ecie di *Mitu* e di *Crax*, generi non più *Pipile*.

e le svariate forme del ceppo *Cracidae*, vole differenziamento morfologico tanto ed anche - secondo taluni sistematici - non sono pervenute a un differenzia- e (in seguito a numerose esperienze di rgenerica da cui risulta che gli ibridi nente fecondi nei due sessi) non è stato enetico.

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ASSUNTO

uta per la prima volta in cattività, di *Pipile ja-* no fornite notizie biologiche riguardanti l'uovo, il suo accrescimento.

JMMARY

d for the first time in captivity, of *Pipile jacu-* ical news concerning the egg, the embriogenetic ven.

PETRU BANARESCU

Academia R.S. Romania
Institutul de Biologie « Tr. Savulescu », Bucuresti

REMARKS ON THE GENUS *CHELA* HAMILTON-BUCHANAN (PISCES, CYPRINIDAE) WITH DESCRIPTION OF A NEW SUBGENUS

A revision of the Oriental minnow genus *Chela* was recently published by SILAS (1958) who recognizes seven species, one of them, (*Ch. fasciatus*), being new; he ascribed them to three subgenera, two of them new. He has not seen specimens from two species he accepted as valid, *Ch. maassi* and *Ch. mouhoti*. Prior to this (SILAS, 1956) he studied the type specimens of *Eustira ceylonensis* - a species which most authors considered congeneric with the species presently included in the genus *Chela* - and concluded that this nominal species is a synonym of *Danio malabaricus*.

I had the opportunity to study specimens of *Chela maassi*, a species not seen by SILAS, and found that they differ from the other species within the genus in having the pharyngeal teeth on two rows, deserving thus subgeneric rank. Besides this, I found that two series of specimens from Thailand are intermediate between *Ch. coeruleostigmata* and *Ch. mouhoti*, so that I concluded that both are synonym.

The specimens examined belong to the following collections: Academy of Natural Sciences of Philadelphia (A.N.S.P.), British Museum, Natural History (B.M.N.H.), Zoologisches Staatsinstitut u. Museum, Hambug (H.Z.S.), Institutul de Biologie « Tr. Savulescu », Bucuresti (I.B.T.S.), Muséum National d'Histoire Naturelle Paris (M.N.H.N.), Rijksmuseum van Natuurlijke Historie, Leiden (R.M.N.H.), Senckenberg Museum, Frankfurt a.M. (S.M.F.), Stanford University, Museum of Zoology (S.U.), Zoologhicheskil Institut Akademii Nauk, Leningrad (Z.I.A.N.), Zoological Survey of India, Calcutta (Z.S.I.).

SYSTEMATIC ACCOUNT.

Subgenus **Chela** Hamilton Buchanan, 1922 s. str. (= *Laubuca* Bleeker, 1860, *Cachius* Günther, 1868).

1. **Chela cachius** (Hamilton Buchanan, 1822)
(For synonymies see SILAS, 1958).

Specimens examined:

S.U. 41182, Sheonath R., Bisrampur, Central Provinces, India, leg. Herre, 1940 December, 1 spec., 36.5 mm standard length.

I.B.T.S. 1132, Barakar R., Hazaribagh, Bihar, India, 2 spec., 33.0 and 42.0 mm (received from Z.S.I., determined *Ch. laubuca*).

The three available specimens agree with the description of this species by DAY, SILAS, etc.

2. **Chela laubuca** (Hamilton-Buchanan, 1822). Figs. 1-3.
(For synonymies see SILAS, 1958).

Specimens examined:

B.M.N.H. 1889. 2. 1. 1356-1359, Madras, don. F. Day, 4 spec., 37. 1 - 62.5 mm.

B.M.N.H. 1889. 2. 1. 1348. Asam, don. F. Day, 1 spec., 43.0 mm.

B.M.N.H. 1889, 2. 1. 1349-1354, Orissa, don. F. Day, 3 spec., 39-46 mm.

B.M.N.H. 0741, Orissa, don F. Day, 1 spec., 57.1 mm.

H.Z.S. 2119, Nishangara, Varei, R., Ganges drainage, 1 sp., 34.8 mm. (determ. *L. laubuca* by MEINKEN).

H.Z.S. 17740 (Old Catal. number!), 5 spec., 17.0 - 32.5 mm.

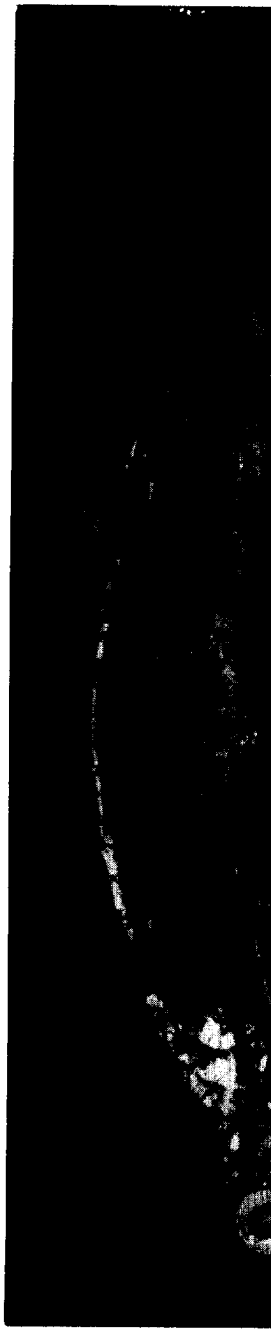
H.Z.S. 3187, Assam, 2 spec., 27.0 - 33.2 mm. (det. *L. laubuca* by MEINKEN).

A.N.S.P. 54000, Sumatra, 1 spec., 57.5 mm., determ. *Laubuca* sp.

D 3/7-9; A 3/18-22; L. lat. 33 $\frac{7\text{-}7\frac{1}{2}}{2\frac{1}{2}\text{-}4}$ 37.

The most variable plastic character is the body maximum depth which ranges, in the specimens examined, between 26.6 and 34.0% of standard length.

I have some hesitation in accepting SMITH's (1945) and SILAS's (1958) synonymization of *Laubuca siamensis* Fowler with *Chela laubuca*.



on Buchanan, 1922 s. str. (= *Laubuca*
inther, 1868).

lton Buchanan, 1822)
ILAS, 1958).

Bisrampur, Central Provinces, India,
spec., 36.5 mm standard length.
., Hazaribagh, Bihar, India, 2 spec.,
om Z.S.I., determined *Ch. laubuca*).
mens agree with the description of this

ilton-Buchanan, 1822). Figs. 1-3.
ILAS, 1958).

59, Madras, don. F. Day, 4 spec., 37.

am, don. F. Day, 1 spec., 43.0 mm.
54, Orissa, don. F. Day, 3 spec., 39-

Day, 1 spec., 57.1 mm.
R., Ganges drainage, 1 sp., 34.8 mm.
MEINKEN).
er!), 5 spec., 17.0 - 32.5 mm.
- 33.2 mm. (det. *L. laubuca* by MEINKEN).
pec., 57.5 mm., determ. *Laubuca* sp.
at. 33 $\frac{7\text{-}7\frac{1}{2}}{2\frac{1}{2}\text{-}4}$ 37.
character is the body maximum depth
s examined, between 26.6 and 34.0%

accepting SMITH's (1945) and SILAS's
ca siamensis Fowler with *Chela laubuca*.

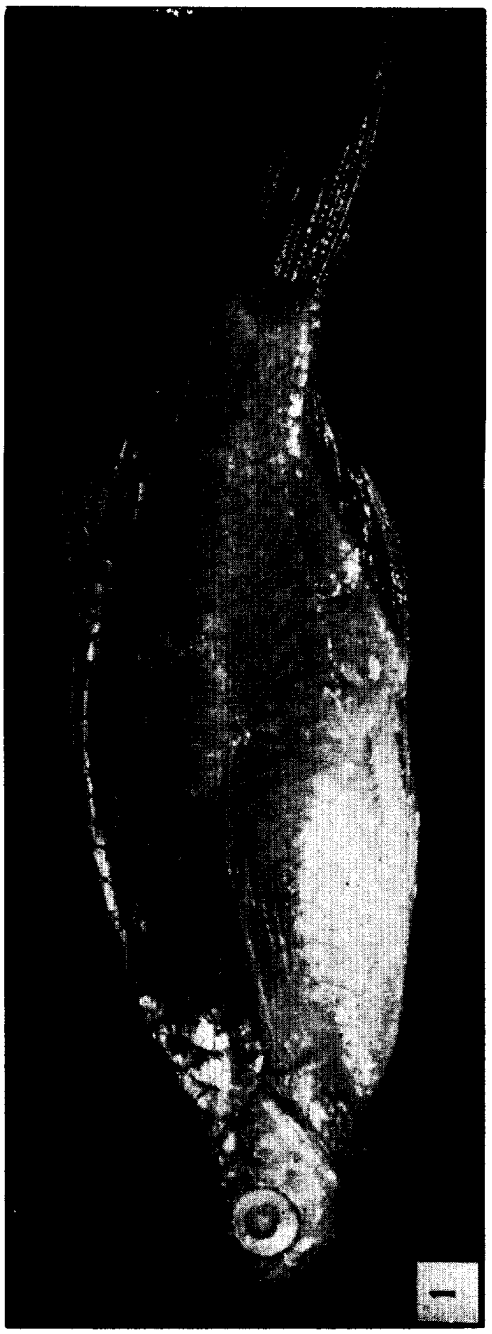


Fig. 1 - *Chela laubuca* (Hamilton-Buchanan), Madras. B.M.N.H. 1889. 2. 1. 1356.

The characters of *L. siamensis* mentioned in the original description (FOWLER, 1939) agree with those of *Ch. laubuca* (D 3/8; L. lat. 35 $\frac{7}{2}$, depth 28.6 - 31.2% of standard length) but, according to the original

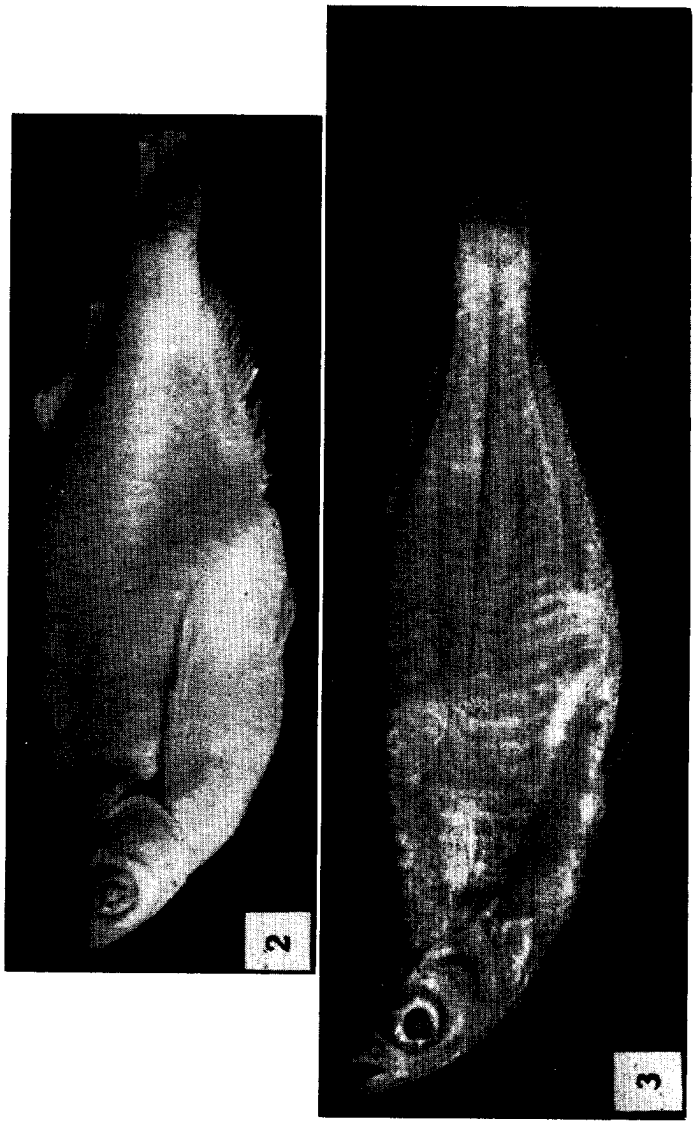


Fig. 2 - *Chela laubuca* (Hamilton-Buchanan). Sumatra A.N.S.P. 54090.
Fig. 3 - *Chela laubuca* (Hamilton-Buchanan). Type of *Laubuca siamensis* Fowler. A.N.S.P. 68496. Courtesy of D. J. Böhlke.

figure and to a photograph of the type specimen (Fig. 3), kindly presented me by Dr. J. BOHLKE, this fish has a different habitus, with dorsal profile almost horizontal and mouth directed upwards, as in *Ch. maassi.*

3. **Chela coeruleostigmata** (

Synonyms: *Laubuca coeruleostig* R.); *Chela coer.*, SMITH, 1945; *Chel* at Pechabun, Central Siam); *Chela*

xamination of type specimens); *Ch. n*

Specimens examined:

S.M.F. 8968, 3 spec., 37.5 - 47. from Tropicarium, Frankfurt).

's mentioned in the original description
se of *Ch. laubuca* (D 3/8; L. lat. 35 $\frac{7}{2}$,
rd length) but, according to the original

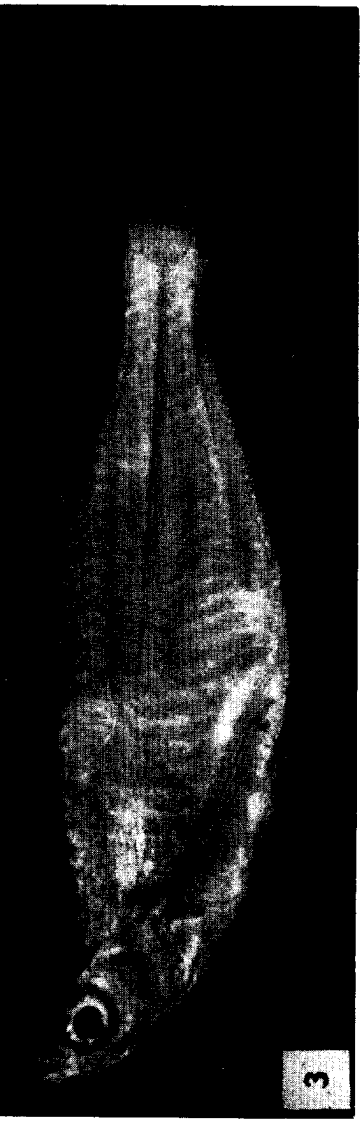


Fig. 2 - *Chela laubuca* (Hamilton-Buchanan). Sumatra A.N.S.P. 54090.
Fig. 3 - *Chela laubuca* (Hamilton-Buchanan). Type of *Laubuca siamensis* Fowler. A.N.S.P. 68496. Courtesy of D. J. Böhlke.

he type specimen (Fig. 3), kindly presen-
fish has a different habitus, with dorsal
outh directed upwards, as in *Ch. maassi.*

3. **Chela coeruleostigmata** (Smith, 1931). Figs. 4,5.

Synonyms: *Laubuca coeruleostigmata* SMITH, 1931 (Menam Chao R.); *Chela coer.*, SMITH, 1945; *Chela mouhoti* SMITH, 1945 (Pasak R. at Pechabun, Central Siam); *Chela coeruleostigmata*, SILAS, 1958 (re-

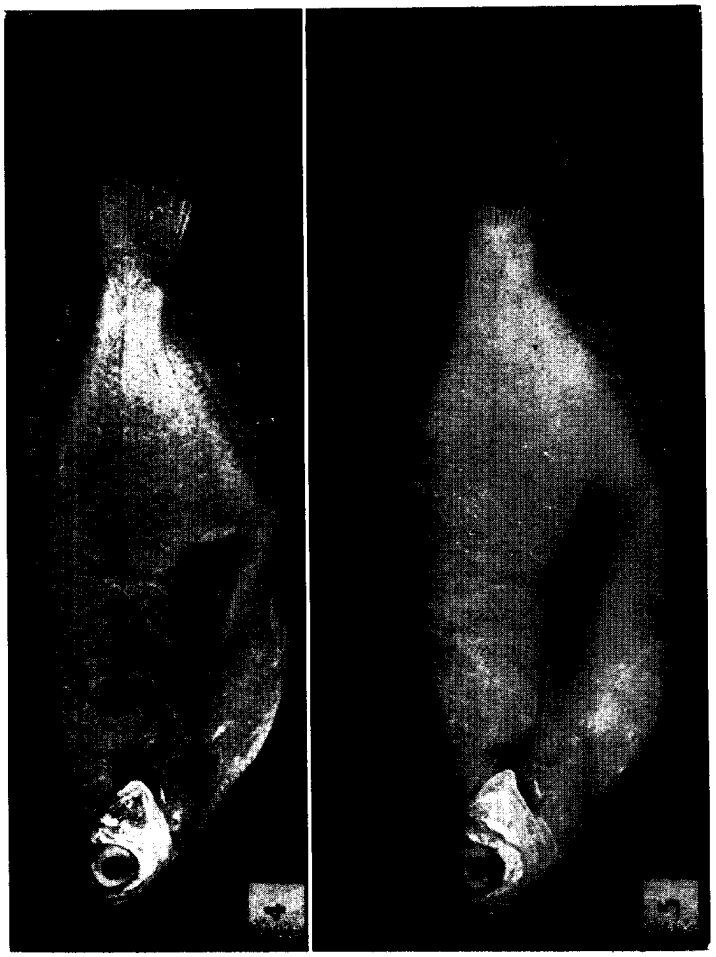


Fig. 4 - *Chela coeruleostigmata* (Smith). No locality. S.M.F. 8968.
Fig. 5 - *Chela coeruleostigmata* (Smith). Near Bangkok. S.M.F. 3932.

xamination of type specimens); *Ch. mouhoti*, SILAS, 1958 (reference).

Specimens examined:

S.M.F. 8968, 3 spec., 37.5 - 47.3 mm. (no locality; obtained from Tropicarium, Frankfurt).

S.M.F. 3932, near Bangkok, leg. H. Schmidt, 1956, 11 spec., 38.5 - 52.6 mm.

D 3/(10) 11-12; A 3/(19) 20-21; L. lat. 32 $\frac{7\text{-}7\frac{1}{2}}{4\text{-}5}$ 35; Sp. br. 10-12; Predorsal scales 16 - 18; Circumpeduncular scales 13 - 14 (15).

Body proportions in % of standard length (the first values refer to the 10 larger specimens from the series S.M.F. 3932, the following values to the 3 other specimens):

Maximum body depth:	36.4 - 40.7% (38.95) - 34.0 - 43.1%
Caudal peduncle length:	11.4 - 14.8% (12.92) - 11.5 - 14.0%
Least depth:	10.1 - 12.0% (11.46) - 10.7 - 11.8%
Predorsal distance:	61.0 - 67.0% (64.24) - 63.5 - 68.0%
Preanal distance:	65.1 - 70.5% (68.1) - 67.0 - 70.0%
Prepelvic distance:	42.5 - 51.8% (48.06) - 47.7 - 49.5%
Pectoral origin-pelvic origin distance:	24.8 - 28.0% (26.31) - 21.9 - 33.8%
Pelvic origin-anal origin distance:	21.6 - 25.2% (23.31) - 21.4 - 23.8%
Pectoral length:	42.5 - 46.0% (44.34) - 44.0 - 46.0%
Pelvic legth:	18.2 - 21.4% (20.2) - 21.6 - 24.0%
Head length:	23.2 - 26.0% (25.07) - 26.0 - 26.9%
Snout length:	4.7 - 7.0% (5.94) - 6.95 - 8.65%
Eye diameter:	7.1 - 8.3% (7.72) - 7.0 - 9.2%
In % of head length:	
Snout length:	20.2 - 26.2% (23.7) - 25.8 - 33.0%
Eye:	27.8 - 34.0% (31.13) - 26.6 - 34.0%
Eye diameter in % of interorbital width:	57.9 - 73.0% (62.8) - 52.5 - 65.5%.

SMITH (1945) considers *Ch. coeruleostigmata* and *Ch. mouhoti* as distinct species and gives the following differences between them:

coeruleostigmata: L. lat. 35 $\frac{9}{3\text{-}4}$; scales around least depth 12; a blue spot on top of head, another in front of dorsal; a dark spot on shoulder and 4-9 short vertical stripes above pectoral

mouhoti: L. lat. 31 $\frac{7}{5}$; scales around least depth 14; no blue spots; a round blackish spot on shoulder but no vertical stripes on sides.

The specimens examined link together both nominal species: the specimens S.M.F. 3932 have 33 - 35 scales in lateral line, 7 - 7½ above

kok, leg. H. Schmidt, 1956, 11 spec.,

) 20-21; L. lat. 32 $\frac{7\text{-}7\frac{1}{2}}{4\text{-}5}$ 35; Sp. br.
; Circumpeduncular scales 13 - 14 (15).
of standard length (the first values refer
m the series S.M.F. 3932, the following
is):

- 40.7% (38.95) - 34.0 - 43.1%
- 14.8% (12.92) - 11.5 - 14.0%
- 12.0% (11.46) - 10.7 - 11.8%
- 67.0% (64.24) - 63.5 - 68.0%
- 70.5% (68.1) - 67.0 - 70.0%
- 51.8% (48.06) - 47.7 - 49.5%

- 28.0% (26.31) - 21.9 - 33.8%

- 25.2% (23.31) - 21.4 - 23.8%
- 46.0% (44.34) - 44.0 - 46.0%
- 21.4% (20.2) - 21.6 - 24.0%
- 26.0% (25.07) - 26.0 - 26.9%
- 7.0% (5.94) - 6.95 - 8.65%
- 8.3% (7.72) - 7.0 - 9.2%

- 26.2% (23.7) - 25.8 - 33.0%
- 34.0% (31.13) - 26.6 - 34.0%

- 73.0% (62.8) - 52.5 - 65.5%.

Ch. coeruleostigmata and *Ch. mouhoti* as
following differences between them:

35 $\frac{9}{3\text{-}4}$; scales around least depth 12;
other in front of dorsal; a dark spot on
stripes above pectoral
cales around least depth 14; no blue
n shoulder but no vertical stripes on

link together both nominal species: the
35 scales in lateral line, 7 - 7½ above,

4-5 below lateral line to pelvic origin; in the three other specimens the values are: 33-34, 7 and respectively 3. The spot on shoulder is well marked in all specimens; the vertical stripes can be recognized in some specimens from the larger series and in two specimens from the small series; they are lacking in the other specimens from the same series.

I therefore believe that *mouhoti* and *coeruleostigmata* are conspecific and that the small differences indicated by SMITH in their original descriptions are due to local (not even subspecific) variation.

Subgenus **Malayochela** nov.

Type species: *Eustira maassi* Weber & De Beaufort.

DIAGNOSIS: Body rather elongate; dorsal with 7, anal with 10-11 branched rays. Pharyngeal teeth on two rows. Lateral line complete, rather gently bent, with 28 - 34 scales; 8-9 scales in oblique line. Mouth strongly oblique, almost vertical; tip of snout often directed upwards.

DERIVATIO NOMINIS: After Malaya, the range of this subgenus being restricted to countries inhabited by people speaking languages of the Malayan family.

DISCUSSION. The main character of this subgenus are the pharyngeal teeth on two rows. The number of rows of teeth is in general considered a generic character within the subfamily Cultrinae, yet in one species, *Hemiculter bleekeri* (= *Toxabramis argentifer*), the teeth are usually on three rows, but in a few specimens they are (at least on one side) on two. The number of rows of teeth varies also within other genera of Cyprinidae, such are *Zacco* (subfamily Danioninae), *Xenocypris* (Xenocyprininae), *Sarcocheilichthys* (Gobioninae) and several genera of Leuciscinae.

WEBER & DE BEAUFORT do not mention the number of teeth rows in *Ch. maassi*, neither in the original description (1912) nor in their 1916 main work. SILAS (1958) ascribes *E. maassi* to his subgenus *Allochela*, with which *maassi* actualy bears some similarity in its rather short anal fin and somewhat elongate body; yet in *Ch. fasciatus*, type of *Allochela*, the are on three rows.

4. **Chela (Malayochela) maassi** (Weber & De Beaufort, 1912). Figs. 6-7.

Synonyms: *Chela acinaces* (not of VALENCIENNES), DUNCKER, 1904 (Muar R., Tubing Singgi, Malaya); *Eustira maassi* WEBER & DE BEAU-

FORT, 1912 (Gunun Sahilan, on Kamper R., Sumatra); *Laubuca* (*Eustira*) *maassi*, WEBER & DE BEAUFORT, 1916 (same locality); *Chela* (*Allochela*) *maassi*, SILAS, 1958 (reference).

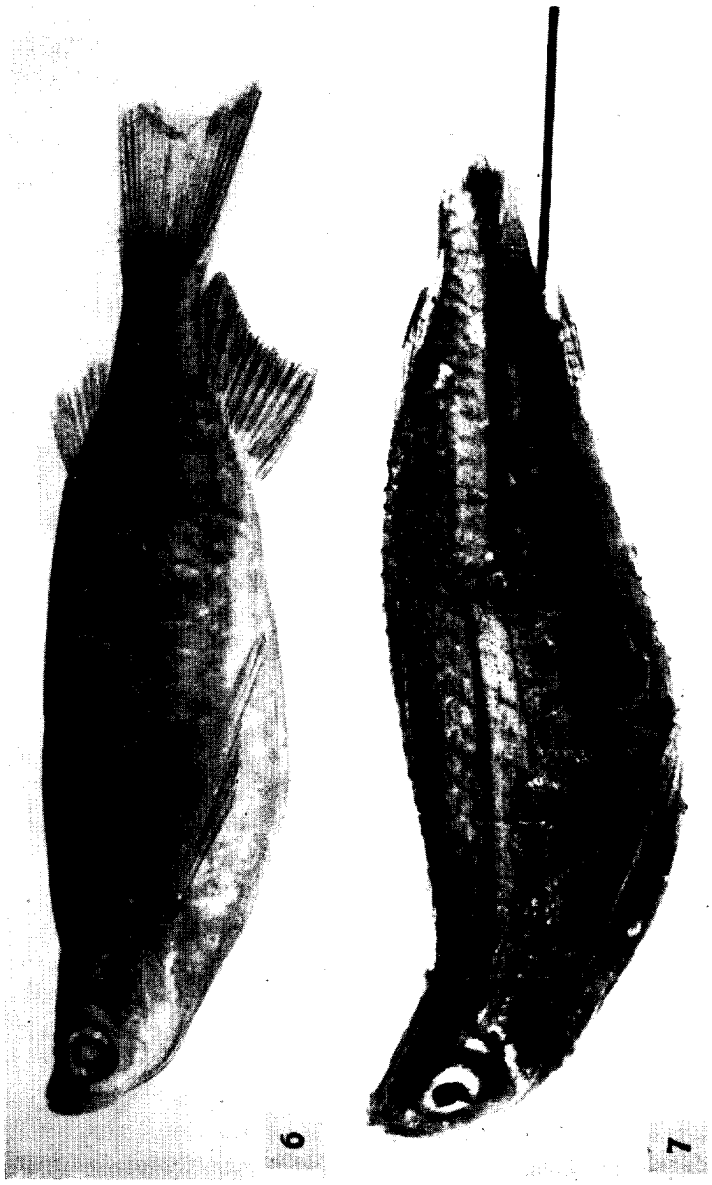


Fig. 6 - *Chela* (*Malayochela*) *maassi* (Weber & De Beaufort). Moesi R., Sumatra. R.M.N.H. 16886.
Fig. 7 - *Chela* (*Malayochela*) *maassi* (Weber & De Beaufort). Muar R., Malaya H.Z.S. 8495.

Specimens examined:

R.M.N.H. 16886, Moesi R., Sum
1 specimen, 40.0 mm. st. length.

M.N.H.N. 91419, Borneo, leg. C
mined *Chela megalolepis*.

H.Z.S. 8495, Muar R., Tubing S
26.1 mm. determined (by DUNCKER)

D 3/7; A 3/10-11; L. lat. 2

5.3 - 3.4; 4.2 - 2.5 or 5.2 - 2.4.

Body depth 27.6 - 29.5 % of s
length 15.5 - 17.6 %; least depth 9.1 -
- 70.0%; preanal 65.5 - 71.0%; preven
pectoral to pelvic 27.6 - 31.0%; from p
length 24.2 - 26.8%; snout 5.8 - 7.0%
23.8 - 28.6% of head; eye diameter 22.
of interorbital width. Mouth almost v
specimens) directed upwards; a rather
beginning at nape, slightly behind ve
preopercle.

Colour pattern (in the Moesi R.
served): brown above; a median dark s
caudal; scales bordered with blackish. S
blotches; a dark stripe from front of ey
where it becomes more intensive. Ventr
pale, their rays slightly bordered by bla
anal base.

This species was recorded up to da
tified it also in Borneo and Malaya.

Subgenus **Neochela**

5. **Chela (Neochela) dadyburjor**

Synonyms: *Laubuca dadidurjori* (s
South India) (*L. dadiburjori* in other plac
(*Neochela*) *dadyburjori*, SILAS, 1958 (Triv

Specimens examined:

H.Z.S. 1766, no locality, don. E.
22.5 mm. st. length.

n Kamper R., Sumatra); *Laubuca* (*Eustira*)
T, 1916 (same locality); *Chela* (*Allochela*)
).

Fig. 6 - *Chela* (*Malayochela*) *maassi* (Weber & De Beaufort), Moesi R., Sumatra. R.M.N.H. 16886.
Fig. 7 - *Chela* (*Malayochela*) *maassi* (Weber & De Beaufort), Muar R., Malaya H.Z.S. 8495.

Specimens examined:

R.M.N.H. 16886, Moesi R., Sumatra, leg. C. Kramer, 22-V-1939, 1 specimen, 40.0 mm. st. length.

M.N.H.N. 91419, Borneo, leg. Chaper, 1 spec., 29.0 mm, determined *Chela megalolepis*.

H.Z.S. 8495, Muar R., Tubing Singgi, Malaya, 2 spec., 25.3 and 26.1 mm. determined (by DUNCKER) as *Chela acinaces*.

D 3/7; A 3/10-11; L. lat. 28 $\frac{6\text{-}6\frac{1}{2}}{1\text{-}1\frac{1}{2}}$ 31; D. phar. 5.2 - 3.5; 5.3 - 3.4; 4.2 - 2.5 or 5.2 - 2.4.

Body depth 27.6 - 29.5 % of standard length; caudal peduncle length 15.5 - 17.6 %; least depth 9.1 - 10.7 %; predorsal distance 64.8 - 70.0%; preanal 65.5 - 71.0%; preventral 52.0 - 45.5%; distance from pectoral to pelvic 27.6 - 31.0%; from pelvic to anal 19.2 - 21.8%; head length 24.2 - 26.8%; snout 5.8 - 7.0%; eye diameter 5.5 - 7.7%; snout 23.8 - 28.6% of head; eye diameter 22.4 - 28.6% of head and 46 - 86% of interorbital width. Mouth almost vertical; snout (in the available specimens) directed upwards; a rather strong concavity at nape. Scales beginning at nape, slightly behind vertical from posterior margin of preopercle.

Colour pattern (in the Moesi R., specimen, the only well preserved): brown above; a median dark stripe from nape to dorsal and caudal; scales bordered with blackish. Sides silvery, with slight darker blotches; a dark stripe from front of eye across opercle to caudal base where it becomes more intensive. Ventral face silvery, unspotted. Fins pale, their rays slightly bordered by blackish. Minute black spots on anal base.

This species was recorded up to day only from Sumatra; I identified it also in Borneo and Malaya.

Subgenus **Neochela** Silas, 1958

5. **Chela** (**Neochela**) **dadyburjori** (Menon, 1952). Fig. 8.

Synonyms: *Laubuca dadidurjori* (sic!) MENON, 1952 (Cochin, South India) (*L. dadiburjori* in other places in the same paper!); *Chela* (*Neochela*) *dadyburjori*, SILAS, 1958 (Trivandrum, Kerala, India).

Specimens examined:

H.Z.S. 1766, no locality, don. E. Roloff, 2 spec., 26.1 and 22.5 mm. st. length.

D 3/6; A 3/10; L. lat. 7; Sq. 31-32; Predors. scales 17.

Body depth 26.7 - 29.8% of st. length; caudal peduncle 22.3 - 27.6%; least depth 8.8 - 9.35%; predorsal distance 62.5 - 65.5%; preanal 61.5 - 64.9%; preventral 42 - 44%; distance from pectoral to pelvic origin 18.3 - 23.0%; from pelvic to anal origin 17.3 - 19.1%; head 23.6 - 23.8%; snout 5.7 - 5.8%; eye diameter 6.9 - 7.6%; snout 24.2 - 24.6% of head; eye 29.0 - 33.0% of head.

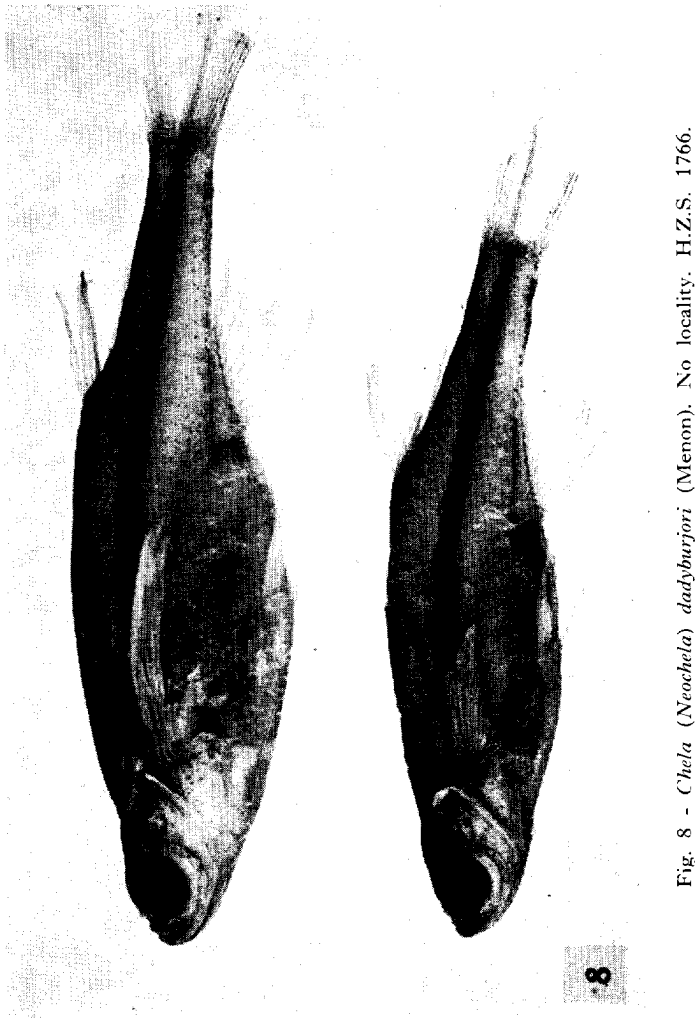


Fig. 8 - *Chela* (*Neochela*) *dadyburjori* (Menon). No locality. H.Z.S. 1766.

A broad moniliform dark stri
extends from opercle to caudal base.

The two available specimens are
and SILAS' ones, although they diffe
authors in number of rays (MENON a
and in a few body proportions.

The species was described and
South-West India. There are no data o
specimens. Mr. E. Roloff collected m
me quite improbable that *Chela dad*
country; it is rather probabble that
fish and spread into natural waters, as
some South American ones!) did it in

* * *

Aknowledgements. Following cura
their care: M.me M. L. Bauchot, Pa
Dr. M. Boeseman, Leiden; Dr. P. H
Klausewitz, Frankfurt; Dr. W. Ladiges
Stanford. Dr. A.G.K. Menon, Calcutt

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; Sq. 31-32; Predors. scales 17.
% of st. length; caudal peduncle 22.3 -
; predorsal distance 62.5 - 65.5%; prea-

Fig. 8 - *Chela (Neochela) dadyburjori* (Menon). No locality. H.Z.S. 1766.

2 - 44%; distance from pectoral to pel-
pelvic to anal origin 17.3 - 19.1%; head
; eye diameter 6.9 - 7.6%; snout 24.2 -
0% of head.

A broad moniliform dark stripe, interrupted in 3 - 5 places, extends from opercle to caudal base.

The two available specimens are surely conspecific with MENON's and SILAS' ones, although they differ from those described by both authors in number of rays (MENON and SILAS give D 3/7; A 3/11-12) and in a few body proportions.

The species was described and recorded up to day only from South-West India. There are no data on the locality of the two available specimens. Mr. E. Roloff collected mainly in Thailand. But it seems me quite improbable that *Chela dadyburjori* is autochtonous in this country; it is rather probabble that it was introduced as aquarium fish and spread into natural waters, as many aquarium fishes (including some South American ones!) did it in Thailand.

* * *

Aknowledgements. Following curators loaned me specimens under their care: M.me M. L. Bauchot, Paris; Dr. J. Böhlke, Philadelphia; Dr. M. Boeseman, Leiden; Dr. P. H. Greenwood, London; Dr. W. Klausewitz, Frankfurt; Dr. W. Ladiges, Hamburg; Prof. G. S. Myers, Stanford. Dr. A.G.K. Menon, Calcutta, sent specimens in exchange.

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SUMMARY

The author examined specimens of all the species of the genus *Chela*, except *Ch. fasciatus*. He accepts, with some hesitations, the synonymization of *Laubuca siamensis* Fowler with *Chela laubuca*. He considers *Ch. mouhoti* a synonym of *Ch. coeruleostigmata*. *Ch. maassi* belongs to a new subgenus, *Malayochela*, characterized by pharyngeal teeth on two rows.

RIASSUNTO

L'A. ha esaminato esemplari di tutte le specie del gen. *Chela*, ad eccezione di *Ch. fasciatus*. Egli accetta, con qualche esitazione, la sinonimia di *Laubuca siamensis* Fowler con *Chela laubuca*. Considera *Ch. mouhoti* sinonimo di *Ch. coeruleostigmata*. *Ch. maassi* appartiene ad un nuovo sottogenere, *Malayochela*, caratterizzato dai denti faringei in due serie.

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METHODES DE
ET DE DOSAGE D
A L'ETAT PARTICUL
ET DISSOUS DANS LE MI

A) INTRODU

L'étude des transformations et
ganique dans le milieu marin a conduit
directions variées, H.J. CECCALDI (196

— dosage du carbone organique total,

— dosage des protéines, des lipides, d

— dosage des pigments photosynthétiq

— dosage des glucides.

Le présent travail consiste à met
séparation et de dosage des glucides.
parés en trois classes, suivant la taille
entrent:

— glucides particulaires,

— glucides colloïdaux,

— glucides dissous.