

SUPPLEMENTARY MATERIAL

Raw data is available on Morphobank (morphobank.org).

Appendix S1: Volume Renderings and CT Scan Slice Examples of the Specimens



Figure S1.1: Volume rendering of *Desmatochelys lowii*



Figure S1.2: Cross-section images of *Desmatochelys lowii*. A: coronal plane, B: sagittal plane

C: transverse plane.



Figure S1.3: Volume rendering of the *Eretmochelys imbricata*.

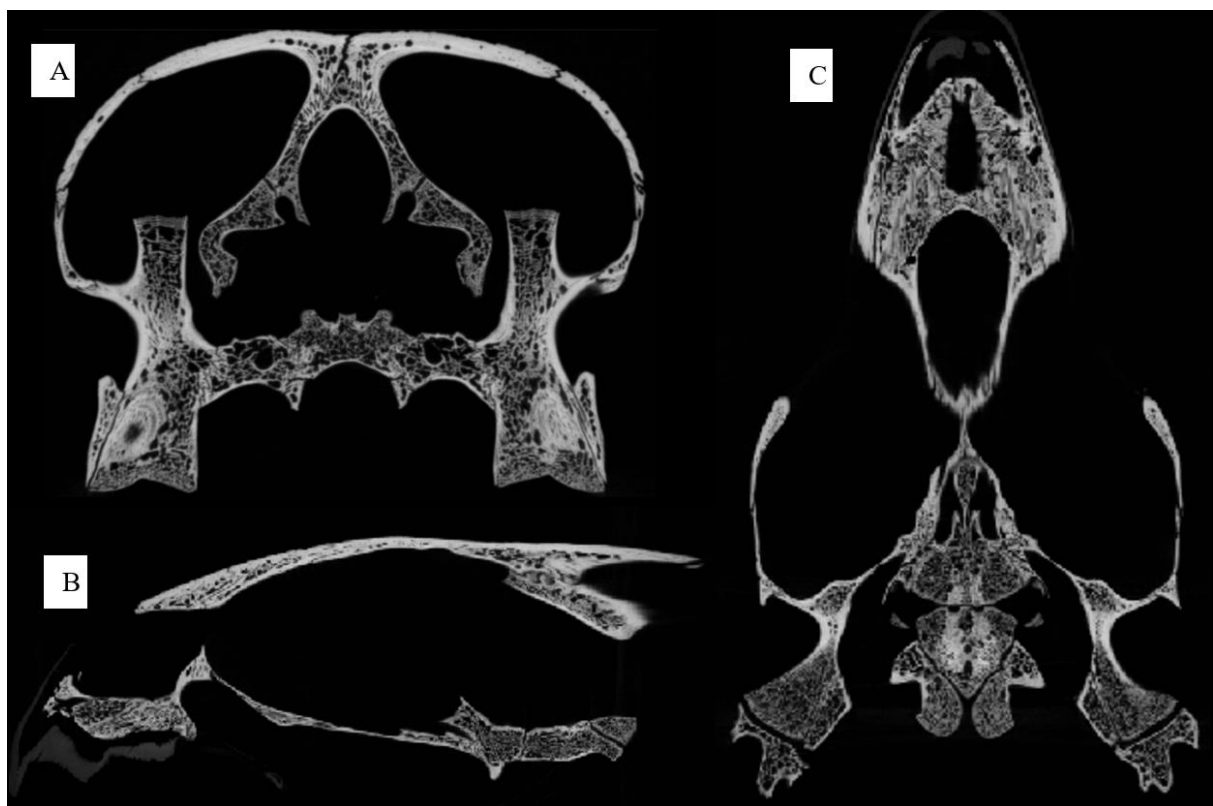


Figure S1.4: Cross-section images of *Eretmochelys imbricata*. A: coronal plane, B: sagittal plane C: transverse plane.

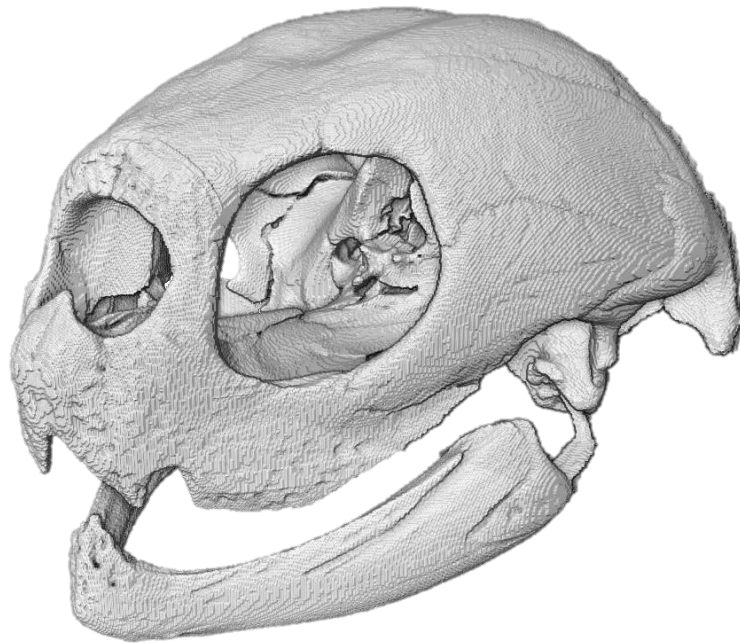


Figure S1.5: Volume rendering of *Dermochelys coriacea*.



**Figure S1.6: Cross-section images of *Dermochelys coriacea*. A: coronal plane, B: sagittal plane
C: transverse plane.**

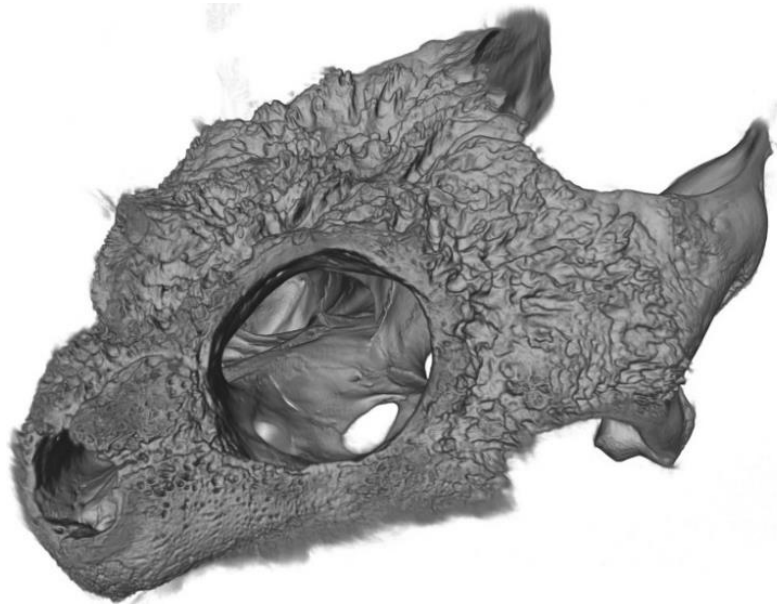


Figure S1.7: Volume rendering of *Chelydra serpentina*.



Figure S1.8: Cross-section images of *Chelydra serpentina*. A: coronal plane B: sagittal plane C: transverse plane.

Appendix S2: List of Segmented Bones

Out of four specimens, in total 81 skull bones were segmented. Every bone was segmented only once per specimen, although some bones occur twice in a skull, e.g. the parietals.

Table S2.1: Segmented bones listed for each specimen. 0 = absent, 1 = present, ? = determination unclear.

	ossified elements	<i>Desmatochelys lowii</i>	<i>Eretmochelys imbricata</i>	<i>Dermochelys coriacea</i>	<i>Chelydra serpentina</i>
dermal roofing	Nasal	1	0	0	0
	Prefrontal	1	1	1	1
	Frontal	1	1	1	1
	Parietal	1	1	1	1
	Poostorbital	1	1	1	1
	Jugal	1	1	1	1
	Quadratojugal	1	1	1	1
	Squamosal	1	1	1	1
palate	Premaxilla	1	1	1	1
	Maxilla	1	1	1	1
	Vomer	1	1	1	1
	Palatine	1	1	1	1
basicranium & braincase	Pterygoid	1	1	1	1
	Epipterygoid	1	?/1	0	1
	Basisphenoid	1/?	1	1	1
	Parasphenoid	?	0	1	?/1
	Prootic	1	1	1	1
	Opisthotic	1	1	1	1
	Quadrato	1	1	1	1
	Basioccipital	1/?	1	1	1
	Exoccipital	1	1	1	1
	Supraoccipital	1	1	1	1

Appendix S3: Phenetic Analysis-Tables

Table S3.1: Bone contacts in *Desmatochelys lowii*. p: parallel; o: overlapping; u: underlying; c: clasping; cb: clasped by; t: vertically transverse; s: smooth; if: faintly interfingering; im: moderately interfingering; ?: determination unclear

A	B	Na	Pf	Fr	Pa	Po	Ju	Qj	Sq	Pm	Mx	Vo	Pal	Pt	Epi	Bs	Ps	Pr	Op	Qu	Bo	Exo	So
	Nasal	p+if	o	u							o+is												
	Prefrontal	u		o+im							u+is, c	u+s, o+ is, p+hi	u?										
	Frontal	o	u+im	p+im	o+im	u+im																	
	Parietal			u+im	p+im	u+if								t+is	t			t+im					o
	Postorbital			o+im	o+if		c	o+is	o+s, cb u+s, c														
	Jugal					cb		o			o+im												
	Quadratojugal					u+is	u		o											s			
	Squamosal					u+s, c o+s, c		u											p	u+if, c			
	Premaxilla									p+im	p	p?											
	Maxilla	u+is	o+is, cb				u+im			p		u?cb?	cb, o										
	Vomer		o+s, u+ is, p+hi							p?	o?c?	-	u?+i										
	Palatine		o?								c, u	o?+i	p+im	u+hi									
	Pterygoid				t+is								o+hi	p+hi	t	?		?	?	c+if	?		
	Epipterygoid				t									t									
	Basisphenoid													?		-					?	?	
	Parashphenoid																						
	Prootic				t+im									?					o	p+if			t, p
	Opisthotic							p						?				u		p, u, p	p		p
	Quadrate							s	o+if, cb					cb+if				p+if	p, o, p				
	Basioccipital													?		?					-	?	
	Exoccipital															?				p	?		?
	Supraoccipital					u												t, p	p			?	-

Tab. S3.2: Bone contacts in *Eretmochelys imbricata*. p: parallel; o: overlapping; u: underlying; c: clasping; cb: clasped by; t: vertically transverse; s: smooth; if: faintly interfingering; im: moderately interfingering; ?: determination unclear.

A	B	Na	Pf	Fr	Pa	Po	Ju	Qj	Sq	Pm	Mx	Vo	Pal	Pt	Epi	Bs	Ps	Pr	Op	Qu	Bo	Exo	So
Nasal																							
Prefrontal			p+im	o+im							t+is	p+is											
Frontal			u+im	p+im	o+im, cb+is	u+im																	
Parietal				u+im, c+is	p+im	p+im			p+is					t+is								o+s, o+is	
Postorbital				o+im	p+im		t+im	p+is	p+is														
Jugal						t+im		o+is			o+im		c+s										
Quadratojugal			t+is			p+is	u+is		t+im											p+im			
Squamosal					p+is	p+is		t+im											c+if	p+im			
Premaxilla										p+im	o+im	o+is											
Maxilla				t+is			u+im			u+im		p+im, o+im	o+im, cb+im, p+im										
Vomer			p+is							u+is	p+im, u+im	-	o+is, s, u+if	o+im									
Palatine							cb+s				u+im, c+im, p+im	u+is, s, o+if		o+im									
Pterygoid					t+is							u+im	u+im	p+im		u+s, u+im, cb+im	p+is, c+s		u+im	cb+im, o+im	u+is		
Epipterygoid																							
Basisphenoid														o+s, o+im, c+im		-	(p+s)				p+s, u+is		
Parashphenoid																							
Prootic														(p+is, cb+s)		(p+s)		im	p+im, cb+im			t+im	
Opisthotic									cb+if								im		u+if			o+s+im	
Quadrat								p+im	p+im					o+im			p+im, c+im	o+if					
Basioccipital														c+im, u+im		p+s, o+is					-	u+im	
Exoccipital														o+is					u+s+im		o+im		t+is, cb
Supraoccipital					u+s, u+is													t+im				t+is, c	-

Tab. S3.3: Bone contacts in *Dermochelys coriacea*. p: parallel; o: overlapping; u:

underlying; c: clasping; cb: clasped by; t: vertically transverse; s: smooth; if: faintly

interfingering; im: moderately interfingering; ?: determination unclear.

A	B	Na	Pf	Fr	Pa	Po	Ju	Qj	Sq	Pm	Mx	Vo	Pal	Pt	Epi	Bs	Ps	Pr	Op	Qu	Bo	Exo	So
	Nasal																						
	Prefrontal		p+if	cb+if		o+is					t+if	t+s											
	Frontal		c+if	p+im	cb+if	c+if																	
	Parietal			c+if	p+im	u+im			c,u+s														o+s, o+if
	Postorbital		u+is	cb+if	o+im		c+if	t+s	o+if														
	Jugal					cb+if		o+if	t+s		o+is												
	Quadratojugal					t+s	u+if		cb+if											o+im, p+if			
	Squamosal				cb,o+s	u+if	t+s	c+if												o+if, p+im, cb			
	Premaxilla									p+if	p+if	o+s											
	Maxilla		t+if				u+is			p+if		p+im											
	Vomer		t+s							u+s		-	p+if, o+s	o+s									
	Palatine										p+im	p+if, u+s		o+s, u+s									
	Pterygoid											u+s	u+s	p+is		p+is	o+if	t+if		u+im	cb+im		
	Epipterygoid																						
	Basisphenoid													p+is		-	p+if	t+s			p+im		
	Parashphenoid													u+if		p+if	-				u+if		
	Prootic													t+if		t+s			p+im	p+im			p+if
	Opisthotic																	p+im		cb+if		o+if	p+if
	Quadrate							u+im, p+if	u+if, p+im,c					o+im				p+im	c+if				
	Basioccipital													c+im		p+im	o+if			-		u+im	
	Exoccipital																			u+if	o+im		u+im
	Supraoccipital				u+s, u+if													p+if	p+if			o+im	-

Tab. S3.4: Bone contacts in *Chelydra serpentina*. p: parallel; o: overlapping; u: underlying; c: clasping; cb: clasped by; t: vertically transverse; s: smooth; if: faintly interfingering; im: moderately interfingering; ?: determination unclear.

A \ B	Na	Pf	Fr	Pa	Po	Ju	Qj	Sq	Pm	Mx	Vo	Pal	Pt	Epi	Bs	Ps	Pr	Op	Qu	Bo	Exo	So
Nasal																						
Prefrontal		p+im	c+im, p+im		o+if				t+is, p+im	c+is	o+im											
Frontal		cb+im, p+im	p+if	o+is, p+im	p+im																	
Parietal			u+is, p+im	p+if	o+im								t+s		o+if, c+s							o+im
Postorbital		u+if	p+im	u+im		t+if, p+im	p+im	p+im														
Jugal					t+if, p+im		p+if		o+im		p+s		cb+is									
Quadratojugal					p+im	p+if		c+if										p+im				
Squamosal					p+im		cb+if											p+im	c+if			
Premaxilla									p+im	p+im	cb+im											
Maxilla		t+is, p+im			u+im				p+im		o+if	cb+if	cb+im									
Vomer		cb+is							c+im	u+if		u+if	cb+im									
Palatine		u+im				p+s				c+if	o+if		cb+im									
Pterygoid						c+is				c+im	c+im	c+im	p+is	u+im, t+s	u+s, p+im	o+s	u+if, cb+s		u+if	cb+if	u+im	
Epipterygoid				t+s									o+im, t+s									
Basisphenoid													o+s, p+im			p+if	p+im, p+s			p+s, p+im		
Parashphenoid																						
Prootic			u+if, cb+s										u+s		p+if	-						o+im, p+s
Opisthotic								p+im					c+s		p+im, p+s			p+s	p+im			
Quadrates																	p+s		c+is	(p+s)	o+is	p+s
							p+im	cb+if					o+if				p+im	cb+is				
Basioccipital													c+if		p+s, p+im		(p+s)			-	?	
Exoccipital													o+im					u+is		?		u+im, cb
Supraoccipital				u+im											u+im, p+s			p+s			o+im, c	-

Appendix S4: Extract of the Character/Taxon Matrix-Scoring of *Desmatochelys lowii*

Desmatochelys_lowii

0010001?110011000010000010000101111000000001-

11100000220112100101221010111010011000?0011021100001?1?0-

1122?1??????001101000-010010110?00020010??1?2?100001110-301112111032-0-

0000????????????1111011120??0010000201??????1110211120?1--

001110111200110101111202?1?1?

Appendix S5: Backbone Constraint Tree Topology

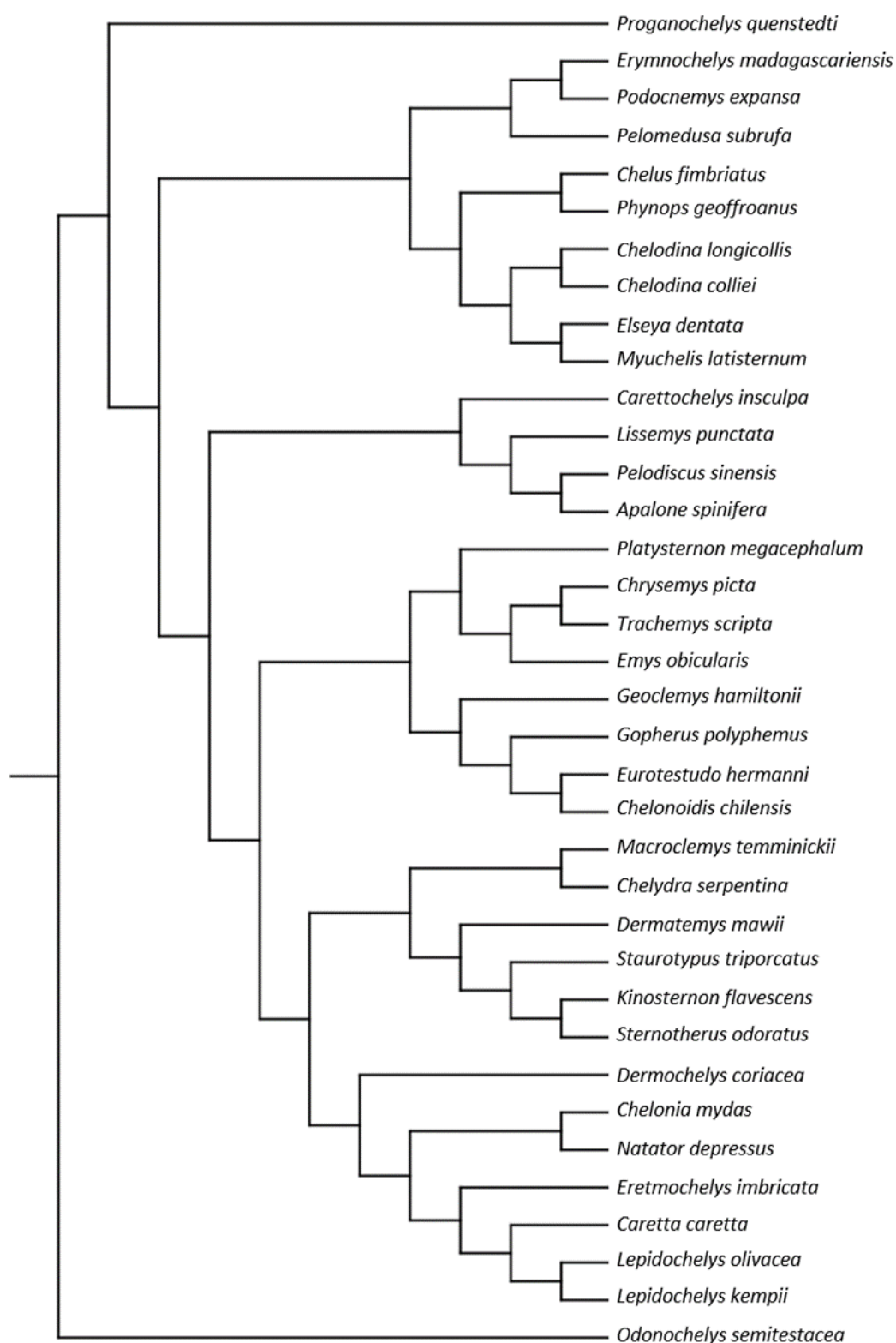


Figure S5.1: Backbone constraint tree topology after Crawford et al. 2015

Appendix S6: Inactive Taxa

Inactive taxa (81/154) from the initial matrix of Cadena & Parham (2015)

1 <i>Annemys latiens</i>	28 <i>Chisternon undatum</i>	55 <i>Niolamia argentina</i>
2 <i>Basilochelys macrobios</i>	29 <i>Chitracephalus dumonii</i>	56 <i>Notoemys laticentralis</i>
3 <i>Changmachelys bohlini</i>	30 <i>Condorchelys antiqua</i>	57 <i>Notoemys oxfordiensis</i>
4 <i>Eileanchelys waldmani</i>	31 <i>Corsochelys haliniches</i>	58 <i>Notoemys zapatocaensis</i>
5 <i>Chubutemys copelloi</i>	32 <i>Ctenochelys stenoporus</i>	59 <i>Ocepechelon bouyai</i>
6 <i>Liaochelys jianchangensis</i>	33 <i>Dinochelys whitei</i>	60 <i>Ordosemys skull</i>
7 <i>Manchurochelys</i>	34 <i>Dorsetochelys delairi</i>	61 <i>Patagoniaemys gasparinae</i>
8 <i>manchoukuoensis</i>	35 <i>Echmatemys wyomingensis</i>	62 <i>Peligrochelys walshae</i>
9 <i>Otwayemys cunicularius</i>	36 <i>Eochelone brabantica</i>	63 <i>Platycheilus oberndorferi</i>
10 <i>Plastomenus aff. thomassii</i>	37 <i>Erquelinnesia gosseleti</i>	64 <i>Portlandemys macdowellii</i>
11 <i>Sinemys brevispinus</i>	38 <i>Euclastes acutirostris</i>	65 <i>Prochelidella cerrobarcinae</i>
12 <i>Stylemys nebrascensis</i>	39 <i>Euclastes platyops</i>	66 <i>Procolpochelys grandaeva</i>
13 <i>Xenochelys Formosa</i>	40 <i>Euclastes wielandi</i>	67 <i>Proterochersis robusta</i>
14 <i>Adocus amtgai</i>	41 <i>Heckerochelys romani</i>	68 <i>Protochelydra zangerli</i>
15 <i>Alienochelys selloumi</i>	42 <i>Helochelydra nopcsai</i>	69 <i>Rhinochelys pulchriceps</i>
16 <i>Allopleuron hoffmanni</i>	43 <i>Hoplochelys crassa</i>	70 <i>Sandownia harrisi</i>
17 <i>Angolachelys mbaxi</i>	44 <i>Hoyasemys jimenezi</i>	71 <i>Shachemys laosiana</i>
18 <i>Argillochelys africana</i>	45 <i>Indochelys spatulata</i>	72 <i>Siamochelys peninsularis</i>
19 <i>Argillochelys cuneiceps</i>	46 <i>Itlochelys rasstrigin</i>	73 <i>Sinemys gamera</i>
20 <i>Ashleychelys palmeri</i>	47 <i>Lophochelys</i>	74 <i>Syllomus aegyptiacus</i>
21 <i>Basilemys variolosa</i>	48 <i>Macroclmemy schmidtii</i>	75 <i>Tasbacka aldabergeni</i>
22 <i>Brachyopsemys tingitana</i>	49 <i>Mexichelys coahuilaensis</i>	76 <i>Tasbacka ouledabdounensis</i>
23 <i>Calcarichelys gemma</i>	50 <i>Mongolemys elegans</i>	77 <i>Terlinguachelys fischbecki</i>
24 <i>Carolinochelys wilsoni</i>	51 <i>Mongolochelys efremovi</i>	78 <i>Warkalania carinaminor</i>
25 <i>Chelonoidis gringorum</i>	52 <i>Neurankylus eximius</i>	79 <i>Xinjiangchelys junggarensis</i>
26 <i>Chelosphargis advena</i>	53 <i>Nichollsemys bareri</i>	80 <i>Yaminuechelys maior</i>
27 <i>Chengyuchelys</i>	54 <i>Ninjemys oweni</i>	81 <i>Yehguia tatsuens</i>

Appendix S7: Strict Consensus



Figure S7.1: The strict consensus of 10 trees

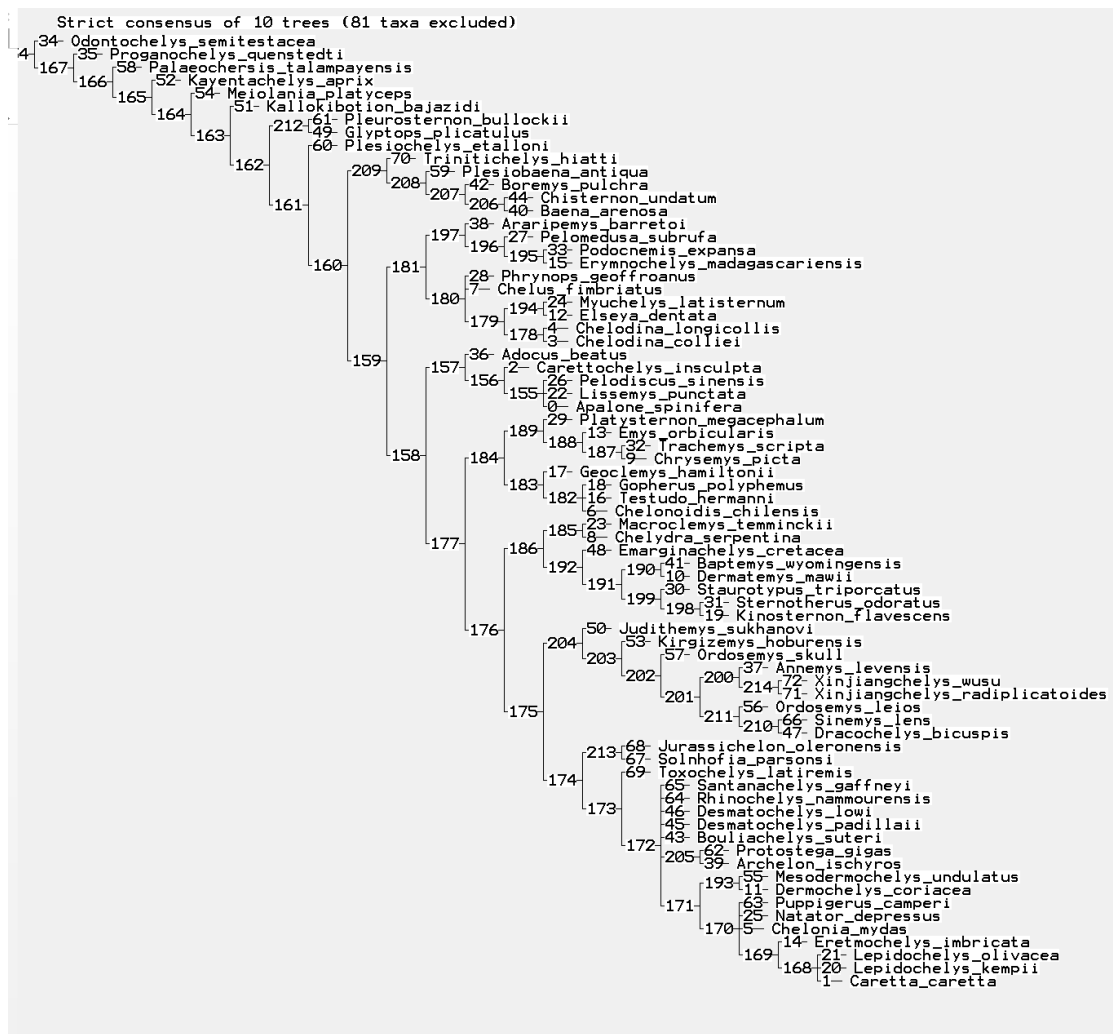


Figure S7.2: Strict consensus of 10 trees including the numbers of the nodes.

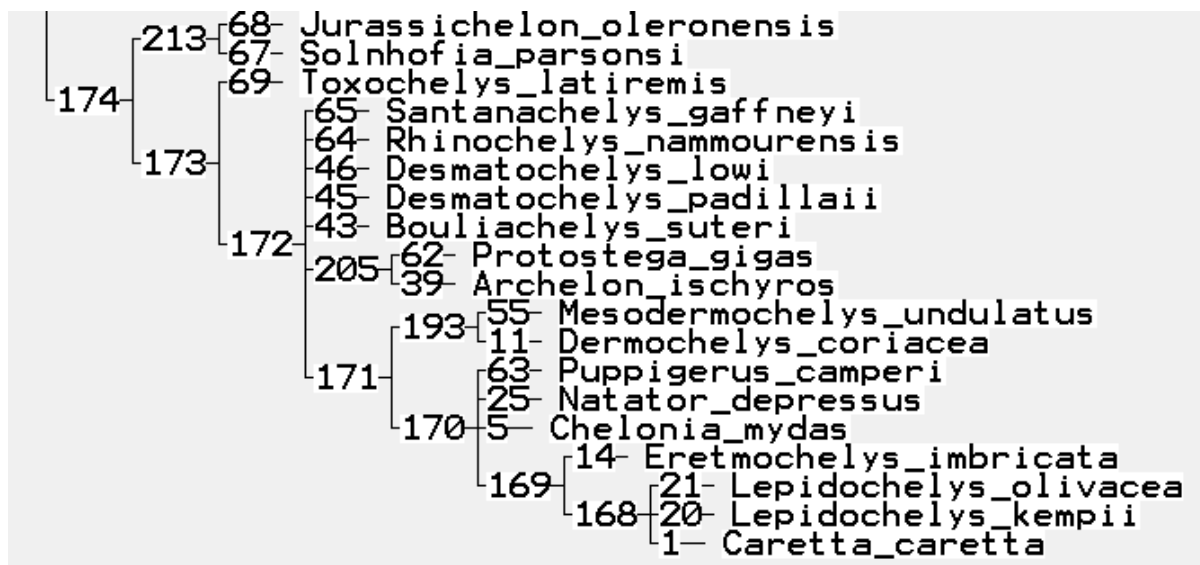


Figure S7.3: Strict consensus tree of 10 trees-Zoom into the marine taxa, closely placed to the protostegids.

Appendix S8: List of all Common Synapomorphies

Synapomorphies common to 10 trees

(Node numbers refer to nodes in consensus)

Apalone spinifera :

All trees:

MX_triturating_surface_definition (43): 0 --> 1

Caretta caretta :

All trees:

FR_orbit_contribution (9): 1 --> 0

VO_vo-premaxila_contact (48): 0, or 1 --> 2

DE_dentary-surangular_arrangement (119): 1 --> 0

CA_parallel_keels (122): 0 --> 3

CO_distal_rib_end (138): 2 --> 3

SUP__sup1_vs_sup2 (144): 1 --> 0

Carettochelys insculpta :

All trees:

QJ_qj-maxilla_contact (23): 0 --> 1

SUP_number_of_suprapygals (143): 1 --> 0

MAN_flippers (256): 1 --> 2

ULNR_ulnare_vs_intermedium (257): 1 --> 2

Chelodina colliei :

All trees:

No autapomorphies:

Chelodina_longicollis :

All trees:

No autapomorphies:

Chelonia_mydas :

All trees:

PM_medial_premax._hook (38): 0 --> 1

MX_triturating_surface_definition (43): 1 --> 2

DE_symphyseal_ridge (117): 0, or 1 --> 2

DE_lingual_ridge (118): 1 --> 0

CA_parallel_keels (122): 0 --> 3

CO_distal_rib_end (138): 2 --> 3

Some trees:

PF_cranial_scutes (7): 0 --> 1

PT_medial_ridge (77): 1 --> 0

PAr_palatine_artery (107): 1 --> 2

NE_number_of_neurals (132): 1 --> 2

Chelonoidis_chilensis :

All trees:

CE_cervical_abs/pres (145): 1 --> 2

VE_position_of_ver._3_and_4 (149): 1 --> 0

HYO_ax._buttress_contact (168): 1 --> 0

CEV_ventral_keels (193): 1 --> 0

ISC_metischial_process (239): 1 --> 0

Chelus_fimbriatus :

All trees:

PR_pref-palatine_contact (5): 1 --> 0
 PM_fusion_pm (35): 0 --> 1
 VO_vo-premaxila_contact (48): 1 --> 0
 CA_parallel_keels (122): 0 --> 2
 CO_posterior_costals_contact (137): 1 --> 0
 PY_pygal_notch (146): 1 --> 0
 HYPOinguinal_buttress_contact (172): 1 --> 3
 EXT_extragulars_medial_contact (180): 0 --> 2
 EXT_restricted_to_epiplastron (182): 0 --> 1
 HU_humero-pectoral_sulcus (185): 0 --> 1
 CEV_ventral_keels (193): 0 --> 1
 CEV_cervicals_8_vs_7 (194): 0 --> 1
 CEV_postzygapophyses (207): 0 --> 1

Chelydra_serpentina :

All trees:

MX_triturating_surface_definition (43): 0 --> 1
 PT_medial_contact (70): 1 --> 0
 NU_costiform_process (127): 1 --> 2
 CO_distal_rib_end (138): 0 --> 2
 SUP_number_of_suprapygals (143): 0, or 1 --> 2
 XI_shape_of_xiphiplastron (175): 0 --> 1

Chrysemys_picta :

All trees:

PEC_anterior-posteriorl_developed (187): 0 --> 1

Dermatemys_mawii :

All trees:

CA_parallel_keels (122): 1 --> 0

XI_anal_notch (174): 0 --> 1

IN_intergular_absence/presence (183): 0 --> 1

CEV_biconvex_middle_neck (198): 1 --> 0

Dermochelys coriacea :

All trees:

CA_carapacial_scutes (121): 1 --> 2

PE_number_of_peripherals (134): 1 --> 3

PLA_hyo-hypo_contact_and_shape (159): 1 --> 4

EN_absence/presence (160): 0 --> 1

HUM_lateral_process (243): 2 --> 3

Some trees:

DE_symphyseal_ridge (117): 1 --> 0

Elseya dentata :

All trees:

MX triturating_surface_definition (43): 0 --> 2

HYPO_termination_inguinal_buttress (173): 1 --> 0

Emys orbicularis :

All trees:

PLA_plastral_kinesis (157): 0 --> 1

EN_size_of_posterior_process (162): 1 --> 0

XI_anal_notch (174): 1 --> 0

HU_humero-pectoral_sulcus (185): 0 --> 1

Eretmochelys_imbricata :

All trees:

MX_triturating_surface_definition (43): 1 --> 2

DE_lingual_ridge (118): 1 --> 0

PY_pygal_notch (146): 1 --> 0

Erymnochelys_madagascariensis :

All trees:

JU_jugal-quadrato_contact (20): 0 --> 1

JU_medial_process (21): 0 --> 2

HYO_termination_ax._buttress (169): 1 --> 0

Testudo_hermanni :

All trees:

PR_dorsal_exposure (85): 0 --> 1

HYPOinguinal_buttress_contact (172): 1 --> 0

Geoclemys_hamiltonii :

All trees:

JU_participation_upper_temp._emargination (19): 0 --> 1

PR_dorsal_exposure (85): 0 --> 1

CA_parallel_keels (122): 0 --> 1

PE_anterior_musk_ducts (135): 0 --> 1

HU_humero-pectoral_sulcus (185): 0 --> 1

Gopherus_polyphemus :

All trees:

HUM_ectepicondylar_foramen (241): 1 --> 0

Kinosternon_flavescens :

All trees:

PE_anterior_musk_ducts (135): 1 --> 0

PUB_epipubics (237): 0 --> 1

Lepidochelys_kempii :

All trees:

No autapomorphies:

Lepidochelys_olivacea :

All trees:

No autapomorphies:

Lissemys_punctata :

All trees:

PT_vertical_flange (72): 1 --> 0

FJ_foramen_jugulare_posterius (103): 1 --> 0

Macrolemys_temminckii :

All trees:

SPR_supramarginals (147): 2 --> 1

CA_anterior_caudal_centra (216): 1 --> 2

Myuchelys_latisternum :

All trees:

BS_paired_of_ventral_pits (93): 0 --> 1

Natator_depressus :

All trees:

PY_pygal_notch (146): 1 --> 0

Some trees:

DE_symphyseal_ridge (117): 1 --> 0

TIB_tibial_pit (262): 0 --> 1

Pelodiscus_sinensis :

All trees:

PT_contribution_foram._palat._post. (71): 1 --> 0

Pelomedusa_subrufa :

All trees:

No autapomorphies:

Phrynops_geoffroanus :

All trees:

PE_peripheral_gutter (133): 0 --> 1

HYPO_termination_inguinal_buttress (173): 1 --> 0

Platysternon_megacephalum :

All trees:

PA_foramen_stap-tempor. (16): 2 --> 0

JU_medial_process (21): 0 --> 1

QJ_qj-maxilla_contact (23): 0 --> 1

SQ_sq-postorbital_contact (25): 1 --> 0

PM_medial_premax._hook (38): 0 --> 1

QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 2

PT_medial_contact (70): 1 --> 0
BS_rostrum_basisphenoidale (92): 0 --> 1
NE_shape_of_neurals (131): 1 --> 0
PE_anterior_musk_ducts (135): 0 --> 1
HYO_termination_ax._buttress (169): 1 --> 3
HYPO_terminationinguinal_buttress (173): 1 --> 2
CEV_ventral_keels (193): 1 --> 0
CA_posterior_caudal_centra (217): 1 --> 2
CA_chevrons (218): 1 --> 0
HUM_ectepicondylar_foramen (241): 1 --> 0

Staurotypus triporcatus :

All trees:

JU_participation_upp._temp._emargination (19): 0 --> 1
PM_medial_premax._hook (38): 0 --> 1
CA_parallel_keels (122): 1 --> 2
XI_shape_of_xiphiplastron (175): 0 --> 1

Sternotherus odoratus :

All trees:

No autapomorphies:

Trachemys scripta :

All trees:

PA_parieta-squamosal_contact (12): 1 --> 0
MX_accessory_ridges (44): 0 --> 1
CO_alternative_lateral_ends (140): 0 --> 1

Podocnemis_expansa :

All trees:

MX_accessory_ridges (44): 0 --> 1

PT_contribution_foram._palat._post. (71): 0 --> 1

SCA_glenoid_neck (223): 0 --> 1

HUM_proximal_articular_surface (242): 0 --> 1

Odontochelys_semitestacea :

All trees:

No autapomorphies:

Proganochelys_quenstedti :

All trees:

CA_tail_club (214): 1 --> 0

Adocus_beatus :

All trees:

MX_triturating_surface_definition (43): 0 --> 2

PAr_palatine_artery (107): 2 --> 1

NE_neural_formula (130): 0 --> 1

HYPO_terminationinguinal_buttress (173): 1 --> 0

CEV__cervical_8_vs_dorsal_cerv._1 (197): 1 --> 0

Annemys_levensis :

All trees:

PF_medial_contact (3): 0 --> 1

CO_posterior_costals_contact (137): 0 --> 1

VE_position_of_ver._3_and_4 (149): 1 --> 0

VE_vertebrals_3-4_sulcus_embayment (150): 0 --> 1

Araripemys_barretoi :

All trees:

JU_participation_upp._temp._emargination (19): 0 --> 1

JU_medial_process (21): 0 --> 2

PT_medial_contact (70): 1 --> 2

CA_parallel_keels (122): 0 --> 1

CA+PLA_pattern_of_sculpturing (124): 3 --> 4

CO_distal_rib_end (138): 0 --> 2

VE_vertebral_1_anterior_carapace (151): 0 --> 1

PLA_connection_with_carapace (154): 0 --> 1

PLA_central_plastral_fontanella (155): 0 --> 1

PLA_posterior_plastral_fontanella (156): 0 --> 1

EN_suture_with_hyop (165): 0 --> 1

HYP0_inguinal_buttress_contact (172): 1 --> 0

EXT_extragulars (179): 0 --> 1

ABD_abdominals_abs/pres (188): 0 --> 1

CEV_postzygapophyses (207): 0 --> 1

Archelon_ischyros :

All trees:

NE_number_of_neurals (132): 1 --> 2

Baena_arenosa :

All trees:

PA_foramen_stap-tempor. (16): 1 --> 0

NU_length_vs_width (128): 0 --> 1

Baptemys_wyomingensis :

All trees:

HYPO_inguinal_buttress_contact (172): 0 --> 1

Boremys_pulchra :

All trees:

No autapomorphies:

Bouliachelys_suteri :

All trees:

PM_fusion_pm (35): 0 --> 1

Some trees:

FR_orbit_contribution (9): 1 --> 0

PM_foramen_prepalatinum (36): 0 --> 1

Chisternon_undatum :

All trees:

CEV_central_articulation (196): 0 --> 1

Desmatochelys_padillai :

All trees:

PA_pineal_foramen (17): 0 --> 1

***Desmatochelys_lowi* :**

All trees:

PF_dorsal_exposure (6): 0 --> 1

QU_antrum_postoticum (56): 2 --> 1

BS_dorsum_sellae (96): 0 --> 1

FN_foramen_nervi_hypoglossi_(XII) (104): 0 --> 2

Some trees:

QJ_qj-squamosal_contact (24): 0 --> 1

process._epipterygoideus (61): 1 --> 0

PT_medial_ridge (77): 1 --> 0

OP_parti.form.stap.temp (91): 0 --> 1

NU_posteromedial_fontanelles (129): 0 --> 1

Dracochelys_bicuspis :

All trees:

MX_triturating_surface_definition (43): 0 --> 1

BO_anterior_morphology (83): 0 --> 1

BS_paired_of_ventral_pits (93): 1 --> 0

CA_carapacial_sutures (125): 0 --> 1

CO_shape_of_costal_3 (142): 0 --> 1

Emarginachelys_cretacea :

All trees:

No autapomorphies:

Glyptops_plicatulus :

All trees:

FR_direction_orbits (11): 0 --> 1

PM_medial_premax._hook (38): 0 --> 1

OP_ventral_ridge (89): 1 --> 2

Judithemys_sukhanovi :

All trees:

No autapomorphies:

Kallokibotion_bajazidi :

All trees:

PM_apertura_narium_externa (34): 1 --> 0

VO_vomer-pterygoid_contact (46): 0 --> 1

PR_dorsal_exposure (85): 0 --> 1

ME_medial_contact (171): 0 --> 1

HYPO_termination_inguinal_buttress (173): 0 --> 2

Kayentachelys_aprix :

All trees:

PF_dorsal_exposure (6): 0 --> 1

OP_procesus_interfenestralis (90): 1 --> 2

BS_paired_of_ventral_pits (93): 0 --> 1

DE_medial_contact (115): 0 --> 1

PE_anterior_musk_ducts (135): 0 --> 1

Kirgizemys_hoburensis :

All trees:

PT_pterygoid-exoccipital (73): 1 --> 0

FJ_foramen_jugulare_posterius (103): 1 --> 0

Meiolania_platyceph :

All trees:

QJ_qj-squamosal_contact (24): 0 --> 1

SQ_sq-supraoccip._contact (26): 0 --> 1
 SQ_posterolateral_protub. (27): 0 --> 2
 MX_triturating_surface_definition (43): 1 --> 2
 PT_basipterygopod_process (65): 1 --> 2
 SO_dorsal_exposure (80): 0 --> 1
 HY_facil_nerve_path (99): 0 --> 1
 IC_foramen_post._canc._carot._intern. (106): 0 --> 1
 CS_cranial_scute_D (109): 0 --> 1
 CS_cranial_scute_O (113): 0 --> 1
 MA_marginal (152): 0 --> 1
 PLA_central_plastral_fontanella (155): 0 --> 1
 ME_absence/presence (170): 1 --> 2
 CEV_central_articulation (196): 0 --> 1
 CA_tail_club (214): 1 --> 0
 CA_caudal_centra (215): 0 --> 1
 CA_caudal_tail_ring (219): 0 --> 1

Mesodermochelys_undulatus :

All trees:

DE_symphyseal_ridge (117): 0, or 1 --> 2
 DE_lingual_ridge (118): 1 --> 0
 CEV_cervicals_8_vs_7 (194): 1 --> 0

Some trees:

PF_cranial_scutes (7): 0 --> 1

Ordosemys_leios :

All trees:

QU_musculatory_facet_of_proc.t.O (59): 0 --> 1

VE_shape_of_vertebrals (148): 1 --> 0
PLA_posterior_plastral_fontanella (156): 0 --> 1
PLA_hyo-hypo_contact_and_shape (159): 2 --> 1
CEV_biconvex_position (200): 0 --> 1

Ordosemys_skull :

All trees:

No autapomorphies:

Palaeochersis_talampayensis :

All trees:

PA_posterodorsal_margin (14): 0 --> 1
MX_triturating_surface_definition (43): 1 --> 0
OP_transverse_plane (88): 0 --> 1
CER_cervical_rib_size (191): 0 --> 1
PEL_pelvis_shell_attachment (229): 0 --> 1

Plesiobaena_antiqua :

All trees:

CEV_central_articulation (196): 0 --> 1
SCA_glenoid_neck (223): 0 --> 1

Plesiochelys_etalloni :

All trees:

PT_foramen_palat._post. (69): 0 --> 1
CO_distal_rib_end (138): 0 --> 2
CE_cervical_abs/pres (145): 1 --> 0
PY_pygal_notch (146): 1 --> 0

Pleurosternon_bullockii :

All trees:

MX_triturating_surface_definition (43): 1 --> 0

SUP_number_of_suprapygals (143): 1 --> 0

CE_cervical_abs/pres (145): 1 --> 2

GU_number_of_gulars (178): 0 --> 1

Protostega_gigas :

All trees:

SP_splenial (120): 1 --> 0

Puppigerus_camperi :

All trees:

DE_width_triturating_surface (116): 0 --> 1

Some trees:

QU_antrum_postoticum (56): 1 --> 2

PT_proc._pteryg._externus (75): 1 --> 3

DE_dentary-surangular_arrangement (119): 1 --> 0

NU_nuchal_articulation_with_neural (126): 2 --> 1

HUM_lateral_process_shape (245): 1 --> 0

TIB_tibial_pit (262): 0 --> 1

Rhinochelys_nammourensis :

All trees:

No autapomorphies:

Santanachelys_gaffneyi :

All trees:

JU_medial_process (21): 0 --> 2
PT_pterygoid-exoccipital (73): 1 --> 0
IC_foramen_post._canc._carot._intern. (106): 1 --> 2
PY_pygal_notch (146): 1 --> 0
VE_shape_of_vertebrals (148): 1 --> 0
VE_position_of_ver._3_and_4 (149): 1 --> 0
HYO_termination_ax._buttress (169): 3 --> 1
DR_dorsal_rib_1_length (210): 1, or 2 --> 0

Some trees:

JU_jugal-quadrato_contact (20): 0 --> 1

Sinemys lens :

All trees:

QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 2
PT_pterygoid-exoccipital (73): 1 --> 0
EPI_shape_and_contacts (166): 1 --> 0
XI_shape_of_xiphiplastron (175): 0 --> 1
CEV_cervicals_8_vs_7 (194): 1 --> 0

Solnhofia parsonsi :

All trees:

PL_secondary_palate (41): 0 --> 1
PT_proc._pteryg._externus (75): 1 --> 2

Jurassichelon oleronensis :

All trees:

PF_medial_contact (3): 1 --> 0

PF_dorsal_exposure (6): 0 --> 1
MX_triturating_surface_definition (43): 0 --> 1
PT_foramen_palat._post. (69): 0 --> 1
SO_crista_supraoccip. (79): 1 --> 0
PR_dorsal_exposure (85): 0 --> 1
HYO_ax._buttress_contact (168): 0 --> 1

Toxochelys latiremis :

All trees:

PL_palatine-vomer_contact (42): 0 --> 1
VO_vomerine_pillar (51): 0 --> 1
BS_ventral_surface_shape (94): 0 --> 1
NU_posteromedial_fontanelles (129): 0 --> 1
AN_anal_vs_xiphiplastron (189): 0 --> 1
CA_chevrons (218): 1 --> 0

Some trees:

NA,_presence/absence (0): 0 --> 1
PT_medial_ridge (77): 0 --> 1
NU_nuchal_articulation_with_neural (126): 1 --> 2
XI_shape_of_xiphiplastron (175): 0 --> 2
CEV_cervicals_7_and_8_shape_art. (209): 0 --> 1

Trinitichelys hiatti :

All trees:

JU_medial_process (21): 0 --> 1

Xinjiangchelys radiplicatoides :

All trees:

IC_foramen_post._canc._carot._intern. (106): 1 --> 2

Xinjiangchelys_wusu :

All trees:

No autapomorphies:

Node 155 :

All trees:

JU_participation_upp._temp._emargination (19): 0 --> 1

PM_apertue_narium_externa (37): 0 --> 1

CA_carapacial_scutes (121): 1 --> 2

PE_number_of_peripherals (134): 2 --> 3

SUP_number_of_suprapygals (143): 1 --> 3

PLA_central_plastral_fontanella (155): 0 --> 1

PLA_posterior_plastral_fontanella (156): 0 --> 1

EN_shape_in_ventral_view (164): 1 --> 4

EN_suture_with_hyop (165): 0 --> 1

CEV__cervical_8_vs_dorsal_cerv._1 (197): 1 --> 2

HUM_proximal_articular_surface (242): 0 --> 1

MAN-PES_hyperphalangy (260): 0 --> 1

Node 156 :

All trees:

PR_pref-palatine_contact (5): 0 --> 1

PM_fusion_pm (35): 0 --> 1

PM_foramen_prepalatinum (36): 0 --> 2

VO_vomer-pterygoid_contact (46): 0 --> 1

VO_vo-premaxila_contact (48): 0 --> 2

QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 2

PT_medial_contact (70): 1 --> 2

PT_proc._pteryg._externus (75): 1 --> 2

PT_posterolateral_extension (78): 0 --> 2

CA_carapacial_scutes (121): 0 --> 1

PE_number_of_peripherals (134): 1 --> 2

PLAS_plastral_scutes (176): 0 --> 1

PUP_pubis_lateral_process (236): 0 --> 1

ISC_metischial_process (239): 1 --> 0

MAN_flipper (256): 0 --> 1

Node 157 :

All trees:

SQ_posterior_process (28): 0 --> 1

PL_contribution_braincase_wall (39): 0 --> 1

QU_musculatory_facet_of_proc.t.O (59): 0 --> 1

SO_horizontal_crest (81): 0 --> 1

FN_foramen_nervi_hypoglossi_(XII) (104): 0 --> 1

CEV_biconvex_middle_neck (198): 1 --> 0

IL_thelial_process (235): 0 --> 1

Node 158 :

All trees:

PT_contribution_foram._palat._post. (71): 0 --> 1

PT_pterygoid-exoccipital (73): 0 --> 1

HYO_ax._buttress_contact (168): 1 --> 0

HYPO_inguinal_buttress_contact (172): 1 --> 0

CEV_transverse_process (192): 0 --> 1

CEV_cervicals_8_vs_7 (194): 0 --> 1
CEV_diapophyses (195): 1 --> 0
CEV_cervicals_6_and_7_double (202): 0 --> 1
CEV_cervicals_7_and_8_double (204): 0 --> 1
CEV_cervical_8_neural_arch (206): 0 --> 1
DV_dorsal_vert._articulation (213): 0 --> 1

Node 159 :

All trees:

PA_foramen_stap-tempor. (16): 1 --> 2
SQ_sq-postorbital_contact (25): 0 --> 1
CER_cervical_rib_size (191): 0 --> 1
CEV_central_articulation (196): 0 --> 1
CEV_heighth_vs_lenght (205): 0 --> 1
DR_dorsal_rib_1_length (210): 1 --> 2
CA_anterior-caudal-centra (216): 2 --> 1
CA chevrons (218): 0 --> 1
PUB_epipubics (237): 0 --> 1

Node 160 :

All trees:

MX_triturating_surface_definition (43): 1 --> 0
OP_ventral_ridge (89): 1 --> 2
VE_shape_of_vertebrals (148): 0 --> 1
DR_dorsal_rib_1_length (210): 0 --> 1

Node 161 :

All trees:

PA_foramen_stap-tempor. (16): 0 --> 1
PT_basipterygoid_process (65): 1 --> 2
BO_anterior_morphology (83): 0 --> 1
IC_foramen_post._canc._carot._intern. (106): 0 --> 1
PAr_palatine_artery (107): 1 --> 2

Node 162 :

All trees:

PA_parieta-squamosal_contact (12): 0 --> 1
IC_internal_carotid_artery_splitting (105): 0 --> 2
NU_nuchal_articulation_with_neural (126): 0 --> 1
VE_position_of_ver._3_and_4 (149): 0 --> 1
CEV_diapophyses (195): 0 --> 1
SCA_lamina_between_sc/acromion (224): 1 --> 2

Node 163 :

All trees:

QU_antrum_postoticum (56): 0, or 1 --> 2
EPt_absence/presence (62): 0 --> 1
PT_interpterygoid_vacuity (66): 1 --> 2
PAr_palatine_artery (107): 0 --> 1
EN_shape_in_ventral_view (164): 0 --> 1
CEV_transverse_process (192): 1 --> 0
SCA_lamina_between_sc/acromion (224): 0 --> 1

Node 164 :

All trees:

PA_foramen_nervi_trigemini (13): 0 --> 1

QU_cavum_acustico-jugulare (53): 1 --> 2
QU_proc._trochlerais_oticum (58): 0 --> 1
PT_interpterygoid_vacuity (66): 0 --> 1
PT_pt-basioccipital (67): 0 --> 1
SO_crista_supraoccip. (79): 0 --> 1
RS_recessus_scalae_tympani (102): 0 --> 1
EN_anterior_process (161): 0 --> 1
EPI_shape_and_contacts (166): 0 --> 1
CA_anterior_caudal_centra (216): 0 --> 2
SCA_ventral_ridge (221): 0 --> 1

Node 165 :

All trees:

LA_presence/absence (8): 0 --> 1
PM_apertura_narium_externa (34): 0 --> 1
VO_number_of_vomer(s) (45): 0 --> 1
QU_caum_tympani (54): 1 --> 2
BO_deep_C-shaped (84): 0 --> 1
OP_procesus_interfenestralis (90): 0 --> 1
EXT_anterior_plastral_tuberosities (181): 0 --> 1
SCA_anterodorsal_ridge (220): 0 --> 1
SCA_horizontal_ridge (222): 0 --> 1
COR_coracoid_foramen (227): 0 --> 1
CLE_cleithrum (228): 0 --> 1
IL_iliac_neck (231): 0 --> 1
HYS_hypoischium_absence/presence (240): 0 --> 1

Node 166 :

All trees:

VO_vomerine_teeth (47): 0 --> 1

QU_cavum_acustico-jugulare (53): 0 --> 1

QU_caum_tympani (54): 0 --> 1

PT_basipterygoid_process (65): 0 --> 1

Node 167 :

All trees:

No synapomorphies

Node 168 :

All trees:

QU_proc._trochlearis_oticum (58): 1 --> 2

QU_musculatory_facet_of_proc.t.O (59): 0 --> 1

DE_width_triturating_surface (116): 0 --> 1

PLR_extrapleurals (153): 0 --> 1

SCA_internal_angle (225): 1 --> 0

Node 169 :

All trees:

FEM_femoral_trochanters (261): 1 --> 2

Some trees:

PF_cranial_scutes (7): 0 --> 1

DE_symphyseal_ridge (117): 1 --> 0

Node 170 :

All trees:

JU_medial_process (21): 0 --> 2

PL_secondary_palate (41): 0 --> 1
PL_palatine-vomer_contact (42): 0 --> 1
VO_vomerine_pillar (51): 0 --> 2
VO_upper_triturating_surface (52): 0 --> 1
BO_deep_C-shaped (84): 0 --> 1
BS_ventral_surface_shape (94): 0 --> 1
BS_dorsum_sellae (96): 0 --> 1
BS_foramen_carotic_laterale (97): 0 --> 1

Some trees:

JU_jugal-quadrato_contact (20): 1 --> 0
PM_foramen_prepalatinum (36): 0 --> 1
PL_contribution_upper_triturating_surf (40): 0 --> 1
PT_medial_ridge (77): 0 --> 1
SUP_number_of_suprapygals (143): 0 --> 1
DV_dorsal_vert._articulation (213): 0 --> 1
ULNR_ulnare_vs_intermedium (257): 2 --> 1

Node 171 :

Some trees:

PF_medial_contact (3): 0 --> 1
postorb._recess (31): 1 --> 0
position_notch (32): 1 --> 0
VO_vomer-pterygoid_contact (46): 1 --> 0
QU_antrum_postoticum (56): 2 --> 1
QU_proc._trochlearis_oticum (58): 2 --> 1
QU_musculatory_facet_of_proc.t.O (59): 1 --> 0
PT_foramen_palat._post. (69): 1 --> 2
PT_posterolateral_extension (78): 1 --> 0

extent_suture (86): 1 --> 0
dors._process (87): 1 --> 0
DE_dentary-surangular_arrangement (119): 0 --> 1
PLA_hyo-hypo_contact_and_shape (159): 3 --> 1
HUM_lateral_process_shape (245): 0 --> 1
HUM_expansion_lateral_process (246): 1 --> 0
HUM_medial_concavity (247): 1 --> 0
RAD_curves_towards_anterior (253): 1 --> 0

Node 172 :

All trees:

FR_direction_orbits (11): 1 --> 0
PA_foramen_stap-tempor. (16): 1 --> 0
PT_foramen_palat._post. (69): 0 --> 1
SCA_internal_angle (225): 0 --> 1
HUM_lateral_process (243): 1 --> 2

Some trees:

PF_medial_contact (3): 1 --> 0
MX triturating_surface_definition (43): 0 --> 1
PT_posterolateral_extension (78): 0 --> 1
SUP_number_of_suprapygals (143): 1 --> 0
PLA_hyo-hypo_contact_and_shape (159): 1 --> 3
COR_coracoid_vs_humerus_lenght (226): 0 --> 1
ISC_metischial_process (239): 1 --> 0
RAD_curves_towards_anterior (253): 0 --> 1
FEM_femoral_trochanters (261): 0 --> 1

Node 173 :

All trees:

SQ_sq-qudrate_contact (29): 0 --> 1

PT_medial_contact (70): 1 --> 0

HYO_termination_ax._buttress (169): 0 --> 3

HUM_lateral_process (243): 0 --> 1

HUM-FEM_length (251): 0 --> 1

MAN_paddles (255): 0 --> 1

MAN-PES_flattening_of_carpals_and_tarsals (259): 0 --> 1

Node 174 :

All trees:

DE_lingual_ridge (118): 0 --> 1

CO_distal_rib_end (138): 0 --> 2

PLA_central_plastral_fontanella (155): 0 --> 1

PLA_hyo-hypo_contact_and_shape (159): 2 --> 1

Some trees:

DE_symphyseal_ridge (117): 0 --> 1

Node 175 :

All trees:

PA_foramen_stap-tempor. (16): 2 --> 1

PT_contribution_foram._palat._post. (71): 1 --> 0

HYO_termination_ax._buttress (169): 1 --> 0

HYPO_terminationinguinal_buttress (173): 1 --> 0

CEV_cervicals_6_and_7_double (202): 1 --> 0

CEV_cervicals_7_and_8_double (204): 1 --> 0

DV_dorsal_vert._articulation (213): 1 --> 0

Some trees:

NA,_presence/absence (0): 1 --> 0

Node 176 :

All trees:

BS_foramen_ant._can._car._int (98): 0 --> 1

EN_suture_with_hyop (165): 0 --> 1

Node 177 :

All trees:

EXT_extragulars (179): 0 --> 1

Node 178 :

All trees:

FR_medially_fused (10): 0 --> 1

QU_qu-basiphenoid (60): 0 --> 1

HYPO_inguinal_buttress_contact (172): 1 --> 0

EXT_extragulars_medial_contact (180): 0 --> 1

CEV_postzygapophyses (207): 0 --> 1

HUM_proximal_articular_surface (242): 0 --> 1

Node 179 :

All trees:

NE_number_of_neurals (132): 1 --> 2

CO_costals_1_contact (136): 0 --> 1

CO_posterior_costals_contact (137): 1 --> 2

Node 180 :

All trees:

PF_dorsal_exposure (6): 0 --> 1
QJ_lower_temp._emarg. (22): 0 --> 1
DE_lingual_ridge (118): 0 --> 1
CEV_biconvex_position (200): 0 --> 1
SCA_glenoid_neck (223): 0 --> 1

Node 181 :

All trees:

PF_pref-vomer_contact (4): 0 --> 1
PR_pref-palatine_contact (5): 0 --> 1
PO_po-palatine_contact (30): 0 --> 1
VO_vo-premaxila_contact (48): 0 --> 1
QU_cavum_acustico-jugulare (53): 2 --> 3
QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 3
QU_proc._trochlerais_oticum (58): 1 --> 0
PT_pt-basioccipital (67): 1 --> 0
PT_proces._troch._pteryg (68): 0 --> 1
OP_ventral_ridge (89): 2 --> 0
HY_facil_nerve_path (99): 0 --> 1
SA_position_of_foramen_st._temp (101): 0 --> 1
IC_foramen_post._canc._carot._intern. (106): 1 --> 3
SUP_number_of_suprapygals (143): 1 --> 0
XI_anal_notch (174): 0 --> 1
GU_number_of_gulars (178): 0 --> 1
INF_inframarginal_absence/presence (190): 0 --> 2
PEL_pelvis_shell_attachment (229): 0 --> 1
ISC_metischial_process (239): 1 --> 0

Node 182 :

All trees:

MX_triturating_surface_definition (43): 0 --> 2
QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 2
PT_pterygoid-exoccipital (73): 1 --> 0
NE_shape_of_neurals (131): 1 --> 0
CO_alternative_lateral_ends (140): 0 --> 1
HYO_termination_ax._buttress (169): 1 --> 0
HYPO_terminationinguinal_buttress (173): 1 --> 0
MAN_phalangeal_formula (254): 1 --> 0
PES_number_of_digits (258): 0 --> 1

Node 183 :

All trees:

VO_ventral_crest (49): 0 --> 1
VO_shape_palate_roof (50): 0 --> 1
EPI_anterior_lip (167): 1 --> 0
HYO_ax._buttress_contact (168): 0 --> 1
HYPO_inguinal_buttress_contact (172): 0 --> 1
PEC_anterior-posteriorl_developed (187): 0 --> 1

Node 184 :

All trees:

XI_anal_notch (174): 0 --> 1
CEV_biconvex_position (200): 0 --> 1

Node 185 :

All trees:

FR_orbit_contribution (9): 1 --> 0
JU_medial_process (21): 0 --> 1
PM_medial_premax._hook (38): 0 --> 1
QU_arrangement_qu,op,stape,_E._tube (57): 1 --> 2
NE_shape_of_neurals (131): 1 --> 0
PY_pygal_notch (146): 1 --> 0
PLA_central_plastral_fontanella (155): 0 --> 1
HYO_termination_ax._buttress (169): 1 --> 3
AN_anal_vs_xiphiplastron (189): 0 --> 1
CA_posterior_caudal_centra (217): 1 --> 2
CA_chevrons (218): 1 --> 0

Node 186 :

All trees:

NU_costiform_process (127): 0 --> 1
ABD_abdominals_abs/pres (188): 0 --> 1

Node 187 :

All trees:

MX_triturating_surface_definition (43): 0 --> 2
HYO_ax._buttress_contact (168): 0 --> 1
HYPOinguinal_buttress_contact (172): 0 --> 1
HYPO_terminationinguinal_buttress (173): 1 --> 0
CEV_cervicals_5_and_6 (201): 0 --> 1

Node 188 :

All trees:

PT_pterygoid-exoccipital (73): 1 --> 0

PR_dorsal_exposure (85): 0 --> 1

SUP_number_of_suprapygals (143): 1 --> 0

Node 189 :

All trees:

PY_pygal_notch (146): 1 --> 0

Node 190 :

All trees:

MX triturating_surface_definition (43): 0 --> 2

SA_size_of_foramen_stap._temp. (100): 1 --> 2

EN_suture_with_hyop (165): 1 --> 0

HYO_ax._buttress_contact (168): 0 --> 1

ABD_abdominals_abs/pres (188): 1 --> 0

Node 191 :

All trees:

SA_size_of_foramen_stap._temp. (100): 0 --> 1

PLA_connection_with_carapace (154): 1 --> 0

Node 192 :

All trees:

PL_contribution_braincase_wall (39): 0 --> 1

CA_parallel_keels (122): 0 --> 1

Node 193 :

All trees:

CEV_heigth_vs_lenght (205): 1 --> 0

PEL_thyroid_fenestra (230): 0 --> 1

HUM_anterior_projection_lateral_proc. (248): 0 --> 1

Some trees:

CA_carapacial_scutes (121): 0 --> 1

PLAS_plastral_scutes (176): 0 --> 1

ULN_contact_with_radius (252): 1 --> 0

Node 194 :

All trees:

PA_foramen_stap-tempor. (16): 2 --> 0

CE_cervical_abs/pres (145): 1 --> 2

HYO_termination_ax._buttress (169): 1 --> 0

Node 195 :

All trees:

PA_foramen_stap-tempor. (16): 2 --> 0

PT_fossa_podocnemidoidea (74): 0 --> 1

FN_foramen_nervi_hypoglossi_(XII) (104): 0 --> 2

HU_humero-pectoral_sulcus (185): 0 --> 1

Node 196 :

All trees:

MX_triturating_surface_definition (43): 1 --> 2

ME_absence/presence (170): 2 --> 1

HYPO_terminationinguinal_buttress (173): 1 --> 0

Node 197 :

All trees:

MX_triturating_surface_definition (43): 0 --> 1

VO_vomer-pterygoid_contact (46): 0 --> 1

QU_precolumellar_fossa (55): 0 --> 1

CE_cervical_abs/pres (145): 1 --> 2

Node 198 :

All trees:

CO_costals_1_contact (136): 0 --> 1

EN_absence/presence (160): 0 --> 1

IN_intergular_absence/presence (183): 0 --> 1

HU_number_of_pairs (184): 0 --> 1

Node 199 :

All trees:

FR_orbit_contribution (9): 1 --> 0

PA_contribution_proc._troch._otic. (15): 0 --> 1

QJ_qj-maxilla_contact (23): 0 --> 1

QU_musculatory_facet_of_proc.t.O (59): 0 --> 1

PE_number_of_peripherals (134): 1 --> 2

PLA_plastral_kinesis (157): 0 --> 1

HYO_termination_ax._buttress (169): 1 --> 2

ABD_abdominals_abs/pres (188): 1 --> 2

INF_inframarginal_absence/presence (190): 0 --> 1

DR_dorsal_ribs_9_and_10 (211): 0 --> 1

Node 200 :

All trees:

BS_paired_of_ventral_pits (93): 1 --> 0

MA_marginal (152): 0 --> 1

EN_shape_in_ventral_view (164): 2 --> 1

EN_suture_with_hyop (165): 1 --> 0

Node 201 :

All trees:

PA_foramen_stap-tempor. (16): 1 --> 2

Node 202 :

All trees:

PF_medial_contact (3): 1 --> 0

Node 203 :

All trees:

PT_basipterygoid_process (65): 2 --> 1

PE_peripheral_gutter (133): 0 --> 1

Node 204 :

All trees:

JU_medial_process (21): 0 --> 1

BO_anterior_morphology (83): 1 --> 0

BS_paired_of_ventral_pits (93): 0 --> 1

IC_internal_carotid_artery_splitting (105): 2 --> 1

PAr_palatine_artery (107): 2 --> 1

CA_posterior-caudal-centra (217): 1 --> 2

HUM_ectepicondylar_foramen (241): 1 --> 0

Node 205 :

Some trees:

NA,_presence/absence (0): 0 --> 1

FR_orbit_contribution (9): 1 --> 0

PT_foramen_palat._post. (69): 1 --> 2

PT_proc._pteryg._externus (75): 1 --> 3

DE_symphyseal_ridge (117): 1 --> 0

EN_shape_in_ventral_view (164): 2 --> 3

EPI_shape_and_contacts (166): 1 --> 2

Node 206 :

All trees:

PA_parieta-squamosal_contact (12): 1 --> 0

SP_splenial (120): 0 --> 1

Node 207 :

All trees:

CE_cervical_abs/pres (145): 1 --> 0

Node 208 :

All trees:

EXT_extragulars_medial_contact (180): 0 --> 2

Node 209 :

All trees:

PF_dorsal_exposure (6): 0 --> 2

SO_crista_supraoccip. (79): 1 --> 0

IC_foramen_post._canc._carot._intern. (106): 1 --> 2

FP_fenestra_perilymphatica (108): 0 --> 1

EXT_restricted_to_epiplastron (182): 0 --> 1

Node 210 :

All trees:

PE_peripheral_gutter (133): 1 --> 0

CE_cervical_abs/pres (145): 1 --> 2

VE_vertebral_1_anterior_carapace (151): 0 --> 1

Node 211 :

All trees:

PLA_central_plastral_fontanella (155): 0 --> 1

Node 212 :

All trees:

NA_medial_contact (1): 0 --> 1

PF_dorsal_exposure (6): 0 --> 1

JU_medial_process (21): 0 --> 1

MA_marginal (152): 0 --> 1

Node 213 :

All trees:

CEV_central_articulation (196): 1 --> 0

Some trees:

VO_vomer-pterygoid_contact (46): 0 --> 1

Node 214 :

All trees:

NA_medial_contact (1): 0 --> 1

FN_foramen_nervi_hypoglossi_(XII) (104): 0 --> 2