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Blurring the limits of anaxyelid subfamilies: a new genus and species (Hymenoptera: Anaxyelidae) from the Albian of the Republic of Korea

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Seung-Hyuk Kwon, Corentin Jouault

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HAL Authorization

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nd species

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ublic of Korea

toire naturelle,

F-75005 Paris,

le Montpellier),

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strated from the
to the subfamily
out differs from
twice as long as
curved distally
tiation between
lue of the wing
nsequently, the
ae.

ning greatly, in
io *et al.*, 2021;
mely: *Syntexis*
curs throughout
ex Don, 1824;
– *Pseudotsuga*
1, 1967). Its life
sperms, with a

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Inner Mongolia,
with age (*i.e.*,
Liu *et al.*, 2012;
Anaxyelidae is
Liu & Nyman, 2014;
species of anaxyelid
is the difference

Jingchun section
see Park *et al.*,
Journal of the Jinju
the age of the
is referred to as
The fossils are
specimens are
GNUE218003,
GNUE218044.
on EF 100 mm

listed in ZooBank
(reference):

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, which means
τηξίς, meaning
ily Syntexinae.
rd of wing (R1,
ll; 2r-rs arising
ilar length as 1-
the same width
curved distally
a, but distinctly
) slender, short
mily Syntexinae
widened apically
in.

105 *lyntexis* than to
106 died specimens,
107
108 lue of previously
109 a combination of
110 t-cu suggests its
111 ng twice as long
112 : shape of cell 2r
113 r. Similarly, the
114 nd Anaxyelinae.
115 he pterostigma's
116 . 3r supports its
117 we extensively
118 : wing venation
119
120
121
122
123
124
125 18003 (paratype,
126 2/GNUE218044
127 al University of
128
129 h means 'heretic'
130

131 inju, Republic of
132
133
134 ngth (excluding
135 nctive coloration
136
137 l lateral surface.
138 y; antennomeres
139
140 mur *ca.* 1.5 mm
141 ally. Metafemur
142
143igma *ca.* 1.5 mm
144 mm wide (2.14×
145 de). Cell 3r 2.3×
146 :ype). Cell 2+3m
147 dest along 3r-m.
148 vide). Cell 2mcu
149 d 0.82 mm wide
150 Cu (*ca.* 0.54 mm
151); Vein 1-Rs+M
152 s curved basally,
153 ets 1-Rs without
154 8 mm long) and
155 n the holotype).
156 ular, longer than

157 ated well before
 158
 159 s long as wide).
 160 ngth distally (in
 161 ly wider basally
 162 abdomen apex
 163 forewing length
 164
 165 he holotype. For
 166 s: GNUE218003
 167 positor about 4.6
 168 ; at least 6.5 mm
 169 l body at least 7
 170 3.8 mm long (as
 171 t 4.17 mm long,
 172
 173
 174 llt *et al.*, 2022):
 175 2
 1766
 1773
 178 orter than cell
 1795
 180 2 (2-A1 0.2× as
 181 axis Wang *et al.*,
 182

183	aced from a1-a2
1844
185	< as long as
186	Rasnitsyn, 1990
187	as long as
188	ault <i>et al.</i> , 2022
189	with cell 3r
190	<i>syntexis</i> Gao <i>et</i>
191	
192	with cell 3r
193	Gao <i>et al.</i> , 2022
194	in apical third of
195	ov, 2019
196 7
197	n basal third of
198	: Kopylov, 2019
199	from middle of
2008
201	lov <i>et al.</i> , 2020
2029
203	1.8× longer than
204	<i>is gen. nov.</i>
205	l 3r longer than
206 10
207	u present; distal
208	Kopylov, 2019

209 -cu absent; distal
210 ohwer, 1915
211
212
213
214
215 ticotomidae, and
216 es of thinner and
217 Gao *et al.*, 2009,
218 st of the time, a
219 new fossils), and
220 m not fused and
221 gellinae: Mason,
222 l venation in the
223 al (*e.g.*, Engel *et*
224 lae are excluded
225 (*e.g.*, Gao *et al.*,
226 r forewings with
227 7; Jouault *et al.*,
228 ls nearly aligned
229 nthredinoidea *s.l.*
230 *al.*, 2015; Nel *et*
231 new specimens)
232 redinoidea (*e.g.*,
233
234 rphology go the

235 & Zhang, 2004).
236 because of their
237 and lacking the
238
239 wings with 1-Rs
240 originating close
241 with 1m-cu (*vs.*
242 the crossvein 2r-
243
244 iricidae), a long,
245 wing membrane
246 these characters
247 Yang *et al.*, 2018;
248
249 often overlap the
250 ng with venation
251 basal section of
252 : Pseudosiricidae
253 new specimens
254 resent (note that
255 eins). The most
256 absence of strong
257 and 1m-cu to the
258
259 ig this family is
260 N. Oyama, pers.

261 unusually long
262 Besides, none of
263 ween the base of
264
265 ause no forewing
266 pulcidae, 2r-m is
267 er having a very
268 ily membranous
269 sils). In the new
270 n GNUE218032
271 rotum associated
272 icide to place the
273
274 in the subfamily
275 of cell 3r; cell 2r
276 chostigmatinae);
277 which all species
278
279 xinae because of
280 istic characters
281 not distinctively
282 pterostigma) is
283 axyela destructa
284 lasnitsyn, 1968).
285 axyelinae rather
286 most diagnostic

287 shares numerous
288
289 l from Kopylov,
290 llowing couplets
291 *axis* Rasnitsyn &
292 2, *Sclerosyntexis*
293 2022); forewing
294 ving (excluding
295 : of 3r cell; 2r-rs
296 , 2019); 1-M of
297
298 :ause of (most of
299 as (most notably
300 in length to the
301 s well as 1Rs+M
302 .se of the cells 2r
303 es (most notably
304 r sheaths (longer
305 is.
306
307
308 . Syntexinae and
309 d genus exhibits
310 e morphological
311 eatures for these
312 ïcant characters

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ing a novel one.
two subfamilies
ther.
tion in regard to
of 1m-cu, usually
, the bifurcation
syntexis antonovi
e other hand, in
m-cu. In certain
irs before 1m-cu
h of Rs+M. We

the Anaxyelidae
times its width,
ern is generally
up. For instance,
, *Sphenosyntexis*
) have the cell 2r
gen. et sp. nov.
xis magadanicus
2r. Additionally,
e trace of 1r-rs,
osyntexis primus
xis khasurtensis

ae. Typically, in

339 described species
340 almost parallel-
341 at approximately
342 the differences in
343 ly when clearly
344
345 l Anaxyelinae. In
346 rostigma near its
347 still noticeable in
348 **gen. et sp. nov.**,
349 pterostigma. On
350 l quarter of the
351 und in *Anaxyela*
352
353 ement within the
354 ounded, and the
355 ction with C. In
356 alting in a sharp
357 oth Anaxyelinae
358 *Hanguksyntexis*
359 lar characteristic
360 ' of the cell apex.
361 r clarity.
362 d to classify the
363 ot provide robust
364 l Kependajinae

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is result could be
completeness of
f the family.

Delclòs, 2000

rich was initially
syn & Martinez-
he bifurcation of
the pterostigma.
sembles that of
sin based on the
ttern observed in
the subfamily

ificantly to our
genus represents
ular interest, this
g the boundaries
ated the value of
propose that the
or distinguishing
noptera from the
order during the

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ed funding.

(Hymenoptera:
s, western North

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ite Paleontology.

rsity of Kansas,

Fossil Xyelidae

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eage of sawflies
ous Research, 60,

s of *Myrmecium*
Early Cretaceous
le Ciências, 92,

elid wood wasps
era). *Journal of*

xiphydriid wood
association with

from the Middle
596.

437 optera) from the
438 *1C Evolutionary*
439
440
441 uide to families.
442
443 oidea) in west-
444
445 e early diverged
446 24, 379–393.
447
448 › (Hymenoptera:
449 *éontologie*, 108,
450
451
452 ›ptera: Siricidae)
453 382–389.
454
455 ›amphiliid genus
456 73–182.
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458 the Jurassic of
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taceous of Asia.

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ozoic. *Euroasian*

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Dmitriev, V.Yu.,

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A., Lukashevich,

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., Prokin, A.A.,

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Štrelnikova, O.D.,

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& Zmarzły, M.

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1221–1394.

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e of Daohugou:

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Daosyntexis and

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04–114.

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is in the eastern

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Journal of Asian Earth

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n: Goulet, H. &
milies. Research

ovas espécies de
aleógeno) Minas

representatives of the
(Hymenoptera,

ς, S.M. & Malm,
fly superfamilies
giosperm hosts.

ia from the Jinju
ology, 17, 1271–

505 *icheskii Zhurnal,*

506

507ymphata) [New

508aratau [Jurassic

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510ykh. *Akademiya*

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512eous of Asia.

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514(Hymenoptera:

515a, 70, 68–73.

516nye Vostochnogo

51739, 177–205.

518optera) from the

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520u hymenopteran

521. *Palaeontology,*

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524e *Entomological*

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526 itsyn, A.P. (2012)
527 radiation of the
528
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530 e (Hymenoptera)
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533 he Hymenoptera
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536 ral diversity and
537 Hymenoptera):
538 22–194.
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540 awflies from the
541 dae). *Historical*
542
543
544 of basal horntail
545 *is Research*, 91,
546
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548) Mirolydidae, a
549 saic evolution of
550
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552 J.P. (2020) A new
553 Myanmar amber.
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556 vfly of the genus
557 ary of Altkirch,
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560 *itexis libocedrii*
561 60, 1291–1295.
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563 New genus and
564 etaceous Kachin
565 !7, 104940.
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567 amphiliids with
568 Northeast China
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138. **A**, Part. **B**,

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(GNUE218032).

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D, Interpretative

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(UE218004). **B**,

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D, Interpretative

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(UE218044). **B**,

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