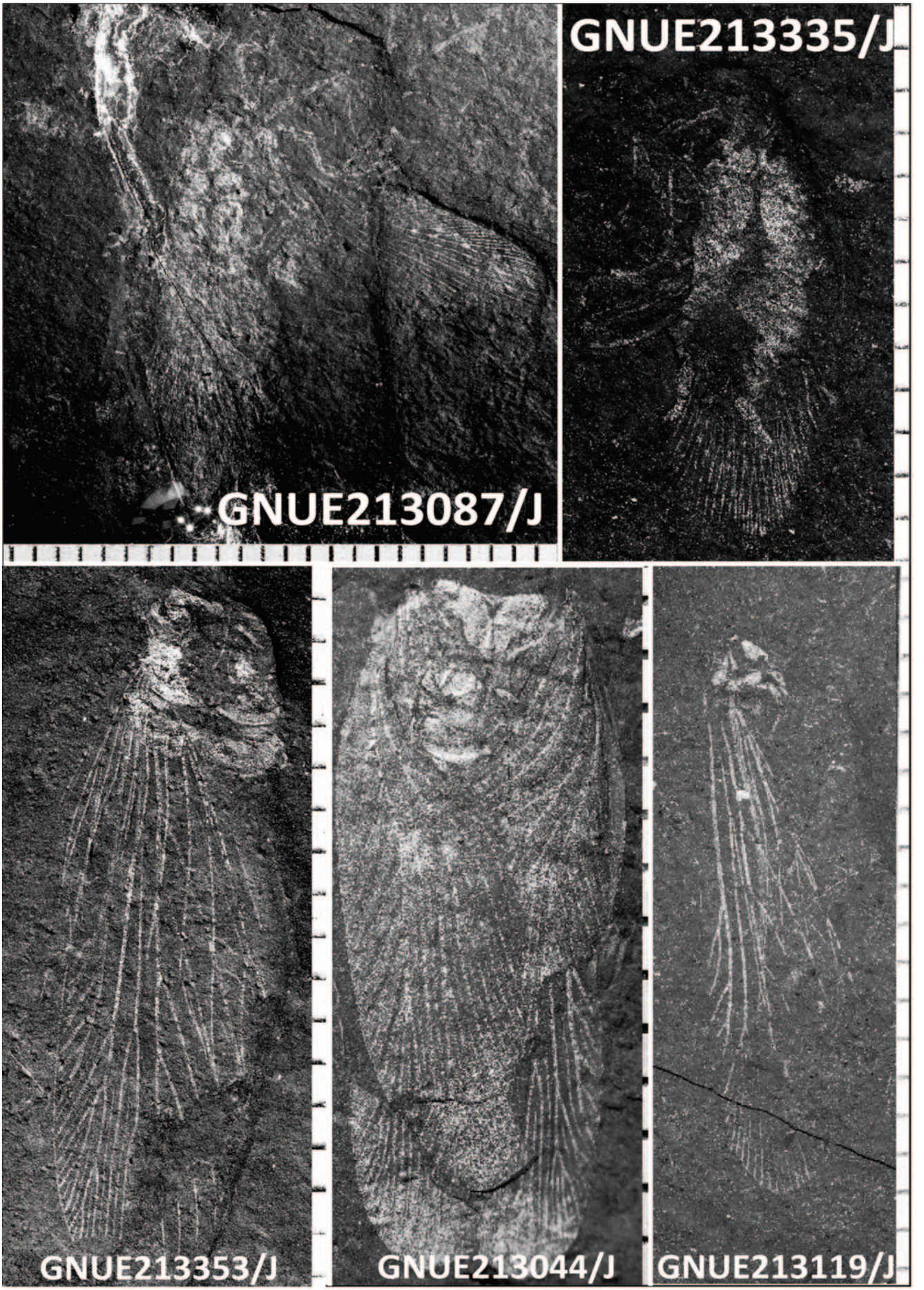
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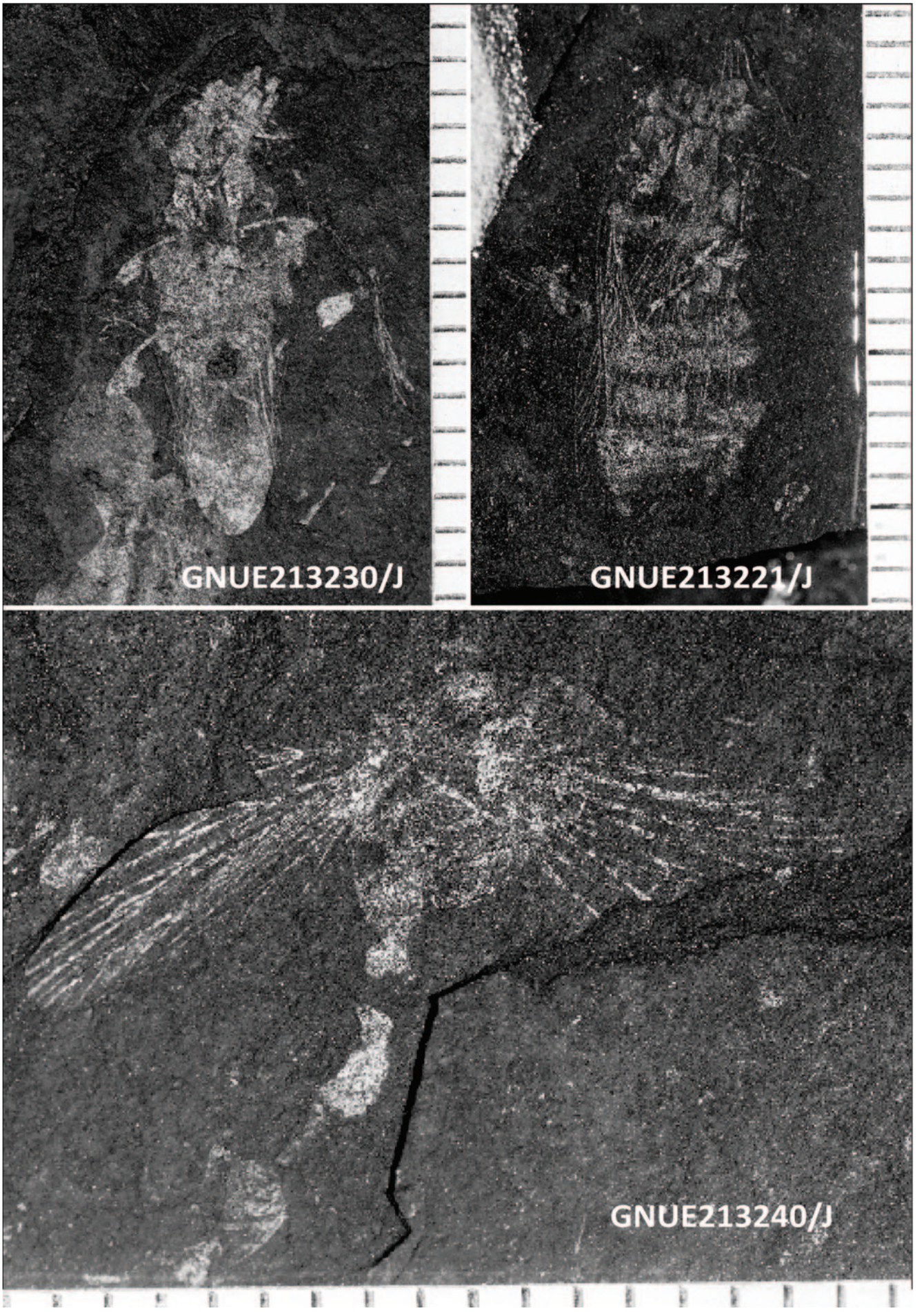
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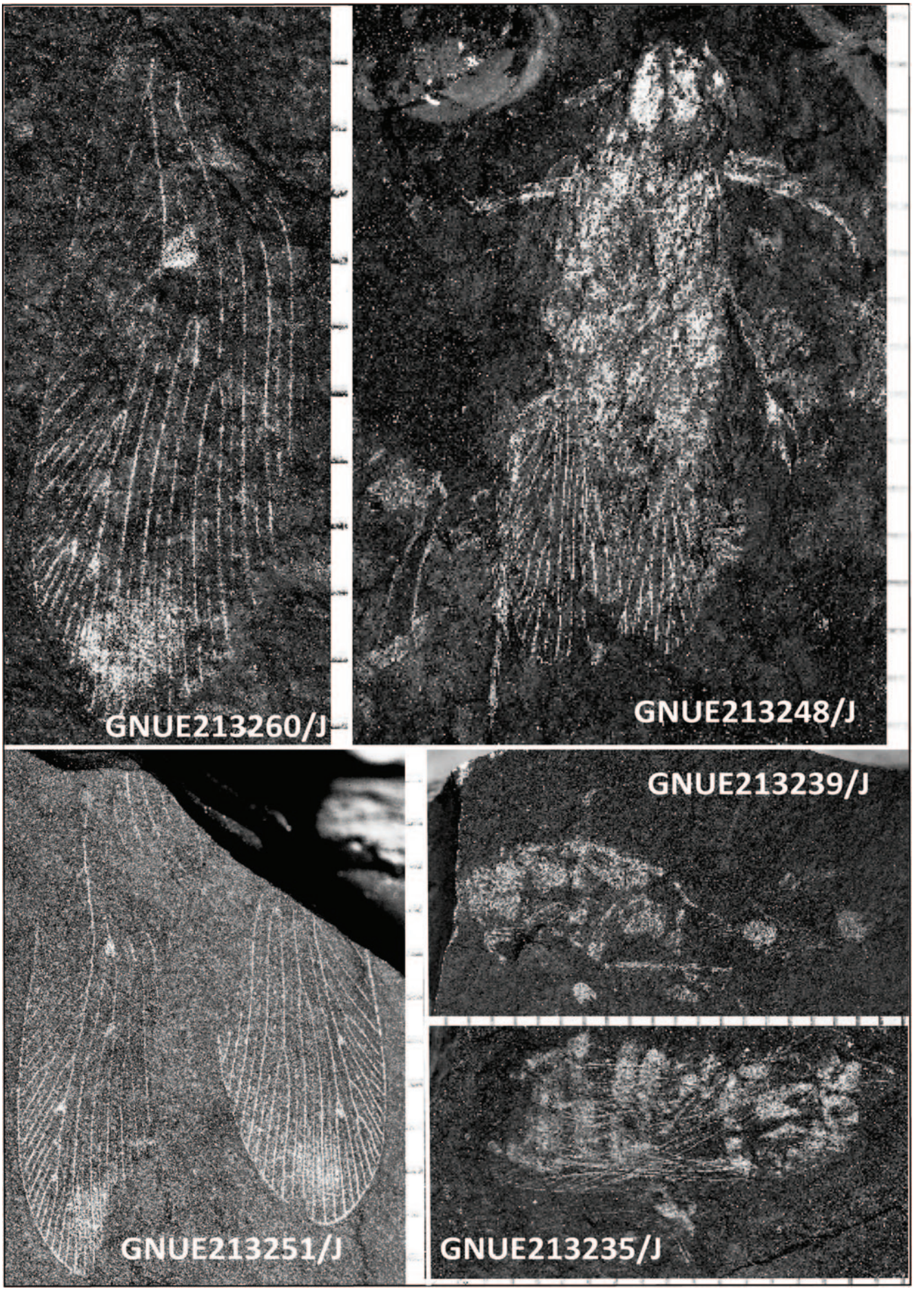
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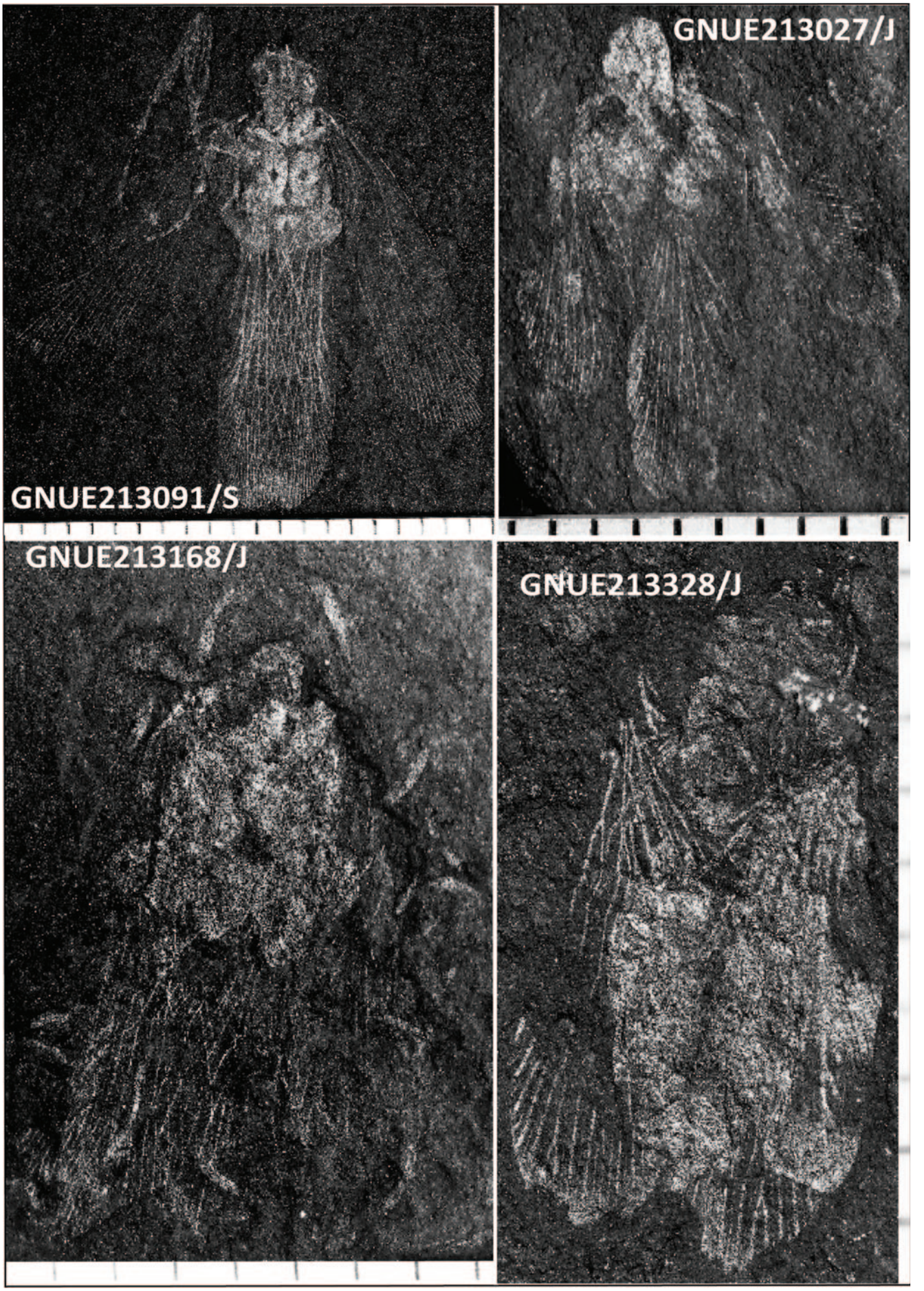
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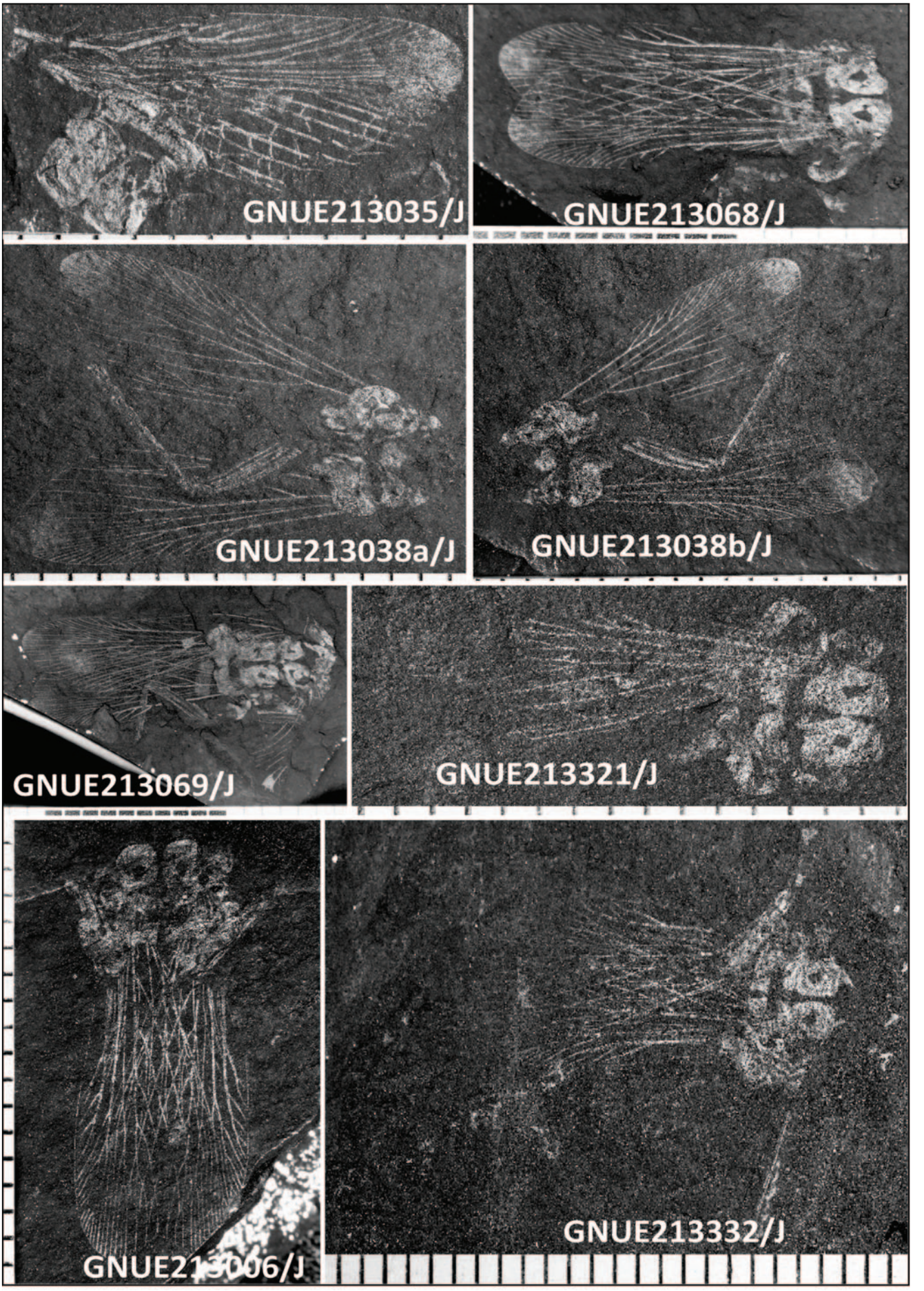
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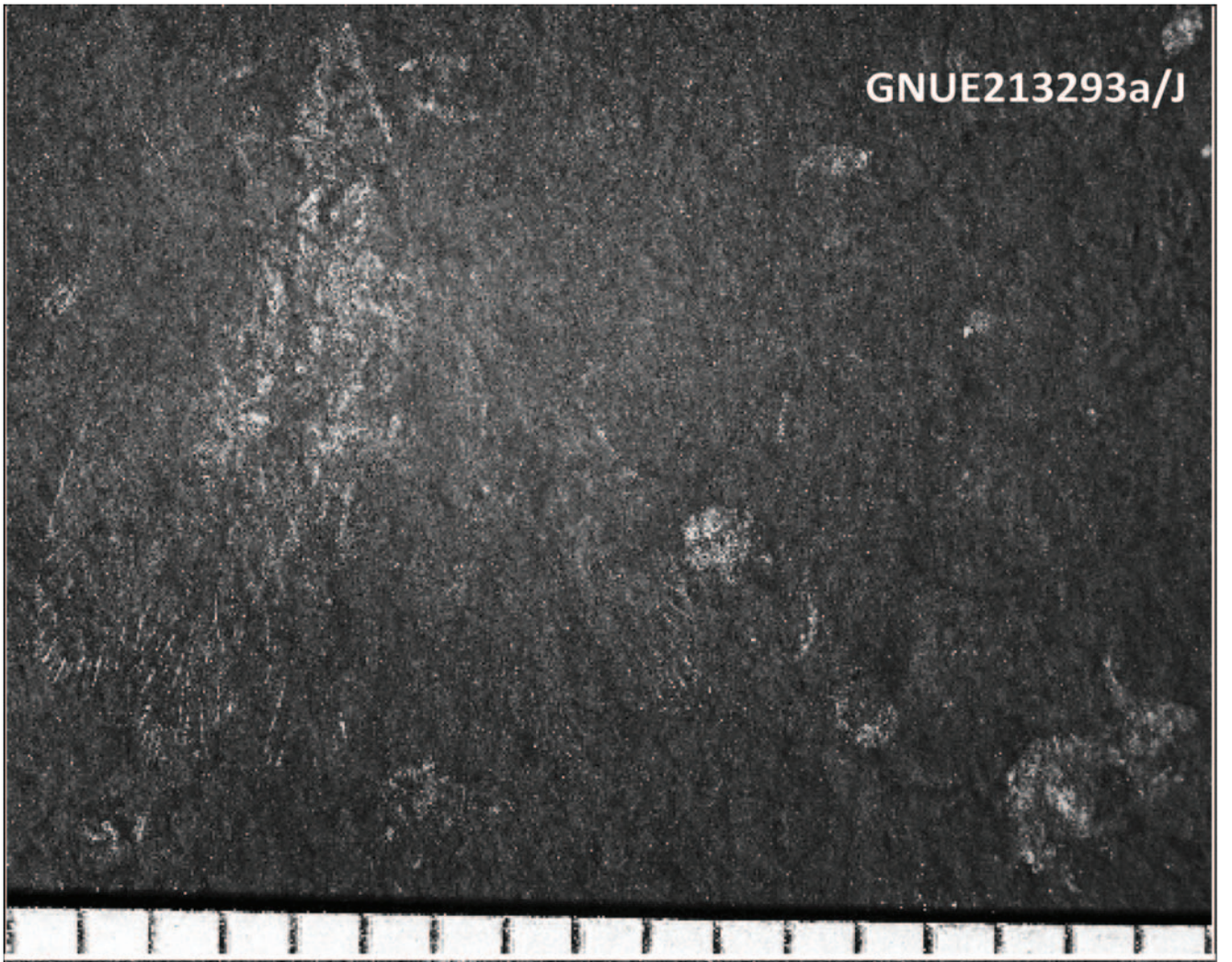
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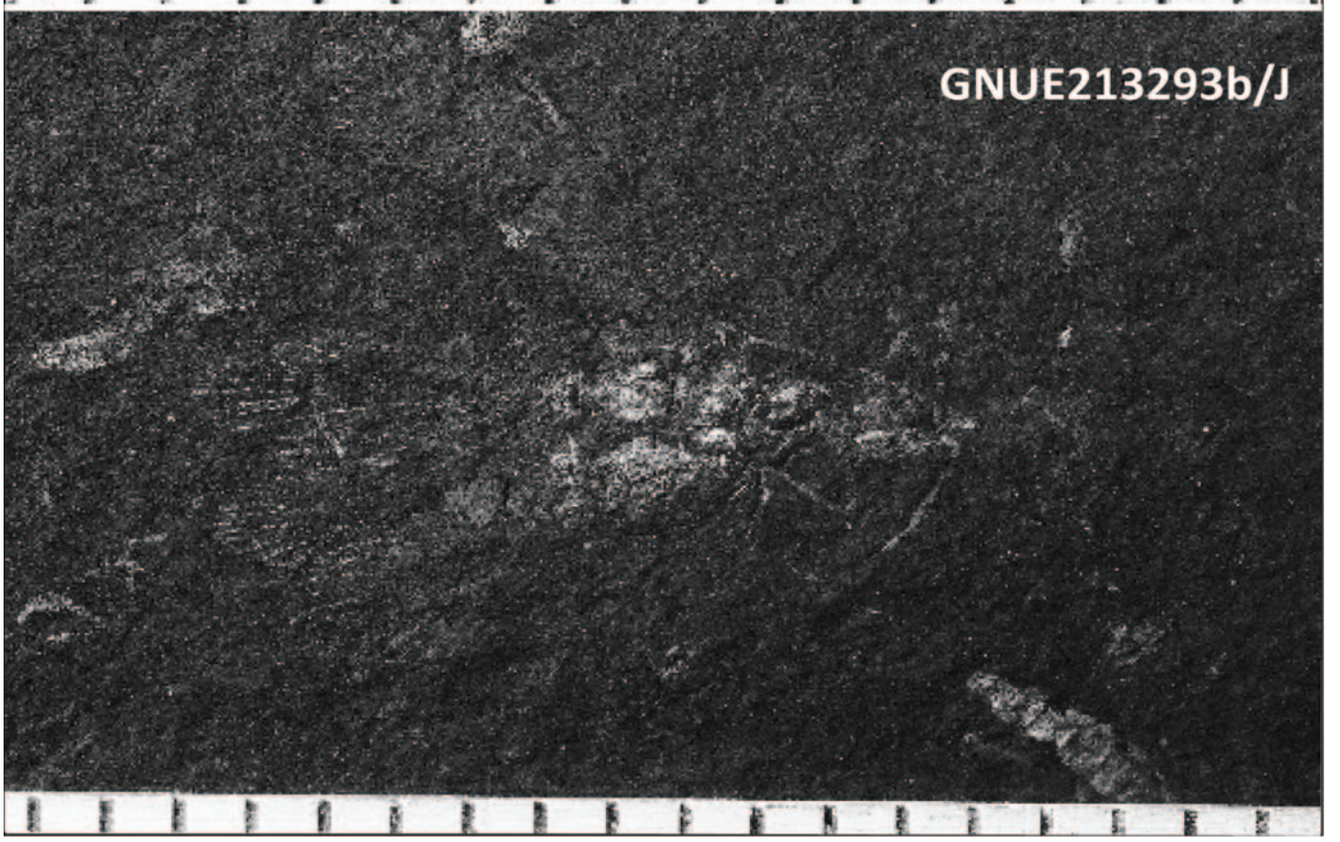
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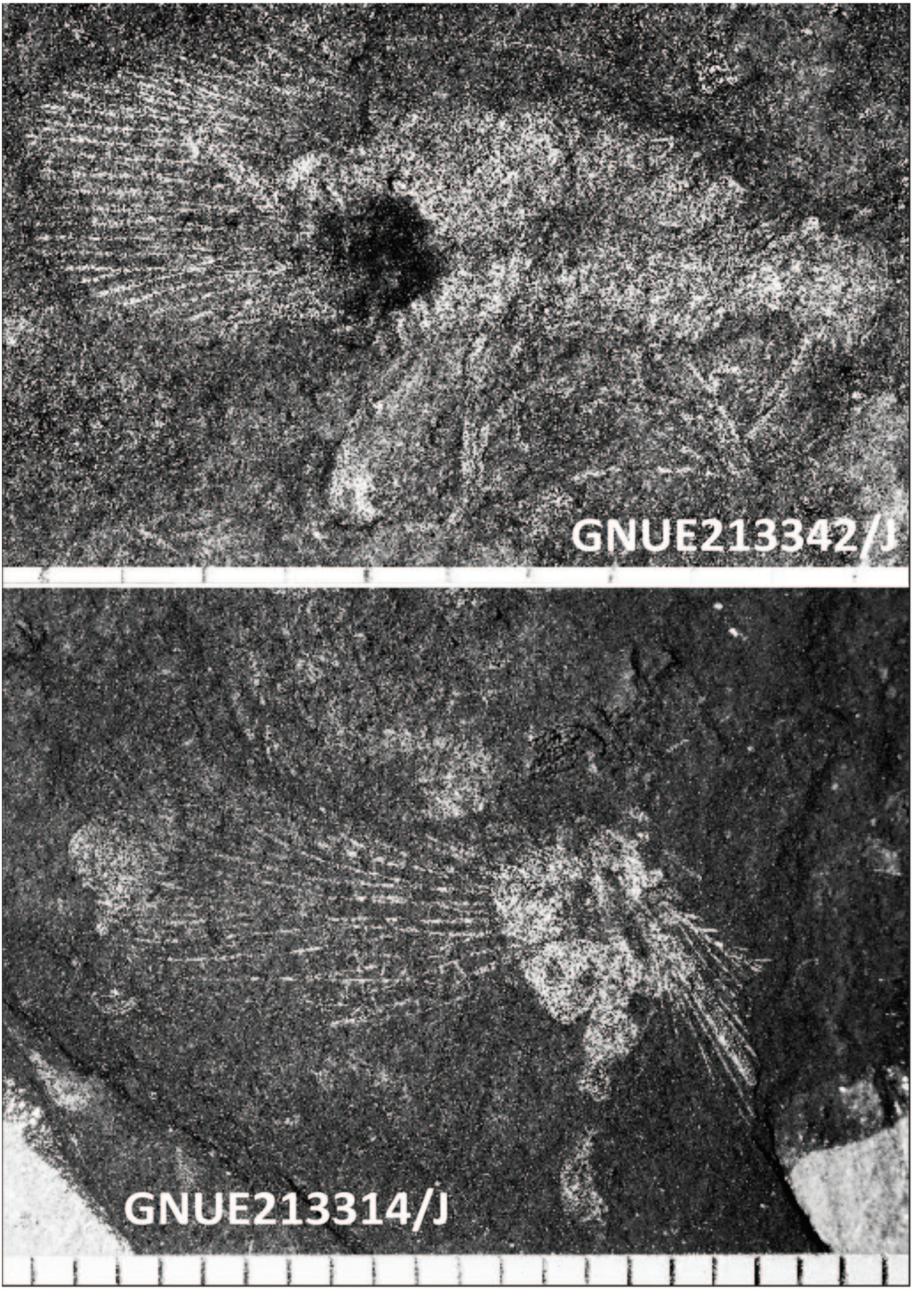
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Superfamily Blattuloidea Vishniakova, 1982 (monotypic)

Family Blattulidae Vishniakova, 1982

Type genus: *Blattula* Handlirsch, 1906
Stratigraphic range: Hettangian–Maastrichtian
Geographic range: Cosmopolitan

Composition: *Batola* Vršanský, 2009; *Blattulites* Vishniakova, 1982; *Elisama* Giebel, 1856; *Vrtula* Vršanský, 2008; *Macaroblattula* Wang et al., 2007; *Kridla* Vršanský, 2005; *Habroblattula* Wang et al., 2007; *Sivis* Vršanský, 2008; *Ocelloblattula* Anisyutkin et Gorochov, 2008; *Pravdupovediac* Sendi et al., 2023; *Svabula* Vršanský, 2005; *Nula* Vršanský, 2008; *Xonpepetla* Cifuentes Ruiz et Vršanský, 2006; *Asvab* Vršanský, 2024; *Okienkula* Vršanský, 2024; *Spono* Vršanský, 2024; *Clypeblattula* Zhang, Chen et Luo, 2024.

Differential diagnosis: Differs from other (corydioid) cockroach families, in having simple SC, hindwing CuA without secondary branches, usually simple CuP, female with short externally protruding ovipositor.

Genus *Blattula* Handlirsch, 1906

Type species: *Blattina langfeldti* Geinitz, 1880, p. 521; subsequent designation by Handlirsch (1906). *Blattina dobbertinensis* Geinitz, 1884 (designated by Beckerr-Migdisova 1962: 103) is now considered a junior synonym of *Blattula langfeldti* (Geinitz, 1880). Dobbertin, Germany, Lower Jurassic
Stratigraphic range: Hettangian–Santonian
Geographic range: Cosmopolitan

Composition: *Blattula aberrans* Vishniakova, 1982, Kubekovo, Russia, Middle Jurassic; *B. anuniversala* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. bacharensis* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. brevicaudata* Vishniakova, 1968, Karatau Mikhailovka, Kazachstan, Jurassic; *B. ctinoida* Lin, 1986, Quiyang, Hunan, Lower Jurassic; *B. choutinensis* Vršanský, 2008, Houtiyn Hotgor, Mongolia, Upper Jurassic; *B. delicatula* Ren, Lu et Guo, 1995, Gaositai railway stat ion, Hebei Province, China, Upper Jurassic; *B. disjuncta* Handlirsch, 1906-1908, Wiltshire, England, UK, Jurassic/Cretaceous; *B. dubia* Handlirsch, 1939, Mecklenburg, Germany, Lower Jurassic; *B. exetenuata* Ren, 1995, Gaositai railway station, Hebei Province, China, Upper Jurassic; *B. extensa* Vishniakova, 1982, Iya River, Russia, Lower Jurassic; *B. f lamma* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. hymena* Lin, 1986, South China; *B. iensis* Vishniakova, 1982, Iya River, Russia, Lower Jurassic; *B. incompleta* Handlirsch, 1906–1908, Stensham, England, UK, Upper Triassic; *B. kellos* Zhang, 1986, N. Hebei, China, Jurassic; *B. lanceolata* Vishniakova, 1982, Novospasskoye village, Middle Jurassic; *B. liaoningensis* Hong, 1986, Beipiao, Liaoning, Middle Jurassic; *B. micro* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. mini* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. mongolica* Vršanský, 2004, Shar Teg, Mongolia, Upper Jurassic; *B. pachohymena* Lin, 1985, South China, Zhongshan, Guangxi, Lower Jurassic; *B. platypa* Ren, Lu et Guo, 1995, Gaositai railway station, Hebei Province, China, Upper Jurassic; *B. prestwichii* Handlirsch, 19061908, England, UK, Jurassic/Cretaceous; *B. rudis* Ren, Lu et Guo, 1995, Qinglongtou village, China, Lower Jurassic; *B. similis* Vishniakova, 1982, Iya River, Siberia, Russia, Lower Jurassic; *B. universala* Vršanský, 2020, Bakhar, Mongolia, Middle Jurassic; *B. vidlickai* Vršanský, 2004, Shar Teg, Mongolia, Upper Jurassic; *B. wilmotti* Martin, 2010, Mintaja, Western Australia, Lower Jurassic; *B. zaoshangensis* Lin, 1986, South China; *B. ahanaha* Vršanský, 2024; *B. druha* Vršanský, 2024; *B. fragilia* Vršanský, 2024; *B. gracilicosta* Vršanský, 2024; *B. microscopica* Vršanský, 2024; *B. nebude* Vršanský, 2024; *B summa* Vršanský, 2024 (all Karabastau).

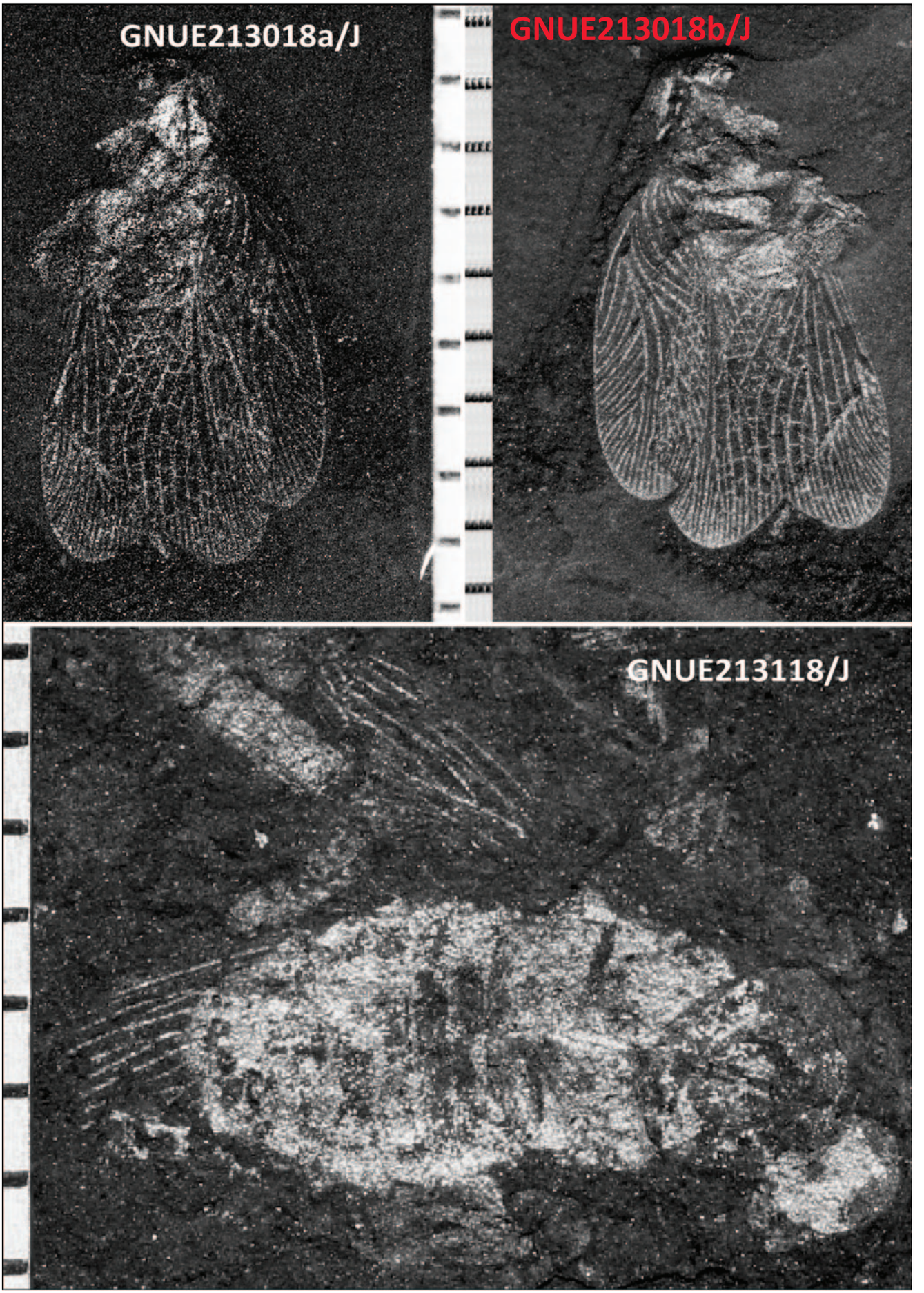
Differential diagnosis (after Vršanský and Ansorge 2007): Very similar in wing venation to the mainly Lower Cretaceous *Elisama* Giebel, 1856. The most striking difference is a dark macula in *Elisama* forewings.

***Blattula pessimusestfinis* sp.n. (FigurePs 106-109)**

Holotype: GNUE213018=213219 (±). A complete specimen without body, head and extremities. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213118, GNUE213185, GNUE213205, GNUE213209, GNUE213308 (complete specimens). GNUE/J/212165 (forewing). GNUE/J/213258 (hindwing). DG005, DG012, KC0018, KCKSDG, KS5032

Differential diagnosis: Differs from congeners in strongly developed costa. Generally nearly identical with *B. ahanaha*, but is much smaller. Such small species in Karatau are structured differently, which is surprising as usually size is forming the shapes within this group. Unique is small colored tip of wings.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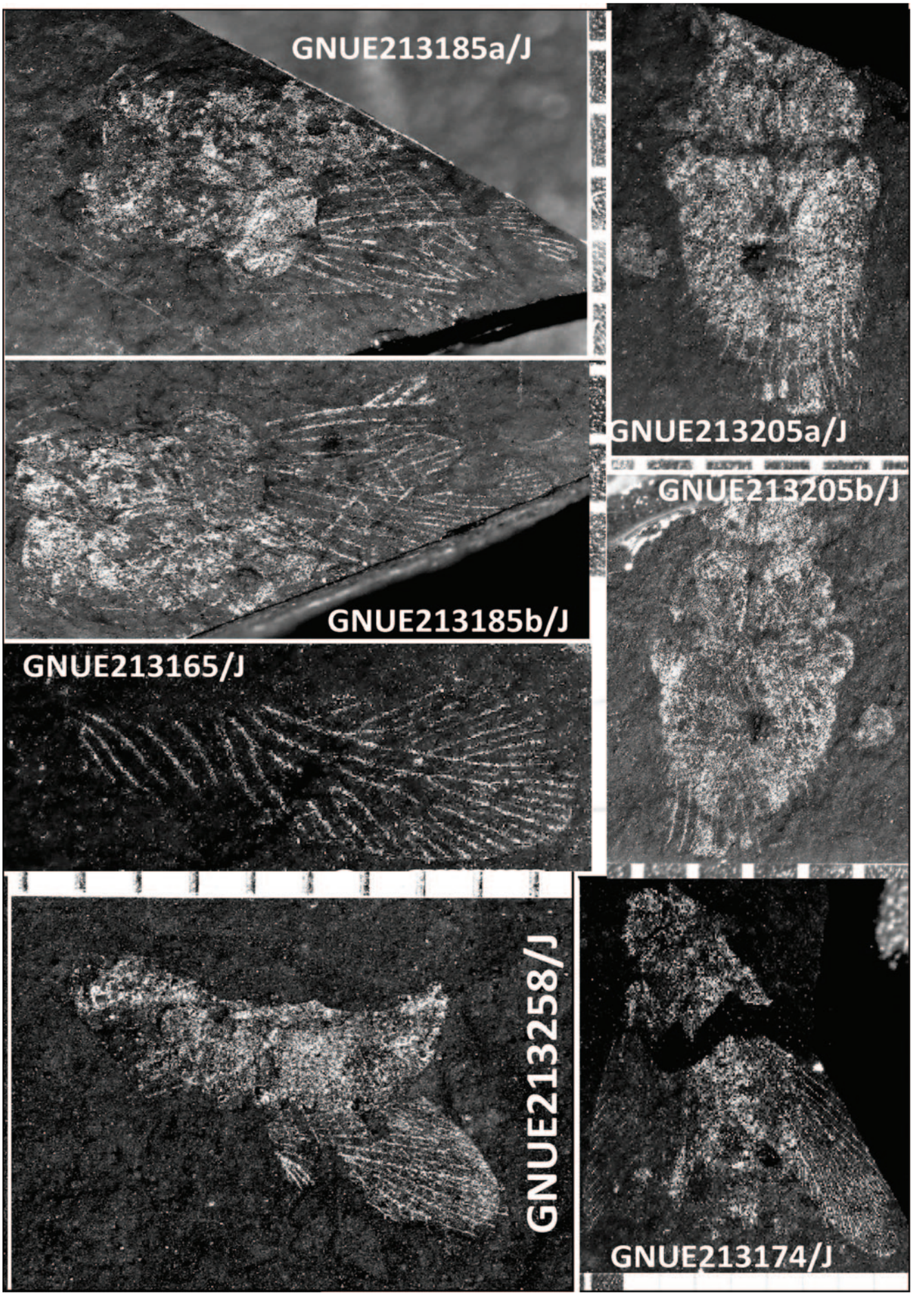
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GNUE213174/J


GNUE213305/J


GNUE213308/J

Autapomorphy: Colored short tip of wings; strongly developed costa is synapomorphic with *B. ahanaha*
Description: Small species. Forewing (4.5-5.5/1.6-2.1 mm), costa well-developed, all around the wing, apex shortly dark. Intercalaries distinct, cross-veins indistinct. Sc simple, curved (not sigmoidal). R long, sigmoidal, with 6-10 veins meeting margin. M simplified (3-5), CuA expanded (3-7). CuP fluent, A simple (5-6). Hindwing (5-5.5 mm) with strongly developed costa all along remigium. SC simple, straight, R1 with 5-6 branches within the comb, pterostigma distinct, RS 4-5; M 2-3, CuA with 5-7 simple branches, CuP siple, A1 in remigium. Hindwings rather symmetrical, but M with 3 veins in left hindwing.
Coloration: Total area caculated 6.47 mm^2 (none dark)
Derivation of name: *pessimus est finis* is Latin for "worst is the end" - a virtual epitaph developed by B.V.
Character of preservation: 5 complete specimens, 6 forewings, 1 hindwing
Taphonomy: Complete specimen without body indicates short pre-depositional transport with possible predation.
Remarks: Relation to *B. ahanaha,* a species from Karatau does not hold any phylogenetic signal simply because in Karatau all types of the genus were represented small futurior macula near clavus; females with short convex ovipositor; male terminalia with styli.

Genus *Elisama* Giebel, 1856

Type species: *Blattidium molossus* Westwood, 1854
Composition: *Araripeblatta bolzoni* Mendes et Coelho, ?2007; *A. dornellesi* Mendes et Coelho, ?2007; *A. oliveirai* Mendes et Coelho, ?2007*; A. simplex* Mendes et Coelho, ?2007; *A. toledoi* Mendes et Coelho, ?2007 (all Crato); *Elisama algeriaensis* Vršanský in Vršanský et al. (2021) (Brezina); *E. brevis* Mendes, 2000 (Crato); *E. cuboides* Wang et al., 2007; *E. exetenuata* Ren, 1995 (all Yixian); *E. fragmentaria* Vršanský, 2005 (Sharin Gol); *E. globosa* Vršanský in Sendi et al. (2023)(lebanite); *E. grandis* Vršanský, 2003 (Bon Tsagaan); *E. hindwingnii* Lee, 2016 (Crato); *E. incerta* Vršanský, 2003 (Bon Tsagaan); *E. kneri* Giebel, 1856 (Dinton); *E. minor* Giebel, 1856 (Purbeck); *E. parallela* Vršanský, 2003 (Bon Tsagaan); *E. pterostigmata* Vršanský, 2004 (Shar Teg); *E. scudderi* Handlirsch, 1906 (Durlston Bay); *E. prelistama* Vršanský, 2024 (Karabastau); *E. kacerovae* Sendi, 2025 (burmite).

Stratigraphic range: Late Jurassic (Kimmeridgian) – Upper Cretaceous (Campanian)
Geographic range: Cosmopolitan
Diagnosis (after Sendi et al. 2023a): Small sized cockroaches with wide head, three ocelli residing in the forehead between the compound eyes; short palps; pronotum transverse, oval, simple shaped; forewings with

Elisama baeki sp.n. (FigurePs 111-137)

Holotype: GNUE55. A complete winged male. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

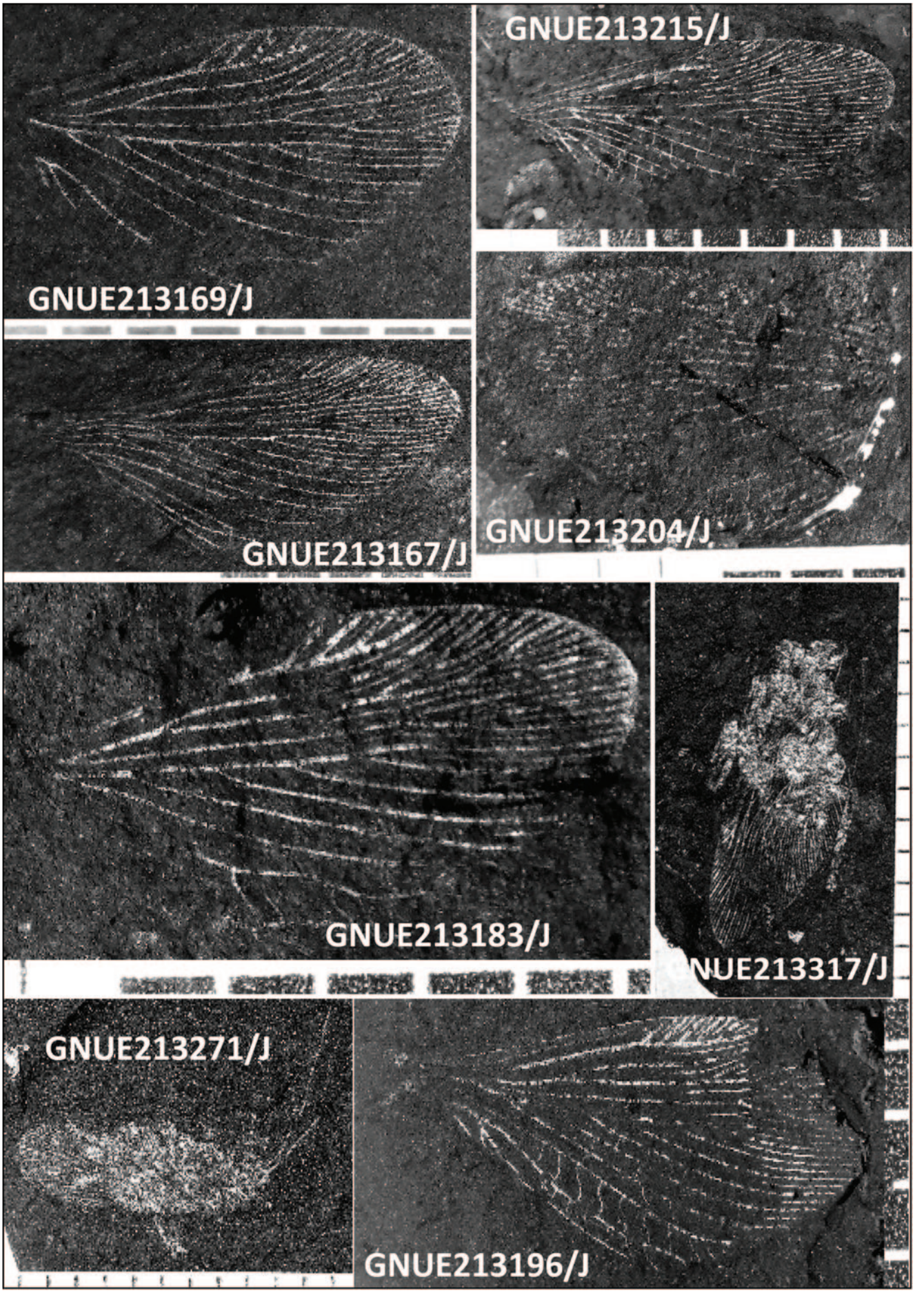
Additional material: GNUE231=213083, GNUE315 (Male), GNUE320, GNUE321, GNUE342, GNUE213001, GNUE213002=(318=213075), GNUE213003, GNUE213010, GNUE213015, GNUE213016=GNUE213058, GNUE213024, GNUE213025=GNUE213037, GNUE213033, GNUE213042, GNUE213047, GNUE213050, GNUE213063, GNUE213066, GNUE213092 (Female), GNUE213094, GNUE213109, GNUE213126, GNUE213127, GNUE213129 (Female), GNUE213131, GNUE213144BH, GNUE213150, GNUE213155, GNUE213161, GNUE213163, GNUE213164, GNUE213173, GNUE213190, GNUE213203, GNUE213208, GNUE213222, GNUE213229, GNUE213242, GNUE213252, GNUE213259, GNUE213263 (with pollen in gut), GNUE213265, GNUE213266HHB, GNUE213267, GNUE213269HB, GNUE213271, GNUE213274, GNUE213303, GNUE213306, GNUE213309=GNUE213310, GNUE213316, GNUE213317, GNUE213318, GNUE213320, GNUE213322, GNUE213330, GNUE213336, GNUE213338, GNUE213341, GNUE213344, GNUE213345, GNUE213346, GNUE213348, GNUE213355, GNUE213357, GNUE213358, GNUE213359=GNUE213360, GNUE213361, GNUE213367, GNUE213368, GNUE213369, DGOO8, KS5401, KS5402 (complete specimens). GNUE213046=213061, GNUE213052, GNUE/J/213060, GNUE213153, GNUE213162, GNUE213166, GNUE213177, GNUE213180, GNUE213197, GNUE213212, DG0014 (forewings). GNUE213004=213086, GNUE213036, GNUE213097, GNUE213116, GNUE213122, GNUE213138, GNUE213145, GNUE213149, GNUE213159, GNUE213167, GNUE213169, GNUE213170, GNUE213183, GNUE213196, GNUE213198, GNUE213204, GNUE213215, GNUE/J/213343, DGOO2, KS5207 (hindwings). The same locality as Type. GNUE/S/213102 Sacheon (complete specimen); 213188 Sacheon (forewing); 213151 Saacheon (hindwing). GNUE/G/213099, 213157Gunwi (forewings).

Additional material not included in statistics: 213301 unassigned counterpart.

Differential diagnosis: From similarly sized *Elisama* (possibly) lacking pterostigma *E. exetenuata* (Yixian) is slightly larger and does not have sharp wing apex.


GNUE213129/J


: GNUE213274/J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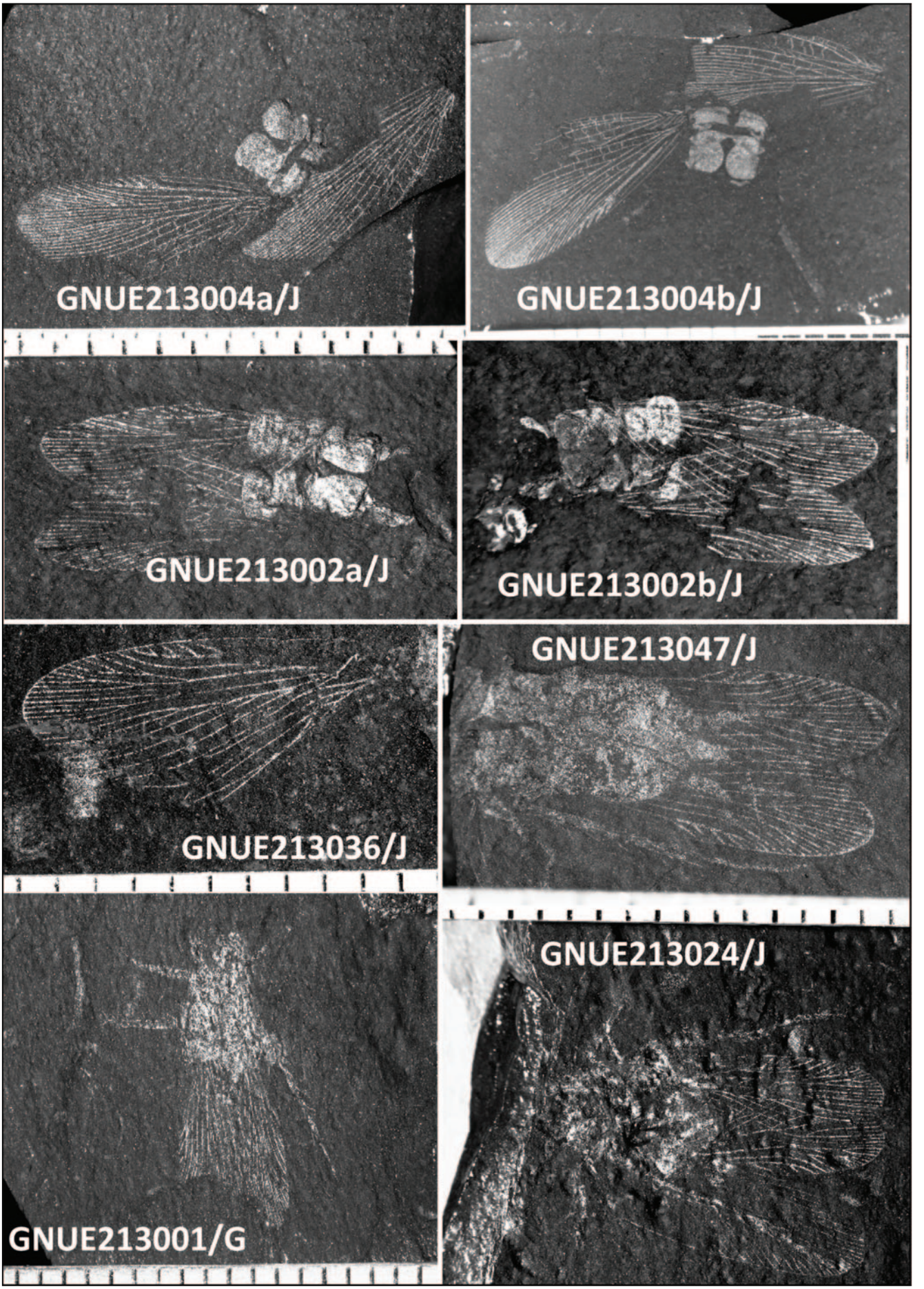
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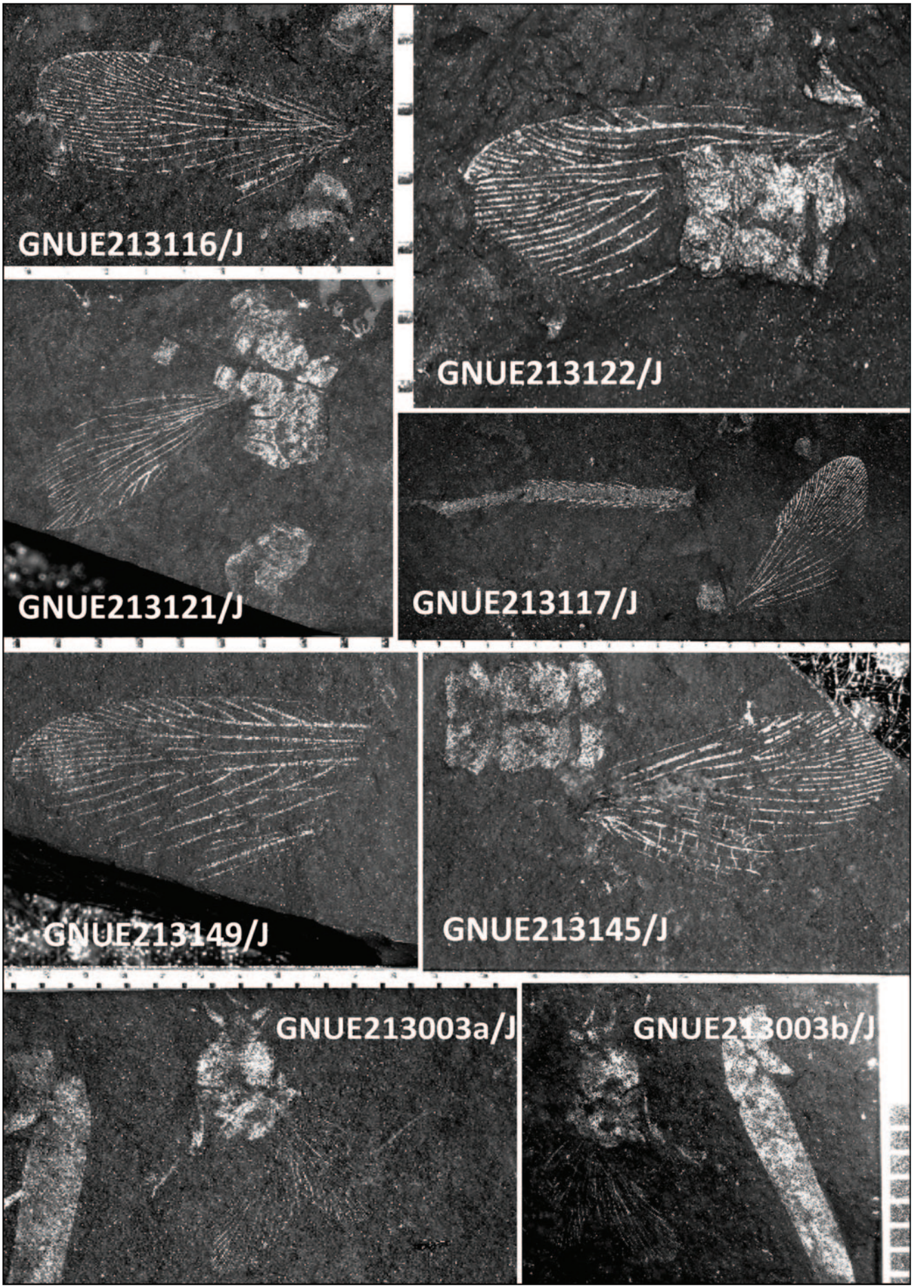
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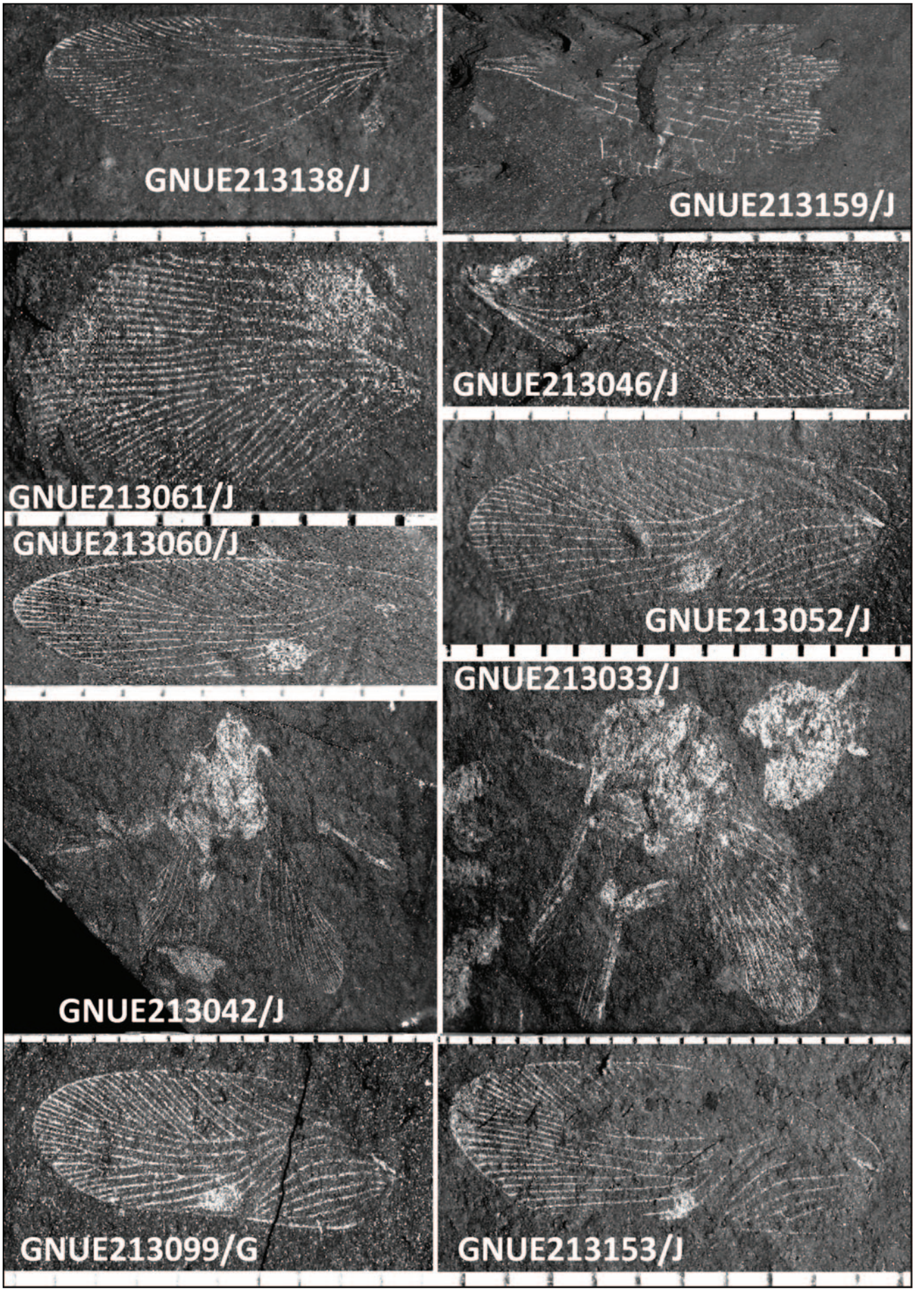
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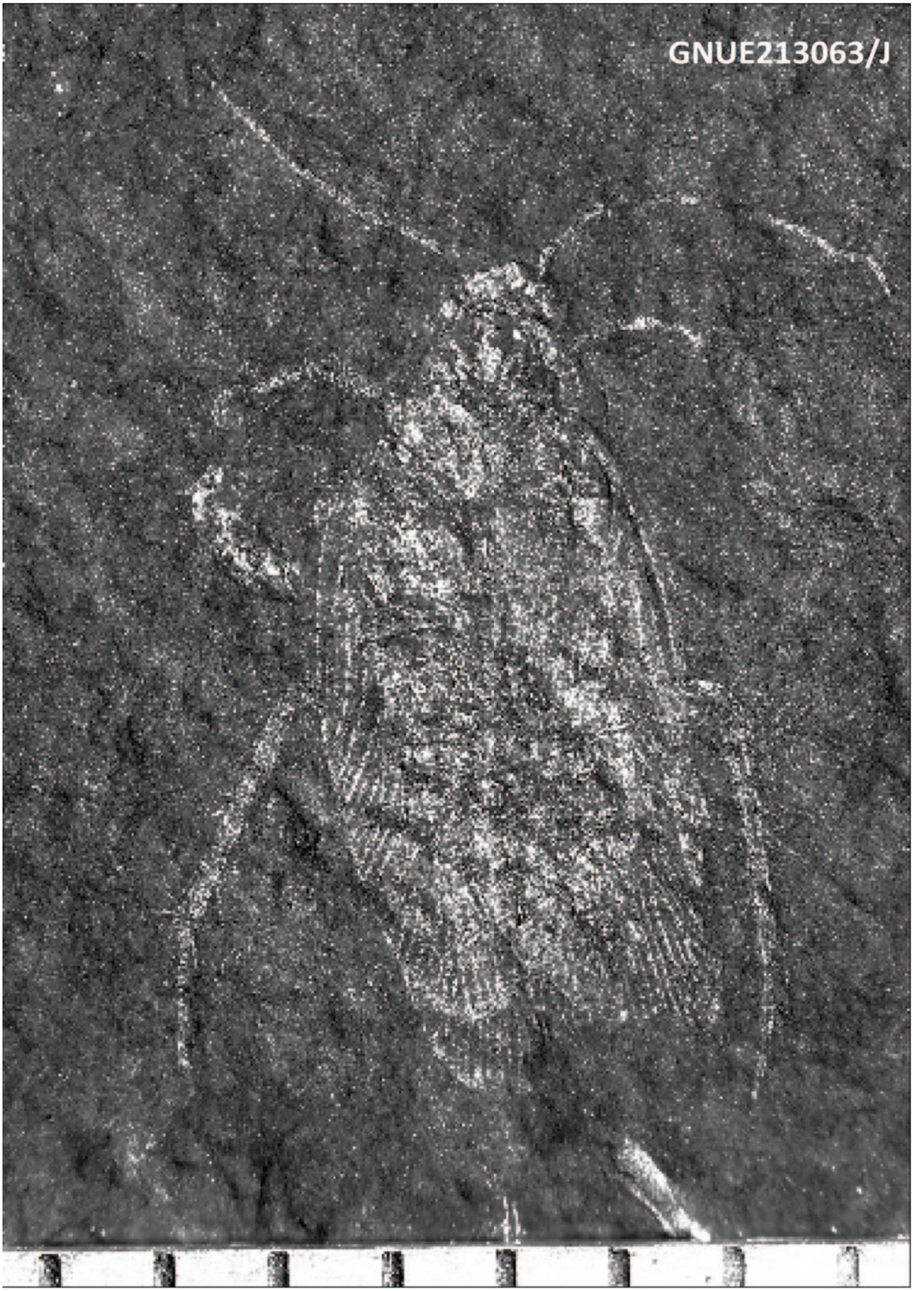
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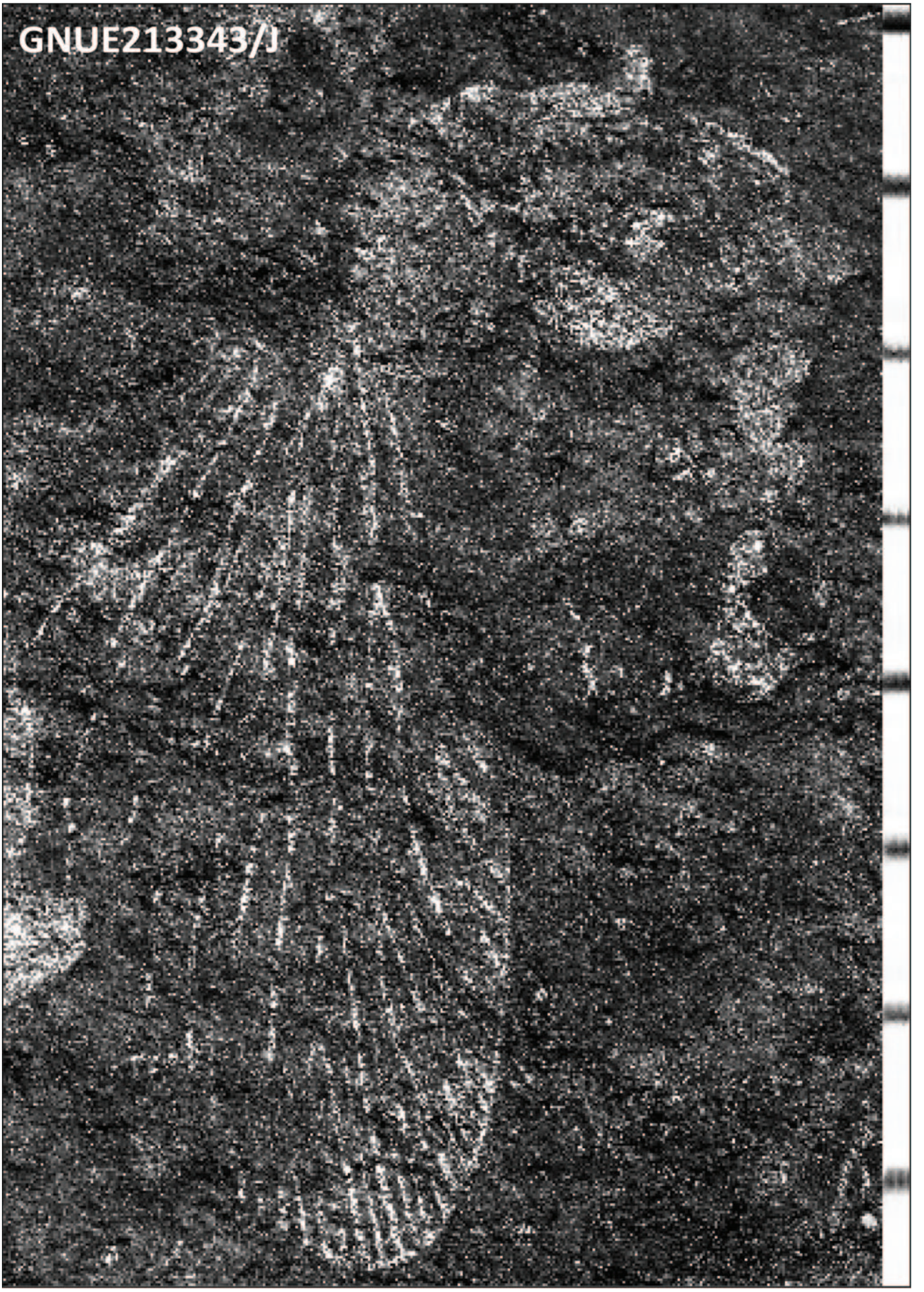
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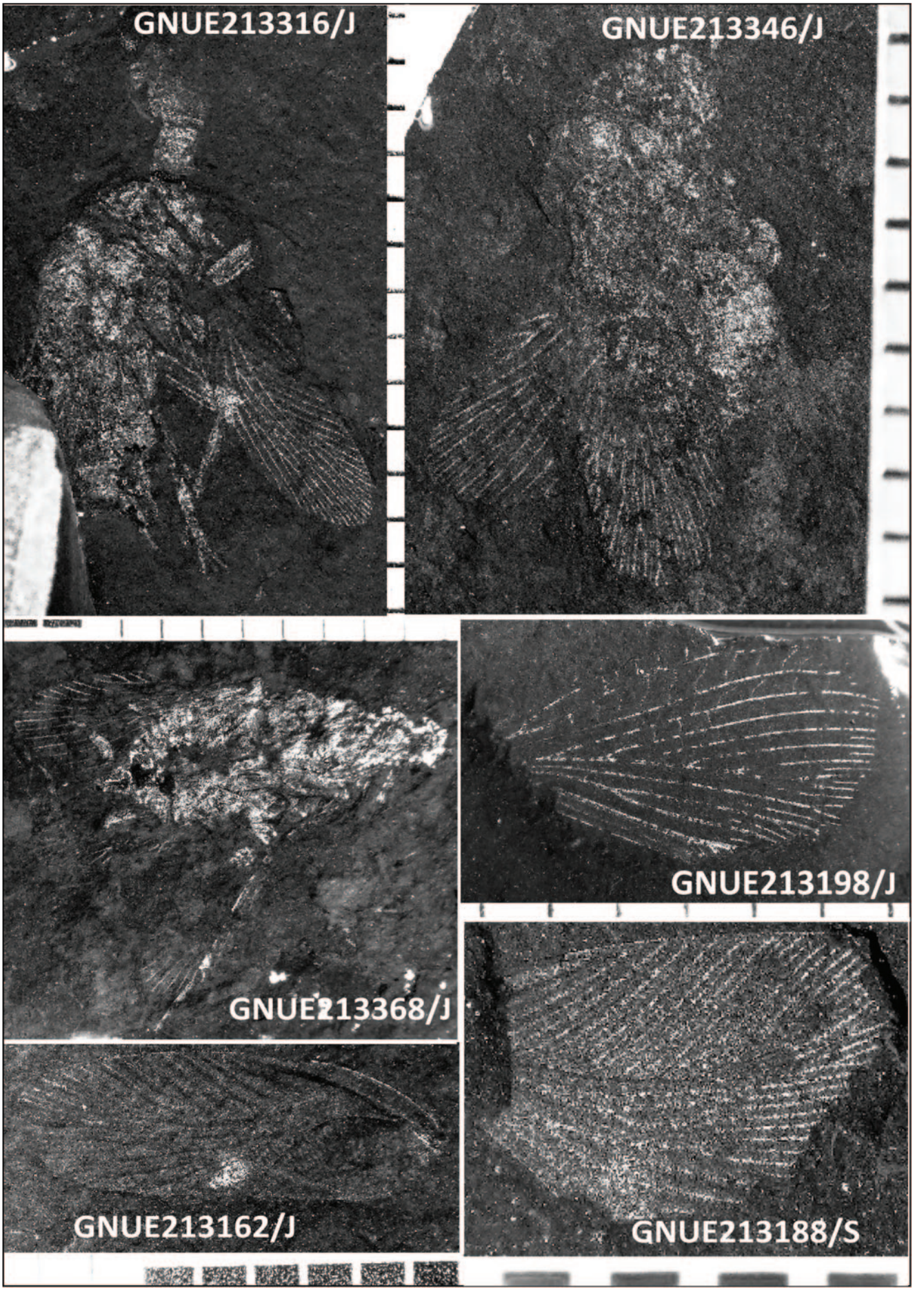
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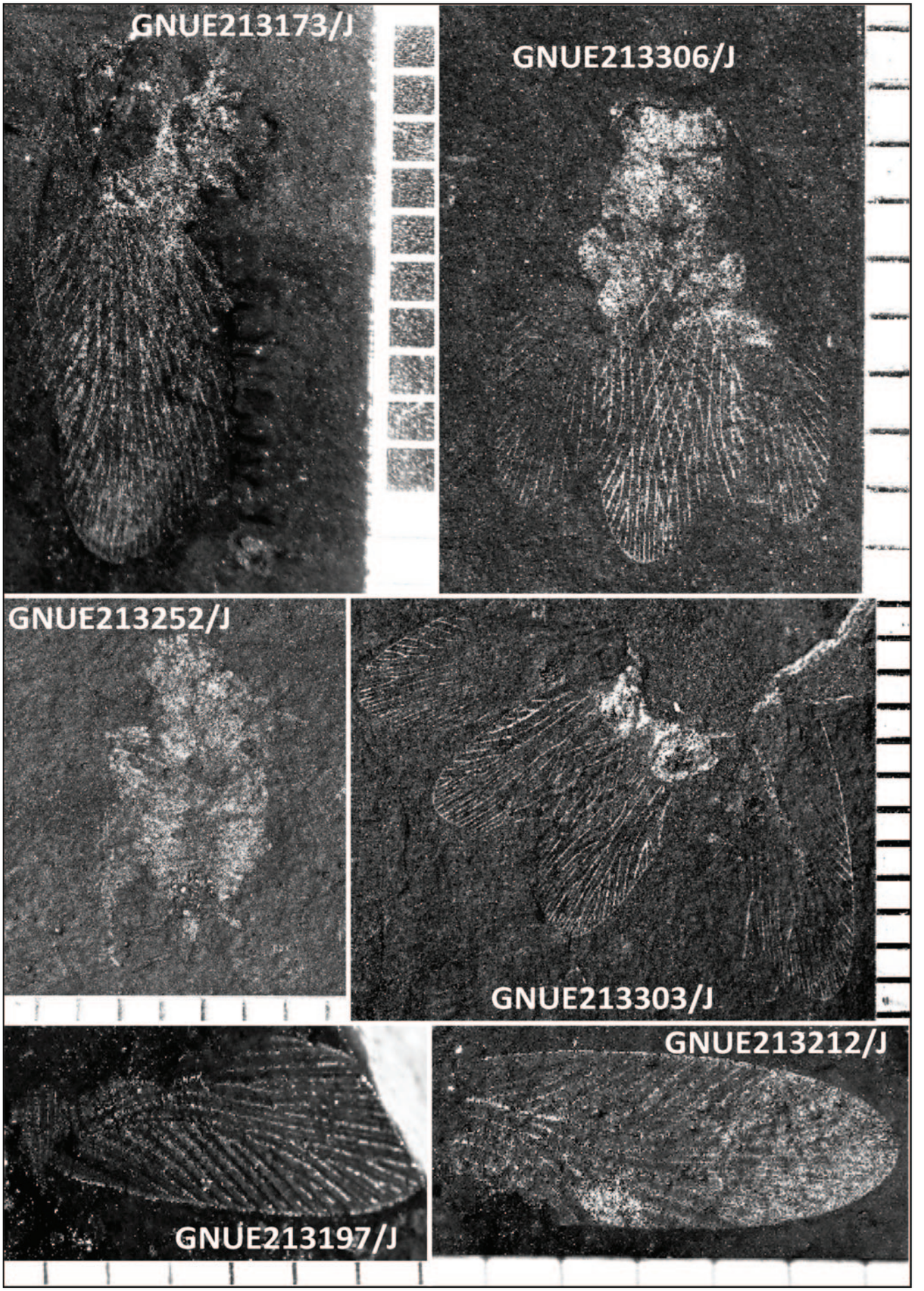
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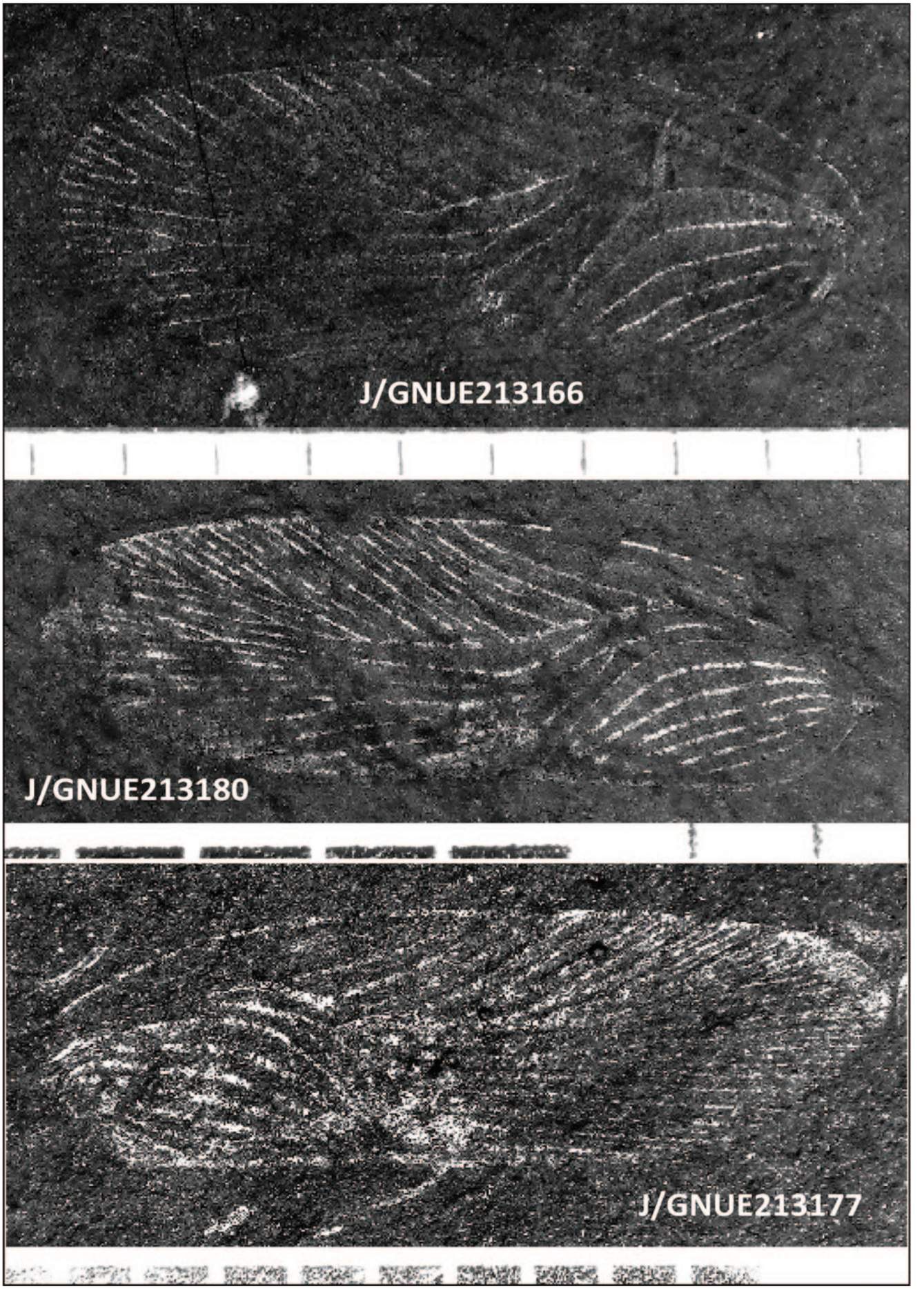
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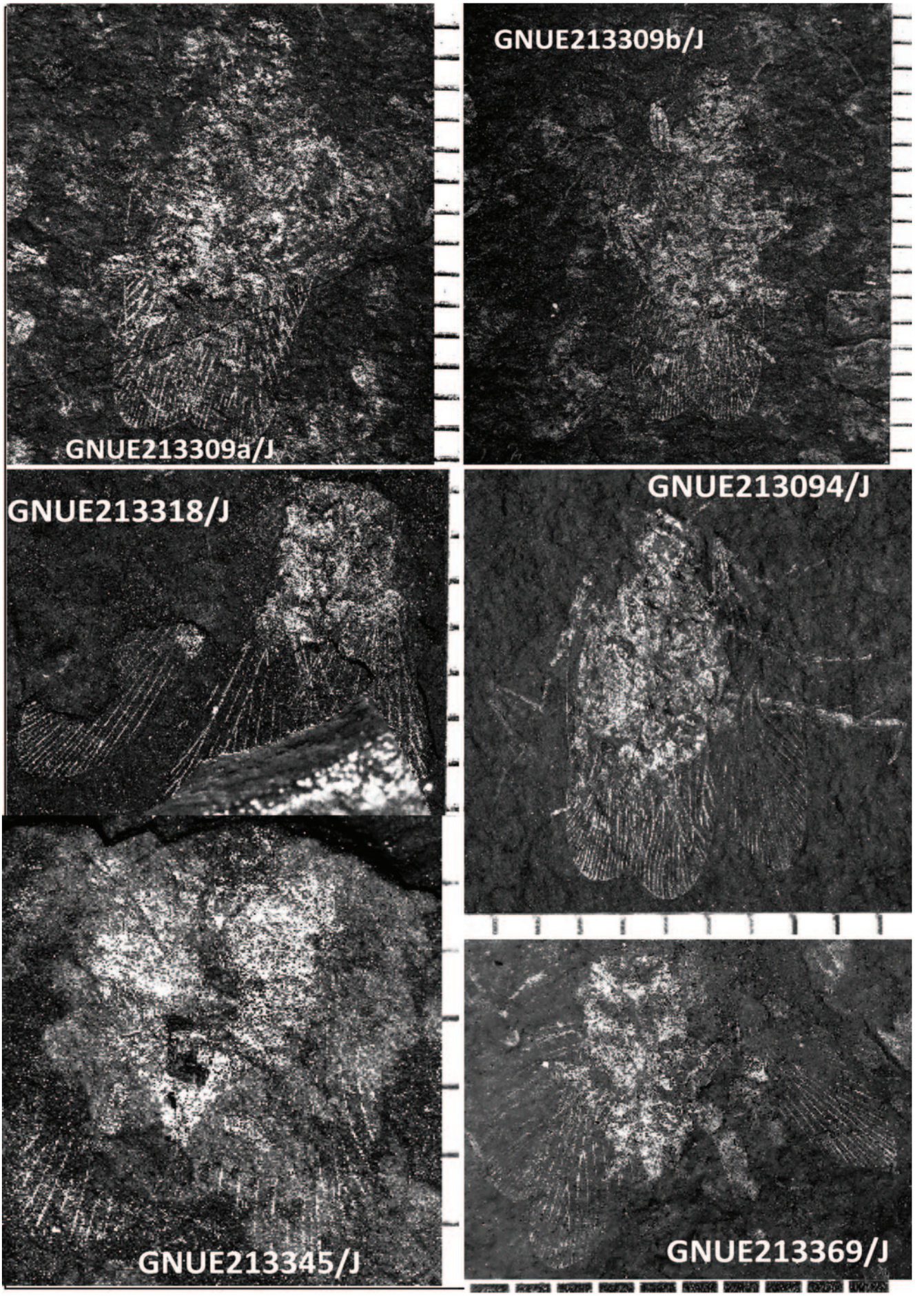
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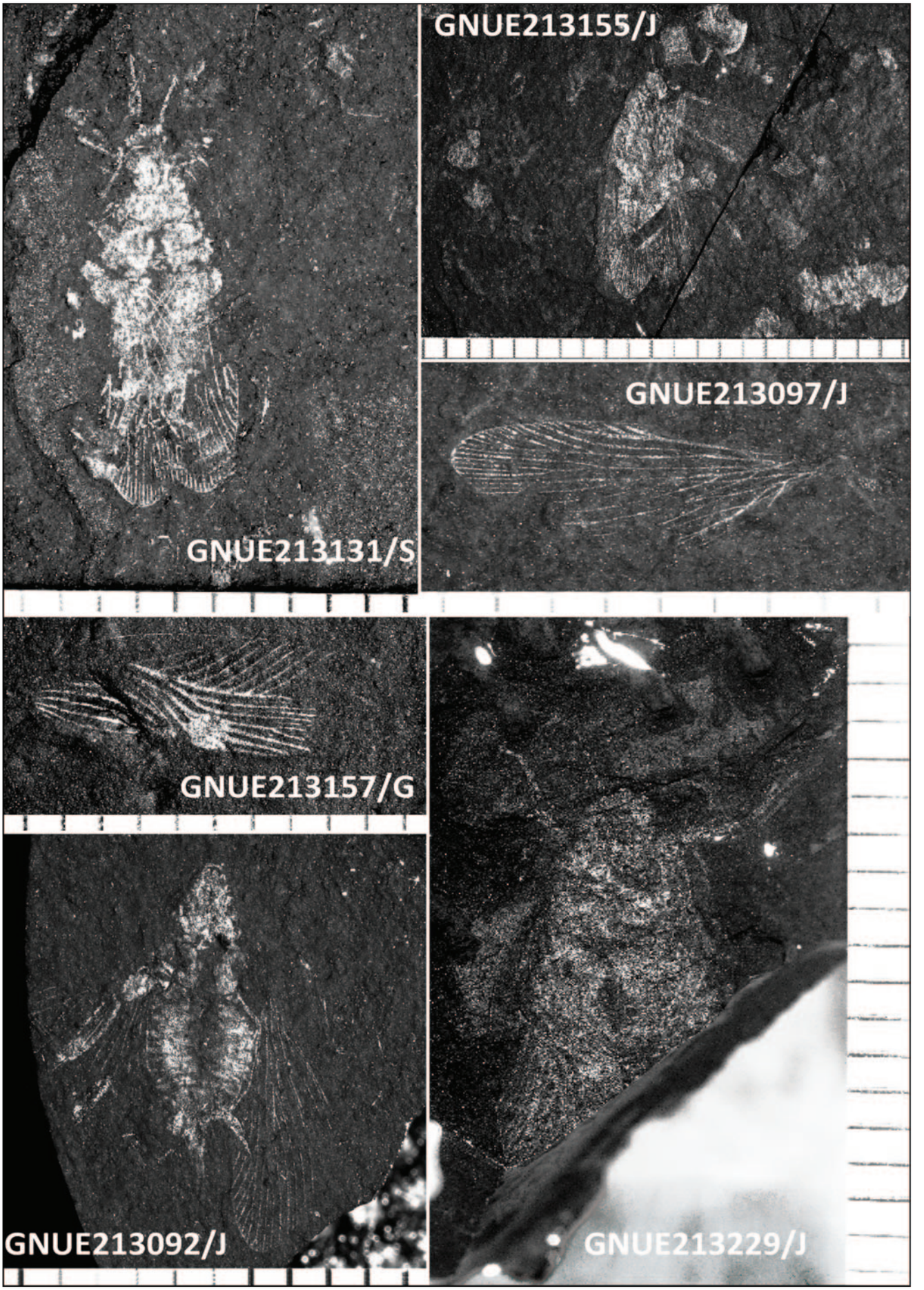
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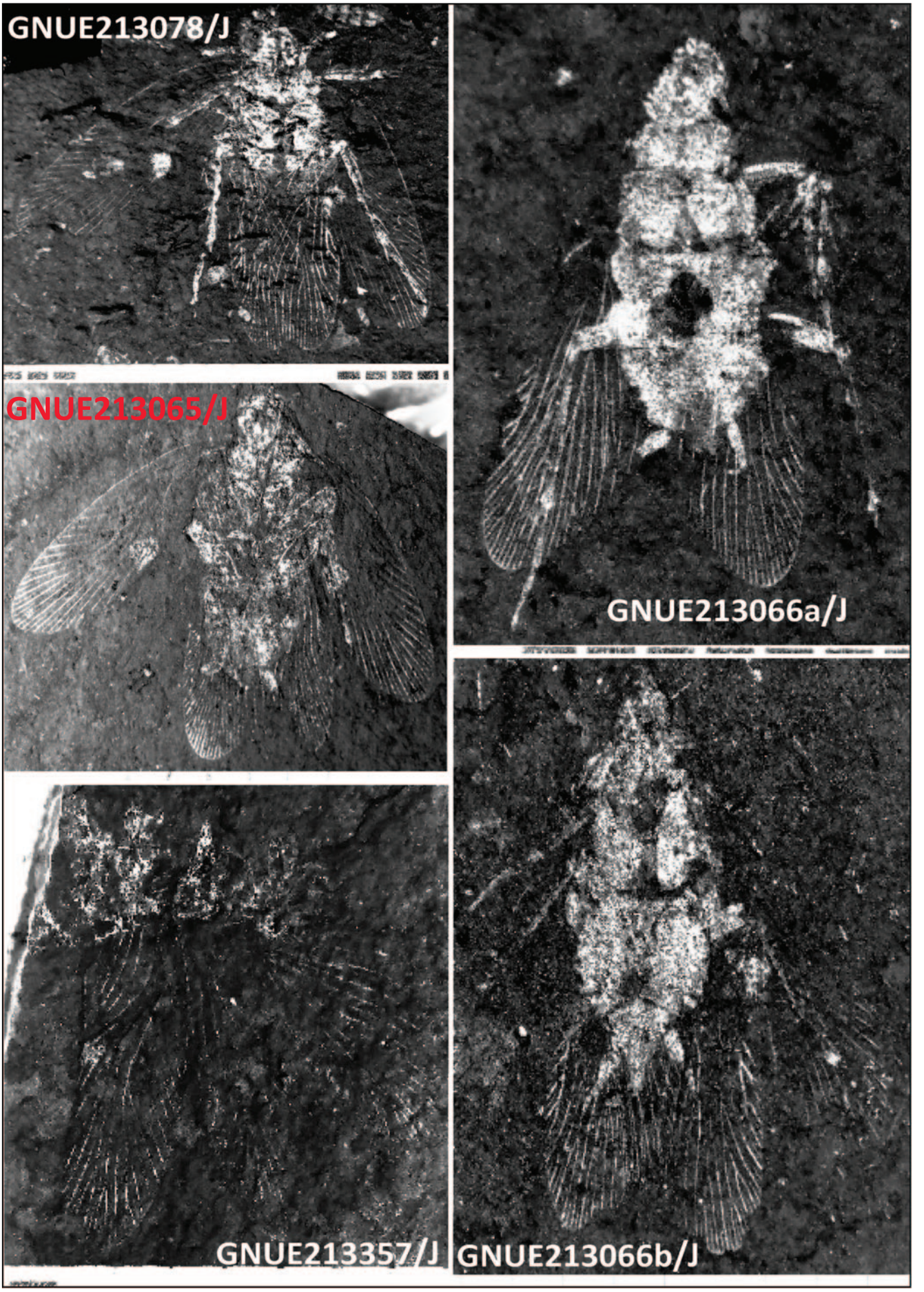
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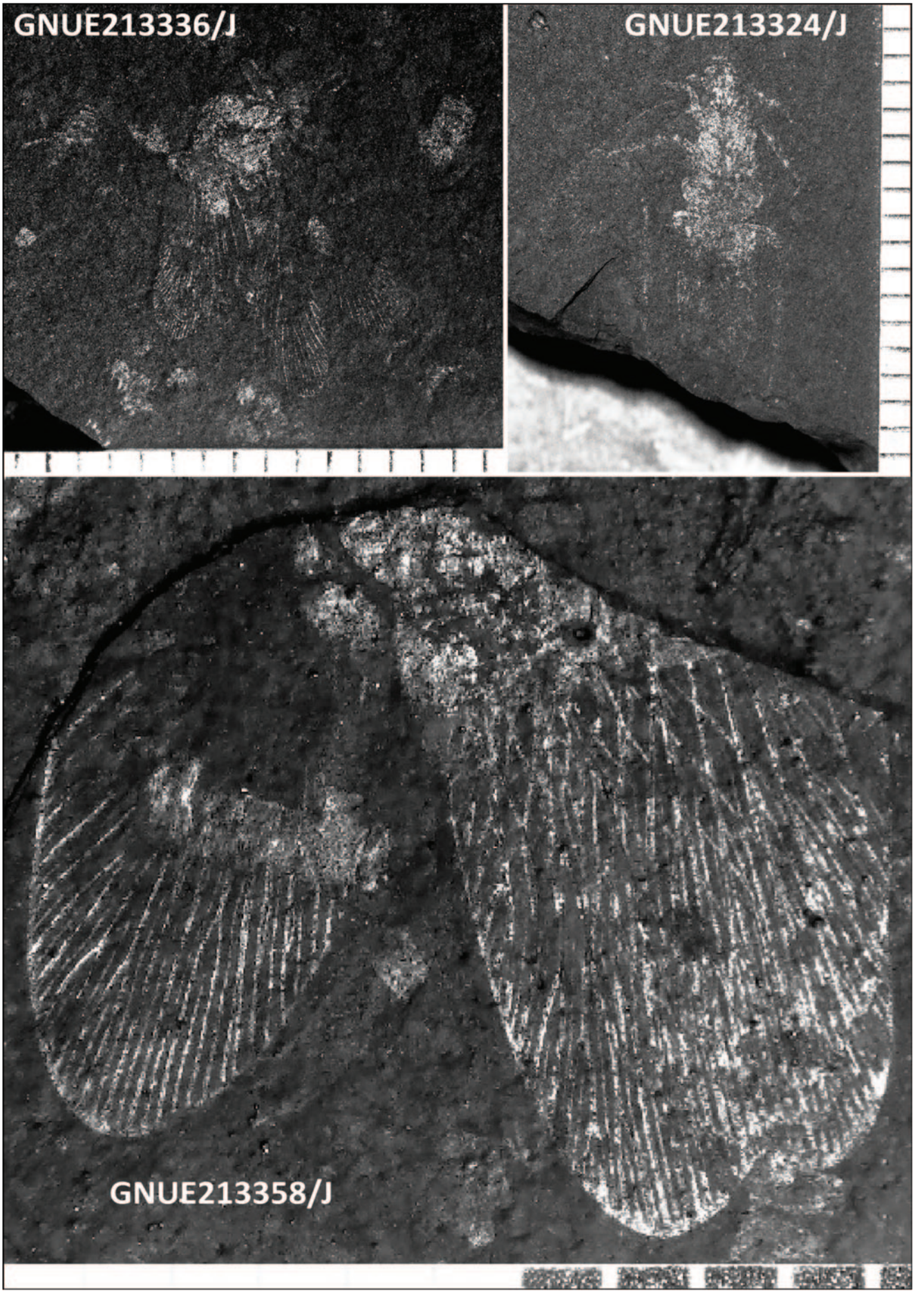
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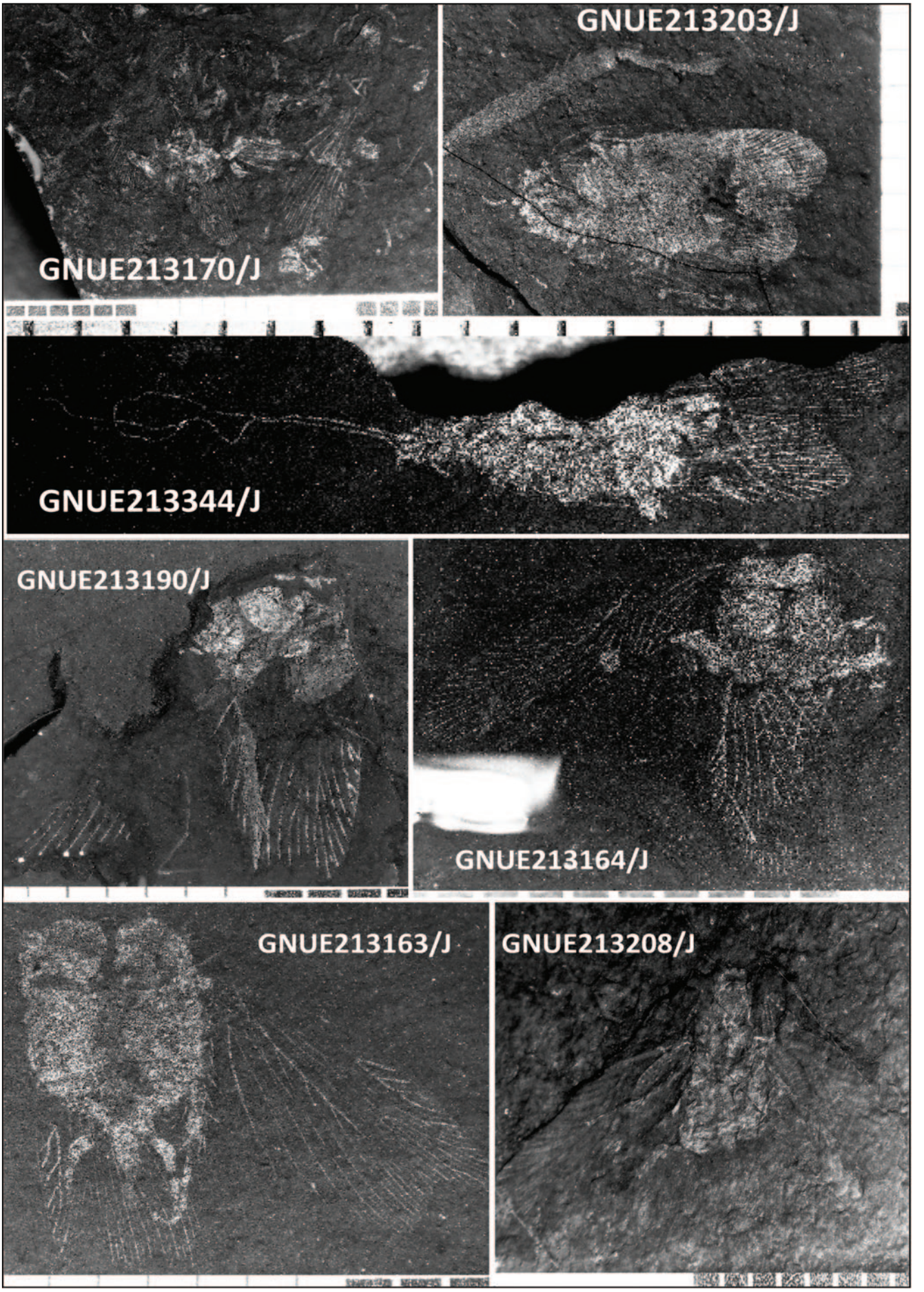
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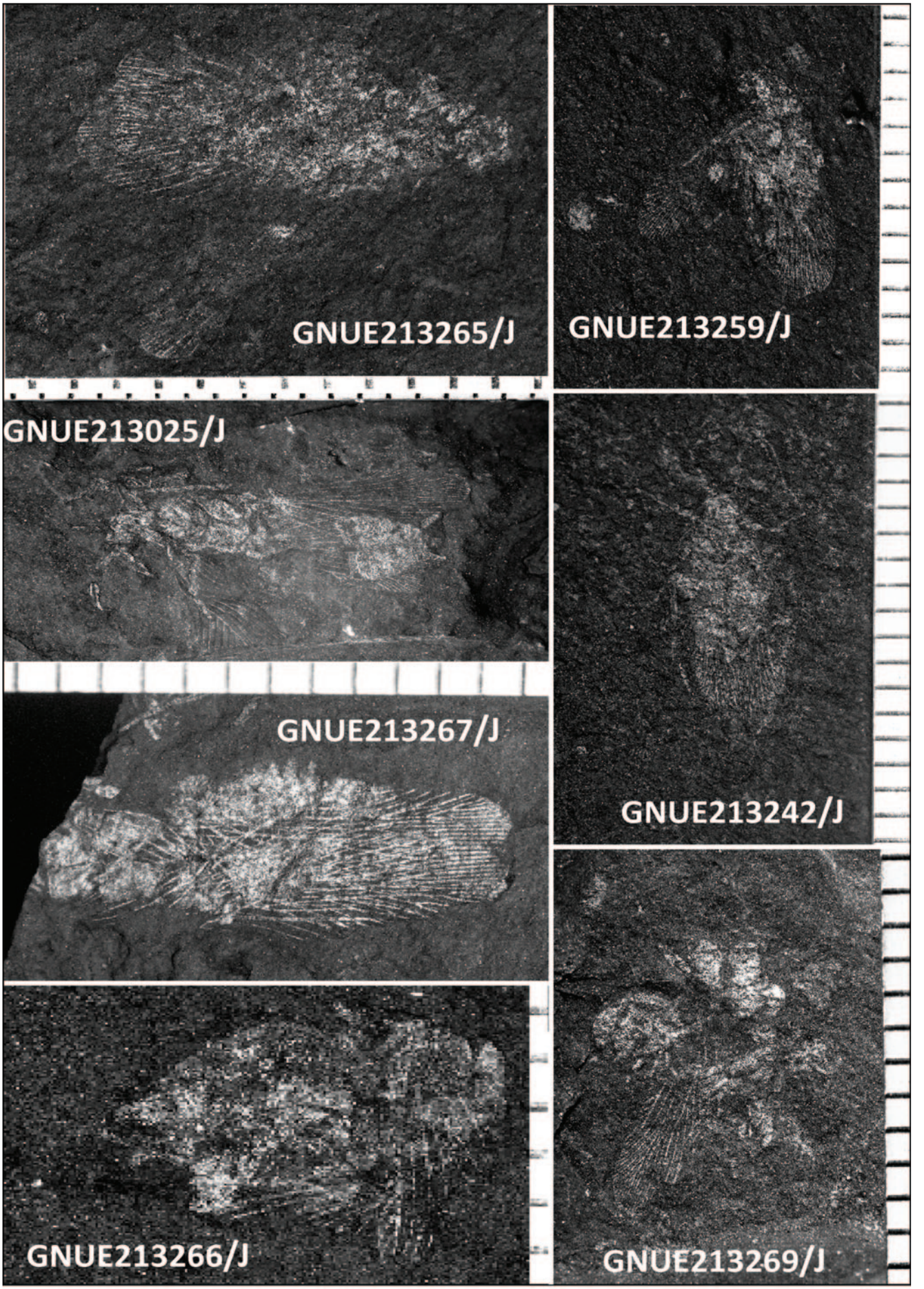
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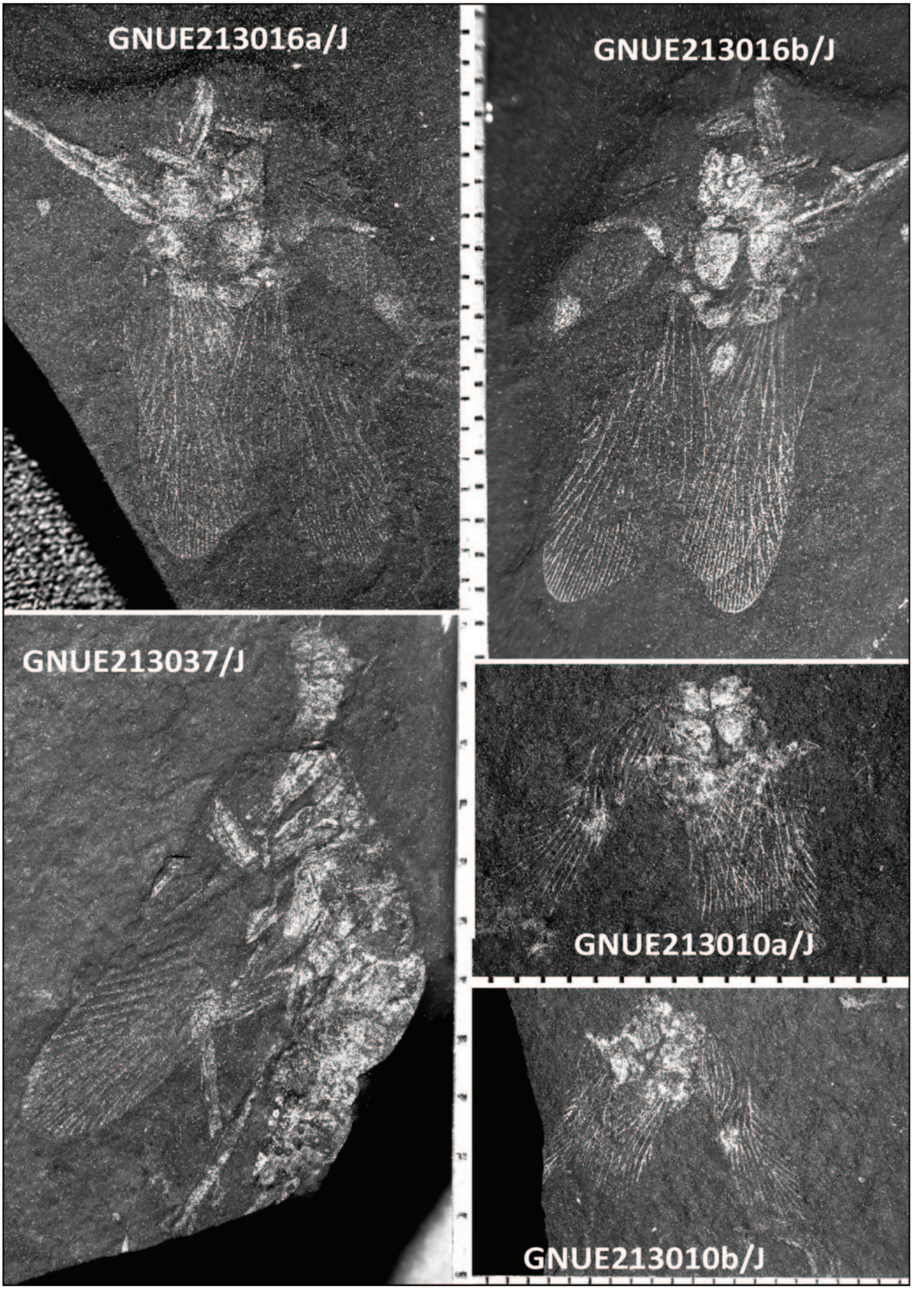
J/GNUE213073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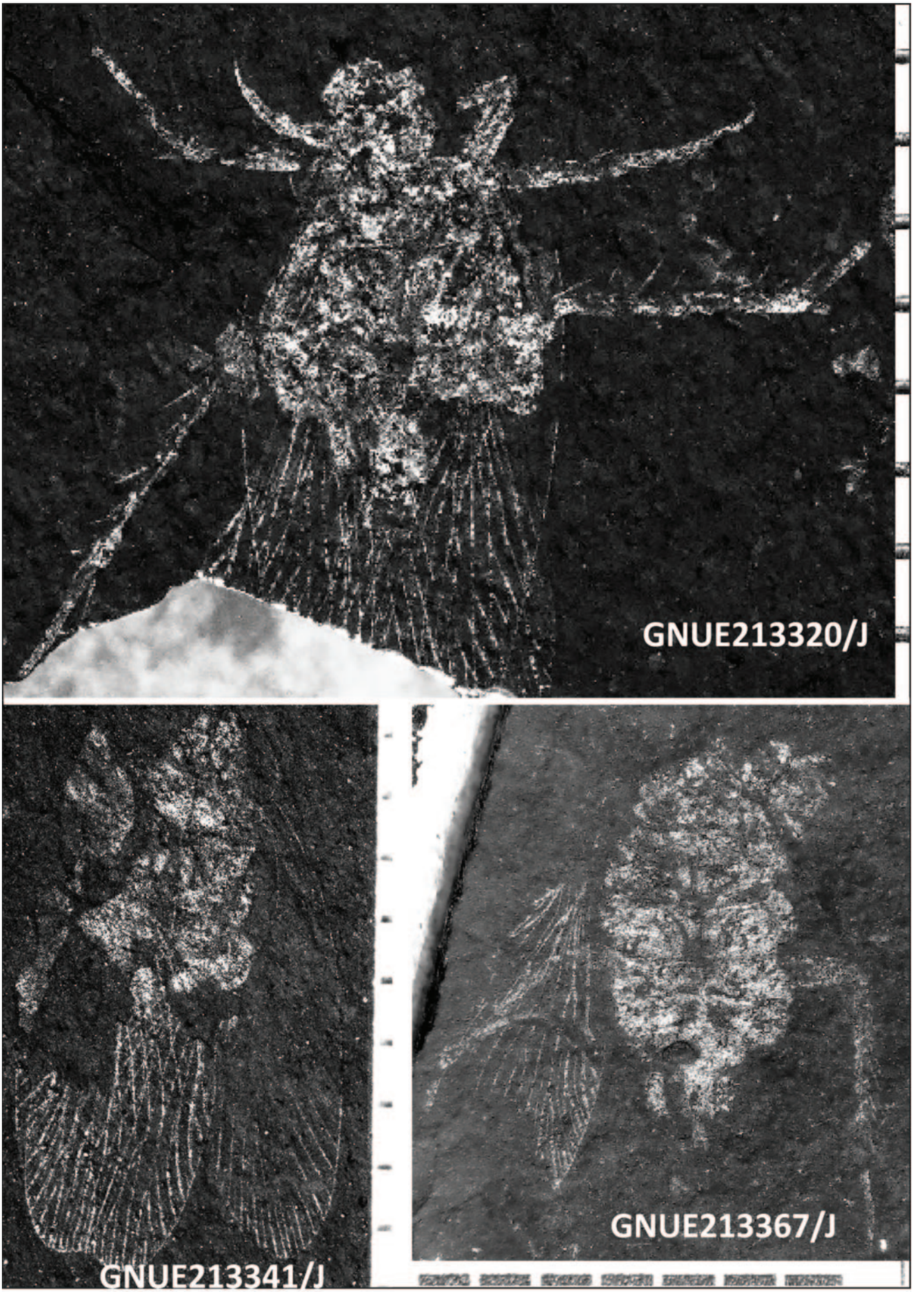
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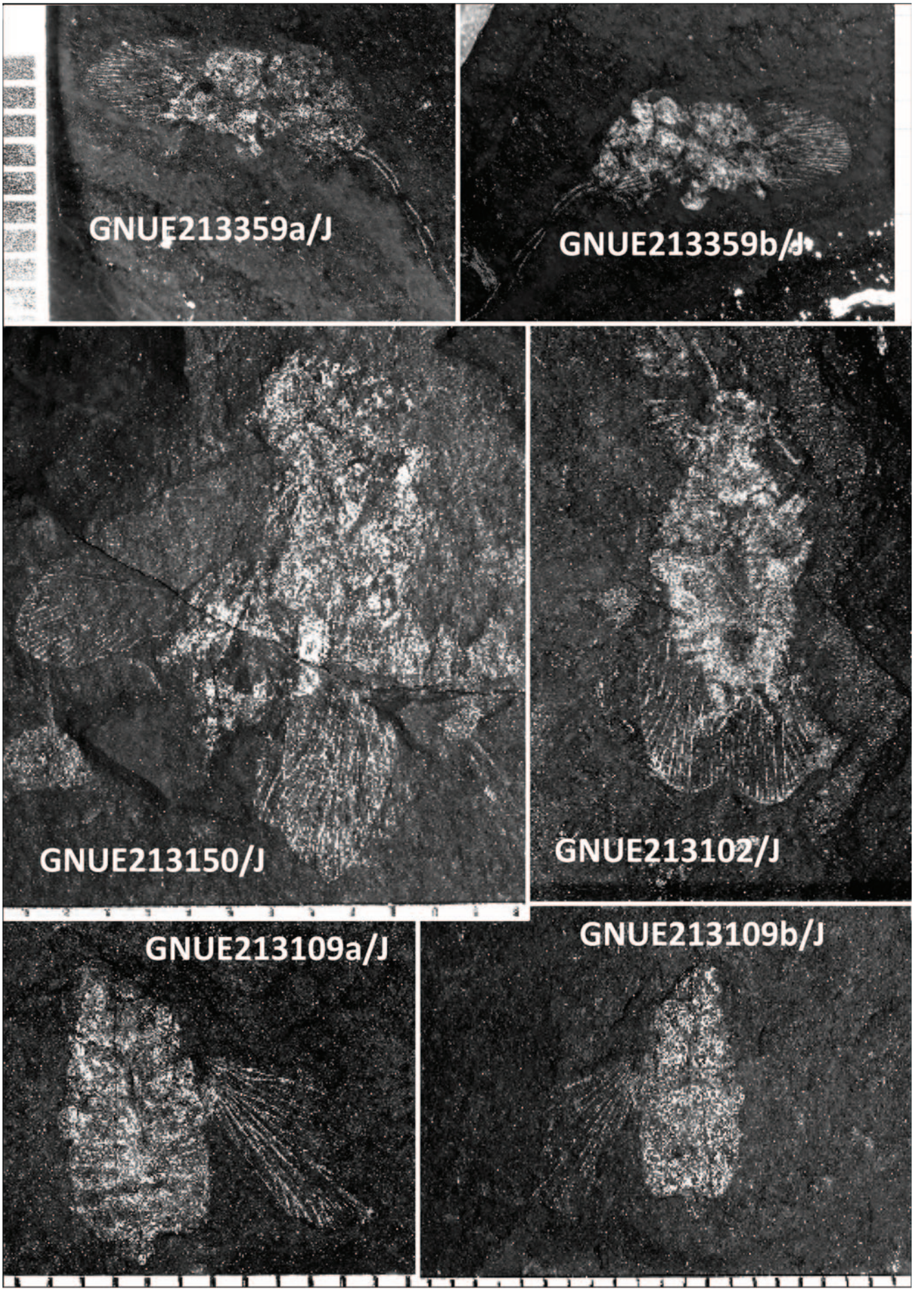
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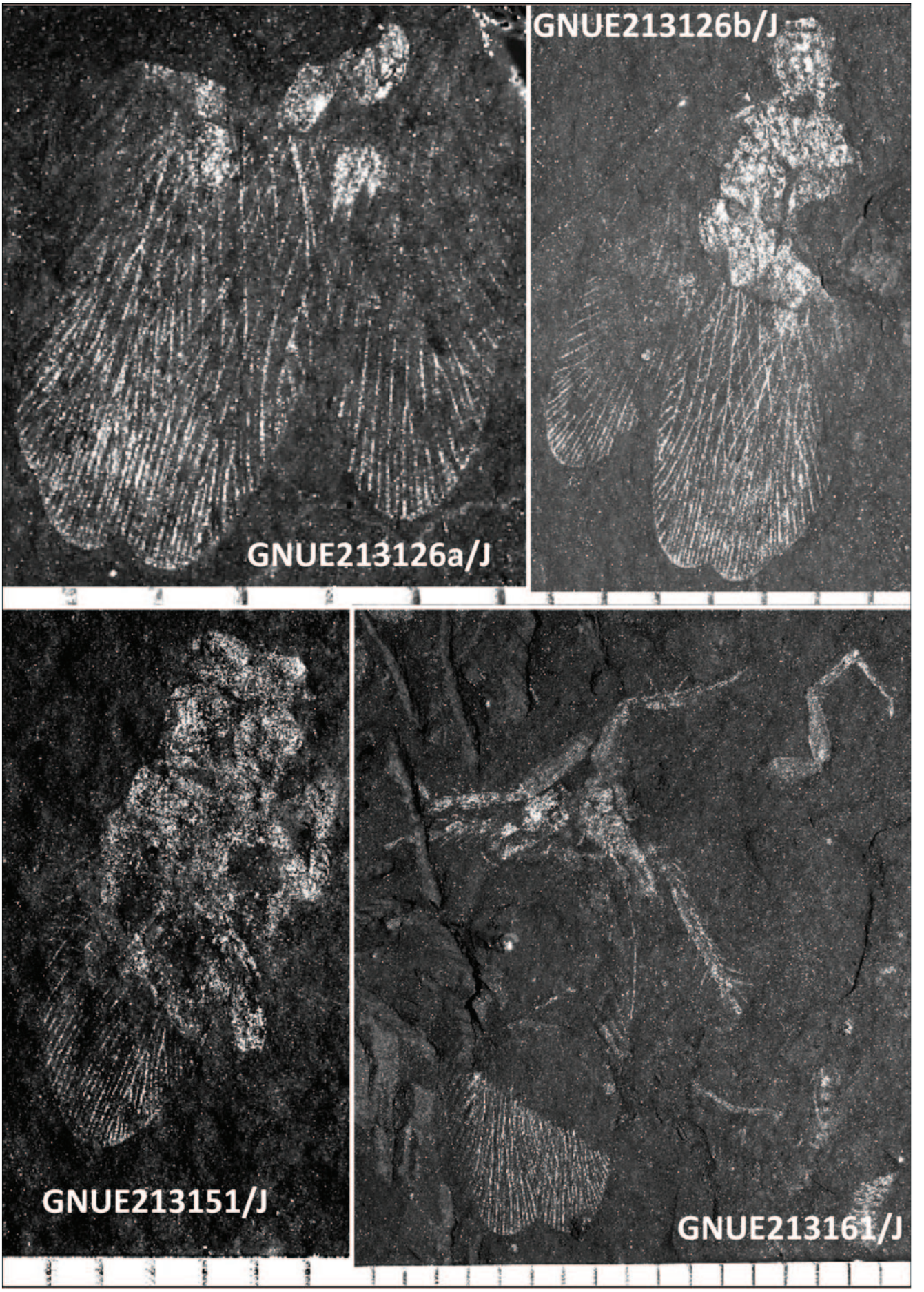
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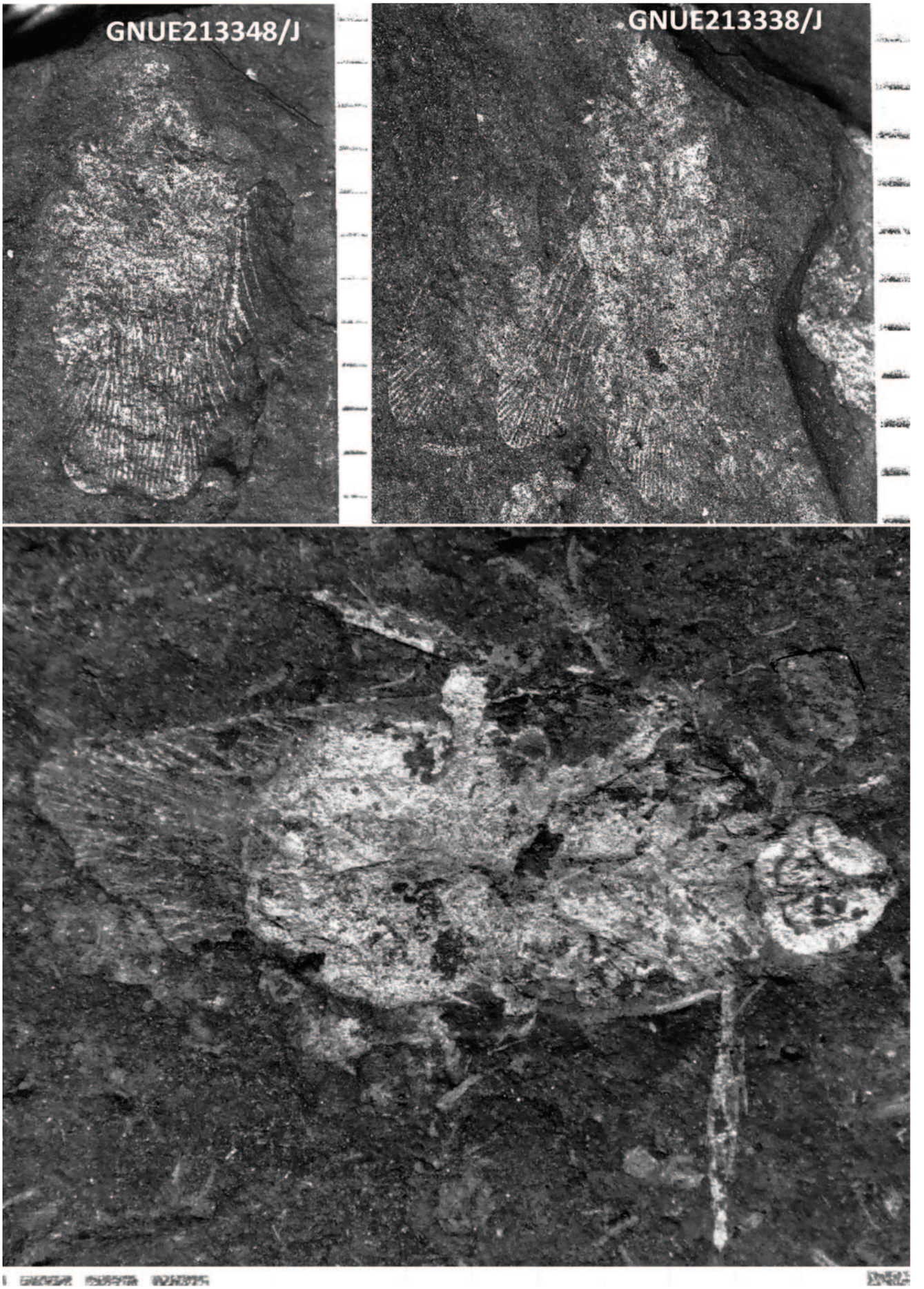
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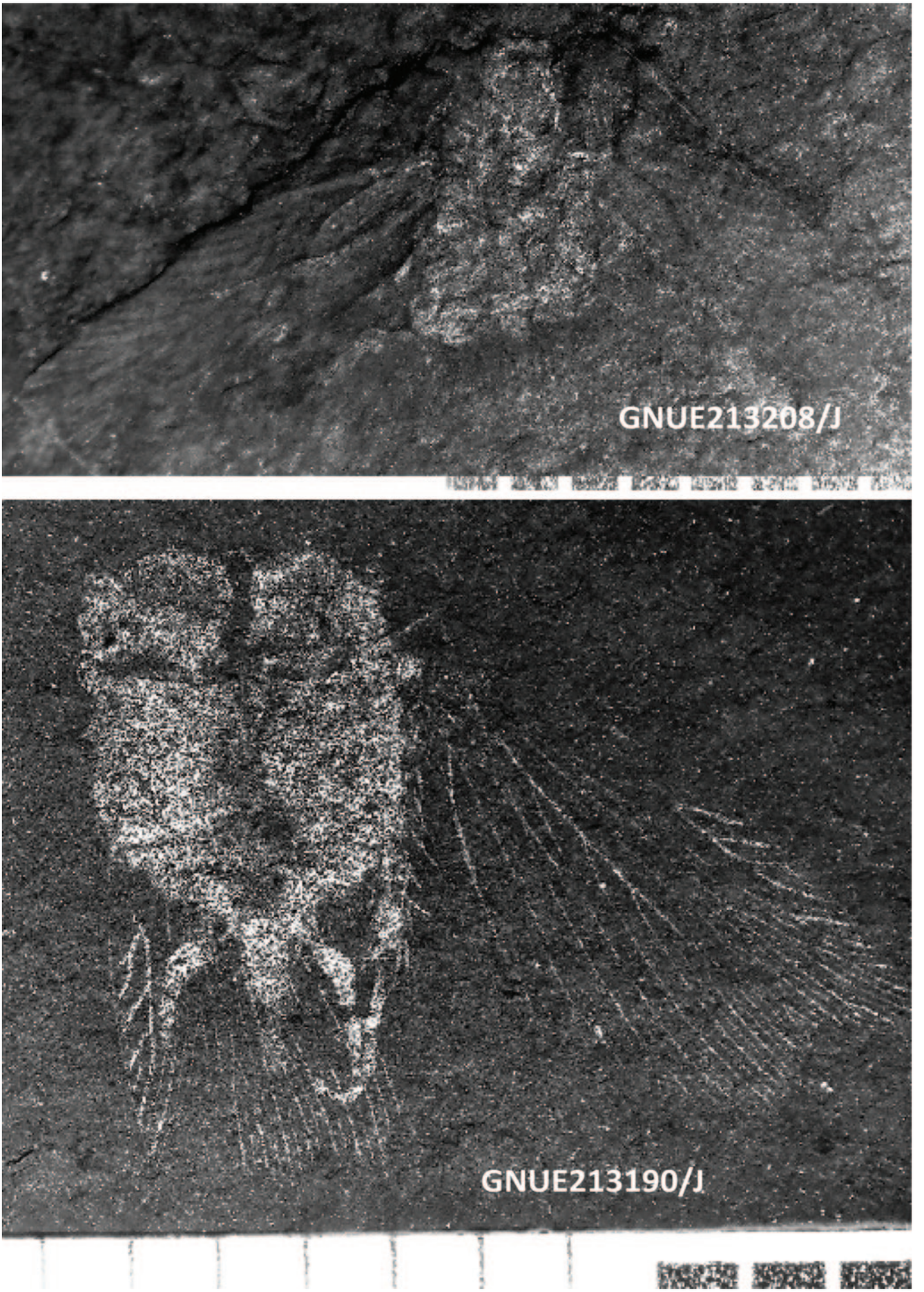
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GNUE213263/J

Elisama HW

specimen			SC	R1	RS	M	CuA	CuP	R	RM	RCuA	MCuA	Total r
55L			1	3	4	3	4	1	7	10	11	7	16
55R			1	3	5	4	5	1	8	12	13	9	19
231L			1	5	5	2	7	1	10	12	17	9	21
231R			1	5	5	3	6	1	10	13	16	9	21
318L			1	4	5	3	5	1	9	12	14	8	19
318R			1	4	4	3	5	1	8	11	13	8	18
321L			1	5	8	3	6	1	13	16	19	9	24
321R			1	5	6	3	6	1	11	14	17	9	22
486	9,2		1	5	9	3	6	1	14	17	20	9	25
GNUE213058L	11,3		1	5	7	2	7	1	12	14	19	9	23
GNUE213058R	11		1	6	6	3	6	1	12	15	18	9	23
GNUE213036	9,6		1	5	7	3	7	1	12	15	19	10	24
GNUE213042L			1	4	5	2	5	1	9	11	14	7	18
GNUE213042R	7,5		1	4	6	3	5	1	10	13	15	8	20
GNUE213047L			1	5	4	5	6	1	9	14	15	11	22
GNUE213047R			1	5	5	3	6	1	10	13	16	11	21
GNUE213024L	9,3		1	5	7	2	6	1	12	14	18	8	22
GNUE213024R	9,3		1	5	6	3	5	1	11	14	16	8	21
KS5207	8		1	4	6	3	7	1	10	13	17	10	22
DGOO2	8		1	5	5	3	6	1	10	13	16	9	21
KS5402L	6,3		1	4	4	3	5	1	8	11	14	8	19
KS5402R	6,3	sym	1	4	6	3	5	1	9	12	14	8	19
213164	6,3		1	5	5	4	6	1	10	14	16	10	22
213169	6,7		1	6	6	4	6	1plus 3	12	16	18	10	24
213167	8		1	6	7	4	6	1	13	17	19	10	25
213183	6		1	5	6	3	6	1	11	14	17	9	22
213215	8		1	5	6	3	6	1	11	14	17	9	22
213204	7,5		1	5	8	2	6	1	13	15	19	8	23
213191	7,2		1	6	7	3	6	1	13	16	19	9	24
213170	7,2		1	5	6				11				
213306	6,1		1	5	6	4	6	1	11	15	17	10	23
213303L			1	5	7	2	4	1	12	14	16	6	21
213303R		Unusual nearly fused R1	1	5	7	3	4	1	12	15	16	7	
213259L			1	5	7	3	5	1	12	15	17	8	22
213259R	5,4	Strong asym	1	3	7	6	8	1	10	16	18	14	26
213269			1	5	7	3	6	1	12	15	18	9	23
213361l	6,5		1	4	5	3	5	1	9	12	14	8	19
213361r		asym	1	3	7	2	5	1	10	12	15	7	19
213355			1	3	5	3	6	1	8	11	14	9	19
213357			1	6	5	3	6	1	11	14		9	

Elisama HW

specimen			SC	R1	RS	M	CuA	CuP	R	RM	RCuA	MCuA	Total r
213346L			1	5	4	3	5	1	9	12	14	8	19
213346R			1	5	7	2	5	1	12	14	17	7	21
213343	6,7		1	5	5	3	5	1	10	13	15	8	20
213338	5,7		1	6	6	3	4	1	12	15	16	7	21
213310L	8,1		1	4	6	4	5	1	10	14	15	9	21
213310R	8,1	sym	1	4	6	4	5	1	10	14	15	9	21
213369	5		1	5	6	3	5	1	11	14	16	8	21
213317	7,9		1	4	4	4	5	1	8	12	13	9	19
213341	6,2		1	3	6	3	5	1	9	12	14	8	19
213336L	6,5		1	4	5	3	6	1	9	12	15	9	20
213336R	6,5	sym	1	4	6	2	6	1	10	12	16	8	20
2133368	8,6		1	4	6	2	6	1	10	12	16	8	20
2133151	7,5		1	5	8	3	6	1	13	16	19	9	24
2133149			1	6	8	3	6	1	14	17	20	9	25
2133145			1	4	6	3	5	1	10	13	15	8	20
2133138	8	M fused with CuA - ascend-ing	1	4	7	1	7	1	11	12	18	8	21
2133129	8		1	3	5	4	5	1	8	12	13	9	19
213127	5,9		1	7	7	2	6	1	14	16	20	8	24
213131	6,9		1	5	5	2	5	1	10	12	15	7	19
213122	7,4		1	5	7	3	6	1	12	15	18	9	24
213121	7,4		1	5	5	3	6	1	10	13	16	9	21
213117	8,7		1	5	7	3	5	1	12	15	17	8	22
213116	8,3		1	5	8	3	6	1	13	16	19	9	24
213097	7,5		1	4	5	3	5	1	9	12	14	8	19
213155			1	5	6	3	5	1	11	14	16	8	21
213094L		Mutation R1RSM	1	6	5	6	6	1	11	17	17	12	25
213094R			1	5	6	3	5	1	11	14	16	8	21
n	42		67	67	67	66	66	65	67	66	65	66	64
min	5		1	3	4	1	4	1	7	10	11	6	16
max	11,3		1	7	9	6	8	1	14	17	20	14	26
ave	7,51		1	4,69	5,99	3,05	5,59	1	10,66	13,7	16,25	8,67	21,33
dev	1,376203939		0	0,874018154	1,148022507	0,849104835	0,784018695	0	1,647332452	1,718404421	2,015802951	1,244474969	2,123598978
CV	18,32		0	18,64	19,17	27,84	14,03	0	15,45	12,54	12,4	14,35	9,96

Elisama FW

specimen	length	Width (mm)	SC	R	M	CuA	CuP	A	RM	RCuA	MCuA	SUM	WITH-OUT A
55L	7	2,3	1	10	4	5	1		14	15	9		21
55R	6,8	2,4	1	11	3	5	1	4	14	16	8	25	21
321L	9,2	2,9	1	19	4	4	1	4	23	23	8	33	29
321R	9,3	2,8	1	14	7	2	1	5	21	16	9	30	25
GNUE213060	11	3,2	1	15	3	7	1		18	22	10		27
GNUE213015	11,9	3,5	1	16	3	6	1	6	19	22	9	33	27
GNUE213052	13	4,8	1	15	4	5	1	6	19	20	9	32	26
DG0014	8,7	2,8	1	13	3	10	1	6	16	23	13	34	28
KS5402L	7,5	2,7	1	12	5	5	1	4	17	17	10	28	24
KS5402R	7,7	2,5	1	10	5	6	1	4	15	16	11	27	23
213167	6,7	2,7	1	11	5	5	1	5	16	16	10	28	23
213212	6,5	2,3	1	13	6	6	1	5	19	19	12	32	27
213180	6,6	2,2	1	13	4	7	1	6	17	20	11	32	26
213166	9	2,7	1	14	4	4	1	5	18	18	8	29	24
213177	10,6	3,4	1	15	4	6	1	6	19	21	10	33	27
213306L	7,4	2,1	1	11	7	4	1	5	18	15	11	29	24
213306R	7,2	2	1	12	6	3	1		18	15	9		23
213259R	5,8	1,7	1	13	5	6	1	4	18	19	11	30	26
213316	7,3	2,3	1	14	3	7	1	5	17	21	10	31	26
213355	7	1,8	1	11	4	5	1	5	15	16	9	27	22
213357	6,9	1,8	1	12	5	5	1	5	17	17	10	29	24
213369	7,2	1,8	1	11	3	7	1	6	14	18	10	29	23
213341	7,4		1	11	4	5	1	4	15	16	9	26	22
213336	7,3	2,1	1	15	3	6	1	5	18	21	9	31	26
213999	9	2,7	1	12	6	5	1	6	18	17	11	31	25
213153	9,7	3	1	12	2	6	1	6	14	18	8	28	22
213129	7,9	2,2	1	14	4	7	1	4	18	21	11	31	27
213094	6,9	2,1	2	11	4	5	1	4	15	16	9	27	23
213099/G	8,7	2,7	1	13	7	6	1	6	20	19	13	34	28
n	29	28	29	29	29	29	29	26	29	29	29	26	29
min	5,8	1,7	1	10	2	2	1	4	14	15	8	25	21
max	13	4,8	2	19	7	10	1	6	23	23	13	34	29
ave	8,18	2,55	1,03	12,86	4,38	5,52	1	5,04	17,24	18,38	9,9	29,96	24,79
dev	1,731716595	0,651199544	0,185695338	2,030554779	1,347319909	1,478915859	0	0,823687768	2,214484339	2,555299718	1,37177746	2,521599004	2,242118105
CV	21,17	25,54	18,03	15,79	30,76	26,8	0	16,34	12,85	13,9	13,86	8,42	9,04

Araripeblatta bolzoni; A. dornellesi (Crato) have round apex. *E. cuboides* (Yixian) has more expanded coloration which includes apex and claval end. *E. prelistama* (Karatau) has a smaller macula.

Autapomorphy: Sophisticated pronotum coloration

Description (on the basis of holotype, variability is provided in the TablePs 138-140): Head subglobular (not triangular, extremely large (213129) , big narrow eyes (1.8/1.4 mm) not protruding beyond the head outline (0.7/0.2 mm). Two large subround lateral ocelli distinct near eyes (0.5 mm in diameter). Occiput with three dark longitudinal stripes joined apically. Antenna thin, scape and pedicel differentiated, ca. 0.15 mm wide and extremely long (9 mm (GNUE213344). Pronotum transverse, wide (2.7/3.7 mm: 213310) with posterior central extension. Coloration consists of dark posterior wide margin and two lateral centroapical maculas.

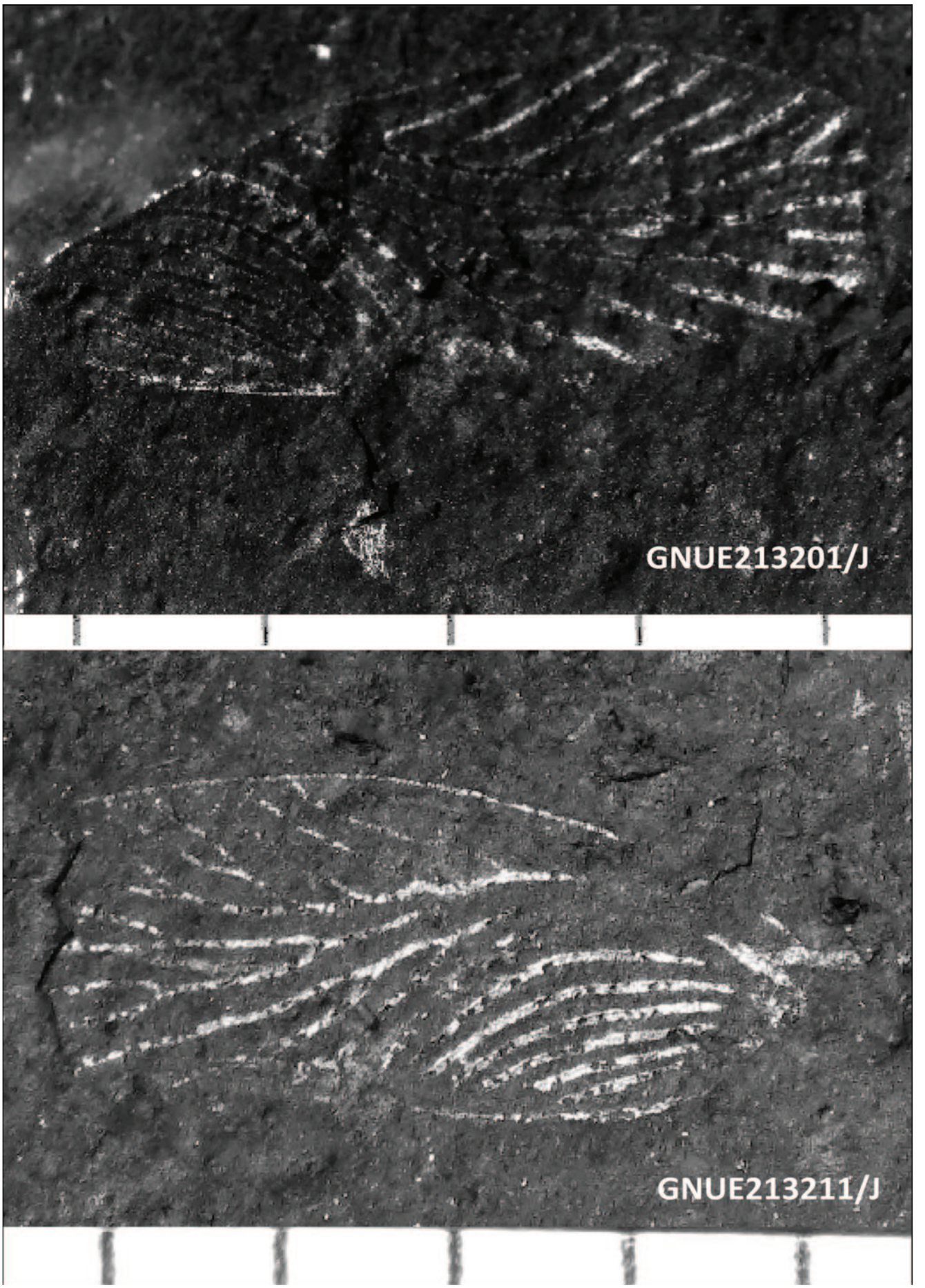
Pronotum pale, with dark disc. Within this dark part, pale structures for a characteristic "face" pattern, formed by central meduse-like shape with central apical dot over it, and lateral interrupted lines, and posterior centrally interrupted "smile". Forewing elongate (6.8-7/2.3-2.4 mm), with indistinct costa, distinct intercalaries and cross-veins forming reticulations in clavus. Sc long, nearly straight, simple R1 and RS differentiated (8-9 plus 2); M nearly straight with 3-4 veins at margin. CuA nearly straight, with 5 veins at margin. CuP simple, fluent, 4 simple anal veins present with reticulation consisting with up to 16 cross-veins per vein. Posterior dark macula large (0.9 mm in longest direction).

Hindwing shorter (6.2 mm), pterostigma absent. Sc simple, R1 (3-4) and RS (4-5) differentiated. M nearly straight (3-4), CuA with simple branches (4-5), CuP simple.

Body standard, not widened like in *Ano*.

Forefemur massive (2/0.7 mm). Midtibia, long, with at least 6 spines on each side. Hindleg very long, femur massive, nearly 3 mm long terminated with terminal femoral spur, hindtibia 4.5 mm long and 0.55 mm wide, terminated with massive spur, tarsus about 3 mm long (very long). Forewing (ca. 7 mm long) transparent, intercalaries distinct in hindwing, main veins of CuA run longitudinally.

Coloration: Total area caculated 53.56 mm^2.


GNUE213201/J
GNUE213211/J

Derivation of name: After Kwang-Seok Baek, who preliminary evaluated Jinju Biota.
Variability (TablePs 138-140): Variability of this species is extremely important as it is only of 53 taxa with variability and only one of very few, which reveals these parameters in statistically significant sample sizes, the more for both fore and hindwings, and these two sets highly correlate (CV= 9.04/9.96% for total number of veins - and as in all species, HW variability was higher than that of the forewing). Otherwise the data are highly similar to those obtained from other representatives of this genus (see Vršanský 2000, 2024), especially those of the similar age Crato *Elisama* (Lee 2016). Different is high value of M (over 30% in forewing, 27.84% in hindwing).
Diversity and variability within this species must be taken with caution as it might contain more species, but one is anyway dominant as in the case of similar dominance of more species, at least the second one will be identified, which was not the case.
Asymmetries of areas: See discussion.
Character of preservation: 72 complete specimens, 14 isolated forewings, 22 hindwings
Taphonomy: Diverse preservation state including complete specimen with partialy articulated antenna and leg spurs suggest no pre-depositional transport. At the same time, isolated forewings with disarticulated clavus suggest a pre-depositional transport and duration in water lasting over two-three weeks. Thus, combined with dominance, this species appears to be common in the actuaocenosis along the stream.
Remarks: Presence of highly dominant one species and rare second species within this genus suggest a single assemblage.

***Elisama simplex* sp.n. (FigureP 141)**

Holotype: GNUE213201. An articulated (with clavus) forewing. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213211**,** DG007 (forewings). The same locality as the type.

Differential diagnosis: Differs from all congeners in highly simplified and longitudinally running CuA. Much smallller than *E. baeki*.
Autapomorphies: Longitudinally running CuA like, small macula like in *E. prelistama* is possibly plesiomorphical; venation simplification apparently relates to partial miniaturisation.
Description: Forewing membrane transparent, posterior dark macula very small (0.72 mm in longest, longitudinal direction); length/width 4.5-5/1.6-1.8 mm. Sc simple, R straight, rather short (15); M sigmoidal (6), CuA simplified to 1-2 veins running longitudinally, CuP fluent, A simple (6).
Derivation of name: The species epithet is a Latin adjective 'simplex' meaning "unmixed" and refers to the simple wing venation of the new species.
Character of preservation: Two joined partially disarticulated (clavus nearby) forewings surrounded with a lot of organic debris and two isolated forewings.
Taphonomy: Partially disarticulated forewings evidence long duration in water, more specifically at the bottom without strong disturbance. This additionally suggest either a rarity in forest in the vicinity of the lake and/or longer pre-depositional transport (not long enough to disarticulate both clavi totally).

Genus *Ocelloblattula* Anisyutkin et Gorochov, 2008

Type species. *Ocelloblattula ponomarenkoi* Anisyutkin et Gorochov, 2008
Type locality: Lebanese amber
Type horizon: Barremian lebanite
Composition. *O. santanensis* Lee, 2016 (Crato)*; O. margarita* Koubová et Vršanský in Vršanský et al. (2021b) (burmite); *O. striata* Káčerová et Azar, 2023 (Quahmez).
Stratigraphic range. Early Cretaceous-Late Cretaceous.
Geographic range. Cosmopolitan (Myanmar, Lebanon, Brazil, possibly Taimyr, Russia).
Diagnosis (after Anisyutkin and Gorochov 2008). Head rather broad (no less than two-thirds of pronotum), subtriangular (slightly wider than long), anteriorly projecting from beneath pronotum; eyes large, rounded, strongly convex; all three ocelli (median and two lateral) developed; subantennal suture conspicuous. Antennae (taphonomically) very thin, about as long as body; antennomeres small (unlike most modern forms), of nearly uniform size (proximal segments not discernible); maxillary palps about as long as head, labial palps somewhat shorter; all palps thin, with apical segments weakly widened distally. Pronotum short, but with large angulate posterior lobe; anterior and lateral margins of pronotum arched, the latter more strongly so. Elytra with markedly curved M and CuA and weakly curved CuP; hindwings with conspicuous pterostigma of thickened distal RA branches and slightly sclerotized membranes between them; legs slender, covered with very long setae; cerci without visible spherical structures.

***Ocelloblattula gyongsangensis* sp.n. (FigureP 144)**

Holotype: GNUE 213289 (possibly 213313). A completely winged adult. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Differential diagnosis: Differs from the known species in being larger and from *striata* in being smaller.
Description: Eyes huge, protruding beyond the head outline. Forewing wide (9.5/2.5 mm), base not cut, costa indistinct,membrane transparent with characteristic rich coloration pattern. Costal area narrow, Sc simple, R slightly sigmoidal (14). M with 5veins, CuA short (4). Cup fluent, clavus short, A simple (4). Total number of veins ca. 27. Hindwing (8 mm long) with simple SC, R1 and RS differentiated (7 plus 7), M simplified to 2 stems, CuA with 6 branches, CuP simple. Pterostigma absent.
Coloration: Total area caculated 9.74 mm^2 (8.27 mm^2 dark).
Derivation of name: The species epithet refers to the province name of the type locality of the new species.
Character of preservation: 1 complete specimen.
Taphonomy: Preservation of single complete specimen suggest none pre-depositional transport and rarity in the actuocenosis.

Genus *Vrtula* Vršanský, 2009

Type species: *Vrtula sama* Vršanský, 2009
Type locality: Shin-Khuduk, Central-Gobi aymag, Mongolia.
Type horizon: Shin-Khuduk Formation, Lower Cretaceous.

Composition: *Elisama* sp. (Upper Wealden); *Ctenoblattina tsaganica* (Vršanský, 2003) Bon Tsaggan;; *V. exploratoremvalidator* Vršanský et Sendi, 2024 (North Myanmar amber).

Stratigraphic range: Barremian–Cenomanian
Geographic range: Laurasia and Burmite

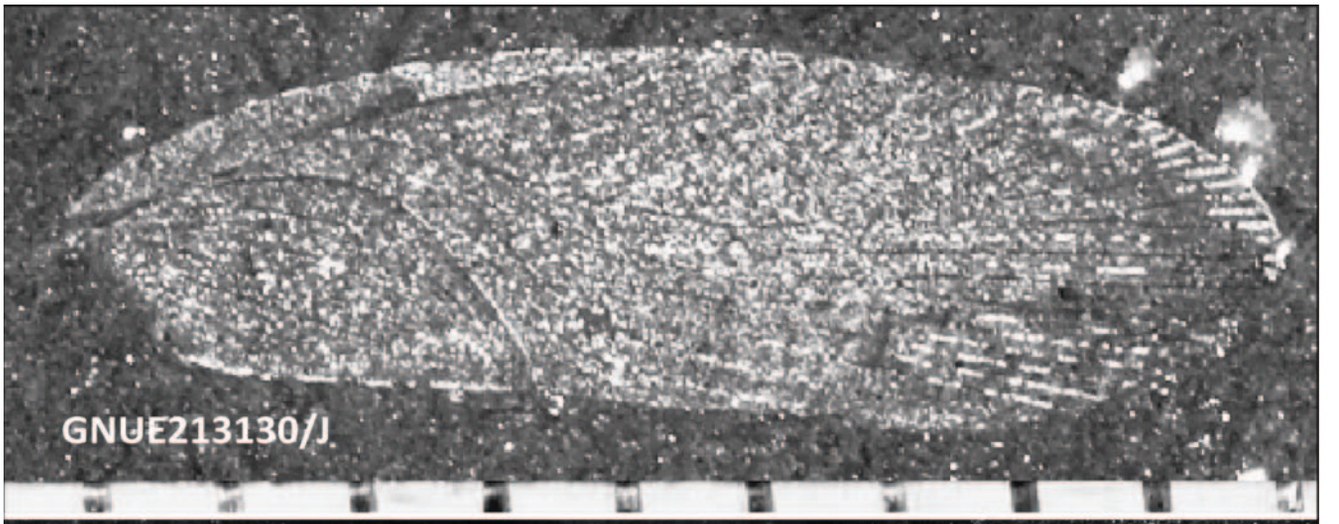
Diagnosis (see Vršanský and Sendi (2024)).

***Vrtula jinjuensis* sp.n. (FigurePs 145-148)**

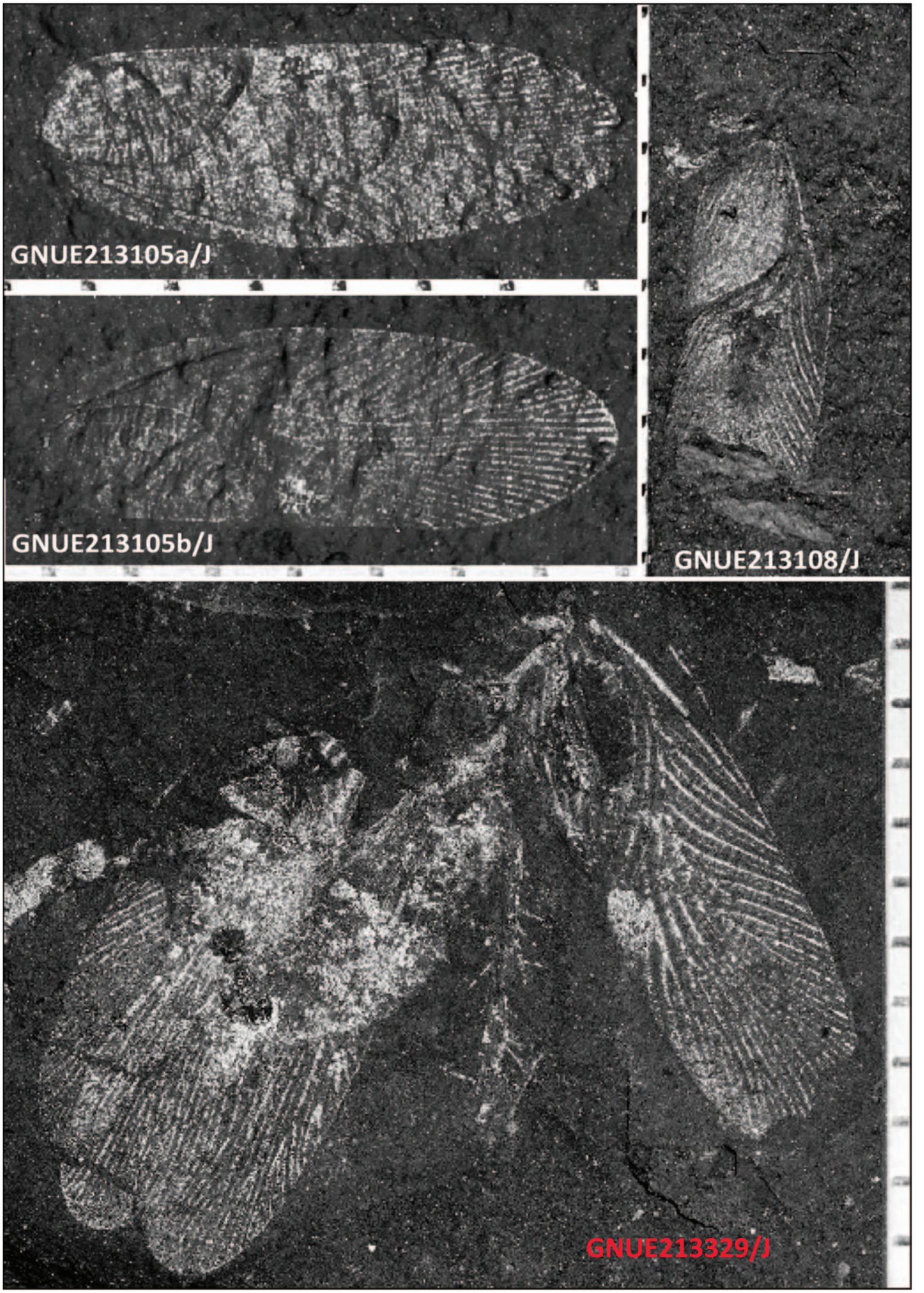
Holotype: GNUE213304. A complete specimen. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation
Additional material: GNUE213329, GNUE213340, GNUE213350, GNUE213354, GNUE213363, (complete specimens). GNUE213105, GNUE213108, GNUE213130, GNUE213210. All the same locality and horizon as type. GNUE/S/213156 Sacheon (complete specimen).

Differential diagnosis: Differs from the type species in being signiifcantly smaller and *from V. exploratoremvalidator* in having simpler pronotal coloration (somewhat similar to *Huablattula jiewenae*).
Description: Antenna very long and thin (6 mm as preserved near a helf). Pronotum with posterior central extension and with coloration formed by longitudinal stripes. Forewing wide (6.9-9.2/2.2-2.8 mm), base not cut, costa indistinct. Costal area narrow, Sc simple, R slightly sigmoidal (13-15). M with 3-5veins, CuA short (6-10). Cup fluent, clavus short, A simple (5-6). Small uncolored points present all over the surface also in dark colored area. Hindwing with simple SC, R1 and RS differentiated (5 plus 6), M simplified to 2 stems, CuA with 6 branches, CuP simple..
Midlegs with very long midtibia with at least 14 spurs long up to 0.9 mm (very long)
Coloration: Total area caculated 11.83 mm^2 (2.5 mm^2 dark).
Derivation of name: After Jinju.
Character of preservation: 10 complete specimens.
Taphonomy: Preservation of several complete specimens suggest none pre-depositional transport and abundance in the actuocenosis.

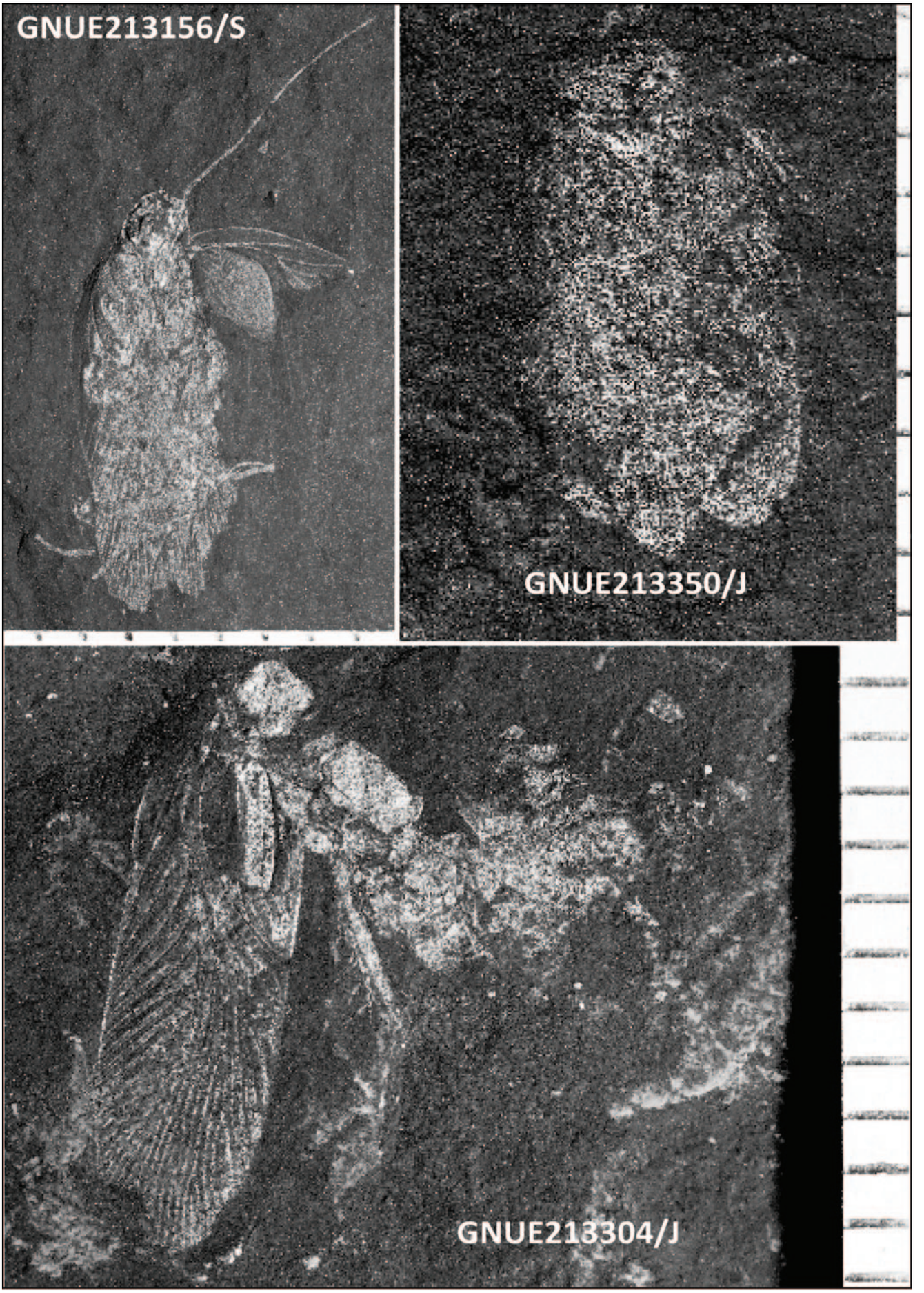

GNUE/J/213289


GNUE213130/J


GNUE213340/J


GNUE213105a/J
GNUE213105b/J
GNUE213108/J
GNUE213329/J


GNUE213363/J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GNUE213350/J
GNUE213304/J

Superfamily Caloblattinoidea Vršanský et Ansorge in Vršanský (2000) (monotypic)

Family Caloblattinidae Vršanský et Ansorge in Vršanský (2000)

Type species: *Blattina mathildae* Geinitz, 1883: 29, pl. 6, fig. 1
Stratigraphic range: lowermost Triassic-Campanian
Geographic range: Laurasia

Composition: *Caloblattina* Handlirsch, 1906; *Etapia* Vishniakova, 1983; *Fusiblatta* Hong, 1980; *Ljablatta* Vishniakova, 1983; *Itchetuja* Vishniakova, 1983; *Kemerowia* Vishniakova, 1983; *Nuurcala* Vršanský, 2003; *Rhipidoblatta* Vishniakova, 1968;, *Rhipidoblattina* Handlirsch, 1906, *Samaroblatta* Tillyard, 1919; *Shartegoblattina* Vršanský, 2004; *Sogdoblatta* Martynov, 1937; *Soliblatta* Lin, 1986; *Taublatta* Martynov, 1937; *Taublattopsis* Vishniakova, 1985; *Thuringoblatta* Kuhn, 1938; *Memento* Vršanský, 2024.

Diagnosis (after Vršanský and Ansorge in Vršanský (2000)): Typical cockroaches in habitus, with more or less long ovipositor. Large cockroaches with forewing usually 15 mm to 30 mm (rarely up to 60 mm, exceptionally under 13 mm). Both wings membraneous or leathery. Forewing with Sc branched, RS expanded, M and Cu both richly branched. Cu obiguely S shaped with most branches ending near ing apex. Clavus usually not surpassing wing midlength. Intercalary veins thick, distinct all over wing surface (visible even in poorly preserved specimens), dark color pattern rather typical. Hindwing with fan like pleating on anal lobe. Sc branched or even reticulated, long. R with R1 and RS abundantly branched. M obliquely branched. Cu with many secondarily branched veins and possibly with several blind branches that may also be secondarily branched. Wing usually with many reticulations.

Genus *Memento* Vršanský, 2024

Type species: *Memento mori* Vršanský, 2024, and by monotypy.
Type locality: Karatau, Kazakhstan
Type Horizn: Kimmeridgian Karabastau Formation

Differential diagnosis: Differs from all representatives of the family in unmodified wings and wide unmodified pronotum (plesiomorphies). From all the known Caloblattinidae it differs in raptorial forelegs and insectivory. *Olzmasg* differs in modified forewing anterior margin.

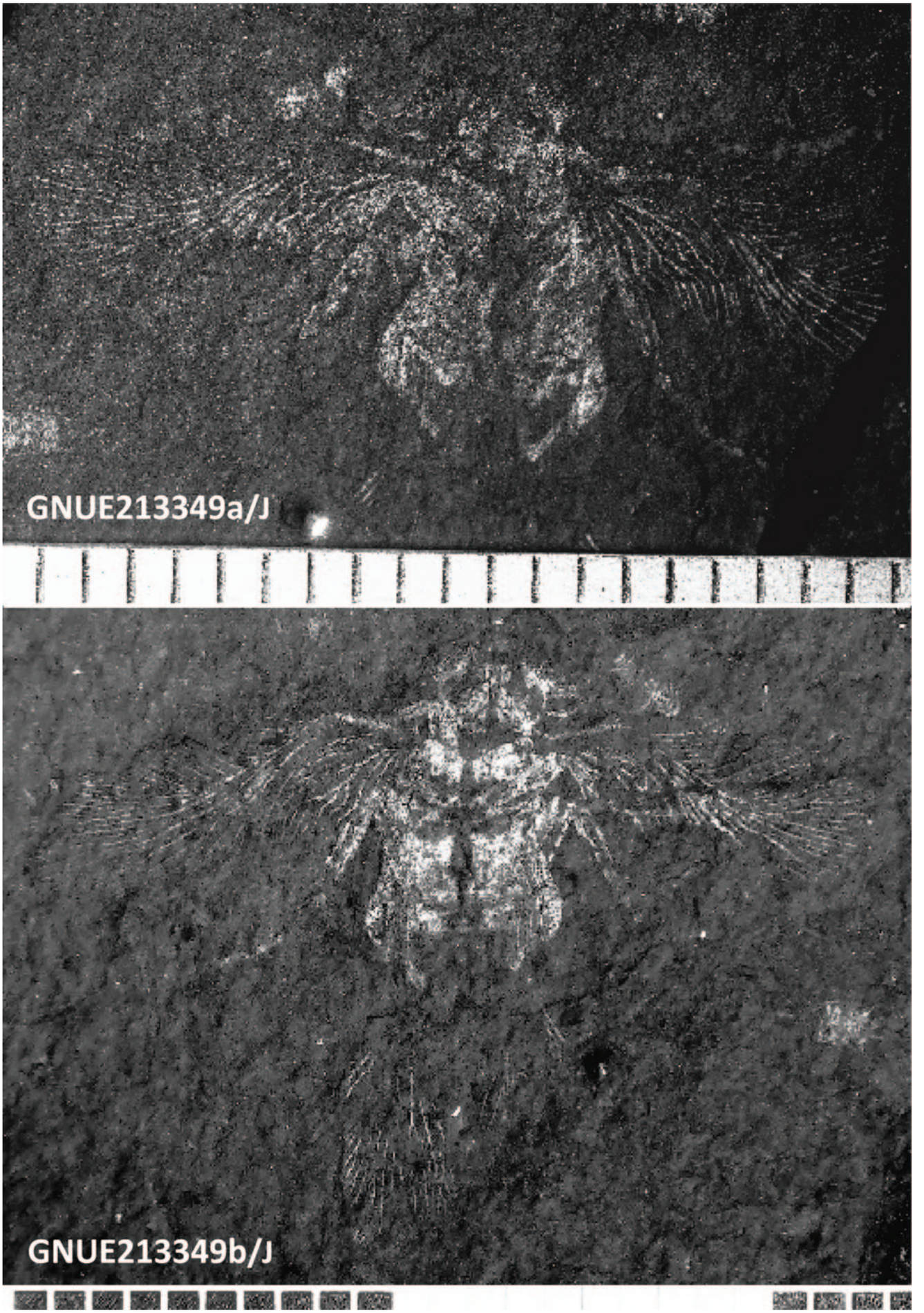
Memento futuri sp.n. (FigurePs 150-151)

Holotype: GNUE213057= (316=213074). Two forewings with two legs. Deposited in Department of Science Education, Gongju National University of Education, Chungchungnamdo, South Korea.
Type locality: Jeongchon, Korea
Type horizon: Jinju Formation

Additional material: GNUE213349= 213371 (complete specimen). KS5031, KS5023 (forewings). All the same locality and horizon as type.

Differential diagnosis: Differs from the type species in having interrupted IC coloration in small stem M-area and in interupted R-intercalaries.
Description: Pronotum with extremely sophisticated weird aposematic coloration (similar to type species, autapomorphy of the genus). Forewing wide, base not cut, costa indistinct. Costal area wide, Sc branched, with basal and also terminal dichotomisations (L7, R10). R short, strongly sigmoidal, with terminal dichotomisations (19, 23). M with about 14 veins, CuA short. Cup fluent, clavus short, A tertiary branched (9, 11). Main veins interrupted and also some IC interrupted. Cross-veins indistinct. Small colored points present all over the surface, coloration additionally present as widened intercalaries and colored area at CuA stem and M descent, interrupted with pale small area aproaching not fully formed *Eye.* Midlegs with short femora without preserved spurs, tibia longer, softly carinated, tarsus long, arolium present.
Coloration: total area caculated -----mm^2 (.....mm^2 dark)
Derivation of name: after future ("remember the future").
Mutations: M-M deformity; and A-A L and blind A clavus deformities present. The same unique and weird symmetrical deformity is present in clavus of 213349.
Character of preservation: Two forewings with two mid-legs (type), totally 4 near-complete (at least articualted) specimens.
Remarks: Categorisation within Liberiblattinidae is excluded due to plesiomorphic state of A branchings, while Raphidiomimidae cannot be excluded (also due to confirmed predatory lifestyle of the type species).
Taphonomy: Preservation of several specimens is surprising and likely relates to taphonomy as this species was common in Karabastau, but totally absent elsewhere till now. Holotype of the type species was preserved in exactly the same state (FF, mlml) and position as the type of the present species, of joined forewings and stetched midlegs.


1 mm
213057
213316


GNUE213349a/J
GNUE213349b/J

Discussion

Unique characters

Particularly valuable are the only forewing characters of Alienopteridae, which include venation (long R, retained clavus, bunky) and especially the medially curved "broken" antenna and the monstrous head of *Recyklovany*, suggesting antennation and the earliest record of myrmecomorphy and behavioural mimicry. A terminally modified antenna also occurs in *Petropterix*. Another umenocoleid, *Blattapterix*, was probably the earliest cockroach with structural colours and metallic coloration.

Unique are also the ascending M CuA present in two taxa, suggesting either a horizontal transfer or ancestry of *Ano* ale to *Brutalista*.
Memento had unique interrupted veins and intercalaries as well as symmetric deleterious mutations.
The coefficients of variation are also very similar, especially in the three statistically significant sets: *Elisama baeki* CV= 9.04/9.96% and *Ano ale*: 7.47% hindwings (10.3% forewings).

Phylogenetic analysis (TableP 168-169)

Forewing parsimony analysis and Bayesian network analysis show weak support suggesting that the assemblages are almost completely preserved. Only Umenocoleidae (*96%;* 99.6%), Mantodea (63%), Corydiidae (63.2%) and Blattulidae (52.7%) are supported. Two species of *Elisama* are also supported (*67%;* 87.4%) and here we can see a reason for the low support - *Blattula* with *Vrtula* (*64%*, 87.4%) of the same family is only supported in the network because of a high congruence with *Ano* (of another family*;* including *Blattula*). *75%;* 88.6% support for *Neoblattella* with *Archimesoblatta* (modern Ectobiidae and its stem Mesoblattinidae) is only exaggarated by weak usage of forewings only in analysis (45.2% with *Taktobybolo*) and Reduction Ring Theory (Vršanský et al. 2019). Raphidiomimidae were not supported, but their *Brutalista* with *Cameloblatta* (60.7%). Mesoblattinidae were also absent in support, except their *Perlucipecta* species (57.4%). In Parsimony, *Juramantis* was supported (*82%*). Blattidae have the earliest record (FOD).

Taphonomy (TableP 153)

The material was extremely well preserved. The contrasting preservation allows details to be distinguished from photographs alone and rarely requires examination of specimens. However, there is a marked migration of organic elements into the sediment, which results in a blurred preservation of detailed margins such as palps and antennal/leg segments. Precise measurements of these minute parts are therefore impossible. Sensilla were mostly not preserved at all, with the exception of small, rigid and dense antennal sensilla of umenocoleoids. The forewing *bunky* were also preserved.
More importantly, despite unbiased collecting, most specimens are represented by complete individuals, suggesting unusually rare, no or extremely short pre-depositional transport. Of these specimens, 116 contain legs and 32 antennae (most within *Elisama baeki*, suggesting mass occurrence near water). Extremities were also preserved in GNUE/J/213344 incomplete individual, suggesting occasional decay of wings prior to decomposition of the extremities. It is remarkable, that the only site in history with comparatively abundant preservation of complete specimens and generally similar taphonomy is roughly coeval Crato in Brazil (Bezerra et al. 2023).
Partitioning of isolated hindwings (to isolated forewings) is standard (35.6%).
Rarely gut contents and pollen on the surface were also preserved (MS in preparation).
Traces of predation can be unequivocally identified very rarely in *Elisama baeki* GNUE213159, but most likely also in other specimens (213188, 213109, 213157, 213274) - the damaged wing without clavus suggests that this could have been done by bottom scavengers. Other possible signs of predation include 213113, 213288 (*Ano*) and 308 (*Spinaeblattina*). Virtually all specimens (213178, 213366, 213125, 213030) or *Arcihmesoblatta* and virtually all *Neoblattella* have damaged forewings which, unlike previous

TAXON	F	FF	FH	H	HH	FFH	FHB	FF head	FH head	FHHB head	FFHHB	B	Complete with head	SUM
Alienopterus													1	1
Recyklovany													1	1
Caputoraptor				1 (/S)										1
Umenocoleus		1											1	2
Petropterix													1	1
Petropterix													1	1
Petrotperix	1												1	2
Pseudoblattapterix	1													1
Blattapterix	1											1		2
Asioblatta													1	1
Cameloblatta										1				1
Memento	2	2												4
Tayphoonoblatta	2 (1/G)											4		6
Blattula	6	1											5	12
Elisama 2	2					1								3
Elisama baeki	14(2G/; 1/S)	1(B)		24 (3B) (1/S)	6 (5B)		2	1		1			59 (1/S)	108
Vrtula	3												7 ((1/S)	10
Ocelloblattula								1	1	1				3
Perlucipecta 1													8 (2/S)	8
Perlucipecta 2	1 (P)	1 (P)												2
Perlucipecta 3								1	1					2
Praeblattella 1	1												3	4
Praeblattella 2													1	1
Archimesoblatta	8	2						2					3	15
Jinjublatta								1						1
Mongolblattta													4	4
Spinaeblattina													7	7
Holocompsa		1 (B)												1
Ioonouool	9 (1/G)												3 (1/S)	12
Bubosa													2	2
Neoblattella	9 (2/G)	1											3	13
Ano	6 (1P/S)	2		6(4B)	6(3, 1Bhead)	1 (head)							23 (1/S)	44
Brutalista	6	2		11 (3P)	4 (2B)						1		20 (1/S)	44
Stictolampra													1	1
Mantodea 1	1													1
Mantodea 2								3						3
Mantodea 3	3													3
Sclerotermes	1													1
IS1													1	1
IS2													1	1
IS IS		2	1										12 (1/S)	15
TOTAL	**76**	**16**	**1**	**42**	**16**	**2**	**3**	**10**	**3**	**3**	**1**	**5**	**170**	**346**

examples, seems to be related to predation on land. Both forewings from the *loouoonool* area may also have been damaged in this way.
The three localities do not differ taxonomically, but they do differ taphonomically, in particular Gunwi contains disproportionately more forewings (standard), whereas the other two localities contain more complete specimens. This suggests a more distant origin of the Gunwi insects. This is further supported by the complete absence of immature individuals, suggesting that the insects are all actively flying individuals, trapped by the surface of the lake. For comparison, immature individuals always make up more than 1% of specimens, and in the best studied Karabastau it is 5.8%. In Jinju it is zero.

Diversity

Diversity parameters show the highest historical values (SW= 2.518/ Hulbert 0.848), which are only comparable with unevaluated burmite. These parameters are even higher than in Karatau and living rainforests. This is evidence for golden times in the history of cockroaches, when they carried out extensive polination (to be treated in a separate publication, and includes pollen preserved on the surface as well as in the gut and faeces) and predation as well as decomposition. Evenness (0.3182) and equitability (0.6874) also indicate a balanced ecosystem, even for the most diverse modern rainforests. They have no equivalent in history or in the palaeontological record.

Time and space indicators in Jinju

Cockroaches are fine stratigraphic indicators (see Schneider 1983). Excluding the widespread *Blattula, Archimesoblatta, Ano* (all J1-K2); *Perlucipecta, Praeblattella, Memento* (all J2-K2); and indigenous taxa (*Tayphoonoblatta, Sclerotermes, Brutalista, Recyklovany, loouoonool*), most genera (*Elisama, Juramantis, Vrtula, Ocelloblattula)* are indicative of the "Cretaceous cockroach fauna" (Kimmeridgian-Maastrichtian). More detailed resolution is provided by *Bubosa, Alienopterus*, *Caputoraptor* (FOD Cenomanian), *Mongolblatta* (Tithonian-Cenomanian), *Spinaeblattina* (Aptian-Cenomanian), *Piniblattella* (Barremian-Aptian LOD Albian), *Petropterix* (Aptian-Albian), *Pseudoblattapterix (?Valanginian* LOD *Albian*), *Umenocoleus* (*?Hauterivian* LOD *Albian*). *Neoblattella, Holocompsa and Stictolampra* are known from the Barremian and are still common in Central and South America. With only two LOD Albian, the age does not seem to be obscured, although these cockroaches alone would rather indicate an Aptian age - however, common Aptian Caloblattinidae are missing, supporting an Albian age. Raphidiomimids are more Jurassic elements, but they are rare in the Cretaceous, supporting a burmite affinity, which is the only significant evidence (along with Sinuiju). This is supported by the cosmopolitan character of Cretaceous biotas *(Blattula, Elisama, Ano, Praeblattella, Praeblattella, Mongolblatta, Archimesoblatta, Perlucipecta, Piniblattella, Neoblattella, Petropterix, Spinaeblattina, Juramantis, Cretophotina, Ocelloblattula, Vrtula*) and also by the rapid evolution of (indigenous) cockroaches. Narrow range taxa may be represented by *Umenocoleus* (with China), *Memento, Asioblatta* (with Karabastau) and *Bubosa, Alienopterus, Caputoraptor* (burmite). The Blattidae family has FOD here in Jinju.
Usually, the higher the stratigraphic resolution, the more species can be identified. In this case, within Jinju, (J, G and S) do not differ taxonomically, statistically or intuitively. This does not mean that there is no difference between them, but the cockroaches do not show any change. Intuitively, these taxa are so specific (in some cases they do not occur anywhere else) that even if there was a difference between these 3 localities, that difference (in time and conditions) was minute (if any).

Size analysis (FigureP 172)

The size of the preserved cockroaches is also directly related to the preservation container. The only difference with Myanmar amber is the size distribution, which is normal in burmite due to the sticky nature of the resin, which is directly related (through viscosity characteristics) to the size of the captured insects. This clearly influences the taxonomic composition, with families differing in size representation. The significant non-taphonomic difference is the extreme rarity of the otherwise eudominant *Blattula* and *Elisama* in the resins (n= 1, 1 in burmite out of 4,000 samples). This may be related to the more arid (Sendi 2025) or simply more open habitats of these two main

genera, which are dominant in virtually all sediment-preserved environments, but rare in all ambers (see also Sendi et al. 2023a).
Thus, the size pattern of Jinju cockroaches is discontinuous (FigureP 172), with a mean size of 10.34 (5-17) mm, compared with 7.0 mm in burmite, and a hiatus between 14 and 17 mm. The size hiatus within *Ano ale* may be indicative of the very first case of polymorphism among Mesozoic cockroaches, or it may be indicative of further species within this species (complex).

Forewing areas and shapes (FigurePs 170-171; TableP 167)

The measured forewing areas range from 6.47 to 60.43 mm^2 (ave=22.18 mm^2). In this study we see for the first time that the areas are almost the same on the left and right side and the average asymmetry difference is only 2.17%. The correlation between total number of veins and areas is insignificant (R2= 0.43) - a result of specimen variability and the need to use average data for each species, which is impossible within this dataset.

Coloration (TableP 167)

As in all complex ecosystems, colouration is often uniquely sophisticated and extensive. Coloration ranges from 0-100% (ave= 26.26%). The total coloration area of the measured holotypes is 135.17 of 510.13 mm^2, which is 26.5 %. These values can be compared with burmite (31.1/57.96%; and similarly, 28.8/54.6% in Karatau), Montsec (10.2/28.6%), Bon Tsagaan (31.8/49.8%), Crato 54.2/58%, and we see the higher coloration partition in the most diverse localities. Unmeasured umenocoleids will ony enhance these values slightly. Different is nearly identical average perfentual coloration and the average of the total coloration, suggesting higher equality of the coloration patterns over different scales in Jinju. In contrast to insignificant asymmetry of areas, asymmtery of coloration is high (due to forewing overap) and reaches 29.07% in average.

Faunal context

The Jinju Formation represents the most diverse fossil record among the formation-level stratigraphic units of the Gyeongsang Supergroup. The diverse fossil record includes body fossils of animals including ostracods (Choi, 1990; Choi et al., 2016; 2018; 2020; 2021) spinicaudatans (Park and Chang, 1998), insects (Engel et al. 2002, 2006, Baek and Yang 2004, Ueda et al. 2005, Nam and Kim 2016, Sohn et al. 2019, 2021, Khramov et al. 2020, Kim et al. 2021, Lee et al. 2022, 2023, 2024ab, Rosse-Gullevic et al. 2023ab, Joault 2023, Sohn and Nam 2024; Khramov and Nam 2023, 2025, Joault et al. 2024, Nel et al. 2025), isopods (Park et al., 2012), spiders (Selden et al., 2012; Park et al., 2019), gastropods (Paik et al., 2019), bivalves (Yun and Yang, 2004), fish (Yabumoto and Yang, 2000; Yabumoto et al., 2006; Kim et al., 2014), pseudosuchians (Yun et al., 2004), pterosaurs and dinosaurs (Lim et al., 2001; Yun and Yang 2001; see also Lockley et al. 2020), trace fossils from various tracemakers (Kim and Lockley 2016; Kim et al., 2017; 2018ab; 2019ab; 2020; Kang et al. 2021; Ha et al., 2022) have been reported from the Jinju Formation. Important interactions with cockroaches are those represented by dung decomposers, validated for the transfer of gut microbiota with herbivorous dinosaurs (Vršanský et al. 2013) - a hypothesis confirmed by the study of transfer of microbiota among living insects and ruminants.

Floral context

The main floral characteristics of the forest are weakly elaborated (Kim 2009, Kim et al. 2016, Paik et al. 2019, Lee 2025). Besides non-diagnostic (bank) *Ruffordia, Onychiopsis, Sphenopteris*, *Cladophlebis* ferns and *Equisetum*, two putative cheirolepidiaceans (*Brachyphyllum ?japonicum* and *Cupressinocladus*) indicate a mixed Ryoseki type (Tropical and arid) and Tetori type (Warm and humid) floras. The presence of cheirolepidiaceans is consistent with the cheirolepidian source of amber from northern Myanmar (see Vršanský et al. 2025) with a highly congruent cockroach fauna. Araucarian pollen was also present.

Global Cretaceous Forest Classification

(details on localities and species in Paleodb active 2025-02-02).

Cretaceous Global Forest Type 1
(Jehol/Yixian: 145-127 Ma)

Tithonian/Berriasian Chernovskie Kopi **Index:** Caloblattinidae; absence of Umenocoleidae and Mantodea (both were common in terminal Jurassic - Karatau, Kota, Shar-Teg, Solnhofen)
Berriasian Purbeck **Index:** Caloblattinidae, absence of Umenocoleidae and Mantodea
Berriasian-Barremian Phrae-Nan **Index:** Jurassic *Elisamoides, Falcatussiblatta, Raphidiomima* Barremian Yixian **Index:** Index site
Barremian Layiang **Index:** Caloblattinidae, absence of Umenocoleidae and Mantodea
Barremian Sinuiju **Index:** Caloblattinidae, absence of Umenocoleidae and Mantodea
Barremian Wealden **Index:** Caloblattinidae, absence of Umenocoleidae and Mantodea

Cretaceous Global Forest Type 2
(Baissa: 127- 115 Ma)

Barremian lebanite **Index:** Mantodea, Umenocoleidae
Barremian Montsec **Index:** Mantodea, *Vitisma*
Aptian Bon Tsagaan **Index:** close relation to Baissa, shared species
Aptian Sharin-Gol **Index:** *Vitisma, Piniblattella*
Aptian Shar-Tologoy **Index:** Mantodea, close relation to Bon Tsagaan
Aptian Gurvan Erenyi Nuur **Reason:** shared *Gurvanoblatta*
Aptian Baissa **Index:** Index site
Aptian Fukui **Index:** *Vitisma*
Aptian Gansu **Index:** Umenocoleidae, *Rhoipidoblattina*
Aptian Shandong **Index:** *Rhipidoblattina*
Aptian Zhixin **Index:** Umenocoleidae, Caloblattinidae
?Aptian Koonwarra **Index:** *Piniblattella, Ocelloblatttulla*, Caloblattinidae

Cretaceous Global Forest Type 3 (Burmite: 115 - 83 Ma) **HERE ESTABLISHED**

Aptian Crato **Reason:** Mantodea, diverse Umenocoleidae, lacking Caloblattinidae (or rare), diverse advanced Mesozoic groups
Albian Huntongbiao **Index:** Umenocoleidae similar to Zhixin, but lacking (or rare) Caloblattinidae
Albian Archingeay **Index:** Mantodea, diverse advanced Mesozoic groups
Albian Spanish amber **Index:** Mantodea
Albian Jinju **Index:** Mantodea, diverse advanced Mesozoic groups, high congruence with burmite
Cenomanian Labrador: **Reason:** Baissomantidae T2-T3 (age correspond to T3)
Cenomanian burmite **Index:** Index site
Cenomanian Buzinie amber **Index:** extant ectobiid
Turonian riparian amber: **Index:** *Jantaropterix, Alienopterix*
Turonian Kyzl-Zhar **Index:** close relation with burmite, *Nigropterix*
Turonian Orapa **Index:** Alienopteridae, diverse advanced Mesozoic group
Santonian taimyrites **Index:** Mantodea, diverse advanced Mesozoic groups
Santonian aikaite **Index:** *Alienopterix, Perspicuus*

Cretaceous Global Forest Type 4 (Nenjiang: 83 - 66 Ma and still lasting) **HERE ESTABLISHED**

Santonian Nenjiang **Index:** Generally living Biota possibly with rare *Praeblattella*
Campanian Cerro del Pueblo **Reason:** *Neoblattella* only

Unassigned:

Berriasian Wadi el Malih **Reason:** undiagnostic mesoblattinid and *Praeblattella* (Time corresponds to T1-T2, more probably T2 due to dominant Raphidiomimidae)
Hauterivian Brezina **Reason:** lacking Caloblattinidae and Umenocoleidae as in T3, but due to isolation on Adria-Turkey microcontinent, this fauna is greatly indigenous and contain Liberiblattinidae and Corydiidae as in T3. Thus this fauna seems to represent much younger T3 fauna (highly modified), but there are no dating indications (Hauterivian was expected only in 1973 by a collector)
Aptian Shin-Khudukh **Reason:** undiagnostic blattulid only (time corresponds to T2)
Aptian Bajo Grande **Reason:** undiagnostic Blattulidae (time corresponds to T2)
Aptian Houmachi **Reason:** undiagnosit cockroach (time corresponds to T2)
Aptian Beiozi **Reason:** undiagnostic cockroach (time corresponds to T2)
Albian Sisteron amber **Reason:** undiagnostic blattulid only
Albian Verkhne-Bureinskaya Depression **Reason:** undiagnostic blattulid only
Cenomanian Namoura **Reason:** undiagnostic Mesoblattinidae and *Ocelloblattula* (time corresponds to T3)
? Hefei **Reason:** undiagnostic cockroach

GCNRP

The recently proposed GCNPR concept (Vršanský 2024) does not include Jinju. The cockroaches alone clearly document the importance of the site as relevant to this concept, and in many ways it overvalues the other sites in the GCNPR. As noted above, it is currently ranked 3rd after Karatau and Daohugou. In terms of other important assemblages that have been preserved (discussed in the faunal context), Junju only needs time to join this club of significant contributions to our knowledge of the evolution of the world's forests. The cockroaches are clearly voting for Jinju.

Declarations

Author contributions
GSN collected and inventarised samples, provided maps, locality documentation and logistical support; LV vectorised illustrations; PV designed research, performed main systematical research, co-illustrated samples and wrote the paper; J-HJ calculated areas and co-illustrated samples; J-C S provided logistical support and co-wrote the paper; SBL prepared photo plates.

Acknowledgements
We thank Corentin Joault (Sorbonne) and Lucia Šmídová (Prague) for coordination, Lucia Vršanská (Bratislava), Jan Hinkelman (Zagreb) for thorough revision and technical assistance, and Štefánia Dugovičová for linguistic revision. We are also grateful to Lee Sam Sik for providing samples (213087-213161). This work was supported by the Scientific Grant Agency of the Ministry of Education of the Slovak Republic and the Slovak Academy of Sciences BARS, by VEGA 2/0070/23, UNESCO-Amba, and by the 'Research Under Protection' sub-programme of the 'Individual Research Program in Basic Science and Engineering' funded by the National Research Foundation of Korea (NRF-2017R1D1A2B05028793

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Data

Major Jurassic and Cretaceous assemblage analysis

	Jinju	Nenijang	NJ	Bak	Kar	Mei	Zho	Hua	Xia	Dao	Dob	Min	Shu	Sha	Che	Polar	Baissa	Bon T	Montsec	Yixian	NM	Lebanese	Crato	Sinuiu	Fukui	Sharin-Gol	Kota
Ano	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Blattula	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	1
Caloblattina	0	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0	0	1
Dostavba	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hra	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Nuurcala	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0
Okras	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perlucipecta	1	0	1	1	1	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1	1	1	1	1	0	0	1
Polliciblattula	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Praeblattella	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	1	0	1	0	1
Raphidiomima	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Rhipidoblattina	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	0	0	0	1
Solemnia	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Truhla	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chresmoda	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0
Elisamoides	0	0	0	1	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1
Euryblattula	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Rhipidoblatta	0	0	1	0	1	1	0	1	0	1	1	1	0	0	1	1	1	0	0	1	0	0	0	0	0	0	1
Mongolblatta	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1
Taublatta	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Samaroblattula	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesoblattula	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mesoblattina	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Sogdoblatta	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Breviblattina	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Kurablattina	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Divocina	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Entropia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fuzia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parvifuzia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colorifuzia	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fortiblatta	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Artitocoblatta	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Asioblatta	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Decomposita	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Karatavoblatta	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latiblatta	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rhipidoblattinopsis	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skok	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Falcatusiblatta	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Batola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	1	0
Facioblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Svabula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Aurora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Major Jurassic and Cretaceous assemblage analysis *continue*

Aposema	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Stictolampra	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
Petropterix	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	0	1
Vitisma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	1	1	1
Elisama	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1
Shartegoblattina	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0
Cretophotina	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	1	1
Piniblattella	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	1	0
Aktassoblatta	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Cameloblatta	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Spinaeblattina	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0
Jantaropterix	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Archimesoblatta	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	1
Brachymesoblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Tarakanula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Elytropterix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
TERMITES	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	0	1	1
Ponopterix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Cratovitisma	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0
Raptoblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Gurvanoblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Baissomantis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Balatronis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Neoblattella	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Liberimala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Habroblattula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
Apiblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Vcelesvab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Morphna	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Mesoblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Bubosa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
OI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Manipulator	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Cretaperiplaneta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Alienopterus	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Alienopterix	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Meilia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Teyia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Formicamendax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Caputoraptor	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Alienopterella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Spongistoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Vzrkadlenie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Anthophilloblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Aethiocarenus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Cercoula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Mulleriblattina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Major Jurassic and Cretaceous assemblage analysis *continue*

Crenocticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Eminespina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Enervipraeala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Laticephalana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Nodosigalea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Perspicuus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Stavba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Burmantis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0
Magniocula	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Lepidopterix	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Sericoblatta	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Macaroblattula	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Cretaholocompsa	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
MANTODEA	1	1	1	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	1	1	1	1	1	1
Pravdupovediac	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Cryptoblatta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Miniblattina	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Pseudomantina	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Nigropterix	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Trapezionotum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sivis	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Okruhliak	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Asvab	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operam	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liberiblattina	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Fractalia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Akinisia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Okienkula	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Spono	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Makacka	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Memento	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hydrokhoohydra	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Katatychi	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kazachiblattina	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influencer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gen.n.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Juramantis	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
Taktobybolo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jinjublatta	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudoblattapterix	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Umenocoleus	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
modern blaberid	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Epilampra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ectobius	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recyklovany	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vrtula	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0
Ocelloblattula	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0	0	0
Holocompsa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Measurement of wings + Markings

Specimen GNUE213	Area (mm^2)	Dark areas	Dark per cents	Asymmetry area/coloration (%)	Total veins
009	59.12	NA			
018	6.47	0	0		26
022	60.43	47.09	77.92		52
034	18.32	Not calculated			
041	38.63	1.02	2.64		34
052	45.47	0.65	1.43		32
059	15.48 | 15.43	3.21 (Right)	20.8	0.32	27/27
064	53.56	0	0		58
084	26.95	4.91	18.22		28
090	51.41	Not calculated			30
093	13.43	5.25	39.09		31
096	13.48 | 13.34	6.39/4.9	47.4/36.73	1.04/23.32	31/30
099	21.02	0.31	1.47		34
104	13.27	0	0		
112	90.89	NA			
136	11.68 | 11.97	9.7/5.5	83.05/45.95	2.42/43.3	28/32
153	23.5	0.16	0.68		28
158	20.72	8.41	40.59		
166	12.29	NA			29
167	21.05	NA			28
171	14.34	4.01	27.96		32
176	55.8	NA			
187	34.1	NA			
216	22.6	Not calculated			
222	17.48	17.48	100		23
228	6.18 | 6.33	0	0	2.37	
289	19.74	Not calculated			29
292	11.72	1.63	13.91		33
319	18.47	8.4	45.48		
331	17.92 | 18.62	0	0	3.76	39/40
334	11.24 | 11.6	1.99/1.58	17.7/13.62	3.1/20.6	
340	11.83	2.58	21.81		
352	14.28	NA			
363	44.77	NA			47
TOTAL	**510.13**	**135.17 (26.5%)**	**Ave 26.26%**	**Ave 2.17/29.07%**	**Ave 33.12**

Character matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Family	modified shape FW	beetle-like	not large	miniaturised = simplified	extremely elongate	FW short	FW elongate	parallel	base cut	widest apically	costa distinct	pseudovein	suttura	kink absent	SC simple	R1 short	R1 modified	RS absent	RS expanded	MCuA sigmoidal
OG Phyloblatta	Phyloblattidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bubosa	Blattidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0
Blattula	Blattulidae	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0
Elisama baeki	Blattulidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
Elisama	Blattulidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
Neoblattella	Ectobiidae	0	0	1	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	0
Archimesoblatta	(Ectobiidae)	0	0	1	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	1	0
Ano	Liberiblattinidae	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0
Memento	Caloblattindiae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Typhoonoblatta	Raphidiomimidae	1	0	1	0	1	0	1	1	0	0	0	0	0	1	1	1	0	0	0	1
Prae 1	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Prae 2	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Perlucipecta	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Spinaeblattina	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Jinjublatta	Mesoblattinidae	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0
Vrtula	Blattulidae	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0
Petropterix	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Pseudoblattapterix	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Umenocoleus	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Juramantis	Juramantidae	1	0	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	1	1
Juramantis EYE	Juramantidae	1	0	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	1	1
Cretophotina	Cretophotinidae	1	0	1	0	0	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1
Sclerotermes	Pabuonquedidae	1	0	1	1	0	0	0	0	0	1	0	0	1	1	0	0	1	0	1	1
Ioonouool	Corydiidae	1	1	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Brutalista	Liberiblattinidae	0	0	0	0	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	1
Cameloblatta	Raphidiomimidae	0	0	1	0	1	0	1	0	1	1	1	0	0	0	0	1	0	0	0	1
Asioblatta	Raphidiomimidae	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1
Blattapterix	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Stictolampra	Blaberidae	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Holocompsa	Corydiidae	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	1	1	1	0	0
Mongolblatta		0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Perlucipecta 2	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Perlucipecta 3	Mesoblattinidae	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Petropterix 2	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Petropterix 3	Umenocoleidae	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
Vrtula	Blattulidae	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
CuA post short	CuA post umbranched	reticulations absent	CuP cut	CuP-A1 fusion	A simple	bunky	intercalaries absent	IC interrupted	intercalaries wide	cross-veins absent	CW straight	vein unstraight	transparent	apex round	R sigmoidal	apex posteriorly	apex centrally	A secondarilz brachd 0	IC widely colored	CI colored	Clavus short	R stem colored	Eye pattern	Sc anterior offshoots	bark	hemelytra
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
0	1	1	0	0	1	0	0	0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
0	1	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
0	1	1	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	0	0
1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	1	1	0	0	1	0	0	?	0	1	1	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	1	0	0	1	0	0	1	?	0	?	?	0	1	0	0	1	0	0	0	0
0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0
1	1	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0
1	1	0	0	1	0	1	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0
1	1	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	1	1	0	0	0	0	1
0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	?	0	0	0	0	0	0
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1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	?	0	0	1	1	0	0	0	0	1
1	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	0	1	0	0	0	0	1	0	0	0
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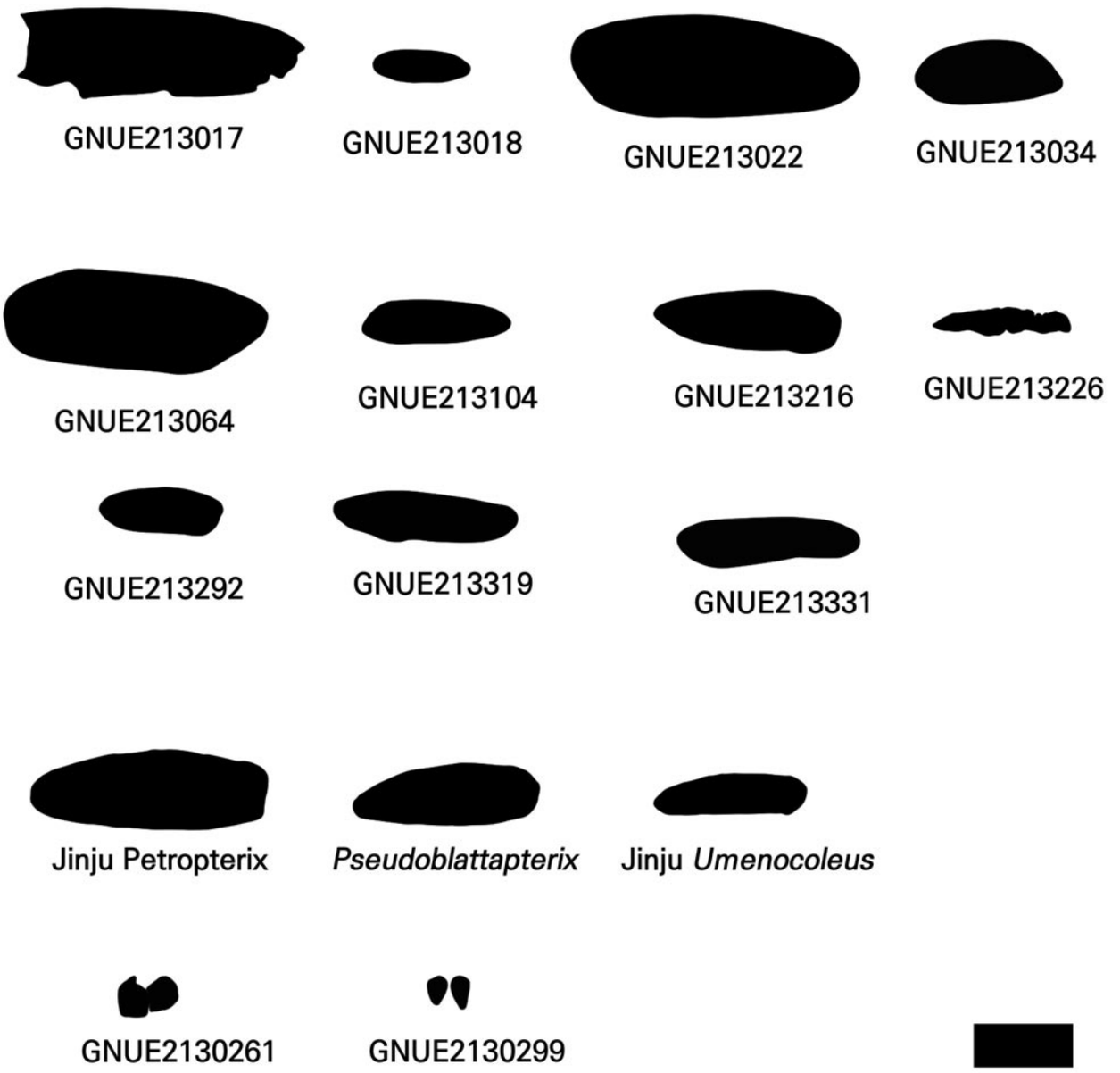
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Jinju Petropterix
Pseudoblattapterix
Jinju *Umenocoleus*
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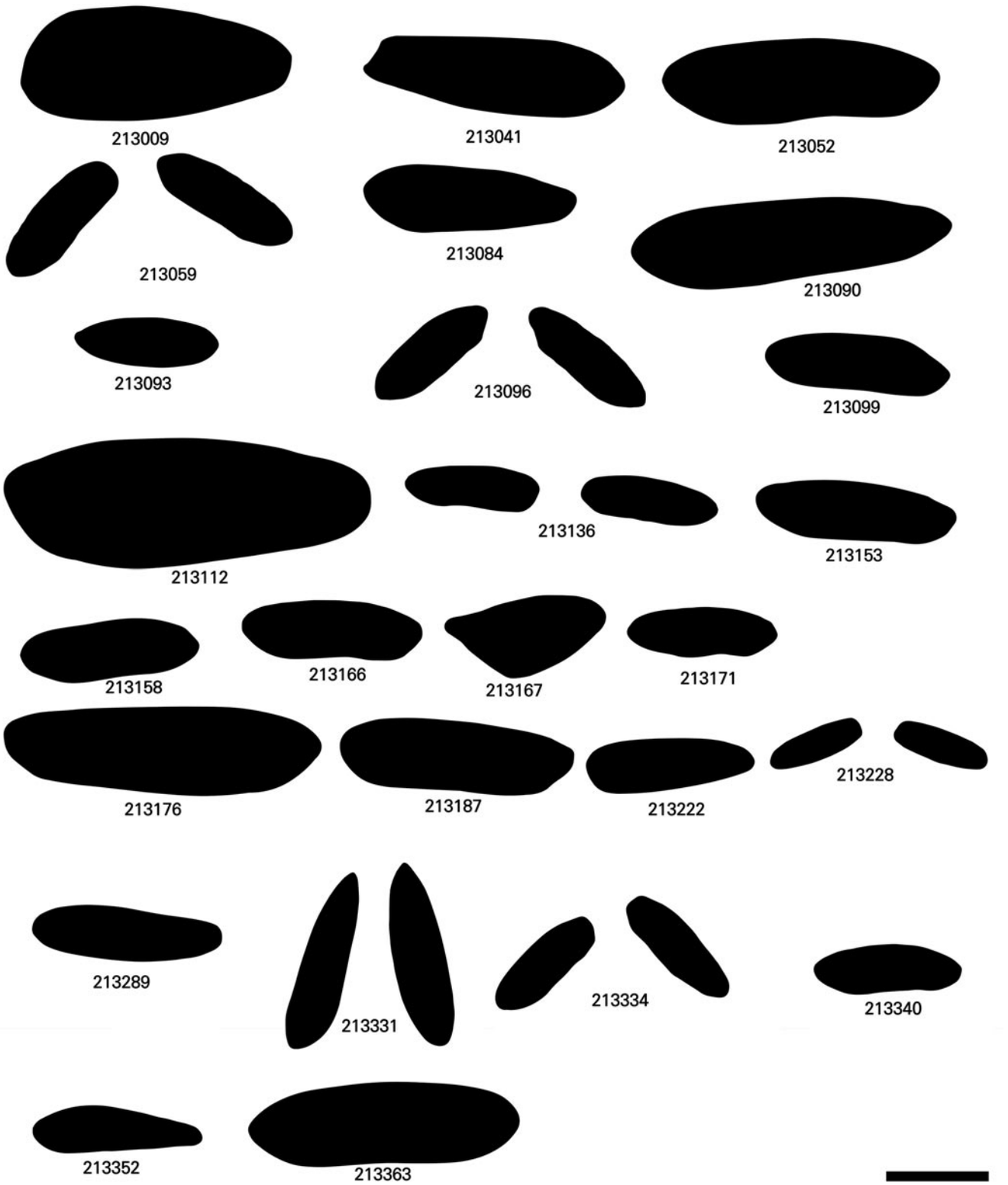
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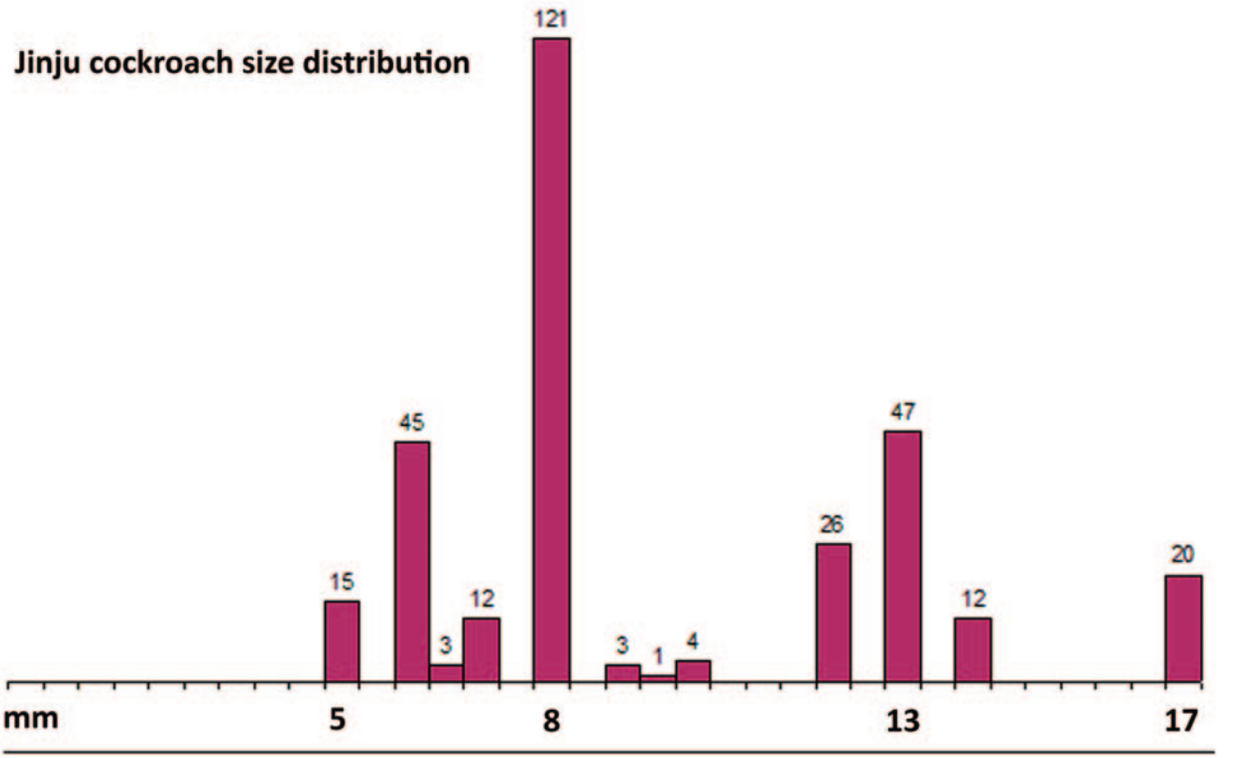
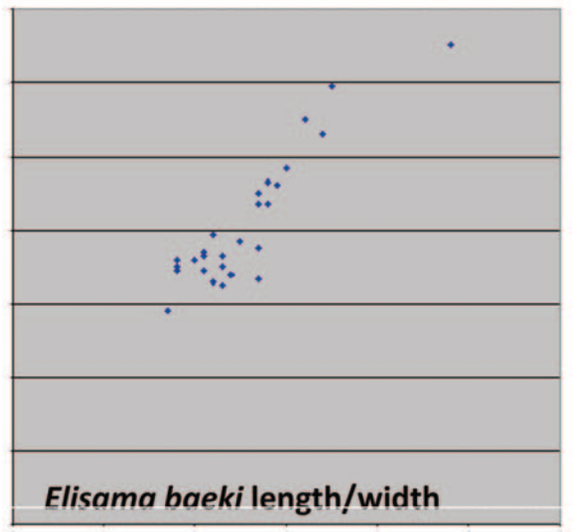
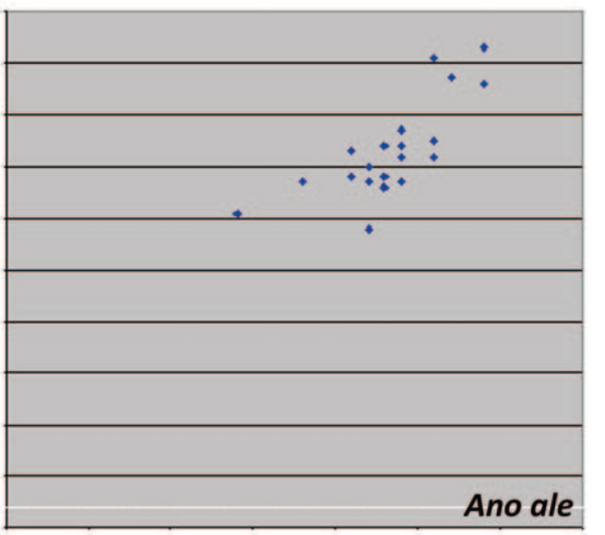
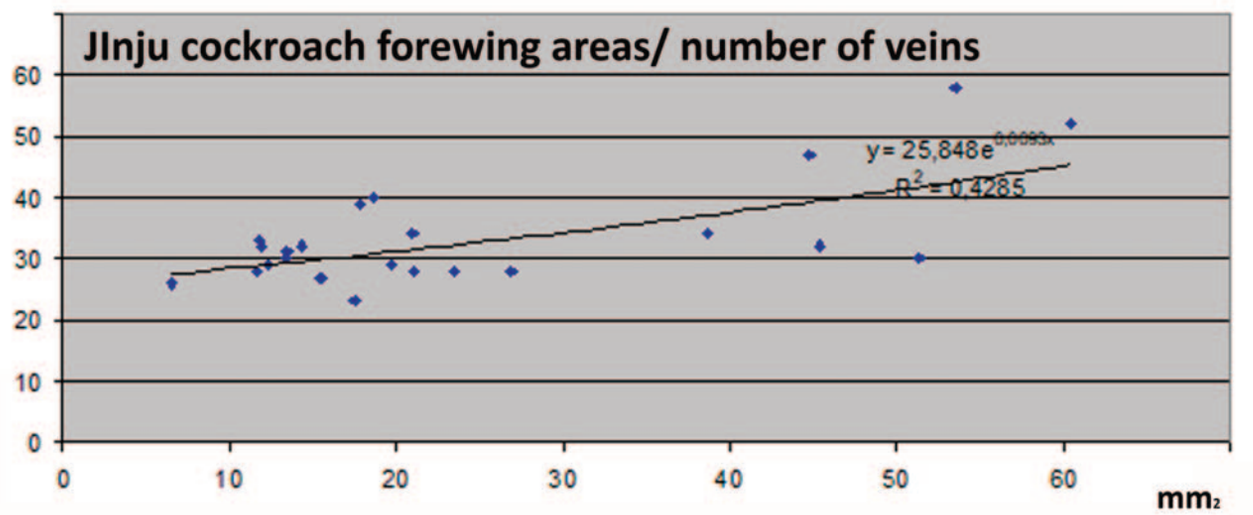

Jinju cockroach size distribution
121
45
47
26
20
15
12
3
12
3
1
4
mm
5
8
13
17


Elisama baeki length/width


Ano ale


JInju cockroach forewing areas/ number of veins
60
50
40
30
20
10
0
0
10
20
30
40
50
60
mm2
y= 25,848e
R2 = 0,4285

Index