

APPENDIX 2

Character optimisation: Synapomorphies by node

'Unambiguous' synapomorphies are those found under both ACCTRAN and DELTRAN optimization. Because some nodes of the phylogeny represent unnamed clades, we use a code to denote the content of these clades. Hereby, the notation 'Taxon+++' indicates the clade comprising the named taxon and all more crownwardly positioned taxa. The notation '(Taxon A ++ Taxon B)' indicates the most inclusive clade including Taxon A and Taxon B.

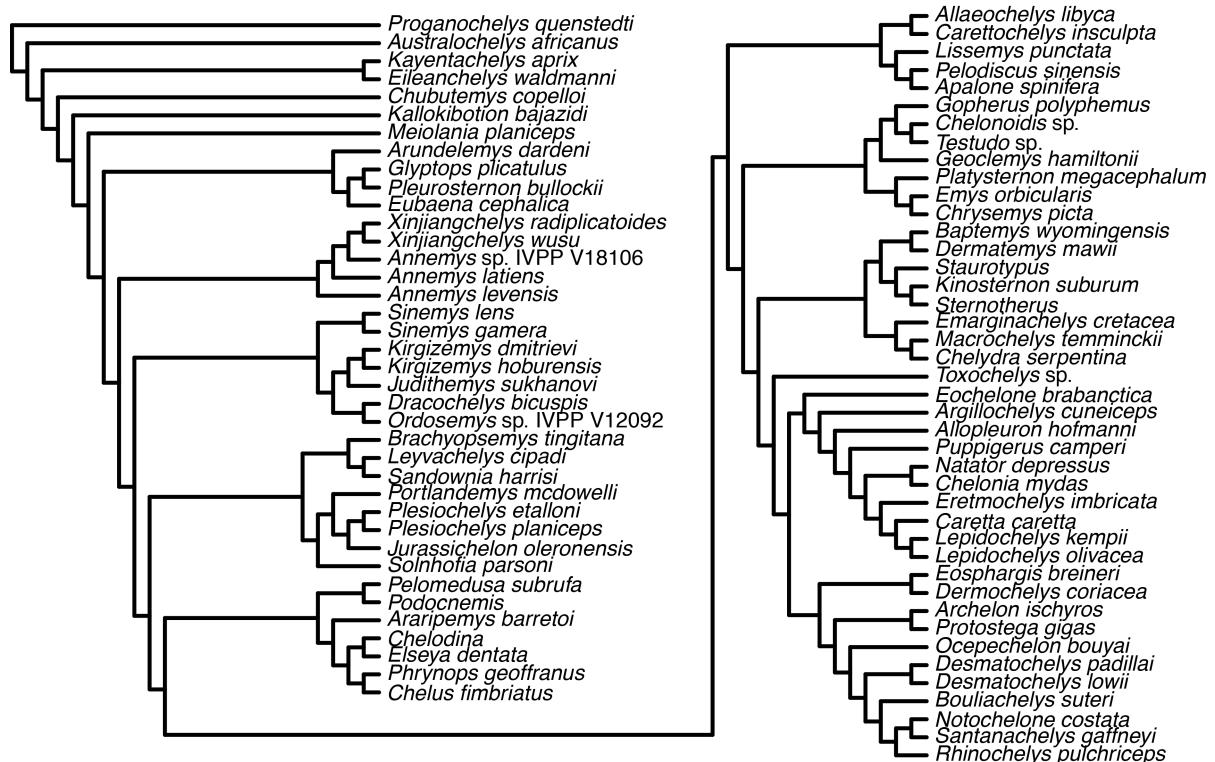


FIG S2.1. Tree topology for character optimisation. Note that this tree is a fully resolved MPT from our analysis using unordered characters.

Optimization by node with node numbers

Australochelys+++:

DELTRAN: CH63: 0->1, CH86: 0->1, CH90: 0->1, CH141: 0->1, CH143: 0->1;
 ACCTRAN: CH11: 0->1, CH24: 0->1, CH25: 0->1, CH45: 0->1, CH49: 0->1, CH61: 0->1,
 CH63: 0->1, CH72: 0->1, CH74: 0->1, CH86: 0->1, CH89: 0->1, CH90: 0->1, CH132: 0->1,
 CH140: 0->1, CH141: 0->1, CH143: 0->1, CH160: 0->1, CH202: 0->1, CH205: 0->1,
 CH221: 0->1, CH222: 0->1, CH230: 0->1, CH239: 0->1, CH241: 0->1, CH261: 0->1,
 CH296: 0->1, CH301: 0->1, CH303: 0->1, CH308: 0->1, CH310: 0->1, CH313: 0->1,
 CH320: 0->1, CH322: 0->1, CH340: 0->1.

(*Eileanchelys* + *Kayentachelys*)+++:

Unambiguous: CH5: 1->0, CH9: 0->1, CH10: 0->1, CH66: 1->0, CH77: 0->1, CH107: 0->1,
 CH113: 1->0, CH118: 0->1, CH130: 0->2, CH139: 2->1;

DELTRAN: CH25: 0->1, CH49: 0->1, CH61: 0->1, CH74: 0->2, CH160: 0->1, CH205: 0->1, CH221: 0->1, CH222: 0->1, CH230: 0->1, CH241: 0->1, CH261: 0->1, CH301: 0->1, CH303: 0->1, CH308: 0->1, CH310: 0->1, CH313: 0->1, CH320: 0->1, CH322: 0->1; ACCTRAN: CH20: 0->1, CH74: 1->2, CH76: 0->1, CH165: 0->1.

Chubutemys+++:

Unambiguous: CH21: 0->1, CH65: 0->2, CH79: 0->1, CH104: 0->1, CH110: 0->1, CH119: 0->1, CH145: 0->1, CH302: 0->1; DELTRAN: CH20: 0->1, CH45: 0->1, CH76: 0->2, CH89: 0->1, CH165: 0->1; ACCTRAN: CH24: 1->0, CH58: 1->0, CH76: 1->2, CH88: 0->1, CH121: 0->1, CH122: 0->1, CH132: 1->0, CH140: 1->0, CH200: 0->1, CH242: 0->1, CH244: 0->1, CH251: 0->1, CH294: 0->1, CH297: 0->1, CH298: 0->2.

Kallokibotion+++:

Unambiguous: CH91: 0->1, CH106: 0->1, CH107: 1->2, CH120: 0->2; DELTRAN: CH88: 0->1, CH122: 0->1, CH200: 0->1, CH202: 0->1, CH239: 0->1, CH244: 0->1.

Meiolania+++:

Unambiguous: CH96: 0->1, CH126: 0->1, CH193: 0->1, CH228: 0->1; DELTRAN: CH298: 0->2; ACCTRAN: CH147: 0->1, CH225: 0->1, CH248: 0->1, CH249: 0->1.

Paracryptodira+++:

Unambiguous: CH16: 1->0, CH18: 0->2, CH34: 0->1, CH47: 0->1, CH100: 0->1, CH109: 0->1, CH119: 1->0, CH240: 0->1, CH305: 0->2, CH331: 0->1; DELTRAN: CH11: 0->1, CH225: 0->1, CH242: 0->1, CH296: 0->1; ACCTRAN: CH22: 0->1, CH121: 1->0, CH179: 0->1, CH206: 0->1, CH287: 0->1, CH299: 0->1, CH312: 1->0, CH319: 0->1, CH336: 0->1.

Xinjiangchelyidae+++:

Unambiguous: CH3: 0->1, CH13: 0->1, CH115: 0->1, CH120: 2->0, CH146: 0->1, CH224: 0->1; DELTRAN: CH22: 0->1, CH58: 1->0, CH72: 0->1, CH147: 0->1, CH206: 0->1, CH249: 0->1, CH287: 0->1, CH336: 0->1; ACCTRAN: CH4: 0->1, CH40: 0->1, CH175: 0->1, CH178: 0->1, CH235: 0->1, CH248: 1->0.

Sinemydidae/Macropaenidae+++:

Unambiguous: CH142: 1->0, CH185: 0->1, CH228: 1->0, CH271: 0->1, CH278: 0->1, CH309: 0->1; DELTRAN: CH23: 0->1, CH175: 0->1, CH274: 0->1, CH294: 0->1, CH297: 0->1, CH299: 0->1; ACCTRAN: CH23: 0->1, CH219: 0->1, CH274: 0->1.

Angolachelonia+++:

Unambiguous: CH65: 2->0, CH79: 1->2, CH123: 1->0, CH128: 0->1, CH141: 1->0, CH147: 1->2, CH180: 0->1, CH208: 0->1, CH273: 0->1, CH323: 0->1; DELTRAN: CH4: 0->1, CH179: 0->1; ACCTRAN: CH62: 0->1, CH98: 0->1, CH127: 1->0, CH132: 0->1, CH230: 1->0, CH235: 1->0, CH252: 0->1, CH292: 0->2, CH298: 2->1.

Testudines:

Unambiguous: CH1: 0->1, CH15: 0->1, CH28: 0->1, CH35: 0->1, CH90: 1->2, CH248: 0->1;
DELTRAN: CH292: 0->2, CH298: 2->1, CH312: 1->0, CH319: 0->1, CH340: 0->1;
ACCTRAN: CH6: 0->1, CH95: 0->1, CH99: 0->2, CH109: 1->0, CH116: 0->2, CH163: 1->0,
CH191: 0->1, CH217: 1->0, CH253: 0->1.

Cryptodira:

Unambiguous: CH34: 1->0, CH69: 0->1, CH75: 0->1, CH122: 1->0, CH206: 1->0, CH276:
0->1, CH284: 0->1, CH286: 0->1, CH288: 0->1, CH295: 0->1;
DELTRAN: CH95: 0->1, CH109: 1->0, CH127: 1->0, CH163: 1->0, CH235: 0->1, CH253: 0->1;
ACCTRAN: CH13: 1->0, CH22: 1->0, CH230: 0->1, CH235: 0->1, CH252: 1->0, CH259: 0->1,
CH271: 1->0, CH318: 0->1.

Durocryptodira:

Unambiguous: CH208: 1->0, CH275: 0->1;
DELTRAN: CH13: 1->0, CH99: 0->2, CH259: 0->1, CH271: 1->0;
ACCTRAN: CH6: 1->0, CH62: 1->0, CH98: 1->0, CH132: 1->0, CH149: 0->1, CH217: 0->1,
CH219: 1->0, CH290: 0->1, CH321: 0->1.

Americhelydia:

Unambiguous: CH67: 0->1, CH243: 0->1;
DELTRAN: CH178: 0->1;
ACCTRAN: CH23: 1->0, CH40: 1->0, CH116: 2->0, CH180: 1->0, CH218: 0->1, CH234: 0->1,
CH247: 0->1, CH265: 0->1.

total-group Chelonioidea:

Unambiguous: CH35: 1->0, CH39: 0->1, CH58: 0->1, CH69: 1->0, CH94: 1->0, CH105: 0->1,
CH132: 0->2, CH139: 1->2, CH142: 0->1, CH144: 0->1, CH163: 0->1, CH210: 0->2,
CH231: 0->1, CH235: 1->0, CH242: 1->2, CH255: 0->2, CH291: 0->1, CH295: 1->0,
CH333: 0->1, CH334: 0->1, CH338: 0->1, CH342: 0->1;
DELTRAN: CH180: 1->0, CH218: 0->1, CH247: 0->1;
ACCTRAN: CH18: 2->0, CH57: 0->1, CH126: 1->0, CH135: 0->1, CH149: 1->0, CH209: 0->1,
CH232: 0->1, CH263: 0->1, CH284: 1->0, CH285: 0->1, CH288: 1->0, CH290: 1->0,
CH324: 0->1, CH325: 0->1.

crown-group Chelonioidea:

Unambiguous: CH15: 1->0, CH93: 0->2, CH104: 1->0, CH306: 0->1, CH307: 0->1, CH337:
0->1, CH344: 0->1;
DELTRAN: CH18: 2->0, CH22: 1->0, CH232: 0->1, CH284: 1->0, CH288: 1->0, CH318: 0->1,
CH324: 0->1, CH325: 0->2;
ACCTRAN: CH49: 1->0, CH125: 0->1, CH138: 0->2, CH140: 0->1, CH186: 0->1, CH219: 0->1,
CH256: 0->1, CH321: 1->0, CH325: 1->2.

Dermochelyoidea:

Unambiguous: CH27: 1->0, CH161: 0->1, CH237: 0->1, CH340: 1->2;
DELTRAN: CH126: 1->0, CH140: 0->1;

ACCTRAN: CH11: 1->0, CH65: 0->1, CH67: 1->0, CH98: 0->2, CH99: 2->1, CH135: 1->0, CH217: 1->0, CH224: 1->0.

Protostegidae:

Unambiguous: CH4: 1->0, CH62: 0->1, CH103: 0->1, CH236: 0->1, CH291: 1->0, CH328: 0->1, CH329: 0->1, CH335: 0->1;

ACCTRAN: CH57: 1->0, CH81: 0->1, CH128: 1->0, CH144: 1->0, CH285: 1->0, CH286: 1->0.

(*Ocepechelon* ++ *Santanachelys*):

Unambiguous: CH1: 1->0, CH40: 0->1, CH75: 1->0, CH116: 0->2;

DELTRAN: CH65: 0->1, CH99: 2->1, CH138: 0->2;

ACCTRAN: CH7: 0->1, CH11: 0->1, CH98: 2->0, CH186: 1->0, CH219: 1->0, CH221: 1->0, CH255: 2->0, CH256: 1->0.

(*Desmatochelys* ++ *Santanachelys*):

Unambiguous: CH15: 0->1, CH87: 0->1, CH93: 2->1, CH104: 0->1, CH142: 1->2;

DELTRAN: CH81: 0->1, CH255: 2->0, CH286: 1->0;

ACCTRAN: CH67: 0->1, CH76: 2->1.

(*Bouliachelys* ++ *Santanachelys*):

Unambiguous: CH115: 1->0, CH174: 0->1;

DELTRAN: CH49: 1->0, CH144: 1->0;

ACCTRAN: CH7: 1->0, CH125: 1->0, CH128: 0->1, CH225: 1->0, CH232: 1->0, CH247: 1->0, CH292: 2->0, CH334: 1->0, CH337: 1->0.

(*Rhinochelys* ++ *Santanachelys*):

Unambiguous: CH14: 1->2, CH95: 1->0, CH152: 1->0, CH161: 1->0;

ACCTRAN: CH185: 1->0.

Rhinochelys pulchriceps:

Unambiguous: CH94: 0->1, CH140: 1->0;

DELTRAN: CH185: 1->0.

(*Santanachelys* + *Notochelone*):

Unambiguous: CH96: 1->0;

ACCTRAN: CH69: 0->1, CH75: 0->1, CH81: 1->0, CH113: 0->1, CH132: 2->0.

Santanachelys gaaffneyi:

Unambiguous: CH105: 1->0, CH148: 1->0;

DELTRAN: CH75: 0->1, CH221: 1->0, CH224: 1->0, CH225: 1->0, CH232: 1->0, CH247: 1->0, CH292: 2->0, CH334: 1->0, CH337: 1->0.

Notochelone:

Unambiguous: CH67: 1->0, CH125: 0->1;

DELTRAN: CH69: 0->1, CH81: 1->0, CH113: 0->1, CH132: 2->0.

Bouliachelys suteri:

Unambiguous: CH4: 0->1, CH9: 1->0, CH11: 1->0, CH76: 1->0, CH83: 0->1, CH122: 0->1, CH133: 0->1, CH177: 0->1.

(*Desmatochelys lowii* + *Desmatochelys padillai*):

Unambiguous: CH19: 0->1, CH274: 1->0;
DELTRAN: CH7: 0->1, CH76: 2->1;
ACCTRAN: CH22: 0->1, CH49: 0->1, CH131: 0->1, CH208: 0->1.

Desmatochelys lowii:

Unambiguous: CH40: 1->0, CH93: 1->0, CH198: 0->1;
DELTRAN: CH22: 0->1, CH125: 0->1, CH128: 1->0, CH131: 0->1, CH208: 0->1, CH209: 0->1.

Desmatochelys padillai:

Unambiguous: CH18: 0->1, CH95: 1->0, CH99: 1->2, CH152: 1->0.

Ocepechelon bouyai:

Unambiguous: CH3: 1->0, CH13: 0->1, CH38: 0->1, CH48: 0->1, CH58: 1->0, CH110: 1->0;
DELTRAN: CH7: 0->1, CH49: 1->0, CH67: 1->0, CH128: 1->0.

(*Protostega* + *Archelon*):

Unambiguous: CH52: 0->1, CH102: 0->1, CH189: 0->1, CH214: 1->0, CH242: 2->3,
CH244: 1->2, CH332: 0->1;
DELTRAN: CH11: 1->0, CH67: 1->0, CH98: 0->2, CH186: 0->1, CH217: 1->0, CH219: 0->1,
CH256: 0->1;
ACCTRAN: CH65: 1->0, CH80: 0->1, CH148: 1->0, CH152: 1->0.

Protostega gigas:

Unambiguous: CH185: 1->0;
DELTRAN: CH80: 0->1, CH148: 1->0, CH152: 1->0.

Archelon ischyros:

Unambiguous: CH44: 0->1, CH201: 0->1, CH274: 1->0.

Dermochelyidae:

Unambiguous: CH16: 0->1, CH53: 0->1, CH96: 1->0, CH110: 1->0, CH115: 1->0, CH149: 0->1;
DELTRAN: CH11: 1->0, CH57: 0->1, CH65: 0->1, CH98: 0->2;
ACCTRAN: CH6: 0->1, CH14: 1->0, CH21: 1->0, CH49: 0->1, CH71: 0->1, CH79: 2->1,
CH87: 0->1, CH120: 0->1, CH124: 0->1, CH138: 2->0, CH177: 0->1, CH183: 0->2, CH194:
0->1, CH201: 0->1, CH204: 0->1, CH238: 0->1, CH287: 1->0, CH312: 0->1, CH325: 2->3,
CH327: 0->1, CH330: 0->1, CH334: 1->0.

Dermochelys coriacea:

Unambiguous: CH25: 1->0, CH42: 0->1, CH58: 1->0, CH94: 0->1;
DELTRAN: CH6: 0->1, CH14: 1->0, CH21: 1->0, CH67: 1->0, CH71: 0->1, CH79: 2->1,
CH87: 0->1, CH120: 0->3, CH124: 0->1, CH177: 0->1, CH183: 0->2, CH186: 0->1, CH194:
0->1, CH201: 0->1, CH204: 0->1, CH219: 0->1, CH238: 0->1, CH256: 0->1, CH285: 0->1,
CH287: 1->0, CH312: 0->1, CH325: 2->3, CH327: 0->1, CH330: 0->1, CH334: 1->0;
ACCTRAN: CH120: 1->3.

Eosphargis breineri:

Unambiguous: CH91: 1->0, CH101: 0->1, CH119: 0->1, CH136: 0->1;
DELTRAN: CH120: 0->1, CH135: 0->1;
ACCTRAN: CH67: 0->1, CH135: 0->1.

total-group Cheloniidae:

Unambiguous: CH44: 0->1, CH68: 0->1, CH109: 0->1, CH119: 0->1, CH176: 0->1;
DELTRAN: CH49: 1->0, CH125: 0->1, CH135: 0->1.

Argillochelys+++:

Unambiguous: CH16: 0->1, CH55: 0->1, CH56: 0->1, CH67: 1->2, CH81: 0->1, CH101: 0->1, CH102: 0->1, CH113: 0->1;
DELTRAN: CH57: 0->1, CH138: 0->2, CH140: 0->1, CH285: 0->1;
ACCTRAN: CH174: 0->1.

Allopleuron+++:

Unambiguous: CH58: 1->0, CH115: 1->0;
ACCTRAN: CH80: 0->1.

Puppigerus+++:

Unambiguous: CH6: 0->1, CH71: 0->1, CH87: 0->1, CH211: 0->1;
ACCTRAN: CH126: 0->1, CH186: 1->0, CH219: 1->0, CH256: 1->0, CH295: 0->1.

crown-group Cheloniidae:

Unambiguous: CH150: 0->1, CH177: 0->1, CH194: 0->1, CH327: 0->1, CH332: 0->1;
DELTRAN: CH295: 0->1;
ACCTRAN: CH58: 0->2, CH69: 0->1, CH80: 1->0, CH201: 0->1, CH212: 0->1.

(*Eretmochelys* ++ *Lepidochelys*):

Unambiguous: CH8: 0->1, CH29: 1->0, CH113: 1->0, CH344: 1->2;
DELTRAN: CH212: 0->1;
ACCTRAN: CH174: 1->0.

(*Caretta* ++ *Lepidochelys*):

Unambiguous: CH229: 0->1, CH306: 1->0;
ACCTRAN: CH11: 1->0, CH58: 2->0, CH142: 1->2, CH182: 0->1, CH189: 0->1, CH205: 1->0, CH263: 1->0.

(*Lepidochelys olivacea* + *Lepidochelys kempii*):

Unambiguous: CH144: 1->0;
DELTRAN: CH69: 0->1, CH174: 0->1, CH201: 0->1;
ACCTRAN: CH174: 0->1.

Lepidochelys olivacea:

Unambiguous: CH100: 1->0, CH132: 2->1, CH173: 0->1;
DELTRAN: CH11: 1->0, CH126: 1->0, CH142: 1->2, CH182: 0->1, CH189: 0->1;
ACCTRAN: CH126: 1->0.

Lepidochelys kempii:

Unambiguous: CH29: 0->1, CH52: 0->1, CH102: 1->0, CH177: 1->0;

DELTRAN: CH58: 0->2;
ACCTRAN: CH11: 0->1, CH58: 0->2, CH142: 2->1, CH182: 1->0, CH189: 1->0.

Caretta caretta:

Unambiguous: CH60: 0->1, CH64: 0->1, CH98: 0->1, CH111: 0->1, CH161: 0->1, CH210: 2->3, CH218: 1->0;
DELTRAN: CH11: 1->0, CH142: 1->2, CH182: 0->1, CH189: 0->1, CH205: 1->0;
ACCTRAN: CH69: 1->0, CH201: 1->0.

Eretmochelys imbricata:

Unambiguous: CH116: 0->1, CH120: 0->1, CH132: 2->0, CH175: 1->0, CH221: 1->0;
DELTRAN: CH58: 0->2, CH69: 0->1, CH126: 1->0, CH201: 0->1, CH263: 0->1;
ACCTRAN: CH126: 1->0.

(*Chelonia* + *Natator*):

Unambiguous: CH79: 2->1, CH178: 1->0;
DELTRAN: CH58: 0->2, CH174: 0->1, CH263: 0->1.

Chelonia mydas:

Unambiguous: CH71: 1->0, CH98: 0->2, CH100: 1->0, CH101: 1->0, CH102: 1->0, CH115: 0->1, CH120: 0->1, CH124: 0->1, CH132: 2->0, CH139: 2->0, CH189: 0->1, CH210: 2->3;
DELTRAN: CH201: 0->1;
ACCTRAN: CH69: 1->0, CH212: 1->0.

Natator depressus:

Unambiguous: CH75: 1->0, CH142: 1->2, CH175: 1->0, CH182: 0->1, CH221: 1->0,
CH345: 0->1;
DELTRAN: CH69: 0->1, CH126: 1->0, CH212: 0->1;
ACCTRAN: CH126: 1->0, CH201: 1->0.

Puppigerus camperi:

Unambiguous: CH16: 1->0, CH65: 0->1, CH125: 1->0, CH138: 2->1, CH140: 1->0, CH144: 1->0, CH149: 0->1, CH173: 0->1, CH345: 0->1;
DELTRAN: CH80: 0->1, CH174: 0->1.

Allopleuron hofmanni:

Unambiguous: CH25: 1->0, CH42: 0->1, CH44: 1->0, CH49: 0->1, CH76: 2->1, CH79: 2->1,
CH84: 0->1, CH93: 2->0, CH128: 1->0, CH131: 0->1, CH163: 1->0, CH175: 1->0, CH185: 1->0, CH189: 0->1, CH221: 1->0, CH236: 0->1;
DELTRAN: CH80: 0->1, CH126: 1->0, CH186: 0->1, CH219: 0->1, CH256: 0->1;
ACCTRAN: CH174: 1->0.

Argillochelys cuneiceps:

Unambiguous: CH149: 0->1, CH154: 1->0;
DELTRAN: CH126: 1->0, CH174: 0->1.

Eochelone:

Unambiguous: CH79: 2->1, CH120: 0->2, CH132: 2->0, CH142: 1->0, CH164: 1->0;
DELTRAN: CH138: 0->1;
ACCTRAN: CH57: 1->0, CH126: 0->1, CH138: 2->1, CH140: 1->0.

Toxochelys latiremis:

Unambiguous: CH1: 1->0, CH13: 0->1, CH28: 1->0, CH38: 0->1, CH95: 1->0, CH99: 2->0, CH115: 1->0, CH172: 0->1, CH177: 0->1, CH182: 0->1, CH194: 0->1, CH198: 0->1, CH268: 0->1, CH270: 0->1, CH271: 0->1, CH286: 1->0, CH299: 1->0; DELTRAN: CH18: 2->1, CH57: 0->1, CH135: 0->1, CH321: 0->1, CH325: 0->1; ACCTRAN: CH18: 0->1.

Chelydroidea:

Unambiguous: CH65: 0->1, CH154: 1->0, CH179: 1->0, CH195: 0->1; DELTRAN: CH149: 0->1, CH217: 1->0, CH290: 0->1; ACCTRAN: CH59: 0->1, CH188: 0->1, CH189: 0->1, CH217: 1->0, CH319: 1->0.

total-group Chelydridae:

Unambiguous: CH81: 0->1, CH269: 0->1; ACCTRAN: CH22: 0->1, CH125: 0->1, CH174: 0->1, CH177: 0->1, CH200: 1->0, CH221: 1->0, CH298: 1->2, CH299: 1->0, CH318: 1->0, CH341: 0->1.

crown-group Chelydridae:

Unambiguous: CH11: 1->0, CH35: 1->0, CH52: 0->1, CH67: 1->0, CH77: 1->2, CH94: 1->0, CH99: 2->0, CH113: 0->1, CH231: 0->1, CH242: 1->2, CH270: 0->1; DELTRAN: CH23: 1->0, CH125: 0->1, CH174: 0->1, CH177: 0->1, CH180: 1->0, CH200: 1->0, CH221: 1->0, CH247: 0->1, CH298: 1->2, CH299: 1->0; ACCTRAN: CH188: 1->0, CH189: 1->0.

Chelydra serpentina:

Unambiguous: CH9: 1->0, CH24: 0->1, CH28: 1->0, CH58: 0->1, CH123: 0->1, CH141: 0->1, CH196: 1->2, CH210: 0->2, CH217: 0->2, CH255: 0->1; DELTRAN: CH40: 0->1, CH265: 0->1; ACCTRAN: CH40: 0->1, CH319: 0->1.

Macrochelys temminckii:

Unambiguous: CH65: 1->0, CH84: 0->1, CH139: 1->0, CH142: 0->1, CH149: 1->0, CH154: 0->1, CH222: 1->0, CH297: 1->2; DELTRAN: CH116: 0->1, CH319: 1->0, CH321: 0->1, CH341: 0->1; ACCTRAN: CH116: 0->1.

Emarginachelys cretacea:

Unambiguous: CH29: 1->0, CH58: 0->2, CH107: 2->1, CH109: 0->1, CH317: 0->1; DELTRAN: CH59: 0->1, CH188: 0->1, CH189: 0->1.

Kinosternoidea:

Unambiguous: CH21: 1->2, CH54: 0->1, CH123: 0->1, CH206: 0->1, CH230: 1->0, CH266: 0->1, CH326: 0->1; DELTRAN: CH22: 1->0, CH116: 0->2, CH318: 0->1, CH319: 1->0; ACCTRAN: CH40: 0->1, CH116: 0->2, CH120: 0->2, CH122: 0->1, CH157: 0->1, CH180: 0->1, CH183: 0->1, CH208: 0->1, CH247: 1->0, CH281: 2->1, CH312: 0->1, CH316: 0->1, CH321: 1->0.

Kinosternidae:

Unambiguous: CH11: 1->0, CH17: 0->1, CH26: 0->1, CH32: 0->1, CH131: 0->1, CH205: 1->2, CH233: 0->1, CH248: 1->2, CH268: 0->1, CH272: 0->1, CH293: 0->1, CH317: 0->1;
DELTRAN: CH157: 0->1, CH183: 0->1, CH188: 0->1, CH189: 0->1, CH191: 0->1, CH234: 0->1, CH281: 2->1, CH316: 0->1;
ACCTRAN: CH42: 0->1, CH67: 1->2, CH68: 0->1, CH77: 1->2, CH100: 1->0.

Kinosterninae:

Unambiguous: CH24: 0->1, CH184: 0->1, CH207: 0->1, CH238: 0->1, CH263: 0->1, CH264: 0->1;
DELTRAN: CH40: 0->1, CH208: 0->1, CH312: 0->1;
ACCTRAN: CH122: 1->0.

Sternotherus:

Unambiguous: CH96: 1->0, CH98: 0->1, CH115: 1->0, CH116: 2->0, CH128: 1->0, CH137: 0->1, CH175: 1->0, CH209: 0->1;
DELTRAN: CH67: 1->2, CH68: 0->1, CH77: 1->2, CH120: 0->2;
ACCTRAN: CH42: 1->0, CH100: 0->1.

Kinosternon suburum hippocrepis:

Unambiguous: CH52: 0->1, CH110: 1->0, CH114: 0->1, CH125: 0->1, CH141: 0->1, CH159: 1->0, CH181: 0->1, CH206: 1->0, CH319: 0->1;
DELTRAN: CH42: 0->1, CH100: 1->0, CH180: 1->0;
ACCTRAN: CH67: 2->1, CH68: 1->0, CH77: 2->1, CH120: 2->0, CH180: 1->0.

Staurotypus:

Unambiguous: CH38: 0->1, CH49: 1->0, CH81: 0->1, CH105: 0->1, CH139: 1->0, CH255: 0->1;
DELTRAN: CH42: 0->1, CH67: 1->2, CH68: 0->1, CH77: 1->2, CH100: 1->0, CH120: 0->2, CH122: 0->1;
ACCTRAN: CH312: 1->0.

total-group Dermatemydidae:

Unambiguous: CH34: 0->1, CH58: 0->2, CH79: 2->1, CH96: 1->0, CH156: 0->1, CH175: 1->0, CH176: 0->1, CH243: 1->0, CH246: 0->1;
DELTRAN: CH312: 0->1;
ACCTRAN: CH126: 1->0, CH253: 1->0.

Dermatemys mawii:

Unambiguous: CH64: 0->1, CH104: 1->0, CH115: 1->0, CH139: 1->0, CH254: 0->1, CH263: 0->1, CH280: 1->0;
DELTRAN: CH40: 0->1, CH122: 0->1, CH126: 1->0, CH183: 0->1, CH208: 0->1, CH253: 1->0;
ACCTRAN: CH59: 1->0, CH120: 2->0, CH188: 1->0, CH189: 1->0, CH265: 1->0, CH316: 1->0.

Baptemys wyomingensis:

Unambiguous: CH119: 0->1, CH142: 0->1, CH149: 1->0, CH154: 0->1, CH172: 0->1, CH184: 0->1, CH252: 0->1;
DELTRAN: CH59: 0->1, CH120: 0->2, CH180: 1->0, CH188: 0->1, CH189: 0->1, CH265: 0->1, CH316: 0->1;

ACCTRAN: CH40: 1->0, CH180: 1->0, CH183: 1->0, CH208: 1->0.

Testudinoidea:

Unambiguous: CH96: 1->0, CH123: 0->1, CH175: 1->0, CH254: 0->1, CH282: 0->1;

DELTRAN: CH149: 0->1, CH321: 0->1;

ACCTRAN: CH11: 1->0, CH22: 0->1, CH65: 0->2, CH79: 2->1, CH115: 1->0, CH176: 0->1, CH197: 0->1, CH272: 0->1, CH312: 0->1, CH318: 1->0, CH326: 0->1.

Emydiae:

Unambiguous: CH221: 1->0;

DELTRAN: CH116: 0->2, CH178: 0->1.

Emydidae:

Unambiguous: CH34: 0->1, CH104: 1->0, CH121: 0->1, CH154: 1->0;

DELTRAN: CH40: 0->1, CH197: 0->1, CH217: 1->0, CH290: 0->1, CH312: 0->1, CH326: 0->1;

ACCTRAN: CH217: 1->0.

Chrysemys picta:

Unambiguous: CH22: 1->0, CH38: 0->1, CH58: 0->2, CH68: 0->1, CH113: 0->1, CH120: 0->1, CH122: 0->1, CH126: 1->0, CH230: 1->0, CH246: 0->1, CH252: 0->1, CH253: 1->0, CH267: 0->1, CH283: 0->1;

DELTRAN: CH65: 0->2, CH115: 1->0, CH176: 0->1, CH272: 0->1;

ACCTRAN: CH11: 0->1, CH79: 1->2.

Emys orbicularis:

Unambiguous: CH28: 1->0, CH72: 1->0, CH91: 1->0, CH141: 0->1, CH144: 0->1, CH233: 0->1, CH240: 1->0, CH254: 1->0, CH265: 0->1;

DELTRAN: CH11: 1->0, CH79: 2->1;

ACCTRAN: CH65: 2->0, CH115: 0->1.

Platysternon megacephalum:

Unambiguous: CH16: 0->1, CH18: 2->0, CH23: 1->0, CH32: 0->1, CH35: 1->0, CH43: 0->1, CH52: 0->1, CH58: 0->1, CH65: 2->1, CH75: 1->0, CH77: 1->2, CH94: 1->0, CH100: 1->0, CH101: 0->1, CH109: 0->1, CH124: 0->1, CH125: 0->1, CH138: 0->2, CH139: 1->0, CH142: 0->1, CH159: 1->0, CH163: 0->1, CH180: 1->0, CH181: 0->1, CH184: 0->1, CH200: 1->0, CH206: 0->1, CH247: 0->1, CH253: 1->2, CH275: 1->0, CH298: 1->2, CH299: 1->0, CH323: 1->0;

DELTRAN: CH11: 1->0, CH79: 2->1, CH115: 1->0;

ACCTRAN: CH40: 1->0, CH176: 1->0, CH197: 1->0, CH272: 1->0, CH290: 1->0, CH312: 1->0, CH326: 1->0.

Testuguria:

Unambiguous: CH66: 0->1, CH72: 1->0, CH155: 0->1, CH179: 1->0, CH230: 1->0, CH245: 1->0, CH246: 0->1, CH267: 0->1;

DELTRAN: CH65: 0->2, CH197: 0->1, CH272: 0->1, CH290: 0->1, CH312: 0->1, CH326: 0->1;

ACCTRAN: CH17: 0->1, CH178: 1->0, CH252: 0->1.

Geoclemys hamiltonii:

Unambiguous: CH26: 0->1, CH42: 0->1, CH67: 0->1, CH68: 0->1, CH120: 0->3, CH121: 0->1, CH188: 0->1, CH189: 0->1, CH206: 0->1, CH265: 0->1;
DELTRAN: CH11: 1->0, CH17: 0->1, CH40: 0->1, CH115: 1->0, CH116: 0->2, CH176: 0->1, CH252: 0->1;
ACCTRAN: CH79: 1->2.

Testudinidae:

Unambiguous: CH27: 1->0, CH34: 0->1, CH58: 0->2, CH76: 2->1, CH77: 1->2, CH141: 0->1, CH154: 1->0, CH200: 1->0, CH248: 1->0, CH253: 1->0;
DELTRAN: CH79: 2->1;
ACCTRAN: CH11: 0->1, CH95: 1->0, CH104: 1->0, CH105: 0->1, CH115: 0->1, CH116: 2->0, CH131: 0->2, CH213: 0->1, CH323: 1->0, CH336: 1->0, CH341: 0->1.

(Testudo + Chelonoidis):

Unambiguous: CH75: 1->0, CH180: 1->0;
DELTRAN: CH17: 0->1;
ACCTRAN: CH176: 1->0, CH252: 1->0.

Testudo:

Unambiguous: CH42: 0->1, CH66: 1->0, CH100: 1->0, CH113: 0->1, CH121: 0->1, CH183: 0->1;
DELTRAN: CH40: 0->1, CH104: 1->0, CH213: 0->1, CH336: 1->0, CH341: 0->1;
ACCTRAN: CH95: 0->1, CH131: 2->0, CH323: 0->1.

Chelonoidis sp.:

Unambiguous: CH13: 0->1, CH161: 0->1, CH197: 1->0, CH206: 0->1, CH221: 1->0, CH230: 0->1, CH245: 0->1, CH246: 1->0, CH247: 0->1, CH253: 0->2, CH267: 1->0, CH272: 1->0, CH275: 1->0, CH290: 1->0, CH298: 1->2, CH299: 1->0, CH312: 1->0, CH326: 1->0;
DELTRAN: CH95: 1->0, CH105: 0->1, CH131: 0->2, CH323: 1->0;
ACCTRAN: CH40: 1->0, CH104: 0->1, CH213: 1->0, CH336: 0->1, CH341: 1->0.

Gopherus polyphemus:

Unambiguous: CH21: 1->2, CH22: 1->0, CH54: 0->1, CH71: 0->1, CH102: 0->1, CH124: 0->1, CH126: 1->0, CH139: 1->0;
DELTRAN: CH95: 1->0, CH104: 1->0, CH131: 0->2, CH176: 0->1, CH213: 0->1, CH252: 0->1, CH323: 1->0, CH336: 1->0, CH341: 0->1;
ACCTRAN: CH17: 1->0.

Trionychia:

Unambiguous: CH17: 0->1, CH21: 1->2, CH24: 0->1, CH38: 0->1, CH48: 0->1, CH49: 1->0, CH54: 0->1, CH64: 0->1, CH71: 0->1, CH77: 1->2, CH94: 1->2, CH103: 0->1, CH112: 0->1, CH113: 0->1, CH125: 0->1, CH190: 0->1, CH256: 0->1, CH280: 1->0;
DELTRAN: CH6: 0->1, CH22: 1->0, CH62: 0->1, CH98: 0->1, CH132: 0->1, CH191: 0->2, CH219: 0->1, CH318: 0->1;
ACCTRAN: CH181: 0->1, CH184: 0->1, CH187: 0->1, CH191: 1->2, CH205: 1->0, CH248: 1->2, CH317: 0->1, CH339: 0->1.

Trionychidae:

Unambiguous: CH26: 0->1, CH30: 0->1, CH42: 0->1, CH50: 0->1, CH51: 0->1, CH60: 0->1, CH65: 0->2, CH80: 0->1, CH104: 1->0, CH148: 1->0, CH186: 0->1, CH204: 0->1, CH216: 0->1, CH231: 0->1, CH232: 0->1, CH242: 1->4, CH243: 0->1, CH247: 0->1, CH279: 1->2, CH324: 0->1, CH326: 0->1, CH343: 0->1;
DELTRAN: CH116: 0->1, CH339: 0->1;
ACCTRAN: CH13: 0->1, CH40: 1->0, CH116: 2->1, CH178: 1->0.

Trionychinae:

DELTRAN: CH181: 0->1, CH184: 0->1;
ACCTRAN: CH163: 0->1, CH317: 1->0.

Apalone spinifera:

Unambiguous: CH58: 0->1, CH95: 1->0;
DELTRAN: CH163: 0->1.

Pelodiscus sinensis:

Unambiguous: CH122: 0->1.

Lissemys punctata:

Unambiguous: CH29: 1->0, CH69: 1->0, CH100: 1->0, CH103: 1->2, CH164: 1->0;
DELTRAN: CH317: 0->1;
ACCTRAN: CH181: 1->0, CH184: 1->0.

total-group Carettochelyidae:

Unambiguous: CH85: 0->1, CH119: 0->1, CH120: 0->3, CH124: 0->1, CH137: 0->1;
DELTRAN: CH40: 0->1, CH116: 0->2;
ACCTRAN: CH32: 0->1, CH58: 0->1, CH66: 0->1, CH76: 2->0, CH175: 1->0, CH176: 0->1, CH193: 1->0, CH323: 1->0, CH339: 1->2, CH340: 1->2.

Carettochelys insculpta:

DELTRAN: CH13: 1->0, CH32: 0->1, CH58: 0->1, CH66: 0->1, CH76: 2->0, CH175: 1->0, CH176: 0->1, CH178: 0->1, CH181: 0->1, CH184: 0->1, CH187: 0->1, CH193: 1->0, CH205: 1->0, CH217: 1->0, CH248: 1->2, CH317: 0->1, CH323: 1->0, CH339: 0->2, CH340: 1->2.

Allaeochelys libyca:

Unambiguous: CH109: 0->1, CH126: 1->0;
DELTRAN: CH76: 2->1;
ACCTRAN: CH76: 0->1.

Pleurodira:

Unambiguous: CH5: 0->1, CH41: 0->1, CH70: 0->1, CH79: 2->0, CH87: 0->1, CH91: 1->0, CH92: 0->1, CH96: 1->0, CH104: 1->0, CH106: 1->2, CH107: 2->0, CH197: 0->1, CH246: 0->1, CH254: 0->1, CH258: 0->1, CH274: 1->0, CH277: 0->1, CH281: 2->0, CH311: 0->1;
DELTRAN: CH6: 0->1, CH40: 0->1, CH127: 1->2, CH132: 0->1, CH191: 0->3, CH217: 1->0;
ACCTRAN: CH2: 0->1, CH73: 0->1, CH77: 1->3, CH123: 0->2, CH127: 0->2, CH151: 0->1, CH153: 1->0, CH154: 1->0, CH158: 0->1, CH178: 1->0, CH191: 1->3, CH304: 0->1.

total-group Chelidae:

Unambiguous: CH7: 0->1, CH23: 1->0, CH72: 1->0, CH172: 0->1, CH180: 1->0, CH190: 0->1, CH289: 0->1;
DELTRAN: CH123: 0->2, CH151: 0->1, CH154: 1->0, CH158: 0->1;
ACCTRAN: CH110: 1->0, CH120: 0->1, CH163: 0->1.

crown-group Chelidae:

Unambiguous: CH4: 1->0, CH31: 0->1, CH34: 1->2, CH185: 1->0, CH281: 0->3, CH282: 0->1;
DELTRAN: CH2: 0->1, CH77: 1->3, CH230: 1->0, CH235: 0->1, CH304: 0->1;
ACCTRAN: CH1: 1->0, CH15: 1->0, CH62: 1->0, CH73: 1->0, CH95: 1->0, CH114: 0->1,
CH117: 0->2, CH182: 0->1, CH219: 1->0, CH235: 0->1.

Chelinae:

DELTRAN: CH15: 1->0, CH110: 1->0, CH114: 0->1, CH116: 0->3, CH117: 0->2, CH120: 0->1, CH163: 1->0;
ACCTRAN: CH116: 2->3, CH163: 1->0.

Chelus fimbriatus:

Unambiguous: CH6: 1->0, CH22: 1->0, CH48: 0->1, CH128: 1->0, CH148: 1->0, CH159: 1->0, CH188: 0->1, CH189: 0->1, CH200: 1->0, CH208: 1->0, CH221: 1->0, CH260: 0->2, CH262: 0->1, CH265: 0->1, CH275: 0->1, CH276: 0->1;
DELTRAN: CH252: 0->3, CH253: 0->1;
ACCTRAN: CH1: 0->1, CH153: 0->1, CH252: 1->3.

Phrynops geoffranius:

Unambiguous: CH24: 0->1, CH103: 0->1, CH141: 0->1, CH190: 1->0, CH203: 0->1, CH289: 1->0;
DELTRAN: CH1: 1->0, CH153: 1->0, CH182: 0->1, CH252: 0->1;
ACCTRAN: CH253: 1->0.

Chelodininae:

Unambiguous: CH201: 0->1, CH207: 0->1, CH209: 0->1;
DELTRAN: CH1: 1->0, CH116: 0->2;
ACCTRAN: CH120: 1->0, CH324: 0->1.

Elseya dentata:

Unambiguous: CH16: 0->1, CH18: 2->0, CH23: 0->1, CH24: 0->1, CH58: 0->2, CH60: 0->1, CH172: 1->0, CH174: 0->1, CH175: 1->0, CH183: 0->1, CH248: 1->0;
DELTRAN: CH15: 1->0, CH182: 0->1, CH219: 0->1, CH252: 0->1;
ACCTRAN: CH110: 0->1, CH114: 1->0, CH117: 2->0, CH153: 0->1, CH219: 0->1, CH253: 1->0.

Chelodina:

Unambiguous: CH12: 0->1, CH82: 0->1, CH103: 0->1, CH128: 1->0, CH179: 1->0, CH260: 0->1;
DELTRAN: CH110: 1->0, CH114: 0->1, CH117: 0->2, CH153: 1->0, CH253: 0->1, CH324: 0->1;
ACCTRAN: CH15: 0->1, CH182: 1->0, CH252: 1->0.

Arariipemys barretoi:

Unambiguous: CH38: 0->1, CH94: 1->2, CH115: 1->0, CH179: 1->0, CH188: 0->1, CH189: 0->1, CH191: 3->4, CH206: 1->0, CH210: 0->2, CH227: 0->1, CH231: 0->1, CH232: 0->1, CH243: 0->1, CH259: 0->1, CH269: 0->1;
DELTRAN: CH62: 0->1, CH73: 0->1, CH95: 0->1, CH120: 0->1, CH153: 1->0, CH219: 0->1, CH253: 0->1;
ACCTRAN: CH77: 3->1, CH116: 2->0, CH230: 0->1, CH252: 1->0.

Pelomedusoides:

Unambiguous: CH21: 1->2, CH54: 0->1, CH58: 0->2, CH61: 1->2, CH82: 0->1, CH175: 1->0, CH249: 1->0;
DELTRAN: CH62: 0->1, CH73: 0->1, CH77: 1->3, CH163: 1->0, CH219: 0->1, CH230: 1->0, CH251: 0->1, CH252: 0->1;
ACCTRAN: CH253: 1->0.

Podocnemis:

Unambiguous: CH18: 2->0, CH24: 0->1, CH30: 0->1, CH42: 0->1, CH55: 0->1, CH97: 0->1, CH115: 1->0, CH148: 1->0, CH265: 0->1, CH324: 0->1;
DELTRAN: CH95: 0->1, CH116: 0->2, CH153: 1->0, CH304: 0->1;
ACCTRAN: CH123: 2->0, CH151: 1->0, CH154: 0->1, CH158: 1->0.

Pelomedusa subrufa:

Unambiguous: CH22: 1->0, CH38: 0->1, CH103: 0->1, CH124: 0->1, CH141: 0->1, CH143: 1->0;
DELTRAN: CH123: 0->2, CH151: 0->1, CH154: 1->0, CH158: 0->1;
ACCTRAN: CH95: 1->0, CH116: 2->0, CH153: 0->1, CH304: 1->0.

Angolachelonia:

Unambiguous: CH18: 2->0, CH83: 0->1, CH84: 0->1, CH94: 1->0, CH103: 0->1, CH181: 0->1, CH182: 0->1, CH184: 0->1;
ACCTRAN: CH49: 1->0, CH56: 0->1, CH67: 0->2, CH120: 0->1, CH139: 1->2, CH173: 0->1, CH209: 0->1, CH219: 1->0, CH231: 0->1.

Thalassochelydia:

Unambiguous: CH81: 0->1, CH113: 0->1, CH142: 0->1, CH185: 1->0, CH210: 0->2, CH211: 0->1, CH224: 1->0, CH278: 1->0;
DELTRAN: CH209: 0->1, CH231: 0->1;
ACCTRAN: CH40: 1->0, CH127: 0->1, CH132: 1->0, CH221: 1->0, CH287: 1->0, CH292: 2->0.

Solnhofia parsoni:

Unambiguous: CH17: 0->1, CH60: 0->1, CH64: 0->1, CH90: 1->2, CH95: 0->1, CH96: 1->0, CH100: 1->0, CH107: 2->1, CH109: 1->0, CH115: 1->0, CH116: 0->2, CH119: 0->1, CH126: 1->0, CH174: 0->1, CH217: 1->2, CH243: 0->1;
DELTRAN: CH49: 1->0, CH56: 0->1, CH62: 0->1, CH67: 0->2, CH98: 0->1, CH120: 0->1, CH173: 0->1, CH178: 0->1;
ACCTRAN: CH139: 2->1, CH230: 0->1, CH252: 1->0.

(*Portlandemys* ++ *Plesiochelys*):

Unambiguous: CH4: 1->0, CH27: 1->0, CH39: 0->1, CH58: 0->1, CH152: 1->0, CH175: 1->0, CH180: 1->0;

DELTRAN: CH132: 0->2, CH139: 1->2;
ACCTRAN: CH7: 0->1, CH49: 0->1, CH56: 1->0, CH67: 2->0, CH98: 1->0, CH120: 1->0,
CH128: 1->0, CH131: 0->1, CH132: 0->2, CH173: 1->0, CH220: 1->0, CH246: 0->1.

(*Jurassichelon* ++ *Plesiochelys*):

Unambiguous: CH93: 0->1, CH99: 0->1, CH155: 0->1;
DELTRAN: CH246: 0->1;
ACCTRAN: CH18: 0->1.

Jurassichelon oleronensis:

Unambiguous: CH75: 0->1, CH81: 1->0, CH94: 0->1, CH110: 1->0, CH147: 2->1;
DELTRAN: CH7: 0->1, CH18: 0->1, CH62: 0->1, CH128: 1->0, CH131: 0->1, CH287: 1->0,
CH292: 0->1;
ACCTRAN: CH292: 0->1.

(*Plesiochelys etalloni* + *Plesiochelys planiceps*):

Unambiguous: CH90: 1->2, CH96: 1->0, CH122: 1->0, CH140: 0->1;
ACCTRAN: CH7: 1->0, CH44: 0->1, CH116: 0->2, CH128: 0->1, CH131: 1->0, CH268: 0->1.

Plesiochelys planiceps:

Unambiguous: CH34: 1->2, CH107: 2->1;
DELTRAN: CH62: 0->1, CH116: 0->2, CH178: 0->1.

Plesiochelys etalloni:

Unambiguous: CH4: 0->1, CH104: 1->0, CH109: 1->0, CH143: 1->0;
DELTRAN: CH44: 0->1, CH220: 1->0, CH221: 1->0, CH230: 1->0, CH252: 0->1, CH268: 0->1;
ACCTRAN: CH62: 1->0, CH178: 1->0.

Portlandemys mcdowellii:

Unambiguous: CH181: 1->0;
DELTRAN: CH7: 0->1, CH128: 1->0, CH131: 0->1;
ACCTRAN: CH62: 1->0.

Sandownidae:

Unambiguous: CH34: 1->0, CH57: 0->1, CH68: 0->1, CH108: 0->1;
DELTRAN: CH56: 0->1, CH67: 0->2, CH98: 0->1, CH132: 0->1, CH173: 0->1;
ACCTRAN: CH2: 0->1, CH16: 0->1, CH62: 1->0, CH105: 0->1, CH275: 0->1.

(*Sandownia* + *Leyvachelys*):

Unambiguous: CH7: 0->1, CH21: 1->2, CH77: 1->2, CH115: 1->0;
DELTRAN: CH139: 1->0;
ACCTRAN: CH116: 0->1, CH139: 2->0.

Sandownia harrisi:

Unambiguous: CH54: 0->1, CH55: 0->1, CH95: 0->1, CH110: 1->0, CH147: 2->1;
DELTRAN: CH2: 0->1, CH49: 1->0, CH116: 0->1, CH127: 1->0;
ACCTRAN: CH16: 1->0, CH105: 1->0.

Leyvachelys cipadi:

Unambiguous: CH3: 1->0, CH27: 1->0, CH141: 0->1, CH142: 0->1;
DELTRAN: CH16: 0->1, CH40: 0->1, CH62: 0->1, CH105: 0->1, CH120: 0->1, CH230: 1->0,
CH252: 0->1, CH275: 0->1, CH292: 0->2;
ACCTRAN: CH2: 1->0, CH49: 0->1, CH62: 0->1.

Brachyopsemys tingitana:

Unambiguous: CH48: 0->1, CH64: 0->1, CH71: 0->1, CH161: 0->1, CH163: 1->0;
DELTRAN: CH2: 0->1, CH16: 0->1, CH49: 1->0, CH105: 0->1, CH139: 1->2.

Sinemydidae/Macropaenidae:

Unambiguous: CH113: 0->1, CH134: 0->1, CH242: 1->2, CH243: 0->1;
DELTRAN: CH235: 0->1;
ACCTRAN: CH40: 1->0, CH122: 1->0, CH131: 0->2, CH179: 1->0, CH227: 0->1, CH259: 0->1, CH275: 0->1.

(*Ordosemys* ++ *Kirgizemys*):

Unambiguous: CH18: 2->1, CH38: 0->1, CH276: 0->1;
DELTRAN: CH275: 0->1.

(*Ordosemys* + *Dracochelys*):

Unambiguous: CH81: 0->1, CH116: 0->2;
ACCTRAN: CH115: 1->0, CH152: 1->0, CH192: 0->1, CH210: 0->1, CH215: 0->1, CH221: 1->0, CH231: 0->1, CH280: 1->0.

Ordosemys sp. IVPP V12092:

Unambiguous: CH80: 0->1, CH83: 0->1, CH99: 0->2;
DELTRAN: CH115: 1->0, CH152: 1->0;
ACCTRAN: CH4: 1->0.

Dracochelys bicuspidata:

Unambiguous: CH53: 0->1, CH58: 0->1, CH65: 2->0, CH134: 1->0, CH146: 1->0;
DELTRAN: CH4: 0->1, CH192: 0->1, CH210: 0->1, CH215: 0->1, CH219: 0->1, CH221: 1->0, CH227: 0->1, CH231: 0->1, CH280: 1->0.

(*Judithemys* ++ *Kirgizemys*):

Unambiguous: CH109: 1->0, CH292: 0->2;
DELTRAN: CH4: 0->1, CH259: 0->1;
ACCTRAN: CH219: 1->0, CH227: 1->0, CH288: 0->1, CH290: 0->1.

Judithemys sukhanovi:

Unambiguous: CH75: 0->1, CH90: 1->2, CH271: 1->0;
DELTRAN: CH290: 0->1.

(*Kirgizemys hoburensis* + *Kirgizemys dmitrievi*):

Unambiguous: CH34: 1->2, CH149: 0->1;
ACCTRAN: CH96: 1->0, CH107: 2->1, CH154: 1->0, CH203: 0->1.

Kirgizemys hoburensis:

Unambiguous: CH40: 0->1, CH163: 1->0;
DELTRAN: CH107: 2->1, CH122: 1->0, CH154: 1->0, CH203: 0->1, CH288: 0->1.

Kirgizemys dmitrievi:

Unambiguous: CH13: 1->0, CH58: 0->1, CH61: 1->0, CH65: 2->1, CH79: 1->2, CH140: 0->1, CH161: 0->1;
DELTRAN: CH96: 1->0.

(*Sinemys lens* + *Sinemys gamera*):

Unambiguous: CH7: 0->1, CH15: 0->1, CH34: 1->2, CH77: 1->2, CH91: 1->0, CH96: 1->0,
CH210: 0->2, CH244: 1->0;
DELTRAN: CH131: 0->2;
ACCTRAN: CH4: 1->0, CH24: 0->1, CH35: 0->1, CH73: 0->1, CH190: 0->1, CH255: 0->1.

Sinemys gamera:

Unambiguous: CH2: 0->1;
DELTRAN: CH24: 0->1, CH35: 0->1, CH73: 0->1, CH190: 0->1.

Sinemys lens:

Unambiguous: CH107: 2->1;
DELTRAN: CH219: 0->1, CH227: 0->1, CH255: 0->1.

Xinjiangchelyidae:

Unambiguous: CH38: 0->1, CH91: 1->0, CH125: 0->1, CH203: 0->1, CH257: 0->1, CH270:
0->1;
DELTRAN: CH179: 0->1, CH235: 0->1;
ACCTRAN: CH34: 1->2, CH107: 2->1, CH152: 1->0, CH226: 0->1, CH294: 1->0, CH340: 1->0.

Annemys levensis:

Unambiguous: CH136: 0->1, CH208: 0->1, CH225: 1->0;
DELTRAN: CH4: 0->1, CH34: 1->2, CH107: 2->1, CH226: 0->1;
ACCTRAN: CH175: 1->0.

(*Annemys latiens* ++ *Xinjiangchelys*):

Unambiguous: CH7: 0->1, CH145: 1->0;
ACCTRAN: CH4: 1->0, CH116: 0->2.

Annemys latiens:

Unambiguous: CH88: 1->0, CH121: 0->1;
DELTRAN: CH226: 0->1.

(*Annemys* sp. ++ *Xinjiangchelys*):

Unambiguous: CH2: 0->1;
DELTRAN: CH116: 0->2;
ACCTRAN: CH226: 1->0.

Annemys sp. IVPP V18106:

Unambiguous: CH81: 0->1, CH96: 1->0, CH131: 0->1, CH143: 1->0, CH155: 0->1;
DELTRAN: CH34: 1->2, CH40: 0->1, CH107: 2->1, CH152: 1->0.

(*Xinjiangchelys wusu* + *Xinjiangchelys radioplacoides*):

Unambiguous: CH75: 0->1, CH76: 2->1;
ACCTRAN: CH34: 2->1, CH62: 0->1, CH107: 1->2, CH123: 1->0, CH139: 1->2.

Xinjiangchelys wusu:

Unambiguous: CH257: 1->0;
ACCTRAN: CH152: 0->1.

Xinjiangchelys radiplicatoides:

Unambiguous: CH91: 0->1; CH109: 1->0, CH185: 0->1;
DELTRAN: CH62: 0->1, CH123: 1->0, CH139: 1->2, CH152: 1->0, CH175: 0->1;
Unambiguous: CH94: 1->2.

Paracryptodira:

Unambiguous: CH7: 0->1, CH43: 0->1, CH145: 1->2;
ACCTRAN: CH2: 0->1, CH24: 0->1, CH28: 0->1, CH58: 0->1, CH65: 2->0, CH72: 1->0,
CH147: 1->0, CH190: 0->1, CH230: 1->0, CH246: 0->1, CH249: 1->0, CH251: 1->0,
CH252: 0->1, CH277: 0->1, CH304: 0->1;
DELTRAN: CH24: 0->1.

(*Eubaena* ++ *Pleurosternon*):

Unambiguous: CH116: 0->2, CH131: 0->1, CH137: 0->1;
DELTRAN: CH28: 0->1;
ACCTRAN: CH69: 0->1, CH128: 0->1, CH133: 0->1.

Eubaena cephalica:

Unambiguous: CH7: 1->2, CH11: 1->0, CH15: 0->1, CH75: 0->1, CH87: 0->1, CH90: 1->2,
CH129: 0->1, CH162: 0->1;
DELTRAN: CH69: 0->1;
ACCTRAN: CH2: 1->0, CH65: 0->2.

Pleurosternidae:

Unambiguous: CH3: 0->1, CH18: 2->0, CH76: 2->1, CH94: 1->2, CH107: 2->1, CH132: 0->1;
DELTRAN: CH2: 0->1, CH65: 2->0, CH190: 0->1, CH230: 1->0, CH248: 0->1, CH252: 0->1;
ACCTRAN: CH17: 0->1, CH80: 0->1, CH120: 2->0.

Pleurosternon bullockii:

Unambiguous: CH35: 0->1, CH58: 1->0, CH131: 1->2, CH191: 0->3, CH217: 1->0, CH219:
0->1, CH258: 0->1;
DELTRAN: CH17: 0->1, CH22: 0->1, CH80: 0->1, CH128: 0->1, CH133: 0->1.

Glyptops plicatulus:

DELTRAN: CH120: 2->0, CH246: 0->1, CH277: 0->1, CH294: 0->1, CH304: 0->1.

Arundellemys dardeni:

Unambiguous: CH105: 0->1, CH122: 1->0, CH125: 0->1;
DELTRAN: CH2: 0->1, CH65: 2->0;
ACCTRAN: CH22: 1->0.

Meiolania planiceps:

Unambiguous: CH25: 1->0, CH33: 0->1, CH36: 0->1, CH37: 0->1, CH58: 0->2, CH66: 0->1, CH75: 0->1, CH76: 2->0, CH77: 1->3, CH78: 0->1, CH90: 1->2, CH104: 1->0, CH111: 0->1, CH139: 1->0, CH142: 1->0, CH159: 1->0, CH161: 0->1, CH182: 0->1, CH221: 1->0, CH231: 0->1, CH278: 0->1, CH300: 0->1;
DELTRAN: CH72: 0->1, CH121: 0->1, CH147: 0->1, CH149: 0->1, CH155: 0->1, CH166: 0->1, CH170: 0->1, CH248: 0->1, CH249: 0->1, CH274: 0->1, CH297: 0->2, CH340: 0->1;
ACCTRAN: CH11: 1->0, CH149: 0->1, CH155: 0->1, CH166: 0->1, CH170: 0->1, CH242: 1->0, CH274: 0->1, CH296: 1->0, CH297: 1->2.

Kallokibotion bajazidi:

Unambiguous: CH60: 0->1, CH79: 1->2, CH117: 0->1, CH129: 0->1, CH144: 0->1, CH146: 0->1, CH175: 0->1, CH218: 0->1, CH253: 0->2, CH305: 0->1;
DELTRAN: CH11: 0->1, CH121: 0->1, CH242: 0->1, CH251: 0->1.

Chubutemys copelloi:

Unambiguous: CH4: 0->1, CH27: 1->0, CH29: 1->0, CH62: 0->1, CH95: 0->1, CH277: 0->1;
DELTRAN: CH58: 1->0;
ACCTRAN: CH11: 1->0.

(*Eileanchelys* + *Kayentachelys*):

Unambiguous: CH7: 0->1, CH28: 0->1, CH47: 0->1, CH109: 0->1, CH172: 0->1;
DELTRAN: CH11: 0->1, CH132: 0->1;
ACCTRAN: CH89: 1->0, CH134: 0->1, CH155: 0->1, CH206: 0->1.

Eileanchelys waldmanni:

Unambiguous: CH203: 0->1;
DELTRAN: CH20: 0->1, CH155: 0->1, CH165: 0->1, CH202: 0->1, CH239: 0->1.

Kayentachelys aprix:

Unambiguous: CH84: 0->1, CH130: 2->1, CH214: 1->0, CH217: 1->0;
DELTRAN: CH24: 0->1, CH76: 0->1, CH134: 0->1, CH140: 0->1, CH206: 0->1, CH296: 0->1;
ACCTRAN: CH20: 1->0, CH165: 1->0, CH202: 1->0, CH239: 1->0.

Australochelys africanus:

Unambiguous: CH129: 0->1;
DELTRAN: CH24: 0->1, CH74: 0->1, CH89: 0->1, CH132: 0->1, CH140: 0->1.

Proganochelys quenstedti:

DELTRAN: CH42: 0->1, CH69: 0->1, CH161: 0->1, CH208: 0->1, CH262: 0->1, CH274: 0->1;
ACCTRAN: CH42: 0->1, CH69: 0->1, CH161: 0->1, CH208: 0->1, CH262: 0->1, CH274: 0->1.