

Table DR1. Hatchling sizes in fossil nautiloids. The hatchling diameters can be recognized by the primary constriction in the innermost whorl

Age	Area	Order	Superfamily *	Family	Species	(mm)	Hatching diameter	
							Reference	
Paleogene	late Eocene	west of the north Aral Sea, Kazakhstan	Nautilida	Nautilaceae	Nautilidae	<i>Nautilus praepompilius</i>	23	Saunders et al., 1996
Cretaceous	early Cenomanian	Hokkaido, Japan	Nautilida	Nautilaceae	Cymatoceratidae	<i>Anglonutilus japonicus</i>	15	Matsumoto et al., 1984
	early Campanian	Hokkaido, Japan	Nautilida	Nautilaceae	Cymatoceratidae	<i>Cymatoceras pacificum</i>	35	unpublished own data
	Turonian	Austral Basin, Argentina	Nautilida	Nautilaceae	Cymatoceratidae	<i>Cymatoceras patagonicum</i>	30	Cichowolski, 2003, CPBA 19861.4, fig. 7E
	Early Cretaceous	Mendoza and Neuquen Basin, Argentina	Nautilida	Nautilaceae	Cymatoceratidae	<i>Cymatoceras perstriatum</i>	32	Cichowolski, 2003, CPBA 19835.1, fig. 5F
	Cretaceous	Mahajunga, Madagascar	Nautilida	Nautilaceae	Cymatoceratidae	<i>Cymatoceras</i> sp.	30	unpublished own data
	late Albian-earlymost Cenomanian	southern India	Nautilida	Nautilaceae	Hercoglossidae	<i>Cimomia angustus</i>	20.4	Wani et al., 2011, MCM.A.1554
	late Albian-earlymost Cenomanian	southern India	Nautilida	Nautilaceae	Hercoglossidae	<i>Hercoglossa forbesianus</i>	22.2	Wani et al., 2011, MCM.A.1553
	Late Cretaceous	Western Interior, USA	Nautilida	Nautilaceae	Nautilidae	<i>Eutrephoceras</i> cf. <i>dekeyi</i>	14.2	Landman, 1988
	middle Turonian	southern India	Nautilida	Nautilaceae	Nautilidae	<i>Eutrephoceras clementinum</i>	20	Wani and Ayyasami, 2009
	Campanian-Maastrichtian	Western Interior, USA	Nautilida	Nautilaceae	Nautilidae	<i>Eutrephoceras dekeyi</i>	9	Landman et al., 1983
	early Campanian	James Ross Island, Antarctic Peninsula	Nautilida	Nautilaceae	Nautilidae	<i>Eutrephoceras</i> sp.	28.2	Cichowolski et al., 2005, CPBA 20042.1, fig. 9
	early Campanian-late Maastrichtian	Vega Island, Antarctic Peninsula	Nautilida	Nautilaceae	Nautilidae	<i>Eutrephoceras subplicatum</i>	32	Cichowolski et al., 2005, CPBA 20041.3, fig. 6a-b
	Cenomanian	Normandy, France	Nautilida			unidentified specimen	35	Chirat, 2001, fig.4C
Jurassic	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Digonioceras</i> sp.	57	Chirat, 2001, fig.1
	Aalenian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Cenoceras</i> sp. aff. <i>clausum</i>	20	Chirat, 2001, fig.2
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Cenoceras</i> sp.	17	Chirat, 2001, fig.3A
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Cenoceras</i> aff. <i>bradfordensis</i>	14.5	Chirat, 2001, fig.3C
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Digonioceras?</i> <i>smithi</i>	28	Chirat, 2001, fig.3G
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Digonioceras?</i> sp.	32.2	Chirat, 2001, fig.4A
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Digonioceras?</i> aff. <i>excavatum</i>	36.3	Chirat, 2001, fig.4E
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Digonioceras?</i> <i>smithi</i>	34	Chirat, 2001, fig.5A
	Aalenian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Cenoceras</i> sp.	16	Chirat, 2001, fig.5C
	late Bajocian	Normandy, France	Nautilida	Nautilaceae	Nautilidae	<i>Cenoceras</i> aff. <i>bradfordensis</i>	20.7	Chirat, 2001, fig.5E
Triassic	Griesbachian, Early Triassic	South Primorye, Russia	Nautilida	Trigoniceratace; Grypoceratidae		<i>Gyronutilus popovi</i>	7.5	Shigeta et al., 2009, p.45
	Griesbachian, Early Triassic	South Primorye, Russia	Nautilida	Trigoniceratace; Grypoceratidae		<i>Gyronutilus praevolutus</i>	11.3	Shigeta et al., 2009, p.47
	Griesbachian, Early Triassic	South Primorye, Russia	Nautilida	Trigoniceratace; Grypoceratidae		<i>Xiaohenutilus abrekenensis</i>	8	Shigeta et al., 2009, p.53
	Dienerian, Early Triassic	South Primorye, Russia	Nautilida	Trigoniceratace; Grypoceratidae		<i>Menuthionutilus korzchi</i>	8	Shigeta et al., 2009, p.59
	Dienerian, Early Triassic	South Primorye, Russia	Nautilida	Trigoniceratace; Grypoceratidae		<i>Menuthionutilus evolutus</i>	7	Shigeta et al., 2009, p.64
Permian	Wordian, latest Permian	Italy	Nautilida	Tainocerataceae Rhiphaeoceratidae	<i>Sholakoceras</i> cf. <i>pleuronai</i>	7	Mapes et al., 2007	
	Russia	Nautilida	Tainocerataceae Tainoceratidae		<i>Mosquoceras jakowlewi</i>	20	Ruzhencev and Shimansky, 1954, fig.9b	
	Russia	Nautilida	Tainocerataceae Tainoceratidae		<i>Metacoceras artiense</i>	14	Ruzhencev and Shimansky, 1954, fig.9c	
	Russia	Nautilida	Trigoniceratace; Trigonoceratidae		<i>Neothrincoeceras soshkinae</i>	19.2	Ruzhencev and Shimansky, 1954, fig.9d	
	Russia	Nautilida	Tainocerataceae Rhiphaeoceratidae		<i>Rhiphaeoceras venustum</i>	14	Ruzhencev and Shimansky, 1954, fig.9e	
	Russia	Nautilida	Tainocerataceae Rhiphaeoceratidae		<i>Sholakoceras bisulcatum</i>	8	Ruzhencev and Shimansky, 1954, fig.9f	
Carboniferous	Pennsylvanian	Ohio, USA	Nautilida	Tainocerataceae Tainoceratidae	<i>Metacoceras mchesneyi</i>	9.5	Wani and Mapes, 2010	
	Mississippian	Arkansas, USA	Nautilida	Trigoniceratace; Trigonoceratidae	<i>Aphelaeceras arkansanum</i>	4.9	Niko and Mapes, 2007	
	late Mississippian	Arkansas, USA	Orthocerida	Pseudorthocerat	<i>Dolorthoceras tenuifilosum</i>	2	Kroger and Mapes, 2004	

late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Reticycloceras peytonense</i>	3	Kroger and Mapes, 2004		
late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Mooreoceras imoense</i>	5	Kroger and Mapes, 2004		
late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Mooreoceras striatum</i>	5	Kroger and Mapes, 2004		
late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Pseudorthoceras knoxense</i>	1	Kroger and Mapes, 2004		
late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Euloxoceras angustinus</i>	1	Kroger and Mapes, 2004		
late Mississippian	Arkansas, USA	Orthocerida Pseudorthocerat Pseudorthoceratid: <i>Mitorthoceras girtyi</i>	1	Kroger and Mapes, 2004		
Silurian	Beroun, Bohemia	Orthocerida Pseudorthocerat Lechritrochocerati <i>Kosovoceras sandbergeri</i>	4.5	Turek, 2010		
	Praha-Lochkov, Bohemia	Orthocerida Pseudorthocerat Lechritrochocerati <i>Calocyrtoceras cognatum</i>	5	Turek, 2010		
	Gotland, Sweden	Orthocerida Pseudorthocerat Lechritrochocerati <i>Calocyrtoceras cf. simulan</i>	11	Turek, 2010		
Ordovician	middle Ordovician	Oland, Sweden	Orthocerida	Baltoceratidae <i>Hedstroemoceras cf. haelli</i>	1.2	Kroger, 2006, Specimen Mo 160674
	middle Ordovician	Oland, Sweden	Orthocerida	Baltoceratidae <i>Hedstroemoceras cf. haelli</i>	0.95	Balashov, 1957
	middle Ordovician	Oland, Sweden	Orthocerida	Geisonoceratidae <i>Archigeisonoceras sp.</i>	2.6	Kroger, 2006, Specimen Mo 160705
	middle Ordovician	Oland, Sweden	Orthocerida	Geisonoceratidae <i>Archigeisonoceras sp.</i>	2	Kroger, 2006, Specimen Mo 160676
	middle Ordovician	Oland, Sweden	Orthocerida	Geisonoceratidae <i>Archigeisonoceras sp.</i>	2.8	Kroger, 2006, Specimen Mo 160678
	late Ordovician	Porkuni, Estonia	Orthocerida	Orthoceratidae Gen. et sp. indet. B	2.4	Kroger, 2007, Specimen TUG 1227/4

* Does not fulfil the requirements of the International Code of Zoological Nomenclature (1999).

Reference

Balashov, S.G., 1957, The protoconch of a specimen of the genus Orthoceras of the Early Paleozoic: Doklady Akademii nauk SSSR, v. 116, p. 855–857 (in Russian).

Chirat, R., 2001, Anomalies of embryonic shell growth in post-Triassic Nautilida: Paleobiology, v. 27, p. 485–499.

Cichowolski, M., 2003, The nautiloid genus Cymatoceras from the Cretaceous of the Neuquén and Austral basins, Argentina: Cretaceous Research, v. 24, p. 375–390.

Cichowolski, M., Ambrosio, A., and Concheyro, A., 2005, Nautilids from the Upper Cretaceous of the James Ross Basin, Antarctic Peninsula: Antarctic Science, v. 17, p. 267–280.

Kröger, B., 2006, Early growth-stages and classification of orthoceridan cephalopods of the Darriwillian (Middle Ordovician) of Baltoscandia: Lethaia, v. 39, p. 129–139.

Kröger, B., 2007, Concentrations of juvenile and small adult cephalopods in the Hirnantian cherts (Late Ordovician) of Porkuni, Estonia: Acta Palaeontologica Polonica, v. 52, p. 591–608.

Kröger, B., and Mapes, R.H., 2004, Lower Carboniferous (Chesterian) embryonic orthoceratid nautiloids: Journal of Paleontology, v. 78, p. 560–573.

Landman, N.H., 1988, Early ontogeny of Mesozoic ammonites and nautilids, in Wiedmann, J., and Kullmann, J., eds., Cephalopods—Present and Past: Stuttgart, Schweizerbart'sche Verlag, p. 215–228.

Landman, N.H., Rye, D.M., and Shelton, K.L., 1983, Early ontogeny of Eutrophoceras compared to Recent Nautilus and Mesozoic ammonites: evidence from shell morphology and light stable isotopes: Paleobiology, v. 9, p. 269–279.

Mapes, R.H., Niko, S., Fryda, J., and Nützel, A., 2007, A newly hatched coiled nautiloid from the Permian: Journal of Paleontology, v. 81, p. 1118–1121.

Matsumoto, T., Takahashi, T., Obata, I., and Futakami, M., 1984, Cretaceous nautiloids from Hokkaido - IV Part 4. An Interesting nautiloid species from the Cenomanian of Hokkaido: Transactions and Proceedings of the Palaeontological Society of Japan, New Series, no. 183, p. 288–299.

Niko, S., and Mapes, R.H., 2007, Trigonoceratid nautilids from the Early Carboniferous Imo Formation of Arkansas, Midcontinent North America: *Paleontological Research*, v. 11, p. 293–303.

Ruzhencev, V.E., and Shimansky, V.E., 1954, Lower Permian coiled and curved nautiloids of the southern Urals: *Transactions of the Paleontological Institute*, v. 50, p. 1–152 (in Russian).

Saunders, W.B., Shimansky, V.N., and Amitrov, O.A., 1996, Clarification of *Nautilus praepompilius* Shimansky from the late Eocene of Kazakhstan: *Journal of Paleontology*, v. 70, p. 609–611.

Shigeta, Y., Zakharov, Y.D., Maeda, H., and Popov, A.M., 2009, The Lower Triassic system in the Abrek Bay area, South Primorye, Russia: National Museum of Nature and Science. Monographs, no. 38, p. 1–218.

Turek, V., 2010, Embryonic shells in some lechritrochoceratids (Nautiloidea, Barrandeocerina), in Tanabe, K., Shigeta, Y., Sasaki, T., and Hirano, H., eds., *Cephalopods—Present and Past*: Tokyo, Tokai University Press, p. 85–92.

Wani, R., and Ayyasami, K., 2009, Ontogenetic change and intra-specific variation of shell morphology in the Cretaceous nautiloid (Cephalopoda, Mollusca) *Eutrephoceras clementinum* (d'Orbigny, 1840) from the Ariyalur area, southern India: *Journal of Paleontology*, v. 83, p. 365–378.

Wani, R., and Mapes, R.H., 2010, Conservative evolution in nautiloid shell morphology: evidence from the Pennsylvanian nautiloid *Metacoceras mcchesneyi* from Ohio, USA: *Journal of Paleontology*, v. 84, p. 477–492.

Wani, R., Kurihara, K., and Ayyasami, K., 2011, Large hatchling size in Cretaceous nautiloids persists across the end-Cretaceous mass extinction: New data of Hercoglossidae hatchlings: *Cretaceous Research*, v. 32, p. 618–622.

Table DR2. Egg numbers, egg sizes and mode of hatchling habit in modern cephalopods. The egg sizes can be approximated to the hatchling sizes.

	Species	Egg no.	Egg diameter (mm)	Adult	Hatchling	Mode of habit	Reference
Squids	<i>Sepia officinalis</i>	500	3	Nektonbenthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Sepiola robusta</i>	54	4.5	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Euprymna scolopes</i>	300	4	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Sepiella oweniana</i>	160	5	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Loligo opalescens</i>	5,450	2.5	Nektonbenthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Loligo pealei</i>	6,000	1.6	Nektonbenthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Loligo vulgaris</i>	7,000	2.7	Nektonbenthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Illex illecebrosus</i>	100,000	1	Nektonic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Todarodes pacificus</i>	470,000	0.8	Nektonic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Dosidicus gigas</i>	650,000	1.1	Nektonic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
Octopods	<i>Bathypolypus arcticus</i>	80	14	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Bathypolypus sponsalis</i>	175	15.5	Benthic	non-planktic		Mangold, 1987
	<i>Eledone cirrhosa</i> (Mediterranean)	5,600	7.5	Benthic	planktic		Mangold, 1987
	<i>Eledone cirrhosa</i> (North Sea)	54,000	7.5	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Eledone moschata</i>	500	16	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Hapalochlaena maculosa</i>	150	7	Benthic	non-planktic		Mangold, 1987
	<i>Octopus australis</i>	129	14.4	Benthic	non-planktic		Mangold, 1987
	<i>Octopus bimaculoides</i>	155	12.2	Benthic	non-planktic		Mangold, 1987
	<i>Octopus briareus</i>	955	14	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus cyanea</i>	700,000	3	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus dofleini</i>	70,000	8	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus joubini</i>	321	8	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus maorum</i>	5,000	4.6	Benthic	planktic		Mangold, 1987
	<i>Octopus maya</i>	5,000	11	Benthic	non-planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus salutii</i>	4,000	6	Benthic	planktic		Mangold, 1987
	<i>Octopus tetricus</i>	15,000	2.4	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus tetricus</i>	700,000	2.4	Benthic	planktic		Mangold, 1987
	<i>Octopus vulgaris</i>	500,000	2	Benthic	planktic		Boyle, 1983; Boyle & Rodhouse, 2005
	<i>Octopus vulgaris</i>	500,000	2.2	Benthic	planktic		Mangold, 1987
	<i>Pteroctopus tetricirrus</i>	1,000	7	Benthic	planktic		Mangold, 1987
	<i>Robsonella australis</i>	1,000	2.9	Benthic	planktic		Mangold, 1987
Nautiloids	<i>Nautilus macromphalus</i>	10	36.8	Nektonbenthic	non-planktic		Boyle, 1983

Reference

- Boyle, P., 1983, Cephalopod Life Cycles. Volume I, Species Accounts: New York, Academic Press, 475 p.
- Boyle, P., and Rodhouse, P., 2005, Cephalopods. Ecology and Fisheries: Oxford, Blackwell, 452 p.
- Mangold, K., 1987, Reproduction, *in* Boyle, P., ed., Cephalopod Life Cycles. Volume II, Comparative Reviews: London, Academic Press, p. 157–200.