

S2. Character optimization (list of changes) resulted in the present analysis.

Diplomystus:

No autapomorphies

Brycon:

Char. 14: 0 --> 1

Char. 97: 0 --> 2

Char. 100: 0 --> 1

Opsariichthys:

Char. 103: 0 --> 1

Aethalionopsis:

Char. 17: 0 --> 1

Char. 77: 0 --> 1

Char. 89: 1 --> 0

Char. 90: 0 --> 1

Char. 94: 1 --> 0

Char. 96: 0 --> 1

Chanos:

Char. 6: 1 --> 2

Char. 19: 1 --> 2

Char. 60: 1 --> 0

Char. 90: 0 --> 1

Char. 91: 0 --> 1

Char. 92: 0 --> 2

Char. 96: 0 --> 1

Char. 97: 0 --> 1

Char. 100: 0 --> 1

Char. 104: 0 --> 1

Dastilbe crandalli:

Char. 30: 1 --> 2

Gonorynchus:

Char. 9: 0 --> 1

Char. 13: 0 --> 1

Char. 15: 0 --> 1

Char. 16: 0 --> 1

Char. 22: 0 --> 2

Char. 23: 0 --> 1

Char. 25: 0 --> 1

Char. 26: 0 --> 1

Char. 37: 0 --> 1

Char. 41: 0 --> 1

Char. 45: 2 --> 1

Char. 46: 0 --> 1

Char. 55: 0 --> 1

Char. 82: 0 --> 1

Char. 87: 0 --> 1

Char. 97: 0 --> 2

Char. 98: 0 --> 1

Char. 99: 0 --> 1

Char. 105: 0 --> 1

Char. 106: 0 --> 1

Gordichthys:

Char. 17: 2 --> 1
Char. 88: 0 --> 1
Char. 102: 0 --> 1

Kneria:

Char. 8: 0 --> 1
Char. 10: 0 --> 1
Char. 11: 0 --> 1
Char. 19: 1 --> 3
Char. 32: 0 --> 1
Char. 35: 0 --> 1
Char. 44: 0 --> 1
Char. 52: 0 --> 2
Char. 56: 0 --> 1
Char. 65: 0 --> 1
Char. 68: 0 --> 1
Char. 73: 0 --> 1
Char. 81: 0 --> 1
Char. 84: 0 --> 1

Parachanos:

Char. 95: 1 --> 2

Rubiesichthys:

No autapomorphies

Tharrhias:

Char. 93: 0 --> 1
Char. 94: 1 --> 0

Nanaichthys:

No autapomorphies

Dastilbe moraesi:

Char. 3: 1 --> 2
Char. 11: 0 --> 1
Char. 18: 0 --> 1
Char. 23: 0 --> 1
Char. 31: 0 --> 1
Char. 35: 1 --> 0
Char. 58: 1 --> 0
Char. 98: 0 --> 1

Node 1:

Char. 82: 0 --> 1
Char. 96: 0 --> 1

Node 2:

Char. 1: 0 --> 1
Char. 6: 0 --> 1
Char. 19: 0 --> 1
Char. 28: 0 --> 1
Char. 45: 0 --> 2
Char. 72: 0 --> 1
Char. 80: 0 --> 1

Node 3:

Char. 21: 0 --> 1
Char. 36: 0 --> 1
Char. 39: 0 --> 1
Char. 42: 0 --> 2

Char. 51: 0 --> 1
Char. 57: 0 --> 1
Char. 67: 0 --> 1
Char. 69: 0 --> 1
Char. 75: 0 --> 1
Char. 85: 0 --> 1
Char. 94: 1 --> 2
Char. 96: 0 --> 2

Node 4:

Char. 27: 0 --> 1
Char. 33: 0 --> 1
Char. 38: 0 --> 1
Char. 48: 0 --> 1
Char. 49: 0 --> 1
Char. 52: 0 --> 1
Char. 54: 0 --> 1
Char. 61: 0 --> 1
Char. 76: 0 --> 1
Char. 95: 3 --> 1
Char. 103: 0 --> 1

Node 5:

Char. 31: 0 --> 1
Char. 58: 0 --> 2
Char. 83: 0 --> 1

Node 6:

Char. 32: 0 --> 1
Char. 60: 0 --> 1

Node 7:

Char. 58: 0 --> 1

Node 8:

Char. 63: 0 --> 1

Node 9:

Char. 35: 0 --> 1

Node 10:

Char. 5: 0 --> 1
Char. 10: 0 --> 2
Char. 92: 1 --> 0

Node 11:

Char. 4: 0 --> 1
Char. 85: 0 --> 1