
















# Preflight Summary Report for: ichthyosauromorph-taxonomy-a3.pdf

Profile: Convert to PDF/A-3a (Processed pages 1 to 14)

Processed by Ben Moon, Date: 29/03/2021 11:46

## Fixups

-  Discard all actions that are not compliant with PDF/A (467 objects)
-  Prepare annotations for PDF/A-2 (1418 objects)
-  Convert to PDF/A-3a (2 objects)
-  Remove, apply or adjust object compression (1 object)
-  Compress all uncompressed objects using lossless ZIP compression (1 object)
-  Recompress LZW as ZIP (1 object)
-  Adjust colors for PDF based ISO standards (1 object)
-  Embed fonts (even if text is invisible) (1 object)
-  Fix font encoding (CIDToGIDMap) (1 object)
-  Insert missing Type entry in StructElem objects (2486 objects)
-  Make document XMP Metadata compliant with PDF/A-2 (1 object)
-  Remove CIDSet if incomplete (1 object)
-  Repair invalid bookmark hierarchies (1 object)
-  Set relationship entry (1 object)
-  Set AF entry for embedded files (1 object)

## Results (Summary)

 **No problems found**

## Document information

File name: "ichthyosauromorph-taxonomy-a3.pdf"  
Path: "/Users/bcm/GitHub/ichthyosaurs/ichthyosauromorph-taxonomy"  
PDF version number: "1.6"  
File size (KB): 457.6  
Title: "Ichthyosauromorpha Taxonomy"  
Author: "Ben Moon"  
Creator: "LaTeX with hyperref"  
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Created: "26/03/2021 11:02"  
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Trapping: "False"  
Additional actions  
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Names of plates: "(Cyan) (Magenta) (Yellow) (Black) "

## Environment

Preflight, 18.4.0 (237)  
Acrobat version: 20.10  
Operating system: macOS 10.16.2

# Ichthyosauromorph Taxonomy

Benjamin Moon

Version 0.6.1746.20210326

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## Introduction

This document presents a list of valid ichthyosauromorph species. It is a constant work in progress given the pace at which new ichthyosaur research happens. Perhaps not as rapidly as some other fossil groups, but certainly fast enough to require some attention.

It’s also intended to give some handle on the vast literature available for ichthyosaurs and their near relatives by means of synonymy lists. I’ve chosen this format for it’s familiarity, but also because I rather enjoy the process and trials to building a complete yet usable synonymy list.

I’ve used this also as an exercise in typography – like much of my more public output. This document is typeset in Lua<sup>La</sup>TeX using typefaces with various nice features – old style figures, small capitals, optical sizes. The fonts used are nonetheless open source, courtesy of their development at Adobe.

### Layout of synonymy lists

The synonymy lists are presented as unruled tables:

Example

Cartorhynchus lenticarpus Motani et al., 2015a				
URN:LSID:ZOOBANK.ORG:ACT:FCCC9BB7-FD52-42F4-B2EC-B0B7E2A1CA32				
<status>	<year>	<Taxon>	<Authority, Year>	<reference, page> [<occurrence information>.] <comments>
*	2015a	Cartorhynchus lenticarpus	Motani et al., 2015a	Motani et al. p 485 [Upper Member, Nanlinghu Formation, Subcolumbites Ammonite Biozone (Olenekian, Lower Triassic, Triassic); Majishan Quarry, Chaohu City, Hefei, China (UTM WGS84 50R 577953 3499041 = 31° 37' 26" N 117° 49' 19" E).] LSID: URN:LSID:ZOOBANK.ORG:PUB:9CFFEE63-2B8A-4C01-B9C7-CD3C53D684F5

If a work names a new species or combination, the LSID of the act is included as a link button alongside the taxon name,<sup>1</sup> where this is available. Similarly all works that have publication LSIDs have those included too.

<sup>1</sup> i.e. 

### *‘Richter symbols’ & certainty of assignment*

I’ve followed the recommendations of Matthews (1973), pretty much to the letter, for the symbols and styles included in the leftmost two columns.

*In front of the year* symbols in the leftmost column

- \* (asterisk) this publication marks the name becoming valid under ICZN rules.
- . (dot/period) we accept responsibility for attaching this reference to the taxon in question.
- (no sign) we cannot responsibly attach this reference, but do not doubt it.
- ? (question mark) there is some doubt in attaching this reference to the current taxon.
- v *vidimus*, we have checked the deposited specimens. Can be accompanied by the above tokens:
  - v\* we have seen the type specimen(s).
  - v. we take responsibility for attaching the deposited specimens.
  - v we do not take responsibility for attaching the deposited specimens.
  - v? the specimens cannot be certainly assigned to this taxon.
- (?) the year of publication is uncertain.
- p only part of the deposited specimens can be assigned to the current taxon.
- vp the deposited specimens have been checked and only part of them belong to this taxon.

*And by formatting the year* surrounding or changing the font

- 1881 (italicised) this work does not add morphological information, only occurrence information.
- 1881 (upright) the work adds to our knowledge on this taxon.
- (1881) (parentheses surrounding the year) the date of this work is uncertain.

### *Life Science Identifiers (LSID)*

*Life science identifiers*<sup>2</sup> are unique keys to identify and locate information important to the various life sciences. Relevant to this document are the identifiers used to link nomenclatural acts in *ZooBank*,<sup>3</sup> the official registry of the International Commission on Zoological Nomenclature (ICZN). Naming new taxa in the recent literature requires registering the act in ZooBank to be ‘officially’ recognised.<sup>4</sup>

Many of the taxa included herein were named before ZooBank was yet a glint in anyone’s eye, although they may well have been included in the printed equivalent *Zoological Record*. I’ve registered several new publications and acts where these were not in ZooBank before, that

<sup>2</sup> <https://en.wikipedia.org/wiki/LSID>

<sup>3</sup> <http://zoobank.org>

<sup>4</sup> [https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature-the-code-online/ \(Article 8.5.3\);https://en.wikipedia.org/wiki/ZooBank](https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature-the-code-online/(Article%208.5.3);https://en.wikipedia.org/wiki/ZooBank)

may be used henceforth. At the moment, these include only the original naming of species, not new combinations of specific and generic names.

Links in this document

The L<sup>A</sup>T<sub>E</sub>X document from which this PDF is compiled includes the *hyperref* package to provide links within the document<sup>5</sup> and to other references on the web.<sup>6</sup> These have different colours, as follows:

<sup>5</sup> e.g. citations and sections  
<sup>6</sup> e.g. LSIDs and DOIs

*Citation* links from the year of a citation to its reference in the bibliography.  
*URL* often web links, particularly to websites, DOI links, LSID with the address fully written.

**LSID** link to a ZooBank LSID for an act.


List of Species

ICHTHYOSAUROMORPHA	4	Guizhouichthyosaurus wolonggangense	7	Platypterygius ochevi	9
HUPEHSUCHIA	4	Gulosaurus helmi	7	Platypterygius platydactylus	9
Eohupehsuchus brevicollis	4	Hauffiopteryx typicus	7	Platypterygius sachicarum	9
Eretmorhipis carrolldongi	4	Himalayasaurus tibetensis	7	Protoichthyosaurus applebyi	9
Hupehsuchus nanchangensis	4	Hudsonelpidia brevirostris	8	Protoichthyosaurus prostaxalis	9
Nanchangosaurus suni	4	Ichthyosaurus acutirostris	8	Qianichthyosaurus xingyiensis	9
Parahupehsuchus longus	4	Ichthyosaurus anningae	8	Qianichthyosaurus zhoui	9
ICHTHYOSAURIFORMES	4	Ichthyosaurus breviceps	8	Quasianosteosaurus vikinghoegdai	9
Acamptonectes densus	4	Ichthyosaurus communis	8	Sclerocormus parviceps	9
Aegirosaurus leptospondylus	4	Ichthyosaurus conybeari	8	Shastasaurus alexandrae	9
Acuetzpalin carranzai	4	Ichthyosaurus larkini	8	Shastasaurus liangae	9
Arthropterygius chrisorum	4	Ichthyosaurus somersetensis	8	Shastasaurus pacificus	9
Arthropterygius hoybergeti	5	Isfordosaurus minor	8	Shastasaurus sikkaniensis	9
Arthropterygius lundii	5	Leninia stellans	8	Shonisaurus popularis	9
Arthropterygius thalassonotus	5	Leptonectes moorei	8	Simbirskiasaurus birjukovi	9
Athabascasaurus bitumineus	5	Leptonectes solei	8	Sisteronia seeleyi	9
Barracudasauroides panxianensis	5	Leptonectes tenuirostris	8	Stenopterygius aaleniensis	9
Besanosaurus leptorhynchus	5	Macgowania janiceps	8	Stenopterygius quadriscissus	9
Brachypterygius alekseevi	5	Maiaspondylus lindoei	8	Stenopterygius triscissus	9
Brachypterygius extremus	6	Malawania anachronus	8	Stenopterygius uniter	9
Brachypterygius pseudoscythica	6	Mikadocephalus gracilirostris	8	Suevoleviathan disinteger	9
Californosaurus perrini	6	Mixosaurus cornalianus	8	Suevoleviathan integer	9
Callawayia neoscapularis	6	Mixosaurus kuhnschneyderi	8	Sveltonectes insolitus	9
Cartorhynchus lenticarpus	6	Mixosaurus xindianensis	8	Temnodontosaurus azerguensis	9
Caypullisaurus bonapartei	6	Mollesaurus pariallus	8	Temnodontosaurus crassimanus	9
Cetarthrosaurus walkeri	6	Muiscasaurus catheti	8	Temnodontosaurus eurycephalus	9
Chacaicosaurus cayi	6	Nannopterygius enthekiodon	8	Temnodontosaurus nuertingensis	9
Chaohusaurus brevifemoralis	7	Nannopterygius saveljeviensis	8	Temnodontosaurus platyodon	9
Chaohusaurus chaoxianensis	7	Nannopterygius yasykovi	8	Temnodontosaurus trigonus	9
Chaohusaurus geishanensis	7	Ophthalmosaurus icenicus	8	Thaisaurus chonglakmanii	9
Chaohusaurus zhangjiawanensis	7	Ophthalmosaurus natans	8	Thalassodraco etchesi	9
Contectopalatus atavus	7	Parvinator wapitiensis	8	Thalattoarchon saurophagis	10
Cymbospondylus buchseri	7	Pervushovisaurus bannovkensis	8	Tholodus schmidi	10
Cymbospondylus nicholli	7	Pervushovisaurus campylodon	8	Toretocnemus californicus	10
Cymbospondylus petrinus	7	Pessopteryx nisseri	9	Toretocnemus zitteli	10
Cymbospondylus piscosus?	7	Phalarodon callawayi	9	Undorosaurus gorodischensis	10
Dearcmhara shawcrossi	7	Phalarodon fraasi	9	Undorosaurus kielanae	10
Eurhinosaurus longirostris	7	Phalarodon major	9	Undorosaurus nessovi	10
Excalibosaurus costini	7	Phantomosaurus neubigi	9	Undorosaurus trautscholdi	10
Gengasaurus nicosiai	7	Platypterygius hercynicus	9	Utatusaurus hataii	10
Grippia longirostris	7	Platypterygius americanus	9	Wahlisaurus massarae	10
Guizhouichthyosaurus tangae	7	Platypterygius australis	9	Wimanius odontopalatus	10
		Platypterygius hauthali	9	Xinminosaurus catactes	10


ICHTHYOSAUAUROMORPHA Motani *et al.*, 2015a

HUPEHSUCHIA Carroll & Zhi-Ming, 1991


*Eohupehsuchus brevicollis* Chen *et al.*, 2014a

URN:LSID:ZOOBANK.ORG:ACT:94F905DD-8995-4477-841A-85DEDA8C8287  
v \* 2014a *Eohupehsuchus brevicollis* Chen *et al.*, 2014a  Chen *et al.* p 4 [Jialingjiang Formation (upper Spathian, Lower Triassic, Triassic); Yangping, Yuan'an County, Hubei Province, China.]  
URN:LSID:ZOOBANK.ORG:PUB:1B8887A9-F513-427D-BE9A-DBBB15DD9A44


*Eretmorhipis carrolldongi* Chen *et al.*, 2015

URN:LSID:ZOOBANK.ORG:ACT:317DA1DF-4381-43F5-90CE-ADFD680F7178  
1991 Hupehsuchia n. gen. n. sp. Carroll & Zhi-Ming p 143 [Jialingjiang Formation (upper Spathian, Lower Triassic, Triassic); Tuling, Baihechuan, Xunjiang District, Nanzhang County, Hubei Province, China.]  
v \* 2015 *Eretmorhipis carrolldongi* Chen *et al.*, 2015  Chen *et al.* p 4 [Jialingjiang Formation (upper Spathian, Lower Triassic, Triassic); Yingzhishang, Yuan'an County, Hubei Province, China.]  
URN:LSID:ZOOBANK.ORG:PUB:132627FE-9142-4EE2-BACB-08CAFC65C3E2


*Hupehsuchus nanchangensis* Young & Dong, 1972

URN:LSID:ZOOBANK.ORG:ACT:416BF673-273A-4F3D-99B3-F369DBEC6CEA  
v \* 1972 *Hupehsuchus nanchangensis* Young & Dong, 1972  Young & Dong p 28 [Jialingjiang Formation (upper Spathian, Lower Triassic, Triassic).] URN:LSID:ZOOBANK.ORG:PUB:D2CAD534-D3B0-4B2B-871F-7011E4B1EE74

*Nanchangosaurus suni* Wang, 1959


\* 1959 *Nanchangosaurus suni* Wang, 1959  Wang [JialingJiang Formation (upper Spathian, Lower Triassic, Triassic).]  
URN:LSID:ZOOBANK.ORG:PUB:C31DBAA9-EDA9-4D29-92DD-BFC80461F0F4  
2014c *Nanchangosaurus suni* Wang, 1959 Chen *et al.* p 3 [JialingJiang Formation (upper Spathian, Lower Triassic, Triassic); Yuan'an County, Hubei Province, China.]

*Parahupehsuchus longus* Chen *et al.*, 2014b

URN:LSID:ZOOBANK.ORG:ACT:0B2F1D4D-0435-496F-B1C0-6913F265240F  
v \* 2014b *Parahupehsuchus longus* Chen *et al.*, 2014b  Chen *et al.* p 3 [JialingJiang Formation (upper Spathian, Lower Triassic, Triassic); Yuan'an County, Hubei Province, China.] URN:LSID:ZOOBANK.ORG:PUB:0F2EED52-F0A2-4125-B96A-8E39E9854DBE

ICHTHYOSAURIFORMES Motani *et al.*, 2015a


*Acamptonectes densus* Fischer *et al.*, 2012

URN:LSID:ZOOBANK.ORG:ACT:AAB4BA7E-F53D-4962-8A9C-3240DFE2C4D8  
v \* 2012 *Acamptonectes densus* Fischer *et al.*, 2012  Fischer *et al.* p 3 [Speeton Clay Formation, *Simbiskites concinnus/staffi* ammonite biozones (basal-upper Hauterivian, Lower Cretaceous, Cretaceous); Speeton, Yorkshire, U.K.] URN:LSID:ZOOBANK.ORG:PUB:66B3821A-1025-48DC-9C5F-7E6277FFD975  
2012 *Acamptonectes densus* Fischer *et al.*, 2012 Fischer *et al.* p 3 [*Simbiskites concinnus/staffi* ammonite biozones (basal-upper Hauterivian, Lower Cretaceous, Cretaceous); Cremlingen, Lower Saxony, Germany.]  
URN:LSID:ZOOBANK.ORG:PUB:66B3821A-1025-48DC-9C5F-7E6277FFD975

*Aegirosaurus leptospondylus* (Wagner, 1853)

\* 1853 *Ichthyosaurus leptospondylus* Wagner, 1853 Wagner [Solnhofen Formation (Lower Tithonian, Upper Jurassic, Jurassic); Germany.]  
2000 *Aegirosaurus leptospondylus* (Wagner, 1853) Bardet & Fernández p 504 [Malm ζ 2b, Solnhofen Formation (early Lower Tithonian, Upper Jurassic, Jurassic); Borsheim, Schrandel quarry district; Bavaria, Germany.]

*Acuetzpalin carranzai* Barrientos-Lara *et al.*, 2020

URN:LSID:ZOOBANK.ORG:ACT:90130A25-6901-4DA6-84B8-D0680DF9BCAB  
\* 2020 *Acuetzpalin carranzai* Barrientos-Lara *et al.*, 2020  Barrientos-Lara *et al.* p 3 [La Casita Formation (Kimmeridgian, Upper Jurassic, Jurassic); Cerro de Palotes, near of Cuencamé, Durango state, Northeast Mexico.]  
URN:LSID:ZOOBANK.ORG:PUB:2287DEB3-3E85-409D-9D97-A946DE865FCB

*Arthropterygius chrisorum* (Russell, 1993)

* 1993	<i>Ophthalmosaurus chrisorum</i> Russell, 1993	Russell p 198 [Ringnes Formation (Oxfordian–Kimmeridgian, Upper Jurassic, Jurassic); Cape Grassy, Melville Island, Canada (UTM WGS84 12X 433220 8453461 = 76° 9' 4" N 113° 30' W).]
? 2017	<i>Keilhauia nui</i> Delsett <i>et al.</i> , 2017	Delsett <i>et al.</i> p 7 [Slottsmøya Member, Agardfjellet Formation (early Berriasian, Lower Cretaceous, Cretaceous); Janusfjellet, Spitsbergen, Svalbard (UTM WGS84 33X 0518847 8696044 = 78.3363734°N 15.8351277°E).] <i>fide</i> Zverkov & Prilepskaya (2019)
p 2018	<i>Palvennia hoybergeti</i> Druckenmiller <i>et al.</i> , 2012	Delsett <i>et al.</i> p 8 [UTM WGS84 33X 0519622 8695649 = 78.3327333°N 15.8692035°E] PMO
2019	<i>Arthropterygius chrisorum</i> (Russell, 1993)	Zverkov & Prilepskaya p 15

*Arthropterygius hoybergeti* (Druckenmiller *et al.*, 2012)

URN:LSID:ZOOBANK.ORG:ACT:03BA5E23-17B5-4AB1-B98A-681B9968A3F9

* 2012	<i>Palvennia hoybergeti</i> Druckenmiller <i>et al.</i> , 2012	Druckenmiller <i>et al.</i> p 326 [Slottsmøya Member, Agardfjellet Formation (Middle Volgian, Upper Jurassic, Jurassic); Spitsbergen, Svalbard (UTM WGS84 33X 0518775 8696150 = 78.3373322°N 15.8320045°E).] URN:LSID:ZOOBANK.ORG:PUB:8791DF9D-E15B-4470-A02A-F05ECC3BB7D6
p 2018	<i>Palvennia hoybergeti</i> Druckenmiller <i>et al.</i> , 2012	Delsett <i>et al.</i> p 8 [UTM WGS84 33X 0519622 8695649 = 78.3327333°N 15.8692035°E]
2019	<i>Arthropterygius hoybergeti</i> (Druckenmiller <i>et al.</i> , 2012)	Zverkov & Prilepskaya p 31

*Arthropterygius lundi* (Roberts *et al.*, 2014)

URN:LSID:ZOOBANK.ORG:ACT:71E65B35-7215-44AA-BCE7-E9A3B265E04F

* 2014	<i>Janusaurus lundi</i> Roberts <i>et al.</i> , 2014	Roberts <i>et al.</i> p 4 [Slottsmøya Member, Agardfjellet Formation (middle Volgian, Upper Jurassic, Jurassic); Janusfjellet, Spitsbergen, Svalbard (UTM WGS84 33X 518821 8696195 = 78° 20.264' N 15° 50.044' E).] URN:LSID:ZOOBANK.ORG:PUB:FF4834F1-AEED-4B08-8E74-7125801C1B3E <i>fide</i> Zverkov & Prilepskaya (2019)
2016	<i>Janusaurus lundi</i> Roberts <i>et al.</i> , 2014	Delsett <i>et al.</i>
2017	<i>Janusaurus lundi</i> Roberts <i>et al.</i> , 2014	Delsett <i>et al.</i>
2019	<i>Arthropterygius lundi</i> (Roberts <i>et al.</i> , 2014)	Zverkov & Prilepskaya p 40

*Arthropterygius thalassonotus* Campos *et al.*, 2019

URN:LSID:ZOOBANK.ORG:ACT:3F09C714-961C-433C-B056-DFD3F8E3B5CD

* 2019	<i>Arthropterygius thalassonotus</i> Campos <i>et al.</i> , 2019	Campos <i>et al.</i> p 184 [Vaca Muerta Formation (late Tithonian, Upper Jurassic, Jurassic); Yesera del Tromen–Pampa Tril area, north-western Neuquén Province, Argentina.] URN:LSID:ZOOBANK.ORG:PUB:A668AA96-CE4F-442E-AD3E-B757AD580CFC
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*Athabascasaurus bitumineus* Druckenmiller & Maxwell, 2010

URN:LSID:ZOOBANK.ORG:ACT:1CE8B3C1-8771-443A-8831-00025FB84CA6

v * 2010	<i>Athabascasaurus bitumineus</i> Druckenmiller & Maxwell, 2010	Druckenmiller & Maxwell p 1039 [Wabiskaw Member, Clearwater Formation (lowermost Albian, Lower Cretaceous, Cretaceous); 35 km north of Fort McMurray, Alberta, Canada (UTM WGS84 12V 459464 6317120 = 56° 59' 45" N 111° 40' 02" W).] URN:LSID:ZOOBANK.ORG:PUB:2540811F-95E5-45BB-9B32-8E0416F61681
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*Barracudasauroides panxianensis* (Jiang *et al.*, 2006)

URN:LSID:ZOOBANK.ORG:ACT:05C7C635-6E53-4070-8856-047553A6B0BF

* 2006	<i>Mixosaurus panxianensis</i> Jiang <i>et al.</i> , 2006	Jiang <i>et al.</i> p 62 [Upper Member, Guanling Formation, <i>Nicoraella germanicus</i> Conodont Biozone (Pelsonian, Anisian, Middle Triassic, Triassic); Yangjuan Village, Xinmin District, Panxian County, Guizhou Province, China.] URN:LSID:ZOOBANK.ORG:PUB:A3ED6813-7AA8-47CA-8197-04CA562417DF
2010	<i>Barracudasauroides panxianensis</i> (Maisch, 2010)	Maisch p 161

*Besanosaurus leptorhynchus* Dal Sasso & Pinna, 1996

URN:LSID:ZOOBANK.ORG:ACT:47C32E1B-18FE-40CF-B98E-E9A537601E43

* 1996	<i>Besanosaurus leptorhynchus</i> Dal Sasso & Pinna, 1996	Dal Sasso & Pinna p 4 [Besano Formation, <i>Nevadites secedensis</i> Ammonite Biozone (Ilyrian, Anisian, Middle Triassic, Triassic); Sasso Caldo quarry, Besano, Varese Province, Lombardy, Northern Italy.] URN:LSID:ZOOBANK.ORG:PUB:EEA0F11C-D7BF-41BE-856E-DC2F3599273A
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*Brachypterygius alekseevi* (Arkhangelsky, 2001)



* 2001	<i>Otschevia alekseevi</i> Arkhangelsky, 2001	Arkhangelsky p 629 [ <i>Dorsoplanites panderi</i> Ammonite Biozone (Volgian, Upper Jurassic, Jurassic); Volga River, 18 km north of Ulyanovsk, Ulyanovsk District, Ulyanovsk Region, Russian.]
2010	<i>Brachypterygius alekseevi</i> (Arkhangelsky, 2001)	Maisch p 167
2015	<i>Grendelius alekseevi</i> (Zverkov <i>et al.</i> , 2015)	Zverkov <i>et al.</i> p 562

*Brachypterygius extremus* (Boulenger, 1904)

URN:LSID:ZOOBANK.ORG:ACT:5B04A1AF-9081-417D-9BFC-DC3AFA6DAAE3

v *	1904	<i>Ichthyosaurus extremus</i> Boulenger, 1904	Boulenger p 425 [Kimmeridge Clay Formation (Kimmeridgian–Tithonian, Upper Jurassic, Jurassic); Smallmouth Sands, Weymouth, Dorset, U.K.] URN:LSID:ZOOBANK.ORG:PUB:98E5CD50-9FAF-458D-9D0A-9464EF76F429
v	1922	<i>Brachypterygius extremus</i> (Boulenger, 1904)	von Huene p 97 URN:LSID:ZOOBANK.ORG:PUB:2E316B82-8A25-43AE-A1C5-3785124EA6AE
v *	1976	<i>Grendelius mordax</i> McGowan, 1976	McGowan p 671 [Kimmeridge Clay Formation, <i>Aulacostephanus autissiodorensis</i> Ammonite Biozone (middle Kimmeridgian, Upper Jurassic, Jurassic); Stowbridge, Norfolk, U.K. (UTM WGS84 31U 321960 5835045 = 52.6361361°N 0.368878°E).]

*Brachypterygius pseudoscythica* (Efimov, 1998)

*	1998	<i>Otschevia pseudoscythica</i> Efimov, 1998	Efimov p 83 [ <i>Ilowaiskya pseudoscythica</i> Ammonite Biozone (Volgian, Upper Jurassic, Jurassic); Volga River, Ulyanovsk District, Ulyanovsk Region, Russia.]
	2000	<i>Brachypterygius psudoscythius</i> (Efimov, 1998) [sic.]	Maisch & Matzke p 79
	2015	<i>Grendelius pseudoscythicus</i> (Efimov, 1998) [sic.]	Zverkov <i>et al.</i> p 561

*Californosaurus perrini* (Merriam, 1902)

*	1902	<i>Shastasaurus perrini</i> Merriam, 1902	Merriam p 89 [Hosselkus Limestone Formation; Shasta County, California, U.S.A.]
	1905	<i>Delphinosaurus perrini</i> (Merriam, 1902)	Merriam p 24
	1934	<i>Californosaurus perrini</i> (Merriam, 1902)	Kuhn p 27 [ <i>non Delphinosaurus</i> von Eichwald, 1853]

*Callawayia neoscapularis* (McGowan, 1994)

*	1994	<i>Shastasaurus neoscapularis</i> McGowan, 1994	McGowan p 170 [Pardonet Formation, <i>Epigondolella triangularis</i> Conodont Biozone (Norian, Upper Triassic, Triassic); Peace Reach, Williston Lake, British Columbia, Canada.]
	2000	<i>Callawayia neoscapularis</i> (McGowan, 1994)	Maisch & Matzke p 69 New combination takes priority over <i>Metashastasaurus</i> (Nicholls & Manabe, 2001, p. 1001).
	2001	<i>Metashastasaurus neoscapularis</i> (McGowan, 1994)	Nicholls & Manabe p 985 [Pardonet Formation (Norian, Upper Triassic, Triassic); Chicken Creek, British Columbia, Canada.]

*Cartorhynchus lenticarpus* Motani *et al.*, 2015a

URN:LSID:ZOOBANK.ORG:ACT:FCCC9BB7-FD52-42F4-B2EC-B0B7E2A1CA32

*	2015a	<i>Cartorhynchus lenticarpus</i> Motani <i>et al.</i> , 2015a	Motani <i>et al.</i> p 485 [Upper Member, Nanlinghu Formation, <i>Subcolumbites</i> Ammonite Biozone (Olenekian, Lower Triassic, Triassic); Majishan Quarry, Chaohu City, Hefei, China (UTM WGS84 50R 577953 3499041 = 31° 37' 26" N 117° 49' 19" E).] URN:LSID:ZOOBANK.ORG:PUB:9CFFEE63-2B8A-4C01-B9C7-CD3C53D684F5
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*Caypullisaurus bonapartei* Fernández, 1997

URN:LSID:ZOOBANK.ORG:ACT:046EED7E-C624-465F-B0D4-1BB782CCD97D

*	1997	<i>Caypullisaurus bonapartei</i> Fernández, 1997	Fernández p 480 [Vaca Muerta Formation, <i>Virgatosphinctes mendozanus</i> Ammonite Biozone (late Tithonian, Upper Jurassic, Jurassic); Cerro Lotena, Neuquén Province, northwest patagonia, Argentina (UTM WGS84 19H 442358 5661434 = 39° 11' 40" N 69° 40' 03" s).] URN:LSID:ZOOBANK.ORG:PUB:1A5DDCD0-1713-410A-AE1B-F02EA1F1DF77
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*Cetarthrosaurus walkeri* (Seeley, 1873)

*	1869	<i>Ichthyosaurus walkeri</i> Seeley, 1869	Seeley p 65 [Gault Formation (late Albian, Lower Cretaceous, Cretaceous).] Re-worked into Cambridge Greensand Member (Lower Chalk Formation; early Cenomanian). Described from a cast.
	1873	<i>Cetarthrosaurus walkeri</i> (Seeley, 1869)	Seeley p 505
	2014a	<i>Cetarthrosaurus walkeri</i> (Seeley, 1869)	Fischer <i>et al.</i> p 17

*Chacaicosaurus cayi* Fernández, 1994

*	1994	<i>Chacaicosaurus cayi</i> Fernández, 1994	Fernández p 293 [Les Molles Formation (early Bajocian, Middle Jurassic, Jurassic); Chacaico Sur, Patagonia, Argentina.]
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2007

Stenopterygius cayi (Fernández, 1994)

Fernández p 277

Chaohusaurus brevifemoralis Huang et al., 2019

URN:LSID:ZOOBANK.ORG:ACT:B0085E53-C6E4-4C2E-96FF-6D485D3585BA

- p

1998a

Chaohusaurus chaoxianensis (Chen, 1985)

Motani & You
- p

1998b

Chaohusaurus geishanensis Young & Dong, 1972

Motani & You p 533
- p

2015b

Chaohusaurus chaoxianensis (Chen, 1985)

Motani et al. p e892011-3
- p

2017

Chaohusaurus chaoxianensis (Chen, 1985)

Zhou et al. p e1343831-3
- \*

2019

Chaohusaurus brevifemoralis Huang et al., 2019

Huang et al. p 7 [Upper Member, Nanlinghu Formation, Subcolumbites Ammonoid Biozone (Spathian, Olenekian, Lower Triassic, Triassic); Majiashan, Anhui Province, China.] URN:LSID:ZOOBANK.ORG:PUB:3FA09089-C940-4499-ABBC-B48F0F70F38E

Chaohusaurus chaoxianensis (Chen, 1985)

- \*

1985

Anhuisaurus chaoxianensis Chen, 1985

Chen p 140 [Upper Member, Nanlinghu Formation (Spathian, Olenekian, Lower Triassic, Triassic); Majiashan, Anhui Province, China.]
- \*

1985

Anhuisaurus faciles Chen, 1985

Chen p 142 [Upper Member, Nanlinghu Formation (Spathian, Olenekian, Lower Triassic, Triassic); Majiashan, Anhui Province, China.]
- 1991

Chensaurus chaoxianensis (Chen, 1985)

Mazin et al. p 1207
- 1991

Chensaurus faciles (Chen, 1985)

Mazin et al. p 1207
- 1998a

Chaohusaurus chaoxianensis (Chen, 1985)

Motani & You
- p

1998b

Chaohusaurus geishanensis Young & Dong, 1972

Motani & You p 533
- 2015b

Chaohusaurus chaoxianensis (Chen, 1985)

Motani et al. p e892011-3

Chaohusaurus geishanensis Young & Dong, 1972

- \*

1972

Chaohusaurus geishanensis Young & Dong, 1972

Young & Dong p 11 [Qinglong Formation (Spathian, Lower Triassic, Triassic); Chao County, Anhui Province, China.]

Chaohusaurus zhangjiawanensis Chen et al., 2013

- v \*

2013

Chaohusaurus zhangjiawanensis Chen et al., 2013

Chen et al. p 673 [Third Member, Jialingjiang Formation, Neospathodus homeri–N. triangularis Conodont Biozone (upper Spathian, Lower Triassic, Triassic); Zhangjiawan Village, Yangping Town, Yuan'an County, Hubei Province, China.]

Contectopalatus atavus (Quenstedt, 1852)

- \*

1852

Ichthyosaurus atavus Quenstedt, 1852

Quenstedt p 129 [Wellenkalk Formation (Anisian, Middle Triassic, Triassic); Althengstett, Baden-Württenbug, Germany.]
- 1891

Mixosaurus atavus atavus (Quenstedt, 1852) [as Mixosaurus atavus var. minor]

Fraas p 38 fide McGowan & Motani (2003, p. 67)
- 1916

Mixosaurus atavus (Quenstedt, 1852)

von Huene p 3
- 1998a

Contectopalatus atavus (Quenstedt, 1852)

Maisch & Matzke p 115
- 2003

Mixosaurus atavus (Quenstedt, 1852)

McGowan & Motani p 67

Cymbospondylus buchseri Sander, 1989

Cymbospondylus nichollsi Fröbisch et al., 2006

Cymbospondylus petrinus Leidy, 1868

Cymbospondylus piscosus? Leidy, 1868

Dearcmhara shawcrossi Brusatte et al., 2015

Eurhinosaurus longirostris (Mantell, 1851)

Excalibosaurus costini McGowan, 1986

Gengasaurus nicosiai Paparella et al., 2016

Grippia longirostris Wiman, 1929

Guizhouichthyosaurus tangae Yin et al., 2000

Guizhouichthyosaurus wolonggangense (Chen et al., 2007)

Gulosaurus helmi Cuthbertson et al., 2013

Hauffiopteryx typicus Maisch, 2008

Himalayasaurus tibetensis Young & Dong, 1972

- \*

1972

Himalayasaurus tibetensis Young & Dong, 1972

Young & Dong p 7 [Langjiexue Group (Norian, Middle Triassic, Triassic); Tulong Area, Xizang, Tibet, China.] URN:LSID:ZOOBANK.ORG:PUB:D2CAD534-D3B0-4B2B-871F-7011E4B1EE74



*Hudsonelpidia brevirostris* McGowan, 1995  
*Ichthyosaurus acutirostris* Owen, 1840  
*Ichthyosaurus anningae* Lomax & Massare, 2015  
*Ichthyosaurus breviceps* Owen, 1881  
*Ichthyosaurus communis* Conybeare, 1822  
*Ichthyosaurus conybeari* Lydekker, 1888  
*Ichthyosaurus larkini* Lomax & Massare, 2017  
*Ichthyosaurus somersetensis* Lomax & Massare, 2017  
*Isfordosaurus minor* (Wiman, 1910)  
*Leninia stellans* Fischer *et al.*, 2014b  
*Leptonectes moorei* McGowan & Milner, 1999  
*Leptonectes solei* (McGowan, 1993)  
*Leptonectes tenuirostris* (Conybeare, 1822)  
*Macgowania janiceps* (McGowan, 1996)  
*Maiaspondylus lindoei* Maxwell & Caldwell, 2006  
*Malawania anachronus* Fischer *et al.*, 2013  
*Mikadocephalus gracilirostris* Maisch & Matzke, 1997  
*Mixosaurus cornalianus* (Bassani, 1886)  
*Mixosaurus kuhnschneyderi* (Brinkmann, 1998)  
*Mixosaurus xindianensis* Chen & Cheng, 2010  
*Mollesaurus pariallus* Fernández, 1999  
*Muiscasaurus catheti* Maxwell *et al.*, 2016

\* 2016 *Muiscasaurus catheti* Maxwell *et al.*, 2016 Maxwell *et al.* p 61 [Arcillolitas abigarradas Member, Paja Formation (Barremian–Aptian, Lower Cretaceous, Cretaceous); Vereda Llanitos, Sachica, Boyaca, Colombia (UTM WGS84 18N 662860 616018 = 05° 34.278' N 73° 31.781' W).]

*Nannopterygius enthekiodon* (Hulke, 1871)

URN:LSID:ZOOBANK.ORG:ACT:8467F95F-AC53-4EA7-9612-230E9222A6FC  
v \* 1871 *Ichthyosaurus enthekiodon* Hulke, 1871 Hulke p 441 [Kimmeridge Clay Formation (Kimmeridgian–Tithonian, Upper Jurassic, Jurassic); Kimmeridge Bay, Dorset, U.K.] URN:LSID:ZOOBANK.ORG:PUB:4F0E90D0-27FF-409A-9CD5-976F182B8B4C  
1922 *Nannopterygius enthekiodon* (Hulke, 1871) von Huene p 98 URN:LSID:ZOOBANK.ORG:PUB:2E316B82-8A25-43AE-A1C5-3785124EA6AE

*Nannopterygius saveljeviensis* (Arkhangelsky, 1997)

\* 1997 *Paraophthalmosaurus savejeviensis* Arkhangelsky p 88  
1999a *Yasykovia kabanovi* Efimov, 1999a Efimov p 98  
2020 *Nannopterygius savejeviensis* (Arkhangelsky, 1997) Zverkov & Jacobs p 246 [Volgian, Upper Jurassic, Jurassic.]

*Nannopterygius yasykovi* (Efimov, 1999a)

\* 1999a *Yasykovia sumini* Efimov, 1999a Efimov p 98

*Ophthalmosaurus icenicus* Seeley, 1874

URN:LSID:ZOOBANK.ORG:ACT:F598EAB9-08BF-44CF-BBF3-BB940BD24DBE  
v \* 1874 *Ophthalmosaurus icenicus* Seeley, 1874 Seeley p 707 [Peterborough Member, Oxford Clay Formation (Callovian, Middle Jurassic, Jurassic); Peterborough, Cambridgeshire.] URN:LSID:ZOOBANK.ORG:PUB:4C83C9B2-665D-4AD7-8AF8-D365E5491831

*Ophthalmosaurus natans* (Marsh, 1879)

*Parvinatator wapitiensis* Nicholls & Brinkman, 1995  
*Pervushovisaurus bannovkensis* Arkhangelsky, 1998  
*Pervushovisaurus campylodon* (Carter, 1846)

\* 1846 *Ichthyosaurus campylodon* Carter, 1846 Carter p 60 [Upper Greensand Formation (Albian–Cenomanian, Lower–Upper Cretaceous, Cretaceous); Cambridge, Cambridgeshire, U.K.]  
1922 *Myopterygius campylodon* (Carter, 1846) von Huene p 98 URN:LSID:ZOOBANK.ORG:PUB:2E316B82-8A25-43AE-A1C5-3785124EA6AE

1972 *Platypterygius campylodon* (Carter, 1846) McGowan p 17  
 2016 *Pervushovisaurus campylodon* (Carter, 1846) Fischer p 8

*Pessopteryx nisseri* Wiman, 1910  
*Phalarodon callawayi* Schmitz *et al.*, 2004  
*Phalarodon fraasi* Merriam, 1910  
*Phalarodon major* von Huene, 1916  
*Phantomosaurus neubigi* (Sander, 1997)  
*Platypterygius hercynicus* Kuhn, 1946  
*Platypterygius americanus* Nace, 1939

\* 1939 *Myopterygius americanus* Nace, 1939 Nace p 674 [Mowry Shale Member, Graneros Formation; Crook County Wyoming, U.S.A.]  
 1968 *Myopterygius americanus* Nace, 1939 Romer p 27 [Mowry Shale Member, Graneros Formation; Osage, Wyoming, U.S.A.]  
 1972 *Platypterygius americanus* (Nace, 1939) McGowan p 17

*Platypterygius australis* (M'Coy, 1867)  
*Platypterygius hauthali* (von Huene, 1927)  
*Platypterygius ochevi* Arkhangelsky *et al.*, 2008  
*Platypterygius platydactylus* (Broili, 1907)

1922 *Platypterygius platydactylus* (Broili, 1907) von Huene p 99 [URN:LSID:ZOOBANK.ORG:PUB:2E316B82-8A25-43AE-A1C5-3785124EA6AE](https://zoobank.org/PUB:2E316B82-8A25-43AE-A1C5-3785124EA6AE)

*Platypterygius sachicarum* Páramo, 1997  
*Protoichthyosaurus applebyi* Lomax *et al.*, 2017  
*Protoichthyosaurus prostaalis* Appleby, 1979  
*Qianichthyosaurus xingyiensis* Yang *et al.*, 2013  
*Qianichthyosaurus zhoui* Li, 1999  
*Quasianosteosaurus vikinghoegdai* Maisch & Matzke, 2003  
*Sclerocormus parviceps* Jiang *et al.*, 2016  
*Shastasaurus alexandrae* Merriam, 1902  
*Shastasaurus liangae* (Yin *et al.*, 2000)  
*Shastasaurus pacificus* Merriam, 1895  
*Shastasaurus sikkaniensis* (Nicholls & Manabe, 2004)  
*Shonisaurus popularis* Camp, 1976  
*Simbirskiasaurus birjukovi* Otschev & Efimov, 1985  
*Sisteronia seeleyi* Fischer *et al.*, 2014a  
*Stenopterygius aalenensis* Maxwell *et al.*, 2012  
*Stenopterygius quadriscissus* (Quenstedt, 1858)  
*Stenopterygius triscissus* (Quenstedt, 1858)  
*Stenopterygius uniter* von Huene, 1931b  
*Suevoleviathan disinteger* (von Huene, 1926)  
*Suevoleviathan integer* (Bronn, 1844)  
*Sveltonectes insolitus* Fischer *et al.*, 2011  
*Temnodontosaurus azerguensis* Martin *et al.*, 2012  
*Temnodontosaurus crassimanus* (Blake, 1876)  
*Temnodontosaurus eurycephalus* McGowan, 1974  
*Temnodontosaurus nuertingensis* (von Huene, 1931a)  
*Temnodontosaurus platyodon* (Conybeare, 1822)  
*Temnodontosaurus trigonus* (von Theodori, 1843)  
*Thaisaurus chonglakmanii* Mazin *et al.*, 1991  
*Thalassodraco etchesi* Jacobs & Martill, 2020

[URN:LSID:ZOOBANK.ORG:ACT:35626449-D5AC-4970-B76E-27A827126D23](https://zoobank.org/ACT:35626449-D5AC-4970-B76E-27A827126D23)

v \* 2020 *Thalassodraco etchesi* Jacobs & Martill, 2020 Jacobs & Martill p 7 [White Stone Band, Kimmeridge Clay Formation, *Pectinatites pectinatus* Ammonite Biozone (early Tithonian, Upper Jurassic, Jurassic); Rope Lake Bay, Kimmeridge, Dorset U.K.] URN:LSID:ZOOBANK.ORG:PUB:C1D99FF1-D4FC-4526-8E28-1B8FA64E21C0 UK GR SY932775

*Thalattoarchon saurophagis* Fröbisch *et al.*, 2013

*Tholodus schmidi* von Meyer, 1849

*Toretocnemus californicus* Merriam, 1903

*Toretocnemus zitteli* (Merriam, 1903)

*Undorosaurus gorodischensis* Efimov, 1999b

\* 1999b *Undorosaurus gorodischensis* Efimov, 1999b Efimov p 52 [*Epirigatites nikitini* Ammonite Biozone (Volgian, Upper Jurassic, Jurassic); Undory, Volga Oblast, Russia.]  
2012 *Cryopterygius kristiansenae* Druckenmiller *et al.*, 2012 Druckenmiller *et al.* p 313 [Slottsmøya Member, Agardfjellet Formation (middle Volgian, Upper Jurassic, Jurassic); Janusfjellet, Spitsbergen, Svalbard (UTM WGS84 33X 0518842 8696067 = 78.3365801°N 15.8349207°E).] URN:LSID:ZOOBANK.ORG:PUB:8791DF9D-E15B-4470-A02A-F05ECC3BB7D6, *fide* Zverkov & Efimov (2019)  
2019 *Undorosaurus gorodischensis* Efimov, 1999b Zverkov & Efimov p 1189

*Undorosaurus kielanae* (Tyborowski, 2016)

\* 2016 *Cryopterygius kielanae* Tyborowski, 2016 Tyborowski p 793 [Sławno Limestone Member, Kcynia Formation (uppermost Lower Tithonian = Middle Volgian, Upper Jurassic, Jurassic); Owadów-Brzezinki Quarry, Sławno (UTM WGS84 34U 439831 5692022 = 51.3762583 N 20.1355167 E).]  
? 2019 *Undorosaurus kielanae* (Tyborowski, 2016) Zverkov & Efimov p 1187

*Undorosaurus nessovi* Efimov, 1999b

*Undorosaurus trautscholdi* Arkhangelsky & Zverkov, 2014

*Utatusaurus hataii* Shikama *et al.*, 1978

*Wahlisaurus massarae* Lomax, 2016

\* 2016 *Wahlisaurus massarae* Lomax, 2016 Lomax p 388 [Barnstone Member?, Scunthorpe Mudstone Formation?, Pre-*planorbis* or *Psiloceras planorbis* beds (lowermost Hettangian, Lower Jurassic, Jurassic); Normanton Hills near Normanton on Soar, Nottinghamshire, U.K.]

*Wimanius odontopalatus* Maisch & Matzke, 1998b

*Xinminosaurus catactes* Jiang *et al.*, 2008

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