

## **Appendix II.**

### **Character statements modified from Costa (2010).**

- 1.** Male flank, ground color: (0) brownish light grey; (1) bluish dark grey; (2) red; (3) black; (4) golden; (5) metallic green or greenish blue; (6) dark brown; (7) dark purple, 8 light brown 9 brownish green,
- 3.** Male flank, dark grey bars: (0) absent; (1) present whole flank, (2) present anterior portion of flank, (3) present posterior portion of flank.
- 7.** Male flank, iridescent blue marks:(0) dots; (1) bars on anterior portion, dots on posterior portion; (2) bars; (3) dots on posterior portion, (4) absent
- 12.** Male head, suborbital region, dark grey bar: (0) absent; (1) oriented ventrally to anteriorly; (2) oriented posteriorly.
- 13.** Male head, cephalic neuromast series, dark pigmentation: (0) not distinctively concentrated; (1) concentrated on parietal series; (2) concentrated on most series above, below and behind orbit.
- 23.** Male anal fin, iridescent color pattern: (0) dots on whole fin; (1) dots just on basal portion; (2) bars on whole fin; (3) vertically elongated spots on anterobasal portion, dots on remaining portions; (4) reticulate; (5) transverse vermiculate stripes; (6) longitudinal lines on fin rays; (7) vertical lines on anterior portion, dots on posterior portion; (8) vertically elongate spots along fin base; (9) iridescent marks inconspicuous.
- 31.** Male anal fin, iridescent marks: (0) dots on whole basal portion; (1) elongated dots on basal portion, (2) lines parallel to fin rays; (3) dots on basal portion, short lines parallel to fin rays on distal half of fin; (4) absent.
- 42.** Male pectoral fin, ground color: (0) hyaline; (1) reddish brown to red; (2) bright blue., (3) hyaline with dark distal margin, (4) pale blue.

**45.** Flank, caudal peduncle, posterior portion, black spot: (0) absent; (1) one or more black spots irregularly arranged; (2) two black spots vertically arranged, sometimes coalesced forming 8-shaped blotch.

**192.** Pectoral fin, posttemporal, ventral process: (0) present; (1) absent; (2) polymorphic.

**Character statements modified from Loureiro (2004).**

1. External row of teeth in jaws: one or two large teeth more developed than the rest (0); all teeth equal in size (1).

2. Ascendent process of the premaxilla: long (aprox. 1/3 of the bone)(0), short (aprox. 1/4 of the bone)(1).

3. Dorsal process of maxilla: reduced (0), well developed (1).

4. Dorsal process of Angulo-articular: reduced (0), medium size (1), well developed (2).

5. Ectopterygoid: same size as autopalatine (0), reduced (1).

6. Rostral cartilage: anterior half covered by ascendent process of premaxilla (0), only anterior border covered (1).

7. Articulation surface of lacrimal with lateral ethmoid: absent (0), present (1).

8. Supraoccipital processes: separated from each other (0), joined in their proximal border (1), fused (2).

9. Epiotic size: anterior border does not overlap supraoccipital (0), anterior border overlaps supraoccipital (1).

10. Ceratohyal: short (0), long (1).

11. Gill rakers in epibranchial 1: 0-1 (0), 1-2 (1), 2-3 (2), 3-5 (3).

12. Small denticles over ceratobranchial 1 gill rakers:: absent (**0**), present (**1**).
13. Proportion of cartilage in the basihyal: less than 45% (**0**), 45-70% (**1**), more than 70% (**2**).
14. Basihyal size: three times larger than ventral hypohyal (**0**), no more than two times larger than ventral hypohyal (**1**).
15. Basibranchial 1 shape: strangled (**0**), not strangled (**1**).
16. Basibranchial 2 shape: medial section strangled (**0**), scale shaped (**1**).
17. Dorsal expansion of epibranchial 4: developed (**0**), reduced (**1**).
18. Dorsal process of interopercle: developed (**0**), reduced or absent (**1**).
19. Supracleitrum size: supracleitrum smaller than posttemporal (**0**), both bones the same size (**1**).
20. Posttemporal and supracleitrum: fused (**0**), not fused (**1**).
21. Scapula shape: triangular (**0**), rounded (**1**).
22. Dorsal pectoral radial: present in all individuals (**0**), polymorphic (**1**), absent (**2**).
23. Number of caudal vertebrae: less than 16 (**0**), 16-19 (**1**), more than 19 (**2**).
24. Number of abdominal vertebrae: less than 14 (**0**), more than 14 (**1**).
25. Number of vertebrae supporting caudal fin rays: 3-5 (**0**), more than 5 (**1**).
26. Number of caudal fin rays: less than 26 (**0**), 26-30 (**1**), 30-34 (**2**), more than 34 (**3**).
27. Number of dorsal fin rays in males: less than 10 (**0**), 10-15 (**1**), 15-19 (**2**), more than 19 (**3**).
28. Number of dorsal fin rays in females: less than 10 (**0**), 10-16 rays (**1**), more than 16 (**2**).
29. Number of anal fin rays in males: less than 14 (**0**), 14-20 (**1**), 20-28 (**2**), more than 28 (**3**).

30. Number of anal fin rays in females: less than 16 (**0**), 16-25 (**1**), more than 25 (**2**).
31. Number of pectoral fin rays: 10-13 (**0**), 12-15 radios (**1**).
32. Number of pelvic fin rays: less than 4 (**0**), 4-6 (**1**), more than 6 (**2**).
33. Position of dorsal fin in males in relation to Vertebrae: V6-V10 (**3**), V10-V14 (**2**), V14-V18 (**1**), beyond V18 (**0**).
34. Position of dorsal fin in females in relation to Vertebrae: before V12 (**0**), V13-V17 (**1**), beyond V17 (**2**).
35. Number of scales in lateral line series: 27-35 (**0**), 35-40 (**1**), more than 40 (**2**).
36. Size of scales: large (**0**), reduced (**1**).
37. Number of supraorbital neuromasts: less than 10 (**0**), 10-16 (**1**), 16-23 (**2**), 23-32 (**3**), more than 32 (**4**).
38. Number of parietal neuromasts: less than 2 (**0**), more than 2 (**1**).
39. Contact organs in pectoral fin of males: absent (**0**), developed (**1**), developed with a bony support (**2**).
40. Contact organs with bony support in anal fin: absent (**0**), present (**1**).
41. Dark gray to black dots in flanks of males: absent (**0**), present (**1**).
42. Gray blotches in head: absent (**0**), present (**1**).
43. Irregular pattern of vertical light bands on flank of males: absent (**0**), present (**1**).