

TABLE S1 | Character matrix for the phylogenetic analysis of the Gymnotiformes based on the dorsolateral head muscles. Outgroup taxa indicated with an asterisk (*); “o&1” indicates polymorphic codification; and hyphen (-) indicates inapplicable state.

Apteronotus albifrons

010000010000011-1110101020001001110101020222011000011100

Adontosternarchus balaenops

00100000100001111110102000001001000111100110011000011100

Archolaemus blax

000000100001000100001001001---10000110100110103000111001

**Apteronotus* bonapartii

010000010000311-0110101030001000110101020222011000011100

Apteronotus camposdapazi

010000010000011-1110101020001001110101020222011000011100

Archolaemus ferreirai

000000100001000100001001001---10000110100110103000111001

Archolaemus janeae

000000100001000100001001001---10000110100110103000111001

Archolaemus luciae

00000010000100010000100100000010000110100110103000111001

Archolaemus orientalis

000000100001000100001020001---10000110100110103000111001

Apteronotus rostratus

01000001000001010000101020001102110101020222011000011100

Adontosternarchus sachi

00100000100001111110102000001001000111100110011000011100

Archolaemus santosi

000000100001000100001001001---10000110100110103000111001

Brachyhypopomus beebei

00100100000000000110101000001000000111020110111000011100

Brachyhypopomus bombilla

00100100000000000110101000001000000111020110111000011100

Brachyhypopomus brevirostris

00100100000000000110102000001000000111020110111000011100

Brachyhypopomus draco

00100100000000000110101000001000000111020110111000011100

*Brycon falcatus**

0000000000000000000000000000000100110000001000000000000000000000

Brachyhypopomus gaudeiro

001001000000000001110101000001000000111020110111000011100

Brachyhypopomus hendersoni

00100100000000000110102000001000000111020110111000011100

Brachyhypopomus janeiroensis

00100100000000000110101000001000000111020110111000011100

Brachyhypopomus pinnicaudatus

00100100000000000110102000001000000111020110111000011100

Brachyhypopomus regani

00100100000000000110102000001000000111020110111000011100

Brachyhypopomus sullivanii

001001000000000001110101000001000000111020110111000011100

*Chanos chanos**

00000000000000000000000000000000-00000000000000000000000000000000

Compsaraia compsa

010000010000011-0100101010001000110101100010111000011100

Distocyclus conirostris

00100010000100010000000000001010000110000110103000111000

*Diplomystes mesembrinus**

10011000000000000100000000001000000101010000211000000001

Eigenmannia antonioi

00000010000100010000002000001010000110000110103000111000

Eigenmannia besouro

00000010000100010000002000001010000110000110103000111000

Eigenmannia desantanae

00000010000100010000002000001010000110000110103000111000

Electrophorus electricus

10111000000000001110010001---0-000100001111100010011111

Eigenmannia guairaca

00000010000100010000002000001010000110000110103000111000

Eigenmannia humboldtii

00000010000100010000002000002010000111000110103000111000

Eigenmannia limbata

00000010000100010000002000001010000111000110103000111000

Eigenmannia macrops

00000010000100010000002000001010000110000110103000111000

Eigenmannia matintaperera

00000010000100010000002000001010000110000110103000111000

Eigenmannia meeki

00000010000100010000002000001010000110000110103000111000

Eigenmannia microstoma

000000100001000100000020000010100001100001101030001110&100

Eigenmannia muirapinima

00000010000100010000002000001010000111100110103000111000

Eigenmannia nigra

00000010000100010000002000001010000111000110103000111000

Eigenmannia pavulagem

00000010000100010000002000001010000111000110103000111000

Eigenmannia oradens

00000010000100010000002000001010000111000110103000111000

Eigenmannia trilineata

00000010000100010000002000001010000110000110103000111000

Eigenmannia vicentespelaea

00000010000100010000002000001010000111100110103000111000

Eigenmannia virescens

00000010000100010000002000001010000110000110103000111000

Eigenmannia waiwai

00000010000100010000002000001010000110000110103000111000

Eigenmannia sayona

00000010000100010000002000001010000110000110103000111000

Gymnotus carapo

101110000000000001110010011---0-000101030110011000011111

Gymnotus cylindricus

101110000000000001110010001---0-000101030110011000011111

Gymnotus maculosus

101110000000000001110010001---0-000101030110011000011111

Gymnotus pantherinus

101110000000000001110010001---0-000101030110011000011111

Gymnorhamphichthys rondoni

010001000000000110100010001---02000101000111101000011100

Gymnorhamphichthys rosemarie

010001000000000110100010001---02000101000111101000011100

Hypopomus artedi

00000100000000000100101000001000000111010110111000011100

Hypopygus lepturus

00000100000000000110101000001000000111000110112000001100

Japigny kirshbaum

00100010000100010010102000002010001111000111113000111000

*Labeo chrysophekadion**

0000000000000000000000000001---00000000000000000000100000

Microsternarchus bilineatus

00000100000000001110101000002000000111010111111000011100

Orthosternarchus tamandua

011000000000011-01101020011---03000101000111102000011100

Pariosternarchus amazonensis

010000010000011-0010001010001000010111120110011000011100

Porotergus gimbeli

010000010000111-0000001010001001110101120222011000011100

Parapteronotus hasemani

010000010000011-1100001020011001010101020222011000011100

Platyrosterne microstoma

11000000000011-01100010201---01000101020222002000011000

Rhabdolichops caviceps

00100010000100011000002000011010000110120110103000111000

Rhamphichthys drepanium

011001000000000110101010011---01000111020111101100011000

Rhabdolichops eastwardi

00100010000100011000002000011010000110120110111000111000

Rhabdolichops electrogrammus

00100010000100011000002000011010000110120110103000111000

Rhamphichthys hahni

011001000000000110101010011---01000111020111101100011000

Rhabdolichops lundbergi

00100010000100011000002000001010000110000110103000011100

Rhamphichthys marmoratus

011001000000000110101010011---01000111020111101100011000

Rhabdolichops nigrimans

00100010000100011000002000001010000110000110103000011100

Rhabdolichops troscheli

00100010000100011000002000011010000111120110101000111000

Rhabdolichops zareti

00100010000100011000002000011010000110120110103000111000

Sternopygus astrabes

001000100001001-0100101000001010000111120111111000011100

Sternarchella ducis

010000010110011-0110101020001001100111020222011001011100

Steatogenys duidae

00000100000000001110101000002000000111010111011000111100

Steatogenys elegans

00000100000000001110101000002000000111010111011000111100

Sternarchorhynchus goeldii

010000000000011-01101110201---03000101020222002000011100

Sternopygus macrurus

001000100001001-0100101000001010000111120111111000011100

Sternarchorhamphus mulleri

010000000000011-11101020201---00000101020111002000011100

Sternarchella orthos

01 0000010110011-0110101020001001100111110222011001011000

Sternarchorhynchus oxyrhynchus

010000000000011-01101110201---03000101020222002000011100

Sternarchogiton porcinum

010000010000211-0110101010001001110101120222111000011100

Tenebrosternarchus preto

010000010000211-0110101010001001110101120222111000011100

Sternarchella raptor

010000010110011-011010102000100110011102022011001011100

Sternarchella schotti

010000010110011-0110101020001001100111110222011001011000

Sternopygus xingu

001000100001001-010010100000101000011112011111100011100

Neotropical Ichthyology



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