

A KEY FOR THE IDENTIFICATION OF THE CATFISHES OF THE GENUS *TACHYSURUS* LA CÈPÈDE, WITH A CATALOGUE OF THE SPECIMENS IN THE COLLECTION OF THE INDIAN MUSEUM (ZOOLOGICAL SURVEY).

By MARY CHANDY, Department of Zoology, University of Delhi, Delhi.

CONTENTS.

	Page
Introduction . . . . .	1
Key to the Indian species of the genus <i>Tachysurus</i> La Cèpède . . . . .	2
Catalogue of the Indian species of <i>Tachysurus</i> . . . . .	3
Geographical and Ecological Distribution of the Indian species . . . . .	18

INTRODUCTION.

This paper is based on the collections of fishes in the Indian Museum of the genus *Tachysurus*, family *Tachysuridae*, order Siluroidea (Nematognathi) and is one of the series of "Notes on the Siluroid Fishes of India, Burma and Ceylon", inaugurated by Dr. S. L. Hora.

While working at the Zoological Survey of India as Museum and Reference Collection Officer of the Central Marine Fisheries Research in 1947, Dr. Hora, Director, Zoological Survey of India, suggested to me, to take up the study of a marine group, material of which is available in the collections of the Indian Museum, for the purpose of acquainting myself with the procedure and practice of fish-taxonomy. Accordingly, the genus *Tachysurus*, species of which constitute the most important marine Siluroids, from the commercial and economic points of view, was chosen. Since Day's work (1877) no attempt has been made to bring up-to-date the systematics and distribution of the species in this genus. As the majority of the species are well-known, I have only attempted to give a key for identification, synonymy of each species, with important notes on taxonomy and distribution.

The work was carried out mainly on the collections of the marine catfishes of the Indian Museum and I am deeply grateful to the Director, Zoological Survey of India, for facilities and assistance he has given me.

There are twenty-three species of *Tachysurus* so far recorded from the seas, estuaries and rivers of India and Burma. These may be distinguished by the key given below:—

KEY TO THE INDIAN SPECIES OF THE GENUS *Tachysurus* LA CÈPÈDE,

1. Palatine teeth in *one* patch on each side . . . . . 7,  
    Palatine teeth in *two* or more patches on each side . . . . . 2.
2. Palatine teeth in *two* distinct patches on each side . . . . . 3,  
    Palatine teeth in *three* distinct patches on each side . . . . . 6.

3. Palatine patches *transverse* (Basal bone of dorsal spine butterfly-shaped) . . . . . *sagor*.
- Palatine patches *longitudinal* ; anterior small, posterior large . . . . . 4.
4. Black spot on adipose fin *present* . . . . . 5.  
Black spot on adipose fin *absent* . . . . . *nella*.
5. Posterior palatine patches elliptical and diverging posteriorly ; teeth molariform . . . . . *dussumieri*.
- Posterior palatine patches pear-shaped and converging posteriorly, teeth globular. (Tips of medium dorsal and paired fins black) . . . . . *crossocheilus*.
6. Keel on the occipital crest *serrated* ; premaxillary band 4 times long as broad ; palatine teeth in 3 isolated patches . . . . . *serratus*.
- Keel on the occipital crest *crenulated* ; premaxillary band 6 times long as broad ; palatine teeth in 3 closely set patches . . . . . *thalassinus*.
7. Premaxillary band of teeth *divided in the middle* . . . . . 8.  
Premaxillary band of teeth *continuous* . . . . . 10.
8. Patches of palatine teeth *oval* and separated from jaw by a space of not more than the width of premaxillary band of teeth (snout elongated and acute) . . . . . *acutirostrus*.
- Patches of palatine teeth *pyriform* and separated from jaw by a space of about 6 times or more than the width of premaxillary band of teeth . . . . . 9.
9. Dorsal tubercles *absent* ; dorsal and pectoral spines strong . . . . . *satparasus*.
- Dorsal tubercles *present* ; dorsal and pectoral spines weak . . . . . *tenuispinis*.
10. Palatine patch *oval, ovoid* or *elliptical* . . . . . 11.  
Palatine patch roughly *triangular* . . . . . 19.
11. Palatine patch *not larger* than eye (teeth conical) . . . . . 12.  
Palatine patch several times *larger* than eye (teeth globular or molariform) . . . . . 15.
12. Premaxillary band of teeth *short*. (Barbels all shorter than the distance between the tip of the snout and posterior border of eye ; snout depressed and elongated ; an elongated dorsal filament reaching the adipose fin) . . . . . *subrostratus*.
- Premaxillary band *arcuate and long* . . . . . 13.
13. Palatine patches of teeth *close* together meeting in middle (maxillary and outer mandibular barbels nearly of the same length) . . . . . *parvipinnis*.
- Palatine patches of teeth widely *separate* . . . . . 14.
14. Snout duck-billed . . . . . *burmanicus*.  
Snout blunt, rounded. (Pre-orbital spine prominent) . . . . . *sumatranus*.
15. Premaxillary band of teeth 3 times as long as broad. (Eye 6-7 diameters in head ; 2-3 apart ;  $2\frac{1}{2}$  from snout ; median fontanelle large, shallow, broad in front and tapering ; height 7) . . . . . *jella*.
- Premaxillary band of teeth more than 3 times as long as broad . . . . . 16.

16. Premaxillary band of teeth  $3\frac{1}{2}$  times long as broad (Eye 6 diameters, 3 apart, 2 from snout ; small median fontanelle behind eye ; height  $5\frac{1}{2}$  ; dorsal filament present) . . . . . *malabaricus*.
- Premaxillary band of teeth more than  $3\frac{1}{2}$  time as long as broad . . . . . 17.
17. Premaxillary band of teeth 4 times as long as broad . . . . . 18.
- Premaxillary band of teeth 5 times as long as broad. (Eye  $5\frac{1}{2}$  diameters,  $2\frac{1}{2}$  apart and 2 from snout ; median fontanelle short, narrow, deep streak) . . . . . *falcarius*.
18. Eye diameters,  $3\frac{1}{2}$  apart, 3 from snout. Dorsal filament absent. (Median fontanelle large, broad between anterior nostrils and occipital crest, tapering at both ends) . . . . . *gagora*.
- Eye diameters, 3 apart, 2 from snout. Dorsal filament present . . . . . *arius*.
19. Vomerine teeth usually distinct as a small patch inner to palatine patch and united with it. (Head broad and depressed) . . . . . *sona*.
- Vomerine teeth indistinct and confluent with palatine patch . . . . . 20.
20. Barbels (maxillary and outer mandibular) shorter than head, thick and fleshy. (Eye diameters 7 in head) . . . . . *platysomus*.
- Barbels (maxillary and outer mandibular) longer than head, reaching half way or two-thirds of pectoral . . . . . 21.
21. Barbels slender, filamentous ; dorsal spine as long as head ; strong at base ; dorsal fin filament absent . . . . . *macronotacanthus*.
- Barbels strong, dorsal spine longer than head, corrugated on the lateral surface ; dorsal fin filament present . . . . . 22.
22. Eye diameters 7 in head, 4 apart . . . . . *coelatus*.  
Eye diameters  $5\frac{1}{2}$  in head 3, apart . . . . . *nenga*.

### CATALOGUE OF THE INDIAN SPECIES OF *Tachysurus*.

#### *Tachysurus acutirostris* (Day).

1877. *Arius acutirostris*, Day, *Fish. India*, p. 459, pl. ovii, fig. 1.

1888. *Arius acutirostris*, Day, *Faun. Brit. Ind., Fish.* I, p.75.

*Tachysurus acutirostris* is represented by specimens from Moulmein, Burma in the collections of the Zoological Survey of India ; the standard length of the largest specimen is 193.5 mm. The specimens in the collection are somewhat mutilated and hence it has not been possible to give illustrations of the head and dentition of this species.

This is one of the species recorded by Day from the fresh waters of Burma, where it is commonly found. The species is easily identified on account of its pointed rostrum, from which the specific name is derived. The rostrum is formed by the elongation of the upper jaw, which is fleshy and lies in advance of the lower jaw.

**Tachysurus arfus** (Hamilton).

(Pl. I, fig. 5.)

1822. *Pimelodus arius*, Hamilton, *Fish. Ganges*, pp. 170 & 376.1877. *Arius buchanani*, Day, *Fish. India*, p. 463, pl. cv., fig. 6.1889. *Arius buchanani*, Day, *Faun. Brit. Ind.*, Fish. I, p. 181.

In the Zoological Survey of India collections *Tachysurus arius* is represented from the following localities : Hooghly River, Nawabgunj ; Puri, Orissa ; Portugese India ; Calicut ; Cochin Harbour ; Alleppy, Travancore and Arukutty, Travancore. I have also examined material from Adayar, Madras.



Hamilton <sup>1</sup> described the species from the Ganges. Day obtained it from Hooghly at Calcutta and also from Burma. As shown in the list of the material examined, it enjoys a much wider distribution all along the coast of India, as far south as Travancore. It is an estuarine form.

<sup>1</sup> Hamilton, F. *An Account of the Fishes of the Ganges* (1822).

Both Hamilton and Day indicate that the anal fin has 22 rays but my observations on a large collection of specimens of the Indian Museum show that the fin formula is 19-20. Hamilton also mentions that the back-fin ends in a flexible point much longer than the membrane, referring to the dorsal filament. In all the specimens I have examined dorsal filament is a distinct feature. Day makes no mention of this.

Weber and de Beaufort<sup>1</sup> and Hora<sup>2</sup>, have raised the question whether *Arius maculatus* Thunberg could be identical with *Arius arius* (Ham.). From a large number of *T. arius* that I have been able to examine and compare with the description and figures of *A. maculatus*, I am of opinion that these two species are distinct. In *maculatus*, the premaxillary band of teeth is 6-7 times as long as broad and the palatine patches of teeth are placed far back on the palate, while in *T. arius*, the premaxillary band of teeth is only 4 times as long as broad and the palatine patches of teeth placed forward, immediately posterior to premaxilla. *T. maculatus* also occurs in seas, estuaries and rivers (Weber & de Beaufort).

### **Tachysurus burmanicus** (Day).

1877. *Arius burmanicus*, Day, *Fish. India*, p. 458.

1899. *Arius burmanicus*, Day, *Faun. Brit. Ind.*, Fish. I, p. 174.

The material of *Tachysurus burmanicus* in the collection of the Zoological Survey of India is from Moulmein, Burma ; the standard length of the largest specimen is 192 mm.

### **Tachysurus coelatus** (Cuv. & Val).

(Pl. I, fig. 7 & Pl. III, fig. 4.)

1840. *Arius coelatus*, Cuv. & Val, *Hist. Nat. Poiss.* XV, p. 66 (type-locality : Bombay).

1864. *Arius coelatus*, Günther, *Cat. Fish Brit. Mus.* V, p. 158, fig. (teeth).

1877. *Arius coelatus*, Day, *Fish. India*, p. 459, pl. cv., fig. 5.

1889. *Arius coelatus*, Day, *Faun. Brit. Ind.* Fish. I p. 174.

1913. *Arius coelatus*, Weber & Beaufort, *Fish. Indo-Austral. Archipel.* 11 p. 310, fig. 134 (upper teeth).

1941. *Tachysurus coelatus*, Fowler, *Bull. U. S. Nat. Mus.* (100) XIII, p. 758.

*Tachysurus coelatus* is represented by specimens in the collections of the Zoological Survey of India from Puri (Orissa) and the Hooghly river at Sunderbans. I have also examined specimens of this species obtained from the Bombay Coast.

The species attains a large size and is one of the six common commercially important fishes on the Bombay coast.

<sup>1</sup> Weber, and de Beaufort, L. F. *Fishes of the Indo-Australian Archipelago* II, 284 (1913).

<sup>2</sup> Hora, S. L. *Fish of the Tale Sap. Mem. Asiat. Soc. Bengal* VI, p. 467 (1926).

**Tachysurus crossocheilus** (Bleeker).

(Text-fig. 2, a.)

1846. *Arius crossocheilus*, Bleeker, *Nat. Geneesk. Arch. Ned. Indie* III(2), p. 137 (type-locality : Batavia).  
 1864. *Arius tonggol*, Günther, *Cat. Fish. Brit. Mus.* V, p. 164.  
 1913. *Arius crossocheilus*, Weber & Beaufort, *Fish. Indo-Austral. Archipel.* II, p. 276.  
 1926. *Arius crossocheilus*, Herre, *Philippine Journ. Sci.* XXXI, p. 398.  
 1941. *Tachysurus crossocheilus*, Fowler, *Bull. U. S. Nat. Mus.* (100) XIII, p. 768.

The species is recorded by the author for the first time in India from Bombay, although its occurrence in the Indo-Pacific seas is known. It closely resembles *T. dussumieri*, from which it can be differentiated by the shape and disposition of the palatine patches of teeth and also by the nature of the individual tooth on these patches.



It is not a common species in India. It is marine and attains a large size. It is marketed in Bombay, from where the author obtained two specimens 191 mm. and 251 mm. in length respectively.

**Tachysurus dussumieri** (Cuv. & Val).

(Pl. II, fig. 1 and Text-fig. 1, e.)

1840. *Arius dussumieri*, Cuv. & Val, *Hist. Nat. Poiss.* XV, p. 84.  
 1864. *Arius dussumieri*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 163.  
 1877. *Arius dussumieri*, Day, *Fish. India*, p. 467, pl. cvii, fig. 7.  
 1889. *Arius dussumieri*, Day, *Faun. Brit. Ind. Fish.* 1, p. 188.

In the collections of the Zoological Survey of India *Tachysurus dussumieri* is represented by specimens from the following localities : Rangoon, Burma, Karachi and Malabar. I have also examined specimens of this species obtained from Bombay and Ennore, Madras.

The species has been recorded by J. L. B. Smith from the Delago Bay, east coast of South Africa and is one of the two marine species of *Tachysurus* of that continent. Smith labels it as an "Indian species". It is common on the Bombay and Madras coasts and contributes towards the catfish fishery.

***Tachysurus falcarius* (Richardson).**

(Pl. II, fig. 4 & Pl. III, fig. 6.)

1844. *Arius falcarius*, Richardson, *Voy. Sulphur. Ich.*, p. 134, pl. lxi, figs. 7-9.  
 1864. *Arius falcarius*, Günther, *Cat. Fish. Brit. Mus.* V, p. 168.  
 1877. *Arius falcarius*, Day, *Fish. India*, p. 463, pl. cvi, fig. 5.  
 1889. *Arius falcarius*, Day, *Faun. Brit. Ind. Fish.* I, p. 182.

*Tachysurus falcarius* is represented by specimens from Rangoon and Canara in the collections of the Zoological Survey of India. I have also examined additional material obtained from Bombay and Madras where *falcarius* is a commercially important species.

***Tachysurus gagora* (Hamilton).**

(Pl. I, fig. 12 and Pl. III, fig. 10.)

1822. *Pimelodus gagora*, Hamilton, *Fish. Ganges*, pp. 167, 376.  
 1864. *Arius gagora*, Günther, *Cat. Fish. Brit. Mus.* V, p. 167.  
 1877. *Arius gagora*, Day, *Fish. India*, p. 465, pl. cvii, fig. 2.  
 1889. *Arius gagora*, Day, *Faun. Brit. Ind.*, Fish. I, p. 185.  
 1945. *Tachysurus gagora*, Smith, *Bull. U. S. Nat. Mus.* 188, p. 406.  
 1948 (1949). *Tachysurus gagora*, Hora, *Rec. Ind. Mus.* XLVI, p. 68.

A widely known freshwater species recorded by Hamilton from Bengal as *Pimelodus gagora*. Suavage reports its occurrence from Siam also. Smith<sup>1</sup> remarks "It (*T. gagora*) was described by Günther as *Arius macracanthus*". In Günther's *Catalogue* (V, p. 167, 168), there is no allusion to this, neither is there any reference to *macracanthus* in his synonymy of *gagora*. Günther describes them as two distinct species. The only possible ground of likeness between the two species is the nature of palatine teeth. But the location of the palatine patches is different in the two species to be of sufficient systematic importance and therefore, there is no ground for Smith's assumption.

The material of *Tachysurus gagora* in the collection of the Zoological Survey is from Calcutta.

***Tachysurus jella* (Day).**

(Pl. I, fig. 9 and Pl. III, fig. 11.)

1803. *Deddijellah*, Russell, *Fishes, Vizagapatam*, p. 54.  
 1877. *Arius jellah*, Day, *Fish. India*, p. 467, pl. cvi, fig. 3.  
 1889. *Arius jellah*, Day, *Faun. Brit. Ind. Fish.* I, p. 187.

*Tachysurus jella* is represented by specimens from Madras, Pulta (Calcutta) and Burma in the collections of the Zoological Survey of India.

<sup>1</sup> Smith, H. M. *Bull. U. S. Nat. Mus.* 188, (1945).

In the present study based on the collections of the Indian Museum, its range of distribution extends north along the coast to mouth of Ganges and eastwards to Burma.

Very common in the Bay of Bengal and contributes a high percentage in the marine catfish industry of this province.

**Tachysurus malabaricus** (Day).

(Pl. I, fig. 11 and Pl. III, fig. 12.)

1877. *Arius malabaricus*, Day, *Fish. India*, p. 464, pl. cv. 11, fig. 4.

1889. *Arius malabaricus*, Day, *Faun. Brit. Ind.* Fish. I, p. 183.

*Tachysurus malabaricus* is represented by specimens in the collection of the Zoological Survey of India from Canara and Malabar ; it is a very common species along the Malabar Coast and attains a large size. It is highly valued as a foodfish.

**Tachysurus macronotacanthus** (Bleeker).

(Pl. II, fig. 3 and Pl. III, fig. 9.)

1862. *Arius macronotacanthus*, Bleeker, *Atl. Ichthy. Silur*, II, p. 32, t. 55.

1864. *Arius macronotacanthus*, Günther, *Cat. Brit. Mus.* V, V. p. 169.

1877. *Arius macronotacanthus*, Day, *Fish. India*, p. 465, pl. cxiii, fig. 1.

1889. *Arius macronotacanthus*, Day, *Faun. Brit. Ind.* Fish. I, p. 184.

1913. *Arius macronotacanthus*, Weber & Beaufort, *Fish. Indo-Austral. Archipel*, II, p. 309.

1945. *Tachysurus macronotacanthus*, Smith, *Bull. U. S. Nat. Mus.* 188, p. 410.

*Tachysurus macronotacanthus* is represented by specimens from Singgora (Thailand) in the collections of the Zoological Survey of India.

According to Günther, *A. macronotacanthus* is synonymous with *A. arius* (Cantor), perhaps on the similarity of dentition, but details of systematic analysis point that this view is not tenable.

**Tachysurus nella** (Cuv. & Val).

(Pl. I, fig. 6 and Pl. III, fig. 2.)

1840. *Pimelodus ? nella*, Cuv. & Val., *Hist. Nat. Poiss.* XV, p. 162.

1877. *Arius nella*, Day, *Fish. India*, p. 465.

1889. *Arius nella*, Day, *Faun. Brit. Ind.*, Fish. I, p. 184.

In the collections of the Zoological Survey of India *Tachysurus nella* is represented by specimens from the Lawsons Bay in Vizagapatam and Puri in Orissa.

As Day's account of the species is inadequate, I have described it below in detail and noted that its range of distribution extends to the Orissa Coast.

*Tachysurus nella* is comparatively a small-sized fish growing to about 18 cm. in length (9½ inches according to Day).



The head is fairly broad, depressed and rounded at the snout ; its length is contained 3.19 times in the standard length. The height of head at the occiput 1.70—1.96 times and its width 1.36—1.50 times in its length. The eyes are situated midway between the tip of the snout and the opercular border, on the lateral margin of the head towards the maxillary bone of the upper jaw. The diameter of the eye is contained about 4.66 times in the length of the head and 2.15 in the length of the snout and 2.99 in the inter-orbital width. The dorsal surface of the head is smooth except in the posterior part, where the tubercles of the headshield are present. Tubercles border the side of the occipital crest which is 4 times as long as broad. The occipital fontanelle is a narrow furrow, not quite reaching the occipital crest. The gape of the mouth equals the distance of the head behind the posterior border of the eye and the operculum. The upper jaw is more prominent than the lower and the lips are fimbriated. There are three pairs of barbels. The maxillary barbels reach the middle of the pectoral fin. The outer mandibular barbels extend beyond the gill-membrane, and the inner mandibular pair is slightly shorter.

The height of the body is about 4.4 times in the standard length. The least height of caudal peduncle is contained about 1.7—1.83 in its length.

The dorsal fin is about as high as the body at the occiput, broken in most of the specimens. The dorsal spine is about 1.48 in a young specimen 8.42 cm. long. Basal bone of the dorsal spine is narrow and shaped like a broad V.

The pectoral fin is immediately behind the opercle and is bordered above by the triangular humeral spine. The spine is 1.69 cm. in the smallest specimen and is comparatively longer than the dorsal spine. The ventral spine almost reaches the anal. The caudal is forked.

The colour is bluish leaden black on the dorsal surface while the ventral part of the abdomen and tail is dull white (the specific name of the fish is derived from the local or Indian name, which means black (*nalla* Telugu, black).

There are villiform teeth on the upper and lower jaws. The premaxillary band is short, about 3 times long as broad. The vomerine and palatine teeth are separated. The vomerine teeth are found in a small patch one on each corner of the roof of the mouth, immediately behind the premaxillary band. The palatine teeth are molariform and are disposed in a long wedge-shaped patch behind the vomerines on either side, reaching almost to the posterior extremity of the buccal cavity. The dentition closely resembles that of *T. dussumieri* from which this species differs in having a narrower head, longer barbels and shorter premaxillary band, and in colouration, size and distribution.

*Distribution.*—Day reports *A. nella* from the Coramandal coast. Of the specimens examined by the author, two are from Lawson's Bay, Vizagapatam, collected by the Zoological Survey of India in 1929 and the third from Puri, Orissa coast. These are preserved in the collection of the Indian Museum.

TABLE OF MEASUREMENTS (in millimetres).

	Vizagapatam.		Orissa.
Standard length . . . . .	142.0	182.4	84.2
Length of head . . . . .	45.0	55.9	24.8
Height of head at occiput . . . . .	22.9	32.8	16.2
Width of head . . . . .	33.0	38.8	19.6
Length of snout . . . . .	20.3	25.7	11.1
Diameter of eye . . . . .	9.8	10.5	6.1
Interorbital width . . . . .	26.8	32.8	13.1
Depth of body . . . . .	35.7	34.0	22.1
Length of caudal peduncle . . . . .	23.8	31.10	16.9
Least height of caudal peduncle . . . . .	14.5	15.3	8.2
Longest ray of dorsal . . . . .	33.8	38.9	14.8
Length of dorsal spine . . . . .	Missing	Missing	14.8
Length of pectoral . . . . .	30.8	38.9	..
Length of pectoral spine . . . . .	Missing	Missing	16.9
Length of ventral . . . . .	20.3	21.00	9.5

***Tachysurus nenga* (Hamilton).**

(Pl. I, fig. 8, and Pl. III, fig. 5.)

1822. *Pimelodus nenga*, Hamilton, *Fish. Ganges*, pp. 171-376.1877. *Arius nenga*, Day, *Fish. India*, p. 458, pl. civ., fig. 3.1889. *Arius nenga*, Day, *Faun. Brit. Ind., Fish.* I, p. 173.1948 (1949). *Arius nenga*, Hora, *Rec. Ind. Mus.* XLVI, p. 69.

*Tachysurus nenga* is represented by specimens in the collections of the Zoological Survey of India from the Hooghly river at Calcutta.

The systematic position of *T. nenga* is rather problematical. The species is recorded by Hamilton and Day from the Ganga. As pointed out by Day, it resembles *T. coelatus* so closely that he has suggested that *nenga* may be variety of *coelatus*. The only difference I could find between the two species is in the proportion of eye-diameter to length of head as indicated in the Key on page 3. The range of distribution is different in the two species; *coelatus* is a marine form with extensive distribution in the Indo-Pacific seas but shows a tendency to migrate into freshwater, while *nenga* is recorded only from the Ganga. Since in no two species of the genus *Tachysurus* the dentition is identical, I am inclined to view that *nenga* is most probably a freshwater variety of *coelatus*, which has undergone changes in size and colouration.

*Tachysurus nenga* is represented by specimens in the collections of the Zoological Survey of India from the Hooghly river at Calcutta.

**Tachysurus parvipinnis (Day).**

(Pl. II, fig. 7 and Text-fig. 2, b.)

1877. *Arius parvipinnis*, Day, *Fish. India*, p. 460, pl. cx. fig. 1.

1889. *Arius parvipinnis*, Day, *Fish. Brit. India*, Fish I, p. 177.

*Tachysurus parvipinnis* is represented by specimens obtained from the Orissa Coast in the collections of the Zoological Survey of India.

**Tachysurus platysomus (Day).**

(Pl. II, fig. 2 and Text-fig. 1. d.)

1877. *Arius platysomus*, Day, *Fish. India*, p. 464, pl. cv. 11, fig. 3.

1889. *Arius platysomus*, Day, *Faun. Brit. Ind.*, Fish. I, p. 183.

*Tachysurus platysomus* is represented by specimens in the collections of the Zoological Survey of India from Canara, Malabar and the Hooghly river at its mouth. I have also examined additional material collected from the Bombay Coast.

This species was established by Day from specimens obtained from Canara, Malabar. Later surveys have shown that it occurs in other parts also, viz., Bay of Bengal and Bombay. It has been recorded as one of the six main catfishes of commercial importance in Bombay and also in Madras.

**Tachysurus sagor (Hamilton).**

(Pl. II, fig. 5 and Pl. III, fig. 8.)

1822. *Pimelodus sagor*, Hamilton, *Fish. Ganges*, p. 169 & 376.

1839. *Bagrus sagor*, Cuvier & Valenciennes, *Hist. Nat. Poiss.* vol. 14, p. 445.

1853. *Arius sagor*, Bleeker, *Verh. Batav. Genootsch.* xxv, p. 56.

1864. *Arius sagor*, Günther, *Cat. Fish. Brit. Mus.* -, p. 141.

1877. *Arius sagor*, Day, *Fish. India*, p. 461, pl. c., fig. 1.

1889. *Arius sagor*, Day, *Faun. Brit. Ind.*, Fish. I, p. 141.

1913. *Arius sagor*, Weber & Beaufort, *Fish. Indo-Austr. Archip.* 2, II p. 289.

1941. *Tachysurus sagor*, Fowler, *Bull. U. S. Nat. Mus.* (100) XIII, p. 761.

1945. *Tachysurus sagor*, Smith, *Bull. U. S. Nat. Mus.* 188, p. 413.

1948 (1949). *Tachysurus sagor*, Hora, *Rec. Ind. Mus.* XLVI, p. 68.

*Tachysurus sagor* is represented by specimens in the collections of the Zoological Survey of India from Calcutta, Penang and the Saugor Island in the Bay of Bengal. I have also examined specimens of the species obtained from Bombay.

**Tachysurus satparanus (Chaudhuri).**

(Pl. I, fig. 3.)

1916. *Arius satparanus*, Chaudhuri, *Mem. Ind. Mus.* V, p. 432.

This species is represented in the collections of the Zoological Survey of India by specimens from the Chilka Lake, Orissa.

**Tachysurus serratus (Day).**

(Pl. II, fig. 6 and Pl. III, fig. 3.)

1877. *Arius serratus*, Day, *Fish. India*, p. 462, pl. CV, fig. 3.1889. *Arius serratus*, Day, *Faun. Brit. Ind.*, Fish. I, p. 180.

*Tachysurus serratus* is represented by specimens from Sind in the collections of the Zoological Survey of India.

**Tachysurus sona (Hamilton).**

(Pl. I, fig. 2 and Pl. III, fig. 1.)

1822. *Pimelodus sona*, Hamilton, *Fish. Ganges*, pp. 172, 376, type locality, Bengal.1864. *Pimelodus sona*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 143.1871. *Arius sona*, Day, *Proc. Zool. Soc. London*, p. 708.1877. *Arius sona*, Day, *Fish. India*, p. 462, pl. CV, fig. 2.1889. *Arius sona*, Day, *Faun. Brit. Ind.*, Fish. I, p. 179.1927. *Tachysurus sona*, Fowler, *Journ. Bomb. Nat. Hist. Soc.* XXXII, p. 255.1941. *Tachysurus sona*, Fowler, *Bull. U. S. Nat. Mus.* (100) XIII, p. 762.1948 (1949). *Tachysurus sona*, Hora, *Rec. Ind. Mus.*, XLVI, p. 69.

*Tachysurus sona* is represented in the collections of the Zoological Survey of India by specimens from Bombay, Puri, Penang and Calcutta. Additional material collected by me from the Bombay Coast has also been examined.

Günther records *Arius gagroides* from Calcutta, which he thinks to be synonymous with *sona*, perhaps on account of the similarity of their palatine teeth. But the two species differ in a number of anatomical features, particularly the anal fin formula.

Günther in his account of *Arius aroides* adds a final comment that "Blyth identified *A. aroides* with *Pimelodus sona* Ham-Buch to which opinion we do not accede" Both these authors seemed to have some confusion regarding the correct identification of *T. sona* (Ham.) which is a clearly defined species and is easily diagnosed by its characteristic dentition and other features.

This is one of the six commercially important marine catfishes of the Bombay coast.

**Tachysurus subrostratus (Cuv. & Val.).**

(Pl. I, fig. 10 and Text-fig. 1.c.)

1840. *Arius subrostratus*, Cuv. & Val., *Hist. Nat. Poiss.* XV, p. 62.1877. *Arius subrostratus*, Day, *Fish. India*, p. 461, pl. CV, 1, fig. 6.1889. *Arius subrostratus*, Day, *Faun. Brit. Ind.* Fish. I, p. 178.

In the collections of the Zoological Survey of India *Tachysurus subrostratus* is represented by specimens from Canara, Palliport, Travancore and Cochin.

This is an exclusive peninsular species of India, recorded first from Canara on the Malabar coast by Day. Its range of distribution is found to extend further south to Cochin and Travancore. It is a marine form, ascending fresh waters.

The snout, which is depressed and pointed, is a characteristic feature. The vomero-palatine teeth are reduced and in this feature it approaches *acutirostris* and *burmanicus*, in both of which the snout is modified. The species has a remarkably long dorsal filament, reaching adipose fin.

### ***Tachysurus sumatranus* (Bennett).**

(Pl. I, fig. 1 and Pl. III, fig. 7.)

1830. *Bagrus sumatranus*, Bennett, *Life of Sir S. Raffles*, p. 691. (type locality : Sumatra).  
 1840. *Arius venosus*, Cuv. & Val., *Hist. Nat. Poiss.* xv, p. 69.  
 1864. *Arius sumatranus*, Günther, *Cat. Fish. Brit. Mus.* v, p. 182.  
 1877. *Arius sumatranus*, Day, *Fish. India*, p. 460, pl. CVII, fig. 6.  
 1889. *Aruys sumatranus* Day, *Faun. Brit. Ind.*, Fish. 1, p. 176.  
 1910. *Tachysurus venosus*, Seake, *Philippine Journ. Sci.* v, p. 266.  
 1913. *Arius venosus*, Weber & Beaufort, *Fish. Ind.-Austr.*, Archip. II, p. 314.  
 1928. *Tachysurus venosus*, Fowler, *Journ. Bomb. Nat. Hist. Soc.* XXXIII, p. 104.  
 1945. *Tachysurus venosus*, Smith, *Freshwater Fishes of Siam*, Bull. U. S. Nat. 188, p. 411.

*Tachysurus sumatranus* is represented by specimens from Andamans and Madras in the collections of the Zoological Survey of India.

### ***Tachysurus tenuispinis* (Day).**

(Pl. II, fig. 8 and Text-fig. 1 b.)

1877. *Arius tenuispinis*, Day, *Fish. India*, p. 466, fig. 5.  
 1889. *Arius tenuispinis*, Day, *Faun. Brit. Ind. Fish.* I, p. 187.

*Tachysurus tenuispinis* is represented by specimens from Puri (Orissa) in the collections of the Zoological Survey of India. I have also examined additional material collected from Bombay.

This is a recently rediscovered species of Day, who described it from a single specimen obtained from Bombay. As the specimen was in a bad state of preservation, his description is inadequate. The author has redescribed the species below from specimens taken from the type locality. Being of large size and occurring in plenty in Bombay, it can be considered an important species economically.

*Tachysurus tenuispinis* is a fairly large sized fish with the characteristic contours of the body of sea catfishes.

The head is dorso-ventrally flattened. Its ventral surface is horizontal while the dorsal slopes down. The length of the head is 2.92 times in the standard length. The height of the head at the occiput (termination of the fontanelle) is 1.86 times and its width is 1.56 times in its length. The snout is very much depressed and angular. The

upper lip is prominent, being produced in front of the lower. The eyes are situated almost on the lower and lateral borders of the head, more towards the anterior half. The diameter of the eye is 7 times the length of the head, 3 times in the length of the snout of 3.43 times in the inter-orbital width. The nostrils are situated almost at the extremity of the snout. The median fontanelle commences at the level of the posterior nares as a narrow well-marked groove, almost reaching to the occipital crest. In the adult specimens, the skin of the head on either side of the fontanelle and behind the eyes is studded with tubercles. These tubercles are sparse in the juvenile fishes. The occipital process is prominent with a crenulated keel and is about four times as long as broad. The width of the mouth equals the distance between the anterior nares and the anterior border of eye. The 3 pairs of barbels are all shorter than the head; the maxillary barbels extend to about  $\frac{3}{4}$  distance in the head, while the outer and inner mandibular both do not reach the gill-membrane. They are narrow fibrous-like filaments tapering to a slender point.

The dorsal fin is situated about midway between the tip of the snout and the adipose fin. The height of the dorsal fin corresponds to the depth of the body. The dorsal spine is as long as the distance of head without snout. It is slender and weak, crenulated on its outer border and serrated on the inner. The basal bone of the dorsal spine is small and V-shaped. The adipose fin is comparatively small and pigmented along the border and is half as long as the anterior dorsal. The pectoral fin also carries a slender spine of more or less the same length as dorsal spine. The spines of the dorsal and pectoral fins give the appearance of attenuation, from which the specific name is derived. The ventral reaches the anal, the caudal is deeply forked.

The premaxillary band of teeth is four times as long as broad and has villiform teeth. The vomerine teeth are absent. The pear-shaped palatine patches are placed far back almost at the posterior extremity of the buccal cavity. The distance between the premaxillary band and the palatine patches is roughly the distance between the anterior nares and the anterior border of the eye. Palatine teeth are globular. Regarding dentition of *T tenuispinis*, Day (*Fish, India*, p. 458) observes "teeth on the palate absent, two pear-shaped globular patches normally" and again on p. 467, "the single specimen procured was not in a good state of preservation, it appears to be distinct *Hemipimelodus*, provided such are not the adult specimens of *Arius* which have lost their palatine teeth, or examples in which such teeth were abnormally deficient during the whole of their existence" From the specimens collected by the author in Bombay, it has been possible to verify this point. *Tachysurus tenuispinis* has the distinctive dentition as described above and since teeth are present on the palate the point raised by Day is no longer tenable and therefore *tenuispinis* does not belong to the genus *Hemipimelodus*.

Day also states "*Arius layardi* Günther from Ceylon, were it not that it has two pear-shaped patches of granular teeth placed far back agrees with the above, but a series of examples is necessary to prove, whether they are identical or not".

A critical examination of the description and figures of *Arius layardi* and the verification of the teeth in *A. tenuispinis* indicate that these two species are most probably identical. However this cannot be confirmed without a study of specimen of *Arius layardi* from Ceylon. Günther commenting on the relationship of *A. layardi* is of opinion that it is closely related to *Arius tenuispinis* and also to *Arius tonggol* and *Arius argylopleuron*, both Malayan species.

The colour of *Tachysurus tenuispinis* is dark grey on the dorsal surface of head and half of the body, merging to silvery grey on the ventral surface. The tips of the dorsal, pectoral and caudal are dark.

*Distribution.*—*Tachysurus tenuispinis* was recorded from Bombay and Ceylon? by Day. The present author has been able to collect three specimens from Bombay recently. Since Day's account has been based on a badly preserved specimen there is no type specimen of *T. tenuispinis* in his collection in the Indian Museum and, therefore, the author's recent collection of *Tachysurus tenuispinis* has been registered in the Indian Museum.

#### Measurements (in Millimetres).

Standard length.	292.0	264.2	138.0
Length of head	100	92.5	44.1
Height of head at occiput (termination of fontanelle).	53.1	48.5	24.5
Width of head . . . . .	64.0	56.2	28.7
Length of snout . . . . .	42.9	37.4	18.3
Diameter of eye . . . . .	14.2	13.7	8.7
Interorbital width . . . . .	48.7	48.2	21.1
Depth of body . . . . .	68.2	54.0	26.0
Length of caudal peduncle . . . . .	44.5	39.5	25.3
Least height of caudal peduncle . . . . .	24.3	22.1	11.8
Longest ray of dorsal	72.1	52.9	33.9
Length of dorsal spine . . . . .	57.7	broken	30.0
Length of pectoral	62.8	40.7	27.5
Length of pectoral spine	60.0	broken	26.1
Length of ventral . . . . .	47.5	38.1	19.9
Longest ray of anal . . . . .	37.1	25.1	18.0
Length of base of anal	43.6	36.5	22.9
Length of base of adipose dorsal . . . . .	14.4	12.8	8.8

#### *Tachysurus thalassinus* (Ruppell).

(Pl. I, fig. 4 and Text-fig. I, a.)

1835. *Bagrus thalassinus*, Rüppell, *Neue Wirebelth Fishche*. p. 75, pl. XX, fig. 2.  
 1864. *Arius thalassinus*, Günther, *Cat. Fish. Brit. Mus.* V, p. 139.  
 1877. *Arius thalassinus*, Day, *Fish. India*, p. 463, pl. civ, fig. 4, and pl. ovi, fig. 1.  
 1889. *Arius thalassinus*, Day, *Faun. Brit. Ind.*, Fish.I., p. 181.  
 1941. *Tachysurus thalassinus*, Fowler, *Bull. U. S. Nat. Mus.* (100) XIII, p. 764.  
 1945. *Tachysurus thalassinus*, Smith, *Bull. U. S. Nat. Mus.* 188, p. 413.  
 1947. *Tachysurus thalassinus*, Misra, *Rec. Ind. Mus.* XLV, p. 125.

*Tachysurus thalassinus* is represented by specimens from Gopalpur and Vizagapatam in the collections of the Zoological Survey of India. Additional material has also been obtained from the Bombay Coast.

The species is found abundantly in Bombay, Bengal and Madras and is important commercially.

### **Tachysurus macracanthus** (Günther).

1864. *Arius macracanthus*, Günther, *Cat. Fish. Brit. Mus.* -, p. 167.

*Tachysurus macracanthus* is represented by specimens from the Bay of Bengal in the collections of the Zoological Survey of India.

### **Tachysurus** sp.

A specimen of *Tachysurus* from Pegu, Burma is present in the collections of the Indian Museum. It has not been possible to specifically determine the specimen and is therefore described here as a doubtful species.

B. VI., P. 1/10., A. 20, V 1/5., C. 17.

*Tachysurus* sp. is about 26.5 cm. long with a disproportionately large head and slender tapering body. The profile of the head is convex, rising gradually from the snout to the beginning of the dorsal spine, from where the trunk begins to narrow towards the caudal end.

The head is longer than broad; its length is contained 3.35 times in the standard length. The height of the head at the occiput is 1.67 and its width 1.34 times in its length. The snout is 2.48 in the length of the head and is broad and flattened. Eyes are rather small and are contained 7 times in the length of the head, 2.84 in the length of the snout and 2.70 in the interorbital width. The nostrils are prominent, the anterior rounded and the posterior with a distinct valve. The dorsal surface of the head has a prominent occipital fontanelle, which commences about the middle of the posterior nares and broadens at the eye and again tapers to a narrow point at the occipital crest. A little behind the broadest part of the fontanelle is a white oval patch. The head shield is prominent and the pattern of the head tubercles is very distinct. The occipital crest is three times as long as broad. The basal bone of the dorsal spine is roughly trough-shaped.

The mouth is moderately large, its gape being equal to the distance between the posterior nares and the posterior border of the eye. There are three pairs of barbels, all shorter than the head; the maxillary barbels extend a little distance beyond the eye, and both the mandibular barbels are still shorter.

The depth of the body is 5.43 times in the standard length. The least height of the caudal peduncle is 2.93 times in its length.

The dorsal fin is situated midway between the snout and the posterior border of the adipose dorsal; its spine is long, thick and strong. The adipose dorsal is comparatively large. The pectoral fins are slightly



longer than the dorsal with a prominent strong spine. The pelvic fins are large and they reach the anal, even overlapping it slightly. The anal fin is fairly long, its rays number twenty.

The premaxillary band of teeth is 5 times as long as broad. The palatine teeth consist of a small patch, about half the diameter of the eye, on each side of the roof of the buccal cavity widely separated from each other, the teeth are small and molariform. The gill-rakers are 23 in number (16+7), and are short, pointed and tooth-like.

The only available alcohol preserved specimen in the collection has a yellowish-brown colour, the upper half of the body more dark than the lower half. The posterior extremity of the dorsal fin, the pectoral fins and anal are darkly pigmented. There is a black blotch on the adipose dorsal.

The specimen is from the collection of Francis Day and is identified by him as *gagora*. A critical examination of the specimen and its comparison with other known species of the genus *Tachysurus* indicate that it cannot be assigned to *gagora*, to which it bears only a superficial resemblance nor to any other previously described species. In the opinion of the author, it is a new species, closely related to *Tachysurus truncatus* Blkr., from which it differs, however, in several features, such as the diameter of the eye, the number of anal rays, the length of the snout and the shape and size of the basal bone of the dorsal fin and the number of gill-rakers. On account of lack of sufficient material, a new name for it is not being proposed at this stage.

*Measurements in Millimetres.*

Standard length	.	264.2
Length of head	.	78.9
Height of head at occiput	. . .	47.1
Width of head	. . .	58.9
Length of snout		31.8
Diameter of eye	.	11.2
Interorbital width	. . .	30.2
Depth of body	. . .	48.6
Length of caudal peduncle	.	48.9
Least height of caudal peduncle	.	16.7
Longest ray of dorsal	. . . .	53.3
Length of dorsal spine	. . . .	52.1
Length of pectoral	. . . .	57.0
Length of pectoral spine	. . . .	60.0
Length of ventral	. . . .	47.2
Longest ray of anal	. . . .	26.6
Length of base of anal	. . . .	36.0
Length of base of adipose dorsal	. . . .	20.0

GEOGRAPHICAL AND ECOLOGICAL DISTRIBUTION OF *Tachysurus*.

The Siluroid fishes constitute a very large and important group in tropical and subtropical regions of the world and are particularly more abundant in South Eastern Asia. Only a small number is represented in the temperate zone. Most of the families of Siluroidea are freshwater inhabitants, living in rivers, ponds and marshes. Only two families, viz., Tachysuridae (Ariidae) and Plotosidae are essentially marine groups and are now adapted for living in shallow waters near the shores. Of these, some members show a tendency to ascend estuaries and rivers, some seem to be more or less permanent inhabitants of the estuaries and a small number has recolonised rivers, which are under tidal influence.

Of the twenty-three species of *Tachysurus* recorded above, the more typical marine ones can be grouped under three categories, according to their range of distribution, as follows:—

- (i) *Species with limited distribution*, restricted to coast of India e.g., *malabaricus*, *parvipinnis*, *tenuispinis*, *serratus* and *nella*.
- (ii) *Species with moderately wide range of distribution*, e.g., *macronotacanthus*, *jella*, *dussumieri* and *platysomus*.
- (iii) *Species enjoying a wide distribution*, e.g., *sagor*, *crossocheilus*, *falcarius*, *coelatus*, *sona*, *thalassinus*, *sumatranus*.

Of these marine forms, *coelatus*, *sagor*, and *sona* are habitual migratory species, ascending estuaries and rivers, as they have been recorded from large rivers under tidal influence, like the Ganga.

Concerning the estuarine forms, *T. arius* is the most typical and is commonly found in the estuaries of rivers like Ganga and Adayar in Madras and also in the Backwaters of Travancore and Cochin. *T. satparanus* is known from the Chilka Lake.

The truly freshwater species are very few, as already pointed out in the introductory remarks regarding distribution. *T. acutirostris burmanicus* and *gagora* stand out as examples, the former two are confined to Burmese rivers and *gagora* is the only Indian freshwater species. It is interesting to note that these fishes are adapted to live in the lower reaches of rivers under tidal influence. Although the ancestry of the Siluroid fishes lies in freshwater, this particular family left its original home and became denizens of the sea, adapting themselves to the marine conditions of life. The few, which have tried to recolonise freshwater, are still physiologically suited to salt water and, therefore, keep themselves within tidal limits.

Catfishes, as a general rule, thrive well in muddy waters. Some information on the bionomics and habitats of the marine catfishes is available from reports of various trawlers which have operated in Indian seas. The Orissa coast and the Gangetic Deltaic area are rich in species of catfishes. The sea-bottom of these two zones is wholly or partly muddy. The Arakan area has a comparatively thin population of catfishes, on account of its sandy bottom. The Bombay Coast is generally good for catfishes, as it is rich in clayey ooze. In Madras, South Canara and Calicut are the most fertile areas for *Tachysurus* while Cape Comorin area, being sandy, is barren.