Ichthyosauromorph taxonomy

Benjamin Moon

Version 0.5.296.20210226

ICHTHYOSAUROMORPHA Motani et al., 2015

HUPEHSUCHIA Carroll & Dong, 1991

Eohupehsuchus brevicollis Chen et al, 2014b

* 2014b Eohupehsuchus brevicollis Chen et al.; p 4 [Jialingjiang Formation (Upper Spathian, Lower Triassic); Yangping, Yuan'an County, Hubei Province, China].

Eretmorhipis carrolldongi Chen et al., 2015

- 1991 Hupehsuchia n. g., n. s.; p 143 [Jialingjiang Formation (Upper Spathian, Lower Triassic); Tuling, Baihechuan, Xunjian District, Nanzhang County, Hubei Province, Chinal
- * 2015 Eretmorhipis carrolldongi Chen et al.; p 4 [Jialingjiang Formation (Upper Spathian, Lower Triassic); Yingzhishang, Yuan'an County, Hubei Province, China].

Hupehsuchus nanchangensis Young & Dong, 1972

Nanchangosaurus suni Wang, 1959

Parahupehsuchus longus Chen et al., 2014a

ICHTHYOSAURIFORMES Motani et al., 2015

Acamptonectes densus Fischer et al., 2012

v* 2012 Acamptonectes densus Fischer et al.; Fischer et al. p 3 [Speeton Clay Formation, Simbiskites concinnus/staffi ammonite biozones (basal–upper Hauterivian, Lower Cretaceous, Cretaceous); Speeton, Yorkshire, U.K. and Cremlingen, Lower Saxony, Germany.]

Aegirosaurus leptospondylus (Wagner, 1853)

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

Arthropterygius chrisorum (Russell, 1993)

* 1993 Ophthalmosaurus chrisorum Russell; Russell p 198 [Ringnes Formation (Oxfordian–Kimmeridgian, Upper Jurassic, Jurassic); Cape Grassy, Melville Island, Canada.]

Arthropterygius hoybergeti (Druckenmiller et al., 2012)

- * 2012 Palvennia hoybergeti Druckenmiller et al.; Druckenmiller et al. p 326 [Slottsmøya Member, Agardfjellet Formation (Middle Volgian, Upper Jurassic, Jurassic); Spitsbergen, Svalbard.]
 - 2018 Palvennia hoybergeti Druckenmiller et al.; Delsett et al. p 8
 - 019 Arthropterygius hoybergeti (Druckenmiller et al.); Zverkov et al. p 31

Athabascasaurus bitumineus Druckenmiller and Maxwell, 2010

Barracudasauroides panxianensis (Jiang et al., 2006)

Besanosaurus leptorhynchus Dal Sasso and Pinna, 1996

Brachypterygius alekseevi (Arkhangelsky, 2001)

Brachypterygius extremus (Boulenger, 1904)

Brachypterygius pseudoscythica (Efimov, 1998)

Californosaurus perrini (Merriam, 1902)

Callawayia neoscapularis (McGowan, 1994)

Cartorhynchus lenticarpus Motani et al., 2015

Caypullisaurus bonapartei Fernández, 1997

Cetarthrosaurus walkeri Seeley, 1873

Chacaicosaurus cayi Fernández, 1994

Chaohusaurus chaoxianensis (Chen, 1985)

Chaohusaurus geishanensis Young and Dong, 1972

Chaohusaurus zhangjiawanensis Chen et al., 2013

Contectopalatus atavus (Quenstedt, 1852)

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 and Dong, 1972

Hudsonelpidia brevirostris McGowan, 1995

Ichthyosaurus acutirostris Owen, 1840

Ichthyosaurus anningae Lomax and Massare, 2015

Ichthyosaurus breviceps Owen, 1881

Ichthyosaurus communis Conybeare, 1822

Ichthyosaurus conybeari Lydekker, 1888

Ichthyosaurus larkini Lomax and Massare, 2017

Ichthyosaurus somersetensis Lomax and Massare, 2017

Isfjordosaurus minor (Wiman, 1910)

Keilhauia nui? Delsett et al., 2017

Leninia stellans Fischer et al., 2014a

Leptonectes moorei McGowan and Milner, 1999

Leptonectes solei (McGowan, 1993)

Leptonectes tenuirostris (Conybeare, 1822)

Macgowania janiceps (McGowan, 1996)

Maiaspondylus lindoei Maxwell and Caldwell, 2006

Malawania anachronus Fischer et al., 2013

Mikadocephalus gracilirostris Maisch and Matzke, 1997

Mixosaurus cornalianus (Bassani, 1886)

Mixosaurus kuhnschneyderi (Brinkmann, 1998)

Mixosaurus xindianensis Chen and Cheng, 2010

Mollesaurus pariallus Fernández, 1999

Muiscasaurus catheti Maxwell et al., 2016

Nannopterygius enthekiodon (Hulke, 1871)

Nannopterygius saveljeviensis (Arkhangelsky, 1997)

* 1997 *Paraophthalmosaurus savejeviensis* Arkhangelsky; Arkhangelsky p 88

* 1999b *Yasykovia kabanovi* Efimov; Efimov p 98

2020 Nannopterygius savejeviensis (Arkhangelsky); Zverkov et al. p 246 [Volgian, Upper Jurassic, Jurassic.]

Nannopterygius yasykovi (Efimov, 1999b)

* 1999b Yasykovia sumini Efimov; Efimov p 98

Ophthalmosaurus icenicus Seeley, 1874

v* 1874 Ophthalmosaurus icenicus Seeley; Seeley p 707 [Peterborough Member, Oxford Clay Formation (Callovian, Middle Jurassic, Jurassic); Peterborough, Cambridgeshire.]

Ophthalmosaurus natans (Marsh, 1879)

Parvinatator wapitiensis Nicholls and Brinkman, 1995

Pervushovisaurus bannovkensis Arkhangelsky, 1998

Pervushovisaurus campylodon (Carter, 1846)

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

Platypterygius australis (M'Coy, 1867)

Platypterygius hauthali (von Huene, 1927)

Platypterygius ochevi Arkhangelsky et al., 2008

Platypterygius platydactylus (Broili, 1907)

Platypterygius sachicarum Páramo, 1997

Protoichthyosaurus applebyi Lomax et al., 2017

Protoichthyosaurus prosaxalis Appleby, 1979

Qianichthyosaurus xingyiensis Yang et al., 2013

Qianichthyosaurus zhoui Li, 1999

Quasianosteosaurus vikinghoegdai Maisch and 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 and Manabe, 2004)

Shonisaurus popularis Camp, 1976

Simbirskiasaurus birjukovi Otschev and Efimov, 1985

Sisteronia seeleyi Fischer et al., 2014b

Stenopterygius aaleniensis Maxwell et al., 2012

Stenopterygius quadriscissus (Quenstedt, 1858)

Stenopterygius triscissus (Quenstedt, 1858)

Stenopterygius uniter von Huene, 1931a

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, 1931b)

Temnodontosaurus platyodon (Conybeare, 1822)

Temnodontosaurus trigonus (von Theodori, 1843)

Thaisaurus chonglakmanii Mazin et al., 1991

Thalattoarchon saurophagis Fröbisch et al., 2013

Tholodus schmidi von Meyer, 1849

Toretocnemus californicus Merriam, 1903

Toretocnemus zitteli (Merriam, 1903)

Undorosaurus gorodischensis Efimov, 1999a

Undorosaurus kielanae (Tyborowski, 2016)

- * 2016 *Cryopterygius kielanae* Tyborowski; Tyborowski p 793 [Sławno Limestone Member, Kcynia Formation (uppermost Lower Tithonian = Middle Volgian, Upper Jurassic, Jurassic); Owadów-Brzezinki Quarry, Sławno.] A test comment.
- ? 2019 Undorosaurus kielanae (Tyborowski); Zverkov et al. p 1187

Undorosaurus nessovi Efimov, 1999a

Undorosaurus trautscholdi Arkhangelsky and Zverkov, 2014

Utatsusaurus hataii Shikama et al., 1978

Wahlisaurus massarae Lomax, 2016

Wimanius odontopalatus Maisch and Matzke, 1998

Xinminosaurus catactes Jiang et al., 2008

References

- Appleby, R. M. (1979). 'The Affinities of Liassic and Later Ichthyosaurs'. In: *Palaeontology* 22.4, pp. 921–946.
- Arkhangelsky, M. S. (1997). 'On a new genus of ichthyosaurs from the Lower Volgian Substage of the Saratov, Volga Region'. In: *Pale-ontologicheskii Zhurnal* 1997.1, pp. 87–91.
- Arkhangelsky, M. S. (2001). 'On a New Ichthyosaur of the Genus *Otschevia* from the Volgian Stage of the Volga Region near Ulyanovsk'. In: *Paleontological Journal* 35.6, pp. 629–635.
- Arkhangelsky, M. S., A. O. Averianov, E. M. Pervushov, V. Y. Ratnikov and N. Y. Zozyrev (2008). 'On Ichthyosaur Remains from the Cretaceous of the Voronezh Region'. In: *Paleontological Journal* 42.3, pp. 287–291. DOI: 10.1134/S0031030108030106.
- Arkhangelsky, M. S. and N. G. Zverkov (2014). 'On a New Ichthyosaur of the Genus *Undorosaurus*'. In: *Proceedings of the Zoological Institute RAS* 318.3, pp. 187–196.
- Arkhangelsky, M. S. (1998). 'On the Ichthyosaurian Genus *Platy-pterygius*'. In: *Paleontological Journal* 32.6, pp. 611–615.
- Bardet, N. and M. S. Fernández (2000). 'A New Ichthyosaur from the Upper Jurassic Lithographic Limestones of Bavaria'. In: *Journal of Paleontology* 74.3, pp. 503–511. DOI: 10.1017/S0022336000031760.
- Bassani, F. (1886). 'Sui Fossili e Sull'età Degli Schisti Bituminosi Triasici Di Besano in Lombardia'. In: *Atti della Società Italiana di Scienza Naturali* 29, pp. 1–58.

- Blake, J. F. (1876). 'Order Ichthyopterygia'. In: London: John van Voorst, pp. 253–254.
- Boulenger, G. A. (1904). 'Exhibition of, and Remarks upon, a Paddle of a New Species of Ichthyosaur'. In: *Proceedings of the Zoological Society of London* 1904.1, pp. 424–426.
- Brinkmann, W. (1998). 'Sangiorgiosaurus n. g. eine neue Mixosauriergattung (Mixosauridae, Ichthyosauria) mit Quetschzähnen aus der Grenzbitumenzone (Mitteltrias) des Monte San Giorgio (Schweiz, Kanton Tessin)'. In: Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen 207.1, pp. 125–144. DOI: 10.1127/njgpa/207/1998/125.
- Broili, F. (1907). 'Ein neuer *Ichthyosaurus* aus der norddeutschen Kreide'. In: *Palaeontographica* 54, pp. 139–162.
- Bronn, H. G. (1844). 'Über Ichthyosauren in den Lias-Schiefern der Gegend von Boll in Württemberg'. In: *Neues Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefakten-Kunde* 1844, pp. 385–408.
- Brusatte, S. L., M. T. Young, T. J. Challands, N. D. L. Clark, V. Fischer, N. C. Fraser, J. J. Liston, C. C. J. MacFadyen, D. A. Ross, S. A. Walsh and M. Wilkinson (2015). 'Ichthyosaurs from the Jurassic of Skye, Scotland'. In: *Scottish Journal of Geology* 51.1, pp. 1–13. DOI: 10.1144/sjg2014-018.
- Camp, C. L. (1976). 'Vorläufige Mitteilung über große Ichthyosaurier aus der oberen Trias von Nevada'. In: *Sitzungberichte der Österrichischen Akademie der Wissenschaften* 185.5–7, pp. 125–134.
- Carroll, R. L. and D. Zhi-Ming (1991). '*Hupehsuchus*, an Enigmatic Aquatic Reptile from the Triassic of China, and the Problem of Establishing Relationships'. In: *Philosophical Transactions of the Royal Society B: Biological Sciences* 331.1260, pp. 131–153. DOI: 10.1098/rstb.1991.0004.
- Carter, A. M. (1846). 'Notice of the Jaws of an *Ichthyosaurus* from the Chalk in the Neighbourhood of Cambridge'. In: *Report of the British Association for the Advancement of Science* 15, p. 60.
- Chen, L. (1985). 'Ichthyosaurs from the Lower Triassic of Chao County, Anhui'. In: *Regional Geology of China* 15, pp. 139–146.
- Chen, X.-h., R. Motani, L. Cheng, D. Jiang and O. C. Rieppel (2014a). 'A Carapace-like Bony Body Tube in an Early Triassic Marine Reptile and the Onset of Marine Tetrapod Predation'. In: *PLoS ONE* 9.4, e94396. DOI: 10.1371/journal.pone.0094396.
- Chen, X.-h., R. Motani, L. Cheng, D. Jiang and O. C. Rieppel (2014b). 'A Small Short-Necked Hupehsuchian from the Lower Triassic of Hubei Province, China'. In: *PLoS ONE* 9.12, e115244. DOI: 10. 1371/journal.pone.0115244.
- Chen, X.-h., R. Motani, L. Cheng, D. Jiang and O. C. Rieppel (2015). 'A New Specimen of Carroll's Mystery Hupehsuchian from the Lower Triassic of China'. In: *PLoS ONE* 10.5, e0126024. DOI: 10.1371/journal.pone.0126024.
- Chen, X. and L. Cheng (2010). 'A new species of *Mixosaurus* (Reptilia: Ichthyosauria) from the Middle Triassic of Pu'an, Guizhou, China'. In: *Acta Palaeontologica Sinica* 49.2, pp. 251–260.

- Chen, X., L. Cheng and P. M. Sander (2007). 'A new species of *Callawayia* (Reptilia: Ichthyosauria) from the Late Triassic in Guanling, Guizhou'. In: *Geology in China* 34, pp. 974–982.
- Chen, X., P. M. Sander, L. Cheng and X. Wang (2013). 'A New Triassic Primitive Ichthyosaur from Yuanan, South China'. In: *Acta Geologica Sinica* 87.3, pp. 672–677. DOI: 10.1111/1755-6724.12078.
- Conybeare, W. D. (1822). 'Additional Notices on the Fossil Genera *Ichthyosaurus* and *Plesiosaurus*'. In: *Transactions of the Geological Society of London* 1.1, pp. 103–123. DOI: 10.1144/transgslb. 1.1.103.
- Cuthbertson, R. S., A. P. Russell and J. S. Anderson (2013). 'Cranial Morphology and Relationships of a New Grippidian (Ichthyopterygia) from the Vega–Phroso Siltstone Member (Lower Triassic) of British Columbia, Canada'. In: *Journal of Vertebrate Paleontology* 33.4, pp. 831–847. DOI: 10.1080/02724634.2013.755989.
- Dal Sasso, C. and G. Pinna (1996). '*Besanosaurus leptorhynchus* n. gen. n. sp. a New Shastasaurid Ichthyosaur from the Middle Triassic of Besano (Lombardy, N. Italy)'. In: *Paleontologia Lombarda* 4.1, pp. 3–23.
- Delsett, L. L., P. S. Druckenmiller, A. J. Roberts and J. H. Hurum (2018). 'A New Specimen of *Palvennia hoybergeti*:: Implications for Cranial and Pectoral Girdle Anatomy in Ophthalmosaurid Ichthyosaurs'. In: *PeerJ* 6, e5776. DOI: 10.7717/peerj.5776.
- Delsett, L. L., A. J. Roberts, P. S. Druckenmiller and J. H. Hurum (2017). 'A New Ophthalmosaurid (Ichthyosauria) from Svalbard, Norway, and Evolution of the Ichthyopterygian Pelvic Girdle'. In: *PLoS ONE* 12.1, e0169971–39. DOI: 10.1371/journal.pone.0169971.
- Druckenmiller, P. S. and E. E. Maxwell (2010). 'A New Lower Cretaceous (Lower Albian) Ichthyosaur Genus from the Clearwater Formation, Alberta, Canada'. In: *Canadian Journal of Earth Sciences* 47.8, pp. 1037–1053. DOI: 10.1139/E10-028.
- Druckenmiller, P. S., J. H. Hurum, E. M. Knutsen and H. A. Nakrem (2012). 'Two New Ophthalmosaurids (Reptilia: Ichthyosauria) from the Agardhfjellet Formation (Upper Jurassic: Volgian/Tithonian), Svalbard, Norway'. In: *Norwegian Journal of Geology* 92, pp. 311–339.
- Efimov, V. M. (1998). 'The ichthyosaur *Otschevia pseudoscythica* gen. et sp. nov. from the Upper Jurassic of Ulyanovsk Volga'. In: *Paleontologicheskii Zhurnal* 1998, pp. 82–86.
- Efimov, V. M. (1999a). 'A new family of ichthyosaurs, the Undorosauridae fam. nov. from the Volgian Stage of the European part of Russia'. In: *Paleontologicheskii Zhurnal* 1999, pp. 174–181.
- Efimov, V. M. (1999b). 'Ichthyosaurs of a new genus *Yasykovia* from the Upper Jurassic strata of European Russia'. In: *Paleontologicheskii Zhurnal* 1999, pp. 91–98.
- Fernández, M. S. (1994). 'A New Long-Snouted Ichthyosaur from the Early Bajocian of Neuquén Basin (Argentina)'. In: *Ameghiniana* 31.3, pp. 291–297.
- Fernández, M. S. (1997). 'A New Ichthyosaur from the Tithonian (Late Jurassic) of the Neuquén Basin, Northwestern Patagonia,

- Argentina'. In: *Journal of Paleontology* 71.3, pp. 479–484. DOI: 10. 1017/S0022336000039494.
- Fernández, M. S. (1999). 'A New Ichthyosaur from the Los Molles Formation (Early Bajocian), Neuquen Basin, Argentina'. In: *Journal of Paleontology* 73.4, pp. 677–681. DOI: 10.1017/S0022336000032492.
- Fischer, V., R. M. Appleby, D. Naish, J. J. Liston, J. B. Riding, S. Brindley and P. Godefroit (2013). 'A Basal Thunnosaurian from Iraq Reveals Disparate Phylogenetic Origins for Cretaceous Ichthyosaurs'. In: *Biology Letters* 9.4, pp. 20130021–20130021. DOI: 10.1098/rsbl.2013.0021.
- Fischer, V., M. S. Arkhangelsky, G. N. Uspensky, I. M. Stenshin and P. Godefroit (2014a). 'A New Lower Cretaceous Ichthyosaur from Russia Reveals Skull Shape Conservatism within Ophthalmosaurinae'. In: *Geological Magazine* 151.01, pp. 60–70. DOI: 10 . 1017/S0016756812000994.
- Fischer, V., N. Bardet, M. Guiomar and P. Godefroit (2014b). 'High Diversity in Cretaceous Ichthyosaurs from Europe Prior to Their Extinction'. In: *PLoS ONE* 9.1, e84709. DOI: 10 . 1371 / journal . pone . 0084709.
- Fischer, V., M. W. Maisch, D. Naish, R. Kosma, J. J. Liston, U. Joger, F. J. Krüger, J. P. Pérez, J. Tainsh and R. M. Appleby (2012). 'New Ophthalmosaurid Ichthyosaurs from the European Lower Cretaceous Demonstrate Extensive Ichthyosaur Survival across the Jurassic–Cretaceous Boundary'. In: *PLoS ONE* 7.1, e29234–2. DOI: 10.1371/journal.pone.0029234.
- Fischer, V., E. Masure, M. S. Arkhangelsky and P. Godefroit (2011). 'A New Barremian (Early Cretaceous) Ichthyosaur from Western Russia'. In: *Journal of Vertebrate Paleontology* 31.5, pp. 1010–1025. DOI: 10.1080/02724634.2011.595464.
- Fröbisch, N. B., P. M. Sander and O. C. Rieppel (2006). 'A New Species of *Cymbospondylus* (Diapsida, Ichthyosauria) from the Middle Triassic of Nevada and a Re-Evaluation of the Skull Osteology of the Genus'. In: *Zoological Journal of the Linnean Society* 147.4, pp. 515–538. DOI: 10.1111/j.1096-3642.2006.00225.x.
- Fröbisch, N. B., J. Fröbisch, P. M. Sander, L. Schmitz and O. C. Rieppel (2013). 'Macropredatory Ichthyosaur from the Middle Triassic and the Origin of Modern Trophic Networks'. In: *Proceedings of the National Academy of Sciences* 110.4, pp. 1393–1397. DOI: 10. 1073/pnas.1216750110.
- Hulke, J. W. (1871). 'Note on an *Ichthyosaurus* (*I. Enthekiodon*) from Kimmeridge Bay, Dorset'. In: *Quarterly Journal of the Geological Society* 27.1-2, pp. 440–441. DOI: 10.1144/GSL.JGS.1871.027.01-02.52.
- Jiang, D., R. Motani, W. Hao, L. Schmitz, O. C. Rieppel, Y.-L. Sun and Z.-Y. Sun (2008). 'New Primitive Ichthyosaurian (Reptilia, Diapsida) from the Middle Triassic of Panxian, Guizhou, Southwestern China and Its Position in the Triassic Biotic Recovery'. In: *Progress in Natural Science* 18.10, pp. 1315–1319. DOI: 10.1016/j.pnsc.2008.01.039.
- Jiang, D., R. Motani, J.-D. Huang, A. Tintori, Y.-C. Hu, O. C. Rieppel, N. C. Fraser, C. Ji, N. P. Kelley, W. Fu and R. Zhang (2016). 'A Large

- Aberrant Stem Ichthyosauriform Indicating Early Rise and Demise of Ichthyosauromorphs in the Wake of the End-Permian Extinction'. In: *Scientific Reports* 6, pp. 26232–9. DOI: 10 . 1038 / srep26232.
- Jiang, D., L. Schmitz, W. Hao and Y.-L. Sun (2006). 'A New Mixosaurid Ichthyosaur from the Middle Triassic of China'. In: *Journal of Vertebrate Paleontology* 26.1, pp. 60–69. DOI: 10 . 1671/0272-4634(2006)26[60:ANMIFT]2.0.CO; 2.
- Kuhn, O. (1946). 'Ein Skelett von *Ichthyosaurus (Platypterygius)* hercynicus n. Sp. Aus Dem Aptium von Gitter'. In: *Bericht der Naturforschenden Gesellschaft in Bamberg* 29, pp. 69–82.
- Leidy, J. (1868). 'Notice of Some Reptilian Remains from Nevada'. In: *Proceedings of the Academy of Natural Sciences of Philadelphia* 20, pp. 177–178.
- Li, C. (1999). 'Ichthyosaur from Guizhou, China'. In: *Chinese Science Bulletin* 44.14, pp. 1329–1333. DOI: 10.1007/BF02885856.
- Lomax, D. R. (2016). 'A New Leptonectid Ichthyosaur from the Lower Jurassic (Hettangian) of Nottinghamshire, England, UK, and the Taxonomic Usefulness of the Ichthyosaurian Coracoid'. In: *Journal of Systematic Palaeontology* 15.5, pp. 1–15. DOI: 10.1080/14772019.2016.1183149.
- Lomax, D. R. and J. A. Massare (2015). 'A New Species of *Ichthyosaurus* from the Lower Jurassic of West Dorset, England, U.K.' In: *Journal of Vertebrate Paleontology* 35.2, e903260. DOI: 10 . 1080/02724634.2014.903260.
- Lomax, D. R. and J. A. Massare (2017). 'Two New Species of *Ichthy-osaurus* from the Lowermost Jurassic (Hettangian) of Somerset, England'. In: *Papers in Palaeontology* 3.1, pp. 1–20. DOI: 10.1002/spp2.1065.
- Lomax, D. R., J. A. Massare and R. T. Mistry (2017). 'The Taxonomic Utility of Forefin Morphology in Lower Jurassic Ichthyosaurs: *Protoichthyosaurus* and *Ichthyosaurus*'. In: *Journal of Vertebrate Paleontology* 37.5, e1361433. DOI: 10.1080/02724634.2017. 1361433.
- Lydekker, R. (1888). 'Ichthyosaurus acutirostris, Zetlandicus & longifrons'. In: Geological Magazine 6.1, p. 44. DOI: 10.1017/S0016756800175818.
- M'Coy, F. (1867). 'On the Occurrence of *Ichthyosaurus* and *Plesiosaurus* in Australia'. In: *Annals and Magazine of Natural History* 19, pp. 1–3.
- Maisch, M. W. and A. T. Matzke (1997). '*Mikadocephalus gracilirostris* n. gen., n. sp. a New Ichthyosaur from the Grenzbitumenzone (Anisian–Ladinian) of Monte San Giorgio (Switzerland)'. In: *Paläontologische Zeitschrift* 71.3/4, pp. 267–289. DOI: 10.1007/BF02988496.
- Maisch, M. W. and A. T. Matzke (1998). 'Observations on Triassic Ichthyosaurs. Part II: A New Ichthyosaur with Palatal Teeth from Monte San Giorgio'. In: *Neues Jahrbuch für Geologie und Paläontologie, Monatshefte* 1998.1, pp. 26–41. DOI: 10.1127/njgpm/1998/1998/26
- Maisch, M. W. and A. T. Matzke (2003). 'Observations on Triassic Ichthyosaurs. Part XII. A New Early Triassic Ichthyosaur Genus from Spitzbergen'. In: *Neues Jahrbuch für Geologie und Paläon-*

- *tologie, Abhandlungen* 229.3, pp. 317–338. DOI: 10.1127/njgpa/229/2003/317.
- Maisch, M. W. (2008). 'Revision der Gattung *Stenopterygius* Jaekel, 1904 emend. von Huene, 1922 (Reptilia: Ichthyosauria) aus dem unteren Jura Westeuropas'. In: *Palaeodiversity* 1, pp. 227–271.
- Mantell, G. A. (1851). *Petrifactions and Their Teachings; Or, a Hand-Book to the Gallery of Organic Remains of the British Museum.*London: Henry G. Bohn.
- Marsh, O. C. (1879). 'A New Order of Extinct Reptiles (Sauranodonta) from the Jurassic Formation of the Rocky Mountains'. In: *Annals and Magazine of Natural History* 3, pp. 175–176. DOI: 10 . 1080/00222937908682501.
- Martin, J. E., V. Fischer, P. Vincent and G. Suan (2012). 'A Longirostrine *Temnodontosaurus* (Ichthyosauria) with Comments on Early Jurassic Ichthyosaur Niche Partitioning and Disparity'. In: *Palaeontology* 55.5, pp. 995–1005. DOI: 10 . 1111/j . 1475-4983 . 2012 . 01159 . x.
- Maxwell, E. E. and M. W. Caldwell (2006). 'A New Genus of Ichthyosaur from the Lower Cretaceous of Western Canada'. In: *Palaeontology* 49.5, pp. 1043–1052. DOI: 10.1111/j.1475-4983.2006.00589.x.
- Maxwell, E. E., D. G. Dick, S. Padilla and M. L. Parra (2016). 'A New Ophthalmosaurid Ichthyosaur from the Early Cretaceous of Colombia'. In: *Papers in Palaeontology* 2.1, pp. 59–70. DOI: 10 . 1002/spp2.1030.
- Maxwell, E. E., M. S. Fernández and R. R. Schoch (2012). 'First Diagnostic Marine Reptile Remains from the Aalenian (Middle Jurassic): A New Ichthyosaur from Southwestern Germany'. In: *PLoS ONE* 7.8, e41692. DOI: 10.1371/journal.pone.0041692.
- Mazin, J.-M., V. Suteethorn, E. Buffetaut, J.-J. Jaeger and R. Elmcke-Ingavat (1991). 'Preliminary Description of *Thaisaurus chonglak-manii* n.g., n.Sp., a New Ichthyopterygian (Reptilia) from the Early Triassic of Thailand'. In: *Comptes rendus de l'Académie des sciences. Série 2, Mécanique, Physique, Chimie, Sciences de l'univers, Sciences de la Terre* 313.10, pp. 1207–1212.
- McGowan, C. (1974). 'A Revision of the Longipinnate Ichthyosaurs of the Lower Jurassic of England, with Descriptions of Two New Species'. In: *Life Sciences Contributions of the Royal Ontario Museum* 97, pp. 1–37. DOI: 10.5962/bhl.title.52055.
- McGowan, C. (1986). 'A Putative Ancestor for the Swordfish-like Ichthyosaur *Eurhinosaurus*'. In: *Nature* 322.6078, pp. 454–456. DOI: 10.1038/322454a0.
- McGowan, C. (1993). 'A New Species of Large, Long-Snouted Ichthyosaur from the English Lower Lias'. In: *Canadian Journal of Earth Sciences* 30.6, pp. 1197–1204. DOI: 10.1139/e93-101.
- McGowan, C. (1994). 'A New Species of *Shastasaurus* (Reptilia: Ichthyosauria) from the Triassic of British Columbia: The Most Complete Exemplar of the Genus'. In: *Journal of Vertebrate Paleontology* 14.2, pp. 168–179. DOI: 10.1080/02724634.1994.10011550.
- McGowan, C. (1995). 'A Remarkable Small Ichthyosaur from the Upper Triassic of British Columbia, Representing a New Genus and

- Species'. In: *Canadian Journal of Earth Sciences* 32.3, pp. 292–303. DOI: 10.1139/e95-024.
- McGowan, C. (1996). 'A New and Typically Jurassic Ichthyosaur from the Upper Triassic of British Columbia'. In: *Canadian Journal of Earth Sciences* 33.1, pp. 24–32. DOI: 10.1139/e96-003.
- McGowan, C. and A. C. Milner (1999). 'A New Pliensbachian Ichthyosaur from Dorset, England'. In: *Palaeontology* 42.5, pp. 761–768. DOI: 10.1111/1475-4983.00096.
- Merriam, J. C. (1895). 'On Some Reptilian Remains from the Triassic of Northern California'. In: *American Journal of Science* 50.295, pp. 55–57. DOI: 10.2475/ajs.s3-50.295.55.
- Merriam, J. C. (1902). 'Triassic Ichthyopterygia from California and Nevada'. In: *University of California, Bulletin of the Department of Geology* 3.4, pp. 63–108.
- Merriam, J. C. (1903). 'New Ichthyosauria from the Upper Triassic of California'. In: *University of California, Bulletin of the Department of Geology* 3.12, pp. 249–263.
- Merriam, J. C. (1910). 'The Skull and Dentition of a Primitive Ichthyosaurian from the Middle Triassic'. In: *University of California, Bulletin of the Department of Geology* 5.24, pp. 381–390.
- Motani, R., D.-Y. Jiang, G. Chen, A. Tintori, O. Rieppel, C. Ji and J.-D. Huang (2015). 'A Basal Ichthyosauriform with a Short Snout from the Lower Triassic of China'. In: *Nature* 517.7535, pp. 485–488. DOI: 10.1038/nature13866.
- Nace, R. L. (1939). 'A New Ichthyosaur from the Upper Cretaceous Mowry Formation of Wyoming.' In: *American Journal of Science* 237.9, pp. 673–686. DOI: 10.2475/ajs.237.9.673.
- Nicholls, E. L. and D. B. Brinkman (1995). 'A New Ichthyosaur from the Triassic Sulphur Mountain Formation of British Columbia'. In: *Vertebrate Fossils and the Evolution of Scientific Concepts*. Ed. by W. A. S. Sarjeant. London: Gordon and Breach Publishers, pp. 521–535. URL: http://scholar.google.com/scholar?q=related:nE1862PPxCsJ:scholar.google.com/&hl=en&num=20&as_sdt=0,5.
- Nicholls, E. L. and M. Manabe (2004). 'Giant Ichthyosaurs of the Triassic—a New Species of *Shonisaurus* from the Pardonet Formation (Norian: Late Triassic) of British Columbia'. In: *Journal of Vertebrate Paleontology* 24.4, pp. 838–849. DOI: 10.1671/0272-4634(2004)024[0838:GIOTTN]2.0.CO; 2.
- Otschev, V. G. and V. M. Efimov (1985). 'A new genus of ichthyosaur from the Ulyanovsk Volga Region'. In: *Paleontologicheskii Zhurnal* 1985.4, pp. 76–80.
- Owen, R. (1840). 'Report on British Fossil Reptiles. Part I'. In: *Report of the British Association for the Advancement of Science* 9, pp. 43–126.
- Owen, R. (1881). 'A Monograph of the Fossil Reptilia of the Liassic Formations. Part Third. *Ichthyosaurus*'. In: *Monographs of the Palaeontographical Society* 35, pp. 83–134. DOI: 10.1080/02693445. 1881.12027969.
- Paparella, I., E. E. Maxwell, A. Cipriani, S. Roncacè and M. W. Caldwell (2016). 'The First Ophthalmosaurid Ichthyosaur from the

- Upper Jurassic of the Umbrian–Marchean Apennines (Marche, Central Italy)'. In: *Geological Magazine* 154.4, pp. 837–858. DOI: 10.1017/S0016756816000455.
- Páramo, M. E. (1997). 'Platypterygius sachicarum (Reptilia, Ichthyosauria) Nueva Especie Del Cretácico de Colombia'. In: Revista Ingeominas 6, pp. 1–12. URL: http://scholar.google.com/scholar?q=related:ltJk9I19J2kJ:scholar.google.com/&hl=en&num=20&as_sdt=0,5.
- Quenstedt, F. A. (1852). *Handbuch der Petrefaktenkunde*. Tübingen: Verlag der H. Laupp'schenn Buchhandlung.
- Quenstedt, F. A. (1858). *Der Jura*. Tübingen: Verlag der H. Laupp'schenn Buchhandlung.
- Russell, D. (1993). 'Jurassic Marine Reptiles from Cape Grassy, Melville Island, Arctic Circle'. In: *Bulletin of the Geological Survey of Canada*. The Geology of Melville Island, Arctic Canada 6: *The Geology of Melville Island, Arctic Canada*, pp. 195–201.
- Sander, P. M. (1989). 'The Large Ichthyosaur *Cymbospondylus buchseri*, sp. nov. from the Middle Triassic of Monte San Giorgio (Switzerland), with a Survey of the Genus in Europe'. In: *Journal of Vertebrate Paleontology* 9.2, pp. 163–173. DOI: 10.1080/02724634. 1989.10011750.
- Sander, P. M. (1997). 'The Paleobiogeography of *Shastasaurus*'. In: *Ancient Marine Reptiles*. San Diego: Academic Press, pp. 1–27.
- Schmitz, L., P. M. Sander, G. W. Storrs and O. C. Rieppel (2004). 'New Mixosauridae (Ichthyosauria) from the Middle Triassic of the Augusta Mountains (Nevada, USA) and Their Implications for Mixosaur Taxonomy'. In: *Palaeontographica Abteilung A: Paläozoologie—Stratigraphie* 270.4–6, pp. 133–162.
- Seeley, H. G. (1873). 'On *Cetarthrosaurus Walkeri* (Seeley), an Ichthyosaurian from the Cambridge Upper Greensand'. In: *Quarterly Journal of the Geological Society* 29.1-2, pp. 505–507. DOI: 10. 1144/GSL.JGS.1873.029.01-02.43.
- Seeley, H. G. (1874). 'On the Pectoral Arch and Fore Limb of *Oph-thalmosaurus*, a New Ichthyosaurian Genus from the Oxford Clay'. In: *Quarterly Journal of the Geological Society* 30.1-4, pp. 696–707. DOI: 10.1144/GSL.JGS.1874.030.01-04.64.
- Shikama, T., T. Kamei and M. Murata (1978). 'Early Triassic *Ichthyosaurus*, *Utatsusaurus hataii* Gen. et Sp. Nov., from the Kitakami Massif, Northeast Japan'. In: *Science Reports of Tohoku University* (*Geology*) 48.2, pp. 77–97.
- Tyborowski, D. (2016). 'A New Ophthalmosaurid Ichthyosaur Species from the Late Jurassic of Owad Mw-Brzezinki Quarry, Poland'. In: *Acta Palaeontologica Polonica* 61.4, pp. 791–803. DOI: 10.4202/app.00252.2016.
- Von Huene, F. F. (1926). 'Neue Ichthyosaurierfunde aus dem schwäbischen Lias'. In: *Neues Jahrbuch für Mineralgie, Geologie und Paläontologie, Beilage Band B* 55, pp. 66–86. URL: http://scholar.google.com/scholar?q=related:XEMFbQyMcbMJ:scholar.google.com/&hl=en&num=20&as_sdt=0,5.

- Von Huene, F. F. (1927). 'Beitrag Zur Kenntnis Mariner Mesozoischer Wirbeltiere in Argentinien'. In: *Zentralblatt für Mineralogie, Geologie und Palänontologie. B.* 1927, pp. 22–29.
- Von Huene, F. F. (1931a). 'Neue Studien über Ichthyosaurier aus Holzmaden'. In: *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* 42.4, pp. 345–382.
- Von Huene, F. F. (1916). 'Beiträge Zur Kenntnis Der Ichthyosaurier Im Deutschen Muschelkalk'. In: *Palaeontographica* 62, pp. 1–68.
- Von Huene, F. F. (1931b). 'Neue Ichthyosaurier aus Württemburg'. In: *Neues Jahrbuch für Mineralogie, Geologie und Paläontologie, Beilage-Band B* 65, pp. 305–320.
- Von Meyer, H. (1849). 'Fossile Fische Aus Dem Muschelkalk von Jena, Querfurt Und Esperstädt'. In: *Palaeontographica*, pp. 1–16.
- Von Theodori, C. (1843). 'Über Einen Kolossalen *Ichthyosaurus Tri-gonodon*'. In: *Gelehrte Anzeigen Königliche Akademie der Wissenschaften. Mathematisch-Physikalisch Classe* 34.113, pp. 905–912. URL: http://scholar.google.com/scholar?q=related:-uhk6vpCaIkJ:scholar.google.com/&hl=en&num=20&as_sdt=0, 5.
- Wagner, A. (1853). 'Die Characteristic Einer Neuen Art von *Ichthyosaurus* Aus Den Lithographischen Schiefern Und Eines Zahnes von *Polyptychodon* Aus Dom Gründsandstein von Kelheim'. In: *Bulletin der königliche Akademie der Wissenschaft, Gelehrte Anzeigen* 3, pp. 25–35.
- Wang, K. (1959). 'Ueber eine neue fossile Reptilform von Provinz Hupeh, China'. In: *Acta Palaeontologica Sinica* 7.5, pp. 47–52.
- Wiman, C. (1910). 'Ichthyosaurier Aus Der Trias Spitzbergens'. In: *Bulletin of the Geological Institute of Upsala* 10.3, pp. 124–148.
- Wiman, C. (1929). 'Eine Neue Marine Reptilien-Ordnung Aus Der Trias Spitzbergens'. In: *Bulletin of the Geological Institute of Upsala* 22, pp. 1–14.
- Yang, P.-F., J. Cheng, D. Jiang, R. Motani, A. Tintori, Y.-L. Sun and Z.-Y. Sun (2013). 'A new species of *Qianichthyosaurus* (Reptilia: Ichthyosauria) from Xingyi Fauna (Ladinian, Middle Triassic) of Guizhou'. In: *Acta Scientiarum Naturalium Universitatis Pekinensis* 49.6, pp. 1002–1008.
- Yin, G.-z., X. Zhou, Z. Cao, Y. Yu and Y. Luo (2000). 'A preliminary study on the Early Late Triassic marine reptiles from Guanling, Guizhou, China'. In: *Geology, Geochemistry* 28.3, pp. 1–23.
- Young, C.-C. and Z. M. Dong (1972). 'On the Triassic marine reptiles of China'. In: *Memoires of the Nanjing Institute of Geology and Palaeontology* 9, pp. 1–34.
- Zverkov, N. G. and V. M. Efimov (2019). 'Revision of *Undorosaurus*, a Mysterious Late Jurassic Ichthyosaur of the Boreal Realm'. In: *Journal of Systematic Palaeontology*, pp. 1–31. DOI: 10 . 1080 / 14772019.2018.1515793.
- Zverkov, N. G. and M. L. Jacobs (2020). 'Revision of *Nannopterygius* (Ichthyosauria: Ophthalmosauridae): Reappraisal of the 'Inaccessible' Holotype Resolves a Taxonomic Tangle and Reveals an Obscure Ophthalmosaurid Lineage with a Wide Distribution'. In:

Zoological Journal of the Linnean Society 191.1, pp. 228–275. DOI: 10.1093/zoolinnean/zlaa028.

Zverkov, N. G. and N. E. Prilepskaya (2019). 'A Prevalence of *Arthropterygius* (Ichthyosauria: Ophthalmosauridae) in the Late Jurassic–Earliest Cretaceous of the Boreal Realm'. In: *PeerJ* 7, e6799. DOI: 10.7717/peerj.6799.