

Supplementary file S2

List and state of the different morphological characters. See Parmentier et al. (2002, 2010) for detailed information.

number	character	State
1	Upper jaws not hidden by skin	0
	Upper jaws hidden by skin	1
2	ascending processes of the premaxilla missing	0
	Not the case	1
3	ascending and lateral processes of the premaxilla clearly distinct and V-shaped	0
	ascending and lateral processes of the premaxilla parallel	1
4	No foramen on the premaxilla	0
	Foramen on the premaxilla	1
5	distal tip of the maxillary large and rounded	0
	distal tip of the maxillary pointed	1
6	Ligament between maxilla and articulo-angular	0
	Ligament absent	1
7	No Connective fibers between maxilla and premaxilla	0
	Connective fibers between maxilla and premaxilla	1
8	Coronoid process = 25 to 30% of the mandible length	0
	Coronoid process = 16 to 18% of the mandible length	1
9	Lateral ethmoid with lateral branch (= U-shaped)	0
	Lateral ethmoid without lateral branch	1
10	Suboperculum having a long dorsocaudal digitation	0
	Suboperculum with numerous small caudal digitations	1
11	Pharyngobranchial 2 larger than pharyngobranchial 4	0
	Pharyngobranchial 2 smaller than or equal in size to pharyngobranchial 4	1
12	Cartilaginous interarcual element	0
	Bony interarcual element	1
13	Site of articulation between interarcual element and epibranchial 1 high or midway on the epibranchial 1	0
	Site of articulation between interarcual element and epibranchial 1 very low on the epibranchial 1	1
14	Three well developed gill rakers on ceratobranchial 1	0
	Three short gill rakers on ceratobranchial 1	1
15*	Pleural ribs	0
	No pleural ribs	1
16	Swimbladder plate on third centrum not greatly expanded posteriorly	0
	Swimbladder plate on third centrum greatly expanded posteriorly, forming a uniform convex plate	1
17	External row of straight, conical teeth on premaxilla	0
	No external row of straight, conical teeth on premaxilla	1
18	No cardiform teeth on premaxilla	0
	Cardiform teeth on premaxilla	1
19	Small conical teeth on the posterior half of the premaxilla	0
	Lack of small conical teeth on the posterior half of the premaxilla	1
20	Conical teeth on the anterior half of the premaxilla	0
	No conical teeth on the anterior half of the premaxilla	1
21	No enlarged conical teeth at anterior end of the premaxilla	0
	Enlarged conical teeth at the anterior end of the premaxilla	1
22	Caniniform teeth (fangs) at distal tips of jaws	1
	No caniniform teeth (fangs) at distal tips of jaws	0
23	No diastema on upper and lower jaws	0
	Diastema on upper and lower jaws	1

24	No small teeth externally bordered by larger, inward-curving teeth on the dentary	0
	Small teeth externally bordered by larger, inward-curving teeth on the dentary	1
25	No uniserial row of big conical teeth on the dentary	0
	Uniserial row of big conical teeth on the dentary	1
26	No uniserial row of small conical teeth on the dentary	0
	Uniserial row of small conical teeth on the dentary	1
27	No prominent tooth on vomer	0
	Prominent tooth on vomer	1
28	Teeth on basibranchial 3	0
	No teeth on basibranchial 3	1
29	No teeth on hypobranchial 3	0
	Teeth on hypobranchial 3	1
30	No cardiform teeth on lower pharyngeal jaws	0
	Cardiform teeth on lower pharyngeal jaws	1
31	Insertion of A1 β on rostral-medial side of the maxillary	0
	Insertion of A1 β on rostral-dorsal side of the maxillary	1
32	Insertion of the adductor branchialis 5 on epibranchial 4	0
	Insertion of the adductor branchialis 5 on epibranchials 3 and 4	1
33	Lack of four recti dorsales muscles	0
	Presence of four recti dorsales muscles	1
34	Primary sonic muscles present	0
	No primary sonic muscles	1
35	No central constriction at level of swim bladder	0
	Swim bladder central constriction	1
36	Rocker bone absent	0
	Rocker bone present	1
37	Pectoral fins present	0
	Pectoral fins absent	1
38	Scapula present	0
	Scapula absent	1
39	Lateral ethmoid with three shelves	0
	Lateral ethmoid with two shelves	1
40	Palatine teeth straight	0
	Palatine teeth curved anteriorly	1
41	No parallel tunic ridges on the swimbladder	0
	Parallel tunic ridges on the swimbladder	1
42	Swimbladder without "tendon-hook" system	1
	Swimbladder with a "tendon-hook" system	0

*Pleural ribs is used in the sense given by Markle 1989.

