

## Database of the Cretaceous ammonoids in Japan — stratigraphic distribution and bibliography —

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Seiichi TOSHIMITSU and Hiromichi HIRANO (2000) Database of the Cretaceous ammonoids in Japan — stratigraphic distribution and bibliography—. *Bull. Geol. Surv. Japan*, vol. 51 (11), p. 559-613, 1 fig, 19 tables.

**Abstract:** A database with a bibliography on the Japanese Cretaceous ammonoids has been made by the survey of various literature (Tables 2-19). This database consists of a list of species, based on higher taxonomy of Wright *et al.* (1996), with their stratigraphic distribution data and a bibliography on them. As a result, it clarified that 790 species are detected from the Japanese Cretaceous deposits, and the species-diversity of the Cretaceous ammonoids in Japan changed cyclically, although the diversity of ammonoids in the Early Cretaceous is much lower than the Late Cretaceous. Diversity changes are controlled by environmental changes, and therefore this database will be useful not only for stratigraphical and biochronological studies but also for paleoenvironmental study of the Cretaceous Period.

### 1. Introduction

Ammonoids are one of the most common fossil animals in the Late Paleozoic and Mesozoic Eras. A great many species of ammonoids have been reported until now, and it is said that the number of described ammonoid species in the world is greater than 5,000, or more than 10,000. Moreover, many unknown species will be found from now onward. Ammonoids are well-known to be useful for biostratigraphical zonation and correlation, because of their remarkable evolution and wide distribution. Besides, they are known to have been influenced by environmental changes, for which the term bioseismometer was introduced by House (1989). We can expect to clarify the Cretaceous environmental changes recorded in Japan and the Northwestern Pacific through the study of ammonoids (Hirano *et al.*, 1999, 2000).

A catalogue containing all Paleozoic and Mesozoic ammonoid genera of the world, with their diagnosis, was written by Arkell *et al.* (1957). However, there is no catalogue containing all ammonoid species of the Paleozoic and Mesozoic of the world. After Arkell *et al.* (1957), many new genera were added through many studies on ammonoids. Wright *et al.* (1996) revised only the Cretaceous ammonoid genera. As far as the Cretaceous ammonoids are concerned, 466

genera and 65 subgenera were recognised in Arkell *et al.* (1967), while 684 genera and 153 subgenera were recognized in Wright *et al.* (1996).

On the other hand, Matsumoto (1942e, 1943, 1954a) listed many ammonoid species, obtained from Japanese Cretaceous deposits, by regional groups. Recently, Tanabe *et al.* (2000) made a database of the Cretaceous ammonoid specimens (about 1500 individuals, including about 200 type specimens) from Japan and Sakhalin housed in the University Museum of the University of Tokyo. However, a catalogue of all Japanese Cretaceous ammonoids was not made until now. Therefore, we have surveyed records of all Cretaceous ammonoid species from Japan from literature in geology, stratigraphy and paleontology. As a result, we made a list comprising about 800 ammonoid species with data of their stratigraphic distributions (Tables 2-19).

### 2. Database of the Japanese Cretaceous ammonoids

This database is made up of a list of all Japanese Cretaceous ammonoid species with their stratigraphic distribution data (Tables 2-19) and a bibliography on them. We follow Wright *et al.* (1996) for higher taxonomy in this database. Stratigraphic subdivision of the Japanese Cretaceous System is based on Matsumoto (1978c) and Matsumoto *et al.* (1982) for the Lower Cretaceous, and Toshimitsu *et al.* (1995a, b)

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for the Upper Cretaceous. However, the subdivisions of the Lower Aptian, Upper Aptian and upper part of Lower Campanian Substages are modified in this paper. For example, K3a1 and K3a2 of the Lower Aptian are united into one substage (K3a1-2) (Fig. 1), because of the difficulty of biostratigraphically higher resolution on this substage at the present. As a result, the Japanese Cretaceous are subdivided into 31 substages in this paper (Fig. 1).

Our term "species" mean not only paleontologically described ones but also undescribed ones such as "sp. nov." and "aff.". Both are reported in geology, stratigraphy and paleontology journals and related magazines. Among these species, some species have problems related to taxonomy and biostratigraphy. The taxonomic problem is of synonyms on *Stoliczkaia*

*amanoi* pointed out by Matsumoto (1980), "*Yokoyamaoceras ishikawai*" by Maeda (1993), and *Polyptychoceras pseudogaultinum* by Okamoto and Shibata (1997). However, we treated the related species to them as independent species in this database. There is also a problem on sexual dimorphism between the following two genera, *Menuites* and *Anapachydiscus*, discussed by Cobban and Kennedy (1993). We treated these two genera as independent from each other in this paper. On the other hand, the biostratigraphic problem was recently pointed out by Naruse *et al.* (2000). They reported that *Gaudryceras hamanakaense* and *Pachydiscus flexuosus*, whose ranges were previously regarded as late Maastrichtian, are early Maastrichtian species based on the stratigraphical study of the Cretaceous of South

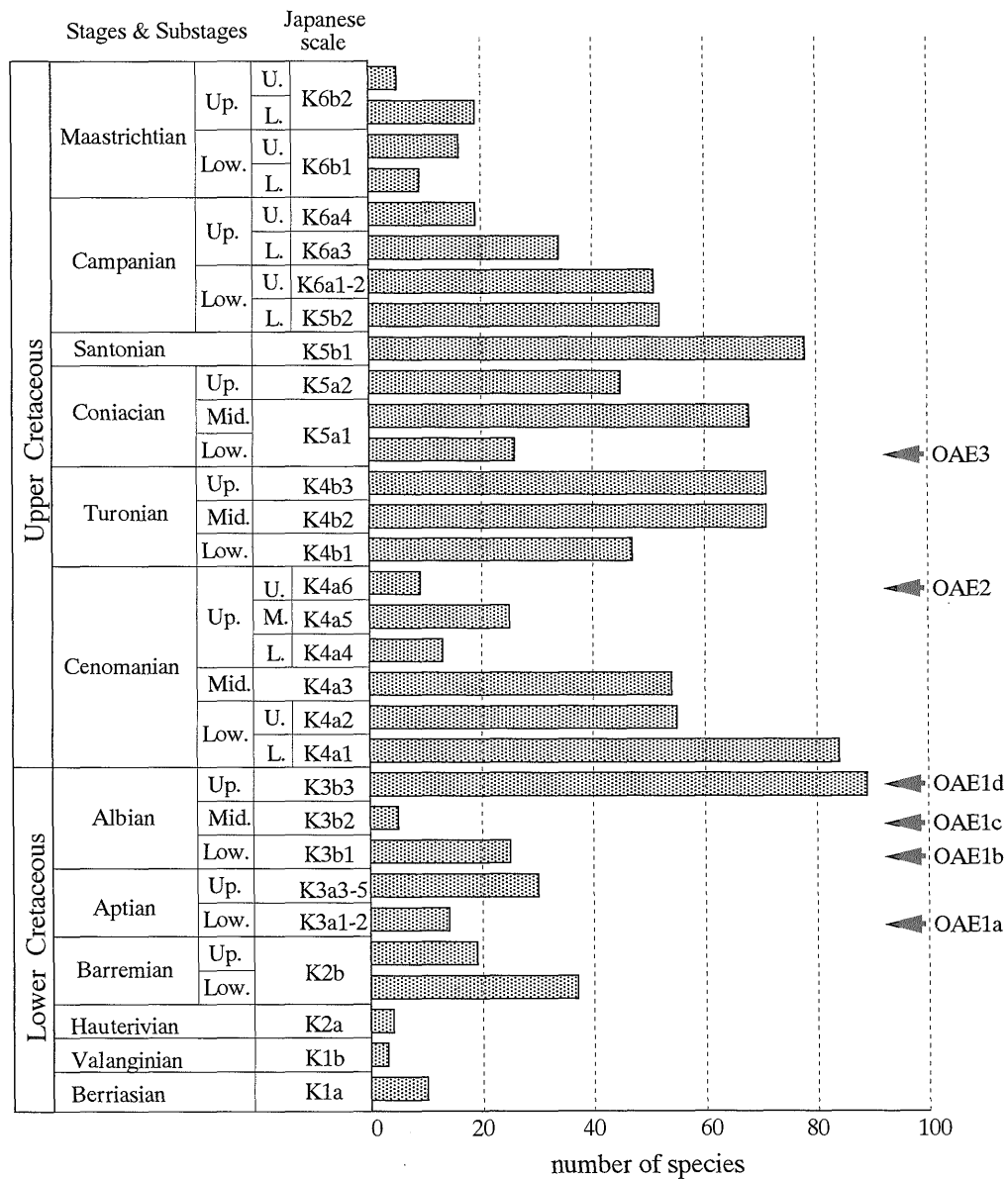


Fig. 1. Changes of number of ammonoid species during the Cretaceous in Japan. Subdivision of substages are modified from Matsumoto (1978c), Matsumoto *et al.* (1982) and Toshimitsu *et al.* (1995a, b).

Sakhalin by Maeda *et al.* (1995: oral presentation). Moreover, the lower biostratigraphic resolution of the Lower Cretaceous System in Japan is another problem. Future studies are required to solve these problems.

This database can clarify the diversity of the Japanese Cretaceous ammonoids, which consist of four suborders, that is, Phylloceratina, Lytoceratina, Ammonitina and Ancyloceratina. The total number of species is 790 (Table 1). As preliminarily mentioned by Hirano *et al.* (1999, 2000), species diversity (=number of species) of the Japanese Cretaceous ammonoids is higher in the Lower Barremian, Upper Aptian to Lower Albian, Upper Albian to Lowermost Cenomanian, Middle to Upper Turonian, Middle Coniacian and Santonian Substages (Fig. 1). Contrastly, the minima occur in the Lower Aptian, Middle Albian, Upper Cenomanian, and Lower Coniacian Substages. As suggested by Hirano *et al.* (1999, 2000), the timing of these declines in species diversity are comparatively harmonious with those of the Cretaceous Anoxic Events (OAE), except for the Upper Albian Substage at the time of OAE1d. Thus, this database could be the useful source of information to analyse the environmental changes and response of the ammonoids.

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Table 1 Composition of the Japanese Cretaceous ammonoids.

	PHYLLOCERATINA	LYTOCERATINA	AMMONITINA	ANCYLOCERATINA	total
family	1	3	27	18	(49)
genus	6	19	163	93	(281)
species	24	71	450	245	(790)

Table 2 List of ammonoid species and their stratigraphic distribution.

List of ammonoid species - 1 -								
check of species	Suborder						System	
	Superfamily						Stage	
	Family						Substage	
	Subfamily							
	Genus	species	author	References*	Remarks	Japanese scale		
	PHYLLOCERATINA							
	PHYLLOCERATACEAE							
	PHYLLOCERATIDAE							
	PHYLLOCERATINAE							
X	Partschiceras	japonicum	(Matsumoto)					
	Partschiceras	sp.						
X	Phylloceras (Hypophylloceras)	velledae	(Michelin)					
X	Phylloceras (Hypophylloceras)	yeharai	(Nakai & Matsumoto)					
X	Phylloceras (Hypophylloceras)	aff. yeharai	(Nakai & Matsumoto)	Futakami (1996)		occurrence from a falling rock		
X	Phylloceras (Hypophylloceras)	cf. onoense	(Stanton)			horizon undecided		
X	Phylloceras (Hypophylloceras)	aff. onoense	(Stanton)	Shimizu (1931), Obata et al.(1975)				
	Phylloceras (Hypophylloceras)	sp.						
	Phylloceras (Hypophylloceras)(?)	sp.						
	Phylloceras (Hypophylloceras)	n.sp.		Matsumoto & Harada (1964)				
X	Phylloceras (Neophylloceras)	aff. bizonatus	(Pervinquierè)	Hashimoto et al.(1965)		horizon undecided		
X	Phylloceras (Neophylloceras)	seresitense	(Pervinquierè)					
X	Phylloceras (Neophylloceras)	ramosum	(Meek)					
X	Phylloceras (Neophylloceras)	aff. ramosum	(Meek)	Matsumoto & Miyauchi (1984)				
X	Phylloceras (Neophylloceras)	aff. subramosum	(Spath)	Matsumoto & Obata (1956)		horizon and locality unknown		
X	Phylloceras (Neophylloceras)	subramosum	(Spath)					
X	Phylloceras (Neophylloceras)	compressum	(Matsumoto)			horizon and locality unknown		
X	Phylloceras (Neophylloceras)	cf. surya	(Forbes)					
X	Phylloceras (Neophylloceras)	nera	(Forbes)					
X	Phylloceras (Neophylloceras)	hetoniense	(Matsumoto)					
X	Phylloceras (Neophylloceras)	aff. mikobokense	(Collignon)	Morozumi (1985)				
	Phylloceras (Neophylloceras)	sp.						
	Phylloceras (Neophylloceras)(?)	sp.						
X	Phylloceras (Neophylloceras)	n.(?) sp.		Nishida et al.(1993b)				
X	Phylloceras	aff. infundibulum	(d'Orbigny)	Obata et al.(1976), Matsukawa (1977, 1983)				
X	Phyllopachyceras	ezoense	(Yokoyama)					
X	Phyllopachyceras	forbesianum	(d'Orbigny)					
	Phyllopachyceras	sp.						
	Phyllopachyceras(?)	sp.						
	CALLIPHYLLOCERATINAE							
X	Calliphylloceras(?)	sp.						
	Calliphylloceras	sp.						
X	Holcophylloceras	caucasica	(Sayn)					
	Holcophylloceras	sp.						
X	Ptychophylloceras	sp.						
	LYTOCERATINA							
	LYTOCERATACEAE							
	LYTOCERATIDAE							
	LYTOCERATINAE							
X	Lytoceras	belliseptatum	(Anthula)					
X	Lytoceras	cf. traski	Anderson					
	Lytoceras	sp.				horizon undecided		
	Lytoceras(?)	sp.				horizon undecided		
X	Ammonoceratites	ezoensis	(Yabe)					
X	Ammonoceratites (Ammonoceratites)	crenocostatus	(Whiteaves)			horizon unknown		
X	Ammonoceratites (Ammonoceratites)	mahadeva	(Stoliczka)					
	Ammonoceratites	sp.						
X	Argonauticeras(?)	sp. nov.?		Futakami (1996)				
	Argonauticeras(?)	sp.						
X	Pictetia	sp.						
	Pictetia(?)	sp.				horizon undecided		
X	Protetragonites	sp.						
	TETRAGONITACEAE							
	GAUDRYCERATIDAE							
X	Eogaudryceras	aff. aurarium	(Anderson)	Shigeta (1993)		horizon undecided		
	Eogaudryceras	sp.						
	Eogaudryceras(?)	sp.						
X	Eotetragonites	aketoensis	Obata & Futakami					
	Eotetragonites	sp.						
X	Anagaudryceras	sacya	(Forbes)			horizon undecided (partly)		
	Anagaudryceras	aff. sacya	(Forbes)	Obata & Muramoto (1966a)				
X	Anagaudryceras	aff. whitneyi	(Gabb)	Matsumoto (1995), Futakami (1996)				
X	Anagaudryceras	madraspatanum	(Stoliczka)					
X	Anagaudryceras	howarthi	Matsumoto					
X	Anagaudryceras	limatum	(Yabe)					
X	Anagaudryceras	yokoyamai	(Yabe)					
X	Anagaudryceras	yamashitai	(Yabe)					

\*: References are shown only for unestablished species, such as "sp. nov." and "aff."



Table 3 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 2 -								
check of species	Suborder							System
	Superfamily							Stage
	Family							Substage
	Subfamily							Japanese scale
	Genus	species	author	References*	Remarks			
X	Anagaudryceras	aff. mikobokensis	Collignon	Matsumoto et al.(1980c)				
X	Anagaudryceras	politissimum	(Kossmat)					
X	Anagaudryceras	nanum	Matsumoto					
X	Anagaudryceras	matsumotoi	Morozumi					
X	Anagaudryceras	tetragonum	Matsumoto & Kanie					
	Anagaudryceras	sp.						
	Anagaudryceras(?)	sp.						
	Anagaudryceras	sp. a		Hashimoto et al.(1965)				
	Anagaudryceras	sp. b		Hashimoto et al.(1965)				
X	Miogaudryceras	yokoi	Matsumoto					
X	Miogaudryceras	sp. nov.(?)		Nishida et al.(1993b), Matsumoto (1995)				
	Miogaudryceras	sp.						
X	Gaudryceras	mite	Hauer					
X	Gaudryceras	subcostatum	Matsumoto					
X	Gaudryceras	stefanii	Venzo					
	Gaudryceras	aff. stefanii	Venzo	Shigeta (1993)				
X	Gaudryceras	sp. nov.(?)		Matsumoto (1995)				
X	Gaudryceras	denseplicatum	(Jimbo)					
	Gaudryceras	aff. denseplicatum	(Jimbo)	Tanabe et al.(1977, 1978)				
X	Gaudryceras	intermedium	Yabe					
X	Gaudryceras	tenuiliratum	Yabe					
	Gaudryceras	aff. tenuiliratum	Yabe	Matsumoto & Katto (1984)				
X	Gaudryceras	striatum	(Jimbo)					
	Gaudryceras	striatum paucistriatum	Matsumoto		MS(nom.nud.); Matsumoto (1941, 1995)			
	Gaudryceras	aff. striatum	(Jimbo)	Matsumoto & Katto (1984), Morozumi (1985)				
X	Gaudryceras	crassicostatum	(Jimbo)					
X	Gaudryceras	venustum	Matsumoto					
X	Gaudryceras	mamiyai	Matsumoto & Miyauchi					
X	Gaudryceras	izumiense	Matsumoto & Morozumi					
X	Gaudryceras	hamanakaense	Matsumoto & Yoshida		refer Naruse et al.(2000)			
X	Gaudryceras	tombetsense	Matsumoto					
	Gaudryceras	sp.						
	Gaudryceras(?)	sp.			horizon undecided (partly)			
X	Vertebrites	kayei	(Forbes)					
X	Vertebrites	aff. kayei	(Forbes)	Matsumoto (1995)				
	Vertebrites	sp.			horizon and locality unknown			
X	Zelandites	inflatus	Matsumoto					
	Zelandites	aff. inflatus	Matsumoto	Hirano et al.(1977)				
X	Zelandites	odiensis	(Kossmat)					
	Zelandites	aff. odiensis	(Kossmat)	Tsushima et al.(1958), Igi et al.(1958)				
X	Zelandites	europae	Wright & Kennedy					
X	Zelandites	mihoensis	Matsumoto		horizon undecided			
X	Zelandites	kawanoi	(Jimbo)					
X	Zelandites	japonicus	Matsumoto					
X	Zelandites	varuna	(Forbes)					
	Zelandites	sp.						
	Zelandites(?)	sp.						
X	Kossmatella (Murphyella)	enigma	Matsumoto, Muramoto & Takahashi					
	Kossmatella	sp.			horizon unknown			
TETRAGONITIDAE								
TETRAGONITINAE								
X	Tetragonites	cf. kitchini	(Krenkel)					
X	Tetragonites	aff. kitchini	(Krenkel)	Nishida et al.(1996, 1997, 1998b), Kawabe et al.(1996), Obata et al.(1981), Obata & Futakami (1975)				
X	Tetragonites	cf. kiliani	Jacob					
X	Tetragonites	aff. kiliani	Jacob	Hashimoto et al.(1965)				
X	Tetragonites	glabrus	(Jimbo)					
X	Tetragonites	epigonus	(Kossmat)					
X	Tetragonites	superstes	van Hoepen					
X	Tetragonites	popetensis	Yabe		refer Naruse et al.(2000)			
X	Tetragonites	cf. subtimotheanus	Wiedmann					
X	Tetragonites	cf. timotheanus	(Mayor)					
X	Tetragonites	minus	Shigeta					
X	Tetragonites	terminus	Shigeta					
	Tetragonites	sp. nov.		Hirano et al.(1977)				
	Tetragonites	sp.						
	Tetragonites(?)	sp.						
X	Saghalinites	teshoensis	Matsumoto					
X	Saghalinites	nuperus	(Hoepen)		horizon undecided			
	Saghalinites	sp.						
	Saghalinites(?)	sp.						
X	Pseudophyllites	indra	(Forbes)					
X	Pseudophyllites	cf. teres	(van Hoepen)					



Table 4 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 3 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
	Pseudophyllites	sp.					
	Pseudophyllites(?)	sp.					
X	Parajaubertella	kawakitana	Matsumoto				
X	Parajaubertella	aff. kawakitana	Matsumoto		Obata & Futakami (1975), Futakami (1996)		
X	Parajaubertella	zizoh	Matsumoto, Yokoi & Kawashita				
	Parajaubertella	sp.					
	Parajaubertella(?)	sp.					
X	Takahashia	eureka	Matsumoto				
	GABBIOCERATINAE						
X	Gabbioceras	yezoense	Shigeta				
X	Gabbioceras	mikasaense	Shigeta				
X	Gabbioceras	melchianum	(d'Orbigny)				
	Gabbioceras	sp.					
	AMMONITINA						
	HAPLOCERATACEAE						
	OPPELIDAE						
	ACONECERATINAE						
	Aconeceras(?)	sp.					
X	Aconeceras	sp.					
	BINNEYITIDAE						
X	Borisjakoceras(?)	sp.					
	PERISPHINCTACEAE						
	POLYPTYCHITIDAE						
	SIMBIRSKITINAE						
X	Simbirskites (Milanowskia)	sp.				somehow questionable	
	OOSTERELLIDAE						
X	Pseudosterella	sp.				somehow questionable	
	OLCOSTEPHANIDAE						
	SPITICERATINAE						
X	Spiticeras (Spiticeras)	cf. binodiger	Uhlig			somehow questionable	
X	Aspidostephanus(?)	sp.					
	OLCOSTEPHANINAE						
X	Olcostephanus (Neoasteria)	cadoceroides	(Karakasche)				
	Olcostephanus	sp.		Sato (1958), Takahashi (1973)			
	Olcostephanus(s.l.)	sp.					
	olcostephanid						
	HOLCODISCIDAE						
	Holcodiscus(?)	sp.					
X	Holcodiscus	sp.					
X	Parasynoceras	sp.					
	NEOCOMITIDAE						
	BERRIASELLINAE						
X	Berriassella	cf. berthel	Toucas				
	Berriassella	nov. sp. ex. gr. B. berthel	Toucas	Sato (1958)		somehow questionable	
X	Berriassella	aff. patula	Schneid	Noda (1972)		somehow questionable	
	Berriassella	sp. B [?group of B. privasensis (Pictet)]		Takahashi (1973)		somehow questionable	
	Berriassella	sp.				somehow questionable	
X	Substeueroceras?	sp.				somehow questionable	
X	Protacanthodiscus	akiyama	(Sato)			somehow questionable	
X	Protacanthodiscus	aff. maibosi	(Pictet)	Takahashi (1973)		somehow questionable	
	NEOCOMITINAE						
X	Thurmanniceras	isokusense	(Kobayashi & Fukada)			somehow questionable	
	Thurmanniceras	sp.				somehow questionable	
X	Kilianella	sp.				somehow questionable	
X	Parakilianella	umazawensis	Sato			somehow questionable	
X	Sarasinella	aff. hyatti	(Stanton)	Takahashi (1967MS in Onuki, 1969)		somehow questionable	
X	Neocomites?	sp.					
X	Lissonia	sp. A		Obata et al.(1975)			
	Lissonia	sp. B		Obata et al.(1975)			
	ENDEMO CERATINAE						
X	Lyticoceras	sp.		Takahashi (1967MS, in Onuki, 1969)			
X	Leopoldia(?)	sp.					
X	Subosterella(?)	sp.					
	Neocomitidae gen. et sp. indet. A			Obata et al.(1975)			
	Neocomitidae gen. et sp. indet. B			Obata et al.(1975)			
	DESMOCERATACEAE						
	DESMOCERATIDAE						
	BARREMITINAE						
X	Barremites (Barremites)	strettostoma	(Uhlig)				
X	Barremites (Barremites)	difficilis	(d'Orbigny)				
X	Barremites (Barremites)	otsukai	(Yabe & Shimizu)				
	Barremites (Barremites)	sp.					
	Barremites (Barremites)(?)	sp.					





Table 5 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 4 -							
check of species	Suborder		Superfamily				System
	Family						Stage
	Subfamily						Substage
	Genus	species	author	References*	Remarks	Japanese scale	
X		Barremites (Raspailceras)	cassida	(Raspail)			
		Barremites (Raspailceras) (?)	sp.				
X		Barremites (Cassidoiceras)	aff. cassidoides	(Uhlig)	Obata & Ogawa (1976)		
		Barremites (Cassidoiceras)	sp.				
X		Barremites (Reboulites) (?)	sp.				
		Barremites	sp.				
		POZOSIINAE					
X		Valdedorsella	akuschaensis	(Anthula)			
X		Valdedorsella	getulina	(Coquand)			
		Valdedorsella (Puezalpella)	sp.				
		Valdedorsella	sp.				
		Valdedorsella(?)	sp.				
X		Pseudohaploceras	nipponicum	Shimizu			
X		Pseudohaploceras	japonicum	Obata & Matsukawa			
X		Pseudohaploceras	cf. liptoviense	(Zeuschner)		horizon undecided	
		Pseudohaploceras	sp.				
		Pseudohaploceras(?)	sp.				
X		Callizoniceras (Callizoniceras)	aff. hoyeri	(Koenen)	Obata et al.(1975)		
X		Melchiorites	yabei	(Shimizu)			
		Melchiorites	sp.				
		Melchiorites(?)	sp.				
X		Puzosia	cf. mayorianum	(d'Orbigny)			
X		Puzosia (Puzosia)	subcorbarica	Matsumoto			
X		Puzosia	aff. subcorbarica	Matsumoto	Obata & Futakami (1975), Futakami (1996)		
X		Puzosia	aff. provincialis	(Parona & Bonarelli)	Matsumoto & Takahashi (in Matsumoto, 1988)		
X		Puzosia	aff. mazambica	Collignon	Futakami (1996)	occurrence from a falling rock	
X		Puzosia	elegans	Matsumoto			
X		Puzosia	orientalis	Matsumoto			
X		Puzosia	intermedia	Kossmat			
X		Puzosia	cf. manasoensis	Collignon			
X		Puzosia	kuratai	Tokunaga & Shimizu			
		Puzosia	sp.				
		Puzosia(?)	sp.				
X		Hyperpuzosia	tamon	Matsumoto, Kawashita & Takahashi			
X		Hyperpuzosia	sp. nov.		Futakami (1996)		
		Hyperpuzosia	sp.			occurrence from a falling rock	
X		Matsumotoceras	sp.				
X		Bhimaites	takahashii	Matsumoto			
X		Bhimaites?	kawai	Matsumoto & Egashira			
X		Mesopuzosia	pacifica	Matsumoto			
X		Mesopuzosia	takahashii	Matsumoto			
X		Mesopuzosia	aff. chivensis	(Arkhanguelsky)	Matsumoto & Kokubun (in Matsumoto, 1988)		
X		Mesopuzosia	indopacifica	(Kossmat)			
X		Mesopuzosia	yubarensis	(Jimbo)			
X		Mesopuzosia	aff. yubarensis	(Jimbo)	Matsumoto & Obata (1956)	horizon and locality unknown	
X		Mesopuzosia	densicostata	Matsumoto			
		Mesopuzosia	sp.				
		Mesopuzosia(?)	sp.				
X		Pteropuzosia	kawashitai	Matsumoto			
		Pteropuzosia	sp.				
X		Pachydesmoceras	denisonianum	(Stoliczka)			
		Pachydesmoceras	aff. denisonianum	(Stoliczka)	Hashimoto et al.(1965)		
		Pachydesmoceras	sp. [denisonianus-form]		Hashimoto et al.(1965)		
X		Pachydesmoceras	aff. kossmati	Matsumoto	Matsumoto et al.(in Matsumoto, 1988), Nishida et al.(1996, 1997)	horizon undecided (partly)	
X		Pachydesmoceras	kossmati	Matsumoto			
X		Pachydesmoceras	pachydiscoide	Matsumoto			
X		Pachydesmoceras	mihoense	(Matsumoto)			
		Pachydesmoceras	aff. mihoense	(Matsumoto)	Matsumoto (1982c)		
		Pachydesmoceras	sp.				
		Pachydesmoceras(?)	sp.				
X		Epipuzosia	maya	Matsumoto & Kawashita			
X		Jimboiceras	planulatiforme	(Jimbo)			
		Jimboiceras	sp.				
		Jimboiceras(?)	sp.				
X		Austniceras	austeni	(Sharpe)			
X		Austniceras	nipponicum	(Matsumoto)			
		Austniceras	sp.				
X		Grandidiericeras	nagai	Matsumoto & Saito			
X		Kitchinites (Neopuzosia)	ishikawai	(Jimbo)		refer Maeda (1993)	
X		Kitchinites (Neopuzosia)	haboroensis	Matsumoto & Inoma		refer Maeda (1993)	
		Kitchinites (Neopuzosia)	aff. haboroensis	Matsumoto & Inoma	Obata et al.(1978)	occurrence from a falling rock; refer Maeda (1993)	



Table 6 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 5 -							
check of species	Suborder						
	Superfamily						
	Family						
	Subfamily						
	Genus	species	author	References*	Remarks	System	Japanese scale
X	Kitchinites (Neopuzosia)	japonicus	Spath		refer Maeda (1993)		
	Kitchinites (Neopuzosia)	sp.					
	BEUDANTICERATINAE						
X	Uhligella	matsushimensis	(Shimizu)				
	Uhligella(?)	sp.			horizon unknown		
	DESMOCERATINAE						
X	Desmoceras (Desmoceras)	latidorsatum	(Michelin)				
X	Desmoceras (Desmoceras)	latidorsatum complanatum	Jacob				
X	Desmoceras (Desmoceras)	aff. latidorsatum complanatum	Jacob	Futakami (1996)			
X	Desmoceras (Desmoceras)	kossmati	Matsumoto				
X	Desmoceras (Desmoceras)	aff. kossmati	Matsumoto	Hayakawa & Nishino (1999)			
	Desmoceras (Desmoceras)	sp.					
X	Desmoceras (Pseudouhligella)	dawsoni	Whiteaves				
X	Desmoceras (Pseudouhligella)	dawsoni shikokuense	(Yabe & Shimizu)				
X	Desmoceras (Pseudouhligella)	cf. vetus	Murphy & Rodda				
X	Desmoceras (Pseudouhligella)	japonicum	Yabe				
X	Desmoceras (Pseudouhligella)	ezoanum	Matsumoto				
X	Desmoceras (Pseudouhligella(?))	poronaicum	Yabe				
	Desmoceras (Pseudouhligella)	sp.					
	Desmoceras	sp. [similar to D. dawsoni shikokuense]		Nishida et al.(1993a)			
	Desmoceras	sp.					
	Desmoceras (s.l.)	sp.					
	Desmoceras ?	sp.					
X	Microdesmoceras	tetragonaum	Matsumoto & Muramoto				
X	Tragodesmoceroides	subcostatus	Matsumoto				
	aff. Tragodesmoceroides	subcostatus	Matsumoto	Nishida et al.(1997)	occurrence from a falling rock		
X	Tragodesmoceroides	matsumotoi	Hirano, Okamoto & Hattori				
X	Tragodesmoceroides	sp. A		Sekine et al.(1985)			
	Tragodesmoceroides	sp.					
	Tragodesmoceroides(?)	sp.					
X	Damesites	laticarinatus	Saito & Matsumoto				
X	Damesites	ainuanus	Matsumoto				
X	Damesites	aff. ainuanus	Matsumoto	Tanabe et al.(1977)			
X	Damesites	damesi	(Jimbo)				
X	Damesites	damesi intermedius	Matsumoto				
X	Damesites	aff. damesi intermedius	Matsumoto	Sekine et al.(1985)			
X	Damesites	semicostatus	Matsumoto				
X	Damesites	sugata	(Forbes)				
X	Damesites	aff. sugata	(Forbes)	Matsumoto & Obata (1956), Obata et al.(1973)			
X	Damesites	hetonaensis	Matsumoto				
X	Damesites	sp. B		Sekine et al.(1985)			
	Damesites	sp.					
X	Desmophyllites	diphyllloides	(Forbes)				
	Desmophyllites	sp.					
	HAUERICERATINAE						
X	Hauericeras (Gardeniceras)	angustum	Yabe				
	Hauericeras(?)	aff. angustum	Yabe	Matsumoto & Yoshimatsu (1982)			
X	Hauericeras (Gardeniceras)	cf. rembda	(Forbes)				
	Hauericeras	sp.					
	Hauericeras(?)	sp.					
	Desmoceratidae gen. et sp. indet.						
	SILESTITIDAE						
X	Silesites	aff. seranonis	(d'Orbigny)	Obata & Ogawa (1976)			
	Silesites(?)	sp.					
X	Miyakoceras	tanohatense	Obata				
X	Miyakoceras	aff. tanohatense	Obata	Obata (1967b)			
X	Miyakoceras	hayamii	Obata				
	Miyakoceras(?)	sp.					
	Silesitidae gen. et sp. indet.						
	KOSSMATICERATIDAE						
	MARSHALLITINAE						
X	Hulenites	aff. alaskana	(Imlay)	Matsumoto & Harada (1964), Obata & Futakami (1975)			
X	Hulenites	n. sp.(?) aff. H. reesidei	(Anderson)	Matsumoto (1978b)	horizon undecided		
	Hulenites	sp.					
	Hulenites(?)	sp.					
X	Marshallites	cumshewaensis	(Whiteaves)				
X	Marshallites	aff. cumshewaensis	(Whiteaves)	Obata et al.(1981), Matsumoto & Inoma (in Matsumoto, 1991b)	occurrence from a falling rock		
X	Marshallites	kossmati	Matsumoto & Inoma				
X	Marshallites	aff. hashimotoi	(Matsumoto & Inoma)	Nishida et al.(1997)			
X	Marshallites	compressus	Matsumoto				
X	Marshallites	olcostephanoides	Matsumoto				
X	Marshallites	aff. olcostephanoides	Matsumoto	Nishida et al.(1997)			



Table 7 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 6 -							
check of species	Suborder		species	author	References*	Remarks	System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus						
X		Marshallites	hendersoni	Matsumoto & Takahashi			
X		Marshallites	aff. hendersoni	Matsumoto & Takahashi	Matsumoto & Inoma (in Matsumoto, 1991b), Nishida et al.(1997)		
X		Marshallites	virgatoides	Matsumoto & Takahashi			
X		Marshallites	involutus	Matsumoto & Saito			
X		Marshallites	rotundatus	Matsumoto & Takahashi			
X		Marshallites	miyakoensis	Obata & Futakami			
X		Marshallites(?)	n. sp.		Nishida et al.(1997)		
		Marshallites	sp.				
		Marshallites?	sp.				
X		Yeharaites	canadensis	(McLearn)			
X		Yeharaites	kobayashii	Matsumoto & Takahashi			
X		Yeharaites	kawashitai	Matsumoto			
X		Yakushicerias	takahashii	Matsumoto			
X		Maccarthites	mikasaensis	Matsumoto, Takahashi & Sanada			
X		Maccarthites	aff. mikasaensis	Matsumoto, Takahashi & Sanada	Matsumoto & Takahashi (in Matsumoto, 1991b)	occurrence from a falling rock	
X		Protokossmaticeras	madagascariense	Collignon			
X		Protokossmaticeras	yezoense	Matsumoto & Takahashi			
X		Holcodiscoides	aquarius	Matsumoto & Takahashi			
X		Holcodiscoides	pussilus	Matsumoto & Takahashi			
		Holcodiscoides	sp.				
X		Eogunnarites	unicus	(Yabe)			
X		Eogunnarites	pentagonus	Matsumoto & Takahashi			
X		Eogunnarites	sanadai	Matsumoto & Takahashi			
X		Eogunnarites	hashimotoi	Matsumoto & Inoma		occurrence from a falling rock	
X		Eogunnarites	tanakai	Hayakawa			
		Eogunnarites	sp.				
		Eogunnarites(?)	sp.			horizon undecided	
X		Sounaites	alaskaensis	(Matsumoto)			
X		Sounaites	hokkaidoensis	Matsumoto & Inoma			
X		Sounaites	aff. hokkaidoensis	Matsumoto & Inoma	Matsumoto & Inoma (in Matsumoto, 1991b), Nishida et al.(1996)		
		Sounaites(?)	sp. (juvenile)				
X		Mikasaites	orbicularis	Matsumoto			
X		Eomadrasites	nipponica	Matsumoto			
X		Eomadrasites	aff. nipponica		Nishida et al.(1996)	occurrence from a falling rock	
X		Eomadrasites	subnipponicus	Matsumoto			
X		Eomadrasites	robustus	Matsumoto & Takahashi			
		Eomadrasites(?)	sp.			occurrence from a falling rock	
X		Wellmanites	japonicus	Matsumoto, Takahashi & Sanada			
		Marshallitinae gen. et sp. indet., nov.(?)			Matsumoto (1955a)		
KOSSMATICERATINAE							
X		Kossmaticeras	pachystoma	(Kossmat)		occurrence from a falling rock	
X		Kossmaticeras	japonicum	Matsumoto			
X		Kossmaticeras	sp. $\beta$ aff. K. japonicum	Matsumoto	Matsumoto et al.(1957)		
X		Kossmaticeras	theobaldianum	(Stoliczka)			
X		Kossmaticeras	aff. theobaldianum	(Stoliczka)	Tanabe et al.(1977)	occurrence from a falling rock	
X		Kossmaticeras	flexuosum	Matsumoto			
		Kossmaticeras	sp. $\gamma$		Matsumoto et al.(1957)		
		Kossmaticeras	sp.				
		Kossmaticeras(?)	sp.			horizon unknown	
X		Yokoyamaoceras	ornatum	Matsumoto			
X		Yokoyamaoceras	minimum	Matsumoto			
		Yokoyamaoceras	aff. minimum	Matsumoto	Obata & Futakami (1977)		
X		Yokoyamaoceras	kotoi	(Jimbo)		refer Maeda (1993)	
X		Yokoyamaoceras	jimboi	Matsumoto		refer Maeda (1993)	
X		Yokoyamaoceras	mysticum	Matsumoto			
X		Yokoyamaoceras	yokoi	Matsumoto			
		Yokoyamaoceras	aff. yokoi	Matsumoto	Matsumoto (1991b)		
		Yokoyamaoceras	sp. a		Hashimoto et al.(1965)		
		Yokoyamaoceras	sp. b		Hashimoto et al.(1965)		
		Yokoyamaoceras	sp.				
X		Maorites	sp.				
X		Pseudokossmaticeras	yagii	Matsumoto		occurrence from a falling rock	
CLEONICERATIDAE							
X		Leconteites	lecontei	(Anderson)		occurrence from a falling rock	
X		Brewericeras	enorme	Matsumoto			
PACHYDISCIDAE							
X		Tongoboryceras	kawashitai	Matsumoto			
X		Tongoboryceras	satoi	Matsumoto		occurrence from a falling rock	
		Lewesiceras(?) or Tongoboryceras(?)	sp. (juvenile)				
X		Nowakites	mikasaensis	Matsumoto			
X		Nowakites	yubarensis	Matsumoto			
X		Canadoceras	yokoyamai	(Jimbo)			



Table 8 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 7 -								
check of species	Suborder							System
	Superfamily							Stage
	Family							Substage
	Subfamily							Japanese scale
	Genus	species	author	References*	Remarks			
X	Canadoceras	kossmati	Matsumoto					
X	Canadoceras	multicostatum	Matsumoto					
X	Canadoceras	mysticum	Matsumoto					
X	Canadoceras	compressum	Matsumoto					
X	Canadoceras	minimum	Matsumoto & Miyauchi					
X	Canadoceras	tanii	Matsumoto & Morozumi					
X	Canadoceras	cf. cottraui	Collignon			horizon unknwn		
	Canadoceras	sp.						
X	Teshioites	ryugasensis	Matsumoto					
X	Teshioites	teshioensis	Matsumoto					
	Teshioites(?)	sp.				horizon undecided		
X	Patagiosites	laevis	Morozumi					
	Patagiosites(?)	sp.						
X	Menuites	cf. menu	(Forbes)			locality unknown		
X	Menuites	japonicus	Matsumoto					
X	Menuites	pusillus	Matsumoto					
X	Menuites	aff. sturi	(Redtenbacher)	Matsumoto (1955b)				
X	Menuites	sanadai	Matsumoto					
	Menuites	sp.						
	Menuites(?)	sp.				horizon undecided		
X	Anapachydiscus	sutneri	(Yokoyama)					
X	Anapachydiscus	deccanensis yezoensis	Matsumoto					
	Anapachydiscus	aff. deccanensis yezoensis	Matsumoto	Futakami (1986a)		horizon undecided		
X	Anapachydiscus	cf. deccanensis	(Stoliczka)					
X	Anapachydiscus (Neopachydiscus)	fascicostatus	(Yabe)					
X	Anapachydiscus (Neopachydiscus)	aff. fascicostatus	(Yabe)	Toshimitsu (1988)				
X	Anapachydiscus (Neopachydiscus)	naumanni	(Yokoyama)					
X	Anapachydiscus(?)	subtililobatus	(Jimbo)					
	Anapachydiscus	sp.						
	Anapachydiscus(?)	sp.				horizon undecided		
X	Pseudomenites	sp.						
X	Eupachydiscus	keramasatoshii	Matsumoto					
X	Eupachydiscus	haradai	(Jimbo)					
X	Eupachydiscus	teshioensis	(Jimbo)					
	Eupachydiscus	sp.						
X	Urakawites	rotalinooides	(Yabe)					
X	Urakawites	aff. binodotus	(Whiteaves)	Matsumoto (1955b)				
X	Pachydiscus (Pachydiscus)	awajiensis	Morozumi					
X	Pachydiscus (Pachydiscus)	aff. awajiensis	Morozumi	Morozumi (1985)				
X	Pachydiscus (Pachydiscus)	kobayashii	(Shimizu)					
X	Pachydiscus (Pachydiscus)	excelsus	Matsumoto					
X	Pachydiscus (Pachydiscus)	flexuosus	Matsumoto			refer Naruse et al.(2000)		
X	Pachydiscus (Pachydiscus)	aff. flexuosus	Matsumoto	Matsumoto et al.(1979), Matsumoto & Morozumi (1980)				
X	Pachydiscus (Pachydiscus)	hidakaensis	Matsumoto & Kanie					
X	Pachydiscus (Pachydiscus)	subcompressum	Matsumoto					
X	Pachydiscus (Pachydiscus)	aff. subcompressum	Matsumoto	Morozumi (1985)				
X	Pachydiscus	soyaensis	Matsumoto & Miyauchi					
X	Pachydiscus	sahekii	Matsumoto & Miyauchi					
X	Pachydiscus	pregertoni	Collignon					
X	Pachydiscus	cf. suciaensis	(Meek)					
X	Pachydiscus	cf. buckhami	Usher			horizon undecided		
X	Pachydiscus (Neodesmoceras)	gracilis	Matsumoto					
X	Pachydiscus (Neodesmoceras)	japonicus	Matsumoto					
	Pachydiscus (Neodesmoceras)	sp. (juvenile)						
X	cf. Pachydiscus	ootacodensis	(Stoliczka)					
	Pachydiscus	sp.						
	Pachydiscus(?)	sp.						
	MUNIERICERATIDAE							
X	Muniericeras(?)	sp.						
	PULCHELLACEAE							
	PULCHELLIIDAE							
X	Nicklesia(?)	sp.						
X	Pulchellia	ishidoensis	Yabe & Shimizu					
X	Pulchellia	compressissima	(d'Orbigny)					
X	Pulchellia (Heinzia)	cf. provincialis	(d'Orbigny)			horizon undecided		
	Pulchellia (Pulchellia)	sp.						
	Pulchellia	sp.						
	Pulchellia(?)	sp.						
	HOPLITACEAE							
	HOPLITIDAE							
	ANAHOPLITINAE							
X	Anahoplites(?)	sp.				horizon undecided		





Table 9 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 8 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
	HOPLITINAE						
X	Hoplites [or Epileymeriella]	sp.					
	hoplitid gen. et sp. indet.						
	SCHLOENBACHIIDAE						
X	Schloenbachia	sp.					
	PLACENTICERATIDAE						
X	Metaplacenticeras	subtilistriatum	(Jimbo)				
X	Hoplitoplacenticeras	monju	Matsumoto				
X	Hoplitoplacenticeras	fugen	Matsumoto				
	?ENGONOCERATIDAE						
X	Platknemiceras	caseyi	Matsumoto				
X	Engonoceras	aff. stolleyi	(Boehm)	Tashiro et al.(1980a), Tanaka et al.(1984)			
	Engonoceras(?)	sp. young					
	Hoplitaceae gen. et sp. indet.						
	ACANTHOCERATACEAE						
	LEYMERIELLIDAE						
	?Proleymeriella	sp.					
X	Epileymeriella	aff. hitzeli	(Jacob)	Obata & Matsumoto (1977) Matsumoto et al.(1980b)		not fully identified	
	BRANCO CERATIDAE						
	BRANCO CERATINAE						
X	Hysteroceeras	orbignyi	(Spath)				
X	Hysteroceeras	subbinum	Spath				
X	Hysteroceeras	cf. bucklandi	(Spath)				
X	Hysteroceeras	aff. carinatum	Spath	Tashiro et al.(1980a)			
	Hysteroceeras	sp. A		Tashiro et al.(1980a)			
	Hysteroceeras	sp. B		Tashiro et al.(1980a)			
	Hysteroceeras	sp.					
	Hysteroceeras(?)	sp.					
X	Neokentoceras	sp.					
	MOJSISOVICZINAE						
	Oxytropidoceras	sp.					
	Oxytropidoceras (Adkinsites)	sp.					
X	Oxytropidoceras (s.s.)	aff. roissyanum	(d'Orbigny)	Obata & Muramoto (1966a)			
X	Oxytropidoceras (Manuaniceras)	aff. elaboratum	Young	Futakami (1982)			
X	Diploceras	pseudoon	Spath				
X	Diploceras	cf. strigilis	(Hoepen)				
X	Diploceras	aff. cristatum	(Deluc)	Futakami (1996)			
X	Diploceras	aff. bauchardianum	(d'Orbigny)	Futakami (1982)			
X	Diploceras (Diploceras)	cf. fredericksburgense	Scott				
X	Diploceras (Diplasioceras)	sp. nov.(?)		Matsumoto & Obata (1982a)			
X	Diploceras (Diplasioceras)	tosaeense	Matsumoto & Hirata				
	Diploceras?	sp.					
	Mojsisovicziniae gen. et sp. indet.					horizon undecided	
	MORTONICERATINAE						
X	Mortoniceras (Mortoniceras)	rostratum	(Sowerby)				
X	Mortoniceras (Mortoniceras)	cf. geometricum	Spath				
X	Mortoniceras (Mortoniceras)	cf. stoliczkaei	(Spath)				
X	Mortoniceras (Mortoniceras)	aff. inflatum	(Sowerby)	Obata et al.(1981)			
X	Mortoniceras (Mortoniceras)	cf. minor	Spath				
X	Mortoniceras (Mortoniceras)	cf. pricei	(Spath)				
	Mortoniceras (Mortoniceras)	aff. hulenum	(Anderson)	Obata & Matsumoto (1977)			
	Mortoniceras (Mortoniceras)	sp.					
X	Mortoniceras (Deiradoceras)	aff. varinodosum	(Hoepen)	Nishida et al.(1996, 1997)			
X	Mortoniceras (Deiradoceras)	aff. balmatianum	(Pictet)	Obata & Futakami (1975, 1977)			
X	Mortoniceras (Deiradoceras)	devonense	Spath				
X	Mortoniceras (Deiradoceras)	aff. albense	Spath	Obata & Futakami (1975, 1977)			
X	Mortoniceras (Deiradoceras)	bispinosum	(Spath)				
X	Mortoniceras (Deiradoceras)	aff. besairiei	Collignon	Obata & Matsumoto (1977), Matsumoto et al.(1991)			
	Mortoniceras (Deiradoceras)	sp.					
X	Mortoniceras (Duranovarites)	cf. subquadratum	(Spath)				
	Mortoniceras (Duranovarites)	sp.					
X	Mortoniceras	cf. kiliani	(Lasswitz)				
	Mortoniceras	sp. [similar to Cantab. subsimplex or C. minor ]		Matsumoto et al.(1991)			
	Mortoniceras (s.l)	sp.					
	Mortoniceras	sp.					
	Mortoniceratinae	gen. et sp. indet.				occurrence from a falling rock	
	Goodhallites(?)	sp.					
X	Neoharpoceras(?)	sp.					
X	Prohysteroceeras (Goodhallites)	aff. candolinum	(Pictet)	Obata et al.(1981)			
	Prohysteroceeras	sp. indet.					
X	Cantabrigites	imaii	(Yabe & Shimizu)				
X	Cantabrigites	subsimplex	Spath				
	Cantabrigites	sp.					



Table 10 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 9 -							
check of species	Suborder						
	Superfamily						
	Family						
	Subfamily						
	Genus	species	author	References*	Remarks	System	
						Stage	
						Substage	
						Japanese scale	
X	Algericeras	proratum	(Coquand)				
X	Euhystrioceras	nicaisei	(Coquand)				
	Euhystrioceras	sp.				occurrence from a falling rock	
	LYELLICERATIDAE						
	LYELLICERATINAE						
X	Prolyellicerias?	sp.					
X	Lyellicerias	cf. lyelli	(d'Orbigny)				
	Lyellicerias	sp.				occurrence from a falling rock	
	STOLICZKAIINAE						
X	Neophlyticeras	aff. spathi	Breistroffer		Obata & Futakami (1975, 1977)		
X	Neophlyticeras	aff. blancheti	(Pictet & Campiche)		Nishida et al.(1997)		
	Neophlyticeras(?)	sp.					
X	Stoliczkaia (Stoliczkaia)	aff. dispar	(d'Orbigny)		Obata et al.(1981)		
X	Stoliczkaia (Stoliczkaia)	cf. clavigera	Neumayr			occurrence from a falling rock	
X	Stoliczkaia (Stoliczkaia)	aff. tetragona	Neumayr		Matsumoto & Inoma (1975)	occurrence from a falling rock	
X	Stoliczkaia (Stoliczkaia)	yezoana	Matsumoto & Inoma			occurrence from a falling rock	
X	Stoliczkaia (Stoliczkaia)	dorsetensis	Neumayr				
X	Stoliczkaia (Lamnyella)	amanoi	Matsumoto & Inoma			refer Matsumoto (1980)	
X	Stoliczkaia (Lamnyella)	sanctacatherinae	Wright & Kennedy				
X	Stoliczkaia (Lamnyella)	cf. juigneti	Wright & Kennedy				
X	Stoliczkaia (Lamnyella)	aff. concinna	(Chiriac)		Nishida et al.(1996)		
X	Stoliczkaia (Shumarinaia)	hashimotoi	Matsumoto & Inoma				
X	Stoliczkaia (Shumarinaia)	asiatica	Matsumoto & Inoma				
	Stoliczkaia (Shumarinaia)	sp.					
X	Stoliczkaia	japonica	(Matsumoto)			refer Matsumoto (1980)	
	Stoliczkaia	spp.					
	Stoliczkaia (?)	sp.					
	Lyelliceratid? indet.					horizon unknown	
	FLICKIIDAE						
	SALAZICERATINAE						
X	Neosaynoceras(?)	sp.				horizon undecided	
	FLICKIINAE						
X	Ficheuria	pussilla	Matsumoto & Inoma				
	FORBESICERATIDAE						
X	Forbesiceras	largilliertianum	(d'Orbigny)				
X	Forbesiceras	mikasaensis	Matsumoto				
X	Forbesiceras	cf. obtectum	(Sharpe)				
X	Forbesiceras	beaumontianum	(d'Orbigny)				
	Forbesiceras	sp.					
	ACANTHOCERATIDAE						
	MANTELLICERATINAE						
X	Mantelliceras	japonicum	Matsumoto, Muramoto & Takahashi				
X	Mantelliceras	aff. japonicum	Matsumoto, Muramoto & Takahashi		Matsumoto & Takahashi (1992)		
X	Mantelliceras	cf. couloni	(d'Orbigny)				
X	Mantelliceras	cantianum	Spath				
X	Mantelliceras	saxbii	(Sharpe)				
X	Mantelliceras	brazoense	Böse				
	Mantelliceras	sp. A			Obata & Muramoto (1966a )		
	Mantelliceras	sp. A'			Obata & Muramoto (1966a )		
	Mantelliceras	sp. B			Obata & Muramoto (1966a )		
	Mantelliceras	sp. B'			Obata & Muramoto (1966a )		
	Mantelliceras	sp. C			Obata & Muramoto (1966a )		
	Mantelliceras	sp. C'			Obata & Muramoto (1966a )		
	Mantelliceras	sp. (group of M. saxbii)			Nishida et al.(1996)		
	Mantelliceras	sp. of martimprayi group			Hashimoto et al.(1965)		
X	Mantelliceras(?)	nagaii	Matsumoto, Saito & Fukada			horizon undecided	
	Mantelliceras	sp.					
	Mantelliceras(?)	sp.				horizon undecided	
	"Submantelliceras"	sp.			Nishida et al. (1997)		
	cf. "Ammonites"	aumalense"	Coquand		Nishida et al. (1997)		
X	Utaturiceras	cf. discoidale					
X	Utaturiceras	vicinale	(Stoliczka)				
X	Utaturiceras	n. sp.			Nishida et al.(1996)		
	Utaturiceras	sp.					
X	Graysonites	wooldridgei	Young				
X	Graysonites	adkinsi	Young				
X	Graysonites	aff. adkinsi	Young		Matsumoto & Inoma (1975)		
X	Graysonites	cf. fountaini	Young				
	Graysonites	sp.					
	Graysonites(?)	sp. indet.					
	Graysonites(?)	sp. indet. $\beta$			Matsumoto (1960)		
X	Sharpeiceras	mexicanum	(Böse)				
X	Sharpeiceras	mocambiquense	(Choffat)				



Table 11 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 10 -							
check of species	Suborder						
	Superfamily						
	Family						
	Subfamily						
	Genus	species	author	References*	Remarks	System Stage	Substage
							Japanese scale
X	Sharpeiceras	kikuae	Matsumoto & Kawashita				
X	Sharpeiceras	florencae	Spath				
X	Sharpeiceras	kongo	Matsumoto, Muramoto & Takahashi				
ACANTHOCERATINAE							
X	Acompsoceras	renevieri	(Sharpe)				
X	Acanthoceras	coringerum	Crick				
X	Acanthoceras	rhotomagense	(Brongnart)				
X	Acanthoceras	jukesbrownei	(Spath)			horizon undecided	
	Acanthoceras	sp.					
X	Cunningtoniceras	takahashii	(Matsumoto)				
X	Cunningtoniceras	cf. diadema	(Spath)				
X	Cunningtoniceras	meridionale	(Stoliczka)				
X	Cunningtoniceras	amphibolum	(Morrow)				
X	Cunningtoniceras	aff. inerme	(Pervinquieré)	Matsumoto et al.(1957, 1989c)		occurrence from a falling rock	
X	Cunningtoniceras	cunningtoni	(Sharpe)				
	Cunningtoniceras	aff. cunningtoni	(Sharpe)	Matsumoto & Obata (1982b)			
X	Cunningtoniceras	lonsdalei	(Adkins)				
X	Cunningtoniceras	aff. lonsdalei	(Adkins)	Matsumoto et al.(1989c)			
X	Cunningtoniceras	asura	(Matsumoto & Muramoto)				
	Cunningtoniceras	sp.					
X	Protacanthoceras	sp.					
X	Sumitomoceras	faustum	Matsumoto & Muramoto				
X	Watnoceras(?)	sp.				somewhat questionable	
X	Calycoceras (Calycoceras)	cf. naviculare	(Mantell)				
X	Calycoceras (Calycoceras)	aff. naviculare	(Mantell)	Matsumoto (1975, 1982c), Matsumoto et al.(1991)			
X	Calycoceras (Calycoceras)	bathymphalum	(Kossmat)				
X	Calycoceras (Newboldiceras)	newboldi	(Kossmat)				
X	Calycoceras (Newboldiceras)	vergonsense	(Collignon)				
X	Calycoceras (Newboldiceras)	asiaticum	(Jimbo)				
X	Calycoceras (Newboldiceras)	orientale	Matsumoto, Saito & Fukada				
X	Calycoceras (Newboldiceras)	spinusum	(Kossmat)				
X	Calycoceras	cf. stoliczkai	Collignon				
X	Calycoceras	sp. nov. aff. C. crassum	Thomel	Matsumoto (1975)			
	Calycoceras	sp. nov.(?)		Matsumoto et al.(1957)		horizon unknown	
	Calycoceras (Newboldiceras)	sp.					
	Calycoceras	sp.					
	Calycoceras	sp. indet. $\alpha$		Matsumoto et al.(1957)			
	Calycoceras	sp. indet. $\beta$		Matsumoto et al.(1957)			
	Calycoceras(?)	sp. young					
X	Tunesites(?)	sp. young					
X	Eucalycoceras	cf. spathi	(Collignon)				
	Eucalycoceras	aff. spathi	(Collignon)	Matsumoto (1975), Matsumoto et al.(1991)			
X	Eucalycoceras	pentagonum	(Jukes-Browae)				
X	Eucalycoceras(?)	aff. collignoni	(Fabre)	Matsumoto & Kawano (1975)			
X	Pseudocalyoceras	dentonense	(Moreman)				
EUOMPHALOCERATINAE							
X	Lotzeites	aberrans	(Kossmat)				
X	Euomphaloceras	septemseriatum	(Cragin)				
X	Kamerunoceras	turonense	(d'Orbigny)				
X	Kamerunoceras	shimizui	(Matsumoto)				
	Kamerunoceras	sp.					
X	Pseudaspidoceras	flexuosum	Powell				
X	Pseudaspidoceras	sorachiense	Matsumoto & Hashimoto				
X	Pseudaspidoceras	regina	Matsumoto, Fujishima & Miyauchi				
	Pseudaspidoceras	aff. footeanum					
	Pseudaspidoceras(?)	sp.	(Stoliczka)	Matsumoto et al.(1978a)		horizon and locality unknown	
X	Romaniceras	sp. nov.		Matsumoto & Suekane (1987)			
X	Romaniceras	deverianum	(d'Orbigny)				
X	Romaniceras	ornatissimum	(Stoliczka)				
X	Romaniceras [n.gen.?)	aequicostatum	Matsumoto			occurrence from a falling rock	
X	Romaniceras (Romaniceras)	sp. nov.(?) aff. kallei	(Zazvorka)	Matsumoto (1982c)			
	Romaniceras	sp.					
	Romaniceras(?)	sp.					
X	Neomphaloceras	pseudomphalum	(Matsumoto)				
X	Neomphaloceras	costatum	(Matsumoto & Kawashita)				
X	Yubariceras	cf. kanei	(Jones)			horizon unknown	
	Yubariceras	aff. kanei	(Jones)	Matsumoto & Yoshimatsu (1982)			
X	Yubariceras	yubarense	Matsumoto, Saito & Fukada				
X	Yubariceras	aff. adkinsi	(Jones)	Matsumoto et al.(1957, 1969)			
X	Yubariceras	japonicum	Matsumoto, Saito & Fukada				
X	Yubariceras	aff. japonicum	Matsumoto, Saito & Fukada	Matsumoto (1975)			
X	Yubariceras	otatumei	(Matsumoto, Saito & Fukada)				
X	Yubariceras	fujishimai	Matsumoto				

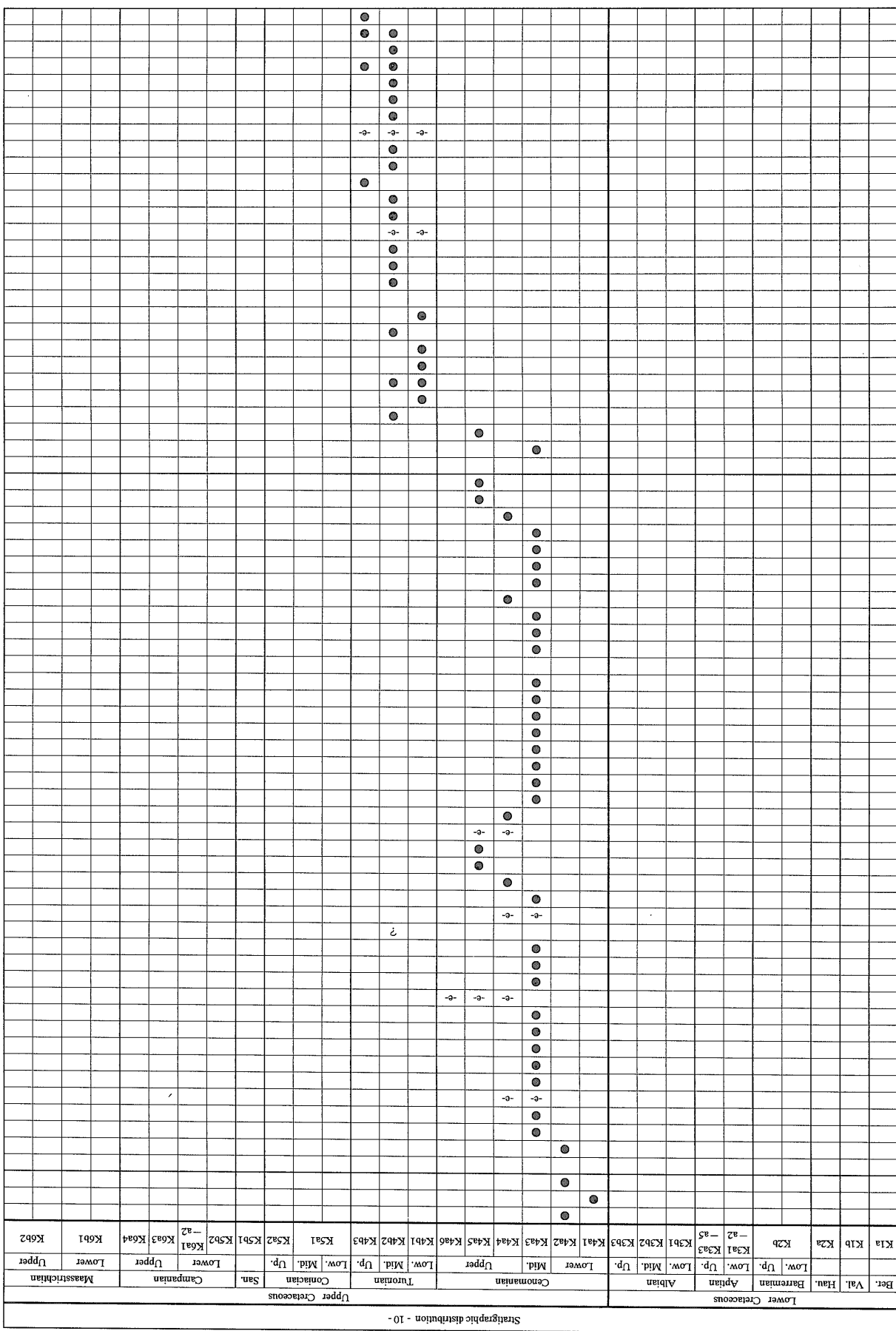


Table 12 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 11 -							
check of species	Suborder		Superfamily				System
	Family						Stage
	Subfamily						Substage
	Genus		species	author	References*	Remarks	Japanese scale
X		Yubariceras	sp. nov.(?)		Matsumoto (1975)		
		Yubariceras	sp.				occurrence from a falling rock
		Yubariceras(?)	sp.				
X		Obiraceras	ornatum	Matsumoto			
X		Shuparoceras	abei	Matsumoto			
X		Shuparoceras	yagii	Matsumoto			
		MAMMITINAE					
X		Metoicoceras(?)	sp. young				horizon undecided
X		Mammites	aff. nodosoides	(Schlüter)	Matsumoto (1991a), Matsumoto et al.(1991)		
X		Mammites	sp. nov.(?) [different from M. aff. nodosoides]		Matsumoto (1991a)		
		Mammites	sp.				
		VASCOCERATIDAE					
X		Vascoceras	durandi	(Thomas & Peron)			
X		Vascoceras	aff. durandi	(Thomas & Peron)	Matsumoto (1973), Tanabe et al.(1977), Matsumoto & Muramoto (1978), Sekine et al.(1985), Asai & Hirano (1990), Nishida et al.(1996)		
		Vascoceras	sp.				
X		Neoptychites	cephalotus	(Courtiller)			
X		Fagesia	thevestensis	(Peron)			
X		Fagesia	japonica	Matumoto & Muramoto			
X		Fagesia	spheroidalis	Pervinquière			
X		Fagesia	cf. rudra	(Stoliczka)			
		Fagesia	sp.				
		Fagesia(?)	sp.				
		PSEUDOTISSOTIDAE					
		HOURCQUINAE					
X		Hourcquia	mirabilis	Collignon			
X		Hourcquia	kawashitai	Matsumoto & Toshimitsu			
X		Hourcquia	ingens	Collignon			occurrence from a falling rock
X		Hourcquia	hataii	Hashimoto			occurrence from a falling rock
		COLLIGNONICERATIDAE					
		COLLIGNONICERATINAE					
X		Collignoniceras	sp. nov.(?)		Matsumoto et al.(1966)		
X		Collignoniceras	woollgari	(Mantell)			
X		Collignoniceras	bravaisianum	(d'Orbigny)			
		Collignoniceras	sp.				
		Collignoniceras(?)	sp.				
X		Subprionocyclus	minimus	(Hayasaka & Fukada)			
X		Subprionocyclus	neptuni	(Geinitz)			
		Subprionocyclus?	sp. A		Obata & Futakami (1975)		
		Subprionocyclus?	sp. B		Obata & Futakami (1975)		
		Subprionocyclus?	sp. C		Obata & Futakami (1975)		
		Subprionocyclus?	sp.				
		Subprionocyclus	spp.				
X		Lymaniceras	planulatum	Matsumoto			
X		Prionocyclus	novimexicanus	(Marcow)			
X		Prionocyclus	aberrans	Matsumoto			
X		Prionocyclus	cobbani	Matsumoto			
X		Prionocyclus	n. sp. aff. P. reesidei	Sidewell	Matsumoto et al.(1981a)		
		Prionocyclus	sp.				
X		Prionocycloceras	sigmoidale	Matsumoto			
X		Prionocycloceras	aff. lenti	(Gerhardt)	Matsumoto (1965a), Matsumoto et al.(1981d)		
X		Prionocycloceras	wrighti	Matsumoto			
X		Prionocycloceras	matsumotoi	Futakami			
X		Prionocycloceras	obatai	Futakami			
		Prionocycloceras	sp.				
		Collignoniceratidae gen. et sp. indet.					
		BARROISICERATINAE					
X		Niceforoceras(?)	japonicum	Matsumoto			
		Barroisiceras	sp.				
X		Barroisiceras	onilahyense	Basse			
X		Barroisiceras (Bassoceras)	inornatum	Matsumoto			
		Barroisiceras(?)	sp.				horizon undecided
X		Reesidites	latus	Matsumoto & Obata			
		Reesidites	sp.				
		Reesidites(?)	sp.				
X		Forresteria	petrocoriensis	(Coquand)			
X		Forresteria	harlei	(de Grossouvre)			
X		Forresteria	aff. itwebae	Hoepen	Toshimitsu (1985)		
X		Forresteria (Forresteria)	alluaudi	(Boule, Lemoine & Thévenin)			
X		Forresteria (Forresteria)	yezoensis	Matsumoto			
X		Forresteria (Forresteria)	muramotoi	Matsumoto			
X		Forresteria (Forresteria)	aff. muramotoi	Matsumoto	Teraoka & Obata (1975)		
		Forresteria (Forresteria)	sp.				









Table 14 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 13 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
	ANCYLOCERATINA						
	ANCYLOCERATACEAE						
	BOCHIANITIDAE						
	PROTANCYLOCERATINAE						
X	Leptoceras	cf. pumilum	(Uhlig)			horizon undecided	
	Leptoceras	sp.				horizon undecided; tentatively identified	
	BOCHIANITINAE						
X	Bochianites(?)	sp.					
X	Kabylites(?)	sp.					
	Bochianitidae gen. et sp. indet.						
	ANCYLOCERATIDAE						
	CRIOCERATINAE						
X	Crioceratites (Crioceratites)	cf. koechlini	(Astier)				
X	Crioceratites (Paracrioceras)	asisticum	(Matsumoto)				
	Crioceratites (Paracrioceras)	sp.				horizon undecided	
X	Crioceratites	ishiwairai	(Yabe & Shimizu)				
X	Crioceratites	yagii	(Yabe & Shimizu)			horizon undecided	
	Crioceratites	spp.					
	Crioceratites(?)	sp.				horizon undecided	
	Crioceratites (s.l.)	sp.				horizon undecided	
X	Crioceratites (Emericeras)	emerici	(Léveillé)				
X	Crioceratites (Emericeras)	cf. hoheneggeri	(Uhlig)				
	Crioceratites?	sp. indet.				horizon undecided	
	Crioceratites (Crioceratites)(?)	sp.					
	Paracrioceras	sp.					
	Paracrioceras(?)	sp.					
X	Pseudothurmannia	hanouraensis	Shimizu				
X	Pedioceras	stentor	Anderson				
X	Shastrioceras	nipponicum	Matsumoto				
X	Shastrioceras	aff. nipponicum	Matsumoto	Yokomizo et al.(1990)			
X	Shastrioceras	patricki	Murphy				
X	Shastrioceras	aff. patricki	Murphy	Obata et al.(1984)			
	Shastrioceras	sp. A				Obata & Ogawa (1976)	
X	Shastrioceras	intermedium	Matsukawa & Obata				
X	Shastrioceras	cf. poniente	Anderson			horizon undecided	
	Shastrioceras	sp.					
	Crioceratinae gen. et sp. indet.						
	ANCYLOCERATINAE						
X	Ancyloceras (Ancyloceras)	aff. vandenheckii	Astier		Noda (1977)		
X	Ancyloceras	giganteum	Yabe & Shimizu				
X	Ancyloceras	choshiense	Shimizu				
	Ancyloceras	sp.					
X	Lithancylus [or Ancyloceras]	aff. atrox	Anderson]			Obata & Ogawa (1976)	
X	Australiceras	aff. gigas	(Sowerby)			Obata et al.(1975, 1982)	
	Australiceras	sp. indet. aff. A. argus	Anderson			Matsumoto (1947)	
X	Australiceras	cf. robustum	Whitehouse			Matsumoto (1947)	
	Australiceras	sp.					
X	Tropaeum	cf. drewi	Casey				
X	Tropaeum	aff. bowerbanki	(Sowerby)			Obata et al.(1975, 1982)	
	HELICANCYLINAE						
X	Acrioceras	aff. tabarelli	(Astier)			Obata et al.(1976)	
X	Acrioceras(?)	aff. julivertii	Serna			Obata & Ogawa (1976)	
	Acrioceras	sp.					
	Acrioceras(?)	sp.					
X	Lytocrioceras(?)	furcatum	(d'Orbigny)				
	Lytocrioceras(?)	sp.					
	Lytocrioceras(?)	sp.					
	Lytocrioceras(?) or Heteroceras(?)	sp.					
	Hoplocrioceras(?)	spp.				horizon undecided (partly)	
X	cf. Hoplocrioceras	remondi	(Gabb)			horizon undecided	
X	Hamiticeras	sp.				somewhat questionable	
	Hamiticeras(?)	sp.				somewhat questionable	
	LEPTOCERATOIDINAE						
X	Hamulinites	sp.					
X	Karsteniceras(?)	asiaticum	(Yabe & Shimizu)				
X	Karsteniceras	obatai	Matsukawa				
	Ancyloceratidae gen. et sp. indet.						
	Ancyloceratidae(?) gen. et sp. indet.						
	Ancyloceratidae(?) or Turrititidae(?) gen. et sp. indet.						
	Ancyloceratidae or Turrititidae gen. et sp. indet.						
	HETERO CERATIDAE						
X	Uhligia	sp.					
X	Heteroceras (Heteroceras)	aff. astieri	d'Orbigny	Obata & Ogawa (1976)			

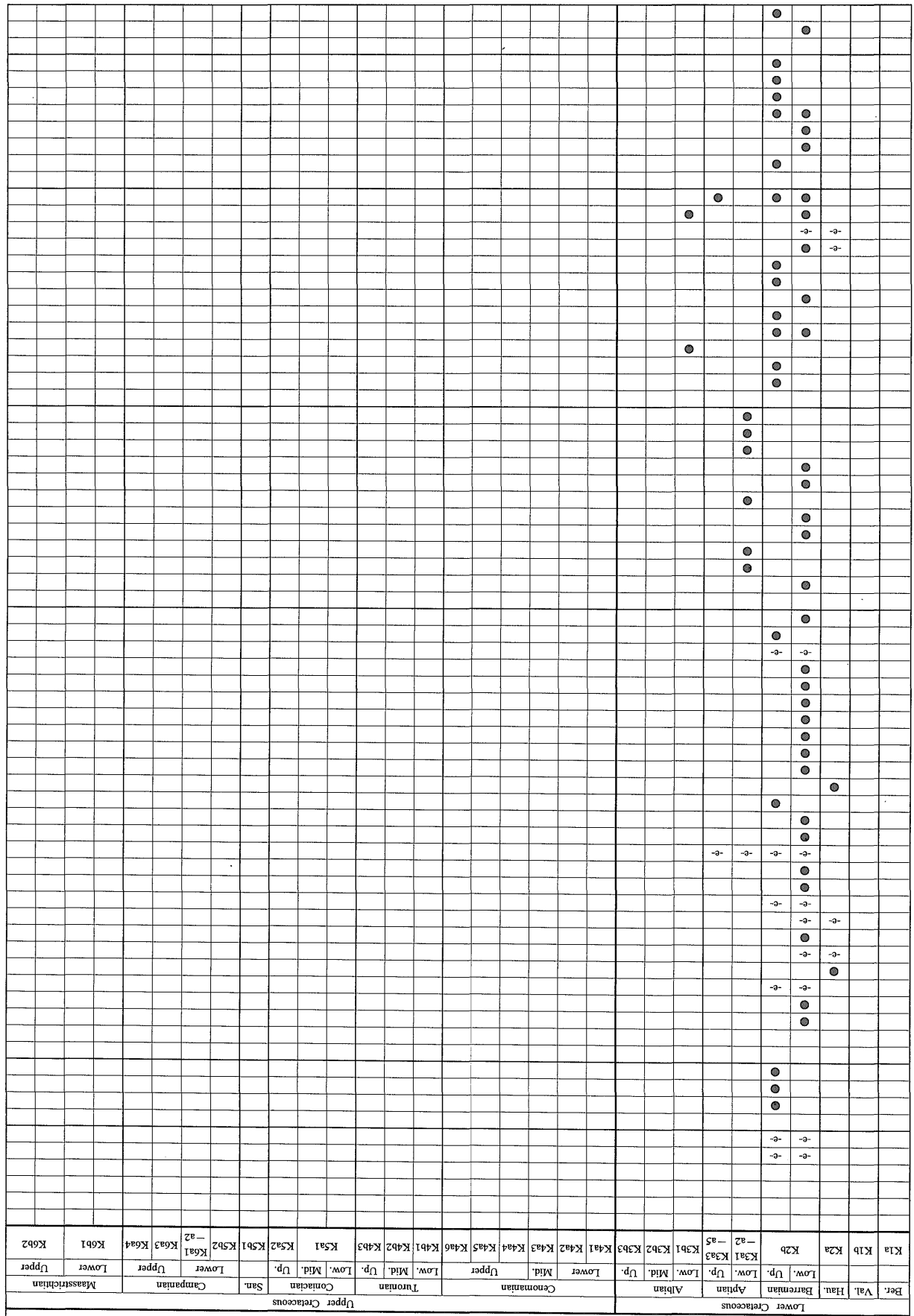


Table 15 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 14 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
	Heteroceras	sp.					
	Heteroceras(?)	sp.					
X	Heteroceras (Argvethites)	sp.					
	Heteroceratidae gen. et sp. indet.						
HAMULINIDAE							
	Hamulina?	sp. indet.					
X	Hamulina	aff. subalternata	Bresk		Obata & Ogawa (1976)		
X	Anahamulina	cf. subcylindrica	(d'Orbigny)				
	Anahamulina	aff. subcylindrica	(d'Orbigny)		Obata & Ogawa (1976)		
	Anahamulina	sp.					
	Anahamulina(?)	sp.					
PTYCHOCERATIDAE							
X	Euptychoceras(?)	sp.					
X	Ptychoceras	sp.					
	Ptychoceras(?)	sp.					
	ptychoceratid					horizon undecided	
	Ptychoceratidae gen. et sp. indet.						
	Ptychoceratidae(?) gen. et sp. indet.						
	Ptychoceratidae or Ancyloceratidae gen. et sp. indet.						
LABECERATIDAE							
X	Hamitoides	sp.					
?MACROSCAPHITIDAE							
	Macroscaphites(?)	sp.					
X	Macroscaphites	sp.					
	Ancyloceratidae or Turrititaceae gen. nov.(?)				Obata & Ogawa (1976)		
TURRILITACEAE							
ANISOCERATIDAE							
X	?Protanisoceras	cf. ierontuberculatus	(Leymry)				
X	Anisoceras	hashimotoi	Inoma				
X	Anisoceras	cf. plicatile	(Sowerby)				
X	Anisoceras	cf. armatum	Sowerby				
X	Anisoceras (Anisoceras)	pseudoelegans	Pictet & Campiche				
	Anisoceras	sp.				horizon undecided	
	Anisoceras?	sp. A [allied to Anisoceras or Idiohamites]			Hashimoto et al.(1965)?, Inoma (1980), Nishida et al.(1996)?	occurrence from a falling rock	
X	Anisoceras?	sp. B [similar to A. exoticum or Protanisoc. nodosum splendens ]			Hashimoto et al.(1965)?, Inoma (1980), Nishida et al.(1996)?	occurrence from a falling rock	
	Anisoceras?	sp.				occurrence from a falling rock	
X	Idiohamites	cf. subspiniger	Spath				
X	Idiohamites	cf. favrinus	(Pictet)				
X	Idiohamites	tuberculatus	(Sowerby)				
	Idiohamites	sp.					
	Idiohamites(?)	sp.					
X	Algerites	cf. proratum	(Coquand)				
X	Allocioceras	sp.					
	Allocioceras(?)	sp.					
	anisoceratid					horizon undecided	
	anisoceratid(?)					horizon undecided	
HAMITIDAE							
X	Hamites	cf. duplicatus	Pictet & Campiche				
X	Hamites	aff. gardneri	Spath		Obata et al.(1981)		
X	Hamites	cf. tenuicostatus	Spath				
X	Hamites	cf. compressus	Sowerby			horizon undecided	
	Hamites	aff. attenuatus	(Sowerby)		Yokomizo et al.(1990)		
X	Hamites	aff. intermedium	(Sowerby)		Shimizu (1931)		
	Hamites	sp.				somewhat questionable	
	Hamites (s.s.)	sp.					
	Hamites(?)	sp.				somewhat questionable	
X	Stomohamites	japonicus	Inoma				
	Stomohamites	sp.					
	Stomohamites(?)	sp.					
X	Psilohamites	sp.					
	similar to Psilohamites(?)	sp.			Nishida et al.(1996)		
X	Hemiptychoceras	ezoanum	Inoma				
X	Metaptychoceras	periodicum	Inoma				
TURRILITIDAE							
X	Turrilitoides(?)	sp.					
X	Ostlingoceras	puzosiformis	Spath				
X	Ostlingoceras	bechii	(Sharpe)				
	Ostlingoceras(?)	sp.				horizon undecided	
X	Neostlingoceras	carcitanense	(Sharpe)				
X	Pseudhelicoceras	seratocostatum	Clark				
X	Pseudhelicoceras	aff. spinosum	(Kossmat)		Hirano et al.(1977)		



Table 16 List of ammonoid species and their stratigraphic distribution(continued).

List of ammonoid species - 15 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
	Pseudelicoceras	n. sp.		Matsumoto & Harada (1964)			
	Pseudelicoceras	sp.					
X	Mariella	bergeri	(Brongniart)				
X	Mariella	aff. bergeri	(Brongniart)	Hashimoto et al.(1965), Matsumoto & Nishida (1999), Matsumoto & Kawashita (1999)			
X	Mariella (Mariella)	lewesiensis	(Spath)				
X	Mariella	galleinii	(Boule, Lemoine & Thévenin)				
X	Mariella	oehlerti	(Pervinquier)				
X	Mariella	dorsetensis	(Spath)				
X	Mariella	aff. dorsetensis	(Spath)	Nishida et al.(1996)			
X	Mariella	aff. cantabrigiensis	(Jukes-Browne)	Nakai & Matsumoto (1968)			
X	Mariella (Mariella)	pacifica	Matsumoto, Inoma & Kawashita				
	Mariella (Mariella)	aff. pacifica	Matsumoto, Inoma & Kawashita	Matsumoto & Nishida (1999)			
X	Mariella	miliaris	(Pictet & Campiche)				
X	Mariella	cf. carrancoi	(Bösc)				
X	Mariella (Mariella)	quadrituberculata	(Bayle)				
	Mariella	sp.					
X	Hypoturrilites	gravesianus	(d'Orbigny)				
X	Hypoturrilites	komotai	(Yabe)				
	Hypoturrilites	aff. komotai	(Yabe)	Obata & Muramoto (1966a, b)			
X	Hypoturrilites	aff. mantelli	(Sharp)	Matsumoto et al.(2000)			
X	Hypoturrilites	primus	Atabekian				
	Hypoturrilites	sp.					
	Hypoturrilites(?)	sp.					
X	Mesoturrilites	boerssumensis	(Schlüter)				
X	Mesoturrilites	aff. aumalensis	(Coquand)	Matsumoto (1982c)			
X	Turrilites	acutus	Passy				
X	Turrilites	costatus	Lamarck				
X	Turrilites	schuchzerianus	Bosc				
	Turrilites	sp. a		Hashimoto et al.(1965)			
	Turrilites	sp. b		Hashimoto et al.(1965)			
	Turrilites?	sp.					
	Turrilites	sp.					
NOSTOCERATIDAE							
X	Eubostrychoceras	japonicum	(Yabe)				
X	Eubostrychoceras	densicostatus	Matsumoto				
X	Eubostrychoceras	indopacificum	Matsumoto				
X	Eubostrychoceras	muramotoi	Matsumoto				
X	Eubostrychoceras	woodsii	(Kitchin)				
X	Eubostrychoceras(?)	indicum	(Stoliczka)				
X	Eubostrychoceras	aff. indicum	(Stoliczka)	Matsumoto (1957), Matsumoto & Harada (1964), Teraoka & Obata (1975), Putakami & Miyata (1983)			
X	Eubostrychoceras	cf. saxonicum	(Schlüter)				
X	Eubostrychoceras	aff. saxonicum	(Schlüter)	Matsumoto et al.(1981a)			
X	Eubostrychoceras(?)	cf. elongatum	(Whiteaves)		horizon undecided		
X	Eubostrychoceras	n. sp.		Matsumoto et al.(1981a)			
	Eubostrychoceras	sp.					
	Eubostrychoceras(?)	sp.					
X	Horotateceras	tatsuyai	Hayakawa				
X	Yezoceras	nodosum	Matsumoto				
X	Yezoceras	miotuberculatum	Matsumoto				
X	Bostrychoceras	otsukai	(Yabe)				
	Bostrychoceras	sp.					
X	Nostoceras	cf. stantoni	Hyatt				
X	Nostoceras	hetonaiense	Matsumoto				
	Nostoceras	sp. B aff. N. hetonaiense	Matsumoto	Matsumoto & Morozumi (1980)			
X	Nostoceras	sp. A aff. N. kernense	(Anderson)	Matsumoto & Morozumi (1980)			
	Nostoceras(?)	sp. A		Matsumoto (1980)		poorly preserved specimen	
	Nostoceras(?)	sp. B [Didymoceras(?) sp.]		Matsumoto (1980)		poorly preserved specimen	
	Nostoceras	sp.					
	Nostoceras(?)	sp.			horizon undecided		
X	Didymoceras	awajense	(Yabe)				
X	Didymoceras	nakaminatoense	Saito				
	Didymoceras	spp.					
X	Nipponites	mirabilis	Yabe				
X	Nipponites	bacchus	Matsumoto & Muramoto				
X	Nipponites	sachalinensis	Kawada				
	Nipponites	sp.					
	Nipponites(?)	sp.					
X	Hyphantoceras	venustum	(Yabe)				
X	Hyphantoceras	oshimai	(Yabe)				
	Hyphantoceras	aff. oshimai	(Yabe)	Igi et al.(1958), Tsushima et al.(1958)			
X	Hyphantoceras	orientale	(Yabe)				





Table 17 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 16 -							
check of species	Suborder						System
	Superfamily						Stage
	Family						Substage
	Subfamily						Japanese scale
	Genus	species	author	References*	Remarks		
X	Hyphantoceras	transitorium	Matsumoto				
X	Hyphantoceras(?)	heteromorphum	Matsumoto			occurrence from a falling rock	
	Hyphantoceras	sp.					
X	Ryuella	ryu	(Matsumoto & Muramoto)				
X	Muramotoceras	yezoense	Matsumoto				
X	Muramotoceras	laxum	Matsumoto				
X	Ainoceras	kamui	Matsumoto & Kanie				
X	Ainoceras	paucicostatum	Matsumoto				
X	Pravitoceras	sigmoidale	Yabe				
	Pravitoceras(?)	sp.				horizon undecided	
X	Tridentoceras(?)	sp.					
	Nostoceratinae gen. et sp. indet.						
	DIPLOMOCERTIDAE						
	DIPLOMOCERTINAE						
X	Scalarites	scalaris	(Yabe)				
	Scalarites	aff. scalaris	(Yabe)		Tanabe et al.(1981)		
X	Scalarites	mihoensis	Wright & Matsumoto				
X	Scalarites	venustus	(Yabe)				
X	Scalarites	densicostatus	Matsumoto				
X	Scalarites	antiquus	(Matsumoto)			horizon undecided	
	Scalarites	sp. A			Matsumoto et al.(1973)	poorly preserved specimen	
	Scalarites	sp. B			Matsumoto et al.(1973)	poorly preserved specimen	
	Scalarites	spp.					
	Scalarites(?)	sp.					
	Glyptoxoceras	cf. indicum	(Forbes)			horizon undecided	
X	Glyptoxoceras	aff. indicum	(Forbes)		Tashiro et al.(1980b)		
	Glyptoxoceras(?)	sp. A [similar to "G. rugatum (Forbes)"]			Matsumoto (1980)	horizon undecided	
	Glyptoxoceras	sp. B aff G. indicum	(Forbes)		Matsumoto (1980)	horizon undecided	
X	Glyptoxoceras	sp. C aff. G. rugatum	(Forbes)		Matsumoto (1980)	horizon undecided	
	Glyptoxoceras	sp.					
	Glyptoxoceras(?)	sp.				horizon undecided	
X	Diplomoceras	notabile	Whiteaves				
	Diplomoceras(?)	sp.				horizon undecided	
X	Exiteloceras(?)	sp.					
X	Neocrioceras	spingerum	(Jimbo)				
X	Neocrioceras(?)	sanushibensis	Wright & Matsumoto				
X	Neocrioceras(?)	undulosum	Matsumoto				
	Neocrioceras (Schluetella) (?)	sp.					
	Neocrioceras	sp.				horizon undecided	
	POLYPTYCHOCERATINAE						
X	Schlueterella	kawadai	Matsumoto & Miyauchi				
X	Schlueterella	sp.					
X	Kawashitaceras	dentatum	(Matsumoto & Obata)				
X	Kawashitaceras	obiraense	Matsumoto				
X	Pseudoxybeloceras	quadrinodosum	(Jimbo)				
X	Pseudoxybeloceras	aff. lineatum	(Gabb)		Hattori (1965)		
	"Pseudoxybeloceras(?)"	n. sp. aff. Hyphantoceras venustum (Yabe)			Matsumoto & Harada (1964)		
	Pseudoxybeloceras	sp.					
	Pseudoxybeloceras(?)	sp.					
X	Parasolenoceras	soyaense	Matsumoto & Miyauchi				
X	Parasolenoceras	tomitai	Matsumoto				
X	Parasolenoceras	periodicum	Matsumoto & Miyauchi				
	Parasolenoceras	sp.					
X	Polyptychoceras	obstrictum	(Jimbo)				
X	Polyptychoceras	haradanum	(Yokoyama)			refer Okamoto & Shibata (1997)	
X	Polyptychoceras	subquadratum	(Yokoyama)			refer Okamoto & Shibata (1997)	
X	Polyptychoceras	pseudogaultinum	(Yokoyama)			refer Okamoto & Shibata (1997)	
X	Polyptychoceras	subundulatum	(Yokoyama)			refer Okamoto & Shibata (1997)	
X	Polyptychoceras	yubarensis	(Yabe)				
X	Polyptychoceras	subundatum	(Yokoyama)				
	Polyptychoceras	sp.					
	Polyptychoceras (Subptychoceras)	sp.				horizon unknown	
	Polyptychoceras(?)	sp.					
X	Dihamites	obiraensis	Matsumoto				
X	Heteroptychoceras	obatai	Matsumoto				
X	Ryoptychoceras	mikasaensis	Matsumoto				
X	Ryugasella	ryugasensis	Wright & Matsumoto				
X	Ryugasella	n. sp.			Obata & Futakami (1977)		
	Ryugasella(?)	sp.				occurrence from a falling rock	
X	Solenoceras (Solenoceras)	cf. texanum	(Shumard)				
X	Solenoceras (Oxybiloceras)	aff. humei	(Douvillé)		Matsumoto (1980), Morozumi (1985)		
X	Solenoceras (Oxybiloceras)	sp. A aff. S. crassum	(Whitfield)		Matsumoto & Morozumi (1980)		
	Solenoceras (Solenoceras)	sp. B aff. S. reisei	Stephenson		Matsumoto & Morozumi (1980)		



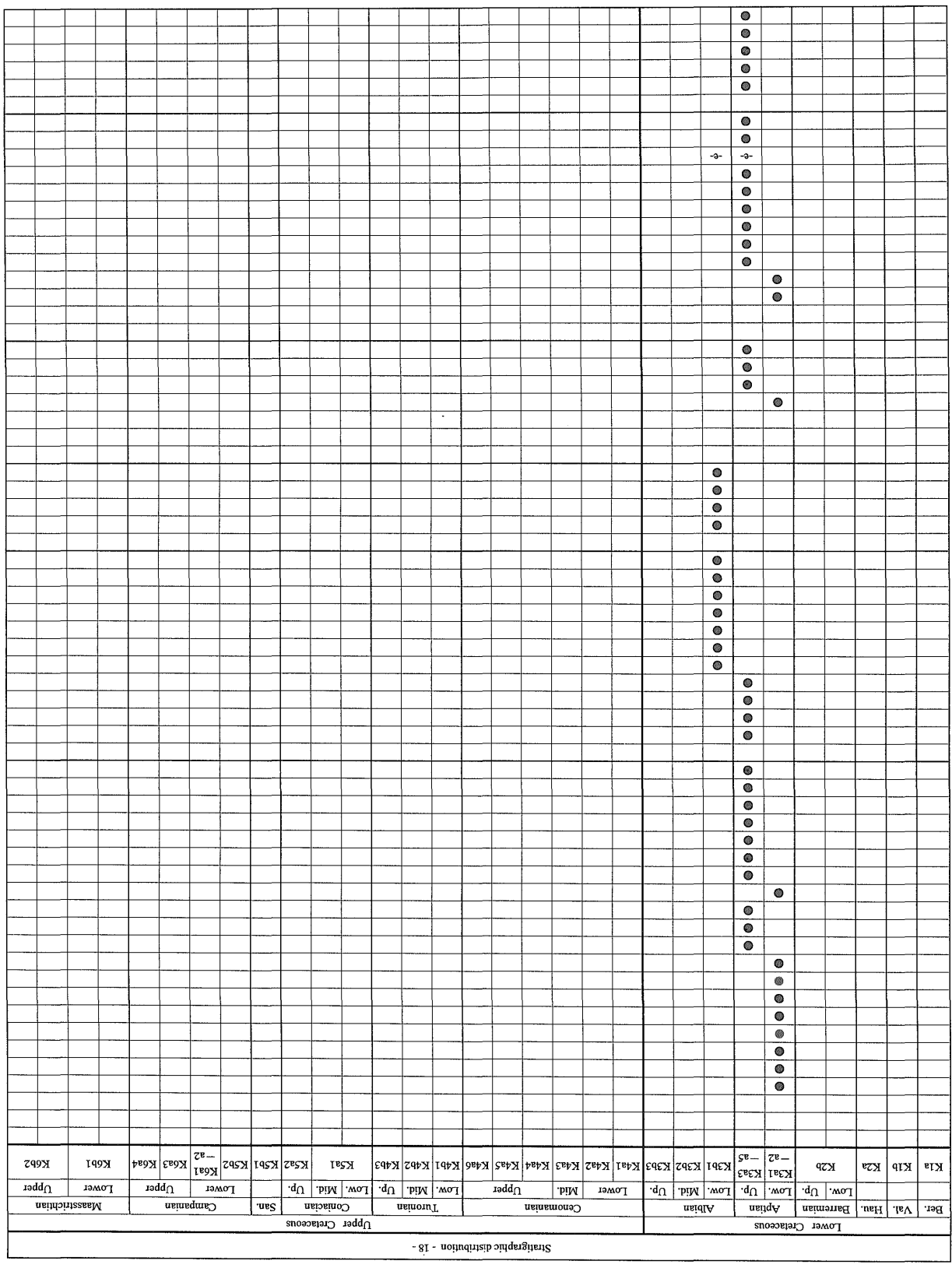
Table 18 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 17 -							
check of species	Suborder					System	
	Superfamily					Stage	
	Family					Substage	
	Subfamily					Japanese scale	
	Genus	species	author	References*	Remarks		
	Solenoceras	sp.					
	BACULITIDAE						
X	Lechites	cf. antanimangaensis	Collignon				
X	Lechites	cf. gaudini	(Pictet & Campiche)				
	Lechites	sp.					
	Lechites(?)	sp.					
X	Sciponoceras	baculojides	(Mantell)				
X	Sciponoceras	kossmati	(Nowak)				
X	Sciponoceras	orientale	Matsumoto & Obata				
X	Sciponoceras	intermedium	Matsumoto & Obata				
X	Sciponoceras	matsumotoi	Inoma				
X	Sciponoceras	bohemicum	(Flitsch)				
	Sciponoceras	sp.					
	Sciponoceras(?)	sp.					
X	Baculites	undulatus	Roman & Mazeran				
X	Baculites	yokoyamai	Tokunaga & Shimizu				
X	Baculites	bailyi	Woods				
X	Baculites	schencki	Matsumoto				
X	Baculites	uedae	Matsumoto & Obata				
X	Baculites	bouleii	Collignon				
X	Baculites	n. sp.(?) aff. B. sulcatus	Baily	Matsumoto & Obata (1963a)		occurrence from a falling rock	
X	Baculites	capensis	Woods				
X	Baculites	tanakae	Matsumoto & Obata				
X	Baculites	princeps	Matsumoto & Obata				
X	Baculites	anceps pacificus	Matsumoto & Obata				
X	Baculites	cf. subanceps	Haughton				
X	Baculites	cf. subanceps pacificus	Matsumoto & Obata				
X	Baculites	aff. hochstetteri	Liebus	Matsumoto & Obata (1963)			
X	Baculites	cf. hochstetteri	Liebus				
X	Baculites	rex	Anderson				
X	Baculites	cf. kirki	Matsumoto				
X	Baculites	chicoensis yezoensis	Matsumoto & Miyauchi				
X	Baculites	pseudobaculus	Matsumoto & Obata				
X	Baculites	inornatus	Meek				
X	Baculites	kotanii	Matsumoto, Hashimoto & Furuichi				
X	Baculites	aff. menabensis	Collignon	Matsumoto & Miyauchi (1984)			
X	Baculites	cf. vagina	Forbes				
X	Baculites	regina	Obata & Matsumoto				
X	Baculites	occidentalis	Meek				
	Baculites	sp.					
	SCAPHITACEAE						
	SCAPHITIDAE						
	OTOSCAPHITINAE						
X	Worthoceras	pacificum	Matsumoto & Yokoi				
X	Yezoites	puerulus	(Jimbo)				
	Yezoites	aff. puerulus	(Jimbo)	Fuatakami (1986a)			
X	Yezoites	perrini	(Anderson)				
X	Yezoites	klamathensis	(Anderson)				
X	Yezoites	aff. klamathensis	(Anderson)	Asai & Hirano (1990)			
	Yezoites	aff. perrini	(Anderson)	Matsumoto et al.(1981a)			
X	Yezoites	matsumotoi	Tanabe				
	Yezoites	sp.					
	SCAPHITINAE						
X	Eoscaphtes	sp. (juvenile)					
	Eoscaphtes(?)	sp.					
X	Scaphites	planus	(Yabe)				
X	Scaphites	pseudoequalis	Yabe				
X	Scaphites	japonicus	Inoma				
X	Scaphites	yokoyamai	Jimbo				
X	Scaphites	yonekurai	Yabe				
X	Scaphites	aff. subdelicatus	Cobban & Gryc	Tanabe et al.(1977), Tanabe (1977b)			
X	Scaphites	formosus	Yabe				
X	Scaphites	aff. arnaudiformis	Collignon	Matsumoto (1984b)			
X	Scaphites	aff. obliquus	Sowerby	Tanabe (1977b)			
X	Scaphites (s.l.)	gracilis	Yabe				
	Scaphites	sp.					
X	Clioscaphtes(?)	sp.					
X	Hoploscaphtes	sp.					
	Hoploscaphtes(?)	sp.					



Table 19 List of ammonoid species and their stratigraphic distribution (continued).

List of ammonoid species - 18 -							
check of species	Suborder						
	Superfamily						
	Family						
	Subfamily						
	Genus	species	author	References*	Remarks	Japanese scale	System Stage Substage
	DOUVILLEICERATACEAE						
	DOUVILLEICERATIDAE						
	CHELONICERATINAE						
X	Cheloniceras (Cheloniceras)	shimizui	Nakai & Hada				
X	Cheloniceras (Cheloniceras)	aff. minimum	Casey	Matsumoto & Hirata (1969)			
X	Cheloniceras (Cheloniceras)	cf. proteus	Casey				
X	Cheloniceras (Cheloniceras)	meyendorffi	(d'Orbigny)				
X	Cheloniceras (Cheloniceras)	aff. kiliani	(Koenen)	Matsumoto & Takahashi (1986a)			
X	Cheloniceras (Cheloniceras)	aff. quadrarium	Casey	Matsumoto et al. (1982)			
	Cheloniceras (Cheloniceras)	sp.					
	Cheloniceras (Cheloniceras)	sp. [similar to C. minimum and C. cornelianum]		Matsumoto et al. (1982)			
X	Cheloniceras (Epicheloniceras)	cf. martinoides	Casey				
X	Cheloniceras (Epicheloniceras)	aff. sellidgense var. audax	Casey	Murakami (1996)			
	Cheloniceras (Epicheloniceras)	sp.					
	Cheloniceras	sp. indet.					
	Cheloniceras(?)	sp.					
X	Diadochoceras	nodosocostatiforme	(Shimizu)				
X	Diadochoceras(?)	aff. nodosocostatiforme	(Shimizu)	Obata (1975)			
X	Diadochoceras	aff. caucasicus	(Lupp.)	Matsumoto (1978b)			
	Diadochoceras	sp.					
	Diadochoceras(?)	sp.					
	Chelonideratidae gen. et sp. indet.						
	DOUVILLEICERATINAE						
X	Eodouvilleiceras	matsumotoi	Obata				
X	Eodouvilleiceras	aff. matsumotoi	Obata	Obata (1969)			
X	Eodouvilleiceras	kumaense	Matsumoto & Tamura				
	Eodouvilleiceras	sp.					
X	Douvilleiceras	mammillatum	(Schlotheim)				
X	Douvilleiceras	aff. mammillatum paraeocox	Casey	Obata et al. (1973)			
X	Douvilleiceras	clementinum	(d'Orbigny)				
X	Douvilleiceras	cf. leightonense	Casey				
X	Douvilleiceras	aff. orbignyi	(Hyatt)	Futakami (1996)			
X	Douvilleiceras	sp. nov.?		Futakami (1996)			
	Douvilleiceras	sp.					
	TROCHLEICERATIDAE						
X	Pseudoleymeriella	hataii	Obata				
X	Pseudoleymeriella	hiranamensis	Obata				
	Pseudoleymeriella(?)	aff. dentatus	(Sowerby)	Shimizu (1931)			
	Pseudoleymeriella	sp.					
	DESHAYESTACEAE						
	DESHAYESTIDAE						
	DESHAYESTINAE						
X	Dufrenoyia	aff. dufrenoyi	(d'Orbigny)	Obata et al. (1975, 1982)			
X	Dufrenoyia	aff. justinae	(Hill)	Matsumoto et al. (1982), Tanaka (1989)			
	Dufrenoyia	sp.					
	Dufrenoyia(?)	sp.					
	?PARAHOPLITIDAE						
	ACANTHOHOPLITINAE						
	Colombiceras(?)	sp.					
X	Colombiceras(?)	satowi	Shimizu				
X	Gargasiceras	sp.					
X	Acanthohoplites	reesidei	(Anderson)				
	Acanthohoplites	sp.					
X	Nolaniceras	yaegashii	(Shimizu)				
X	Hypacanthoplites	subcornuerianus	(Shimizu)				
X	Hypacanthoplites	kawakamii	Obata & Futakami				
X	Hypacanthoplites	n. sp.? aff. H. jacobi	(Collet)	Matsumoto (1978b)	horizon undecided		
	Hypacanthoplites	sp.					
	Hypacanthoplites(?)	sp.					
	PARAHOPLITINAE						
X	Parahoplites	colssus	Matsumoto				
X	Parahoplites	aff. vectensis	Casey	Obata & Matsumoto (1977), Kawakami et al. (1983)			
	Parahoplites	sp.					
X	Kazanskyella(?)	japonica	Matsumoto				
X	Oshimaceras	kanazawai	Obata & Futakami				



Stratigraphic distribution - 18 -

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## 日本産白亜紀アンモナイト類データベース—層序的分布と文献目録—

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### 要 旨

これまで出版されている様々な学術的文献を調査し、日本産白亜紀アンモナイト化石種のデータベースを作成した。本データベースでは Wright *et al.* (1996) の高次分類に従い、各種を配列している。また、日本の白亜系をこれまでの研究を基に31の亜階に区分し直し、各種の層序的分布も示した。また、このデータベースを作成する際に用いた文献リストも示した。このデータベースの作成により、これまで報告されている日本産白亜紀アンモナイトの総種数が790種に及ぶこと、各亜階におけるアンモナイトの種多様性（産出種数）は周期的に変化することが明らかとなった。本データベースは、白亜系の対比のみならず、白亜紀における海洋古環境変遷の研究に役立つことが期待される。