

BEAUFORTIA

SERIES OF MISCELLANEOUS PUBLICATIONS

ZOOLOGICAL MUSEUM - AMSTERDAM

No. 3

1951

MAY 10

Studies on African Characid Fishes I The tribe *Alestidi* (1)

by

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1. Introduction

Among a recent importation from the Belgian Congo there was a multitude of lovely little aquariumfishes, mostly well-known to aquarists, but partly new to them, and some of these fishes even new to science. A large number of small "Tetra's" closely resembled the well-known species *Petersius caudalis*. Four perfectly preserved specimens (formol), were supplied to me by Mr. C. A. SPOELSTRA of Haarlem, a well-known aquarist-breeder.

In order to identify this species, and designate its proper place, I started to study literature and material in the Museum. It then became evident that the classification and nomenclature of this group is far behind, a case somewhat similar to the one I recently discussed concerning the South-American *Nannostomidi* (HOEDEMAN, 1950 : 11-27¹). A large number of forms, merely of subspecific rank or local varieties only, have been named and classified as good species, while too much stress has been laid upon the dentition and number of rows of teeth as a character in the classification of this group. This character now clearly is of polyphyletic nature, and even highly variable in species and subspecies.

The above mentioned specimens showed to be most closely related to the *Petersius caudalis*-group, to be discussed later on. In the second account I should like to deal with part of the tribe, merely the larger forms while a third part will deal with the dwarfed forms.

As it appeared to me to be almost impossible to get the right idea of the evolution and relationship of the group with the old classification of BOULENGER (1909 : 187-241, and 1916 : 176-187), I have tried to compile a new key, and a phylogenetical tree showing the probable relationship of the species.

Though less than in the South-American *Cheirodontinae*, the diversity in this group of African representatives is still very great. In this connection I should like to bring forward that the duplication of forms

¹) Full bibliographic reference will be given at the end of the series on *Alestidi*.

in both continents is partly due to close relationship, and partly to convergent evolution. I will try to discuss this matter later.

The greatest difficulty in the classification of this group is the polyphyletic characters. In nearly every case at least a combination of 2 or more characters is needed to separate genera, species and even forms. Technically most groups overlap each other to some extent. If we consider *Alestes dentex* to be nearest the stem of the tribe, there is in the first place a noticeable polyphyly in the reduction of the number of lateral and transverse scales, the number and length of the gill-rakers, the number of rows of teeth, the depth, and any other character used in classification. While working on these fishes we often feel sure that two species or forms from the same locality that have many characters in common are less closely related than both are with species from remote localities. We often need some artistic feeling to determine what changes has been caused by the environments of the species. Several forms, which technically belong to the same genus or species in the older classifications, will have to be separated, though the generic and specific designations will become more complicated. Divergent evolution now causes us much trouble, but the subject becomes more interesting. If we involve geographical and ecological features in modern classification, the system will doubtless become more natural.

The consequence, however, will be smaller groups, more genera, new names, and thus changes in established nomenclature. I am sure the profits, will fully balance the disadvantages, in course of time.

In the below key the character are given on which the present classification is based, while a further discussion of each genus, rediagnoses, and ecological and geographical features will be given later on.

2. Key to the *Alestidi*

- A. Lateral line usually separated from the ventral fins by more than 3 scales *Cheirodontinae* (S. America)
- B. Lateral line separated from the ventral fins by 3 or less scales,
..... *Cheirodontinae* (Africa),
tribe *Alestidi* (new name)
 - I. dorsal well in advance of the ventral origin; 3 scales between lateral line and ventrals; D. ii/8; A. iii/17—20; depth 2.75—3.5; head 3.3—4; eye 2.5—3.25; depth of caudal peduncle 1.2—1.6; gill-rakers in lower part of anterior branch 12—17, moderate; scales 6—7/35—40/4; lateral line complete; teeth 2+6+8/6—8+2; adipose eye-lid much developed; branchiostegals 3,
..... subtribe *Bryconaethiopini* (new name)
(This subtribe consists of but one genus, *Bryconaethiops* GÜNTHER, 1873. For key to the species see POLL, 1939: 23).
 - II. dorsal fin above or behind ventral origin; teeth 4—10 + 8—10/6—10 + 0—2; branchiostegals 4; 1 or 2 scales between lateral line and ventral fins,
 - a. adipose eye-lid usually developed; eye more than 3 times in head (not including opercular ear-flap); body rather elongate; gill-rakers moderate to long, subtribe *Alestini* (new name)

- b. upper jaw not projecting; origin of dorsal at $\frac{1}{2}$ distance between snout to occiput and base of caudal; D. ii—iii.8 (7).
- c. head 4 to 6 in length; gill-rakers long; adipose eye-lid normally much developed. genus *Alestes* MÜLLER & TROSCHEL, 1846
- d. scales between lateral line and dorsal 8—9; 44—51 in a median lateral series.
- e. anal iii.19—23; gill-rakers 20—26.
 — *denter* (LINNÉ, 1766)
- ee. anal iii.22—27; gill-rakers 30—58,
 — *baremore* (JOANNIS, 1835)
- dd. scales between lateral line and dorsal 5—8; 30—45 in a median lateral series; anal iii(iv).15—20.
 subgenus *Alestiops* subgen. n.
- f. dept 3.5—4.5.
- g. scales 6—8 39—45.3; gill rakers 17—20; head 4.3—5.5.
- h. anal iii.17—20; scales 6—8/39—45.3; interorbital width 3—3.5; head 4.3—5; depth 3.5—4.5; dorsal ii.8,
 — *macrophthalmus macrophthalmus*
 GÜNTHER, 1867
- hh. anal iii.16—20; scales 6—7.40—45; interorbital width 2.5—3.5; head 4.3—5.5; depth 3.25—4; dorsal ii.8,
 — *macrophthalmus tanagericae*
 ssp. n.
- hhh. anal iii.15—16; scales 6.39—41.3; interorbital width 2—2.6; head 4.3—5; depth 3.25—4; dorsal iii.8,
 — *macrophthalmus liebrechtsi*
 BOULENGER, 1898
- gg. scales 5—5 $\frac{1}{2}$.30—33.3; gill-rakers 20—27; anal iii—iv/15—16; caudal peduncle 1.5—1.6; dorsal ii—iii.8,
 — *lateralis* BOULENGER, 1900
- ff. depth 2.5—3.5; gill-rakers 16—18; scales 6/33—37/3,
- i. interorbital width 3; anal iii.20; scales 6/36.3,
 — *stuhmanni* PFEFFER, 1896
- ii. interorbital width 2.5—2.8.
- j. scales 6/37/3; depth 2.6—3; eye 2.6—3; anal iii.17—19.
 — *tessmani* PAPPENHEIM, 1911
- jj. scales 6/33.3; depth 3.25—3.5; eye 3—3.25; anal iii/16—17.
 — *sadleri* BOULENGER, 1906
- cc. head 4 (4.25) or less in length; depth 2.5—3.75; eye 2.6—4; gill-rakers 12—20, moderate, or rather long and than 22—28 in number. genus *Alestobrycon* gen. n. (*intermedius*)
- l. scales 6—7.33—37/3; depth 3; head 4; eye 2.5—2.75; gill-rakers 12—13, moderate,
- m. anal iii.19—22; interorbital 2.6—2.75;
 — *intermedius* (BOULENGER, 1903)
- mm. anal iii.24—26; interorbital 3.3,
 — *tholloni* (PELLEGRIN, 1901)
- ll. scales 4—6.22—30/3,
- n. gill-rakers 20—28, usually rather long.

- o. interorbital width 2—2.5.
 — anal iii/12—14; depth 3.3—3.75; eye 3—3.5,
 — *taeniurus bimaculatus*
 (BOULENGER, 1899)
 = anal iii/15—17; depth 2.5—2.8; eye 2.6—3.25,
 — *taeniurus taeniurus* (GÜNTHER,
 1867)
- oo. interorbital width 3.3—3.5; anal iii/15—17; depth 3—3.25; eye
 2.75—3. — *taeniurus opisthotaenia* (BOU-
 LENGER, 1903)
- nn. gill-rakers moderate, 20 or less in number; 4 to 6 scales between
 lateral line and dorsal,
- p. gill-rakers 15—20, genus *Brachyalestes* GÜNTHER, 1864
 (nurse)
- q. interorbital width 2—2.6.
 r. scales 6/27—30/3, — *nurse* (RÜPPELL, 1832)
- rr. scales 4—5/23—30/3,
 s. anal iii/16—18; depth 3—3.5,
 — *imberi affinis* (GÜNTHER, 1894)
- ss. anal iii/14—16; depth 2.5—3,
 — eye 3—3.5; scales 4½—5/23—29/3,
 — *imberi imberi* (PETERS, 1852)
 = eye 3.5; scales 4/23/3,
 — *imberi curtis* (BOULENGER, 1920)
- sss. anal iii/12—13; scales 4/24—25/3; interorbital width 2.3—
 2.5; depth 3—3.5, — *imberi kingsleyi* (GÜNTHER,
 1896)
- qq. interorbital width 1.6; anal iii/10,
 — *poptae* (PELLEGRIN, 1867)
- pp. gill-makers 12—14, *Bryconalestes* gen. n. (*longipinnis*)
 — eye 2.6—3.25; anal iii/19—21,
 — *longipinnis longipinnis*
 (GÜNTHER 1864)
 = eye 2.5—2.6; anal iii/18—20,
 — *longipinnis chaperi* (SAUVAGE,
 1882)
- bb. upper jaw projecting beyond anterior border of lower jaw; origin
 of dorsal posterior, at 3/5 to 2/3 distance from tip of snout and base
 of caudal; snout 3 to 3.8 in head; scales larger or as large as eye,
 4/21—29/2—3; anal sheath of 2 or 3 rows of small scales, usually on
 posterior rays only; gill-rakers 15—22, short or moderate; anal
 iii/10—15; head 3.5—4.6; teeth 8—12 + 8—10/8 + 2 or 2 + 8/8
 + 2, genus *Brycinus* CUVIER & VALENCIENNES,
 1849 (*macrolepidotus*)
- t. depth 3.3—4.5.
- u. gill-rakers 18—22,
 — depth of caudal peduncle 1—1.5; anal iii/12—14; eye 3—5.25,
 — *macrolepidotus macrolepidotus*
 CUVIER & VALENCIENNES, 1849

- = depth of caudal peduncle 1.5-2; anal iii/12-13; eye 4; depth 4, — *macrolepidotus rhodopleura* (BOULENGER, 1906)
- ≡ depth of caudal peduncle 1.2; anal iii/11-12; eye 3.3-4; depth 3.3-3.6, — *macrolepidotus schootendeni* (BOULENGER, 1912)
- uu. gill-rakers 15-18,
— anal iii/10-11; depth of caudal peduncle 1.1-1.3; scales 4/23-27/2-3, — *grandisquamis grandisquamis* (BOULENGER, 1899)
- = anal iii/12-13; depth of caudal peduncle 1.3-1.5; scales 4/28-29/3, — *grandisquamis batesi* (BOULENGER, 1903)
- tt. depth 2.75-3; gill-rakers 18-20, short; anal iii/13-15; depth of caudal peduncle 0.8-1; scales 4/21-23/2.
- aa. adipose eye-lid scarcely distinct, rudimentary or entirely absent; body more or less compressed, less elongate; usually smaller (dwarfed) forms gill-rakers never long, usually moderate or short, moderately long in *Alestopetersius altus*; teeth 4-6 + 8-10/8-10 + 0-2, genus *Alestopetersiini* (new name)
- v. parietal fontanels completely closed over; eye 3.5 in head; 7 scales between lateral line and dorsal fin; maxillary not reaching to below anterior border of eye; adipose eyelid absent; length without caudal fin up to 150 mm., ... genus *Petersius* HILGENDORF, 1894 (*conserialis*)
- vv. parietal fontanels present; usually less than 7 scales between lateral line and dorsal fin (8 in the small scaled species *Micralestes modestus*); maxillary not reaching eye, or extending beyond anterior margin; length without caudal not more than 100 mm.; lateral line normally complete, reduced in some specialized forms.
- w. basal anal sheath undeveloped or indistinct; no humeral spot, pseudotympanum feebly developed; a more or less conspicuous dark lateral line, as a narrow streak or rather broad band; fins without prolonged rays; depth 3-4.5; eye 2.3-3; gill-rakers 10-20, short; scales 4-8/23-40/2-4; lateral line complete or nearly complete, perforating only 5 scales in the aberrant genus *Clupeopetersius*; interorbital width 2.3-4.
- x. scales above and below lateral line of about equal size; dorsal ii/8; anal ii-iii/14-20; head 3.5-4, genus *Micralestes* BOULENGER, 1899 (*acutidens*)
- y. gill-rakers 12-15, short.
- z. lateral line complete.
- l. scales 4/23-30/2-3; maxillary not reaching to below anterior border of eye.
— anal iii/14-16; depth 3-3.75; head 3.5-4.2; eye 2.3-3; scales 4/23-28/2-3; interorbital width 2.3-3, — *acutidens acutidens* (PETERS, 1852)
- = anal ii/15; depth 3; head 4.5; eye 3; scales 4/25/3; inter-

- orbital width 3. — *acutidens neglectus* (BOULENGER, 1920)
anal iii 16—19; depth 3.5—4; head 3.5—4; eye 2.5—2.6;
scales 4:27—30/3; interorbital width 2.5—2.6.
..... — *acutidens humilis* (BOULENGER, 1899)
= anal iii 17—19; depth 2.6—3; head 3.5—4; eye 2.5—3;
scales 4:23—25/3; interorbital width 2.5.
..... — *acutidens holargyreus*
(GÜNTHER, 1873)
= anal iii 18—21; depth 3—3.25; head 3.5—4; eye 2.5—2.75;
scales 4:24—27/3; interorbital width 2.5—2.75.
..... — *acutidens occidentalis*
(GÜNTHER, 1899)
2. scales 8:40 3; maxillary extending to anterior border of eye;
anal iii:20; depth 3.3; head 4; eye 2.5; interorbital width 2.5.
..... — *modestus* (BOULENGER, 1899)
zz. lateral line nearly complete, perforating 25 scales; 5:30/2—3;
anal ii:15—17; depth 3.5; head 3.6—3.9; interorbital width 3.2.
..... — *lernerii* FOWLER, 1938
zzz. lateral line rudimentary; scales 4:25—26/2; anal iii:13—14;
depth 3.5—3.75; head 3.5—3.75; interorbital width 2.5.
..... — *septentrionalis* BOULENGER, 1911)
yy. gill-rakers 16—17, short; lateral line complete; anal iii 16—17;
head 4—4.5; eye 2.3—2.75.
..... subgenus *Rhabdalestes* subgen. n.
— depth 4—4.5; scales 5:33—36/3; interorbital width 2.8—3.
..... — *tangensis rhodesiensis*
RICARDO-BERTRAM, 1943
= depth 3.75—4; scales 6:35—36/4; interorbital width 2.5—2.6.
..... — *tangensis tangensis*
(LÖNNBERG, 1907)
yyy. gill-makers 20, short; lateral line perforating but 5 scales;
scales 4:32/3; anal iii:17; depth 3.6—4; head 3.4—3.6; eye
2.6—2.8; interorbital width about 4; maxillary extending to
beyond anterior border of eye.
..... genus *Clupeopetersius* PELLEGRIN, 1928
(*schoutedeni*)
xx. scales above lateral line abruptly larger than those below it;
dorsal ii:10; anal iii:11; gill-rakers 10, short; scales 4:28—30/3;
lateral line complete; depth 3.3; head 3.3; eye 3; teeth 8 + 10/10.
..... genus *Arnoldichthys* MYERS, 1926
(*spilopterus*)
ww. basal anal sheath well developed; a more or less conspicuous dark
lateral streak or band extending from posterior border of oper-
culum on to the mid-caudal rays, or constricted to the posterior
half of body, or in a caudal spot; humeral spot often distinct;
fins, particularly the dorsal fin, and in older specimens of several
forms the mid-caudal rays, prolonged anal ii—iv/15—26; dorsal
ii—iii/7—9; depth 2.2—3.5.
..... genus *Alestopetersius* gen. nov.

- A. maxillary not reaching to below anterior border of eye.
- B. scales 7/30—36/3; gill-rakers 15—16, moderate; anal ii—iii/20—23; lateral line complete.
 — head 3.5—3.6; anal iii/20—23; scales 7/35—36/3; interorbital width 2.6—3; dorsal ii/8; eye 2.5—3; teeth 4 + 8/8 + 0—2; basal anal sheath of 6—10 scales,
 — *hilgendorfi hilgendorfi*
 (BOULENGER, 1899)
 = head 3.25—4; anal ii/21—22; 7/30—33/3; interorbital width 3.12—3.6; dorsal ii/7 (8); eye 3—3.12; teeth 6 + 8/8 + 2; basal anal sheath of 12 scales,
 — *hilgendorfi grandis* (FOWLER, 1936)
 ≡ head 3.25—3.3; anal iii/20—22; scales 7/32—33/3; interorbital width 3.1—3.25; dorsal iii/8—9; eye 3—3.8; teeth 4—8 + 8/8; basal anal sheath of 9 scales,
 — *hilgendorfi kribensis* ssp.n.
- BB. scales 4—5/20—33/3—4; gill-rakers 11—19;
- C. anal iii—iv/13—21.
- D. lateral line complete; dorsal ii/8,
 subgenus *Alestogrammus* subgen. n.
- E. scales 4—5/24—26/2—3; depth 3—3.6; head 2.8—3; eye 2.75—3; anal iii/13; interorbital width 3—3.2; gill-rakers 19,
 — *abeli* (FOWLER, 1936)
- EE. scales 4/22—24/3; depth 3.5; head 4; eye 2.6—3; anal iii/15—16; interorbital width 2.6—3; gill-rakers 12—13, ...
 — *stormsi* (BOULENGER, 1902)
- EEE. scales 4/21—22/3; depth 2.6—3; head 3.3—3.5; eye 2.3; anal iii/20—21; gill-rakers 13—15,
 — *nummifer* (BOULENGER, 1920)
- DD. lateral line incomplete,
 subgenus *Phenacogrammus* EIGENMANN, 1907
- F. interorbital width 2.5—2.8; eye 2.5—2.75,
1. depth 3—3.4; head 3.3—3.5; dorsal ii/8; lateral line 7—10,
 — *interruptus* (BOULENGER, 1899)
2. depth 2.25—3; head 3.5—4,
 — lateral line 11—15; anal iii/18—19; head 4,
 — *major major* (BOULENGER, 1903)
 = lateral line 6—10; anal iii/17; head 3.5—3.75,
 — *major pulcher* (BOULENGER, 1909)
- ≡ lateral line 10—16; anal iii/15—16; head 4,
 — *major urotænia* (BOULENGER, 1909)
- FF. interorbital width 3—3.2; lateral line 8; scales 4/20/2½—3; depth 2.8; head 3; eye 3; dorsal ii/9,
 — *stigmatura* (FOWLER, 1936)
- CC. anal iii/21—26.
- G. scales 5/33/4; interorbital width 3.3; depth 2.5; head 3.5;

- eye 2.3; lateral line 10—11.
..... subgenus *Microlepidalestes* subgen. n.
..... — *caudomaculatus* (PELLEGRIN,
1925)
- GG. lateral line complete.
..... subgenus *Brachypetersius* subgen. n.
— scales 5/21—23/3; interorbital width 3.25—3.5; depth 2.4—2.5;
head 3.25—3.3; eye 2.4—2.5; lateral line complete,
..... — *rochefoucauldi* (FOWLER, 1936)
= scales 4/23—26/3; interorbital width 3; depth 2.2—2.3; head
3.5—3.6; eye 2—2.3, ... — *altus* (BOULENGER, 1899)
- AA. maxillary extending to below anterior border of eye.
H. gill-rakers 16—30; interorbital width 2.5—2.6; head 3.5—4;
eye 2.5—2.6, subgenus *Nannopetersius* subgen. n.
- I. scales 6½—7/30—34/3;
— anal iii/18—20; gill-rakers 16—18; depth 3—3.5; lateral line
8—12. — *ansorgei ubalo* (BOULENGER,
1910)
= anal ii—iii/20—23; gill-rakers 18—20; depth 2.5—2.75; la-
teral line 29—31. — *ansorgei ansorgei* (BOULENGER,
1910)
- II. scales 5/28—31/3; anal ii—iv/19—20.
J. interorbital width 2.5—2.6; depth 2.3—3; head 3.5—4; eye
2.5—2.6; gill-rakers 16—18, rather long; scales 5/29—30/3, ...
..... — *caudalis* (BOULENGER, 1899)
JJ. interorbital width 3—3.3; head 3.5—3.6; eye 2.8—3; depth
3.5—3.6, subgenus *Rhabdopetersius* subgen. n.
— gill-rakers 25—30, rather long; scales 5/30—31/3
..... — *leopoldianus leopoldianus*
(BOULENGER, 1899)
= gill-rakers 14, rather long; scales 5/28/3,
..... — *leopoldianus brumpti*
(PELLEGRIN 1906)
- HH. gill-rakers 11—15; lateral line complete or nearly complete; sca-
les 6/27—31/3; interorbital width 2.2—2.25,
..... subgenus *Petersialestes* subgen. n.
— lateral line extending on 22—23 scales; gill-rakers 12—15;
eye 2.5; dorsal profil a regular curve; basal anal sheath of 6
small scales, — *xenurus xenurus*
(BOULENGER, 1920)
= lateral line extending on 24—26 scales; gill-rakers 12—13;
eye 2.8; dorsal profil depressed at occiput; basal anal sheath of
8—10 small scales, — *xenurus tumbensis* ssp.n.

Photomechanical reproduction